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Subject: Military Electronic Equipment RIN 0694-AF64 and RIN 1400-AD25

This supplements Attachment 3 to my January 14 comments by adding means to resolve ambiguities in CCL Category 9. Most of them concern the line between State and Commerce jurisdiction or between MT and non-MT.

Virtually all of Category 9 is "electronic," if the applicability of "software" to the controlled commodities is construed as evidence of "electronic."

References to USML Category VIII are to the proposed revision of that Category pursuant to a November 7, 2011, proposed rule. That rule does not use Wassenaar or MTCR language. That leaves for Commerce jurisdiction Wassenaar or MTCR controls relevant to aircraft and associated equipment which would not be unambiguously covered by Category VIII. The same would be true for Categories IV and XV, if eventual published proposed rules for those Categories similarly avoid use of Wassenaar and MTCR language.

9A001
a. Note b. ~~Intended~~ ...
b ~~Designed~~ ...

9A002
... and ~~specially designed~~ assemblies and components ~~therefor~~ having those characteristics

9A003
~~Specially designed~~ assemblies and components, incorporating ...

9A004
Space launch vehicles and "spacecraft" not controlled by USML IV or XV.a
MT applies to 9A004 also described in 9A104
Related Controls: Move the detail in existing 9A004 concerning DOS jurisdiction to the USML to the extent that it is still relevant under the Export Control Reform.

9A005
Liquid rocket propulsion systems, not controlled by USML IV, containing any of the systems or components controlled by 9A006. ~~(These items are subject to the export licensing authority of the Department of State, Office of Defense Trade Controls. See 22 CFR part 121)~~
MT applies to 9A005 also described in 9A105

9A006

Systems and components, not controlled by USML IV, ~~specially designed~~ for liquid rocket propulsion systems, having the following characteristics (See List of Items Controlled): ~~(These items are subject to the export licensing authority of the Department of State, Office of Defense Trade Controls. See 22 CFR part 121)~~

MT applies to 9A006 also described in 9A106

Related Controls: See also 9A106 and 9A108.

Items:

a. Cryogenic refrigerators, flightweight dewars, cryogenic heat pipes or cryogenic systems ~~specially designed~~ for ~~use in~~ space vehicles ~~and capable of~~ restricting cryogenic fluid losses to less than 30% per year;

b. Cryogenic containers or closed-cycle refrigeration systems ~~capable of~~ providing temperatures of 100 K (-173°C) or less for "aircraft" ~~capable of~~ sustained flight at speeds exceeding Mach 3, launch vehicles or "spacecraft";

c. Slush hydrogen storage or transfer systems;

d. High pressure (exceeding 17.5 MPa) turbo pumps, pump components or their associated gas generator or expander cycle turbine drive systems;

e. High-pressure (exceeding 10.6 MPa) thrust chambers and nozzles therefor;

f. Propellant storage systems ~~using the principle of~~ capillary containment or positive expulsion (*i.e.*, with flexible bladders);

g. Liquid propellant injectors, with individual orifices of 0.381 mm or smaller in diameter (an area of 1.14 x 10^{-3} cm^2 or smaller for non-circular orifices) ~~specially designed~~ for liquid rocket engines;

h. One-piece carbon-carbon thrust chambers or one-piece carbon-carbon exit cones with densities exceeding 1.4 g/cm^3 and tensile strengths exceeding 48 MPa.

(To conform with Wassenaar and EU)

9A007

Solid rocket propulsion systems, not controlled by USML IV, with any of the following (see List of Items Controlled) ~~(These items are subject to the export licensing authority of the Department of State, Office of Defense Trade Controls. See 22 CFR part 121)~~:

MT applies to 9A007 also described in 9A107

Items:

a Total impulse capacity exceeding 1.1 Mns;

b. Specific impulse of 2.4 kNs/kg or more when the nozzle flow is expanded to ambient sea level conditions for an adjusted chamber pressure of 7 MPa;

c. Stage mass fractions exceeding 88% and propellant solid loadings exceeding 86%;

d. Any of the components controlled by 9A008; or

e. Insulation and propellant bonding systems using direct-bonded motor designs to provide a strong mechanical bond or a barrier to chemical migration between the solid propellant and case insulation material.

Technical Note

For the purposes of 9A007.e, a strong mechanical bond means bond strength equal to or

more than propellant strength.

9A008

Components, not controlled by USML IV, ~~specially designed~~ for solid rocket propulsion systems, as follows (see List of Items Controlled): ~~(These items are subject to the export licensing authority of the Department of State, Office of Defense Trade Controls. See 22 CFR part 121)~~

MT applies to 9A008 also described in 9A108

Items:

a. Insulation and propellant bonding systems using liners to provide a strong mechanical bond or a barrier to chemical migration between the solid propellant and case insulation material;

Technical Note: For the purposes of 9A008.a., a strong mechanical bond means bond strength equal to or more than propellant strength.

b. Filament-wound "composite" motor cases exceeding 0.61 m in diameter or having 'structural efficiency ratios (PV/W)' exceeding 25 km.

