CATEGORY 9 - AEROSPACE AND PROPULSION

A. "END ITEMS," "EQUIPMENT," "ACCESSORIES," "ATTACHMENTS," "PARTS," "COMPONENTS," AND "SYSTEMS"

N.B.: *For propulsion systems designed or rated against neutron or transient ionizing radiation, see the U.S. Munitions List, 22 CFR part 121.*

9A001 Aero gas turbine engines having any of the following (see List of Items Controlled).

License Requirements

Reason for Control: NS, MT, AT

Control(s)	*Country Chart (See Supp. No. 1 to part 738).*
NS applies to entire entry	NS Column 1
MT applies to only to those engines that meet the characteristics listed in 9A101	MT Column 1
AT applies to entire entry	AT Column 1

List Based License Exceptions (See Part 740 for a description of all license exceptions)

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

List of Items Controlled

Related Controls: See also 9A101 and 9A991
Related Definitions: N/A

Items:

a. Incorporating any of the technologies controlled by 9E003.a, 9E003.h, or 9E003.i; *or*

Note: *9A001.a. does not control aero gas turbine engines which meet all of the following:*

a. Certified by the civil aviation authority in a country listed in Supplement No. 1 to Part 743; and

b. Intended to power non-military manned aircraft for which any of the following has been issued by a Wassenaar Arrangement Participating State listed in Supplement No. 1 to Part 743 for the aircraft with this specific engine type:

b.1. A civil type certificate; or

b.2. An equivalent document recognized by the International Civil Aviation Organization (ICAO).

b. Designed to power an aircraft designed to cruise at Mach 1 or higher, for more than 30 minutes.

9A002 'Marine gas turbine engines' with an ISO standard continuous power rating of 24,245 kW or more and a specific fuel consumption not exceeding 0.219 kg/kWh in the power range from 35 to 100%, and "specially designed" assemblies and "components" therefor.

License Requirements

Reason for Control: NS, AT

Control(s)	*Country Chart (See Supp. No. 1 to part 738).*

NS applies to entire entry	NS Column 2
AT applies to entire entry	AT Column 1

List Based License Exceptions (See Part 740 for a description of all license exceptions)

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

List of Items Controlled:

Related Controls: N/A
Related Definition: The term 'marine gas turbine engines' includes those industrial, or aero-derivative, gas turbine engines adapted for a ship's electric power generation or propulsion.
Items:

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

9A003 "Specially designed" assemblies and "components," incorporating any of the "technologies" controlled by 9E003.a, 9E003.h or 9E003.i, for any of the following gas turbine engine propulsion systems (see List of Items Controlled).

License Requirements

Reason for Control: NS, AT

Control(s)	*Country Chart (See Supp. No. 1 to part 738).*
NS applies to entire entry	NS Column 2
AT applies to entire entry	AT Column 1

List Based License Exceptions (See Part 740 for a description of all license exceptions)

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

List of Items Controlled

Related Controls: N/A
Related Definition: N/A
Items:

a. Controlled by 9A001; *or*

b. Whose design or production origins are either countries in Country Group D:1 or unknown to the manufacturer.

9A004 Space launch vehicles and "spacecraft" (see List of Items Controlled).

License Requirements

Reason for Control: NS and AT

Control(s)	*Country Chart (See Supp. No. 1 to part 738).*
NS applies to entire entry	NS Column 1
AT applies to entire entry	AT Column 1

List Based License Exceptions (See Part 740 for a description of all license exceptions)

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

List of Items Controlled

Related Controls:
(1) See also 9A104.
(2) Space launch vehicles are "subject to the ITAR" (see 22 CFR parts 120 through 130).
(3) Effective March 15, 1999, all satellites, including commercial communications

satellites, are subject to the ITAR. Effective March 15, 1999, all license applications for the export of commercial communications satellites will be processed by the State Department, Directorate of Defense Trade Controls. Retransfer of jurisdiction for commercial communications satellites and related items shall not affect the validity of any export license issued by the Department of Commerce prior to March 15, 1999, or of any export license application filed under the Export Administration Regulations on or before March 14, 1999, and subsequently issued by the Department of Commerce. Commercial communications satellites licensed by the Department of Commerce, including those already exported, remain subject to the EAR and all terms and conditions of issued export licenses until their stated expiration date. All licenses issued by the Department of Commerce for commercial communications satellites, including licenses issued after March 15, 1999, remain subject to SI controls throughout the validity of the license. Effective March 15, 1999, Department of State jurisdiction shall apply to any instance where a replacement license would normally be required from the Department of Commerce. Transferring registration or operational control to any foreign person of any item controlled by this entry must be authorized on a license issued by the Department of State, Directorate of Defense Trade Controls. This requirement applies whether the item is physically located in the United States or abroad.

(4) All other "spacecraft" not controlled under 9A004 and their payloads, and specifically designed or modified "parts," "components," "accessories," "attachments," and associated equipment, including ground support equipment, are "subject to the ITAR" (see 22 CFR parts 120 through 130), unless otherwise transferred to the Department of Commerce via a commodity jurisdiction determination by the Department of State.

(5) Exporters requesting a license from the Department of Commerce for "spacecraft" and their associated "parts" and "components," other than the international space station, must provide a statement from the Department of State, Directorate of Defense Trade Controls, verifying that the item intended for export is under the licensing jurisdiction of the Department of Commerce. All "specially designed" or modified "parts," "components," "accessories," "attachments," and associated equipment for "spacecraft" that have been determined by the Department of State through the commodity jurisdiction process to be under the licensing jurisdiction of the Department of Commerce and that are not controlled by any other ECCN on the Commerce Control List will be assigned a classification under this ECCN 9A004.

(6) Technical data required for the detailed design, development, manufacturing, or production of the international space station (to include specifically designed "parts" and "components") remains "subject to the ITAR" (see 22 CFR parts 120 through 130). This control by the ITAR of detailed design, development, manufacturing or production technology for NASA's international space station does not include that level of technical data necessary and reasonable for assurance that a U.S.-built item intended to operate on NASA's international space station has been designed, manufactured, and tested in conformance with specified requirements (e.g., operational performance, reliability, lifetime, product quality, or delivery expectations). All technical data and all defense services, including all technical assistance, for launch of the international space station, including launch vehicle compatibility, integration, or processing data, are "subject to the ITAR" (see 22 CFR parts 120 through 130).

Items:

a. The international space station being

developed, launched and operated under the supervision of the U.S. National Aeronautics and Space Administration. Hardware specific to the international space station transferred to the Department of Commerce by commodity jurisdiction action is also included.

b. Specific items as may be determined to be not subject to the ITAR through the commodity jurisdiction procedure administered by the Department of State after March 15, 1999.

9A005 Liquid rocket propulsion systems containing any of the systems or "components," controlled by 9A006. (These items are "subject to the ITAR." See 22 CFR parts 120 through 130.)

9A006 Systems, "components," "specially designed" for liquid rocket propulsion systems. (These items are "subject to the ITAR." See 22 CFR parts 120 through 130.)

9A007 Solid rocket propulsion systems. (These items are "subject to the ITAR." See 22 CFR parts 120 through 130.)

9A008 "Components" "specially designed" for solid rocket propulsion systems. (These items are "subject to the ITAR." See 22 CFR parts 120 through 130.)

9A009 Hybrid rocket propulsion systems. (These items are "subject to the ITAR." See 22 CFR parts 120 through 130.)

9A010 "Specially designed" "parts," "components," systems and structures, for launch vehicles, launch vehicle propulsion systems or "spacecraft". (These items are "subject to the ITAR." See 22 CFR parts 120 through 130.)

9A011 Ramjet, scramjet or combined cycle engines, and "specially designed" "parts" and "components" therefor. (These items are "subject to the ITAR." See 22 CFR parts 120 through 130.)

9A012 Non-military "unmanned aerial vehicles," ("UAVs"), unmanned "airships", associated systems, equipment and "components," as follows (see List of Items Controlled).

License Requirements

Reason for Control: NS, MT, AT

Control(s)	*Country Chart (See Supp. No. 1 to part 738).*
NS applies to entire entry	NS Column 1
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.	MT Column 1
AT applies to entire entry	AT Column 1

List Based License Exceptions (See Part 740 for a description of all license exceptions)

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

List of Items Controlled

Related Controls: See the U.S. Munitions List Category VIII (22 CFR Part 121). Also see section 744.3 of the EAR.
Related Definitions: N/A
Items:

a. "UAVs" or unmanned "airships", having any of the following:

a.1. An autonomous flight control and navigation capability (*e.g.*, an autopilot with an Inertial Navigation System); *or*

a.2. Capability of controlled flight out of the direct visual range involving a human operator (*e.g.*, televisual remote control);

b. Associated systems, equipment and "components," as follows:

b.1. Equipment "specially designed" for remotely controlling the "UAVs" or unmanned "airships", controlled by 9A012.a.;

b.2. Systems for navigation, attitude, guidance or control, other than those controlled in Category 7, "specially designed" to provide autonomous flight control or navigation capability to "UAVs" or unmanned "airships", controlled by 9A012.a.;

b.3. Equipment or "components" "specially designed" to convert a manned "aircraft" or a manned "airship" to a "UAV" or unmanned "airship", controlled by 9A012.a;

b.4. Air breathing reciprocating or rotary internal combustion type engines, "specially designed" or modified to propel "UAVs" or unmanned "airships", at altitudes above 50,000 feet (15,240 meters).

***Note**: 9A012 does not control model aircraft or model "airships".*

9A018 Equipment on the Wassenaar Arrangement Munitions List (see List of Items Controlled).

License Requirements

Reason for Control: NS, RS, AT, UN

Control(s)	*Country Chart (See Supp. No. 1 to part 738).*
NS applies to entire entry	NS Column 1
RS applies to 9A018.b	RS Column 2
AT applies to entire entry	AT Column 1
UN applies to entire entry	See § 746.1(b) for UN controls.

List Based License Exceptions (See Part 740 for a description of all license exceptions)

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

List of Items Controlled

Related Controls: (1) The Department of State, Directorate of Defense Trade Controls has export licensing jurisdiction for: (a) all military ground vehicles and "components" therefor as described in 22 CFR 121, Category VII; and (b) vehicles that have been armed or armored with articles described in 22 CFR 121 or that have been manufactured or fitted with special reinforcements for mounting arms or other specialized military equipment described in 22 CFR 121, Category VII, see § 770.2(h) Interpretation 8: "Ground vehicles". (2) See ECCN 9A610 for the aircraft, refuelers, ground equipment, parachutes, harnesses, and instrument flight trainers, as well as "parts," "accessories," and "attachments" for the forgoing that, immediately prior to October 15, 2013, were

classified under 9A018.a.1, .a.3, .c, .d, .e, or .f. (3) See ECCN 9A619 for military trainer aircraft turbo prop engines and "parts" and "components" therefor that, immediately prior to October 15, 2013, were classified under ECCN 9A018.a.2 or .a.3.

Related Definition: N/A
Items:

a. [RESERVED]

b. Ground vehicles (including trailers) and "components," as follows:

b.1. Ground transport vehicles (including trailers) and "parts" and "components" therefor designed or modified for non-combat military use;

b.2. Other ground vehicles having all of the following:

b.2.a. Manufactured or fitted with "materials" or "components" to provide ballistic protection to level III (National Institute of Justice standard 0108.01, September 1985) or better; (See § 770.2(h)—Interpretation 8).

b.2.b. A transmission to provide drive to both front and rear wheels simultaneously, including those vehicles having additional wheels for load bearing purposes whether driven or not;

b.2.c. Gross Vehicle Weight Rating (GVWR) greater than 4,500 kg; *and*

b.2.d. Designed or modified for off-road use;

b.3. "Components" having all of the following:

b.3.a. "Specially designed" for vehicles specified in 9A018.b.2; *and*

b.3.b. Providing ballistic protection to level III (NIJ 0108.01, September 1985, or comparable national standard) or better.

