

**CATEGORY 1 - MATERIALS, CHEMICALS,  
“MICROORGANISMS,” AND TOXINS**

**Note:** The Food and Drug Administration (FDA) and the Drug Enforcement Administration (DEA) may control exports of items subject to the EAR and on the Commerce Control List. BIS provides cross references to these other agency controls for convenience only. Therefore, please consult relevant FDA and DEA regulations for guidance related to the item you wish to export and do not rely solely on the EAR for information about other agency export control requirements. See Supplement No. 3 to part 730 (Other U.S. Government Departments and Agencies with Export Control Responsibilities) for more information.

**A. SYSTEMS, EQUIPMENT AND  
COMPONENTS**

**1A001 Components made from fluorinated compounds, as follows (see List of Items Controlled).**

**License Requirements**

*Reason for Control:* NS, AT

<i>Control(s)</i>	<i>Country Chart</i>
NS applies to entire entry	NS Column 2
AT applies to entire entry	AT Column 1

**License Exceptions**

LVS: \$5000  
GBS: N/A  
CIV: N/A

**List of Items Controlled**

*Unit:* Kilograms  
*Related Controls:* (1) Items specially designed or modified for missiles or for items on the

U.S. Munitions List are subject to the export licensing authority of the U.S. Department of State, Directorate of Defense Trade Controls (see 22 CFR 121.1 Category XXI). (2) See also [1C009](#).

*Related Definitions:* N/A

*Items:*

- 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 controlled by 1C009.b or 1C009.c;
- b. Piezoelectric polymers and copolymers made from vinylidene fluoride materials controlled by 1C009.a:
  - b.1. In sheet or film form; *and*
  - b.2. With a thickness exceeding 200 µm;
- c. Seals, gaskets, valve seats, bladders or diaphragms made from fluoroelastomers containing at least one vinyl ether group as a constitutional unit, specially designed for “aircraft”, aerospace or missile use.

**1A002 “Composite” structures or laminates, having any of the following (see List of Items Controlled).**

**License Requirements**

*Reason for Control:* NS, NP, AT

<i>Control(s)</i>	<i>Country Chart</i>
NS applies to entire entry	NS Column 2
NP applies to 1A002.b.1 in the form of tubes with an inside diameter between 75 mm and 400 mm	NP Column 1
AT applies to entire entry	AT Column 1

**License Requirement Notes:** See §743.1 of

the EAR for reporting requirements for exports under License Exceptions.

### License Exceptions

LVS: \$1,500; N/A for NP; N/A for “composite” structures or laminates controlled by 1A002.a, having an organic “matrix” and made from materials controlled by 1C010.c or 1C010.d.

GBS: N/A

CIV: N/A

### List of Items Controlled

*Unit:* Kilograms

*Related Controls:* (1) See ECCNs [1E001](#) (“development” and “production”) and 1E201 (“use”) for technology for items controlled by this entry. (2) Also see ECCNs [1A202](#), [1C010](#), [1C210](#), 9A010, and 9A110. (3) “Composite” structures specially designed for missile applications (including specially designed subsystems and components) are controlled by ECCN 9A110. (4) “Composite” structures or laminates specially designed or prepared for use in separating uranium isotopes are subject to the export licensing authority of the Nuclear Regulatory Commission (see 10 CFR part 110).

*Related Definitions:* N/A

*Items:*

- a. Consisting of an organic “matrix” and materials controlled by 1C010.c 1C010.d, or 1C010.e or

*Note:* 1A002.a does not control finished or semifinished items specially designed for purely civilian applications as follows:

- a. Sporting goods;
- b. Automotive industry;
- c. Machine tool industry; and

d. Medical applications.

- b. Consisting of a metal or carbon “matrix” and any of the following:

b.1. Carbon “fibrous or filamentary materials” with:

b.1.a. A “specific modulus” exceeding  $10.15 \times 10^6$  m; and

b.1.b. A “specific tensile strength” exceeding  $17.7 \times 10^4$  m; or

b.2. Materials controlled by 1C010.c.

*Note:* 1A002.b does not control finished or semifinished items specially designed for purely civilian applications as follows:

- a. Sporting goods;
- b. Automotive industry;
- c. Machine tool industry; and
- d. Medical applications.

#### Technical Notes:

1. *Specific modulus:* Young’s modulus in pascals, equivalent to  $N/m^2$ , divided by specific weight in  $N/m^3$ , measured at a temperature of  $(296 \pm 2)$  K  $((23 \pm 2)^\circ C)$  and a relative humidity of  $(50 \pm 5)$  %.
2. *Specific tensile strength:* ultimate tensile strength in pascals, equivalent to  $N/m^2$  divided by specific weight in  $N/m^3$ , measured at a temperature of  $(296 \pm 2)$  K  $((23 \pm 2)^\circ C)$  and a relative humidity of  $(50 \pm 5)$  %.

*Note:* 1A002 does not control composite structures or laminates made from epoxy resin impregnated carbon “fibrous or filamentary materials” for the repair of “civil aircraft” structures or laminates, provided that the size does not exceed 100 cm x 100 cm.

**1A003 Manufactures of non-fluorinated polymeric substances controlled by 1C008.a.3 in film, sheet, tape or ribbon form with either of the following characteristics (see List of Items Controlled).**

#### License Requirements

*Reason for Control:* NS, AT

*Control(s)* Country Chart

NS applies to entire entry NS Column 2

AT applies to entire entry AT Column 1

#### License Exceptions

LVS: \$200  
GBS: N/A  
CIV: N/A

#### List of Items Controlled

*Unit:* Kilograms

*Related Controls:* This entry does not control manufactures when coated or laminated with copper and designed for the production of electronic printed circuit boards. See also [1C008](#).

*Related Definitions:* N/A

*Items:*

- a. With a thickness exceeding 0.254 mm; *or*
- b. Coated or laminated with carbon, graphite, metals or magnetic substances.

**1A004 Protective and detection equipment and components not specially designed for military use as follows (see List of Items Controlled).**

#### License Requirements

*Reason for Control:* NS, CB, AT

*Control(s)*

NS applies to entire entry

CB applies to chemical detection systems and dedicated detectors therefor, in 1A004.c, that also have the technical characteristics described in 2B351.a

AT applies to entire entry

#### License Exceptions

LVS: N/A  
GBS: N/A  
CIV: N/A

#### List of Items Controlled

*Unit:* \$ value

*Related Controls:* (1) See ECCNs [1A995](#), 2B351, and 2B352. (2) See ECCN [1D003](#) for "software" specially designed or modified to enable equipment to perform the functions of equipment controlled under section [1A004.c](#) (Nuclear, biological and chemical (NBC) detection systems). (3) See ECCN [1E002.g](#) for control libraries (parametric technical databases) specially designed or modified to enable equipment to perform the functions of equipment controlled under [1A004.c](#) (Nuclear, biological and chemical (NBC) detection systems). (4) Chemical and biological protective and detection equipment specifically designed, developed, modified, configured, or adapted for military applications is subject to the export licensing jurisdiction of the Department of State, Directorate of Defense Trade Controls (see 22 CFR part 121, category XIV(f)), as is commercial equipment that incorporates components or parts controlled under that category unless those components or parts are: 1) integral to the device; 2) inseparable from the device; and 3) incapable of

replacement without compromising the effectiveness of the device, in which case the equipment is subject to the export licensing jurisdiction of the Department of Commerce under ECCN [1A004](#).

*Related Definitions:* 1) “adapted for use in war” 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. 2) “Riot control agents” are 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. (Tear gases are a subset of “riot control agents”.)

*Items:*

a. Gas masks, filter canisters and decontamination equipment therefor, designed or modified for defense 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*
4. “Riot control agents”, as follows:

a. Bromobenzeneacetonitrile, (Bromobenzyl cyanide) (CA) (CAS 5798-79-8);

b. [(2-chlorophenyl) methylene] propanedinitrile, (o-Chlorobenzylidenemalononitrile) (CS) (CAS 2698-41-1);

c. 2-Chloro-1-phenylethanone,

Phenylacetyl chloride (-chloroacetophenone) (CN) (CAS 532-27-4);

d. Dibenz-(b,f)-1,4-oxazepine, (CR) (CAS 257-07-8);

e. 10-Chloro-5,10-dihydrophenarsazine, (Phenarsazine chloride), (Adamsite), (DM) (CAS 578-94-9);

f. N-Nonanoylmorpholine, (MPA) (CAS 5299-64-9);

b. Protective suits, gloves and shoes, specially designed or modified for defense against any of the following:

1. Biological agents “adapted for use in war”;
2. Radioactive materials “adapted for use in war”; *or*
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'; *or*
3. Chemical warfare (CW) agents.

**Note:** 1A004 does not control:

a. Personal radiation monitoring dosimeters;

b. Equipment limited by design or function to protect against hazards specific to civil industries, such as mining, quarrying,

agriculture, pharmaceuticals, medical, veterinary, environmental, waste management, or to the food industry.

**Technical Notes**

1. ECCN 1A004 includes equipment and components that have been identified, successfully tested to national standards or otherwise proven effective, for the detection of or defense 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': A substance or material that is used in place of toxic agent (chemical or biological) in training, research, testing or evaluation.

**1A005 Body armor, and specially designed components therefor, not manufactured to military standards or specifications, nor to their equivalents in performance.**

**License Requirements**

*Reason for Control:* NS, UN, AT

<i>Control(s)</i>	<i>Country Chart</i>
NS applies to entire entry	NS Column 2
UN applies to entire entry	Iraq, North Korea, and Rwanda
AT applies to entire entry	AT Column 1

**License Exceptions**

LVS: N/A  
 GBS: Yes, except UN

CIV: N/A

**List of Items Controlled**

*Unit:* \$ value

*Related Controls:* 1.) Bulletproof and bullet resistant vests (body armor) NIJ levels III and IV, are subject to the export licensing authority of the U.S. Department of State, Directorate of Defense Trade Controls (see 22 CFR 121.1 Categories X(a) and XIV(f, h)). 2) For “fibrous or filamentary materials” used in the manufacture of body armor, see ECCN [1C010](#). 3.) See §746.8(b)(1) for additional licensing requirements concerning this entry.

*Related Definitions:* N/A

*Items:*

**Note to ECCN 1A005:** 1. This entry does not control body armor or protective garments when accompanying their user for the user’s own personal protection.

2. This entry does not control body armor designed to provide frontal protection only from both fragment and blast from non-military explosive devices.

The list of items controlled is contained in the ECCN heading.

**1A006 Equipment, specially designed or modified for the disposal of improvised explosive devices, as follows (see List of Items Controlled), and specially designed components and accessories therefor.**

**License Requirements**

*Reason for Control:* NS, AT

<i>Control(s)</i>	<i>Country Chart</i>
NS applies to entire entry	NS Column 2
AT applies to entire entry	AT Column 1

**License Requirement Note:** 1A006 does not apply to equipment when accompanying its operator.

**License Exceptions**

LVS: N/A  
 GBS: N/A  
 CIV: N/A

**List of Items Controlled**

*Unit:* \$ value

*Related Controls:* Equipment specially designed for military use for the disposal of improvised explosive devices is subject to the export licensing jurisdiction of the Department of State, Directorate of Defense Trade Controls (see 22 CFR part 121, Category IV).

*Related Definitions:* 'Disruptors' - Devices specially designed for the purpose of preventing the operation of an explosive device by projecting a liquid, solid or frangible projectile.

*Items:*

- a. Remotely operated vehicles;
- b. 'Disruptors'.

**1A007 Equipment and devices, specially designed to initiate charges and devices containing energetic materials, by electrical means, as follows (see List of Items Controlled).**

**License Requirements**

*Reason for Control:* NS, NP, AT

*Control(s)* Country Chart

NS applies to entire entry NS Column 2

NP applies to 1A007.b, as well as 1A007.a when the detonator firing set meets or exceeds the parameters of 3A229.

NP Column 1

AT applies to entire entry AT Column 1

**License Requirement Note:** 1A007 does not apply to equipment when accompanying its operator.

**License Exceptions**

LVS: N/A  
 GBS: N/A  
 CIV: N/A

**List of Items Controlled**

*Unit:* \$ value

*Related Controls:* High explosives and related equipment specially designed for military use is subject to the export licensing jurisdiction of the Department of State, Directorate of Defense Trade Controls (see 22 CFR part 121). This entry does not control detonators using only primary explosives, such as lead azide. See also 3A229. See 1E001 for “development” and “production” technology controls, and 1E201 for “use” technology controls.

*Related Definitions:* N/A

*Items:*

- a. Explosive detonator firing sets designed to drive explosive detonators specified by 1A007.b;
- b. Electrically driven explosive detonators as follows:
  - b.1. Exploding bridge (EB);
  - b.2. Exploding bridge wire (EBW);

b.3. Slapper;

CIV: N/A

b.4. Exploding foil initiators (EFI).

**List of Items Controlled**

**Technical Notes**

1. The word initiator or igniter is sometimes used in place of the word detonator.

2. For the purpose of 1A007.b the detonators of concern all utilize a small electrical conductor (bridge, bridge wire, or foil) that explosively vaporizes 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 vaporization 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. Also, the word initiator is sometimes used in place of the word detonator.

Unit: \$ value

Related Controls: See also [1C101](#). For commodities that meet the definition of defense articles under 22 CFR 120.3 of the International Traffic in Arms Regulations (ITAR), see also 22 CFR 121.16, Item 17-Category II of the (ITAR), which describes similar commodities under the jurisdiction of the Department of State, Directorate of Defense Trade Controls.

Related Definitions: N/A

Items:

The list of items controlled is contained in the ECCN heading.

**1A101 Devices for reduced observables such as radar reflectivity, ultraviolet/infrared signatures and acoustic signatures, for applications usable in “missiles” and their subsystems.**

**1A102 Resaturated pyrolyzed carbon-carbon components designed for rockets, missiles, or unmanned aerial vehicles capable of achieving a “range” equal to or greater than 300km. (These items are subject to the export licensing authority of the U.S. Department of State, Directorate of Defense Trade Controls. See 22 CFR part 121).**

**License Requirements**

Reason for Control: MT, AT

Control(s)	Country Chart
MT applies to entire entry	MT Column 1
AT applies to entire entry	AT Column 1

**License Exceptions**

LVS: N/A  
GBS: N/A

**1A202 Composite structures, other than those controlled by 1A002, in the form of tubes and having both of the following characteristics (see List of Items Controlled).**

**License Requirements**

Reason for Control: NP, AT

Control(s)	Country Chart
NP applies to entire entry	NP Column 1
AT applies to entire entry	AT Column 1

**License Exceptions**



LVS: N/A  
 GBS: N/A  
 CIV: N/A

**List of Items Controlled**

*Unit:* Kilograms

*Related Controls:* (1) See ECCNs [1E201](#) (“use”) and [1E202](#) (“development” and “production”) for technology for items controlled by this entry. (2) Also see ECCNs [1A002](#), [1C010](#), [1C210](#), 9A010, and 9A110. (3) “Composite” structures specially designed or prepared for use in separating uranium isotopes are subject to the export licensing authority of the Nuclear Regulatory Commission (see 10 CFR part 110).

*Related Definitions:* N/A

*Items:*

- a. An inside diameter of between 75 mm and 400 mm; *and*
- b. Made with any of the “fibrous or filamentary materials” specified in 1C010.a or .b or 1C210.a or with carbon prepreg materials specified in 1C210.c.

**1A225 Platinized 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.**

**License Requirements**

*Reason for Control:* NP, AT

<i>Control(s)</i>	<i>Country Chart</i>
NP applies to entire entry	NP Column 1
AT applies to entire entry	AT Column 1

**License Exceptions**

LVS: N/A  
 GBS: N/A  
 CIV: N/A

**List of Items Controlled**

*Unit:* Kilograms

*Related Controls:* (1) See ECCNs [1E201](#) (“use”) and [1E202](#) (“development” and “production”) for technology for items controlled by this entry. (2) Equipment specially designed or prepared for the production of heavy water is subject to the export licensing authority of the Nuclear Regulatory Commission (see 10 CFR part 110).

*Related Definitions:* N/A

*Items:*

The list of items controlled is contained in the ECCN heading.

**1A226 Specialized packings, which may be used in separating heavy water from ordinary water, having both of the following characteristics (see List of Items Controlled).**

**License Requirements**

*Reason for Control:* NP, AT

<i>Control(s)</i>	<i>Country Chart</i>
NP applies to entire entry	NP Column 1
AT applies to entire entry	AT Column 1

**License Exceptions**

LVS: N/A  
 GBS: N/A  
 CIV: N/A

**List of Items Controlled**



*Unit:* \$ value

*Related Controls:* (1) See ECCNs [1E201](#) (“use”) and [1E202](#) (“development” and “production”) for technology for items controlled by this entry. (2) Equipment specially designed or prepared for the production of heavy water is subject to the export licensing authority of the Nuclear Regulatory Commission (see 10 CFR part 110).

*Related Definitions:* N/A

*Items:*

- 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 (see List of Items Controlled), and specially designed frames therefor.**

**License Requirements**

*Reason for Control:* NP, AT

<i>Control(s)</i>	<i>Country Chart</i>
NP applies to entire entry	NP Column 1
AT applies to entire entry	AT Column 1

**License Exceptions**

LVS: N/A  
 GBS: N/A  
 CIV: N/A

**List of Items Controlled**

*Unit:* \$ value

*Related Controls:* (1) See ECCNs [1E201](#) (“use”) and [1E202](#) (“development” and

“production”) for technology for items controlled by this entry. (2) Equipment specially designed or prepared for nuclear reactors and reprocessing facilities is subject to the export licensing authority of the Nuclear Regulatory Commission (see 10 CFR part 110).

*Related Definitions:* In 1A227.a, the term “cold area” means the viewing area of the window exposed to the lowest level of radiation in the design application.

*Items:*

- a. A “cold area” greater than 0.09 m<sup>2</sup>;
- b. A density greater than 3 g/cm<sup>3</sup>; *and*
- c. A thickness of 100 mm or greater.

**1A290 Depleted uranium (any uranium containing less than 0.711% of the isotope U-235) in shipments of more than 1,000 kilograms in the form of shielding contained in X-ray units, radiographic exposure or teletherapy devices, radioactive thermoelectric generators, or packaging for the transportation of radioactive materials.**

**License Requirements**

*Reason for Control:* NP, AT

<i>Control(s)</i>	<i>Country Chart</i>
NP applies to entire entry	NP Column 2
AT applies to entire entry	AT Column 1

**License Exceptions**

LVS: N/A  
 GBS: N/A  
 CIV: N/A

**List of Items Controlled**

*Unit:* Kilograms

*Related Controls:* 1.) This entry does not control depleted uranium in fabricated forms for use in munitions. See 22 CFR part 121 for depleted uranium subject to the export licensing authority of the U.S. Department of State, Directorate of Defense Trade Controls. 2.) Depleted uranium that is not fabricated for use in munitions or fabricated into commodities solely to take advantage of its high density (e.g., aircraft, ship, or other counterweights) or in the forms listed in this entry are subject to the export licensing authority of the Nuclear Regulatory Commission. (See 10 CFR part 110.) 3.) See also 0C001.

*Related Definitions:* N/A

*Items:*

The list of items controlled is contained in the ECCN heading.

**1A984 Chemical agents, including tear gas formulation containing 1 percent or less of orthochlorobenzalmalononitrile (CS), or 1 percent or less of chloroacetophenone (CN), except in individual containers with a net weight of 20 grams or less; liquid pepper except when packaged in individual containers with a net weight of 3 ounces (85.05 grams) or less; smoke bombs; non-irritant smoke flares, canisters, grenades and charges; and other pyrotechnic articles having dual military and commercial use.**

**License Requirements**

*Reason for Control:* CC

*Control(s)* Country Chart

CC applies to entire entry CC Column 1

**License Exceptions**

LVS: N/A

GBS: N/A

CIV: N/A

**List of Items Controlled**

*Unit:* \$ value

*Related Controls:* N/A

*Related Definitions:* N/A

*Items:*

The list of items controlled is contained in the ECCN heading.

**1A985 Fingerprinting powders, dyes, and inks.**

**License Requirements**

*Reason for Control:* CC

*Control(s)* Country Chart

CC applies to entire entry CC Column 1

**License Exceptions**

LVS: N/A

GBS: N/A

CIV: N/A

**List of Items Controlled**

*Unit:* \$ value

*Related Controls:* N/A

*Related Definitions:* N/A

*Items:*

The list of items controlled is contained in the ECCN heading.

**1A995 Protective and detection equipment and components not specially designed for military use and not controlled by ECCN 1A004 or ECCN 2B351, as follows (see List of Items Controlled).**

*Reason for Control:* AT

**License Requirements**

*Reason for Control:* AT

<i>Control(s)</i>	<i>Country Chart</i>
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AT applies to entire entry	AT Column 1
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**License Exceptions**

LVS: N/A  
 GBS: N/A  
 CIV: N/A

**List of Items Controlled**

*Unit:* \$ value  
*Related controls:* See ECCNs [1A004](#), 2B351, and 2B352.  
*Related Definitions:* N/A  
*Items:*

- a. Personal radiation monitoring dosimeters;
- b. Equipment limited by design or function to protect against hazards specific to civil industries, such as mining, quarrying, agriculture, pharmaceuticals, medical, veterinary, environmental, waste management, or to the food industry.

*Note:* This entry (1A995) does not control items for protection against chemical or biological agents that are consumer goods, packaged for retail sale or personal use, or medical products, such as latex exam gloves, latex surgical gloves, liquid disinfectant soap, disposable surgical drapes, surgical gowns, surgical foot covers, and surgical masks. Such items are classified as EAR99.

**1A999 Specific processing equipment, n.e.s., as follows (see List of Items Controlled).**

**License Requirements**

<i>Control(s)</i>	<i>Country Chart</i>
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AT applies to entire entry. A license is required for items controlled by this entry to North Korea for anti-terrorism reasons. The Commerce Country Chart is not designed to determine AT licensing requirements for this entry. See §742.19 of the EAR for additional information.

**License Exceptions**

LVS: N/A  
 GBS: N/A  
 CIV: N/A

**List of Items Controlled**

*Unit:* \$ value  
*Related Controls:* N/A  
*Related Definitions:* N/A  
*Items:*

- a. Radiation detection, monitoring and measurement equipment, n.e.s.;
- b. Radiographic detection equipment such as x-ray converters, and storage phosphor image plates.

**B. TEST, INSPECTION AND PRODUCTION EQUIPMENT**

**1B001 Equipment for the production of fibers, preregs, preforms or “composites” controlled by 1A002 or 1C010, as follows (see List of Items Controlled), and specially designed components and accessories therefor.**

**License Requirements**

*Reason for Control:* NS, MT, NP, AT

<i>Control(s)</i>	<i>Country Chart</i>
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NS applies to entire entry NS Column 2

of “composite” structures or laminates from “fibrous or filamentary materials”;

MT applies to entire entry, MT Column 1  
except 1B001.d.4 and .f.