Technical Note: The 'structural efficiency ratio (PV/W)' is the burst pressure (P) multiplied by the vessel volume (V) divided by the total pressure vessel weight (W).

c. Nozzles with thrust levels exceeding 45 kN or nozzle throat erosion rates of less than 0.075 mm/s;

d. Movable nozzle or secondary fluid injection thrust vector control systems ~~capable of~~ any of the following:

d.1. Omni-axial movement exceeding + or - 5°;

d.2. Angular vector rotations of 20°/s or more; or

d.3. Angular vector accelerations of $40^{o}/s^{2}$ or more.

9A009

Hybrid rocket propulsion systems, not controlled by USML IV, with either of the following (see List of Items controlled): ~~(These items are subject to the export licensing authority of the Department of State, Office of Defense Trade Controls. See 22 CFR part 121)~~

MT applies to 9A009 also described in 9A109

Items:

a. Total impulse capacity exceeding 1.1 MNs; or

b Thrust levels exceeding 220 kN in vacuum exit conditions.

9A010

~~Specially designed~~ components , systems and structures, not controlled by USML IV, for launch vehicles, launch vehicle propulsion systems, or "spacecraft", as follows (see List of Items Controlled): ~~(These items are subject to the export licensing authority of the Department of State, Office of Defense Trade Controls. See 22 CFR part 121)~~

MT applies to 9A009 also described in 9A109

Items:

a. Components and structures each exceeding 10 kg. ~~specially designed~~ for launch vehicles manufactured using metal "matrix", "composite", organic "composite", ceramic "matrix"

or intermetallic reinforced materials controlled by 1C007 or 1C010;
Note: The weight cut-off is not relevant for nose cones.

b. Components and structures ~~specially designed~~ for launch vehicle propulsion systems controlled by 9A005 to 9A009 ~~manufactured using~~ metal matrix, composite, organic composite, ceramic matrix or intermetallic reinforced materials controlled by 1C007 or 1C010;

c. Structural components and isolation systems ~~specially designed~~ to control actively the dynamic response or distortion of "spacecraft" structures;

d. Pulsed liquid rocket engines with thrust-to-weight ratios equal to or more than 1 kN/kg and a response time (the time required to achieve 90% of total rated thrust from start-up) of less than 30 ms.

9A011

Ramjet, scramjet, or combined cycle engines, not controlled by USML IV or VIII.b, and ~~specially designed~~ components ~~therefor~~ having the characteristics of such engines ~~(These items are subject to the export licensing authority of the Department of State, Office of Defense Trade Controls. See 22 CFR part 121)~~
MT applies to 9A011 also described in 9A111

9A012

MT applies to ~~non-military unmanned air vehicle systems (UAVs) and remotely piloted vehicles (RPVs) that are capable of a maximum range of at least 300 kilometers (km), regardless of payload~~ 9A012 also described in 9A120 or 9A104.b or .d
Unit: ... ~~parts and accessories~~ components in $ value
Items:

a.1 ... ~~capability~~ ...
a.2 ... ~~capability~~ ...
b. ~~Associated~~ ...
b.1 ... ~~specially designed~~ ...

b.2 ... ~~specially designed~~ ...
b.3 ... ~~specially designed~~ ...
b.4 ... ~~specially designed or modified~~ ...

9A101

Turbojet and turbofan engines, ~~other than those~~ not controlled by 9A001 or USML IV or VIII.b, as follows (see List of Items Controlled)
Unit: ~~Equipment in~~ number~~; parts and accessories in $ value~~
(MTCR 3.A.1. and ECCN 9A101 do not control parts or accessories)
Items: ...

b. Engines ~~designed or modified~~ for ~~use in~~ "missiles", regardless of thrust or specific fuel consumption.

9A102

‘Turboprop engine systems,’ not controlled by USML IV or VIII.b, ~~specially designed~~ for complete rocket systems ~~capable of~~ with a “range” of at least 300 km ~~and specially designed components therefor,~~ having a maximum power greater than 10 kW (achieved uninstalled at sea level standard conditions) and components having any of those characteristics, excluding civil certified engines and civil certified components
Related Definition: For the purpose of 9A102, a ‘turboprop engine system’ incorporates all of the following:
a Turboshaft engine; and
b Power transmission system to transfer the power to a propeller.
(New 9A102, not now in the CCL, is to conform with MTCR 3.A.9.)