***Note**: 9A018 does not apply to civil vehicles designed or modified for transporting money or valuables.*

c. [RESERVED]

d. [RESERVED]

e. [RESERVED]

f. [RESERVED]

9A101 Turbojet and turbofan engines, other than those controlled by 9A001, as follows (see List of Items Controlled).

License Requirements

Reason for Control: MT, AT

Control(s)	*Country Chart (See Supp. No. 1 to part 738).*
MT applies to entire entry	MT Column 1
AT applies to entire entry	AT Column 1

List Based License Exceptions (See Part 740 for a description of all license exceptions)

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

List of Items Controlled

Related Controls: 9A101.b controls only engines for non-military unmanned air vehicles [UAVs] or remotely piloted vehicles [RPVs], and does not control other engines designed or modified for use in "missiles", which are "subject to the ITAR" (see 22 CFR

parts 120 through 130).
Related Definitions: 'Maximum thrust value' in 9A101.a.1 is the manufacturer's demonstrated maximum thrust for the engine type un-installed. The civil type certified thrust value will be equal to or less than the manufacturer's demonstrated maximum thrust for the engine type.
Items:

a. Engines having both of the following characteristics:

a.1. 'Maximum thrust value' greater than 400 N (achieved un-installed) excluding civil certified engines with a maximum thrust value greater than 8,890 N (achieved un-installed), *and*

a.2. Specific fuel consumption of 0.15 kg/N/hr or less (at maximum continuous power at sea level static and standard conditions); *or*

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

9A103 Liquid propellant tanks "specially designed" for the propellants controlled in ECCNs 1C011, 1C111 or other liquid propellants used in "missiles." (These items are "subject to the ITAR." See 22 CFR parts 120 through 130.)

9A104 Sounding rockets, capable of a range of at least 300 km. (These items are "subject to the ITAR." See 22 CFR parts 120 through 130.)

9A105 Liquid propellant rocket engines. (These items are "subject to the ITAR." See 22 CFR parts 120 through 130.)

9A106 Systems, "parts" or "components," other than those controlled by 9A006, usable in "missiles", and "specially designed" for liquid rocket propulsion systems, as follows (see List of Items Controlled).

License Requirements

Reason for Control: MT, AT

Control(s)	*Country Chart (See Supp. No. 1 to part 738).*
MT applies to entire entry	MT Column 1
AT applies to entire entry	AT Column 1

List Based License Exceptions (See Part 740 for a description of all license exceptions)

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

List of Items Controlled

Related Controls: Items described in 9A106.a, .b, and .c are "subject to the ITAR" (see 22 CFR parts 120 through 130).
Related Definitions: N/A
Items:

a. Ablative liners for thrust or combustion chambers;

b. Rocket nozzles;

c. Thrust vector control sub-systems;

Technical Note: *Examples of methods of achieving thrust vector control controlled by 9A106.c includes:*

1. *Flexible nozzle;*

2. *Fluid or secondary gas injection;*

3. *Movable engine or nozzle;*

4. Deflection of exhaust gas steam (jet vanes or probes); or

5. Thrust tabs.

d. Liquid and slurry propellant (including oxidizers) control systems, and "specially designed" "parts" and "components" therefor, designed or modified to operate in vibration environments greater than 10 g rms between 20 Hz and 2000 Hz.

Note: *The only servo valves and pumps controlled by 9A106.d, are the following:*

a. Servo valves designed for flow rates equal to or greater than 24 liters per minute, at an absolute pressure equal to or greater than 7 MPa, that have an actuator response time of less than 100 ms;

b. Pumps, for liquid propellants, with shaft speeds equal to or greater than 8,000 rpm or with discharge pressures equal to or greater than 7 Mpa.

e. Flight control servo valves designed or modified for use in "missiles" and designed or modified to operate in a vibration environment greater than 10g rms over the entire range between 20Hz and 2 kHz.

9A107 Solid propellant rocket engines, usable in rockets with a range capability of 300 km or greater, other than those controlled by 9A007, having total impulse capacity equal to or greater than 8.41 x 10^5 Ns, but less than 1.1 x 10^6 Ns. (These items are "subject to the ITAR." See 22 CFR parts 120 through 130.)

9A108 Solid rocket propulsion "parts" and "components," other than those controlled by 9A008, usable in rockets with a range capability of 300 km or greater. (These items are "subject to the ITAR." See 22 CFR parts 120 through 130.)

9A109 Hybrid rocket motors, usable in rockets with a range capability of 300 km or greater, other than those controlled by 9A009, and "specially designed" "parts" and "components" therefor. (These items are "subject to the ITAR." See 22 CFR parts 120 through 130.)

9A110 Composite structures, laminates and manufactures thereof, other than those controlled by entry 9A010, "specially designed" for use in rockets, missiles, or unmanned aerial vehicles capable of achieving a "range" equal to or greater than 300 km or the subsystems controlled by entries 9A005, 9A007, 9A105.a, 9A106 to 9A109, 9A116, or 9A119.

License Requirements

Reason for Control: MT, AT

Control(s)	*Country Chart (See Supp. No. 1 to part 738).*
MT applies to entire entry	MT Column 1
AT applies to entire entry	AT Column 1

List Based License Exceptions (See Part 740 for a description of all license exceptions)

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

List of Items Controlled

Related Controls: 1.) See also 1A002. (2) "Composite structures, laminates, and manufactures thereof, "specially designed"

for use in missile systems are "subject to the ITAR" (see 22 CFR parts 120 through 130), except those "specially designed" for non-military unmanned air vehicles controlled in 9A012.
Related Definitions: N/A
Items:

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

9A111 Pulse jet engines, usable in rockets, missiles, or unmanned aerial vehicles capable of achieving a "range" equal to or greater than 300km, and "specially designed" "parts" and "components" therefor. (These items are "subject to the ITAR." See 22 CFR parts 120 through 130.)

9A115 Apparatus, devices and vehicles, designed or modified for the transport, handling, control, activation and launching of rockets, missiles, and unmanned aerial vehicles capable of achieving a "range" equal to or greater than 300 km. (These items are "subject to the ITAR." See 22 CFR parts 120 through 130.)

9A116 Reentry vehicles, usable in "missiles", and equipment designed or modified therefor. (These items are "subject to the ITAR." See 22 CFR parts 120 through 130.)

9A117 Staging mechanisms, separation mechanisms, and interstages therefor, usable in "missiles". (These items are "subject to the ITAR." See 22 CFR parts 120 through 130.)

9A118 Devices to regulate combustion usable in engines which are usable in rockets, missiles, and unmanned aerial vehicles capable of achieving a "range" equal to or greater than 300 km, controlled by 9A011 or 9A111. (These items are "subject to the ITAR." See 22 CFR parts 120 through 130.)

9A119 Individual rocket stages, usable in rockets with a range capability greater than 300 km or greater, other than those controlled by 9A005, 9A007, 9A009, 9A105, 9A107 and 9A109. (These items are "subject to the ITAR." See 22 CFR parts 120 through 130.)

9A120 Complete unmanned aerial vehicles, not specified in 9A012, having all of the following characteristics (see List of Items Controlled.)

License Requirements

Reason for Control: MT, AT

Control(s)	*Country Chart (See Supp. No. 1 to part 738).*
MT applies to entire entry	MT Column 1
AT applies to entire entry	AT Column 1

List Based License Exceptions (See Part 740 for a description of all license exceptions)

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

List of Items Controlled

Related Controls: See ECCN 9A012 or the U.S. Munitions List Category VIII (22 CFR part 121). Also see ECCN 2B352.i for controls on certain spraying or fogging systems, and "parts" and "components" therefor, "specially designed" or modified for fitting to aircraft, "lighter than air vehicles," or "UAVs."

Related Definitions: N/A
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 an aerosol dispensing system/mechanism with a capacity of greater than 20 liters.

Note: *9A120 does not control model aircraft, "specially designed" for recreational or competition purposes.*

Technical Notes:

1. An aerosol consists of particulate or liquids other than fuel components, by-products or additives, as part of the "payload" to be dispersed in the atmosphere. Examples of aerosols include pesticides for crop dusting and dry chemicals for cloud seeding.

2. An aerosol dispensing system/mechanism contains all above devices (mechanical, electrical, hydraulic, etc.), which are necessary for storage and dispersion of an aerosol into the atmosphere. This includes the possibility of aerosol injection into the combustion exhaust vapor and into the propeller slip stream.

9A610 Military aircraft and related commodities, other than those enumerated in 9A991.a (see List of Items Controlled).

License Requirements

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

Control(s)	*Country Chart (See Supp. No. 1 to part 738).*
NS applies to entire entry except 9A610.u, .v, .w, and .y	NS Column 1
RS applies to entire entry except 9A610.y	RS Column 1
MT applies to 9A610.u, .v, and .w	MT Column 1
AT applies to entire entry	AT Column 1
UN applies to entire entry except 9A610.y	See § 746.1(b) for UN controls

List Based License Exceptions (See Part 740 for a description of all license exceptions)

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

Special Conditions for STA

STA: (1) Paragraph (c)(1) of License Exception STA (§ 740.20(c)(1) of the EAR) may not be used for any item in 9A610.a (i.e., "end item" military aircraft), unless determined by BIS to be eligible for License Exception STA in accordance with § 740.20(g) (License Exception STA eligibility requests for "600 series" end items). (2) Paragraph (c)(2) of License Exception STA (§ 740.20(c)(2) of the EAR) may not be used for any item in 9A610.

List of Items Controlled

Related Controls: Military aircraft and related articles that are enumerated in USML Category VIII, and technical data (including software) directly related thereto, are subject to the ITAR. See ECCN 0A919 for controls on foreign-made "military commodities" that incorporate more than a *de minimis* amount of U.S.-origin "600 series" controlled content.
Related Definitions: N/A
Items:

a. 'Military Aircraft' "specially designed" for a military use that are not enumerated in USML paragraph VIII(a).

Note 1: *For purposes of paragraph .a the term 'military aircraft' includes the following types of aircraft to the extent they were "specially designed" for a military use, and are not enumerated in USML paragraph VIII(a): trainer aircraft; cargo aircraft; utility fixed wing aircraft; military helicopters; observation aircraft; military non-expansive balloons and other lighter than air aircraft, and unarmed military aircraft, regardless of origin or designation. Aircraft with modifications made to incorporate safety of flight features or other FAA or NTSB modifications such as transponders and air data recorders are "unmodified" for the purposes of this paragraph .a.*

Note 2: *9A610.a does not control 'military aircraft' that:*

a. Were first manufactured before 1946;

b. Do not incorporate defense articles enumerated or otherwise described on the U.S. Munitions List, unless the items are required to meet safety or airworthiness standards of a Wassenaar Arrangement Participating State; <u>and</u>

c. Do not incorporate weapons enumerated or otherwise described on the U.S. Munitions List, unless inoperable and incapable of being returned to operation.

b. [RESERVED]

c. [RESERVED]

d. [RESERVED]

e. [RESERVED]

f. 'Ground equipment' "specially designed" for aircraft controlled by either USML paragraph VIII(a) or ECCN 9A610.a.

