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No. S 152

STRATEGIC GOODS (CONTROL) ACT
(CHAPTER 300)

STRATEGIC GOODS (CONTROL) ORDER 2010

ARRANGEMENT OF PARAGRAPHS

Paragraph

In exercise of the powers conferred by section 4A(1) of the Strategic Goods (control Act, the Minister for Trade and Industry hereby makes the following Order:

Citation and commencement

1. This Order may be cited as the Strategic Goods (Control Order 2010 and shall come into operation on 1st April 2010.

Strategic goods and strategic goods technology

2. The goods and technology specified in the Schedule shall be strategic goods and strategic goods technology, respectively, for the purposes of the Act.

Revocation

3. The Strategic Goods (Control) Order 2009 (G.N. No. S 115/2009) is revoked.

THE SCHEDULE

Paragraph 2

PART I

DIVISION 1 — Preliminary Provisions

Subdivision () — Subdivision 1 — General Notes

1. Goods (including plant) containing one or more goods set out in Division 2 shall be considered as coming withing the description or descriptions of the second-mentioned goods if the second-mentioned goods are the principal element of the first-mentioned goods and can feasibly be removed or used for other purposes.

2. In determining whether goods are to be considered the principal element of other goods for the purposes of paragraph 1, factors such as the quantity, value and technological know-how involved and other special circumstances which might establish the goods as the principal element of those other goods must be weighed.

3. Goods specified in Division 2 include both new and used goods.

4. Chemicals in Division 2 are listed by name and CAS number. Chemicals of the same structural formula (including hydrates) as chemicals listed in Division 2 are to be considered as coming within the descriptions of the second-mentioned chemicals regardless of name or CAS number. CAS numbers are shown in order to assist in identifying whether a particular chemical or mixture is a chemical within Division 2, irrespective of nomenclature. CAS numbers are not intended to be used as unique identifiers because some forms of the listed chemical have different CAS numbers, and mixtures containing a listed chemical may also have different CAS numbers.

5. Specially formulated pharmaceutical products that contain any item under Category Code ML8 in Division 2 shall not be treated as coming under that Division.

6. An aircraft shall not be treated as coming under Category Code ML10 in Division 2 if it has no item listed in that Division and it is not configured for military use.

Subdivision () — Subdivision 2 — Definitions of Words and Expressions in this Part

7. In this Part, words and expressions in quotation marks (“ ”) take the definitions set out against them in this paragraph:

THE SCHEDULE — *continued*

“adapted for use in war” (ML 7) means any modification or selection (such as altering purity, shelf life, virulence, dissemination characteristics, or resistance to UV radiation) designed to increase the effectiveness in producing casualties in humans or animals, degrading equipment or damaging crops or the environment;

“additives” (ML 8) means substances used in explosive formulations to improve their properties;

“aircraft” (ML 8, 10, 14) means a fixed wing, swivel wing, rotary wing (helicopter), tilt rotor or tilt-wing airborne vehicle;

“automated command and control systems” (ML11) means electronic systems, through which information essential to the effective operation of the grouping, major formation, tactical formation, unit, ship, subunit or weapons under command is entered, processed and transmitted. This is achieved by the use of computer and other specialised hardware designed to support the functions of a military command and control organisation. The main functions of an automated command and control system are: the efficient automated collection, accumulation, storage and processing of information; the display of the situation and the circumstances affecting the preparation and conduct of combat operations; operational and tactical calculations for the allocation of resources among force groupings or elements of the operational order of battle or battle deployment according to the mission or stage of the operation; the preparation of data for appreciation of the situation and decision-making at any point during operation or battle and computer simulation of operations;

“biocatalysts” (ML 7, 22) means “enzymes” for specific chemical or biochemical reactions or other biological compounds which bind to and accelerate the degradation of CW agents;

Technical Note

“enzymes” means “biocatalysts” for specific chemical or biochemical reactions.

“biopolymers” (ML 7, 22) means the following biological macromolecules:

(*a*) Enzymes for specific chemical or biochemical reactions;

(*b*) “Monoclonal, polyclonal or anti-idiotypic antibodies”;

(*c*) Specially designed or specially processed “receptors”;

Technical Notes

1. “Anti-idiotypic antibodies” means antibodies which bind to the specific antigen binding sites of other antibodies;

THE SCHEDULE — *continued*

2. “Monoclonal antibodies” means proteins which bind to one antigenic site and are produced by a single clone of cells;

3. “Polyclonal antibodies” means a mixture of proteins which bind to the specific antigen and are produced by more than one clone of cells;

4. “Receptors” means biological macromolecular structures capable of binding ligands, the binding of which affects physiological functions.

“civil aircraft” (ML 4, 10) means an “aircraft” listed by designation in published airworthiness certification lists by civil aviation authorities to fly commercial and civil internal and external routes or for legitimate civil, private or business use;

“development” (All Categories) has the same meaning as in the Act;

“end-effectors” (ML 17) means grippers, “active tooling units” and any other tooling that is attached to the baseplate on the end of a “robot” manipulator arm;

Technical Note

“Active tooling units” means devices for applying motive power, process energy or sensing to a workpiece.

“energetic materials” (ML 8) means substances or mixtures that react chemically to release energy required for their intended application.

“Explosives”, “pyrotechnics” and “propellants” are subclasses of energetic materials;

“explosives” (ML 8, 18) means solid, liquid or gaseous substances or mixtures of substances which, in their application as primary, booster, or main charges in warheads, demolition and other applications, are required to detonate;

“expression vectors” (ML 7) means carriers (e.g. plasmid and virus) used to introduce genetic material into host cells;

“fibrous or filamentary materials” (ML 13) includes:

(*a*) Continuous monofilaments;

(*b*) Continuous yarns and rovings;

(*c*) Tapes, fabrics, random mats and braids;

(*d*) Chopped fibres, staple fibres and coherent fibre blankets;

(*e*) Whiskers, either monocrystalline or polycrystalline, of any length;

THE SCHEDULE — *continued*

and

(*f*) Aromatic polyamide pulp;

“first generation image intensifier tubes” (ML 15) means electrostatically focused tubes, employing input and output fibre optic or glass face plates, multi-alkali photocathodes (S-20 or S-25), but not microchannel plate amplifiers;

“fuel cell” (ML 17) means an electrochemical device that converts chemical energy directly into Direct Current (DC) electricity by consuming fuel from an external source;

“laser” (ML 9, 19) means an assembly of components which produce both spatially and temporally coherent light that is amplified by stimulated emission of radiation;

“lighter-than-air vehicles” (ML 10) means balloons and airships that rely on hot air or on lighter-than-air gases such as helium or hydrogen for their lift;

“nuclear reactor” (ML 17) includes the items within or attached directly to the reactor vessel, the equipment which controls the level of power in the core, and the components which normally contain or come into direct contact with or control the primary coolant of the reactor core;

“precursors” (ML 8) means speciality chemicals used in the manufacture of “explosives”;

“production” (All Categories) has the same meaning as in the Act;

“propellants” (ML 8) means substances or mixtures that react chemically to produce large volumes of hot gases at controlled rates to perform mechanical work;

“pyrotechnic(s)” (ML 4, 8) means mixtures of solid or liquid fuels and oxidisers which, when ignited, undergo an energetic chemical reaction at a controlled rate intended to produce specific time delays, or quantities of heat, noise, smoke, visible light or infrared radiation. Pyrophorics are a subclass of “pyrotechnics”, which contain no oxidisers but ignite spontaneously on contact with air;

“required” (ML 22), in relation to “technology”, means only that portion of “technology” which is peculiarly responsible for achieving or exceeding the controlled performance levels, characteristics or functions. Such “required” “technology” may be shared by different products;

“riot control agents” (ML 7) means substances which, under the expected conditions of use for riot control purposes, produce rapidly in humans sensory irritation or disabling physical effects which disappear within a

THE SCHEDULE — *continued*

short time following termination of exposure. (Tear gases are a subset of "riot control agents");

"robot" (ML 17) means a manipulation mechanism of the continuous path or the point-to-point variety, may use sensors, and has all the following characteristics:

(*a*) it is multifunctional;

(*b*) it is capable of positioning or orienting material, parts, tools or special devices through variable movements in three dimensional space;

(*c*) it incorporates three or more closed or open loop servo-devices which may include stepping motors; and

(*d*) it has "user-accessible programmability" by means of the teach/playback method or by means of an electronic computer which may be a programmable logic controller, i.e., without mechanical intervention;

Note

"Robot" does not include the following devices:

1. Manipulation mechanisms which are only manually or teleoperator controllable;

2. Fixed sequence manipulation mechanisms which are automated moving devices, operating according to mechanically fixed programmed motions. The programme is mechanically limited by fixed stops such as pins or cams. The sequence of motions and the selection of paths or angles are not variable or changeable by mechanical, electronic or electrical means;

3. Mechanically controlled variable sequence manipulation mechanisms which are automated moving devices, operating according to mechanically fixed programmed motions. The programme is mechanically limited by fixed, but adjustable stops such as pins or cam. The sequence of motions and the selection of paths or angles are variable within the fixed programme pattern. Variations or modifications of the programme pattern (e.g. changes of pins or exchanges of cams) in one or more motion axes are accomplished only through mechanical operations;

4. Non-servo-controlled variable sequence manipulation mechanisms which are automated moving devices, operating according to mechanically fixed programmed motions, where the programme is variable but the sequence proceeds only by the binary signal from mechanically fixed electrical binary devices or adjustable stops;

THE SCHEDULE — *continued*

5. Stacker cranes defined as Cartesian coordinate manipulator systems manufactured as an integral part of a vertical array of storage bins and designed to access the contents of those bins for storage or retrieval.

"software" (All Categories) has the same meaning as in the Act;

"space qualified" (ML 19) means designed, manufactured and tested to meet the special electrical, mechanical or environmental requirements for use in the launch and deployment of satellites or high altitude flight systems operating at altitudes of 100 km or higher;

"superconductive" (ML 20), in relation to any equipment, means the equipment is made of any material (such as a metal, alloy or compound) which can lose all electrical resistance (that is, it can attain infinite electrical conductivity and carry very large electrical currents without Joule heating);

Technical Note

The "superconductive" state of a material is individually characterised by a critical temperature, a critical magnetic field, which is a function of temperature, and a critical current density which is, however, a function of both magnetic field and temperature.

"technology" (All Categories) has the same meaning as in the Act;

"use" (ML 21, 22) has the same meaning as in the Act.

8. In paragraph 7 —

(*a*) a reference to a Category Code (prefixed with the abbreviation "ML") in brackets is a reference to that Category Code in Division 2 in which the defined word or expression appears;

(*b*) a word or expression enclosed with single quotation marks ("") takes the definition set out against it in the Technical Note that follows immediately after the definition in which the word or expression appears.

DIVISION 2 — List of Military Goods

Category Code	*Description of Item*
ML1	Smooth-bore weapons with a calibre of less than 20 mm, other arms and automatic weapons with a calibre of 12.7 mm (calibre 0.50

THE SCHEDULE — *continued*

Category Code	*Description of Item*
	inches) or less and accessories, as follows, and specially designed components therefor:
	a. Rifles, carbines, revolvers, pistols, machine pistols and machine guns; <u>*Note*</u> *Category Code ML1.a. does not apply to the following:* *a. Muskets, rifles and carbines manufactured earlier than 1938;* *b. Reproductions of muskets, rifles and carbines the originals of which were manufactured earlier than 1890;* *c. Revolvers, pistols and machine guns manufactured earlier than 1890, and their reproductions.*
	b. Smooth-bore weapons as follows: 1. Smooth-bore weapons specially designed for military use; 2. Other smooth-bore weapons as follows: a. Fully automatic type weapons; b. Semi-automatic or pump-action type weapons;
	c. Weapons using caseless ammunition;
	d. Silencers, special gun-mountings, clips, weapons sights and flash suppressors for arms specified in Category Code ML1.a., ML1.b. or ML1.c.
	<u>*Note 1*</u> *Category Code ML1 does not apply to smooth-bore weapons used for hunting or sporting purposes unless they are specially designed for military use or of the fully automatic firing type.*
	<u>*Note 2*</u> *Category Code ML1 does not apply to firearms specially designed for dummy ammunition and which are incapable of firing any ammunition specified in Category Code ML3.*
	<u>*Note 3*</u>

THE SCHEDULE — *continued*

Category Code	*Description of Item*
	Category Code ML1 does not apply to weapons using non-centre fire cased ammunition and which are not of the fully automatic firing type.
	Note 4 *Category Code ML1.d. does not apply to optical weapon sights without electronic image processing, with a magnification of 4 times or less, provided they are not specially designed or modified for military use.*
ML2	Smooth-bore weapons with a calibre of 20 mm or more, other weapons or armament with a calibre greater than 12.7 mm (calibre 0.50 inches), projectors and accessories, as follows, and specially designed components therefor:
	a. Guns, howitzers, cannon, mortars, anti-tank weapons, projectile launchers, military flame throwers, rifles, recoilless rifles, smooth-bore weapons and signature reduction devices therefor; *Note 1* *Category Code ML2.a. includes injectors, metering devices, storage tanks and other specially designed components for use with liquid propelling charges for any of the equipment specified in Category Code ML2.a.* *Note 2* *Category Code ML2.a. does not apply to weapons as follows:* *a. Muskets, rifles and carbines manufactured earlier than 1938;* *b. Reproductions of muskets, rifles and carbines the originals of which were manufactured earlier than 1890.* *Note 3* *Category Code ML2.a. does not apply to hand-held projectile launchers specially designed to launch tethered projectiles having no high explosive charge or communications link, to a range of less than or equal to 500 m.*
	b. Smoke, gas and pyrotechnic projectors or generators, specially designed or modified for military use;

THE SCHEDULE — *continued*

Category Code	*Description of Item*
	Note *Category Code ML2.b. does not apply to signal pistols.*
	c. Weapons sights;
	d. Mountings specially designed for the weapons specified in Category Code ML2.a.
ML3	Ammunition and fuze setting devices, as follows, and specially designed components therefor:
	a. Ammunition for the weapons specified in Category Code ML1, ML2 or ML12;
	b. Fuse setting devices specially designed for ammunition specified in Category Code ML3.a.
	Note 1 *Specially designed components specified in Category Code ML3 include:* *a. Metal or plastic fabrications such as primer anvils, bullet cups, cartridge links, rotating bands and munitions metal parts;* *b. Safing and arming devices, fuses, sensors and initiation devices;* *c. Power supplies with high one-time operational output;* *d. Combustible cases for charges;* *e. Submunitions including bomblets, minelets and terminally guided projectiles.* *Note 2* *Category Code ML3.a. does not apply to ammunition crimped without a projectile (blank star) and dummy ammunition with a pierced powder chamber.* *Note 3* *Category Code ML3.a. does not apply to cartridges specially designed for any of the following purposes:* *a. Signalling;*

THE SCHEDULE — *continued*

Category Code	*Description of Item*
	b. Bird scaring; or *c. Lighting of gas flares at oil wells.*
ML4	Bombs, torpedoes, rockets, missiles, other explosive devices and charges and related equipment and accessories, as follows, and specially designed components therefor: ***N.B. 1*** ***For guidance and navigation equipment, see Category Code ML11.*** ***N.B. 2*** ***For Aircraft Missile Protection Systems (AMPS), see Category Code ML4.c.***
	a. Bombs, torpedoes, grenades, smoke canisters, rockets, mines, missiles, depth charges, demolition-charges, demolition-devices, demolition-kits, "pyrotechnic" devices, cartridges and simulators (i.e., equipment simulating the characteristics of any of these items), specially designed for military use; *Note* *Category Code ML4.a. includes:* a. Smoke grenades, fire bombs, incendiary bombs and explosive devices; b. Missile rocket nozzles and re-entry vehicle nosetips.
	b. Equipment having all of the following: 1. Specially designed for military use; and 2. Specially designed for the handling, controlling, activating, powering with one-time operational output, launching, laying, sweeping, discharging, decoying, jamming, detonating, disrupting, disposing or detecting of any of the following: a. Items specified in Category Code ML4.a.; or b. Improvised Explosive Devices (IEDs); *Note 1* *Category Code ML4.b. includes:*

THE SCHEDULE — *continued*

Category Code	*Description of Item*
	a. Mobile gas liquefying equipment capable of producing 1,000 kg or more per day of gas in liquid form; *b. Buoyant electric conducting cable suitable for sweeping magnetic mines.* *<u>Note 2</u>* *Category Code ML4.b. does not apply to hand-held devices limited by design solely to the detection of metal objects and incapable of distinguishing between mines and other metal objects.*
	c. Aircraft Missile Protection Systems (AMPS). *<u>Note</u>* *Category Code ML4.c. does not apply to AMPS having all of the following:* *a. Any of the following missile warning sensors:* *1. Passive sensors having peak response between 100-400 nm; <u>or</u>* *2. Active pulsed Doppler missile warning sensors;* *b. Countermeasures dispensing systems;* *c. Flares, which exhibit both a visible signature and an infrared signature, for decoying surface-to-air missiles; <u>and</u>* *d. Installed on "civil aircraft" and having all of the following:* *1. The AMPS is only operable in a specific "civil aircraft" in which the specific AMPS is installed and for which any of the following has been issued:* *a. A civil Type Certificate; <u>or</u>* *b. An equivalent document recognised by the International Civil Aviation Organisation (ICAO);* *2. The AMPS employs protection to prevent unauthorised access to "software"; <u>and</u>* *3. The AMPS incorporates an active mechanism that forces the system not to function when it is removed from the "civil aircraft" in which it was installed.*

THE SCHEDULE — *continued*

Category Code	*Description of Item*
ML5	Fire control, and related alerting and warning equipment, and related systems, test and alignment and countermeasure equipment, as follows, specially designed for military use, and specially designed components and accessories therefor:
	a. Weapon sights, bombing computers, gun laying equipment and weapon control systems;
	b. Target acquisition, designation, range-finding, surveillance or tracking systems; detection, data fusion, recognition or identification equipment; and sensor integration equipment;
	c. Countermeasure equipment for items specified in Category Code ML5.a. or ML5.b.; *Note* *For the purposes of Category Code ML5.c., countermeasure equipment includes detection equipment.*
	d. Field test or alignment equipment, specially designed for items specified in Category Code ML5.a., ML5.b. or ML5.c.
ML6	Ground vehicles and components, as follows: ***N.B.*** ***For guidance and navigation equipment, see Category Code ML11.***
	a. Ground vehicles and components therefor, specially designed or modified for military use; *Technical Note* *For the purposes of Category Code ML6.a. the term ground vehicles includes trailers.*
	b. All wheel-drive vehicles capable of off-road use which have been manufactured or fitted with materials to provide ballistic protection to level III (NIJ 0108.01, September 1985, or comparable national standard) or better. ***N.B.*** **See also Category Code ML13.a.**
	Note 1 *Category Code ML6.a. includes:*

THE SCHEDULE — *continued*

Category Code	*Description of Item*
	a. Tanks and other military armed vehicles and military vehicles fitted with mountings for arms or equipment for mine laying or the launching of munitions specified in Category Code ML4; *b. Armoured vehicles;* *c. Amphibious and deep water fording vehicles;* *d. Recovery vehicles and vehicles for towing or transporting ammunition or weapon systems and associated load handling equipment.* *Note 2* *Under Category Code ML6.a., modification of a ground vehicle for military use entails a structural, electrical or mechanical change involving one or more components that are specially designed for military use. Such components include:* *a. Pneumatic tyre casings of a kind specially designed to be bullet-proof or to run when deflated;* *b. Armoured protection of vital parts, (e.g., fuel tanks or vehicle cabs);* *c. Special reinforcements or mountings for weapons;* *d. Black-out lighting.* *Note 3* *Category Code ML6 does not apply to civil automobiles, or trucks designed or modified for transporting money or valuables, having armoured or ballistic protection.*
ML7	Chemical or biological toxic agents, “riot control agents”, radioactive materials, related equipment, components and materials, as follows:
	a. Biological agents and radioactive materials “adapted for use in war” to produce casualties in humans or animals, degrade equipment or damage crops or the environment;
	b. Chemical warfare (CW) agents including: 1. CW nerve agents:

THE SCHEDULE — *continued*

Category Code	*Description of Item*
	a. O-Alkyl (equal to or less than C_{10}, including cycloalkyl) alkyl (Methyl, Ethyl, n-Propyl or Isopropyl)-phosphonofluoridates, such as: Sarin (GB):O-Isopropyl methylphosphonofluoridate (107-44-8); and Soman (GD):O-Pinacolyl methylphosphonofluoridate (96-64-0); b. O-Alkyl (equal to or less than C_{10}, including cycloalkyl) N,N-dialkyl (Methyl, Ethyl, n-Propyl or Isopropyl) phosphoramidocyanidates, such as: Tabun (GA):O-Ethyl N,N-dimethylphosphoramidocyanidate (77-81-6); c. O-Alkyl (H or equal to or less than C_{10}, including cycloalkyl) S-2-dialkyl (Methyl, Ethyl, n-Propyl or Isopropyl)-aminoethyl alkyl (Methyl, Ethyl, n-Propyl or Isopropyl) phosphonothiolates and corresponding alkylated and protonated salts, such as: VX: O-Ethyl S-2-diisopropylaminoethyl methyl phosphonothiolate (50782-69-9); 2. CW vesicant agents: a. Sulphur mustards, such as: 1. 2-Chloroethylchloromethylsulphide (2625-76-5); 2. Bis(2-chloroethyl) sulphide (505-60-2); 3. Bis(2-chloroethylthio) methane (63869-13-6); 4. 1,2-bis (2-chloroethylthio) ethane (3563-36-8); 5. 1,3-bis (2-chloroethylthio) -n-propane (63905-10-2); 6. 1,4-bis (2-chloroethylthio) -n-butane (142868-93-7) ; 7. 1,5-bis (2-chloroethylthio) -n-pentane (142868-94-8); 8. Bis (2-chloroethylthiomethyl) ether (63918-90-1); 9. Bis (2-chloroethylthioethyl) ether (63918-89-8); b. Lewisites, such as:

THE SCHEDULE — *continued*

Category Code	*Description of Item*
	1. 2-chlorovinyldichloroarsine (541-25-3); 2. Tris (2-chlorovinyl) arsine (40334-70-1); 3. Bis (2-chlorovinyl) chloroarsine (40334-69-8); c. Nitrogen mustards, such as: 1. HN1: bis (2-chloroethyl) ethylamine (538-07-8); 2. HN2: bis (2-chloroethyl) methylamine (51-75-2); 3. HN3: tris (2-chloroethyl) amine (555-77-1); 3. CW incapacitating agents, such as: a. 3-Quinuclidinyl benzilate (BZ) (6581-06-2); 4. CW defoliants, such as a. Butyl 2-chloro-4-fluorophenoxyacetate (LNF); b. 2,4,5-trichlorophenoxyacetic acid (93-76-5) mixed with 2,4-dichlorophenoxyacetic acid (94-75-7) (Agent Orange (39277-47-9));
	c. CW binary precursors and key precursors, as follows: 1. Alkyl (Methyl, Ethyl, n-Propyl or Isopropyl) Phosphonyl Difluorides, such as: DF: Methyl Phosphonyldifluoride (676-99-3); 2. O-Alkyl (H or equal to or less than C_{10}, including cycloalkyl) O-2-dialkyl (Methyl, Ethyl, n-Propyl or Isopropyl) aminoethyl alkyl (Methyl, Ethyl, n-Propyl or Isopropyl) phosphonites and corresponding alkylated and protonated salts, such as: QL: O-Ethyl-2-di-isopropylaminoethyl methylphosphonite (57856-11-8); 3. Chlorosarin: O-Isopropyl methylphosphonochloridate (1445-76-7); 4. Chlorosoman: O-Pinacolyl methylphosphonochloridate (7040-57-5);
	d. “Riot control agents”, active constituent chemicals and combinations thereof, including:

THE SCHEDULE — *continued*

Category Code	*Description of Item*
	1. α-Bromobenzeneacetonitrile, (Bromobenzyl cyanide) (CA) (5798-79-8); 2. [(2-chlorophenyl) methylene] propanedinitrile, (o-Chlorobenzylidenemalononitrile) (CS) (2698-41-1); 3. 2-Chloro-1-phenylethanone, Phenylacyl chloride (w-chloroacetophenone) (CN) (532-27-4); 4. Dibenz-(b,f)-1,4-oxazephine, (CR) (257-07-8); 5. 10-Chloro-5,10-dihydrophenarsazine, (Phenarsazine chloride), (Adamsite), (DM) (578-94-9); 6. N-Nonanoylmorpholine, (MPA) (5299-64-9); <u>*Note 1*</u> *Category Code ML7.d. does not apply to "riot control agents" individually packaged for personal self defence purposes.* <u>*Note 2*</u> *Category Code ML7.d. does not apply to active constituent chemicals, and combinations thereof, identified and packaged for food production or medical purposes.*
	e. Equipment, specially designed or modified for military use, designed or modified for the dissemination of any of the following, and specially designed components therefor: 1. Materials or agents under Category Code ML7.a., ML7.b. or ML7.d.; <u>or</u> 2. CW agents made up of precursors specified in Category Code ML7.c.;
	f. Protective and decontamination equipment, specially designed or modified for military use, components and chemical mixtures, as follows: 1. Equipment designed or modified for defence against materials specified in Category Code ML7.a., ML7.b. or ML7.d., and specially designed components therefor; 2. Equipment designed or modified for decontamination of objects contaminated with materials specified in Category

THE SCHEDULE — *continued*

Category Code	*Description of Item*
	Code ML7.a. or ML7.b., and specially designed components therefor; 3. Chemical mixtures specially developed or formulated for the decontamination of objects contaminated with materials specified in Category Code ML7.a. or ML7.b.; <u>*Note*</u> *Category Code ML7.f.1. includes:* *a. Air conditioning units specially designed or modified for nuclear, biological or chemical filtration;* *b. Protective clothing.* ***<u>N.B.</u>*** ***For civil gas masks, protective and decontamination equipment, see also Category Code 1A004 in Division 2 of Part II of this Schedule.***
	g. Equipment, specially designed or modified for military use designed or modified for the detection or identification of materials specified in Category Code ML7.a., ML7.b. or ML7.d., and specially designed components therefor; <u>*Note*</u> *Category Code ML7.g. does not apply to personal radiation monitoring dosimeters.* ***N.B.*** ***See also Category Code 1A004 in Division 2 of Part II of this Schedule.***
	h. "Biopolymers" specially designed or processed for the detection or identification of CW agents specified in Category Code ML7.b., and the cultures of specific cells used to produce them;
	i. "Biocatalysts" for the decontamination or degradation of CW agents, and biological systems therefor, as follows:
	1. "Biocatalysts" specially designed for the decontamination or degradation of CW agents specified in Category Code

THE SCHEDULE — *continued*

Category Code	*Description of Item*
	ML7.b. resulting from directed laboratory selection or genetic manipulation of biological systems;
	2. Biological systems as follows: "expression vectors", viruses or cultures of cells, containing the genetic information specific to the production of "biocatalysts" specified in Category Code ML7.i.1.
	<u>*Note 1*</u> *Category Codes ML7.b. and ML7.d. do not apply to the following:* *a. Cyanogen chloride (506-77-4);* *b. Hydrocyanic acid (74-90-8);* *c. Chlorine (7782-50-5);* *d. Carbonyl chloride (phosgene) (75-44-5);* *e. Diphosgene (trichloromethyl-chloroformate) (503-38-8);* *f. Not used ;* *g. Xylyl bromide, ortho: (89-92-9), meta: (620-13-3), para: (104-81-4);* *h. Benzyl bromide (100-39-0);* *i. Benzyl iodide (620-05-3);* *j. Bromo acetone (598-31-2);* *k. Cyanogen bromide (506-68-3);* *l. Bromo methylethylketone (816-40-0);* *m. Chloro acetone (78-95-5);* *n. Ethyl iodoacetate (623-48-3);* *o. Iodo acetone (3019-04-3);* *p. Chloropicrin (76-06-2).* <u>*Note 2*</u> *The cultures of cells and biological systems specified in Category Codes ML7.h. and ML7.i.2. are exclusive and these sub-items do not apply to cells or biological systems for civil purposes, such as*

THE SCHEDULE — *continued*

Category Code	*Description of Item*
	agricultural, pharmaceutical, medical, veterinary, environmental, waste management, or in the food industry.
ML8	"Energetic materials" and related substances, as follows: ***N.B. 1*** ***See also Category Codes 1C011 in Division 2 of Part II of this Schedule.*** ***N.B. 2*** ***For charges and devices, see Category Code ML4 and Category Code 1A008 in Division 2 of Part II of this Schedule.*** *Technical Notes* *1. For the purposes of Category Code ML8, mixture refers to a composition of two or more substances with at least one substance being listed in the sub-items under this Category Code.* *2. Any substance listed in the sub-items under Category Code ML8 is treated as coming within the description of that substance even when utilised in an application other than that indicated. (e.g., TAGN is predominantly used as an explosive but can also be used either as a fuel or an oxidiser.)*
	a. "Explosives" as follows, and mixtures thereof: 1. ADNBF (aminodinitrobenzofuroxan or 7-amino-4,6-dinitrobenzofurazane-1-oxide) (97096-78-1); 2. BNCP (cis-bis (5-nitrotetrazolato) tetra amine-cobalt (III) perchlorate) (117412-28-9); 3. CL-14 (diamino dinitrobenzofuroxan or 5,7-diamino-4,6-dinitrobenzofurazane-1-oxide) (117907-74-1); 4. CL-20 (HNIW or Hexanitrohexaazaisowurtzitane) (135285-90-4); chlathrates of CL-20 **(see also Category Codes ML8.g.3. and g.4. for its "precursors")**; 5. CP (2-(5-cyanotetrazolato) penta amine-cobalt (III) perchlorate) (70247-32-4); 6. DADE (1,1-diamino-2,2-dinitroethylene, FOX7) (145250-81-3);

THE SCHEDULE — *continued*

Category Code	*Description of Item*
	7. DATB (diaminotrinitrobenzene) (1630-08-6); 8. DDFP (1,4-dinitrodifurazanopiperazine); 9. DDPO (2,6-diamino-3,5-dinitropyrazine-1-oxide, PZO) (194486-77-6); 10. DIPAM (3,3'-diamino-2,2',4,4',6,6'-hexanitrobiphenyl or dipicramide) (17215-44-0); 11. DNGU (DINGU or dinitroglycoluril) (55510-04-8); 12. Furazans as follows: a. DAAOF (diaminoazoxyfurazan); b. DAAzF (diaminoazofurazan) (78644-90-3); 13. HMX and derivatives **(see also Category Code ML8.g.5. for its "precursors")**, as follows: a. HMX (Cyclotetramethylenetetranitramine, octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazine, 1,3,5,7-tetranitro-1,3,5,7-tetraza-cyclooctane, octogen or octogene) (2691-41-0); b. Difluoroaminated analogs of HMX; c. K-55 (2,4,6,8-tetranitro-2,4,6,8-tetraazabicyclo [3,3,0]-octanone-3, tetranitrosemiglycouril or keto-bicyclic HMX) (130256-72-3); 14. HNAD (hexanitroadamantane) (143850-71-9); 15. HHNS (hexanitrostilbene) (20062-22-0); 16. Imidazoles as follows: a. BNNII (Octahydro-2,5-bis(nitroimino)imidazo [4,5-d] imidazole); b. DNI (2,4-dinitroimidazole) (5213-49-0); c. FDIA (1-fluoro-2,4-dinitroimidazole); d. NTDNIA (N-(2-nitrotriazolo)-2,4-dinitroimidazole); e. PTIA (1-picryl-2,4,5-trinitroimidazole);

THE SCHEDULE — *continued*

Category Code	*Description of Item*
	17. NTNMH (1-(2-nitrotriazolo)-2-dinitromethylene hydrazine); 18. NTO (ONTA or 3-nitro-1,2,4-triazol-5-one) (932-64-9); 19. Polynitrocubanes with more than four nitro groups; 20. PYX (2,6-Bis(picrylamino)-3,5-dinitropyridine) (38082-89-2); 21. RDX and derivatives, as follows: a. RDX (cyclotrimethylenetrinitramine, cyclonite, T4, hexahydro-1,3,5-trinitro-1,3,5-triazine, 1,3,5-trinitro-1,3,5-triaza-cyclohexane, hexogen or hexogene) (121-82-4); b. Keto-RDX (K-6 or 2,4,6-trinitro-2,4,6-triazacyclohexanone) (115029-35-1); 22. TAGN (triaminoguanidinenitrate) (4000-16-2); 23. TATB (triaminotrinitrobenzene) (3058-38-6) **(see also Category Code ML8.g.7 for its "precursors")**; 24. TEDDZ (3,3,7,7-tetrabis(difluoroamine) octahydro-1,5-dinitro-1,5-diazocine); 25. Tetrazoles as follows: a. NTAT (nitrotriazol aminotetrazole); b. NTNT (1-N-(2-nitrotriazolo)-4-nitrotetrazole); 26. Tetryl (trinitrophenylmethylnitramine) (479-45-8); 27. TNAD (1,4,5,8-tetranitro-1,4,5,8-tetraazadecalin) (135877-16-6) **(see also Category Code ML8.g.6. for its "precursors")**; 28. TNAZ (1,3,3-trinitroazetidine) (97645-24-4) **(see also Category Code ML8.g.2. for its "precursors")**; 29. TNGU (SORGUYL or tetranitroglycoluril) (55510-03-7); 30. TNP (1,4,5,8-tetranitro-pyridazino[4,5-d]pyridazine) (229176-04-9); 31. Triazines as follows:

THE SCHEDULE — *continued*

Category Code	*Description of Item*
	a. DNAM (2-oxy-4,6-dinitroamino-s-triazine) (19899-80-0); b. NNHT (2-nitroimino-5-nitro-hexahydro-1,3,5-triazine) (130400-13-4); 32. Triazoles as follows: a. 5-azido-2-nitrotriazole; b. ADHTDN (4-amino-3,5-dihydrazino-1,2,4-triazole dinitramide) (1614-08-0); c. ADNT (1-amino-3,5-dinitro-1,2,4-triazole); d. BDNTA ([bis-dinitrotriazole]amine); e. DBT (3,3'-dinitro-5,5-bi-1,2,4-triazole) (30003-46-4); f. DNBT (dinitrobistriazole) (70890-46-9); g. NTDNA (2-nitrotriazole 5-dinitramide) (75393-84-9); h. NTDNT (1-N-(2-nitrotriazolo) 3,5-dinitrotriazole); i. PDNT (1-picryl-3,5-dinitrotriazole); j. TACOT (tetranitrobenzotriazolobenzotriazole) (25243-36-1); 33. Explosives not listed elsewhere in Category Code ML8.a. and having any of the following: a. Detonation velocity exceeding 8,700 m/s, at maximum density, or b. Detonation pressure exceeding 34 GPa (340 kbar); 34. Organic explosives not listed elsewhere in Category Code ML8.a. and having all of the following: a. Yielding detonation pressures of 25 GPa (250 kbar) or more; and b. Remaining stable at temperatures of 523K (250°C) or higher, for periods of 5 minutes or longer;
	b. “Propellants”, as follows: 1. Any United Nations (UN) Class 1.1 solid “propellant” with a theoretical specific impulse (under standard conditions) of

THE SCHEDULE — *continued*

Category Code	*Description of Item*
	more than 250 seconds for non-metallised, or more than 270 seconds for aluminised compositions; 2. Any UN Class 1.3 solid "propellant" with a theoretical specific impulse (under standard conditions) of more than 230 seconds for non-halogenised, 250 seconds for non-metallised compositions and 266 seconds for metallised compositions; 3. "Propellants" having a force constant of more than 1,200 kJ/kg; 4. "Propellants" that can sustain a steady-state linear burning rate of more than 38 mm/s under standard conditions (as measured in the form of an inhibited single strand) of 6.89 MPa (68.9 bar) pressure and 294K (21°C); 5. Elastomer Modified Cast Double Base (EMCDB) "propellants" with extensibility at maximum stress of more than 5% at 233K (-40°C); 6. Any "propellant" containing substances specified in Category Code ML8.a; 7. "Propellants", not specified elsewhere in any part of this Division, specially designed for military use;
	c. "Pyrotechnics", fuels and related substances, as follows, and mixtures thereof: 1. Aircraft fuels specially formulated for military purposes; 2. Alane (aluminium hydride) (7784-21-6); 3. Carboranes; decaborane (17702-41-9); pentaboranes (19624-22-7 and 18433-84-6) and their derivatives; 4. Hydrazine and derivatives, as follows **(see also Category Codes ML8.d.8. and d.9. for oxidising hydrazine derivatives)**: a. Hydrazine (302-01-2) in concentrations of 70% or more; b. Monomethyl hydrazine (60-34-4); c. Symmetrical dimethyl hydrazine (540-73-8); d. Unsymmetrical dimethyl hydrazine (57-14-7);

THE SCHEDULE — *continued*

Category Code	*Description of Item*
	5. Metal fuels in particle form whether spherical, atomised, spheroidal, flaked or ground, manufactured from material consisting of 99% or more of any of the following: a. Metals as follows and mixtures thereof: 1. Beryllium (7440-41-7) in particle sizes of less than 60 µm; 2. Iron powder (7439-89-6) with particle size of 3 µm or less produced by reduction of iron oxide with hydrogen; b. Mixtures containing any of the following: 1. Zirconium (7440-67-7), magnesium (7439-95-4) or alloys of these in particle sizes of less than 60 µm; <u>or</u> 2. Boron (7440-42-8) or boron carbide (12069-32-8) fuels of 85% purity or higher and particle sizes of less than 60 µm; 6. Military materials, containing thickeners for hydrocarbon fuels, specially formulated for use in flame throwers or incendiary munitions, such as metal stearates or palmates (e.g. octal (637-12-7)) and M1, M2, and M3 thickeners; 7. Perchlorates, chlorates and chromates composited with powdered metal or other high energy fuel components; 8. Spherical aluminium powder (7429-90-5) with a particle size of 60 µm or less, manufactured from material with an aluminium content of 99% or more; 9. Titanium subhydride (TiH_n) of stoichiometry equivalent to n= 0.65-1.68; <u>*Note 1*</u> *Aircraft fuels specified in Category Code ML8.c.1. are finished products, not their constituents.* <u>*Note 2*</u> *Category Code ML8.c.4.a. does not apply to hydrazine 'mixtures' specially formulated for corrosion control.* <u>*Note 3*</u>

THE SCHEDULE — *continued*

Category Code	*Description of Item*
	Category Code ML8.c.5. applies to explosives and fuels, whether or not the metals or alloys are encapsulated in aluminium, magnesium, zirconium, or beryllium. *Note 4* *Category Code ML8.c.5.b.2. does not apply to boron and boron carbide enriched with boron-10 (20% or more of total boron-10 content).*
	d. Oxidisers as follows, and mixtures thereof: 1. ADN (ammonium dinitramide or SR 12) (140456-78-6); 2. AP (ammonium perchlorate) (7790-98-9); 3. Compounds composed of fluorine and any of the following: a. Other halogens; b. Oxygen; or c. Nitrogen; *Note 1* *Category Code ML8.d.3 does not apply to chlorine trifluoride (7790-91-2).* *Note 2* *Category Code ML8.d.3 does not apply to nitrogen trifluoride (7783-54-2) in its gaseous state.* 4. DNAD (1,3-dinitro-1,3-diazetidine) (78246-06-7); 5. HAN (hydroxylammonium nitrate) (13465-08-2); 6. HAP (hydroxylammonium perchlorate) (15588-62-2); 7. HNF (hydrazinium nitroformate) (20773-28-8); 8. Hydrazine nitrate (37836-27-4); 9. Hydrazine perchlorate (27978-54-7); 10. Liquid oxidisers comprised of or containing inhibited red fuming nitric acid (IRFNA) (8007-58-7); *Note*

THE SCHEDULE — *continued*

Category Code	*Description of Item*
	Category Code ML8.d.10. does not apply to non-inhibited fuming nitric acid.
	e. Binders, plasticisers, monomers and polymers, as follows: 1. AMMO (azidomethylmethyloxetane and its polymers) (90683-29-7) **(see also Category Code ML8.g.1. for its "precursors")**; 2. BAMO (bisazidomethyloxetane and its polymers) (17607-20-4) **(see also Category Code ML8.g.1. for its "precursors")**; 3. BDNPA (bis (2,2-dinitropropyl)acetal) (5108-69-0); 4. BDNPF (bis (2,2-dinitropropyl)formal) (5917-61-3); 5. BTTN (butanetrioltrinitrate) (6659-60-5) **(see also Category Code ML8.g.8. for its "precursors")**; 6. Energetic monomers, plasticisers or polymers, specially formulated for military use and containing any of the following: a. Nitro groups b. Azido groups; c. Nitrate groups; d. Nitraza groups; <u>or</u> e. Difluoroamino groups; 7. FAMAO (3-difluoroaminomethyl-3-azidomethyl oxetane) and its polymers; 8. FEFO (bis-(2-fluoro-2,2-dinitroethyl) formal) (17003-79-1); 9. FPF-1 (poly-2,2,3,3,4,4-hexafluoropentane-1,5-diol formal) (376-90-9); 10. FPF-3 (poly-2,4,4,5,5,6,6-heptafluoro-2-tri-fluoromethyl-3- oxaheptane-1,7-diol formal); 11. GAP (glycidylazide polymer) (143178-24-9) and its derivatives;

THE SCHEDULE — *continued*

Category Code	*Description of Item*
	12. HTPB (hydroxyl terminated polybutadiene) with a hydroxyl functionality equal to or greater than 2.2 and less than or equal to 2.4, a hydroxyl value of less than 0.77 meq/g, and a viscosity at 30°C of less than 47 poise (69102-90-5); 13. Alcohol functionalised, poly(epichlorohydrin) with a molecular weight of less than 10,000, as follows: a. Poly(epichlorohydrindiol); b. Poly(epichlorohydrintriol). 14. NENAs (nitratoethylnitramine compounds) (17096-47-8, 85068-73-1, 82486-83-7, 82486-82-6 and 85954-06-9); 15. PGN (poly-GLYN, polyglycidylnitrate or poly(nitratomethyl oxirane) (27814-48-8); 16. Poly-NIMMO (poly nitratomethylmethyloxetane) or poly-NMMO (poly[3-Nitratomethyl-3-methyloxetane]) (84051-81-0); 17. Polynitroorthocarbonates; 18. TVOPA (1,2,3-tris[1,2-bis(difluoroamino)ethoxy] propane or tris vinoxy propane adduct) (53159-39-0);
	f. "Additives" as follows: 1. Basic copper salicylate (62320-94-9); 2. BHEGA (bis-(2-hydroxyethyl) glycolamide) (17409-41-5); 3. BNO (butadienenitrileoxide) (9003-18-3); 4. Ferrocene derivatives, as follows: a. Butacene (125856-62-4); b. Catocene (2,2-bis-ethylferrocenyl propane) (37206-42-1); c. Ferrocene carboxylic acids; d. n-butyl-ferrocene (31904-29-7); e. Other adducted polymer ferrocene derivatives; 5. Lead beta-resorcylate (20936-32-7); 6. Lead citrate (14450-60-3);

THE SCHEDULE — *continued*

Category Code	*Description of Item*
	7. Lead-copper chelates of beta-resorcylate or salicylates (68411-07-4); 8. Lead maleate (19136-34-6); 9. Lead salicylate (15748-73-9); 10. Lead stannate (12036-31-6); 11. MAPO (tris-1-(2-methyl)aziridinyl phosphine oxide) (57-39-6); BOBBA 8 (bis(2-methyl aziridinyl) 2-(2-hydroxypropanoxy) propylamino phosphine oxide); and other MAPO derivatives; 12. Methyl BAPO (bis(2-methyl aziridinyl) methylamino phosphine oxide) (85068-72-0); 13. N-methyl-p-nitroaniline (100-15-2); 14. 3-Nitraza-1,5-pentane diisocyanate (7406-61-9); 15. Organo-metallic coupling agents as follows: a. Neopentyl[diallyl]oxy, tri[dioctyl]phosphato-titanate (103850-22-2); also known as titanium IV, 2,2[bis 2-propenolato-methyl, butanolato, tris (dioctyl) phosphato] (110438-25-0); or LICA 12 (103850-22-2); b. Titanium IV, [(2-propenolato-1) methyl, n-propanolatomethyl] butanolato-1, tris[dioctyl] pyrophosphate or KR3538; c. Titanium IV, [(2-propenolato-1)methyl, n-propanolatomethyl] butanolato-1, tris(dioctyl)phosphate; 16. Polycyanodifluoroaminoethyleneoxide; 17. Polyfunctional aziridine amides with isophthalic, trimesic (BITA or butylene imine trimesamide), isocyanuric or trimethyladipic backbone structures and 2-methyl or 2-ethyl substitutions on the aziridine ring; 18. Propyleneimine (2-methylaziridine) (75-55-8); 19. Superfine iron oxide (Fe_2O_3) (1317-60-8) with a specific surface area more than 250 m^2/g and an average particle size of 3.0 nm or less;

THE SCHEDULE — *continued*

Category Code	*Description of Item*
	20. TEPAN (tetraethylenepentaamineacrylonitrile) (68412-45-3); cyanoethylated polyamines and their salts; 21. TEPANOL (tetraethylenepentaamineacrylonitrileglycidol) (68412-46-4); cyanoethylated polyamines adducted with glycidol and their salts; 22. TPB (triphenyl bismuth) (603-33-8);
	g. "Precursors" as follows: *N.B.* *The references in Category Code ML8.g. are specified "energetic materials" manufactured from these substances.* 1. BCMO (bischloromethyloxetane) (142173-26-0) **(see also Category Code ML8.e.1. and e.2.)**; 2. Dinitroazetidine-t-butyl salt (125735-38-8) **(see also Category Code ML8.a.28.)**; 3. HBIW (hexabenzylhexaazaisowurtzitane) (124782-15-6) **(see also Category Code ML8.a.4.)**; 4. TAIW (tetraacetyldibenzylhexaazaisowurtzitane) **(see also Category Code ML8.a.4.)** (182763-60-6); 5. TAT (1,3,5,7 tetraacetyl-1,3,5,7,-tetraaza cyclo-octane) (41378-98-7) **(see also Category Code ML8.a.13.)**; 6. 1,4,5,8-tetraazadecalin (5409-42-7) **(see also Category Code ML8.a.27.)**; 7. 1,3,5-trichlorobenzene (108-70-3) **(see also Category Code ML8.a.23.)**; 8. 1,2,4-trihydroxybutane (1,2,4-butanetriol) (3068-00-6) **(see also Category Code ML8.e.5.)**.
	Note 1 *Not used.* *Note 2* *Category Code ML8. does not apply to the following substances unless they are compounded or mixed with the "energetic material"*

THE SCHEDULE — *continued*

Category Code	*Description of Item*
	specified in Category Code ML8.a. or powdered metals specified in Category Code ML8.c.: *a. Ammonium picrate (131-74-8);* *b. Black powder;* *c. Hexanitrodiphenylamine (131-73-7);* *d. Difluoroamine (10405-27-3);* *e. Nitrostarch (9056-38-6);* *f. Potassium nitrate (7757-79-1);* *g. Tetranitronaphthalene;* *h. Trinitroanisol;* *i. Trinitronaphthalene;* *j. Trinitroxylene;* *k. N-pyrrolidinone; 1-methyl-2-pyrrolidinone (872-50-4);* *l. Dioctylmaleate (142-16-5);* *m. Ethylhexylacrylate (103-11-7);* *n. Triethylaluminium (TEA) (97-93-8), trimethylaluminium (TMA) (75-24-1), and other pyrophoric metal alkyls and aryls of lithium, sodium, magnesium, zinc or boron;* *o. Nitrocelluose (9004-70-0);* *p. Nitroglycerin (or glyceroltrinitrate, trinitroglycerine) (NG) (55-63-0);* *q. 2,4,6-trinitrotoluene (TNT) (118-96-7);* *r. Ethylenediaminedinitrate (EDDN) (20829-66-7);* *s. Pentaerythritoltetranitrate (PETN) (78-11-5);* *t. Lead azide (13424-46-9), normal lead styphnate (15245-44-0) and basic lead styphnate (12403-82-6), and primary explosives or priming compositions containing azides or azide complexes;* *u. Triethyleneglycoldinitrate (TEGDN) (111-22-8);* *v. 2,4,6-trinitroresorcinol (styphnic acid) (82-71-3);*

THE SCHEDULE — *continued*

Category Code	*Description of Item*
	w. Diethyldiphenylurea; (85-98-3); dimethyldiphenylurea; (611-92-7); methylethyldiphenylurea; [Centralites]; *x. N,N-diphenylurea (unsymmetrical diphenylurea)(603-54-3);* *y. Methyl-N,N-diphenylurea (methyl unsymmetrical diphenylurea) (13114-72-2);* *z. Ethyl-N,N-diphenylurea (ethyl unsymmetrical diphenylurea)(64544-71-4);* *aa. 2-Nitrodiphenylamine (2-NDPA) (119-75-5);* *bb. 4-Nitrodiphenylamine (4-NDPA) (836-30-6);* *cc. 2,2-dinitropropanol (918-52-5);* *Nitroguanidine (556-88-7)* ***(see Category Code 1C011.d. in Division 2 of Part II of this Schedule)****.*
ML9	Vessels of war (surface or underwater), special naval equipment, accessories, components and other surface vessels, as follows: ***N.B.*** ***For guidance and navigation equipment, see Category Code ML11.***
	a. Vessels and components, as follows: 1. Vessels (surface or underwater) specially designed or modified for military use, regardless of current state of repair or operating condition, and whether or not they contain weapon delivery systems or armour, and hulls or parts of hulls for such vessels, and components therefor specially designed for military use; 2. Surface vessels, other than those specified in Category Code ML9.a.1., having any of the following, fixed or integrated into the vessel: a. Automatic weapons having a calibre of 12.7 mm or greater specified in Category Code ML1., or weapons specified in Category Code ML2., ML4., ML12. or ML19., or ‘mountings’ or hard points for such weapons; *Technical Note*

THE SCHEDULE — *continued*

Category Code	*Description of Item*
	'Mountings' refers to weapon mounts or structural strengthening for the purpose of installing weapons. b. Fire control systems specified in Category Code ML5.; c. Having all of the following: 1. 'Chemical, Biological, Radiological and Nuclear (CBRN) protection'; <u>and</u> 2. 'Pre-wet or wash down system' designed for decontamination purposes; <u>or</u> <u>*Technical Notes*</u> *1. 'CBRN protection' is a self contained interior space containing features such as over-pressurisation, isolation of ventilation systems, limited ventilation openings with CBRN filters and limited personnel access points incorporating air-locks.* *2. 'Pre-wet or wash down system' is a seawater spray system capable of simultaneously wetting the exterior superstructure and decks of a vessels.* d. Active weapon countermeasure systems specified in Category Code ML4.b., ML5.c. or ML11.a. and having any of the following: 1. 'CBRN protection'; 2. Hull and superstructure, specially designed to reduce the radar cross section; 3. Thermal signature reduction devices, (e.g., an exhaust gas cooling system), excluding those specially designed to increase overall power plant efficiency or to reduce the environmental impact; <u>or</u> 4. A degaussing system designed to reduce the magnetic signature of the whole vessel;
	b. Engines and propulsion systems, as follows, specially designed for military use and components therefor specially designed for military use:

THE SCHEDULE — *continued*

Category Code	*Description of Item*
	1. Diesel engines specially designed for submarines and having all of the following: a. Power output of 1.12 MW (1,500 hp) or more; <u>and</u> b. Rotary speed of 700 rpm or more; 2. Electric motors specially designed for submarines and having all of the following: a. Power output of more than 0.75 MW (1,000 hp); b. Quick reversing; c. Liquid cooled; <u>and</u> d. Totally enclosed; 3. Non-magnetic diesel engines having all of the following: a. Power output of 37.3 kW (50 hp) or more; <u>and</u> b. Non-magnetic content in excess of 75% of total mass; 4. ‘Air Independent Propulsion’ (AIP) systems specially designed for submarines; <u>*Technical Note*</u> *‘Air Independent Propulsion’ (AIP) allows a submerged submarine to operate its propulsion system, without access to atmospheric oxygen, for a longer time than the batteries would have otherwise allowed. For the purpose of Category Code ML9.b.4., AIP does not include nuclear power.*
	c. Underwater detection devices, specially designed for military use, controls therefor and components therefor specially designed for military use;
	d. Anti-submarine nets and anti-torpedo nets, specially designed for military use;
	e. Not used;
	f. Hull penetrators and connectors, specially designed for military use, that enable interaction with equipment external to a vessel, and components therefor specially designed for military use; <u>*Note*</u>

THE SCHEDULE — *continued*

Category Code	*Description of Item*
	Category Code ML9.f. includes connectors for vessels which are of the single-conductor, multi-conductor, coaxial or waveguide type, and hull penetrators for vessels, both of which are capable of remaining impervious to leakage from without and of retaining required characteristics at marine depths exceeding 100 m; and fibre-optic connectors, and optical hull penetrators, specially designed for "laser" beam transmission, regardless of depth. Category Code ML9.f. does not apply to ordinary propulsive shaft and hydrodynamic control-rod hull penetrators.
	g. Silent bearings, having any of the following, components therefor and equipment containing those bearings, specially designed for military use: 1. Gas or magnetic suspension; 2. Active signature controls; <u>or</u> 3. Vibration suppression controls.
ML10	"Aircraft", "lighter-than-air vehicles", unmanned airborne vehicles, aero-engines and "aircraft" equipment, related equipment and components, specially designed or modified for military use, as follows: **<u>N.B.</u>** **For guidance and navigation equipment, see Category Code ML11.**
	a. Combat "aircraft" and specially designed components therefor;
	b. Other "aircraft" and "lighter-than-air vehicles", specially designed or modified for military use, including military reconnaissance, assault, military training, transporting and airdropping troops or military equipment, logistics support, and specially designed components therefor;
	c. Unmanned airborne vehicles and related equipment, specially designed or modified for military use, as follows, and specially designed components therefor: 1. Unmanned airborne vehicles including remotely piloted air vehicles (RPVs), autonomous programmable vehicles and "lighter-than-air vehicles";

THE SCHEDULE — *continued*

Category Code	*Description of Item*
	2. Associated launchers and ground support equipment; 3. Related equipment for command and control;
	d. Aero-engines specially designed or modified for military use, and specially designed components therefor;
	e. Airborne equipment, including airborne refuelling equipment, specially designed for use with the “aircraft” specified in Category Code ML10.a. or ML10.b. or the aero-engines specified in Category Code ML10.d., and specially designed components therefor;
	f. Pressure refuellers, pressure refuelling equipment, equipment specially designed to facilitate operations in confined areas and ground equipment, developed specially for “aircraft” specified in Category Code ML10.a. or ML10.b., or for aero-engines under Category Code ML10.d.;
	g. Military crash helmets and protective masks, and specially designed components therefor, pressurised breathing equipment and partial pressure suits for use in “aircraft”, anti-g suits, liquid oxygen converters used for “aircraft” or missiles, and catapults and cartridge actuated devices, for emergency escape of personnel from “aircraft”;
	h. Parachutes, paragliders and related equipment, as follows, and specially designed components therefor: 1. Parachutes not specified elsewhere in any part of this Division; 2. Paragliders; 3. Equipment specially designed for high altitude parachutists (e.g., suits, special helmets, breathing systems, navigation equipment);
	i. Automatic piloting systems for parachuted loads; equipment specially designed or modified for military use for controlled opening jumps at any height, including oxygen equipment.
	Note 1

THE SCHEDULE — *continued*

Category Code	*Description of Item*
	Category Code ML10.b. does not apply to "aircraft" or variants of those "aircraft" specially designed for military use and which are all of the following: *a. Not configured for military use and not fitted with equipment or attachments specially designed or modified for military use; and* *b. Certified for civil use by the relevant civil aviation authority.* *Note 2* *Category Code ML10.d. does not apply to:* *a. Aero-engines designed or modified for military use which have been certified by the relevant civil aviation authority for use in "civil aircraft", or specially designed components therefor;* *b. Reciprocating engines or specially designed components therefor, except those specially designed for unmanned airborne vehicles.* *Note 3* *The references in Category Codes ML10.b. and ML10.d. to specially designed components and related equipment for non-military "aircraft" or aero-engines modified for military use include only those military components and to military related equipment required for the modification to military use.*
ML11	Electronic equipment, not specified elsewhere in any part of this Division, as follows, and specially designed components therefor:
	a. Electronic equipment specially designed for military use; *Note* *Category Code ML11.a. includes:* a. Electronic countermeasure and electronic counter-countermeasure equipment (i.e., equipment designed to introduce extraneous or erroneous signals into radar or radio communication receivers or otherwise hinder the reception, operation or effectiveness of adversary electronic receivers including their countermeasure equipment), including jamming and counter-jamming equipment;

THE SCHEDULE — *continued*

Category Code	*Description of Item*
	b. Frequency agile tubes; c. Electronic systems or equipment, designed either for surveillance and monitoring of the electro-magnetic spectrum for military intelligence or security purposes or for counteracting such surveillance and monitoring; d. Underwater countermeasures, including acoustic and magnetic jamming and decoy, equipment designed to introduce extraneous or erroneous signals into sonar receivers; e. Data processing security equipment, data security equipment and transmission and signalling line security equipment, using ciphering processes; f. Identification, authentification and keyloader equipment and key management, manufacturing and distribution equipment; g. Guidance and navigation equipment; h. Digital troposcatter-radio communications transmission equipment; i. Digital demodulators specially designed for signals intelligence; j. "Automated Command and Control Systems". ***N.B.*** ***For "software" associated with military "Software" Defined Radio (SDR), see Category Code ML21.***
	b. Global Navigation Satellite Systems(GNSS) jamming equipment.
ML12	High velocity kinetic energy weapon systems and related equipment, as follows, and specially designed components therefor:
	a. Kinetic energy weapon systems specially designed for destruction or effecting mission-abort of a target;
	b. Specially designed test and evaluation facilities and test models, including diagnostic instrumentation and targets, for dynamic testing of kinetic energy projectiles and systems.
	N.B.