9A103
liquid propellant tanks, not controlled by USML IV, ~~specially designed~~ for the propellants controlled in ECCNs 1C011, 1C111 or other liquid propellants ~~used in~~ for “missiles. ~~(These items are subject to the export licensing authority of the Department of State, Office of Defense Trade Controls. See 22 CFR part 121)~~
Related Controls: USML controls tanks for the propellants which USML controls.

9A104
Rocket and unmanned air vehicle systems, as follows (see List of Items Controlled)(also see 9A120) (These items are subject to the export licensing authority of the Department of State, Office of Defense Trade Controls. See 22 CFR part 121)
Items:
a. Complete rocket systems (including ballistic missile systems, space launch vehicles, and ~~S~~sounding rockets) ~~capable of~~ delivering at least a 500 kg payload to a range of at least 300 km;
(To conform with MTCR 1.A.1.)
b. Complete unmanned air vehicle systems (including cruise missile systems, target drones and reconnaissance drones), ~~capable of~~ delivering at least a 500 kg payload to a maximum “range” of at least 300 km
(To conform with MTCR 1.A.2.)
c. Complete rocket systems (including ballistic missile systems, space launch vehicles, and sounding rockets), not controlled by 9A104.a, ~~capable of~~ a “range” of at least 300 km;
(To conform with MTCR 19.A.1.)
d` Complete unmanned air vehicle systems (including cruise missile systems, target drones and reconnaissance drones), not controlled by 9A104.b, ~~capable of~~ a maximum “range” of at least 300 km
(To conform with MTCR 19.A.2.)

9A105
Liquid propellant rocket engines, not controlled by 9A005 or USML IV, as follows: ~~(These items are subject to the export licensing authority of the Department of State, Office of Defense Trade~~

~~Controls. See 22 CFR part 121)~~
Items:
a. Liquid propellant rocket engines, ~~usable in~~ for "missiles", having a total impulse capacity of 1.1 MNs or greater;
b. Liquid propellant rocket engines, ~~usable in~~ for rockets with a "range" ~~capability~~ of 300 km or greater, ~~other than those~~ not controlled by 9A105.a, having a total impulse capacity of 0.841 MNs or greater.
(To conform with MTCR 2.A.1.c and 20.A.1.b.)

9A106
~~Liquid r~~Rocket propulsion systems or components, ~~other than those~~ not controlled by 9A006, 9A008, or USML IV, ~~usable in~~ for "missiles", as follows ...
Unit: ~~Equipment and components in~~ number; ~~parts and accessories in $ value~~
(MTCR 2.A.1.e and 3.A.5 and ECCN 9A106 do not control parts or accessories)
a. ~~Ablative liners for thrust combustion chambers;~~
~~b. Rocket nozzles;~~
~~c.~~ a. Thrust vector control subsystems: ....
~~d.~~ b. Liquid or slurry propellant (including oxidizers) control systems ...
Note: 9A106.b includes flight control servo valves ~~designed or modified~~ for ECCN 7A116 operating in a vibration environment of more than 10 g rms over the entire range between 20 Hz and 2 kHz.
(To conform with MTCR 2.A.1.e, 3.A.5, and 10.A.3.)

9A107
Solid propellant rocket ~~engines~~ motors, ~~other than those~~ not controlled by 9A007 or USML IV, as follows: ~~(These items are subject to the export licensing authority of the Department of State, Office of Defense Trade Controls. See 22 CFR part 121)~~
Items:
a. Solid propellant rocket motors, ~~usable in~~ for "missiles", having a total impulse capacity of 0.841 MNs or greater;
b. Solid propellant rocket motors, not controlled by 9A107.a, ~~usable in~~ for rockets with a "range" ~~capability of~~ equal to or greater than 300 km ~~or greater~~ having a total impulse capacity of 0.841 MNs or greater.
(To conform with MTCR 2.A.1.c and 20.A.1.b.)

9A108
~~Solid rocket propulsion components~~ Rocket motor cases, 'insulation' components and nozzles therefor, ~~other than those~~ not controlled by 9A008 or USML IV, ~~usable in~~ ~~rockets with a range capability of 300 km or greater~~ for "missiles" ~~(These items are subject to the export licensing authority of the Department of State, Office of Defense Trade Controls. See 22 CFR part 121)~~
(To conform with MTCR 3.A.3.)

9A109
Hybrid rocket motors, ~~usable in rockets with a range capability of 300 Km or greater, other than those~~ not controlled by 9A009 or USML IV, for "missiles", and ~~specially designed~~ components

~~therefor~~ having those characteristics. ~~(These items are subject to the export licensing authority of the Department of State, Office of Defense Trade Controls. See 22 CFR part 121)~~

(To conform with MTCR 3.A.6.)