Technical Note: *'Ground equipment' includes pressure refueling equipment and equipment designed to facilitate operations in confined areas.*

g. Aircrew life support equipment, aircrew safety equipment and other devices for emergency escape from aircraft controlled by either USML paragraph VIII(a) or ECCN 9A610.a.

h. Parachutes, paragliders, complete canopies, harnesses, platforms, electronic release mechanisms "specially designed" for use with aircraft controlled by either USML paragraph VIII(a) or ECCN 9A610.a, and "equipment" "specially designed" for military high altitude parachutists, such as suits, special helmets, breathing systems, and navigation equipment.

i. Controlled opening equipment or automatic piloting systems, designed for parachuted loads.

j. Ground effect machines (GEMS), including surface effect machines and air cushion vehicles, "specially designed" for use by a military.

k. through s. [RESERVED]

t. Military aircraft instrument flight trainers that are not "specially designed" to simulate combat. (See USML Cat IX for controls on such trainers

that are "specially designed" to simulate combat.)

u. Apparatus and devices "specially designed" for the handling, control, activation and non-ship-based launching of UAVs or drones controlled by either USML paragraph VIII(a) or ECCN 9A610.a, and capable of a range equal to or greater than 300 km.

v. Radar altimeters designed or modified for use in UAVs or drones controlled by either USML paragraph VIII(a) or ECCN 9A610.a., and capable of delivering at least 500 kilograms payload to a range of at least 300 km.

w. Hydraulic, mechanical, electro-optical, or electromechanical flight control systems (including fly-by-wire systems) and attitude control equipment designed or modified for UAVs or drones controlled by either USML paragraph VIII(a) or ECCN 9A610.a., and capable of delivering at least 500 kilograms payload to a range of at least 300 km.

x. "Parts," "components," "accessories," and "attachments" that are "specially designed" for a commodity subject to control in this ECCN or a defense article in USML Category VIII and not elsewhere specified on the USML or in ECCN 9A610.y.

Note 1: *Forgings, castings, and other unfinished products, such as extrusions and machined bodies, that have reached a stage in manufacturing where they are clearly identifiable by mechanical properties, material composition, geometry, or function as commodities controlled by ECCN 9A610.x are controlled by ECCN 9A610.x.*

Note 2: *"Parts," "components," "accessories," and "attachments" specified in USML subcategory VIII(f) or VIII(h) are subject to the controls of that paragraph. "Parts," "components," "accessories," and "attachments" specified in ECCN 9A610.y are subject to the controls of that paragraph.*

y. Specific "parts," "components," "accessories," and "attachments" "specially designed" for a commodity subject to control in this ECCN or a defense article in USML Category VIII and not elsewhere specified in the USML or the CCL, and other aircraft commodities "specially designed" for a military use, as follows:

y.1. Aircraft tires;

y.2. Analog cockpit gauges and indicators;

y.3. Audio selector panels;

y.4. Check valves for hydraulic and pneumatic systems;

y.5. Crew rest equipment;

y.6. Ejection seat mounted survival aids;

y.7. Energy dissipating pads for cargo (for pads made from paper or cardboard);

y.8. Filters and filter assemblies for hydraulic, oil and fuel systems;

y.9. Galleys;

y.10. Hydraulic and fuel hoses, straight and unbent lines, fittings, couplings, and brackets;

y.11. Lavatories;

y.12. Life rafts;

y.13. Magnetic compass, magnetic azimuth detector;

y.14. Medical litter provisions;

y.15. Mirrors, cockpit;

y.16. Passenger seats including palletized seats;

y.17. Potable water storage systems;

y.18. Public address (PA) systems;

y.19. Steel brake wear pads (does not include sintered mix or carbon/carbon materials);

y.20. Underwater beacons;

y.21. Urine collection bags/pads/cups/pumps;

y.22. Windshield washer and wiper systems;

y.23. Filtered and unfiltered cockpit panel knobs, indicators, switches, buttons, and dials;

y.24. Lead-acid and Nickel-Cadmium batteries;

y.25. Propellers, propeller systems, and propeller blades used with reciprocating engines;

y.26. Fire extinguishers;

y.27. Flame and smoke/CO_2 detectors; and

y.28. Map cases.

y.29. 'Military Aircraft' that were first manufactured from 1946 to 1955 that do not incorporate defense articles enumerated or otherwise described on the U.S. Munitions List, unless the items are required to meet safety or airworthiness standards of a Wassenaar Arrangement Participating State; and do not incorporate weapons enumerated or otherwise described on the U.S. Munitions List, unless inoperable and incapable of being returned to operation."

9A619 Military gas turbine engines and related commodities (see List of Items Controlled).

License Requirements

Reason for Control: NS, RS, AT, UN

Control(s)	*Country Chart (See Supp. No. 1 to part 738).*
NS applies to entire entry except 9A619.y	NS Column 1
RS applies to entire entry except 9A619.y	RS Column 1
AT applies to entire entry	AT Column 1
UN applies to entire entry except 9A619.y	See § 746.1(b) for UN controls

List Based License Exceptions (See Part 740 for a description of all license exceptions)

LVS: $1,500
GBS: N/A
CIV: N/A

Special Conditions for STA

STA: Paragraph (c)(2) of License Exception STA (§ 740.20(c)(2) of the EAR) may not be used for any item in ECCN 9A619.

List of Items Controlled

Related Controls: (1) Military gas turbine engines and related articles that are enumerated or otherwise described in USML Category XIX, and technical data (including software) directly related thereto, are subject to the jurisdiction of the International Traffic in Arms Regulations (ITAR). (2) See ECCN 0A919 for foreign-made "military commodities" that incorporate more than a *de minimis* amount of U.S.-origin "600 series" controlled content.
Related Definitions: N/A
Items:

a. "Military Gas Turbine Engines" "specially designed" for a military use that are not controlled in USML Category XIX(a), (b), (c), or (d).

Note: *For purposes of ECCN 9A619.a, the term "military gas turbine engines" means gas turbine engines "specially designed" for "end items" enumerated in USML Category VIII or on the CCL under ECCN 9A610.*

b. Digital engine controls (e.g., Full Authority Digital Engine Controls (FADEC) and Digital Electronic Engine Controls (DEEC)) "specially designed" for gas turbine engines controlled in this ECCN 9A619.

c. If "specially designed" for gas turbine engines controlled in 9A619.a, hot section components (i.e., combustion chambers and liners; high pressure turbine blades, vanes, disks and related cooled structure; cooled low pressure turbine blades, vanes, disks and related cooled structure; cooled augmenters; and cooled nozzles);

d. If "specially designed" for gas turbine engines controlled in 9A619.a, uncooled turbine blades, vanes, disks, and tip shrouds;

e. If "specially designed" for gas turbine engines controlled in 9A619.a, combustor cowls, diffusers, domes, and shells;

Note: *Forgings, castings, and other unfinished products, such as extrusions and machined bodies, that have reached a stage in manufacturing where they are clearly identifiable by mechanical properties, material composition, geometry, or function as commodities controlled by ECCN 9A619.c are controlled by ECCN 9A619.c.*

f. Engine monitoring systems (i.e., those that conduct prognostics, diagnostics, and monitor health) "specially designed" for gas turbine engines and components controlled in this ECCN 9A619.

g. through w. [RESERVED]

x. Parts," "components," "accessories," and "attachments" that are "specially designed" for a commodity controlled by this ECCN 9A619 (other than ECCN 9A619.c) or for a defense article enumerated in USML Category XIX and not specified elsewhere on the USML or in ECCN 9A619.y.

Note 1: *Forgings, castings, and other unfinished products, such as extrusions and machined bodies, that have reached a stage in manufacturing where they are clearly identifiable by mechanical properties, material composition, geometry, or function as commodities controlled by ECCN 9A619.x are controlled by ECCN 9A619.x.*

Note 2: *"Parts," "components," "accessories," and "attachments" specified in USML subcategory XIX(f) are subject to the controls of that paragraph. "Parts," "components," "accessories," and "attachments" specified in ECCN 9A619.y are subject to the controls of that paragraph.*

y. Specific "parts," "components," "accessories," and "attachments" "specially designed" for a commodity subject to control in this ECCN 9A619 or for a defense article in USML Category XIX and not elsewhere specified on the USML or in the CCL, and other aircraft commodities, as follows:

y.1. Oil tank and reservoirs;

y.2. Oil lines and tubes;

y.3. Fuel lines and hoses;

y.4. Fuel and oil filters;

y.5. V-Band, cushion, broomstick, hinged, and loop clamps;

y.6. Shims;

y.7. Identification plates;

y.8. Air, fuel, and oil manifolds.

9A980 Nonmilitary mobile crime science laboratories; and parts and "accessories," n.e.s.

Heading Note: *In order for a vehicle to be classified as a nonmilitary mobile crime scene laboratory under ECCN 9A980, the vehicle must contain one or more analytical or laboratory items controlled for Crime Control (CC) reasons on the CCL, such as ECCNs 3A980 and 3A981.*

License Requirements

Reason for Control: CC

Control(s)	*Country Chart (See Supp. No. 1 to part 738).*
CC applies to entire entry	CC Column 1

List Based License Exceptions (See Part 740 for a description of all license exceptions)

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

List of Items Controlled

Related Controls: N/A
Related Definitions: N/A
Items:

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

9A990 Diesel engines, n.e.s., and tractors and "specially designed" "parts" and "components" therefor, n.e.s. (see List of Items Controlled).

License Requirements

Reason for Control: AT

Control(s)	*Country Chart (See Supp. No. 1 to part 738).*
AT applies to entire entry except 9A990.a	AT Column 1
AT applies to 9A990.a only	AT Column 2

List Based License Exceptions (See Part 740 for a description of all license exceptions)

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

List of Items Controlled

Related Controls: N/A
Related Definitions: N/A
Items:

a. Diesel engines, n.e.s., for trucks, tractors, and automotive applications of continuous brake horsepower of 400 BHP (298 kW) or greater (performance based on SAE J1349 standard conditions of 100 Kpa and 25°)

b. Off highway wheel tractors of carriage capacity 9 mt (20,000 lbs) or more; and "major components" and "accessories," n.e.s.

c. On-Highway tractors, with single or tandem rear axles rated for 9 mt per axel (20,000 lbs.) or greater and "specially designed" "major components".

9A991 "Aircraft", n.e.s., and gas turbine

engines not controlled by 9A001 or 9A101 and "parts" and "components," n.e.s. (see List of Items Controlled).

License Requirements

Reason for Control: AT, UN

Control(s)	*Country Chart (See Supp. No. 1 to part 738).*
AT applies to entire entry	AT Column 1
UN applies to 9A991.a	See § 746.1(b) for UN controls.

License Requirement Notes: *There is no de minimis level for foreign-made aircraft described by this entry that incorporate commercial primary or standby instrument systems that integrate QRS11-00100-100/101 or commercial automatic flight control systems that integrate QRS11-00050-443/569 Micromachined Angular Rate Sensors (see §734.4(a) of the EAR).*

List Based License Exceptions (See Part 740 for a description of all license exceptions)

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

List of Items Controlled

Related Controls: QRS11 Micromachined Angular Rate Sensors are "subject to the ITAR" (see 22 CFR parts 120 through 130), unless the QRS11-00100-100/101 is integrated into and included as an integral "component" of a commercial primary or standby instrument system of the type described in ECCN 7A994, or aircraft of the type described in ECCN 9A991 that incorporates such a system, or is exported solely for integration into such a system; or the QRS11-00050-443/569 is integrated into an automatic flight control system of the type described in ECCN 7A994, or aircraft of the type described in ECCN 9A991 that incorporates such a system, or are exported solely for integration into such a system. (See Commodity Jurisdiction requirements in 22 CFR Part 121; Category VIII(e), Note(1)) In the latter case, such items are subject to the EAR. Technology specific to the development and production of QRS11 sensors remains "subject to the ITAR" (see 22 CFR parts 120 through 130).
Related Definitions: N/A
Items:

a. Military aircraft, demilitarized (not specifically equipped or modified for military operation), as follows:

a.1 Cargo aircraft bearing "C" designations and numbered C-45 through C-118 inclusive, C-121 through C-125 inclusive, and C-131, using reciprocating engines only.

a.2 Trainer aircraft bearing "T" designations and using reciprocating engines or turboprop engines with less than 600 horsepower (s.h.p.).

a.3 Utility aircraft bearing "U" designations and using reciprocating engines only.

a.4 All liaison aircraft bearing an "L" designation.

a.5 All observation aircraft bearing "O" designations and using reciprocating engines.

b. Aircraft n.e.s.;

c. Aero gas turbine engines, and "parts" and "components" "specially designed" therefor.