THE SCHEDULE — *continued*

Category Code	*Description of Item*
	For weapon systems using sub-calibre ammunition or employing solely chemical propulsion, and ammunition therefor, see Category Codes ML1 to ML4. *Note 1* *Category Code ML12 includes the following when specially designed for kinetic energy weapon systems:* *a. Launch propulsion systems capable of accelerating masses larger than 0.1 g to velocities in excess of 1.6 km/s, in single or rapid fire modes;* *b. Prime power generation, electric armour, energy storage, thermal management, conditioning, switching or fuel-handling equipment; and electrical interfaces between power supply, gun and other turret electric drive functions;* *c. Target acquisition, tracking, fire control or damage assessment systems;* *d. Homing seeker, guidance or divert propulsion (lateral acceleration) systems for projectiles.* *Note 2* *Category Code ML12 applies to weapon systems using any of the following methods of propulsion:* *a. Electromagnetic;* *b. Electrothermal;* *c. Plasma;* *d. Light gas; or* *e. Chemical (when used in combination with any of the above).*
ML13	Armoured or protective equipment, constructions and components, as follows:
	a. Armoured plate, having any of the following: 1. Manufactured to comply with a military standard or specification; or 2. Suitable for military use;

THE SCHEDULE — *continued*

Category Code	*Description of Item*
	b. Constructions of metallic or non-metallic materials, or combinations thereof, specially designed to provide ballistic protection for military systems, and specially designed components therefor;
	c. Helmets manufactured according to military standards or specifications, or comparable national standards, and specially designed components therefor (i.e., helmet shell, liner and comfort pads);
	d. Body armour and protective garments manufactured according to military standards or specifications, or equivalent, and specially designed components therefor.
	Note 1 *Category Code ML13.b. includes materials specially designed to form explosive reactive armour or to construct military shelters.* *Note 2* *Category Code ML13.c. does not apply to conventional steel helmets, neither modified or designed to accept, nor equipped with any type of accessory device.* *Note 3* *Category Codes ML13.c. and ML13.d. do not apply to helmets, body armour or protective garments when accompanying their user for the user's own personal protection.* *Note 4* *The only helmets specially designed for bomb disposal personnel that are specified in Category Code ML13 are those specially designed for military use* ***N.B. 1*** ***See also Category Code 1A005 in Division 2 of Part II of this Schedule.*** ***N.B. 2***

THE SCHEDULE — *continued*

Category Code	*Description of Item*
	For "fibrous or filamentary materials" used in the manufacture of body armour and helmets, see Category Code 1C010 in Division 2 of Part II of this Schedule.
ML14	'Specialised equipment for military training' or for simulating military scenarios, simulators specially designed for training in the use of any firearm or weapon specified in Category Code ML1 or ML2, and specially designed components and accessories therefor. <u>*Technical Note*</u> *The term 'specialised equipment for military training' includes military types of attack trainers, operational flight trainers, radar target trainers, radar target generators, gunnery training devices, anti-submarine warfare trainers, flight simulators (including human-rated centrifuges for pilot/astronaut training), radar trainers, instrument flight trainers, navigation trainers, missile launch trainers, target equipment, drone "aircraft", armament trainers, pilotless "aircraft" trainers, mobile training units and training equipment for ground military operations.* <u>*Note 1*</u> *Category Code ML14 includes image generating and interactive environment systems for simulators, when specially designed or modified for military use.* <u>*Note 2*</u> *Category Code ML14 does not apply to equipment specially designed for training in the use of hunting or sporting weapons.*
ML15	Imaging or countermeasure equipment, as follows, specially designed for military use, and specially designed components and accessories therefor:
	a. Recorders and image processing equipment;
	b. Cameras, photographic equipment and film processing equipment;
	c. Image intensifier equipment;
	d. Infrared or thermal imaging equipment;
	e. Imaging radar sensor equipment;

THE SCHEDULE — *continued*

Category Code	*Description of Item*
	f. Countermeasure or counter-countermeasure equipment for the equipment specified in Category Codes ML15.a. to ML15.e. Note Category Code ML15.f. includes equipment designed to degrade the operation or effectiveness of military imaging systems or to minimise such degrading effects.
	Note 1 *In Category Code ML15, the term specially designed components includes the following, when specially designed for military use:* *a. Infrared image converter tubes;* *b. Image intensifier tubes (other than first generation);* *c. Microchannel plates;* *d. Low-light-level television camera tubes;* *e. Detector arrays (including electronic interconnection or read out systems);* *f. Pyroelectric television camera tubes;* *g. Cooling systems for imaging systems;* *h. Electrically triggered shutters of the photochromic or electro-optical type having a shutter speed of less than 100 μs, except in the case of shutters which are an essential part of a high speed camera;* *i. Fibre optic image inverters;* *j. Compound semiconductor photocathodes.* *Note 2* *Category Code ML15 does not apply to "first generation image intensifier tubes" or equipment specially designed to incorporate "first generation image intensifier tubes".* ***N.B.*** ***For the classification of weapons sights incorporating "first generation image intensifier tubes" see Category Codes ML1, ML2 and ML5.a.***

THE SCHEDULE — *continued*

Category Code	*Description of Item*
	N.B. ***See also Category Codes 6A002.a.2. and 6A002.b. in Division 2 of Part II of this Schedule.***
ML16	Forgings, castings and other unfinished products, the use of which in a specified product is identifiable by material composition, geometry or function, and which are specially designed for any products specified in Category Code ML1 to ML4, ML6, ML9, ML10, ML12 or ML19.
ML17	Miscellaneous equipment, materials and 'libraries', as follows, and specially designed components therefor:
	a. Self-contained diving and underwater swimming apparatus, as follows: 1. Closed or semi-closed circuit (rebreathing) apparatus, specially designed for military use (i.e., specially designed to be non-magnetic); 2. Specially designed components for use in the conversion of open-circuit apparatus to military use; 3. Articles designed exclusively for military use with self-contained diving and underwater swimming apparatus;
	b. Construction equipment specially designed for military use;
	c. Fittings, coatings and treatments, for signature suppression, specially designed for military use;
	d. Field engineer equipment specially designed for use in a combat zone;
	e. "Robots", "robot" controllers and "robot" "end-effectors", having any of the following characteristics: 1. Specially designed for military use; 2. Incorporating means of protecting hydraulic lines against externally induced punctures caused by ballistic fragments (e.g., incorporating self-sealing lines) and designed to use hydraulic fluids with flash points higher than 839 K (566°C); or

THE SCHEDULE — *continued*

Category Code	*Description of Item*
	3. Specially designed or rated for operating in an electro-magnetic pulse (EMP) environment; <u>*Technical Note*</u> *Electro-magnetic pulse does not refer to unintentional interference caused by electromagnetic radiation from nearby equipment (e.g., machinery, appliances or electronics) or lightning.*
	f. 'Libraries' (parametric technical databases) specially designed for military use with equipment specified in this Division;
	g. Nuclear power generating equipment or propulsion equipment, including "nuclear reactors", specially designed for military use and components therefor specially designed or 'modified' for military use;
	h. Equipment and material, coated or treated for signature suppression, specially designed for military use, other than those specified elsewhere in this Division;
	i. Simulators specially designed for military "nuclear reactors";
	j. Mobile repair shops specially designed or 'modified' to service military equipment;
	k. Field generators specially designed or 'modified' for military use;
	l. Containers specially designed or 'modified' for military use;
	m. Ferries, other than those specified elsewhere in this Division, bridges and pontoons, specially designed for military use;
	n. Test models specially designed for the "development" of items specified in Category Code ML4, ML6, ML9 or ML10;
	o. Laser protection equipment (e.g., eye and sensor protection) specially designed for military use;
	p. "Fuel cells", other than those specified elsewhere in any part of this Division, specially designed or 'modified' for military use.
	<u>*Technical Notes*</u> *1. For the purpose of Category Code ML17, the term 'library' (parametric technical database) means a collection of*

THE SCHEDULE — *continued*

Category Code	*Description of Item*
	technical information of a military nature, reference to which may enhance the performance of military equipment or systems. *2. For the purpose of Category Code ML17, 'modified' means any structural, electrical, mechanical, or other change that provides a non-military item with military capabilities equivalent to an item which is specially designed for military use.*
ML18	Production equipment and components, as follows:
	a. Specially designed or modified 'production' equipment for the 'production' of products specified in this Division, and specially designed components therefor;
	b. Specially designed environmental test facilities and specially designed equipment therefor, for the certification, qualification or testing of products specified in this Division.
	<u>Technical Note</u> *For the purposes of Category Code ML18, the term 'production' includes design, examination, manufacture, testing and checking.* <u>Note</u> *Category Codes ML18.a. and ML18.b. include the following equipment:* *a. Continuous nitrators;* *b. Centrifugal testing apparatus or equipment, having any of the following:* *1. Driven by a motor or motors having a total rated horsepower of more than 298 kW (400 hp);* *2. Capable of carrying a payload of 113 kg or more; <u>or</u>* *3. Capable of exerting a centrifugal acceleration of 8 g or more on a payload of 91 kg or more;* *c. Dehydration presses;* *d. Screw extruders specially designed or modified for military explosive extrusion;*

THE SCHEDULE — *continued*

Category Code	*Description of Item*
	e. Cutting machines for the sizing of extruded propellants; *f. Sweetie barrels (tumblers) 1.85 m or more in diameter and having over 227 kg product capacity;* *g. Continuous mixers for solid propellants;* *h. Fluid energy mills for grinding or milling the ingredients of military explosives;* *i. Equipment to achieve both sphericity and uniform particle size in metal powder listed in Category Code ML8.c.8.;* *j. Convection current converters for the conversion of materials listed in Category Code ML8.c.3.*
ML19	Directed energy weapon systems (DEW), related or countermeasure equipment and test models, as follows, and specially designed components therefor:
	a. "Laser" systems specially designed for destruction or effecting mission-abort of a target;
	b. Particle beam systems capable of destruction or effecting mission-abort of a target;
	c. High power radio-frequency (RF) systems capable of destruction or effecting mission-abort of a target;
	d. Equipment specially designed for the detection or identification of, or defence against, systems specified in Category Codes ML19.a. to ML19.c.;
	e. Physical test models for the systems, equipment and components, specified in Category Code ML19;
	f. Continuous wave or pulsed "laser" systems, specially designed to cause permanent blindness to unenhanced vision, i.e., to the naked eye or to the eye with corrective eyesight devices.
	<u>*Note 1*</u> *Directed energy weapon systems specified in Category Code ML19 include systems whose capability is derived from the controlled application of:*

THE SCHEDULE — *continued*

Category Code	*Description of Item*
	a. “Lasers” of sufficient continuous wave or pulsed power, to effect destruction similar to the manner of conventional ammunition; *b. Particle accelerators which project a charged or neutral particle beam with destructive power;* *c. High pulsed power or high average power radio frequency beam transmitters, which produce fields sufficiently intense to disable electronic circuitry at a distant target.* *<u>Note 2</u>* *Category Code ML19 includes the following when specially designed for directed energy weapon systems:* *a. Prime power generation, energy storage, switching, power conditioning or fuel-handling equipment;* *b. Target acquisition or tracking systems;* *c. Systems capable of assessing target damage, destruction or mission-abort;* *d. Beam-handling, propagation or pointing equipment;* *e. Equipment with rapid beam slew capability for rapid multiple target operations;* *f. Adaptive optics and phase conjugators;* *g. Current injectors for negative hydrogen ion beams;* *h. “Space qualified” accelerator components;* *i. Negative ion beam funnelling equipment;* *j. Equipment for controlling and slewing a high energy ion beam;* *k. “Space qualified” foils for neutralising negative hydrogen isotope beams.*
ML20	Cryogenic and “superconductive” equipment, as follows, and specially designed components and accessories therefor:
	a. Equipment specially designed or configured to be installed in a vehicle for military ground, marine, airborne or space

THE SCHEDULE — *continued*

Category Code	*Description of Item*
	applications, capable of operating while in motion and of producing or maintaining temperatures below 103 K (-170°C); *Note* *Category Code ML20.a. includes mobile systems incorporating or employing accessories or components manufactured from non-metallic or non-electrical conductive materials, such as plastics or* epoxy-impregnated materials.
	b. “Superconductive” electrical equipment (rotating machinery and transformers) specially designed or configured to be installed in a vehicle for military ground, marine, airborne or space applications and capable of operating while in motion. *Note* *Category Code ML20.b. does not apply to direct-current hybrid homopolar generators that have single-pole normal metal armatures which rotate in a magnetic field produced by superconducting windings, provided those windings are the only superconducting components in the generator.*
ML21	“Software” as follows:
	a. “Software” specially designed or modified for the “development”, “production” or “use” of equipment, materials or “software”, specified in this Division;
	b. Specific “software”, other than that specified in Category Code ML21.a., as follows: 1. “Software” specially designed for military use and specially designed for modelling, simulating or evaluating military weapon systems; 2. “Software” specially designed for military use and specially designed for modelling or simulating military operational scenarios; 3. “Software” for determining the effects of conventional, nuclear, chemical or biological weapons; 4. “Software” specially designed for military use and specially designed for Command, Communications, Control and

THE SCHEDULE — *continued*

Category Code	*Description of Item*
	Intelligence (C^3I) or Command, Communications, Control, Computer and Intelligence (C^4I) applications;
	c. "Software", not specified in Category Code ML21.a., or ML21.b., specially designed or modified to enable equipment not specified in this Division to perform the military functions of equipment specified in this Division.
ML22	"Technology" as follows:
	a. "Technology", other than specified in Category Code ML22.b, which is "required" for the "development", "production" or "use" of items specified in this Division;
	b. "Technology" as follows: 1. "Technology" "required" for the design of, the assembly of components into, and the operation, maintenance and repair of, complete production installations for items specified in this Division, even if the components of such production installations are not specified; 2. "Technology" "required" for the "development" and "production" of small arms, even if used to produce reproductions of antique small arms; 3. "Technology" "required" for the "development", "production" or "use" of toxicological agents, related equipment or components specified in Category Codes ML7.a. to ML7.g.; 4. "Technology" "required" for the "development", "production" or "use" of "biopolymers" or cultures of specific cells, specified in Category Code ML7.h.; 5. "Technology" "required" exclusively for the incorporation of "biocatalysts", specified in Category Code ML7.i.1., into military carrier substances or military material.
	<u>*Note 1*</u> *"Technology" "required" for the "development", "production" or "use" of items specified in this Division is considered to fall within Category Code ML22 even when applicable to any goods which applicable to any item not specified in this Division.*

THE SCHEDULE — *continued*

Category Code	*Description of Item*
	Note 2 *Category Code ML22 does not include "technology" for magnetic induction for continuous propulsion of civil transport devices.*

PART II

DUAL-USE GOODS THE EXPORT, TRANSHIPMENT OR BRINGING IN TRANSIT OF WHICH, AND TECHNOLOGY THE EXPORT OR TRANSMISSION OF WHICH, REQUIRE A PERMIT

Division 1 — Preliminary Provisions

Subdivision 1: General Notes

1. Goods (including plant) containing one or more goods set out in Division 2 shall be considered as coming within the description or descriptions of the second-mentioned goods if the second-mentioned goods are the principal element of the first-mentioned goods and can feasibly be removed or used for other purposes.

2. In determining whether goods are to be considered the principal element of other goods for the purposes of paragraph 1, factors such as the quantity, value and technological know-how involved and other special circumstances which might establish the goods as the principal element of the other goods must be weighed.

3. Goods specified in Division 2 include both new and used goods.

Subdivision 2: Nuclear Technology Note (NTN)

(To be read in conjunction with section E of Category 0.)

4. "Technology" for the "development", "production" or "use" of goods specified in Category 0 are considered to be "technology" under section E of that Category even when applicable to goods not so specified.

Subdivision 3: General Technology Note (GTN)

(To be read in conjunction with section E of Categories 1 to 9.)

5. "Technology" under section E of Categories 1 to 9 is "technology" which is "required" for the "development", "production" or "use" of goods specified in those Categories.

THE SCHEDULE — *continued*

"Technology" for the "development", "production" or "use" of goods specified in Categories 1 to 9 are considered to be "technology" under section E of those Categories even when applicable to goods not so specified.

Subdivision 4: General Software Note (GSN)

6. Categories 0 to 9 of Division 2 do not include "software" which is generally available to the public by being:

a Sold from stock at retail selling points, without restriction, by means of:

1 Over-the-counter transactions;

2 Mail order transactions;

3 Electronic transactions; or

4 Telephone order transactions; and

b. Designed for installation by the user without further substantial support by the supplier.

<u>Note:</u>

Paragraph 6 does not extend to "software" specified in Category 5 — Part 2 ("Information Security").

Subdivision 5: Definitions of Words and Expressions in this Part

7. In this Part, words and expressions in quotation marks ("") take the definitions set out against them in this paragraph:

"accuracy" (Categories 2, 6), usually measured in terms of inaccuracy, means the maximum deviation, positive or negative, of an indicated value from an accepted standard or true value.

"active flight control systems" (Category 7) means systems that function to prevent undesirable "aircraft" and missile motions or structural loads by autonomously processing outputs from multiple sensors and then providing the necessary preventive commands to effect automatic control.

"active pixel" (Categories 6, 8) means a minimum (single) element of the solid state array which has a photoelectric transfer function when exposed to light (electromagnetic) radiation.

"adapted for use in war" (Category 1) means any modification or selection (such as altering purity, shelf life, virulence, dissemination characteristics, or resistance to UV radiation) designed to increase the effectiveness in

THE SCHEDULE — *continued*

producing casualties in humans or animals, degrading equipment or damaging crops or the environment.

"adjusted peak performance" (Category 4) means an adjusted peak rate at which "digital computers" perform 64-bit or larger floating point additions and multiplications, and is expressed in Weighted TeraFLOPS (WT) with units of 1012 adjusted floating point operations per second.

N.B.

See Category 4, Technical Note.

"aircraft" (Categories 1, 7, 9) means a fixed wing, swivel wing, rotary wing (helicopter), tilt rotor or tilt-wing airborne vehicle.

N.B.

See also "civil aircraft".

"all compensations available" (Category 2) means after all feasible measures available to the manufacturer to minimise all systematic positioning errors for the particular machine-tool model are considered.

"allocated by the ITU" (Categories 3, 5) means the allocation of frequency bands according to the current edition of the ITU Radio Regulations for primary, permitted and secondary services.

Note

Additional and alternative allocations are not included.

"angle random walk" (Category 7) means the angular error build-up with time that is due to white noise in angular rate. (IEEE STD 528-2001).

"angular position deviation" (Category 2) means the maximum difference between angular position and the actual, very accurately measured angular position after the workpiece mount of the table has been turned out of its initial position (Ref. VDI/VDE 2617, Draft: 'Rotary tables on coordinate measuring machines').

"APP" (Category 4) is equivalent to "Adjusted Peak Performance".

"asymmetric algorithm" (Category 5) means a cryptographic algorithm using different, mathematically-related keys for encryption and decryption.

Note

A common use of "asymmetric algorithms" is key management.

"automatic target tracking" (Category 6) means a processing technique that automatically determines and provides as output an extrapolated value of the most probable position of the target in real time.

THE SCHEDULE — *continued*

"average output power" (Category 6) means the total "laser" output energy in joules divided by the "laser duration" in seconds.

"basic gate propagation delay time" (Category 3) means the propagation delay time value corresponding to the basic gate used in a "monolithic integrated circuit". For a 'family' of "monolithic integrated circuits", this may be specified either as the propagation delay time per typical gate within the given 'family' or as the typical propagation delay time per gate within the given 'family'.

Note 1

"Basic gate propagation delay time" is not to be confused with the input or output delay time of a complex "monolithic integrated circuit".

Note 2

'Family' consists of all integrated circuits to which all of the following are applied as their manufacturing methodology and specifications except their respective functions:

a. The common hardware and software architecture;

b. The common design and process technology; and

c. The common basic characteristics.

"bias" (accelerometer) (Category 7) means the average over a specified time of accelerometer output, measured at specified operating conditions, that has no correlation with input acceleration or rotation. "Bias" is expressed in grams or in metres per second squared (g or m/s2). (IEEE Std 528-2001) (Micro g equals 1 x 10-6 g).

"bias (gyro)" (Category 7) means the average over a specified time of gyro output measured at specified operating conditions that has no correlation with input rotation or acceleration. "Bias" is typically expressed in degrees per hour (deg/hr). (IEEE Std 528-2001)

"camming" (Category 2) means axial displacement in one revolution of the main spindle measured in a plane perpendicular to the spindle faceplate, at a point next to the circumference of the spindle faceplate (Ref. ISO 230/1 1986, paragraph 5.63).

"carbon fibre preforms" (Category 1) means an ordered arrangement of uncoated or coated fibres intended to constitute a framework of a part before the "matrix" is introduced to form a "composite".

THE SCHEDULE — *continued*

"CEP" (circle of equal probability) (Category 7) means a measure of accuracy; the radius of the circle centred at the target, at a specific range, in which 50 % of the payloads impact.

"chemical laser" (Category 6) means a "laser" in which the excited species is produced by the output energy from a chemical reaction.

"chemical mixture" (Category 1) means a solid, liquid or gaseous product made up of two or more components which do not react together under the conditions under which the mixture is stored.

"circulation-controlled anti-torque or circulation controlled direction control systems" (Category 7) means systems that use air blown over aerodynamic surfaces to increase or control the forces generated by the surfaces.

"civil aircraft" (Categories 1, 7, 9) means an "aircraft" listed by designation in published airworthiness certification lists by the civil aviation authorities to fly commercial civil internal and external routes or for legitimate civil, private or business use.

N.B.

See also "aircraft".

"commingled" (Category 1) means filament to filament blending of thermoplastic fibres and reinforcement fibres in order to produce a fibre reinforcement "matrix" mix in total fibre form.

"comminution" (Category 1) means a process to reduce a material to particles by crushing or grinding.

"common channel signalling" (Category 5) means a signalling method in which a single channel between exchanges conveys, by means of labelled messages, signalling information relating to a multiplicity of circuits or calls and other information such as that used for network management.

"communications channel controller" (Category 4) means the physical interface which controls the flow of synchronous or asynchronous digital information. It is an assembly that can be integrated into computer or telecommunications equipment to provide communications access.

"compensation systems" (Category 6) means systems which consist of the primary scalar sensor, one or more reference sensors (e.g., vector magnetometers) together with software that permit reduction of rigid body rotation noise of the platform.

THE SCHEDULE — *continued*

"composite" (Categories 1, 2, 6, 8, 9) means a "matrix" and an additional phase or additional phases consisting of particles, whiskers, fibres or any combination thereof, present for a specific purpose or purposes.

"compound rotary table" (Category 2) means a table allowing the workpiece to rotate and tilt about two non-parallel axes, which can be coordinated simultaneously for "contouring control".

"III/V compounds" (Categories 3, 6) means polycrystalline or binary or complex monocrystalline products consisting of elements of groups IIIA and VA of Mendeleyev's periodic classification table (e.g., gallium arsenide, gallium-aluminium arsenide, indium phosphide).

"contouring control" (Category 2) means two or more "numerically controlled" motions operating in accordance with instructions that specify the next required position and the required feed rates to that position. These feed rates are varied in relation to each other so that a desired contour is generated (Ref. ISO/DIS 2806-1980).

"critical temperature" (Categories 1, 3, 6) (sometimes referred to as the transition temperature) of a specific "superconductive" material means the temperature at which the material loses all resistance to the flow of direct electrical current.

"cryptography" (Category 5) means the discipline which embodies principles, means and methods for the transformation of data in order to hide its information content, prevent its undetected modification or prevent its unauthorised use. "Cryptography" is limited to the transformation of information using one or more 'secret parameters' (e.g., crypto variables) or associated key management.

Note

'Secret parameter' means a constant or key kept from the knowledge of others or shared only within a group.

"CW laser" (Category 6) means a "laser" that produces a nominally constant output energy for greater than 0.25 seconds.

"Data-Based Referenced Navigation" ("DBRN") (Category 7) Systems means systems which use various sources of previously measured geo-mapping data integrated to provide accurate navigation information under dynamic conditions. Data sources include bathymetric maps, stellar maps, gravity maps, magnetic maps or 3-D digital terrain maps.

"deformable mirrors" (Category 6) (also known as adaptive optic mirrors) means mirrors having:

THE SCHEDULE — *continued*

a. a single continuous optical reflecting surface which is dynamically deformed by the application of individual torques or forces to compensate for distortions in the optical waveform incident upon the mirror; or

b. multiple optical reflecting elements that can be individually and dynamically repositioned by the application of torques or forces to compensate for distortions in the optical waveform incident upon the mirror.

"depleted uranium" (Category 0) means uranium depleted in the isotope 235 below that occurring in nature.

"development" (GTN, NTN, All Categories) has the same meaning as in the Act.

"diffusion bonding" (Categories 1, 2, 9) means a solid state molecular joining of at least two separate metals into a single piece with a joint strength equivalent to that of the weakest material.

"digital computer" (Categories 4, 5) means equipment which can, in the form of one or more discrete variables, perform all of the following:

a. Accept data;

b. Store data or instructions in fixed or alterable (writable) storage devices;

c. Process data by means of a stored sequence of instructions which is modifiable; and

d. Provide output of data.

Note

Modifications of a stored sequence of instructions include replacement of fixed storage devices, but not a physical change in wiring or interconnections.

"digital transfer rate" (Category 5) means the total bit rate of the information that is directly transferred on any type of medium.

N.B.

See also "total digital transfer rate".

"direct-acting hydraulic pressing" (Category 2) means a deformation process which uses a fluid-filled flexible bladder in direct contact with the workpiece.

THE SCHEDULE — *continued*

"drift rate" (gyro) (Category 7) means the component of gyro output that is functionally independent of input rotation.It is expressed as an angular rate. (IEEE STD 528-2001)

"dynamic signal analysers" (Category 3) means "signal analysers" which use digital sampling and transformation techniques to form a Fourier spectrum display of the given waveform including amplitude and phase information.

N.B.

See also "signal analysers".

"effective gramme" (Categories 0, 1) of "special fissile material" means:

a. For plutonium isotopes and uranium-233, the isotope weight in grammes;

b. For uranium enriched 1 per cent or greater in the isotope uranium-235, the element weight in grammes multiplied by the square of its enrichment expressed as a decimal weight fraction;

c. For uranium enriched below 1 per cent in the isotope uranium-235, the element weight in grammes multiplied by 0.0001.

"electronic assembly" (Categories 2, 3, 4, 5) means a number of electronic components (i.e., 'circuit elements', 'discrete components', integrated circuits, etc.) connected together to perform one or more specific functions, replaceable as an entity and normally capable of being disassembled.

Note 1

'Circuit element' means a single active or passive functional part of an electronic circuit, such as one diode, one transistor, one resistor, one capacitor, etc.

Note 2

'Discrete component' means a separately packaged 'circuit element' with its own external connections.

"electronically steerable phased array antenna" (Categories 5, 6) means an antenna which forms a beam by means of phase coupling, i.e., the beam direction is controlled by the complex excitation coefficients of the radiating elements and the direction of that beam can be varied in azimuth or in elevation, or both, by application, both in transmission and reception, of an electrical signal.

"end-effectors" (Category 2) means grippers, 'active tooling units' and any other tooling that is attached to the baseplate on the end of a "robot" manipulator arm.

THE SCHEDULE — *continued*

Note

'Active tooling unit' means a device for applying motive power, process energy or sensing to the workpiece.

"equivalent density" (Category 6) means the mass of an optic per unit optical area projected onto the optical surface.

"expert systems" (Category 7) mean systems providing results by application of rules to data which are stored independently of the "programme" and capable of any of the following:

a. Modifying automatically the "source code" introduced by the user;

b. Providing knowledge linked to a class of problems in quasi-natural language; or

c. Acquiring the knowledge required for their development (symbolic training).

"explosives" (Category 1) means solid, liquid or gaseous substances or mixtures of substances which, in their application as primary, booster, or main charges in warheads, demolition and other applications, are required to detonate.

"FADEC" is equivalent to "full authority digital engine control".

"fault tolerance" (Category 4) means the capability of a computer system, after any malfunction of any of its hardware or "software" components, to continue to operate without human intervention, at a given level of service that provides: continuity of operation, data integrity and recovery of service within a given time.

"fibrous or filamentary materials" (Categories 0, 1, 2, 8) includes:

a. Continuous "monofilaments";

b. Continuous "yarns" and "rovings";

c. "Tapes", fabrics, random mats and braids;

d. Chopped fibres, staple fibres and coherent fibre blankets;

e. Whiskers, either monocrystalline or polycrystalline, of any length;

f. Aromatic polyamide pulp.

"film type integrated circuit" (Category 3) means an array of 'circuit elements' and metallic interconnections formed by deposition of a thick or thin film on an insulating "substrate".

Note

THE SCHEDULE — *continued*

'Circuit element' means a single active or passive functional part of an electronic circuit, such as one diode, one transistor, one resistor, one capacitor, etc.

"fixed" (Category 5) means the coding or compression algorithm cannot accept externally supplied parameters (e.g., cryptographic or key variables) and cannot be modified by the user.

"flight control optical sensor array" (Category 7) means a network of distributed optical sensors, using "laser" beams, to provide real-time flight control data for on-board processing.

"flight path optimisation" (Category 7) means a procedure that minimises deviations from a four-dimensional (space and time) desired trajectory based on maximising performance or effectiveness for mission tasks.

"focal plane array" (Category 6) means a linear or two-dimensional planar layer, or combination of planar layers, of individual detector elements, with or without readout electronics, which work in the focal plane.

Note

"Focal plane array" does not include a stack of single detector elements or any two, three or four element detectors provided time delay and integration is not performed within the element.

"fractional bandwidth" (Categories 3, 5) means the "instantaneous bandwidth" divided by the centre frequency, expressed as a percentage.

"frequency hopping" (Category 5) means a form of "spread spectrum" in which the transmission frequency of a single communication channel is made to change by a random or pseudo-random sequence of discrete steps.

"frequency switching time" (Categories 3, 5) means the maximum time (i.e. delay), taken by a signal, when switched from one selected output frequency to another selected output frequency, to reach:

a. A frequency within 100 Hz of the final frequency; or

b. An output level within 1 dB of the final output level.

"frequency synthesiser" (Category 3) means any kind of frequency source or signal generator, regardless of the actual technique used, providing a multiplicity of simultaneous or alternative output frequencies, from one or more outputs, controlled by, derived from or disciplined by a lesser number of standard (or master) frequencies.

"Full Authority Digital Engine Control" ("FADEC") (Categories 7, 9) means an electronic control system for gas turbine or combined cycle engines

THE SCHEDULE — *continued*

utilising a digital computer to control the variables required to regulate engine thrust or shaft power output throughout the engine operating range from the beginning of fuel metering to fuel shutoff.

"fusible" (Category 1) means capable of being cross-linked or polymerised further (cured) by the use of heat, radiation, catalysts, or other means, or that can be melted without pyrolysis (charring).

"gas atomisation" (Category 1) means a process to reduce a molten stream of metal alloy to droplets of 500 micrometre diameter or less by a high pressure gas stream.

"geographically dispersed" (Category 6) means a state where each location is distant from any other more than 1,500 m in any direction. Mobile sensors are always considered "geographically dispersed".

"guidance set" (Category 7) means systems that integrate the process of measuring and computing a vehicle's position and velocity (i.e. navigation) with that of computing and sending commands to the vehicle's flight control systems to correct the trajectory.

"hot isostatic densification" (Category 2) means the process of pressurising a casting at temperatures exceeding 375 K (102ºC) in a closed cavity through various media (gas, liquid, solid particles, etc.) to create equal force in all directions to reduce or eliminate internal voids in the casting.

"hybrid computer" (Category 4) means equipment which can perform all of the following:

a. Accept data;

b. Process data, in both analogue and digital representations; and

c. Provide output of data.

"hybrid integrated circuit" (Category 3) means any combination of integrated circuit or circuits, or integrated circuit with 'circuit elements' or 'discrete components' connected together to perform one or more specific functions, and having all of the following characteristics:

a. Containing at least one unencapsulated device;

b. Connected together using typical IC production methods;

c. Replaceable as an entity; and

d. Not normally capable of being disassembled.

<u>*Note 1*</u>

THE SCHEDULE — *continued*

'Circuit element' means a single active or passive functional part of an electronic circuit, such as one diode, one transistor, one resistor, one capacitor, etc.

Note 2

'Discrete component' means a separately packaged 'circuit element' with its own external connections.

"image enhancement" (Category 4) means the processing of externally derived information-bearing images by algorithms such as time compression, filtering, extraction, selection, correlation, convolution or transformations between domains (e.g., fast Fourier transform or Walsh transform). This does not include algorithms using only linear or rotational transformation of a single image, such as translation, feature extraction, registration or false coloration.

"immunotoxin" (Category 1) means a conjugate of one cell specific monoclonal antibody and a "toxin" or "sub-unit of toxin", that selectively affects diseased cells.

"information security" (Categories 4, 5) means all the means and functions ensuring the accessibility, confidentiality or integrity of information or communications, excluding the means and functions intended to safeguard against malfunctions. "Information security" includes "cryptography", 'cryptanalysis', protection against compromising emanations and computer security.

Note

'Cryptanalysis' means analysis of a cryptographic system or its inputs and outputs to derive confidential variables or sensitive data, including clear text.

"instantaneous bandwidth" (Categories 3, 5, 7) means the bandwidth over which output power remains constant within 3 dB without adjustment of other operating parameters.

"instrumented range" (Category 6) means the specified unambiguous display range of a radar.

"insulation" (Category 9) means insulation that is applied to the components of a rocket motor, i.e. the case, nozzle, inlets, case closures, and includes cured or semi-cured compounded rubber sheet stock containing an insulating or refractory material. It may also be incorporated as stress relief boots or flaps.

THE SCHEDULE — *continued*

"interconnected radar sensors" (Category 6) means two or more radar sensors are interconnected when they mutually exchange data in real time.

"interior lining" (Category 9) means interior lining that is suited for the bond interface between the solid propellant and the case or insulating liner, and is usually a liquid polymer based dispersion of refractory or insulating materials, e.g. carbon filled hydroxyl terminated polybutadiene (HTPB) or other polymer with added curing agents sprayed or screeded over a case interior.

"intrinsic magnetic gradiometer" (Category 6) means a single magnetic field gradient sensing element and associated electronics the output of which is a measure of magnetic field gradient.

N.B.

See also "magnetic gradiometer".

"isolated live cultures" (Category 1) includes live cultures in dormant form and in dried preparations.

"isostatic presses" (Category 2) means equipment capable of pressurising a closed cavity through various media (e.g., gas, liquid, solid particles, etc.) to create equal pressure in all directions within the cavity upon a workpiece or material.

"laser" (Categories 0, 2, 3, 5, 6, 7, 8, 9) means an assembly of components which produce both spatially and temporally coherent light that is amplified by stimulated emission of radiation.

N.B.

See also:

"Chemical laser";

"Q-switched laser";

"Super High Power Laser";

"Transfer laser".

"laser duration" (Category 6) means the time over which a "laser" emits "laser" radiation, which for "pulsed lasers" corresponds to the time over which a single pulse or series of consecutive pulses is emitted.

"lighter-than-air vehicles" (Category 9) means balloons and airships that rely on hot air or other lighter-than-air gases such as helium or hydrogen for their lift.

THE SCHEDULE — *continued*

"linearity" (Category 2) (usually measured in terms of non-linearity) means the maximum deviation of the actual characteristic (average of upscale and downscale readings), positive or negative, from a straight line so positioned as to equalise and minimise the maximum deviations.

"local area network" (Categories 4, 5) means a data communication system having all of the following characteristics:

a. Allows an arbitrary number of independent 'data devices' to communicate directly with each other; and

b. Is confined to a geographical area of moderate size (e.g., office building, plant, campus, warehouse).

Note

'Data device' means equipment capable of transmitting or receiving sequences of digital information.

"magnetic gradiometers" (Category 6) means instruments designed to detect the spatial variation of magnetic fields from sources external to the instrument. They consist of multiple "magnetometers" and associated electronics the output of which is a measure of magnetic field gradient.

N.B.

See also "intrinsic magnetic gradiometer".

"magnetometers" (Category 6) means instruments designed to detect magnetic fields from sources external to the instrument. They consist of a single magnetic field sensing element and associated electronics the output of which is a measure of the magnetic field.

"main storage" (Category 4) means the primary storage for data or instructions for rapid access by a central processing unit. It consists of the internal storage of a "digital computer" and any hierarchical extension thereto, such as cache storage or non-sequentially accessed extended storage.

"materials resistant to corrosion by UF6" (Category 0) means copper, stainless steel, aluminium, aluminium oxide, aluminium alloys, nickel or alloy containing 60 weight percent or more nickel and UF6-resistant fluorinated hydrocarbon polymers, as appropriate for the type of separation process.

"matrix" (Categories 1, 2, 8, 9) means a substantially continuous phase that fills the space between particles, whiskers or fibres.

THE SCHEDULE — *continued*

"measurement uncertainty" (Category 2) means the characteristic parameter which specifies in what range around the output value the correct value of the measurable variable lies with a confidence level of 95 %. It includes the uncorrected systematic deviations, the uncorrected backlash and the random deviations (Ref. ISO 10360-2, or VDI/VDE 2617).

"mechanical alloying" (Category 1) means an alloying process resulting from the bonding, fracturing and rebonding of elemental and master alloy powders by mechanical impact. Non-metallic particles may be incorporated in the alloy by addition of the appropriate powders.

"melt extraction" (Category 1) means a process to 'solidify rapidly' and extract a ribbon-like alloy product by the insertion of a short segment of a rotating chilled block into a bath of a molten metal alloy.

Note

'Solidify rapidly' means solidification of molten material at cooling rates exceeding 1,000 K/s.

"melt spinning" (Category 1) means a process to 'solidify rapidly' a molten metal stream impinging upon a rotating chilled block, forming a flake, ribbon or rod-like product.

Note

'Solidify rapidly' means solidification of molten material at cooling rates exceeding 1,000 K/s.

"microcomputer microcircuit" (Category 3) means a "monolithic integrated circuit" or "multichip integrated circuit" containing an arithmetic logic unit (ALU) capable of executing general purpose instructions from an internal storage, on data contained in the internal storage.

Note

The internal storage may be augmented by an external storage.

"microprocessor microcircuit" (Category 3) means a "monolithic integrated circuit" or "multichip integrated circuit" containing an arithmetic logic unit (ALU) capable of executing a series of general purpose instructions from an external storage.

Note 1

"Microprocessor microcircuit" normally does not contain integral user-accessible storage, although storage present on-the-chip may be used in performing its logic function.

Note 2

THE SCHEDULE — *continued*

"Microprocessor microcircuit" includes chip sets which are designed to operate together to provide the function of a "microprocessor microcircuit".

"microorganisms" (Categories 1, 2) means bacteria, viruses, mycoplasms, rickettsiae, chlamydiae or fungi, whether natural, enhanced or modified, either in the form of "isolated live cultures" or as material including living material which has been deliberately inoculated or contaminated with such cultures.

"missiles" (Categories 1, 3, 6, 7, 9) means complete rocket systems and unmanned aerial vehicle systems, capable of delivering at least 500 kg payload to a range of at least 300 km.

"monofilament" (Category 1) or filament means the smallest increment of fibre, usually several micrometres in diameter.

"monolithic integrated circuit" (Category 3) means a combination of passive or active 'circuit elements' or both which:

a. Are formed by means of diffusion processes, implantation processes or deposition processes in or on a single semiconducting piece of material, a so-called 'chip';

b. Can be considered as indivisibly associated; and

c. Perform the function or functions of a circuit.

<u>*Note*</u>

'Circuit element' means a single active or passive functional part of an electronic circuit, such as one diode, one transistor, one resistor or one capacitor, etc.

"monospectral imaging sensors" (Category 6) means sensors capable of acquisition of imaging data from one discrete spectral band.

"multichip integrated circuit" (Category 3) means two or more "monolithic integrated circuits" bonded to a common "substrate".

"multispectral imaging sensors" (Category 6) means sensors capable of simultaneous or serial acquisition of imaging data from two or more discrete spectral bands. Sensors having more than twenty discrete spectral bands are sometimes referred to as hyperspectral imaging sensors.

"natural uranium" (Category 0) means uranium containing the mixtures of isotopes occurring in nature.

"network access controller" (Category 4) means a physical interface to a distributed switching network. It uses a common medium which operates

THE SCHEDULE — *continued*

throughout at the same "digital transfer rate" using arbitration (e.g., token or carrier sense) for transmission. Independently from any other, it selects data packets or data groups (e.g., IEEE 802) addressed to it. It is an assembly that can be integrated into computer or telecommunications equipment to provide communications access.

"neural computer" (Category 4) means a computational device designed or modified to mimic the behaviour of a neuron or a collection of neurons, i.e., a computational device which is distinguished by its hardware capability to modulate the weights and numbers of the interconnections of a multiplicity of computational components based on previous data.

"nuclear reactor" (Category 0) means a complete reactor capable of operation so as to contain a controlled self-sustaining fission chain reaction. A "nuclear reactor" includes all the items within or attached directly to the reactor vessel, the equipment which controls the level of power in the core, and the components which normally contain, come into direct contact with or control the primary coolant of the reactor core.

"numerical control" (Category 2) means the automatic control of a process performed by a device that makes use of numeric data usually introduced as the operation is in progress (Ref. ISO 2382).

"object code" (Category 9) means an equipment executable form of a convenient expression of one or more processes ("source code" or source language) which has been converted by programming system.

"optical amplification" (Category 5) in optical communications, means an amplification technique that introduces a gain of optical signals that have been generated by a separate optical source, without conversion to electrical signals, i.e., using semiconductor optical amplifiers, optical fibre luminescent amplifiers.

"optical computer" (Category 4) means a computer designed or modified to use light to represent data and whose computational logic elements are based on directly coupled optical devices.

"optical integrated circuit" (Category 3) means a "monolithic integrated circuit" or a "hybrid integrated circuit", containing one or more parts designed to function as a photosensor or photoemitter or to perform an optical or an electro-optical function or functions.

"optical switching" (Category 5) means the routing of or switching of signals in optical form without conversion to electrical signals.

"overall current density" (Category 3) means the total number of ampere-turns in the coil (i.e., the sum of the number of turns multiplied by the

THE SCHEDULE — *continued*

maximum current carried by each turn) divided by the total cross-section of the coil (comprising the superconducting filaments, the metallic matrix in which the superconducting filaments are embedded, the encapsulating material, any cooling channels, etc.).

"participating state" (Categories 7, 9) means a state participating in the Wassenaar Arrangement (details of which are set out in http://www.wassenaar.org/participants/index.html).

"peak power" (Category 6) means the highest level of power attained in the "laser duration".

"personal area network" (Category 5) means a data communication system having all of the following characteristics:

a. Allows an arbitrary number of independent or interconnected 'data devices' to communicate directly with each other; and

b. Is confined to the communication between devices within the immediate vicinity of an individual person or device controller (e.g., single room, office, or automobile).

Technical Note:

'Data device' means equipment capable of transmitting or receiving sequences of digital information.

"personalised smart card" (Category 5) means a smart card or an electronically readable personal document (e.g., e-passport), containing a microcircuit which has been programmed for a specific application and cannot be reprogrammed for any other application by the user.

"power management" (Category 7) means changing the transmitted power of the altimeter signal so that received power at the "aircraft" altitude is always at the minimum necessary to determine the altitude.

"pressure transducers" (Category 2) means devices that convert pressure measurements into an electrical signal.

"previously separated" (Categories 0, 1) means the application of any process intended to increase the concentration of the controlled isotope.

"primary flight control" (Category 7) means an "aircraft" stability or manoeuvring control using force or moment generators, i.e., aerodynamic control surfaces or propulsive thrust vectoring.

"principal element" (Category 4), as it applies in Category 4, is a "principal element" when its replacement value is more than 35 % of the total value of the system of which it is an element. Element value is the price paid for the

THE SCHEDULE — *continued*

element by the manufacturer of the system, or by the system integrator. Total value is the normal international selling price to unrelated parties at the point of manufacture or consolidation of shipment.

"production" (GTN, NTN, All Categories) has the same meaning as in the Act.

"production equipment" (Categories 1, 7, 9) means tooling, templates, jigs, mandrels, moulds, dies, fixtures, alignment mechanisms, test equipment, other machinery and components therefor, limited to those specially designed or modified for "development" or for one or more phases of "production".

"production facilities" (Categories 7, 9) means equipment and specially designed software therefor integrated into installations for "development" or for one or more phases of "production".

"programme" (Categories 2, 6) means a sequence of instructions to carry out a process in, or convertible into, a form executable by an electronic computer.

"pulse compression" (Category 6) means the coding and processing of a radar signal pulse of long time duration to one of short time duration, while maintaining the benefits of high pulse energy.

"pulse duration" (Category 6) means the duration of a "laser" pulse measured at Full Width Half Intensity (FWHI) levels.

"pulsed laser" (Category 6) means a "laser" having a "pulse duration" that is less than or equal to 0.25 seconds.

"quantum cryptography" (Category 5) means a family of techniques for the establishment of shared key for "cryptography" by measuring the quantum-mechanical properties of a physical system (including those physical properties explicitly governed by quantum optics, quantum field theory or quantum electrodynamics).

"Q-switched laser" (Category 6) means a "laser" in which the energy is stored in the population inversion or in the optical resonator and subsequently emitted in a pulse.

"radar frequency agility" (Category 6) means any technique which changes, in a pseudo-random sequence, the carrier frequency of a pulsed radar transmitter between pulses or between groups of pulses by an amount equal to or larger than the pulse bandwidth.

"radar spread spectrum" (Category 6) means any modulation technique for spreading energy originating from a signal with a relatively narrow frequency band, over a much wider band of frequencies, by using random or pseudo-random coding.

"real-time bandwidth" (Category 3) for "dynamic signal analysers" is the widest frequency range which the analyser can output to display or mass storage without causing any discontinuity in the analysis of the input data. For analysers with more than one channel, the channel configuration yielding the widest "real-time bandwidth" shall be used to make the calculation.

"real time processing" (Categories 6, 7) means the processing of data by a computer system providing a required level of service, as a function of available resources, within a guaranteed response time, regardless of the load of the system, when stimulated by an external event.

"repeatability" (Category 7) means the closeness of agreement among repeated measurements of the same variable under the same operating conditions when changes in conditions or non-operating periods occur between measurements. (Reference: IEEE STD 528-2001 (one sigma standard deviation))

"required" (GTN, Categories 1-9), as applied to "technology", refers to only that portion of "technology" which is peculiarly responsible for achieving or extending the controlled performance levels, characteristics or functions. Such "required" "technology" may be shared by different goods.

"resolution" (Category 2) means the least increment of a measuring device; on digital instruments, the least significant bit. (ref. ANSI B-89.1.12)

"riot control agent" (Category 1) means substances which, under the expected conditions of use for riot control purposes, produce rapidly in human sensory irritation or disabling physical effects which disappear within a short time following termination of exposure.

Technical Note:

Tear gases are a subset of "riot control agents".

"robot" (Categories 2, 8) means a manipulation mechanism, which may be of the continuous path or of the point-to-point variety, may use sensors, and has all the following characteristics:

a. Is multifunctional;

b. Is capable of positioning or orienting material, parts, tools or special devices through variable movements in three dimensional space;

THE SCHEDULE — *continued*

c. Incorporates three or more closed or open loop servo-devices which may include stepping motors; and

d. Has "user-accessible programmability" by means of teach or playback method or by means of an electronic computer which may be a programmable logic controller, i.e. without mechanical intervention.

Note

"Robot" does not include the following devices:

a. Manipulation mechanisms which are only manually or teleoperator controllable;

b. Fixed sequence manipulation mechanisms which are automated moving devices, operating according to mechanically fixed programmed motions. The programme is mechanically limited by fixed stops such as pins or cams. The sequence of motions and the selection of paths or angles are not variable or changeable by mechanical, electronic or electrical means;

c. Mechanically controlled variable sequence manipulation mechanisms which are automated moving devices, operating according to mechanically fixed programmed motions. The programme is mechanically limited by fixed, but adjustable stops, such as pins or cams. The sequence of motions and the selection of paths or angles are variable within the fixed programme pattern. Variations or modifications of the programme pattern (e.g., changes of pins or exchanges of cams) in one or more motion axes are accomplished only through mechanical operations;

d. Non-servo-controlled variable sequence manipulation mechanisms which are automated moving devices, operating according to mechanically fixed programmed motions. The programme is variable but the sequence proceeds only by the binary signal from mechanically fixed electrical binary devices or adjustable stops;

e. Stacker cranes defined as Cartesian coordinate manipulator systems manufactured as an integral part of a vertical array of storage bins and designed to access the contents of those bins for storage or retrieval.

"rotary atomisation" (Category 1) means a process to reduce a stream or pool of molten metal to droplets to a diameter of 500 micrometre or less by centrifugal force.

"roving" (Category 1) means a bundle (typically 12-120) of approximately parallel 'strands'.

THE SCHEDULE — *continued*

<u>*Note*</u>

'Strand' means a bundle of "monofilaments" (typically over 200) arranged approximately parallel to each other.

"run-out" (Category 2) (out-of-true running) means radial displacement in one revolution of the main spindle measured in a plane perpendicular to the spindle axis at a point on the external or internal revolving surface to be tested. (Ref. ISO 230/1 1986, paragraph 5.61)

"scale factor" (gyro or accelerometer) (Category 7) means the ratio of change in output to a change in the input intended to be measured. "Scale factor" is generally evaluated as the slope of the straight line that can be fitted by the method of least squares to input-output data obtained by varying the input cyclically over the input range.

"settling time" (Category 3) means the time required for the output to come within one-half bit of the final value when switching between any two levels of the converter.

"SHPL" is equivalent to "super high power laser".

"signal analysers" (Category 3) means apparatus capable of measuring and displaying basic properties of the single-frequency components of multi-frequency signals.

"signal processing" (Categories 3, 4, 5, 6) means the processing of externally derived information-bearing signals by algorithms such as time compression, filtering, extraction, selection, correlation, convolution or transformations between domains (e.g., fast Fourier transform or Walsh transform).

"software" (GSN, All Categories) has the same meaning as in the Act.

"source code" (or source language) (Categories 4, 6, 7, 9) means a convenient expression of one or more processes which may be turned by a programming system into equipment executable form ("object code" (or object language)).

"spacecraft" (Categories 7, 9) means active and passive satellites and space probes.

"space qualified" (Categories 3, 6) means designed, manufactured and tested to meet the special electrical, mechanical or environmental requirements for use in the launch and deployment of satellites or high altitude flight systems operating at altitudes of 100 km or higher.

THE SCHEDULE — *continued*

“special fissile material” (Category 0) means plutonium-239, uranium-233, “uranium enriched in the isotopes 235 or 233”, and any material containing the foregoing.

“specific modulus” (Categories 0, 1, 9) means Young’s modulus in pascals, equivalent to N/m2 divided by specific weight in N/m3, measured at a temperature of (296 ± 2) K ((23 ± 2)ºC) and a relative humidity of (50 ± 5) %.

“specific tensile strength” (Categories 0, 1, 9) means ultimate tensile strength in pascals, equivalent to N/m2 divided by specific weight in N/m3, measured at a temperature of (296 ± 2) K ((23 ± 2)ºC) and a relative humidity of (50 ± 5) %.

“splat quenching” (Category 1) means a process to ‘solidify rapidly’ a molten metal stream impinging upon a chilled block, forming a flake-like product.

<u>Note</u>

‘Solidify rapidly’ means solidification of molten material at cooling rates exceeding 1,000 K/s.

“spread spectrum” (Category 5) means the technique whereby energy in a relatively narrow-band communication channel is spread over a much wider energy spectrum.

“spread spectrum” radar (Category 6) — see “radar spread spectrum”.

“stability” (Category 7) means the standard deviation (1 sigma) of the variation of a particular parameter from its calibrated value measured under stable temperature conditions. It can be expressed as a function of time.

“substrate” (Category 3) means a sheet of base material with or without an interconnection pattern and on which or within which ‘discrete components’ or integrated circuits or both can be located.

<u>Note 1</u>

‘Discrete component’ means a separately packaged ‘circuit element’ with its own external connections.

<u>Note 2</u>

‘Circuit element’ means a single active or passive functional part of an electronic circuit, such as one diode, one transistor, one resistor or one capacitor, etc.

THE SCHEDULE — *continued*

"substrate blanks" (Category 6) means monolithic compounds with dimensions suitable for the production of optical elements such as mirrors or optical windows.

"sub-unit of toxin" (Category 1) means a structurally and functionally discrete component of a whole "toxin".

"superalloys" (Categories 2, 9) means nickel-, cobalt- or iron-base alloys having strengths superior to any alloys in the AISI 300 series at temperatures over 922 K (649 ºC) under severe environmental and operating conditions.

"superconductive" (Categories 1, 3, 5, 6, 8) means materials, i.e. metals, alloys or compounds, which can lose all electrical resistance, i.e. which can attain infinite electrical conductivity and carry very large electrical currents without joule heating.

Note

The "superconductive" state of a material is individually characterised by a "critical temperature", a critical magnetic field, which is a function of temperature, and a critical current density which is, however, a function of both magnetic field and temperature.

"Super High Power Laser" ("SHPL") (Category 6) means a "laser" capable of delivering (the total or any portion of) the output energy exceeding 1 kJ within 50 ms or having an average or CW power exceeding 20 kW.

"superplastic forming" (Categories 1, 2) means a deformation process using heat for metals that are normally characterised by low values of elongation (less than 20 %) at the breaking point as determined at room temperature by conventional tensile strength testing, in order to achieve elongations during processing which are at least 2 times those values.

"symmetric algorithm" (Category 5) means a cryptographic algorithm using an identical key for both encryption and decryption.

Note

A common use of "symmetric algorithms" is to safeguard confidentiality of data.

"system tracks" (Category 6) means processed, correlated (fusion of radar target data to flight plan position) and updated aircraft flight position report available to air traffic control centre controllers.

"systolic array computer" (Category 4) means a computer where the flow and modification of the data is dynamically controllable at the logic gate level by the user.

THE SCHEDULE — *continued*

"tape" (Category 1) means a material constructed of interlaced or unidirectional "monofilaments", 'strands', "rovings", "tows", "yarns", etc., usually preimpregnated with resin.

Note

'Strand' is a bundle of "monofilaments" (typically over 200) arranged approximately parallel to each other.

"technology" (GTN, NTN, All Categories) has the same meaning as in the Act.

"tilting spindle" (Category 2) means a tool-holding spindle which alters, during the machining process, the angular position of its centre line with respect to any other axis.

"time constant" (Category 6) means the time taken from the application of a light stimulus for the current increment to reach a value of 1-1/e times the final value (i.e. 63 % of the final value).

"total control of flight" (Category 7) means an automated control of "aircraft" state variables and flight path to meet mission objectives responding to real time changes in data regarding objectives, hazards or other "aircraft".

"total digital transfer rate" (Category 5) means the number of bits, including line coding, overhead and so forth per unit time passing between corresponding equipment in a digital transmission system.

N.B.

See also "digital transfer rate".

"tow" (Category 1) means a bundle of "monofilaments", usually approximately parallel to each other.

"toxins" (Categories 1, 2) means toxins in the form of deliberately isolated preparations or mixtures, no matter how produced, other than toxins present as contaminants of other materials such as pathological specimens, crops, foodstuffs or seed stocks of "microorganisms".

"transfer laser" (Category 6) means a "laser" in which the lasing species is excited through the transfer of energy by collision of a non-lasing atom or molecule with a lasing atom or molecule species.

"tunable" (Category 6) means the ability of a "laser" to produce a continuous output at all wavelengths over a range of several "laser" transitions. A line selectable "laser" produces discrete wavelengths within one "laser" transition and is not considered "tunable".

THE SCHEDULE — *continued*

"Unmanned Aerial Vehicle" ("UAV") (Category 9) means any aircraft capable of initiating flight and sustaining controlled flight and navigation without any human presence on board.

"uranium enriched in the isotopes 235 or 233"(Category 0) means uranium containing the isotopes 235 or 233, or both, in an amount such that the abundance ratio of the sum of these isotopes to the isotope 238 is more than the ratio of the isotope 235 to the isotope 238 occurring in nature (isotopic ratio 0.71 per cent).

"use" (GTN, NTN, All Categories) has the same meaning as in the Act.

"user accessible programmability" (Category 6) means the facility allowing a user to insert, modify or replace "programmes" by means other than:

a. A physical change in wiring or interconnections; or

b. The setting of function controls including entry of parameters.

"vaccine" (Category 1) means a medicinal product in a pharmaceutical formulation licensed by, or having marketing or clinical trial authorisation from, the regulatory authorities of either the country of manufacture or of use, which is intended to stimulate a protective immunological response in humans or animals in order to prevent disease in those to whom or to which it is administered.

"vacuum atomisation" (Category 1) means a process to reduce a molten stream of metal to droplets of a diameter of 500 micrometre or less by the rapid evolution of a dissolved gas upon exposure to a vacuum.

"variable geometry airfoils" (Category 7) means the use of trailing edge flaps or tabs, or leading edge slats or pivoted nose droop, the position of which can be controlled in flight.

"yarn" (Category 1) means a bundle of twisted 'strands'.

Note

'Strand' means a bundle of "monofilaments" (typically over 200) arranged approximately parallel to each other.

8. In this Part, a word or expression enclosed with single quotation marks ('') takes the definition set out against it in the Note that follows immediately after the provision in which the word or expression appears.

Subdivision 6: Acronyms and Abbreviations used in this Part

The acronyms and abbreviations used in this Part and set out in the first column have the meanings set out against them in the second column.

THE SCHEDULE — *continued*

Acronym or Abbreviation	*Meaning*
ABEC	Annular Bearing Engineers Committee
AGMA	American Gear Manufacturers' Association
AHRS	attitude and heading reference systems
AISI	American Iron and Steel Institute
ALU	arithmetic logic unit
ANSI	American National Standards Institute
ASTM	the American Society for Testing and Materials
ATC	air traffic control
AVLIS	atomic vapour laser isotope seperation
CAD	computer-aided-design
CAS	Chemical Abstracts Service
CDU	control and display unit
CEP	circular error probable
CNTD	controlled nucleation thermal deposition
CRISLA	chemical reaction by isotope selective laser activation
CVD	chemical vapour deposition
CW	chemical warfare
CW (for lasers)	continuous wave
DME	distance measuring equipment
DS	directionally solidified
EB-PVD	electron beam physical vapour deposition
EBU	European Broadcasting Union
ECM	electro-chemical machining
EDM	electrical discharge machines
EEPROMS	electrically erasable programmable read only memory
EIA	Electronic Industries Association

THE SCHEDULE — *continued*

Acronym or Abbreviation	*Meaning*
EMC	electromagnetic compatibility
ETSI	European Telecommunications Standards Institute
FFT	Fast Fourier Transform
GLONASS	global navigation satellite system
GPS	global positioning system
HBT	hetero-bipolar transistors
HDDR	high density digital recording
HEMT	high electron mobility transistors
ICAO	International Civil Aviation Organisation
IEC	International Electro-technical Commission
IEEE	Institute of Electrical and Electronic Engineers
IFOV	instantaneous-field-of-view
ILS	instrument landing system
IRIG	inter-range instrumentation group
ISA	international standard atmosphere
ISAR	inverse synthetic aperture radar
ISO	International Organization for Standardization
ITU	International Telecommunication Union
JIS	Japanese Industrial Standard
JT	Joule-Thomson
LIDAR	light detection and ranging
LRU	line replaceable unit
Mach	ratio of speed of an object to speed of sound (after Ernst Mach)
MLIS	molecular laser isotopic seperation
MLS	microwave landing systems
MOCVD	metal organic chemical vapour deposition

THE SCHEDULE — *continued*

Acronym or Abbreviation	*Meaning*
MRI	magnetic resonance imaging
MTBF	mean-time-between-failures
Mtops	million theoretical operations per second
MTTF	mean-time-to-failure
NBC	Nuclear, Biological and Chemical
NDT	non-destructive test
PAR	precision approach radar
PIN	personal identification number
ppm	parts per million
PSD	power spectral density
QAM	quadrature-amplitude-modulation
RF	radio frequency
SACMA	Suppliers of Advanced Composite Materials Association
SAR	synthetic aperture radar
SC	single crystal
SLAR	sidelooking airborne radar
SMPTE	Society of Motion Picture and Television Engineers
SRA	shop replaceable assembly
SRAM	static random access memory
SRM	SACMA Recommended Methods
SSB	single sideband
SSR	secondary surveillance radar
TIR	total indicated reading
UV	ultraviolet
UTS	ultimate tensile strength
VOR	very high frequency omni-directional range

THE SCHEDULE — *continued*

Acronym or Abbreviation	*Meaning*
YAG	yttrium/aluminium garnet

Division 2 — List of Dual-Use Goods

Category Code	*Item Description*
CATEGORY 0 — NUCLEAR MATERIALS, FACILITIES, AND EQUIPMENT	
0A	**Systems, Equipment and Components**
0A001	“Nuclear reactors” and specially designed or prepared equipment and components therefor, as follows:
	a. “Nuclear reactors”;
	b. Metal vessels, or major shop-fabricated parts therefor, including the reactor vessel head for a reactor pressure vessel, specially designed or prepared to contain the core of a “nuclear reactor”;
	c. Manipulative equipment specially designed or prepared for inserting or removing fuel in a “nuclear reactor”;
	d. Control rods specially designed or prepared for the control of the fission process in a “nuclear reactor”, support or suspension structures therefor, rod drive mechanisms and rod guide tubes;
	e. Pressure tubes specially designed or prepared to contain fuel elements and the primary coolant in a “nuclear reactor” at an operating pressure in excess of 5.1 MPa;
	f. Zirconium metal and alloys in the form of tubes or assemblies of tubes in which the ratio of hafnium to zirconium is less than 1:500 parts by weight, specially designed or prepared for use in a “nuclear reactor”;
	g. Coolant pumps specially designed or prepared for circulating the primary coolant of “nuclear reactors”;
	h. ‘Nuclear reactor internals’ specially designed or prepared for use in a “nuclear reactor”, including support columns for the

THE SCHEDULE — *continued*

Category Code	*Item Description*
	core, fuel channels, thermal shields, baffles, core grid plates, and diffuser plates; <u>Note</u> *In Category Code 0A001.h. 'nuclear reactor internals' means any major structure within a reactor vessel which has one or more functions such as supporting the core, maintaining fuel alignment, directing primary coolant flow, providing* radiation shields for the reactor vessel, and guiding in-core instrumentation.
	i. Heat exchangers (steam generators) specially designed or prepared for use in the primary coolant circuit of a "nuclear reactor";
	j. Neutron detection and measuring instruments specially designed or prepared for determining neutron flux levels within the core of a "nuclear reactor".
0B	**Test, Inspection and Production Equipment**
0B001	Plant for the separation of isotopes of "natural uranium", "depleted uranium" and "special fissile materials", and specially designed or prepared equipment and components therefor, as follows:
	a. Plant specially designed for separating isotopes of "natural uranium", "depleted uranium", and "special fissile materials", as follows: 1. Gas centrifuge separation plant; 2. Gaseous diffusion separation plant; 3. Aerodynamic separation plant; 4. Chemical exchange separation plant; 5. Ion-exchange separation plant; 6. Atomic vapour "laser" isotope separation (AVLIS) plant; 7. Molecular "laser" isotope separation (MLIS) plant; 8. Plasma separation plant; 9. Electro magnetic separation plant;

THE SCHEDULE — *continued*

Category Code	*Item Description*
	b. Gas centrifuges and assemblies and components, specially designed or prepared for gas centrifuge separation process, as follows: Note In Category Code 0B001.b. 'high strength-to-density ratio material' means any of the following: *a. Maraging steel capable of an ultimate tensile strength of 2,050 MPa or more;* *b. Aluminium alloys capable of an ultimate tensile strength of 460 MPa or more; or* *c. "Fibrous or filamentary materials" with a "specific modulus" of more than 3.18 x 10^6 m and a "specific tensile strength" greater than 76.2 x 10^3 m;* 1. Gas centrifuges; 2. Complete rotor assemblies; 3. Rotor tube cylinders with a wall thickness of 12 mm or less, a diameter of between 75 mm and 400 mm, made from 'high strength-to-density ratio materials'; 4. Rings or bellows with a wall thickness of 3 mm or less and a diameter of between 75 mm and 400 mm and designed to give local support to a rotor tube or to join a number together, made from 'high strength-to-density ratio materials'; 5. Baffles of between 75 mm and 400 mm diameter for mounting inside a rotor tube, made from 'high strength-to-density materials'; 6. Top or bottom caps of between 75 mm and 400 mm diameter to fit the ends of a rotor tube, made from 'high strength-to-density materials'; 7. Magnetic suspension bearings consisting of an annular magnet suspended within a housing made of or protected by "materials resistant to corrosion by UF_6" containing a damping medium and having the magnet coupling with a

THE SCHEDULE — *continued*

Category Code	*Item Description*
	pole piece or second magnet fitted to the top cap of the rotor; 8. Specially prepared bearings comprising a pivot-cup assembly mounted on a damper; 9. Molecular pumps comprised of cylinders having internally machined or extruded helical grooves and internally machined bores; 10. Ring-shaped motor stators for multiphase AC hysteresis (or reluctance) motors for synchronous operation within a vacuum in the frequency range of 600 Hz to 2,000 Hz and a power range of 50 Volt-Amps to 1,000 Volt-Amps; 11. Centrifuge housing/recipients to contain the rotor tube assembly of a gas centrifuge, consisting of a rigid cylinder of wall thickness up to 30 mm with precision machined ends and made of or protected by "materials resistant to corrosion by UF_6"; 12. Scoops consisting of tubes of up to 12 mm internal diameter for the extraction of UF_6 gas from within a centrifuge rotor tube by a Pitot tube action, made of or protected by "materials resistant to corrosion by UF_6"; 13. Frequency changers (converters or inverters) specially designed or prepared to supply motor stators for gas centrifuge enrichment, having all of the following characteristics, and specially designed components therefor: a. Multiphase output of 600 Hz to 2,000 Hz; b. Frequency control better than 0.1%; c. Harmonic distortion of less than 2%; and d. An efficiency greater than 80%; 14. Bellow valves made of or protected by "materials resistant to corrosion by UF_6", with a diameter of 10 mm to 160 mm;
	c. Equipment and components, specially designed or prepared for gaseous diffusion separation process, as follows:

THE SCHEDULE — *continued*

Category Code	*Item Description*
	1. Gaseous diffusion barriers made of porous metallic, polymer or ceramic "materials resistant to corrosion by UF_6" with a pore size of 10 nm to 100 nm, a thickness of 5 mm or less, and, for tubular forms, a diameter of 25 mm or less; 2. Gaseous diffuser housings made of or protected by "materials resistant to corrosion by UF_6"; 3. Compressors (positive displacement, centrifugal and axial flow types) or gas blowers with a suction volume capacity of 1 m^3/min or more of UF_6, and discharge pressure up to 666.7 kPa, made of or protected by "materials resistant to corrosion by UF_6"; 4. Rotary shaft seals for compressors or blowers specified in Category Code 0B001.c.3. and designed for a buffer gas in-leakage rate of less than 1,000 cm^3/min; 5. Heat exchangers made of aluminium, copper, nickel, or alloys containing more than 60 per cent nickel, or combinations of these metals as clad tubes, designed to operate at sub-atmospheric pressure with a leak rate that limits the pressure rise to less than 10 Pa per hour under a pressure differential of 100 kPa; 6. Bellow valves made of or protected by "materials resistant to corrosion by UF_6" with a diameter of 40 mm to 1,500 mm;
	d. Equipment and components, specially designed or prepared for aerodynamic separation process, as follows: 1. Separation nozzles consisting of slit-shaped, curved channels having a radius of curvature less than 1 mm, resistant to corrosion by UF_6, and having a knife-edge contained within the nozzle which separates the gas flowing through the nozzle into two streams; 2. Tangential inlet flow-driven cylindrical or conical tubes, (vortex tubes), made of or protected by "materials resistant to corrosion by UF_6" with a diameter of between 0.5 cm and 4 cm and a length to diameter ratio of 20:1 or less and with one or more tangential inlets;

THE SCHEDULE — *continued*

Category Code	*Item Description*
	3. Compressors (positive displacement, centrifugal and axial flow types) or gas blowers with a suction volume capacity of 2 m^3/min or more, made of or protected by "materials resistant to corrosion by UF_6", and rotary shaft seals therefor; 4. Heat exchangers made of or protected by "materials resistant to corrosion by UF_6"; 5. Aerodynamic separation element housings, made of or protected by "materials resistant to corrosion by UF_6" to contain vortex tubes or separation nozzles; 6. Bellows valves made of or protected by "materials resistant to corrosion by UF_6", with a diameter of 40 nm to 1,500 mm; 7. Process systems for separating UF_6 from carrier gas (hydrogen or helium) to 1 ppm UF_6 content or less, including: a. Cryogenic heat exchangers and cryoseparators capable of temperatures of 153K (-120ºC) or less; b. Cryogenic refrigeration units capable of temperatures of 153 K (-120ºC) or less; c. Separation nozzle or vortex tube units for the separation of UF_6 from carrier gas; d. UF_6 cold traps capable of temperatures of 253 K (-20ºC) or less;
	e. Equipment and components, specially designed or prepared for chemical exchange separation process, as follows: 1. Fast-exchange liquid-liquid pulse columns with stage residence time of 30 seconds or less and resistant to concentrated hydrochloric acid (e.g., made of or protected by suitable plastic materials such as fluorocarbon polymers or glass); 2. Fast-exchange liquid-liquid centrifugal contactors with stage residence time of 30 seconds or less and resistant to concentrated hydrochloric acid (e.g., made of or protected

THE SCHEDULE — *continued*

Category Code	*Item Description*
	by suitable plastic materials such as fluorocarbon polymers or glass); 3. Electrochemical reduction cells resistant to concentrated hydrochloric acid solutions, for reduction of uranium from one valence state to another; 4. Electrochemical reduction cells feed equipment to take U $^{+4}$ from the organic stream and, for those parts in contact with the process stream, made of or protected by suitable materials (e.g., glass, fluorocarbon polymers, polyphenyl sulphate, polyether sulfone and resin-impregnated graphite); 5. Feed preparation systems for producing high purity uranium chloride solution consisting of dissolution, solvent extraction and/or ion exchange equipment for purification and electrolytic cells for reducing the uranium U^{+6} or U^{+4} to U^{+3}; 6. Uranium oxidation systems for oxidation of U^{+3} to U^{+4};
	f. Equipment and components, specially designed or prepared for ion-exchange separation process, as follows: 1. Fast reacting ion-exchange resins, pellicular or porous macro-reticulated resins in which the active chemical exchange groups are limited to a coating on the surface of an inactive porous support structure, and other composite structures in any suitable form, including particles or fibres, with diameters of 0.2 mm or less, resistant to concentrated hydrochloric acid and designed to have an exchange rate half-time of less than 10 seconds and capable of operating at temperatures in the range of 373 K (100ºC) to 473 K (200ºC); 2. Ion exchange columns (cylindrical) with a diameter greater than 1,000 mm, made of or protected by materials resistant to concentrated hydrochloric acid (e.g., titanium or fluorocarbon plastics) and capable of operating at temperatures in the range of 373 K (100ºC) to 473 K (200ºC) and pressures above 0.7 MPa;

THE SCHEDULE — *continued*

Category Code	*Item Description*
	3. Ion exchange reflux systems (chemical or electrochemical oxidation or reduction systems) for regeneration of the chemical reducing or oxidising agents used in ion exchange enrichment cascades;
	g. Equipment and components, specially designed or prepared for atomic vapour “laser” isotope separation process (AVLIS), as follows: 1. High power strip or scanning electron beam guns with a delivered power of more than 2.5 kW/cm for use in uranium vaporisation systems; 2. Liquid uranium metal handling systems for molten uranium or uranium alloys, consisting of crucibles, made of or protected by suitable corrosion and heat resistant materials (e.g., tantalum, yttria-coated graphite, graphite coated with other rare earth oxides or mixtures thereof), and cooling equipment for the crucibles; ***N.B.:*** ***See also Category Code 2A225*.** 3. Product and tails collector systems made of or lined with materials resistant to the heat and corrosion of uranium metal vapour or liquid, such as yttria-coated graphite or tantalum; 4. Separator module housings (cylindrical or rectangular vessels) for containing the uranium metal vapour source, the electron beam gun and the product and tails collectors; 5. “Lasers” or “laser” systems for the separation of uranium isotopes with a spectrum frequency stabiliser for operation over extended periods of time; ***N.B.*** ***See also Category Codes 6A005 and 6A205.***
	h. Equipment and components, specially designed or prepared for molecular “laser” (MLIS) or chemical reaction by isotope selective laser activation (CRISLA), as follows:

THE SCHEDULE — *continued*

Category Code	*Item Description*
	1. Supersonic expansion nozzles for cooling mixtures of UF_6 and carrier gas to 150 K (-123ºC) or less and made from “materials resistant to corrosion by UF_6”; 2. Uranium pentafluoride (UF_5) product collectors consisting of filter, impact, or cyclone-type collectors or combinations thereof, and made of “materials resistant to corrosion by UF_5/UF_6”; 3. Compressors made of or protected by “materials resistant to corrosion by UF_6”, and rotary shaft seals therefor; 4. Equipment for fluorinating UF_5 (solid) to UF_6 (gas); 5. Process systems for separating UF_6 from carrier gas (e.g., nitrogen or argon) including: a. Cryogenic heat exchangers and cryoseparators capable of temperatures of 153 K (-120ºC) or less; b. Cryogenic refrigeration units capable of temperatures of 153 K (-120ºC) or less; c. UF_6 cold traps capable of temperatures of 253 K (-20ºC) or less; 6. “Lasers” or “laser” systems for the separation of uranium isotopes with a spectrum frequency stabiliser for operation over extended periods of time; ***N.B.*** ***See also Cat*****egory Codes 6A005 and 6A205.**
	i. Equipment and components, specially designed or prepared for plasma separation process, as follows: 1. Microwave power sources and antennae for producing or accelerating ions, with an output frequency greater than 30 GHz and mean power output greater than 50 kW; 2. Radio frequency ion excitation coils for frequencies of more than 100 kHz and capable of handling more than 40 kW mean power; 3. Uranium plasma generation systems;

THE SCHEDULE — *continued*

Category Code	*Item Description*
	4. Liquid metal handling systems for molten uranium or uranium alloys, consisting of crucibles, made of or protected by suitable corrosion and heat resistant materials (e.g., tantalum, yttria-coated graphite, graphite coated with other rare earth oxides or mixtures thereof), and cooling equipment for the crucibles; ***N.B.:*** ***See also Category Code 2A225.*** 5. Product and tails collectors made of or protected by materials resistant to the heat and corrosion of uranium vapour such as yttria-coated graphite or tantalum; 6. Separator module housings (cylindrical) for containing the uranium plasma source, radio-frequency drive coil and the product and tails collectors and made of a suitable non-magnetic material (e.g. stainless steel);
	j. Equipment and components, specially designed or prepared for electromagnetic separation process, as follows: 1. Ion sources, single or multiple, consisting of a vapour source, ioniser, and beam accelerator made of suitable non-magnetic materials (e.g., graphite, stainless steel, or copper) and capable of providing a total ion beam current of 50 mA or greater; 2. Ion collector plates for collection of enriched or depleted uranium ion beams, consisting of two or more slits and pockets and made of suitable non-magnetic materials (e.g., graphite or stainless steel); 3. Vacuum housings for uranium electromagnetic separators made of non-magnetic materials (e.g., stainless steel) and designed to operate at pressures of 0.1 Pa or lower; 4. Magnet pole pieces with a diameter greater than 2 m; 5. High voltage power supplies for ion sources, having all of the following characteristics: a. Capable of continuous operation; b. Output voltage of 20,000 V or greater;

THE SCHEDULE — *continued*

Category Code	*Item Description*
	c. Output current of 1 A or greater; <u>and</u> d. Voltage regulation of better than 0.01% over a period of 8 hours; ***<u>N.B.</u>*** ***See also Category Code 3A227.*** 6. Magnet power supplies (high power, direct current) having all of the following characteristics: a. Capable of continuous operation with a current output of 500 A or greater at a voltage of 100 V or greater; <u>and</u> b. Current or voltage regulation better than 0.01% over a period of 8 hours. ***<u>N.B.</u>*** ***See also Category Code 3A226.***
0B002	Specially designed or prepared auxiliary systems, equipment and components, as follows, for isotope separation plant specified in Category Code 0B001, made of or protected by "materials resistant to corrosion by UF_6":
	a. Feed autoclaves, ovens or systems used for passing UF_6 to the enrichment process;
	b. Desublimers or cold traps, used to remove UF_6 from the enrichment process for subsequent transfer upon heating;
	c. Product and tails stations for transferring UF_6 into containers;
	d. Liquefaction or solidification stations used to remove UF_6 from the enrichment process by compressing, cooling and converting UF_6 to a liquid or solid form;
	e. Piping systems and header systems specially designed for handling UF_6 within gaseous diffusion, centrifuge or aerodynamic cascades;
	f. 1. Vacuum manifolds or vacuum headers having a suction capacity of 5 m^3/minute or more; <u>or</u>

THE SCHEDULE — *continued*

Category Code	*Item Description*
	2. Vacuum pumps specially designed for use in UF_6 bearing atmospheres;
	g. UF_6 mass spectrometers/ion sources specially designed or prepared for taking on-line samples of feed, product or tails from UF_6 gas streams and having all of the following characteristics: 1. Unit resolution for mass of more than 320 amu; 2. Ion sources constructed of or lined with nichrome or monel, or nickel plated; 3. Electron bombardment ionisation sources; and 4. Collector system suitable for isotopic analysis.
0B003	Plant for the conversion of uranium and equipment specially designed or prepared therefor, as follows: a. Systems for the conversion of uranium ore concentrates to UO_3; b. Systems for the conversion of UO_3 to UF_6; c. Systems for the conversion of UO_3 to UO_2; d. Systems for the conversion of UO_2 to UF_4; e. Systems for the conversion of UF_4 to UF_6; f. Systems for the conversion of UF_4 to uranium metal; g. Systems for the conversion of UF_6 to UO_2; h. Systems for the conversion of UF_6 to UF_4; i. Systems for the conversion of UO_2 to UCl_4.
0B004	Plant for the production or concentration of heavy water, deuterium and deuterium compounds and specially designed or prepared equipment and components therefor, as follows:
	a. Plant for the production of heavy water, deuterium or deuterium compounds, as follows: 1. Water-hydrogen sulphide exchange plants; 2. Ammonia-hydrogen exchange plants;

THE SCHEDULE — *continued*

Category Code	*Item Description*
	b. Equipment and components, as follows: 1. Water-hydrogen sulphide exchange towers fabricated from fine carbon steel (e.g., ASTM A516) with diameters of 6 m to 9 m, capable of operating at pressures greater than or equal to 2 MPa and with a corrosion allowance of 6 mm or greater; 2. Single stage, low head (i.e. 0.2 MPa) centrifugal blowers or compressors for hydrogen sulphide gas circulation (i.e. gas containing more than 70% H_2S) with a throughput capacity greater than or equal to 56 m^3/second when operating at pressures greater than or equal to 1.8 MPa suction and having seals designed for wet H_2S service; 3. Ammonia-hydrogen exchange towers greater than or equal to 35 m in height with diameters of 1.5 m to 2.5 m capable of operating at pressures greater than 15 MPa; 4. Tower internals, including stage contactors, and stage pumps, including those which are submersible, for heavy water production utilising the ammonia-hydrogen exchange process; 5. Ammonia crackers with operating pressures greater than or equal to 3 MPa for heavy water production utilising the ammonia-hydrogen exchange process; 6. Infrared absorption analysers capable of on-line hydrogen/deuterium ratio analysis where deuterium concentrations are equal to or greater than 90%; 7. Catalytic burners for the conversion of enriched deuterium gas into heavy water utilising the ammonia-hydrogen exchange process; 8. Complete heavy water upgrade systems, or columns therefor, for the upgrade of heavy water to reactor-grade deuterium concentration.
0B005	Plant specially designed for the fabrication of “nuclear reactor” fuel elements and specially designed or prepared equipment therefor. Note

THE SCHEDULE — *continued*

Category Code	*Item Description*
	A plant for the fabrication of "nuclear reactor" fuel elements includes equipment which: *a. Normally comes into direct contact with or directly processes or controls the production flow of nuclear materials;* *b. Seals the nuclear materials within the cladding;* *c. Checks the integrity of the cladding or the seal; or* *d. Checks the finish treatment of the sealed fuel.*
0B006	Plant for the reprocessing of irradiated "nuclear reactor" fuel elements, and specially designed or prepared equipment and components therefor. *Note* *Category Code 0B006 includes:* *a. Plant for the reprocessing of irradiated "nuclear reactor" fuel elements including equipment and components which normally come into direct contact with and directly control the irradiated fuel and the major nuclear material and fission product processing streams;* *b. Fuel element chopping or shredding machines, i.e., remotely operated equipment to cut, chop, shred or shear irradiated "nuclear reactor" fuel assemblies, bundles or rods;* *c. Dissolvers, critically safe tanks (e.g., small diameter, annular or slab tanks) specially designed or prepared for the dissolution of irradiated "nuclear reactor" fuel, which are capable of withstanding hot, highly corrosive liquids, and which can be remotely loaded and maintained;* *d. Counter-current solvent extractors and ion-exchange processing equipment specially designed or prepared for use in a plant for the reprocessing of irradiated "natural uranium", "depleted uranium" or "special fissile materials";*

THE SCHEDULE — *continued*

Category Code	*Item Description*
	e. Holding or storage vessels specially designed to be critically safe and resistant to the corrosive effects of nitric acid; *<u>Note</u>* *Holding or storage vessels may have the following features:* *1. Walls or internal structures with a boron equivalent (calculated for all constituent elements as defined in the note to Category Code 0C004) of at least two per cent;* *2. A maximum diameter of 175 mm for cylindrical vessels; <u>or</u>* *3. A maximum width of 75 mm for either a slab or annular vessel.* *f. Process control instrumentation specially designed or prepared for monitoring or controlling the reprocessing of irradiated "natural uranium", "depleted uranium" or "special fissile materials".*
0B007	Plant for the conversion of plutonium and equipment specially designed or prepared therefor, as follows: a. Systems for the conversion of plutonium nitrate to oxide; b. Systems for plutonium metal production.
0C	**Materials**
0C001	"Natural uranium" or "depleted uranium" or thorium in the form of metal, alloy, chemical compound or concentrate and any other material containing one or more of the foregoing. *<u>Note</u>* *Category Code 0C001 does not include the following:* *a. Four grammes or less of "natural uranium" or "depleted uranium" when contained in a sensing component in instruments;* *b. "Depleted uranium" specially fabricated for the following civil non-nuclear applications:* *1. Shielding;*

THE SCHEDULE — *continued*

Category Code	*Item Description*
	2. Packaging; *3. Ballasts having a mass not greater than 100 kg;* *4. Counter-weights having a mass not greater than 100 kg;* *c. Alloys containing less than 5% thorium;* *d. Ceramic products containing thorium, which have been manufactured for non-nuclear use.*
0C002	"Special fissile materials". <u>*Note*</u> *Category Code 0C002 does not include four "effective grammes" or less when contained in a sensing component in instruments.*
0C003	Deuterium, heavy water (deuterium oxide) and other compounds of deuterium, and mixtures and solutions containing deuterium, in which the isotopic ratio of deuterium to hydrogen exceeds 1:5,000.
0C004	Graphite, nuclear grade, having a purity level of less than 5 parts per million 'boron equivalent' and with a density greater than 1.5 g/cm^3. <u>***N.B.***</u> ***See also Category Code 1C107.*** <u>*Note 1*</u> *Category Code 0C004 does not include the following:* *a. Manufactures of graphite having a mass less than 1 kg, other than those specially designed or prepared for use in a nuclear reactor;* *b. Graphite powder.* <u>*Note 2*</u> *In Category Code 0C004, 'boron equivalent' (BE) means the sum of BE_Z for impurities (excluding BE_{carbon} since carbon is not considered an impurity) including boron, where:* BE_z (ppm) = CF × concentration of element Z in ppm; *where CF is the conversion factor =*

THE SCHEDULE — *continued*

Category Code	*Item Description*
	and σ_B and σ_Z are the thermal neutron capture cross sections (in barns) for naturally occurring boron and element Z respectively; and A_B and A_Z are the atomic masses of naturally occurring boron and element Z, respectively.
0C005	Specially prepared compounds or powders for the manufacture of gaseous diffusion barriers, resistant to corrosion by UF_6 (e.g., nickel or alloy containing 60% by weight or more nickel, aluminium oxide and fully fluorinated hydrocarbon polymers), having a purity of 99.9% by weight or more and a mean particle size of less than 10 micrometres measured by American Society for Testing and Materials (ASTM) B330 standard and a high degree of particle size uniformity.
0D	**Software**
0D001	"Software" specially designed or modified for the "development", "production" or "use" of goods specified in this Category.
0E	**Technology**
0E001	"Technology" according to the Nuclear Technology Note for the "development", "production" or "use" of goods specified in this Category.

CATEGORY 1 — SPECIAL MATERIALS AND RELATED EQUIPMENT

1A **Systems, Equipment and Components**

1A001 Components made from fluorinated compounds, as follows:

a. Seals, gaskets, sealants or fuel bladders, specially designed for "aircraft" or aerospace use, made from more than 50% by weight of any of the materials specified in Category Code 1C009.b. or 1C009.c.;

b. Piezoelectric polymers and copolymers, made from vinylidene fluoride materials, specified in Category Code 1C009.a.:

1. In sheet or film form; and

2. With a thickness exceeding 200 μm;

c. Seals, gaskets, valve seats, bladders or diaphragms, having all of the following:

THE SCHEDULE — *continued*

Category Code	*Item Description*
	1. Made from fluoroelastomers containing at least one vinylether group as a constitutional unit, <u>and</u> 2. Specially designed for “aircraft”, aerospace or ‘missile’ use. <u>*Note*</u> *In Category Code 1A001.c., ‘missile’ means complete rocket systems and unmanned aerial vehicle systems.*
1A002	“Composite” structures or laminates, having any of the following characteristics: <u>***N.B.***</u> ***See also Category Codes 1A202, 9A010 and 9A110.*** a. Consisting of an organic “matrix” and materials specified in Category Code 1C010.c., 1C010.d. or 1C010.e.; <u>or</u> b. Consisting of a metal or carbon “matrix” and any of the following: 1. Carbon “fibrous or filamentary materials” having all of the following: a. A “specific modulus” exceeding 10.15×10^6 m; <u>and</u> b. A “specific tensile strength” exceeding 17.7×10^4 m; <u>or</u> 2. Materials specified in Category Code 1C010.c. <u>*Note 1*</u> *Category Code 1A002 does not include composite structures or laminates made from epoxy resin impregnated carbon “fibrous or filamentary materials” for the repair of “civil aircraft” structures or laminates, provided the size does not exceed 100 cm x 100 cm.* <u>*Note 2*</u> *Category Code 1A002 does not include finished or semi-finished items specially designed for purely civilian applications as follows:* *a. Sporting goods;* *b. Automotive industry;*

THE SCHEDULE — *continued*

Category Code	*Item Description*
	c. Machine tool industry;
	d. Medical applications.
	Note 3
	Category Code 1A002.b.1. does not include finished or semi-finished items containing a maximum of two dimensions of inter-woven filaments and specially designed for applications as follows:
	a. Metal heat-treatment furnaces for tempering metals;
	b. Silicon boule production equipment.
1A003	Manufactures of non-"fusible" aromatic polyimides in film, sheet, tape or ribbon form having any of the following:
	a. A thickness exceeding 0.254 mm; or
	b. Coated or laminated with carbon, graphite, metals or magnetic substances.
	Note
	Category Code 1A003 does not include manufactures when coated or laminated with copper and designed for the production of electronic printed circuit boards.
	N.B.
	For "fusible" aromatic polyimides in any form, see Category Code 1C008.a.3.
1A004	Protective and detection equipment and components, other than those specified in Division 2 of Part I of this Schedule, as follows:
	N.B.
	See also Category Codes 2B351 and 2B352.
	a. Gas masks, filter canisters and decontamination equipment therefor, designed or modified for defence against any of the following, and specially designed components therefor:
	1. Biological agents "adapted for use in war";
	2. Radioactive materials "adapted for use in war";
	3. Chemical warfare (CW) agents ; or

THE SCHEDULE — *continued*

Category Code	*Item Description*
	4. “Riot control agents”, including: a. α-Bromobenzeneacetonitrile, (Bromobenzyl cyanide) (CA) (5798-79-8); b. [(2-chlorophenyl) methylene] propanedinitrile, (o-Chlorobenzylidenemalononitrile) (CS) (2698-41-1); c. 2-Chloro-1-phenylethanone, Phenylacyl chloride (ω-chloroacetophenone) (CN) (532-27-4); d. Dibenz-(b,f)-1,4-oxazephine (CR) (257-07-8); e. 10-Chloro-5,10-dihydrophenarsazine, (Phenarsazine chloride), (Adamsite), (DM) (578-94-9); f. N-Nonanoylmorpholine, (MPA) (5299-64-9); b. Protective suits, gloves and shoes, specially designed or modified for defence against any of the following: 1. Biological agents “adapted for use in war”; 2. Radioactive materials “adapted for use in war”; <u>or</u> 3. Chemical warfare (CW) agents; c. Nuclear, biological and chemical (NBC) detection systems, specially designed or modified for detection or identification of any of the following, and specially designed components therefor: 1. Biological agents “adapted for use in war”; 2. Radioactive materials “adapted for use in war”; <u>or</u> 3. Chemical warfare (CW) agents.

THE SCHEDULE — *continued*

Category Code	*Item Description*
	d. Electronic equipment designed for automatically detecting or identifying the presence of "explosives" residues and utilising 'trace detection' techniques (e.g., surface acoustic wave, ion mobility spectrometry, differential mobility spectrometry, mass spectrometer).
	Technical Note:
	'Trace detection' is defined as the capability to detect less than 1 ppm vapour or 1 mg solid or liquid.
	Note 1:
	Category Code 1A004.d. does not include equipment specially designed for laboratory use.
	Note 2:
	Category Code 1A004.d. does not include non-contact walk-through security portals.

THE SCHEDULE — *continued*

Category Code	*Item Description*
	Note
	Category Code 1A004 does not include:
	a. Personal radiation monitoring dosimeters;
	b. Equipment limited by design or function to protect against hazards specific to residential safety and civil industries, such as mining, quarrying, agriculture, pharmaceuticals, medical, veterinary, environmental, waste management, or to the food industry.
	Technical Notes:
	1. Category Code 1A004 includes equipment and components that have been identified, successfully tested to national standards or otherwise proven effective, for the detection of or defence against radioactive materials "adapted for use in war", biological agents "adapted for use in war", chemical warfare agents, 'simulants' or "riot control agents", even if such equipment or components are used in civil industries such as mining, quarrying, agriculture, pharmaceuticals, medical, veterinary, environmental, waste management, or the food industry.
	2 'Simulant' is a substance or material that is used in place of toxic agent (chemical or biological) in training, research, testing or evaluation.
1A005	Body armour, and specially designed components therefor, other than those manufactured to military standards or specifications or to their equivalents in performance.
	N.B.
	See also Division 2 of Part of this Schedule 1.
	N.B.
	For "fibrous or filamentary materials" used in the manufacture of body armour, see Category Code 1C010.
	Note 1
	Category Code 1A005 does not include body armour or protective garments when accompanying their user for the user's own personal protection.

THE SCHEDULE — *continued*

Category Code	*Item Description*
	<u>*Note 2*</u> *Category Code 1A005 does not include body armour designed to provide frontal protection only from both fragment and blast from non-military explosive devices.*
1A006	Equipment, specially designed or modified for the disposal of improvised explosive devices, as follows, and specially designed components and accessories therefor: ***<u>N.B.</u>*** ***See also in Division 2 of Part 1 of this Schedule.*** a. Remotely operated vehicles; b. 'Disruptors'. <u>*Technical Note:*</u> *'Disruptors' are devices specially designed for the purpose of preventing the operation of an explosive device by projecting a liquid, solid or frangible projectile.* <u>*Note:*</u> *Category Code 1A006 does not include equipment when accompanying its operator.*
1A007	Equipment and devices, specially designed to initiate charges and devices containing energetic materials, by electrical means, as follows: ***<u>N.B.</u>*** ***See also Division 2 of Part I of this Schedule, and Category Codes 3A229 and 3A232.*** a. Explosive detonator firing sets designed to drive explosive detonators specified in Category Code 1A007.b.; b. Electrically driven explosive detonators, as follows: 1. Exploding bridge (EB); 2. Exploding bridge wire (EBW); 3. Slapper; 4. Exploding foil initiators (EFI).

THE SCHEDULE — *continued*

Category Code	*Item Description*
	<u>*Technical Notes:*</u> *1. The word initiator or igniter is sometimes used in place of the word detonator.* *2. For the purpose of Category Code 1A007.b. the detonators of concern all utilise a small electrical conductor (bridge, bridge wire, or foil) that explosively vaporises when a fast, high-current electrical pulse is passed through it. In non slapper types, the exploding conductor starts a chemical detonation in a contacting high explosive material such as PETN (pentaerythritoltetranitrate). In slapper detonators, the explosive vaporisation of the electrical conductor drives a flyer or slapper across a gap, and the impact of the slapper on an explosive starts a chemical detonation. The slapper in some designs is driven by magnetic force. The term exploding foil detonator may refer to either an EB or a slapper-type detonator.*
1A008	Charges, devices and components, as follows: a. 'Shaped charges' having all of the following: 1. Net Explosive Quantity (NEQ) greater than 90g; <u>and</u> 2. Outer casing diameter equal to or greater than 75 mm; b. Linear shaped cutting charges having all of the following, and specially designed components therefor: 1. An explosive load greater than 40 g/m; <u>and</u> 2. A width of 10 mm or more; c. Detonating cord with explosive core load greater than 64 g/m; d. Cutters, other than those specified in Category Code 1A008.b., and severing tools, having a Net Explosive Quantity (NEQ) greater than 3.5 kg. <u>*Technical Note*</u> *'Shaped charges' are explosive charges shaped to focus the effects of the explosive blast.*

THE SCHEDULE — *continued*

Category Code	*Item Description*
1A102	Resaturated pyrolised carbon-carbon components designed for space launch vehicles specified in Category Code 9A004 or sounding rockets specified in Category Code 9A104.
1A202	Composite structures, other than those specified in Category Code 1A002, in the form of tubes and having both of the following characteristics: *N.B.* *See also Category Codes 9A010 and 9A110.* a. An inside diameter of between 75 mm and 400 mm; and b. Made with any of the "fibrous or filamentary materials" specified in Category Code 1C010.a. or 1C010b. or 1C210.a. or with carbon prepreg materials specified in Category Code 1C210.c.
1A225	Platinised catalysts specially designed or prepared for promoting the hydrogen isotope exchange reaction between hydrogen and water for the recovery of tritium from heavy water or for the production of heavy water.
1A226	Specialised packings which may be used in separating heavy water from ordinary water, having both of the following characteristics: a. Made of phosphor bronze mesh chemically treated to improve wettability; and b. Designed to be used in vacuum distillation towers.
1A227	High-density (lead glass or other) radiation shielding windows, having all of the following characteristics, and specially designed frames therefor: a. A 'cold area' greater than 0.09 m^2; b. A density greater than 3 g/cm^3; and c. A thickness of 100 mm or greater. *Technical Note* *In Category Code 1A227, the term 'cold area' means the viewing area of the window exposed to the lowest level of radiation in the design application.*

THE SCHEDULE — *continued*

Category Code	*Item Description*
1B	Test, Inspection and Production Equipment
1B001	Equipment for the production of fibres, prepregs, preforms or “composites”, specified in Category Code 1A002 or 1C010, as follows, and specially designed components and accessories therefor:
	N.B.
	See also Category Codes 1B101 and 1B201.
	a. Filament winding machines of which the motions for positioning, wrapping and winding fibres are coordinated and programmed in three or more axes, specially designed for the manufacture of “composite” structures or laminates, from “fibrous or filamentary materials”;
	b. Tape-laying or tow-placement machines, of which the motions for positioning and laying tape, tows or sheets are coordinated and programmed in two or more axes, specially designed for the manufacture of “composite” airframe or ‘missile’ structures;
	Note
	In Category Code 1B001.b., ‘missile’ means complete rocket systems and unmanned aerial vehicle systems.
	c. Multidirectional, multidimensional weaving machines or interlacing machines, including adapters and modification kits, for weaving, interlacing or braiding fibres, to manufacture “composite” structures;
	Technical Note
	For the purposes of Category Code 1B001.c., the technique of interlacing includes knitting.
	Note
	Category Code 1B001.c. does not include textile machinery not modified for the above end-uses.
	d. Equipment specially designed or adapted for the production of reinforcement fibres, as follows:

THE SCHEDULE — *continued*

Category Code	*Item Description*
	1. Equipment for converting polymeric fibres (e.g., polyacrylonitrile, rayon, pitch or polycarbosilane) into carbon fibres or silicon carbide fibres, including special equipment to strain the fibre during heating;
	2. Equipment for the chemical vapour deposition of elements or compounds, on heated filamentary substrates to manufacture silicon carbide fibres;
	3. Equipment for the wet-spinning of refractory ceramics (e.g., aluminium oxide);
	4. Equipment for converting aluminium containing precursor fibres into alumina fibres by heat treatment;
	e. Equipment for producing prepregs specified in Category Code 1C010.e. by the hot melt method;
	f. Non-destructive inspection equipment specially designed for “composite” materials, as follows:
	1. X-ray tomography for three dimensional defect inspection;
	2. Numerically controlled ultrasonic testing machines of which the motions for positioning transmitters or receivers or both, are simultaneously coordinated and programmed in four or more axes to follow the three dimensional contours of the component under inspection.
1B002	Equipment for producing metal alloys, metal alloy powder or alloyed materials, specially designed to avoid contamination and specially designed for use in one of the processes specified in Category Code 1C002.c.2.
	N.B.
	See also Category Code 1B102.
1B003	Tools, dies, moulds or fixtures, for “superplastic forming” or “diffusion bonding” titanium, aluminium or their alloys, specially designed for the manufacture of any of the following:
	a. Airframe or aerospace structures;
	b. “Aircraft” or aerospace engines; or

THE SCHEDULE — *continued*

Category Code	*Item Description*
	c. Specially designed components for structures specified in Category Code 1B003.a. or for engines specified in Category Code 1B003.b.
1B101	Equipment, other than that specified in Category Code 1B001, for the "production" of structural composites as follows; and specially designed components and accessories therefor:
	N.B.
	See also Category Code 1B201.
	Note
	Components and accessories specified in Category Code 1B101 include moulds, mandrels, dies, fixtures and tooling for the preform pressing, curing, casting, sintering or bonding of composite structures, laminates and manufactures thereof.
	a. Filament winding machines or fibre placement machines, of which the motions for positioning, wrapping and winding fibres can be coordinated and programmed in three or more axes, designed to fabricate composite structures or laminates from fibrous or filamentary materials, and coordinating and programming controls;
	b. Tape-laying machines of which the motions for positioning and laying tape and sheets can be coordinated and programmed in two or more axes, designed for the manufacture of composite airframe and "missile" structures;
	c. Equipment designed or modified for the "production" of "fibrous or filamentary materials", as follows:
	1. Equipment for converting polymeric fibres (e.g., polyacrylonitrile, rayon or polycarbosilane) including special provision to strain the fibre during heating;
	2. Equipment for the vapour deposition of elements or compounds on heated filament substrates;
	3. Equipment for the wet-spinning of refractory ceramics (e.g., aluminium oxide);

THE SCHEDULE — *continued*

Category Code	*Item Description*
	d. Equipment designed or modified for special fibre surface treatment or for producing prepregs and preforms specified in Category Code 9C110. *Note* *Category Code 1B101.d. includes rollers, tension stretchers, coating equipment, cutting equipment and clicker dies.*
1B102	Metal powder "production equipment", other than that specified in Category Code 1B002, and components, as follows: ***N.B.*** ***See also Category Code 1B115.b.*** a. Metal powder "production equipment" usable for the "production", in a controlled environment, of spherical or atomised materials specified in Category Code 1C011.a., 1C011.b., 1C111.a.1., 1C111.a.2. or in Division 2 of Part I of this Schedule. b. Specially designed components for "production equipment" specified in Category Code 1B002 or 1B102.a. *Note* *Category Code 1B102 includes:* *a. Plasma generators (high frequency arc-jet) usable for obtaining sputtered or spherical metallic powders with organisation of the process in an argon-water environment;* *b. Electroburst equipment usable for obtaining sputtered or spherical metallic powders with organisation of the process in an argon-water environment;* *c. Equipment usable for the "production" of spherical aluminium powders by powdering a melt in an inert medium (e.g., nitrogen).*
1B115	Equipment, other than that specified in Category Code 1B002 or 1B102, for the production of propellant and propellant constituents, as follows, and specially designed components therefor:

THE SCHEDULE — *continued*

Category Code	*Item Description*
	a. “Production equipment” for the “production”, handling or acceptance testing of liquid propellants or propellant constituents specified in Category Code 1C011.a., 1C011.b., 1C111 or in Division 2 of Part I of this Schedule;
	b. “Production equipment” for the “production”, handling, mixing, curing, casting, pressing, machining, extruding or acceptance testing of solid propellants or propellant constituents specified in Category Code 1C011.a., 1C011.b., 1C111 or in Division 2 of Part I of this Schedule.
	<u>Note</u>
	Category Code 1B115.b. does not include batch mixers, continuous mixers or fluid energy mills. For batch mixers, continuous mixers and fluid energy mills see Category Codes 1B117, 1B118 and 1B119.
	<u>Note 1</u>
	For equipment specially designed for the production of military goods, see Division 2 of Part I of this Schedule.
	<u>Note 2</u>
	Category Code 1B115 does not include equipment for the “production”, handling and acceptance testing of boron carbide.
1B116	Specially designed nozzles for producing pyrolitically derived materials formed on a mould, mandrel or other substrate from precursor gases which decompose in the 1,573 K (1,300ºC) to 3,173 K (2,900ºC) temperature range at pressures of 130 Pa to 20 kPa.
1B117	Batch mixers with provision for mixing under vacuum in the range of zero to 13.326 kPa and with a temperature control capability of the mixing chamber and having all of the following, and specially designed components therefor:
	a. A total volumetric capacity of 110 litres or more; <u>and</u>
	b. At least one mixing/kneading shaft mounted off centre.

THE SCHEDULE — *continued*

Category Code	*Item Description*
1B118	Continuous mixers with provision for mixing under vacuum in the range of zero to 13.326 kPa and with a temperature control capability of the mixing chamber having any of the following, and specially designed components therefor: a. Two or more mixing/kneading shafts; <u>or</u> b. A single rotating shaft which oscillates and having kneading teeth/pins on the shaft as well as inside the casing of the mixing chamber.
1B119	Fluid energy mills usable for grinding or milling substances specified in Category Code 1C011.a., 1C011.b., 1C111 or in Division 2 of Part I of this Schedule, and specially designed components therefor.
1B201	Filament winding machines, other that those specified in Category Code 1B001 or 1B101, and related equipment, as follows: a. Filament winding machines having all of the following characteristics: 1. Having motions for positioning, wrapping, and winding fibres coordinated and programmed in two or more axes; 2. Specially designed to fabricate composite structures or laminates from "fibrous or filamentary materials"; <u>and</u> 3. Capable of winding cylindrical rotors of diameter between 75 mm and 400 mm and lengths of 600 mm or greater; b. Coordinating and programming controls for the filament winding machines specified in Category Code 1B201.a.; c. Precision mandrels for the filament winding machines specified in Category Code 1B201.a.
1B225	Electrolytic cells for fluorine production with an output capacity greater than 250 g of fluorine per hour.
1B226	Electromagnetic isotope separators designed for, or equipped with, single or multiple ion sources capable of providing a total ion beam current of 50 mA or greater. <u>*Note*</u> *Category Code 1B226 includes separators:*

THE SCHEDULE — *continued*

Category Code	*Item Description*
	a. Capable of enriching stable isotopes; b. With the ion sources and collectors both in the magnetic field and those configurations in which they are external to the field.
1B227	Ammonia synthesis converters or ammonia synthesis units, in which the synthesis gas (nitrogen and hydrogen) is withdrawn from an ammonia or hydrogen high-pressure exchange column and the synthesised ammonia is returned to said column.
1B228	Hydrogen-cryogenic distillation columns having all of the following characteristics: a. Designed for operation with internal temperatures of 35 K (-238ºC) or less; b. Designed for operation at an internal pressure of 0.5 MPa to 5 MPa; c. Constructed of either: 1. Stainless steel of the 300 series with low sulphur content and with an austenitic ASTM (or equivalent standard) grain size number of 5 or greater; or 2. Equivalent materials which are both cryogenic and H_2-compatible; and d. With internal diameters of 1 m or greater and effective lengths of 5 m or greater.
1B229	Water-hydrogen sulphide exchange tray columns and 'internal contactors', as follows: ***N.B.*** ***For columns which are specially designed or prepared for the production of heavy water see Category Code 0B004.*** a. Water-hydrogen sulphide exchange tray columns, having all of the following characteristics: 1. Can operate at pressures of 2 MPa or greater; 2. Constructed of carbon steel having an austenitic ASTM (or equivalent standard) grain size number of 5 or greater; and

THE SCHEDULE — *continued*

Category Code	*Item Description*
	3. With a diameter of 1.8 m or greater;
	b. 'Internal contactors' for the water-hydrogen sulphide exchange tray columns specified in Category Code 1B229.a.
	Technical Note
	'Internal contactors' of the columns are segmented trays which have an effective assembled diameter of 1.8 m or greater, are designed to facilitate countercurrent contacting and are constructed of stainless steels with a carbon content of 0.03% or less. These may be sieve trays, valve trays, bubble cap trays, or turbogrid trays.
1B230	Pumps capable of circulating solutions of concentrated or dilute potassium amide catalyst in liquid ammonia (KNH_2/NH_3), having all of the following characteristics:
	a. Airtight (i.e., hermetically sealed);
	b. A capacity greater than 8.5 m^3/h; and
	c. Either of the following characteristics:
	1. For concentrated potassium amide solutions (1% or greater), an operating pressure of 1.5 MPa to 60 MPa; or
	2. For dilute potassium amide solutions (less than 1%), an operating pressure of 20 MPa to 60 MPa.
1B231	Tritium facilities or plants, and equipment therefor, as follows:
	a. Facilities or plants for the production, recovery, extraction, concentration, or handling of tritium;
	b. Equipment for tritium facilities or plants, as follows:
	1. Hydrogen or helium refrigeration units capable of cooling to 23 K (-250ºC) or less, with heat removal capacity greater than 150 W;
	2. Hydrogen isotope storage or purification systems using metal hydrides as the storage or purification medium.
1B232	Turboexpanders or turboexpander-compressor sets having both of the following characteristics:

THE SCHEDULE — *continued*

Category Code	*Item Description*
	a. Designed for operation with an outlet temperature of 35 K (-238ºC) or less; and b. Designed for a throughput of hydrogen gas of 1,000 kg/h or greater.
1B233	Lithium isotope separation facilities or plants, and equipment therefor, as follows: a. Facilities or plants for the separation of lithium isotopes; b. Equipment for the separation of lithium isotopes, as follows: 1. Packed liquid-liquid exchange columns specially designed for lithium amalgams; 2. Mercury or lithium amalgam pumps; 3. Lithium amalgam electrolysis cells; 4. Evaporators for concentrated lithium hydroxide solution.
1C	**Materials** *Technical Note* *Unless provision to the contrary is made, the words 'metals' and 'alloys' in Category Codes 1C001 to 1C012 cover crude and semi-fabricated forms, as follows:* *"Crude forms", in relation to materials, means anodes, balls, bars (including notched bars and wire bars), billets, blocks, blooms, brickets, cakes, cathodes, crystals, cubes, dice, grains, granules, ingots, lumps, pellets, pigs, powder, rondelles, shot, slabs, slugs, sponge, sticks;* *"Semi-fabricated forms", in relation to materials, means any of the following:* *a. Wrought or worked materials fabricated by rolling, drawing, extruding, forging, impact extruding, pressing, graining, atomising, and grinding, i.e.: angles, channels, circles, discs, dust, flakes, foils and leaf, forging, plate, powder, pressings and stampings, ribbons, rings, rods (including bare welding rods, wire rods, and rolled wire), sections, shapes, sheets, strip, pipe and tubes (including*

THE SCHEDULE — *continued*

Category Code	*Item Description*
	tube rounds, squares, and hollows), drawn or extruded wire;
	b. Cast material produced by casting in sand, die, metal, plaster or other types of moulds, including high pressure castings, sintered forms, and forms made by powder metallurgy,
	whether or not coated, plated, drilled or punched.
	Category 1C includes non-listed forms of those materials which are purportedly finished products but are in reality "crude forms" or "semi-fabricated forms".
1C001	Materials specially designed for use as absorbers of electromagnetic waves, or intrinsically conductive polymers, as follows:
	N.B.
	See also Category Code 1C101.
	a. Materials for absorbing frequencies exceeding 2×10^8 Hz but less than 3×10^{12} Hz;
	Note 1
	Category Code 1C001.a. does not include:
	a. Hair type absorbers, constructed of natural or synthetic fibres, with non-magnetic loading to provide absorption;
	b. Absorbers having no magnetic loss and whose incident surface is non-planar in shape, including pyramids, cones, wedges and convoluted surfaces;
	c. Planar absorbers, having all of the following characteristics:
	1. Made from any of the following:
	a. Plastic foam materials (flexible or non-flexible) with carbon-loading, or organic materials, including binders, providing more than 5% echo compared with metal over a bandwidth exceeding ±15% of the centre frequency of the incident energy, and not

THE SCHEDULE — *continued*

Category Code	*Item Description*
	capable of withstanding temperatures exceeding 450 K (177ºC); or

b. Ceramic materials providing more than 20% echo compared with metal over a bandwidth exceeding ±15% of the centre frequency of the incident energy, and not capable of withstanding temperatures exceeding 800 K (527ºC);

Technical Note

Absorption test samples for Category Code 1C001.a. Note:1.c.1. should be a square at least 5 wavelengths of the centre frequency on a side and positioned in the far field of the radiating element.

2. Tensile strength less than 7 × 10^6 N/m^2; and

3. Compressive strength less than 14 × 10^6 N/m^2;

d. Planar absorbers made of sintered ferrite, having all of the following characteristics:

1. A specific gravity exceeding 4.4; and

2. A maximum operating temperature of 548 K (275ºC).

Note 2

Nothing in Note 1 to Category Code 1C001.a. releases magnetic materials to provide absorption when contained in paint.

b. Materials for absorbing frequencies exceeding 1.5 × 10^{14} Hz but less than 3.7 × 10^{14} Hz and not transparent to visible light;

c. Intrinsically conductive polymeric materials with a ‘bulk electrical conductivity’ exceeding 10,000 S/m (Siemens per metre) or a ‘sheet (surface) resistivity’ of less than 100 ohms/square, based on any of the following polymers:

1. Polyaniline;

2. Polypyrrole;

3. Polythiophene;

THE SCHEDULE — *continued*

Category Code	*Item Description*
	4. Poly phenylene-vinylene; <u>or</u> 5. Poly thienylene-vinylene. <u>*Technical Note*</u> *'Bulk electrical conductivity' and 'sheet (surface) resistivity' should be determined using ASTM D-257 or national equivalents.*
1C002	Metal alloys, metal alloy powder and alloyed materials, as follows: ***<u>N.B.</u>*** ***See also Category Code 1C202.*** <u>*Note*</u> *Category Code 1C002 does not include metal alloys, metal alloy powder and alloyed materials for coating substrates.* *Technical Notes* *1. The metal alloys in Category Code 1C002 are those containing a higher percentage by weight of the stated metal than of any other element.* *2. 'Stress-rupture life' is be measured in accordance with ASTM standard E-139 or national equivalents.* *3. 'Low cycle fatigue life' is be measured in accordance with ASTM standard E-606 'Recommended Practice for Constant-Amplitude Low-Cycle Fatigue Testing' or national equivalents. Testing should be axial with an average stress ratio equal to 1 and a stress-concentration factor (K_t) equal to 1. The average stress is defined as maximum stress minus minimum stress divided by maximum stress.* a. Aluminides, as follows: 1. Nickel aluminides containing a minimum of 15% by weight aluminium, a maximum of 38% by weight aluminium and at least one additional alloying element; 2. Titanium aluminides containing 10% by weight or more aluminium and at least one additional alloying element;

THE SCHEDULE — *continued*

Category Code	*Item Description*
	b. Metal alloys, as follows, made from material specified in Category Code 1C002.c.: 1. Nickel alloys having any of the following: a. A ‘stress-rupture life’ of 10,000 hours or longer at 923 K (650ºC) at a stress of 676 MPa; <u>or</u> b. A ‘low cycle fatigue life’ of 10,000 cycles or more at 823 K (550ºC) at a maximum stress of 1,095 MPa; 2. Niobium alloys having any of the following: a. A ‘stress-rupture life’ of 10,000 hours or longer at 1,073 K (800ºC) at a stress of 400 MPa; <u>or</u> b. A ‘low cycle fatigue life’ of 10,000 cycles or more at 973 K (700ºC) at a maximum stress of 700 MPa; 3. Titanium alloys having any of the following: a. A ‘stress-rupture life’ of 10,000 hours or longer at 723 K (450ºC) at a stress of 200 MPa; <u>or</u> b. A ‘low cycle fatigue life’ of 10,000 cycles or more at 723 K (450ºC) at a maximum stress of 400 MPa; 4. Aluminium alloys having any of the following: a. A tensile strength of 240 MPa or more at 473 K (200ºC); <u>or</u> b. A tensile strength of 415 MPa or more at 298 K (25ºC); 5. Magnesium alloys having all of the following: a. A tensile strength of 345 MPa or more; <u>and</u> b. A corrosion rate of less than 1 mm/year in 3% sodium chloride aqueous solution measured in accordance with ASTM standard G-31 or national equivalents; c. Metal alloy powder or particulate material, having all of the following: 1. Made from any of the following composition systems: <u>*Technical Note*</u> *X in the following equals one or more alloying elements.*

THE SCHEDULE — *continued*

Category Code	*Item Description*
	a. Nickel alloys (Ni-Al-X, Ni-X-Al) qualified for turbine engine parts or components, i.e. with less than 3 non-metallic particles (introduced during the manufacturing process) larger than 100 μm in 10^9 alloy particles; b. Niobium alloys (Nb-Al-X or Nb-X-Al, Nb-Si-X or Nb-X-Si, Nb-Ti-X or Nb-X-Ti); c. Titanium alloys (Ti-Al-X or Ti-X-Al); d. Aluminium alloys (Al-Mg-X or Al-X-Mg, Al-Zn-X or Al-X-Zn, Al-Fe-X or Al-X-Fe); or e. Magnesium alloys (Mg-Al-X or Mg-X-Al); 2. Made in a controlled environment by any of the following processes: a. "Vacuum atomisation"; b. "Gas atomisation"; c. "Rotary atomisation"; d. "Splat quenching"; e. "Melt spinning" and "comminution"; f. "Melt extraction" and "comminution"; or g. "Mechanical alloying"; and 3. Capable of forming materials specified in Category Code 1C002.a. or 1C002.b. d. Alloyed materials having all of the following: 1. Made from any of the composition systems specified in Category Code 1C002.c.1.; 2. In the form of uncomminuted flakes, ribbons or thin rods; and 3. Produced in a controlled environment by any of the following: a. "Splat quenching"; b. "Melt spinning"; or

THE SCHEDULE — *continued*

Category Code	*Item Description*
	c. "Melt extraction".
1C003	Magnetic metals, of all types and of whatever form, having any of the following: a. Initial relative permeability of 120,000 or more and a thickness of 0.05 mm or less; *Technical Note* *Measurement of initial permeability is that performed on fully annealed materials.* b. Magnetostrictive alloys, having any of the following: 1. A saturation magnetostriction of more than 5×10^{-4}; or 2. A magnetomechanical coupling factor (k) of more than 0.8; or c. Amorphous or 'nanocrystalline' alloy strips, having all of the following characteristics: 1. A composition having a minimum of 75% by weight of iron, cobalt or nickel; 2. A saturation magnetic induction (B_s) of 1.6 T or more; and 3. Any of the following: a. A strip thickness of 0.02 mm or less; or b. An electrical resistivity of 2×10^{-4} ohm cm or more. Technical Note 'Nanocrystalline' materials in Category Code 1C003.c. are those materials having a crystal grain size of 50 nm or less, as determined by X-ray diffraction.
1C004	Uranium titanium alloys or tungsten alloys with a "matrix" based on iron, nickel or copper, having all of the following: a. A density exceeding 17.5 g/cm^3; b. An elastic limit exceeding 880 MPa; c. An ultimate tensile strength exceeding 1,270 MPa; and d. An elongation exceeding 8%.

THE SCHEDULE — *continued*

Category Code	Item Description
1C005	"Superconductive" "composite" conductors in lengths exceeding 100 m or with a mass exceeding 100 g, as follows: a. Superconductive" "composite" conductors containing one or more niobium-titanium 'filaments', having all of the following: 1. Embedded in a "matrix" other than a copper or copper-based mixed "matrix"; <u>and</u> 2. Having a cross-section area less than 0.28×10^{-4} mm^2 (6 μm in diameter for circular 'filaments'); b. "Superconductive" "composite" conductors consisting of one or more "superconductive" 'filaments' other than niobium-titanium, having all of the following: 1. A "critical temperature" at zero magnetic induction exceeding 9.85 K (-263.31ºC); <u>and</u> 2. Remaining in the "superconductive" state at a temperature of 4.2 K (-268.96ºC) when exposed to a magnetic field oriented in any direction perpendicular to the longitudinal axis of conductor and corresponding to a magnetic induction of 12 T with critical current density exceeding 1,750 A/mm^2 on overall cross-section of the conductor; c. "Superconductive" "composite" conductors consisting of one or more "superconductive" 'filaments' which remain "superconductive" above 115 K (-158.16°C). <u>*Technical Note*</u> *For the purpose of Category Code 1C005 'filaments' may be in wire, cylinder, film, tape or ribbon form.*
1C006	Fluids and lubricating materials, as follows: a. Hydraulic fluids containing, as their principal ingredients, any of the following: 1. Synthetic 'silahydrocarbon oils' having all of the following: Technical Note

THE SCHEDULE — *continued*

Category Code	*Item Description*
	For the purpose of Category Code 1C006.a.1, 'silahydrocarbon oils' contain exclusively silicon, hydrogen and carbon. a. A 'flash point' exceeding 477 K (204ºC); b. A 'pour point' at 239 K (-34ºC) or less; c. A 'viscosity index' of 75 or more; <u>and</u> d. A thermal stability at 616 K (343ºC); <u>or</u> 2. 'Chlorofluorocarbons' having all of the following: <u>*Technical Note*</u> *For the purpose of Category Code 1C006.a.2., 'chlorofluorocarbons' contain exclusively carbon, fluorine and chlorine.* a. No 'flash point'; b. An 'autogenous ignition temperature' exceeding 977 K (704ºC); c. A 'pour point' at 219 K (-54ºC) or less; d. A 'viscosity index' of 80 or more; <u>and</u> e. A boiling point at 473 K (200ºC) or higher; b. Lubricating materials containing, as their principal ingredients, any of the following: 1. Phenylene or alkylphenylene ethers or thio-ethers, or their mixtures, containing more than two ether or thio-ether functions or mixtures thereof; <u>or</u> 2. Fluorinated silicone fluids with a kinematic viscosity of less than 5,000 mm^2/s (5,000 centistokes) measured at 298 K (25ºC); c. Damping or flotation fluids with a purity exceeding 99.8%, containing less than 25 particles of 200 µm or larger in size per 100 ml and made from at least 85% of any of the following: 1. Dibromotetrafluoroethane;

THE SCHEDULE — *continued*

Category Code	*Item Description*
	2. Polychlorotrifluoroethylene (oily and waxy modifications only); <u>or</u>
	3. Polybromotrifluoroethylene;
	d. Fluorocarbon electronic cooling fluids, having all of the following:
	1. Containing 85% by weight or more of any of the following, or mixtures thereof:
	a. Monomeric forms of perfluoropolyalkylether-triazines or perfluoroaliphatic-ethers;
	b. Perfluoroalkylamines;
	c. Perfluorocycloalkanes; <u>or</u>
	d. Perfluoroalkanes;
	2. Density at 298 K (25ºC) of 1.5 g/ml or more;
	3. In a liquid state at 273 K (0ºC); <u>and</u>
	4. Containing 60% or more by weight of fluorine.
	<u>*Technical Note*</u>
	For the purpose of Category Code 1C006:
	a. 'Flash point' is determined using the Cleveland Open Cup Method described in ASTM D-92 or national equivalents;
	b. 'Pour point' is determined using the method described in ASTM D-97 or national equivalents;
	c. 'Viscosity index' is determined using the method described in ASTM D-2270 or national equivalents;
	d. 'Thermal stability' is determined by the following test procedure or national equivalents:
	Twenty ml of the fluid under test is placed in a 46 ml type 317 stainless steel chamber containing one each of 12.5 mm (nominal) diameter balls of M-10 tool steel, 52,100 steel and naval bronze (60% Cu, 39% Zn, 0.75% Sn);

THE SCHEDULE — *continued*

Category Code	*Item Description*
	The chamber is purged with nitrogen, sealed at atmospheric pressure and the temperature raised to and maintained at 644 ± 6 K (371 ± 6ºC) for six hours;
	The specimen will be considered thermally stable if, on completion of the above procedure, all of the following conditions are met:
	1. The loss in weight of each ball is less than 10 mg/mm^2 of ball surface;
	2. The change in original viscosity as determined at 311 K (38ºC) is less than 25%; <u>and</u>
	3. The total acid or base number is less than 0.40;
	e. 'Autogenous ignition temperature' is determined using the method described in ASTM E-659 or national equivalents.
1C007	Ceramic base materials, non-"composite" ceramic materials, ceramic-"matrix" "composite" materials and precursor materials, as follows:
	<u>N.B.</u>
	See also Category Code 1C107.
	a. Base materials of single or complex borides of titanium having total metallic impurities, excluding intentional additions, of less than 5,000 ppm, an average particle size equal to or less than 5 µm and no more than 10% of the particles larger than 10 µm;
	b. Non-"composite" ceramic materials in crude or semi-fabricated form, composed of borides of titanium with a density of 98% or more of the theoretical density;
	<u>Note</u>
	Category Code 1C007.b. does not include abrasives.
	c. Ceramic-ceramic "composite" materials with a glass or oxide-"matrix" and reinforced with fibres having all of the following:
	1. Made from any of the following materials:
	a. Si-N;

THE SCHEDULE — *continued*

Category Code	*Item Description*
	b. Si-C;
	c. Si-Al-O-N; or
	d. Si-O-N; and
	2. Having a "specific tensile strength" exceeding 12.7×10^3 m;
	d. Ceramic-ceramic "composite" materials, with or without a continuous metallic phase, incorporating particles, whiskers or fibres, where carbides or nitrides of silicon, zirconium or boron form the "matrix";
	e. Precursor materials (i.e., special purpose polymeric or metallo-organic materials) for producing any phase or phases of the materials specified in Category Code 1C007.c., as follows:
	1. Polydiorganosilanes (for producing silicon carbide);
	2. Polysilazanes (for producing silicon nitride);
	3. Polycarbosilazanes (for producing ceramics with silicon, carbon and nitrogen components);
	f. Ceramic-ceramic "composite" materials with an oxide or glass "matrix" reinforced with continuous fibres from any of the following systems:
	1. Al_2O_3; or
	2. Si-C-N.
	Note:
	Category Code 1C007.f. does not include "composites" containing fibres from these systems with a fibre tensile strength of less than 700 MPa at 1,273 K (1,000℃) or fibre tensile creep resistance of more than 1% creep strain at 100 MPa load and 1,273 K (1,000℃) for 100 hours.
1C008	Non-fluorinated polymeric substances, as follows:
	a. 1. Bismaleimides;
	2. Aromatic polyamide-imides;
	3. Aromatic polyimides;

THE SCHEDULE — *continued*

Category Code	Item Description

4. Aromatic polyetherimides having a glass transition temperature (T_g) exceeding 513 K (240ºC)

Note

Category Code 1C008.a. includes the substances in liquid or solid "fusible" form, including resin, powder, pellet, film, sheet, tape or ribbon;

N.B.

For non-"fusible"aromatic polyimides in film, sheet, tape or ribbon form, see Category Code 1A003.

b. Thermoplastic liquid crystal copolymers having a heat distortion temperature exceeding 523 K (250ºC) measured according to ISO 75-2 (2004), method A or national equivalents, with a load of 1.80 N/mm^2 and composed of:

1. Any of the following:

a. Phenylene, biphenylene or naphthalene; or

b. Methyl, tertiary-butyl or phenyl substituted phenylene, biphenylene or naphthalene; and

2. Any of the following:

a. Terephthalic acid;

b. 6-hydroxy-2 naphthoic acid; or

c. 4-hydroxybenzoic acid;

c. Not used;

d. Polyarylene ketones;

e. Polyarylene sulphides, where the arylene group is biphenylene, triphenylene or combinations thereof;

f. Polybiphenylenethersulphone having a 'glass transition temperature (T_g)' exceeding 513 K (240ºC).

Technical Note

The 'glass transition temperature (T_g)' for Category Code 1C008 materials is determined using the method described in ISO 11357-2 (1999) or national equivalents.

THE SCHEDULE — *continued*

Category Code	*Item Description*
1C009	Unprocessed fluorinated compounds, as follows: a. Copolymers of vinylidene fluoride having 75% or more beta crystalline structure without stretching; b. Fluorinated polyimides containing 10% by weight or more of combined fluorine; c. Fluorinated phosphazene elastomers containing 30% by weight or more of combined fluorine.
1C010	"Fibrous or filamentary materials" which may be used in organic "matrix", metallic "matrix" or carbon "matrix" "composite" structures or laminates, as follows: ***<u>N.B.</u>*** ***See also Category Codes 1C210 and 9C110.*** a. Organic "fibrous or filamentary materials", having all of the following: 1. A "specific modulus" exceeding 12.7×10^6 m; <u>and</u> 2. A "specific tensile strength" exceeding 23.5×10^4 m; *<u>Note</u>* *Category Code 1C010.a. does not include polyethylene.* b. Carbon "fibrous or filamentary materials", having all of the following: 1. A "specific modulus" exceeding 12.7×10^6 m; <u>and</u> 2. A "specific tensile strength" exceeding 23.5×10^4 m; *<u>Note</u>* *Category Code 1C010.b. does not include fabric made from "fibrous or filamentary materials" for the repair of "civil aircraft" structures or laminates, in which the size of individual sheets does not exceed 100 cm × 100 cm.* *<u>Technical Note</u>* *Properties for materials described in Category Code 1C010.b. is determined using SACMA recommended methods SRM 12 to*

THE SCHEDULE — *continued*

Category Code	*Item Description*
	17, ISO 10618 (2004) 10.2.1 Method A or national equivalent tow tests and based on lot average.

c. Inorganic "fibrous or filamentary materials", having all of the following:

1. A "specific modulus" exceeding 2.54×10^6 m; and

2. A melting, softening, decomposition or sublimation point exceeding 1,922 K (1,649ºC) in an inert environment;

Note

Category Code 1C010.c. does not include:

a. Discontinuous, multiphase, polycrystalline alumina fibres in chopped fibre or random mat form, containing 3% by weight or more silica, with a "specific modulus" of less than 10×10^6 m;

b. Molybdenum and molybdenum alloy fibres;

c. Boron fibres;

d. Discontinuous ceramic fibres with a melting, softening, decomposition or sublimation point lower than 2,043 K (1,770ºC) in an inert environment.

d. "Fibrous or filamentary materials" having any of the following:

1. Composed of any of the following:

a. Polyetherimides specified in Category Code 1C008.a.; or

b. Materials specified in Category Codes 1C008.b. to 1C008.f.; or

2. Composed of materials specified in Category Code 1C010.d.1.a. or 1C010.d.1.b. and "commingled" with other fibres specified in Category Code 1C010.a., 1C010.b. or 1C010.c.;

e. Resin-impregnated or pitch-impregnated fibres (prepregs), metal or carbon-coated fibres (preforms) or "carbon fibre preforms", as follows:

THE SCHEDULE — *continued*

Category Code	*Item Description*
	1. Made from "fibrous or filamentary materials" specified in Category Code 1C010.a., 1C010.b. or 1C010.c.;
	2. Made from organic or carbon "fibrous or filamentary materials" having all of the following:
	a. A "specific tensile strength" exceeding 17.7×10^4 m;
	b. A "specific modulus" exceeding 10.15×10^6 m;
	c. Not specified in Category Code 1C010.a. or 1C010.b.; <u>and</u>
	d. When impregnated with materials specified in Category Code 1C008 or 1C009.b., having a 'glass transition temperature (T_g)' exceeding 383 K (110ºC) or with phenolic or epoxy resins, having a 'glass transition temperature (T_g)' equal to or exceeding 418 K (145ºC).
	<u>Notes</u>
	Category Code 1C010.e. does not include:
	a. Epoxy resin "matrix" impregnated carbon "fibrous or filamentary materials" (prepregs) for the repair of "civil aircraft" structures or laminates, in which the size of individual sheets of prepreg does not exceed 100 cm × 100 cm;
	b. Prepregs when impregnated with phenolic or epoxy resins having a 'glass transition temperatureg (T_g)' less than 433 K (160ºC) and a cure temperature lower than the 'glass transition temperature'.
	<u>Technical Note</u>
	g The 'glass transition temperature (T_g)' for Category Code 1C010.e. materials is determined using the method described in ASTM D 3418 using the dry method. The 'glass transition temperature (T_g)' for phenolic and epoxy resins is determined using the method described in ASTM D 4065 at a frequency of 1 Hz and a heating rate of 2 K (ºC) per minute using the dry method.
1C011	Metals and compounds, as follows:
	<u>N.B.</u>
	See also Division 2 of Part I of this Schedule and Category Code 1C111.
	a. Metals in particle sizes of less than 60 µm whether spherical, atomised, spheroidal, flaked or ground, manufactured from material consisting of 99% or more of zirconium, magnesium and alloys thereof;
	<u>Technical Note</u>

THE SCHEDULE — *continued*

Category Code	*Item Description*
	The natural content of hafnium in the zirconium (typically 2% to 7%) is counted with the zirconium.
	<u>*Note*</u>
	Category Code 1C011.a. includes metals or alloys listed therein whether or not they are encapsulated in aluminium, magnesium, zirconium or beryllium.
	b. Boron or boron carbide of 85% purity or higher and a particle size of 60 µm or less;
	<u>*Note*</u>
	Category Code 1C011.b. includes metals or alloys listed therein whether or not they are encapsulated in aluminium, magnesium, zirconium or beryllium.
	c. Guanidine nitrate;
	d. Nitroguanidine (NQ) (556-88-7).
1C012	Materials as follows:
	<u>*Technical Note*</u>
	These materials are typically used for nuclear heat sources.
	a. Plutonium in any form with a plutonium isotopic assay of plutonium-238 of more than 50% by weight;
	<u>*Note*</u>
	Category Code 1C012.a. does not include:
	a. Shipments with a plutonium content of 1 g or less;
	b. Shipments of 3 "effective grammes" or less when contained in a sensing component in instruments.
	b. "Previously separated" neptunium-237 in any form.
	<u>*Note*</u>
	Category Code 1C012.b. does not include shipments with a neptunium-237 content of 1 g or less.
1C101	Materials and devices for reduced observables such as radar reflectivity, ultraviolet/infrared signatures and acoustic signatures, other than those specified in Category Code 1C001, usable in

THE SCHEDULE — *continued*

Category Code	Item Description
	‘missiles’, “missile” subsystems or unmanned aerial vehicles specified in Category Code 9A012.
	Note 1
	Category Code 1C101 includes:
	a. Structural materials and coatings specially designed for reduced radar reflectivity;
	b. Coatings, including paints, specially designed for reduced or tailored reflectivity or emissivity in the microwave, infrared or ultraviolet regions of the electromagnetic spectrum.
	Note 2
	Category Code 1C101 does not include coatings when specially used for the thermal control of satellites.
	Technical Note
	In Category Code 1C101 ‘missile’ means complete rocket systems and unmanned aerial vehicle systems capable of a range exceeding 300 km.
1C102	Resaturated pyrolised carbon-carbon materials designed for space launch vehicles specified in Category Code 9A004 or sounding rockets specified in Category Code 9A104.
1C107	Graphite and ceramic materials, other than those specified in Category Code 1C007, as follows:
	a. Fine grain graphites with a bulk density of 1.72 g/cm^3 or greater, measured at 288 K (15ºC), and having a grain size of 100 µm or less, usable for rocket nozzles and re-entry vehicle nose tips, which can be machined to any of the following products:
	1. Cylinders having a diameter of 120 mm or greater and a length of 50 mm or greater;
	2. Tubes having an inner diameter of 65 mm or greater and a wall thickness of 25 mm or greater and a length of 50 mm or greater; or

THE SCHEDULE — *continued*

Category Code	*Item Description*
	3. Blocks having a size of 120 mm × 120 mm × 50 mm or greater; ***N.B.*** ***See also Category Code 0C004.*** b. Pyrolytic or fibrous reinforced graphites, usable for rocket nozzles and re-entry vehicle nose tips usable in “missiles”, space launch vehicles specified in Category Code 9A004 or sounding rockets specified in Category Code 9A104; ***N.B.*** ***See also Category Code 0C004.*** c. Ceramic composite materials (dielectric constant less than 6 at any frequency from 100 MHz to 100 GHz) for use in radomes usable in “missiles”, space launch vehicles specified in Category Code 9A004 or sounding rockets specified in Category Code 9A104; d. Bulk machinable silicon-carbide reinforced unfired ceramic, usable for nose tips usable in “missiles”, space launch vehicles specified in Category Code 9A004 or sounding rockets specified in Category Code 9A104. e. Reinforced silicon-carbide ceramic composites, usable for nose tips, re-entry vehicles and nozzle flaps usable in “missiles”, space launch vehicles specified in Category Code 9A004 or sounding rockets specified in Category Code 9A104.
1C111	Propellants and constituent chemicals for propellants, other than those specified in Category Code 1C011, as follows: a. Propulsive substances: 1. Spherical aluminium powder, other than that specified in Division 2 of Part I of this Schedule, with particles of uniform diameter of less than 200 µm and an aluminium content of 97% by weight or more, if at least 10% of the total weight is made up of particles of less than 63 µm, according to ISO 2591:1988 or national equivalents; Technical Note

THE SCHEDULE — *continued*

Category Code	*Item Description*
	A particle size of 63 µm (ISO R-565) corresponds to 250 mesh (Tyler) or 230 mesh (ASTM standard E-11).
	2. Metal fuels, other than that specified in Division 2 of Part I of this Schedule, in particle sizes of less than 60 µm, whether spherical, atomised, spheroidal, flaked or ground, consisting 97% by weight or more of any of the following:
	a. Zirconium;
	b. Beryllium;
	c. Magnesium; <u>or</u>
	d. Alloys of the metals specified by a. to c. above;
	<u>*Technical Note*</u>
	The natural content of hafnium in the zirconium (typically 2% to 7%) is counted with the zirconium.
	3. Oxidiser substances usable in liquid propellant rocket engines as follows:
	a. Dinitrogen trioxide(10544-73-7);
	b. Nitrogen dioxide(10102-44-0)/dinitrogen tetroxide (10544-72-6);
	c. Dinitrogen pentoxide(10102-03-1);
	d. Mixed Oxides of Nitrogen (MON);
	<u>*Technical Note*</u>
	Mixed Oxides of Nitrogen (MON) are solutions of Nitric Oxide (NO) in Dinitrogen Tetroxide/ Nitrogen Dioxide (N_2O_4/NO_2) that can be used in missile systems. There are a range of compositions that can be denoted as MONi or MONij, where i and j are integers representing the percentage of Nitric Oxide in the mixture (e.g., MON3 contains 3% Nitric Oxide, MON25 25% Nitric Oxide. An upper limit is MON40, 40% by weight).
	e. **See Inhibited Red Fuming Nitric Acid (IRFNA) in Division 2 of Part I of this Schedule;**

THE SCHEDULE — *continued*

Category Code	*Item Description*

f. **See Compounds composed of fluorine and one or more of other halogens, oxygen or nitrogen in Division 2 of Part I of this Schedule and Category Code 1C238;**

4. Hydrazine derivatives as follows:

N.B.

