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**DEPARTMENT OF STATE**

**22 CFR Part 121**

**RIN 1400-AD02**

**[Public Notice 7861]**

**Amendment to the International Traffic in Arms Regulations: Revision of U.S. Munitions List Category V.**

**AGENCY:** Department of State.

**ACTION:** Proposed Rule.

**SUMMARY:** As part of the President's Export Control Reform effort, the Department of State proposes to amend the International Traffic in Arms Regulations (ITAR) to revise Category V (explosives and energetic materials, propellants, incendiary agents, and their constituents) of the U.S. Munitions List (USML) to describe more precisely the articles warranting control on the USML.

**DATES:** The Department of State will accept comments on this proposed rule until [insert date 45 days from date of publication in the *Federal Register*].

**ADDRESSES:**

Interested parties may submit comments within 45 days of the date of publication by one of the following methods:

- E-mail: *DDTCResponseTeam@state.gov* with the subject line, “ITAR Amendment – Category V.”
- Internet: At *www.regulations.gov*, search for this notice by using this rule’s RIN (1400-AD02).

Comments received after that date will be considered if feasible, but consideration cannot be assured. Those submitting comments should not include any personally identifying information they do not desire to be made public or information for which a claim of confidentiality is asserted because those comments and/or transmittal e-mails will be made available for public inspection and copying after the close of the comment period via the Directorate of Defense Trade Controls website at *www.pmdtdc.state.gov*. Parties who wish to comment anonymously may do so by submitting their comments via *www.regulations.gov*, leaving the fields that would identify the commenter blank and including no identifying information in the comment itself. Comments submitted via *www.regulations.gov* are immediately available for public inspection.

**FOR FURTHER INFORMATION CONTACT:** Ms. Candace M. J. Goforth, Acting Director, Office of Defense Trade Controls Policy,

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*DDTCResponseTeam@state.gov*. ATTN: Regulatory Change, USML

Category V.

**SUPPLEMENTARY INFORMATION:** The Directorate of Defense Trade Controls (DDTC), U.S. Department of State, administers the International Traffic in Arms Regulations (ITAR) (22 CFR parts 120-130). The items subject to the jurisdiction of the ITAR, *i.e.*, “defense articles,” are identified on the ITAR’s U.S. Munitions List (USML) (22 CFR 121.1). With few exceptions, items not subject to the export control jurisdiction of the ITAR are subject to the jurisdiction of the Export Administration Regulations (“EAR,” 15 CFR parts 730-774, which includes the Commerce Control List in Supplement No. 1 to Part 774), administered by the Bureau of Industry and Security (BIS), U.S. Department of Commerce. Both the ITAR and the EAR impose license requirements on exports and reexports. Items not subject to the ITAR or to the exclusive licensing jurisdiction of any other set of regulations are subject to the EAR.

### **Export Control Reform Update**

The Departments of State and Commerce described in their respective Advanced Notices of Proposed Rulemaking (ANPRM) in December 2010 the Administration’s plan to make the USML and the CCL positive, tiered,

and aligned so that eventually they can be combined into a single control list (see “Commerce Control List: Revising Descriptions of Items and Foreign Availability,” 75 FR 76664 (December 9, 2010) and “Revision to the United States Munitions List,” 75 FR 76935 (December 10, 2010)). The notices also called for the establishment of a “bright line” between the USML and the CCL to reduce government and industry uncertainty regarding export jurisdiction by clarifying whether particular items are subject to the jurisdiction of the ITAR or the EAR. While these remain the Administration’s ultimate Export Control Reform objectives, their concurrent implementation would be problematic in the near term. In order to more quickly reach the national security objectives of greater interoperability with U.S. allies, enhancing the defense industrial base, and permitting the U.S. Government to focus its resources on controlling and monitoring the export and reexport of more significant items to destinations, end-uses, and end-users of greater concern than NATO allies and other multi-regime partners, the Administration has decided, as an interim step, to propose and implement revisions to both the USML and the CCL that are more positive, but not yet tiered.

Specifically, based in part on a review of the comments received in response to the December 2010 notices, the Administration has determined

that fundamentally altering the structure of the USML by tiering and aligning it on a category-by-category basis would significantly disrupt the export control compliance systems and procedures of exporters and reexporters. For example, until the entire USML was revised and became final, some USML categories would follow the legacy numbering and control structures while the newly revised categories would follow a completely different numbering structure. In order to allow for the national security benefits to flow from re-aligning the jurisdictional status of defense articles that no longer warrant control on the USML on a category-by-category basis while minimizing the impact on exporters' internal control and jurisdictional and classification marking systems, the Administration plans to proceed with building positive lists now and afterward return to structural changes.