Note: *9A991.c does not control aero gas turbine engines that are destined for use in civil "aircraft" and that have been in use in bona fide*

civil "aircraft" for more than eight years. If they have been in use in bona fide civil "aircraft" for more than eight years, such engines are controlled under 9A991.d.

d. "Parts" and "components" "specially designed" for "aircraft" subject to the controls of 9A991.a or .b, n.e.s.

e. Pressurized aircraft breathing equipment, n.e.s.; *and* "parts" and "components" "specially designed" therefor, n.e.s.

9A992 Complete canopies, harnesses, and platforms and electronic release mechanisms therefor, except such types as are in normal sporting use.

License Requirements

Reason for Control: AT

Control(s)	*Country Chart (See Supp. No. 1 to part 738).*
AT applies to entire entry	AT Column 1

List Based License Exceptions (See Part 740 for a description of all license exceptions)

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

List of Items Controlled

Related Controls: N/A
Related Definitions: N/A
Items:

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

B. TEST, INSPECTION AND "PRODUCTION EQUIPMENT"

9B001 Equipment, tooling and fixtures, "specially designed" for manufacturing gas turbine blades, vanes or "tip shroud" castings, as follows (see List of Items Controlled).

License Requirements

Reason for Control: NS, MT, AT

Control(s)	*Country Chart (See Supp. No. 1 to part 738).*
NS applies to entire entry	NS Column 1
MT applies to equipment for controlled under 9A001 for MT reasons and for engines controlled under 9A101.	MT Column 1
AT applies to entire entry	AT Column 1

Reporting Requirements

See § 743.1 of the EAR for reporting requirements for exports under License Exceptions, Special Comprehensive Licenses, and Validated End-User authorizations.

List Based License Exceptions (See Part 740 for a description of all license exceptions)

LVS: $5000, except N/A for MT
GBS: Yes, except N/A for MT
CIV: Yes, except N/A for MT

Special Conditions for STA

STA: License Exception STA may not be used to ship commodities in 9B001.b to any of the destinations listed in Country Group A:6 (See Supplement No.1 to part 740 of the EAR)

List of Items Controlled

Related Controls: For "specially designed" production equipment of systems, sub-systems, "parts" and "components" controlled by 9A005 to 9A009, 9A011, 9A101, 9A105 to 9A109, 9A111, and 9A116 to 9A119 usable in "missiles" see 9B115. See also 9B991.
Related Definitions: N/A
Items:

a. Directional solidification or single crystal casting equipment;

b. Ceramic cores or shells.

9B002 On-line (real time) control systems, instrumentation (including sensors) or automated data acquisition and processing equipment, having all of the following (see List of Items Controlled).

License Requirements

Reason for Control: NS, MT, AT

Control(s)	*Country Chart (See Supp. No. 1 to part 738).*
NS applies to entire entry	NS Column 1
MT applies to equipment for engines controlled under 9A001 for MT reasons and for engines Controlled under 9A101.	MT Column 1
AT applies to entire entry	AT Column 1

List Based License Exceptions (See Part 740 for a description of all license exceptions)

LVS: $3000, except N/A for MT
GBS: Yes, except N/A for MT
CIV: Yes, except N/A for MT

List of Items Controlled

Related Controls: N/A
Related Definitions: N/A
Items:

a. "Specially designed" for the "development" of gas turbine engines, assemblies, "parts" or "components"; *and*

b. Incorporating "technologies" controlled by 9E003.h or 9E003.i.

9B003 Equipment "specially designed" for the "production" or test of gas turbine brush seals designed to operate at tip speeds exceeding 335 m/s, and temperatures in excess of 773 K (500°C), and "specially designed" "components" or "accessories" therefor.

License Requirements

Reason for Control: NS, MT, AT

Control(s)	*Country Chart (See Supp. No. 1 to part 738).*
NS applies to entire entry	NS Column 1
MT applies to equipment for engines controlled under 9A001 for MT reasons and for engines Controlled under 9A101.	MT Column 1
AT applies to entire entry	AT Column 1

List Based License Exceptions (See Part 740 for a description of all license exceptions)

LVS: $5000, except N/A for MT
GBS: Yes, except N/A for MT

CIV: Yes, except N/A for MT

List of Items Controlled

Related Controls: See also 9B115
Related Definitions: N/A
Items:

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

9B004 Tools, dies or fixtures, for the solid state joining of "superalloy", titanium or intermetallic airfoil-to-disk combinations described in 9E003.a.3 or 9E003.a.6 for gas turbines.

License Requirements

Reason for Control: NS, MT, AT

Control(s)	*Country Chart (See Supp. No. 1 to part 738).*
NS applies to entire entry	NS Column 1
MT applies to equipment for engines controlled under 9A001 for MT reasons and for engines controlled under 9A101.	MT Column 1
AT applies to entire entry	AT Column 1

List Based License Exceptions (See Part 740 for a description of all license exceptions)

LVS: $3000, except N/A for MT
GBS: Yes, except N/A for MT
CIV: Yes, except N/A for MT

List of Items Controlled

Related Controls: N/A
Related Definitions: N/A
Items:

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

9B005 On-line (real time) control systems, instrumentation (including sensors) or automated data acquisition and processing equipment, "specially designed" for use with any of the following (see List of Items Controlled).

License Requirements

Reason for Control: NS, AT

Control(s)	*Country Chart (See Supp. No. 1 to part 738).*
NS applies to entire entry	NS Column 1
AT applies to entire entry	AT Column 1

List Based License Exceptions (See Part 740 for a description of all license exceptions)

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

List of Items Controlled

Related Controls: See also 9B105
Related Definitions: N/A
Items:

a. Wind tunnels designed for speeds of Mach 1.2 or more;

Note: *9B005.a does not control wind tunnels "specially designed" for educational purposes and having a 'test section size' (measured laterally) of less than 250 mm.*

Technical Note: *'Test section size' in 9B005.a means the diameter of the circle, or the side of the square, or the longest side of the rectangle, at the largest test section location.*

b. Devices for simulating flow-environments at speeds exceeding Mach 5, including hot-shot tunnels, plasma arc tunnels, shock tubes, shock tunnels, gas tunnels and light gas guns; *or*

c. Wind tunnels or devices, other than two-dimensional sections, capable of simulating Reynolds number flows exceeding 25 x 10^6.

9B006 Acoustic vibration test equipment capable of producing sound pressure levels of 160 Db or more (referenced to 20 µPa) with a rated output of 4 kW or more at a test cell temperature exceeding 1,273 K (1,000°C), and "specially designed" quartz heaters therefor.

License Requirements

Reason for Control: NS, AT

Control(s)	*Country Chart (See Supp. No. 1 to part 738).*
NS applies to entire entry	NS Column 2
AT applies to entire entry	AT Column 1

List Based License Exceptions (See Part 740 for a description of all license exceptions)

LVS: $3000
GBS: Yes
CIV: Yes

List of Items Controlled

Related Controls: See also 9B106. Note that some items in 9B006 may also be controlled under 9B106.

Related Definitions: N/A
Items:

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

9B007 Equipment "specially designed" for inspecting the integrity of rocket motors and using Non-Destructive Test (NDT) techniques other than planar x-ray or basic physical or chemical analysis.

License Requirements

Reason for Control: NS, MT, AT

Control(s)	*Country Chart (See Supp. No. 1 to part 738).*
NS applies to entire entry	NS Column 1
MT applies to entire entry	MT Column 1
AT applies to entire entry	AT Column 1

List Based License Exceptions (See Part 740 for a description of all license exceptions)

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

List of Items Controlled

Related Controls: N/A
Related Definitions: N/A
Items:

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

9B008 Direct measurement wall skin friction transducers "specially designed" to operate at a test flow total (stagnation)

temperature exceeding 833 K (560ºC).

Reason for Control: NS, AT

Control(s)	*Country Chart (See Supp. No. 1 to part 738).*
NS applies to entire entry	NS Column 2
AT applies to entire entry	AT Column 1

List Based License Exceptions (See Part 740 for a description of all license exceptions)

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

List of Items Controlled

Related Controls: N/A
Related Definitions: N/A
Items:

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

9B009 Tooling "specially designed" for producing turbine engine powder metallurgy rotor "parts" or "components" capable of operating at stress levels of 60% of Ultimate Tensile Strength (UTS) or more and metal temperatures of 873 K (600°C) or more.

License Requirements

Reason for Control: NS, AT

Control(s)	*Country Chart (See Supp. No. 1 to part 738).*
NS applies to entire entry	NS Column 2
AT applies to entire entry	AT Column 1

List Based License Exceptions (See Part 740 for a description of all license exceptions)

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

List of Items Controlled

Related Controls: See 9B002.
Related Definitions: N/A
Items:

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

9B010 Equipment "specially designed" for the production of "UAVs" and associated systems, equipment and "components," controlled by 9A012.

License Requirements

Reason for Control: NS, AT

Control(s)	*Country Chart (See Supp. No. 1 to part 738).*
NS applies to entire entry	NS Column 1
AT applies to entire entry	AT Column 1

List Based License Exceptions (See Part 740 for a description of all license exceptions)

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

List of Items Controlled

Related Controls: N/A
Related Definitions: N/A
Items:

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

9B105 'Aerodynamic test facilities' for speeds of Mach 0.9 or more, usable for rockets, missiles, or unmanned aerial vehicles capable of achieving a "range" equal to or greater than 300 km and their subsystems.

License Requirements

Reason for Control: MT, AT

Control(s)	*Country Chart (See Supp. No. 1 to part 738).*
MT applies to entire entry	MT Column 1
AT applies to entire entry	AT Column 1

List Based License Exceptions (See Part 740 for a description of all license exceptions)

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

List of Items Controlled

Related Controls: See also 9B005
Related Definitions: N/A
Items:

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

Note: *9B105 does not control wind tunnels for speeds of Mach 3 or less with the dimension of the 'test cross section size' equal to or less than 250 mm.*

Technical Notes:

1. 'Aerodynamic test facilities' includes wind tunnels and shock tunnels for the study of airflow over objects.

2. 'Test cross section size' means the diameter of the circle, or the side of the square, or the longest side of the rectangle, or the major axis of the ellipse at the largest 'test cross section' location. 'Test cross section' is the section perpendicular to the flow direction.

9B106 Environmental chambers usable for rockets, missiles, or unmanned aerial vehicles capable of achieving a "range" equal to or greater than 300 km and their subsystems, as follows (see List of Items Controlled).

License Requirements

Reason for Control: MT, AT

Control(s)	*Country Chart (See Supp. No. 1 to part 738).*
MT applies to entire entry	MT Column 1
AT applies to entire entry	AT Column 1

List Based License Exceptions (See Part 740 for a description of all license exceptions)

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

List of Items Controlled

Related Controls: N/A
Related Definitions: N/A
Items:

a. Environmental chambers capable of simulating all of the following flight conditions:

a.1. Having any of the following:

a.1.a. Altitude equal to or greater than 15,000 m; or

a.1.b. Temperature range of at least -50° C to +125° C; and

a.2. Incorporating, or designed or modified to incorporate, a shaker unit or other vibration test equipment to produce vibration environments equal to or greater than 10 g rms, measured 'bare table', between 20 Hz and 2 kHz imparting forces equal to or greater than 5 kN;

Technical Notes:

1. Item 9B106.a.2 describes systems that are capable of generating a vibration environment with a single wave (e.g., a sine wave) and systems capable of generating a broad band random vibration (i.e., power spectrum).

