

Controlled Chemicals

The Bureau of Industry and Security of the U.S. Department of Commerce may require a license to export the following chemicals listed in Category 1 (one) of the **Export Administration Regulations (EAR)**. For details regarding regulations, please review the Chemical Weapons Convention (CWC) provisions of the EAR at http://www.cwc.gov/regulations_ear_provisions.html

Sections of Category 1
modified for the CWC
(Scroll to the
applicable ECCN):

1C350	Chemicals That May Be Used as Precursors for Toxic Chemical Agents
1C351	Human and Zoonotic Pathogens and "Toxins"
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
1C395	Mixtures and Medical, Analytical, Diagnostic, and Food Testing Kits Not Controlled by ECCN 1C350
1C991*	Vaccines, Immunotoxins, Medical Products, Diagnostic and Food Testing Kits
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).
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, 1A101, 1B, or 1C (except 1C355, 1C980 to 1C984, 1C988, 1C990, 1C991, 1C992, and 1C995)
1E355	Technology for the Production of Chemical Weapons Convention (CWC) Schedule 2 and 3 Chemicals

* ECCN is not subject to CWC control (CW reason for control), but is a related control

A license is required to export the following chemicals listed in the U.S. Department of State, Directorate of Defense Trade Controls (DDTC), Consolidated **International Traffic in Arms Regulations (ITAR)** Title 22, Code of Federal Regulations, Chapter I, Part 121. For details regarding regulations, please review the Chemical Weapons Convention (CWC) provisions of the U.S. State Department regulation at http://www.cwc.gov/regulations_state.html :

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CATEGORY XIV—TOXICOLOGICAL AGENTS, INCLUDING CHEMICAL AGENTS, BIOLOGICAL AGENTS, AND ASSOCIATED EQUIPMENT

* (a) Chemical agents, to include:

(1) Nerve agents:

- (i) O-Alkyl (equal to or less than C10, including cycloalkyl) alkyl (Methyl, Ethyl, n-Propyl or Isopropyl)phosphonofluoridates, such as: Sarin (GB): O-Isopropyl methylphosphonofluoridate (CAS 107–44–8) (CWC Schedule 1A); and Soman (GD): OPinacolyl methylphosphonofluoridate (CAS 96–64–0) (CWC Schedule 1A);
- (ii) O-Alkyl (equal to or less than C10, including cycloalkyl) N,N-dialkyl (Methyl, Ethyl, n-Propyl or Isopropyl) phosphoramidocyanidates, such as: Tabun (GA): O-Ethyl N, Ndimethylphosphoramidocyanidate (CAS 77– 81–6) (CWC Schedule 1A);
- (iii) O-Alkyl (H or equal to or less than C10, including cycloalkyl) S–2-dialkyl (Methyl, Ethyl, n-Propyl or Isopropyl)aminoethyl alkyl (Methyl, Ethyl, n-Propyl or Isopropyl) phosphonothiolates and corresponding alkylated and protonated salts, such as: VX: O-Ethyl S-2- diisopropylaminoethyl methyl phosphonothiolate (CAS 50782–69–9) (CWC Schedule 1A);

(2) Amiton: O,O-Diethyl S- [2(diethylamino)ethyl] phosphorothiolate and corresponding alkylated or protonated salts (CAS 78–53–5) (CWC Schedule 2A);

(3) Vesicant agents:

- (i) Sulfur mustards, such as: 2- Chloroethylchloromethylsulfide (CAS 2625– 76–5) (CWC Schedule 1A); Bis(2- chloroethyl)sulfide (CAS 505–60–2) (CWC Schedule 1A); Bis(2- hloroethylthio)methane (CAS 63839–13–6) (CWC Schedule 1A); 1,2-bis (2- chloroethylthio)ethane (CAS 3563–36–8) (CWC Schedule 1A); 1,3-bis (2- chloroethylthio)-n-propane (CAS 63905–10–2) (CWC Schedule 1A); 1,4-bis (2- chloroethylthio)-n-butane (CWC Schedule 1A); 1,5-bis (2-chloroethylthio)-n-pentane (CWC Schedule 1A); Bis (2- chloroethylthiomethyl)ether (CWC Schedule 1A); Bis (2- chloroethylthioethyl)ether (CAS 63918–89–8) (CWC Schedule 1A);
- (ii) Lewisites, such as: 2- chlorovinylchloroarsine (CAS 541–25–3) (CWC Schedule 1A); Tris (2-chlorovinyl) arsine (CAS 40334–70–1) (CWC Schedule 1A); Bis (2-chlorovinyl) chloroarsine (CAS 40334–69–8) (CWC Schedule 1A);
- (iii) Nitrogen mustards, such as: HN1: bis (2-chloroethyl) ethylamine (CAS 538–07–8) (CWC Schedule 1A); HN2: bis (2-chloroethyl) methylamine (CAS 51–75–2) (CWC Schedule 1A); HN3: tris (2-chloroethyl)amine (CAS 555– 77–1) (CWC Schedule 1A);
- (iv) Ethyldichloroarsine (ED);
- (v) Methylchloroarsine (MD);

