

SCHEDULE

Article 2

Replacement Schedule 2 to the Export Control Order 2008

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MILITARY GOODS, SOFTWARE AND TECHNOLOGY

Note: In this Schedule, defined terms are printed in quotation marks.

Definitions

In this Schedule:

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

“biocatalyst” means enzymes for specific chemical or biochemical reactions and other biological compounds which bind to and accelerate the degradation of chemical warfare (CW) agents;

“biopolymer” means the following biological macromolecules:

- a. enzymes for specific chemical or biochemical reactions;
- b. ‘monoclonal antibodies’, ‘polyclonal antibodies’ or ‘anti-idiotypic antibodies’;
- c. specially designed or specially processed ‘receptors’;

Technical Note:

‘Monoclonal antibodies’ means proteins which bind to a specific antigenic site and are produced by a single clone of cells;

‘Polyclonal antibodies’ means a mixture of proteins which bind to a specific antigen and are produced by more than one clone of cells;

‘Anti-idiotypic antibodies’ means antibodies which bind to the specific antigen binding sites of other antibodies;

‘Receptors’ means biological macromolecular structures capable of binding ligands, the binding of which affects physiological functions.

“development” means all stages prior to “production” (e.g. design, design research, design analyses, design concepts, assembly and testing of prototypes, pilot production schemes, design data, process of transforming design data into goods or “software”, configuration design, integration design, layouts);

“end-effectors” means grippers, active tooling units (i.e. devices for applying motive power, process energy or sensing to the workpiece) and any other tooling that is attached to the baseplate on the end of a “robot” manipulator arm

“energetic materials” means substances or mixtures that react chemically to release energy required for their intended application; “explosives”, “pyrotechnics” and “propellants” are sub-classes of energetic materials;

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The Export Control (Amendment) Order 2015. (See end of Document for details)

“explosives” 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” means carriers (e.g. plasmid or virus) used to introduce genetic material into host cells;

“first generation image intensifier tubes” 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” means an electrochemical device that converts chemical energy directly into Direct Current (DC) electricity by consuming fuel from an external source;

“improvised explosive devices” means devices fabricated or intended to be placed in an improvised manner incorporating destructive, lethal, noxious, “pyrotechnic” or incendiary chemicals designed to destroy, disfigure or harass; they may incorporate military stores, but are normally devised from non-military components;

“laser” means an assembly of components which produce both spatially and temporally coherent light which is amplified by stimulated emission of radiation;

“lighter-than-air vehicles” 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” means the goods 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;

“production” means all production stages (e.g. product engineering, manufacture, integration, assembly (mounting), inspection, testing, quality assurance);

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

“pyrotechnic(s)” 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” as applied to “technology”, refers to 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 goods and the intended use of “technology” is irrelevant to whether it is “required”;

“riot control agents” 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 short time following termination of exposure;

Technical Note:

Tear gases are a subset of “riot control agents”.

“robot” means a manipulation mechanism, which may be of the continuous path or of the point-to-point variety, may use sensors, and which:

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

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- 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 the teach/playback method or by means of an electronic computer which may be a programmable logic controller, i.e. without mechanical intervention;

Note: This definition does not include:

- a. manipulation mechanisms which are only manually/teleoperator controllable;
- b. fixed sequence manipulation mechanisms, which are automated moving devices, operating according to “programmes” where the motions are limited by fixed stops, such as pins or cams and 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 “programmes” where the motions are limited by fixed, but adjustable stops, such as pins or cams and 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 (such as 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.

“special gun-mounting” means any fixture designed to mount a gun;

“superconductive” in relation to materials (e.g. metals, alloys or compounds) means those which can lose all electrical resistance (i.e. which can attain infinite electrical conductivity and carry very large electrical currents without Joule heating); 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 a function of both magnetic field and temperature;

Technical Note:

‘Critical temperature’ (also known as the transition temperature) of a specific “superconductive” material means the temperature at which the specific material loses all resistance to the flow of direct electrical current.

“technology” means specific ‘information’ necessary for the “development”; “production” or “use” of goods or “software”;

Technical Note:

‘Information’ may take forms including, not limited to: blueprints, plans, diagrams, models, formulae, tables, ‘source code’, engineering designs and specifications, manuals and instructions written or recorded on other media or devices (e.g. disk, tape, read-only memories);

Changes to legislation: There are currently no known outstanding effects for the The Export Control (Amendment) Order 2015. (See end of Document for details)

‘source code’ (or source language) is a convenient expression of one or more processes which may be turned by a programming system into equipment executable form.

“Unmanned Aerial Vehicle” (“UAV”) means any “aircraft” capable of initiating flight and sustaining controlled flight and navigation without any human presence on board;

“use” means operation, installation (e.g. on-site installation), maintenance, checking, repair, overhaul and refurbishing;

“user-accessible programmability” means the facility allowing a user to insert, modify or replace “programmes” by means other than:

- a. a physical change in writing or interconnections; or
- b. The setting of function controls including entry of parameters.

Military, Security and Para-military Goods, Software and Technology and Arms, Ammunition and Related Material

ML1 Smooth-bore weapons with a calibre of less than 20 mm, other firearms and automatic weapons with a calibre of 12.7 mm (calibre 0.50 inches) or less and accessories, as follows, and specially designed components therefor:

Note: ML1 does not control:

- a. Firearms specially designed for dummy ammunition and which are incapable of discharging a projectile;
- b. Firearms specially designed to launch tethered projectiles, having no high explosive charge or communications link, to a range of 500 m or less;
- c. Firearms certified by a registered UK Proof House as having been rendered incapable of firing any ammunition in this Schedule.

- a. Rifles and combination guns, handguns, machine, sub-machine and volley guns;

Note: ML1.a does not control:

- a. Bayonets;
- b. Rifles and combination guns, manufactured earlier than 1938;
- c. Reproductions of rifles and combination guns, the originals of which were manufactured earlier than 1890;
- d. Handguns, volley guns and machine guns, manufactured earlier than 1890, and their reproductions;
- e. Rifles or handguns, specially designed to discharge an inert projectile by compressed air or CO₂.

- b. Smooth-bore weapons as follows:

1. **Smooth-bore weapons specially designed for military use;**
2. Smooth-bore weapons not controlled by ML1.b.1., as follows:
 - (a) Fully automatic type weapons;

Changes to legislation: There are currently no known outstanding effects for the The Export Control (Amendment) Order 2015. (See end of Document for details)

(b) Semi-automatic or pump-action type weapons;

Note: ML1.b does not control:

- a. Smooth-bore weapons manufactured earlier than 1938;
- b. Reproductions of smooth-bore weapons, the originals of which were manufactured earlier than 1890;
- c. Smooth-bore weapons, specially designed for any of the following:
 1. Slaughtering of domestic animals;
 2. Tranquilising of animals;
 3. Seismic testing;
 4. Firing of industrial projectiles;
- d. Signal pistols;
- e. Industrial Tools;
- f. Smooth-bore weapons that are both not specially designed for military use and specially designed to discharge an inert projectile by compressed air or CO₂.