See also Division 2 of Part I of this Schedule.

a. Trimethylhydrazine (1741-01-1);

b. Tetramethylhydrazine (6415-12-9);

c. N,N diallylhydrazine;

d. Allylhydrazine (7422-78-8);

e. Ethylene dihydrazine;

f. Monomethylhydrazine dinitrate;

g. Unsymmetrical dimethylhydrazine nitrate;

h. Hydrazinium azide (14546-44-2);

i. Dimethylhydrazinium azide;

j. Hydrazinium nitrate;

k. Diimido oxalic acid dihydrazine;

l. 2-hydroxyethylhydrazine nitrate (HEHN);

m. See Hydrazinium perchlorate in Division 2 of Part I of this Schedule;

n. Hydrazinium diperchlorate;

o. Methylhydrazine nitrate (MHN);

p. Diethylhydrazine nitrate (DEHN);

q. 3,6-dihydrazino tetrazine nitrate (1,4-dihydrazine nitrate) (DHTN);

b. Polymeric substances:

1. Carboxy-terminated polybutadiene (including carboxyl-terminated polybutadiene) (CTPB);

THE SCHEDULE — *continued*

Category Code	*Item Description*
	2. Hydroxy-terminated polybutadiene (including hydroxyl-terminated polybutadiene) (HTPB), other than that specified in Division 2 of Part I of this Schedule;
	3. Polybutadiene-acrylic acid (PBAA);
	4. Polybutadiene-acrylic acid-acrylonitrile (PBAN);
	5. Polytetrahydrofuran polyethylene glycol (TPEG);
	Technical Note:
	Polytetrahydrofuran polyethylene glycol (TPEG) is a block co-polymer of poly 1,4-Butanediol and polyethylene glycol (PEG).
	c. Other propellant additives and agents:
	1. **See Carboranes, decaboranes, pentaboranes and derivatives thereof in Division 2 of Part I of this Schedule;**
	2. Triethylene glycol dinitrate (TEGDN) (111-22-8);
	3. 2-Nitrodiphenylamine (119-75-5);
	4. Trimethylolethane trinitrate (TMETN) (3032-55-1);
	5. Diethylene glycol dinitrate (DEGDN) (693-21-0);
	6. Ferrocene derivatives as follows:
	a. **See Catocene in Division 2 of Part I of this Schedule;**
	b. Ethyl ferrocene (1273-89-8);
	c. Propyl ferrocene;
	d. **See n-butyl ferrocene in Division 2 of Part I of this Schedule;**
	e. Pentyl ferrocene (1274-00-6);
	f. Dicyclopentyl ferrocene;
	g. Dicyclohexyl ferrocene;
	h. Diethyl ferrocene;
	i. Dipropyl ferrocene;
	j. Dibutyl ferrocene (1274-08-4);

THE SCHEDULE — *continued*

Category Code	*Item Description*
	k. Dihexyl ferrocene (93894-59-8); l. Acetyl ferrocenes; m. **See Ferrocene carboxylic acids in Division 2 of Part I of this Schedule;** n. **See Butacene in Division 2 of Part I of this Schedule;** o. Other ferrocene derivatives usable as rocket propellant burning rate modifiers, other than those specified in Division 2 of Part I of this Schedule; 7. 4,5 diazidomethyl-2-methyl-1,2,3-triazole (iso-DAMTR), other than that specified in Division 2 of Part I of this Schedule. ***Note*** ***For propellants and constituent chemicals for propellants not specified in Category Code 1C111, see Division 2 of Part I of this Schedule.***
1C116	Maraging steels having an ultimate tensile strength of 1,500 MPa or greater, measured at 293 K (20ºC), in the form of sheet, plate or tubing with a wall or plate thickness equal to or less than 5 mm. N.B. See also Category Code 1C216. Technical Note: Maraging steels are iron alloys generally characterised by high nickel, very low carbon content and the use of substitutional elements or precipitates to produce strengthening and age-hardening of the alloy.
1C117	Tungsten, molybdenum and alloys of these metals in the form of uniform spherical or atomised particles of 500 micrometre diameter or less with a purity of 97% or greater for fabrication of rocket motor components usable in “missiles”, space launch vehicles specified in Category Code 9A004 or sounding rockets specified in Category Code 9A104 (i.e., heat shields, nozzle substrates, nozzle throats and thrust vector control surfaces).

THE SCHEDULE — *continued*

Category Code	*Item Description*
1C118	Titanium-stabilised duplex stainless steel (Ti-DSS) having all of the following: a. Having all of the following characteristics: 1. Containing 17.0-23.0 % by weight chromium and 4.5-7.0 % by weight nickel; 2. Having a titanium content of greater than 0.10 % by weight; <u>and</u> 3. A ferritic-austenitic microstructure (also referred to as a two-phase microstructure) of which at least 10 percent is austenite by volume (according to ASTM E-1181-87 or national equivalents); <u>and</u> b. Having any of the following forms: 1. Ingots or bars having a size of 100 mm or more in each dimension; 2. Sheets having a width of 600 mm or more and a thickness of 3 mm or less; <u>or</u> 3. Tubes having an outer diameter of 600 mm or more and a wall thickness of 3 mm or less.
1C202	Alloys, other than those specified in Category Code 1C002.b.3. or .b.4., as follows: a. Aluminium alloys having both of the following characteristics: 1. 'Capable of' an ultimate tensile strength of 460 MPa or more at 293 K (20ºC); <u>and</u> 2. In the form of tubes or cylindrical solid forms (including forgings) with an outside diameter of more than 75 mm; b. Titanium alloys having both of the following characteristics: 1. 'Capable of' an ultimate tensile strength of 900 MPa or more at 293 K (20ºC); <u>and</u> 2. In the form of tubes or cylindrical solid forms (including forgings) with an outside diameter of more than 75 mm. <u>*Technical Note*</u>

THE SCHEDULE — *continued*

Category Code	*Item Description*
	The phrase alloys 'capable of' encompasses alloys before or after heat treatment.
1C210	'Fibrous or filamentary materials' or prepregs, other than those specified in Category Code 1C010.a., b. or e., as follows:

a. Carbon or aramid 'fibrous or filamentary materials' having either of the following characteristics:

1. A "specific modulus" of 12.7×10^6 m or greater; or
2. A "specific tensile strength" of 235×10^3 m or greater;

Note

Category Code 1C210.a. does not include aramid 'fibrous or filamentary materials' having 0.25 percent or more by weight of an ester based fibre surface modifier;

b. Glass 'fibrous or filamentary materials' having both of the following characteristics:

1. A "specific modulus" of 3.18×10^6 m or greater; and
2. A "specific tensile strength" of 76.2×10^3 m or greater;

c. Thermoset resin impregnated continuous "yarns", "rovings", "tows" or "tapes" with a width of 15 mm or less (prepregs), made from carbon or glass 'fibrous or filamentary materials' specified in Category Code 1C210.a. or b.

Technical Note

The resin forms the matrix of the composite.

Note

In Category Code 1C210, 'fibrous or filamentary materials' is restricted to continuous "monofilaments", "yarns", "rovings", "tows" or "tapes".

1C216 Maraging steel, other than that specified in Category Code 1C116, 'capable of' an ultimate tensile strength of 2,050 MPa or more, at 293 K (20ºC)

Note

Category Code 1C216 does not include forms in which all linear dimensions are 75 mm or less.

THE SCHEDULE — *continued*

Category Code	*Item Description*
	<u>*Technical Note*</u>
	The phrase maraging steel 'capable of' encompasses maraging steel before or after heat treatment.
1C225	Boron enriched in the boron-10 (^{10}B) isotope to greater than its natural isotopic abundance, as follows: elemental boron, compounds, mixtures containing boron, manufactures thereof, waste or scrap of any of the foregoing.
	<u>*Note*</u>
	In Category Code 1C225, mixtures containing boron include boron loaded materials.
	<u>*Technical Note*</u>
	The natural isotopic abundance of boron-10 is approximately 18.5 weight per cent (20 atom per cent).
1C226	Tungsten, tungsten carbide, and alloys containing more than 90% tungsten by weight, having both of the following characteristics:
	1. In forms with a hollow cylindrical symmetry (including cylinder segments) with an inside diameter between 100 mm and 300 mm; <u>and</u>
	2. A mass greater than 20 kg.
	<u>*Note*</u>
	Category Code 1C226 does not include manufactures specially designed as weights or gamma-ray collimators.
1C227	Calcium having both of the following characteristics:
	a. Containing less than 1,000 parts per million by weight of metallic impurities other than magnesium; <u>and</u>
	b. Containing less than 10 parts per million by weight of boron.
1C228	Magnesium having both of the following characteristics:
	a. Containing less than 200 parts per million by weight of metallic impurities other than calcium; <u>and</u>
	b. Containing less than 10 parts per million by weight of boron.
1C229	Bismuth having both of the following characteristics:

THE SCHEDULE — *continued*

Category Code	*Item Description*
	a. A purity of 99.99% or greater by weight; <u>and</u>
	b. Containing less than 10 parts per million by weight of silver.
1C230	Beryllium metal, alloys containing more than 50% beryllium by weight, beryllium compounds, manufactures thereof, and waste or scrap of any of the foregoing.
	<u>*Note*</u>
	Category Code 1C230 does not include the following:
	a. Metal windows for X-ray machines, or for bore-hole logging devices;
	b. Oxide shapes in fabricated or semi-fabricated forms specially designed for electronic component parts or as substrates for electronic circuits;
	c. Beryl (silicate of beryllium and aluminium) in the form of emeralds or aquamarines.
1C231	Hafnium metal, alloys containing more than 60% hafnium by weight, hafnium compounds containing more than 60% hafnium by weight, manufactures thereof, and waste or scrap of any of the foregoing.
1C232	Helium-3 (^{3}He), mixtures containing helium-3, and products or devices con

THE SCHEDULE — *continued*

Category Code	*Item Description*
	tain ing any of the forego ing.
	<u>*Note*</u>
	Cate gory Code 1C23 2 does not includ e a pro duct or device con tain ing less than 1 g of heliu m-3.
1C233	Lithium enriched in the lithium-6 (^{6}Li) isotope to greater than its natural isotopic abundance, and products or devices containing enriched lithium, as follows: elemental lithium, alloys, compounds, mixtures containing lithium, manufactures thereof, waste or scrap of any of the foregoing.
	<u>*Note*</u>
	Category Code 1C233 does not include thermoluminescent dosimeters.
	<u>*Technical Note*</u>

THE SCHEDULE — *continued*

Category Code	*Item Description*
	The natural isotopic abundance of lithium-6 is approximately 6.5 weight per cent (7.5 atom per cent).
1C234	Zirconium with a hafnium content of less than 1 part hafnium to 500 parts zirconium by weight, as follows: metal, alloys containing more than 50% zirconium by weight, compounds, manufactures thereof, waste or scrap of any of the foregoing.
	<u>Note</u>
	Category Code 1C234 does not include zirconium in the form of foil having a thickness of 0.10 mm or less.
1C235	Tritium, tritium compounds, mixtures containing tritium in which the ratio of tritium to hydrogen atoms exceeds 1 part in 1,000, and products or devices containing any of the foregoing.
	<u>Note</u>
	Category Code 1C235 does not include a product or device containing less than 1.48×10^3 GBq (40 Ci) of tritium.
1C236	Alpha-emitting radionuclides having an alpha half-life of 10 days or greater but less than 200 years, in the following forms:
	a. Elemental;
	b. Compounds having a total alpha activity of 37 GBq/kg (1 Ci/kg) or greater;
	c. Mixtures having a total alpha activity of 37 GBq/kg (1 Ci/kg) or greater;
	d. Products or devices containing any of the foregoing.
	<u>Note</u>
	Category Code 1C236 does not include a product or device containing less than 3.7 GBq (100 millicuries) of alpha activity.
1C237	Radium-226 (^{226}Ra), radium-226 alloys, radium-226 compounds, mixtures containing radium-226, manufactures thereof, and products or devices containing any of the foregoing.
	<u>Note</u>
	Category Code 1C237 does not include the following:
	a. Medical applicators;

THE SCHEDULE — *continued*

Category Code	*Item Description*
	b A product or device containing less than 0.37 GBq (10 millicuries) of radium-226.
1C238	Chlorine trifluoride (ClF_3).
1C239	High explosives, other than those specified in Division 2 of Part I of this Schedule, or substances or mixtures containing more than 2% by weight thereof, with a crystal density greater than 1.8 g/cm^3 and having a detonation velocity greater than 8,000 m/s.
1C240	Nickel powder and porous nickel metal, other than those specified in Category Code 0C005, as follows: a. Nickel powder having both of the following characteristics: 1. A nickel purity content of 99.0% or greater by weight; <u>and</u> 2. A mean particle size of less than 10 micrometres measured by American Society for Testing and Materials (ASTM) B330 standard; b. Porous nickel metal produced from materials specified in Category Code 1C240.a. *Note* *Category Code 1C240 does not include the following:* *a. Filamentary nickel powders;* *b. Single porous nickel sheets with an area of 1,000 cm^2 per sheet or less.* <u>*Technical Note*</u> *Category Code 1C240.b. refers to porous metal formed by compacting and sintering the materials in Category Code 1C240.a to form a metal material with fine pores interconnected throughout the structure.*
1C350	Chemicals, which may be used as precursors for toxic chemical agents, as follows, and "chemical mixtures" containing one or more thereof: <u>*N.B.*</u> *See also Division 2 of Part I of this Schedule and Category Code 1C450.*

THE SCHEDULE — *continued*

Category Code	*Item Description*
	1. Thiodiglycol (111-48-8);
	2. Phosphorus oxychloride (10025-87-3);
	3. Dimethyl methylphosphonate (756-79-6);
	4. **See Methyl phosphonyl difluoride (676-99-3) in Division 2 of Part I of this Schedule;**
	5. Methyl phosphonyl dichloride (676-97-1);
	6. Dimethyl phosphite (DMP) (868-85-9);
	7. Phosphorus trichloride (7719-12-2);
	8. Trimethyl phosphite (TMP) (121-45-9);
	9. Thionyl chloride (7719-09-7);
	10. 3-Hydroxy-1-methylpiperidine (3554-74-3);
	11. N,N-Diisopropyl-(beta)-aminoethyl chloride (96-79-7);
	12. N,N-Diisopropyl-(beta)-aminoethane thiol (5842-07-9);
	13. 3-Quinuclidinol (1619-34-7);
	14. Potassium fluoride (7789-23-3);
	15. 2-Chloroethanol (107-07-3);
	16. Dimethylamine (124-40-3);
	17. Diethyl ethylphosphonate (78-38-6);
	18. Diethyl-N,N-dimethylphosphoramidate (2404-03-7);
	19. Diethyl phosphite (762-04-9);
	20. Dimethylamine hydrochloride (506-59-2);
	21. Ethyl phosphinyl dichloride (1498-40-4);
	22. Ethyl phosphonyl dichloride (1066-50-8);
	23. **See Ethyl phosphonyl difluoride (753-98-0) in Division 2 of Part I of this Schedule;**
	24. Hydrogen fluoride (7664-39-3);
	25. Methyl benzilate (76-89-1);
	26. Methyl phosphinyl dichloride (676-83-5);

THE SCHEDULE — *continued*

Category Code	Item Description
	27. N,N-Diisopropyl-(beta)-amino ethanol (96-80-0);
	28. Pinacolyl alcohol (464-07-3);
	29. **See O-Ethyl-2-diisopropylaminoethyl methyl phosphonite (QL) (57856-11-8) in Division 2 of Part I of this Schedule;**
	30. Triethyl phosphite (122-52-1);
	31. Arsenic trichloride (7784-34-1);
	32. Benzilic acid (76-93-7);
	33. Diethyl methylphosphonite (15715-41-0);
	34. Dimethyl ethylphosphonate (6163-75-3);
	35. Ethyl phosphinyl difluoride (430-78-4);
	36. Methyl phosphinyl difluoride (753-59-3);
	37. 3-Quinuclidone (3731-38-2);
	38. Phosphorus pentachloride (10026-13-8);
	39. Pinacolone (75-97-8);
	40. Potassium cyanide (151-50-8);
	41. Potassium bifluoride (7789-29-9);
	42. Ammonium hydrogen fluoride or ammonium bifluoride (1341-49-7);
	43. Sodium fluoride (7681-49-4);
	44. Sodium bifluoride (1333-83-1);
	45. Sodium cyanide (143-33-9);
	46. Triethanolamine (102-71-6);
	47. Phosphorus pentasulphide (1314-80-3);
	48. Di-isopropylamine (108-18-9);
	49. Diethylaminotethanol (100-37-8);
	50. Sodium sulphide (1313-82-2);
	51. Sulphur monochloride (10025-67-9);

THE SCHEDULE — *continued*

Category Code	*Item Description*
	52. Sulphur dichloride (10545-99-0);
	53. Triethanolamine hydrochloride (637-39-8);
	54. N,N-Diisopropyl-(Beta)-aminoethyl chloride hydrochloride (4261-68-1);
	55. Methylphosphonic acid (993-13-5);
	56. Diethyl methylphosphonate (683-08-9);
	57. N,N-Dimethylaminophosphoryl dichloride (677-43-0);
	58. Triisopropyl phosphite (116-17-6);
	59. Ethyldiethanolamine (139-87-7)
	60. O,O-Diethyl phosphorothioate (2465-65-8);
	61. O,O-Diethyl phosphorodithioate (298-06-6);
	62. Sodium hexaflurosilicate (16893-85-9);
	63. Methylphosphonothioic dichloride (676-98-2).
	Note 1
	Category Code 1C350 does not include "chemical mixtures" containing one or more of the chemicals specified in Category Codes 1C350.2, .6, .7, .8, .9, .10, .14, .15, .16, .19, .20, .24, .25, 30, .37, .38, .39, .40, .41, .42, .43, .44, .45, .46, .47, .48, .49, .50, 51, .52, .53, .58, .59, .60, .61 and .62 in which no individually specified chemical constitutes more than 30% by the weight of the mixture.
	Note 2
	Category Code 1C350 does not include products identified as consumer goods and packaged for retail sale for personal use or packaged for individual use
1C351	Human pathogens, zoonoses and "toxins", as follows:
	a. Viruses, whether natural, enhanced or modified, either in the form of "isolated live cultures" or as material including living material which has been deliberately inoculated or contaminated with such cultures, as follows:
	1. Chikungunya virus;

THE SCHEDULE — *continued*

Category Code	*Item Description*
	2. Congo-Crimean haemorrhagic fever virus;
	3. Dengue fever virus;
	4. Eastern equine encephalitis virus;
	5. Ebola virus;
	6. Hantaan virus;
	7. Junin virus;
	8. Lassa fever virus;
	9. Lymphocytic choriomeningitis virus;
	10. Machupo virus;
	11. Marburg virus;
	12. Monkey pox virus;
	13. Rift Valley fever virus;
	14. Tick-borne encephalitis virus (Russian Spring-Summer encephalitis virus);
	15. Variola virus;
	16. Venezuelan equine encephalitis virus;
	17. Western equine encephalitis virus;
	18. Not used;
	19. Yellow fever virus;
	20. Japanese encephalitis virus;
	21. Kyasanur Forest virus;
	22. Louping ill virus;
	23. Murray Valley encephalitis virus;
	24. Omsk haemorrhagic fever virus;
	25. Oropouche virus;
	26. Powassan virus;
	27. Rocio virus;
	28. St Louis encephalitis virus;

THE SCHEDULE — *continued*

Category Code	*Item Description*
	29. Hendra virus (Equine morbillivirus);
	30. South American haemorrhagic fever (Sabia, Guanarito);
	31. Pulmonary & renal syndrome-haemorrhagic fever viruses (Seoul, Dobrava, Puumala, Sin Nombre);
	32. Nipah virus;
	b. Rickettsiae, whether natural, enhanced or modified, either in the form of “isolated live cultures” or as material including living material which has been deliberately inoculated or contaminated with such cultures, as follows:
	1. Coxiella burnetii;
	2. Bartonella quintana (Rochalimaea quintana, Rickettsia quintana);
	3. Rickettsia prowasecki;
	4. Rickettsia rickettsii;
	c. Bacteria, whether natural, enhanced or modified, either in the form of “isolated live cultures” or as material including living material which has been deliberately inoculated or contaminated with such cultures, as follows:
	1. Bacillus anthracis;
	2. Brucella abortus;
	3. Brucella melitensis;
	4. Brucella suis;
	5. Chlamydia psittaci;
	6. Clostridium botulinum;
	7. Francisella tularensis;
	8. Burkholderia mallei (Pseudomonas mallei);
	9. Burkholderia pseudomallei (Pseudomonas pseudomallei);
	10. Salmonella typhi;
	11. Shigella dysenteriae;
	12. Vibrio cholerae;

THE SCHEDULE — *continued*

Category Code	*Item Description*
	13. Yersinia pestis;
	14. Clostridum perfringens epsilon toxin producing types;
	15. Enterohaemorrhagic Escherichia coli, serotype O157 and other verotoxin producing serotypes;
	d. “Toxins”, as follows, and “sub-unit of toxins” thereof:
	1. Botulinum toxins;
	2. Clostridium perfringens toxins;
	3. Conotoxin;
	4. Ricin;
	5. Saxitoxin;
	6. Shiga toxin;
	7. Staphylococcus aureus toxins;
	8. Tetrodotoxin;
	9. Verotoxin and shiga-like ribosome inactivating proteins;
	10. Microcystin (Cyanginosin);
	11. Aflatoxins;
	12. Abrin;
	13. Cholera toxin;
	14. Diacetoxyscirpenol toxin;
	15. T-2 toxin;
	16. HT-2 toxin;
	17. Modeccin;
	18. Volkensin;
	19. Viscum album Lectin 1 (Viscumin);
	<u>*Note*</u>
	Category Code 1C351.d. does not include botulinum toxins or conotoxins in product form meeting all of the following criteria:

THE SCHEDULE — *continued*

Category Code	*Item Description*
	1. Are pharmaceutical formulations designed for human administration in the treatment of medical conditions;
	2. Are pre-packaged for distribution as medical products;
	3. Are authorised by a state authority to be marketed as medical products.
	e. Fungi, whether natural, enhanced or modified, either in the form of "isolated live cultures" or as material including living material which has been deliberately inoculated or contaminated with such cultures, as follows:
	1. Coccidioides immitis;
	2. Coccidioides posadasii.
	<u>Note</u>
	Category Code 1C351 does not include "vaccines" or "immunotoxins".
1C352	Animal pathogens, as follows:
	a. Viruses, whether natural, enhanced or modified, either in the form of "isolated live cultures" or as material including living material which has been deliberately inoculated or contaminated with such cultures, as follows:
	1. African swine fever virus;
	2. Avian influenza virus, which are:
	a. Uncharacterised; <u>or</u>
	b. Defined in Annex I(2) EC Directive 2005/94/EC (O.J. L.10 14.1.2006 p.16) as having high pathogenicity, as follows:
	1. Type A viruses with an IVPI (intravenous pathogenicity index) in 6 week old chickens of greater than 1.2; <u>or</u>
	2. Type A viruses of the subtypes H5 or H7 subtype with genome sequences codified for multiple basic amino acids at the cleavage site of haemagglutinin molecule similar to that observed for other HPAI

THE SCHEDULE — *continued*

Category Code	*Item Description*
	viruses, indicating that the haemagglutinin molecule can be cleaved by a host ubiquitous protease;
	3. Bluetongue virus;
	4. Foot and mouth disease virus;
	5. Goat pox virus;
	6. Porcine herpes virus (Aujeszky's disease);
	7. Swine fever virus (Hog cholera virus);
	8. Lyssa virus;
	9. Newcastle disease virus;
	10. Peste des petits ruminants virus;
	11. Porcine enterovirus type 9 (swine vesicular disease virus);
	12. Rinderpest virus;
	13. Sheep pox virus;
	14. Teschen disease virus;
	15. Vesicular stomatitis virus;
	16. Lumpy skin disease virus;
	17. African horse sickness virus;
	b. Mycoplasmas, whether natural, enhanced or modified, either in the form of "isolated live cultures" or as material including living material which has been deliberately inoculated or contaminated with such cultures, as follows:
	1. Mycoplasma mycoides subspecies mycoides SC (small colony);
	2. Mycoplasma capricolum subspecies capripneumoniae.
	<u>Note</u>
	Category Code 1C352 does not include "vaccines".
1C353	Genetic elements and genetically modified organisms, as follows:
	a. Genetically modified organisms or genetic elements that contain nucleic acid sequences associated with pathogenicity

THE SCHEDULE — *continued*

Category Code	*Item Description*
	of organisms specified in Category Code 1C351.a. to c., 1C351.e., 1C352 or 1C354;
	b. Genetically modified organisms or genetic elements that contain nucleic acid sequences coding for any of the "toxins" specified in Category Code 1C351.d. or "sub-units of toxins" thereof.
	<u>*Technical Note*</u>
	1. Genetic elements include, inter alia, chromosomes, genomes, plasmids, transposons and vectors whether genetically modified or unmodified.
	2. Nucleic acid sequences associated with the pathogenicity of any of the microorganisms specified in Category Code 1C351.a. to c., 1C351.e., 1C352 or 1C354 means any sequence specific to the specified microorganism that:
	a. In itself or through its transcribed or translated products represents a significant hazard to human, animal or plant health; <u>*or*</u>
	b. Is known to enhance the ability of a specified microorganism, or any other organism into which it may be inserted or otherwise integrated, to cause serious harm to humans, animals or plant health.
	<u>*Note*</u>
	Category Code 1C353 does not extend to nucleic acid sequences associated with the pathogenicity of enterohaemorrhagic Escherichia coli, serotype O157 and other verotoxin producing strains, other than those coding for the verotoxin, or for its sub-units.
1C354	Plant pathogens, as follows:
	a. Viruses, whether natural, enhanced or modified, either in the form of "isolated live cultures" or as material including living material which has been deliberately inoculated or contaminated with such cultures, as follows:
	1. Potato Andean latent tymovirus;
	2. Potato spindle tuber viroid;

THE SCHEDULE — *continued*

Category Code	*Item Description*
	b. Bacteria, whether natural, enhanced or modified, either in the form of "isolated live cultures" or as material which has been deliberately inoculated or contaminated with such cultures, as follows:
	1. Xanthomonas albilineans;
	2. Xanthomonas campestris pv. citri including strains referred to as Xanthomonas campestris pv. citri types A,B, C,D,E or otherwise classified as Xanthomonas citri, Xanthomonas campestris pv. aurantifolia or Xanthomonas campestris pv. citrumelo;
	3. Xanthomonas oryzae pv. Oryzae (Pseudomonas campestris pv. Oryzae);
	4. Clavibacter michiganensis subsp. Sepedonicus (Corynbacterium michiganensis subsp. Sepedonicum or Corynebacterium Sepedonicum);
	5. Ralstonia solanacearum Races 2 and 3 (Pseudomonas solanacearum Races 2 and 3 or Burkholderia solanacearum Races 2 and 3);
	c. Fungi, whether natural, enhanced or modified, either in the form of "isolated live cultures" or as material which has been deliberately inoculated or contaminated with such cultures, as follows:
	1. Colletotrichum coffeanum var. virulans (Colletotrichum kahawae);
	2. Cochliobolus miyabeanus (Helminthosporium oryzae);
	3. Microcyclus ulei (syn. Dothidella ulei);
	4. Puccinia graminis (syn. Puccinia graminis f. sp. tritici);
	5. Puccinia striiformis (syn. Puccinia glumarum);
	6. Magnaporthe grisea (pyricularia grisea/pyricularia oryzae).
1C450	Toxic chemicals and toxic chemical precursors, as follows, and "chemical mixtures" containing one or more thereof:
	N.B.

THE SCHEDULE — *continued*

Category Code	*Item Description*
	See also Category Codes 1C350, 1C351.d. Division 2 of Part I of this Schedule.

a. Toxic chemicals, as follows:

1. Amiton: O,O-Diethyl S-[2-(diethylamino)ethyl] phosphorothiolate (78-53-5) and corresponding alkylated or protonated salts;
2. PFIB: 1,1,3,3,3-Pentafluoro-2-(trifluoromethyl)-1-propene (382-21-8);
3. **See BZ: 3-Quinuclidinyl benzilate (6581-06-2) in Division 2 of Part I of this Schedule;**
4. Phosgene: Carbonyl dichloride (75-44-5);
5. Cyanogen chloride (506-77-4);
7. Hydrogen cyanide (74-90-8);
8. Chloropicrin: Trichloronitromethane (76-06-2).

b. Toxic chemical precursors, as follows:

1. Chemicals, other than those specified in Division 2 of Part I of this Schedule or in Category Code 1C350, containing a phosphorus atom to which is bonded one methyl, ethyl or propyl (normal or iso) group but not further carbon atoms;

<u>*Note*</u>

Category Code 1C450.b.1 does not include Fonofos: O-Ethyl S- phenyl ethylphosphonothiolothionate (944-22-9).

2. N,N-Dialkyl [methyl, ethyl or propyl (normal or iso)] phosphoramidic dihalides, other than N,N-Dimethylaminophosphoryl dichloride;

<u>***N.B.:***</u>

See Category Code 1C350.57. for N,N-Dimethylaminophosphoryl dichloride.

3. Dialkyl [methyl, ethyl or propyl (normal or iso)] N,N-dialkyl [methyl, ethyl or propyl (normal or iso)]-phosphoramidates, other than Diethyl-N,N-

THE SCHEDULE — *continued*

Category Code	*Item Description*
	dimethylphosphoramidate which is specified in Category Code 1C350;
	4. N,N-Dialkyl [methyl, ethyl or propyl (normal or iso)] aminoethyl-2-chlorides and corresponding protonated salts, other than N,N-Diisopropyl-(beta)-aminoethyl chloride or N,N-Diisopropyl-(beta)-aminoethyl chloride hydrochloride which are specified in Category Code 1C350;
	5. N,N-Dialkyl [methyl, ethyl or propyl (normal or iso)] aminoethane-2-ols and corresponding protonated salts, other than N,N-Diisopropyl-(beta)-aminoethanol (96-80-0) and N, N-Diethylaminoethanol (100-37-8) which are specified in Category Code 1C350;
	Note
	Category Code 1C450.b.5. does not include the following:
	a. N,N-Dimethylaminoethanol (108-01-0) and corresponding protonated salts;
	b. Protonated salts of N,N-Diethylaminoethanol (100-37-8).
	6. N,N-Dialkyl [methyl, ethyl or propyl (normal or iso)] aminoethane-2-thiols and corresponding protonated salts, other than N,N-Diisopropyl-(beta)-aminoethane thiol which is specified in Category Code 1C350;
	7. **See Category Code 1C350 for ethyldiethanolamine (139-87-7);**
	8. Methyldiethanolamine (105-59-9).
	Note 1
	Category Code 1C450 does not include "chemical mixtures" containing one or more of the chemicals specified in Category Codes 1C450.a.4, .a.5, .a.6, .a.7, and .b.8 in which no individually specified chemical constitutes more than 30% by weight of the mixture.
	Note 2
	Category Code 1C450 does not include products identified as consumer goods packaged for retail sale for personal use or packaged for individual use.

THE SCHEDULE — *continued*

Category Code	*Item Description*
1D	**Software**
1D001	"Software" specially designed or modified for the "development", "production" or "use" of equipment specified in Category Codes 1B001 to 1B003.
1D002	"Software" for the "development" of organic "matrix", metal "matrix" or carbon "matrix" laminates or "composites".
1D003	"Software" specially designed or modified to enable equipment to perform the functions of equipment specified in Category Code 1A004.c. or 1A004.d.
1D101	"Software" specially designed or modified for the "use" of goods specified in Category Code 1B101, 1B102, 1B115, 1B117, 1B118 or 1B119.
1D103	"Software" specially designed for analysis of reduced observables such as radar reflectivity, ultraviolet/infrared signatures and acoustic signatures.
1D201	"Software" specially designed for the "use" of goods specified in Category Code 1B201.
1E	**Technology**
1E001	"Technology" according to the General Technology Note for the "development" or "production" of equipment or materials specified in Category Code 1A001.b., 1A001.c., 1A002 to 1A005, 1A006.B., 1A007 or Category 1B or 1C.
1E002	Other "technology", as follows: a. "Technology" for the "development" or "production" of polybenzothiazoles or polybenzoxazoles; b. "Technology" for the "development" or "production" of fluoroelastomer compounds containing at least one vinylether monomer; c. "Technology" for the design or "production" of the following base materials or non-"composite" ceramic materials: 1. Base materials having all of the following: a. Any of the following compositions:

THE SCHEDULE — *continued*

Category Code	*Item Description*
	1. Single or complex oxides of zirconium and complex oxides of silicon or aluminium; 2. Single nitrides of boron (cubic crystalline forms); 3. Single or complex carbides of silicon or boron; <u>or</u> 4. Single or complex nitrides of silicon; b. Any of the following total metallic impurities (excluding intentional additions): 1. Less than 1,000 ppm for single oxides or carbides; <u>or</u> 2. Less than 5,000 ppm for complex compounds or single nitrides; <u>and</u> c. Being any of the following: 1. Zirconia with an average particle size equal to or less than 1 µm and no more than 10% of the particles larger than 5 µm; 2. Other base materials with an average particle size equal to or less than 5 µm and no more than 10% of the particles larger than 10 µm; <u>or</u> 3. Having all of the following: a. Platelets with a length to thickness ratio exceeding 5; b. Whiskers with a length to diameter ratio exceeding 10 for diameters less than 2 µm; <u>and</u> c. Continuous or chopped fibres less than 10 µm in diameter; 2. Non-“composite” ceramic materials composed of the materials specified in Category Code 1E002.c.1.; <u>Note</u> *Category Code 1E002.c.2. does not include “technology” for the design or production of abrasives.* d. “Technology” for the “production” of aromatic polyamide fibres;

THE SCHEDULE — *continued*

Category Code	Item Description
	e. "Technology" for the installation, maintenance or repair of materials specified in Category Code 1C001;
	f. "Technology" for the repair of "composite" structures, laminates or materials specified in Category Code 1A002, 1C007.c. or 1C007.d.
	Note
	Category Code 1E002.f. does not include "technology" for the repair of "civil aircraft" structures using carbon "fibrous or filamentary materials" and epoxy resins, contained in aircraft manufacturers' manuals.
	g. 'Libraries (parametric technical databases)' specially designed or modified to enable equipment to perform the functions of equipment specified in Category Code 1A004.c.
	Technical Note:
	For the purpose of Category Code 1E002.g., 'library (parametric technical database)' means a collection of technical information, reference to which may enhance the performance of relevant equipment or systems.
1E101	"Technology" (according to the General Technology Note) for the "use" of goods specified in Category Code 1A102, 1B001, 1B101, 1B102, 1B115 to 1B119, 1C001, 1C101, 1C107, 1C111 to 1C118, 1D101 or 1D103.
1E102	"Technology" (according to the General Technology Note) for the "development" of "software" specified in Category Code 1D001, 1D101 or 1D103.
1E103	"Technology" for the regulation of temperature, pressure or atmosphere in autoclaves or hydroclaves, when used for the "production" of "composites" or partially processed "composites".
1E104	"Technology" relating to the "production" of pyrolytically derived materials formed on a mould, mandrel or other substrate from precursor gases which decompose in the 1,573 K (1,300 ºC) to 3,173 K (2,900 ºC) temperature range at pressures of 130 Pa to 20 kPa.
	Note

THE SCHEDULE — *continued*

Category Code	Item Description
	Category Code 1E104 includes "technology" for the composition of precursor gases, flow-rates and process control schedules and parameters.
1E201	"Technology" (according to the General Technology Note) for the "use" of goods specified in Category Code 1A002, 1A007, 1A202, 1A225 to 1A227, 1B201, 1B225 to 1B233, 1C002.b.3 or .b.4., 1C010.b., 1C202, 1C210, 1C216, 1C225 to 1C240 or 1D201.
1E202	"Technology" (according to the General Technology Note) for the "development" or "production" of goods specified in Category Code 1A007, 1A202 or 1A225 to 1A227.
1E203	"Technology" (according to the General Technology Note) for the "development" of "software" specified in Category Code 1D201.
CATEGORY 2 — MATERIALS PROCESSING	
2A	**Systems, Equipment and Components**
	N.B.
	For quiet running bearings, see Division 2 of Part I of this Schedule.
2A001	Anti-friction bearings and bearing systems, as follows, and components therefor:
	Note
	Category Code 2A001 does not include balls with tolerances specified by the manufacturer in accordance with ISO 3290 as grade 5 or worse.
	a. Ball bearings and solid roller bearings having all tolerances specified by the manufacturer in accordance with ISO 492 Tolerance Class 4 (or ANSI/ABMA Std 20 Tolerance Class ABEC-7 or RBEC-7, or other national equivalents), or better, and having both rings and rolling elements (ISO 5593) made from monel or beryllium;
	Note
	Category Code 2A001.a. does not include tapered roller bearings.

THE SCHEDULE — *continued*

Category Code	*Item Description*
	b. Other ball bearings and solid roller bearings having all tolerances specified by the manufacturer in accordance with ISO 492 Tolerance Class 2 (or ANSI/ABMA Std 20 Tolerance Class ABEC-9 or RBEC-9, or other national equivalents) or better;
	Note
	Category Code 2A001.b. does not include tapered roller bearings.
	c. Active magnetic bearing systems using any of the following:
	1. Materials with flux densities of 2.0 T or greater and yield strengths greater than 414 MPa;
	2. All-electromagnetic 3D homopolar bias designs for actuators; or
	3. High temperature (450 K (177ºC) and above) position sensors.
2A225	Crucibles made of materials resistant to liquid actinide metals, as follows:
	a. Crucibles having both of the following characteristics:
	1. A volume of between 150 cm^3 and 8,000 cm^3; and
	2. Made of or coated with any of the following materials, having a purity of 98% or greater by weight:
	a. Calcium fluoride (CaF_2);
	b. Calcium zirconate (metazirconate) ($CaZrO_3$);
	c. Cerium sulphide (Ce_2S_3);
	d. Erbium oxide (erbia) (Er_2O_3);
	e. Hafnium oxide (hafnia) (HfO_2);
	f. Magnesium oxide (MgO);
	g. Nitrided niobium-titanium-tungsten alloy (approximately 50% Nb, 30% Ti, 20% W);
	h. Yttrium oxide (yttria) (Y_2O_3); or
	i. Zirconium oxide (zirconia) (ZrO_2);

THE SCHEDULE — *continued*

Category Code	*Item Description*
	b. Crucibles having both of the following characteristics:
	1. A volume of between 50 cm^3 and 2,000 cm^3; and
	2. Made of or lined with tantalum, having a purity of 99.9% or greater by weight;
	c. Crucibles having all of the following characteristics:
	1. A volume of between 50 cm^3 and 2,000 cm^3;
	2. Made of or lined with tantalum, having a purity of 98% or greater by weight; and
	3. Coated with tantalum carbide, nitride, boride, or any combination thereof.
2A226	Valves having all of the following characteristics:
	a. A 'nominal size' of 5 mm or greater;
	b. Having a bellows seal; and
	c. Wholly made of or lined with aluminium, aluminium alloy, nickel, or nickel alloy containing more than 60% nickel by weight.
	Technical Note
	For valves with different inlet and outlet diameters, the 'nominal size' in Category Code 2A226 refers to the smallest diameter.
2B	**Test, Inspection and Production Equipment**
	Technical Notes
	1. Secondary parallel contouring axes, (e.g., the w-axis on horizontal boring mills or a secondary rotary axis the centre line of which is parallel to the primary rotary axis) are not counted in the total number of contouring axes. Rotary axes need not rotate over 360°. A rotary axis can be driven by a linear device (e.g., a screw or a rack-and-pinion).
	2. For the purposes of Category 2B, the number of axes which can be co-ordinated simultaneously for "contouring control" is the number of axes along or around which, during processing of the workpiece, simultaneous and interrelated motions are performed between the workpiece

THE SCHEDULE — *continued*

Category Code	Item Description
	and a tool. This does not include any additional axes along or around which other relative movement within the machine are performed such as:
	a. Wheel-dressing systems in grinding machines;
	b. Parallel rotary axes designed for mounting of separate workpieces;
	c. Co-linear rotary axes designed for manipulating the same workpiece by holding it in a chuck from different ends.
	3. Axis nomenclature shall be in accordance with International Standard ISO 841, 'Numerical Control Machines — Axis and Motion Nomenclature'.
	4. For the purposes of Category Codes 2B001 to 2B009, a "tilting spindle" is counted as a rotary axis.
	5. 'Stated positioning accuracy' derived from measurements made according to ISO 230/2 (1988) or national equivalents may be used for each machine tool model as an alternative to individual machine tests. 'Stated positioning accuracy' means the accuracy value provided to the competent authorities of the country in which the exporter is established as representative of the accuracy of a specific machine model.
	Determination of 'Stated Positioning Accuracy'
	a. Select five machines of a model to be evaluated;
	b. Measure the linear axis accuracies according to ISO 230/2 (1988);
	c. Determine the A-values for each axis of each machine. The method of calculating the A-value is described in the ISO standard;
	d. Determine the mean value of the A-value of each axis. This mean value Â becomes the stated value of each axis for the model (Âx Ây...);
	e. Since the Category 2 list refers to each linear axis there will be as many stated values as there are linear axes;

THE SCHEDULE — *continued*

Category Code	*Item Description*
	f. If any axis of a machine model included under Category Code 2B001.a. to 2B001.c. or 2B201 has a stated accuracy Â of 6 microns for grinding machines and 8 microns for milling and turning machines or better, the manufacturer should be required to reaffirm the accuracy level once every eighteen months.
2B001	Machine tools and any combination thereof, for removing (or cutting) metals, ceramics or "composites", which, according to the manufacturer's technical specification, can be equipped with electronic devices for "numerical control", and specially designed components as follows:

N.B.

See also Category Code 2B201.

For optical finishing machines, see Category Code 2B202*.*

Note 1

Category Code 2B001 does not include special purpose machine tools limited to the manufacture of gears. ***For such machines see Category Code 2B003****.*

Note 2

Category Code 2B001 does not include special purpose machine tools limited to the manufacture of any of the following:

a. Crankshafts or camshafts;

b. Tools or cutters;

c. Extruder worms; or

d. Engraved or faceted jewellery parts.

Note 3

A machine tool having at least two of the three turning, milling or grinding capabilities, (e.g., a turning machine with milling capability), shall be treated as coming within those entries in Category Codes 2B001.a, .b and .c that are applicable to its capabilities.

a. Machine tools for turning, having all of the following:

THE SCHEDULE — *continued*

Category Code	*Item Description*

1. Positioning accuracy with “all compensations available” equal to or less (better) than 6 µm according to ISO 230/2 (1988) or national equivalents along any linear axis; and
2. Two or more axes which can be coordinated simultaneously for “contouring control”;

Note

Category Code 2B001.a. does not include turning machines specially designed for producing contact lenses having all of the following:

a. Machine controller limited to using ophthalmic based “software” for part programming data input; and

b. No vacuum chucking.

b. Machine tools for milling having any of the following:

1. Having all of the following:
   a. Positioning accuracy with “all compensations available” equal to or less (better) than 6 µm according to ISO 230/2 (1988) or national equivalents along any linear axis; and
   b. Three linear axes plus one rotary axis which can be coordinated simultaneously for “contouring control”;
2. Five or more axes which can be coordinated simultaneously for “contouring control”;
3. A positioning accuracy for jig boring machines, with “all compensations available”, equal to or less (better) than 4 µm according to ISO 230/2 (1988) or national equivalents along any linear axis; or
4. Fly cutting machines having all of the following:
   a. Spindle “run-out” and “camming” less (better) than 0.0004 mm TIR; and
   b. Angular deviation of slide movement (yaw, pitch and roll) less (better) than 2 seconds of arc, TIR over 300 mm of travel;

c. Machine tools for grinding having any of the following:

THE SCHEDULE — *continued*

Category Code	*Item Description*
	1. Having all of the following: a. Positioning accuracy with “all compensations available” equal to or less (better) than 4 µm according to ISO 230/2 (1988) or national equivalents along any linear axis; <u>and</u> b. Three or more axes which can be coordinated simultaneously for “contouring control”; <u>or</u> 2. Five or more axes which can be coordinated simultaneously for “contouring control”; <u>*Note*</u> *Category Code 2B001.c. does not include grinding machine as follows:* *a. Cylindrical external, internal, and external-internal grinding machines having all of the following:* *1. Limited to cylindrical grinding; <u>and</u>* *2. Limited to a maximum workpiece capacity of 150 mm outside diameter or length.* *b. Machines designed specifically as jig grinders that do not have a z-axis or a w-axis, with a positioning accuracy with “all compensations available” less (better) than 4 µm according to ISO 230/2 (1988) or national equivalents.* *c. Surface grinders.* d. Electrical discharge machines (EDM) of the non-wire type which have two or more rotary axes which can be coordinated simultaneously for “contouring control”; e. Machine tools for removing metals, ceramics or “composites” having all of the following: 1. Removing material by means of any of the following: a. Water or other liquid jets, including those employing abrasive additives; b. Electron beam; <u>or</u>

THE SCHEDULE — *continued*

Category Code	*Item Description*
	c. "Laser" beam; and
	2. Having two or more rotary axes and all of the following:
	a. Can be coordinated simultaneously for "contouring control"; and
	b. A positioning accuracy of less (better) than 0.003º;
	f. Deep-hole-drilling machines and turning machines modified for deep-hole-drilling, having a maximum depth-of-bore capability exceeding 5 m and specially designed components therefor.
2B002	Numerically controlled optical finishing machine tools equipped for selective material removal to produce non-spherical optical surfaces and having all of the following characteristics:
	a. Finishing the form to less (better) than 1.0 µm;
	b. Finishing to a roughness less (better) than 100 nm rms;
	c. Four or more axes which can be coordinated simultaneously for "contouring control"; and
	d. Using any of the following processes:
	1. Magnetorheological finishing ('MRF');
	2. Electrorheological finishing ('ERF');
	3. 'Energetic particle beam finishing';
	4. 'Inflatable membrane tool finishing'; or
	5. 'Fluid jet finishing'.
	Technical Note
	For the purposes of Category Code 2B002:
	1. 'MRF' is a material removal process using an abrasive magnetic fluid whose viscosity is controlled by a magnetic field.
	2. 'ERF' is a removal process using an abrasive fluid whose viscosity is controlled by an electric field.

THE SCHEDULE — *continued*

Category Code	*Item Description*
	3. *'Energetic particle beam finishing' uses Reactive Atom Plasmas (RAP) or ion-beams to selectively remove material.*
	4. *'Inflatable membrane tool finishing' is a process that uses a pressurised membrane that deforms to contact the workpiece over a small area.*
	5. *'Fluid jet finishing' makes use of a fluid stream for material removal.*
2B003	"Numerically controlled" or manual machine tools, and specially designed components, controls and accessories therefor, specially designed for the shaving, finishing, grinding or honing of hardened (R_c = 40 or more) spur, helical and double-helical gears with a pitch diameter exceeding 1,250 mm and a face width of 15% of pitch diameter or larger finished to a quality of AGMA 14 or better (equivalent to ISO 1328 class 3).
2B004	Hot "isostatic presses", having all of the following, and specially designed components and accessories therefor:
	N.B.
	See also Category Codes 2B104 and 2B204.
	a. A controlled thermal environment within the closed cavity and a chamber cavity with an inside diameter of 406 mm or more; and
	b. Having any of the following:
	1. A maximum working pressure exceeding 207 MPa;
	2. A controlled thermal environment exceeding 1,773 K (1,500 ºC); or
	3. A facility for hydrocarbon impregnation and removal of resultant gaseous degradation products.
	Technical Note
	The inside chamber dimension is that of the chamber in which both the working temperature and the working pressure are achieved and does not include fixtures. That dimension will be the smaller of either the inside diameter of the pressure chamber or the inside

THE SCHEDULE — *continued*

Category Code	*Item Description*
	diameter of the insulated furnace chamber, depending on which of the two chambers is located inside the other.
	N.B.
	For specially designed dies, moulds and tooling see Category Codes 1B003, 9B009 and Division 2 of Part I of this Schedule.
2B005	Equipment specially designed for the deposition, processing and in-process control of inorganic overlays, coatings and surface modifications, as follows, for non-electronic substrates, by processes shown in the Table and associated Notes following Category Code 2E003.f., and specially designed automated handling, positioning, manipulation and control components therefor:
	a. Chemical vapour deposition (CVD) production equipment having all of the following:
	N.B.
	See also Category Code 2B105.
	1. A process modified for one of the following:
	a. Pulsating CVD;
	b. Controlled nucleation thermal deposition (CNTD); or
	c. Plasma enhanced or plasma assisted CVD; and
	2. Having any of the following:
	a. Incorporating high vacuum (equal to or less than 0.01 Pa) rotating seals; or
	b. Incorporating *in situ* coating thickness control;
	b. Ion implantation production equipment having beam currents of 5 mA or more;
	c. Electron beam physical vapour deposition (EB-PVD) production equipment incorporating power systems rated for over 80 kW and having any of the following:
	1. A liquid pool level "laser" control system which regulates precisely the ingots feed rate; or

THE SCHEDULE — *continued*

Category Code	*Item Description*
	2. A computer controlled rate monitor operating on the principle of photo-luminescence of the ionised atoms in the evaporant stream to control the deposition rate of a coating containing two or more elements;
	d. Plasma spraying production equipment having any of the following:
	1. Operating at reduced pressure controlled atmosphere (equal to or less than 10 kPa measured above and within 300 mm of the gun nozzle exit) in a vacuum chamber capable of evacuation down to 0.01 Pa prior to the spraying process; <u>or</u>
	2. Incorporating *in situ* coating thickness control;
	e. Sputter deposition production equipment capable of current densities of 0.1 mA/mm^2 or higher at a deposition rate of 15 µm/h or more;
	f. Cathodic arc deposition production equipment incorporating a grid of electromagnets for steering control of the arc spot on the cathode;
	g. Ion plating production equipment allowing for the *in situ* measurement of any of the following:
	1. Coating thickness on the substrate and rate control; <u>or</u>
	2. Optical characteristics.
	<u>Note</u>
	Category Code 2B005 does not include chemical vapour deposition, cathodic arc, sputter deposition, ion plating or ion implantation equipment specially designed for cutting or machining tools.
2B006	Dimensional inspection or measuring systems, equipment and “electronic assemblies”, as follows:
	a. Computer controlled or “numerically controlled” co-ordinate measuring machines (CMM), having a three dimensional (volumetric) maximum permissible error of indication (MPE_E) at any point within the operating range of the machine (i.e., within the length of axes) equal to or less

THE SCHEDULE — *continued*

Category Code	*Item Description*
	(better) than (1.7 + L/1,000) µm (L is the measured length in mm), tested according to ISO 10360-2 (2001);

N.B.

See also Category Code 2B206.

b. Linear and angular displacement measuring instruments, as follows:

1. 'Linear displacement' measuring instruments having any of the following:

Technical Note

For the purpose of Category Code 2B006.b.1., 'linear displacement' means the change of distance between the measuring probe and the measured object.

a. Non-contact type measuring systems with a "resolution" equal to or less (better) than 0.2 µm within a measuring range up to 0.2 mm;

b. Linear voltage differential transformer systems having all of the following:

1. "Linearity" equal to or less (better) than 0.1% within a measuring range up to 5 mm; and

2. Drift equal to or less (better) than 0.1% per day at a standard ambient test room temperature ±1 K;

c. Measuring systems having all of the following:

1. Containing a "laser"; and

2. Maintaining, for at least 12 hours at a temperature range of 20±1˚C, all of the following:

a. A "resolution" over their full scale of 0.1 µm or less (better); and

b. Capable of achieving a "measurement uncertainty", when compensated for the refractive index of air, equal to or less (better) than (0.2 + L/2,000) µm (L is the measured length in mm); or

THE SCHEDULE — *continued*

Category Code	*Item Description*
	d. "Electronic assemblies" specially designed to provide feedback capability in systems specified in Category Code 2B006.b.1.c..
	Note
	Category Code 2B006.b.1. does not include measuring interferometer systems, with an automatic control system that is designed to use no feedback techniques, containing a "laser" to measure slide movement errors of machine-tools, dimensional inspection machines or similar equipment.
	2. Angular displacement measuring instruments having an "angular position deviation" equal to or less (better) than 0.00025º;
	Note
	Category Code 2B006.b.2. does not include optical instruments, such as autocollimators, using collimated light (e.g., laser light) to detect angular displacement of a mirror.
	c. Equipment for measuring surface irregularities, by measuring optical scatter as a function of angle, with a sensitivity of 0.5 nm or less (better).
	Note:
	Machine tools which can be used as measuring machines are included under Category Code 2B006 if they meet or exceed the criteria specified for the machine tool function or the measuring machine function.
2B007	"Robots" having any of the following characteristics and specially designed controllers and "end-effectors" therefor:
	N.B.
	See also Category Code 2B207.
	a. Are capable in real time of full three-dimensional image processing or full three-dimensional 'scene analysis' to generate or modify "programmes" or to generate or modify numerical programme data;
	Technical Note

THE SCHEDULE — *continued*

Category Code	*Item Description*
	The 'scene analysis' limitation does not include approximation of the third dimension by viewing at a given angle, or limited grey scale interpretation for the perception of depth or texture for the approved tasks (2½ D).
	b. Specially designed to comply with national safety standards applicable to potentially explosive munitions environments;
	<u>*Note*</u>*:*
	Category Code 2B007.b. does not include "robots" specially designed for paint-spraying booths.
	c. Specially designed or rated as radiation-hardened to withstand a total radiation dose greater than 5×10^3 Gy (silicon) without operational degradation; or
	Technical Note
	The term Gy (silicon) refers to the energy in Joules per kilogram absorbed by an unshielded silicon sample when exposed to ionising radiation.
	d. Specially designed to operate at altitudes exceeding 30,000 m.
2B008	Assemblies or units, specially designed for machine tools, or dimensional inspection or measuring systems and equipment, as follows:
	a. Linear position feedback units (e.g., inductive type devices, graduated scales, infrared systems or "laser" systems) having an overall "accuracy" less (better) than $(800 + (600 \times L \times 10^{-3}))$ nm (L equals the effective length in mm);
	<u>***N.B.***</u>
	For "laser" systems see also Note to Category Code 2B006.b.1.c. and d.
	b. Rotary position feedback units (e.g., inductive type devices, graduated scales, infrared systems or "laser" systems) having an "accuracy" less (better) than 0.00025º;
	<u>***N.B.***</u>

THE SCHEDULE — *continued*

Category Code	*Item Description*
	For "laser" systems see also Note to Category Code 2B006.b.2.
	c. "Compound rotary tables" and "tilting spindles", capable of upgrading, according to the manufacturer's specifications, machine tools to or above the levels specified in Category 2B.
2B009	Spin-forming machines and flow-forming machines, which, according to the manufacturer's technical specification, can be equipped with "numerical control" units or a computer control and having all of the following:
	N.B.
	See also Category Codes 2B109 and 2B209.
	a. Two or more controlled axes of which at least two can be coordinated simultaneously for "contouring control"; and
	b. A roller force more than 60 kN.
	Technical Note
	For the purpose of Category Code 2B009, machines combining the function of spin-forming and flow-forming are regarded as flow-forming machines.
2B104	"Isostatic presses", other than those specified in Category Code 2B004, having all of the following:
	N.B.
	See also Category Code 2B204.
	a. Maximum working pressure of 69 MPa or greater;
	b. Designed to achieve and maintain a controlled thermal environment of 873 K (600ºC) or greater; and
	c. Possessing a chamber cavity with an inside diameter of 254 mm or greater.
2B105	Chemical Vapour Deposition (CVD) furnaces, other than those specified in Category Code 2B005.a., designed or modified for the densification of carbon-carbon composites.

THE SCHEDULE — *continued*

Category Code	*Item Description*
2B109	Flow-forming machines, other than those specified in Category Code 2B009, and specially designed components as follows: ***N.B.*** ***See also Category Code 2B209.*** a. Flow-forming machines having all of the following: 1. According to the manufacturer's technical specification, can be equipped with "numerical control" units or a computer control, even when not equipped with such units; and 2. With more than two axes which can be coordinated simultaneously for "contouring control". b. Specially designed components for flow-forming machines specified in Category Code 2B009 or 2B109.a. *Note* *Category Code 2B109 does not include machines that are not usable in the production of propulsion components and equipment (e.g. motor cases) for systems specified in Category Code 9A005, 9A007.a. or 9A105.a.* *Technical Note* *Machines combining the function of spin-forming and flow-forming are for the purpose of Category Code 2B109 regarded as flow-forming machines.*
2B116	Vibration test systems, equipment and components therefor, as follows: a. Vibration test systems employing feedback or closed loop techniques and incorporating a digital controller, capable of vibrating a system at an acceleration equal to or greater than 10 g rms between 20 Hz and 2 kHz while imparting forces equal to or greater than 50 kN, measured 'bare table'; b. Digital controllers, combined with specially designed vibration test software, with a 'real-time control bandwidth' greater than 5 kHz designed for use with vibration test systems specified in Category Code 2B116.a.;

THE SCHEDULE — *continued*

Category Code	*Item Description*
	<u>Technical Note</u> *In Category Code 2B116.b., 'real-time control bandwidth' means the maximum rate at which a controller can execute complete cycles of sampling, processing data and transmitting control signals.* c. Vibration thrusters (shaker units), with or without associated amplifiers, capable of imparting a force equal to or greater than 50 kN, measured 'bare table', and usable in vibration test systems specified in Category Code 2B116.a.; d. Test piece support structures and electronic units designed to combine multiple shaker units in a system capable of providing an effective combined force equal to or greater than 50 kN, measured 'bare table', and usable in vibration systems specified in Category Code 2B116.a. <u>Technical Note</u> *In Category Code 2B116, 'bare table' means a flat table, or surface, with no fixture or fittings.*
2B117	Equipment and process controls, other than those specified in Category Code 2B004, 2B005.a., 2B104 or 2B105, designed or modified for densification and pyrolysis of structural composite rocket nozzles and re-entry vehicle nose tips.
2B119	Balancing machines and related equipment, as follows: ***<u>N.B.</u>*** ***See also Category Code 2B219.*** a. Balancing machines having all the following characteristics: 1. Not capable of balancing rotors/assemblies having a mass greater than 3 kg; 2. Capable of balancing rotors/assemblies at speeds greater than 12,500 rpm; 3. Capable of correcting unbalance in two planes or more; <u>and</u> 4. Capable of balancing to a residual specific unbalance of 0.2 g mm per kg of rotor mass;

THE SCHEDULE — *continued*

Category Code	*Item Description*
	<u>*Note*</u> *Category Code 2B119.a. does not include balancing machines designed or modified for dental or other medical equipment.* b. Indicator heads designed or modified for use with machines specified in Category Code 2B119.a. <u>*Technical Note*</u> *Indicator heads are sometimes known as balancing instrumentation.*
2B120	Motion simulators or rate tables having all of the following characteristics: a. Two axes or more; b. Designed or modified to incorporate slip rings or integrated non-contact devices capable of transferring electrical power, signal information or both; <u>and</u> c. Having any of the following characteristics: 1. For any single axis having all of the following: a. Capable of rates of 400 degrees/s or more, or 30 degrees/s or less; <u>and</u> b. A rate resolution equal to or less than 6 degrees/s and an accuracy equal to or less than 0.6 degrees/s; 2. Having a worst-case rate stability equal to or better (less) than plus or minus 0.05% averaged over 10 degrees or more; <u>or</u> 3. A positioning accuracy equal to or less (better) than 5 arc second. <u>*Note 1*</u> *Category Code 2B120 does not include rotary tables designed or modified for machine tools or for medical equipment.* ***For machine tool rotary tables see Category Code 2B008.*** <u>*Note 2*</u> *Motion simulators or rate tables that satisfy all the characteristics under Category Code 2B120 remain within that Code whether or*

THE SCHEDULE — *continued*

Category Code	*Item Description*
	not slip rings or integrated non-contact devices are fitted on them at time of export.
2B121	Positioning tables (equipment capable of precise rotary positioning in any axes), other than those specified in Category Code 2B120, having all the following characteristics: a. Two axes or more; and b. A positioning accuracy equal to or less (better) than 5 arc second. *Note* *Category Code 2B121 does not include rotary tables designed or modified for machine tools or for medical equipment.* ***For machine tool rotary tables see Category Code 2B008.***
2B122	Centrifuges capable of imparting accelerations above 100 g and designed or modified to incorporate slip rings or integrated non-contact devices capable of transferring electrical power, signal information, or both. *Note* *Centrifuges that come within the description in Category Code 2B122 remain within that Code whether or not slip rings or integrated non-contact devices are fitted on them at time of export.*
2B201	Machine tools and any combination thereof, other than those specified in Category Code 2B001, as follows, for removing or cutting metals, ceramics or “composites”, which, according to the manufacturer’s technical specification, can be equipped with electronic devices for simultaneous “contouring control” in two or more axes:
	a. Machine tools for milling, having any of the following characteristics: 1. Positioning accuracies with “all compensations available” equal to or less (better) than 6 μm according to ISO 230/2 (1988) or national equivalents along any linear axis; or 2. Two or more contouring rotary axes; *Note*

THE SCHEDULE — *continued*

Category Code	*Item Description*
	Category Code 2B201.a. does not include milling machines having the following characteristics: *a. X-axis travel greater than 2 m; and* *b. Overall positioning accuracy on the x-axis more (worse) than 30 µm.*

b. Machine tools for grinding, having any of the following characteristics:

1. Positioning accuracies with "all compensations available" equal to or less (better) than 4 µm according to ISO 230/2 (1988) or national equivalents along any linear axis; or

2. Two or more contouring rotary axes.

Note

Category Code 2B201.b. does not include the following grinding machines:

a. Cylindrical external, internal, and external-internal grinding machines having all of the following characteristics:

1. Limited to a maximum workpiece capacity of 150 mm outside diameter or length; and

2. Axes limited to x, z and c;

b. Jig grinders that do not have a z-axis or a w-axis with an overall positioning accuracy less (better) than 4 µm according to ISO 230/2 (1988) or national equivalents.

Note 1

Category Code 2B201 does not include special purpose machine tools limited to the manufacture of any of the following parts:

a. Gears;

b. Crankshafts or camshafts;

c. Tools or cutters;

d. Extruder worms.