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:** *MT applies to equipment in 1B001.d that meet or exceed the parameters of 1B101.*

NP applies to filament NP Column 1  
winding machines described in 1B001.a that are capable of winding cylindrical rotors having a diameter between 75 mm (3 in) and 400 mm (16 in) and lengths of 600 mm (24 in) or greater; AND coordinating and programming controls and precision mandrels for these filament winding machines

c. Multidirectional, multidimensional weaving machines or interlacing machines, including adapters and modification kits, for weaving, interlacing or braiding fibers to manufacture “composite” structures;

**Technical Note:** *For the purposes of 1B001.c the technique of interlacing includes knitting.*

**Note:** *1B001.c does not control textile machinery not modified for the above end-uses.*

AT applies to entire entry AT Column 1

d. Equipment specially designed or adapted for the production of reinforcement fibers, as follows:

### License Exceptions

LVS: N/A for MT and for 1B001.a;  
\$5000 for all other items

GBS: N/A

CIV: N/A

d.1. Equipment for converting polymeric fibers (such as polyacrylonitrile, rayon, pitch or polycarbosilane) into carbon fibers or silicon carbide fibers, including special equipment to strain the fiber during heating;

### List of Items Controlled

*Unit:* \$ value

*Related Controls:* (1) See ECCN [1D001](#) for software for items controlled by this entry and see ECCNs [1E001](#) (“development” and “production”) and [1E101](#) (“use”) for technology for items controlled by this entry. (2) Also see ECCNs [1B101](#) and [1B201](#).

*Related Definitions:* N/A

*Items:*

d.2. Equipment for the chemical vapor deposition of elements or compounds on heated filamentary substrates to manufacture silicon carbide fibers;

d.3. Equipment for the wet-spinning of refractory ceramics (such as aluminum oxide);

d.4. Equipment for converting aluminum containing precursor fibers into alumina fibers by heat treatment;

a. Filament winding machines of which the motions for positioning, wrapping and winding fibers are coordinated and programmed in three or more axes, specially designed for the manufacture

e. Equipment for producing prepregs controlled by 1C010.e by the hot melt method;

f. Non-destructive inspection equipment specially designed for “composite” materials, as follows:

f.1. X-ray tomography systems for three dimensional defect inspection;

f.2. Numerically controlled ultrasonic testing machines of which the motions for positioning transmitters and/or receivers 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 1C002.c.2.**

**License Requirements**

*Reason for Control:* NS, AT

<i>Control(s)</i>	<i>Country Chart</i>
NS applies to entire entry	NS Column 2
AT applies to entire entry	AT Column 1

**License Exceptions**

LVS: \$5000  
 GBS: N/A  
 CIV: N/A

**List of Items Controlled**

*Unit:* \$ value  
*Related Controls:* N/A  
*Related Definitions:* N/A

*Items:*

The list of items controlled is contained in the ECCN heading.

**1B003 Tools, dies, molds or fixtures, for “superplastic forming” or “diffusion bonding” titanium or aluminum or their alloys, specially designed for the manufacture of (see List of Items Controlled).**

**License Requirements**

*Reason for Control:* NS, AT

<i>Control(s)</i>	<i>Country Chart</i>
NS applies to entire entry	NS Column 2
AT applies to entire entry	AT Column 1

**License Exceptions**

LVS: \$5000  
 GBS: N/A  
 CIV: N/A

**List of Items Controlled**

*Unit:* Tools in number; dies, molds, or fixtures in \$ value  
*Related Controls:* For specially designed production equipment of systems, sub-systems and components controlled by 9A005 to 9A009, 9A011, 9A101, 9A105 to 9A109, 9A111, and 9A116 to 9A120 usable in “missiles”, see 9B115.  
*Related Definitions:* N/A  
*Items:*

- a. Airframe or aerospace structures;
- b. “Aircraft” or aerospace engines; *or*
- c. Specially designed components for those structures or engines.

**1B018 Equipment on the Wassenaar Arrangement Munitions List.**

**License Requirements**

*Reason for Control:* NS, MT, RS, AT, UN

<i>Control(s)</i>	<i>Country Chart</i>
NS applies to entire entry.	NS Column 1
MT applies to equipment for the “production” of rocket propellants.	MT Column 1
RS applies to 1B018.a.	RS Column 2
AT applies to entire entry.	AT Column 1
UN applies to entire entry.	Iraq, North Korea, and Rwanda.

**License Exceptions**

LVS: \$3000 for 1B018.a for countries WITHOUT an “X” in RS Column 2 on the Country Chart contained in Supplement No. 1 to part 738 of the EAR; \$5000 for 1B018.b; N/A for Rwanda.  
 GBS: N/A  
 CIV: N/A

**List of Items Controlled**

*Unit:* Equipment in number; parts and accessories in \$ value  
*Related Controls:* N/A  
*Related Definitions:* N/A  
*Items:*

- a. Equipment for the “production” of military explosives and solid propellants.
  - a.1. Complete installations;

- a.2. Specialized components (for example, dehydration presses; extrusion presses for the extrusion of small arms, cannon and rocket propellants; cutting machines for the sizing of extruded propellants; sweetie barrels (tumblers) 6 feet and over in diameter and having over 500 pounds product capacity; and continuous mixers for solid propellants); or

- a.3. Nitrators, continuous types; and

- a.4. Specially designed parts and accessories therefor.

- b. Environmental chambers capable of pressures below (10<sup>-4</sup>) Torr, and specially designed components therefor.

**1B101 Equipment, other than that controlled by 1B001, for the “production” of structural composites, fibers, prepregs or preforms as follows (see List of Items Controlled); and specially designed components, and accessories therefor.**

**License Requirements**

*Reason for Control:* MT, NP, AT

<i>Control(s)</i>	<i>Country Chart</i>
MT applies to entire entry	MT Column 1
NP applies to filament winding machines described in 1B101.a that are capable of winding cylindrical rotors having a diameter between 75 mm (3 in.) and 400 mm (16 in.) and lengths of 600 mm (24 in.) or greater AND to coordinating and programming controls and precision mandrels for these filament winding machines	NP Column 1

AT applies to entire entry

AT Column 1

strain the fiber during heating;

**License Exceptions**

LVS: N/A

GBS: N/A

CIV: N/A

c.2. Equipment for the vapor deposition of elements or compounds on heated filament substrates; *and*

c.3. Equipment for the wet-spinning of refractory ceramics (such as aluminum oxide);

d. Equipment designed or modified for special fiber surface treatment or for producing prepregs and preforms controlled by 9A110.

*Note: Equipment covered in 1B101.d includes but is not limited to, rollers, tension stretchers, coating equipment, cutting equipment and clicker dies.*

**List of Items Controlled**

*Unit:* \$ value

*Related Controls:* See ECCN [1D101](#) for software for items controlled by this entry and see ECCNs [1E001](#) (“development” and “production”) and [1E101](#) (“use”) for technology for items controlled by this entry. Also see [1B201](#).

*Related Definitions:* Examples of components and accessories for the machines controlled by this entry are molds, mandrels, dies, fixtures and tooling for the preform pressing, curing, casting, sintering or bonding of composite structures, laminates and manufactures thereof.

*Items:*

a. Filament winding machines of which the motions for positioning, wrapping and winding fibers 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:

c.1. Equipment for converting polymeric fibers (such as polyacrylonitrile, rayon or polycarbosilane) including special provision to

**1B102 Metal powder “production equipment,” other than that specified in 1B002, and components as follows (see List of Items Controlled).**

**License Requirements**

*Reason for Control:* MT, AT

<i>Control(s)</i>	<i>Country Chart</i>
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MT applies to entire entry	MT Column 1
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AT applies to entire entry	AT Column 1
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**License Exceptions**

LVS: N/A

GBS: N/A

CIV: N/A

**List of Items Controlled**

*Unit:* Equipment in number; components in \$ value

*Related Controls:* 1.) See also [1B115.b](#).

*Related Definitions:* N/A

*Items:*



a. Metal power “production equipment usable for the “production,” in a controlled environment, of spherical or atomized materials specified in 1C011.a, 1C011.b, 1C111.a.1, 1C111.a.2, or on the U.S. Munitions List.

b. Specially designed components for “production equipment” specified in 1B002 or 1B102.a.

*Note: 1B102 includes:*

a. *Plasma generators (high frequency arc-jet) usable for obtaining sputtered or spherical metallic powders with organization of the process in an argon-water environment;*

b. *Electroburst equipment usable for obtaining sputtered or spherical metallic powders with organization of the process in an argon-water environment;*

c. *Equipment usable for the “production” of spherical aluminum powders by powdering a melt in an inert medium (e.g., nitrogen).*

**1B115 Equipment, other than that controlled in 1B002 or 1B102, for the “production” of propellant or propellant constituents, and specially designed components therefor.**

**License Requirements**

*Reason for Control:* MT, AT

<i>Control(s)</i>	<i>Country Chart</i>
MT applies to entire entry	MT Column 1
AT applies to entire entry	AT Column 1

**License Exceptions**

LVS: N/A  
 GBS: N/A  
 CIV: N/A

**List of Items Controlled**

*Unit:* Equipment in number; components in \$ value

*Related Controls:* For the control of batch mixers, continuous mixers and fluid energy mills, see [1B117](#), [1B118](#) and [1B119](#).

*Related Definitions:* N/A

*Items:*

a. “Production equipment” for the “production”, handling or acceptance testing of liquid propellants or propellant constituents controlled by 1C011.a, 1C011.b, 1C111 or on the U.S. Munitions List;

b. “Production equipment,” for the production, handling, mixing, curing, casting, pressing, machining, extruding or acceptance testing of solid propellants or propellant constituents described in 1C011.a, 1C011.b or 1C111, or on the U.S. Munitions List.

*Note: 1B115.b does not control batch mixers, continuous mixers or fluid energy mills. For the control of batch mixers, continuous mixers and fluid energy mills see 1B117, 1B118, and 1B119.*

*Note 1: [RESERVED]*

*Note 2: 1B115 does not control equipment for the “production,” handling and acceptance testing of boron carbide.*

**1B116 Specially designed nozzles for producing pyrolytically derived materials formed on a mold, mandrel or other substrate from precursor gases which decompose in the 1,573 K (1,300 °C) to 3,173 K (2,900 °C) temperature range at pressures of 130 Pa to 20 kPa.**

**License Requirements**

*Reason for Control:* MT, AT



*Items:*

- a. Two or more mixing/kneading shafts; or
- b. A single rotating shaft which oscillates and has kneading teeth/pins on the shaft as well as inside the casing of the mixing chamber.

The list of items controlled is contained in the ECCN heading.

**1B201 Filament winding machines, other than those controlled by 1B001 or 1B101, and related equipment, as follows (see List of Items Controlled).**

**License Requirements**

*Reason for Control:* NP, AT

<i>Control(s)</i>	<i>Country Chart</i>
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NP applies to entire entry	NP Column 1
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AT applies to entire entry	AT Column 1
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**License Exceptions**

LVS: N/A

GBS: N/A

CIV: N/A

**1B119 Fluid energy mills usable for grinding or milling propellant or propellant constituents specified in 1C011.a, 1C011.b or 1C111, or on the U.S. Munitions List, and specially designed components therefor.**

**License Requirements**

*Reason for Control:* MT, AT

<i>Control(s)</i>	<i>Country Chart</i>
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MT applies to entire entry	MT Column 1
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AT applies to entire entry	AT Column 1
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**License Exceptions**

LVS: N/A

GBS: N/A

CIV: N/A

**List of Items Controlled**

*Unit:* \$ value

*Related Controls:* See ECCN [1D201](#) for software for items controlled by this entry and see ECCNs [1E001](#) (“development” and “production”) and [1E201](#) (“use”) for technology for items controlled by this entry. Also see ECCN [1E203](#) for technology for the “development” of software controlled by ECCN [1D201](#).

*Related Definitions:* N/A

*Items:*

**List of Items Controlled**

*Unit:* Equipment in number; components in \$ value

*Related Controls:* N/A

*Related Definitions:* N/A

*Items:*

a. Filament winding machines having all of the following characteristics:

- a.1. Having motions for positioning, wrapping, and winding fibers coordinated and programmed in two or more axes;

- a.2. Specially designed to fabricate

composite structures or laminates from “fibrous or filamentary materials”; *and*

a.3. Capable of winding cylindrical rotors of diameter between 75 mm (3 in.) and 400 mm (16 in.) and lengths of 600 mm (24 in.) or greater;

b. Coordinating and programming controls for filament winding machines controlled by 1B201.a;

c. Precision mandrels for filament winding machines controlled by 1B201.a.

**1B225 Electrolytic cells for fluorine production with a production capacity greater than 250 g of fluorine per hour.**

**License Requirements**

*Reason for Control:* NP, AT

<i>Control(s)</i>	<i>Country Chart</i>
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NP applies to entire entry	NP Column 1
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AT applies to entire entry	AT Column 1
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**License Exceptions**

LVS: N/A

GBS: N/A

CIV: N/A

**List of Items Controlled**

*Unit:* \$ value

*Related Controls:* See ECCNs [1E001](#) (“development” and “production”) and [1E201](#) (“use”) for technology for items controlled by this entry.

*Related Definitions:* N/A

*Items:*

The list of items controlled is contained in the ECCN heading.

**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.**

**License Requirements**

*Reason for Control:* NP, AT

<i>Control(s)</i>	<i>Country Chart</i>
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NP applies to entire entry	NP Column 1
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AT applies to entire entry	AT Column 1
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**License Exceptions**

LVS: N/A

GBS: N/A

CIV: N/A

**List of Items Controlled**

*Unit:* \$ value

*Related Controls:* (1) Electromagnetic isotope separators specially designed or prepared for use in separating uranium isotopes are subject to the export licensing authority of the Nuclear Regulatory Commission (see 10 CFR part 110). (2) See ECCNs [1E001](#) (“development” and “production”) and [1E201](#) (“use”) for technology for items controlled by this entry.

*Related Definitions:* N/A

*ECCN Controls:* This entry includes separators capable of enriching stable isotopes and separators with the ion sources and collectors both in the magnetic field and those configurations in which they are external to the field.

*Items:*

The list of items controlled is contained in the



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 (see List of Items Controlled).**

**License Requirements**

*Reason for Control:* NP, AT

<i>Control(s)</i>	<i>Country Chart</i>
NP applies to entire entry	NP Column 1
AT applies to entire entry	AT Column 1

**License Exceptions**

LVS: N/A  
 GBS: N/A  
 CIV: N/A

**List of Items Controlled**

*Unit:* \$ value

*Related Controls:* (1) Equipment specially designed or prepared for the production of heavy water is subject to the export licensing authority of the Nuclear Regulatory Commission (see 10 CFR part 110). (2) See ECCNs [1E001](#) (“development” and “production”) and [1E201](#) (“use”) for technology for items controlled by this entry.

*Related Definitions:* The “internal contactors” controlled by [1B229.b](#) are segmented trays that have an effective assembled diameter of 1.8 m (6 ft.) 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.

*Items:*

a. Water-hydrogen sulphide exchange tray

columns, having all of the following characteristics:

- a.1. Can operate at pressures of 2 MPa or greater;
- a.2. Constructed of carbon steel having an austenitic ASTM (or equivalent standard) grain size number of 5 or greater; *and*
- a.3. With a diameter of 1.8 m (6 ft.) or greater;

b. “Internal contactors” for the water-hydrogen sulphide exchange tray columns controlled by 1B229.a.

**1B230 Pumps capable of circulating solutions of concentrated or dilute potassium amide catalyst in liquid ammonia (KNH<sub>2</sub>/NH<sub>3</sub>), having all of the following characteristics (see List of Items Controlled).**

**License Requirements**

*Reason for Control:* NP, AT

<i>Control(s)</i>	<i>Country Chart</i>
NP applies to entire entry	NP Column 1
AT applies to entire entry	AT Column 1

**License Exceptions**

LVS: N/A  
 GBS: N/A  
 CIV: N/A

**List of Items Controlled**

*Unit:* \$ value

*Related Controls:* (1) Equipment specially designed or prepared for the production of heavy water is subject to the export licensing authority of the Nuclear Regulatory

Commission (see 10 CFR part 110). (2) See ECCNs [1E001](#) (“development” and “production”) and [1E201](#) (“use”) for technology for items controlled by this entry.

*Related Definitions:* N/A

*Items:*

- a. Airtight (i.e., hermetically sealed);
- b. A capacity greater than 8.5 m<sup>3</sup>/h; *and*
- c. Either of the following characteristics:
  - c.1. For concentrated potassium amide solutions (1% or greater), an operating pressure of 1.5 to 60 MPa (15-600 atmospheres); *or*
  - c.2. For dilute potassium amide solutions (less than 1%), an operating pressure of 20 to 60 MPa (200-600 atmospheres).

**1B231 Tritium facilities or plants, and equipment therefor, as follows (see List of Items Controlled).**

**License Requirements**

*Reason for Control:* NP, AT

<i>Control(s)</i>	<i>Country Chart</i>
NP applies to entire entry	NP Column 1
AT applies to entire entry	AT Column 1

**License Exceptions**

LVS: N/A  
 GBS: N/A  
 CIV: N/A

**List of Items Controlled**

*Unit:* \$ value

*Related Controls:* (1) Tritium, tritium compounds, and mixtures containing tritium

are subject to the export licensing authority of the Nuclear Regulatory Commission (see 10 CFR part 110). (2) See ECCNs [1E001](#) (“development” and “production”) and [1E201](#) (“use”) for technology for items controlled by this entry.

*Related Definitions:* N/A

*Items:*

- a. Facilities or plant for the production, recovery, extraction, concentration, or handling of tritium;
- b. Equipment for tritium facilities or plant, as follows:
  - b.1. Hydrogen or helium refrigeration units capable of cooling to 23 K (-250 °C) or less, with heat removal capacity greater than 150 watts; *or*
  - b.2. Hydrogen isotope storage and purification systems using metal hydrides as the storage, or purification medium.

**1B232 Turboexpanders or turboexpander-compressor sets having both of the following characteristics (see List of Items Controlled).**

**License Requirements**

*Reason for Control:* NP, AT

<i>Control(s)</i>	<i>Country Chart</i>
NP applies to entire entry	NP Column 1
AT applies to entire entry	AT Column 1

**License Exceptions**

LVS: N/A  
 GBS: N/A  
 CIV: N/A

**List of Items Controlled**

*Unit:* \$ value



*Related Controls:* (1) Equipment specially designed or prepared for the production of heavy water is subject to the export licensing authority of the Nuclear Regulatory Commission (see 10 CFR part 110). (2) See ECCNs [1E001](#) (“development” and “production”) and [1E201](#) (“use”) for technology for items controlled by this entry.  
*Related Definitions:* N/A  
*Items:*

- a. Designed for operation with an outlet temperature of 35 K (-238 °C) 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 (see List of Items Controlled).**

**License Requirements**

*Reason for Control:* NP, AT

*Control(s)* Country Chart

Facilities and plants described in 1B233.a are subject to the export licensing authority of the Nuclear Regulatory Commission (see 10 CFR part 110).

NP applies to 1B233.b NP Column 1  
 AT applies to 1B233.b AT Column 1

**License Exceptions**

LVS: N/A  
 GBS: N/A  
 CIV: N/A

**List of Items Controlled**

*Unit:* \$ value

*Related Controls:* See ECCN [1E001](#) (“development” and “production”) and ECCN [1E201](#) (“use”) for technology for items described in this entry.

*Related Definitions:* N/A

*Items:*

- a. Facilities or plants for the separation of lithium isotopes;
- b. Equipment for the separation of lithium isotopes, as follows:
  - b.1. Packed liquid-liquid exchange columns specially designed for lithium amalgams;
  - b.2. Mercury and/or lithium amalgam pumps;
  - b.3. Lithium amalgam electrolysis cells;
  - b.4. Evaporators for concentrated lithium hydroxide solution.

**1B999 Specific processing equipment, n.e.s., as follows (see List of Items Controlled).**

**License Requirements**

*Reason for Control:* AT, RS

*Control(s)* Country Chart

AT applies to entire entry. A license is required for items controlled by this entry to North Korea for anti-terrorism reasons. The Commerce Country Chart is not designed to determine AT license requirements for this entry. See §742.19 of the EAR for additional information.

RS applies to entire entry. A license is required for items controlled by this entry for export or reexport to Iraq or transfer within Iraq for regional stability reasons. The Commerce Country Chart is not designed to determine RS license requirements for this entry. See §§742.6

and 746.3 of the EAR for additional information.

Semi-fabricated forms (whether or not coated, plated, drilled or punched):

**License Exceptions**

LVS: N/A  
 GBS: N/A  
 CIV: N/A

a. Wrought or worked materials fabricated by rolling, drawing, extruding, forging, impact extruding, pressing, graining, atomizing, 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 tube rounds, squares, and hollows), drawn or extruded wire;

b. Cast material produced by casting in sand, die, metal, plaster or other types of molds, including high pressure castings, sintered forms, and forms made by powder metallurgy.

The object of the control should not be defeated by the export of non-listed forms alleged to be finished products but representing in reality crude forms or semi-fabricated forms.

**List of Items Controlled**

*Unit:* \$ value  
*Related Controls:* See also [1B001](#), [1B101](#), [1B201](#), [1B225](#) and [1D999](#)  
*Related Definitions:* N/A  
*Items:*

- a. Electrolytic cells for fluorine production, n.e.s.;
- b. Particle accelerators;
- c. Industrial process control hardware/systems designed for power industries, n.e.s.;
- d. Freon and chilled water cooling systems capable of continuous cooling duties of 100,000 BTU/hr (29.3 kW) or greater;
- e. Equipment for the production of structural composites, fibers, prepregs and preforms, n.e.s.

**1C001 Materials specially designed for use as absorbers of electromagnetic waves, or intrinsically conductive polymers, as follows (see List of Items Controlled).**

**License Requirements**

*Reason for Control:* NS, MT, AT

**Technical Note:**

Metals and alloys: Unless provision to the contrary is made, the words “metals” and “alloys” in 1C001 to 1C012 cover crude and semi-fabricated forms, as follows:

Crude forms: Anodes, balls, bars (including notched bars and wire bars), billets, blocks, blooms, bricks, cakes, cathodes, crystals, cubes, dice, grains, granules, ingots, lumps, pellets, pigs, powder, rondelles, shot, slabs, slugs, sponge, sticks;

<i>Control(s)</i>	<i>Country Chart</i>
NS applies to entire entry	NS Column 1
MT applies to entire entry	MT Column 1
AT applies to entire entry	AT Column 1

**License Exceptions**

LVS: N/A  
 GBS: N/A  
 CIV: N/A

**List of Items Controlled**

*Unit:* Kilograms

*Related Controls:* See also [1C101](#)

*Related Definitions:* N/A

*Items:*

a. Materials for absorbing frequencies exceeding  $2 \times 10^8$  Hz but less than  $3 \times 10^{12}$  Hz.