- c. Weapons using caseless ammunition;
- d. Sound suppressors or moderators, “special gun-mountings”, optical weapon sights and flash suppressors, for firearms specified in ML1.a., ML1.b. or ML1.c.

Note: ML1.d. does not control:

- a. Optical weapon sights without electronic image processing (i.e., using only lenses to view the target), with a magnification of 9 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 armament or weapons 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: ML2.a. does not control:

- a. Rifles, smooth-bore weapons and combination guns, manufactured earlier than 1938;
- b. Reproductions of rifles, smooth-bore weapons and combination guns, the originals of which were manufactured earlier than 1890;
- c. Guns, howitzers, cannons, mortars, manufactured earlier than 1890;
- d. Smooth-bore weapons specially designed for any of the following:

Changes to legislation: There are currently no known outstanding effects for the The Export Control (Amendment) Order 2015. (See end of Document for details)

1. *Slaughtering of domestic animals;*
 2. *Tranquilising of animals;*
 3. *Seismic testing;*
 4. *Firing of industrial projectiles;*
 - e. *Signal pistols;*
 - f. *Hand-held projectile launchers, specially designed to launch tethered projectiles, having no high explosive charge or communications link, to a range of 500 m or less.*
- b. Smoke, gas and “pyrotechnic” projectors or generators specially designed or modified for military use;
 - c. Weapon sights and weapon sight mounts meeting both of the following descriptions:
 1. **specially designed for military use, and**
 2. **specially designed for weapons specified in ML2.a.**
 - d. **Mountings specially designed for the weapons specified in ML2.a.**

ML3 Ammunition and fuze setting devices, as follows, and specially designed components therefor:

- a. Ammunition for weapons specified in ML1, ML2 or ML12;
Note: ML3.a. does not control:
 - a. *Ammunition crimped without a projectile (blank star);*
 - b. *Dummy ammunition with a pierced powder chamber;*
 - c. *Other blank and dummy ammunition, not incorporating components designed for live ammunition;*
 - d. *Components specially designed for blank or dummy ammunition, specified in this Note a, b or c; or*
 - e. *Cartridges specially designed for signalling, bird scaring or lighting of gas flares at oil wells.*
- b. Fuze setting devices specially designed for ammunition specified in ML3.a.

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: Electronic guidance and navigation equipment is controlled in ML11.a.

N.B. 2: Aircraft missile protection systems are controlled in ML4.c.

- a. Bombs, torpedoes, grenades, smoke canisters, rockets, mines, missiles, depth charges, demolition-charges, demolition-devices, demolition-kits, devices that

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- contain “pyrotechnics”, cartridges and simulators (i.e. equipment simulating the characteristics of any of these goods), specially designed for military use;
- b. Equipment that is both specially designed for military use and specially designed for ‘activities’ relating to any of the following:
1. goods specified in ML4.a.; or
 2. “improvised explosive devices”;
- Technical note:* For the purpose of ML.4.b. ‘activities’ applies to handling, controlling, activating, powering with one-time operational output, launching, laying, sweeping, discharging, decoying, jamming, detonating, disrupting, detecting or disposing.
- Note:* ML4.b. does not control 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).

ML5 Fire control equipment and related alerting and warning equipment, 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 goods specified in ML5.a. or ML5.b.;
- Note:* For the purposes of ML.5.c.countermeasure equipment includes detection equipment.
- d. Field test or alignment equipment, specially designed for goods specified in ML5.a., ML5.b. or ML 5.c.

ML6 Ground “vehicles” and components as follows:

N.B. Electronic guidance and navigation equipment is controlled in ML.II.a.

- a. Ground “vehicles” and components therefor, specially designed or modified for military use;
- Technical Note:* For the purposes of ML6.a. the term ground “vehicles” includes trailers.
- Note:* In ML6.a. modification of a ground “vehicle” for military use entails a structural, electrical or mechanical change involving one or more specially designed military components.
- b. Other ground “vehicles” and components, as follows:
 1. “Vehicles” having all of the following:

Changes to legislation: There are currently no known outstanding effects for the The Export Control (Amendment) Order 2015. (See end of Document for details)

- a. manufactured or fitted with materials or components to provide ballistic protection to level III (NIJ 0108.01, September 1985, or comparable national standard) or better;
 - b. a transmission to provide drive to both front and rear wheels simultaneously, including those vehicles having additional wheels for load bearing purposes whether driven or not;
 - c. “Gross Vehicle Weight Rating (GVWR)” greater than 4,500 kg; and
 - d. designed or modified for off-road use;
2. Components meeting both of the following descriptions—
- a. specially designed for “vehicles” specified in ML6.b.1.; and
 - b. providing ballistic protection to level III (NIJ 0108.01, September 1985 or comparable national standard), or better.

Technical Notes: NIJ 0108.01 means the National Institute of Justice standard for Ballistic Resistance for Protective Materials.

- 2. “Gross Vehicle Weight Rating (GVWR)” is also known as Maximum Authorised Mass, Gross Vehicle Weight or Permissible Maximum Weight.

N.B. See also ML13.a. for armoured plate.

Note 1: ML6.b. does not control “vehicles” designed or modified for transporting money or valuables .

Note 2: ML6.b. does not control “vehicles” fitted with, or designed or modified to be fitted with, a plough, flail or tiller for the purpose of land mine clearance.

Note 3: ML 6. does not control “vehicles” that meet all of the following descriptions:

- a. were manufactured before 1946;
- b. do not have items specified in this Schedule and manufactured after 1945, except for reproductions of original components or accessories for the vehicle; and
- c. do not incorporate weapons specified in ML1., ML2. or ML 4. unless they have been certified by a registered UK Proof House as having been rendered incapable of firing any ammunition in this Schedule.

ML7 Chemical or biological toxic agents, toxic chemicals and mixtures containing such agents or chemicals, “riot control agents”, radioactive materials, related equipment, components and materials as follows:

Note: In some instances chemicals are listed by name and Chemical Abstract Service (CAS) number. Chemicals of the same structural formula (e.g. hydrates) are controlled regardless of name or CAS number. CAS numbers are shown to assist in identifying whether a particular chemical or mixture is controlled, irrespective of

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nomenclature. CAS numbers cannot 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.