2. The term 'bare table' means a flat table, or surface, with no fixture or fittings.

3. In Item 9B106.a.2, designed or modified means the environmental chamber provides appropriate interfaces (e.g., sealing devices) to incorporate a shaker unit or other vibration test equipment as specified in this Item.

b. Environmental chambers capable of simulating all of the following flight conditions:

b.1. Acoustic environments at an overall sound pressure level of 140 dB or greater (referenced to 2×10^{-5} N/m²) or with a total rated acoustic power output of 4kW or greater; *and*

b.2. Any of the following:

b.2.a. Altitude equal to or greater than 15,000 m; or

b.2.b. Temperature range of at least -50° C to +125° C.

9B115 "Specially designed" "production equipment" for the systems, sub-systems, "parts" and "components" controlled by 9A004 to 9A009, 9A011, 9A101, 9A104 to 9A109, 9A111, 9A116 to 9A119.

License Requirements

Reason for Control: MT, AT

Control(s)	*Country Chart (See Supp. No. 1 to part 738).*
MT applies to entire entry	MT Column 1
AT applies to entire entry	AT Column 1

List Based License Exceptions (See Part 740 for a description of all license exceptions)

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

List of Items Controlled

Related Controls: Although items described in ECCNs 9A004 to 9A009, 9A011, 9A101, 9A104 to 9A109; 9A111, 9A116 to 9A119 are "subject to the ITAR" (see 22 CFR parts 120 through 130), the "production equipment" controlled in this entry that is related to these items is subject to the EAR.
Related Definitions: NA.
Items:

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

9B116 "Specially designed" "production facilities" for the systems, sub-systems, "parts" and "components" controlled by 9A004 to 9A009, 9A011, 9A012, 9A101, 9A103 to 9A109, 9A111, 9A116 to 9A119.

License Requirements

Reason for Control: MT, AT

Control(s)	*Country Chart (See Supp. No. 1 to part 738).*
MT applies to entire entry	MT Column 1
AT applies to entire entry	AT Column 1

List Based License Exceptions (See Part 740 for a description of all license exceptions)

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

List of Items Controlled

Related Controls: Although items described in ECCNs 9A004 to 9A009, 9A011, 9A101, 9A104 to 9A109, 9A111, 9A116 to 9A119 are "subject to the ITAR" (see 22 CFR parts 120 through 130), the "production equipment" controlled in this entry that is related to these items is subject to the EAR.
Related Definitions: NA
Items:

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

9B117 Test benches and test stands for solid or liquid propellant rockets, motors or rocket engines, having either of the following characteristics (see List of Items Controlled).

License Requirements

Reason for Control: MT, AT

Control(s)	*Country Chart (See Supp. No. 1 to part 738).*
MT applies to entire entry	MT Column 1
AT applies to entire entry	AT Column 1

List Based License Exceptions (See Part 740 for a description of all license exceptions)

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

List of Items Controlled

Related Controls: See also 9B990
Related Definitions: N/A
Items:

a. The capacity to handle solid or liquid propellant rocket motors or rocket engines having a thrust greater than 68 kN; *or*

b. Capable of simultaneously measuring the three axial thrust components.

9B610 Test, inspection, and production "equipment" and related commodities "specially designed" for the "development" or "production" of commodities enumerated or otherwise described in ECCN 9A610 or USML Category VIII (see List of Items Controlled).

License Requirements

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

Control(s)	*Country Chart (See Supp. No. 1 to part 738).*
NS applies to entire entry	NS Column 1

except 9B610.c	
RS applies to entire entry	RS Column 1
MT applies to 9B610.c	MT Column 1
AT applies to entire entry	AT Column 1
UN applies to entire entry	See § 746.1(b) for UN controls

List Based License Exceptions (See Part 740 for a description of all license exceptions)

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

Special Conditions for STA

STA: Paragraph (c)(2) of License Exception STA (§ 740.20(c)(2) of the EAR) may not be used for any item in 9B610.

List of Items Controlled

Related Controls: USML Category VIII(h)(1) controls parts, components, "accessories", and attachments specially designed for various models of stealth and low-observable aircraft.
Related Definitions: N/A
Items:

a. Test, inspection, and production "equipment" "specially designed" for the "production," "development," operation, installation, maintenance, repair, overhaul, or refurbishing of commodities enumerated or otherwise described in ECCN 9A610 (except 9A610.y) or USML Category VIII, and "parts," "components," "accessories," and "attachments" "specially designed" therefor."

b. Environmental test facilities "specially designed" for the certification, qualification, or testing of commodities enumerated or otherwise described in ECCN 9A610 (except for 9A610.y) or USML Category VIII and "parts," "components," "accessories," and "attachments" "specially designed" therefor.

c. "Production facilities" designed or modified for UAVs or drones that are (i) controlled by either USML paragraph VIII(a) or ECCN 9A610.a and (ii) capable of a range equal to or greater than 300 km.

9B619 Test, inspection, and production "equipment" and related commodities "specially designed" for the "development" or "production" of commodities enumerated or otherwise described in ECCN 9A619 or USML Category XIX.

License Requirements

Reason for Control: NS, RS, AT, UN

Control(s)	*Country Chart (See Supp. No. 1 to part 738).*
NS applies to entire entry except 9B619.y	NS Column 1
RS applies to entire entry except 9B619.y	RS Column 1
AT applies to entire entry	AT Column 1
UN applies to entire entry except 9B619.y	See § 746.1(b) for UN controls

List Based License Exceptions (See Part 740 for a description of all license exceptions)

LVS: $1,500
GBS: N/A
CIV: N/A

Special Conditions for STA

STA: Paragraph (c)(2) of License Exception STA (§ 740.20(c)(2) of the EAR) may not be used for any item in ECCN 9B619.

List of Items Controlled

Related Controls: USML Category XIX(f)(1) controls parts, components, "accessories," equipment, and "attachments" specially designed for various models of stealth and low observable aircraft.
Related Definitions: N/A
Items:

a. Test, inspection, and production "equipment" "specially designed" for the "production," "development," operation, installation, maintenance, repair, overhaul, or refurbishing of commodities enumerated or otherwise described in ECCN 9A619 (except for 9A619.y) or in USML Category XIX, and "parts," "components," "accessories," and "attachments" "specially designed" therefor.

b. Equipment, cells, or stands "specially designed" for testing, analysis and fault isolation of engines, "systems," "components," "parts," "accessories," and "attachments" enumerated or otherwise described in ECCN 9A619 (except for 9A619.y) on the CCL or in Category XIX on the USML.

c. through x. [RESERVED]

y. Bearing pullers "specially designed" for the -"production" or "development" of commodities enumerated or otherwise described in ECCN 9A619 (except for 9A619.y) or USML Category XIX and "parts," "components," "accessories," and "attachments" "specially designed" therefor.

9B990 Vibration test equipment and "specially designed" "parts" and "components," n.e.s.

License Requirements

Reason for Control: AT

Control(s)	*Country Chart (See Supp. No. 1 to part 738).*
AT applies to entire entry	AT Column 1

List Based License Exceptions (See Part 740 for a description of all license exceptions)

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

List of Items Controlled

Related Controls: N/A
Related Definitions: N/A
Items:

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

9B991 "Specially designed" equipment, tooling or fixtures, not controlled by 9B001, as described in the List of Items Controlled, for manufacturing or measuring gas turbine blades, vanes or tip shroud castings as follows (see List of Items Controlled).

License Requirements

Reason for Control: AT

Control(s)	*Country Chart (See Supp. No. 1 to part 738).*
AT applies to entire entry	AT Column 1

List Based License Exceptions (See Part 740 for a description of all license exceptions)

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

List of Items Controlled

Related Controls: N/A
Related Definitions: N/A
Items:

a. Automated equipment using non-mechanical methods for measuring airfoil wall thickness;

b. Tooling, fixtures or measuring equipment for the "laser", water jet or ECM/EDM hole drilling processes controlled by 9E003.c;

c. Ceramic core leaching equipment;

d. Ceramic core manufacturing equipment or tools;

e. Ceramic shell wax pattern preparation equipment;

f. Ceramic shell burn out or firing equipment.

C. "MATERIALS"

9C110 Resin impregnated fiber prepregs and metal coated fiber preforms therefor, for composite structures, laminates and manufactures specified in 9A110, made either with organic matrix or metal matrix utilizing fibrous or filamentary reinforcements having a "specific tensile strength" greater than 7.62 x 10^4 m and a "specific modulus" greater than 3.18 x 10^6 m.

License Requirements

Reason for Control: MT, AT

Control(s)	*Country Chart (See Supp. No. 1 to part 738).*
MT applies to entire entry	MT Column 1
AT applies to entire entry	AT Column 1

List Based License Exceptions (See Part 740 for a description of all license exceptions)

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

List of Items Controlled

Related Controls: 1.) See also 1C010 and 1C210.c. 2.) The only resin impregnated fiber prepregs controlled by entry 9C110 are those using resins with a glass transition temperature (T_g), after cure, exceeding 418 K (145 °C) as determined by ASTM D4065 or national equivalents.
Related Definitions: N/A
Items:

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

9C610 Materials "specially designed" for commodities controlled by 9A610 not elsewhere specified in the CCL or the USML (see List of Items Controlled).

License Requirements

Reason for Control: NS, RS, AT, UN

Control(s)	*Country Chart (See Supp. No. 1 to part 738).*
NS applies to entire entry	NS Column 1
RS applies to entire entry	RS Column 1
AT applies to entire entry	AT Column 1

UN applies to entire entry	See § 746.1(b) for UN controls

List Based License Exceptions (See Part 740 for a description of all license exceptions)

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

Special Conditions for STA

STA: Paragraph (c)(2) of License Exception STA (§ 740.20(c)(2) of the EAR) may not be used for any item in 9C610.

List of Items Controlled

Related Controls: USML subcategory XIII(f) controls structural materials specifically designed, developed, configured, modified, or adapted for defense articles, such as USML subcategory VIII(a) aircraft. See ECCN 0A919 for foreign made "military commodities" that incorporate more than a *de minimis* amount of U.S.-origin "600 series" controlled content.
Related Definitions: N/A
Items:

a. Materials not elsewhere specified in the USML or the CCL and "specially designed" for commodities enumerated or otherwise described in ECCN 9A610 (except 9A610.y).

Note 1: *Materials enumerated elsewhere in the CCL, such as in a CCL Category 1 ECCN, are controlled pursuant to controls of the applicable ECCN.*

Note 2: *Materials "specially designed" for both aircraft enumerated in USML Category VIII and aircraft enumerated in ECCN 9A610 are subject to the controls of this ECCN.*

b. [RESERVED]

9C619 Materials "specially designed" for commodities controlled by 9A619 not elsewhere specified in the CCL or on the USML (see List of Items Controlled).

License Requirements

Reason for Control: NS, RS, AT, UN

Control(s)	*Country Chart (See Supp. No. 1 to part 738).*
NS applies to entire entry	NS Column 1
RS applies to entire entry	RS Column 1
AT applies to entire entry	AT Column 1
UN applies to entire entry	See § 746.1(b) for UN controls

List Based License Exceptions (See Part 740 for a description of all license exceptions)

LVS: $1,500
GBS: N/A
CIV: N/A

Special Conditions for STA

STA: Paragraph (c)(2) of License Exception STA (§ 740.20(c)(2) of the EAR) may not be used for any item in ECCN 9C619.