9A110

Composite structures, laminates, and manufactures thereof, ~~other than those~~ not controlled by ~~entry~~ 1A002, 1A102, 1C010, 1C210, 9A010, or USML IV, ~~specially designed~~ for ~~use in "missiles" or the subsystems controlled by entries 9A005, 9A007, 9A105.a, 9A106 to 9A108, 9A116 or 9A119~~ 7A117, 9A104, 9A105, 9A106.a, 9A107, 9A116, 9A119.a, 9A119.b, or 9A121

(To conform with MTCR 6.A.1. 1C010 Related Controls describes overlap with 9A110. MTCR 6.A.1 covers composite structures, laminates, and manufactures thereof for MTCR 1.A, 19.A.1, 19.A.2, 2.A, and 20.A, which omit the portions of 9A005 and 9A007 not also described in 9A105 or 9A107 and omit 9A106.b, 9A108, 9A117, 9A118, and 9A119.c; but which include 7A117, 9A104, 9A105.b, and recommended new 9A121)

NP applies to composite structures also described in 1A202

Related Controls: .. ~~(2) composite structures, laminates, and manufactures thereof specially designed for use in missile systems are under the licensing authority ot the U.S. Department of State, except those specially designed for non-military unmanned air vehicles controlled by 9A012.~~

9A111

Pulse jet engines, not controlled by 9A011, USML IV or VIII.b, ~~usable in~~ for ~~rockets, missiles, or unmanned aerial vehicles capable of achieving a "range" equal to or greater than 300 km~~ 9A104.a, .b, or .d, and ~~specially designed~~ components ~~therefor~~ having those characteristics ~~(These items are subject to the export licensing authority of the Department of State, Office of Defense Trade Controls. See 22 CFR part 121)~~

9A115

Launch support equipment, not controlled by USML IV, ~~designed or modified for "missiles"~~, as follows (see List of Items Controlled): ~~(These items are subject to the export licensing authority of the Department of State, Office of Defense Trade Controls. See 22 CFR part 121)~~

Items:

a. Apparatus and devices ~~designed or modified~~ for the handling, control, activation and launching of "missiles" or rocket systems or UAVs with a "range" equal to or greater than 300 km and individual rocket stages or rocket motors or engines therefor having a total impulse capacity equal to or greater than 8.41×10^5 Ns but less than 1.1×10^6 Ns.;

b. Vehicles ~~designed or modified~~ for the transport, handling, control, activation and launching of "missiles".

(To conform with MTCR 12.A.1 and 12.A.2.)

9A116

Reentry vehicles equipment, not controlled by USML IV, ~~usable in~~ for "missiles"~~, and equipment designed or modified therefor~~, as follows (see List of Items Controlled). ~~(These items are subject to the export licensing authority of the Department of State, Office of Defense Trade~~

~~Controls. See 22 CFR part 121)~~
Items:
a. Heat shields~~, and components thereof~~ fabricated of ceramic or ablative materials and components having those characteristics;
b. Heat sinks ~~and components thereof~~ fabricated of light-weight, high heat capacity materials and components having those characteristics;
c. Electronic equipment ~~specially designed~~ having characteristics for reentry vehicles.
(To conform with MTCR 2.A.1.b.)

9A117
Staging mechanisms, separation mechanisms, and interstages therefor, ~~usable in~~ for "missiles" not controlled by USML IV. ~~(These items are subject to the export licensing authority of the Department of State, Office of Defense Trade Controls. See 22 CFR part 121)~~.

9A118
Devices, not controlled by USML IV or VIII.b, to regulate combustion ~~usable~~ in engines ~~which are usable in rockets~~ for "missiles" or UAVs with a "range" ~~capability~~ equal to or greater than 300 km ~~or greater~~, controlled by 9A011 or 9A111 and components having those characteristics ~~(These items are subject to the export licensing authority of the Department of State, Office of Defense Trade Controls. See 22 CFR part 121)~~
(For consistency with the "including" portion of MTCR 3.A.2.)

9A119
Individual rocket stages, ~~other than those~~ not controlled by 9A005, 9A007, 9A009, 9A105, 9A107, ~~and~~ 9A109, or USML IV, for any of the following (see List of Items Controlled). ~~(These items are subject to the export licensing authority of the Department of State, Office of Defense Trade Controls. See 22 CFR part 121)~~
a. "missiles";
b. rockets or UAVs with a "range" equal to or greater than 300 km; or
c. UAVs controlled by 9A120
(To conform with MTCR 2.A.1.a and 20.A.1.a)

9A120
Complete unmanned aerial vehicles systems, not ~~specified in~~ controlled by 9A012 or USML VIII, having all of the following (see List of Items Controlled)
Unit: ~~Equipment in~~ number~~; parts and accessories in $ value~~
(MTCR 19.A.1. and 19.A.2. do not cover parts or accessories)

Items:
a Having any of the following:
a.1 ~~An~~ autonomous flight control and navigation ~~capability~~; or
a.2 ~~Capability of~~ controlled flight out of the direct vision range involving a human operator; and
b Having any of the following:

b.1 Incorporating an aerosol dispensing system/mechanism with a capacity greater than 20 liters; or

b.2 ~~Designed or modified to incorporate~~ Equipped for later incorporation of an aerosol dispensing system/mechanism with a capacity greater than 20 liters

9A121

Weapon or warhead safing, arming, fuzing, and firing mechanisms ~~usable in~~ for "missiles" not controlled by USML IV

(To conform with MTCR 2.A.1.f.)