(4) Incapacitating agents, such as:

- (i) 3-Quinuclidinyl benzilate (BZ) (CAS 6581–06–2) (CWC Schedule 2A);
- (ii) Diphenylchloroarsine (DA) (CAS 712–48– 1);
- (iii) Diphenylcyanoarsine (DC);

* (b) Biological agents and biologically derived substances specifically developed, configured, adapted, or modified for the purpose of increasing their capability to produce casualties in humans or livestock, degrade equipment or damage crops.

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* (c) Chemical agent binary precursors and key precursors, as follows:

- (1) Alkyl (Methyl, Ethyl, n-Propyl or Isopropyl) phosphonyl difluorides, such as: DF: Methyl Phosphonyldifluoride (CAS 676–99–3) (CWC Schedule 1B); Methylphosphinyldifluoride;
- (2) O-Alkyl (H or equal to or less than C10, including cycloalkyl) O–2-dialkyl (methyl, ethyl, n-Propyl or isopropyl)aminoethyl alkyl (methyl, ethyl, N-propyl or isopropyl) phosphonite and corresponding alkylated and protonated salts, such as: QL: O-Ethyl-2-di-isopropylaminoethyl methylphosphonite (CAS 57856–11–8) (CWC Schedule 1B);
- (3) Chlorosarin: O-Isopropyl methylphosphonochloridate (CAS 1445–76–7) (CWC Schedule 1B);
- (4) Chlorosoman: O-Pinakolyl methylphosphonochloridate (CAS 7040–57–5) (CWC Schedule 1B);
- (5) DC: Methylphosphonyl dichloride (CAS 676–97–1) (CWC Schedule 2B); Methylphosphinyldichloride;

(d) Tear gases and riot control agents including:

- (1) Adamsite (Diphenylamine chloroarsine or DM) (CAS 578–94–9);
- (2) CA (Bromobenzyl cyanide) (CAS 5798–79–8);
- (3) CN (Phenylacetyl chloride or w- Chloroacetophenone) (CAS 532–27–4);
- (4) CR (Dibenz-(b,f)-1,4-oxazepine) (CAS 257–07–8);
- (5) CS (o-Chlorobenzylidenemalononitrile or o-Chlorobenzalmalononitrile) (CAS 2698–41–1);
- (6) Dibromodimethyl ether (CAS 4497–29–4);
- (7) Dichlorodimethyl ether (ClCi) (CAS 542–88–1);
- (8) Ethyldibromoarsine (CAS 683–43–2);
- (9) Bromo acetone;
- (10) Bromo methylethylketone;
- (11) Iodo acetone;
- (12) Phenylcarbylamine chloride;
- (13) Ethyl iodoacetate;

(e) Defoliants, as follows:

- (1) Agent Orange (2,4,5– Trichlorophenoxyacetic acid mixed with 2,4-dichlorophenoxyacetic acid);
- (2) LNF (Butyl 2-chloro-4- fluorophenoxyacetate)

* (f) Equipment and its components, parts, accessories, and attachments specifically designed or modified for military operations and compatibility with military equipment as follows:

- (1) The dissemination, dispersion or testing of the chemical agents, biological agents, tear gases and riot control agents, and defoliants listed in paragraphs (a), (b), (d), and (e), respectively, of this category;
- (2) The detection, identification, warning or monitoring of the chemical agents and biological agents listed in paragraph (a) and (b) of this category;
- (3) Sample collection and processing of the chemical agents and biological agents listed in paragraph (a) and (b) of this category;
- (4) Individual protection against the chemical and biological agents listed in paragraphs (a) and (b) of this category.
- (5) Collective protection against the chemical agents and biological agents listed in paragraph (a) and (b) of this category.
- (6) Decontamination or remediation of the chemical agents and biological agents listed in paragraph (a) and (b) of this category.

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(g) Antibodies, polynucleoides, biopolymers or biocatalysts specifically designed or modified for use with articles controlled in paragraph (f) of this category.