### **Revision of Category V**

This proposed rule revises USML Category V, covering explosives and energetic materials, propellants, incendiary agents, and their constituents, to establish a clear “bright line” between the USML and the CCL for the control of these articles.

One major change proposed to this category involves removal of broad catchalls with the listing of specific materials that warrant ITAR

control caught by current catchalls. For example, paragraph (a)(35) as currently written broadly controls, “Any other explosive not elsewhere identified in this category specifically designed, modified, adapted, or configured (*e.g.*, formulated) for military application.” This catchall is being removed. Examples of materials added because of deletion of catchalls are as follows: tetrazines (BTAT (Bis(2,2,2-trinitroethyl)-3,6-diaminotetrazine); LAX-112 (3,6-diamino- 1,2,4,5-tetrazine- 1,4dioxide); PNO (Poly(3-nitrato oxetane)); 4,5 diazidomethyl-2-methyl-1,2,3-triazole (iso- DAMTR)); TEPB (Tris (ethoxyphenyl) bismuth) (CAS 90591-48-3); and TEX (4,10-Dinitro-2,6,8,12-tetraoxa-4,10-diazaisowurtzitane). Those materials currently captured in the catchalls that do not warrant control on the USML are to be controlled on the CCL. Examples of such materials to be removed from various catchalls and controlled on the CCL are spherical aluminum powder and hydrazine and its derivatives.

Another major change proposed to this category involves addressing U.S. obligations to multinational regimes. There is a limited catchall (a)(32) that is being changed from 8700 meters per second to 8000 meters per second to match the criteria from the Nuclear Suppliers Group. The proposed revision would read as follows (*see* paragraph (a)(38)):

“Explosives, not otherwise enumerated in this paragraph or on the CCL in

ECCN 1C608, with a detonation velocity exceeding 8,000m/s at maximum density or a detonation pressure exceeding 34 Gpa (340 kbar).” Additional hydrazine materials are specified by the Missile Technology Control Regime (MTCR) and these entries were added.

Additionally, some materials are to be added that are significant to the military but have little commercial application. For example, DNAN (2,4 Dinitroanisole), a military explosive currently covered by the catchall in (a)(35), will be controlled in paragraph (a)(11).

### **Request for Comments**

As the U.S. Government works through the proposed revisions to the USML, some solutions have been adopted that were determined to be the best of available options. With the thought that multiple perspectives would be beneficial to the USML revision process, the Department welcomes the assistance of users of the lists and requests input on the following:

1) A key goal of this rulemaking is to ensure the USML and the CCL together control all the items that meet Wassenaar Arrangement commitments embodied in Munitions List Category 8 (WA-ML8). To that end, the public is asked to identify any potential lack of coverage brought about by the proposed rules for Category V contained in this notice and the

new Category 1 ECCNs published separately by the Department of Commerce when reviewed together.

2) The key goal of this rulemaking is to establish a “bright line” between the USML and the CCL for the control of these materials. The public is asked to provide specific examples of explosives and energetic materials whose jurisdiction would be in doubt based on this revision.

## **REGULATORY ANALYSIS AND NOTICES**

### *Administrative Procedure Act*

The Department of State is of the opinion that controlling the import and export of defense articles and services is a foreign affairs function of the United States Government and that rules implementing this function are exempt from §553 (Rulemaking) and §554 (Adjudications) of the Administrative Procedure Act. Although the Department is of the opinion that this rule is exempt from the rulemaking provisions of the APA, the Department is publishing this rule with a 45-day provision for public comment and without prejudice to its determination that controlling the import and export of defense services is a foreign affairs function. As noted above, and also without prejudice to the Department position that this rulemaking is not subject to the APA, the Department previously published a

related Advance Notice of Proposed Rulemaking (RIN 1400-AC78), and accepted comments for 60 days.

*Regulatory Flexibility Act*

Since the Department is of the opinion that this rule is exempt from the rulemaking provisions of 5 U.S.C. 553, it does not require analysis under the Regulatory Flexibility Act.

*Unfunded Mandates Reform Act of 1995*

This proposed amendment does not involve a mandate that will result in the expenditure by State, local, and tribal governments, in the aggregate, or by the private sector, of \$100 million or more in any year and it will not significantly or uniquely affect small governments. Therefore, no actions were deemed necessary under the provisions of the Unfunded Mandates Reform Act of 1995.