List of Items Controlled

Related Controls: (1) See USML subcategory XIII(f) for controls on structural materials specifically designed, developed, configured, modified, or adapted for defense articles, such as USML Category XIX engines. (2) See ECCN 0A919 for foreign made "military

commodities" that incorporate more than a *de minimis* amount of U.S.-origin "600 series" controlled content.
Related Definitions: N/A
Items:

a. Materials not elsewhere specified in the CCL or on the USML and "specially designed" for commodities enumerated in or otherwise described in ECCN 9A619 (except for 9A619.y).

Note 1: *Materials enumerated elsewhere in the CCL, such as in a CCL Category 1 ECCN, are controlled pursuant to the controls of the applicable ECCN.*

Note 2: *Materials "specially designed" for both an engine enumerated in USML Category XIX and an engine enumerated in ECCN 9A619 are subject to the controls of this ECCN 9C619.*

b. [RESERVED]

D. "SOFTWARE"

9D001 "Software" "specially designed" or modified for the "development" of equipment or "technology", controlled by 9A (except 9A018, 9A990 or 9A991), 9B (except 9B990 or 9B991) or 9E003.

License Requirements

Reason for Control: NS, MT, AT

Control(s)	*Country Chart (See Supp. No. 1 to part 738).*
NS applies to "software" for equipment controlled by 9A001 to 9A003, 9A012, 9B001 to 9B010, and technology controlled By 9E003.	NS Column 1
MT applies to "software" for equipment controlled by 9A106.a and .b, or 9B116 for MT reasons	MT Column 1
AT applies to entire entry	AT Column 1

Reporting Requirements

See § 743.1 of the EAR for reporting requirements for exports under License Exceptions, Special Comprehensive Licenses, and Validated End-User authorizations.

List Based License Exceptions (See Part 740 for a description of all license exceptions)

CIV: N/A
TSR: N/A .

Special Conditions for STA

STA: License Exception STA may not be used to ship or transmit "software" "specially designed" or modified for the "development" of equipment or "technology", specified by ECCNs 9B001.b. or 9E003.a.1, 9E003.a.2 to a.5, 9E003.a.8, or 9E003.h to any of the destinations listed in Country Group A:6 (See Supplement No.1 to part 740 of the EAR).

List of Items Controlled

Related Controls: (1) "Software" "required" for the "development" of items controlled by 9A004 is "subject to the ITAR" (see 22 CFR parts 120 through 130). 2.) "Software" "required" for the "development" of equipment or "technology" "subject to the ITAR" is also "subject to the ITAR" (see 22 CFR parts 120 through 130).
Related Definitions: N/A

Items:

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

9D002 "Software" "specially designed" or modified for the "production" of equipment controlled by 9A (except 9A018, 9A990, or 9A991) or 9B (except 9B990 or 9B991).

License Requirements

Reason for Control: NS, MT, AT

Control(s)	*Country Chart (See Supp. No. 1 to part 738).*
NS applies to "software" for equipment controlled by 9A001 to 9A003, 9A012, 9B001 to 9B010, and technology controlled by 9E003.	NS Column 1
MT applies to "software" for equipment controlled by 9B116 for MT reasons	MT Column 1
AT applies to entire entry	AT Column 1

Reporting Requirements

See § 743.1 of the EAR for reporting requirements for exports under License Exceptions, Special Comprehensive Licenses, and Validated End-User authorizations.

List Based License Exceptions (See Part 740 for a description of all license exceptions)

CIV: N/A
TSR: N/A.

Special Conditions for STA

STA: License Exception STA may not be used to ship or transmit "software" "specially designed" or modified for the "production" of equipment specified by 9B001.b to any of the destinations listed in Country Group A:6 (See Supplement No.1 to part 740 of the EAR).

List of Items Controlled

Related Controls: (1) "Software" "required" for the "production" of items controlled by 9A004 is "subject to the ITAR" (see 22 CFR parts 120 through 130). (2) "Software" "required" for the "production" of equipment or "technology" "subject to the ITAR" is also "subject to the ITAR" (see 22 CFR parts 120 through 130)
Related Definitions: N/A
Items:

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

9D003 "Software" incorporating "technology" specified by 9E003.h and used in "FADEC Systems" for propulsion systems controlled by 9A (except 9A018, 9A990 or 9A991) or equipment controlled by 9B (except 9B990 or 9B991).

License Requirements

Reason for Control: NS, MT, AT

Control(s)	*Country Chart (See Supp. No. 1 to part 738).*
NS applies to "software" for "use" of "FADEC systems" for equipment controlled by 9A001 to 9A003	NS Column 1

MT applies to "software" required for the "use" of "FADEC systems" for gas turbine engines controlled by 9A101, or 9A106	MT Column 1
AT applies to entire entry	AT Column 1

List Based License Exceptions (See Part 740 for a description of all license exceptions)

CIV: Yes, except N/A for MT
TSR: Yes, except N/A for MT

List of Items Controlled

Related Controls: 1.) See also 9D103. (2) "Software" "required" for the "use" of equipment or "technology" "subject to the ITAR" is also "subject to the ITAR" (see 22 CFR parts 120 through 130).
Related Definitions: N/A
Items:

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

9D004 Other "software" as follows (see List of Items Controlled).

License Requirements

Reason for Control: NS, AT

Control(s)	*Country Chart (See Supp. No. 1 to part 738).*
NS applies to entire entry	NS Column 1
AT applies to entire entry	AT Column 1

List Based License Exceptions (See Part 740 for a description of all license exceptions)

CIV: N/A
TSR: N/A.

Special Conditions for STA

STA: License Exception STA may not be used to ship or transmit software in 9D004.a and 9D004.c to any of the destinations listed in Country Group A:6 (See Supplement No.1 to part 740 of the EAR)

List of Items Controlled

Related Controls: See also 9D104.
Related Definitions: N/A
Items:

a. 2D or 3D viscous "software", validated with wind tunnel or flight test data required for detailed engine flow modelling;

b. "Software" for testing aero gas turbine engines, assemblies, "parts" or "components," "specially designed" to collect, reduce and analyze data in real time and capable of feedback control, including the dynamic adjustment of test articles or test conditions, as the test is in progress;

c. "Software" "specially designed" to control directional solidification or single crystal casting;

d. [RESERVED]

e. "Software" "specially designed" or modified for the operation of "UAVs" and associated systems, equipment and "components," controlled by 9A012;

f. "Software" "specially designed" to design the internal cooling passages of aero gas turbine engine blades, vanes and "tip shrouds";

g. "Software" having all of the following:

g.1. "Specially designed" to predict aero thermal, aeromechanical and combustion conditions in aero gas turbine engines; *and*

g.2. Theoretical modeling predictions of the aero thermal, aeromechanical and combustion conditions, which have been validated with actual turbine engine (experimental or production) performance data.

9D018 "Software" for the "use" of equipment controlled by 9A018.

License Requirements

Reason for Control: NS, RS, AT, UN

Control(s)	*Country Chart (See Supp. No. 1 to part 738).*
NS applies to entire entry	NS Column 1
RS applies to 9A018.b	RS Column 2
AT applies to entire entry	AT Column 1
UN applies to entire entry	See § 746.1(b) for UN controls.

List Based License Exceptions (See Part 740 for a description of all license exceptions)

CIV: N/A
TSR: Yes for Australia, Japan, New Zealand, and NATO countries that are also listed in Country Group B of Supplement No. 1 to part 740 of the EAR.

List of Items Controlled

Related Controls: (1) See ECCN 9D610 for "software" related to aircraft, refuelers, ground equipment, parachutes, harnesses, instrument flight trainers and "parts," "accessories," and "attachments" for the forgoing that, immediately prior to October 15, 2013, were classified under 9A018.a.1, .a.3, .c, .d, .e, or .f. (2) See ECCN 9D619 for "software" related to military trainer aircraft turbo prop engines and "parts" and "components" therefor that, immediately prior to October 15, 2013, were classified under ECCN 9A018.a.2 or .a.3.
Related Definitions: N/A
Items:

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

9D101 "Software" "specially designed" or modified for the "use" of commodities controlled by 9B105, 9B106, 9B116, or 9B117.

License Requirements

Reason for Control: MT, AT

Control(s)	*Country Chart (See Supp. No. 1 to part 738).*
MT applies to entire entry	MT Column 1
AT applies to entire entry	AT Column 1

List Based License Exceptions (See Part 740 for a description of all license exceptions)

CIV: N/A
TSR: N/A

List of Items Controlled

Related Controls: N/A
Related Definitions: N/A
Items:

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

9D103 "Software" "specially designed" for

modelling, simulation or design integration of "missiles", or the subsystems controlled by 9A005, 9A007, 9A009, 9A105, 9A106, 9A107, 9A108, 9A109, 9A116 or 9A119. (This entry is "subject to the ITAR." See 22 CFR parts 120 through 130.)

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

License Requirements

Reason for Control: MT, AT

Control(s)	*Country Chart (See Supp. No. 1 to part 738).*
MT applies to entire entry	MT Column 1
AT applies to entire entry	AT Column 1

List Based License Exceptions (See Part 740 for a description of all license exceptions)

CIV: N/A
TSR: N/A

List of Items Controlled

Related Controls: "Software" for commodities controlled by 9A005 to 9A011, 9A105, 9A106.c, 9A107 to 9A109, 9A111, 9A115, 9A116, 9A117, and 9A118 is "subject to the ITAR" (see 22 CFR parts 120 through 130).
Related Definitions: N/A
Items:

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

9D105 "Software" that coordinates the function of more than one subsystem, "specially designed" or modified for "use" in rockets, missiles, or unmanned aerial vehicles capable of achieving a "range" equal to or greater than 300km. (These items are "subject to the ITAR." See 22 CFR parts 120 through 130.)

9D610 Software "specially designed" for the "development," "production," operation, or maintenance of military aircraft and related commodities controlled by 9A610, equipment controlled by 9B610, or materials controlled by 9C610 (see List of Items Controlled).

License Requirements
Reason for Control: NS, RS, MT, AT, UN

Control(s)	*Country Chart (See Supp. No. 1 to part 738).*
NS applies to entire entry except 9D610.y	NS Column 1
RS applies to entire entry except 9D610.y	RS Column 1
MT applies to software "specially designed" for the operation, installation, maintenance, repair, overhaul, or refurbishing of commodities controlled for MT reasons in 9A610 or 9B610	MT Column 1
AT applies to entire entry	AT Column 1
UN applies to entire entry except 9D610.y	See § 746.1(b) for UN controls

List Based License Exceptions (See Part 740 for a description of all license exceptions)

CIV: N/A
TSR: N/A

Special Conditions for STA

STA: (1) Paragraph (c)(1) of License Exception STA (§ 740.20(c)(1) of the EAR) may not be used for 9D610.b. (2) Paragraph (c)(2) of License Exception STA (§ 740.20(c)(2) of the EAR) may not be used for any software in 9D610.