- a. Biological agents or 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, but not limited to, the following:
 1. CW nerve agents:
 - a. O-Alkyl (equal to or less than C₁₀, including cycloalkyl) alkyl (Methyl, Ethyl, n-Propyl or Isopropyl)-phosphonofluoridates, such as:

Sarin (GB):O-Isopropyl methylphosphonofluoridate (CAS 107-44-8); and

Soman (GD):O-Pinacolyl methylphosphonofluoridate (CAS 96-64-0);
 - b. O-Alkyl (equal to or less than C₁₀, including cycloalkyl) N,N-dialkyl (Methyl, Ethyl, n-Propyl or Isopropyl) phosphoramidocyanidates, such as:

Tabun (GA):O-Ethyl N,N-dimethylphosphoramidocyanidate (CAS 77-81-6);
 - c. O-Alkyl (H or equal to or less than C₁₀, 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 (CAS 50782-69-9);
 2. CW vesicant agents:
 - a. Sulphur mustards, such as:
 1. 2-Chloroethylchloromethylsulphide (CAS 2625-76-5);
 2. Bis(2-chloroethyl) sulphide (CAS 505-60-2);
 3. Bis(2-chloroethylthio) methane (CAS 63869-13-6);
 4. 1,2-bis (2-chloroethylthio) ethane (CAS 3563-36-8);
 5. 1,3-bis (2-chloroethylthio)-n-propane (CAS 63905-10-2);
 6. 1,4-bis (2-chloroethylthio)-n-butane (CAS 142868-93-7);
 7. 1,5-bis (2-chloroethylthio)-n-pentane (CAS 142868-94-8);

Changes to legislation: There are currently no known outstanding effects for the The Export Control (Amendment) Order 2015. (See end of Document for details)

8. Bis (2-chloroethylthiomethyl) ether (CAS 63918-90-1);
9. Bis (2-chloroethylthioethyl) ether (CAS 63918-89-8);
- b. Lewisites, such as:
 1. 2-chlorovinyl dichloroarsine (CAS 541-25-3);
 2. Tris (2-chlorovinyl) arsine (CAS 40334-70-1);
 3. Bis (2-chlorovinyl) chloroarsine (CAS 40334-69-8);
- c. Nitrogen mustards, such as:
 1. HN1: bis (2-chloroethyl) ethylamine (CAS 538-07-8);
 2. HN2: bis (2-chloroethyl) methylamine (CAS 51-75-2);
 3. HN3: tris (2-chloroethyl) amine (CAS 555-77-1);
3. CW Incapacitating agents, such as:
 - a. 3-Quinuclidinyl benzilate (BZ) (CAS 6581-06-2);
4. CW defoliants, such as:
 - a. Butyl 2-chloro-4-fluorophenoxyacetate (LNF);
 - b. 2,4,5-trichlorophenoxyacetic acid (CAS 93-76-5) mixed with 2,4-dichlorophenoxyacetic acid (CAS 94-75-7) (Agent Orange (CAS 39277-47-9));
- c. CW binary precursors and key precursors, as follows, and chemical mixtures containing one or more of these precursors:
 1. Alkyl (Methyl, Ethyl, n-Propyl or Isopropyl) Phosphonyl Difluorides, such as:
DF: Methyl Phosphonyldifluoride (CAS 676-99-3);
 2. O-Alkyl (H equal to or less than C₁₀, 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 O-2-di-isopropylaminoethyl methylphosphonite (CAS 57856-11-8);
 3. Chlorosarin: Q-Isopropyl methylphosphonochloridate (CAS 1445-76-7);
 4. Chlorosoman O-Pinacolyl methylphosphonochloridate (CAS 7040-57-5);
- d. "Riot control agents", active constituent chemicals and combinations thereof including:
 1. α -Bromobenzeneacetonitrile, (Bromobenzyl cyanide) (CA) (CAS 5798-79-8);

Changes to legislation: There are currently no known outstanding effects for the The Export Control (Amendment) Order 2015. (See end of Document for details)

2. [2-chlorophenyl] methylene] propanedinitrile, (o-Chlorobenzylidenemalononitrile) (CS) (CAS 2698-41-1);
3. 2-Chloro-1-phenylethanone, Phenylacetyl chloride (o-chloroacetophenone) (CN) CAS 532-27-4);
4. Dibenz-(b,f)-1,4-oxazepine (CR) (CAS 257-07-8);
5. 10-Chloro-5,10-dihydrophenarsazine, (Phenarsazine chloride), (Adamsite), (DM) (CAS 578-94-9);
6. N-Nonanoylmorpholine, (MPA) (CAS 5299-64-9);

Note 1: ML7.d. does not control “riot control agents” individually packaged for personal self-defence purposes.

Note 2: ML7.d. does not control 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 specified in ML7.a., ML7.b. or ML7.d.;
 2. CW agents made up of precursors specified in ML7.c.;
- f. Protective and decontamination goods, specially designed or modified for military use, components and chemical mixtures as follows:
 1. Goods designed or modified for defence against materials specified in ML7.a., ML7.b. or ML7.d. and specially designed components therefor;

N.B.: See also 1A of Annex 1 to “the dual-use Regulation”.
 2. Goods designed or modified for decontamination of goods contaminated with materials specified in ML7.a. or ML7.b. and specially designed components therefor;
 3. Chemical mixtures specially developed or formulated for the decontamination of goods contaminated with materials specified in ML7.a. or ML7.b.;
- g. Goods specially designed or modified for military use, designed or modified for the detection or identification of materials specified in ML7.a., ML7.b. or ML7.d. and specially designed components therefor;

N.B. See also 1A in Annex I to “the dual-use Regulation”.

Note: ML7.g. does not control personal radiation monitoring dosimeters.
- h. “Biopolymers” specially designed or processed for the detection or identification of CW agents specified in 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:

Changes to legislation: There are currently no known outstanding effects for the The Export Control (Amendment) Order 2015. (See end of Document for details)

1. “Biocatalysts” specially designed for the decontamination or degradation of CW agents specified in ML7.b., and resulting from directed laboratory selection or genetic manipulation of biological systems;
2. Biological systems containing the genetic information specific to the “production” of “biocatalysts” specified in ML7.i.1. as follows:
 - a. “Expression vectors”;
 - b. Viruses;
 - c. Cultures of cells.