9A191

Items, not controlled by USML IV or VIII, otherwise described in 9A102 through 9A111. 9A115 through 9A119, 9A121, or the MT portions of 9A004 through 9A011 for "missiles," but with a "range" between 25 and 300 kilometers to China or between 150 and 300 kilometers to Iraq

9B001

Equipment, tooling and fixtures ~~specially designed~~ for manufacturing gas turbine blades, vanes or tip shroud castings, as follows (see List of Items Controlled)

MT applies ~~only to equipment for engines that meet the characteristics described in 9A001~~ to 9B001 also described in 9B115 or 9B116

Related Controls: For ~~specially designed~~ production equipment ... ~~usable in~~ for "missiles."

9B002

MT applies ~~only to equipment for engines that meet the characteristics described in 9A001~~ to 9B002 also described in 9B115 or 9B116

a. ~~Specially designed~~ ...

9B003

Equipment ~~specially designed~~ ... ~~designed~~ ... and ~~specially designed~~ components ~~or accessories therefor~~ having those characteristics

MT applies ~~only to equipment for engines that meet the characteristics described in 9A001~~ to 9B003 also described in 9B115 or 9B116

9B004

MT applies ~~only to equipment for engines that meet the characteristics described in 9A001~~ to 9B003 also described in 9B115 or 9B116

9B005

... ~~specially designed~~ for ~~use with~~ any of the following ...

~~MT applies to entire entry MT Column 1~~

(MTCR 15.B.2. controls specified wind tunnels but not control systems, instrumentation, or data processing equipment therefor)

a ... ~~designed~~ ...

Note: ... ~~specially designed~~ ...

c ... ~~capable of~~ ...

9B006
... ~~capable of~~ ... ~~specially designed~~ ...
MT applies to 9B006 also described in 2B116 or 9B106
(9B006 overlaps 2B116 and 9B106.)

9B007
... ~~specially designed~~ ...
MT applies to ~~entire entry~~ 9B007 also described in 9B115 to 9B117
(9B007 is broader than MTCR 2.B.1, 2.B.2, 20.B.1. and 20.B.2, which are limited to equipment to produce specified types of rocket motors)

9B008
... ~~specially designed~~ ...

9B009
Tooling ~~specially designed~~ for producing turbine engine powder metallurgy rotor components ~~capable of~~ operating at stress levels of ... and metal temperatures of ...
Unit: ~~Equipment in~~ number~~; parts and accessories in $ value~~

9B010
... ~~specially designed~~ ... ~~associated~~ ...

9B105
Wind tunnels, not controlled by 1B018.b, for speeds of Mach 0.9 or more ~~usable~~ for rockets, missiles, or unmanned aerial vehicles and their subsystems described in 7A117, 9A105, 9A106, 9A107, 9A108, 9A116, or 9A121
(To conform with MTCR 15.B.2.)

9B106
Environmental chambers and anechoic chambers, not controlled by 2B018.b, 2B116, or 9B006, ~~usable~~ for rockets, missiles, or unmanned aerial vehicles and their subsystems described in 7A117, 9A105, 9A106, 9A107, 9A108, 9A116, or 9A121 as follows:
(To conform with MTCR 15.B.4, which overlaps Wassenaar 9.B.6. and ML 18.b and MTCR 15.B.1(*i.e.*, 2B116.)

9B115
~~Specially designed~~ "production equipment" , not controlled by 2B018, 2B116, 9B001 to 9B004, 9B006, 9B007, or 9B106 for the ~~systems, sub-systems, and components controlled by 9A004 to 9A009, 9A011, 9A101, 9A104 to 9A109, 9A111, 9A116 to 9A119~~ following:~~. See 22 CFR part 121.)~~ MT portions of 9A001, 9A005 to 9A009, 9A011, and all of 7A117, 9A101, 9A102, 9A105 to 9A109, 9A111, 9A116 to 9A119, 9A121
(To conform with MTCR 2.B.2, 3.B.2, and 20.B.2 "production equipment.” It omits

9A004 and 9A104, because MTCR 1.B controls “production facilities” and not “production equipment.” MTCR 2, 3, and 20 omit the portions of 9A005 to 9A009 and 9A011 not overlapping 9A105 to 9A109 or 9A111; but include 7A117, the MT portion of 9A001, 9A102, *i.e.*, 3.A.9, and “weapon or warhead safing, arming, fuzing, and firing mechanisms”, which is proposed to become new 9A121. It omits any reference to 7B103, because that ECCN controls “production facilities” and not “production equipment.”)