(h) Medical countermeasures, to include pre- and post-treatments, vaccines, antidotes and medical diagnostics, specifically designed or modified for use with the chemical agents listed in paragraph (a) of this category and vaccines with the sole purpose of protecting against biological agents identified in paragraph (b) of this category. Examples include: barrier creams specifically designed to be applied to skin and personal equipment to protect against vesicant agents controlled in paragraph (a) of this category; atropine auto injectors specifically designed to counter nerve agent poisoning.

(i) Modeling or simulation tools specifically designed or modified for chemical or biological weapons design, development or employment. The concept of modeling and simulation includes software covered by paragraph (m) of this category specifically designed to reveal susceptibility or vulnerability to biological agents or materials listed in paragraph (b) of this category.

(j) Test facilities specifically designed or modified for the certification and qualification of articles controlled in paragraph (f) of this category.

(k) Equipment, components, parts, accessories, and attachments, exclusive of incinerators (including those which have specially designed waste supply systems and special handling facilities), specifically designed or modified for destruction of the chemical agents in paragraph (a) or the biological agents in paragraph (b) of this category. This destruction equipment includes facilities specifically designed or modified for destruction operations.

(l) Tooling and equipment specifically designed or modified for the production of articles controlled by paragraph (f) of this category.

(m) Technical data (as defined in § 120.10 of this subchapter) and defense services (as defined in § 120.9 of this subchapter) related to the defense articles enumerated in paragraphs (a) through (l) of this category. (See § 125.4 of this subchapter for exemptions.) Technical data directly related to the manufacture or production of any defense articles enumerated elsewhere in this Category that are designated as Significant Military Equipment (SME) shall itself be designated as SME.

(n) The following interpretations explain and amplify the terms used in this category and elsewhere in this subchapter.

(1) A chemical agent in category XIV(a) is a substance having military application, which by its ordinary and direct chemical action, produces a powerful physiological effect.

(2) The biological agents or biologically derived substances in paragraph (b) of this category are those agents and substances capable of producing casualties in humans or livestock, degrading equipment or damaging crops and which have been modified for the specific purpose of increasing such effects. Examples of such modifications include increasing resistance to UV radiation or improving dissemination characteristics. This does not include modifications made only for civil applications (e.g., medical or environmental use).

(3) The destruction equipment controlled by this category related to biological agents in paragraph (b) is that equipment specifically designed to destroy only the agents identified in paragraph (b) of this category.

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(4)(i) The individual protection against the chemical and biological agents controlled by this category includes military protective clothing and masks, but not those items designed for domestic preparedness (e.g., civil defense). Domestic preparedness devices for individual protection that integrate components and parts identified in this subparagraph are licensed by the Department of Commerce when such components are:

- (A) Integral to the device;
- (B) inseparable from the device; and,
- (C) incapable of replacement without compromising the effectiveness of the device.

(ii) Components and parts identified in this subparagraph exported for integration into domestic preparedness devices for individual protection are subject to the controls of the ITAR;

(5) Technical data and defense services in paragraph (l) include libraries, databases and algorithms specifically designed or modified for use with articles controlled in paragraph (f) of this category.

(6) The tooling and equipment covered by paragraph (l) of this category includes molds used to produce protective masks, overboots, and gloves controlled by paragraph (f) and leak detection equipment specifically designed to test filters controlled by paragraph(f) of this category.

(7) The resulting product of the combination of any controlled or non-controlled substance compounded or mixed with any item controlled by this subchapter is also subject to the controls of this category.

NOTE 1: This Category does not control formulations containing 1% or less CN or CS or individually packaged tear gases or riot control agents for personal self-defense purposes.

NOTE 2: Categories XIV(a) and (d) do not include the following:

- (1) Cyanogen chloride;
- (2) Hydrocyanic acid;
- (3) Chlorine;
- (4) Carbonyl chloride (Phosgene);
- (5) Ethyl bromoacetate;
- (6) Xylyl bromide;
- (7) Benzyl bromide;
- (8) Benzyl iodide;
- (9) Chloro acetone;
- (10) Chloropicrin (trichloronitromethane);
- (11) Fluorine;
- (12) Liquid pepper.

NOTE 3: Chemical Abstract Service (CAS) registry numbers do not cover all the substances and mixtures controlled by this category. The numbers are provided as examples to assist the government agencies in the license review process and the exporter when completing their license application and export documentation.

NOTE 4: With respect to U.S. obligations under the Chemical Weapons Convention (CWC), refer to Chemical Weapons Convention Regulations (CWCRC) (15 CFR parts 710 through 722). As appropriate, the CWC schedule is provided to assist the exporter.