Note 1: ML7.b. and ML7.d. do not control:

- a. Cyanogen chloride (CAS 506-77-4);
N.B.: See IC of Annex I to “the dual-use Regulation”.
- b. Hydrocyanic acid (CAS 74-90-8);
- c. Chlorine (CAS 7782-50-5);
- d. Carbonyl chloride (phosgene) (CAS 75-44-5);
N.B.: See IC of Annex I to “the dual-use Regulation”.
- e. Diphosgene (trichloromethyl-1-chloroformate) (CAS 503-38-8);
- f. This entry is not used;
- g. Xylyl bromide: *ortho:* (CAS 89-92-9), *meta:* (CAS 620-13-3), *para:* (CAS 104-81-4);
- h. Benzyl bromide (CAS 100-39-01);
- i. Benzyl iodide (CAS 620-05-3);
- j. Bromo acetone (CAS 598-31-2);
- k. Cyanogen bromide (CAS 506-68-3);
- l. Bromo methylethylketone (CAS 816-40-0);
- m. Chloro acetone (CAS 78-95-5);
- n. Ethyl iodoacetate (CAS 623-48-3);
- o. Iodo acetone (CAS 3019-04-3);
- p. Chloropicrin (CAS 76-06-2);
N.B.: See IC of Annex I to “the dual-use Regulation”.
- q. Pelargonic acid vanillylamide (PAVA) (CAS 2444-46-4);
N.B.: See 3.2. of Annex III to “the torture Regulation”.
- r. Oleoresin capsicum (OC) (CAS 8023-77-6).

Changes to legislation: There are currently no known outstanding effects for the The Export Control (Amendment) Order 2015. (See end of Document for details)

N.B.: See 3.3. of Annex III to “the torture Regulation”.

Note 2: The cultures of cells and biological systems specified in ML7.h. and ML7.i.2. are exclusive and ML7.h. and ML7.i.2 do not include cells or biological systems for civil purposes, (e.g. agricultural, pharmaceutical, medical, veterinary, environmental, waste management, or in the food industry).

ML8 “Energetic materials”, and related substances, as follows

N.B. Charges and devices are controlled in ML4 and I.A.8 of Annex I to “the dual-use Regulation”.

Note: In some instances chemicals are listed by name and Chemical Abstract Service (CAS) number. Chemicals of the same structural formula (e.g. hydrates) are controlled regardless of name or CAS number. CAS numbers are shown to assist in identifying whether a particular chemical or ‘mixture’ is controlled, irrespective of nomenclature. CAS numbers cannot 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.

Technical Note: 1. A ‘mixture’ refers to a composition of two or more substances with at least one substance being controlled in ML8.

2. Particle size is the mean particle diameter on a weight or volume basis. International or equivalent national standards will be used in sampling and determining particle size.

a. “Explosives”, as follows, and ‘mixtures’ thereof:

1. ADNBF (aminodinitrobenzofuroxan or 7-amino-4,6-dinitrobenzofurazane-1-oxide) (CAS 97096-78-1);
2. BNCP (cis-bis (5-nitrotetrazolato) tetra amine-cobalt (III) perchlorate) (CAS 117412-28-9);
3. CL-14 (diamino dinitrobenzofuroxan or 5,7-diamino-4,6-dinitrobenzofurazane-1-oxide) (CAS 117907-74-1);
4. CL-20 (HNIW or Hexanitrohexaazaisowurtzitane) (CAS 135285-90-4; chlathrates of CL-20);
5. CP (2-(5-cyanotetrazolato)penta amine-cobalt (III) perchlorate) (CAS 70247-32-4);
6. DADE (1,1-diamino-2,2-dinitroethylene, FOX7); (CAS 145250-81-3);
7. DATB (diaminotrinitrobenzene) (CAS 1630-08-6);
8. DDFP (1,4-dinitrodifurazanopiperazine);
9. DDPO (2,6-diamino-3,5-dinitropyrazine-1-oxide, PZO) (CAS 194486-77-6);

Changes to legislation: There are currently no known outstanding effects for the The Export Control (Amendment) Order 2015. (See end of Document for details)

10. DIPAM (3,3'-diamino-2,2',4,4',6,6'-hexanitrobiphenyl or dipicramide) (CAS 17215-44-0);
11. DNGU (DINGU or dinitroglycoluril) (CAS 55510-04-8);
12. Furazans as follows:
 - a. DAAOF (DAAF, DDAFox, or diaminoazoxyfurazan);
 - b. DAAzF (diaminoazofurazan) (CAS 78644-90-3);
13. HMX and derivatives 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) (CAS 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) (CAS 130256-72-3);
14. HNAD (hexanitroadamantane) (CAS 143850-71-9);
15. HNS (hexanitrostilbene) (CAS 2006-22-0);
16. Imidazoles as follows:
 - a. BNNII (Octahydro-2,5-bis(nitroimino)imidazo [4,5-d]imidazole);
 - b. DNI (2,4-dinitroimidazole) (CAS 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);
17. NTNMH (1-(2-nitrotriazolo)-2-dinitromethylene hydrazine);
18. NTO (ONTA or 3-nitro-1,2,4-triazol-5-one) (CAS 932-64-9);
19. Polynitrocubanes with more than four nitro groups;
20. PYX (2,6-bis(picrylamino)-3,5-dinitropyridine) (CAS 38082-89-2);
21. RDA 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) (CAS 121-82-4);
 - b. Keto-RDX (K-6 or 2,4,6-trinitro-2,4,6-triazacyclohexanone) (CAS 115029-35-1);
22. TAGN (trianimoguanidinenitrate) (CAS 4000-16-2);
23. TATB (triaminotrinitrobenzene) (CAS 3058-38-6);

Changes to legislation: There are currently no known outstanding effects for the The Export Control (Amendment) Order 2015. (See end of Document for details)

24. TEDDZ (3,3,7,7-tetrakis(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) (CAS 479-45-8);
27. TNAD (1,4,5,8-tetranitro-1,4,5,8-tetraazadecalin) (CAS 135877-16-6);
28. TNAZ (1,3,3-trinitroazetidine) (CAS 97645-24-4);
29. TNGU (SORGUYL or tetranitroglycoluril) (CAS 55510-03-7);
30. TNP (1,4,5,8-tetranitro-pyridazino[4,5-d]pyridazine) (CAS 229176-04-9);
31. Triazines as follows:
 - a. DNAM (2-oxy-4,6-dinitroamino-s-triazine) (CAS 19899-80-0);
 - b. NNHT (2-nitroimino-5-nitro-hexahydro-1,3,5-triazine) (CAS 130400-13-4);
32. Triazoles as follows:
 - a. 5-azido-2-nitrotriazole;
 - b. ADHTDN (4-amino-3,5-dihydrazino-1,2,4-triazole dinitramide) (CAS 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) (CAS 30003-46-4);
 - f. DNBT (dinitrobistriazole) (CAS 70890-46-9);
 - g. This entry is not used.
 - h. NTDNT (1-N-(2-nitrotriazolo)-3,5-dinitrotriazole);
 - i. PDNT (1-picryl-3,5-dinitrotriazole);
 - j. TACOT (tetranitrobenzotriazolobenzotriazole) (CAS 25243-36-1);
33. "Explosives" not listed elsewhere in ML8.a. and meeting any of the following descriptions:
 - a. Detonation velocity exceeding 8,700 m/s at maximum density or
 - b. Detonation pressure exceeding 34 GPa (340 kbar)
34. This entry is not used;
35. DNAN (2,4-dinitroanisoole) (CAS 119-27-7);