9B116

~~Specially designed~~ "production facilities" , not controlled by 2B018, 2D018, 2B116, 2D101, 7B001, 7B003, 7D001, 7D101, 7D103, 9B001 to 9B004, 9B006, 9B007, 9B106, 9D001 to 9D004, 9D101 to 9D103 for the ~~systems, sub-systems, and components controlled by 9A004 to 9A009, 9A011, 9A101, 9A104 to 9A109, 9A111, 9A116 to 9A119~~ following: MT portions of 9A001, 9A005 to 9A009, and 9A011; 9A104.a and .b; and all of 7A117, 9A101, 9A102, 9A105 to 9A109, 9A111, 9A116 to 9A119, and 9A121

(To conform with MTCR 1.B.1, 2.B.1, 3.B.1, and 20.B.1 "production facilities.” MTCR does not control the portions of 9A005 to 9A009 and 9A011 not overlapping 9A105 to 9A109 or 9A111. MTCR does not control “production facilities” or “production equipment” for 9A104.c or .d or 9A120, *i.e*. 19.A.1, 19.A.2, or 19.A.3. MTCR does control “production facilities” for 7A117; the MT portion of 9A001; and proposed new 9A102 (MTCR 3.A.9) and 9A121 (MTCR 2.A.1.f). The above assumes 9B116 coverage of “production facilities” for 7A117, deletion of 7B103, and addition of “see also 9B116" to 7A117.)

9B117

Test benches and test stands, not controlled by 2B018, for solid or liquid propellant rockets or rocket motors for MT portions of 9A004 to 9A007 and all of 7A117, 9A104 to 9A107, 9A116, 9A119, 9A121 having either of the following characteristics:

(MTCR 15.B.3. is limited to test equipment for MTCR 1.A, 2.A, 19.A.1, 19.A.2, or 20.A.)

9C101

‘Interior lining’ ~~usable~~ for rocket motor cases in 1A104

Related Definition: In 9C101, ‘interior lining' suited for the bond interface between the solid propellant and the case or insulating liner is usually a liquid polymer based dispersion of refractory or insulating material, *e.g.*, carbon filled HTPB or other polymer with added curing agents to be sprayed or screeded over a case interior.

(To conform with MTCR 3.C.1.)

9C102

‘Insulation’ material in bulk form ~~usable~~ for rocket cases in “missiles.”

Related Definition: In 9C102, 'insulation' intended to be applied to the components of a rocket motor, *i.e.*, the case, nozzle inlets, case closures, includes cured or semi-cured compounded rubber sheet stock containing an insulating or refractory material. It may also be incorporated as stress relief boots or flaps specified in 9A108.

(To conform with MTCR 3.C.2.)

9C110
Resin impregnated fiber prepregs and metal coated fiber preforms ~~therefor~~, not controlled by 1C010, for ... 9A110 ...
(To conform with MTCR 6.C.1)

9D001
"Software" ~~specially designed or modified~~ "required" for the "development" of equipment or "technology" controlled by ~~9A (except 9A018, 9A990 or 9A991), 9B (except 9B990 or 9B991)~~ 9A001 to 9A012, 9A108, 9A111, 9A117, 9A118, 9B001 to 9B009, the portion of 9B116 for 9A105.b, 9A107.b, or 9A119.b or 9E003
MT applies to "software" for equipment controlled by ~~9A001, 9A101, 9A106, 9A110, 9A120, B001, 9B002, 9B003, 9B004, 9B005, 9B007, 9B105, 9B106, 9B116, and 9B117~~ 9A011, 9A111, 9A117, 9A118, or the portion of 9B116 for 9A105.b. 9A107.b, or 9A119.b for MT reasons
(The only MTCR software item which mentions "development" is 3.D.3. MTCR 20.D.1 does not mention "development," "production," or "use" and might, therefore, be construed to cover "development." The above assumes DOC jurisdiction for "development" of USML items.)

9D002
"Software" ~~specially designed or modified~~ "required" for the "production" of equipment controlled by ~~9A (except 9A018, 9A990 or 9A991), 9B (except 9B990 or 9B991)~~ 9A001 to 9A012, 9B001 to 9B009, or the portion of 9B116 for 9A105.b, 9A107.b, or 9A119.b
MT applies to "software" for equipment controlled by 9B116 for MT reasons the portion of 9B116 for 9A105.b, 9A107.b, or 9A119.b
(No MTCR software item mentions "production." MTCR 20.D.1 does not mention "development," "production," or "use" and might, therefore, be construed to cover "production." The above assumes DOC jurisdiction for "production" of USML items.)