**Note 1:** 1C001.a does not control:

a. Hair type absorbers, constructed of natural or synthetic fibers, 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  $\pm 15\%$  of the center frequency of the incident energy, and not capable of withstanding temperatures exceeding 450 K (177 °C); or

b. Ceramic materials providing more than 20% echo compared with metal over a bandwidth exceeding  $\pm 15\%$  of the center frequency of the incident energy, and not capable of withstanding temperatures exceeding 800 K (527 °C);

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

2. Tensile strength less than  $7 \times 10^6$  N/m<sup>2</sup>; and

3. Compressive strength less than  $14 \times 10^6$  N/m<sup>2</sup>;

d. Planar absorbers made of sintered ferrite, having:

1. A specific gravity exceeding 4.4; and

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

**Note 2:** Nothing in Note 1 releases magnetic materials to provide absorption when contained in paint.

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

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

c.1. Polyaniline;

c.2. Polypyrrole;

c.3. Polythiophene;

c.4. Poly phenylene-vinylene; or

c.5. Poly thienylene-vinylene.

**Technical Note:** 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 (see List of Items Controlled).**

**License Requirements**

*Reason for Control:* NS, NP, AT

<i>Control(s)</i>	<i>Country Chart</i>
NS applies to entire entry	NS Column 2
NP applies to 1C002.b.3 or b.4 if they exceed the parameters stated in 1C202	NP Column 1
AT applies to entire entry	AT Column 1

**License Exceptions**

LVS: \$3000; N/A for NP

GBS: N/A

CIV: N/A

**List of Items Controlled**

*Unit:* Kilograms

*Related Controls:* (1) See ECCNs [1E001](#) (“development” and “production”) and [1E201](#) (“use”) for technology for items controlled by this entry. (2) Also see ECCN [1C202](#). (3) Aluminum alloys and titanium alloys in physical forms and finished products specially designed or prepared for use in separating uranium isotopes are subject to the export licensing authority of the Nuclear Regulatory Commission (see 10 CFR part 110).

*Related Definition:* N/A

*Items:*

**Note:** 1C002 does not control metal alloys, metal alloy powder or alloyed materials for coating substrates.

**Technical Note 1:** The metal alloys in 1C002 are those containing a higher percentage by weight of the stated metal than of any other element.

**Technical Note 2:** Stress-rupture life should be measured in accordance with ASTM standard E-139 or national equivalents.

**Technical Note 3:** Low cycle fatigue life should 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:

a.1. Nickel aluminides containing a minimum of 15 weight percent aluminum, a maximum of 38 weight percent aluminum and at least one additional alloying element;

a.2. Titanium aluminides containing 10 weight percent or more aluminum and at least one additional alloying element;

b. Metal alloys, as follows, made from material controlled by 1C002.c:

b.1. Nickel alloys with:

b.1.a. A stress-rupture life of 10,000 hours or longer at 923 K (650 °C) at a stress of 676 MPa; *or*

b.1.b. A low cycle fatigue life of 10,000 cycles or more at 823 K (550 °C) at a maximum stress of 1,095 MPa;

b.2. Niobium alloys with:

b.2.a. A stress-rupture life of 10,000

hours or longer at 1,073 K (800 °C) at a stress of 400 MPa; *or*

b.2.b. A low cycle fatigue life of 10,000 cycles or more at 973 K (700 °C) at a maximum stress of 700 MPa;

b.3. Titanium alloys with:

b.3.a. A stress-rupture life of 10,000 hours or longer at 723 K (450 °C) at a stress of 200 MPa; *or*

b.3.b. A low cycle fatigue life of 10,000 cycles or more at 723 K (450 °C) at a maximum stress of 400 MPa;

b.4 Aluminum alloys with a tensile strength of:

b.4.a. 240 MPa or more at 473 K (200 °C); *or*

b.4.b. 415 MPa or more at 298 K (25 °C);

b.5. Magnesium alloys with:

b.5.a. A tensile strength of 345 MPa or more; and

b.5.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 characteristics:

c.1. Made from any of the following composition systems:

**Technical Note:** *X in the following equals one or more alloying elements.*

c.1.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<sup>9</sup> alloy particles;

c.1.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.1.c. Titanium alloys (Ti-Al-X or Ti-X-Al);

c.1.d. Aluminum alloys (Al-Mg-X or Al-X-Mg, Al-Zn-X or Al-X-Zn, Al-Fe-X or Al-X-Fe); *or*

c.1.e. Magnesium alloys (Mg-Al-X or Mg-X-Al); *and*

c.2. Made in a controlled environment by any of the following processes:

c.2.a. “Vacuum atomization”;

c.2.b. “Gas atomization”;

c.2.c. “Rotary atomization”;

c.2.d. “Splat quenching”;

c.2.e. “Melt spinning” and “comminution”;

c.2.f. “Melt extraction” and “comminution”; *or*

c.2.g. “Mechanical alloying”;

d. Alloyed materials, having all the following characteristics:

d.1. Made from any of the composition systems specified in 1C002.c.1;

d.2. In the form of uncomminuted flakes, ribbons or thin rods; *and*

d.3. Produced in a controlled environment by any of the following:

- d.3.a. “Splat quenching”;
- d.3.b. “Melt spinning”; or
- d.3.c. “Melt extraction”.

**1C003 Magnetic metals, of all types and of whatever form, having any of the characteristics (see List of Items Controlled).**

**License Requirements**

*Reason for Control:* NS, AT

<i>Control(s)</i>	<i>Country Chart</i>
NS applies to entire entry	NS Column 2
AT applies to entire entry	AT Column 1

**License Exceptions**

- LVS: \$3000
- GBS: N/A
- CIV: N/A

**List of Items Controlled**

*Unit:* Kilograms  
*Related Controls:* N/A  
*Related Definitions:* N/A  
*Items:*

- a. Initial relative permeability of 120,000 or more and a thickness of 0.05 mm or less;

***Technical Note:*** *Measurement of initial permeability must be performed on fully annealed materials.*

- b. Magnetostrictive alloys, having any of the following characteristics:

- b.1. A saturation magnetostriction of more than  $5 \times 10^{-4}$ ; or

- b.2. A magnetomechanical coupling factor (k) of more than 0.8; or

- c. Amorphous or nanocrystalline alloy strips, having all of the following characteristics:

- c.1. A composition having a minimum of 75 weight percent of iron, cobalt or nickel;

- c.2. A saturation magnetic induction ( $B_s$ ) of 1.6 T or more; and

- c.3. Any of the following:

- c.3.a. A strip thickness of 0.02 mm or less; or

- c.3.b. An electrical resistivity of  $2 \times 10^{-4}$  ohm cm or more.

***Technical Note:*** *Nanocrystalline materials in 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 characteristics (see List of Items Controlled).**

**License Requirements**

*Reason for Control:* NS, AT

<i>Control(s)</i>	<i>Country Chart</i>
NS applies to entire entry	NS Column 2
AT applies to entire entry	AT Column 1

**License Exceptions**

- LVS: \$3000
- GBS: N/A
- CIV: N/A

**List of Items Controlled**

*Unit:* Kilograms

*Related Controls:* See also [1C117](#) and [1C226](#).

*Related Definitions:* N/A

*Items:*

- a. A density exceeding 17.5 g/cm<sup>3</sup>;
  - b. An elastic limit exceeding 880 MPa;
  - c. An ultimate tensile strength exceeding 1,270 MPa; *and*
  - d. An elongation exceeding 8%.
- 1C005 “Superconductive” “composite” conductors in lengths exceeding 100 m or with a mass exceeding 100 g, as follows (see List of Items Controlled).**

**License Requirements**

*Reason for Control:* NS, AT

<i>Control(s)</i>	<i>Country Chart</i>
NS applies to entire entry	NS Column 2
AT applies to entire entry	AT Column 1

**License Exceptions**

LVS: \$1500  
 GBS: N/A  
 CIV: N/A

**List of Items Controlled**

*Unit:* Kilograms

*Related Controls:* N/A

*Related Definitions:* N/A

*Items:*

- a. “Superconductive” “composite” conductors containing one or more niobium-titanium filaments, having all of the following:

a.1. Embedded in a “matrix” other than a copper or copper-based mixed “matrix”; *and*

a.2. Having a cross-section area less than 0.28 x 10<sup>-4</sup> mm<sup>2</sup> (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:

b.1. A “critical temperature” at zero magnetic induction exceeding 9.85 K (-263.31 °C); *and*

b.2. Remaining in the “superconductive” state at a temperature of 4.2 K (-268.96°C) 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 1750 A/mm<sup>2</sup> 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).

**Technical Note:** *For the purpose of 1C005, filaments may be in wire, cylinder, film, tape or ribbon form.*

**1C006 Fluids and lubricating materials, as follows (see List of Items Controlled).**

**License Requirements**

*Reason for Control:* NS, AT

<i>Control(s)</i>	<i>Country Chart</i>
NS applies to entire entry	NS Column 2
AT applies to entire entry	AT Column 1



**License Exceptions**

LVS: \$3000  
 GBS: Yes for 1C006.d  
 CIV: Yes for 1C006.d

**List of Items Controlled**

*Unit:* Barrels (55 U.S. gallons/ 209 liters)

*Related Controls:* See also [1C996](#).

*Related Definitions:* N/A

*Items:*

a. Hydraulic fluids containing, as their principal ingredients, any of the following compounds or materials:

a.1. Synthetic silahydrocarbon oils, having all of the following:

**Technical Note:** For the purpose of 1C006.a.1, silahydrocarbon oils contain exclusively silicon, hydrogen and carbon.

a.1.a. A flash point exceeding 477 K (204 °C);

a.1.b. A pour point at 239 K (-34 °C) or less;

a.1.c. A viscosity index of 75 or more;  
 and

a.1.d. A thermal stability at 616 K (343 °C); or

a.2. Chlorofluorocarbons, having all of the following:

**Technical Note:** For the purpose of 1C006.a.2, chlorofluorocarbons contain exclusively carbon, fluorine and chlorine.

a.2.a. No flash point;

a.2.b. An autogenous ignition

temperature exceeding 977 K (704 °C);

a.2.c. A pour point at 219 K (-54 °C) or less;

a.2.d. A viscosity index of 80 or more;  
 and

a.2.e. A boiling point at 473 K (200 °C) or higher;

b. Lubricating materials containing, as their principal ingredients, any of the following compounds or materials:

b.1. Phenylene or alkylphenylene ethers or thio-ethers, or their mixtures, containing more than two ether or thio-ether functions or mixtures thereof; or

b.2. Fluorinated silicone fluids with a kinematic viscosity of less than 5,000 mm<sup>2</sup>/s (5,000 centistokes) measured at 298 K (25 °C);

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 compounds or materials:

c.1. Dibromotetrafluoroethane;

c.2. Polychlorotrifluoroethylene (oily and waxy modifications only); or

c.3. Polybromotrifluoroethylene;

d. Fluorocarbon electronic cooling fluids, having all of the following characteristics:

d.1. Containing 85% by weight or more of any of the following, or mixtures thereof:

d.1.a. Monomeric forms of perfluoropolyalkylether- triazines or perfluoroaliphatic-ethers;

- d.1.b. Perfluoroalkylamines;
- d.1.c. Perfluorocycloalkanes; or
- d.1.d. Perfluoroalkanes;
- d.2. Density at 298 K (25 °C) of 1.5 g/ml or more;
- d.3. In a liquid state at 273 K (0 °C); and
- d.4. Containing 60% or more by weight of fluorine.

**Technical Note:** For the purpose of 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 describe 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, 52100 steel and naval bronze (60% Cu, 39% Zn, 0.75% Sn);

The chamber is purged with nitrogen, sealed at atmospheric pressure and the temperature raised to and maintained at  $644 \pm 6$  K ( $371 \pm 6$  °C) 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<sup>2</sup> of ball surface;

- 2. The change in original viscosity as determined at 311 K (38 °C) is less than 25%; and
- 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 (see List of Items Controlled).**

**License Requirements**

Reason for Control: NS, MT, AT

Control(s)	Country Chart
NS applies to entire entry	NS Column 2
MT applies to items in 1C007.d and .f when the dielectric constant is less than 6 at any frequency from 100 MHz to 100 GHz for use in “missile” radomes.	MT Column 1
AT applies to entire entry	AT Column 1

**License Requirement Notes:** See §743.1 of the EAR for reporting requirements for exports under License Exceptions.

**License Exceptions**

- LVS: \$5000, except N/A for MT and for 1C007.e
- GBS: N/A
- CIV: N/A

**List of Items Controlled**

*Unit:* Kilograms

*Related Controls:* See also [1C107](#)

*Related Definitions:* N/A

*Items:*

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;

*Note:* 1C007.b does not control abrasives.

c. Ceramic-ceramic “composite” materials with a glass or oxide-“matrix” and reinforced with fibers having all the following:

c.1 Made from any of the following materials:

c.1.a. Si-N;

c.1.b. Si-C;

c.1.c. Si-Al-O-N; *or*

c.1.d. Si-O-N; and

c.2. Having a “specific tensile strength” exceeding 12.7 x 10<sup>3</sup> m;

d. Ceramic-ceramic “composite” materials, with or without a continuous metallic phase, incorporating particles, whiskers or fibers, 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 controlled by 1C007.c, as follows:

e.1. Polydiorganosilanes (for producing silicon carbide);

e.2. Polysilazanes (for producing silicon nitride);

e.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 fibers from any of the following systems:

f.1. Al<sub>2</sub>O<sub>3</sub>; *or*

f.2. Si-C-N.

*Note:* 1C007.f does not control “composites” containing fibers from these systems with a fiber tensile strength of less than 700 MPa at 1,273 K (1,000 °C) or fiber tensile creep resistance of more than 1% creep strain at 100 MPa load and 1,273 K (1,000 °C) for 100 hours.

**1C008 Non-fluorinated polymeric substances, as follows (see List of Items Controlled).**

**License Requirements**

*Reason for Control:* NS, AT

<i>Control(s)</i>	<i>Country Chart</i>
NS applies to entire entry	NS Column 2
AT applies to entire entry	AT Column 1

**License Exceptions**

LVS: \$200

GBS: N/A

CIV: N/A

**List of Items Controlled**

*Unit:* Kilograms

*Related Controls:* See also [1A003](#).

*Related Definitions:* N/A

*Items:*

a. Non-fluorinated polymeric substances, as follows:

a.1. Bismaleimides;

a.2. Aromatic polyamide-imides;

a.3. Aromatic polyimides;

a.4. Aromatic polyetherimides having a glass transition temperature (Tg) exceeding 513K (240 °C).

**Notes:**

1. 1C008.a controls the substances in liquid or solid form, including resin, powder, pellet, film, sheet, tape, or ribbon.
2. 1C008.a does not control non-fusible compression molding powders or molded forms.

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

b.1. Any of the following:

b.1.a. Phenylene, biphenylene or naphthalene; or

b.1.b. Methyl, tertiary-butyl or phenyl substituted phenylene, biphenylene or naphthalene; and

b.2. Any of the following acids:

b.2.a. Terephthalic acid;

b.2.b. 6-hydroxy-2 naphthoic acid; or

b.2.c. 4-hydroxybenzoic acid;

c. [RESERVED]

d. Polyarylene ketones;

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

f. Polybiphenylenethersulphone having a glass transition temperature (Tg) exceeding 513 K (240°C).

**Technical Note:** *The glass transition temperature (Tg) for 1C008 materials is determined using the method described in ISO 11357-2 (1999) or national equivalents.*

**1C009 Unprocessed fluorinated compounds, as follows (see List of Items Controlled).**

**License Requirements**

*Reason for Control:* NS, AT

<i>Control(s)</i>	<i>Country Chart</i>
NS applies to entire entry	NS Column 2
AT applies to entire entry	AT Column 1

**License Exceptions**

LVS: \$5000  
 GBS: N/A  
 CIV: N/A

**List of Items Controlled**

*Unit:* Kilograms

*Related Controls:* See also [1A001](#).

*Related Definitions:* N/A

*Items:*

- 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 (see List of Items Controlled).**

**License Requirements**

*Reason for Control:* NS, NP, AT

<i>Control(s)</i>	<i>Country Chart</i>
NS applies to entire entry	NS Column 2
NP applies to 1C010.a (aramid “fibrous or filamentary materials”, .b (carbon “fibrous and filamentary materials”), and e.1 for “fibrous and filamentary materials” that meet or exceed the control criteria of ECCN 1C210	NP Column 1
AT applies to entire entry	AT Column 1

**License Requirement Notes:** See §743.1 of the EAR for reporting requirements for exports under License Exceptions.

**License Exceptions**

- LVS: \$1500, N/A for NP
- GBS: N/A
- CIV: N/A

**List of Items Controlled**

*Unit:* Kilograms

*Related Controls:* (1) See ECCNs [1E001](#) (“development” and “production”) and [1E201](#) (“use”) for technology for items controlled by this entry. (2) Also see ECCNs [1C210](#) and [1C990](#). (3) See also 9C110 for material not controlled by [1C010.e](#), as defined by notes 1 or 2.

*Related Definitions:* 1.) Specific modulus: Young’s modulus in pascals, equivalent to N/m<sup>2</sup> divided by specific weight in N/m<sup>3</sup>, measured at a temperature of (296±2) K ((23±2) °C) and a relative humidity of (50±5)%. 2.) Specific tensile strength: ultimate tensile strength in pascals, equivalent to N/m<sup>2</sup> divided by specific weight in N/m<sup>3</sup>, measured at a temperature of (296±2) K ((23±2) °C) and a relative humidity of (50±5)%.

*Items:*

a. Organic “fibrous or filamentary materials”, having all of the following:

- a.1. A specific modulus exceeding 12.7 x 10<sup>6</sup> m; *and*
- a.2. A specific tensile strength exceeding 23.5 x 10<sup>4</sup> m;

*Note:* 1C010.a does not control polyethylene.

b. Carbon “fibrous or filamentary materials”, having all of the following:

- b.1. A specific modulus exceeding 12.7 x 10<sup>6</sup> m; *and*
- b.2. A specific tensile strength exceeding 23.5 x 10<sup>4</sup> m;

**Technical Note:** Properties for materials described in 1C010.b should be determined using SACMA recommended methods SRM 12 to 17, or national equivalent tow tests, such as Japanese

*Industrial Standard JIS-R-7601, Paragraph 6.6.2, and based on lot average.*

**Note:** *1C010.b does not control 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 x 100 cm.*

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

c.1. A specific modulus exceeding  $2.54 \times 10^6$  m; *and*

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

**Note:** *1C010.c does not control:*

1. *Discontinuous, multiphase, polycrystalline alumina fibers in chopped fiber or random mat form, containing 3 weight percent or more silica, with a specific modulus of less than  $10 \times 10^6$  m;*

2. *Molybdenum and molybdenum alloy fibers;*

3. *Boron fibers;*

4. *Discontinuous ceramic fibers with a melting, softening, decomposition or sublimation point lower than 2,043 K (1,770 °C) in an inert environment.*

d. “Fibrous or filamentary materials”:

d.1. Composed of any of the following:

d.1.a. Polyetherimides controlled by 1C008.a; *or*

d.1.b. Materials controlled by 1C008.b to 1C008.f; *or*

d.2. Composed of materials controlled by

1C010.d.1.a or 1C010.d.1.b and “commingled” with other fibers controlled by 1C010.a, 1C010.b or 1C010.c;

e. Resin-impregnated or pitch-impregnated fibers (prepregs), metal or carbon-coated fibers (preforms) or “carbon fiber preforms”, as follows:

e.1. Made from “fibrous or filamentary materials” controlled by 1C010.a, 1C010.b or 1C010.c;

e.2. Made from organic or carbon “fibrous or filamentary materials”:

e.2.a. With a “specific tensile strength” exceeding  $17.7 \times 10^4$ m;

e.2.b. With a “specific modulus” exceeding  $10.15 \times 10^6$  m;

e.2.c. Not controlled by 1C010.a or 1C010.b; *and*

e.2.d. When impregnated with materials controlled by 1C008 or 1C009.b, having a glass transition temperature ( $T_g$ ) exceeding 383 K (110 °C) or with phenolic or epoxy resins, having a glass transition temperature ( $T_g$ ) equal to or exceeding 418 K (145 °C).

**Notes:** *1C010.e does not control:*

1. *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 x 100cm;*

2. *Prepregs when impregnated with phenolic or epoxy resins having a glass transition temperature ( $T_g$ ) less than 433 K (160 °C) and a cure temperature lower than the glass transition temperature.*

**Technical Note:** *The glass transition temperature ( $T_g$ ) for 1C010.e materials is*

determined using the method described in ASTM D 3418 using the dry method. The glass transition temperature 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 (2°C) per minute using the dry method.

**1C011 Metals and compounds, as follows (see List of Items Controlled).**

**License Requirements**

*Reason for Control:* NS, MT, AT

<i>Control(s)</i>	<i>Country Chart</i>
NS applies to entire entry	NS Column 1
MT applies to 1C011.a and .b	MT Column 1
AT applies to entire entry	AT Column 1

**License Exceptions**

LVS: N/A  
 GBS: N/A  
 CIV: N/A

**List of Items Controlled**

*Unit:* N/A  
*Related Controls:* 1.) See also [1C018](#) and [1C111](#). 2.) Items controlled by [1C011.a](#), and metal fuels in particle form, whether spherical, atomized, spheroidal, flaked or ground, manufactured from material consisting of 99 percent or more of items controlled by [1C011.b](#), are subject to the export licensing authority of the U.S. Department of State, Directorate of Defense Trade Controls (see 22 CFR 121.1 Category V).

*Related Definitions:* N/A  
*Items:*

- a. Metals in particle sizes of less than 60 μm whether spherical, atomized, spheroidal, flaked or ground, manufactured from material consisting of 99% or more of zirconium, magnesium and alloys of these;

**Technical Note:** *The natural content of hafnium in the zirconium (typically 2% to 7%) is counted with the zirconium.*

**Note:** *The metals or alloys listed in 1C011.a are controlled whether or not the metals or alloys are encapsulated in aluminum, magnesium, zirconium or beryllium.*

- b. Boron or boron carbide of 85% purity or higher and a particle size of 60 μm or less;

**Note:** *The metals or alloys listed in 1C011.b are controlled whether or not the metals or alloys are encapsulated in aluminum, magnesium, zirconium or beryllium.*

- c. Guanidine nitrate;
- d. Nitroguanidine (NQ) (CAS 556-88-7).

**1C012 Materials, as follows (see List of Items Controlled).**

**License Requirements**

*Reason for Control:*

*Control(s)*

Items described in 1C012 are subject to the export licensing authority of the Nuclear Regulatory Commission (see 10 CFR part 110, item 9A)).

**License Exceptions**

LVS: N/A

GBS: N/A  
 CIV: N/A

except as noted therein

**List of Items Controlled**

*Unit:* N/A  
*Related Controls:* See also 0C002.  
*Related Definitions:* These materials are typically used for nuclear heat sources.  
*Items:*

- a. Plutonium in any form with a plutonium isotopic assay of plutonium-238 of more than 50% by weight;

*Note:* 1C012.a does not control:

- 1. Shipments with a plutonium content of 1 g or less;
- 2. Shipments of 3 “effective grams” or less when contained in a sensing component in instruments.

- b. Previously separated neptunium-237 in any form.

*Note:* 1C012.b does not control shipments with a neptunium-237 content of 1 g or less.