Changes to legislation: There are currently no known outstanding effects for the The Export Control (Amendment) Order 2015. (See end of Document for details)

36. TEX (4,10-Dinitro-2,6,8,12-tetraoxa-4,10-diazaisowurtzitane);
 37. GUDN (Guanylurea dinitramide) FOX-12 (CAS 217464-38-5);
 38. Tetrazines as follows:
 - a. BTAT (Bis(2,2,2-trinitroethyl)-3,6-diaminotetrazine);
 - b. LAX-112 (3,6-diamino-1,2,4,5-tetrazine-1,4-dioxide);
 39. Energetic ionic materials melting between 343 K (70°C) and 373 K (100°C) and with detonation velocity exceeding 6,800 m/s or detonation pressure exceeding 18 GPa (180 kbar);
- b. “Propellants” as follows:
1. Any solid “propellant” with a theoretical specific impulse (under standard conditions) of more than:
 - a. 240 seconds for non-metallised, non-halogenised “propellant”;
 - b. 250 seconds for non-metallised, halogenised “propellant”;
 - c. 260 seconds for metallised “propellant”;
 2. This entry is not used;
 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 294 K (21°C);
 5. Elastomer Modified Cast Double Base (EMCDB) “propellants” with extensibility at maximum stress of more than 5% at 233 K (-40°C);
 6. Any “propellant” containing substances specified in ML8.a.;
 7. “Propellants” not specified elsewhere in this Schedule, specially designed for military use.
- c. “Pyrotechnics”, fuels and related substances, as follows, and ‘mixtures’ thereof:
1. Aircraft fuels specifically formulated for military purposes;
Note: Aircraft fuels in ML8.c.1. are finished goods, not their constituents.
 2. Alane (aluminium hydride) (CAS 7784-21-6);
 3. Carboranes; decaborane (CAS 17702-41-9); pentaboranes (CAS 19624-22-7 and 18433-84-6) and their derivatives;
 4. Hydrazine and derivatives as follows (see also ML8.d.8. and ML8.d.9. for oxidising hydrazine derivatives);
 - a. Hydrazine (CAS 302-01-2) in concentrations of 70% or more;

Changes to legislation: There are currently no known outstanding effects for the The Export Control (Amendment) Order 2015. (See end of Document for details)

Note: ML8.c.4.a. does not control hydrazine 'mixtures' specially formulated for corrosion control.

- b. Monomethyl hydrazine (CAS 60-34-4);
 - c. Symmetrical dimethyl hydrazine (CAS 540-73-8);
 - d. Unsymmetrical dimethyl hydrazine (CAS 57-14-7);
5. Metal fuels, fuel mixtures or “pyrotechnic” mixtures, 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 (CAS 7440-41-7) in particle sizes of less than 60µm;
 - 2. Iron powder (CAS 7439-89-6) with particle size of 3µm or less produced by reduction of iron oxide with hydrogen;
 - b. ‘Mixtures’ containing any of the following:
 - 1. Zirconium (CAS 7440-67-7), magnesium (CAS 7439-95-4) or alloys of these in particle sizes of less than 60µm;
 - 2. Boron (CAS 7440-42-8) or boron carbide (CAS 12069-32-8) fuels of 85% purity or higher and particle sizes of less than 60µm;

Note 1: ML8.c.5.b.2. does not control boron and boron carbide enriched with boron-10 (20% or more of total boron-10 content).

Note 2: ML8.c.5.b. only controls metal fuels in particle form when they are mixed with other substances to form a mixture formulated for military purposes such as liquid propellant slurries, solid propellants or pyrotechnic mixtures.

Note 3: “Explosives” and fuels containing the metals or alloys specified in ML8.c.5. are controlled whether or not the metals or alloys are encapsulated in aluminium, magnesium, zirconium, or beryllium.

N.B. See also IC of Annex I to “the dual-use Regulation”.

- 6. Military material containing thickeners for hydrocarbon fuels specifically formulated for use in flame throwers or incendiary munitions, such as metal stearates (e.g., octal (CAS 637-12-7) or palmitates;
- 7. Perchlorates, chlorates and chromates composited with powdered metal or other high energy fuel components;
- 8. Spherical or spheroidal aluminium powder (CAS 7429-90-5) with a particle size of 60µm or less, and manufactured from material with an aluminium content of 99% or more;

Changes to legislation: There are currently no known outstanding effects for the The Export Control (Amendment) Order 2015. (See end of Document for details)

9. Titanium subhydride (TiH_n) of stoichiometry equivalent to $n = 0.65-1.68$;
10. Liquid high energy density fuels not controlled in ML8.c.1., as follows:
 - a. Mixed fuels, that incorporate both solid and liquid fuels (e.g., boron slurry), having a mass-based energy density of 40 MJ/kg or greater;
 - b. Other high energy density fuels and fuel additives (e.g., cubane, ionic solutions, JP-7, JP-10), having a volume-based energy density of 37.5 GJ per cubic meter or greater, measured at 293 K (20°C) and one atmosphere (101.325 kPa) pressure;

Note: ML8.c.10.b. does not apply to JP-4, JP-8, fossil refined fuels or biofuels, or fuels for engines certified for use in civil aviation.
11. “Pyrotechnic” and pyrophoric materials as follows:
 - a. “pyrotechnic” or pyrophoric materials specifically formulated to enhance or control the production of radiated energy in any part of the IR spectrum;
 - b. Mixtures of magnesium, polytetrafluoroethylene (PTFE) and a vinylidene difluoride-hexafluoropropylene copolymer (e.g., MTV);
12. Fuel mixtures, “polytechnic” mixtures or “energetic materials”, not specified elsewhere in ML8, having all of the following:
 - a. Containing greater than 0.5% of particles of any of the following:
 1. Aluminium;
 2. Beryllium;
 3. Boron;
 4. Zirconium;
 5. Magnesium; or
 6. Titanium;
 - b. Particles specified by ML8.c.12.a. with a size less than 200 nm in any direction; and
 - c. Particles specified by ML8.c.12.a. with a metal content of 60% or greater;
- d. Oxidisers, as follows, and ‘mixtures’ thereof:
 1. ADN (ammonium dinitramide or SR 12) (CAS 140456-78-6);
 2. AP (ammonium perchlorate) (CAS 7790-98-9);
 3. Compounds composed of fluorine and any of the following:
 - a. Other halogens;

Changes to legislation: There are currently no known outstanding effects for the The Export Control (Amendment) Order 2015. (See end of Document for details)

b. Oxygen; or

c. Nitrogen;

Note 1: ML8.d.3. does not control chlorine trifluoride.

Note 2: ML8.d.3. does not control nitrogen trifluoride in its gaseous state.