NOTE 5: Pharmacological formulations containing nitrogen mustards and certain reference standards for these drugs are not considered to be chemical agents and are licensed by the Department of Commerce

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when:

- (1) The drug is in the form of a final medical product; or
- (2) The reference standard contains salts of HN2 [bis(2-chloroethyl) methylamine], the quantity to be shipped is 150 milligrams or less, and individual shipments do not exceed twelve per calendar year per end user.

Technical data for the production of HN1 [bis(2-chloroethyl)ethylamine]; HN2 [bis(2-chloroethyl)methylamine], HN3 [tris(2-chloroethyl)amine]; or salts of these, such as tris(2-chloroethyl)amine hydrochloride, remains controlled under this Category.

The Bureau of Industry and Security of the U.S. Department of Commerce requires adherence to specific regulations regarding the following chemicals. For details, please visit the **Chemical Weapons Convention** website at http://www.cwc.gov/regulations_cwc.html :

Schedule 1 chemicals:

A. Toxic chemicals:	(CAS registry number)
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(1) 0-Alkyl ($\leq C_{10}$, incl. cycloalkyl) alkyl (Me, Et, n-Pr or i-Pr)-phosphonofluoridates	
e.g. Sarin: 0-Isopropyl methylphosphonofluoridate	(107-44-8)
Soman: 0-Pinacolyl methylphosphonofluoridate	(96-64-0)
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(2) 0-Alkyl ($\leq C_{10}$, incl. cycloalkyl) N,N-dialkyl (Me, Et, n-Pr or i-Pr)-phosphoramidocyanidates	
e.g. Tabun: 0-Ethyl N,N-dimethyl phosphoramidocyanidate	(77-81-6)
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(3) 0-Alkyl (H or $\leq C_{10}$, incl. cycloalkyl) S-2- dialkyl (Me, Et, n-Pr or i-Pr)-aminoethyl alkyl (Me, Et, n-Pr or i-Pr)-phosphonothiolates and corresponding alkylated or protonated salts	
e.g. VX: 0-Ethyl S-2-diisopropylaminoethyl methyl phosphonothiolate	(50782-69-9)
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(4) Sulfur mustards:	
2-Chloroethylchloromethylsulfide	(2625-76-5)
Mustard gas: Bis(2-chloroethyl)sulfide	(505-60-2)
Bis(2-chloroethylthio)methane	(63869-13-6)
Sesquimustard: 1,2-Bis(2-chloroethylthio)ethane	(3563-36-8)
1,3-Bis(2-chloroethylthio)-n-propane	(63905-10-2)
1,4-Bis(2-chloroethylthio)-n-butane	(142868-93-7)
1,5-Bis(2-chloroethylthio)-n-pentane	(142868-94-8)
Bis(2-chloroethylthiomethyl)ether	(63918-90-1)
0-Mustard: Bis(2-chloroethylthioethyl)ether	(63918-89-8)
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(5) Lewisites:	
Lewisite 1: 2-Chlorovinyl dichloroarsine	(541-25-3)
Lewisite 2: Bis(2-chlorovinyl)chloroarsine	(40334-69-8)
Lewisite 3: Tris(2-chlorovinyl)arsine	(40334-70-1)
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(6) Nitrogen mustards:	
HN1: Bis(2-chloroethyl)ethylamine	(538-07-8)
HN2: Bis(2-chloroethyl)methylamine	(51-75-2)
HN3: Tris(2-chloroethyl)amine	(555-77-1)
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(7) Saxitoxin	(35523-89-8)
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(8) Ricin	(9009-86-3)
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B. Precursors:	(CAS registry number)
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(9) Alkyl (Me, Et, n-Pr or i-Pr) phosphonyldifluorides	
e.g. DF: Methylphosphonyldifluoride	(676-99-3)
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(10) O-Alkyl (H or $\leq C_{10}$, incl. cycloalkyl) O-2- dialkyl (Me, Et, n-Pr or i-Pr)- aminoethyl alkyl (Me, Et, n-Pr or i-Pr) phosphonites and corresponding alkylated or protonated salts	
e.g. QL: O-Ethyl O-2- diisopropylaminoethyl methylphosphonite	(57856-11-8)
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(11) Chlorosarin: O- Isopropyl methylphosphonochloridate	(1445-76-7)
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(12) Chlorosoman: O- Pinacolyl methylphosphonochloridate	(7040-57-5)
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Notes to Supplement No. 1:

Note 1: Note that the following Schedule 1 chemicals are controlled for export purposes under the Export Administration Regulations (see part 774 of the EAR, the Commerce Control List): 0-Ethyl-2-diisopropylaminoethyl methylphosphonite (QL) (C.A.S. #57856-11-8), Ethylphosphonyl difluoride (C.A.S. #753-98-0), Methylphosphonyl difluoride (C.A.S. #676-99-3), Saxitoxin (35523-89-8), Ricin (9009-86-3).