*Small Business Regulatory Enforcement Fairness Act of 1996*

This proposed amendment has been found not to be a major rule within the meaning of the Small Business Regulatory Enforcement Fairness Act of 1996.

*Executive Orders 12372 and 13132*

This proposed amendment will not have substantial direct effects on the States, on the relationship between the national government and the

States, or on the distribution of power and responsibilities among the various levels of government. Therefore, in accordance with Executive Order 13132, it is determined that this proposed amendment does not have sufficient federalism implications to require consultations or warrant the preparation of a federalism summary impact statement. The regulations implementing Executive Order 12372 regarding intergovernmental consultation on Federal programs and activities do not apply to this proposed amendment.

*Executive Order 12866*

The Department is of the opinion that controlling the import and export of defense articles and services is a foreign affairs function of the United States Government and that rules governing the conduct of this function are exempt from the requirements of Executive Order 12866. However, the Department has reviewed the proposed rule to ensure its consistency with the regulatory philosophy and principles set forth in the Executive Order.

*Executive Order 13563*

The Department of State has considered this rule in light of Executive Order 13563, dated January 18, 2011, and affirms that this regulation is consistent with the guidance therein.

*Executive Order 12988*

The Department of State has reviewed the proposed amendment in light of sections 3(a) and 3(b)(2) of Executive Order 12988 to eliminate ambiguity, minimize litigation, establish clear legal standards, and reduce burden.

*Executive Order 13175*

The Department of State has determined that this rulemaking will not have tribal implications, will not impose substantial direct compliance costs on Indian tribal governments, and will not preempt tribal law. Accordingly, Executive Order 13175 does not apply to this rulemaking.

*Paperwork Reduction Act*

This proposed amendment does not impose any new reporting or recordkeeping requirements subject to the Paperwork Reduction Act, 44 U.S.C. Chapter 35.

**List of Subjects in 22 CFR Part 121**

Arms and munitions, Exports

Accordingly, for the reasons set forth above, Title 22, Chapter I, Subchapter M, part 121 is proposed to be amended as follows:

**PART 121 – THE UNITED STATES MUNITIONS LIST**

1. The authority citation for part 121 continues to read as follows:

**Authority:** Secs. 2, 38, and 71, Pub. L. 90–629, 90 Stat. 744 (22 U.S.C. 2752, 2778, 2797); E.O. 11958, 42 FR 4311; 3 CFR, 1977 Comp. p. 79; 22 U.S.C. 2651a; Pub. L. 105–261, 112 Stat. 1920.

2. Section 121.1 is amended by revising U.S. Munitions List

Category V to read as follows:

**§121.1 General. The United States Munitions List.**

\* \* \* \* \*

**Category V—Explosives and Energetic Materials, Propellants, Incendiary Agents, and Their Constituents**

\*(a) Explosives, and mixtures thereof, as follows:

- (1) ADNBF (aminodinitrobenzofuroxan or 7-Amino 4,6-dinitrobenzofurazane-1-oxide) (CAS 97096–78–1);
- (2) BNCP (cis-bis(5-nitrotetrazolato) tetra amine-cobalt (III) perchlorate) (CAS 117412–28–9);
- (3) CL–14 (diaminodinitrobenzofuroxan or 5,7-diamino-4,6-dinitrobenzofurazane-1-oxide) (CAS 117907–74–1);
- (4) CL–20 (HNIW or Hexanitrohexaazaisowurtzitane) (CAS 135285–90-4); clathrates of CL–20;
- (5) CP (2-(5-cyanotetrazolato) penta aminecobalt (III) perchlorate) (CAS 70247–32–4);