N.B.: See also IC of Annex 1 to “the dual-use Regulation”.

4. DNAD (1,3-dinitro-1,3-diazetidene) (CAS 78246-06-7);
 5. HAN (hydroxylammonium nitrate) (CAS 13465-08-2);
 6. HAP (hydroxylammonium perchlorate) (CAS 15588-62-2);
 7. HNF (hydrazinium nitroformate) (CAS 20773-28-8);
 8. Hydrazine nitrate (CAS 37836-27-4);
 9. Hydrazine perchlorate (CAS 27978-54-7);
 10. Liquid oxidisers comprised of or containing inhibited red fuming nitric acid (IRFNA) (CAS 8007-58-7);
- e. Binders, plasticizers, monomers and polymers as follows:
1. AMMO (azidomethylmethyloxetane and its polymers) (CAS 90683-29-7);
 2. BAMO (bisazidomethyloxetane and its polymers) (CAS 17607-20-4);
 3. BDNPA (bis (2,2-dinitropropyl)acetal) (CAS 5108-69-0);
 4. BDNPF (bis (2,2-dinitropropyl)formal) (CAS 5917-61-3);
 5. BTTN (butanetrioltrinitrate) (CAS 6659-60-5);
 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. Nitro groups; or
 - e. Difluoroamino groups;
 7. FAMAO (3-difluoroaminomethyl-3-azidomethyl oxetane) and its polymers;
 8. FEFO (bis-(2-fluoro-2,2-dinitroethyl) formal) (CAS 17003-79-1);
 9. FPF-1 (poly-2,2,3,3,4,4-hexafluoropentane-1,5-diol formal) (CAS 376-90-9);
 10. FPF-3 (poly-2,4,4,5,5,6,6-heptafluoro-2-tri-fluoromethyl-3-oxaheptane-1,7-diol formal);

Changes to legislation: There are currently no known outstanding effects for the The Export Control (Amendment) Order 2015. (See end of Document for details)

11. GAP (glycidylazide polymer) (CAS 143178-24-9) and its derivatives;
 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 (CAS 69102-90-5);
 13. Alcohol functionalised poly(epichlorohydrin) with a molecular weight of less than 10,000), as follows:
 - a. Poly(epichlorohydrin); and
 - b. Poly(epichlorohydrindiol);
 14. NENAs (nitroethylnitramine compounds) (CAS 17096-47-8, 85068-73-1, 82486-83-7, 82486-82-6 and 85954-06-9);
 15. PGN (poly-GLYN, polyglycidyl nitrate or poly(nitratomethyl oxirane)) (CAS 27814-48-8);
 16. Poly-NIMMO (poly nitratomethylmethyloxetane), poly-NMMO or (poly (3-Nitratomethyl-3-methyloxetane)) (CAS 84051-81-0);
 17. Polynitroorthocarbonates;
 18. TVOPA (1,2,3-tris[1,2-bis(difluoroamino)ethoxy] propane or tris vinoxyl propane adduct) (CAS 53159-39-0);
 19. 4,5 diazidomethyl-2-methyl-1,2,3-triazole (iso- DAMTR);
 20. PNO (Poly(3-nitrate oxetane));
- f. Additives as follows:
1. Basic copper salicylate (CAS 62320-94-9);
 2. BHEGA (bis-(2-hydroxyethyl) glycolamide) (CAS 17409-41-5);
 3. BNO (butadienenitrileoxide);
 4. Ferrocene derivatives as follows:
 - a. Butacene (CAS 125856-62-4);
 - b. Catocene (2,2-bis-ethylferrocenyl propane) (CAS 37206-42-1);
 - c. Ferrocene carboxylic acids and ferrocene carboxylic acid esters;
 - d. n-butyl-ferrocene (CAS 31904-29-7);
 - e. Other adducted polymer ferrocene derivatives not specified elsewhere in ML8.f.4.;
 - f. Ethyl ferrocene (CAS 1273-89-8);
 - g. Propyl ferrocene;
 - h. Pentyl ferrocene (CAS 1274-00-6);
 - i. Dicyclopentyl ferrocene;
 - j. Dicyclohexyl ferrocene;

Changes to legislation: There are currently no known outstanding effects for the The Export Control (Amendment) Order 2015. (See end of Document for details)

- k. Diethyl ferrocene (CAS 1273-97-8);
 - l. Dipropyl ferrocene;
 - m. Dibutyl ferrocene (CAS 1274-08-4);
 - n. Dihexyl ferrocene (CAS 93894-59-8);
 - o. Acetyl ferrocene (CAS 1271-55-2)/1,1'-diacetyl ferrocene (CAS-1273-94-5);
5. Lead beta-resorcylate (CAS 20936-32-7);
 6. Lead citrate (CAS 14450-60-3);
 7. Lead-copper chelates of beta-resorcylate or salicylates (CAS 68411-07-4);
 8. Lead maleate (CAS 19136-34-6);
 9. Lead salicylate (CAS 15748-73-9);
 10. Lead stannate (CAS 12036-31-6);
 11. MAPO (tris-1-(2-methyl)aziridinyl phosphine oxide) (CAS 57-39-6), and 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) (CAS 85068-72-0);
 13. N-methyl-p-nitroaniline (CAS 100-15-2);
 14. 3-Nitrazo-1,5-pentane diisocyanate (CAS 7406-61-9);
 15. Organo-metallic coupling agents as follows:
 - a. Neopentyl[diallyl]oxy, tri[diethyl]phosphato-titanate (CAS 103850-22-2); also known as titanium IV, 2,2-[bis 2-propenolatomethyl, butanolato, tris (diethyl) phosphato] (CAS 110438-25-0); or LICA 12 (CAS 103850-22-2);
 - b. Titanium IV, [(2-propenolato-1) methyl, n-propanolatomethyl] butanolato-1, tris[diethyl] pyrophosphate or KR3538;
 - c. Titanium IV, [(2-propenolato-1) methyl, n-propanolatomethyl] butanolato-1, tris(diethyl)phosphate;
 16. Polycyanodifluoroaminoethyleneoxide;
 17. Bonding agents as follows:
 - a. 1,1R,1S-trimeoyl-tris(2-ethylaziridine) (HX-868, BITA) (CAS 7722-73-8);
 - b. Polyfunctional aziridine amides with isophthalic, trimesic, isocyanuric or trimethyladipic backbone also having a 2-methyl Or 2-ethyl aziridine group;

Note Item ML8.f.17.b. includes:

Changes to legislation: There are currently no known outstanding effects for the The Export Control (Amendment) Order 2015. (See end of Document for details)