Note 2

THE SCHEDULE — *continued*

Category Code	*Item Description*
	A machine tool having at least two of the three turning, milling or grinding capabilities (e.g., a turning machine with milling capability) shall be treated as coming within those entries in Category Code 2B001.a. or 2B201.a. or .b. that are applicable to its capabilities.
2B204	“Isostatic presses”, other than those specified in Category Code 2B004 or 2B104, and related equipment, as follows: a. “Isostatic presses” having both of the following characteristics: 1. Capable of achieving a maximum working pressure of 69 MPa or greater; <u>and</u> 2. A chamber cavity with an inside diameter in excess of 152 mm; b. Dies, moulds and controls, specially designed for “isostatic presses” specified in Category Code 2B204.a. <u>*Technical Note*</u> *In Category Code 2B204, the inside chamber dimension is that of the chamber in which both the working temperature and the working pressure are achieved and does not include fixtures. That dimension will be the smaller of either the inside diameter of the pressure chamber or the inside diameter of the insulated furnace chamber, depending on which of the two chambers is located inside the other.*
2B206	Dimensional inspection machines, instruments or systems, other than those specified in Category Code 2B006, as follows: a. Computer controlled or numerically controlled dimensional inspection machines having both of the following characteristics: 1. Two or more axes; <u>and</u> 2. A one-dimensional length “measurement uncertainty” equal to or less (better) than (1.25 + L/1,000) µm tested with a probe of an “accuracy” of less (better) than 0.2 µm (L is the measured length in mm) (Ref. VDI/VDE 2617 Parts 1 and 2);

THE SCHEDULE — *continued*

Category Code	*Item Description*
	b. Systems for simultaneous linear-angular inspection of hemishells, having both of the following characteristics:
	1. "Measurement uncertainty" along any linear axis equal to or less (better) than 3.5 µm per 5 mm; <u>and</u>
	2. "Angular position deviation" equal to or less than 0.02º.
	<u>*Note 1*</u>
	Machine tools that can be used as measuring machines are included if they meet or exceed the criteria specified for the machine tool function or the measuring machine function.
	<u>*Note 2*</u>
	A machine specified in Category Code 2B206 is included in that Category Code if it exceeds the specifications stated therein anywhere within its operating range.
	<u>*Technical Notes*</u>
	1. The probe used in determining the measurement uncertainty of a dimensional inspection system is that described in VDI/VDE 2617 parts 2, 3 and 4
	2. All parameters of measurement values in Category Code 2B206 represent plus/minus i.e., not total band.
2B207	"Robots", "end-effectors" and control units, other than those specified in Category Code 2B007, as follows:
	a. "Robots" or "end-effectors" specially designed to comply with national safety standards applicable to handling high explosives (e.g., meeting electrical code ratings for high explosives) in their country of manufacture;
	b. Control units specially designed for any of the "robots" or "end-effectors" specified in Category Code 2B207.a.
2B209	Flow forming machines, spin forming machines capable of flow forming functions, other than those specified in Category Code 2B009 or 2B109, and mandrels, as follows:
	a. Machines having both of the following characteristics:
	1. Three or more rollers (active or guiding); <u>and</u>

THE SCHEDULE — *continued*

Category Code	*Item Description*
	2. Which, according to the manufacturer's technical specification, can be equipped with "numerical control" units or a computer control;
	b. Rotor-forming mandrels designed to form cylindrical rotors of inside diameter between 75 mm and 400 mm.
	Note
	Category Code 2B209.a. includes machines which have only a single roller designed to deform metal plus two auxiliary rollers which support the mandrel, but do not participate directly in the deformation process.
2B219	Centrifugal multiplane balancing machines, fixed or portable, horizontal or vertical, as follows:
	a. Centrifugal balancing machines designed for balancing flexible rotors having a length of 600 mm or more and having all of the following characteristics:
	1. Swing or journal diameter greater than 75 mm;
	2. Mass capability of from 0.9 kg to 23 kg; and
	3. Capable of balancing speed of revolution greater than 5,000 rpm;
	b. Centrifugal balancing machines designed for balancing hollow cylindrical rotor components and having all of the following characteristics:
	1. Journal diameter greater than 75 mm;
	2. Mass capability of from 0.9 to 23 kg;
	3. Capable of balancing to a residual imbalance equal to or less than 0.01 kg × mm/kg per plane; and
	4. Belt drive type.
2B225	Remote manipulators that can be used to provide remote actions in radiochemical separation operations or hot cells, having either of the following characteristics:
	a. A capability of penetrating 0.6 m or more of hot cell wall (through-the-wall operation); or

THE SCHEDULE — *continued*

Category Code	*Item Description*
	b. A capability of bridging over the top of a hot cell wall with a thickness of 0.6 m or more (over-the-wall operation).
	Technical Note
	Remote manipulators provide translation of human operator actions to a remote operating arm and terminal fixture. They may be of 'master/slave' type or operated by joystick or keypad.
2B226	Controlled atmosphere (vacuum or inert gas) induction furnaces, and power supplies therefor, as follows:
	N.B
	See also Category 3B.
	a. Furnaces having all of the following characteristics:
	1. Capable of operation above 1,123 K (850 ºC);
	2. Induction coils 600 mm or less in diameter; and
	3. Designed for power inputs of 5 kW or more;
	b. Power supplies, with a specified power output of 5 kW or more, specially designed for furnaces specified in Category Code 2B226.a.
	Note
	Category Code 2B226.a. does not include furnaces designed for the processing of semiconductor wafers.
2B227	Vacuum or other controlled atmosphere metallurgical melting and casting furnaces and related equipment as follows:
	a. Arc remelt and casting furnaces having both of the following characteristics:
	1. Consumable electrode capacities between 1,000 cm^3 and 20,000 cm^3; and
	2. Capable of operating with melting temperatures above 1,973 K (1,700 ºC);
	b. Electron beam melting furnaces and plasma atomisation and melting furnaces, having both of the following characteristics:

THE SCHEDULE — *continued*

Category Code	*Item Description*
	1. A power of 50 kW or greater; <u>and</u> 2. Capable of operating with melting temperatures above 1,473 K (1,200ºC). c. Computer control and monitoring systems specially configured for any of the furnaces specified in Category Code 2B227.a. or .b.
2B228	Rotor fabrication or assembly equipment, rotor straightening equipment, bellows-forming mandrels and dies, as follows: a. Rotor assembly equipment for assembly of gas centrifuge rotor tube sections, baffles, and end caps; <u>*Note*</u> *Category Code 2B228.a. includes precision mandrels, clamps, and shrink fit machines.* b. Rotor straightening equipment for alignment of gas centrifuge rotor tube sections to a common axis; <u>*Technical Note*</u> *Equipment specified in Category Code 2B228.b. normally consists of precision measuring probes linked to a computer that subsequently controls the action of, e.g., pneumatic rams used for aligning the rotor tube sections.* c. Bellows-forming mandrels and dies for producing single-convolution bellows. <u>*Technical Note*</u> *In Category Code 2B228.c. the bellows have all of the following characteristics:* *1. Inside diameter between 75 mm and 400 mm;* *2. Length equal to or greater than 12.7 mm;* *3. Single convolution depth greater than 2 mm; <u>and</u>* *4. Made of high-strength aluminium alloys, maraging steel or high strength "fibrous or filamentary materials".*

THE SCHEDULE — *continued*

Category Code	*Item Description*
2B230	"Pressure transducers" capable of measuring absolute pressures at any point in the range 0 Pa to 13 kPa and having both of the following characteristics: a. Pressure sensing elements made of or protected by aluminium, aluminium alloy, nickel or nickel alloy with more than 60% nickel by weight; <u>and</u> b. Having either of the following characteristics: 1. A full scale of less than 13 kPa and an 'accuracy' of better than ±1% of full-scale; <u>or</u> 2. A full scale of 13 kPa or greater and an 'accuracy' of better than ±130 Pa. <u>*Technical Note*</u> *For the purposes of Category Code 2B230, 'accuracy' includes non-linearity, hysteresis and repeatability at ambient temperature.*
2B231	Vacuum pumps having all of the following characteristics: a. Input throat size equal to or greater than 380 mm; b. Pumping speed equal to or greater than 15 m^3/s; <u>and</u> c. Capable of producing an ultimate vacuum better than 13 mPa. <u>*Technical Notes*</u> *1. The pumping speed is determined at the measurement point with nitrogen gas or air.* *2. The ultimate vacuum is determined at the input of the pump with the input of the pump blocked off.*
2B232	Multistage light gas guns or other high-velocity gun systems (coil, electromagnetic, and electrothermal types, and other advanced systems) capable of accelerating projectiles to 2 km/s or greater.
2B350	Chemical manufacturing facilities, equipment and components, as follows: a. Reaction vessels or reactors, with or without agitators, with total internal (geometric) volume greater than 0.1 m^3 (100 litres) and less than 20 m^3 (20,000 litres), where all surfaces

THE SCHEDULE — *continued*

Category Code	*Item Description*
	that come in direct contact with the chemical(s) being processed or contained are made from any of the following materials: 1. Alloys with more than 25% nickel and 20% chromium by weight; 2. Fluoropolymers; 3. Glass (including vitrified or enamelled coating or glass lining); 4. Nickel or alloys with more than 40% nickel by weight; 5. Tantalum or tantalum alloys; 6. Titanium or titanium alloys; 7. Zirconium or zirconium alloys; or 8. Niobium (columbium) or niobium alloys; b. Agitators for use in reaction vessels or reactors specified in Category Code 2B350.a.; and impellers, blades or shafts designed for such agitators, where all surfaces of the agitator that come in direct contact with the chemical(s) being processed or contained are made from any of the following materials: 1. Alloys with more than 25% nickel and 20% chromium by weight; 2. Fluoropolymers; 3. Glass (including vitrified or enamelled coatings or glass lining); 4. Nickel or alloys with more than 40% nickel by weight; 5. Tantalum or tantalum alloys; 6. Titanium or titanium alloys; 7. Zirconium or zirconium alloys; or 8. Niobium (columbium) or niobium alloys; c. Storage tanks, containers or receivers with a total internal (geometric) volume greater than 0.1 m^3 (100 litres) where all

THE SCHEDULE — *continued*

Category Code	*Item Description*
	surfaces that come in direct contact with the chemical(s) being processed or contained are made from any of the following materials:
	1. Alloys with more than 25% nickel and 20% chromium by weight;
	2. Fluoropolymers;
	3. Glass (including vitrified or enamelled coatings or glass lining);
	4. Nickel or alloys with more than 40% nickel by weight;
	5. Tantalum or tantalum alloys;
	6. Titanium or titanium alloys;
	7. Zirconium or zirconium alloys; or
	8. Niobium (columbium) or niobium alloys;
	d. Heat exchangers or condensers with a heat transfer surface area greater than 0.15 m^2, and less than 20 m^2; and tubes, plates, coils or blocks (cores) designed for such heat exchangers or condensers, where all surfaces that come in direct contact with the chemical(s) being processed are made from any of the following materials:
	1. Alloys with more than 25% nickel and 20% chromium by weight;
	2. Fluoropolymers;
	3. Glass (including vitrified or enamelled coatings or glass lining);
	4. Graphite or ‘carbon graphite’;
	5. Nickel or alloys with more than 40% nickel by weight;
	6. Tantalum or tantalum alloys;
	7. Titanium or titanium alloys;
	8. Zirconium or zirconium alloys;
	9. Silicon carbide;
	10. Titanium carbide; or

THE SCHEDULE — *continued*

Category Code	*Item Description*
	11. Niobium (columbium) or niobium alloys;
	e. Distillation or absorption columns of internal diameter greater than 0.1 m; and liquid distributors, vapour distributors or liquid collectors designed for such distillation or absorption columns, where all surfaces that come in direct contact with the chemical(s) being processed are made from any of the following materials:
	1. Alloys with more than 25% nickel and 20% chromium by weight;
	2. Fluoropolymers;
	3. Glass (including vitrified or enamelled coatings or glass lining);
	4. Graphite or 'carbon graphite';
	5. Nickel or alloys with more than 40% nickel by weight;
	6. Tantalum or tantalum alloys;
	7. Titanium or titanium alloys;
	8. Zirconium or zirconium alloys; or
	9. Niobium (columbium) or niobium alloys;
	f. Remotely operated filling equipment in which all surfaces that come in direct contact with the chemical(s) being processed are made from any of the following materials:
	1 Alloys with more than 25% nickel and 20% chromium by weight; or
	2. Nickel or alloys with more than 40% nickel by weight;
	g. Valves with nominal sizes greater than 10 mm and casings (valve bodies) or preformed casing liners designed for such valves, in which all surfaces that come in direct contact with the chemical(s) being processed or contained are made from any of the following materials:
	1. Alloys with more than 25% nickel and 20% chromium by weight;
	2. Fluoropolymers;

THE SCHEDULE — *continued*

Category Code	*Item Description*
	3. Glass (including vitrified or enamelled coatings or glass lining); 4. Nickel or alloys with more than 40% nickel by weight; 5. Tantalum or tantalum alloys; 6. Titanium or titanium alloys; 7. Zirconium or zirconium alloys; or 8. Niobium (columbium) or niobium alloys; 9. Ceramic materials as follows: a. Silicon carbide with purity of 80% or more by weight; b. Aluminium oxide (alumina) with purity of 99.9% or more by weight; c. Zirconium oxide (zirconia); h. Multi-walled piping incorporating a leak detection port, in which all surfaces that come in direct contact with the chemical(s) being processed or contained are made from any of the following materials: 1. Alloys with more than 25% nickel and 20% chromium by weight; 2. Fluoropolymers; 3. Glass (including vitrified or enamelled coatings or glass lining); 4. Graphite or ‘carbon graphite’; 5. Nickel or alloys with more than 40% nickel by weight; 6. Tantalum or tantalum alloys; 7. Titanium or titanium alloys; 8. Zirconium or zirconium alloys; or 9. Niobium (columbium) or niobium alloys; i. Multiple-seal and seal-less pumps, with manufacturer’s specified maximum flow-rate greater than 0.6 m^3/hour, or vacuum pumps with manufacturer’s specified maximum

THE SCHEDULE — *continued*

Category Code	*Item Description*
	flow-rate greater than 5 m^3/hour (under standard temperature (273 K (0ºC)) and pressure (101.3 kPa) conditions); and casings (pump bodies), preformed casing liners, impellers, rotors or jet pump nozzles designed for such pumps, in which all surfaces that come in direct contact with the chemical(s) being processed are made from any of the following materials:
	1. Alloys with more than 25% nickel and 20% chromium by weight;
	2. Ceramics;
	3. Ferrosilicon;
	4. Fluoropolymers;
	5. Glass (including vitrified or enamelled coatings or glass lining);
	6. Graphite or 'carbon graphite';
	7. Nickel or alloys with more than 40% nickel by weight;
	8. Tantalum or tantalum alloys;
	9. Titanium or titanium alloys;
	10. Zirconium or zirconium alloys; <u>or</u>
	11. Niobium (columbium) or niobium alloys;
	j. Incinerators designed to destroy chemicals specified in Category Code 1C350, having specially designed waste supply systems, special handling facilities and an average combustion chamber temperature greater than 1,273 K (1,000ºC), in which all surfaces in the waste supply system that come into direct contact with the waste products are made from or lined with any of the following materials:
	1. Alloys with more than 25% nickel and 20% chromium by weight;
	2. Ceramics; <u>or</u>
	3. Nickel or alloys with more than 40% nickel by weight.
	<u>*Technical Note*</u>

THE SCHEDULE — *continued*

Category Code	*Item Description*
	'Carbon graphite' is a composition of amorphous carbon and graphite, in which the graphite content is 8% or more by weight.
2B351	Toxic gas monitoring systems, other than those specified in Category Code 1A004, as follows; and dedicated detectors therefor; a. Designed for continuous operation and usable for the detection of chemical warfare agents or chemicals specified in Category Code 1C350, at concentrations of less than 0.3 mg/m^3; or b. Designed for the detection of cholinesterase-inhibiting activity.
2B352	Equipment capable of use in handling biological materials, as follows: a. Complete biological containment facilities at P3, P4 containment level; Technical Note *P3 or P4 (BL3, BL4, L3, L4) containment levels are as specified in the WHO Laboratory Biosafety manual (3rd edition, Geneva 2004).* b. Fermenters capable of cultivation of pathogenic "microorganisms", viruses or capable of toxin production, without the propagation of aerosols, and having a total capacity of 20 litres or more; Technical Note *Fermenters include bioreactors, chemostats and continuous-flow systems.* c. Centrifugal separators, capable of continuous separation without the propagation of aerosols, having all the following characteristics: 1. Flow rate exceeding 100 litres per hour; 2. Components of polished stainless steel or titanium; 3. One or more sealing joints within the steam containment area; and

THE SCHEDULE — *continued*

Category Code	*Item Description*
	4. Capable of in-situ steam sterilisation in a closed state;
	<u>*Technical Note*</u>
	Centrifugal separators include decanters.
	d. Cross (tangential) flow filtration equipment and components as follows:
	1. Cross (tangential) flow filtration equipment capable of separation of pathogenic microorganisms, viruses, toxins or cell cultures, without the propagation of aerosols, having both of the following characteristics:
	a. A total filtration area equal to or greater than 1 m^2; <u>and</u>
	b. Having any of the following characteristics:
	1. Capable of being sterilised or disinfected in-situ; <u>or</u>
	2. Using disposable or single-use filtration components;
	<u>*Technical Note*</u>*:*
	In Category Code 2B352.d.1.b. sterilised denotes the elimination of all viable microbes from the equipment through the use of either physical (e.g., steam) or chemical agents. Disinfected denotes the destruction of potential microbial infectivity in the equipment through the use of chemical agents with a germicidal effect. Disinfection and sterilisation are distinct from sanitisation, the latter referring to cleaning procedures designed to lower the microbial content of equipment without necessarily achieving elimination of all microbial infectivity or viability.
	2. Cross (tangential) flow filtration components (e.g., modules, elements, cassettes, cartridges, units or plates) with filtration area equal to or greater than 0.2 m^2 for each component and designed for use in cross (tangential) flow filtration equipment specified in Category Code 2B352.d.;
	<u>*Note*</u>
	Category Code 2B352.d. does not include reverse osmosis equipment, as specified by the manufacturer.

THE SCHEDULE — *continued*

Category Code	*Item Description*
	e. Steam sterilisable freeze drying equipment with a condenser capacity exceeding 10 kg of ice in 24 hours and less than 1,000 kg of ice in 24 hours;
	f. Protective and containment equipment, as follows:
	1. Protective full or half suits, or hoods dependent upon a tethered external air supply and operating under positive pressure;
	<u>*Note*</u>
	Category Code 2B352.f.1. does not include suits designed to be worn with self-contained breathing apparatus.
	2. Class III biological safety cabinets or isolators with similar performance standards;
	<u>*Note*</u>
	In Category Code 2B352.f.2., isolators include flexible isolators, dry boxes, anaerobic chambers, glove boxes and laminar flow hoods (closed with vertical flow).
	g. Chambers designed for aerosol challenge testing with “microorganisms”, viruses or “toxins” and having a capacity of 1 m^3 or greater.
2C	**Materials**
	None.
2D	**Software**
2D001	“Software”, other than that specified in Category Code 2D002, specially designed or modified for the “development”, “production” or “use” of equipment specified in Category Code 2A001 or 2B001 to 2B009.
2D002	“Software” for electronic devices, even when residing in an electronic device or system, enabling such devices or systems to function as a “numerical control” unit, capable of co-ordinating simultaneously more than four axes for “contouring control”.
	<u>*Note 1*</u>

THE SCHEDULE — *continued*

Category Code	*Item Description*
	Category Code 2D002 does not include "software" specially designed or modified for the operation of machine tools not specified in Category 2.
	Note 2
	Category Code 2D002 does not include "software" for items specified in Category Code 2B002. ***See Category Code 2D001 for "software" for items specified in Category Code 2B002.***
2D101	"Software" specially designed or modified for the "use" of equipment specified in Category Code 2B104, 2B105, 2B109, 2B116, 2B117 or 2B119 to 2B122.
	N.B.
	See also Category Code 9D004.
2D201	"Software" specially designed for the "use" of equipment specified in Category Code 2B204, 2B206, 2B207, 2B209, 2B219 or 2B227.
2D202	"Software" specially designed or modified for the "development", "production" or "use" of equipment specified in Category Code 2B201.
2D351	"Software", other than that specified in Category Code 1D003, specially designed for the "use" of equipment specified in Category Code 2B351.
2E	**Technology**
2E001	"Technology" (according to the General Technology Note) for the "development" of equipment or "software" specified in Category 2A, 2B or 2D.
2E002	"Technology" (according to the General Technology Note) for the "production" of equipment specified in Category 2A or 2B.
2E003	Other "technology", as follows:
	a. "Technology" for the "development" of interactive graphics as an integrated part in "numerical control" units for preparation or modification of part programmes;
	b. "Technology" for metal-working manufacturing processes, as follows:

THE SCHEDULE — *continued*

Category Code	*Item Description*
	1. “Technology” for the design of tools, dies or fixtures specially designed for any of the following processes: a. “Superplastic forming”; b. “Diffusion bonding”; or c. “Direct-acting hydraulic pressing”; 2. Technical data consisting of process methods or parameters as listed below used to control: a. “Superplastic forming” of aluminium alloys, titanium alloys or “superalloys”: 1. Surface preparation; 2. Strain rate; 3. Temperature; 4. Pressure; b. “Diffusion bonding” of “superalloys” or titanium alloys: 1. Surface preparation; 2. Temperature; 3. Pressure; c. “Direct-acting hydraulic pressing” of aluminium alloys or titanium alloys: 1. Pressure; 2. Cycle time; d. “Hot isostatic densification” of titanium alloys, aluminium alloys or “superalloys”: 1. Temperature; 2. Pressure; 3. Cycle time; c. “Technology” for the “development” or “production” of hydraulic stretch-forming machines and dies therefor, for the manufacture of airframe structures;

THE SCHEDULE — *continued*

Category Code	*Item Description*
	d. "Technology" for the "development" of generators of machine tool instructions (e.g., part programmes) from design data residing inside "numerical control" units;
	e. "Technology" for the "development" of integration "software" for incorporation of expert systems for advanced decision support of shop floor operations into "numerical control" units;
	f. "Technology" for the application of inorganic overlay coatings or inorganic surface modification coatings (specified in column 3 of the Table entitled Deposition Techniques) to non-electronic substrates (specified in column 2 of that Table), by processes specified in column 1 of that Table and defined in the Technical Note.
	Note
	The Table entitled Deposition Techniques and Technical Note appear after Category Code 2E301.
2E101	"Technology" (according to the General Technology Note) for the "use" of equipment or "software" specified in Category Code 2B004, 2B009, 2B104, 2B109, 2B116, 2B119 to 2B122 or 2D101.
2E201	"Technology" (according to the General Technology Note) for the "use" of equipment or "software" specified in Category Code 2A225, 2A226, 2B001, 2B006, 2B007.b., 2B007.c., 2B008, 2B009, 2B201, 2B204, 2B206, 2B207, 2B209, 2B225 to 2B232, 2D201, or 2D202.
2E301	"Technology" (according to the General Technology Note) for the "use" of goods specified in Category Codes 2B350 to 2B352.

[S 721/2011]

TABLE — DEPOSITION TECHNIQUES

Notes

1. *Bracketed numbers are explained in the Notes that appear after the table.*
2. *The coating processes under column 1 are further explained in the Technical Notes below.*

THE SCHEDULE — *continued*

1.	Coating Process (1)	2.	Substrate	3.	Resultant Coating
A.	Chemical Vapour Deposition (CVD)		"Superalloys"		Aluminides for internal passages
			Ceramics (19) and Low-expansion glasses (14)		Silicides
					Carbides
					Dielectric layers (15)
					Diamond
					Diamond-like carbon (17)
			Carbon-carbon, Ceramic and Metal "matrix" "composites"		Silicides
					Carbides
					Refractory metals
					Mixtures thereof (4)
					Dielectric layers (15)
					Aluminides
					Alloyed aluminides (2)
					Boron nitride
			Cemented tungsten carbide (16), Silicon carbide (18)		Carbides
					Tungsten
					Mixtures thereof (4)
					Dielectric layers (15)
			Molybdenum and Molybdenum alloys		Dielectric layers (15)
			Beryllium and Beryllium alloys		Dielectric layers (15)

THE SCHEDULE — *continued*

			Diamond Diamond-like carbon (17)
		Sensor window materials (9)	Dielectric layers (15) Diamond Diamond-like carbon (17)
B	Thermal-Evaporation Physical Vapour Deposition (TE-PVD)		
B.1.	Physical Vapour Deposition (PVD): Electron-Beam (EB-PVD)	"Superalloys"	Alloyed silicides Alloyed aluminides (2) MCrAlX (5) Modified zirconia (12) Silicides Aluminides Mixtures thereof (4)
		Ceramics (19) and Low-expansion glasses (14)	Dielectric layers (15)
		Corrosion resistant steel (7)	MCrAlX (5) Modified zirconia (12) Mixtures thereof (4)
		Carbon-carbon, Ceramic and Metal "matrix" "composites"	Silicides Carbides

THE SCHEDULE — *continued*

			Refractory materials
			Mixtures thereof (4)
			Dielectric layers (15)
			Boron nitride
		Cemented tungsten carbide (16), Silicon carbide (18)	Carbides
			Tungsten
			Mixtures thereof (4)
			Dielectric layers (15)
		Molybdenum and Molybdenum alloys	Dielectric layers (15)
			Borides
			Beryllium
		Sensor window materials (9)	Dielectric layers (15)
		Titanium alloys (13)	Borides
			Nitrides
B.2.	Ion assisted resistive heating Physical Vapour Deposition (PVD) (Ion Plating)	Ceramics (19) and Low-expansion glasses (14)	Dielectric layers (15)
			Diamond-like carbon (17)
		Carbon-carbon, Ceramic and Metal “matrix” “composites”	Dielectric layers (15)
		Cemented tungsten carbide (16), Silicon carbide	Dielectric layers (15)

THE SCHEDULE — *continued*

		Molybdenum and Molybdenum alloys	Dielectric layers (15)
		Beryllium and Beryllium alloys	Dielectric layers (15)
		Sensor window materials (9)	Dielectric layers (15) Diamond-like carbon (17)
B.3.	Physical Vapour Deposition (PVD): "Laser" Vaporisation	Ceramics (19) and Low-expansion glasses (14)	Silicides Dielectric layers (15) Diamond-like carbon (17)
		Carbon-carbon, Ceramic and Metal "matrix" "composites"	Dielectric layers (15)
		Cemented tungsten carbide (16), Silicon carbide	Dielectric layers (15)
		Molybdenum and Molybdenum alloys	Dielectric layers (15)
		Beryllium and Beryllium alloys	Dielectric layers (15)
		Sensor window materials (9)	Dielectric layers (15) Diamond-like carbon (17)
B.4.	Physical Vapour Deposition (PVD):	"Superalloys"	Alloyed silicides Alloyed aluminides (2)

THE SCHEDULE — *continued*

	Cathodic Arc Discharge		MCrAlX (5)
		Polymers (11) and Organic "matrix" "composites"	Borides Carbides Nitrides Diamond-like carbon (17)
C.	Pack cementation (See A above for out-of-pack cementation) (10)	Carbon-carbon, Ceramic and Metal "matrix" "composites"	Silicides Carbides Mixtures thereof (4)
		Titanium alloys (13)	Silicides Aluminides Alloyed aluminides (2)
		Refractory metals and alloys (8)	Silicides Oxides
D.	Plasma spraying	"Superalloys"	MCrAlX (5) Modified zirconia (12) Mixtures thereof (4) Abradable Nickel-Graphite Abradable materials containing Ni-Cr-Al Abradable Al-Si-Polyester Alloyed aluminides (2)

THE SCHEDULE — *continued*

		Aluminium alloys (6)	MCrAlX (5) Modified zirconia (12) Silicides Mixtures thereof (4)
		Refractory metals and alloys (8)	Aluminides Silicides Carbides
		Corrosion resistant steel (7)	MCrAlX (5) Modified zirconia (12) Mixtures thereof (4)
		Titanium alloys (13)	Carbides Aluminides Silicides Alloyed aluminides (2) Abradable Nickel-Graphite Abradable materials containing Ni-Cr-Al Abradable Al-Si-Polyester
E.	Slurry Deposition	Refractory metals and alloys (8)	Fused silicides Fused aluminides except for resistance heating elements

THE SCHEDULE — *continued*

		Carbon-carbon, Ceramic and Metal “matrix” “composites”	Silicides Carbides Mixtures thereof (4)
F.	Sputter Deposition	“Superalloys”	Alloyed silicides Alloyed aluminides (2) Noble metal modified aluminides (3) MCrAlX (5) Modified zirconia (12) Platinum Mixtures thereof (4)
		Ceramics and Low-expansion glasses (14)	Silicides Platinum Mixtures thereof (4) Dielectric layers (15) Diamond-like carbon (17)
		Titanium alloys (13)	Borides Nitrides Oxides Silicides Aluminides Alloyed aluminides (2) Carbides

THE SCHEDULE — *continued*

	Carbon-carbon, Ceramic and Metal “matrix” “composites”	Silicides Carbides Refractory materials Mixtures thereof (4) Dielectric layers (15) Boron nitride
	Cemented tungsten carbide (16), Silicon carbide (18)	Carbides Tungsten Mixtures thereof (4) Dielectric layers (15) Boron nitride
	Molybdenum and Molybdenum alloys	Dielectric layers (15)
	Beryllium and Beryllium alloys	Borides Dielectric layers (15) Beryllium
	Sensor window materials (9)	Dielectric layers (15) Diamond-like carbon (17)
	Refractory metals and alloys (8)	Aluminides Silicides Oxides Carbides

THE SCHEDULE — *continued*

G.	Ion Implantation	High temperature bearing steels	Additions of Chromium, Tantalum or Niobium (Columbium)
		Titanium alloys (13)	Borides Nitrides
		Beryllium and Beryllium alloys	Borides
		Cemented tungsten carbide (16)	Carbides Nitrides

TABLE — DEPOSITION TECHNIQUES — NOTES

1. The term 'coating process' includes coating repair and refurbishing as well as original coating.
2. The term 'alloyed aluminide' coating includes single or multiple-step coatings in which an element or elements are deposited prior to or during application of the aluminide coating, even if these elements are deposited by another coating process. It does not, however, include the multiple use of single-step pack cementation processes to achieve alloyed aluminides.
3. The term 'noble metal modified aluminide' coating includes multiple-step coatings in which the noble metal or noble metals are laid down by some other coating process prior to application of the aluminide coating.
4. The term 'mixtures thereof' includes infiltrated material, graded compositions, co-deposits and multilayer deposits and are obtained by one or more of the coating processes specified in the Table.
5. 'MCrAlX' refers to a coating alloy where M equals cobalt, iron, nickel or combinations thereof and X equals hafnium, yttrium, silicon, tantalum in any amount or other intentional additions over 0.01% by weight in various proportions and combinations, except:
   a. CoCrAlY coatings which contain less than 22% by weight of chromium, less than 7% by weight of aluminium and less than 2% by weight of yttrium;

THE SCHEDULE — *continued*

b. CoCrAlY coatings which contain 22% to 24% by weight of chromium, 10% to 12% by weight of aluminium and 0.5% to 0.7% by weight of yttrium; or

c. NiCrAlY coatings which contain 21% to 23% by weight of chromium, 10% to 12% by weight of aluminium and 0.9% to 1.1% by weight of yttrium.

6. The term ‘aluminium alloys’ refers to alloys having an ultimate tensile strength of 190 MPa or more measured at 293 K (20°C).

7. The term ‘corrosion resistant steel’ refers to AISI (American Iron and Steel Institute) 300 series or equivalent national standard steels.

8. ‘Refractory metals and alloys’ include the following metals and their alloys: niobium (columbium), molybdenum, tungsten and tantalum.

9. ‘Sensor window materials’, as follows: alumina, silicon, germanium, zinc sulphide, zinc selenide, gallium arsenide, diamond, gallium phosphide, sapphire and the following metal halides: sensor window materials of more than 40 mm diameter for zirconium fluoride and hafnium fluoride.

10. “Technology” for single-step pack cementation of solid airfoils is not included in Category 2.

11. ‘Polymers’, as follows: polyimide, polyester, polysulphide, polycarbonates and polyurethanes.

12. ‘Modified zirconia’ refers to additions of other metal oxides (e.g., calcia, magnesia, yttria, hafnia, rare earth oxides) to zirconia in order to stabilise certain crystallographic phases and phase compositions. Thermal barrier coatings made of zirconia, modified with calcia or magnesia by mixing or fusion, are not included.

13. ‘Titanium alloys’ refers only to aerospace alloys having an ultimate tensile strength of 900 MPa or more measured at 293 K (20°C).

14. ‘Low-expansion glasses’ refers to glasses which have a coefficient of thermal expansion of 1 x 10-7 K-1 or less measured at 293 K (20°C).

15. ‘Dielectric layers’ are coatings constructed of multi-layers of insulator materials in which the interference properties of a design composed of materials of various refractive indices are used to reflect, transmit or absorb various wavelength bands. Dielectric layers refers to more than four dielectric layers or dielectric/metal “composite” layers.

16. ‘Cemented tungsten carbide’ does not include cutting and forming tool materials consisting of tungsten carbide/(cobalt, nickel), titanium

THE SCHEDULE — *continued*

carbide/(cobalt, nickel), chromium carbide/nickel-chromium and chromium carbide/nickel.

17. “Technology” specially designed to deposit diamond-like carbon on any of the following is not included in Category 2:

magnetic disk drives and heads, equipment for the manufacture of disposables, valves for faucets, acoustic diaphragms for speakers, engine parts for automobiles, cutting tools, punching-pressing dies, office automation equipment, microphones or medical devices or moulds, for casting or moulding of plastics, manufactured from alloys containing less than 5% beryllium.

18. ‘Silicon carbide’ does not include cutting and forming tool materials.

19. Ceramic substrates, as used in this Table, does not include ceramic materials containing 5% by weight, or greater, clay or cement content, either as separate constituents or in combination.

TABLE — DEPOSITION TECHNIQUES — TECHNICAL NOTE

Processes specified in Column 1 of the Table are defined as follows:

a. Chemical Vapour Deposition (CVD) is an overlay coating or surface modification coating process wherein a metal, alloy, “composite”, dielectric or ceramic is deposited upon a heated substrate. Gaseous reactants are decomposed or combined in the vicinity of a substrate resulting in the deposition of the desired elemental, alloy or compound material on the substrate. Energy for this decomposition or chemical reaction process may be provided by the heat of the substrate, a glow discharge plasma, or “laser” irradiation.

Note 1

CVD includes the following processes: directed gas flow out-of-pack deposition, pulsating CVD, controlled nucleation thermal deposition (CNTD), plasma enhanced or plasma assisted CVD processes.

Note 2

Pack denotes a substrate immersed in a powder mixture.

Note 3

The gaseous reactants used in the out-of-pack process are produced using the same basic reactions and parameters as the pack cementation process, except that the substrate to be coated is not in contact with the powder mixture.

THE SCHEDULE — *continued*

b. Thermal Evaporation-Physical Vapour Deposition (TE-PVD) is an overlay coating process conducted in a vacuum with a pressure less than 0.1 Pa wherein a source of thermal energy is used to vaporise the coating material. This process results in the condensation, or deposition, of the evaporated species onto appropriately positioned substrates.

The addition of gases to the vacuum chamber during the coating process to synthesize compound coatings is an ordinary modification of the process.

The use of ion or electron beams, or plasma, to activate or assist the coating's deposition is also a common modification in this technique. The use of monitors to provide in-process measurement of optical characteristics and thickness of coatings can be a feature of these processes.

Specific TE-PVD processes are as follows:

1. Electron Beam PVD uses an electron beam to heat and evaporate the material which forms the coating;
2. Ion Assisted Resistive Heating PVD employs electrically resistive heating sources in combination with impinging ion beam(s) to produce a controlled and uniform flux of evaporated coating species;
3. "Laser" Vaporisation uses either pulsed or continuous wave "laser" beams to vaporise the material which forms the coating;
4. Cathodic Arc Deposition employs a consumable cathode of the material which forms the coating and has an arc discharge established on the surface by a momentary contact of a ground trigger. Controlled motion of arcing erodes the cathode surface creating a highly ionised plasma. The anode can be either a cone attached to the periphery of the cathode, through an insulator, or the chamber. Substrate biasing is used for non line-of-sight deposition.

<u>Note</u>

This definition does not include random cathodic arc deposition with non-biased substrates.

5. Ion Plating is a special modification of a general TE-PVD process in which a plasma or an ion source is used to ionise the species to be deposited, and a negative bias is applied to the substrate in order to facilitate the extraction of the species from the plasma. The introduction of reactive species, evaporation of solids within the process chamber, and the use of monitors to provide in-process measurement of optical characteristics and thicknesses of coatings are ordinary modifications of the process.

c. Pack Cementation is a surface modification coating or overlay coating process wherein a substrate is immersed in a powder mixture (a pack), that consists of:

1. The metallic powders that are to be deposited (usually aluminium, chromium, silicon or combinations thereof);
2. An activator (normally a halide salt); and
3. An inert powder, most frequently alumina.

The substrate and powder mixture is contained within a retort which is heated to between 1,030 K (757°C) and 1,375 K (1,102°C) for sufficient time to deposit the coating.

d. Plasma Spraying is an overlay coating process wherein a gun (spray torch) which produces and controls a plasma accepts powder or wire coating materials, melts them and propels them towards a substrate, whereon an integrally bonded coating is formed. Plasma spraying constitutes either low pressure plasma spraying or high velocity plasma spraying.

Note 1

Low pressure means less than ambient atmospheric pressure.

Note 2

High velocity refers to nozzle-exit gas velocity exceeding 750 m/s calculated at 293 K (20°C) at 0.1 MPa.

e. Slurry Deposition is a surface modification coating or overlay coating process wherein a metallic or ceramic powder with an organic binder is suspended in a liquid and is applied to a substrate by either spraying, dipping or painting, subsequent air or oven drying, and heat treatment to obtain the desired coating.

f. Sputter Deposition is an overlay coating process based on a momentum transfer phenomenon, wherein positive ions are accelerated by an electric field towards the surface of a target (coating material). The kinetic energy of the impacting ions is sufficient to cause target surface atoms to be released and deposited on an appropriately positioned substrate.

Note 1

The Table refers only to triode, magnetron or reactive sputter deposition which is used to increase adhesion of the coating and rate of deposition and to radio frequency (RF) augmented sputter deposition used to permit vaporisation of non-metallic coating materials.

Note 2

Low-energy ion beams (less than 5 keV) can be used to activate the deposition.

g. Ion Implantation is a surface modification coating process in which the element to be alloyed is ionised, accelerated through a potential gradient and implanted into the surface region of the substrate. This includes processes in which ion implantation is performed simultaneously with electron beam physical vapour deposition or sputter deposition.

Category Code	Item Description
CATEGORY 3 — ELECTRONICS	
3A	Systems, Equipment and Components
	Note 1
	Equipment and components described in Category Code 3A001 or 3A002, other than those described in Category Code 3A001.a.3. to 3A001.a.10. or 3A001.a.12., which are specially designed for or which have the same functional characteristics as other equipment shall only be treated as coming within that description if that other equipment is included in Division 2 of this Part.
	Note 2
	Integrated circuits described in Category Code 3A001.a.3. to 3A001.a.9. or 3A001.a.12. which are unalterably programmed or designed for a specific function for another equipment shall only be treated as coming within that description if that other equipment is included in Division 2 of this Part.
	N.B.
	Where it is unclear if the other equipment is included in Division 2 of this Part, then the integrated circuit is treated as falling within Cateogry Code 3A001.a.3 to 3A001.a.9 and 3A001.a.12. if it comes within the relevant description therein.
3A001	Electronic components and specially designed components therefor, as follows:
	a. General purpose integrated circuits, as follows:
	Note 1

THE SCHEDULE — *continued*

Category Code	Item Description

Category Code 3A001.a. includes wafers (finished or unfinished) in which the function has been determined, if it comes within the parameters set out therein.

Note 2

Integrated circuits include the following types:

- *"Monolithic integrated circuits";*
- *"Hybrid integrated circuits";*
- *"Multichip integrated circuits";*
- *"Film type integrated circuits", including silicon-on-sapphire integrated circuits;*
- *"Optical integrated circuits".*

1. Integrated circuits designed or rated as radiation hardened to withstand any of the following:

   a. A total dose of 5×10^3 Gy (silicon) or higher;

   b. A dose rate upset of 5×10^6 Gy (silicon)/s or higher; or

   c. A fluence (integrated flux) of neutrons (1 MeV equivalent) of 5×10^{13} n/cm^2 or higher on silicon, or its equivalent for other materials;

   Note

   Category Code 3A001.a.1.c. does not include Metal Insulator Semiconductors (MIS).

2. "Microprocessor microcircuits", "microcomputer microcircuits", microcontroller microcircuits, storage integrated circuits manufactured from a compound semiconductor, analogue-to-digital converters, digital-to-analogue converters, electro-optical or "optical integrated circuits" designed for "signal processing", field programmable logic devices, custom integrated circuits for which either the function is unknown or it is unknown if the equipment in which the integrated circuit will be used is included in this Part, Fast Fourier Transform (FFT) processors, electrical erasable programmable read-only

THE SCHEDULE — *continued*

Category Code	Item Description
	memories (EEPROMs), flash memories or static random-access memories (SRAMs), having any of the following:
	a. Rated for operation at an ambient temperature above 398 K (125ºC);
	b. Rated for operation at an ambient temperature below 218 K (-55ºC); or
	c. Rated for operation over the entire ambient temperature range from 218 K (-55ºC) to 398K (125ºC);
	Note
	Category Code 3A001.a.2. does not include integrated circuits for civil automobiles or railway train applications.
	3. "Microprocessor microcircuits", "microcomputer microcircuits" and microcontroller microcircuits, manufactured from a compound semiconductor and operating at a clock frequency exceeding 40 MHz;
	Note
	Category Code 3A001.a.3. includes digital signal processors, digital array processors and digital coprocessors.
	4. Storage integrated circuits manufactured from a compound semiconductor;
	5. Analogue-to-digital and digital-to-analogue converter integrated circuits, as follows:
	a. Analogue-to-digital converters having any of the following:
	N.B.
	See also Category Code 3A101.
	1. A resolution of 8 bit or more, but less than 10 bit, with an output rate greater than 500 million words per second;
	2. A resolution of 10 bit or more, but less than 12 bit, with an output rate greater than 200 million words per second;

THE SCHEDULE — *continued*

Category Code	Item Description
	3. A resolution of 12 bit with an output rate greater than 105 million words per second 4. A resolution of more than 12 bit, but equal to or less than 14 bit with an output rate greater than 10 million words per second; <u>or</u> 5. A resolution of more than 14 bit with an output rate greater than 2.5 million words per second; b. Digital-to-analogue converters with a resolution of 12 bit or more, and a "settling time" of less than 10 ns; <u>*Technical Notes*</u> *1. A resolution of n bit corresponds to a quantisation of* 2^n *levels.* *2. The number of bits in the output word is equal to the resolution of the analogue-to-digital converter.* *3. The output rate is the maximum output rate of the converter, regardless of the architecture or oversampling. The output rate may be referred to as sampling rate, conversion rate or throughput rate. It is often specified in megahertz (MHz) or mega samples per second (MSPS).* *4. For the purpose of measuring output rate, one output word per second is equivalent to one Hertz or one sample per second.* 6. Electro-optical and "optical integrated circuits", designed for "signal processing" and having all of the following: a. One or more than one internal "laser" diode; b. One or more than one internal light detecting element; <u>and</u> c. Optical waveguides; 7. 'Field programmable logic devices' having any of the following: a. A 'maximum number of digital inputs/outputs' greater than 200; <u>or</u>

THE SCHEDULE — *continued*

Category Code	Item Description
	b. A system gate counter of greater than 230,000;
	Note
	Category Code 3A001.a.7. includes:
	− *Simple Programmable Logic Devices (SPLDs)*
	− *Complex Programmable Logic Devices (CPLDs)*
	− *Field Programmable Gate Arrays (FPGAs)*
	− *Field Programmable Logic Arrays (FPLAs)*
	− *Field Programmable Interconnects (FPICs)*
	Technical Notes:
	1. 'Field programmable logic devices' are also known as field programmable gate or field programmable logic arrays.
	2. 'Maximum number of digital inputs/outputs' is also known as the maximum user inputs/outputs or maximum available inputs/outputs, whether the integrated circuit is packaged or bare die.
	8. Not used;
	9. Neural network integrated circuits;
	10. Custom integrated circuits for which the function is unknown, having any of the following:
	a. More than 1,500 terminals;
	b. A typical "basic gate propagation delay time" of less than 0.02 ns; or
	c. An operating frequency exceeding 3 GHz;
	11. Digital integrated circuits, other than those described in Category Codes 3A001.a.3. to 3A001.a.10. and 3A001.a.12., based upon any compound semiconductor and having any of the following:
	a. An equivalent gate count of more than 3,000 (2 input gates); or
	b. A toggle frequency exceeding 1.2 GHz;

THE SCHEDULE — *continued*

Category Code	Item Description

12. Fast Fourier Transform (FFT) processors having a rated execution time for an N-point complex FFT of less than (N $\log_2$ N)/20,480 ms, where N is the number of points;

Technical Note

When N is equal to 1,024 points, the formula in Category Code 3A001.a.12. gives an execution time of 500 μs.

b. Microwave or millimetre wave components, as follows:

1. Electronic vacuum tubes and cathodes, as follows:

Note 1

Category Code 3A001.b.1. does not include tubes designed or rated for operation in any frequency band having all of the following:

a. Does not exceed 31.8 GHz; and

b. Is “allocated by the ITU” for radio-communications services, but not for radio-determination.

Note 2

Category Code 3A001.b.1. does not include non-“space-qualified” tubes having all of the following:

a. An average output power equal to or less than 50 W; and

b. Designed or rated for operation in any frequency band which meets all of the following:

1. Exceeds 31.8 GHz but does not exceed 43.5 GHz; and

2. Is “allocated by the ITU” for radio-communications services, but not for radio-determination.

a. Travelling wave tubes, pulsed or continuous wave, as follows:

1. Tubes operating at frequencies exceeding 31.8 GHz;

2. Tubes having a cathode heater element with a turn on time to rated RF power of less than 3 seconds;

THE SCHEDULE — *continued*

Category Code	Item Description
	3. Coupled cavity tubes, or derivatives thereof, with a "fractional bandwidth" of more than 7% or a peak power exceeding 2.5 kW;
	4. Helix tubes, or derivatives thereof, having any of the following:
	a. An "instantaneous bandwidth" of more than one octave, and average power (expressed in kW) times frequency (expressed in GHz) of more than 0.5;
	b. An "instantaneous bandwidth" of one octave or less, and average power (expressed in kW) times frequency (expressed in GHz) of more than 1; <u>or</u>
	c. Being "space qualified";
	b. Crossed-field amplifier tubes with a gain of more than 17 dB;
	c. Impregnated cathodes designed for electronic tubes producing a continuous emission current density at rated operating conditions exceeding 5 A/cm^2;
	2. Microwave "Monolithic Integrated Circuits" (MMIC) power amplifiers having any of the following:
	a. Rated for operation at frequencies exceeding 3.2 GHz up to and including 6 GHz and with an average output power greater than 4 W (36 dBm) with a "fractional bandwidth" greater than 15%;
	b. Rated for operation at frequencies exceeding 6 GHz up to and including 16 GHz and with an average output power greater than 1 W (30 dBm) with a "fractional bandwidth" greater than 10%;
	c. Rated for operation at frequencies exceeding 16 GHz up to and including 31.8 GHz and with an average output power greater than 0.8 W (29 dBm) with a "fractional bandwidth" greater than 10%;
	d. Rated for operation at frequencies exceeding 31.8 GHz up to and including 37.5 GHz;

THE SCHEDULE — *continued*

Category Code	Item Description
	e. Rated for operation at frequencies exceeding 37.5 GHz up to and including 43.5 GHz and with an average output power greater than 0.25 W (24 dBm) with a "fractional bandwidth" greater than 10%; or f. Rated for operation at frequencies exceeding 43.5 GHz. <u>*Note 1*</u> *Category Code 3A001.b.2. does not include broadcast satellite equipment designed or rated to operate in the frequency range of 40.5 GHz to 42.5 GHz.* <u>*Note 2*</u> *Whether any MMIC whose rated operating frequency includes frequencies listed in more than one frequency range, as defined by Category Codes 3A001.b.2.a. to 3A001.b.2.f., is included in that Category is determined by the lowest average output power control threshold.* <u>*Note 3*</u> *Notes 1 and 2 in the chapeau to Category 3 mean that Category Code 3A001.b.2. does not include MMICs if they are specially designed for other applications, e.g., telecommunications, radar, automobiles.* 3. Discrete microwave transistors having any of the following: a. Rated for operation at frequencies exceeding 3.2 GHz up to and including 6 GHz and having an average output power greater than 60 W (47.8 dBm); b. Rated for operation at frequencies exceeding 6 GHz up to and including 31.8 GHz and having an average output power greater than 20 W (43 dBm); c. Rated for operation at frequencies exceeding 31.8 GHz up to and including 37.5 GHz and having an average output power greater than 0.5 W (27 dBm); d. Rated for operation at frequencies exceeding 37.5 GHz up to and including 43.5 GHz and having an average output power greater than 1 W (30 dBm); <u>or</u>

THE SCHEDULE — *continued*

Category Code	Item Description
	e. Rated for operation at frequencies exceeding 43.5 GHz.
	<u>*Note*</u>
	Whether a transistor whose rated operating frequency includes frequencies listed in more than one frequency range, as defined by Category Codes 3A001.b.3.a. to 3A001.b.3.e., is included under that Category is determined by the lowest average output power control threshold.
	4. Microwave solid state amplifiers and microwave assemblies/modules containing microwave solid state amplifiers having any of the following:
	a. Rated for operation at frequencies exceeding 3.2 GHz up to and including 6 GHz and with an average output power greater than 60 W (47.8 dBm) with a “fractional bandwidth” greater than 15%;
	b. Rated for operation at frequencies exceeding 6 GHz up to and including 31.8 GHz and with an average output power greater than 15 W (42 dBm) with a “fractional bandwidth” greater than 10%;
	c. Rated for operation at frequencies exceeding 31.8 GHz up to and including 37.5 GHz;
	d. Rated for operation at frequencies exceeding 37.5 GHz up to and including 43.5 GHz and with an average output power greater than 1 W (30 dBm) with a “fractional bandwidth” greater than 10%;
	e. Rated for operation at frequencies exceeding 43.5 GHz; <u>or</u>
	f. Rated for operation at frequencies above 3.2 GHz and having all of the following:
	1. An average output power (in watts), P, greater than 150 divided by the maximum operating frequency (in GHz) squared [$P > 150\ W*GHz^2/f_{GHz}^2$];
	2. A “fractional bandwidth” of 5% or greater; and

THE SCHEDULE — *continued*

Category Code	Item Description
	3. Any two sides perpendicular to one another with length d (in cm) equal to or less than 15 divided by the lowest operating frequency in GHz [$d \leq 15$ cmxGHz/f_{GHz}].
	<u>*Technical Note*</u>*:*
	3.2 GHz is to be used as the lowest operating frequency (f_{GHz}) in the formula in Category Code 3A001.b.4.f.3., for amplifiers that have a rated operating range extending downward to 3.2 GHz and below [$d \leq 15$cm x GHz/3.2GHz].
	<u>*N.B.*</u>
	MMIC power amplifiers should be evaluated against the criteria in Category Code 3A001.b.2.
	<u>*Note 1*</u>
	Category Code 3A001.b.4. does not include broadcast satellite equipment designed or rated to operate in the frequency range of 40.5 GHz. to 42.5 GHz.
	<u>*Note 2*</u>
	Whether an item whose rated operating frequency includes frequencies listed in more than one frequency range, as defined by Category Codes 3A001.b.4.a. to 3A001.b.4.e., is included in that Category is determined by the lowest average output power control threshold.
	5. Electronically or magnetically tunable band-pass or band-stop filters having more than 5 tunable resonators capable of tuning across 1.5:1 frequency band (f_{max}/f_{min}) in less than 10 μs and having any of the following:
	a. A band-pass bandwidth of more than 0.5% of centre frequency; <u>or</u>
	b. A band-stop bandwidth of less than 0.5% of centre frequency;
	6. Not used;
	7. Converters and harmonic mixers designed to extend the frequency range of equipment described in Category Code

THE SCHEDULE — *continued*

Category Code	Item Description
	3A002.c., 3A002.d., 3A002.e. or 3A002.f. beyond the limits stated therein;
	8. Microwave power amplifiers containing tubes specified in Category Code 3A001.b.1. and having all of the following:
	a. Operating frequencies above 3 GHz;
	b. An average output power density exceeding 80 W/kg; <u>and</u>
	c. A volume of less than 400 cm^3;
	<u>Note</u>
	Category Code 3A001.b.8. does not include equipment designed or rated for operation in any frequency band which is "allocated by the ITU" for radio-communications services, but not for radio-determination.
	9. Microwave power modules (MPM), consisting of, at least, a travelling wave tube, a microwave "monolithic integrated circuit" and an integrated electronic power conditioner and having all of the following characteristics:
	a. A 'turn-on time' from off to fully operational in less than 10 seconds;
	b. A volume less than the maximum rated power in Watts multiplied by 10 cm^3/W; <u>and</u>
	c. An "instantaneous bandwidth" greater than 1 octave ($f_{max} > 2f_{min}$) and any of the following:
	i. For frequencies equal to or less than 18 GHz, an RF output power greater than 100 W; <u>or</u>
	ii. Having a frequency greater than 18 GHz.
	<u>Technical Notes</u>:
	1. To calculate the control volume in Category Code 3A001.b.9.b., the following example is provided: for a maximum rated power of 20 W, the volume would be: 20 $W \times 10\ cm^3/W = 200\ cm^3$.

THE SCHEDULE — *continued*

Category Code	Item Description
	2. The 'turn-on time' in Category Code 3A001.b.9.a. refers to the time from fully-off to fully operational; i.e., it includes the warm-up time of the MPM.
	10. Oscillators or oscillator assemblies, designed to operate with all of the following:
	a. A single sideband (SSB) phase noise, in dBc/Hz, better than $-(126+20\log_{10}F - 20\log_{10}f)$ for $10Hz<F<10kHz$; <u>and</u>
	b. A single sideband (SSB) phase noise, in dBc/Hz, better than $-(114+20\log_{10}F-20\log_{10}f)$ for $10kHz \leq F<500kHz$;
	<u>Technical Notes</u>:
	In Category Code 3A001.b.10., F is the offset from the operating frequency in Hz and f is the operating frequency in MHz.
	c. Acoustic wave devices as follows and specially designed components therefor:
	1. Surface acoustic wave and surface skimming (shallow bulk) acoustic wave devices, having any of the following:
	a. A carrier frequency exceeding 6 GHz;
	b. A carrier frequency exceeding 1 GHz, but not exceeding 6 GHz, and having any of the following:
	1. A 'frequency side-lobe rejection' exceeding 65 dB;
	2. A product of the maximum delay time and the bandwidth (time in µs and bandwidth in MHz) of more than 100;
	3. A bandwidth greater than 250 MHz; or
	4. A dispersive delay of more than 10 µs; or
	c. A carrier frequency of 1 GHz or less and having any of the following:
	1. A product of the maximum delay time and the bandwidth (time in µs and bandwidth in MHz) of more than 100;
	2. A dispersive delay of more than 10 µs; <u>or</u>

THE SCHEDULE — *continued*

Category Code	Item Description

3. A ‘frequency side-lobe rejection’ exceeding 65 dB and a bandwidth greater than 100 MHz;

<u>Technical Note</u>:

‘Frequency side-lobe rejection’ is the maximum rejection value specified in data sheet.

2. Bulk (volume) acoustic wave devices which permit the direct processing of signals at frequencies exceeding 6 GHz;

3. Acoustic-optic “signal processing” devices employing interaction between acoustic waves (bulk wave or surface wave) and light waves which permit the direct processing of signals or images, including spectral analysis, correlation or convolution;

<u>Note</u>:

Category Code 3A001.c. does not include acoustic wave devices that are limited to a single band pass, low pass, high pass or notch filtering, or resonating function.

d. Electronic devices and circuits containing components, manufactured from “superconductive” materials specially designed for operation at temperatures below the “critical temperature” of at least one of the “superconductive” constituents and having any of the following:

1. Current switching for digital circuits using “superconductive” gates with a product of delay time per gate (in seconds) and power dissipation per gate (in watts) of less than 10^{-14} J; <u>or</u>

2. Frequency selection at all frequencies using resonant circuits with Q-values exceeding 10,000;

e. High energy devices, as follows:

1. ‘Cells’, as follows:

a. ‘Primary cells’ having an ‘energy density’ exceeding 550 Wh/kg at 20ºC;

b. ‘Secondary cells’ having an ‘energy density’ exceeding 250 Wh/kg;

THE SCHEDULE — *continued*

Category Code	Item Description
	<u>*Technical Note*</u> 1. For the purpose of Category Code 3A001.e.1., ‘energy density’ (Wh/kg) is calculated from the nominal voltage multiplied by the nominal capacity in ampere-hours (Ah) divided by the mass in kilograms. If the nominal capacity is not stated, energy density is calculated from the nominal voltage squared then multiplied by the discharge duration in hours divided by the discharge load in ohms and the mass in kilograms. 2. For the purpose of Category Code 3A001.e.1., a 'cell' is defined as an electrochemical device, which has positive and negative electrodes, and electrolyte, and is a source of electrical energy. It is the basic building block of a battery. 3. For the purpose of Category Code 3A001.e.1.a., a 'primary cell' is a 'cell' that is not designed to be charged by any other source. 4. For the purpose of Category Code 3A001.e.1.b., a 'secondary cell' is a 'cell' that is designed to be charged by an external electrical source. <u>*Note*</u> *Category Code 3A001.e.1. does not include batteries, including single cell batteries.* 2. High energy storage capacitors, as follows: <u>***N.B.***</u> ***See also Category Code 3A201.a.*** a. Capacitors with a repetition rate of less than 10 Hz (single shot capacitors) and having all of the following: 1. A voltage rating equal to or more than 5 kV; 2. An energy density equal to or more than 250 J/kg; <u>and</u> 3. A total energy equal to or more than 25 kJ;

THE SCHEDULE — *continued*

Category Code	Item Description
	b. Capacitors with a repetition rate of 10 Hz or more (repetition rated capacitors) and having all of the following:
	1. A voltage rating equal to or more than 5 kV;
	2. An energy density equal to or more than 50 J/kg;
	3. A total energy equal to or more than 100 J; and
	4. A charge/discharge cycle life equal to or more than 10,000;
	3. "Superconductive" electromagnets and solenoids specially designed to be fully charged or discharged in less than one second and having all of the following:
	N.B.
	See also Category Code 3A201.b.
	Note
	Category Code 3A001.e.3. does not include "superconductive" electromagnets or solenoids specially designed for Magnetic Resonance Imaging (MRI) medical equipment.
	a. Energy delivered during the discharge exceeding 10 kJ in the first second;
	b. Inner diameter of the current carrying windings of more than 250 mm; and
	c. Rated for a magnetic induction of more than 8 T or "overall current density" in the winding of more than 300 A/mm^2;
	4. Solar cells, cell-interconnect-coverglass (CIC) assemblies, solar panels, and solar arrays, which are "space qualified", having a minimum average efficiency exceeding 20% at an operating temperature of 301 K (28° C) under simulated 'AM0' illumination with an irradiance of 1,367 watts per square metre (W/m^2).
	Technical Note:

THE SCHEDULE — *continued*

Category Code	Item Description
	'AM0', or 'Air Mass Zero', refers to the spectral irradiance of sun light in the earth's outer atmosphere when the distance between the earth and sun is one astronomical unit (AU).
	f. Rotary input type shaft absolute position encoders having an accuracy equal to or less (better) than ± 1.0 second of arc;
	g. Solid-state pulsed power switching thyristor devices and 'thyristor modules' using either electrically, optically, or electron radiation controlled switch methods, having any of the following:
	1. A maximum turn-on current rate of rise (di/dt) greater than 30,000 A/μs and off-state voltage greater than 1,100 V; <u>or</u>
	2. A maximum turn-on current rate of rise (di/dt) greater than 2,000 A/μs and all of the following:
	a. An off-state peak voltage equal to or greater than 3,000 V; <u>and</u>
	b. A peak (surge) current equal to or greater than 3,000 A.
	<u>Note 1</u>:
	Category Code 3A001.g. includes:
	− *Silicon Controlled Rectifiers (SCRs)*
	− *Electrical Triggering Thyristors (ETTs)*
	− *Light Triggering Thyristors (LTTs)*
	− *Integrated Gate Commutated Thyristors (IGCTs)*
	− *Gate Turn-off Thyristors (GTOs)*
	− *MOS Controlled Thyristors (MCTs)*
	− *Solidtrons*
	<u>Note 2</u>:
	Category Code 3A001.g. does not include thyristor devices and 'thyristor modules' incorporated into equipment designed for civil railway or "civil aircraft" applications.
	<u>Technical Note</u>:

THE SCHEDULE — *continued*

Category Code	Item Description
	For the purposes of Category Code 3A001.g., a thyristor module' contains one or more thyristor devices.
	h. Solid-state power semiconductor switches, diodes, or 'modules', having all of the following:
	1. Rated for a maximum operating junction temperature greater than 488 K (215˚C); or
	2. 'Repetitive peak off-state voltage' (blocking voltage) exceeding 300V; and
	3. Continuous current greater than 1A.
	Note 1
	'Repetitive peak off-state voltage' in Category Code 3A001.h. includes drain to source voltage, collector to emitter voltage, repetitive peak reverse voltage and peak repetitive off-state blocking voltage.
	Note 2
	Category Code 3A001.h. includes:
	- Junction Field Effect Transistors (JFETs)
	- Vertical Junction Field Effect Transistors (VJFETs)
	- Metal Oxide Semiconductor Field Effect Transistors (MOSFETs)
	- Double Diffused Metal Oxide Semiconductor Field Effect Transistor (DMOSFET)
	- Insulated Gate Bipolar Transistor (IGBT)
	- High Electron Mobility Transistors (HEMTs)
	- Bipolar Junction Transistors (BJTs)
	- Thyristors and Silicon Controlled Rectifiers (SCRs)
	- Gate Turn-Off Thyristors (GTOs)
	- Emitter Turn-Off Thyristors (ETOs)
	- PiN Diodes
	- Schottky Diodes

THE SCHEDULE — *continued*

Category Code	Item Description
	<u>*Note 3*</u>
	Category Code 3A001.h. does not include switches, diodes, or 'modules' incorporated into equipment, specially designed for civil automobile, civil railway or "civil aircraft" applications.
	<u>*Technical Note*</u>
	For the purpose of Category Code 3A001.h., 'modules' contain one or more solid-state power semiconductor switches or diodes.
3A002	General purpose electronic equipment and accessories therefor, as follows:
	a. Recording equipment as follows and specially designed test tape therefor:
	1. Analogue instrumentation magnetic tape recorders, including those permitting the recording of digital signals (e.g., using a high density digital recording (HDDR) module), having any of the following:
	a. A bandwidth exceeding 4 MHz per electronic channel or track;
	b. A bandwidth exceeding 2 MHz per electronic channel or track and having more than 42 tracks; <u>or</u>
	c. A time displacement (base) error, measured in accordance with applicable IRIG or EIA documents, of less than ± 0.1 µs;
	<u>*Note*</u>
	Analogue magnetic tape recorders specially designed for civilian video purposes are not considered to be instrumentation tape recorders.
	2. Digital video magnetic tape recorders having a maximum digital interface transfer rate exceeding 360 Mbit/s;
	<u>*Note*</u>
	Category Code 3A002.a.2. does not include digital video magnetic tape recorders specially designed for television recording using a signal format, which may include a compressed signal format, standardised or recommended by

THE SCHEDULE — *continued*

Category Code	Item Description
	the ITU, the IEC, the SMPTE, the EBU, the ETSI or the IEEE for civil television applications.
	3. Digital instrumentation magnetic tape data recorders employing helical scan techniques or fixed head techniques and having any of the following:
	a. A maximum digital interface transfer rate exceeding 175 Mbit/s; or
	b. Being “space qualified”;
	Note
	Category Code 3A002.a.3. does not include analogue magnetic tape recorders equipped with HDDR conversion electronics and configured to record only digital data.
	4. Equipment having a maximum digital interface transfer rate exceeding 175 Mbit/s and designed to convert digital video magnetic tape recorders for use as digital instrumentation data recorders;
	5. Waveform digitisers and transient recorders having all of the following:
	a. Digitising rate equal to or more than 200 million samples per second and a resolution of 10 bit or more; and
	b. A ‘continuous throughput’ of 2 Gbit/s or more;
	Technical Note
	1. For those instruments with a parallel bus architecture, the ‘continuous throughput’ rate is the highest word rate multiplied by the number of bits in a word.
	2. ‘Continuous throughput’ is the fastest data rate the instrument can output to mass storage without the loss of any information whilst sustaining the sampling rate and analogue-to-digital conversion.
	6. Digital instrumentation data recorders, using magnetic disk storage technique and having all of the following:

THE SCHEDULE — *continued*

Category Code	Item Description
	a. Digitising rate equal to or more than 100 million samples per second and a resolution of 8 bit or more; and
	b. A ‘continuous throughput’ of 1 Gbit/s or more;
	b. “Frequency synthesiser” “electronic assemblies” having a “frequency switching time” from one selected frequency to another of less than 1 ms;
	Note:
	The “signal analysers”, signal generators, network analysers and microwave test receivers as stand-alone instruments come within Category Codes 3A002.c., 3A002.d., 3A002.e., and 3A002.f., respectively, if they come within the description of those Category Codes.
	c. Radio frequency “signal analysers”, as follows:
	1. “Signal analysers” capable of analysing frequencies exceeding 31.8 GHz but not exceeding 37.5 GHz and having a 3 dB resolution bandwidth (RBW) exceeding 10 MHz;
	2. “Signal analysers” capable of analysing frequencies exceeding 43.5 GHz;
	3. “Dynamic signal analysers” having a “real-time bandwidth” exceeding 500 kHz;
	Note
	Category Code 3A002.c.3. does not include those “dynamic signal analysers” using only constant percentage bandwidth filters (also known as octave or fractional octave filters).
	d. Frequency synthesised signal generators producing output frequencies, the accuracy and short term and long term stability of which are controlled, derived from or disciplined by the internal master reference oscillator, and having any of the following:
	1. A maximum synthesised frequency exceeding 31.8 GHz but not exceeding 43.5 GHz and rated to generate a ‘pulse duration’ of less than 100 ns;

THE SCHEDULE — *continued*

Category Code	Item Description

2. A maximum synthesised frequency exceeding 43.5 GHz;
3. A “frequency switching time” from one selected frequency to another as specified by any of the following:
   a. Less than 312 ps;
   b. Less than 100 μs for any frequency change exceeding 1.6 GHz within the synthesised frequency range exceeding 3.2 GHz but not exceeding 10.6 GHz;
   c. Less than 250 μs for any frequency change exceeding 550 MHz within the synthesised frequency range exceeding 10.6 GHz but not exceeding 31.8 GHz;
   d. Less than 500 μs for any frequency change exceeding 550 MHz within the synthesised frequency range exceeding 31.8 GHz but not exceeding 43.5 GHz; <u>or</u>
   e. Less than 1 ms within the synthesised frequency range exceeding 43.5 GHz; <u>or</u>
4. A maximum synthesised frequency exceeding 3.2 GHz and having all of the following:
   a. A single sideband (SSB) phase noise, in dBc/Hz, better than $-(126 + 20\log_{10}F - 20\log_{10}f)$ for $10Hz<F<10kHz$; and
   b. A single sideband (SSB) phase noise, in dBc/Hz, better than $-(114 + 20\log_{10}F - 20\log_{10}f)$ for $10kHz=F<500kHz$;

<u>*Technical Note*</u>

In Category Code 3A002.d.4., F is the off-set from the operating frequency in Hz and f is the operating frequency in MHz;

<u>*Note 1*</u>

For the purpose of Category Code 3A002.d., the term frequency synthesised signal generators includes arbitrary waveform and function generators.

<u>*Note 2*</u>

THE SCHEDULE — *continued*

Category Code	Item Description
	Category Code 3A002.d. does not include equipment in which the output frequency is either produced by the addition or subtraction of two or more crystal oscillator frequencies, or by an addition or subtraction followed by a multiplication of the result.
	Technical Notes
	1. Arbitrary waveform and function generators are normally specified by sample rate (e.g., GSample/s), which is converted to the RF domain by the Nyquist factor of two. Thus, a 1 GSample/s arbitrary waveform has a direct output capability of 500 MHz. Or, when oversampling is used, the maximum direct output capability is proportionately lower.
	2. For the purposes of Category Code 3A002.d.1., 'pulse duration' is defined as the time interval between the leading edge of the pulse achieving 90% of the peak and the trailing edge of the pulse achieving 10% of the peak.
	e. Network analysers with a maximum operating frequency exceeding 43.5 GHz;
	f. Microwave test receivers having all of the following:
	1. A maximum operating frequency exceeding 43.5 GHz; and
	2. Being capable of measuring amplitude and phase simultaneously;
	g. Atomic frequency standards being any of the following:
	1. "Space qualified";
	2. Non-rubidium and having a long-term stability less (better) than 1×10^{-11}/month; or
	3. Non-"space qualified" and having all of the following:
	a. Being a rubidium standard;
	b. Long-term stability less (better) than $1 \text{ x } 10^{-11}$/month; and
	c. Total power consumption of less than 1 W.