Note 2: All Schedule 1 chemicals not listed in Note 1 to this Supplement are controlled for export purposes by the Office of Defense Trade Control of the Department of State under the International Traffic in Arms Regulations (22 CFR parts 120 through 130).

Schedule 2 Chemicals:

A. Toxic chemicals:

(CAS registry number)

(1) Amiton: 0,0-Diethyl S-[2-(diethylamino)ethyl] phosphorothiolate and corresponding alkylated or protonated salts (78-53-5)

(2) PFIB: 1,1,3,3,3-Pentafluoro-2-(trifluoromethyl)-1-propene (382-21-8)

(3) BZ: 3-Quinuclidinyl benzilate (*) (6581-06-2)

B. Precursors:

(CAS registry number)

(4) 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,

e.g. Methylphosphonyl dichloride (676-97-1)

Dimethyl methylphosphonate (756-79-6)

Exemption: Fonofos: 0-Ethyl S-phenyl ethylphosphonothiolothionate (944-22-9)

(5) N,N-Dialkyl (Me, Et, n-Pr or i-Pr) phosphoramidic dihalides -

(6) Dialkyl (Me, Et, n-Pr or i-Pr) N,N-dialkyl (Me, Et, n-Pr or i-Pr)-phosphoramidates -

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(7) Arsenic trichloride	(7784-34-1)
(8) 2,2-Diphenyl-2-hydroxyacetic acid	(76-93-7)
(9) Quinuclidine-3-ol	(1619-34-7)
(10) N,N-Dialkyl (Me, Et, n-Pr or i-Pr) aminoethyl-2-chlorides and corresponding protonated salts	-
(11) N,N-Dialkyl (Me, Et, n-Pr or i-Pr) aminoethane-2-ols and corresponding protonated salts	-
Exemptions: N,N-Dimethylaminoethanol and corresponding protonated salts	(108-01-0)
N,N-Diethylaminoethanol and corresponding protonated salts	(100-37-8)
(12) N,N-Dialkyl (Me, Et, n-Pr or i-Pr) aminoethane-2-thiols and corresponding protonated salts	-
(13) Thiodiglycol: Bis(2-hydroxyethyl) sulfide	(111-48-8)
(14) Pinacolyl alcohol: 3,3-Dimethylbutane-2-ol	(464-07-3)

Notes to Supplement No. 1:

Note 1: Note that the following Schedule 1 chemicals are controlled for export purposes under the Export Administration Regulations (see part 774 of the EAR, the Commerce Control List): 0-Ethyl-2-diisopropylaminoethyl methylphosphonite (QL) (C.A.S. #57856-11-8), Ethylphosphonyl difluoride (C.A.S. #753-98-0), Methylphosphonyl difluoride (C.A.S. #676-99-3), Saxitoxin (35523-89-8), Ricin (9009-86-3).

Note 2: All Schedule 1 chemicals not listed in Note 1 to this Supplement are controlled for export purposes by the Office of Defense Trade Control of the Department of State under the International Traffic in Arms Regulations (22 CFR parts 120 through 130).

Schedule 3 Chemicals:

A. Toxic chemicals:

(CAS registry number)

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(1) Phosgene: Carbonyl dichloride	(75-44-5)
(2) Cyanogen chloride	(506-77-4)
(3) Hydrogen cyanide	(74-90-8)
(4) Chloropicrin: Trichloronitromethane	(76-06-2)

B. Precursors:

(CAS registry number)

(5) Phosphorus oxychloride	(10025-87-3)
(6) Phosphorus trichloride	(7719-12-2)
(7) Phosphorus pentachloride	(10026-13-8)
(8) Trimethyl phosphite	(121-45-9)
(9) Triethyl phosphite	(122-52-1)
(10) Dimethyl phosphite	(868-85-9)
(11) Diethyl phosphite	(762-04-9)
(12) Sulfur monochloride	(10025-67-9)
(13) Sulfur dichloride	(10545-99-0)
(14) Thionyl chloride	(7719-09-7)
(15) Ethyl-diethanolamine	(139-87-7)
(16) Methyl-diethanolamine	(105-59-9)
(17) Triethanolamine	(102-71-6)

Note to Supplement No. 1: Refer to Supplement No. 1 to part 774 of the Export Administration Regulations (the Commerce Control List), ECCN 1C355, Related Controls for chemicals controlled under the International Traffic in Arms Regulations (22 CFR parts 120 through 130).

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