**1C018 Commercial Charges and Devices Containing Energetic Materials on the Wassenaar Arrangement Munitions List and Certain Chemicals as Follows (See List of Items Controlled).**

**License Requirements**

*Reason for Control:* NS, MT, AT, UN

<i>Control(s)</i>	<i>Country Chart</i>
NS applies to entire entry, except as noted in 1C018.m	NS Column 1
MT applies to 1C018.m,	MT Column 1

AT Applies to entire entry AT Column 1

UN applies to entire entry Iraq, North Korea, and Rwanda

**License Exceptions**

LVS: \$3000, except N/A for Rwanda.  
 GBS: N/A  
 CIV: N/A

**List of Items Controlled**

*Unit:* Number  
*Related Controls:* (1) Explosive devices or charges in paragraphs .a through .k of this entry that utilize USML controlled energetic materials (See 22 CFR 121.1 Category V) are subject to the licensing authority of the U.S. Department of State, Directorate of Defense Trade Controls if they have been specifically designed, developed, configured, adapted, or modified for a military application. (2) With the exception of slurries, cutters and severing tools, if the USML controlled materials utilized in devices and charges controlled by paragraphs .a through .k of this entry can be easily extracted without destroying the device or charge, then they are subject to the export licensing authority of the U.S. Department of State, Directorate of Defense Trade Controls. (3) Commercial prefabricated slurries and emulsions containing greater than 35% of USML controlled energetic materials are subject to the export licensing authority of the U.S. Department of State, Directorate of Defense Trade Controls. (4) The individual USML controlled energetic materials in paragraphs .a through .k of this entry, even when compounded with other materials, remain subject to the export licensing authority of the Department of State when not incorporated into explosive devices or charges controlled by this entry or [1C992](#).



(5) The chemicals in paragraphs .l and .m of this entry, when incorporated into items listed on the United States Munitions List, become subject to the licensing jurisdiction of the U.S. Department of State, Directorate of Defense Trade Controls. (6) See also ECCNs [1C011](#), [1C111](#), and [1C239](#) for additional controlled energetic materials. (7) See ECCN [1C238](#) for additional controls on chlorine trifluoride (ClF<sub>3</sub>)

*Related Definitions:* (1) For purposes of this entry, the term “controlled materials” means controlled energetic materials (see ECCNs 1C011, 1C111, 1C239 and 22 CFR 121.1 Category V). (2) For purposes of this entry, the mass of aluminum powder, potassium perchlorate, and any of the substances listed in the note to the USML (see 22 CFR 121.1 Category V) (such as ammonium pictrate, black powder, etc.) contained in commercial explosive devices and in the charges are omitted when determining the total mass of controlled material.

*Items:*

- a. Shaped charges specially designed for oil well operations, utilizing one charge functioning along a single axis, that upon detonation produce a hole; and
  - a.1. Contain any controlled materials;
  - a.2. Have a uniform shaped conical liner with an included angle of 90 degrees or less;
  - a.3. Have more than 0.090 kg, but not more than 2.0 kg of controlled materials; and
  - a.4. Have a diameter not exceeding 4.5 inches.
- b. Detonating cord or shock tubes containing greater than 0.064 kg per meter (300 grains per foot), but not more than 0.1 kg per meter (470 grains per foot) of controlled materials;

- c. Cartridge power devices containing greater than 0.70 kg, but not more than 1.0 kg of controlled materials;
- d. Detonators (electric or nonelectric) and assemblies thereof containing greater than 0.01 kg, but not more than 0.1 kg of controlled materials;
- e. Igniters containing greater than 0.01 kg, but not more than 0.1 kg of controlled materials;
- f. Oil well cartridges containing greater than 0.015 kg, but not more than 0.1 kg of controlled materials;
- g. Commercial cast or pressed boosters containing greater than 1.0 kg, but not more than 5.0 kg of controlled materials;
- h. Commercial prefabricated slurries and emulsions containing greater than 10 kg and less than or equal to thirty-five percent by weight of USML controlled materials;
- i. Cutters and severing tools containing greater than 3.5 kg, but not more than 10 kg of controlled materials;
- j. Pyrotechnic devices when designed exclusively for commercial purposes (e.g., theatrical stages, motion picture special effects, and fireworks displays), and containing greater than 3.0 kg, but not more than 5.0 kg of controlled materials; or
- k. Other commercial explosive devices and charges, not controlled by 1C018.a through g above, when used for commercial applications and containing greater than 1.0 kg, but not more than 5.0 kg of controlled materials.
- l. Propyleneimine (2-methylaziridine) (CAS 75-55-8); or
- m. Any oxidizer or mixture thereof that is a compound composed of fluorine and one or more of the following – other halogens, oxygen, or

nitrogen.

*Note:* Nitrogen trifluoride (NF<sub>3</sub>) in a gaseous state is controlled by ECCN 1C992 and not by 1C018.

*Note:* National security is not a reason for control for chlorine trifluoride.

*Note:* If a chemical in paragraphs .1 or .m of 1C018 is incorporated into a commercial charge or device described in paragraphs .a through .k of ECCN 1C018 or in 1C992, the classification of the commercial charge or device applies to the item.

**1C101 Materials for Reduced Observables such as Radar Reflectivity, Ultraviolet/Infrared Signatures and Acoustic Signatures (i.e., Stealth Technology), Other than Those Controlled by 1C001, for applications usable in rockets, missiles, or unmanned aerial vehicles capable of achieving a “range” equal to or greater than 300km, and their subsystems.**

**License Requirements**

*Reason for Control:* MT, AT

<i>Control(s)</i>	<i>Country Chart</i>
MT applies to entire entry	MT Column 1
AT applies to entire entry	AT Column 1

**License Exceptions**

LVS: N/A  
 GBS: N/A  
 CIV: N/A

**List of Items Controlled**

*Unit:* \$ value  
*Related Controls:* (1) Materials controlled by

this entry include structural materials and coatings (including paints), specially designed for reduced or tailored reflectivity or emissivity in the microwave, infrared or ultraviolet spectra. (2) This entry does not control coatings (including paints) when specially used for the thermal control of satellites. (3) For commodities that meet the definition of defense articles under 22 CFR 120.3 of the International Traffic in Arms Regulations (ITAR), see 22 CFR 121.16, Item 17-Category II of the (ITAR), which describes similar commodities under the jurisdiction of the Department of State, Directorate of Defense Trade Controls.

*Related Definitions:* N/A

*Items:*

The list of items controlled is contained in the ECCN heading.

**1C102 Resaturated pyrolyzed carbon-carbon materials designed for space launch vehicles specified in 9A004 or sounding rockets specified in 9A104. (These items are subject to the export licensing authority of the U.S. Department of State, Directorate of Defense Trade Controls. See 22 CFR part 121.)**

**1C107 Graphite and ceramic materials, other than those controlled by 1C007, which can be machined to any of the following products as follows (see List of Items Controlled).**

**License Requirements**

*Reason for Control:* MT, AT

<i>Control(s)</i>	<i>Country Chart</i>
MT applies to entire entry	MT Column 1
AT applies to entire entry	AT Column 1

**License Exceptions**

LVS: N/A  
 GBS: N/A  
 CIV: N/A

**List of Items Controlled**

*Unit:* Kilograms

*Related Controls:* (1) See also 0C005, [1C004](#), and [1C298](#). (2) For commodities that meet the definition of defense articles under 22 CFR 120.3 of the ITAR, see 22 CFR 121.16, Item 8-Category II of the International Traffic in Arms Regulations (ITAR), which describes similar commodities under the jurisdiction of the Department of State, Directorate of Defense Trade Controls.

*Related Definitions:* N/A

*Items:*

a. Fine grain graphites with a bulk density of 1.72 g/cm<sup>3</sup> or greater, measured at 15 °C, and having a grain size of 100 micrometers or less, usable for rocket nozzles and reentry vehicle nose tips as follows:

a.1. Cylinders having a diameter of 120 mm or greater and a length of 50 mm or greater;

a.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;

a.3. Blocks having a size of 120 mm x 120 mm x 50 mm or greater.

b. Pyrolytic or fibrous reinforced graphites, usable for rocket nozzles and reentry vehicle nose tips;

c. Ceramic composite materials (dielectric constant is less than 6 at any frequency from 100 MHz to 100 GHz) for use in radomes useable in rockets, missiles, and unmanned aerial vehicles capable of achieving a “range” equal to or greater than 300 km; *or*

d. Silicon-Carbide materials, useable in rockets, missiles, and unmanned aerial vehicles capable of achieving a “range” equal to or greater than 300 km, as follows:

d.1. Bulk machinable silicon-carbide reinforced unfired ceramic, usable for nose tips.

d.2. Reinforced silicon-carbide ceramic composites usable for nose tips, re-entry vehicles, nozzle flaps.

**1C111 Propellants and constituent chemicals for propellants, other than those specified in 1C011, as follows (see List of Items Controlled).**

**License Requirements**

*Reason for Control:* MT, AT

<i>Control(s)</i>	<i>Country Chart</i>
MT applies to entire entry	MT Column 1
AT applies to entire entry	AT Column 1

**License Exceptions**

LVS: N/A  
 GBS: N/A  
 CIV: N/A

**List of Items Controlled**

*Unit:* Kilograms

*Related Controls:* (1) Butacene as defined by [1C111.c.1](#) is subject to the export licensing authority of the U.S. Department of State, Directorate of Defense Trade Controls. (See 22 CFR 121.12 (b)(6), other ferrocene derivatives). (2) See [1C018](#) for controls on oxidizers that are composed of fluorine and one or more of the following - other halogens, oxygen, or nitrogen. Solid oxidizer substances are subject to the export licensing

authority of the U.S. Department of State, Directorate of Defense Trade Controls (See 22 CFR 121.1 Category V).

*Related Definitions:* N/A

*Items:*

a. Propulsive substances:

a.1. Spherical aluminum powder, other than that specified on the U.S. Munitions List, with particles of uniform diameter of less than 200 micrometer and an aluminum content of 97% by weight or more, if at least 10 percent of the total weight is made up of particles of less than 63 micrometer, according to ISO 2591:1988 or national equivalents such as JIS Z8820.

**Technical Note:** A particle size of 63 micrometer (ISO R-565) corresponds to 250 mesh (Tyler) or 230 mesh (ASTM standard E-11).

a.2. Metal fuels, other than that controlled by the U.S. Munitions List, in particle sizes of less than  $60 \times 10^{-6}$  m (60 micrometers), whether spherical, atomized, spheroidal, flaked or ground, consisting 97% by weight or more of any of the following:

a.2.a Zirconium;

a.2.b Beryllium;

a.2.c Magnesium; or

a.2.d Alloys of the metals specified by a.2.a to a.2.c above.

**Technical Note:** The natural content of hafnium in the zirconium (typically 2 % to 7 %) is counted with the zirconium.

a.3. Oxidizer substances usable in liquid propellant rocket engines, as follows:

a.3.a. Dinitrogen trioxide;

a.3.b. Nitrogendioxide/dinitrogen tetroxide;

a.3.c. Dinitrogen pentoxide;

a.3.d. Mixed oxides of nitrogen (MON);

a.3.e. Inhibited red fuming nitric acid (IRFNA);

**Technical Note:** 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  $MON_i$  or  $MON_{ij}$ , where  $i$  and  $j$  are integers representing the percentage of nitric oxide in the mixture (e.g.,  $MON_3$  contains 3% nitric oxide,  $MON_{25}$  25% nitric oxide. An upper limit is  $MON_{40}$ , 40% by weight).

b. Polymeric substances:

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

b.2. Hydroxy - terminated polybutadiene (including hydroxyl - terminated polybutadiene) (HTPB);

b.3. Polybutadiene-acrylic acid (PBAA);

b.4. Polybutadiene-acrylic acid-acrylonitrile (PBAN);

b.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:

c.1. Butacene;

- c.2. Triethylene glycol dinitrate (TEGDN);
- c.3. 2-Nitrodiphenylamine;
- c.4. Trimethylolethane trinitrate (TMETN);
- c.5. Diethylene glycol dinitrate (DEGDN).

*Related Controls:* (1) See ECCNs [1E001](#) (“development” and “production”) and [1E101](#) (“use”) for technology for items controlled by this entry. (2) Also see ECCN [1C216](#). (3) Maraging steel, in physical forms and finished products and specially designed or prepared for use in separating uranium isotopes, is subject to the export licensing authority of the Nuclear Regulatory Commission (see 10 CFR part 110).

*Related Definitions:* N/A

*Items:*

**1C116 Maraging steels (iron alloys generally characterized by high nickel, very low carbon content and the use of substitutional elements or precipitates to produce strengthening and age-hardening of the alloy) having an ultimate tensile strength equal to or greater than 1.5 GPa, measured at 293 K (20 °C), in the form of sheet, plate or tubing with a wall or plate thickness equal to or less than 5 mm.**

**License Requirements**

*Reason for Control:* MT, NP, AT

<i>Control(s)</i>	<i>Country Chart</i>
MT applies to entire entry	MT Column 1
NP applies to items that meet or exceed the parameters of 1C216	NP Column 1
AT applies to entire entry	AT Column 1

**License Exceptions**

LVS: N/A  
 GBS: N/A  
 CIV: N/A

**List of Items Controlled**

*Unit:* Kilograms

The list of items controlled is contained in the ECCN heading.

**1C117 Tungsten, molybdenum and alloys of these metals in the form of uniform, spherical or atomized particles of 500 micrometer diameter or less with a purity of 97% or greater for fabrication of rocket motor components, i.e., heat shields, nozzle substrates, nozzle throats and thrust vector control surfaces.**

**License Requirements**

*Reason for Control:* MT, AT

<i>Control(s)</i>	<i>Country Chart</i>
MT applies to entire entry	MT Column 1
AT applies to entire entry	AT Column 1

**License Exceptions**

LVS: N/A  
 GBS: N/A  
 CIV: N/A

**List of Items Controlled**

*Unit:* Kilograms  
*Related Controls:* N/A

*Related Definitions:* N/A  
*Items:*

The list of items controlled is contained in the ECCN heading.

**1C118 Titanium-stabilized duplex stainless steel (Ti-DSS), having all of the following characteristics (see List of Items Controlled).**

**License Requirements**

*Reason for Control:* MT, AT

<i>Control(s)</i>	<i>Country Chart</i>
MT applies to entire entry	MT Column 1
AT applies to entire entry	AT Column 1

**License Exceptions**

LVS: N/A  
 GBS: N/A  
 CIV: N/A

**List of Items Controlled**

*Unit:* Kilograms  
*Related Controls:* N/A  
*Related Definitions:* N/A  
*Items:*

- a. Having all of the following characteristics:
  - a.1. Containing 17.0-23.0 weight percent chromium and 4.5-7.0 weight percent nickel;
  - a.2. Having a titanium content of greater than 0.10 weight percent; *and*
  - a.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), *and*

b. Having any of the following forms:

- b.1. Ingots or bars having a size of 100 mm or more in each dimension;
- b.2. Sheets having a width of 600 mm or more and a thickness of 3 mm or less; *or*
- b.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 controlled by 1C002.b.3 or 1C002.b.4 as follows (see List of Items Controlled).**

**License Requirements**

*Reason for Control:* NP, AT

<i>Control(s)</i>	<i>Country Chart</i>
NP applies to entire entry	NP Column 1
AT applies to entire entry	AT Column 1

**License Exceptions**

LVS: N/A  
 GBS: N/A  
 CIV: N/A

**List of Items Controlled**

*Unit:* Kilograms  
*Related Controls:* 1) See ECCNs [1E001](#) (“development” and “production”) and [1E201](#) (“use”) for technology for items controlled by this entry. (2) Also see ECCN [1C002](#). (3) Aluminum alloys and titanium alloys, in physical forms and finished products and specially designed or prepared for use in separating uranium isotopes, are subject to the export licensing authority of the Nuclear Regulatory Commission (see 10 CFR part

110).

*Related Definitions:* The phrase “capable of” refers to aluminum alloys and titanium alloys either before or after heat treatment.

*Items:*

a. Aluminum alloys having both of the following characteristics:

a.1. “Capable of” an ultimate tensile strength of 460 MPa or more at 293 K (20 °C); *and*

a.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:

b.1. “Capable of” an ultimate tensile strength of 900 MPa or more at 293 K (20 °C); *and*

b.2. In the form of tubes or cylindrical solid forms (including forgings) with an outside diameter of more than 75 mm.

**1C210 “Fibrous or filamentary materials” or prepregs, other than those controlled by 1C010.a, .b or .e, as follows (see List of Items Controlled).**

**License Requirements**

*Reason for Control:* NP, AT

*Control(s)* Country Chart

NP applies to entire entry NP Column 1

AT applies to entire entry AT Column 1

**License Exceptions**

LVS: N/A

GBS: N/A

CIV: N/A

**List of Items Controlled**

*Unit:* Kilograms

*Related Controls:* (1) See ECCNs [1E001](#) (“development” and “production”) and [1E201](#) (“use”) for technology for items controlled by this entry. (2) Also see ECCNs [1C010](#) and [1C990](#).

*Related Definitions:* For the purpose of this entry, the term “fibrous or filamentary materials” is restricted to continuous “monofilaments”, “yarns”, “rovings”, “tows”, or “tapes”.

Definitions for other terms used in this entry:

*Filament or Monofilament* is the smallest increment of fiber, usually several μm in diameter.

*Strand* is a bundle of filaments (typically over 200) arranged approximately parallel.

*Roving* is a bundle (typically 12-120) of approximately parallel strands.

*Yarn* is a bundle of twisted strands.

*Tow* is a bundle of filaments, usually approximately parallel.

*Tape* is a material constructed of interlaced or unidirectional filaments, strands, rovings, tows or yarns, etc., usually preimpregnated with resin.

*Specific modulus* is the Young’s modulus in N/m<sup>2</sup> divided by the specific weight in N/m<sup>3</sup>, measured at a temperature of (296 ± 2) K ((23 ± 2) °C) and a relative humidity of 50 ± 5 percent.

*Specific tensile strength* is the ultimate tensile strength in N/m<sup>2</sup> divided by specific weight in N/m<sup>3</sup>, measured at a temperature of (296 ± 2) K ((23 ± 2) °C)

and a relative humidity of 50 ± 5 percent.

*Items:*

- a. Carbon or aramid “fibrous or filamentary materials” having a “specific modulus” of 12.7 x 10<sup>6</sup> m or greater or a “specific tensile strength” of 235 x 10<sup>3</sup> m or greater *except* Aramid “fibrous or filamentary materials” having 0.25 percent or more by weight of an ester based fiber surface modifier;
- b. Glass “fibrous or filamentary materials” having a “specific modulus” of 3.18 x 10<sup>6</sup> m or greater and a “specific tensile strength” of 76.2 x 10<sup>3</sup> m or greater; *or*
- c. Thermoset resin impregnated continuous “yarns”, “rovings”, “tows” or “tapes” with a width no greater than 15 mm (prepregs), made from carbon or glass “fibrous or filamentary materials” controlled by 1C210.a or .b.

**Technical Note:** *The resin forms the matrix of the composite.*

**1C216 Maraging steel, other than that controlled by 1C116, “capable of” an ultimate tensile strength of 2,050 MPa or more, at 293 K (20 °C).**

**License Requirements**

*Reason for Control:* NP, AT

<i>Control(s)</i>	<i>Country Chart</i>
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NP applies to entire entry	NP Column 1
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AT applies to entire entry	AT Column 1
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**License Exceptions**

LVS: N/A  
 GBS: N/A  
 CIV: N/A

**List of Items Controlled**

*Unit:* Kilograms

*Related Controls:* 1) See ECCNs [1E001](#) (“development” and “production”) and [1E201](#) (“use”) for technology for items controlled by this entry. (2) Also see ECCN [1C116](#). (3) Maraging steel, in physical form and finished products specially designed or prepared for use in separating uranium isotopes, is subject to the export licensing authority of the Nuclear Regulatory Commission (see 10 CFR part 110).

*Related Definitions:* The phrase “capable of” in the ECCN heading refers to maraging steel either before or after heat treatment.

*ECCN Controls:* This entry does not control forms in which all linear dimensions are 75 mm or less.

*Items:*

The list of items controlled is contained in the ECCN heading.

**1C225 Boron enriched in the boron-10 (<sup>10</sup>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.**

**License Requirements**

*Reason for Control:* NP, AT

<i>Control(s)</i>	<i>Country Chart</i>
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NP applies to entire entry	NP Column 1
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AT applies to entire entry	AT Column 1
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**License Exceptions**

LVS: N/A  
 GBS: N/A  
 CIV: N/A



**List of Items Controlled**

*Unit:* Kilograms

*Related Controls:* See ECCNs [1E001](#) (“development” and “production”) and [1E201](#) (“use”) for technology for items controlled by this entry.

*Related Definitions:* In this entry, mixtures containing boron include boron-loaded materials.

*Items:*

**Technical Note:** *The natural isotopic abundance of boron-10 is approximately 18.5 weight percent (20 atom percent).*

The list of items controlled is contained in the ECCN heading.

**1C226 Tungsten, tungsten carbide, and alloys containing more than 90% tungsten by weight, having both of the following characteristics (see List of Items Controlled).**

**License Requirements**

*Reason for Control:* NP, AT

<i>Control(s)</i>	<i>Country Chart</i>
NP applies to entire entry	NP Column 1
AT applies to entire entry	AT Column 1

**License Exceptions**

LVS: N/A  
 GBS: N/A  
 CIV: N/A

**List of Items Controlled**

*Unit:* Kilograms

*Related Controls:* See ECCNs [1E001](#) (“development” and “production”) and [1E201](#) (“use”) for technology for items controlled by

this entry.

*Related Definitions:* N/A

*ECCN Controls:* This entry does not control manufactures specially designed as weights or gamma-ray collimators.

*Items:*

- a. In forms with a hollow cylindrical symmetry (including cylinder segments) with an inside diameter between 100 mm and 300 mm; *and*
- b. A mass greater than 20 kg.

**1C227 Calcium having both of the following characteristics (see List of Items Controlled).**

**License Requirements**

*Reason for Control:* NP, AT

<i>Control(s)</i>	<i>Country Chart</i>
NP applies to entire entry	NP Column 1
AT applies to entire entry	AT Column 1

**License Exceptions**

LVS: N/A  
 GBS: N/A  
 CIV: N/A

**List of Items Controlled**

*Unit:* Kilograms

*Related Controls:* See ECCNs [1E001](#) (“development” and “production”) and [1E201](#) (“use”) for technology for items controlled by this entry.

*Related Definitions:* N/A

*Items:*

- a. Containing less than 1,000 parts per million by weight of metallic impurities other than magnesium; *and*
- b. Containing less than 10 parts per million by

weight of boron.

*Control(s)*

*Country Chart*

NP applies to entire entry

NP Column 1

AT applies to entire entry

AT Column 1

**1C228 Magnesium having both of the following characteristics (see List of Items Controlled).**

### License Requirements

*Reason for Control:* NP, AT

*Control(s)*

*Country Chart*

NP applies to entire entry

NP Column 1

AT applies to entire entry

AT Column 1

### License Exceptions

LVS: N/A

GBS: N/A

CIV: N/A

### List of Items Controlled

*Unit:* Kilograms

*Related Controls:* See ECCNs [1E001](#) (“development” and “production”) and [1E201](#) (“use”) for technology for items controlled by this entry.