THE SCHEDULE — *continued*

Category Code	Item Description
3A003	Spray cooling thermal management systems employing closed loop fluid handling and reconditioning equipment in a sealed enclosure where a dielectric fluid is sprayed onto electronic components using specially designed spray nozzles that are designed to maintain electronic components within their operating temperature range, and specially designed components therefor.
3A101	Electronic equipment, devices and components, other than those specified in Category Code 3A001, as follows: a. Analogue-to-digital converters, usable in “missiles”, designed to meet military specifications for ruggedised equipment; b. Accelerators capable of delivering electromagnetic radiation produced by bremsstrahlung from accelerated electrons of 2 MeV or greater, and systems containing those accelerators. *<u>Note</u>* *Category Code 3A101.b. above does not include equipment specially designed for medical purposes.*
3A102	'Thermal batteries' designed or modified for 'missiles'. *<u>Technical Notes</u>:* *1. In Category Code 3A102 'thermal batteries' are single use batteries that contain a solid nonconducting inorganic salt as the electrolyte. These batteries incorporate a pyrolytic material that, when ignited, melts the electrolyte and activates the battery.* *2. In Category Code 3A102 'missile' means complete rocket systems and unmanned aerial vehicle systems capable of a range exceeding 300 km.*
3A201	Electronic components, other than those specified in Category Code 3A001, as follows; a. Capacitors having either of the following sets of characteristics: 1. a.Voltage rating greater than 1.4 kV; b. Energy storage greater than 10 J;

THE SCHEDULE — *continued*

Category Code	Item Description
	c. Capacitance greater than 0.5 μF; and d. Series inductance less than 50 nH; or 2. a.Voltage rating greater than 750 V; b. Capacitance greater than 0.25 μF; and c. Series inductance less than 10 nH; b. Superconducting solenoidal electromagnets having all of the following characteristics: 1. Capable of creating magnetic fields greater than 2 T; 2. A ratio of length to inner diameter greater than 2; 3. Inner diameter greater than 300 mm; and 4. Magnetic field uniform to better than 1% over the central 50% of the inner volume; *Note* *Category Code 3A201.b. does not include magnets specially designed for and exported, 'as parts of' medical nuclear magnetic resonance (NMR) imaging systems. For this purpose, the magnets and NMR imaging systems may be part of the same shipment or in separate shipments from different sources, provided the related export documents clearly specify that the separate shipments are dispatched 'as part of' the imaging systems.* c. Flash X-ray generators or pulsed electron accelerators having either of the following sets of characteristics: 1. a.An accelerator peak electron energy of 500 keVor greater but less than 25 MeV; and b. With a 'figure of merit' (K) of 0.25 or greater; or 2. a.An accelerator peak electron energy of 25 MeVor greater; and b. A 'peak power' greater than 50 MW. *Note*

THE SCHEDULE — *continued*

Category Code	Item Description
	Category Code 3A201.c. does not include accelerators that are component parts of devices designed for purposes other than electron beam or X-ray radiation (e.g., electron microscopy) nor those designed for medical purposes:

Technical Notes

1. *The 'figure of merit' K is defined as:*

   $K = 1.7 \times 10^{3} V^{2.65} Q$

   V is the peak electron energy in million electron volts.

   If the accelerator beam pulse duration is less than or equal to 1 μs, then Q is the total accelerated charge in Coulombs. If the accelerator beam pulse duration is greater than 1 μs, then Q is the maximum accelerated charge in 1 μs.

Q equals the integral of i with respect to t, over the lesser of 1 μs or the time duration of the beam pulse ($Q = \int i dt$), where i is beam current in amperes and t is time in seconds.

2. *'Peak power' = (peak potential in volts) × (peak beam current in amperes).*
3. *In machines based on microwave accelerating cavities, the time duration of the beam pulse is the lesser of 1 μs or the duration of the bunched beam packet resulting from one microwave modulator pulse.*
4. *In machines based on microwave accelerating cavities, the peak beam current is the average current in the time duration of a bunched beam packet.*

3A225 Frequency changers or generators, other than those specified in Category Code 0B001.b.13., having all of the following characteristics:

a. Multiphase output capable of providing a power of 40 W or greater;

b. Capable of operating in the frequency range between 600 Hz and 2,000 Hz;

c. Total harmonic distortion better (less) than 10%; and

d. Frequency control better (less) than 0.1%.

THE SCHEDULE — *continued*

Category Code	Item Description
	<u>*Technical Note*</u> *Frequency changers in Category Code 3A225 are also known as converters or inverters.*
3A226	High-power direct current power supplies, other than those specified in Category Code 0B001.j.6., having both of the following characteristics: a. Capable of continuously producing, over a time period of 8 hours, 100 V or greater with current output of 500 A or greater; <u>and</u> b. Current or voltage stability better than 0.1% over a time period of 8 hours.
3A227	High-voltage direct current power supplies, other than those specified in Category Code 0B001.j.5., having both of the following characteristics: a. Capable of continuously producing, over a time period of 8 hours, 20 kV or greater with current output of 1 A or greater; <u>and</u> b. Current or voltage stability better than 0.1% over a time period of 8 hours.
3A228	Switching devices, as follows: a. Cold-cathode tubes, whether gas filled or not, operating similarly to a spark gap, having all of the following characteristics: 1. Containing three or more electrodes; 2. Anode peak voltage rating of 2.5 kV or more; 3. Anode peak current rating of 100 A or more; <u>and</u> 4. Anode delay time of 10 μs or less; <u>*Note*</u> *Category Code 3A228 includes gas krytron tubes and vacuum sprytron tubes.* b. Triggered spark-gaps having both of the following characteristics:

THE SCHEDULE — *continued*

Category Code	Item Description
	1. An anode delay time of 15 μs or less; <u>and</u>
	2. Rated for a peak current of 500 A or more;
	c. Modules or assemblies with a fast switching function, other than those specified in Category Code 3A001.g., having all of the following characteristics:
	1. Anode peak voltage rating greater than 2 kV;
	2. Anode peak current rating of 500 A or more; <u>and</u>
	3. Turn-on time of 1 μs or less.
3A229	High-current pulse generators as follows:
	<u>N.B.</u>
	See also Division 2 of Part I of this Schedule.
	See Category Code 1A007.a. for explosive detonator firing sets.
	a. Not used;
	b. Modular electrical pulse generators (pulsers) having all of the following characteristics:
	1. Designed for portable, mobile, or ruggedised-use;
	2. Enclosed in a dust-tight enclosure;
	3. Capable of delivering their energy in less than 15 μs;
	4. Having an output greater than 100 A;
	5. Having a 'rise time' of less than 10 μs into loads of less than 40 ohms;
	6. No dimension greater than 254 mm;
	7. Weight less than 25 kg; <u>and</u>
	8. Specified for use over an extended temperature range 223 K (-50ºC) to 373 K (100ºC) or specified as suitable for aerospace applications.
	<u>Note</u>
	Category Code 3A229.b. includes xenon flash-lamp drivers.
	<u>Technical Note</u>

THE SCHEDULE — *continued*

Category Code	Item Description
	In Category Code 3A229.b.5., 'rise time' is defined as the time interval from 10% to 90% current amplitude when driving a resistive load.
3A230	High-speed pulse generators having both of the following characteristics: a. Output voltage greater than 6 V into a resistive load of less than 55 ohms, and b. 'Pulse transition time' less than 500 ps. *Technical Note* *In Category Code 3A230, 'pulse transition time' is defined as the time interval between 10% and 90% voltage amplitude.*
3A231	Neutron generator systems, including tubes, having both of the following characteristics: a. Designed for operation without an external vacuum system; and b. Utilising electrostatic acceleration to induce a tritium-deuterium nuclear reaction.
3A232	Multipoint initiation systems, other than those specified in Category Code 1A007, as follows: ***N.B.*** ***See also Division 2 of Part I of this Schedule.*** ***See Category Code 1A007.b. for detonators.*** a. Not used; b. Arrangements using single or multiple detonators designed to nearly simultaneously initiate an explosive surface over greater than 5,000 mm2 from a single firing signal with an initiation timing spread over the surface of less than 2.5 µs. *Note* *Category Code 3A232 does not include detonators using only primary explosives, such as lead azide.*
3A233	Mass spectrometers, other than those specified in Cateogry Code 0B002.g., capable of measuring ions of 230 atomic mass units or

THE SCHEDULE — *continued*

Category Code	Item Description
	greater and having a resolution of better than 2 parts in 230, as follows, and ion sources therefor:
	a. Inductively coupled plasma mass spectrometers (ICP/MS);
	b. Glow discharge mass spectrometers (GDMS);
	c. Thermal ionisation mass spectrometers (TIMS);
	d. Electron bombardment mass spectrometers which have a source chamber constructed from, lined with or plated with materials resistant to UF6;
	e. Molecular beam mass spectrometers having either of the following characteristics:
	1. A source chamber constructed from, lined with or plated with stainless steel or molybdenum and equipped with a cold trap capable of cooling to 193 K (-80ºC) or less; or
	2. A source chamber constructed from, lined with or plated with materials resistant to UF6;
	f. Mass spectrometers equipped with a microfluorination ion source designed for actinides or actinide fluorides.
3B	**Test, Inspection and Production Equipment**
3B001	Equipment for the manufacturing of semiconductor devices or materials, as follows, and specially designed components and accessories therefor:
	a. Equipment designed for epitaxial growth, as follows:
	1. Equipment capable of producing a layer of any material other than silicon with a thickness uniform to less than ±2.5% across a distance of 75 mm or more;
	<u>*Note*</u>
	Category Code 3B001.a.1. includes Atomic Layer Epitaxy (ALE) equipment.
	2. Metal Organic Chemical Vapour Deposition (MOCVD) reactors specially designed for compound semiconductor crystal growth by the chemical reaction between materials specified in Category Code 3C003 or 3C004;

THE SCHEDULE — *continued*

Category Code	Item Description
	3. Molecular beam epitaxial growth equipment using gas or solid sources;
	b. Equipment designed for ion implantation and having any of the following:
	1. A beam energy (accelerating voltage) exceeding 1 MeV;
	2. Being specially designed and optimised to operate at a beam energy (accelerating voltage) of less than 2 keV;
	3. Direct write capability; or
	4. A beam energy of 65 keV or more and a beam current of 45 mA or more for high energy oxygen implant into a heated semiconductor material "substrate";
	c. Anisotropic plasma dry etching equipment as follows:
	1. Equipment with cassette-to-cassette operation and load-locks, and having any of the following:
	a. Designed or optimised to produce critical dimensions of 180 nm or less with ±5% 3 sigma precision; or
	b. Designed for generating less than 0.04 particles/cm^2 with a measurable particle size greater than 0.1 μm in diameter;
	2. Equipment specially designed for equipment specified in Category Code 3B001.e. and having any of the following:
	a. Designed or optimised to produce critical dimensions of 180 nm or less with ±5% 3 sigma precision; or
	b. Designed for generating less than 0.04 particles/cm^2 with a measurable particle size greater than 0.1μm in diameter;
	d. Plasma enhanced Chemical Vapour Deposition (CVD) equipment, as follows:
	1. Equipment with cassette-to-cassette operation and load-locks, and designed according to the manufacturer's specifications or optimised for use in the production of semiconductor devices with critical dimensions of 180 nm or less;

THE SCHEDULE — *continued*

Category Code	Item Description
	2. Equipment specially designed for equipment specified in Category Code 3B001.e. and designed according to the manufacturer's specifications or optimised for use in the production of semiconductor devices with critical dimensions of 180 nm or less;
	e. Automatic loading multi-chamber central wafer handling systems, having all of the following:
	1. Interfaces for wafer input and output, to which more than two pieces of semiconductor processing equipment are to be connected; and
	2. Designed to form an integrated system in a vacuum environment for sequential multiple wafer processing;
	Note
	Category Code 3B001.e. does not include automatic robotic wafer handling systems not designed to operate in a vacuum environment.
	f. Lithography equipment as follows:
	1. Align and expose step and repeat (direct step on wafer) or step and scan (scanner) equipment for wafer processing using photo-optical or X-ray methods and having any of the following:
	a. A light source wavelength shorter than 245 nm; or
	b. Capable of producing a pattern with a 'minimum resolvable feature size' of 180 nm or less;
	Technical Note
	The 'minimum resolvable feature size' is calculated by the following formula:
	MRF = (an exposure light source wavelength in nm) × (K factor) numerical aperture
	where the K factor = 0.45
	MRF = 'minimum resolvable feature' size
	2. Imprint lithography equipment capable of producing features of 180 nm or less;

THE SCHEDULE — *continued*

Category Code	Item Description
	<u>*Note*</u> *Category Code 3B001.f.2. includes:* − *Micro contact printing tools* − *Hot embossing tools* − *Nano-imprint lithography tools* − *Step and flash imprint lithography (S-FIL) tools* 3. Equipment specially designed for mask making or semiconductor device processing using direct writing methods and having all of the following: a. Using deflected focused electron beam ion beam or “laser” beam; <u>and</u> b. Having any of the following: 1. A spot size smaller than 0.2 µm; 2. Being capable of producing a pattern with a feature size of less than 1 µm; <u>or</u> 3. An overlay accuracy of better than ±0.20 µm (3 sigma); g. Masks and reticles designed for integrated circuits specified in Category Code 3A001; h. Multi-layer masks with a phase shift layer. <u>*Note*</u> *Category Code 3B001.h. does not include multi-layer masks with a phase shift layer designed for the fabrication of memory devices not specified in Category Code 3A001.* i. Imprint lithography templates designed for integrated circuits specified in Category Code 3A001.
3B002	Test equipment specially designed for testing finished or unfinished semiconductor devices, as follows, and specially designed components and accessories therefor: a. For testing S-parameters of transistor devices at frequencies exceeding 31.8 GHz;

THE SCHEDULE — *continued*

Category Code	Item Description
	b. Not used;
	c. For testing microwave integrated circuits specified in Category Code 3A001.b.2.
3C	**Materials**
3C001	Hetero-epitaxial materials consisting of a "substrate" having stacked epitaxially grown multiple layers of any of the following:
	a. Silicon (Si);
	b. Germanium (Ge);
	c. Silicon carbide (SiC); or
	d. "III/V compounds" of gallium or indium.
3C002	Resist materials as follows, and "substrates" coated with the following resists:
	a. Positive resists designed for semiconductor lithography specially adjusted (optimised) for use at wavelengths below 245 nm;
	b. All resists designed for use with electron beams or ion beams, with a sensitivity of 0.01 μcoulomb/mm^2 or better;
	c. All resists designed for use with X-rays, with a sensitivity of 2.5 mJ/mm^2 or better;
	d. All resists optimised for surface imaging technologies, including 'silylated' resists;
	Technical Note
	'Silylation' techniques are defined as processes incorporating oxidation of the resist surface to enhance performance for both wet and dry developing.
	e. All resists designed or optimised for use with imprint lithography equipment specified in Category Code 3B001.f.2. that use either a thermal or photo-curable process.
3C003	Organo-inorganic compounds as follows:
	a. Organo-metallic compounds of aluminium, gallium or indium having a purity (metal basis) better than 99.999%;

THE SCHEDULE — *continued*

Category Code	Item Description
	b. Organo-arsenic, organo-antimony and organo-phosphorus compounds having a purity (inorganic element basis) better than 99.999%.
	<u>*Note*</u>
	Category Code 3C003 only includes compounds whose metallic, partly metallic or non-metallic element is directly linked to carbon in the organic part of the molecule.
3C004	Hydrides of phosphorus, arsenic or antimony, having a purity better than 99.999%, even diluted in inert gases or hydrogen.
	<u>*Note*</u>
	Category Code 3C004 does not include hydrides containing 20% molar or more of inert gases or hydrogen.
3C005	Silicon carbide (SiC), gallium nitride (GaN), aluminium nitride (AlN) or aluminium gallium nitride (AlGaN) "substrates", or ingots, boules, or other preforms of those materials, having resistivities greater than 10,000 ohm-cm at 20°C.
3C006	"Substrates" specified in Category Code 3C005 with at least one epitaxial layer of silicon carbide, gallium nitride, aluminium nitride or aluminium gallium nitride.
3D	**Software**
3D001	"Software" specially designed for the "development" or "production" of equipment specified in Category Codes 3A001.b. to 3A002.g. or Category 3B.
3D002	"Software" specially designed for the "use" of equipment specified in Category Code 3B001.a. to f. or3B002.
3D003	'Physics-based' simulation "software" specially designed for the "development" of lithographic, etching or deposition processes for translating masking patterns into specific topographical patterns in conductors, dielectrics or semiconductor materials.
	<u>*Technical Note*</u>
	'Physics-based' in Category Code 3D003 means using computations to determine a sequence of physical cause and effect events based on physical properties (e.g., temperature, pressure, diffusion constants and semiconductor materials properties).

THE SCHEDULE — *continued*

Category Code	Item Description
	<u>*Note*</u>
	Libraries, design attributes or associated data for the design of semiconductor devices or integrated circuits are considered as "technology".
3D004	"Software" specially designed for the "development" of the equipment specified in Category Code 3A003.
3D101	"Software" specially designed or modified for the "use" of equipment specified in Category Code 3A101.b.
3E	**Technology**
3E001	"Technology" (according to the General Technology Note) for the "development" or "production" of equipment or materials specified in Category 3A, 3B or 3C;
	<u>*Note 1*</u>
	Category Code 3E001 does not include "technology" for the "production" of equipment or components specified in Category Code 3A003.
	<u>*Note 2*</u>
	Category Code 3E001 does not include "technology" for the "development" or "production" of integrated circuits specified in Category Codes 3A001.a.3. to 3A001.a.12., having all of the following:
	1 Using "technology" of 0.5 µm or more, and
	2. Not incorporating 'multi-layer structures'.
	<u>*Technical Note*</u>
	'Multi-layer structures' do not include devices incorporating a maximum of three metal layers and three polysilicon layers.
3E002	"Technology" (according to the General Technology Note) other than that specified in Category Code 3E001 for the "development" or "production" of a "microprocessor microcircuit", "microcomputer microcircuit" or microcontroller microcircuit core, having an arithmetic logic unit with an access width of 32 bits or more and any of the following characteristics:

THE SCHEDULE — *continued*

Category Code	Item Description
	a. A 'vector processor unit' designed to perform more than two calculations on floating-point vectors (one-dimensional arrays of 32-bit or larger numbers) simultaneously;
	<u>*Technical Note*</u>
	A 'vector processing unit' is a processor element with built-in instructions that perform multiple calculations on floating-point vectors (one-dimensional arrays of 32-bit or larger numbers) simultaneously, having at least one vector arithmetic logic unit.
	b. Designed to perform more than two 64-bit or larger floating-point operation results per cycle; <u>or</u>
	c. Designed to perform more than four 16-bit fixed-point multiply-accumulate results per cycle (e.g., digital manipulation of analogue information that has been previously converted into digital form, also known as digital "signal processing").
	<u>*Note*</u>
	Category Code 3E002.c. does not include "technology" for multimedia extensions.
	<u>*Note 1*</u>
	Category Code 3E002 does not include "technology" for the "development" or "production" of micro-processor cores, having all of the following:
	a. Using "technology" at or above 0.130 µm; <u>and</u>
	b. Incorporating multi-layer structures with five or fewer metal layers.
	<u>*Note 2*</u>
	Category Code 3E002 includes "technology" for digital signal processors and digital array processors.
3E003	Other "technology" for the "development" or "production" of the following:
	a. Vacuum microelectronic devices;

THE SCHEDULE — *continued*

Category Code	Item Description
	b. Hetero-structure semiconductor devices such as high electron mobility transistors (HEMT), hetero-bipolar transistors (HBT), quantum well and super lattice devices;
	Note
	Category Code 3E003.b. does not include "technology" for high electron mobility transistors (HEMT) operating at frequencies lower than 31.8 GHz and hetero-junction bipolar transistors (HBT) operating at frequencies lower than 31.8 GHz.
	c. "Superconductive" electronic devices;
	d. Substrates of films of diamond for electronic components;
	e. Substrates of silicon-on-insulator (SOI) for integrated circuits in which the insulator is silicon dioxide;
	f. Substrates of silicon carbide for electronic components;
	g. Electronic vacuum tubes operating at frequencies of 31.8 GHz or higher.
3E101	"Technology" (according to the General Technology Note) for the "use" of equipment or "software" specified in Category Code 3A001.a.1. or 2., 3A101, 3A102 or 3D101.
3E102	"Technology" (according to the General Technology Note) for the "development" of "software" specified in Category Code 3D101.
3E201	"Technology" (according to the General Technology Note) for the "use" of equipment specified in Category Code 3A001.e.2., 3A001.e.3., 3A001.g., 3A201 or 3A225 to 3A233.

CATEGORY 4 — COMPUTERS

Note 1

Computers, related equipment and "software" performing telecommunications or "local area network" functions with the performance characteristics in Category 5, Part 1 (Telecommunications) shall also be treated as coming within that Category.

Note 2

THE SCHEDULE — *continued*

Category Code	Item Description
	Control units which directly interconnect the buses or channels of central processing units, "main storage" or disk controllers are not regarded as telecommunications equipment described in Category 5, Part 1 (Telecommunications).
	N.B.
	For "software" specially designed for packet switching, see Category Code 5D001.
	Note 3
	Computers, related equipment and "software" performing cryptographic, cryptanalytic, certifiable multi-level security or certifiable user isolation functions, or which limit electromagnetic compatibility (EMC), with the performance characteristics in Category 5, Part 2 ("Information Security") shall also be treated as coming within that Category.
4A	**Systems, Equipment and Components**
4A001	Electronic computers and related equipment, having any of the following characteristics, and "electronic assemblies" and specially designed components therefor:
	N.B.
	See also Category Code 4A101.
	a. Specially designed to have any of the following:
	1. Rated for operation at an ambient temperature below 228 K (-45ºC) or above 358 K (85ºC); or
	Note
	Category Code 4A001.a.1. does not apply to computers specially designed for civil automobile or railway train applications.
	2. Radiation hardened to exceed any of the following specifications:
	a. Total Dose 5 × 10^3 Gy (silicon);
	b. Dose Rate Upset 5 × 10^6 Gy (silicon)/s; or
	c. Single Event Upset 1 × 10^{-7} Error/bit/day;

THE SCHEDULE — *continued*

Category Code	Item Description
	b. Having characteristics or performing functions exceeding the limits in Category 5, Part 2 (“Information Security”).
	<u>*Note*</u>
	Category Code 4A001.b. does not include electronic computers and related equipment when accompanying their user for the user’s personal use.
4A003	“Digital computers”, “electronic assemblies”, and related equipment therefor, as follows, and specially designed components therefor:
	<u>*Note 1*</u>
	Category Code 4A003 includes the following:
	− Vector processors;
	− Array processors;
	− Digital signal processors;
	− Logic processors;
	− Equipment designed for “image enhancement”;
	− Equipment designed for “signal processing”.
	<u>*Note 2*</u>
	The control status of the “digital computers” and related equipment described in Category Code 4A003 is determined by the control status of other equipment or systems provided:
	a. The “digital computers” or related equipment are essential for the operation of the other equipment or systems;
	b. The “digital computers” or related equipment are not a “principal element” of the other equipment or systems; <u>*and*</u>
	<u>*N.B.1*</u>
	The control status of “signal processing” or “image enhancement” equipment specially designed for other equipment with functions limited to those required for the other

THE SCHEDULE — *continued*

Category Code	Item Description
	equipment is determined by the control status of the other equipment even if it exceeds the "principal element" criterion.

N.B.2

For the control status of "digital computers" or related equipment for telecommunications equipment, see Category 5, Part 1 (Telecommunications).

c. The "technology" for the "digital computers" and related equipment is determined by Category Code 4E,

a. Designed or modified for "fault tolerance";

Note

For the purposes of Category Code 4A003.a.,"digital computers" and related equipment are not considered to be designed or modified for "fault tolerance" if they utilise any of the following:

1. Error detection or correction algorithms in "main storage";
2. The interconnection of two "digital computers" so that, if the active central processing unit fails, an idling but mirroring central processing unit can continue the system's functioning;
3. The interconnection of two central processing units by data channels or by using shared storage to permit one central processing unit to perform other work until the second central processing unit fails, at which time the first central processing unit takes over in order to continue the system's functioning; or
4. The synchronisation of two central processing units by "software" so that one central processing unit recognises when the other central processing unit fails and recovers tasks from the failing unit.

b. "Digital computers" having an "Adjusted Peak Performance" ("APP") **(please see Technical Note below on calculation of APP)** exceeding 0.75 Weighted TeraFLOPS (WT);

THE SCHEDULE — *continued*

Category Code	Item Description
	c. "Electronic assemblies" specially designed or modified for enhancing performance by aggregation of processors so that the "APP" of the aggregation exceeds the limit specified in Category Code 4A003.b.;
	Note 1
	Category Code 4A003.c. includes only "electronic assemblies" and programmable interconnections not exceeding the limit specified in Category Code 4A003.b. when shipped as unintegrated "electronic assemblies". It does not include "electronic assemblies" inherently limited by nature of their design for use as related equipment specified in Category Code 4A003.e.
	Note 2
	Category Code 4A003.c. does not include "electronic assemblies" specially designed for a product or family of products whose maximum configuration does not exceed the limit specified in Category Code 4A003.b.
	d. Not used;
	e. Equipment performing analogue-to-digital conversions exceeding the limits specified in Category Code 3A001.a.5.;
	f. Not used;
	g. Equipment specially designed to provide external interconnection of "digital computers" or associated equipment which allows communications at data rates exceeding 1.25 Gbyte/s.
	Note
	Category Code 4A003.g. does not include internal interconnection equipment (e.g,. backplanes and buses), passive interconnection equipment, "network access controllers" or "communications channel controllers".
4A004	Computers, as follows, and specially designed related equipment, "electronic assemblies" and components therefor:
	a. "Systolic array computers";
	b. "Neural computers";

THE SCHEDULE — *continued*

Category Code	Item Description
	c. "Optical computers".
4A101	Analogue computers, "digital computers" or digital differential analysers, other than those specified in Category Code 4A001.a.1., which are ruggedised and designed or modified for use in space launch vehicles specified in Category Code 9A004 or sounding rockets specified in Category Code 9A104.
4A102	"Hybrid computers" specially designed for modelling, simulation or design integration of space launch vehicles specified in Category Code 9A004 or sounding rockets specified in Category Code 9A104.
	<u>*Note*</u>
	Category Code 4A102 only extends to equipment supplied with "software" specified in Category Code 7D103 or 9D103.
4B	**Test, Inspection and Production Equipment**
	None.
4C	**Materials**
	None.
4D	**Software**
	<u>*Note*</u>
	For "software" for the "development", "production", or "use" of equipment described in other Categories, please see the appropriate Category. *"Software" for equipment described in this Category is dealt with herein.*
4D001	"Software", as follows:
	a. "Software" specially designed or modified for the "development", "production" or "use" of equipment or "software" specified in Category Codes 4A001 to 4A004, or Category 4D;
	b. "Software", other than that specified in Category Code 4D001.a., specially designed or modified for the "development" or "production" of equipment, as follows:

THE SCHEDULE — *continued*

Category Code	Item Description
	1. "Digital computers" having an "Adjusted Peak Performance" ("APP") exceeding 0.1 Weighted TeraFLOPS (WT);
	2. "Electronic assemblies" specially designed or modified for enhancing performance by aggregation of processors so that the "APP" of the aggregation exceeds the limit in Category Code 4D001.b.1.
	Note
	Please see Technical Note on calculation of APP immediately after Category Code 4E001.
4D002	"Software" specially designed or modified to support "technology" specified in Category 4E.
4D003	"Software" having characteristics or performing functions exceeding the limits in Category 5, Part 2 ("Information Security").
	Note
	Category Code 4D003.c. does not include "software" when accompanying its user for the user's personal use.
4E	**Technology**
4E001	a. "Technology" according to the General Technology Note, for the "development", "production" or "use" of equipment or "software" specified in Category 4A or 4D.
	b. "Technology", other than that specified in Category Code 4E001.a., specially designed or modified for the "development" or "production" of equipment, as follows:
	1. "Digital computers" having an "Adjusted Peak Performance" ("APP") exceeding 0.1 Weighted TeraFLOPS (WT);
	2. "Electronic assemblies" specially designed or modified for enhancing performance by aggregation of processors so that the "APP" of the aggregation exceeds the limit in Category Code 4E001.b.1.
	Note

THE SCHEDULE — *continued*

Category Code	Item Description
	Please see Technical Note on calculation of "APP" immediately after Category Code 4E001.

TECHNICAL NOTE ON "ADJUSTED PEAK PERFORMANCE" ("APP")

"APP" is an adjusted peak rate at which "digital computers" perform 64-bit or larger floating point additions and multiplications.

"APP" is expressed in Weighted TeraFLOPS (WT), in units of 1012 adjusted floating point operations per second.

Abbreviations used in this Technical Note

n number of processors in the "digital computer"

i processor number (i,...n)

t_i processor cycle time (ti = 1/Fi)

F_i processor frequency

R_i peak floating point calculating rate

W_i architecture adjustment factor

Outline of "APP" calculation method

1. For each processor i, determine the peak number of 64-bit or larger floating point operations, FPOi, performed per cycle for each processor in the "digital computer".

Note

In determining FPO, include only 64-bit or larger floating point additions and/or multiplications. All floating point operations must be expressed in operations per processor cycle; operations requiring multiple cycles may be expressed in fractional results per cycle. For processors not capable of performing calculations on floating point operands of 64-bit or more, the effective calculating rate R is zero.

2. Calculate the floating point rate R for each processor Ri = FPOi/ti
3. Calculate "APP" as "APP" = W1 x R1 + W2 x R2 + … + Wn x Rn.
4. For 'vector processors', Wi = 0.9. For non- 'vector processors', W_i = 0.3.

THE SCHEDULE — *continued*

Note 1

For processors that perform compound operations in a cycle, such as addition and multiplication, each operation is counted.

Note 2

For a pipelined processor the effective calculating rate R is the faster of the pipelined rate, once the pipeline is full, or the non-pipelined rate.

Note 3

The calculating rate R of each contributing processor is to be calculated at its maximum value theoretically possible before the "APP" of the combination is derived. Simultaneous operations are assumed to exist when the computer manufacturer claims concurrent, parallel, or simultaneous operation or execution in a manual or brochure for the computer.

Note 4

Do not include processors that are limited to input/output and peripheral functions (e.g., disk drive, communication and video display) when calculating "APP".

Note 5

"APP" values are not to be calculated for processor combinations (inter) connected by "Local Area Networks", Wide Area Networks, I/O shared connections/devices, I/O controllers and any communication interconnection implemented by "software".

Note 6

"APP" values must be calculated for:

1. processor combinations containing processors specially designed to enhance performance by aggregation, operating simultaneously and sharing memory; or
2. multiple memory/processor combinations operating simultaneously utilizing specially designed hardware.

Note 7

A 'vector processor' is defined as a processor with built-in instructions that perform multiple calculations on floating-point vectors (one-dimensional arrays of 64-bit or larger numbers) simultaneously, having at least 2 vector functional units and at least 8 vector registers of at least 64 elements each.

THE SCHEDULE — *continued*

Category Code	*Item Description*

CATEGORY 5 — TELECOMMUNICATIONS AND "INFORMATION SECURITY"

Part 1 — TELECOMMUNICATIONS

Note 1

Category 5, Part 1 concerns components, "lasers", test and "production" equipment and "software" therefor which are specially designed for telecommunications equipment or systems.

Note 2

"Digital computer", related equipment or "software", when essential for operation and support of telecommunications equipment described in this Category, are regarded as specially designed components for the purposes of this Category, provided they are the standard models customarily supplied by the manufacturer. This includes operation, administration, maintenance, engineering or billing computer systems.

5A1 **Systems, Equipment and Components**

5A001 Telecommunications systems, equipment, components and accessories as follows:

a. Any type of telecommunications equipment having any of the following characteristics, functions or features:

1. Specially designed to withstand transitory electronic effects or electromagnetic pulse effects, both arising from a nuclear explosion;

2. Specially hardened to withstand gamma, neutron or ion radiation; or

3. Specially designed to operate outside the temperature range from 218 K (-55ºC) to 397 K (124ºC);

Note

Category Code 5A001.a.3. applies only to electronic equipment.

Note

Category Codes 5A001.a.2. and 5A001.a.3. do not include equipment designed or modified for use on board satellites.

THE SCHEDULE — *continued*

Category Code	*Item Description*
	b. Telecommunication systems and equipment, and specially designed components and accessories therefor, having any of the following characteristics, functions or features: 1. Being underwater untethered communications systems having any of the following: a. An acoustic carrier frequency outside the range from 20 kHz to 60 kHz; b. Using an electromagnetic carrier frequency below 30 kHz; c. Using electronic beam steering techniques; <u>or</u> d. Using “lasers” or light-emitting diodes (LEDs) with an output wavelength greater than 400 nm and less than 700 nm, in a “local area network”; 2. Being radio equipment operating in the 1.5 MHz to 87.5 MHz band and having all of the following: a. Automatically predicting and selecting frequencies and “total digital transfer rates” per channel to optimise the transmission; <u>and</u> b. Incorporating a linear power amplifier configuration having a capability to support multiple signals simultaneously at an output power of 1 kW or more in the frequency range of 1.5 MHz or more but less than 30 MHz, or 250 W or more in the frequency range of 30 MHz or more but not exceeding 87.5 MHz, over an “instantaneous bandwidth” of one octave or more and with an output harmonic and distortion content of better than -80 dB; 3. Being radio equipment employing “spread spectrum” techniques, including “frequency hopping” techniques, other than those specified in Category Code 5A001.b.4. and having any of the following: a. User programmable spreading codes; <u>or</u> b. A total transmitted bandwidth which is 100 or more times the bandwidth of any one information channel and in excess of 50 kHz;

THE SCHEDULE — *continued*

Category Code	*Item Description*

Note

Category Code 5A001.b.3.b. does not include radio equipment specially designed for use with civil cellular radio-communications systems.

Note

Category Code 5A001.b.3 does not include equipment designed to operate at an output power of 1 Watt or less.

4. Being radio equipment employing ultra-wideband modulation techniques, having user programmable channelising codes, scrambling codes or network identification codes and having any of the following:

   a. A bandwidth exceeding 500 MHz; or

   b. A “fractional bandwidth” of 20% or more;

5. Being digitally controlled radio receivers having all of the following:

   a. More than 1,000 channels;

   b. A “frequency switching time” of less than 1 ms;

   c. Automatic searching or scanning of a part of the electromagnetic spectrum; and

   d. Identification of the received signals or the type of transmitter; or

Note

Category Code 5A001.b.5. does not include radio equipment specially designed for use with civil cellular radio-communications systems.

6. Employing functions of digital “signal processing” to provide ‘voice coding’ output at rates of less than 2,400 bit/s.

Technical Notes

1. *For variable rate ‘voice coding’, Category Code 5A001.b.6. applies to the ‘voice coding’ output of continuous speech.*

THE SCHEDULE — *continued*

Category Code	*Item Description*

2. For the purpose of Category Code 5A001.b.6., 'voice coding' is defined as the technique to take samples of human voice and then convert these samples into a digital signal, taking into account specific characteristics of human speech.

c. Optical fibre communication cables, optical fibres and accessories, as follows:

1. Optical fibres of more than 500 m in length, and specified by the manufacturer as being capable of withstanding a 'proof test' tensile stress of 2×10^9 N/m^2 or more;

Technical Note

'Proof Test': on-line or off-line production screen testing that dynamically applies a prescribed tensile stress over a 0.5 m to 3 m length of fibre at a running rate of 2 m/s to 5 m/s while passing between capstans approximately 150 mm in diameter. The ambient temperature is a nominal 293 K (20ºC) and relative humidity 40%. Equivalent national standards may be used for executing the proof test.

2. Optical fibre cables and accessories designed for underwater use;

Note

Category Code 5A001.c.2. does not include standard civil telecommunication cables and accessories.

N.B.1

For underwater umbilical cables, and connectors therefor, see Category Code 8A002.a.3.

N.B.2

For fibre-optic hull penetrators or connectors, see Category Code 8A002.c.

d. "Electronically steerable phased array antennae" operating above 31.8 GHz;

Note

THE SCHEDULE — *continued*

Category Code	*Item Description*

Category Code 5A001.d. does not include "electronically steerable phased array antennae" for landing systems with instruments meeting ICAO standards covering Microwave Landing Systems (MLS).

e. Radio direction finding equipment operating at frequencies above 30 MHz and having all of the following, and specially designed components therefor:

1. "Instantaneous bandwidth" of 10 MHz or more; and
2. Capable of finding a Line Of Bearing (LOB) to non-cooperating radio transmitters with a signal duration of less than 1 ms;

f. Jamming equipment specially designed or modified to intentionally and selectively interfere with, deny, inhibit, degrade or seduce mobile telecommunication services and perform any of the following, and specially designed components therefor:

1. Simulating the functions of Radio Access Network (RAN) equipment;
2. Detecting and exploiting specific characteristics of the mobile telecommunications protocol employed (e.g., GSM); or
3. Exploiting specific characteristics of the mobile telecommunications protocol employed (e.g., GSM);

N.B.

For GNSS jamming equipment see Division 2 of Part I of this Schedule.

g. Passive Coherent Location (PCL) systems or equipment, specially designed for detecting and tracking moving objects by measuring reflections of ambient radio frequency emissions, supplied by non-radar transmitters;

Technical Note

Non-radar transmitters may include commercial radio, television or cellular telecommunications base stations.

Note

Category Code	*Item Description*
	Category Code 5A001.g. does not include any of the following: *a. Radio-astronomical equipment; <u>or</u>* *b. Systems or equipment, that require any radio transmission from the target.* h. Electronic equipment designed or modified to prematurely activate or prevent the initiation of Radio Controlled Improvised Devices (RCIED). ***<u>N.B.</u>*** ***See also Division 2 of Part I of this Schedule.***
5A101	Telemetery and telecontrol equipment, including ground equipment, designed or modified for ‘missiles’. <u>*Technical Note*</u> *In Category Code 5A101 ‘missile’ means complete rocket systems and unmanned aerial vehicle systems capable of a range exceeding 300 km.* <u>*Note*</u> *Category Code 5A101 does not include:* *a. Equipment designed or modified for manned aircraft or satellites;* *b. Ground based equipment designed or modified for terrestrial or marine applications;* *c. Equipment designed for commercial, civil or ‘Safety of Life’ (e.g., data integrity, flight safety) GNSS services.*
5B1	**Test, Inspection and Production Equipment**
5B001	Telecommunications test, inspection and production equipment, components and accessories, as follows: a. Equipment and specially designed components or accessories therefor, specially designed for the “development”, “production” or “use” of equipment, functions or features specified in Category Code 5A001; <u>*Note*</u>

THE SCHEDULE — *continued*

Category Code	*Item Description*
	Category Code 5B001.a. does not include optical fibre characterisation equipment.
	b. Equipment and specially designed components or accessories therefor, specially designed for the "development" of any of the following telecommunication transmission or switching equipment:
	1. Equipment employing digital techniques designed to operate at a "total digital transfer rate" exceeding 15 Gbit/s;
	Technical Note
	For switching equipment the "total digital transfer rate" is measured at the highest speed port or line.
	2. Equipment employing a "laser" and having any of the following:
	a. A transmission wavelength exceeding 1,750 nm;
	b. Performing "optical amplification" using praseodymium-doped fluoride fibre amplifiers (PDFFA);
	c. Employing coherent optical transmission or coherent optical detection techniques (also called optical heterodyne or homodyne techniques); or
	d. Employing analogue techniques and having a bandwidth exceeding 2.5 GHz;
	Note
	Category Code 5B001.b.2.d. does not include equipment specially designed for the "development" of commercial TV systems.
	3. Equipment employing "optical switching";
	4. Radio equipment employing Quadrature-Amplitude-Modulation (QAM) techniques above level 256; or
	5. Equipment employing "common channel signalling" operating in non-associated mode of operation.
5C1	**Materials**

THE SCHEDULE — *continued*

Category Code	*Item Description*
	None.
5D1	**Software**
5D001	"Software", as follows:

a. "Software" specially designed or modified for the "development", "production" or "use" of equipment, functions or features, specified in Category Code 5A001;

b. "Software" specially designed or modified to support "technology" specified in Category Code 5E001;

c. Specific "software" specially designed or modified to provide characteristics, functions or features of equipment, specified in Category Code 5A001 or 5B001;

d. "Software" specially designed or modified for the "development" of any of the following telecommunication transmission or switching equipment:

1. Equipment employing digital techniques designed to operate at a "total digital transfer rate" exceeding 15 Gbit/s;

Technical Note

For switching equipment the "total digital transfer rate" is measured at the highest speed port or line.

2. Equipment employing a "laser" and having any of the following:

a. A transmission wavelength exceeding 1,750 nm; or

b. Employing analogue techniques and having a bandwidth exceeding 2.5 GHz;

Note

Category Code 5D001.d.2.b. does not include "software" specially designed or modified for the "development" of commercial TV systems.

3. Equipment employing "optical switching"; or

4. Radio equipment employing Quadrature-Amplitude-Modulation (QAM) techniques above level 256.

THE SCHEDULE — *continued*

Category Code	*Item Description*
5D101	“Software” specially designed or modified for the “use” of equipment specified in Category Code 5A101.
5E1	**Technology**
5E001	“Technology”, as follows:

a. “Technology” (according to the General Technology Note) for the “development”, “production” or “use” (excluding operation) of equipment, functions or features specified in Category Code 5A001 or “software”, specified in Category Code 5D001.a.;

b. Specific “technology”, as follows:

1. “Required” “technology” for the “development” or “production” of telecommunications equipment specially designed to be used on board satellites;

2. “Technology” for the “development” or “use” of “laser” communication techniques with the capability of automatically acquiring and tracking signals and maintaining communications through exoatmosphere or sub-surface (water) media;

3. “Technology” for the “development” of digital cellular radio base station receiving equipment whose reception capabilities that allow multi-band, multi-channel, multi-mode, multi-coding algorithm or multi-protocol operation can be modified by changes in “software”;

4. “Technology” for the “development” of “spread spectrum” techniques, including “frequency hopping” techniques;

c. “Technology” (according to the General Technology Note) for the “development” or “production” of any of the following:

1. Equipment employing digital techniques designed to operate at a “total digital transfer rate” exceeding 15 Gbit/s;

<u>*Technical Note*</u>

For switching equipment the “total digital transfer rate” is measured at the highest speed port or line.

THE SCHEDULE — *continued*

Category Code	*Item Description*
	2. Equipment employing a “laser” and having any of the following: a. A transmission wavelength exceeding 1,750 nm; b. Performing “optical amplification” using Praseodymium-Doped Fluoride Fibre Amplifiers (PDFFA); c. Employing coherent optical transmission or coherent optical detection techniques (also called optical heterodyne or homodyne techniques); d. Employing wavelength division multiplexing techniques of optical carriers at less than 100 GHz spacing; <u>or</u> e. Employing analogue techniques and having a bandwidth exceeding 2.5 GHz; <u>*Note*</u> *Category Code 5E001.c.2.e. does not include “technology” for the “development” or “production” of commercial TV systems.* <u>***N.B.***</u> ***For “technology” for the “development” or “production” of non-telecommunication equipment employing a laser, see Category 6E.*** 3. Equipment employing “optical switching”; 4. Radio equipment having any of the following: a. Quadrature-Amplitude-Modulation (QAM) techniques above level 256; b. Operating at input or output frequencies exceeding 31.8 GHz; <u>or</u> <u>*Note*</u> *Category Code 5E001.c.4.b. does not include “technology” for the “development” or “production” of equipment designed or modified for operation in any*

THE SCHEDULE — *continued*

Category Code	Item Description
	frequency band which is "allocated by the ITU" for radio-communications services, but not for radio-determination.
	c. Operating in the 1.5 MHz to 87.5 MHz band and incorporating adaptive techniques providing more than 15 dB suppression of an interfering signal;
	5. Equipment employing "common channel signalling" operating in non-associated mode of operation; or
	6. Mobile equipment having all of the following:
	a. Operating at an optical wavelength greater than or equal to 200 nm and less than or equal to 400 nm; and
	b. Operating as a "local area network";
	d. "Technology" (according to the General Technology Note) for the "development" or "production" of Microwave Monolithic Integrated Circuit (MMIC) power amplifiers specially designed for telecommunications and having any of the following:
	1. Rated for operation at frequencies exceeding 3.2 GHz up to and including 6 GHz and with an average output power greater than 4 W (36 dBm) with a "fractional bandwidth" greater than 15 %;
	2. Rated for operation at frequencies exceeding 6 GHz up to and including 16 GHz and with an average output power greater than 1 W (30 dBm) with a "fractional bandwidth" greater than 10 %;
	3. Rated for operation at frequencies exceeding 16 GHz up to and including 31.8 GHz and with an average output power greater than 0.8 W (29 dBm) with a "fractional bandwidth" greater than 10 %;
	4. Rated for operation at frequencies exceeding 31.8 GHz up to and including 37.5 GHz;
	5. Rated for operation at frequencies exceeding 37.5 GHz up to and including 43.5 GHz and with an average output power greater than 0.25 W (24 dBm) with a "fractional bandwidth" greater than 10 %; or

THE SCHEDULE — *continued*

Category Code	*Item Description*
	6. Rated for operation at frequencies exceeding 43.5 GHz;
	e. “Technology” (according to the General Technology Note) for the “development” or “production” of electronic devices and circuits, specially designed for telecommunications and containing components manufactured from “superconductive” materials, specially designed for operation at temperatures below the “critical temperature” of at least one of the “superconductive” constituents, and having any of the following:
	1. Current switching for digital circuits using “superconductive” gates with a product of delay time per gate (in seconds) and power dissipation per gate (in watts) of less than 10^{-14} J; or
	2. Frequency selection at all frequencies using resonant circuits with Q-values exceeding 10,000.
5E101	“Technology” (according to the General Technology Note) for the “development”, “production” or “use” of equipment specified in Category Code 5A101.

Part 2 — “INFORMATION SECURITY”

Note 1

Category 5, Part 2 concerns “information security” equipment, “software”, systems, application specific “electronic assemblies”, modules, integrated circuits, components or functions whether or not they are components or “electronic assemblies” of other equipment.

Note 2

Category 5 - Part 2 does not include products when accompanying their user for the user’s personal use.

Note 3

Cryptography Note

Category Codes 5A002 and 5D002 do not include goods that meet all of the following:

a. *Generally available to the public by being sold, without restriction, from stock at retail selling points by means of any of the following:*

THE SCHEDULE — *continued*

Category Code	*Item Description*

1. Over-the-counter transactions;

2. Mail order transactions;

3. Electronic transactions; or

4. Telephone call transactions;

b. The cryptographic functionality cannot easily be changed by the user; and

c. Designed for installation by the user without further substantial support by the supplier.

Technical Note

In Category 5 — Part 2, parity bits are not included in the key length.

5A2	**Systems, Equipment and Components**
5A002	"Information security" systems, equipment and components therefor, as follows:
	a. Systems, equipment, application specific "electronic assemblies", modules and integrated circuits for "information security", as follows, and other specially designed components therefor: ***N.B.*** ***For Global Navigation Satellite Systems (GNSS) receiving equipment containing or employing decryption (i.e. GPS or GLONASS), see Category Code 7A005.*** 1. Designed or modified to use "cryptography" employing digital techniques performing any cryptographic function other than authentication or digital signature and having any of the following: *Technical Notes* *1. Authentication and digital signature functions include their associated key management function.* *2. Authentication includes all aspects of access control where there is no encryption of files or text except as directly related to the protection of passwords, Personal Identification Numbers (PINs) or similar data to prevent unauthorised access.*

THE SCHEDULE — *continued*

Category Code	*Item Description*
	3. "Cryptography" does not include "fixed" data compression or coding techniques. Note *Category Code 5A002.a.1. includes equipment designed or modified to use "cryptography" employing analogue principles when implemented with digital techniques.* a. A "symmetric algorithm" employing a key length in excess of 56 bits; or b. An "asymmetric algorithm" where the security of the algorithm is based on any of the following: 1. Factorisation of integers in excess of 512 bits (e.g., RSA); 2. Computation of discrete logarithms in a multiplicative group of a finite field of size greater than 512 bits (e.g., Diffie-Hellman over Z/pZ); or 3. Discrete logarithms in a group other than mentioned in Category Code 5A002.a.1.b.2. in excess of 112 bits (e.g., Diffie-Hellman over an elliptic curve); 2. Designed or modified to perform cryptanalytic functions; 3. Not used; 4. Specially designed or modified to reduce the compromising emanations of information-bearing signals beyond what is necessary for health, safety or electromagnetic interference standards; 5. Designed or modified to use cryptographic techniques to generate the spreading code for "spread spectrum" systems, other than those specified in Category Code 5A002.a.6., including the hopping code for "frequency hopping" systems; 6. Designed or modified to use cryptographic techniques to generate channelising codes, scrambling codes or network identification codes, for systems using ultra-wideband modulation techniques and having any of the following: a. A bandwidth exceeding 500 MHz; or

THE SCHEDULE — *continued*

Category Code	*Item Description*
	b. A “fractional bandwidth” of 20% or more; 7. Non-cryptographic information and communications technology (ICT) security systems and devices evaluated to an assurance level exceeding class EAL-6 (evaluation assurance level) of the Common Criteria (CC) or equivalent; 8. Communications cable systems designed or modified using mechanical, electrical or electronic means to detect surreptitious intrusion; 9. Designed or modified to use “quantum cryptography”. <u>*Technical Note*</u> *“Quantum cryptography” is also known as Quantum Key Distribution (QKD).* <u>*Note*</u> *Category Code 5A002 does not include any of the following:* *a. “Personalised smart cards” having any of the following:* *1. Where the cryptographic capability is restricted for use in equipment or systems excluded from control under entries b. to g .of this Note;* <u>*or*</u> *2. For general public-use applications where the cryptographic capability is not user-accessible and it is specially designed and limited to allow protection of personal data stored within;* *N.B.* *If a “personalised smart card” has multiple functions, the control status of each function is assessed individually.* *b. Receiving equipment for radio broadcast, pay television or similar restricted audience broadcast of the consumer type, without digital encryption except that exclusively used for sending the billing or programme-related information back to the broadcast providers;*

THE SCHEDULE — *continued*

Category Code	*Item Description*
	c. Equipment where the cryptographic capability is not user-accessible and which is specially designed and limited to allow any of the following: *1. Execution of copy-protected "software";* *2. Access to any of the following:* *a. Copy-protected contents stored on read-only media; <u>or</u>* *b Information stored in encrypted form on media (e.g., in connection with the protection of intellectual property rights) when the media is offered for sale in identical sets to the public; <u>or</u>* *3. Copying control of copyright protected audio or video data; <u>or</u>* *4. Encryption and decryption(or either of them) for protection of libraries, design attributes, or associated data for the design of semiconductor devices or integrated circuits;* *d. Cryptographic equipment specially designed and limited for banking use or 'money transactions';* *<u>Technical Note</u>* *'Money transactions' in Category Code 5A002 Note d. includes the collection and settlement of fares or credit functions.* *e. Portable or mobile radiotelephones for civil use (e.g., use with commercial civil cellular radiocommunications systems) that are not capable of transmitting encrypted data directly to another radiotelephone or equipment (other than Radio Access Network (RAN) equipment), nor of passing encrypted data through RAN equipment (e.g., Radio Network Controller (RNC) or Base Station Controller (BSC));* *f. Cordless telephone equipment not capable of end-to-end encryption where the maximum effective range of unboosted cordless operation (i.e., a single, unrelayed hop*

THE SCHEDULE — *continued*

Category Code	*Item Description*
	between terminal and home basestation) is less than 400 metres according to the manufacturer's specifications; <u>or</u> *g. Portable or mobile radiotelephones and similar client wireless devices for civil use, that implement only published or commercial cryptographic standards (except for anti-piracy functions, which may be non-published) and also meet the provisions of paragraphs b. to c. of the Cryptography Note (Note 3 in Category 5 - Part 2), that have been customised for a specific civil industry application with features that do not affect the cryptographic functionality of these original non-customised devices.* *h. Equipment specially designed for the servicing of portable or mobile radiotelephones and similar client wireless devices that meet all the provisions of the Cryptography Note (see Note 3 in Category 5, Part 2), where the servicing equipment meets all of the following:* *1. The cryptographic functionality of the servicing equipment cannot easily be changed by the user of the equipment;* *2. The servicing equipment is designed for installation without further substantial support by the supplier; <u>and</u>* *3. The servicing equipment cannot change the cryptographic functionality of the device being serviced;* *i. Wireless "personal area network" equipment that implement only published or commercial cryptographic standards and where the cryptographic capability is limited to nominal operating range not exceeding 30 metres according to the manufacturer's specifications.*
5B2	**Test, Inspection and Production Equipment**
5B002	"Information security" test, inspection and "production" equipment, as follows:
	a. Equipment specially designed for "development" or "production" of equipment specified in Category Code 5A002 or 5B002.b.;

THE SCHEDULE — *continued*

Category Code	*Item Description*
	b. Measuring equipment specially designed to evaluate and validate the "information security" functions of the equipment specified in Category Code 5A002 or "software" specified in Category Code 5D002.a. or 5D002.c.
5C2	**Materials**
	None.
5D2	**Software**
5D002	"Software" as follows:
	a. "Software" specially designed or modified for the "development", "production" or "use" of equipment specified in Category Code 5A002 or "software" specified in Category Code 5D002.c.;
	b. "Software" specially designed or modified to support "technology" specified in Category Code 5E002;
	c. Specific "software", as follows: 1. "Software" having the characteristics, or performing or simulating the functions of the equipment specified in Category Code 5A002; 2. "Software" to certify "software" specified in Category Code 5D002.c.1. *Note* *Category Code 5D002 does not include "software" as follows:* *a. "Software" required for the "use" of equipment excluded from control under the Note to Category Code 5A002;* *b. "Software" providing any of the functions of equipment excluded from control under the Note to Category Code 5A002.*
5E2	**Technology**
5E002	"Technology" (according to the General Technology Note) for the "development", "production" or "use" of equipment specified in Category Code 5A002, 5B002 or "software" specified in Category Code 5D002.a. or 5D002.c.

THE SCHEDULE — *continued*

Category Code	*Item Description*
CATEGORY 6 — SENSORS AND LASERS	
6A	**Systems, Equipment and Components**
6A001	Acoustic systems, equipment and components, as follows:
	a. Marine acoustic systems, equipment and specially designed components therefor, as follows: 1. Active (transmitting or transmitting-and-receiving) systems, equipment and specially designed components therefor, as follows: <u>*Note*</u> *Category Code 6A001.a.1. does not include equipment as follows:* *a. Depth sounders operating vertically below the apparatus, not including a scanning function exceeding ±20º, and limited to measuring the depth of water, the distance of submerged or buried objects or fish finding;* *b. Acoustic beacons, as follows:* *1. Acoustic emergency beacons;* *2. Pingers specially designed for relocating or returning to an underwater position.* a. Wide-swath bathymetric survey systems designed for sea bed topographic mapping and having all of the following: 1. Designed to take measurements at an angle exceeding 20º from the vertical; 2. Designed to measure depths exceeding 600 m below the water surface; <u>and</u> 3. Designed to provide any of the following: a. Incorporation of multiple beams any of which is less than 1.9º; <u>or</u> b. Data accuracies of better than 0.3% of water depth across the swath averaged over the individual measurements within the swath;

THE SCHEDULE — *continued*

Category Code	*Item Description*
	b. Object detection or location systems having any of the following: 1. A transmitting frequency below 10 kHz; 2. Sound pressure level exceeding 224 dB (reference 1 μPa at 1 m) for equipment with an operating frequency in the band from 10 kHz to 24 kHz inclusive; 3 Sound pressure level exceeding 235 dB (reference 1 μPa at 1 m) for equipment with an operating frequency in the band between 24 kHz and 30 kHz; 4. Forming beams of less than 1º on any axis and having an operating frequency of less than 100 kHz; 5. Designed to operate with an unambiguous display range exceeding 5,120 m; <u>or</u> 6. Designed to withstand pressure during normal operation at depths exceeding 1,000 m and having transducers with any of the following: a. Dynamic compensation for pressure; <u>or</u> b. Incorporating other than lead zirconate titanate as the transduction element; c. Acoustic projectors, including transducers, incorporating piezoelectric, magnetostrictive, electrostrictive, electrodynamic or hydraulic elements operating individually or in a designed combination and having any of the following: <u>*Note 1*</u> *Whether acoustic projectors, including transducers, specially designed for other equipment is included in Category Code 6A001.c. is determined by whether the other equipment is included in that Category Code.* <u>*Note 2*</u> *Category Code 6A001.a.1.c. does not include electronic sources which direct the sound vertically only, or*

THE SCHEDULE — *continued*

Category Code	*Item Description*
	mechanical (e.g., air gun or vapour-shock gun) or chemical (e.g., explosive) sources. 1. An instantaneous radiated 'acoustic power density' exceeding 0.01 mW/mm^2/Hz for devices operating at frequencies below 10 kHz; 2. A continuously radiated 'acoustic power density' exceeding 0.001 mW/mm^2/Hz for devices operating at frequencies below 10 kHz; <u>or</u> <u>*Technical Note*</u> *'Acoustic power density' is obtained by dividing the output acoustic power by the product of the area of the radiating surface and the frequency of operation.* 3. Side-lobe suppression exceeding 22 dB; d. Acoustic systems, equipment and specially designed components for determining the position of surface vessels or underwater vehicles, designed to operate at a range exceeding 1,000 m with a positioning accuracy of less than 10 m rms (root mean square) when measured at a range of 1,000 m; <u>*Note*</u> *Category Code 6A001.a.1.d. includes*: *a. Equipment using coherent "signal processing" between two or more beacons and the hydrophone unit carried by the surface vessel or underwater vehicle;* *b. Equipment capable of automatically correcting speed-of-sound propagation errors for calculation of a point.*
	2. Passive (receiving, whether or not related in normal application to separate active equipment) systems, equipment and specially designed components therefor, as follows: a. Hydrophones having any of the following characteristics:

THE SCHEDULE — *continued*

Category Code	*Item Description*
	<u>Note</u> *Whether hydrophones specially designed for other equipment is included in Category Code 6A001.a.2.a is determined by whether the other equipment is included in that Category Code.* 1. Incorporating continuous flexible sensing elements; 2. Incorporating flexible assemblies of discrete sensing elements with either a diameter or length less than 20 mm and with a separation between elements of less than 20 mm; 3. Having any of the following sensing elements: a. Optical fibres; b. ‘Piezoelectric polymer films’ other than polyvinylidene-fluoride (PVDF) and its co-polymers {P(VDF-TrFE) and P(VDF-TFE)}; <u>or</u> c. ‘Flexible piezoelectric composites’; 4. A ‘hydrophone sensitivity’ better than -180 dB at any depth with no acceleration compensation; 5. Designed to operate at depths exceeding 35 m with acceleration compensation; or 6. Designed for operation at depths exceeding 1,000 m; Technical Notes 1. ‘Piezoelectric polymer film’ sensing elements consist of polarised polymer film that is stretched over and attached to a supporting frame or spool (mandrel). 2. ‘Flexible piezoelectric composite’ sensing elements consist of piezoelectric ceramic particles or fibres combined with an electrically insulating, acoustically transparent rubber, polymer or epoxy compound, where the compound is an integral part of the sensing elements.