- (6) DADE (1,1-diamino-2,2-dinitroethylene, FOX-7);
- (7) DATB (Diaminotrinitrobenzene) (CAS 1630-08-6);
- (8) DDFP (1,4-dinitrodifurazanopiperazine);
- (9) DDPO (2,6-diamino-3,5-dinitropyrazine-1-oxide, PZO) (CAS 194486-77-6);
- (10) DIPAM (3,3'-Diamino-2,2',4,4',6,6'-hexanitrobiphenyl or dipicramide) (CAS 17215-44-0);
- (11) DNAN (2,4-Dinitroanisole) (CAS 119-27-7);
- (12) DNGU (DINGU or dinitroglycoluril) (CAS 55510-04-8);
- (13) Furazans, as follows:
- (i) DAAOF (DAAF, DAAFox, or diaminoazoxyfurazan);
- (ii) DAAzF (diaminoazofurazan) (CAS 78644-90-3);
- (iii) ANF (Furazanamine, 4-nitro- or 3-Amino-4-nitrofurazan; or 4-Nitro-1,2,5-oxadiazol-3-amine; or 4-Nitro-3-furazanamine; CAS 66328-69-6); or
- (iv) ANAzF (Aminonitroazofurazan or 1,2,5-Oxadiazol-3-amine, 4-[2-(4-nitro-1,2,5-oxadiazol-3-yl) diazenyl]; or 1,2,5-Oxadiazol-3-amine, 4-[(4-nitro-1,2,5-oxadiazol-3-yl)azo]- (9CI); or Furazanamine, 4-[(nitrofuranyl)azo]-; or 4-[(4-Nitro-1,2,5-oxadiazol-3-yl)azo]-1,2,5-oxadiazol-3-amine) (CAS 155438-11-2);
- (14) GUDN (Guanylurea dinitramide) FOX-12 (CAS 217464-38-5);

- (15) HMX and derivatives, as follows:
- (i) HMX (Cyclotetramethylenetetranitramine; octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazine; 1,3,5,7-tetranitro-1,3,5,7-tetraza-cyclooctane; octogen, octogene) (CAS 2691-41-0);
  - (ii) Difluoroaminated analogs of HMX; or
  - (iii) K-55 (2,4,6,8-tetranitro-2,4,6,8-tetraazabicyclo [3,3,0]-octanone-3, tetranitrosemiglycouril, or keto-bicyclic HMX) (CAS 130256-72-3);
- (16) HNAD (hexanitroadamantane) (CAS 143850-71-9);
- (17) HNS (hexanitrostilbene) (CAS 20062-22-0);
- (18) Imidazoles, as follows:
- (i) BNNII (Octahydro-2,5-bis(nitroimino) imidazo [4,5-d]imidazole);
  - (ii) DNI (2,4-dinitroimidazole) (CAS 5213-49-0);
  - (iii) FDIA (1-fluoro-2,4-dinitroimidazole);
  - (iv) NTDNIA (N-(2-nitrotriazolo)-2,4-dinitro-imidazole); or
  - (v) PTIA (1-picryl-2,4,5-trinitroimidazole);
- (19) NTNMH (1-(2-nitrotriazolo)-2-dinitromethylene hydrazine);
- (20) NTO (ONTA or 3-nitro-1,2,4-triazol-5-one) (CAS 932-64-9);
- (21) Polynitrocubanes with more than four nitro groups;
- (22) PYX (2,6-Bis(picrylamino)-3,5-dinitropyridine) (CAS 38082-89-2);
- (23) RDX and derivatives, as follows:

- (i) RDX (cyclotrimethylenetrinitramine), cyclonite, T4, hexahydro-1,3,5-trinitro-1,3,5-triazine, 1,3,5-trinitro-1,3,5-triaza-cyclohexane, hexogen, or hexogene) (CAS 121-82-4);
- (ii) Keto-RDX (K-6 or 2,4,6-trinitro-2,4,6-triazacyclohexanone) (CAS 115029-35-1); or
- (iii) Difluoraminated derivative of RDX; 1,3-Dinitro-5,5-bis(difluoramino)1,3-diazahehexane (CAS No. 193021-34-0);
- (24) TAGN (Triaminoguanidinenitrate) (CAS 4000-16-2);
- (25) TATB (Triaminotrinitrobenzene) (CAS 3058-38-6);
- (26) TEDDZ (3,3,7,7-tetrakis(difluoroamine) octahydro-1,5-dinitro-1,5-diazocine);
- (27) Tetrazines, as follows:
- (i) BTAT (Bis(2,2,2-trinitroethyl)-3,6-diaminotetrazine); or
- (ii) LAX-112 (3,6-diamino-1,2,4,5-tetrazine-1,4-dioxide);
- (28) Tetrazoles, as follows:
- (i) NTAT (nitrotriazolaminotetrazole); or
- (ii) NTNT (1-N-(2-nitrotriazolo)-4-nitrotetrazole);
- (29) Tetryl (trinitrophenylmethylnitramine) (CAS 479-45-8);
- (30) TEX (4,10-Dinitro-2,6,8,12-tetraoxa-4,10-diazaisowurtzitane)
- (31) TNAD (1,4,5,8-tetranitro-1,4,5,8-tetraazadecalin) (CAS 135877-16-6);