*Related Definitions:* N/A

*Items:*

a. Containing less than 200 parts per million by weight of metallic impurities other than calcium; and

b. Containing less than 10 parts per million by weight of boron.

**1C229 Bismuth having both of the following characteristics (see List of Items Controlled).**

### License Requirements

*Reason for Control:* NP, AT

### License Exceptions

LVS: N/A

GBS: N/A

CIV: N/A

### List of Items Controlled

*Unit:* Kilograms

*Related Controls:* See ECCNs [1E001](#) (“development” and “production”) and [1E201](#) (“use”) for technology for items controlled by this entry.

*Related Definitions:* N/A

*Items:*

a. A purity of 99.99% or greater by weight; and

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.**

### License Requirements

*Reason for Control:* NP, AT

*Control(s)*

*Country Chart*

NP applies to entire entry

NP Column 1

AT applies to entire entry

AT Column 1

### License Exceptions

LVS: N/A

GBS: N/A

CIV: N/A

**List of Items Controlled**

*Unit:* Kilograms

*Related Controls:* See ECCNs [1E001](#) (“development” and “production”) and [1E201](#) (“use”) for technology for items controlled by this entry.

*Related Definitions:* N/A

*ECCN Controls:* This entry does not control 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 aluminum) in the form of emeralds or aquamarines.

*Items:*

The list of items controlled is contained in the ECCN heading.

**1C231 Hafnium metal, hafnium alloys and compounds containing more than 60% hafnium by weight, manufactures thereof, and waste or scrap of any of the foregoing.**

**License Requirements**

*Reason for Control:* NP, AT

<i>Control(s)</i>	<i>Country Chart</i>
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NP applies to entire entry	NP Column 1
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AT applies to entire entry	AT Column 1
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**License Exceptions**

LVS: N/A  
 GBS: N/A  
 CIV: N/A

**List of Items Controlled**

*Unit:* Kilograms

*Related Controls:* See ECCNs [1E001](#) (“development” and “production”) and [1E201](#) (“use”) for technology for items controlled by this entry.

*Related Definitions:* N/A

*Items:*

The list of items controlled is contained in the ECCN heading.

**1C232 Helium-3 (<sup>3</sup>He), mixtures containing helium-3, and products or devices containing any of the foregoing.**

**License Requirements**

*Reason for Control:* NP, AT

<i>Control(s)</i>	<i>Country Chart</i>
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NP applies to entire entry	NP Column 1
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AT applies to entire entry	AT Column 1
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**License Exceptions**

LVS: N/A  
 GBS: N/A  
 CIV: N/A

**List of Items Controlled**

*Unit:* Liters

*Related Controls:* See ECCNs [1E001](#) (“development” and “production”) and [1E201](#) (“use”) for technology for items controlled by this entry.

*Related Definitions:* N/A

*ECCN Controls:* This entry does not control a product or device containing less than 1 g of helium-3.

*Items:*

The list of items controlled is contained in the ECCN heading.

abundance of lithium-6 is approximately 6.5 weight percent (7.5 atom percent).

*ECCN Controls:* This entry does not control thermoluminescent dosimeters.

*Items:*

The list of items controlled is contained in the ECCN heading.

**1C233 Lithium enriched in the lithium-6 (<sup>6</sup>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, and waste or scrap of any of the foregoing.**

**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, and waste or scrap of any of the foregoing.**

**License Requirements**

*Reason for Control:* NP, AT

<i>Control(s)</i>	<i>Country Chart</i>
NP applies entire entry	NP Column 1
AT applies to entire entry	AT Column 1

**License Requirements**

*Reason for Control:* NP, AT

<i>Control(s)</i>	<i>Country Chart</i>
NP applies to entire entry	NP Column 1
AT applies to entire entry	AT Column 1

**License Exceptions**

LVS: N/A  
 GBS: N/A  
 CIV: N/A

**License Exceptions**

LVS: N/A  
 GBS: N/A  
 CIV: N/A

**List of Items Controlled**

*Unit:* Kilograms  
*Related Controls:* (1) See ECCNs [1E001](#) (“development” and “production”) and [1E201](#) (“use”) for technology for items controlled by this entry. (2) Facilities or plants specially designed or prepared for the separation of lithium isotopes are subject to the export licensing authority of the Nuclear Regulatory Commission (see 10 CFR part 110).  
*Related Definitions:* The natural isotopic

**List of Items Controlled**

*Unit:* Kilograms  
*Related Controls:* (1) See ECCNs [1E001](#) (“development” and “production”) and [1E201](#) (“use”) for technology for items controlled by this entry. (2) Zirconium metal and alloys in the form of tubes or assemblies of tubes, specially designed or prepared for use in a reactor, are subject to the export licensing authority of the Nuclear Regulatory Commission (see 10 CFR part 110).  
*Related Definitions:* N/A

*ECCN Controls:* This entry does not control zirconium in the form of foil having a thickness of 0.10 mm (0.004 in.) or less.

*Items:*

The list of items controlled is contained in the ECCN heading.

**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.**

**License Requirements**

*Reason for Control:* NP, AT

<i>Control(s)</i>	<i>Country Chart</i>
NP applies to entire entry	NP Column 1
AT applies to entire entry	AT Column 1

**License Exceptions**

LVS: N/A  
 GBS: N/A  
 CIV: N/A

**List of Items Controlled**

*Unit:* Kilograms

*Related Controls:* (1) See ECCNs [1E001](#) (“development” and “production”) and [1E201](#) (“use”) for technology for items controlled by this entry. (2) Also see ECCN [1B231](#). (3) Tritium that is byproduct material (e.g., produced in a nuclear reactor) is subject to the export licensing authority of the Nuclear Regulatory Commission (see 10 CFR part 110).

*Related Definitions:* N/A

*ECCN Controls:* (1) This entry does not

control tritium, tritium compounds, and mixtures that are byproduct material (e.g., produced in a nuclear reactor) – such materials are subject to the licensing jurisdiction of the Nuclear Regulatory Commission (see Related Controls paragraph for this entry). (2) This entry does not control a product or device containing less than  $1.48 \times 10^3$  GBq (40 Ci) of tritium.

*Items:*

The list of items controlled is contained in the ECCN heading.

**1C236 Alpha-emitting radionuclides having an alpha half-life of 10 days or greater, but less than 200 years, in the following forms (see List of Items Controlled).**

**License Requirements**

*Reason for Control:* NP, AT

<i>Control(s)</i>	<i>Country Chart</i>
NP applies to entire entry	NP Column 1
AT applies to entire entry	AT Column 1

**License Exceptions**

LVS: N/A  
 GBS: N/A  
 CIV: N/A

**List of Items Controlled**

*Unit:* Gigabecquerels

*Related Controls:* (1) See ECCNs [1E001](#) (“development” and “production”) and [1E201](#) (“use”) for technology for items controlled by this entry. (2) Certain alpha-emitting radionuclides are subject to the export licensing authority of the Nuclear Regulatory Commission (see 10 CFR part 110).

*Related Definitions:* N/A

*ECCN Controls:* This entry does not control a product or device containing less than 3.7 GBq (100 millicuries) of alpha activity.

*Items:*

- 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 items in 1C236.a, .b., or .c.

**1C237 Radium-226 (<sup>226</sup>Ra), radium-226 alloys, radium-226 compounds, mixtures containing radium-226, manufactures thereof, and products or devices containing any of the foregoing.**

**License Requirements**

*Reason for Control:* NP, AT

<i>Control(s)</i>	<i>Country Chart</i>
NP applies to entire entry	NP Column 1
AT applies to entire entry	AT Column 1

**License Exceptions**

LVS: N/A  
 GBS: N/A  
 CIV: N/A

**List of Items Controlled**

*Unit:* Gigabecquerels  
*Related Controls:* See ECCNs [1E001](#) (“development” and “production”) and [1E201](#) (“use”) for technology for items controlled by this entry.  
*Related Definitions:* N/A

*ECCN Controls:* This entry does not control the following:

- a. Medical applicators;
- b. A product or device containing less than 0.37 GBq (10 millicuries) of radium-226.

*Items:*

The list of items controlled is contained in the ECCN heading.

**1C238 Chlorine trifluoride (ClF<sub>3</sub>).**

**License Requirements**

*Reason for Control:* NP, AT

<i>Control(s)</i>	<i>Country Chart</i>
NP applies to entire entry	NP Column 1
AT applies to entire entry	AT Column 1

**License Exceptions**

LVS: N/A  
 GBS: N/A  
 CIV: N/A

**List of Items Controlled**

*Unit:* Kilograms  
*Related Controls:* See ECCNs [1E001](#) (“development” and “production”) and [1E201](#) (“use”) for technology for items controlled by this entry. See [1C018](#) for additional controls on Chlorine trifluoride (ClF<sub>3</sub>).  
*Related Definitions:* N/A  
*Items:*

The list of items controlled is contained in the ECCN heading.

**1C239 High explosives, other than those controlled by the U.S. Munitions List, or**

substances or mixtures containing more than 2% by weight thereof, with a crystal density greater than 1.8 g/cm<sup>3</sup> and having a detonation velocity greater than 8,000 m/s.

**License Requirements**

*Reason for Control:* NP, AT

<i>Control(s)</i>	<i>Country Chart</i>
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NP applies to entire entry	NP Column 1
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AT applies to entire entry	AT Column 1
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**License Exceptions**

LVS: N/A

GBS: N/A

CIV: N/A

**List of Items Controlled**

*Unit:* Kilograms

*Related Controls:* (1) See ECCNs [1E001](#) (“development” and “production”) and [1E201](#) (“use”) for technology for items controlled by this entry. (2) See ECCNs [1C018](#) (commercial charges and devices containing energetic materials on the Wassenaar Arrangement Munitions List and certain chemicals as follows) and [1C992](#) (commercial charges and devices containing energetic materials, n.e.s and nitrogen trifluoride in a gaseous state). (3) High explosives for military use are subject to the export licensing authority of the U.S. Department of State, Directorate of Defense Trade Controls (see 22 CFR part 121.12).

*Related Definitions:* N/A

*Items:*

The list of items controlled is contained in the ECCN heading.

**1C240 Nickel powder or porous nickel metal,**

other than those described in 0C006, as follows (see List of Items Controlled).

**License Requirements**

*Reason for Control:* NP, AT

<i>Control(s)</i>	<i>Country Chart</i>
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NP applies to entire entry	NP Column 1
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AT applies to entire entry	AT Column 1
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**License Exceptions**

LVS: N/A

GBS: N/A

CIV: N/A

**List of Items Controlled**

*Unit:* Kilograms

*Related Controls:* (1) See ECCNs [1E001](#) (“development” and “production”) and [1E201](#) (“use”) for technology for items controlled by this entry. (2) Nickel powder and porous nickel metal, specially designed or prepared for use in separating uranium isotopes, are subject to the export licensing authority of the Nuclear Regulatory Commission (see 10 CFR part 110).

*Related Definitions:* N/A

*ECCN Controls:* This entry does not control the following:

- a. Filamentary nickel powders;
- b. Single porous nickel sheets with an area of 1,000 cm<sup>2</sup> per sheet or less.

*Items:*

a. Nickel powder having both of the following characteristics:

- a.1. A nickel purity content of 99.0% or greater by weight; and

- a.2. A mean particle size of less than 10 micrometers measured by American Society for



Testing and Materials (ASTM) B330 standard;

b. Porous nickel metal produced from materials controlled by 1C240.a.

**Technical Note:** 1C240.b refers to porous metal formed by compacting and sintering the materials in 1C240.a to form a metal material with fine pores interconnected throughout the structure.

**1C298 Graphite with a boron content of less than 5 parts per million and a density greater than 1.5 grams per cubic centimeter that is intended for use other than in a nuclear reactor.**

**License Requirements**

*Reason for Control:* NP

*Control(s)* Country Chart

NP applies to entire entry NP Column 2

**License Requirement Note:** This entry does not control graphite intended for use in a nuclear reactor. Such graphite is subject to the export licensing authority of the Nuclear Regulatory Commission (see ECCN 0C005 and 10 CFR part 110).

**License Exceptions**

LVS: N/A  
 GBS: N/A  
 CIV: N/A

**List of Items Controlled**

*Unit:* N/A  
*Related Controls:* See also [1C107](#) and 0C005  
*Related Definitions:* For the purpose of this entry, graphite with a purity level better than 5 parts per million boron equivalent is

determined according to ASTM standard C1233-98. In applying ASTM standard C1233-98, the boron equivalence of the element carbon is not included in the boron equivalence calculation, since carbon is not considered an impurity.

*Items:*

The list of items controlled is contained in the ECCN heading.

**1C350 Chemicals that may be used as precursors for toxic chemical agents.**

**License Requirements:**

*Reason for Control:* CB, CW, AT

*Control(s)* Country Chart

CB applies to entire entry CB Column 2

CW applies to 1C350 .b, and .c. The Commerce Country Chart is not designed to determine licensing requirements for items controlled for CW reasons. A license is required, for CW reasons, to export or reexport Schedule 2 chemicals and mixtures identified in 1C350.b to States not Party to the CWC (destinations not listed in Supplement No. 2 to part 745 of the EAR). A license is required, for CW reasons, to export Schedule 3 chemicals and mixtures identified in 1C350.c to States not Party to the CWC, unless an End Use Certificate issued by the government of the importing country has been obtained by the exporter prior to export. A license is required, for CW reasons, to reexport Schedule 3 chemicals and mixtures identified in 1C350.c from a State not Party to the CWC to any other State not Party to the CWC. (See §742.18 of the EAR for license requirements and policies for toxic and precursor chemicals controlled for CW reasons. See §745.2 of the EAR for End Use Certificate requirements that apply to exports of Schedule 3 chemicals to countries not listed in



Supplement No. 2 to part 745 of the EAR.)

AT applies to entire entry. The Commerce Country Chart is not designed to determine licensing requirements for items controlled for AT reasons in 1C350. A license is required, for AT reasons, to export or reexport items controlled by 1C350 to a country in Country Group E:1 of Supplement No. 1 to part 740 of the EAR. (See part 742 of the EAR for additional information on the AT controls that apply to Iran, North Korea, Sudan, and Syria. See part 746 of the EAR for additional information on the comprehensive trade sanctions that apply to Cuba and Iran. See Supplement No. 1 to part 736 of the EAR for export controls on Syria.)

#### License Requirement Notes:

1. *SAMPLE SHIPMENTS*: Subject to the following requirements and restrictions, a license is not required for sample shipments when the cumulative total of these shipments does not exceed a 55-gallon container or 200 kg of a single chemical to any one consignee during a calendar year. A consignee that receives a sample shipment under this exclusion may not resell, transfer, or reexport the sample shipment, but may use the sample shipment for any other legal purpose unrelated to chemical weapons.

##### a. Chemicals Not Eligible:

A. [RESERVED]

B. *CWC Schedule 2 chemicals (States not Party to the CWC)*. No CWC Schedule 2 chemical or mixture identified in 1C350.b is eligible for sample shipment to States not Party to the CWC (destinations not listed in Supplement No. 2 to part 745 of the EAR) without a license.

b. *Countries Not Eligible*: Countries in Country Group E:1 of Supplement No. 1 to part 740 of the EAR are not eligible to receive sample shipments of any chemicals controlled by this ECCN without a license.

c. *Sample shipments that require an End-Use Certificate for CW reasons*: No CWC Schedule 3 chemical or mixture identified in 1C350.c is eligible for sample shipment to States not Party to the CWC (destinations not listed in Supplement No. 2 to part 745 of the EAR) without a license, unless an End-Use Certificate issued by the government of the importing country is obtained by the exporter prior to export (see §745.2 of the EAR for End-Use Certificate requirements).

d. *Sample shipments that require a license for reasons set forth elsewhere in the EAR*: Sample shipments, as described in this Note 1, may require a license for reasons set forth elsewhere in the EAR. See, in particular, the end-use/end-user restrictions in part 744 of the EAR, and the restrictions that apply to embargoed countries in part 746 of the EAR.

e. *Quarterly report requirement*. The exporter is required to submit a quarterly written report for shipments of samples made under this Note 1. The report must be on company letterhead stationery (titled "Report of Sample Shipments of Chemical Precursors" at the top of the first page) and identify the chemical(s), Chemical Abstract Service Registry (C.A.S.) number(s), quantity(ies), the ultimate consignee's name and address, and the date exported. The report must be sent, via courier, to the U.S. Department of Commerce, Bureau of Industry and Security, 14th and Pennsylvania Ave., NW., Room 2705, Washington, DC 20230, Attn: "Report of Sample Shipments of Chemical Precursors".

##### 2. MIXTURES:

a. Mixtures that contain precursor chemicals identified in ECCN 1C350, in concentrations that are below the levels indicated in 1C350.b through .d, are controlled by ECCN 1C395 or 1C995 and are subject to the licensing requirements specified in those ECCNs.

b. A license is not required under this ECCN for a mixture, when the controlled chemical in the mixture is a normal ingredient in consumer goods packaged for retail sale for personal use. Such consumer goods are designated EAR99. However, a license may be required for reasons set forth elsewhere in the EAR.

*Note to Mixtures: Calculation of concentrations of AG-controlled chemicals:*

a. *Exclusion.* No chemical may be added to the mixture (solution) for the sole purpose of circumventing the Export Administration Regulations;

b. *Percent Weight Calculation.* When calculating the percentage, by weight, of components in a chemical mixture, include all components of the mixture, including those that act as solvents.

3. *COMPOUNDS.* Compounds created with any chemicals identified in this ECCN 1C350 may be shipped NLR (No License Required), without obtaining an End-Use Certificate, unless those compounds are also identified in this entry or require a license for reasons set forth elsewhere in the EAR.

4. *TESTING KITS:* Certain medical, analytical, diagnostic, and food testing kits containing small quantities of chemicals identified in this ECCN 1C350, are excluded from the scope of this ECCN and are controlled under ECCN 1C395 or 1C995. (Note that replacement reagents for such kits are controlled by this ECCN 1C350 if the reagents contain one or more of the precursor chemicals identified in 1C350 in concentrations equal to or greater than the control levels for mixtures indicated in 1C350.)

*Technical Notes:* 1. For purposes of this entry, a "mixture" is defined as a solid, liquid or gaseous product made up of two or more

*components that do not react together under normal storage conditions.*

2. *The scope of this control applicable to Hydrogen Fluoride (see 1C350.d.7 in the List of Items Controlled) includes its liquid, gaseous, and aqueous phases, and hydrates.*

#### License Exceptions

LVS: N/A

GBS: N/A

CIV: N/A

#### List of Items Controlled

*Unit:* Liters or kilograms, as appropriate

*Related Controls:* The chemicals 0-Ethyl-2-diisopropylaminoethyl methyl phosphonite (QL) (C.A.S. #57856-11-8); Ethyl phosphonyl difluoride (C.A.S. #753-98-0); and Methyl phosphonyl difluoride (C.A.S. #676-99-3); methylphosphinyl dichloride (C.A.S. 676-83-5); methylphosphinyl difluoride (C.A.S. #753-59-3); and methylphosphonyl dichloride (C.A.S. #676-97-1) are subject to the licensing jurisdiction of the Directorate of Defense Trade Controls, U.S. Department of State.

*Related Definitions:* See §770.2(k) of the EAR for synonyms for the chemicals listed in this entry.

*Items:*

a. [RESERVED]

b. Australia Group-controlled precursor chemicals also identified as Schedule 2 chemicals under the CWC, as follows, and mixtures in which at least one of the following chemicals constitutes 30 percent or more of the weight of the mixture:

b.1. (C.A.S. #7784-34-1) Arsenic trichloride;

b.2. (C.A.S. #76-93-7) Benzilic acid;

b.3. (C.A.S. #78-38-6) Diethyl ethylphosphonate;

b.4. (C.A.S. #15715-41-0) Diethyl methylphosphonite;

b.5. (C.A.S. #2404-03-7) Diethyl-N,N-dimethylphosphoramidate;

b.6. (C.A.S. #5842-07-9) N,N-Diisopropyl-beta-aminoethane thiol;

b.7. (C.A.S. #4261-68-1) N,N-Diisopropyl-beta-aminoethyl chloride hydrochloride;

b.8. (C.A.S. #96-80-0) N,N-Diisopropyl-beta-aminoethanol;

b.9. (C.A.S. #96-79-7), N,N-Diisopropyl-beta-aminoethyl chloride;

b.10. (C.A.S. #6163-75-3) Dimethyl ethylphosphonate;

b.11. (C.A.S. #756-79-6) Dimethyl methylphosphonate;

b.12. (C.A.S. #1498-40-4) Ethyl phosphonous dichloride [Ethyl phosphinyl dichloride];

b.13. (C.A.S. #430-78-4) Ethyl phosphonous difluoride [Ethyl phosphinyl difluoride];

b.14. (C.A.S. #1066-50-8) Ethyl phosphonyl dichloride;

b.15. [RESERVED]

b.16. [RESERVED]

b.17. [RESERVED]

b.18. (C.A.S. #464-07-3) Pinacolyl alcohol;

b.19. (C.A.S. #1619-34-7) 3-Quinuclidinol;

b.20. (C.A.S. #111-48-8) Thiodiglycol;

b.21. (C.A.S. #993-13-5) Methylphosphonic acid;

b.22. (C.A.S. #683-08-9) Diethyl methylphosphonate;

b.23. (C.A.S. #677-43-0) N,N-dimethylamino-phosphoryl dichloride;

b.24. (C.A.S. #676-98-2) Methylphosphonothioic dichloride.

c. Australia Group-controlled precursor chemicals also identified as Schedule 3 chemicals under the CWC, as follows, and mixtures in which at least one of the following chemicals constitutes 30 percent or more of the weight of the mixture:

c.1. (C.A.S. #762-04-9) Diethyl phosphite;

c.2. (C.A.S. #868-85-9) Dimethyl phosphite (dimethyl hydrogen phosphite);

c.3. (C.A.S. #10025-87-3) Phosphorus oxychloride;

c.4. (C.A.S. #10026-13-8) Phosphorus pentachloride;

c.5. (C.A.S. #7719-12-2) Phosphorus trichloride;

c.6. (C.A.S. #10025-67-9) Sulfur monochloride;

c.7. (C.A.S. #10545-99-0) Sulfur dichloride;

c.8. (C.A.S. #7719-09-7) Thionyl chloride;

c.9. (C.A.S. #102-71-6) Triethanolamine;

c.10. (C.A.S. #122-52-1) Triethyl phosphite;

c.11. (C.A.S. #121-45-9) Trimethyl phosphite

c.12. (C.A.S. #139-87-7)  
Ethyldiethanolamine.

d. Other Australia Group-controlled precursor chemicals not also identified as Schedule 1, 2, or 3 chemicals under the CWC, as follows, and mixtures in which at least one of the following chemicals constitutes 30 percent or more of the weight of the mixture:

d.1. (C.A.S. #1341-49-7) Ammonium hydrogen fluoride;

d.2. (C.A.S. #107-07-3) 2-Chloroethanol;

d.3. (C.A.S. #100-37-8)  
N,N-Diethylaminoethanol;

d.4. (C.A.S. #108-18-9) Di-isopropylamine;

d.5. (C.A.S. #124-40-3) Dimethylamine;

d.6. (C.A.S. #506-59-2) Dimethylamine hydrochloride;

d.7. (C.A.S. #7664-39-3) Hydrogen fluoride;

d.8. (C.A.S. #3554-74-3)  
3-Hydroxyl-1-methylpiperidine;

d.9. (C.A.S. #76-89-1) Methyl benzilate;

d.10. (C.A.S. #1314-80-3) Phosphorus pentasulfide;

d.11. (C.A.S. #75-97-8) Pinacolone;

d.12. (C.A.S. #151-50-8) Potassium cyanide;

d.13. (C.A.S. #7789-23-3) Potassium fluoride;

d.14. (C.A.S. #7789-29-9) Potassium bifluoride;

d.15. (C.A.S. #3731-38-2) 3-Quinuclidone;

d.16. (C.A.S. #1333-83-1) Sodium bifluoride;

d.17. (C.A.S. #143-33-9) Sodium cyanide;

d.18. (C.A.S. #7681-49-4) Sodium fluoride;

d.19. (C.A.S. #1313-82-2) Sodium sulfide;

d.20. (C.A.S. #637-39-8) Triethanolamine hydrochloride;

d.21. (C.A.S. #116-17-6) Tri-isopropyl phosphite;

d.22. (C.A.S. #2465-65-8) O,O-diethyl phosphorothioate;

d.23. (C.A.S. #298-06-6) O,O-diethyl phosphorodithioate;

d.24. (C.A.S. #16893-85-9) Sodium hexafluorosilicate.