THE SCHEDULE — *continued*

Category Code	*Item Description*
	3. 'Hydrophone sensitivity' is defined as twenty times the logarithm to the base 10 of the ratio of rms output voltage to a 1 V rms reference, when the hydrophone sensor, without a pre-amplifier, is placed in a plane wave acoustic field with an rms pressure of 1 μPa. For example, a hydrophone of -160 dB (reference 1 V per μPa) would yield an output voltage of 10^{-8} V in such a field, while one of -180 dB sensitivity would yield only 10^{-9} V output. Thus, -160 dB is better than -180 dB.
	b. Towed acoustic hydrophone arrays having any of the following:
	1. Hydrophone group spacing of less than 12.5 m or 'able to be modified' to have hydrophone group spacing of less than 12.5 m;
	2. Designed or 'able to be modified' to operate at depths exceeding 35 m;
	<u>*Technical Note*</u>
	'Able to be modified' in Category Codes 6A001.a.2.b.1. and 2. means having provisions to allow a change of the wiring or interconnections to alter hydrophone group spacing or operating depth limits. These provisions are: spare wiring exceeding 10% of the number of wires, hydrophone group spacing adjustment blocks or internal depth limiting devices that are adjustable or that control more than one hydrophone group.
	3. Heading sensors specified in Category Code 6A001.a.2.d.;
	4. Longitudinally reinforced array hoses;
	5. An assembled array of less than 40 mm in diameter; <u>or</u>
	6. Not used;
	7. Hydrophone characteristics specified in Category Code 6A001.a.2.a.;
	c. Processing equipment, specially designed for towed acoustic hydrophone arrays, having "user accessible

THE SCHEDULE — *continued*

Category Code	*Item Description*
	programmability” and time or frequency domain processing and correlation, including spectral analysis, digital filtering and beamforming using Fast Fourier or other transforms or processes; d. Heading sensors having all of the following: 1. An accuracy of better than ±0.5º; <u>and</u> 2. Designed to operate at depths exceeding 35 m or having an adjustable or removable depth sensing device in order to operate at depths exceeding 35 m; e. Bottom or bay cable systems having any of the following: 1. Incorporating hydrophones specified in Category Code 6A001.a.2.a.; <u>or</u> 2. Incorporating multiplexed hydrophone group signal modules having all of the following characteristics: a. Designed to operate at depths exceeding 35 m or having an adjustable or removable depth sensing device in order to operate at depths exceeding 35 m; <u>and</u> b. Capable of being operationally interchanged with towed acoustic hydrophone array modules; f. Processing equipment, specially designed for bottom or bay cable systems, having “user accessible programmability” and time or frequency domain processing and correlation, including spectral analysis, digital filtering and beamforming using Fast Fourier or other transforms or processes;
	b. Correlation-velocity and Doppler-velocity sonar log equipment, designed to measure the horizontal speed of the equipment carrier relative to the sea bed, as follows: 1. Correlation-velocity sonar log equipment having any of the following characteristics: a. Designed to operate at distances between the carrier and the sea bed exceeding 500 m; <u>or</u>

THE SCHEDULE — *continued*

Category Code	*Item Description*
	b. Having speed accuracy better than 1% of speed; 2. Doppler-velocity sonar log equipment having speed accuracy better than 1% of speed. *Note 1* *Category Code 6A001.b. does not include depth sounders limited to any of the following:* *a. Measuring the depth of water;* *b. Measuring the distance of submerged or buried objects; or* *c. Fish finding.* *Note 2* *Category Code 6A001.b. does not include equipment specially designed for installation on surface vessels.*
	c. Diver deterrent acoustic systems specially designed or modified to disrupt divers and having a sound pressure equal to or exceeding 190 dB (reference 1µPa at 1 m) frequencies of 200 Hz and below. *Note 1* *Category Code 6A001.c. does not include diver deterrent systems based on underwater explosive devices, air guns or combustible sources.* *Note 2* *Category Code 6A001.c. includes diver deterrent acoustic systems that use spark gap sources, also known as plasma sound sources.*
6A002	Optical sensors or equipment and components therefor, as follows: N.B. See also Category Code 6A102.
	a. Optical detectors, as follows: 1. “Space-qualified” ‘solid-state detectors’, as follows: *Note*

THE SCHEDULE — *continued*

Category Code	*Item Description*
	For the purpose of Category Code 6A002.a.1., 'solid-state detectors' include "focal plane arrays". a. "Space-qualified" solid-state detectors, having all of the following: 1. A peak response in the wavelength range exceeding 10 nm but not exceeding 300 nm; <u>and</u> 2. A response of less than 0.1% relative to the peak response at a wavelength exceeding 400 nm; b. "Space-qualified" solid-state detectors having all of the following: 1. A peak response in the wavelength range exceeding 900 nm but not exceeding 1,200 nm; <u>and</u> 2. A response "time constant" of 95 ns or less; c. "Space-qualified" solid-state detectors having a peak response in the wavelength range exceeding 1,200 nm but not exceeding 30,000 nm; d. "Space-qualified" "focal plane arrays" having more than 2,048 elements per array and having a peak response in the wavelength range exceeding 300 nm but not exceeding 900 nm. 2. Image intensifier tubes and specially designed components therefor, as follows: *<u>Note</u>* *Category Code 6A002.a.2. does not include non-imaging photomultiplier tubes having an electron sensing device in the vacuum space limited solely to any of the following:* *a. A single metal anode; <u>or</u>* *b. Metal anodes with a centre to centre spacing greater than 500 µm.* *<u>Technical Note</u>:* *'Charge multiplication' is a form of electronic image amplification and is defined as the generation of charge carriers as a result of an impact ionisation gain process.*

THE SCHEDULE — *continued*

Category Code	Item Description
	'Charge multiplication' sensors may take the form of an image intensifier tube, solid state detector or "focal plane array". a. Image intensifier tubes having all of the following: 1. A peak response in the wavelength range exceeding 400 nm but not exceeding 1,050 nm; 2. Electron image amplification using any of the following: a. A microchannel plate with a hole pitch (centre-to-centre spacing) of 12 µm or less; <u>or</u> b. An electron sensing device with a non-binned pixel pitch of 500 µm or less, specially designed or modified to achieve 'charge multiplication' other than by a microchannel plate; <u>and</u> 3. Any of the following photocathodes: a. Multialkali photocathodes (e.g., S-20 and S-25) with a luminous sensitivity exceeding 350 µA/lm; b. GaAs or GaInAs photocathodes; or c. Other "III/V compound" semiconductor photocathodes having a maximum radiant sensitivity exceeding 10 mA/W; b. Image intensifier tubes having all of the following: 1. A peak response in the wavelength range exceeding 1,050 nm but not exceeding 1,800 nm; 2. Electron image amplification using any of the following: a. A microchannel plate with a hole pitch (centre-to-centre spacing) of 12 µm or less; <u>or</u> b. An electron sensing device with a non-binned pixel pitch of 500 µm or less, specially designed or modified to achieve 'charge multiplication' other than by a microchannel plate; <u>and</u> 3. "III/V compound" semiconductor (e.g., GaAs or GaInAs) photocathodes and transferred electron

THE SCHEDULE — *continued*

Category Code	*Item Description*
	photocathodes, having a maximum radiant sensitivity exceeding 15 mA/W; c. Specially designed components as follows: 1. Microchannel plates having a hole pitch (centre-to-centre spacing) of 12 μm or less; 2. An electron sensing device with a non-binned pixel pitch of 500 μm or less, specially designed or modified to achieve 'charge multiplication' other than by a microchannel plate; 3. "III/V compound" semiconductor (e.g., GaAs or GaInAs) photocathodes and transferred electron photocathodes; *Note* *Category Code 6A002.a.2.c.3. does not include compound semiconductor photocathodes designed to achieve a maximum radiant sensitivity of any of the following:* *a 10 mA/W or less at the peak response in the wavelength range exceeding 400 nm but not exceeding 1,050 nm; or* *b. 15 mA/W or less at the peak response in the wavelength range exceeding 1,050 nm but not exceeding 1,800 nm.* 3. "Non-space-qualified" "focal plane arrays" as follows: *N.B.* *'Microbolometer' non-"space-qualified" "focal plane arrays" are only specified in Category Code 6A002.a.3.f.* *Technical Note* *Linear or two-dimensional multi-element detector arrays are referred to as "focal plane arrays";* *Note 1* *Category Code 6A002.a.3. includes photoconductive arrays and photovoltaic arrays.*

THE SCHEDULE — *continued*

Category Code	*Item Description*
	Note 2 *Category Code 6A002.a.3. does not include:* *a. Multi-element (not to exceed 16 elements) encapsulated photoconductive cells using either lead sulphide or lead selenide.* *b. Pyroelectric detectors using any of the following:* *1. Triglycine sulphate and variants;* *2. Lead-lanthanum-zirconium titanate and variants;* *3. Lithium tantalate;* *4. Polyvinylidene fluoride and variants; or* *5. Strontium barium niobate and variants.* *c. "Focal plane arrays" specially designed or modified to achieve 'charge multiplication' and limited by design to have a maximum radiant sensitivity of 10 mA/W or less for wavelengths exceeding 760 nm, having all of the following:* *1. Incorporating a response limiting mechanism designed not to be removed or modified; and* *2. Any of the following:* *a. The response limiting mechanism is integral to or combined with the detector element; or* *b. The "focal plane array" is only operable with the response limiting mechanism in place.* *Technical Note* *A response limiting mechanism integral to the detector element is designed not to be removed or modified without rendering the detector inoperable.* *Technical Note* *'Charge multiplication' is a form of electronic image amplification and is defined as the generation of charge carriers as a result of an impact ionisation gain process.*

THE SCHEDULE — *continued*

Category Code	*Item Description*
	'Charge multiplication' sensors may take the form of an image intensifier tube, solid state detector or "focal plane array". a. Non-"space-qualified" "focal plane arrays", having all of the following: 1. Individual elements with a peak response within the wavelength range exceeding 900 nm but not exceeding 1,050 nm; <u>and</u> 2. Any of the following: a. A response "time constant" of less than 0.5 ns; <u>or</u> b. Specially designed or modified to achieve 'charge multiplication' and having a maximum radiant sensitivity exceeding 10 mA/W; b. Non-"space-qualified" "focal plane arrays", having all of the following: 1. Individual elements with a peak response in the wavelength range exceeding 1,050 nm but not exceeding 1,200 nm; <u>and</u> 2. Any of the following: a. A response "time constant" of 95 ns or less; <u>or</u> b. Specially designed or modified to achieve 'charge multiplication' and having a maximum radiant sensitivity exceeding 10 mA/W; c. Non-"space-qualified" non-linear (2-dimensional) "focal plane arrays" having individual elements with a peak response in the wavelength range exceeding 1,200 nm but not exceeding 30,000 nm; <u>*N.B.*</u> *Silicon and other material based 'microbolometer' non-"space-qualified" "focal plane arrays" are only specified in Category Code 6A002.a.3.f.* d. Non-"space-qualified" linear (1-dimensional) "focal plane arrays" having all of the following:

THE SCHEDULE — *continued*

Category Code	*Item Description*
	1. Individual elements with a peak response in the wavelength range exceeding 1,200 nm but not exceeding3,000 nm; and 2. Any of the following: a. A ratio of 'scan direction' dimension of the detector element to the 'cross-scan direction' dimension of the detector element of less than 3.8 ; or b. Signal Processing In The Element (SPRITE); *Note* *Category Code 6A002.a.3.d. does not include "focal plane arrays" (not to exceed 32 elements) having detector elements limited solely to germanium material.* *Technical Note:* *For the purposes of Category Code 6A002.a.3.d., 'cross-scan direction' is defined as the axis parallel to the linear array of detector elements and the 'scan direction' is defined as the axis perpendicular to the linear array of detector elements.* e. Non-"space-qualified" linear (1-dimensional) "focal plane arrays" having individual elements with a peak response in the wavelength range exceeding3,000 nm but not exceeding 30,000 nm; f. Non-"space-qualified" non-linear (2-dimensional) infrared "focal plane arrays" based on 'microbolometer' material, having individual elements with an unfiltered response in the wavelength range equal to or exceeding8,000 nm but not exceeding 14,000 nm. *Technical Note* *For the purposes of Category Code 6A002.a.3.f. 'microbolometer' is defined as a thermal imaging detector that, as a result of a temperature change in the detector caused by the absorption of infrared radiation, is used to generate any usable signal.*

THE SCHEDULE — *continued*

Category Code	*Item Description*
	g. Non-"space-qualified" "focal plane arrays" having all of the following: 1. Individual detector elements with a peak response in the wavelength range exceeding 400 nm but not exceeding 900 nm; 2. Specially designed or modified to achieve 'charge multiplication' and having a maximum radiant sensitivity exceeding 10 mA/W for wavelengths exceeding 760 nm; <u>and</u> 3. Greater than 32 elements;
	b. "Monospectral imaging sensors" and "multispectral imaging sensors" designed for remote sensing applications and having any of the following: 1. An Instantaneous-Field-Of-View (IFOV) of less than 200 μrad (microradians); <u>or</u> 2. Specified for operation in the wavelength range exceeding 400 nm but not exceeding 30,000 nm and having all the following: a. Providing output imaging data in digital format; <u>and</u> b. Having any of the following characteristics: 1. "Space-qualified"; <u>or</u> 2. Designed for airborne operation, using other than silicon detectors, and having an IFOV of less than 2.5 mrad (milliradians). <u>*Note*</u> *Category Code 6A002.b.1. does not include "monospectral imaging sensors" with a peak response in the wavelength range exceeding 300 nm but not exceeding 900 nm and only incorporating any of the following non-"space-qualified" detectors or non-"space-qualified" focal plane arrays:* *a. Charged Coupled Devices (CCD) not designed or modified to achieve 'charge multiplication'; <u>or</u>*

THE SCHEDULE — *continued*

Category Code	*Item Description*
	b. Complementary Metal Oxide Semiconductor (CMOS) devices not designed or modified to achieve 'charge multiplication'.
	c. 'Direct view' imaging equipment incorporating any of the following: 1. Image intensifier tubes specified in Category Code 6A002.a.2.a. or 6A002.a.2.b.; 2. "Focal plane arrays" specified in Category Code 6A002.a.3 or 6A002.e.; <u>or</u> 3. Solid state detectors specified in Category Code 6A002.a.1.; <u>Technical Note</u> *'Direct view' refers to imaging equipment, operating in the visible or infrared spectrum, that presents a visual image to a human observer without converting the image into an electronic signal for television display, and that cannot record or store the image photographically, electronically or by any other means.* <u>*Note*</u> *Category Code 6A002.c. does not include equipment as follows, when incorporating other than GaAs or GaInAs photocathodes:* *a. Industrial or civilian intrusion alarm, traffic or industrial movement control or counting systems;* *b. Medical equipment;* *c. Industrial equipment used for inspection, sorting or analysis of the properties of materials;* *d. Flame detectors for industrial furnaces;* *e. Equipment specially designed for laboratory use.*
	d. Special support components for optical sensors, as follows: 1. "Space-qualified" cryocoolers; 2. Non-"space-qualified" cryocoolers, having a cooling source temperature below 218 K (-55ºC), as follows:

THE SCHEDULE — *continued*

Category Code	*Item Description*
	a. Closed cycle type with a specified Mean-Time-To-Failure (MTTF), or Mean-Time-Between-Failures (MTBF), exceeding 2,500 hours; b. Joule-Thomson (JT) self-regulating minicoolers having bore (outside) diameters of less than 8 mm; 3. Optical sensing fibres specially fabricated either compositionally or structurally, or modified by coating, to be acoustically, thermally, inertially, electromagnetically or nuclear radiation sensitive;
	e. Not used.
6A003	Cameras, systems or equipment, and components therefor, as follows: ***N.B.*** ***See also Category Code 6A203.*** ***N.B.*** ***For cameras specially designed or modified for underwater use, see Category Codes 8A002.d. and 8A002.e.***
	a. Instrumentation cameras and specially designed components therefor, as follows: *Note* *Instrumentation cameras, specified in Category Codes 6A003.a.3. to 6A003.a.5., with modular structures should be evaluated by their maximum capability, using plug-ins available according to the camera manufacturer's specifications.* 1. High-speed cinema recording cameras using any film format from 8 mm to 16 mm inclusive, in which the film is continuously advanced throughout the recording period, and that are capable of recording at framing rates exceeding 13,150 frames/s; *Note* *Category Code 6A003.a.1. does not include cinema recording cameras designed for civil purposes.*

THE SCHEDULE — *continued*

Category Code	*Item Description*
	2. Mechanical high-speed cameras, in which the film does not move, capable of recording at rates exceeding 1,000,000 frames/s for the full framing height of 35 mm film, or at proportionately higher rates for lesser frame heights, or at proportionately lower rates for greater frame heights; 3. Mechanical or electronic streak cameras having writing speeds exceeding 10 mm/µs; 4. Electronic framing cameras having a speed exceeding 1,000,000 frames/s; 5. Electronic cameras, having all of the following: a. An electronic shutter speed (gating capability) of less than 1 µs per full frame; and b. A read out time allowing a framing rate of more than 125 full frames per second. 6. Plug-ins, having all of the following characteristics: a. Specially designed for instrumentation cameras which have modular structures and which are specified in Category Code 6A003.a.; and b. Enabling these cameras to meet the characteristics specified in Category Code 6A003.a.3., 6A003.a.4., or 6A003.a.5., according to the manufacturer's specifications.
	b. Imaging cameras, as follows: *Note* *Category Code 6A003.b. does not include television or video cameras specially designed for television broadcasting.* 1. Video cameras incorporating solid state sensors, having a peak response in the wavelength range exceeding 10 nm, but not exceeding 30,000 nm and having all of the following: a. Having any of the following: 1. More than 4×10^6 "active pixels" per solid state array for monochrome (black and white) cameras;

THE SCHEDULE — *continued*

Category Code	*Item Description*
	2. More than 4×10^6 "active pixels" per solid state array for colour cameras incorporating three solid state arrays; <u>or</u> 3. More than 12×10^6 "active pixels" for solid state array colour cameras incorporating one solid state array; and b. Having any of the following: 1. Optical mirrors specified in Category Code 6A004.a.; 2. Optical control equipment specified in Category Code 6A004.d.; <u>or</u> 3. The capability for annotating internally generated 'camera tracking data'; <u>*Technical Note*</u> *1. For the purpose of this entry, digital video cameras should be evaluated by the maximum number of "active pixels" used for capturing moving images.* *2. For the purpose of this entry, 'camera tracking data' is the information necessary to define camera line of sight orientation with respect to the earth. This includes: 1) the horizontal angle the camera line of sight makes with respect to the earth's magnetic field direction and; 2) the vertical angle between the camera line of sight and the earth's horizon.* 2. Scanning cameras and scanning camera systems, having all of the following: a. A peak response in the wavelength range exceeding 10 nm, but not exceeding 30,000 nm; b. Linear detector arrays with more than 8,192 elements per array; <u>and</u> c. Mechanical scanning in one direction; 3. Imaging cameras incorporating image intensifier tubes specified in Category Code 6A002.a.2.a. or 6A002.a.2.b.;

THE SCHEDULE — *continued*

Category Code	*Item Description*
	4. 'Imaging cameras' incorporating "focal plane arrays" having any of the following: a. Incorporating "focal plane arrays" specified in Category Codes 6A002.a.3.a. to 6A002.a.3.e.; b. Incorporating "focal plane arrays" specified in Category Code 6A002.a.3.f.; <u>or</u> c. Incorporating "focal plane arrays" specified in Category Code 6A002.a.3.g.; *<u>Note 1</u>* *'Imaging cameras' specified in Category Code 6A003.b.4. include "focal place arrays" combined with sufficient "signal processing" electronics, beyond the read out integrated circuit, to enable as a minimum the output of an analogue or digital signal once power is supplied.* *<u>Note 2</u>* *Category Code 6A003.b.4.a does not include imaging cameras incorporating linear "focal plane arrays" with 12 elements or fewer, not employing time-delay-and-integration within the element and designed for any of the following:* *a. Industrial or civilian intrusion alarm, traffic or industrial movement control or counting systems;* *b. Industrial equipment used for inspection or monitoring of heat flows in buildings, equipment or industrial processes;* *c. Industrial equipment used for inspection, sorting or analysis of the properties of materials;* *d. Equipment specially designed for laboratory use; <u>or</u>* *e. Medical equipment.* *<u>Note 3</u>* *Category Code 6A003.b.4.b. does not include imaging cameras having any of the following:* *a. A maximum frame rate equal to or less than 9 Hz;*

THE SCHEDULE — *continued*

Category Code	*Item Description*
	b. Having all of the following: *1. Having a minimum horizontal or vertical 'Instantaneous-Field-of-View (IFOV)' of at least 10 mrad/pixel (milliradians/pixel);* *2. Incorporating a fixed focal-length lens that is not designed to be removed;* *3. Not incorporating a 'direct view' display; and* *4. Having any of the following:* *a. No facility to obtain a viewable image of the detected field-of-view, or* *b. The camera is designed for a single kind of application and designed not to be user modified; or* *c. The camera is specially designed for installation into a civilian passenger land vehicle of less than 3 tonnes (gross vehicle weight) and having all of the following:* *1. Is only operable when installed in any of the following:* *a. The civilian passenger land vehicle for which it was intended; or* *b. A specially designed, authorised maintenance test facility; and* *2. Incorporates an active mechanism that forces the camera not to function when it is removed from the vehicle for which it was intended.* *Technical Notes* *1. 'Instantaneous-Field-of-View (IFOV)' specified in Category Code 6A003.b.4. Note 3.b. is the lesser figure of the 'Horizontal IFOV' or the 'Vertical IFOV'.* *'Horizontal IFOV' = horizontal Field of View (FOV) / number of horizontal detector elements* *'Vertical IFOV' = vertical Field of View (FOV) / number of vertical detector elements*

THE SCHEDULE — *continued*

Category Code	*Item Description*
	2. 'Direct view' in Category Code 6A003.b.4. Note 3.b. refers to an imaging camera operating in the infrared spectrum that presents a visual image to a human observer using a near-to-eye micro display incorporating any light-security mechanism. *<u>Note 4</u>* *Category Code 6A003.b.4.c. does not include 'imaging cameras' having any of the following:* *a. Having all of the following:* *1. Where the camera is specially designed for installation as an integrated component into indoor and wall-plug-operated systems or equipment, limited by design for a single kind of application, as follows;* *a. Industrial process monitoring, quality control, or analysis of the properties of materials;* *b. Laboratory equipment specially designed for scientific research;* *c. Medical equipment;* *d. Financial fraud detection equipment; <u>and</u>* *2. Is only operable when installed in any of the following:* *a. The system(s) or equipment for which it was intended; <u>or</u>* *b. A specially designed, authorised maintenance facility; <u>and</u>* *3. Incorporates an active mechanism that forces the camera not to function when it is removed from the system(s) or equipment for which it was intended;* *b. Where the camera is specially designed for installation into a civilian passenger land vehicle of less than three tonnes (gross vehicle weight), or passenger and vehicle ferries having a length overall (LOA) 65 m or greater, and having all of the following:*

THE SCHEDULE — *continued*

Category Code	*Item Description*
	1. Is only operable when installed in any of the following: *a. The civilian passenger land vehicle or passenger and vehicle ferry for which it was intended; or* *b. A specially designed, authorised maintenance test facility; <u>and</u>* *2. Incorporates an active mechanism that forces the camera not to function when it is removed from the vehicle for which it was intended;* *c. Limited by design to have a maximum radiant sensitivity of 10 mA/W or less for wavelengths exceeding 760 nm, having all of the following:* *1. Incorporating a response limiting mechanism designed not to be removed or modified; <u>and</u>* *2. Incorporates an active mechanism that forces the camera not to function when the response limiting mechanism is removed; <u>or</u>* *d. Having all of the following:* *1. Not incorporating a 'direct view' or electronic image display;* *2. Has no facility to output a viewable image of the detected field of view;* *3. The "focal plane array" is only operable when installed in the camera for which it was intended; <u>and</u>* *4. The "focal plane array" incorporates an active mechanism that forces it to be permanently inoperable when removed from the camera for which it was intended.* 5. Imaging cameras incorporating solid-state detectors specified by Category Code 6A002.a.1.
6A004	Optical equipment and components, as follows:
	a. Optical mirrors (reflectors), as follows: ***<u>N.B.</u>***

THE SCHEDULE — *continued*

Category Code	*Item Description*
	For optical mirrors specially designed for lithography equipment, see Category Code 3B001. 1. “Deformable mirrors” having either continuous or multi-element surfaces, and specially designed components therefor, capable of dynamically repositioning portions of the surface of the mirror at rates exceeding 100 Hz; 2. Lightweight monolithic mirrors having an average “equivalent density” of less than 30 kg/m^2 and a total mass exceeding 10 kg; 3. Lightweight “composite” or foam mirror structures having an average “equivalent density” of less than 30 kg/m^2 and a total mass exceeding 2 kg; 4. Beam steering mirrors more than 100 mm in diameter or length of major axis, which maintain a flatness of λ/2 or better (λ is equal to 633 nm) having a control bandwidth exceeding 100 Hz;
	b. Optical components made from zinc selenide (ZnSe) or zinc sulphide (ZnS) with transmission in the wavelength range exceeding 3,000 nm but not exceeding 25,000 nm and having any of the following: 1. Exceeding 100 cm^3 in volume; <u>or</u> 2. Exceeding 80 mm in diameter or length of major axis and 20 mm in thickness (depth);
	c. “Space-qualified” components for optical systems, as follows: 1. Components lightweighted to less than 20% “equivalent density” compared with a solid blank of the same aperture and thickness; 2. Raw substrates, processed substrates having surface coatings (single-layer or multi-layer, metallic or dielectric, conducting, semiconducting or insulating) or having protective films; 3. Segments or assemblies of mirrors designed to be assembled in space into an optical system with a collecting aperture equivalent to or larger than a single optic 1 m in diameter;

THE SCHEDULE — *continued*

Category Code	*Item Description*
	4. Components manufactured from "composite" materials having a coefficient of linear thermal expansion equal to or less than 5×10^{-6} in any coordinate direction;
	d. Optical control equipment, as follows: 1. Equipment specially designed to maintain the surface figure or orientation of the "space-qualified" components specified in Category Code 6A004.c.1. or 6A004.c.3.; 2. Equipment having steering, tracking, stabilisation or resonator alignment bandwidths equal to or more than 100 Hz and an accuracy of 10 µrad (microradians) or less; 3. Gimbals having all of the following: a. A maximum slew exceeding 5º; b. A bandwidth of 100 Hz or more; c. Angular pointing errors of 200 µrad (microradians) or less; and d. Having any of the following: 1. Exceeding 0.15 m but not exceeding 1 m in diameter or major axis length and capable of angular accelerations exceeding 2 rad (radians)/s^2; or 2. Exceeding 1 m in diameter or major axis length and capable of angular accelerations exceeding 0.5 rad (radians)/s^2; 4. Specially designed to maintain the alignment of phased array or phased segment mirror systems consisting of mirrors with a segment diameter or major axis length of 1 m or more;
	e. 'Aspheric optical elements' having all of the following: 1. Largest dimension of the optical-aperture greater than 400 mm; 2. Surface roughness less than 1 nm (rms) for sampling lengths equal to or greater than 1 mm; and 3. Coefficient of linear thermal expansion's absolute magnitude less than 3×10^{-6}/K at 25 ºC.

THE SCHEDULE — *continued*

Category Code	*Item Description*
	<u>*Technical Notes*</u> *1. An 'aspheric optical element' is any element used in an optical system whose imaging surface or surfaces are designed to depart from the shape of an ideal sphere.* *2. It is not necessary to evaluate the surface roughness of the optical element against the criteria in Category Code 6A004.e.2., unless the optical element was designed or manufactured with the intent to meet, or exceed the control parameter.* <u>*Note*</u> *Category Code 6A004.e. does not include 'aspheric optical elements' having any of the following:* *a. Largest optical-aperture dimension less than 1 m and a focal length to aperture ratio equal to or greater than 4.5:1;* *b. Largest optical-aperture dimension equal to or greater than 1 m and a focal length to aperture ratio equal to or greater than 7:1;* *c. Designed as Fresnel, flyeye, stripe, prism or diffractive optical elements;* *d. Fabricated from borosilicate glass having a coefficient of linear thermal expansion greater than 2.5 × 10^{-6}/K at 25°C;* <u>*or*</u> *e. An x-ray optical element having inner mirror capabilities (e.g., tube-type mirrors).* <u>***N.B.***</u> ***For 'aspheric optical elements' specially designed for lithography equipment, see Category Code 3B001.***
6A005	"Lasers", other than those specified in Category Code 0B001.g.5. or 0B001.h.6., components and optical equipment, as follows: <u>***N.B.***</u> ***See also Category Code 6A205.*** <u>*Note 1*</u>

THE SCHEDULE — *continued*

Category Code	*Item Description*
	Pulsed "lasers" include those that run in a continuous wave (CW) mode with pulses superimposed. *<u>Note 2</u>* *Excimer, semiconductor, chemical, CO, CO_2, and non-repetitive pulsed Nd:glass "lasers" are only specified in Category Code 6A005.d.* *<u>Note 3</u>* *Category Code 6A005 includes fibre "lasers".* *<u>Note 4</u>* *The status of "lasers" incorporating frequency conversion (i.e., wavelength change) by means other than one "laser" pumping another "laser" is determined by applying the parameters for both the output of the source "laser" and the frequency-converted optical output.* *<u>Note 5</u>* *Category Code 6A005 does not include "lasers" as follows:* *a. Ruby with output energy below 20 J;* *b. Nitrogen;* *c. Krypton.* *<u>Technical Note</u>* *In Category Code 6A005 'Wall-plug efficiency' is defined as the ratio of "laser" output power (or "average output power") to total electrical input power required to operate the "laser", including the power supply/ conditioning and thermal conditioning/heat exchanger.*
	a. Non-"tunable" continuous wave "(CW lasers)" having any of the following: 1. Output wavelength less than 150 nm and output power exceeding 1 W; 2. Output wavelength of 150 nm or more but not exceeding 520 nm and output power exceeding 30 W; *<u>Note</u>*

THE SCHEDULE — *continued*

Category Code	*Item Description*
	Category Code 6A005.a.2. does not control Argon "lasers" having an output power equal or less than 50 W. 3. Output wavelength exceeding 520 nm but not exceeding 540 nm and having any of the following: a. Single transverse mode output and output power exceeding 50 W; or b. Multiple transverse mode output and output power exceeding 150 W; 4. Output wavelength exceeding 540 nm but not exceeding 800 nm and output power exceeding 30 W; 5. Output wavelength exceeding 800 nm but not exceeding 975 nm and any of the following: a. Single transverse mode output and output power exceeding 50 W; or b. Multiple transverse mode output and output power exceeding 80 W; 6. Output wavelength exceeding 975 nm but not exceeding 1,150 nm and having any of the following: a. Single transverse mode output and any of the following: 1. 'Wall-plug efficiency' exceeding 12% and output power exceeding 100 W; or 2. Output power exceeding 150 W; or b. Multiple transverse mode output and any of the following: 1. 'Wall-plug efficiency' exceeding 18% and output power exceeding 500 W; or 2. Output power exceeding 2 kW; *Note* *Category Code 6A005.a.6.b. does not include multiple transverse mode, industrial "lasers" with output power exceeding 2 kW and not exceeding 6 kW with a total mass greater than 1,200 kg. For the purpose of this note, total*

THE SCHEDULE — *continued*

Category Code	*Item Description*
	mass includes all components required to operate the "laser", e.g., "laser", power supply, heat exchanger, but excludes external optics for beam conditioning and/or delivery. 7. Output wavelength exceeding 1,150 nm but not exceeding 1,555 nm and any of the following: a. Single transverse mode and output power exceeding 50 W; or b. Multiple transverse mode and output power exceeding 80 W; or 8. Output wavelength exceeding 1,555 nm and output power exceeding 1 W.
	b. Non-"tunable" "pulsed lasers" having any of the following:: 1. Output wavelength less than 150 nm and any of the following: a. Output energy exceeding 50 mJ per pulse and "peak power" exceeding 1 W; or b. "Average output power" exceeding 1 W; 2. Output wavelength of 150 nm or more but not exceeding 520 nm and having any of the following: a. Output power exceeding 1.5 J per pulse and "peak power" exceeding 30 W; or; b. "Average output power" exceeding 30 W; *Note:* *Category Code 6A005.b.2.b. does not include Argon "lasers" having an "average output power" equal to or less than 50 W.* 3. Output wavelength exceeding 520 nm but not exceeding 540 nm and any of the following: a. Single transverse mode output and any of the following: 1. Output energy exceeding 1.5 J per pulse and "peak power" exceeding 50 W; or 2. "Average output power" exceeding 50 W; or

THE SCHEDULE — *continued*

Category Code	*Item Description*
	b. Multiple transverse mode output and any of the following 1. Output energy exceeding 1.5 J per pulse and "peak power" exceeding 150 W; or 2. "Average output power" exceeding 150 W; 4. Output wavelength exceeding 540 nm but not exceeding 800 nm and any of the following: a. Output energy exceeding 1.5 J per pulse and "peak power" exceeding 30 W; or b. "Average output power" exceeding 30 W; 5. Output wavelength exceeding 800 nm but not exceeding 975 nm and any of the following: a. "Pulse duration" not exceeding 1 μs and any of the following: 1. Output energy exceeding 0.5 J per pulse and "peak power" exceeding 50 W; or 2. Single transverse mode output and "average output power" exceeding 20 W; or 3. Multiple transverse mode output and "average output power" exceeding 50 W; or b. "Pulse duration" exceeding 1 μs and any of the following: 1. Output energy exceeding 2 J per pulse and "peak power" exceeding 50 W; 2. Single transverse mode output and "average output power" exceeding 50 W; or 3. Multiple transverse mode output and "average output power" exceeding 80 W; 6. Output wavelength exceeding 975 nm but not exceeding 1,150 nm and any of the following: a. "Pulse duration" of less than 1 ns and any of the following:

THE SCHEDULE — *continued*

Category Code	*Item Description*
	1. Output “peak power” exceeding 5 GW per pulse; 2. “Average output power” exceeding 10 W; <u>or</u> 3. Output energy exceeding 0.1 J per pulse; b. “Pulse duration” equal to or exceeding 1 ns but not exceeding 1 μs, and any of the following: 1. Single transverse mode output and any of the following: a. “Peak power” exceeding 100 MW; b. “Average output power” exceeding 20 W limited by design to a maximum pulse repetition frequency less than or equal to 1 kHz; c. ‘Wall-plug efficiency’ exceeding 12%, “average output power” exceeding 100 W and capable of operating at a pulse repetition frequency greater than 1 kHz; d. “Average output power” exceeding 150 W and capable of operating at a pulse repetition frequency greater than 1 kHz; <u>or</u> e. Output energy exceeding 2 J per pulse; <u>or</u> 2. Multiple transverse mode output and any of the following: a. “Peak power” exceeding 400 MW; b. 'Wall-plug efficiency' exceeding 18% and “average output power” exceeding 500 W; c. “Average output power” exceeding 2 kW; <u>or</u> d. Output energy exceeding 4 J per pulse; <u>or</u> c. “Pulse duration” exceeding 1 μs and any of the following: 1. Single transverse mode output and any of the following: a. “Peak power” exceeding 500 kW;

THE SCHEDULE — *continued*

Category Code	*Item Description*
	b. 'Wall-plug efficiency' exceeding 12% and "average output power" exceeding 100 W; or c. "Average output power" exceeding 150 W; or 2. Multiple transverse mode output and any of the following: a. "Peak power" exceeding 1 MW; b. 'Wall-plug efficiency' exceeding 18% and "average output power" exceeding 500 W; or c. "Average output power" exceeding 2 kW; 7. Output wavelength exceeding 1,150 nm but not exceeding 1,555 nm and any of the following: a. "Pulse duration" not exceeding 1 μs and any of the following: 1. Output energy exceeding 0.5 J per pulse and "peak power" exceeding 50 W: 2. Single transverse mode output and "average output power" exceeding 20 W; or 3. Multiple transverse mode output and "average output power" exceeding 50 W; or b. "Pulse duration" exceeding 1 μs and any of the following: 1. Output energy exceeding 2 J per pulse and "peak power" exceeding 50 W: 2. Single transverse mode output and "average output power" exceeding 50 W; or 3. Multiple transverse mode output and "average output power" exceeding 80 W; or 8. Output wavelength exceeding 1,555 nm and any of the following: a. Output energy exceeding 100 mJ per pulse and "peak power" exceeding 1 W; or b. "Average output power" exceeding 1 W;

THE SCHEDULE — *continued*

Category Code	*Item Description*
	c. "Tunable" "lasers" having any of the following: Note *Category Code 6A005.c. includes titanium-sapphire (Ti:Al_2O_3), thulium-YAG (Tm:YAG), thulium-YSGG (Tm:YSGG), alexandrite (Cr:$BeAl_2O_4$) and colour centre "lasers", dye "lasers", and liquid "lasers".* 1. Output wavelength less than 600 nm and having any of the following: a. Output energy exceeding 50 mJ per pulse and "peak power" exceeding 1 W; or b. Average or CW output power exceeding 1 W; 2. Output wavelength of 600 nm or more but not exceeding 1,400 nm and having any of the following: a. Output energy exceeding 1 J per pulse and "peak power" exceeding 20 W; or b. Average or CW output power exceeding 20 W; or 3. Output wavelength exceeding 1,400 nm and having any of the following: a. Output energy exceeding 50 mJ per pulse and "peak power" exceeding 1 W; or b. Average or CW output power exceeding 1 W;
	d. Other "lasers", not specified in Category Code 6A005.a., 6A005.b. or 6A005.c. as follows: 1. Semiconductor "lasers", as follows: Note 1 *Category Code 6A005.d.1. includes semiconductor "lasers" having optical output connectors (e.g., fibre optic pigtails).* Note 2 *The status of semiconductor "lasers" specially designed for other equipment is determined by the status of the other equipment.*

THE SCHEDULE — *continued*

Category Code	*Item Description*
	a. Individual single-transverse mode semiconductor "lasers" having any of the following: 1. Wavelength equal or less than 1,510 nm and average or CW output power, exceeding 1.5 W; <u>or</u> 2. Wavelength greater than 1,510 nm, and average or CW output power exceeding 500 mW; b. Individual, multiple-transverse mode semiconductor "lasers" having any of the following: 1. Wavelength of less than 1,400 nm and average or CW output power, exceeding 10 W; 2. Wavelength equal to or greater than 1,400 nm and less than 1,900 nm and average or CW output power, exceeding 2.5 W; <u>or</u> 3. Wavelength equal to or greater than 1,900 nm and average or CW output power exceeding 1 W; c. Individual semiconductor "laser" arrays, having any of the following: 1. Wavelength of less than 1,400 nm and average or CW output power, exceeding 80 W; 2. Wavelength of equal to or greater than 1,400 nm and less than 1,900 nm and average or CW output power, exceeding 25 W; <u>or</u> 3. Wavelength equal to or greater than 1,900 nm and average or CW output power, exceeding 10W; d. 'Array stacks' of semiconductor "lasers" containing at least one 'array' specified in Category Code 6A005.d.1.c; <u>*Technical Notes*</u> *1. Semiconductor "lasers" are commonly called "laser" diodes.* *2. An 'array' consists of multiple semiconductor "laser" emitters fabricated as a single chip so that the centres of the emitted light beams are on parallel paths.*

THE SCHEDULE — *continued*

Category Code	*Item Description*
	3. An ‘array stack’ is fabricated by stacking, or otherwise assembling, ‘arrays' so that the centres of the emitted light beams are on parallel paths.
	2. Carbon monoxide (CO) “lasers” having any of the following:
	a. Output energy exceeding 2 J per pulse and “peak power” exceeding 5 kW; <u>or</u>
	b. Average or CW output power exceeding 5 kW;
	3. Carbon dioxide (CO_2) “lasers” having any of the following:
	a. CW output power exceeding 15 kW;
	b. Pulsed output with a “pulse duration” exceeding 10 µs and any of the following:
	1. “Average output power” exceeding 10 kW; <u>or</u>
	2. “Peak power” exceeding 100 kW; <u>or</u>
	c. Pulsed output with a “pulse duration” equal to or less than 10 µs and any of the following:
	1. Pulse energy exceeding 5 J per pulse; <u>or</u>
	2. “Average output power” exceeding 2.5 kW;
	4. Excimer “lasers” having any of the following:
	a. Output wavelength not exceeding 150 nm and any of the following:
	1. Output energy exceeding 50 mJ per pulse; <u>or</u>
	2. “Average output power” exceeding 1 W;
	b. Output wavelength exceeding 150 nm but not exceeding 190 nm and any of the following:
	1. Output energy exceeding 1.5 J per pulse; <u>or</u>
	2. “Average output power” exceeding 120 W;
	c. Output wavelength exceeding 190 nm but not exceeding 360 nm and any of the following:
	1. Output energy exceeding 10 J per pulse; <u>or</u>

THE SCHEDULE — *continued*

Category Code	*Item Description*
	2. "Average output power" exceeding 500 W; or d. Output wavelength exceeding 360 nm and any of the following: 1. Output energy exceeding 1.5 J per pulse; or 2. "Average output power" exceeding 30 W; ***N.B.*** ***For excimer "lasers" specially designed for lithography equipment, see Category Code 3B001.*** 5. "Chemical lasers", as follows: a. Hydrogen Fluoride (HF) "lasers"; b. Deuterium Fluoride (DF) "lasers"; c. "Transfer lasers", as follows: 1. Oxygen Iodine (O_2-I) "lasers"; 2. Deuterium Fluoride-Carbon dioxide (DF-CO_2) "lasers"; 6. 'Non-repetitive pulsed' Nd: glass "lasers" having any of the following: a. "Pulse duration" not exceeding 1 µs and output energy exceeding 50 J per pulse; or b. "Pulse duration" exceeding 1 µs and output energy exceeding 100 J per pulse; *Note* *'Non-repetitive pulsed' refers to "lasers" that produce either a single output pulse or that have a time interval between pulses exceeding one minute.*
	e. Components, as follows: 1. Mirrors cooled either by 'active cooling' or by heat pipe cooling; *Technical Note*

THE SCHEDULE — *continued*

Category Code	*Item Description*
	'Active cooling' is a cooling technique for optical components using flowing fluids within the subsurface (nominally less than 1 mm below the optical surface) of the optical component to remove heat from the optic. 2. Optical mirrors or transmissive or partially transmissive optical or electro-optical components specially designed for use with specified "lasers";
	f. Optical equipment, as follows: ***N.B.*** ***For shared aperture optical elements, capable of operating in "Super-High Power Laser" ("SHPL") applications, see Division 2 of Part I of this Schedule.*** 1. Dynamic wavefront (phase) measuring equipment capable of mapping at least 50 positions on a beam wavefront and any of the following: a. Frame rates equal to or more than 100 Hz and phase discrimination of at least 5% of the beam's wavelength; or b. Frame rates equal to or more than 1,000 Hz and phase discrimination of at least 20% of the beam's wavelength; 2. "Laser" diagnostic equipment capable of measuring "SHPL" system angular beam steering errors of equal to or less than 10 μrad; 3. Optical equipment and components specially designed for a phased-array "SHPL" system for coherent beam combination to an accuracy of λ/10 at the designed wavelength, or 0.1 μm, whichever is the smaller; 4. Projection telescopes specially designed for use with "SHPL" systems.
6A006	"Magnetometers", "magnetic gradiometers", "intrinsic magnetic gradiometers", underwater electric field sensors, "compensation systems", and specially designed components therefor, as follows: *Note*

THE SCHEDULE — *continued*

Category Code	*Item Description*
	Category Code 6A006 does not include instruments specially designed for fishery applications or biomagnetic measurements for medical diagnostics.
	a. "Magnetometers" and subsystems, as follows:
	1. "Magnetometers" using "superconductive" (SQUID) "technology" and having any of the following:
	a. SQUID systems designed for stationary operation, without specially designed subsystems designed to reduce in-motion noise, and having a 'sensitivity' equal to or lower (better) than 50 fT (rms) per square root Hz at a frequency of 1 Hz; or
	b. SQUID systems having an in-motion-magnetometer 'sensitivity' lower (better) than 20 pT (rms) per square root Hz at a frequency of 1 Hz and specially designed to reduce in-motion noise;
	2. "Magnetometers" using optically pumped or nuclear precession (proton/Overhauser) "technology" having a 'sensitivity' lower (better) than 20 pT (rms) per square root Hz at a frequency of 1 Hz;
	3. "Magnetometers" using fluxgate "technology" having a 'sensitivity' equal to or lower (better) than 10 pT (rms) per square root Hz at a frequency of 1 Hz;
	4. Induction coil "magnetometers" having a 'sensitivity' lower (better) than any of the following:
	a. 0.05 nT (rms) per square root Hz at frequencies of less than 1 Hz;
	b. 1×10^{-3} nT (rms) per square root Hz at frequencies of 1 Hz or more but not exceeding 10 Hz; <u>or</u>
	c. 1×10^{-4} nT (rms) per square root Hz at frequencies exceeding 10 Hz;
	5. Fibre optic "magnetometers" having a 'sensitivity' lower (better) than 1 nT (rms) per square root Hz;

THE SCHEDULE — *continued*

Category Code	*Item Description*
	b. Underwater electric field sensors having a 'sensitivity' lower (better) than 8 nanovolt per metre per square root Hz when measured at 1 Hz; c. "Magnetic gradiometers" as follows: 1. "Magnetic gradiometers" using multiple "magnetometers" specified in Category Code 6A006.a.; 2. Fibre optic "intrinsic magnetic gradiometers" having a magnetic gradient field 'sensitivity' lower (better) than 0.3 nT/m (rms) per square root Hz; 3. "Intrinsic magnetic gradiometers", using "technology" other than fibre-optic "technology", having a magnetic gradient field 'sensitivity' lower (better) than 0.015 nT/m (rms) per square root Hz; d. "Compensation systems" for magnetic or underwater electric field sensors resulting in a performance equal to or better than the specified parameters of Category Code 6A006.a., 6A006.b. or 6A006.c. <u>*Technical Note*</u> *For the purposes of Category Code 6A006, 'sensitivity' (noise level) is the root mean square of the device limit floor which is the lowest signal that can be measured.*
6A007	Gravity meters (gravimeters) and gravity gradiometers, as follows: <u>***N.B.***</u> ***See also Category Code 6A107.*** a. Gravity meters designed or modified for ground use and having a static accuracy of less (better) than 10 µgal; <u>*Note*</u> *Category Code 6A007.a. does not include ground gravity meters of the quartz element (Worden) type.* b. Gravity meters designed for mobile platforms and having all of the following: 1. A static accuracy of less (better) than 0.7 mgal; <u>and</u>

THE SCHEDULE — *continued*

Category Code	*Item Description*
	2. An in-service (operational) accuracy of less (better) than 0.7 mgal having a time-to-steady-state registration of less than 2 minutes under any combination of attendant corrective compensations and motional influences; c. Gravity gradiometers.
6A008	Radar systems, equipment and assemblies having any of the following, and specially designed components therefor: *N.B.* *See also Category Code 6A108.* *Note* *Category Code 6A008 does not include:* − Secondary surveillance radar (SSR); − Civil Automotive Radar; − Displays or monitors used for air traffic control (ATC) having no more than 12 resolvable elements per mm; − Meteorological (weather) radar. a. Operating at frequencies from 40 GHz to 230 GHz and having any of the following: 1. An average output power exceeding 100 mW; or 2. Locating accuracy of 1 m or less (better) in range and 0.2 degree or less (better) in azimuth; b. A tunable bandwidth exceeding ±6.25% of the ‘centre operating frequency’; *Technical Note* *The ‘centre operating frequency’ equals one half of the sum of the highest plus the lowest specified operating frequencies.* c. Capable of operating simultaneously on more than two carrier frequencies; d. Capable of operating in synthetic aperture (SAR), inverse synthetic aperture (ISAR) radar mode, or sidelooking airborne (SLAR) radar mode;

THE SCHEDULE — *continued*

Category Code	*Item Description*
	e. Incorporating "electronically steerable phased array antennae"; f. Capable of heightfinding non-cooperative targets; <u>Note</u> *Category Code 6A008.f. does not include precision approach radar (PAR) equipment conforming to ICAO standards.* g. Specially designed for airborne (balloon or airframe mounted) operation and having Doppler "signal processing" for the detection of moving targets; h. Employing processing of radar signals and using any of the following: 1. "Radar spread spectrum" techniques; or 2. "Radar frequency agility" techniques; i. Providing ground-based operation with a maximum "instrumented range" exceeding 185 km; <u>Note</u> *Category Code 6A008.i. does not include:* *a. Fishing ground surveillance radar;* *b. Ground radar equipment specially designed for enroute air traffic control and having all the following:* *1. A maximum "instrumented range" of 500 km or less;* *2. Configured so that radar target data can be transmitted only one way from the radar site to one or more civil ATC centres;* *3. Contains no provisions for remote control of the radar scan rate from the enroute ATC centre; <u>and</u>* *4. Permanently installed;* *c. Weather balloon tracking radars.* j. Being "laser" radar or Light Detection and Ranging (LIDAR) equipment and having any of the following: 1. "Space-qualified";

THE SCHEDULE — *continued*

Category Code	*Item Description*
	2. Employing coherent heterodyne or homodyne detection techniques and having an angular resolution of less (better) than 20 μrad (microradians); <u>or</u> 3. Designed for carrying out airborne bathymetric littoral surveys to the parameters in the International Hydrographic Organisation (IHO) Order 1a Standard (5th Edition February 2008) for Hydrographic Surveys or better, and using one or more lasers with a wavelength exceeding 400 nm but not exceeding 600 nm. ***<u>Note 1</u>*** ***LIDAR equipment specially designed for surveying is only specified in Category Code 6A008.j.3.*** *Note 2* *Category Code 6A008.j. does not include LIDAR equipment specially designed for meteorological observation.* *<u>Note 3</u>* *Parameters in the IHO Order 1a Standard 5th Edition February 2008 are summarised as follows:* *- Horizontal Accuracy (95% Confidence Level)=5 m + 5% of depth* *- Depth Accuracy for Reduced Depths (95% confidence level)= ±√ $(a^2+(b*d)^2$, where* *a=0.5 m=constant depth error,* *i.e., the sum of all constant depth errors* *b=0.013=factor of depth dependent error* *b*d=depth dependent error,* *i.e., the sum of all depth dependent errors* *d=depth* *- Feature Detection=Cubic features>2 m in depths up to 40 m;* *10% of depth beyond 40 m.*

THE SCHEDULE — *continued*

Category Code	*Item Description*
	k. Having "signal processing" subsystems using "pulse compression" and having any of the following: 1. A "pulse compression" ratio exceeding 150; <u>or</u> 2. A pulse width of less than 200 ns; <u>or</u> l. Having data processing subsystems and having any of the following: 1. "Automatic target tracking" providing, at any antenna rotation, the predicted target position beyond the time of the next antenna beam passage; <u>*Note*</u> *Category Code 6A008.l.1. does not include conflict alert capability in ATC systems, or marine or harbour radar.* 2. Calculation of target velocity from primary radar having non-periodic (variable) scanning rates; 3. Processing for automatic pattern recognition (feature extraction) and comparison with target characteristic data bases (waveforms or imagery) to identify or classify targets; <u>or</u> 4. Superposition and correlation, or fusion, of target data from two or more "geographically dispersed" and "interconnected radar sensors" to enhance and discriminate targets. <u>*Note*</u> *Category Code 6A008.l.4. does not include systems, equipment and assemblies used for marine traffic control.*
6A102	Radiation hardened 'detectors', other than those specified in Category Code 6A002, specially designed or modified for protecting against nuclear effects (e.g., electromagnetic pulse (EMP), X-rays, combined blast and thermal effects) and usable for "missiles", designed or rated to withstand radiation levels which meet or exceed a total irradiation dose of 5×10^5 rads (silicon). <u>*Technical Note*</u>

THE SCHEDULE — *continued*

Category Code	*Item Description*
	In Category Code 6A102, a 'detector' is defined as a mechanical, electrical, optical or chemical device that automatically identifies and records, or registers a stimulus such as an environmental change in pressure or temperature, an electrical or electromagnetic signal or radiation from a radioactive material. This includes devices that sense by one time operation or failure.
6A107	Gravity meters (gravimeters) and components for gravity meters and gravity gradiometers, as follows: a. Gravity meters, other than those specified in Category Code 6A007.b., designed or modified for airborne or marine use, and having a static or operational accuracy of 7×10^{-6} m/s^2 (0.7 milligal) or less (better), and having a time-to-steady-state registration of two minutes or less; b. Specially designed components for gravity meters specified in Category Code 6A007.b. or 6A107.a. and gravity gradiometers specified in Category Code 6A007.c.
6A108	Radar systems and tracking systems, other than those specified in Category Code 6A008, as follows: a. Radar and laser radar systems designed or modified for use in space launch vehicles specified in Category Code 9A004 or sounding rockets specified in Category Code 9A104; <u>Note</u> *Category Code 6A108.a. includes the following:* *a. Terrain contour mapping equipment;* *b. Imaging sensor equipment;* *c. Scene mapping and correlation (both digital and analogue) equipment;* *d. Doppler navigation radar equipment;* b. Precision tracking systems, usable for 'missiles', as follows: 1. Tracking systems which use a code translator in conjunction with either surface or airborne references or navigation satellite systems to provide real-time measurements of in-flight position and velocity;

THE SCHEDULE — *continued*

Category Code	*Item Description*
	2. Range instrumentation radars including associated optical/infrared trackers with all of the following capabilities: a. Angular resolution better than 1.5 milliradians; b. Range of 30 km or greater with a range resolution better than 10 m rms; and c. Velocity resolution better than 3 m/s. *Technical Note* *In Category Code 6A108.b. 'missile' means complete rocket systems and unmanned aerial vehicle systems capable of a range exceeding 300 km.*
6A202	Photomultiplier tubes having both of the following characteristics: a. Photocathode area of greater than 20 cm^2; and b. Anode pulse rise time of less than 1 ns.
6A203	Cameras and components, other than those specified in Category Code 6A003, as follows:
	a. Mechanical rotating mirror cameras, as follows, and specially designed components therefor: 1. Framing cameras with recording rates greater than 225,000 frames per second; 2. Streak cameras with writing speeds greater than 0.5 mm per microsecond; *Note* *In Category Code 6A203.a. components of such cameras include their synchronising electronics units and rotor assemblies consisting of turbines, mirrors and bearings.*
	b. Electronic streak cameras, electronic framing cameras, tubes and devices, as follows: 1. Electronic streak cameras capable of 50 ns or less time resolution; 2. Streak tubes for cameras specified in Category Code 6A203.b.1.;

THE SCHEDULE — *continued*

Category Code	*Item Description*
	3. Electronic (or electronically shuttered) framing cameras capable of 50 ns or less frame exposure time; 4. Framing tubes and solid-state imaging devices for use with cameras specified in Category Code 6A203.b.3., as follows: a. Proximity focused image intensifier tubes having the photocathode deposited on a transparent conductive coating to decrease photocathode sheet resistance; b. Gate silicon intensifier target (SIT) videcon tubes, where a fast system allows gating the photoelectrons from the photocathode before they impinge on the SIT plate; c. Kerr or Pockels cell electro-optical shuttering; d. Other framing tubes and solid-state imaging devices having a fast-image gating time of less than 50 ns specially designed for cameras specified in Category Code 6A203.b.3.;
	c. Radiation-hardened TV cameras, or lenses therefor, specially designed or rated as radiation hardened to withstand a total radiation dose greater than 50×10^3 Gy (silicon) (5×10^6 rad (silicon)) without operational degradation. *Technical Note* *The term Gy (silicon) refers to the energy in Joules per kilogram absorbed by an unshielded silicon sample when exposed to ionising radiation.*
6A205	"Lasers", "laser" amplifiers and oscillators, other than those specified in Category Codes 0B001.g.5., 0B001.h.6. and 6A005; as follows: ***N.B.*** ***For copper vapour lasers, see Category Code 6A005.b.***
	a. Argon ion "lasers" having both of the following characteristics: 1. Operating at wavelengths between 400 nm and 515 nm; and

THE SCHEDULE — *continued*

Category Code	*Item Description*
	2. An average output power greater than 40 W;
	b. Tunable pulsed single-mode dye laser oscillators having all of the following characteristics: 1. Operating at wavelengths between 300 nm and 800 nm; 2. An average output power greater than 1 W; 3. A repetition rate greater than 1 kHz; and 4. Pulse width less than 100 ns;
	c. Tunable pulsed dye laser amplifiers and oscillators, having all of the following characteristics: 1. Operating at wavelengths between 300 nm and 800 nm; 2. An average output power greater than 30 W; 3. A repetition rate greater than 1 kHz; and 4. Pulse width less than 100 ns; *Note* *Category Code 6A205.c. does not include single mode oscillators.*
	d. Pulsed carbon dioxide "lasers" having all of the following characteristics: 1. Operating at wavelengths between 9,000 nm and 11,000 nm; 2. A repetition rate greater than 250 Hz; 3. An average output power greater than 500 W; and 4. Pulse width of less than 200 ns;
	e. Para-hydrogen Raman shifters designed to operate at 16 micrometre output wavelength and at a repetition rate greater than 250 Hz;
	f. Neodymium-doped (other than glass) "lasers" with an output wavelength between 1,000 nm and 1,100 nm, having either of the following:

THE SCHEDULE — *continued*

Category Code	*Item Description*
	1. Pulse-excited and Q-switched with a pulse duration equal to or more than 1 ns; and having either of the following: a. A single–transverse mode output with an average output power greater than 40W; <u>or</u> b. A multiple-transverse mode output having an average power greater than 50 W; <u>or</u> 2. Incorporating frequency doubling to give an output wavelength between 500 nm and 550 nm with an average output power of more than 40 W.
6A225	Velocity interferometers for measuring velocities exceeding 1 km/s during time intervals of less than 10 microseconds. <u>*Note*</u> *Category Code 6A225 includes velocity interferometers such as VISARs (Velocity interferometer systems for any reflector) and DLIs (Doppler laser interferometers).*
6A226	Pressure sensors, as follows: a. Manganin gauges for pressures greater than 10 GPa; b. Quartz pressure transducers for pressures greater than 10 GPa.
6B	**Test, Inspection and Production Equipment**
6B004	Optical equipment, as follows: a. Equipment for measuring absolute reflectance to an accuracy of ±0.1% of the reflectance value; b. Equipment other than optical surface scattering measurement equipment, having an unobscured aperture of more than 10 cm, specially designed for the non-contact optical measurement of a non-planar optical surface figure (profile) to an “accuracy” of 2 nm or less (better) against the required profile. <u>*Note*</u> *Category Code 6B004 does not include microscopes.*
6B007	Equipment to produce, align and calibrate land-based gravity meters with a static accuracy of better than 0.1 mgal.

THE SCHEDULE — *continued*

Category Code	*Item Description*
6B008	Pulse radar cross-section measurement systems having transmit pulse widths of 100 ns or less and specially designed components therefor. ***N.B.*** ***See also Category Code 6B108.***
6B108	Systems, other than those specified in Category Code 6B008, specially designed for radar cross section measurement usable for ‘missiles’ and their subsystems. *Technical Note* *In Category Code 6B108 'missile' means complete rocket systems and unmanned aerial vehicle systems capable of a range exceeding 300 km.*
6C	**Materials**
6C002	Optical sensor materials as follows: a. Elemental tellurium (Te) of purity levels of 99.9995% or more; b. Single crystals (including epitaxial wafers) of any of the following: 1. Cadmium zinc telluride (CdZnTe), with zinc content of less than 6% by ‘mole fraction’; 2. Cadmium telluride (CdTe) of any purity level; or 3. Mercury cadmium telluride (HgCdTe) of any purity level. *Technical Note* *‘Mole fraction’ is defined as the ratio of moles ZnTe to the sum of moles CdTe and ZnTe present in the crystal.*
6C004	Optical materials as follows:
	a. Zinc selenide (ZnSe) and zinc sulphide (ZnS) “substrate blanks”, produced by the chemical vapour deposition process and having any of the following: 1. A volume greater than 100 cm^3; or

THE SCHEDULE — *continued*

Category Code	*Item Description*
	2. A diameter greater than 80 mm and a thickness of 20 mm or more;
	b. Boules of any of the following electro-optic materials: 1. Potassium titanyl arsenate (KTA); 2. Silver gallium selenide ($AgGaSe_2$); <u>or</u> 3. Thallium arsenic selenide (Tl_3AsSe_3, also known as TAS);
	c. Non-linear optical materials having all of the following: 1. Third order susceptibility (chi 3) of 10^{-6} m^2/V^2 or more; <u>and</u> 2. A response time of less than 1 ms;
	d. "Substrate blanks" of silicon carbide or beryllium beryllium (Be/Be) deposited materials exceeding 300 mm in diameter or major axis length;
	e. Glass, including fused silica, phosphate glass, fluorophosphate glass, zirconium fluoride (ZrF_4) and hafnium fluoride (HfF_4) and having all of the following: 1. A hydroxyl ion (OH-) concentration of less than 5 ppm; 2. Integrated metallic purity levels of less than 1 ppm; <u>and</u> 3. High homogeneity (index of refraction variance) less than 5×10^{-6};
	f. Synthetically produced diamond material with an absorption of less than 10^{-5} cm^{-1} for wavelengths exceeding 200 nm but not exceeding 14,000 nm.
6C005	Synthetic crystalline "laser" host material in unfinished form as follows: a. Titanium doped sapphire; b. Alexandrite.
6D	**Software**
6D001	"Software" specially designed for the "development" or "production" of equipment specified in Category Code 6A004, 6A005, 6A008 or 6B008.

THE SCHEDULE — *continued*

Category Code	*Item Description*
6D002	"Software" specially designed for the "use" of equipment specified in Category Code 6A002.b., 6A008 or 6B008.
6D003	Other "software" as follows:
	a. "Software" as follows: 1. "Software" specially designed for acoustic beam forming for the "real time processing" of acoustic data for passive reception using towed hydrophone arrays; 2. "Source code" for the "real time processing" of acoustic data for passive reception using towed hydrophone arrays; 3. "Software" specially designed for acoustic beam forming for "real time processing" of acoustic data for passive reception using bottom or bay cable systems; 4. "Source code" for "real time processing" of acoustic data for passive reception using bottom or bay cable systems;
	b. Not used;
	c. "Software" designed or modified for cameras incorporating "focal plane arrays" specified in Category Code 6A002.a.3.f. and designed or modified to remove a frame rate restriction and allow the camera to exceed the frame rate specified in Category Code 6A003.b.4. Note 3.a.;
	d. Not used;
	e. Not used;
	f. "Software" as follows: 1. "Software" specially designed for magnetic and electric field "compensation systems" for magnetic sensors designed to operate on mobile platforms; 2. "Software" specially designed for magnetic and electric field anomaly detection on mobile platforms;
	g. "Software" specially designed to correct motional influences of gravity meters or gravity gradiometers;
	h. "Software" as follows:

THE SCHEDULE — *continued*

Category Code	*Item Description*
	1. Air Traffic Control (ATC) "software" application "programmes" hosted on general purpose computers located at Air Traffic Control centres and capable of any of the following: a. Processing and displaying more than 150 simultaneous "system tracks"; <u>or</u> b. Accepting radar target data from more than four primary radars; 2. "Software" for the design or "production" of radomes and having all of the following: a. Specially designed to protect the "electronically steerable phased array "antennae" specified in Category Code 6A008.e.; <u>and</u> b. Resulting in an antenna pattern having an 'average side lobe level' more than 40 dB below the peak of the main beam level. <u>Technical Note</u> *'Average side lobe level' in Category Code 6D003.h.2.b. is measured over the entire array excluding the angular extent of the main beam and the first two side lobes on either side of the main beam.*
6D102	"Software" specially designed or modified for the "use" of goods specified in Category Code 6A108.
6D103	"Software" which processes post-flight, recorded data, enabling determination of vehicle position throughout its flight path, specially designed or modified for 'missiles'. <u>Technical Note</u> *In Category Code 6D103 'missile' means complete rocket systems and unmanned aerial vehicle systems capable of a range exceeding 300 km.*
6E	**Technology**
6E001	"Technology" (according to the General Technology Note) for the "development" of equipment, materials or "software" specified in Category 6A, 6B, 6C or 6D.

THE SCHEDULE — *continued*

Category Code	*Item Description*
6E002	"Technology" (according to the General Technology Note) for the "production" of equipment or materials specified in Category 6A, 6B or 6C.
6E003	Other "technology", as follows:
	a. "Technology" as follows: 1. Optical surface coating and treatment "technology" "required" to achieve uniformity of 99.5% or better for optical coatings 500 mm or more in diameter or major axis length and with a total loss (absorption and scatter) of less than 5×10^{-3}; ***N.B.*** ***See also Category Code 2E003.f.*** 2. Optical fabrication "technology" using single point diamond turning techniques to produce surface finish accuracies of better than 10 nm rms on non-planar surfaces exceeding 0.5 m^2;
	b. "Technology" "required" for the "development", "production" or "use" of specially designed diagnostic instruments or targets in test facilities for "SHPL" testing or testing or evaluation of materials irradiated by "SHPL" beams;
6E101	"Technology" (according to the General Technology Note) for the "use" of equipment or "software" specified in Category Code 6A002, 6A007.b. and c., 6A008, 6A102, 6A107, 6A108, 6B108, 6D102 or 6D103. Note *Category Code 6E101 only specifies "technology" for equipment specified in Category Code 6A008 when it is designed for airborne applications and is usable in "missiles".*
6E201	"Technology" (according to the General Technology Note) for the "use" of equipment specified in Category Code 6A003, 6A005.a.2., 6A005.b.2., 6A005.b.3., 6A005.b.4., 6A005.b.6., 6A005.c.2., 6A005.d.3.c., 6A005.d.4.c., 6A202, 6A203, 6A205, 6A225 or 6A226.

THE SCHEDULE — *continued*

Category Code	*Item Description*

CATEGORY 7 — NAVIGATION AND AVIONICS

7A **Systems, Equipment and Components**

N.B.

For automatic pilots for underwater vehicles, see Category 8. For radar, see Category 6.

7A001 Accelerometers as follows, and specially designed components therefor:

N.B.

See also Category Code 7A101.

For angular or rotational accelerometers, see Category Code 7A001.b.

a. Linear accelerometers having any of the following:

1. Specified to function at linear acceleration levels less than or equal to 15 g and having any of the following:

a. A "bias" "stability" of less (better) than 130 micro g with respect to a fixed calibration value over a period of one year; or

b. A "scale factor" "stability" of less (better) than 130 ppm with respect to a fixed calibration value over a period of one year;

2. Specified to function at linear acceleration levels exceeding 15 g and having all of the following:

a. A "bias" "repeatability" of less (better) than 5,000 micro g over a period of one year; and

b. A "scale factor" "repeatability" of less (better) than 2,500 ppm over a period of one year; or

3. Designed for use in inertial navigation or guidance systems and specified to function at linear acceleration levels exceeding 100 g;

b. Angular or rotational accelerometers specified to function at linear acceleration levels exceeding 100 g.

THE SCHEDULE — *continued*

Category Code	*Item Description*
7A002	Gyros, and angular rate sensors, having any of the following and specially designed components therefor:

N.B.

See also Category Code 7A102.

For angular or rotational accelerometers, see Category Code 7A001.b.

a. A "bias" "stability", when measured in a 1 g environment over a period of one month, and with respect to a fixed calibration value of less (better) than 0.5 degree per hour when specified to function at linear acceleration levels up to and including 100 g;

b. An "angle random walk" of less (better) than or equal to 0.0035 degree per square root hour;

Note

Category Code 7A002.b. does not include 'spinning mass gyros'.

Technical Note

'Spinning mass gyros' are gyros which use a continually rotating mass to sense angular motion.

c. A rate range greater than or equal to 500 degrees per second and having any of the following:

1. A "bias" "stability", when measured in a 1 g environment over a period of three minutes and with respect to a fixed calibration value of less (better) than 40 degrees per hour; or

2. An "angle random walk" of less (better) than or equal to 0.2 degree per square root hour; or

d. Specified to function at linear acceleration levels exceeding 100 g.

7A003	Inertial systems and specially designed components, as follows:

N.B.

See also Category Code 7A103.

THE SCHEDULE — *continued*

Category Code	*Item Description*

a. Inertial Navigation Systems (INS) (gimballed or strapdown) and inertial equipment designed for "aircraft", land vehicle, vessels (surface or underwater) or "spacecraft" for navigation, attitude, guidance or control and having any of the following and specially designed components therefor:

1. Navigation error (free inertial) subsequent to normal alignment of 0.8 nautical mile per hour (nm/hr) 'Circular Error Probable' (CEP) or less (better); <u>or</u>

2. Specified to function at linear acceleration levels exceeding 10 g;

b. Hybrid Inertial Navigation Systems embedded with Global Navigation Satellite Systems(s) (GNSS) or with "Data-Based Referenced Navigation" ("DBRN") System(s) for navigation, attitude, guidance or control, subsequent to normal alignment and having an INS navigation position accuracy, after loss of GNSS or "DBRN" for a period of up to four minutes, of less (better) than 10 metres 'Circular Error Probable' (CEP);

c. Inertial Measurement equipment for heading, or True North determination and having any of the following and specially designed components therefor:

1. Designed to have heading, or True North determination accuracy equal to or less (better) than 0.07 deg sec (Lat) (equivalent to 6 arc minutes rms at 45 degrees latitude); <u>or</u>

2. Designed to have a non-operating shock level of 900 g or greater at a duration of 1 msec, or greater;

d. Inertial measurement equipment including Inertial Measurement Units (IMU) and Inertial Reference Systems (IRS), incorporating accelerometers or gyros specified in Category Code 7A001 or 7A002, and specially designed components therefor.