- (32) TNAZ (1,3,3-trinitroazetidine) (CAS 97645–24–4);
- (33) TNGU (SORGUYL or tetranitroglycoluril) (CAS 55510–03–7);
- (34) TNP (1,4,5,8-tetranitro-pyridazino [4,5-d] pyridazine) (CAS 229176–04–9);
- (35) Triazines, as follows:
- (i) DNAM (2-oxy-4,6-dinitroamino-s-triazine) (CAS 19899–80–0); or
  - (ii) NNHT (2-nitroimino-5-nitro-hexahydro-1,3,5 triazine) (CAS 130400–13–4);
- (36) Triazoles, as follows:
- (i) 5-azido-2-nitrotriazole;
  - (ii) ADHTDN (4-amino-3,5-dihydrazino-1,2,4-triazole dinitramide) (CAS 1614–08–0);
  - (iii) ADNT (1-amino-3,5-dinitro-1,2,4-triazole);
  - (iv) BDNTA (Bis(dinitrotriazole)amine);
  - (v) DBT (3,3'-dinitro-5,5-bi-1,2,4-triazole) (CAS 30003–46–4);
  - (vi) DNBT (dinitrobistriazole) (CAS 70890–46–9);
  - (vii) NTDNT (1-N-(2-nitrotriazolo) 3,5-dinitro-triazole);
  - (viii) PDNT (1-picryl-3,5-dinitrotriazole); or
  - (ix) TACOT (tetranitrobenzotriazolobenzotriazole) (CAS 25243–36–1);

(37) Energetic ionic materials melting between 70 and 100 degrees C and with detonation velocity exceeding 6800 m/s or detonation pressure exceeding 18 GPa (180 kbar); or

(38) Explosives, not otherwise enumerated in this paragraph or on the CCL in ECCN 1C608, with a detonation velocity exceeding 8,000m/s at maximum density or a detonation pressure exceeding 34 Gpa (340 kbar).

\* (b) Propellants, as follows:

(1) Any solid propellant with a theoretical specific impulse (*see* paragraph (k)(4) of this category) greater than:

(i) 240 seconds for non-metallized, non-halogenated propellant;

(ii) 250 seconds for non-metallized, halogenated propellant; or

(iii) 260 seconds for metallized propellant;

(2) Propellants having a force constant of more than 1,200 kJ/Kg;

(3) Propellants that can sustain a steady-state burning rate more than 38mm/s under standard conditions (as measured in the form of an inhibited single

strand) of 6.89 Mpa (68.9 bar) pressure and 294K (21<sup>0</sup>C); or

(4) Elastomer-modified cast double-based propellants with extensibility at maximum stress greater than 5% at 233 K ( $-40^{\circ}\text{C}$ ).

(c) Pyrotechnics, fuels and related substances, and mixtures thereof, as follows:

(1) Alane (aluminum hydride) (CAS 7784–21–6);

(2) Carboranes; decaborane (CAS 17702–41–9); pentaborane and derivatives thereof;

(3) Liquid high energy density fuels, as follows:

(i) Mixed fuels that incorporate both solid and liquid fuels, such as boron slurry, having a mass-based energy density of 40 MJ/kg or greater; or

(ii) Other high energy density fuels and fuel additives (*e.g.*, cubane, ionic solutions, JP-7, JP-10) having a volume-based energy density of 37.5 GJ per

cubic meter or greater, measured at 20<sup>0</sup>C and one atmosphere (101.325 kPa)

pressure;

*Note to paragraph (c)(3)(ii):* JP-4, JP-8, fossil refined fuels or biofuels, or fuels for engines certified for use in civil aviation are not included.

(4) Metal fuels, and fuel or pyrotechnic mixtures in particle form whether spherical, atomized, spheroidal, flaked, or ground, manufactured from material consisting of 99% or more of any of the following:

(i) Metals, and mixtures thereof, as follows:

(A) Beryllium (CAS 7440–41–7) in particle sizes of less than 60 micrometers; or

(B) Iron powder (CAS 7439–89–6) with particle size of 3 micrometers or less produced by reduction of iron oxide with hydrogen;

(ii) Fuel mixtures or pyrotechnic mixtures, which contain any of the following:

(A) Boron (CAS 7440–42–8) or boron carbide (CAS 12069–32–8) fuels of 85% purity or higher and particle sizes of less than 60 micrometers; or