**1C351 Human and zoonotic pathogens and “toxins”, as follows (see List of Items Controlled).**

**License Requirements**

*Reason for Control:* CB, CW, AT

<i>Control(s)</i>	<i>Country Chart</i>
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CB applies to entire entry	CB Column 1
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CW applies to 1C351.d.5 and d.6 and a license is required for CW reasons for all destinations, including Canada, as follows: CW applies to 1C351.d.5 for ricin in the form of 1) Ricinus Communis Agglutinin<sub>II</sub> (RCA<sub>II</sub>), also known as ricin D or Ricinus Communis Lectin<sub>III</sub> (RCL<sub>III</sub>); and 2) Ricinus Communis Lectin<sub>IV</sub> (RCL<sub>IV</sub>), also known as ricin E. CW applies to 1C351.d.6 for saxitoxin identified by C.A.S. #35523-89-8. See §742.18 of the EAR for licensing information

pertaining to chemicals subject to restriction pursuant to the Chemical Weapons Convention (CWC). The Commerce Country Chart is not designed to determine licensing requirements for items controlled for CW reasons.

AT applies to entire entry      AT Column 1

### License Requirement Notes:

1. All vaccines and “immunotoxins” are excluded from the scope of this entry. Certain medical products and diagnostic and food testing kits that contain biological toxins controlled under paragraph (d) of this entry, with the exception of toxins controlled for CW reasons under d.5 and d.6, are excluded from the scope of this entry. Vaccines, “immunotoxins”, certain medical products, and diagnostic and food testing kits excluded from the scope of this entry are controlled under ECCN 1C991.

2. For the purposes of this entry, only saxitoxin is controlled under paragraph d.6; other members of the paralytic shellfish poison family (e.g. neosaxitoxin) are designated EAR99.

3. Clostridium perfringens strains, other than the epsilon toxin-producing strains of Clostridium perfringens described in c.14, are excluded from the scope of this entry, since they may be used as positive control cultures for food testing and quality control.

### License Exceptions

LVS: N/A  
GBS: N/A  
CIV: N/A

### List of Items Controlled

*Unit:* \$ value.

*Related Controls:* (1) Certain forms of ricin and saxitoxin in 1C351.d.5. and d.6 are CWC

Schedule 1 chemicals (see §742.18 of the EAR). The U.S. Government must provide advance notification and annual reports to the OPCW of all exports of Schedule 1 chemicals. See §745.1 of the EAR for notification procedures. See 22 CFR part 121, Category XIV and §121.7 for additional CWC Schedule 1 chemicals controlled by the Department of State.

(2) The Animal and Plant Health Inspection Service (APHIS), U.S. Department of Agriculture, and the Centers for Disease Control and Prevention (CDC), U.S. Department of Health and Human Services, maintain controls on the possession, use, and transfer within the United States of certain items controlled by this ECCN (for APHIS, see 7 CFR 331.3(c), 9 CFR 121.3(c), and 9 CFR 121.4(c); for CDC, see 42 CFR 73.3(c) and 42 CFR 73.4(c)).

*Related Definitions:* (1) For the purposes of this entry “immunotoxin” is defined as an antibody-toxin conjugate intended to destroy specific target cells (e.g., tumor cells) that bear antigens homologous to the antibody. (2) For the purposes of this entry “subunit” is defined as a portion of the “toxin”.

#### *Items:*

a. Viruses, as follows:

- a.1. Chikungunya virus;
- a.2. Congo-Crimean haemorrhagic fever virus (a.k.a. Crimean-Congo haemorrhagic fever virus);
- a.3. Dengue fever virus;
- a.4. Eastern equine encephalitis virus;
- a.5. Ebola virus;
- a.6. Hantaan virus;
- a.7. Japanese encephalitis virus;
- a.8. Junin virus;

- a.9. Lassa fever virus
- a.10. Lymphocytic choriomeningitis virus;
- a.11. Machupo virus;
- a.12. Marburg virus;
- a.13. Monkey pox virus;
- a.14. Rift Valley fever virus;
- a.15. Tick-borne encephalitis virus (Russian Spring-Summer encephalitis virus);
- a.16. Variola virus;
- a.17. Venezuelan equine encephalitis virus;
- a.18. Western equine encephalitis virus;
- a.19. White pox;
- a.20. Yellow fever virus;
- a.21. Kyasanur Forest virus;
- a.22. Louping ill virus;
- a.23. Murray Valley encephalitis virus;
- a.24. Omsk haemorrhagic fever virus;
- a.25. Oropouche virus;
- a.26. Powassan virus;
- a.27. Rocio virus;
- a.28. St. Louis encephalitis virus;
- a.29. Hendra virus (Equine morbillivirus);
- a.30. South American haemorrhagic fever (Sabia, Flexal, Guanarito);
- a.31. Pulmonary and renal syndrome-  
haemorrhagic fever viruses (Seoul, Dobrava, Puumala, Sin Nombre); *or*
- a.32. Nipah virus.
- b. Rickettsiae, as follows:
- b.1. Bartonella quintana (Rochalimea quintana, Rickettsia quintana);
- b.2. Coxiella burnetii;
- b.3. Rickettsia prowasecki (a.k.a. Rickettsia prowazekii); *or*
- b.4. Rickettsia rickettsii.
- c. Bacteria, as follows:
- c.1. Bacillus anthracis;
- c.2. Brucella abortus;
- c.3. Brucella melitensis;
- c.4. Brucella suis;
- c.5. Burkholderia mallei (Pseudomonas mallei);
- c.6. Burkholderia pseudomallei (Pseudomonas pseudomallei);
- c.7. Chlamydia psittaci;
- c.8. Clostridium botulinum;
- c.9. Francisella tularensis;
- c.10. Salmonella typhi;
- c.11. Shigella dysenteriae;
- c.12. Vibrio cholerae;
- c.13. Yersinia pestis;

c.14. Clostridium perfringens, epsilon toxin producing types; *or*

c.15. Enterohaemorrhagic Escherichia coli, serotype O157 and other verotoxin producing serotypes.

d. “Toxins”, as follows, and “subunits” thereof:

d.1. Botulinum toxins;

d.2. Clostridium perfringens toxins;

d.3. Conotoxin;

d.4. Microcystin (Cyanginosin);

d.5. Ricin;

d.6. Saxitoxin;

d.7. Shiga toxin;

d.8. Staphylococcus aureus toxins;

d.9. Tetrodotoxin;

d.10. Verotoxin and other Shiga-like ribosome inactivating proteins;

d.11. Aflatoxins;

d.12. Abrin;

d.13. Cholera toxin;

d.14. Diacetoxyscirpenol toxin;

d.15. T-2 toxin;

d.16. HT-2 toxin;

d.17. Modeccin toxin;

d.18. Volkensin toxin; *or*

d.19. Viscum Album Lectin 1 (Viscumin).

e. “Fungi”, as follows:

e.1. Coccidioides immitis; *or*

e.2. Coccidioides posadasii.

**1C352 Animal pathogens, as follows (see List of Items Controlled).**

**License Requirements**

*Reason for Control:* CB, AT

<i>Control(s)</i>	<i>Country Chart</i>
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CB applies to entire entry	CB Column 1
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AT applies to entire entry	AT Column 1
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**License Requirement Note:** All vaccines are excluded from the scope of this ECCN. See ECCN 1C991 for vaccines.

**License Exceptions**

LVS: N/A

GBS: N/A

CIV: N/A

**List of Items Controlled**

*Unit:* \$ value

*Related Controls:* The Animal and Plant Health Inspection Service (APHIS), U.S. Department of Agriculture, and the Centers for Disease Control and Prevention (CDC), U.S. Department of Health and Human Services, maintain controls on the possession, use, and transfer within the United States of certain items controlled by this ECCN (for APHIS, see 7 CFR 331.3(c), 9 CFR §121.3(c), and 9 CFR 121.4(c); for CDC, see 42 CFR 73.3(c) and 42 CFR 73.4(c)).

*Related Definition:* N/A

*Items:*

a. Viruses, as follows:

a.1. African swine fever virus;

a.2. Avian influenza (AI) viruses identified as having high pathogenicity (HP), as follows:

a.2.a. AI viruses that have an intravenous pathogenicity index (IVPI) in 6-week old chickens greater than 1.2; *or*

a.2.b. AI viruses that cause at least 75% mortality in 4- to 8-week old chickens infected intravenously.

*Note: Avian influenza (AI) viruses of the H5 or H7 subtype that do not have either of the characteristics described in 1C352.a.2 (specifically, 1C352.a.2.a or a.2.b) should be sequenced to determine whether multiple basic amino acids are present at the cleavage site of the haemagglutinin molecule (HA0). If the amino acid motif is similar to that observed for other HPAI isolates, then the isolate being tested should be considered as HPAI and the virus is controlled under 1C352.a.2.*

a.3. Bluetongue virus;

a.4. Foot and mouth disease virus;

a.5. Goat pox virus;

a.6. Porcine herpes virus (Aujeszky's disease);

a.7. Swine fever virus (Hog cholera virus);

a.8. Lyssa virus;

a.9. Newcastle disease virus;

a.10. Peste des petits ruminants virus;

a.11. Porcine enterovirus type 9 (swine vesicular disease virus);

a.12. Rinderpest virus;

a.13. Sheep pox virus;

a.14. Teschen disease virus;

a.15. Vesicular stomatitis virus;

a.16. Lumpy skin disease virus;

a.17. African horse sickness virus.

b. Bacteria, as follows:

b.1 Mycoplasma mycoides, as follows:

b.1.a. Mycoplasma mycoides subspecies mycoides SC (small colony) (a.k.a. contagious bovine pleuropneumonia);

b.1.b. Mycoplasma capricolum subspecies capripneumoniae (“strain F38”).

b.2 [RESERVED.]

**1C353 Genetic elements and genetically-modified organisms, as follows (see List of Items Controlled).**

**License Requirements**

*Reason for Control:* CB, AT

<i>Control(s)</i>	<i>Country Chart</i>
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CB applies to entire entry	CB Column 1
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AT applies to entire entry	AT Column 1
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**License Requirement Note:** Vaccines that contain genetic elements or genetically modified organisms identified in this ECCN are controlled by ECCN 1C991.



**License Exceptions**

LVS: N/A  
 GBS: N/A  
 CIV: N/A

**List of Items Controlled**

*Unit:* \$ value

*Related Controls:* The Animal and Plant Health Inspection Service (APHIS), U.S. Department of Agriculture, and the Centers for Disease Control and Prevention (CDC), U.S. Department of Health and Human Services, maintain controls on the possession, use, and transfer within the United States of certain items controlled by this ECCN, including (but not limited to) genetic elements, recombinant nucleic acids, and recombinant organisms associated with the agents or toxins in ECCN 1C360 (for APHIS, see 7 CFR 331.3(c), 9 CFR 121.3(c), and 9 CFR 121.4(c); for CDC, see 42 CFR 73.3(c) and 42 CFR 73.4(c)).

*Related Definition:* N/A

*Items:*

a. Genetic elements, as follows:

a.1. Genetic elements that contain nucleic acid sequences associated with the pathogenicity of microorganisms controlled by 1C351.a to .c, 1C352, 1C354, or 1C360;

a.2. Genetic elements that contain nucleic acid sequences coding for any of the “toxins” controlled by 1C351.d or “sub-units of toxins” thereof.

b. Genetically modified organisms, as follows:

b.1. Genetically modified organisms that contain nucleic acid sequences associated with the pathogenicity of microorganisms controlled by 1C351.a to .c, 1C352, 1C354, or 1C360;

b.2. Genetically modified organisms that

contain nucleic acid sequences coding for any of the “toxins” controlled by 1C351.d or “sub-units of toxins” thereof.

**Technical Note:** 1. “Genetic elements” include, *inter alia*, chromosomes, genomes, plasmids, transposons, and vectors, whether genetically modified or unmodified.

2. This ECCN does not control nucleic acid sequences associated with the pathogenicity of enterohaemorrhagic *Escherichia coli*, serotype O157 and other verotoxin producing strains, except those nucleic acid sequences that contain coding for the verotoxin or its sub-units.

3. “Nucleic acid sequences associated with the pathogenicity of any of the microorganisms controlled by 1C351.a to .c, 1C352, 1C354, or 1C360” means any sequence specific to the relevant controlled microorganism that:

a. In itself or through its transcribed or translated products represents a significant hazard to human, animal or plant health; or

b. Is known to enhance the ability of a microorganism controlled by 1C351.a to .c, 1C352, 1C354, or 1C360, or any other organism into which it may be inserted or otherwise integrated, to cause serious harm to human, animal or plant health.

**1C354 Plant pathogens, as follows (see List of Items Controlled).**

**License Requirements**

*Reason for Control:* CB, AT

<i>Control(s)</i>	<i>Country Chart</i>
CB applies to entire entry	CB Column 1
AT applies to entire entry	AT Column 1

**License Requirement Note:** All vaccines are excluded from the scope of this ECCN. See

ECCN 1C991 for vaccines.

### License Exceptions

LVS: N/A

GBS: N/A

CIV: N/A

### List of Items Controlled

*Unit:* \$ value

*Related Controls:* The Animal and Plant Health Inspection Service (APHIS), U.S. Department of Agriculture, maintains controls on the possession, use, and transfer within the United States of certain items controlled by this ECCN (see 7 CFR 331.3(c), 9 CFR 121.3(c), and 9 CFR 121.4(c)).

*Related Definitions:* N/A

*Items:*

a. Bacteria, as follows:

a.1. *Xanthomonas albilineans*;

a.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*;

a.3. *Xanthomonas oryzae* pv. *oryzae* (syn. *Pseudomonas campestris* pv. *oryzae*);

a.4. *Clavibacter michiganensis* subspecies *sepedonicus* (syn. *Corynebacterium michiganensis* subspecies *sepedonicum* or *Corynebacterium sepedonicum*);

a.5. *Ralstonia solanacearum* Races 2 and 3 (syn. *Pseudomonas solanacearum* Races 2 and 3 or *Burkholderia solanacearum* Races 2 and 3);

b. Fungi, as follows:

b.1. *Colletotrichum coffeanum* var. *virulans* (*Colletotrichum kahawae*);

b.2. *Cochliobolus miyabeanus* (*Helminthosporium oryzae*);

b.3. *Microcyclus ulei* (syn. *Dothidella ulei*);

b.4. *Puccinia graminis* (syn. *Puccinia graminis* f. sp. *tritici*);

b.5. *Puccinia striiformis* (syn. *Puccinia glumarum*);

b.6. *Magnaporthe grisea* (*pyricularia grisea/pyricularia oryzae*);

c. Viruses, as follows:

c.1. Potato Andean latent tymovirus;

c.2. Potato spindle tuber viroid.

**1C355 Chemical Weapons Convention (CWC) Schedule 2 and 3 chemicals and families of chemicals not controlled by ECCN 1C350 or by the Department of State under the ITAR.**

### License Requirements

*Reason for Control:* CW, AT

*Control(s)*

CW applies to entire entry. The Commerce Country Chart is not designed to determine licensing requirements for items controlled for CW reasons. A license is required to export or reexport CWC Schedule 2 chemicals and mixtures identified in 1C355.a to States not Party to the CWC (destinations not listed in Supplement No. 2 to part 745 of the EAR). A license is required to export CWC Schedule 3 chemicals and mixtures identified in 1C355.b to States not Party to the CWC, unless an End Use Certificate issued by the government of the importing country is obtained by the exporter,

prior to export. A license is required to reexport CWC Schedule 3 chemicals and mixtures identified in 1C355.b from a State not Party to the CWC to any other State not Party to the CWC. (See §742.18 of the EAR for license requirements and policies for toxic and precursor chemicals controlled for CW reasons.)

AT applies to entire entry. The Commerce Country Chart is not designed to determine licensing requirements for items controlled for AT reasons in 1C355. A license is required, for AT reasons, to export or reexport items controlled by 1C355 to a country in Country Group E:1 of Supplement No. 1 to part 740 of the EAR. (See part 742 of the EAR for additional information on the AT controls that apply to Iran, North Korea, Sudan, and Syria. See part 746 of the EAR for additional information on the comprehensive trade sanctions that apply to Cuba and Iran. See Supplement No. 1 to part 736 of the EAR for export controls on Syria.)

#### License Requirements Notes:

##### 1. MIXTURES:

a. Mixtures containing toxic and precursor chemicals identified in ECCN 1C355, in concentrations that are below the control levels indicated in 1C355.a and .b, are controlled by ECCN 1C995 and are subject to the license requirements specified in that ECCN.

b. Mixtures containing chemicals identified in this entry are not controlled by ECCN 1C355 when the controlled chemical is a normal ingredient in consumer goods packaged for retail sale for personal use or packaged for individual use. Such consumer goods are classified as EAR99.

*Note to mixtures: Calculation of concentrations of CW-controlled chemicals:*

*a. Exclusion. No chemical may be added to the mixture (solution) for the sole purpose of*

*circumventing the Export Administration Regulations;*

*b. Percent Weight Calculation. When calculating the percentage, by weight, of components in a chemical mixture, include all components of the mixture, including those that act as solvents.*

2. **COMPOUNDS:** Compounds created with any chemicals identified in this ECCN 1C355 may be shipped NLR (No License Required), without obtaining an End-Use Certificate, unless those compounds are also identified in this entry or require a license for reasons set forth elsewhere in the EAR.

**Technical Notes:** For purposes of this entry, a "mixture" is defined as a solid, liquid or gaseous product made up of two or more components that do not react together under normal storage conditions.

#### License Exceptions

LVS: N/A  
GBS: N/A  
CIV: N/A

#### List of Items Controlled

*Unit:* Liters or kilograms, as appropriate

*Related Controls:* See also ECCNs [1C350](#), [1C351](#), [1C395](#), and [1C995](#). See §§742.18 and 745.2 of the EAR for End-Use Certification requirements.

*Related Definitions:* N/A

*Items:*

a. CWC Schedule 2 chemicals and mixtures containing Schedule 2 chemicals:

a.1. Toxic chemicals, as follows, and mixtures containing toxic chemicals:

a.1.a. PFIB: 1,1,3,3,3-Pentafluoro-2-(trifluoromethyl)-1-propene (C.A.S. 382-21-8)

and mixtures in which PFIB constitutes more than 1 percent of the weight of the mixture;

a.1.b. [RESERVED]

a.2. Precursor chemicals, as follows, and mixtures in which at least one of the following precursor chemicals constitutes more than 10 percent of the weight of the mixture:

a.2.a. Chemicals, except for those listed in Schedule 1, containing a phosphorus atom to which is bonded one methyl, ethyl, or propyl (normal or iso) group but not further carbon atoms.

*Note: 1C355.a.2.a does not control Fonofos: O-Ethyl S-phenyl ethylphosphonothiothionate (C.A.S. 944-22-9).*

a.2.b. FAMILY: N,N-Dialkyl (Me, Et, n-Pr or i-Pr) phosphoramidic dihalides;

a.2.c. FAMILY: Dialkyl (Me, Et, n-Pr or i-Pr) N,N-dialkyl (Me, Et, n-Pr, or i-Pr)-phosphoramidates;

a.2.d. FAMILY: N,N-Dialkyl (Me, Et, n-Pr or i-Pr) aminoethyl-2-chlorides and corresponding protonated salts;

a.2.e. FAMILY: N,N-Dialkyl (Me, Et, n-Pr or i-Pr) aminoethane-2-ols and corresponding protonated salts;

*Note: 1C355.a.2.e. does not control N,N-Dimethylaminoethanol and corresponding protonated salts (C.A.S. 108-01-0) or N,N-Diethylaminoethanol and corresponding protonated salts (C.A.S. 100-37-8).*

a.2.f. FAMILY: N,N-Dialkyl (Me, Et, n-Pr or i-Pr) aminoethane-2-thiols and corresponding protonated salts.

b. CWC Schedule 3 chemicals and mixtures containing Schedule 3 chemicals:

b.1. Toxic chemicals, as follows, and mixtures in which at least one of the following toxic chemicals constitutes 30 percent or more of the weight of the mixture:

b.1.a. Phosgene: Carbonyl dichloride (C.A.S. 75-44-5);

b.1.b. Cyanogen chloride (C.A.S. 506-77-4);

b.1.c. Hydrogen cyanide (C.A.S. 74-90-8);

b.1.d. Chloropicrin: Trichloronitromethane (CAS 76-06-2).

b.2. Precursor chemicals, as follows, and mixtures in which at least one of the following precursor chemicals constitutes 30 percent or more of the weight of the mixture:

b.2.a. [RESERVED];

b.2.b. Methyldiethanolamine (C.A.S. 105-59-9).

**1C360 Select agents not controlled under ECCN 1C351, 1C352, or 1C354.**

**License Requirements**

*Reason for Control:* CB, AT

<i>Controls</i>	<i>Country Chart</i>
CB applies to entire entry	CB Column 1
AT applies to entire entry	AT Column 1

**License Requirement Note:** All vaccines are excluded from the scope of this ECCN. See ECCN 1C991 for vaccines.

**License Exceptions**

LVS: N/A

GBS: N/A

CIV: N/A

**List of Items Controlled***Unit:* \$ value.

*Related Controls:* (1) Also see ECCNs 1C351 (AG-controlled human and zoonotic pathogens and “toxins”), 1C352 (AG-controlled animal pathogens), and 1C354 (AG-controlled plant pathogens). (2) The Animal and Plant Health Inspection Service (APHIS), U.S. Department of Agriculture, and the Centers for Disease Control and Prevention (CDC), U.S. Department of Health and Human Services, maintain controls on the possession, use, and transfer within the United States of items controlled by this ECCN (for APHIS, see 7 CFR 331.3(b), 9 CFR 121.3(b), and 9 CFR 121.4(b); for CDC, see 42 CFR 73.3(b) and 42 CFR 73.4(b)).