9D003
"Software" incorporating "technology" specified by 9E003.h and used in "FADEC systems" for propulsion systems controlled by ~~9A (except 9A018, 9A990 or 9A991)~~ 9A001 to 9A003, 9A005, 9A007, 9A009, or 9A011 or equipment controlled by ~~9B (except 9B990 or 9B991)~~ 9B001 to 9B009.
NS applies to ~~"software" for "use" of FADEC for equipment controlled by 9A001 to 9A003,~~ entire item
~~MT applies to "software" required for the "use" of "FADEC systems" for gas turbine engines controlled by 9A101 or 9A106 MT Column 1.~~
(To conform with apparent Wassenaar intent. MTCR does not mention FADEC. No portion of 9D003 would be DOS jurisdiction, because all the referenced ECCNs would exclude the DOS jurisdiction portions.)

9D004

MT applies to ~~entire entry except 9D004.g and .f~~:
9D004.a also described in 9D101 for 9B105;
9D004.b also described in 9D104 for 9A001 or 9A101;
9D004.c also described in 9B116; and
9D004.e also described in 9D104 for 9A012.
b ... ~~specially designed~~ ... ~~capable of~~ ...

9D101
"Software," not controlled by 9D004, ~~specially designed or modified~~ "required" for the "use" of goods controlled by 9B001 to 9B005, 9B007, 9B105, 9B106, 9B116 or 9B117 for MT reasons

(To conform with MTCR 1.D.1, 2.D.1, 3.D.1, 15.D.1, and 20.D.1. No portion of 9D101 would be DOS jurisdiction, because all the referenced ECCNs would exclude the DOS jurisdiction portions.)

9D103
"Software" ~~specially designed~~ for modelling, simulation or design integration of ~~"missiles", or the subsystems controlled by 9A005, 9A007, 9A105.a, 9A106, 9A108, 9A116 or 9A119~~ 7A117, 9A105.a,b, 9A106.a, 9A107.a,b, 9A116. 9A119.a,b, 9A121, and MT portions of 9A005, 9A006, and 9A007 ~~(This entry is subject to the export licensing authority of the U.S. Department of State,Office of Defense Trade Controls. See 22 CFR part 121.)~~

(To conform with MTCR 16.D.1. MTCR 1.A (9A104.a and .b) is omitted, because all of 9A104 is DOS jurisdiction. MTCR 2.A, and 20.A subsystems omit the portions of 9A005 and 9A007 not overlapping 9A105 or 9A107 and omit 9A106.b, 9A108, and 9A119.c. But they include 7A117 and recommended new 9A121. No portion of 9D103 would be DOS jurisdiction, because all the referenced ECCNs would exclude the DOS jurisdiction portions.)

9D104
"Software" ~~specially designed and modified~~ "required" for the "use" of equipment controlled by ~~9A001, 9A005, 9A006.d, 9A006.g, 9A007.a, 9A008.d, 9A009.a, 9A010.d, 9A011., 9A012 (for MT controlled items only), 9A101, 9A105, 9A106.c and .d, 9A107, 9A108.c, 9A109, 9A111, 9A115.a, 9A116.d, 9A117, or 9A118~~ 9A001, 9A005, 9A006, 9A007, 9A008.d , 9A009, 9A011 (for MT controlled items only), 9A101. 9A102, 9A105, 9A106.b, 9A107, 9A109, 9A111, 9A115.a, 9A116.c, 9A117, 9A118, or 9A121

(To conform with MTCR:
2.D.2 for 2.A.1.c (9A005, 9A007, 9A105, 9A107);
2.D.4 for 2.A1.b.3 (9A116.c);
2.D.5 for 2.A.1.e (9A005.c, 9A008.d);
2.D.6 for 2.A.1.f (9A121);
3.D.2 for 3.A.1 (9A001, 9A101),
3.A.2 (9A011, 9A111, 9A118),
3.A.4 (9A117), 3.A.5 (9A006, 9A106.b),
3.A.6 (9A009, 9A109),
3.A.9 (9A102);

10.D.1 for 10.A.3 (9A106.b);
12.D.1 for 12.A.1 (9A115); and
20.D.2 for 20.A.1.b (9A005, 9A105, 9A107.
The above includes new ECCNs 9A102 (MTCR 3.A.9) and 9A121 (MTCR 2.A.1.f). No portion of 9D003 would be DOS jurisdiction, because all the referenced ECCNs would exclude the DOS jurisdiction portions.)