- (B) Zirconium (CAS 7440–67–7), magnesium (CAS 7439–95–4), or alloys of these in particle sizes of less than 60 micrometers;
- (iii) Explosives and fuels containing the metals or alloys listed in paragraphs (c)(4)(i) and (c)(4)(ii) of this category whether or not the metals or alloys are encapsulated in aluminum, magnesium, zirconium, or beryllium;
- (5) Fuel, pyrotechnic, or energetic mixtures having any nanosized aluminum, beryllium, boron, zirconium, magnesium, or titanium as follows:
- (i) Having particle size less than 200 nm in any direction; and
- (ii) Having 60% or higher purity;
- (6) Pyrotechnic and pyrophoric materials, as follows:
- (i) Pyrotechnic or pyrophoric materials specifically formulated to enhance or control the production of radiated energy in any part of the IR spectrum; or
- (ii) Mixtures of magnesium, polytetrafluoroethylene and the copolymer vinylidene difluoride and hexafluoropropylene (MTV);
- (7) Titanium subhydride ( $\text{TiH}_n$ ) of stoichiometry equivalent to  $n = 0.65$ – $1.68$ ; or
- (8) Hydrocarbon fuels specially formulated for use in flame throwers or incendiary munitions containing metal stearates (*e.g.*, octal) or palmitates, and M1, M2, and M3 thickeners.
- (d) Oxidizers, as follows:

- (1) ADN (ammonium dinitramide or SR-12) (CAS 140456-78-6);
- (2) AP (ammonium perchlorate) (CAS 7790-98-9);
- (3) BDNPN (bis(2,2-dinitropropyl)nitrate) (CAS 28464-24-6);
- (4) DNAD (1,3-dinitro-1,3-diazetidene) (CAS 78246-06-7);
- (5) HAN (Hydroxylammonium nitrate) (CAS 13465-08-2);
- (6) HAP (hydroxylammonium perchlorate) (CAS 15588-62-2);
- (7) HNF (Hydrazinium nitroformate) (CAS 20773-28-8);
- (8) Hydrazine nitrate (CAS 37836-27-4);
- (9) Hydrazine perchlorate (CAS 27978-54-7);
- (10) Liquid oxidizers comprised of or containing inhibited red fuming nitric acid (IRFNA) (CAS 8007-58-7) or oxygen difluoride; or
- (11) Perchlorates, chlorates, and chromates composited with powdered metal or other high energy fuel components controlled by this category.

\*(e) Binders, and mixtures thereof, as follows:

- (1) AMMO (azidomethylmethyloxetane and its polymers) (CAS 90683-29-7);
- (2) BAMO (bis(azidomethyl)oxetane and its polymers) (CAS 17607-20-4);
- (3) BTTN (butanetriol trinitrate) (CAS 6659-60-5);
- (4) FAMA0 (3-difluoroaminomethyl-3-azidomethyloxetane) and its polymers;

- (5) FEFO (bis(2-fluoro-2,2-dinitroethyl)formal) (CAS 17003–79–1);
- (6) GAP (glycidyl azide polymer) (CAS 143178–24–9) and its derivatives;
- (7) HTPB (hydroxyl-terminated polybutadiene) with a hydroxyl functionality equal to or greater than 2.2 and less than or equal to 2.4, a hydroxyl value of less than 0.77 meq/g, and a viscosity at 30 °C of less than 47 poise (CAS 69102–90–5);
- (8) 4,5 diazidomethyl-2-methyl-1,2,3-triazole (iso- DAMTR);
- (9) NENAS (nitrateethylnitramine compounds) as follows:
  - (i) N-Methyl 2-nitrateethylnitramine (Methyl-NENA) (CAS 17096–47–8);
  - (ii) N-Ethyl 2-nitrateethylnitramine (Ethyl-NENA) (CAS 85068-73–1);
  - (iii) N-Propyl 2-nitrateethylnitramine (CAS 82486-83-7);
  - (iv) N-Butyl-2-nitrateethylnitramine (BuNENA) (CAS 82486–82–6); or
  - (v) N-Pentyl 2-nitrateethylnitramine (CAS 85954-06-9);
- (10) Poly-NIMMO (poly nitratomethylmethyloxetane, poly-NMMO, (poly[3-nitratomethyl-3-methyl oxetane])) (CAS 84051–81–0);
- (11) PNO (Poly(3-nitrateoxetane));
- (12) TVOPA 1,2,3-Tris [1,2-bis(difluoroamino)ethoxy]propane; tris vinoxyl propane adduct (CAS 53159–39–0);
- (13) Polynitrorthocarbonates;

(14) FPF-1 (poly-2,2,3,3,4,4-hexafluoro pentane-1,5-diolformal) (CAS 376-90-9);