*Related Definitions:* N/A.*Items:*

**Note:** *The control status of items listed in this ECCN is not affected by the exemptions or exclusions contained in the domestic possession, use, and transfer regulations maintained by APHIS (at 7 CFR part 331 and 9 CFR part 121) and/or CDC (at 42 CFR part 73).*

## a. Human and zoonotic pathogens, as follows:

## a.1. Viruses, as follows:

a.1.a. Central European tick-borne encephalitis viruses, as follows:

a.1.a.1. Absettarov;

a.1.a.2. Hanzalova;

a.1.a.3. Hypr;

a.1.a.4. Kumlinge;

a.1.b. Cercopithecine herpesvirus 1 (Herpes B virus);

a.1.c. Reconstructed replication competent forms of the 1918 pandemic influenza virus containing any portion of the coding regions of all eight gene segments;

a.2. [RESERVED];

## b. Animal pathogens, as follows:

## b.1. Viruses, as follows:

b.1.a. Akabane virus;

b.1.b. Bovine spongiform encephalopathy agent;

b.1.c. Camel pox virus;

b.1.d. Malignant catarrhal fever virus;

b.1.e. Menangle virus;

## b.2. Mycoplasma, as follows:

b.2.a. Mycoplasma capricolum, except subspecies capripneumoniae (see ECCN 1C352.b.1.b);

b.2.b. Mycoplasma mycoides capri;

## b.3. Rickettsia, as follows:

b.3.a. Ehrlichia ruminantium (a.k.a. Cowdria ruminantium);

b.3.b. [RESERVED];

## c. Plant pathogens, as follows:

## c.1. Bacteria, as follows:

c.1.a. Candidatus Liberobacter africanus

(a.k.a. *Liberobacter africanus*);

c.1.b. *Candidatus Liberobacter asiaticus*  
(a.k.a. *Liberobacter asiaticus*);

c.1.c. *Xylella fastidiosa* pv. *citrus*  
variegated chlorosis (CVC);

c.2. Fungi, as follows:

c.2.a. *Peronosclerospora philippinensis*;

c.2.b. *Sclerophthora rayssiae* var. *zeae*;

c.2.c. *Synchytrium endobioticum*.

**1C395 Mixtures and medical, analytical, diagnostic, and food testing kits not controlled by ECCN 1C350, as follows (See List of Items Controlled).**

#### License Requirements

*Reason for Control:* CB, CW, AT

#### Controls

CB applies to entire entry. The Commerce Country Chart is not designed to determine licensing requirements for items controlled for CB reasons in 1C395. A license is required, for CB reasons, to export or reexport mixtures controlled by 1C395.a and test kits controlled by 1C395.b to States not Party to the CWC (destinations not listed in Supplement No. 2 to part 745 of the EAR).

CW applies to entire entry. The Commerce Country Chart is not designed to determine licensing requirements for items controlled for CW reasons. A license is required for CW reasons, as follows, to States not Party to the CWC (destinations not listed in Supplement No. 2 to part 745 of the EAR): (1) exports and reexports of mixtures controlled by 1C395.a, (2) exports and reexports of test kits controlled by

1C395.b that contain CWC Schedule 2 chemicals controlled by ECCN 1C350, (3) exports of test kits controlled by 1C395.b that contain CWC Schedule 3 chemicals controlled by ECCN 1C350, except that a license is not required, for CW reasons, to export test kits containing CWC Schedule 3 chemicals if an End Use Certificate issued by the government of the importing country is obtained by the exporter prior to export, and (4) reexports from States not Party to the CWC of test kits controlled by 1C395.b that contain CWC Schedule 3 chemicals. (See §742.18 of the EAR for license requirements and policies for toxic and precursor chemicals controlled for CW reasons.)

AT applies to entire entry. The Commerce Country Chart is not designed to determine licensing requirements for items controlled for AT reasons in 1C395. A license is required, for AT reasons, to export or reexport items controlled by 1C395 to a country in Country Group E:1 of Supplement No. 1 to part 740 of the EAR. (See part 742 of the EAR for additional information on the AT controls that apply to Iran, North Korea, Sudan, and Syria. See part 746 of the EAR for additional information on the comprehensive trade sanctions that apply to Cuba and Iran. See Supplement No. 1 to part 736 of the EAR for information on export controls that apply to Syria.)

#### License Requirements Notes

1. 1C395.b does not control mixtures that contain precursor chemicals identified in ECCN 1C350.b or .c in concentrations below the control levels for mixtures indicated in 1C350.b or .c. 1C395.a and 1C995.a.1 and a.2.a control such mixtures, unless they are consumer goods, as described in License Requirements Note 2 of this ECCN.

2. This ECCN does not control mixtures when the controlled chemicals are normal ingredients in consumer goods packaged for retail sale for personal use. Such consumer goods are

classified as EAR99.

### License Exceptions

LVS: N/A

GBS: N/A

CIV: N/A

### List of Items Controlled

*Unit:* \$ value

*Related Controls:* 1. ECCN [1C350](#) controls mixtures containing 30 percent or higher concentrations, by weight, of any single CWC Schedule 2 chemical identified in ECCN [1C350.b](#); ECCN [1C995](#) controls such mixtures containing concentrations of 10 percent or less. 2. ECCN [1C995](#) controls “medical, analytical, diagnostic, and food testing kits” (as defined in the Related Definitions paragraph of this ECCN) that contain precursor chemicals listed in ECCN [1C350.d](#). ECCN [1C350](#) controls any such kits in which the amount of any single chemical listed in [1C350.b](#), [.c](#), or [.d](#) exceeds 300 grams by weight.

*Related Definitions:* For the purpose of this entry, “medical, analytical, diagnostic, and food testing kits” are pre-packaged materials of defined composition that are specifically developed, packaged and marketed for medical, analytical, diagnostic, or public health purposes. Replacement reagents for medical, analytical, diagnostic, and food testing kits described in [1C395.b](#) are controlled by ECCN [1C350](#) if the reagents contain at least one of the precursor chemicals identified in that ECCN in concentrations equal to or greater than the control levels for mixtures indicated in [1C350.b](#) or [.c](#).

*Items:*

a. Mixtures containing more than 10 percent, but less than 30 percent, by weight of any single CWC Schedule 2 chemical identified in ECCN [1C350.b](#). (For controls on other mixtures

containing these chemicals, see Note 1 in the Related Controls paragraph of this ECCN.)

b. “Medical, analytical, diagnostic, and food testing kits” (as defined in the Related Definitions for this ECCN) that contain CWC Schedule 2 or 3 chemicals controlled by ECCN [1C350.b](#) or [.c](#) in an amount *not* exceeding 300 grams per chemical. (For controls on other such test kits containing these and other controlled chemicals, see Note 2 in the Related Controls paragraph of this ECCN.)

**1C980 Inorganic chemicals listed in Supplement No. 1 to part 754 of the EAR that were produced or derived from the Naval Petroleum Reserves (NPR) or became available for export as a result of an exchange of any NPR produced or derived commodities.**

### License Requirements

*Reason for Control:* SS

*Control(s)*

SS applies to entire entry. For licensing requirements (and possible License Exceptions) proceed directly to part 754 of the EAR. The Commerce Country Chart is not designed to determine licensing requirements for items controlled for SS reasons.

### List of Items Controlled

*Unit:* Barrels/Liters

*Related Controls:* N/A

*Related Definitions:* N/A

*Items:*

The list of items controlled is contained in the ECCN heading.

**1C981 Crude petroleum including reconstituted crude petroleum, tar sands & crude shale oil listed in Supplement No. 1 to part 754 of the EAR.**

#### License Requirements

*Reason for Control:* SS

#### *Control(s)*

SS applies to entire entry. For licensing requirements (and possible License Exceptions) proceed directly to part 754 of the EAR. The Commerce Country Chart is not designed to determine licensing requirements for items controlled for SS reasons.

#### List of Items Controlled

*Unit:* Barrels/Liters  
*Related Controls:* N/A  
*Related Definitions:* N/A  
*Items:*

The list of items controlled is contained in the ECCN heading.

**1C982 Other petroleum products listed in Supplement No. 1 to part 754 of the EAR that were produced or derived from the Naval Petroleum Reserves (NPR) or became available for export as a result of an exchange of any NPR produced or derived commodities.**

#### License Requirements

*Reason for Control:* SS

#### *Control(s)*

SS applies to entire entry. For licensing requirements (and possible License Exceptions) proceed directly to part 754 of the EAR. The Commerce Country Chart is not designed to determine licensing requirements for items

controlled for SS reasons.

#### List of Items Controlled

*Unit:* \$ value  
*Related Controls:* N/A  
*Related Definitions:* N/A  
*Items:*

The list of items controlled is contained in the ECCN heading.

**1C983 Natural gas liquids and other natural gas derivatives listed in Supplement No. 1 to part 754 of the EAR that were produced or derived from the Naval Petroleum Reserves (NPR) or became available for export as a result of an exchange of any NPR produced or derived commodities.**

#### License Requirements

*Reason for Control:* SS

#### *Control(s)*

SS applies to entire entry. For licensing requirements (and possible License Exceptions) proceed directly to part 754 of the EAR. The Commerce Country Chart is not designed to determine licensing requirements for items controlled for SS reasons.

#### List of Items Controlled

*Unit:* Barrels/Liters  
*Related Controls:* N/A  
*Related Definitions:* N/A  
*Items:*

The list of items controlled is contained in the ECCN heading.

**1C984 Manufactured gas and synthetic natural gas (except when commingled with**



**natural gas and thus subject to export authorization from the Department of Energy) listed in Supplement No. 1 to part 754 of the EAR that were produced or derived from the Naval Petroleum Reserves (NPR) or became available for export as a result of an exchange of any NPR produced or derived commodities.**

### License Requirements

*Reason for Control:* SS

#### *Control(s)*

SS applies to entire entry. For licensing requirements (and possible License Exceptions) proceed directly to part 754 of the EAR. The Commerce Country Chart is not designed to determine licensing requirements for items controlled for SS reasons.

### List of Items Controlled

*Unit:* Millions of cubic feet

*Related Controls:* N/A

*Related Definitions:* N/A

*Items:*

The list of items controlled is contained in the ECCN heading.

**1C988 Western red cedar (*Thuja plicata*), logs and timber, and rough, dressed and worked lumber containing wane listed in Supplement No. 2 to part 754 of the EAR.**

### License Requirements

*Reason for Control:* SS

#### *Control(s)*

SS applies to entire entry. For licensing requirements (and possible License Exceptions) proceed directly to part 754 of the EAR. The Commerce Country Chart is not designed to

determine licensing requirements for items controlled for SS reasons.

### List of Items Controlled

*Unit:* Million board feet scribner

*Related Controls:* N/A

*Related Definitions:* N/A

*Items:*

The list of items controlled is contained in the ECCN heading.

**1C990 Fibrous and filamentary materials, not controlled by 1C010 or 1C210, for use in “composite” structures and with a specific modulus of  $3.18 \times 10^6$  m or greater and a specific tensile strength of  $7.62 \times 10^4$  m or greater.**

### License Requirements

*Reason for Control:* AT

#### *Control(s)*

*Country Chart*

AT applies to entire entry

AT Column 1

### License Exceptions

LVS: N/A

GBS: N/A

CIV: N/A

### List of Items Controlled

*Unit:* Kilograms

*Related Controls:* N/A

*Related Definitions:* N/A

*Items:*

The list of items controlled is contained in the ECCN heading.

**1C991 Vaccines, immunotoxins, medical**

**products, diagnostic and food testing kits, as follows (see List of Items controlled).**

### License Requirements

*Reason for Control:* CB, AT

<i>Control(s)</i>	<i>Country Chart</i>
CB applies to 1C991.d	CB Column 3
AT applies to entire entry	AT Column 1

### License Exceptions

LVS: N/A

GBS: N/A

CIV: N/A

### List of Items Controlled

*Unit:* \$ value

*Related Controls:* (1) Medical products containing ricin or saxitoxin, as follows, are controlled for CW reasons under ECCN [1C351](#):

(a) Ricinus Communis Agglutinin<sub>II</sub> (RCA<sub>II</sub>), also known as ricin D, or Ricinus Communis Lectin<sub>III</sub> (RCL<sub>III</sub>);

(b) Ricinus Communis Lectin<sub>IV</sub> (RCL<sub>IV</sub>), also known as ricin E; or

(c) Saxitoxin identified by C.A.S. #35523-89-8.

(2) The export of a “medical product” that is an “Investigational New Drug” (IND), as defined in 21 CFR §312.3, is subject to certain U.S. Food and Drug Administration (FDA) requirements that are independent of the export requirements specified in this ECCN or elsewhere in the EAR. These FDA requirements are described in 21 CFR §312.110 and must be satisfied in addition to any requirements specified in the EAR.

(3) Also see 21 CFR §314.410 for FDA requirements concerning exports of new drugs and new drug substances.

*Related Definitions:* For the purpose of this

entry, “immunotoxin” is defined as an antibody-toxin conjugate intended to destroy specific target cells (e.g., tumor cells) that bear antigens homologous to the antibody. For the purpose of this entry, “medical products” are: (1) pharmaceutical formulations designed for testing and human administration in the treatment of medical conditions, (2) prepackaged for distribution as clinical or medical products, and (3) approved by the U.S. Food and Drug Administration either to be marketed as clinical or medical products or for use as an “Investigational New Drug” (IND) (see 21 CFR Part 312). For the purpose of this entry, “diagnostic and food testing kits” are specifically developed, packaged and marketed for diagnostic or public health purposes. Biological toxins in any other configuration, including bulk shipments, or for any other end-uses are controlled by ECCN 1C351 or ECCN 1C360. For the purpose of this entry, “vaccine” is defined as a medicinal (or veterinary) product in a pharmaceutical formulation, approved by the U.S. Food and Drug Administration or the U.S. Department of Agriculture to be marketed as a medical (or veterinary) product or for use in clinical trials, that 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.

*Items:*

- a. Vaccines against items controlled by ECCN 1C351, 1C352, 1C353, 1C354, or 1C360;
- b. Immunotoxins containing items controlled by 1C351.d;
- c. Medical products containing botulinum toxins controlled by ECCN 1C351.d.1 or conotoxins controlled by ECCN 1C351.d.3;
- d. Medical products containing items controlled by ECCN 1C351.d (except botulinum toxins

controlled by ECCN 1C351.d.1, conotoxins controlled by ECCN 1C351.d.3, and items controlled for CW reasons under 1C351.d.5 or .d.6);

e. Diagnostic and food testing kits containing items controlled by ECCN 1C351.d (except items controlled for CW reasons under ECCN 1C351.d.5 or .d.6).

**1C992 Commercial charges and devices containing energetic materials, n.e.s. and nitrogen trifluoride in a gaseous state.**

**License Requirements**

*Reason for Control:* AT, RS

<i>Control(s)</i>	<i>Country Chart</i>
AT applies to entire entry	AT Column 1
RS applies to entire entry.	A license is required for items controlled by this entry for export or reexport to Iraq and transfer within Iraq for regional stability reasons. The Commerce Country Chart is not designed to determine RS license requirements for this entry. See §§742.6 and 746.3 of the EAR for additional information.

**License Exceptions**

LVS: N/A  
 GBS: N/A  
 CIV: N/A

**List of Items Controlled**

*Unit:* \$ value

*Related Controls:* (1) Commercial charges and devices containing USML controlled energetic materials that exceed the quantities noted or that are not covered by this entry are controlled under [1C018](#). (2) Nitrogen trifluoride when not in a gaseous state is controlled under [1C018](#).

*Related Definitions:* (1) Items controlled by this entry 1C992 are those materials not subject to the licensing authority of the U.S. Department of State, Directorate of Defense Trade Controls (see 22 CFR part 121) or controlled by ECCN 1C018. (2) For purposes of this entry, the term “controlled materials” means controlled energetic materials (see ECCNs 1C011, 1C111, 1C239 and 22 CFR 121.1 Category V). (3) The individual USML controlled energetic materials, even when compounded with other materials, remain subject to the export licensing authority of the Department of State when not incorporated into explosive devices or charges controlled by this entry. (4) Commercial prefabricated slurries and emulsions containing greater than 35% of USML controlled energetic materials are subject to the export licensing authority of the U.S. Department of State, Office of Defense Trade Control. (5) For purposes of this entry, the mass of aluminum powder, potassium perchlorate, and any of the substances listed in the note to the USML (see 22 CFR 121.12) (such as ammonium pictrate, black powder, etc.) contained in commercial explosive devices and in the charges are omitted when determining the total mass of controlled material.

*Items:*

a. Shaped charges specially designed for oil well operations, utilizing one charge functioning along a single axis, that upon detonation produce a hole, and

- a.1. Contain any formulation of controlled materials;
- a.2. Have only a uniform shaped conical liner with an included angle of 90 degrees or less;
- a.3. Contain more than 0.010 kg but less than or equal to 0.090 kg of controlled materials; and
- a.4. Have a diameter not exceeding 4.5 inches;
- b. Shaped charges specially designed for oil well operations containing less than or equal to 0.010 kg of controlled materials;
- c. Detonation cord or shock tubes containing less than or equal to 0.064 kg per meter (300 grains per foot) of controlled materials;
- d. Cartridge power devices, that contain less than or equal to 0.70 kg of controlled materials in the deflagration material;
- e. Detonators (electric or nonelectric) and assemblies thereof, that contain less than or equal to 0.01 kg of controlled materials;
- f. Igniters, that contain less than or equal to 0.01 kg of controlled materials;
- g. Oil well cartridges, that contain less than or equal to 0.015 kg of controlled energetic materials;
- h. Commercial cast or pressed boosters containing less than or equal to 1.0 kg of controlled materials;
- i. Commercial prefabricated slurries and emulsions containing less than or equal to 10.0 kg and less than or equal to thirty-five percent by weight of USML controlled materials;
- j. Cutters and severing tools containing less than or equal to 3.5 kg of controlled materials;

k. Pyrotechnic devices when designed exclusively for commercial purposes (e.g., theatrical stages, motion picture special effects, and fireworks displays) and containing less than or equal to 3.0 kg of controlled materials; or

l. Other commercial explosive devices and charges not controlled by 1C992.a through .k containing less than or equal to 1.0 kg of controlled materials.

*Note: 1C992.l includes automotive safety devices; extinguishing systems; cartridges for riveting guns; explosive charges for agricultural, oil and gas operations, sporting goods, commercial mining, or public works purposes; and delay tubes used in the assembly of commercial explosive devices.*

m. Nitrogen trifluoride (NF<sub>3</sub>) in a gaseous state.

**1C995 Mixtures not controlled by ECCN 1C350, ECCN 1C355 or ECCN 1C395 that contain chemicals controlled by ECCN 1C350 or ECCN 1C355 and medical, analytical, diagnostic, and food testing kits not controlled by ECCN 1C350 or ECCN 1C395 that contain chemicals controlled by ECCN 1C350.d, as follows (see List of Items Controlled).**

**License Requirements**

*Reason for Control:* AT, RS

<i>Control(s)</i>	<i>Country Chart</i>
AT applies to entire entry	AT Column 1

RS applies to entire entry. A license is required for items controlled by this entry for export or reexport to Iraq or transfer within Iraq for regional stability reasons. The Commerce Country Chart is not designed to determine RS license requirements for this entry. See §§742.6 and 746.3 of the EAR for additional information.

**License Requirement Notes:**

1. This ECCN does not control mixtures containing less than 0.5% of any single toxic or precursor chemical controlled by ECCN 1C350.b, .c, or .d or ECCN 1C355 as unavoidable by-products or impurities. Such mixtures are classified as EAR99.

2. 1C995.c does not control mixtures that contain precursor chemicals identified in 1C350.d in concentrations below the levels for mixtures indicated in 1C350.d. 1C995.a.2.b controls such mixtures, unless they are consumer goods as described in License Requirements Note 3 of this ECCN.

3. This ECCN does not control mixtures when the controlled chemicals are normal ingredients in consumer goods packaged for retail sale for personal use. Such consumer goods are classified as EAR99

**License Exceptions**

LVS: N/A  
GBS: N/A  
CIV: N/A

**List of Items Controlled**

*Unit:* \$ value

*Related Controls:* 1. ECCN [1C350](#) controls mixtures containing 30 percent or higher concentrations of any single CWC Schedule 2 chemical identified in ECCN [1C350.b](#). ECCN [1C395](#) controls mixtures containing concentrations of more than 10 percent, but less than 30 percent, of any single CWC Schedule 2 chemical identified in ECCN [1C350.b](#). 2. ECCN [1C350](#) controls mixtures containing chemicals identified in ECCN [1C350.c](#) or [.d](#) that exceed the concentration levels indicated in [1C995.a.2](#). 3. ECCN [1C355](#) controls mixtures containing chemicals identified in ECCN [1C355](#) that exceed the concentration levels indicated in

[1C995.b](#). 4. ECCN [1C395](#) controls “medical, analytical, diagnostic, and food testing kits” (as defined in the Related Controls paragraph of this ECCN) that contain CWC Schedule 2 or 3 chemicals listed in [1C350.b](#) or [.c](#). ECCN [1C350](#) controls any such testing kits in which the amount of any single chemical listed in [1C350.b](#), [.c](#), or [.d](#) exceeds 300 grams by weight.

*Related Definitions:* For the purpose of this entry, “medical, analytical, diagnostic, and food testing kits” are pre-packaged materials of defined composition that are specifically developed, packaged and marketed for medical, analytical, diagnostic, or public health purposes. Replacement reagents for medical, analytical, diagnostic, and food testing kits described in 1C995.c are controlled by ECCN 1C350 if the reagents contain at least one of the precursor chemicals identified in that ECCN in concentrations equal to or greater than the control levels for mixtures indicated in 1C350.d.