<u>*Note 1*</u>

The parameters of Category Codes 7A003.a. and 7A003.b. are applicable with any of the following environmental conditions:

a. Input random vibration with an overall magnitude of 7.7 g rms in the first 0.5 hour and a total test duration of 1.5hour

THE SCHEDULE — *continued*

Category Code	*Item Description*
	per axis in each of the 3 perpendicular axes, when the random vibration meets all the following: *1. A constant Power Spectral Density (PSD) value of 0.04 g^2/Hz over a frequency interval of 15 Hz to 1,000 Hz; <u>and</u>* *2. The PSD attenuates with frequency from 0.04 g^2/Hz to 0.01 g^2/Hz over a frequency interval from 1,000 Hz to 2,000 Hz;* *b. An angular rate capability about one or more axes of equal to or more than +2.62 rad/s (150 deg/s); <u>or</u>* *c. According to national standards equivalent to a. or b. above.* <u>*Note 2*</u> *Category Code 7A003 does not include inertial navigation systems which are certified for use on "civil aircraft" by civil aviation authorities of a "participating state".* <u>*Note 3*</u> *Category Code 7A003.c.1. does not include theodolite systems incorporating inertial equipment specially designed for civil surveying purposes.* <u>*Technical Notes*</u> 1. Category Code 7A003.b. applies to systems in which an INS and other independent navigation aids are built into a single unit (embedded) in order to achieve improved performance. 2. 'Circular Error Probable' (CEP) means, in a circular normal distribution, the radius of the circle containing 50% of the individual measurements being made, or the radius of the circle within which there is a 50% probability of being located.
7A004	Gyro-astro compasses and other devices which derive position or orientation by means of automatically tracking celestial bodies or satellites, with an azimuth accuracy of equal to or less (better) than 5 seconds of arc. <u>***N.B.***</u> ***See also Category Code 7A104.***

THE SCHEDULE — *continued*

Category Code	*Item Description*
7A005	Global navigation satellite systems (i.e., GPS or GLONASS) receiving equipment having any of the following and specially designed components therefor: ***N.B.*** ***See also Category Code 7A105.*** a. Employing decryption; or b. Incorporating a null-steerable antenna.
7A006	Airborne altimeters operating at frequencies other than 4.2 GHz to 4.4 GHz inclusive and having any of the following: ***N.B.*** ***See also Category Code 7A106.*** a. "Power management"; or b. Using phase shift key modulation.
7A008	Underwater sonar navigation systems using doppler velocity or correlation velocity logs integrated with a heading source and having a positioning accuracy of equal to or less (better) than 3% of distance travelled 'Circular Error Probable' ('CEP') and specially designed components therefor. *Note* *Category Code 7A008 does not include systems specially designed for installation on surface vessels or systems requiring acoustic beacons or buoys to provide positioning data.* ***N.B.*** ***See Category Code 6A001.a. for acoustic systems, and Category Code 6A001.b. for correlation-velocity and Doppler-velocity sonar log equipment.*** ***See Category Code 8A002 for other marine systems.***
7A101	Linear accelerometers, other than those specified in Category Code 7A001, designed for use in inertial navigation systems or in guidance systems of all types, usable in 'missiles', having all the following characteristics, and specially designed components therefor:

THE SCHEDULE — *continued*

Category Code	*Item Description*
	a. A “bias” “repeatability” of less (better) than 1,250 micro g; and
	b. A “scale factor” “repeatability” of less (better) than 1,250 ppm.
	Note
	Category Code 7A101 does not include accelerometers which are specially designed and developed as MWD (Measurement While Drilling) Sensors for use in downhole well service operations.
	Technical Notes
	1. In Category Code 7A101 ‘missile’ means complete rocket systems and unmanned aerial vehicle systems capable of a range exceeding 300 km;
	2. In Category Code 7A101 the measurement of “bias” and “scale factor” refers to a one sigma standard deviation with respect to a fixed calibration over a period of one year.
7A102	All types of gyros, other than those specified in Category Code 7A002, usable in ‘missiles’, with a rated “drift rate” ‘stability’ of less than 0.5º (1 sigma or rms) per hour in a 1 g environment and specially designed components therefor.
	Technical Note
	1. In Category Code 7A102 ‘missile’ means complete rocket systems and unmanned aerial vehicle systems capable of a range exceeding 300 km.
	2. In Category Code 7A102, ‘stability’ is defined as a measure of the ability of a specific mechanism or performance coefficient to remain invariant when continuously exposed to a fixed operating condition (IEEE STD 528-2001 paragraph 2.247).
7A103	Instrumentation, navigation equipment and systems, other than those specified in Category Code 7A003, as follows; and specially designed components therefor:
	a. Inertial or other equipment, using accelerometers or gyros as follows, and systems incorporating such equipment:

THE SCHEDULE — *continued*

Category Code	*Item Description*
	1. Accelerometers specified in Category Code 7A001.a.3., 7A001.b. or 7A101 or gyros specified in Category Code 7A002 or 7A102;
	2. Accelerometers specified in Category Code 7A001.a.1. or 7A001.a.2. and having all of the following:
	a. Designed for use in inertial navigation systems or in guidance systems of all types and usable in ‘missiles’;
	b. A “bias” “repeatability” of less (better) than 1,250 micro g; <u>and</u>
	c. A “scale factor” “repeatability” of less (better) than 1,250 ppm;
	<u>Note</u>
	Category Code 7A103.a. does not include equipment containing accelerometers specified in Category Code 7A001 where such accelerometers are specially designed and developed as MWD (Measurement While Drilling) sensors for use in downhole well services operations.
	b. Integrated flight instrument systems which include gyrostabilisers or automatic pilots, designed or modified for use in ‘missiles’;
	c. ‘Integrated navigation systems’, designed or modified for ‘missiles’ and capable of providing a navigational accuracy of 200 m Circle of Equal Probability (CEP) or less.
	<u>Technical Notes</u>
	An ‘integrated navigation system’ typically incorporates the following components:
	1. An inertial measurement device (e.g., an attitude and heading reference system, inertial reference unit, or inertial navigation system);
	2. One or more external sensors used to update the position and/or velocity, either periodically or continuously throughout the flight (e.g., satellite navigation receiver, radar altimeter, and/or Doppler radar); <u>and</u>
	3. Integration hardware and software.

THE SCHEDULE — *continued*

Category Code	*Item Description*
	d. Three axis magnetic heading sensors, designed or modified to be integrated with flight control and navigation systems, having all the following characteristics, and specially designed components therefor:
	1. Internal tilt compensation in pitch (±90 degrees) and roll (±180 degrees) axes; <u>and</u>
	2. Capable of providing azimuthal accuracy better (less) than 0.5 degrees rms at latitude of ±80 degrees, reference to local magnetic field.
	<u>Note</u>
	Flight control and navigation systems in Category Code 7A103.d. include gyrostabilisers, automatic pilots and inertial navigation systems.
	<u>Technical Note</u>
	In Category Code 7A103 'missile' means complete rocket systems and unmanned aerial vehicle systems capable of a range exceeding 300 km.
7A104	Gyro-astro compasses and other devices, other than those specified in Category Code 7A004, which derive position or orientation by means of automatically tracking celestial bodies or satellites and specially designed components therefor.
7A105	Receiving equipment for Global Navigation Satellite Systems (GNSS; e.g., GPS, GLONASS, or Galileo), having any of the following characteristics, and specially designed components therefor:
	a. Designed or modified for use in space launch vehicles specified in Category Code 9A004, unmanned aerial vehicles specified in Category Code 9A012 or sounding rockets specified in Category Code 9A104; <u>or</u>
	b. Designed or modified for airborne applications and having any of the following:
	1. Capable of providing navigation information at speeds in excess of 600 m/s;

THE SCHEDULE — *continued*

Category Code	*Item Description*
	2. Employing decryption, designed or modified for military or governmental services, to gain access to GNSS secured signal/data; <u>or</u>
	3. Being specially designed to employ anti-jam features (e.g., null steering antenna or electronically steerable antenna) to function in an environment of active or passive countermeasures.
	<u>*Note*</u>
	Category Codes 7A105.b.2. and 7A105.b.3. do not include equipment designed for commercial, civil or 'Safety of Life' (e.g., data integrity, flight safety) GNSS services.
7A106	Altimeters, other than those specified in Category Code 7A006, of radar or laser radar type, designed or modified for use in space launch vehicles specified in Category Code 9A004 or sounding rockets specified in Category Code 9A104.
7A115	Passive sensors for determining bearing to specific electromagnetic source (direction finding equipment) or terrain characteristics, designed or modified for use in space launch vehicles specified in Category Code 9A004 or sounding rockets specified in Category Code 9A104.
	<u>*Note*</u>
	Category Code 7A115 includes sensors for the following equipment:
	a. Terrain contour mapping equipment;
	b. Imaging sensor equipment (both active and passive);
	c. Passive interferometer equipment.
7A116	Flight control systems and servo valves, as follows; designed or modified for use in space launch vehicles specified in Category Code 9A004 or sounding rockets specified in Category Code 9A104.
	a. Hydraulic, mechanical, electro-optical, or electro-mechanical flight control systems (including fly-by-wire types);
	b. Attitude control equipment;

THE SCHEDULE — *continued*

Category Code	*Item Description*
	c. Flight control servo valves designed or modified for the systems specified in Category Code 7A116.a. or 7A116.b., and designed or modified to operate in a vibration environment greater than 10 g rms between 20 Hz and 2 kHz.
7A117	"Guidance sets", usable in "missiles" capable of achieving system accuracy of 3.33% or less of the range (e.g., a "CEP" of 10 km or less at a range of 300 km).
7B	**Test, Inspection and Production Equipment**
7B001	Test, calibration or alignment equipment specially designed for equipment specified in Category 7A.

Note

Category Code 7B001 does not include test, calibration or alignment equipment for 'Maintenance Level I' or 'Maintenance Level II'.

Technical Notes

1. 'Maintenance Level I'

The failure of an inertial navigation unit is detected on the aircraft by indications from the Control and Display Unit (CDU) or by the status message from the corresponding subsystem. By following the manufacturer's manual, the cause of the failure may be localised at the level of the malfunctioning Line Replaceable Unit (LRU). The operator then removes the LRU and replaces it with a spare.

2. 'Maintenance Level II'

The defective LRU is sent to the maintenance workshop (the manufacturer's or that of the operator responsible for Level II maintenance). At the maintenance workshop, the malfunctioning LRU is tested by various appropriate means to verify and localise the defective Shop Replaceable Assembly (SRA) module responsible for the failure. This SRA is removed and replaced by an operative spare. The defective SRA (or possibly the complete LRU) is then shipped to the manufacturer.

Note

THE SCHEDULE — *continued*

Category Code	Item Description
	'Maintenance Level II' does not include the removal of controlled accelerometers or gyro sensors from the SRA.
7B002	Equipment specially designed to characterise mirrors for ring "laser" gyros, as follows: ***N.B.*** ***See also Category Code 7B102.*** a. Scatterometers having a measurement accuracy of 10 ppm or less (better); b. Profilometers having a measurement accuracy of 0.5 nm (5 angstrom) or less (better).
7B003	Equipment specially designed for the "production" of equipment specified in Category 7A. *Note* *Category Code 7B003 includes:* − Gyro tuning test stations; − Gyro dynamic balance stations; − Gyro run-in/motor test stations; − Gyro evacuation and fill stations; − Centrifuge fixtures for gyro bearings; − Accelerometer axis align stations; − Fibre optic gyro coil winding machines.
7B102	Reflectometers specially designed to characterise mirrors, for "laser" gyros, having a measurement accuracy of 50 ppm or less (better).
7B103	"Production facilities" and "production equipment" as follows: a. "Production facilities" specially designed for equipment specified in Category Code 7A117; b. "Production equipment", and other test, calibration and alignment equipment, other than that specified in Category Codes 7B001 to 7B003, designed or modified to be used with equipment specified in Category 7A.

THE SCHEDULE — *continued*

Category Code	*Item Description*
7C	**Materials**
	None.
7D	**Software**
7D001	"Software" specially designed or modified for the "development" or "production" of equipment specified in Category 7A or 7B.
7D002	"Source code" for the "use" of any inertial navigation equipment, including inertial equipment not specified in Category Code 7A003 or 7A004, or Attitude and Heading Reference Systems ('AHRS').
	<u>*Note*</u>
	Category Code 7D002 does not include "source code" for the "use" of gimballed 'AHRS'.
	<u>*Technical Note*</u>
	'AHRS' generally differ from Inertial Navigation Systems (INS) in that an 'AHRS' provides attitude and heading information and normally does not provide the acceleration, velocity and position information associated with an INS.
7D003	Other "software", as follows:
	a. "Software" specially designed or modified to improve the operational performance or reduce the navigational error of systems to the levels specified in Category Code 7A003, 7A004 or 7A008;
	b. "Source code" for hybrid integrated systems which improves the operational performance or reduces the navigational error of systems to the level specified in Category Code 7A003 or 7A008 by continuously combining heading data with any of the following:
	1. Doppler radar or sonar velocity data;
	2. Global navigation satellite systems (i.e., GPS or GLONASS) reference data; <u>or</u>
	3. Data from "Data-Based Referenced Navigation" ("DBRN") systems;
	c. "Source code" for integrated avionics or mission systems which combine sensor data and employ "expert systems";

THE SCHEDULE — *continued*

Category Code	*Item Description*
	d. "Source code" for the "development" of any of the following: 1. Digital flight management systems for "total control of flight"; 2. Integrated propulsion and flight control systems; 3. Fly-by-wire or fly-by-light control systems; 4. Fault-tolerant or self-reconfiguring "active flight control systems"; 5. Airborne automatic direction finding equipment; 6. Air data systems based on surface static data; <u>or</u> 7. Raster-type head-up displays or three dimensional displays;
	e. Computer-Aided-Design (CAD) "software" specially designed for the "development" of "active flight control systems", helicopter multi-axis fly-by-wire or fly-by-light controllers or helicopter "circulation controlled anti-torque or circulation-controlled direction control systems" whose "technology" is specified in Category Code 7E004.b., 7E004.c.1. or 7E004.c.2.
7D101	"Software" specially designed or modified for the "use" of equipment specified in Category Code 7A001 to 7A006, 7A101 to 7A106, 7A115, 7A116.a., 7A116.b., 7B001, 7B002, 7B003, 7B102 or 7B103.
7D102	Integration "software" as follows: a. Integration "software" for the equipment specified in Category Code 7A103.b.; b. Integration "software" specially designed for the equipment specified in Category Code 7A003 or 7A103.a.; c. Integration "software" designed or modified for the equipment specified in Category Code 7A103.c. <u>Note</u> *A common form of integration "software" employs Kalman filtering.*

THE SCHEDULE — *continued*

Category Code	*Item Description*
7D103	"Software" specially designed for modelling or simulation of the "guidance sets" specified in Category Code 7A117 or for their design integration with the space launch vehicles specified in Category Code 9A004 or sounding rockets specified in Category Code 9A104. *Note* *"Software" specified in Category Code 7D103 remains within the description in that Category when combined with specially designed hardware specified in Category Code 4A102.*
7E	**Technology**
7E001	"Technology" (according to the General Technology Note) for the "development" of equipment or "software" specified in Category 7A, 7B or 7D.
7E002	"Technology" (according to the General Technology Note) for the "production" of equipment specified in Category 7A or 7B.
7E003	"Technology" (according to the General Technology Note) for the repair, refurbishing or overhaul of equipment specified in Category Codes 7A001 to 7A004. *Note* *Category Code 7E003 does not include maintenance "technology" directly associated with calibration, removal or replacement of damaged or unserviceable LRUs and SRAs of a "civil aircraft" as described in 'Maintenance Level I' or 'Maintenance Level II'.* ***N.B.*** ***See Technical Notes to Category Code 7B001.***
7E004	Other "technology", as follows: a. "Technology" for the "development" or "production" of any of the following: 1. Airborne automatic direction finding equipment operating at frequencies exceeding 5 MHz; 2. Air data systems based on surface static data only, i.e., which dispense with conventional air data probes;

THE SCHEDULE — *continued*

Category Code	*Item Description*

3. Raster-type head-up displays or three dimensional displays for "aircraft";
4. Inertial navigation systems or gyro-astro compasses containing accelerometers or gyros specified in Category Code 7A001 or 7A002;
5. Electric actuators (i.e., electromechanical, electrohydrostatic and integrated actuator package) specially designed for "primary flight control";
6. "Flight control optical sensor array" specially designed for implementing "active flight control systems"; or
7. "DBRN" systems designed to navigate underwater, using sonar or gravity databases that provide a positioning accuracy equal to or less (better) than 0.4 nautical miles;

b. "Development" "technology", as follows, for "active flight control systems" (including fly-by-wire or fly-by-light):

1. Configuration design for interconnecting multiple microelectronic processing elements (on-board computers) to achieve "real time processing" for control law implementation;
2. Control law compensation for sensor location or dynamic airframe loads, i.e., compensation for sensor vibration environment or for variation of sensor location from the centre of gravity;
3. Electronic management of data redundancy or systems redundancy for fault detection, fault tolerance, fault isolation or reconfiguration;

Note

Category Code 7E004.b.3. does not include "technology" for the design of physical redundancy.

4. Flight controls which permit inflight reconfiguration of force and moment controls for real time autonomous air vehicle control;

THE SCHEDULE — *continued*

Category Code	*Item Description*
	5. Integration of digital flight control, navigation and propulsion control data, into a digital flight management system for "total control of flight";
	<u>*Note*</u>
	Category Code 7E004.b.5. does not include:
	a. "Development" "technology" for integration of digital flight control, navigation and propulsion control data, into a digital flight management system for "flight path optimisation";
	b. "Development" "technology" for "aircraft" flight instrument systems integrated solely for VOR, DME, ILS or MLS navigation or approaches.
	6. Full authority digital flight control or multisensor mission management systems employing "expert systems";
	<u>***N.B.***</u>
	For "technology" for Full Authority Digital Engine Control ("FADEC"), see Category Code 9E003.a.9.
	c. "Technology" for the "development" of helicopter systems, as follows:
	1. Multi-axis fly-by-wire or fly-by-light controllers, which combine the functions of at least two of the following into one controlling element:
	a. Collective controls;
	b. Cyclic controls;
	c. Yaw controls;
	2. "Circulation-controlled anti-torque or circulation-controlled directional control systems";
	3. Rotor blades incorporating "variable geometry airfoils", for use in systems using individual blade control.
7E101	"Technology" (according to the General Technology Note) for the "use" of equipment specified in Category Code 7A001 to 7A006, 7A101 to 7A106, 7A115 to 7A117, 7B001, 7B002, 7B003, 7B102, 7B103 or 7D101 to 7D103.

THE SCHEDULE — *continued*

Category Code	*Item Description*
7E102	"Technology" for protection of avionics and electrical subsystems against electromagnetic pulse (EMP) and electromagnetic interference (EMI) hazards, from external sources, as follows: a. Design "technology" for shielding systems; b. Design "technology" for the configuration of hardened electrical circuits and subsystems; c. Design "technology" for the determination of hardening criteria of Category Codes 7E102.a. and 7E102.b.
7E104	"Technology" for the integration of the flight control, guidance, and propulsion data into a flight management system for optimisation of rocket system trajectory.
CATEGORY 8 — MARINE	
8A	**Systems, Equipment and Components**
8A001	Submersible vehicles and surface vessels, as follows: ***N.B.*** ***For equipment for submersible vehicles, see:*** − Category 5, Part 2 "Information Security" for encrypted communication equipment; − Category 6 for sensors; − Categories 7 and 8 for navigation equipment; − Category 8A for underwater equipment. a. Manned, tethered submersible vehicles designed to operate at depths exceeding 1,000 m; b. Manned, untethered submersible vehicles, having any of the following: 1. Designed to 'operate autonomously' and having a lifting capacity of all the following: a. 10% or more of their weight in air; and b. 15 kN or more; 2. Designed to operate at depths exceeding 1,000 m; or

THE SCHEDULE — *continued*

Category Code	*Item Description*

3. Having all of the following:

   a. Designed to continuously ‘operate autonomously’ for 10 hours or more; <u>and</u>

   b. ‘Range’ of 25 nautical miles or more;

   <u>*Technical Notes*</u>

   1. *For the purposes of Category Code 8A001.b., ‘operate autonomously’ means fully submerged, without snorkel, all systems working and cruising at minimum speed at which the submersible can safely control its depth dynamically by using its depth planes only, with no need for a support vessel or support base on the surface, sea-bed or shore, and containing a propulsion system for submerged or surface use.*

   2. *For the purposes of Category Code 8A001.b., ‘range’ means half the maximum distance a submersible vehicle can ‘operate autonomously’.*

c. Unmanned, tethered submersible vehicles designed to operate at depths exceeding 1,000 m and having any of the following:

   1. Designed for self-propelled manoeuvre using propulsion motors or thrusters specified in Category Code 8A002.a.2.; <u>or</u>

   2. Fibre optic data link;

d. Unmanned, untethered submersible vehicles, having any of the following:

   1. Designed for deciding a course relative to any geographical reference without real-time human assistance;

   2. Acoustic data or command link; <u>or</u>

   3. Fibre optic data or command link exceeding 1,000 m;

e. Ocean salvage systems with a lifting capacity exceeding 5 MN for salvaging objects from depths exceeding 250 m and having any of the following:

THE SCHEDULE — *continued*

Category Code	*Item Description*
	1. Dynamic positioning systems capable of position keeping within 20 m of a given point provided by the navigation system; <u>or</u> 2. Seafloor navigation and navigation integration systems for depths exceeding 1,000 m and with positioning accuracies to within 10 m of a predetermined point; f. Surface-effect vehicles (fully skirted variety) having all of the following: 1. Maximum design speed, fully loaded, exceeding 30 knots in a significant wave height of 1.25 m (Sea State 3) or more; 2. Cushion pressure exceeding 3,830 Pa; <u>and</u> 3. Light-ship-to-full-load displacement ratio of less than 0.70; g. Surface-effect vehicles (rigid sidewalls) with a maximum design speed, fully loaded, exceeding 40 knots in a significant wave height of 3.25 m (Sea State 5) or more; h. Hydrofoil vessels with active systems for automatically controlling foil systems, with a maximum design speed, fully loaded, of 40 knots or more in a significant wave height of 3.25 m (Sea State 5) or more; i. 'Small waterplane area vessels' having any of the following: 1. Full load displacement exceeding 500 tonnes with a maximum design speed, fully loaded, exceeding 35 knots in a significant wave height of 3.25 m (Sea State 5) or more; <u>or</u> 2. Full load displacement exceeding 1,500 tonnes with a maximum design speed, fully loaded, exceeding 25 knots in a significant wave height of 4 m (Sea State 6) or more. <u>*Technical Note*</u> *A 'small waterplane area vessel' is defined by the following formula: waterplane area at an operational design draught less than 2 × (displaced volume at the operational design draught)* $^{2/3}$.
8A002	Marine systems, equipment and components, as follows:

THE SCHEDULE — *continued*

Category Code	*Item Description*

_N.B._

For underwater communications systems, see Category 5, Part 1 — Telecommunications.

a. Systems, equipment and components, specially designed or modified for submersible vehicles and designed to operate at depths exceeding 1,000 m, as follows:

1. Pressure housings or pressure hulls with a maximum inside chamber diameter exceeding 1.5 m;
2. Direct current propulsion motors or thrusters;
3. Umbilical cables, and connectors therefor, using optical fibre and having synthetic strength members;
4. Components manufactured from material specified in Category Code 8C001;

Technical Note

Category Code 8A002.a.4. includes 'syntactic foam' specified in Category Code 8C001 when an intermediate stage of manufacture has been performed and it is not yet in the final component form.

b. Systems specially designed or modified for the automated control of the motion of submersible vehicles specified in Category Code 8A001, using navigation data, having closed loop servo-controls and having any of the following:

1. Enabling a vehicle to move within 10 m of a predetermined point in the water column;
2. Maintaining the position of the vehicle within 10 m of a predetermined point in the water column; or
3. Maintaining the position of the vehicle within 10 m while following a cable on or under the seabed;

c. Fibre optic hull penetrators or connectors;

d. Underwater vision systems, as follows:

1. Television systems and television cameras, as follows:

THE SCHEDULE — *continued*

Category Code	*Item Description*
	a. Television systems (comprising camera, monitoring and signal transmission equipment) having a limiting resolution when measured in air of more than 800 lines and specially designed or modified for remote operation with a submersible vehicle;
	b. Underwater television cameras having a 'limiting resolution' when measured in air of more than 1,100 lines;
	c. Low light level television cameras specially designed or modified for underwater use and having all of the following:
	1. Image intensifier tubes specified in Category Code 6A002.a.2.a.; <u>and</u>
	2. More than 150,000 "active pixels" per solid state area array;
	<u>*Technical Note*</u>
	'Limiting resolution' is a measure of horizontal resolution usually expressed in terms of the maximum number of lines per picture height discriminated on a test chart, using IEEE Standard 208/1960 or any equivalent standard.
	2. Systems specially designed or modified for remote operation with an underwater vehicle, employing techniques to minimise the effects of back scatter and including range-gated illuminators or "laser" systems;
	e. Photographic still cameras specially designed or modified for underwater use below 150 m, with a film format of 35 mm or larger and having any of the following:
	1. Annotation of the film with data provided by a source external to the camera;
	2. Automatic back focal distance correction; <u>or</u>
	3. Automatic compensation control specially designed to permit an underwater camera housing to be usable at depths exceeding 1,000 m;

THE SCHEDULE — *continued*

Category Code	*Item Description*

f. Electronic imaging systems specially designed or modified for underwater use and having any of the following:

1. Image intensifier tubes specified in Category Code 6A002.a.2.a. or 6A002.a.2.b., and using electron image amplification other than by microchannel plate; or

2. Non-"space-qualified" "focal plane arrays" specified in Category Code 6A002.a.3.g.;

g. Light systems specially designed or modified for underwater use, as follows:

1. Stroboscopic light systems capable of a light output energy of more than 300 J per flash and a flash rate of more than 5 flashes per second;

2. Argon arc light systems specially designed for use below 1,000 m;

h. "Robots" specially designed for underwater use, controlled by using a dedicated computer and having any of the following:

1. Systems that control the "robot" using information from sensors which measure force or torque applied to an external object, distance to an external object, or tactile sense between the "robot" and an external object; or

2. The ability to exert a force of 250 N or more or a torque of 250 Nm or more and using titanium based alloys or "composite" "fibrous or filamentary materials" in their structural members;

i. Remotely controlled articulated manipulators specially designed or modified for use with submersible vehicles, having any of the following:

1. Systems which control the manipulator using the information from sensors which measure the torque or force applied to an external object, or tactile sense between the manipulator and an external object; or

2. Controlled by proportional master-slave techniques or by using a dedicated computer and having 5 degrees of 'freedom of movement' or more;

THE SCHEDULE — *continued*

Category Code	*Item Description*

Technical Note

Only functions having proportional control using positional feedback or by using a dedicated computer are counted when determining the number of degrees of 'freedom of movement'.

j. Air independent power systems, specially designed for underwater use as follows:

1. Brayton or Rankine cycle engine air independent power systems having any of the following:

   a. Chemical scrubber or absorber systems, specially designed to remove carbon dioxide, carbon monoxide and particulates from recirculated engine exhaust;

   b. Systems specially designed to use a monoatomic gas;

   c. Devices or enclosures specially designed for underwater noise reduction in frequencies below 10 kHz, or special mounting devices for shock mitigation; or

   d. Systems having all of the following:

      1. Specially designed to pressurise the products of reaction or for fuel reformation;

      2. Specially designed to store the products of the reaction; and

      3. Specially designed to discharge the products of the reaction against a pressure of 100 kPa or more;

2. Diesel cycle engine air independent systems having all of the following:

   a. Chemical scrubber or absorber systems, specially designed to remove carbon dioxide, carbon monoxide and particulates from recirculated engine exhaust;

   b. Systems specially designed to use a monoatomic gas;

   c. Devices or enclosures specially designed for underwater noise reduction in frequencies below 10 kHz or special mounting devices for shock mitigation; and

   d. Specially designed exhaust systems that do not exhaust continuously the products of combustion;

THE SCHEDULE — *continued*

Category Code	*Item Description*
	3. Fuel cell air independent power systems with an output exceeding 2 kW and having any of the following: a. Devices or enclosures specially designed for underwater noise reduction in frequencies below 10 kHz or special mounting devices for shock mitigation; or b. Systems having all of the following: 1. Specially designed to pressurise the products of reaction or for fuel reformation; 2. Specially designed to store the products of the reaction; and 3. Specially designed to discharge the products of the reaction against a pressure of 100 kPa or more; 4. Stirling cycle engine air independent power systems having all of the following: a. Devices or enclosures, specially designed for underwater noise reduction in frequencies below 10 kHz or special mounting devices for shock mitigation; and b. Specially designed exhaust systems which discharge the products of combustion against a pressure of 100 kPa or more; k. Skirts, seals and fingers, having any of the following: 1. Designed for cushion pressures of 3,830 Pa or more, operating in a significant wave height of 1.25 m (Sea State 3) or more and specially designed for surface effect vehicles (fully skirted variety) specified in Category Code 8A001.f.; or 2. Designed for cushion pressures of 6,224 Pa or more, operating in a significant wave height of 3.25 m (Sea State 5) or more and specially designed for surface effect vehicles (rigid sidewalls) specified in Category Code 8A001.g.; l. Lift fans rated at more than 400 kW and specially designed for surface effect vehicles specified in Category Code 8A001.f. or 8A001.g.;

THE SCHEDULE — *continued*

Category Code	*Item Description*
	m. Fully submerged subcavitating or supercavitating hydrofoils, specially designed for vessels specified in Category Code 8A001.h.;
	n. Active systems specially designed or modified to control automatically the sea-induced motion of vehicles or vessels specified in Category Code 8A001.f., 8A001.g., 8A001.h. or 8A001.i.;
	o. Propellers, power transmission systems, power generation systems and noise reduction systems, as follows:
	1. Water-screw propeller or power transmission systems, as follows, specially designed for surface effect vehicles (fully skirted or rigid sidewall variety), hydrofoils or 'small waterplane area vessels' specified in Category Code 8A001.f., 8A001.g., 8A001.h. or 8A001.i., as follows:
	a. Supercavitating, super-ventilated, partially-submerged or surface piercing propellers rated at more than 7.5 MW;
	b. Contrarotating propeller systems rated at more than 15 MW;
	c. Systems employing pre-swirl or post-swirl techniques, for smoothing the flow into a propeller;
	d. Light-weight, high capacity (K factor exceeding 300) reduction gearing;
	e. Power transmission shaft systems incorporating "composite" material components and capable of transmitting more than 1 MW;
	2. Water-screw propeller, power generation systems or transmission systems, designed for use on vessels, as follows:
	a. Controllable-pitch propellers and hub assemblies, rated at more than 30 MW;
	b. Internally liquid-cooled electric propulsion engines with a power output exceeding 2.5 MW;

THE SCHEDULE — *continued*

Category Code	*Item Description*
	c. “Superconductive” propulsion engines, or permanent magnet electric propulsion engines, with a power output exceeding 0.1 MW;
	d. Power transmission shaft systems incorporating “composite” material components and capable of transmitting more than 2 MW;
	e. Ventilated or base-ventilated propeller systems rated at more than 2.5 MW;
	3. Noise reduction systems designed for use on vessels of 1,000 tonnes displacement or more, as follows:
	a. Systems that attenuate underwater noise at frequencies below 500 Hz and consist of compound acoustic mounts for the acoustic isolation of diesel engines, diesel generator sets, gas turbines, gas turbine generator sets, propulsion motors or propulsion reduction gears, specially designed for sound or vibration isolation and having an intermediate mass exceeding 30% of the equipment to be mounted;
	b. Active noise reduction or cancellation systems, or magnetic bearings, specially designed for power transmission systems, and incorporating electronic control systems capable of actively reducing equipment vibration by the generation of anti-noise or anti-vibration signals directly to the source;
	p. Pumpjet propulsion systems having a power output exceeding 2.5 MW using divergent nozzle and flow conditioning vane techniques to improve propulsive efficiency or reduce propulsion-generated underwater-radiated noise;
	q. Self-contained, closed or semi-closed circuit (rebreathing) diving and underwater swimming apparatus.
	Note
	Category Code 8A002.q. does not include an individual apparatus for personal use when accompanying its user.
8B	**Test, Inspection and Production Equipment**

THE SCHEDULE — *continued*

Category Code	*Item Description*
8B001	Water tunnels having a background noise of less than 100 dB (reference 1 μPa, 1 Hz), in the frequency range from 0 Hz to 500 Hz and designed for measuring acoustic fields generated by a hydro-flow around propulsion system models.
8C	**Materials**
8C001	'Syntactic foam' designed for underwater use and having all of the following: ***N.B.*** ***See also Category Code 8A002.a.4.*** a. Designed for marine depths exceeding 1,000 m; and b. A density less than 561 kg/m^3. Technical Note *'Syntactic foam' consists of hollow spheres of plastic or glass embedded in a resin matrix.*
8D	**Software**
8D001	"Software" specially designed or modified for the "development", "production" or "use" of equipment or materials, specified in Category 8A, 8B or 8C.
8D002	Specific "software" specially designed or modified for the "development", "production", repair, overhaul or refurbishing (re-machining) of propellers specially designed for underwater noise reduction.
8E	**Technology**
8E001	"Technology" (according to the General Technology Note) for the "development" or "production" of equipment or materials specified in Category 8A, 8B or 8C.
8E002	Other "technology", as follows: a. "Technology" for the "development", "production", repair, overhaul or refurbishing (re-machining) of propellers specially designed for underwater noise reduction;

THE SCHEDULE — *continued*

Category Code	*Item Description*

b. "Technology" for the overhaul or refurbishing of equipment specified in Category Code 8A001, 8A002.b., 8A002.j., 8A002.o. or 8A002.p.

CATEGORY 9 — AEROSPACE AND PROPULSION

9A **Systems, Equipment and Components**

N.B.

For propulsion systems designed or rated against neutron or transient ionising radiation, see Division 2 of Part I of this Schedule.

9A001 Aero gas turbine engines having any of the following:

N.B.

See also Category Code 9A101.

a. Incorporating any of the "technologies" specified in Category Code 9E003.a.; or

Note

Category Code 9A001.a. does not include aero gas turbine engines which meet all of the following:

a. Certified by the civil aviation authority of a "participating state"; and

b. Intended to power non-military manned aircraft for which any of the following has been issued by a "participating state":

1. A civil type certificate; or

2. An equivalent document recognised by the International Civil Aviation Organisation (ICAO).

b. Designed to power an aircraft to cruise at Mach 1 or higher for more than thirty minutes.

9A002 'Marine gas turbine engines' with an ISO standard continuous power rating of 24,245 kW or more and a specific fuel consumption not exceeding 0.219 kg/kWh in the power range from 35% to 100%, and specially designed assemblies and components therefor.

Note

THE SCHEDULE — *continued*

Category Code	*Item Description*
	The term 'marine gas turbine engines' includes those industrial, or aero-derivative, gas turbine engines adapted for a ship's electric power generation or propulsion.
9A003	Specially designed assemblies and components, incorporating any of the "technologies" specified in Category Code 9E003.a., for gas turbine engine propulsion systems and having any of the following: a. Specified in Category Code 9A001; or b. Whose design or production origins are either non-"participating state" or unknown to the manufacturer.
9A004	Space launch vehicles and "spacecraft". ***N.B.*** ***See also Category Code 9A104.*** *Note* *Category Code 9A004 does not include payloads.* ***N.B.*** ***For products contained in "spacecraft" payloads, see the appropriate Categories.***
9A005	Liquid rocket propulsion systems containing any of the systems or components specified in Category Code 9A006. ***N.B.*** ***See also Category Codes 9A105 and 9A119.***
9A006	Systems and components specially designed for liquid rocket propulsion systems, as follows: ***N.B.*** ***See also Category Codes 9A106, 9A108 and 9A120.*** a. Cryogenic refrigerators, flightweight dewars, cryogenic heat pipes or cryogenic systems specially designed for use in space vehicles and capable of restricting cryogenic fluid losses to less than 30% per year;

THE SCHEDULE — *continued*

Category Code	*Item Description*
	b. Cryogenic containers or closed-cycle refrigeration systems, capable of providing temperatures of 100 K (-173ºC) or less for “aircraft” capable of sustained flight at speeds exceeding Mach 3, launch vehicles or “spacecraft”;
	c. Slush hydrogen storage or transfer systems;
	d. High pressure (exceeding 17.5 MPa) turbo pumps, pump components or their associated gas generator or expander cycle turbine drive systems;
	e. High-pressure (exceeding 10.6 MPa) thrust chambers and nozzles therefor;
	f. Propellant storage systems using the principle of capillary containment or positive expulsion (i.e., with flexible bladders);
	g. Liquid propellant injectors with individual orifices of 0.381 mm or smaller in diameter (an area of 1.14×10^{-3} cm^2 or smaller for non-circular orifices) and specially designed for liquid rocket engines;
	h. One-piece carbon-carbon thrust chambers or one-piece carbon-carbon exit cones with densities exceeding 1.4 g/cm^3 and tensile strengths exceeding 48 MPa.
9A007	Solid rocket propulsion systems having any of the following:
	N.B.:
	See also Category Codes 9A107 and 9A119.
	a. Total impulse capacity exceeding 1.1 MNs;
	b. Specific impulse of 2.4 kNs/kg or more, when the nozzle flow is expanded to ambient sea level conditions for an adjusted chamber pressure of 7 MPa;
	c. Stage mass fractions exceeding 88% and propellant solid loadings exceeding 86%;
	d. Components specified in Category Code 9A008; or
	e. Insulation and propellant bonding systems, using direct-bonded motor designs to provide a ‘strong mechanical bond’

THE SCHEDULE — *continued*

Category Code	*Item Description*
	or a barrier to chemical migration between the solid propellant and case insulation material.
	Technical Note
	'Strong mechanical bond' means bond strength equal to or more than propellant strength.
9A008	Components specially designed for solid rocket propulsion systems, as follows:
	N.B.
	See also Category Code 9A108.
	a. Insulation and propellant bonding systems using liners to provide a 'strong mechanical bond' or a barrier to chemical migration between the solid propellant and case insulation material;
	Technical Note
	'Strong mechanical bond' means bond strength equal to or more than propellant strength.
	b. Filament-wound "composite" motor cases exceeding 0.61 m in diameter or having 'structural efficiency ratios (PV/W)' exceeding 25 km;
	Technical Note
	'Structural efficiency ratio (PV/W)' is the burst pressure (P) multiplied by the vessel volume (V) divided by the total pressure vessel weight (W).
	c. Nozzles with thrust levels exceeding 45 kN or nozzle throat erosion rates of less than 0.075 mm/s;
	d. Movable nozzle or secondary fluid injection thrust vector control systems, capable of any of the following:
	1. Omni-axial movement exceeding ±5º;
	2. Angular vector rotations of 20º/s or more; or
	3. Angular vector accelerations of 40º/s^2 or more.
9A009	Hybrid rocket propulsion systems having any of the following:

THE SCHEDULE — *continued*

Category Code	*Item Description*
	N.B.
	See also Category Codes 9A109 and 9A119.
	a. Total impulse capacity exceeding 1.1 MNs; or
	b. Thrust levels exceeding 220 kN in vacuum exit conditions.
9A010	Specially designed components, systems and structures for launch vehicles, launch vehicle propulsion systems or "spacecraft", as follows:
	N.B.
	See also Category Codes 1A002 and 9A110.
	a. Components and structures, each exceeding 10 kg and specially designed for launch vehicles manufactured using metal "matrix", "composite", organic "composite", ceramic "matrix" or intermetallic reinforced materials specified in Category Code 1C007 or 1C010;
	Note
	The weight cut-off is not relevant for nose cones.
	b. Components and structures, specially designed for launch vehicle propulsion systems specified in Category Codes 9A005 to 9A009 manufactured using metal "matrix", "composite", organic "composite", ceramic "matrix" or intermetallic reinforced materials, specified in Category Code 1C007 or 1C010;
	c. Structural components and isolation systems, specially designed to control actively the dynamic response or distortion of "spacecraft" structures;
	d. Pulsed liquid rocket engines with thrust-to-weight ratios equal to or more than 1 kN/kg and a response time (the time required to achieve 90% of total rated thrust from start-up) of less than 30 ms.
9A011	Ramjet, scramjet or combined cycle engines, and specially designed components therefor.
	N.B.
	See also Category Codes 9A111 and 9A118.

THE SCHEDULE — *continued*

Category Code	*Item Description*
9A012	"Unmanned aerial vehicles" ("UAVs"), associated systems, equipment and components, as follows: a. "UAVs" having any of the following: 1. An autonomous flight control and navigation capability (e.g., an autopilot with an Inertial Navigation System); <u>or</u> 2. Capability of controlled-flight out of the direct vision range involving a human operator (e.g., televisual remote control); b. Associated systems, equipment and components, as follows: 1. Equipment specially designed for remotely controlling the "UAVs" specified in Category Code 9A012.a.; 2. Systems for navigation, attitude, guidance or control systems, other than those specified in Category 7A and specially designed to provide autonomous flight control or navigation capability to "UAVs" specified in Category Code 9A012.a.; 3. Equipment and components specially designed to convert a manned "aircraft" to a "UAV" specified in Category Code 9A012.a.; 4. Air breathing reciprocating or rotary internal combustion type engines, specially designed or modified to propel "UAVs" at altitudes above 50,000 feet (15,240 metres).
9A101	Turbojet and turbofan engines (including turbocompound engines), other than those specified in Category Code 9A001, as follows: a. Engines having both of the following characteristics: 1. Maximum thrust value greater than 400 N (achieved un-installed) excluding civil certified engines with a maximum thrust value greater than 8,890 N (achieved un-installed), <u>and</u> 2. Specific fuel consumption of 0.15 kg/N/hr or less (at maximum continuous power at sea level static and standard conditions); b. Engines designed or modified for use in "missiles" or unmanned aerial vehicles specified in Category Code 9A012.

THE SCHEDULE — *continued*

Category Code	*Item Description*
9A102	'Turboprop engine systems' specially designed for unmanned aerial vehicles specified in Category Code 9A012, and specially designed components therefor, having a 'maximum power' greater than 10 kW. *Note* *Category Code 9A102 does not include civil certified engines.* *Technical Notes* *1. For the purposes of Category Code 9A102 a 'turboprop engine system' incorporates all of the following:* *a. Turboshaft engine; and* *b. Power transmission system to transfer the power to a propeller.* *2. For the purposes of Category Code 9A102 the 'maximum power' is achieved uninstalled at sea level standard conditions.*
9A104	Sounding rockets, capable of a range of at least 300 km. ***N.B.*** ***See also Category Code 9A004.***
9A105	Liquid propellant rocket engines, as follows: ***N.B.*** ***See also Category Code 9A119.*** a. Liquid propellant rocket engines usable in "missiles", other than those specified in Category Code 9A005, having a total impulse capacity equal to or greater than 1.1 MNs; b. Liquid propellant rocket engines, usable in complete rocket systems or unmanned aerial vehicles, capable of a range of 300 km, other than those specified in Category Code 9A005 or 9A105.a., having a total impulse capacity equal to or greater than 0.841 MNs.
9A106	Systems or components, other than those specified in Category Code 9A006 as follows, specially designed for liquid rocket propulsion systems:

THE SCHEDULE — *continued*

Category Code	*Item Description*
	a. Ablative liners for thrust or combustion chambers, usable in "missiles", space launch vehicles specified in Category Code 9A004 or sounding rockets specified in Category Code 9A104;
	b. Rocket nozzles, usable in "missiles", space launch vehicles specified in Category Code 9A004 or sounding rockets specified in Category Code 9A104;
	c. Thrust vector control subsystems, usable in "missiles";
	<u>*Technical Note*</u>
	Examples of methods of achieving thrust vector control specified in Category Code 9A106.c. are:
	1. Flexible nozzle;
	2. Fluid or secondary gas injection;
	3. Movable engine or nozzle;
	4. Deflection of exhaust gas stream (jet vanes or probes); <u>or</u>
	5. Thrust tabs.
	d. Liquid and slurry propellant (including oxidisers) control systems, and specially designed components therefor, usable in "missiles", designed or modified to operate in vibration environments greater than 10 g rms between 20 Hz and 2 kHz.
	<u>*Note*</u>
	The only servo valves and pumps specified in Category Code 9A106.d., are the following:
	a. Servo valves designed for flow rates equal to or greater than 24 litres per minute, at an absolute pressure equal to or greater than 7 MPa, that have an actuator response time of less than 100 ms;
	b. Pumps, for liquid propellants, with shaft speeds equal to or greater than 8,000 rpm or with discharge pressures equal to or greater than 7 MPa.
9A107	Solid propellant rocket engines, usable in complete rocket systems or unmanned aerial vehicles, capable of a range of 300 km, other

THE SCHEDULE — *continued*

Category Code	*Item Description*
	than those specified in Category Code 9A007, having total impulse capacity equal to or greater than 0.841 MNs.
	N.B.
	See also Category Code 9A119.
9A108	Components, other than those specified in Category Code 9A008, as follows, specially designed for solid rocket propulsion systems:
	a. Rocket motor cases and "insulation" components therefor, usable in "missiles", space launch vehicles specified in Category Code 9A004 or sounding rockets specified in Category Code 9A104;
	b. Rocket nozzles, usable in "missiles", space launch vehicles specified in Category Code 9A004 or sounding rockets specified in Category Code 9A104;
	c. Thrust vector control sub-systems, usable in "missiles".
	Technical Note
	Examples of methods of achieving thrust vector control specified in Category Code 9A108.c. are:
	1. Flexible nozzle;
	2. Fluid or secondary gas injection;
	3. Movable engine or nozzle;
	4. Deflection of exhaust gas stream (jet vanes or probes); or
	5. Thrust tabs.
9A109	Hybrid rocket motors, usable in 'missiles', other than those specified in Category Code 9A009, and specially designed components therefor.
	N.B.
	See also Category Code 9A119.
	Technical Note
	In Category Code 9A109 'missile' means complete rocket systems and unmanned aerial vehicle systems capable of a range exceeding 300 km.

THE SCHEDULE — *continued*

Category Code	*Item Description*
9A110	Composite structures, laminates and manufactures thereof, other than those specified in Category Code 9A010, specially designed for use in 'missiles' or the subsystems specified in Category Code 9A005, 9A007, 9A105, 9A106.c., 9A107, 9A108.c., 9A116 or 9A119. ***N.B.*** ***See also Category Code 1A002.*** *Technical Note* *In Category Code 9A110 'missiles' means complete rocket systems and unmanned aerial vehicle systems capable of a range exceeding 300 km.*
9A111	Pulse jet engines, usable in "missiles" or unmanned aerial vehicles specified in Category Code 9A102, and specially designed components therefor. ***N.B.*** ***See also Category Codes 9A011 and 9A118.***
9A115	Launch support equipment, as follows: a. Apparatus and devices for handling, control, activation or launching, designed or modified for space launch vehicles specified in Category Code 9A004, unmanned aerial vehicles specified in Category Code 9A012 or sounding rockets specified in Category Code 9A104; b. Vehicles for transport, handling, control, activation or launching, designed or modified for space launch vehicles specified in Category Code 9A004 or sounding rockets specified in Category Code 9A104.
9A116	Re-entry vehicles, usable in "missiles", and equipment designed or modified therefor, as follows: a. Re-entry vehicles; b. Heat shields and components therefor fabricated of ceramic or ablative materials; c. Heat sinks and components therefor fabricated of light-weight, high heat capacity materials;

THE SCHEDULE — *continued*

Category Code	*Item Description*
	d. Electronic equipment specially designed for re-entry vehicles.
9A117	Staging mechanisms, separation mechanisms, and interstages, usable in “missiles”.
9A118	Devices to regulate combustion usable in engines, which are usable in “missiles” or unmanned aerial vehicles specified in Category Code 9A102, specified in Category Code 9A011 or 9A111.
9A119	Individual rocket stages, usable in complete rocket systems or unmanned aerial vehicles, capable of a range of 300 km, other than those specified in Category Codes 9A005, 9A007, 9A009, 9A105, 9A107 and 9A109.
9A120	Liquid propellant tanks, other than those specified in Category Code 9A006, specially designed for propellants specified in Category Code 1C111 or ‘other liquid propellants’, used in rocket systems capable of delivering at least a 500 kg payload to a range of at least 300 km.
	Note
	In Category Code 9A120 ‘other liquid propellants’ includes, but is not limited to, propellants specified in Division 2 of Part I of this Schedule.
9A350	Spraying or fogging systems, specially designed or modified for fitting to aircraft, “lighter-than-air vehicles” or unmanned aerial vehicles, and specially designed components therefor, as follows:
	a. Complete spraying or fogging systems capable of delivering, from a liquid suspension, an initial droplet ‘VMD’ of less than 50 μm at a flow rate of greater than two litres per minute;
	b. Spray booms or arrays of aerosol generating units capable of delivering, from a liquid suspension, an initial droplet ‘VMD’ of less than 50 μm at a flow rate of greater than two litres per minute;
	c. Aerosol generating units specially designed for fitting to systems specified in Category Codes 9A350.a. and b.
	Note

THE SCHEDULE — *continued*

Category Code	*Item Description*
	Aerosol generating units are devices specially designed or modified for fitting to aircraft such as nozzles, rotary drum atomisers and similar devices.
	Note
	Category Code 9A350 does not include spraying or fogging systems and components that are demonstrated not to be capable of delivering biological agents in the form of infectious aerosols.
	Technical Notes
	1. Droplet size for spray equipment or nozzles specially designed for use on aircraft, "lighter-than-air vehicles" or unmanned aerial vehicles should be measured using either of the following:
	a. Doppler laser method;
	b. Forward laser diffraction method.
	2. In Category Code 9A350, 'VMD' means Volume Median Diameter and for water-based systems this equates to Mass Median Diameter (MMD).
9B	**Test, Inspection and Production Equipment**
9B001	Equipment, tooling and fixtures specially designed for manufacturing gas turbine blades, vanes or tip shroud castings, as follows:
	a. Directional solidification or single crystal casting equipment;
	b. Ceramic cores or shells;
9B002	On-line (real time) control systems, instrumentation (including sensors) or automated data acquisition and processing equipment, specially designed for the "development" of gas turbine engines, assemblies or components and incorporating "technologies" specified in Category Code 9E003.a.
9B003	Equipment specially designed for the "production" or test of gas turbine brush seals designed to operate at tip speeds exceeding 335 m/s and temperatures in excess of 773 K (500ºC), and specially designed components or accessories therefor.

THE SCHEDULE — *continued*

Category Code	*Item Description*
9B004	Tools, dies or fixtures for the solid state joining of "superalloy", titanium or intermetallic airfoil-to-disk combinations described in Category Code 9E003.a.3. or 9E003.a.6. for gas turbines.
9B005	On-line (real time) control systems, instrumentation (including sensors) or automated data acquisition and processing equipment, specially designed for use with any of the following: ***N.B.*** ***See also Category Code 9B105.*** a. Wind tunnels designed for speeds of Mach 1.2 or more; *Note* *Category Code 9B005.a. does not include wind tunnels specially designed for educational purposes and having a 'test section size' (measured laterally) of less than 250 mm.* *Technical Note* *'Test section size' means the diameter of the circle, or the side of the square, or the longest side of the rectangle, at the largest test section location.* b. Devices for simulating flow-environments at speeds exceeding Mach 5, including hot-shot tunnels, plasma arc tunnels, shock tubes, shock tunnels, gas tunnels and light gas guns; or c. Wind tunnels or devices, other than two-dimensional sections, capable of simulating Reynolds number flows exceeding 25×10^6.
9B006	Acoustic vibration test equipment capable of producing sound pressure levels of 160 dB or more (referenced to 20 μPa) with a rated output of 4 kW or more at a test cell temperature exceeding 1,273 K (1,000ºC), and specially designed quartz heaters therefor. ***N.B.*** ***See also Category Code 9B106.***
9B007	Equipment specially designed for inspecting the integrity of rocket motors using Non-Destructive Test (NDT) techniques other than planar X-ray or basic physical or chemical analysis.

THE SCHEDULE — *continued*

Category Code	*Item Description*
9B008	Transducers specially designed for the direct measurement of the wall skin friction of the test flow with a stagnation temperature exceeding 833 K (560ºC).
9B009	Tooling specially designed for producing turbine engine powder metallurgy rotor components capable of operating at stress levels of 60% of Ultimate Tensile Strength (UTS) or more and metal temperatures of 873 K (600ºC) or more.
9B010	Equipment specially designed for the production of "UAVs" and associated systems, equipment and components specified in Category Code 9A012.
9B105	Wind tunnels for speeds of Mach 0.9 or more, usable for 'missiles' and their subsystems. ***N.B.*** ***See also Category Code 9B005.*** *Technical Note* *In Category Code 9B105 'missile' means complete rocket systems and unmanned aerial vehicle systems capable of a range exceeding 300 km.*
9B106	Environmental chambers and anechoic chambers, as follows: a. Environmental chambers capable of simulating all of the following flight conditions: 1. Having any of the following: a. Altitude equal to greater than 15 km; or b. Temperature range from below 223 K (-50ºC) to above 398 K (+125ºC); and 2. Incorporating, or 'designed or modified' to incorporate, a shaker unit or other vibration test equipment to produce vibration environments equal to or greater than 10 g rms, measured 'bare table', between 20 Hz and 2 kHz imparting forces equal to or greater than 5 kN; *Technical Notes* *1. Category Code 9B106.a.2. describes systems that are capable of generating a vibration environment with a*

THE SCHEDULE — *continued*

Category Code	*Item Description*
	single wave (e.g., a sine wave) and systems capable of generating a broad band random vibration (i.e., power spectrum); *2. In Category Code 9B106.a.2., 'designed or modified' means the environmental chamber provides appropriate interfaces (e.g., sealing devices) to incorporate a shaker unit or other vibration test equipment as specified in Category Code 2B116.* *3. In Category Code 9B106.a.2., 'bare table' means a flat table, or surface, with no fixture or fittings.* b. Environmental chambers capable of simulating the following flight conditions: 1. Acoustic environments at an overall sound pressure level of 140 dB or greater (referenced to 20 µPa) or with a total rated acoustic power output of 4 kW or greater; <u>and</u> 2. Altitude equal to greater than 15 km; <u>or</u> 3. Temperature range from below 223 K (−50ºC) to above 398 K (+125ºC).
9B115	Specially designed "production equipment" for the systems, subsystems and components specified in Category Code 9A005 to 9A009, 9A011, 9A101, 9A102, 9A105 to 9A109, 9A111 or 9A116 to 9A120.
9B116	Specially designed "production facilities" for the space launch vehicles specified in Category Code 9A004, or systems, subsystems, and components specified in Category Code 9A005 to 9A009, 9A011, 9A101, 9A102, 9A104 to 9A109, 9A111, or 9A116 to 9A120.
9B117	Test benches and test stands for solid or liquid propellant rockets or rocket motors, having either of the following characteristics: a. The capacity to handle more than 68 kN of thrust; or b. Capable of simultaneously measuring the three axial thrust components.
9C	**Materials**

THE SCHEDULE — *continued*

Category Code	*Item Description*
9C108	"Insulation" material in bulk form and "interior lining", other than those specified in Category Code 9A008, for rocket motor cases usable in 'missiles' or specially designed for 'missiles'. <u>*Technical Note*</u> *In Category Code 9C108 'missile' means complete rocket systems and unmanned aerial vehicle systems capable of a range exceeding 300 km.*
9C110	Resin impregnated fibre prepregs and metal coated fibre preforms therefor, for composite structures, laminates and manufactures specified in Category Code 9A110, made either with organic matrix or metal matrix utilising fibrous or filamentary reinforcements having a "specific tensile strength" greater than 7.62×10^4 m and a "specific modulus" greater than 3.18×10^6 m. <u>***N.B.***</u> ***See also Category Codes 1C010 and 1C210.*** <u>*Note*</u> *The only resin impregnated fibre prepregs specified in Category Code 9C110 are those using resins with a glass transition temperature (T_g), after cure, exceeding 418K (145°C) as determined by ASTM D4065 or equivalent.*
9D	**Software**
9D001	"Software" specially designed or modified for the "development" of equipment or "technology" specified in Category Codes 9A001 to 9A119, Category 9B or Category Code 9E003.
9D002	"Software" specially designed or modified for the "production" of equipment specified in Category Codes 9A001 to 9A119 or Category 9B.
9D003	"Software" specially designed or modified for the "use" of "Full Authority Digital Electronic Engine Controls" ("FADEC") for propulsion systems specified in Category 9A or equipment specified in Category 9B, as follows: a. "Software" in digital electronic controls for propulsion systems, aerospace test facilities or air breathing aero-engine test facilities;

THE SCHEDULE — *continued*

Category Code	*Item Description*
	b. Fault-tolerant “software” used in “FADEC” systems for propulsion systems and associated test facilities.
9D004	Other “software”, as follows:
	a. 2D or 3D viscous “software” validated with wind tunnel or flight test data required for detailed engine flow modelling;
	b. “Software” for testing aero gas turbine engines, assemblies or components, specially designed to collect, reduce and analyse data in real time and capable of feedback control, including the dynamic adjustment of test articles or test conditions, as the test is in progress;
	c. “Software” specially designed to control directional solidification or single crystal casting;
	d. “Software” in “source code”, “object code” or machine code required for the “use” of active compensating systems for rotor blade tip clearance control.
	<u>Note</u>
	Category Code 9D004.d. does not include “software” embedded in equipment not specified elsewhere in any part of this Division or required for maintenance activities associated with the calibration or repair or updates to the active compensating clearance control system.
	e. “Software” specially designed or modified for the “use” of “UAVs” and associated systems, equipment and components specified in Category Code 9A012;
	f. “Software” specially designed to design the internal cooling passages of aero gas turbine blades, vanes and tip shrouds;
	g. “Software” having all of the following:
	1. Specially designed to predict aero thermal, aeromechanical and combustion conditions in aero gas turbine engines; <u>and</u>
	2. Theoretical modelling predictions of the aero thermal, aeromechanical and combustion conditions, which have been validated with actual aero gas turbine engine (experimental or production) performance data.

THE SCHEDULE — *continued*

Category Code	*Item Description*
9D101	"Software" specially designed or modified for the "use" of goods specified in Category Code 9B105, 9B106, 9B116 or 9B117.
9D103	"Software" specially designed for modelling, simulation or design integration of the space launch vehicles specified in Category Code 9A004 or sounding rockets specified in Category Code 9A104, or the subsystems specified in Category Code 9A005, 9A007, 9A105, 9A106.c., 9A107, 9A108.c., 9A116 or 9A119.
	<u>*Note*</u>
	"Software" specified in Category Code 9D103 remains within the description of that Category when combined with specially designed hardware specified in Category Code 4A102.
9D104	"Software" specially designed or modified for the "use" of goods specified in Category Code 9A001, 9A005, 9A006.d., 9A006.g., 9A007.a., 9A008.d., 9A009.a., 9A010.d., 9A011, 9A101, 9A102, 9A105, 9A106.c., 9A106.d., 9A107, 9A108.c., 9A109, 9A111, 9A115.a., 9A116.d., 9A117 or 9A118.
9D105	"Software" which coordinates the function of more than one subsystem, specially designed or modified for "use" in space launch vehicles specified in Category Code 9A004 or sounding rockets specified in Category Code 9A104.
9E	**Technology**
	<u>*Note*</u>
	"Development" or "production" "technology" specified in Category Codes 9E001 to 9E003 for gas turbine engines remains within the description of that Category when used as "use" "technology" for repair, rebuild and overhaul. Excluded from that Category are: technical data, drawings or documentation for maintenance activities directly associated with calibration, removal or replacement of damaged or unserviceable line replaceable units, including replacement of whole engines or engine modules.
9E001	"Technology" (according to the General Technology Note) for the "development" of equipment or "software" specified in Category Code 9A001.b., 9A004 to 9A012, 9A350, or Category 9B or 9D.

THE SCHEDULE — *continued*

Category Code	*Item Description*
9E002	"Technology" (according to the General Technology Note) for the "production" of equipment specified in Category Code 9A001.b., 9A004 to 9A011, 9A350 or Category 9B. ***N.B.*** ***For "technology" for the repair of structures, laminates or materials, see Category Code 1E002.f.***
9E003	Other "technology" as follows: a. "Technology" "required" for the "development" or "production" of any of the following gas turbine engine components or systems: 1. Gas turbine blades, vanes or tip shrouds made from directionally solidified (DS) or single crystal (SC) alloys and having (in the 001 Miller Index Direction) a stress-rupture life exceeding 400 hours at 1,273 K (1,000°C) at a stress of 200 MPa, based on the average property values; 2. Multiple domed combustors operating at average burner outlet temperatures exceeding 1,813 K (1,540°C) or combustors incorporating thermally decoupled combustion liners, non-metallic liners or non-metallic shells; 3. Components manufactured from any of the following: a. Organic "composite" materials designed to operate above 588 K (315°C); b. Metal "matrix" "composite", ceramic "matrix", intermetallic or intermetallic reinforced materials specified in Category Code 1C007; <u>or</u> c. "Composite" material specified in Category Code 1C010 and manufactured with resins specified in Category Code 1C008. 4. Uncooled turbine blades, vanes, tip-shrouds or other components, designed to operate at gas path total (stagnation) temperatures of 1,323 K (1,050ºC) or more at sea-level static take-off (ISA) in a 'steady state mode' of engine operation;

THE SCHEDULE — *continued*

Category Code	*Item Description*

5. Cooled turbine blades, vanes or tip-shrouds, other than those described in Category Code 9E003.a.1., exposed to gas path total (stagnant) temperatures of 1,643 K (1,370ºC) or more at sea-level static take-off (ISA) in a 'steady state mode' of engine operation;

Technical Note

The term 'steady state mode' defines engine operation conditions, where the engine parameters, such as thrust/power, rpm and others, have no appreciable fluctuations, when the ambient air temperature and pressure at the engine inlet are constant.

6. Airfoil-to-disk blade combinations using solid state joining;

7. Gas turbine engine components using "diffusion bonding" "technology" specified in Category Code 2E003.b.;

8. Damage tolerant gas turbine engine rotating components using powder metallurgy materials specified in Category Code 1C002.b.;

9. "FADEC" for gas turbine and combined cycle engines and their related diagnostic components, sensors and specially designed components;

10. Adjustable flow path geometry and associated control systems for:

    a. Gas generator turbines;

    b. Fan or power turbines;

    c. Propelling nozzles;

Note 1

Adjustable flow path geometry and associated control systems in Category Code 9E003.a.10. do not include inlet guide vanes, variable pitch fans, variable stators or bleed valves for compressors.

Note 2

THE SCHEDULE — *continued*

Category Code	*Item Description*

Category Code 9E003.a.10. does not include "development" or "production" "technology" for adjustable flow path geometry for reverse thrust.

11. Hollow fan blades;

b. "Technology" "required" for the "development" or "production" of any of the following:

1. Wind tunnel aero-models equipped with non-intrusive sensors capable of transmitting data from the sensors to the data acquisition system; <u>or</u>

2. "Composite" propeller blades or propfans capable of absorbing more than 2,000 kW at flight speeds exceeding Mach 0.55;

c. "Technology" "required" for the "development" or "production" of gas turbine engine components using "laser", water jet, Electro-Chemical Machining (ECM) or Electrical Discharge Machines (EDM) hole-drilling processes to produce holes having any of the following:

1. All of the following:

a. Depths more than four times their diameter;

b. Diameters less than 0.76 mm; <u>and</u>

c. 'Incidence angles' equal to or less than 25º; <u>or</u>

2. All of the following:

a. Depths more than five times their diameter;

b. Diameters less than 0.4 mm; <u>and</u>

c. 'Incidence angles' of more than 25º;

<u>Technical Note</u>

For the purposes of Category Code 9E003.c., 'incidence angle' is measured from a plane tangential to the airfoil surface at the point where the hole axis enters the airfoil surface.

d. "Technology" "required" for the "development" or "production" of helicopter power transfer systems or tilt rotor or tilt wing "aircraft" power transfer systems;

THE SCHEDULE — *continued*

Category Code	*Item Description*
	e. "Technology" for the "development" or "production" of reciprocating diesel engine ground vehicle propulsion systems having all of the following:
	1. 'Box volume' of 1.2 m^3 or less;
	2. An overall power output of more than 750 kW based on 80/1269/EEC, ISO 2534 or national equivalents; <u>and</u>
	3. Power density of more than 700 kW/m^3 of 'box volume';
	<u>*Technical Note*</u>
	'Box volume' in Category Code 9E003.e. is the product of three perpendicular dimensions measured in the following way:
	<u>*Length:*</u> *The length of the crankshaft from front flange to flywheel face;*
	<u>*Width:*</u> *The widest of any of the following:*
	a. The outside dimension from valve cover to valve cover;
	b. The dimensions of the outside edges of the cylinder heads; <u>*or*</u>
	c. The diameter of the flywheel housing;
	<u>*Height:*</u> *The largest of any of the following:*
	a. The dimension of the crankshaft centre-line to the top plane of the valve cover (or cylinder head) plus twice the stroke; <u>*or*</u>
	b. The diameter of the flywheel housing.
	f. "Technology" "required" for the "production" of specially designed components for high output diesel engines, as follows:
	1. "Technology" "required" for the "production" of engine systems having all of the following components employing ceramics materials specified in Category Code 1C007:
	a. Cylinder liners;
	b. Pistons;

THE SCHEDULE — *continued*

Category Code	*Item Description*
	c. Cylinder heads; <u>and</u> d. One or more other components (including exhaust ports, turbochargers, valve guides, valve assemblies or insulated fuel injectors); 2. “Technology” “required” for the “production” of turbocharger systems with single-stage compressors and having all of the following: a. Operating at pressure ratios of 4:1 or higher; b. Mass flow in the range from 30 kg to 130 kg per minute; <u>and</u> c. Variable flow area capability within the compressor or turbine sections; 3. “Technology” “required” for the “production” of fuel injection systems with a specially designed multifuel (e.g., diesel or jet fuel) capability covering a viscosity range from diesel fuel (2.5 cSt at 310.8 K (37.8 ºC)) down to gasoline fuel (0.5 cSt at 310.8 K (37.8 ºC)) and having all of the following: a. Injection amount in excess of 230 mm^3 per injection per cylinder; <u>and</u> b. Electronic control features specially designed for switching governor characteristics automatically depending on fuel property to provide the same torque characteristics by using the appropriate sensors; g. “Technology” “required” for the “development” or “production” of ‘high output diesel engines’ for solid, gas phase or liquid film (or combinations thereof) cylinder wall lubrication and permitting operation to temperatures exceeding 723 K (450ºC), measured on the cylinder wall at the top limit of travel of the top ring of the piston. <u>Technical Note</u> *‘High output diesel engines’ are diesel engines with a specified brake mean effective pressure of 1.8 MPa or more at a speed of 2,300 rpm, provided the rated speed is 2,300 rpm or more.*

THE SCHEDULE — *continued*

Category Code	*Item Description*
9E101	a. "Technology" (according to the General Technology Note) for the "development" of goods specified in Category Code 9A101, 9A102, 9A104 to 9A111 or 9A115 to 9A119. b. "Technology" (according to the General Technology Note) for the "production" of 'UAVs' specified in Category Code 9A012 or goods specified in Category Code 9A101, 9A102, 9A104 to 9A111 or 9A115 to 9A119. *Technical Note* *In Category Code 9E101.b. 'UAV' means unmanned aerial vehicle systems capable of a range exceeding 300 km.*
9E102	"Technology" (according to the General Technology Note) for the "use" of space launch vehicles specified in Category Code 9A004, goods specified in Category Code 9A005 to 9A011, 'UAVs' specified in Category Code 9A012 or goods specified in Category Code 9A101, 9A102, 9A104 to 9A111, 9A115 to 9A119, 9B105, 9B106, 9B115, 9B116, 9B117, 9D101 or 9D103. *Technical Note* *In Category Code 9E102 'UAV' means unmanned aerial vehicle systems capable of a range exceeding 300 km.*

Made this 12th day of March 2010.