(15) FPF-3 (poly-2,4,4,5,5,6,6-heptafluoro-2-trifluoromethyl-3-oxaheptane-1,7-diolformal);

(16) PGN (Polyglycidyl nitrate or poly(nitratomethyloxirane); poly-GLYN); (CAS 27814-48-8);

(17) N-methyl-p-nitroaniline;

(18) Low (less than 10,000) molecular weight, alcohol-functionalized, poly(epichlorohydrin); poly(epichlorohydrindiol); and triol;

(19) Dinitropropyl based plasticizers, as follows:

(i) BDNPA (bis (2,2-dinitropropyl) acetal) (CAS 5108-69-0); or

(ii) BDNPF (bis (2,2-dinitropropyl) formal) (CAS 5917-61-3).

(f) Additives, as follows:

(1) Basic copper salicylate (CAS 62320-94-9);

(2) BHEGA (Bis-(2-hydroxyethyl)glycolamide) (CAS 17409-41-5);

(3) BNO (Butadienenitrile oxide);

(4) Ferrocene derivatives, as follows:

(i) Butacene (CAS 125856-62-4);

(ii) Catocene (2,2-Bis-ethylferrocenylpropane) (CAS 37206-42-1);

(iii) Ferrocene carboxylic acids and ferrocene carboxylic acid esters;

- (iv) n-butylferrocene (CAS 31904-29-7);
- (v) Ethylferrocene (CAS 1273-89-8);
- (vi) Propylferrocene;
- (vii) Pentylferrocene (CAS 1274-00-6);
- (viii) Dicyclopentylferrocene;
- (ix) Dicyclohexylferrocene;
- (x) Diethylferrocene (CAS 173-97-8);
- (xi) Dipropylferrocene;
- (xii) Dibutylferrocene (CAS 1274-08-4);
- (xiii) Dihexylferrocene (CAS 93894-59-8);
- (xiv) Acetylferrocene (CAS 1271-55-2)/1,1'-diacetyl ferrocene (CAS 1273-94-5); or
- (xv) Other ferrocene derivatives that do not contain a six carbon aromatic functional group attached to the ferrocene molecule;
- (5) Lead beta-resorcylate (CAS 20936-32-7);
- (6) Lead citrate (CAS 14450-60-3);
- (7) Lead-copper chelates of beta-resorcylate or salicylates (CAS 68411-07-4);
- (8) Lead maleate (CAS 19136-34-6);
- (9) Lead salicylate (CAS 15748-73-9);

- (10) Lead stannate (CAS 12036-31-6);
- (11) MAPO (tris-1-(2-methyl) aziridinylphosphine oxide) (CAS 57-39-6); BOBBA-8 (bis(2-methyl aziridinyl)-2-(2-hydroxypropanoxy) propylamino phosphine oxide); and other MAPO derivatives;
- (12) Methyl BAPO (Bis(2-methyl aziridinyl)methylaminophosphine oxide) (CAS 85068-72-0);
- (13) 3-Nitrazo-1,5-pentane diisocyanate (CAS 7406-61-9);
- (14) Organo-metallic coupling agents, as follows:
- (i) Neopentyl[diallyl]oxy, tri [dioctyl] phosphatotitanate (CAS 103850-22-2); also known as titanium IV, 2,2[bis 2-propenolato-methyl, butanolato, tris (dioctyl) phosphato] (CAS 110438-25-0), or LICA 12 (CAS 103850-22-2);
- (ii) Titanium IV, [(2-propenolato-1) methyl, n-propanolatomethyl] butanolato-1, tris(dioctyl)pyrophosphate, or KR3538; or
- (iii) Titanium IV, [(2-propenolato-1)methyl, propanolatomethyl] butanolato-1, tris(dioctyl) phosphate;
- (15) PCDE (Polycyanodifluoroaminoethylene oxide);
- (16) Certain bonding agents, as follows:
- (i) 1,1R,1S-trimesoyl-tris(2-ethylaziridine) (HX-868, BITA) (CAS 7722-73-8); or

(ii) Polyfunctional aziridine amides with isophthalic, trimesic, isocyanuric, or trimethyladipic backbone also having a 2-methyl or 2-ethyl aziridine group;

*Note to paragraph (f)(16)(ii):* Included are 1) 1,1H-Isophthaloyl-bis(2-methylaziridine) (HX-752) (CAS 7652-64-4); 2) 2,4,6-tris(2-ethyl-1-aziridinyl)-1,3,5-triazine (HX-874) (CAS 18924-91-9); and 3) 1,1'-trimethyladipoylbis(2-ethylaziridine) (HX-877) (CAS 71463-62-2).