List of Items Controlled

Related Controls: Software directly related to articles enumerated or otherwise described in USML Category VIII is subject to the control of USML paragraph VIII(i).
Related Definitions: N/A
Items:

a. "Software" (other than software controlled in paragraphs .b or .y of this entry) "specially designed" for the "development," "production," operation, or maintenance of commodities controlled by ECCN 9A610, ECCN 9B610, or ECCN 9C610.

b. "Software" "specially designed" for the "development" or "production" of any of the following:

b.1. Static structural members;

b.2. Exterior skins, removable fairings, non-removable fairings, radomes, access doors and panels, and in-flight opening doors;

b.3. Control surfaces, leading edges, trailing edges, and leading edge flap seals;

b.4. Leading edge flap actuation system commodities (i.e., power drive units, rotary geared actuators, torque tubes, asymmetry brakes, position sensors, and angle gearboxes) "specially designed" for fighter, attack, or bomber aircraft controlled in USML Category VIII;

b.5. Engine inlets and ducting;

b.6. Fatigue life monitoring systems "specially designed" to relate actual usage to the analytical or design spectrum and to compute amount of fatigue life "specially designed" for aircraft controlled by either USML subcategory VIII(a) or ECCN 9A610.a, except for Military Commercial Derivative Aircraft;

b.7. Landing gear, and "parts" and "components" "specially designed" therefor, "specially designed" for use in aircraft weighing more than 21,000 pounds controlled by either USML subcategory VIII(a) or ECCN 9A610.a, except for Military Commercial Derivative Aircraft;

b.8. Conformal fuel tanks and "parts" and "components" "specially designed" therefor;

b.9. Electrical "equipment," "parts," and "components" "specially designed" for electro-magnetic interference (EMI) – i.e., conducted emissions, radiated emissions, conducted susceptibility and radiated susceptibility – protection of aircraft that conform to the requirements of MIL-STD-461;

b.10. HOTAS (Hand-on Throttle and Stick) controls, HOCAS (Hands on Collective and Stick), Active Inceptor Systems (i.e., a combination of Active Side Stick Control Assembly, Active Throttle Quadrant Assembly, and Inceptor Control Unit), rudder pedal assemblies for digital flight control systems, and parts and components "specially designed" therefor;

b.11. Integrated Vehicle Health Management Systems (IVHMS), Condition Based Maintenance (CBM) Systems, and Flight Data Monitoring (FDM) systems;

b.12. Equipment "specially designed" for system prognostic and health management of aircraft;

b.13. Active Vibration Control Systems; or

b.14. Self-sealing fuel bladders "specially designed" to pass a .50 caliber or larger gunfire test (MIL-DTL-5578, MIL-DTL-27422).

c. to x. [RESERVED]

y. Specific "software" "specially designed" for the "development," "production," operation, or maintenance of commodities enumerated in ECCN 9A610.y.

9D619 Software "specially designed" for the "development," "production," operation or maintenance of military gas turbine engines and related commodities controlled by 9A619, equipment controlled by 9B619, or materials controlled by 9C619 (see List of Items Controlled).

License Requirements

Reason for Control: NS, RS, AT, UN

Control(s)	*Country Chart (See Supp. No. 1 to part 738).*
NS applies to entire entry except 9D619.y	NS Column 1
RS applies to entire entry except 9D619.y	RS Column 1
AT applies to entire entry	AT Column 1
UN applies to entire entry except 9D619.y	See § 746.1(b) for UN controls

List Based License Exceptions (See Part 740 for a description of all license exceptions)

CIV: N/A
TSR: N/A

Special Conditions for STA

STA: (1) Paragraph (c)(1) of License Exception STA (§ 740.20(c)(1) of the EAR) may not be used for 9D619.b. (2) Paragraph (c)(2) of License Exception STA (§ 740.20(c)(2) of the EAR) may not be used for any software in ECCN 9D619.

List of Items Controlled

Related Controls: Software directly related to articles enumerated or otherwise described in USML Category XIX is subject to the control of USML paragraph XIX(g).
Related Definitions: N/A
Items:

a. "Software" (other than software controlled in paragraph .b of this entry) "specially designed" for the "development," "production," operation, or maintenance of commodities controlled by ECCN 9A619 (except 9A619.y), ECCN 9B619 (except 9B619.y), or ECCN 9C619.

b. "Software" "specially designed" for the "development" or "production" of any of the following:

b.1. Front, turbine center, and exhaust frames;

b.2. Low pressure compressor (i.e., fan) "components" and "parts" as follows: nose cones, casings, blades, vanes, spools, shrouds, blisks, shafts and disks;

b.3. High pressure compressor "components" and "parts" as follows: casings, blades, vanes, spools, shrouds, blisks, shafts, disks, and impellers;

b.4. Combustor "components" and "parts" as follows: casings, fuel nozzles, swirlers, swirler cups, deswirlers, valve injectors, igniters, diffusers, liners, chambers, cowlings, domes and shells;

b.5. High pressure turbine "components" and "parts" as follows: casings, shafts, disks, blades, vanes, nozzles, and tip shrouds;

b.6. Low pressure turbine "components" and "parts" as follows: casings, shafts, disks, blades, vanes, nozzles, and tip shrouds;

b.7. Augmentor "components" and "parts" as follows: casings, flame holders, spray bars, pilot burners, augmentor fuel controls, flaps (external, convergent, and divergent), guide and syncronization rings, and flame detectors and sensors;

b.8. Mechanical "components" and "parts" as follows: fuel metering units and fuel pump metering units, valves (fuel throttle, main metering, oil flow management), heat exchangers (air/air, fuel/air, fuel/oil), debris monitoring (inlet and exhaust), seals (carbon, labyrinth, brush, balance piston, and knife-edge), permanent magnetic alternator and generator, eddy current sensors;

b.9. Torquemeter assembly (i.e., housing, shaft, reference shaft, and sleeve);

b.10. Digital engine control systems (e.g., Full Authority Digital Engine Controls (FADEC) and Digital Electronic Engine Controls (DEEC)) "specially designed" for gas turbine engines controlled in this ECCN; or

b.11. Engine monitoring systems (i.e., prognostics, diagnostics, and health) "specially designed" for gas turbine engines and components controlled in this ECCN.

c. to x. [RESERVED]

y. Specific "software" "specially designed" for the "development," "production," operation, or maintenance of commodities enumerated in ECCN 9A619.y or 9B619.y.

9D990 "Software", n.e.s., for the "development" or "production" of equipment controlled by 9A990 or 9B990.

License Requirements

Reason for Control: AT

Control(s)	*Country Chart (See Supp. No. 1 to part 738).*
AT applies to "software" for equipment under 9A990 except 9A990.a	AT Column 1
AT applies to "software" for equipment under 9A990.a only	AT Column 2

List Based License Exceptions (See Part 740 for a description of all license exceptions)

CIV: N/A
TSR: N/A

List of Items Controlled

Related Controls: N/A
Related Definitions: N/A
Items:

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

9D991 "Software", for the "development" or "production" of equipment controlled by 9A991 or 9B991.

License Requirements

Reason for Control: AT

Control(s)	*Country Chart (See Supp. No. 1 to part 738).*
AT applies to entire entry	AT Column 1

List Based License Exceptions (See Part 740 for a description of all license exceptions)

CIV: N/A
TSR: N/A

List of Items Controlled

Related Controls: N/A
Related Definitions: N/A
Items:

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

E. "TECHNOLOGY"

Note: *"Development" or "production" "technology" controlled by 9E001 to 9E003 for gas turbine engines remains controlled when used for repair or overhaul. Excluded from 9E001 to 9E003 control are: technical data, drawings or documentation for maintenance activities directly associated with calibration, removal or replacement of damaged or unserviceable line replaceable units, including replacement of whole engines or engine modules.*

9E001 "Technology" according to the General Technology Note for the "development" of equipment or "software", controlled by 9A001.b, 9A004 to 9A012, 9B (except 9B990 or 9B991), or 9D (except 9D990 or 9D991).

License Requirements

Reason for Control: NS, MT, AT

Control(s)	*Country Chart (See Supp. No. 1 to part 738).*
NS applies to "technology" for items controlled by 9A001.b, 9A012, 9B001 to 9B010, 9D001 to 9D004 for NS reasons	NS Column 1
MT applies to "technology" for items controlled by 9B001, 9B002, 9B003, 9B004, 9B005, 9B007, 9B105, 9B106, 9B116, 9B117, 9D001, 9D002, 9D003, and 9D004 for MT reasons	MT Column 1
AT applies to entire entry	AT Column 1

Reporting Requirements

See § 743.1 of the EAR for reporting requirements for exports under License Exceptions, Special Comprehensive Licenses, and Validated End-User authorizations.

List Based License Exceptions (See Part 740 for a description of all license exceptions)

CIV: N/A
TSR: N/A

Special Conditions for STA

STA: License Exception STA may not be used to ship or transmit any technology in this entry to any of the destinations listed in Country Group A:6 (See Supplement No.1 to part 740 of the EAR)

List of Items Controlled

Related Controls: (1) See also 9E101 and 1E002.f (for controls on "technology" for the repair of controlled structures, laminates or materials). (2) The "technology" required for the "development" of equipment controlled by 9A004 is "subject to the ITAR" (see 22 CFR parts 120 through 130). (3) "Technology", required for the "development" of equipment or "software" "subject to the ITAR," is also "subject to the ITAR" (see 22 CFR parts 120 through 130).
Related Definitions: N/A
Items:

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

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).

License Requirements

Reason for Control: NS, MT, AT

Control(s)	*Country Chart (See Supp. No. 1 to part 738).*
NS applies to entire entry	NS Column 1
MT applies to "technology" for equipment controlled by 9B001, 9B002, 9B003, 9B004, 9B005, 9B007, 9B105, 9B106, 9B116, and 9B117 for MT reasons	MT Column 1
AT applies to entire entry	AT Column 1

Reporting Requirements

See § 743.1 of the EAR for reporting requirements for exports under License Exceptions, Special Comprehensive Licenses, and Validated End-User authorizations.

List Based License Exceptions (See Part 740 for a description of all license exceptions)

CIV: N/A
TSR: N/A

Special Conditions for STA

STA: License Exception STA may not be used to ship or transmit any technology in this entry to any of the destinations listed in Country Group A:6 (See Supplement No.1 to part 740 of the EAR).

List of Items Controlled

Related Controls: (1) See also 9E102. (2) See also 1E002.f for 'technology" for the repair of controlled structures, laminates or materials. (3) The "technology" required for the "development" of equipment controlled by 9A004 is "subject to the ITAR" (see 22 CFR parts 120 through 130). (4) "Technology," required for the "development" of equipment or "software" "subject to the ITAR," is also "subject to the ITAR" (see 22 CFR parts 120 through 130).
Related Definitions: N/A
Items:

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

9E003 Other "technology" as follows (see List of Items Controlled).

License Requirements

Reason for Control: NS, SI, AT

Control(s)	*Country Chart (See Supp. No. 1 to part 738).*
NS applies to entire entry	NS Column 1

SI applies to 9E003.a.1 through a.8,.h, .i, and .j. See §742.14 of the EAR for additional information.

AT applies to entire entry AT Column 1

Reporting Requirements

See § 743.1 of the EAR for reporting requirements for exports under License Exceptions, Special Comprehensive Licenses, and Validated End-User authorizations.

List Based License Exceptions (See Part 740 for a description of all license exceptions)

CIV: N/A
TSR: N/A

Special Conditions for STA

STA: License Exception STA may not be used to ship or transmit any technology in 9E003.a.1, 9E003.a.2 to a.5, 9E003.a.8, or 9E003.h to any of the destinations listed in Country Group A:6 (See Supplement No.1 to part 740 of the EAR).

List of Items Controlled

Related Controls: (1) Hot section "technology" specifically designed, modified, or equipped for military uses or purposes, or developed principally with U.S. Department of Defense funding, is "subject to the ITAR" (see 22 CFR parts 120 through 130). (2) "Technology" is subject to the EAR when actually applied to a commercial aircraft engine program. Exporters may seek to establish commercial application either on a case-by-case basis through submission of documentation demonstrating application to a commercial program in requesting an export license from the Department Commerce in respect to a specific export, or in the case of use for broad categories of aircraft, engines, "parts" or "components," a commodity jurisdiction determination from the Department of State.
Related Definitions: N/A
Items:

a. "Technology" "required" for the "development" or "production" of any of the following gas turbine engine "parts," "components" or systems:

a.1. Gas turbine blades, vanes or "tip shrouds", made from directionally solidified (DS) or single crystal (SC) alloys and having (in the 001 Miller Index Direction) a stress-rupture life exceeding 400 hours at 1,273 K (1,000°C) at a stress of 200 MPa, based on the average property values;

a.2. Combustors having any of the following:

a.2.a. Thermally decoupled liners designed to operate at 'combustor exit temperature' exceeding 1,883K (1,610° C);

a.2.b. Non-metallic liners;

a.2.c. Non-metallic shells; *or*

a.2. d. Liners designed to operate at 'combustor exit temperature' exceeding 1,883K (1,610°C) and having holes that meet the parameters specified by 9E003.c;

***Note**: The "required" "technology" for holes in 9E003.a.2 is limited to the derivation of the geometry and location of the holes.*

***Technical Note**: 'Combustor exit temperature' is the bulk average gas path total (stagnation) temperature between the combustor*

exit plane and the leading edge of the turbine inlet guide vane (i.e., measured at engine station T40 as defined in SAE ARP 755A) when the engine is running in a 'steady state mode' of operation at the certificated maximum continuous operating temperature.