*Items:*

a. Mixtures containing the following concentrations of precursor chemicals controlled by ECCN 1C350 (For controls on other mixtures containing these chemicals, see Notes 1 and 2 in the Related Controls paragraph of this ECCN.):

a.1. Mixtures containing 10 percent or less, by weight, of any single CWC Schedule 2 chemical controlled by ECCN 1C350.b;

a.2. Mixtures containing less than 30 percent, by weight, of:

a.2.a. Any single CWC Schedule 3 chemical controlled by ECCN 1C350.c; or

a.2.b. Any single precursor chemical controlled by ECCN 1C350.d.

b. Mixtures containing the following concentrations of toxic or precursor chemicals

controlled by ECCN 1C355 (For controls on other mixtures containing these chemicals, see Note 3 in the Related Controls paragraph of this ECCN.):

GBS: N/A

CIV: N/A

b.1. Mixtures containing the following concentrations of CWC Schedule 2 chemicals controlled by ECCN 1C355.a:

b.1.a. Mixtures containing 1 percent or less, by weight, of any single CWC Schedule 2 chemical controlled by ECCN 1C355.a.1 (i.e., mixtures containing PFIB); or

b.1.b. Mixtures containing 10 percent or less, by weight, of any single CWC Schedule 2 chemical controlled by 1C355.a.2;

b.2. Mixtures containing less than 30 percent, by weight, of any single CWC Schedule 3 chemical controlled by ECCN 1C355.b.

c. “Medical, analytical, diagnostic, and food testing kits” (as defined in the Related Definitions for this ECCN) that contain precursor chemicals controlled by ECCN 1C350.d in an amount *not* exceeding 300 grams per chemical. (For controls on other such test kits containing these and other controlled chemicals, see Note 4 in the Related Controls paragraph of this ECCN.)

**1C996 Hydraulic fluids containing synthetic hydrocarbon oils, having all the following characteristics (see List of Items Controlled).**

**License Requirements**

*Reason for Control:* AT

*Control(s)* Country Chart

AT applies to entire entry AT Column 1

**License Exceptions**

LVS: N/A

**List of Items Controlled**

*Unit:* Barrels (55 U.S. gallons/209 liters)

*Related Controls:* N/A

*Related Definitions:* N/A

*Items:*

- a. A flash point exceeding 477 K (204 °C);
- b. A pour point at 239 K (-34 °C) or less;
- c. A viscosity index of 75 or more; *and*
- d. A thermal stability at 616 K (343 °C).

**1C997 Ammonium nitrate, including fertilizers and fertilizer blends containing more than 15% by weight ammonium nitrate, except liquid fertilizers (containing any amount of ammonium nitrate) or dry fertilizers containing less than 15% by weight ammonium nitrate.**

**License Requirements**

*Reason for Control:* AT, RS

*Control(s)* Country Chart

AT applies to entire entry AT Column 1

RS applies to entire entry. A license is required for items controlled by this entry for export or reexport to Iraq or transfer within Iraq for regional stability reasons. The Commerce Country Chart is not designed to determine RS license requirements for this entry. See §§742.6 and 746.3 of the EAR for additional information.

**License Exceptions**

LVS: N/A

GBS: N/A  
 CIV: N/A

**List of Items Controlled**

*Unit:* Kilograms  
*Related Controls:* N/A  
*Related Definitions:* N/A  
*Items:*

The list of items controlled is contained in the ECCN heading.

**1C998 Non-fluorinated polymeric substances, not controlled by 1C008, as follows (see List of Items Controlled).**

**License Requirements**

*Reason for Control:* AT

<i>Control(s)</i>	<i>Country Chart</i>
AT applies to entire entry	AT Column 1

**License Exceptions**

LVS: N/A  
 GBS: N/A  
 CIV: N/A

**List of Items Controlled**

*Unit:* Kilograms  
*Related Controls:* N/A  
*Related Definitions:* N/A  
*Items:*

- a. Polyarylene ether ketones, as follows:
  - a.1 Polyether ether ketone (PEEK);
  - a.2. Polyether ketone ketone (PEKK);
  - a.3. Polyether ketone (PEK);

a.4. Polyether ketone ether ketone ketone (PEKEKK);

b. [RESERVED].

**1C999 Specific materials, n.e.s., as follows (see List of Items Controlled).**

**License Requirements**

*Reason for Control:* AT, RS

*Control(s)*

AT applies to entire entry. A license is required for items controlled by this entry to North Korea for anti-terrorism reasons. The Commerce Country Chart is not designed to determine AT license requirements for this entry. See §742.19 of the EAR for additional information.

RS applies to entire entry. A license is required for items controlled by this entry for export or reexport to Iraq or transfer within Iraq for regional stability reasons. The Commerce Country Chart is not designed to determine RS license requirements for this entry. See §§742.6 and 746.3 of the EAR for additional information.

**License Exceptions**

LVS: N/A  
 GBS: N/A  
 CIV: N/A

**List of Items Controlled**

*Unit:* \$ value  
*Related Controls:* See also [1C236](#)  
*Related Definitions:* N/A  
*Items:*

- a. Hardened steel and tungsten carbide precision ball bearings (3mm or greater diameter);
- b. 304 and 316 stainless steel plate, n.e.s.;

- c. Monel plate;
- d. Tributyl phosphate;
- e. Nitric acid in concentrations of 20 weight percent or greater;
- f. Fluorine;
- g. Alpha-emitting radionuclides, n.e.s.

*Unit:* \$ value  
*Related Controls:* (1) See ECCNs [1E101](#) (“use”) and [1E102](#) (“development” and “production”) for technology for items controlled by this entry. (2) Also see [1D002](#), [1D101](#), [1D201](#), and [1D999](#).  
*Related Definitions:* N/A  
*Items:*

The list of items controlled is contained in the ECCN heading.

**D. SOFTWARE**

**1D001 “Software” specially designed or modified for the “development”, “production” or “use” of equipment controlled by 1B001 to 1B003.**

**1D002 “Software” for the “development” of organic “matrix”, metal “matrix” or carbon “matrix” laminates or “composites”.**

**License Requirements**

**License Requirements**

*Reason for Control:* NS, MT, NP, AT

*Reason for Control:* NS, AT

<i>Control(s)</i>	<i>Country Chart</i>
NS applies to entire entry	NS Column 1
MT applies to “software” for the “development”, “production”, or “use” of items controlled by 1B001 for MT reasons	MT Column 1
NP applies to “software” for the “development”, “production” or “use” of items controlled by 1B001 for NP reasons	NP Column 1
AT applies to entire entry	AT Column 1

<i>Control(s)</i>	<i>Country Chart</i>
NS applies to entire entry	NS Column 1
AT applies to entire entry	AT Column 1

**License Requirement Notes:** See §743.1 of the EAR for reporting requirements for exports under Exceptions.

**License Exceptions**

**License Exceptions**

CIV: Yes, except N/A for MT  
 TSR: Yes, except N/A for MT

CIV: Yes  
 TSR: Yes

**List of Items Controlled**

**List of Items Controlled**

*Unit:* \$ value  
*Related Controls:* “Software” for items controlled by [1A102](#) are subject to the export licensing authority of the U.S. Department of State, Directorate of Defense Trade Controls (see 22 CFR part 121).  
*Related Definitions:* N/A  
*Items:*

The list of items controlled is contained in the



ECCN heading.

**1D003 “Software” specially designed or modified to enable equipment to perform the functions of equipment controlled under 1A004.c.**

**License Requirements**

*Reason for Control:* NS, AT

*Control(s)* Country Chart

NS applies to entire entry NS Column 2

AT applies to entire entry AT Column 1

**License Exceptions**

CIV: N/A  
TSR: N/A

**List of Items Controlled**

*Unit:* \$ value  
*Related Controls:* N/A  
*Related Definitions:* N/A  
*Items:*

The list of items controlled is contained in the ECCN heading.

**1D018 “Software” specially designed or modified for the “development”, “production”, or “use” of items controlled by 1B018.**

**License Requirements**

*Reason for Control:* NS, MT, AT, UN.

*Control(s)* Country Chart

NS applies to entire entry NS Column 1

MT applies to “software” MT Column 1

for the “development”, “production”, or “use” of items controlled by 1B018 for MT reasons.

AT applies to entire entry AT Column 1

UN applies to entire entry Iraq, North Korea, and Rwanda

**License Exceptions**

CIV: N/A  
TSR: N/A

**List of Items Controlled**

*Unit:* \$ value  
*Related Controls:* See §746.8(b)(1) for additional BIS licensing requirements for Rwanda concerning this entry.  
*Related Definitions:* N/A  
*Items:*

The list of items controlled is contained in the ECCN heading.

**1D101 “Software” specially designed or modified for the “use” of commodities controlled by 1B101, 1B102, 1B115, 1B117, 1B118, or 1B119.**

**License Requirements**

*Reason for Control:* MT, NP, AT

*Control(s)* Country Chart

MT applies to entire entry MT Column 1

NP applies to “software” for the “use” of items controlled by 1B101.a NP Column 1

AT applies to entire entry AT Column 1

**License Exceptions**

CIV: N/A  
 TSR: N/A

**List of Items Controlled**

*Unit:* \$ value  
*Related Controls:* See ECCNs [1E101](#) (“use”) and [1E102](#) (“development” and “production”) for technology for items controlled by this entry.  
*Related Definitions:* N/A  
*Items:*

The list of items controlled is contained in the ECCN heading.

**1D103 “Software” specially designed for reduced observables such as radar reflectivity, ultraviolet/infrared signatures and acoustic signatures, for applications usable in “missiles” or their subsystems.**

**License Requirements**

*Reason for Control:* MT, AT

<i>Control(s)</i>	<i>Country Chart</i>
MT applies to entire entry	MT Column 1
AT applies to entire entry	AT Column 1

**License Exceptions**

CIV: N/A  
 TSR: N/A

**List of Items Controlled**

*Unit:* \$ value  
*Related Controls:* (1) This entry includes “software” specially designed for analysis of signature reduction. (2) For software that

meets the definition of defense articles under 22 CFR 120.3 of the International Traffic in Arms Regulations (ITAR), see 22 CFR 121.16, Item 17-Category II of the (ITAR), which describes similar software that are under the jurisdiction of the Department of State, Directorate of Defense Trade Controls.  
*Related Definitions:* N/A  
*Items:*

The list of items controlled is contained in the ECCN heading.

**1D201 “Software” specially designed or modified for the “use” of items controlled by 1B201.**

**License Requirements**

*Reason for Control:* NP, AT

<i>Control(s)</i>	<i>Country Chart</i>
NP applies to entire entry	NP Column 1
AT applies to entire entry	AT Column 1

**License Exceptions**

CIV: N/A  
 TSR: N/A

**List of Items Controlled**

*Unit:* \$ value  
*Related Controls:* See ECCNs [1E201](#) (“use”) and [1E203](#) (“development” and “production”) for technology for items controlled by this entry.  
*Related Definitions:* N/A  
*Items:*

The list of items controlled is contained in the ECCN heading.

**1D390 “Software” for process control that is specifically configured to control or initiate “production” of chemicals controlled by 1C350.**

**License Requirements**

*Reason for Control:* CB, AT

*Control(s)* Country Chart

CB applies to entire entry CB Column 2

AT applies to entire entry AT Column 1

**License Exceptions**

CIV: N/A

TSR: N/A

**List of Items Controlled**

*Unit:* \$ value

*Related Controls:* N/A

*Related Definitions:* N/A

*Items:*

The list of items controlled is contained in the ECCN heading.

**1D993 “Software” specially designed for the “development”, “production”, or “use” of equipment or materials controlled by 1C210.b, or 1C990.**

**License Requirements**

*Reason for Control:* AT

*Control(s)* Country Chart

AT applies to entire entry AT Column 1

**License Exceptions**

CIV: N/A

TSR: N/A

**List of Items Controlled**

*Unit:* \$ value

*Related Controls:* N/A

*Related Definitions:* N/A

*Items:*

The list of items controlled is contained in the ECCN heading.

**1D999 Specific software, n.e.s., as follows (see List of Items Controlled).**

**License Requirements**

*Reason for Control:* AT

*Control(s)*

AT applies to entire entry. A license is required for items controlled by this entry to North Korea for anti-terrorism reasons. The Commerce Country Chart is not designed to determine AT licensing requirements for this entry. See §742.19 of the EAR for additional information.

**License Exceptions**

CIV: N/A

TSR: N/A

**List of Items Controlled**

*Unit:* \$ value

*Related Controls:* See also [1B999](#)

*Related Definitions:* N/A

*Items:*

a. Software specially designed for industrial process control hardware/systems controlled by 1B999, n.e.s.;

b. Software specially designed for equipment for

the production of structural composites, fibers, prepreps and preforms controlled by 1B999, n.e.s.

for items controlled by 1C351, 1C352, 1C353, 1C354, or 1C360

**E. TECHNOLOGY**

**1E001 “Technology” according to the General Technology Note for the “development” or “production” of items controlled by 1A001.b, 1A001.c, 1A002, 1A003, 1A004, 1A005, 1A006, 1A007, 1A101, 1B (except 1B999), or 1C (except 1C355, 1C980 to 1C984, 1C988, 1C990, 1C991, 1C992, 1C995 to 1C999).**

CB applies to “technology” CB Column 2  
for materials controlled by 1C350 and for chemical detection systems and dedicated detectors therefor, in 1A004.c, that also have the technical characteristics described in 2B351.a

AT applies to entire entry AT Column 1

**License Requirements**

*Reason for Control:* NS, MT, NP, CB, AT

**License Requirements Note:** See §743.1 of the EAR for reporting requirements for exports under License Exceptions.

*Control(s)* Country Chart

NS applies to “technology” NS Column 1  
for items controlled by 1A001.b and .c, 1A002, 1A003, 1A005, 1A006, 1A007, 1B001 to 1B003, 1B018, 1C001 to 1C011, or 1C018

NS applies to “technology” NS Column 2  
for items controlled by 1A004

MT applies to “technology” MT Column 1  
for items controlled by 1A101, 1B001, 1B101, 1B102, 1B115 to 1B119, 1C001, 1C007, 1C011, 1C101, 1C102, 1C107, 1C111, 1C116, 1C117, or 1C118 for MT reasons

NP applies to “technology” NP Column 1  
for items controlled by 1A002, 1A007, 1B001, 1B101, 1B201, 1B225 to 1B233, 1C002, 1C010, 1C116, 1C202, 1C210, 1C216, 1C225 to 1C240 for NP reasons

CB applies to “technology” CB Column 1

**License Exceptions**

CIV: N/A

TSR: Yes, except for the following:

- 1) Items controlled for MT reasons; or
- 2) Exports and reexports to destinations outside of Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Japan, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, or the United Kingdom of “technology” for the “development” or production” of the following:
  - (a) Items controlled by 1C001; or
  - (b) Items controlled by 1A002.a which are composite structures or laminates having an organic “matrix” and being made from materials listed under 1C010.c or 1C010.d.

**List of Items Controlled**

*Unit:* N/A

*Related Controls:* (1) Also see ECCNs [1E101](#), [1E201](#), and [1E202](#). (2) See ECCN [1E002.g](#) for control libraries (parametric technical databases) specially designed or modified to enable equipment to perform the functions of equipment controlled under [1A004.c](#) (Nuclear, biological and chemical (NBC) detection systems). (3) “Technology” for lithium isotope separation (see related ECCN [1B233](#)) and “technology” for items described in ECCN [1C012](#) are subject to the export licensing authority of the Nuclear Regulatory Commission (see 10 CFR part 110). (4) “Technology” for items described in ECCN [1A102](#) is subject to the export licensing authority of the U.S. Department of State, Directorate of Defense Trade Controls (see 22 CFR part 121).

*Related Definitions:* N/A

*Items:*

The list of items controlled is contained in the ECCN heading.

**1E002 Other “technology”, as follows (see List of Items Controlled).**

**License Requirements**

*Reason for Control:* NS, MT, NP, AT

<i>Control(s)</i>	<i>Country Chart</i>
NS applies to entire entry, except 1E002.g	NS Column 1
NS applies to 1E002.g	NS Column 2
MT applies to 1E002.e	MT Column 1
NP applies to “technology” for items controlled by 1A002 for NP reasons.	NP Column 1
AT applies to entire entry	AT Column 1

**License Requirement Notes:** See §743.1 of the EAR for reporting requirements for exports under License Exceptions.

**License Exceptions**

CIV: N/A

TSR: Yes, except for 1E002.e

**List of Items Controlled**

*Unit:* N/A

*Related Controls:* See also [1E001](#), [1E101](#), [1E102](#), [1E202](#), and [1E994](#) for “technology” related to [1E002.e](#) or [.f](#).

*Related Definitions:* N/A

*Items:*

- 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 vinyl ether monomer;
- c. “Technology” for the design or “production” of the following base materials or non-“composite” ceramic materials:
  - c.1. Base materials having all of the following characteristics:
    - c.1.a. Any of the following compositions:
      - c.1.a.1. Single or complex oxides of zirconium and complex oxides of silicon or aluminum;
      - c.1.a.2. Single nitrides of boron (cubic crystalline forms);
      - c.1.a.3. Single or complex carbides of silicon or boron; *or*
      - c.1.a.4. Single or complex nitrides of

silicon;

c.1.b. Total metallic impurities, excluding intentional additions, of less than:

c.1.b.1. 1,000 ppm for single oxides or carbides; *or*

c.1.b.2. 5,000 ppm for complex compounds or single nitrides; *and*

c.1.c. Being any of the following:

c.1.c.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;

c.1.c.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; *or*

c.1.c.3. Having all of the following:

c.1.c.3.a. Platelets with a length to thickness ratio exceeding 5;

c.1.c.3.b. Whiskers with a length to diameter ratio exceeding 10 for diameters less than 2 μm; *and*

c.1.c.3.c. Continuous or chopped fibers less than 10 μm in diameter;

c.2. Non-“composite” ceramic materials composed of the materials described in 1E002.c.1;

*Note: 1E002.c.2 does not control technology for the design or production of abrasives.*

d. “Technology” for the “production” of aromatic polyamide fibers;

e. “Technology” for the installation, maintenance or repair of materials controlled by 1C001;

f. “Technology” for the repair of “composite” structures, laminates or materials controlled by 1A002, 1C007.c or 1C007.d.

*Note: 1E002.f does not control “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 controlled under 1A004.c.

*Technical Note: For the purpose of 1E002.g, the term ‘library’ (parametric technical database) means a collection of technical information, reference to which may enhance the performance of relevant equipment or systems.*

**1E101 “Technology”, in accordance with the General Technology Note, for the “use” of commodities and software controlled by 1A101, 1A102, 1B001, 1B101, 1B102, 1B115 to 1B119, 1C001, 1C007, 1C011, 1C101, 1C107, 1C111, 1C116, 1C117, 1C118, 1D001, 1D101, or 1D103.**

**License Requirements**

*Reason for Control:* MT, NP, AT

<i>Control(s)</i>	<i>Country Chart</i>
MT applies to entire entry	MT Column 1
NP applies to “technology” for items controlled by 1B001, 1B101, 1C116, 1D001, and 1D101 for NP reasons	NP Column 1
AT applies to entire entry	AT Column 1

**License Exceptions**

CIV: N/A  
 TSR: N/A

*Related Controls:* This entry includes databases specially designed for analysis of signature reduction.

*Related Definitions:* N/A

*Items:*

**List of Items Controlled**

*Unit:* N/A

*Related Controls:* “Technology” for items controlled by [1A102](#) are subject to the export licensing authority of the U.S. Department of State, Directorate of Defense Trade Controls (see 22 CFR part 121).

*Related Definitions:* N/A

*Items:*

The list of items controlled is contained in the ECCN heading.

The list of items controlled is contained in the ECCN heading.

**1E102 “Technology” according to the General Technology Note for the “development” of software controlled by 1D001, 1D101 or 1D103.**

**1E103 “Technical data” (including processing conditions) and procedures for the regulation of temperature, pressure or atmosphere in autoclaves or hydroclaves, when used for the “production” of “composites” or partially processed “composites”, usable for equipment or materials specified in 1C007, 1C102, 1C107, 1C116, 1C117, 1C118, 9A110, and 9C110.**

**License Requirements**

*Reason for Control:* MT, NP, AT

<i>Control(s)</i>	<i>Country Chart</i>
MT applies to entire entry	MT Column 1
NP applies to “technology” for items controlled by 1D001 and 1D101 for NP reasons	NP Column 1
AT applies to entire entry	AT Column 1

**License Requirements**

*Reason for Control:* MT, AT

<i>Control(s)</i>	<i>Country Chart</i>
MT applies to entire entry	MT Column 1
AT applies to entire entry	AT Column 1

**License Exceptions**

CIV: N/A  
 TSR: N/A

**License Exceptions**

CIV: N/A  
 TSR: N/A

**List of Items Controlled**

*Unit:* N/A

**List of Items Controlled**

*Unit:* N/A

*Related Controls:* See also [1E203](#)

*Related Definitions:* N/A

*Items:*

The list of items controlled is contained in the ECCN heading.

**1E104 “Technology” for the “production” of pyrolytically derived materials formed on a mold, mandrel or other substrate from precursor gases which decompose in the 1,573 K (1,300 °C) to 3,173 K (2,900 °C) temperature range at pressures of 130 Pa (1 mm Hg) to 20 kPa (150 mm Hg), including “technology” for the composition of precursor gases, flow-rates and process control schedules and parameters.**

**License Requirements**

*Reason for Control:* MT, AT

<i>Control(s)</i>	<i>Country Chart</i>
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MT applies to entire entry	MT Column 1
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AT applies to entire entry	AT Column 1
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**License Exceptions**

CIV: N/A  
 TSR: N/A

**List of Items Controlled**

*Unit:* N/A  
*Related Controls:* N/A  
*Related Definitions:* N/A  
*Items:*

The list of items controlled is contained in the ECCN heading.

**1E201 “Technology” according to the General Technology Note for the “use” of items controlled by 1A002, 1A007, 1A202, 1A225 to 1A227, 1B201, 1B225 to 1B232, 1B233.b, 1C002.a.2.c or .d, 1C010.a, 1C010.b, 1C010.e.1, 1C202, 1C210, 1C216, 1C225 to 1C240 or 1D201.**

**License Requirements**

*Reason for Control:* NP, AT

<i>Control(s)</i>	<i>Country Chart</i>
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NP applies to entire entry, for items controlled for NP reasons.	NP Column 1
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AT applies to entire entry	AT Column 1
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**License Exceptions**

CIV: N/A  
 TSR: N/A

**List of Items Controlled**

*Unit:* N/A  
*Related Controls:* N/A  
*Related Definitions:* N/A  
*Items:*

The list of items controlled is contained in the ECCN heading.

**1E202 “Technology” according to the General Technology Note for the “development” or “production” of goods controlled by 1A202 or 1A225 to 1A227.**

**License Requirements**

*Reason for Control:* NP, AT

<i>Control(s)</i>	<i>Country Chart</i>
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NP applies to entire entry	NP Column 1
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AT applies to entire entry	AT Column 1
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**License Exceptions**

CIV: N/A  
 TSR: N/A

**List of Items Controlled**







The list of items controlled is contained in the ECCN heading.

CIV: N/A  
 TSR: N/A

**List of Items Controlled**

*Unit:* N/A  
*Related Controls:* N/A  
*Related Definitions:* N/A  
*Items:*

**1E998 “Technology” for the “development” or “production” of processing equipment controlled by 1B999, and materials controlled by 1C995, 1C996, 1C997, 1C998, and 1C999.**

The list of items controlled is contained in the ECCN heading.

**License Requirements**

*Reason for Control:* AT

**EAR99** Items subject to the EAR that are *not* elsewhere controlled by this CCL Category *or* in any other category in the CCL are designated by the number *EAR99*.

<i>Control(s)</i>	<i>Country Chart</i>
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AT applies to entire entry	AT Column 1
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**License Exceptions**