- a. *1,1H-Isophthaloyl-bis(2-methylaziridine)* (HX-752) (CAS 7652-64-4);
 - b. *2,4,6-tris(2-ethyl-1-aziridinyl)-1,3,5-triazine* (HX-874) (CAS 18924-91-9);
 - c. *1,1'-trimethyladipoyl-bis(2-ethylaziridine)* (HX-877) (CAS 71463-62-2).
18. Propyleneimine (2-methylaziridine) (CAS 75-55-8);
 19. Superfine iron oxide (Fe₂O₃) with a specific surface area more than 250 m²/g and an average particle size of 3.0 nm or less;
 20. TEPAN (tetraethylenepentaamineacrylonitrile) (CAS 68412-45-3); cyanoethylated polyamines and their salts;
 21. TEPANOL (tetraethylenepentaamineacrylonitrileglycidol) (CAS 68412-46-4); cyanoethylated polyamines adducted with glycidol and their salts;
 22. TPB (triphenyl bismuth) (CAS 603-33-8);
 23. TEPB (Tris (ethoxyphenyl) bismuth) (CAS 90591-48-3);
- g. Precursors as follows:
1. BCMO (bischloromethyloxetane) (CAS 142173-26-0);
 2. Dinitroazetidene-t-butyl salt (CAS 125735-38-8);
 3. Hexaazaisowurtzitane derivatives including HBIW (hexabenzylhexaazaisowurtzitane) (CAS 124782-15-6) (see also ML8.a.4.) and TAIW (tetraacetyldibenzylhexaazaisowurtzitane) (CAS 182763-60-6) (see also ML8.a.4.);
 4. This entry is not used;
 5. TAT (1,3,5,7-tetraacetyl-1,3,5,7-tetraaza cyclo-octane) (CAS 41378-98-7);
 6. 1,4,5,8-tetraazadecalin (CAS 5409-42-7);
 7. 1,3,5-trichlorobenzene (CAS 108-70-3);
 8. 1,2,4-trihydroxybutane (1,2,4-butanetriol) (CAS 3068-00-6);
 9. DADN (1,5-diacetyl-3,7-dinitro-1,3,5,7-tetraaza-cyclooctane) (see also ML8.a.13.).

ML9 “Vessels” of war, special naval equipment, accessories, components and other surface “vessels” as follows:

N.B.: Electronic guidance and navigation equipment is controlled in ML11.a.

- 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 conditions, and whether or not they contain weapon delivery systems or armour, and components therefor specially designed or modified for military use;

Changes to legislation: There are currently no known outstanding effects for the The Export Control (Amendment) Order 2015. (See end of Document for details)

2. Surface “vessels” other than those specified in 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 ML1, or weapons specified in ML2., ML4., ML12. or ML19, or ‘mountings’ or hard points for such weapons;

Technical Note: ‘Mountings’ refers to weapon mounts or structural strengthening for the purpose of installing weapons.

- b. Fire control systems specified in ML5;
- c. Both:
 1. ‘CBRN protection’; and
 2. ‘Pre-wet or wash down system’ designed for decontamination purposes; or

Technical Note: 1. ‘CBRN protection’ is self-contained interior space containing features such as over-pressurization, isolation of ventilation systems, limited ventilation openings with chemical, biological, radiological and nuclear 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 vessel.

- d. Active weapon countermeasure systems specified in ML4.b., or ML5 c. or ML11.a. but only where the “vessel” has 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; or
 4. A degaussing system designed to reduce the magnetic signature of the whole vessel.
- b. Anti-submarine nets and anti-torpedo nets, specially designed for military use;
- c. 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.

ML10 “Aircraft”, “lighter-than-air vehicles”, “Unmanned Aerial Vehicles” (“UAVs”), aero-engines and “aircraft” equipment, related goods and components, as follows, specially designed or modified for military use.

N.B.: Electronic guidance and navigation equipment is controlled in ML11.a.

- a. Manned “aircraft” and “lighter-than-air vehicles”, and specially designed components therefor;

Changes to legislation: There are currently no known outstanding effects for the The Export Control (Amendment) Order 2015. (See end of Document for details)

- b. This entry is not used.
- c. Unmanned aircraft and related equipment, as follows, and specially designed components therefor:
 - 1. “UAVs” Remotely Piloted Air Vehicles (RPVs), autonomous programmable vehicles and unmanned “lighter-than-air vehicles”;
 - 2. Launchers, recovery equipment and ground support equipment;
 - 3. Equipment designed for command or control;
- d. Propulsion aero-engines and specially designed components therefor;
- e. Airborne refuelling equipment specially designed or modified for any of the following, and specially designed components therefor:
 - 1. “Aircraft” specified by ML10.a.; or
 - 2. Unmanned aircraft specified by ML10.c.;
- f. ‘Ground equipment’ specially designed for aircraft specified by ML10.a. or aero-engines specified by ML10.d.;

Technical Notes:

- 1. ‘Ground equipment’ includes pressure refuelling equipment and equipment designed to facilitate operations in confined areas.
 - 2. ‘Ground equipment’ means ground-based equipment for the operation, handling, maintenance, checking, repair, overhaul and refurbishment of “aircraft” or aero-engines.
- g. Aircrew life support equipment, aircrew safety equipment and other devices for emergency escape, not specified in ML10.a., designed for “aircraft” specified by ML10.a.;

Note ML10.g. does not control aircrew helmets that do not incorporate, or have mountings or fittings for, equipment specified in this Schedule.

N.B. For helmets see also ML13.c.

- h. Parachutes, paragliders and related equipment, as follows, and specially designed components therefor:
 - 1. Parachutes not specified elsewhere in this Schedule;
 - 2. Paragliders;
 - 3. Equipment specially designed for high altitude parachutists;
- i. Controlled opening equipment or automatic piloting systems designed for parachuted loads.

Note: ML 10. does not control “aircraft” meeting all of the following descriptions:

- a. were first manufactured before 1946;
- b. do not incorporate items specified in this Schedule unless the items are required to meet safety or airworthiness standards; and
- c. do not incorporate weapons specified in this Schedule, unless they have been certified by a registered UK Proof

Changes to legislation: There are currently no known outstanding effects for the The Export Control (Amendment) Order 2015. (See end of Document for details)

House as having been rendered incapable of firing any ammunition listed in this Schedule.

ML11 Electronic equipment, “spacecraft” and components, not specified elsewhere in this Schedule, as follows:

- a. Electronic equipment specially designed or modified for military use and specially designed components therefor;
- b. Global Navigation Satellite Systems (GNSS) jamming equipment and specially designed components therefor;

Note: *ML11.a. controls all electronic guidance and navigation equipment.*

- c. “spacecraft” specially designed or modified for military use, and “spacecraft” components specially designed for military use.

ML12 High velocity kinetic energy weapon (KEW) 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;

N.B.: For weapon systems using sub-calibre ammunition or employing solely chemical propulsion, and ammunition therefor, see ML1 to ML4.