9D105
"Software" that coordinates the function of more than one subsystem, ~~specially designed or modified~~ "required" for "use" in ~~"missiles."~~ 9A104. (These items are subject to the export licensing authority of the Department of State, Office of Defense Trade Controls. See 22 CFR part 121)

9E001
"Technology" according to the General Technology Note for the "development" of equipment or "software" controlled by 9A001.b, 9A004 to 9A012 ~~or 9B (except 9B990 or 9B991)~~ 9B001 to 9B010, ~~or 9D (except 9D990 or 9D991)~~ 9D001 to 9D004
(To avoid double coverage with 9E101)
NS applies to "technology" for items controlled by 9A001.b, 9A004 to 9A012, 9B001 to 9B010, ~~9D001 to 9D004~~ the NS portions of 9D001 to 9D003, or 9D004 ~~for NS reasons~~
MT applies to "technology" for items controlled by 9A001.b, 9A004 to 9A012,... ~~9B005,~~ 9B006, ... 9B115, ...
(MTCR does not cover 9B005 wind tunnel control systems.)
Related Definition: ~~"Development" ...~~ N/A
(Note at beginning of E. Technology makes 9E001 Related Definition redundant.)
(The above assumes DOC jurisdiction for "development" of USML items.)

9E002
"Technology" according to the General Technology Note for the "production" of equipment controlled by 9A001.b, 9A004 to 9A011 ~~or 9B (except 9B990 or 9B991)~~ 9B001 to 9B010
MT applies to "technology" for items controlled by 9A001.b, 9A004 to 9A011, ... ~~9B005,~~ 9B006, ... 9B115, ... for MT reasons
(MTCR does not cover 9B005 wind tunnel control systems. The above assumes DOC jurisdiction for "production" of USML items.)

9E003
Other "technology," not controlled by USML IV or VIII, as follows
Related Controls: ~~(1) ... (2) ...~~ N/A
(USML, rather than CCL, should describe details of USML controls.)

a.2.a ... ~~designed~~ ...
a.3.a ... ~~designed~~ ...
a.4 ... ~~designed~~ ...
a.8 Technical Note ... ~~designed~~ ...

b.1 ... ~~capable of~~ ...
f,3 ... ~~specially designed~~ ... ~~capability~~ ...
I ... ~~designed~~ ...
I.2 ... components ~~unique to~~ of the adjustable flow path system ~~and~~ that maintain engine stability
I.3 ... ~~unique to~~ of the adjustable flow path system ~~and~~ that maintain engine stability

9E101
"Technology" according to the General Technology Note, not controlled by USML IV or VIII, for the "development", ~~or~~ "production", or "use" of commodities or software controlled by ~~9A012,~~ 9A101, 9A102, 9A104 to 9A111, 9A115 to 9A119, 9A121, 9B105, 9B106, 9B107, 9B109, 9B115, 9B116, 9C101, 9C102, 9C110, 9D101, 9D103. 9D104, or 9D105
Related Controls: "Technology" controlled by 9E101 for the "use" of the portions of the following items which are subject to the export licensing authority of the U.S. Department of State ~~items in 9A012,~~ 9A101.b, 9A102, 9A104~~, 9A105, to 9A109, 9A110 that are specially designed for use in missile systems and subsystems,~~ to 9A111, 9A115~~, 9A116~~ to 9A119, 9A121, 9D105 are subject to the export licensing authority of the U.S. Department of State, Office of Defense Trade Controls (see 22 CFR part 121)

9E102
"Technology" according to the General Technology Note, not controlled by USML IV or VIII, for the "use" of space launch vehicles specified in 9A004 or commodities or software controlled by 9A005 to 9A012, ~~9A101, 9A104 to 9A111, 9A115 to 9A119,~~ 9B001, 9B002, 9B004, 9B006, 9B007, 9B009, ~~9B105, 9B106, 9B115, 9B116, 9B117, 9D101, 9D103, 9D104, or 9D105~~ 9D001 to 9D004 for MT reasons

(To avoid double coverage with 9E101.)

Related Controls: ~~(1) For the purpose of this entry, "use" "technology" is limited to items controlled for MT and their subsystems. (2)~~ "Technology" controlled by 9E102 for the "use" of the portions of the following commodities or software which are subject to the export licensing jurisdiction of the Department of State: 9A004 to 9A011, ~~9A101.b, 9A104, 9A105, 9A106.a to .c, 9A107 to 9A109, 9A110 that are specially designed for use in missile systems and subsystems, 9A111, 9A115 to 9A1199, 9B115, 9B116. 9D103, specified software in 9D104, and 9D105~~ are subject to the export licensing authority of the U.S. Department of State, Directorate of Defense Trade Controls (see 22 CFR part 121.)