(17) Superfine iron oxide ( $\text{Fe}_2\text{O}_3$ , hematite) with a specific surface area more than  $250 \text{ m}^2/\text{g}$  and an average particle size of 0.003 micrometers or less (CAS 1309-37-1);

(18) TEPAN (HX-879) (tetraethylenepentaamineacrylonitrile) (CAS 68412-45-3); cyanoethylated polyamines and their salts;

(19) TEPANOL (HX-878) (tetraethylenepentaamineacrylonitrileglycidol) (CAS 110445-33-5); cyanoethylated polyamines adducted with glycidol and their salts;

(20) TPB (triphenyl bismuth) (CAS 603-33-8); or

(21) Tris (ethoxyphenyl) bismuth (TEPB) (CAS 90591-48-3).

(g) Precursors, as follows:

(1) BCMO (bischloromethyloxetane) (CAS 142173-26-0);

(2) DADN (1,5-diacetyl-3,7-dinitro-1, 3, 5, 7-tetraazacyclooctane);

- (3) Dinitroazetidine-t-butyl salt (CAS 125735–38–8);
  - (4) CL-20 precursors (any molecule containing hexaazaisowurtzitane) (*e.g.*, HBIW (hexabenzylhexaazaisowurtzitane), TAIW (tetraacetyldibenzylhexaazaisowurtzitane));
  - (5) TAT (1, 3, 5, 7-tetraacetyl-1, 3, 5, 7-tetraazacyclooctane) (CAS 41378–98–7);
  - (6) Tetraazadecalin (CAS 5409–42–7);
  - (7) 1,3,5-trichlorobenzene (CAS 108–70–3); or
  - (8) 1,2,4-trihydroxybutane (1,2,4-butanetriol) (CAS 3068–00–6).
- (h) Any explosive, propellant, pyrotechnic, fuel, oxidizer, binder, additive, or precursor that:
- (1) is classified;
  - (2) is manufactured using classified production data; or
  - (3) is being developed using classified information.

“Classified” means classified pursuant to Executive Order 13526, or predecessor order, and a security classification guide developed pursuant thereto or equivalent, or to the corresponding classification rules of another government.

(i) Developmental explosives, propellants, pyrotechnics, fuels, oxidizers, binders, additives, or precursors therefor developed under a contract with the U.S. Government not otherwise controlled under this category.

(j) Technical data (as defined in §120.10 of this subchapter) and defense services (as defined in §120.9 of this subchapter) directly related to the defense articles numerated in paragraphs (a) through (i) of this category (*see* also §123.20 of this subchapter).

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

(1) Category V contains explosives, energetic materials, propellants, and pyrotechnics and specially formulated fuels for aircraft, missile, and naval applications. Explosives are solid, liquid, or gaseous substances or mixtures of substances, which, in their primary, booster, or main charges in warheads, demolition, or other military applications, are required to detonate.

(2) The resulting product of the combination or conversion of any substance controlled by this category into an item not controlled will no longer be controlled by this category provided the controlled item cannot easily be recovered through dissolution, melting, sieving, etc. As an example, beryllium converted to a near net shape using hot isostatic processes will result in an uncontrolled part. A cured thermoset containing beryllium

powder is not controlled unless meeting an explosive or propellant control. The mixture of beryllium powder in a cured thermoset shape is not controlled by this category. The mixture of controlled beryllium powder mixed with a typical propellant binder will remain controlled by this category. The addition of dry silica powder to dry beryllium powder will remain controlled.

(3) Paragraph (c)(4)(ii)(A) of this category does not control boron and boron carbide enriched with boron-10 (20% or more of total boron-10 content).

(4) Theoretical specific impulse (Isp) is calculated using standard conditions (1000 psi chamber pressure expanded to 14.7 psi) and measured in units of pound-force-seconds per pound-mass (lbf-s/lbm) or simplified to seconds (s). Calculations will be based on shifting equilibrium.

(5) Particle size is the mean particle diameter on a weight basis. Best industrial practices will be used in determining particle size and the controls may not be undermined by addition of larger or smaller sized material to shift the mean diameter.

*Note 1:* To assist the exporter, an item has been categorized by the most common use. Also, where appropriate, references have been provided to the related controlled precursors.

*Note 2:* 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 government agencies in the license review process and exporters when completing their license application and export documentation.

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April 24, 2012\_\_\_\_\_

(Date)

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