- b. Specially designed test and evaluation facilities and test models (e.g. diagnostic instrumentation and targets), for dynamic testing of kinetic energy projectiles and systems.

ML13 Armoured or protective goods and constructions, as follows:

- a. Armoured plate, having any of the following characteristics:
 1. manufactured to comply with a military standard or specification; or
 2. suitable for military use;

N.B. For body armour plate, see ML 13.d.2.

- b. Constructions of metallic or non-metallic materials or combinations thereof specially designed to provide ballistic protection for military systems;
- c. Helmets manufactured according to military standards or specifications, or comparable national standards, and specially designed components therefor;

Note: *ML13.c. does not control:*

- a. *Conventional steel helmets, neither modified nor designed to accept, nor equipped with, any type of accessory device;*
- b. *Helmets manufactured before 1945;*

Changes to legislation: There are currently no known outstanding effects for the The Export Control (Amendment) Order 2015. (See end of Document for details)

- c. *Individual helmets not specially designed for military use when accompanying their users.*

N.B.: *Military high altitude parachutists' protective headgear is controlled in ML10.h.3.*

- d. Body armour or protective garments, and components therefor, as follows:
 - 1. Soft body armour or protective garments, manufactured to military standards or specifications, or to their equivalents, and specially designed components therefor;
Note: *For the purposes of ML 13.d.1. military standards or specifications include, at a minimum, specifications for fragmentation protection.*
 - 2. Hard body armour plates providing ballistic protection equal to or greater than level III (NIJ 0101.06 July 2008) or national equivalents
Note: *ML13.d. does not control individual suits of body armour or ballistic protective garments for personal protection and accessories therefor when accompanying their users.*

N.B. *See also 1A of Annex I to “the dual-use Regulation”.*

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 ML1 or ML2, and specially designed components and accessories therefor.

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;
- f. Countermeasure or counter-countermeasure equipment for the equipment specified in ML15.a. to ML15.e.

Note: *ML15 does not control “first generation image intensifier tubes” or equipment specially designed so that only “first generation image intensifier tubes” are or can be incorporated in it.*

N.B. 1: *For weapons sights incorporating “first generation image intensifier tubes” see ML1., ML2. and ML5.*

N.B. 2: *See also 6A of Annex I to “the dual-use Regulation”.*

ML16 Forgings, castings and other unfinished goods, specially designed for any of the goods specified in ML1 to ML4, ML6, ML9, ML10, ML12 or ML19.

ML17 Miscellaneous goods, material 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. Goods designed exclusively for military use with self-contained diving and underwater swimming apparatus;

N.B.: See also 8A002.q. of Annex I to “the dual-use Regulation”.

- 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”, meeting any of the following descriptions:
 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
 3. specially designed or rated for operating in an electro-magnetic pulse (EMP) environment;

Technical Note: 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 Schedule;

Technical Note: For the purpose of ML17, the term ‘libraries’ (parametric technical databases) means a collection of technical information of a military nature, reference to which may enhance the performance of military equipment or systems.

- g. Nuclear power generating equipment or propulsion equipment (e.g. “nuclear reactors”), specially designed for military use and components therefor, specially designed or modified for military use;
- h. Goods and material, coated, treated or prepared to provide signature suppression, specially designed for military use, other than those controlled elsewhere in this Schedule;

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- 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 controlled elsewhere in this Schedule, rafts, bridges and pontoons, specially designed for military use;
- n. Test models specially designed for the “development” of goods controlled in 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 this Schedule, specially designed or modified for military use.

ML18 Production equipment and components, as follows:

- a. Specially designed or modified production equipment for the “production” of goods specified in this Schedule, and specially designed components therefor;
- b. Specially designed environmental test facilities and specially designed equipment therefor, for the certification, qualification or testing of goods specified in this Schedule.

PL5017 Equipment and test models other than those specified in ML11, ML12.b., ML17.n. or ML19.e. specially designed or modified for the “development” or “use” of military goods specified in this Schedule.

ML19 Directed energy weapon (DEW) systems, 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 ML19.a. to ML19.c.;
- e. Physical test models for the systems, equipment and components specified in ML19;
- f. “Laser” systems specially designed to cause permanent blindness to un-enhanced vision (i.e. to the naked eye or to the eye with corrective eyesight devices).

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 applications, capable of operating while in motion and of producing or maintaining temperatures below 103 K (-170°C);
- 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: ML20 does not control 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 component 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 Schedule;
- b. Specific “software”, other than that specified in ML21.a., as follows:
 1. “Software” that is both specially designed for military use and specially designed for modelling, simulating or evaluating military weapons systems;
 2. “Software” that is both 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” that is both specially designed for military use and specially designed for Command, Communications, Control and Intelligence (C³I) applications or Command, Communications, Control, Computer and Intelligence (C⁴I) applications;
- c. “Software”, not specified in ML21.a. or b., specially designed or modified to enable equipment not specified in this Schedule to perform the military functions of equipment specified in this Schedule;
- d. Other “software” specially designed or modified for military use.

N.B. Source code for “software” is controlled in ML22.

PL5001 Other security and para-military police goods as follows:

- a. Acoustic devices represented by the manufacturers or suppliers thereof as suitable for riot control purposes, and specially designed components therefor;

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- b. Anti-riot and ballistic shields and specially designed components therefor;
 - c. Shackles designed for restraining human beings having an overall dimension including chain, when measured from the outer edge of one cuff to the outer edge of the other cuff, of between 240mm and 280mm when locked;
N.B.: See also 1.1 of Annex III to “the torture Regulation”.
 - d. Water cannon and specially designed components therefor;
N.B.: See also 3.6 of Annex III to “the torture Regulation”.
 - e. Riot control vehicles which have been specially designed or modified to be electrified to repel boarders and components therefor specially designed or modified for that purpose;
 - f. Components specially designed or modified for portable devices designed or modified for the purposes of riot control or self-protection by the administration of an electric shock (e.g. electric-shock batons, electric-shock shields, stun-guns and electric-shock dart-guns).*N.B.*
- N.B.* See also article 9 of this Order.

ML22 “Technology” as follows:

- a. “Technology”, other than “technology” specified in ML22.b., which is “required” for the “development”, “production”, operation, installation, maintenance (checking), repair, overhaul or refurbishing of goods or “software” specified in this Schedule;
 - 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 goods specified in this Schedule, even if the components of such production installations are not specified;
 - 2. This entry is not used;
 - 3. This entry is not used;
 - 4. “Technology” “required” exclusively for the incorporation of “biocatalysts”, specified in ML7.i.1, into military carrier substances or military material.
- N.B.* See article 18 and article 26 of this Order for exceptions from the controls on “technology”.
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Changes to legislation:

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