***N.B.**: See 9E003.c for "technology" "required" for manufacturing cooling holes.*

a.3. "Parts" or "components" manufactured from any of the following:

a.3.a. Organic "composite" materials designed to operate above 588 K (315°C);

a.3.b. Metal "matrix" "composite", ceramic "matrix", intermetallic or intermetallic reinforced materials, controlled by 1C007; *or*

a.3.c. "Composite" material controlled by 1C010 and manufactured with resins controlled by 1C008;

a.4. Uncooled turbine blades, vanes, "tip-shrouds" or other "parts" or "components," designed to operate at gas path total (stagnation) temperatures of 1,323 K (1,050°C) or more at sea-level static take-off (ISA) in a 'steady state mode' of engine operation;

a.5. Cooled turbine blades, vanes or "tip-shrouds", other than those described in 9E003.a.1, designed to operate at a 'gas path temperature' of 1,693 K (1,420°C) or more;

***Technical Notes**:*

1. 'Gas path temperature' is the bulk average gas path total (stagnation) temperature at the leading edge plane of the turbine component when the engine is running in a 'steady state mode' of operation at the certificated or specified maximum continuous operating temperature.

2. The term 'steady state mode' defines engine operation conditions, where the engine parameters, such as thrust/power, rpm and others, have no appreciable fluctuations, when the ambient air temperature and pressure at the engine inlet are constant.

a.6. Airfoil-to-disk blade combinations using solid state joining;

a.7. Gas turbine engine "parts" or "components" using "diffusion bonding" "technology" controlled by 2E003.b;

a.8. 'Damage tolerant' gas turbine engine rotor "parts" or "components" using powder metallurgy materials controlled by 1C002.b;*or*

***Technical Note**: 'Damage tolerant' "parts" and "components" are designed using methodology and substantiation to predict and limit crack growth.*

a.9. [RESERVED]

***N.B.:** For "FADEC systems", see 9E003.h.*

a.10. [RESERVED]

***N.B.**: For adjustable flow path geometry, see 9E003.i.*

a.11. Hollow fan blades;

b. "Technology" "required" for the "development" or "production" of any of the following:

b.1. Wind tunnel aero-models equipped with non-intrusive sensors capable of transmitting data from the sensors to the data acquisition system; *or*

b.2. "Composite" propeller blades or propfans, capable of absorbing more than 2,000 kW at flight speeds exceeding Mach 0.55;

c. "Technology" "required" for manufacturing

cooling holes, in gas turbine engine "parts" or "components" incorporating any of the "technologies" specified by 9E003.a.1, 9E003.a.2 or 9E003.a.5, and having any of the following:

c.1. Having all of the following:

c.1.a. Minimum 'cross-sectional area' less than 0.45 mm^2;

c.1.b. 'Hole shape ratio' greater than 4.52; *and*

c.1.c. 'Incidence angle' equal to or less than 25°; *or*

c.2. Having all of the following:

c.2.a. Minimum 'cross-sectional area' less than 0.12 mm^2;

c.2.b. 'Hole shape ratio' greater than 5.65; *and*

c.2.c. 'Incidence angle' more than 25°;

***Note**: 9E003.c does not apply to "technology" for manufacturing constant radius cylindrical holes that are straight through and enter and exit on the external surfaces of the component.*

***Technical Notes**:*

1. For the purposes of 9E003.c, the 'cross-sectional area' is the area of the hole in the plane perpendicular to the hole axis.

2. For the purposes of 9E003.c, 'hole shape ratio' is the nominal length of the axis of the hole divided by the square root of its minimum 'cross-sectional area'.

3. For the purposes of 9E003.c, 'incidence angle' is the acute angle measured between the plane tangential to the airfoil surface and the hole axis at the point where the hole axis enters the airfoil surface.

4. Techniques for manufacturing holes in 9E003.c include "laser", water jet, Electro-Chemical Machining (ECM) or Electrical Discharge Machining (EDM) methods.

d. "Technology" "required" for the "development" or "production" of helicopter power transfer systems or tilt rotor or tilt wing "aircraft" power transfer systems;

e. "Technology" for the "development" or "production" of reciprocating diesel engine ground vehicle propulsion systems having all of the following:

e.1. 'Box volume' of 1.2 m^3 or less;

e.2. An overall power output of more than 750 kW based on 80/1269/EEC, ISO 2534 or national equivalents; *and*

e.3. Power density of more than 700 kW/m^3 of 'box volume';

***Technical Note:** 'Box volume' is the product of three perpendicular dimensions measured in the following way:*

Length: The length of the crankshaft from front flange to flywheel face;

Width: The widest of any of the following:

a. The outside dimension from valve cover to valve cover;

b. The dimensions of the outside edges of the cylinder heads; or

c. The diameter of the flywheel housing;

Height: The largest of any of the following:

a. The dimension of the crankshaft center-line to the top plane of the valve cover (or cylinder head) plus twice the stroke; or

b. The diameter of the flywheel housing.

f. "Technology" "required" for the "production" of "specially designed" "parts" or "components" for high output diesel engines, as follows:

f.1. "Technology" "required" for the "production" of engine systems having all of the following "parts" and "components" employing ceramics materials controlled by 1C007:

f.1.a Cylinder liners;

f.1.b. Pistons;

f.1.c. Cylinder heads; *and*

f.1.d. One or more other "part" or "component" (including exhaust ports, turbochargers, valve guides, valve assemblies or insulated fuel injectors);

f.2. "Technology" "required" for the "production" of turbocharger systems with single-stage compressors and having all of the following:

f.2.a. Operating at pressure ratios of 4:1 or higher;

f.2.b. Mass flow in the range from 30 to 130 kg per minute; *and*

f.2.c. Variable flow area capability within the compressor or turbine sections;

f.3. "Technology" "required" for the "production" of fuel injection systems with a "specially designed" multifuel (e.g., diesel or jet fuel) capability covering a viscosity range from diesel fuel (2.5 cSt at 310.8 K (37.8°C)) down to gasoline fuel (0.5 cSt at 310.8 K (37.8°C)) and having all of the following:

f.3.a. Injection amount in excess of 230 mm^3 per injection per cylinder; *and*

f.3.b. Electronic control features "specially designed" for switching governor characteristics automatically depending on fuel property to provide the same torque characteristics by using the appropriate sensors;

g. "Technology" "required" for the development" or "production" of 'high output diesel engines' for solid, gas phase or liquid film (or combinations thereof) cylinder wall lubrication and permitting operation to temperatures exceeding 723 K (450°C), measured on the cylinder wall at the top limit of travel of the top ring of the piston;

***Technical Note**: 'High output diesel engines' are diesel engines with a specified brake mean effective pressure of 1.8 MPa or more at a speed of 2,300 r.p.m., provided the rated speed is 2,300 r.p.m. or more.*

h. "Technology" for gas turbine engine "FADEC systems" as follows:

h.1. "Development" "technology" for deriving the functional requirements for the "parts" or "components" necessary for the "FADEC system" to regulate engine thrust or shaft power (e.g., feedback sensor time constants and accuracies, fuel valve slew rate);

h.2. "Development" or "production" "technology" for control and diagnostic "parts" or "components" unique to the "FADEC system" and used to regulate engine thrust or shaft power;

h.3. "Development" "technology" for the control law algorithms, including "source code", unique to the "FADEC system" and used to regulate engine thrust or shaft power;

Note: *9E003.h does not apply to technical data related to engine aircraft integration required by the civil aviation certification authorities to be published for general airline use (e.g., installation manuals, operating instructions, instructions for continued airworthiness) or interface functions (e.g., input/output processing, airframe thrust or shaft power demand).*

i. "Technology" for adjustable flow path systems designed to maintain engine stability for gas generator turbines, fan or power turbines, or propelling nozzles, as follows:

i.1. "Development" "technology" for deriving the functional requirements for the "parts" or "components" that maintain engine stability;

i.2. "Development" or "production" "technology" for "parts" or "components" unique to the adjustable flow path system and that maintain engine stability;

i.3. "Development" "technology" for the control law algorithms, including "source code", unique to the adjustable flow path system and that maintain engine stability;

Note: *9E003.i does not apply to "development" or "production" "technology" for any of the following:*

a. Inlet guide vanes;
b. Variable pitch fans or prop-fans;
c. Variable compressor vanes;
d. Compressor bleed valves; or
e. Adjustable flow path geometry for reverse thrust.

j. "Technology" not otherwise controlled in 9E003.a.1 through a.8, a.10, and .h and used in the "development", "production", or overhaul of hot section "parts" or "components" of civil derivatives of military engines controlled on the U.S. Munitions List.

9E018 "Technology" for the "development", "production", or "use" of equipment controlled by 9A018.

License Requirements

Reason for Control: NS, RS, AT, UN

Control(s)	*Country Chart (See Supp. No. 1 to part 738).*
NS applies to entire entry	NS Column 1
RS applies to 9A018.b	RS Column 2
AT applies to entire entry	AT Column 1
UN applies to entire entry	See § 746.1(b) for UN controls.

List Based License Exceptions (See Part 740 for a description of all license exceptions)

CIV: N/A
TSR: Yes for Australia, Japan, New Zealand, and NATO countries that are also listed in Country Group B of Supplement No. 1 to part 740 of the EAR.

List of Items Controlled

Related Controls: (1) See ECCN 9E610 for "technology" related to aircraft, refuelers, ground equipment, parachutes, harnesses, instrument flight trainers and "parts," "accessories," and "attachments" for the forgoing that, immediately prior to October 15, 2013, were classified under 9A018.a.1, .a.3, .c, .d, .e, or .f. (2) See ECCN 9E619 for "technology" related to military trainer aircraft turbo prop engines and "parts" and "components" therefor that, immediately prior to October 15, 2013, were classified

under ECCN 9A018.a.2 or .a.3.
Related Definitions: N/A
Items:

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

9E101 "Technology" according to the General Technology Note for the "development," "production," or "use" of commodities or software controlled by 9A012 (for MT controlled commodities only), 9A101, 9A103 to 9A111, 9A115 to 9A119, 9C110, 9D101, 9D103, 9D104 or 9D105.

License Requirements

Reason for Control: MT, AT

Control(s)	*Country Chart (See Supp. No. 1 to part 738).*
MT applies to entire entry	MT Column 1
AT applies to entire entry	AT Column 1

List Based License Exceptions (See Part 740 for a description of all license exceptions)

CIV: N/A
TSR: N/A

List of Items Controlled

Related Controls: "Technology" controlled by 9E101 for items in 9A101.b, 9A104 to 9A111, 9A115 to 9A119, 9D103, and 9D105 is "subject to the ITAR" (see 22 CFR parts 120 through 130).
Related Definitions: N/A
Items:

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

9E102 "Technology" according to the General Technology Note 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, 9B105, 9B106, 9B115, 9B116, 9B117, 9D101, 9D103, 9D104 or 9D105.

License Requirements

Reason for Control: MT, AT

Control(s)	*Country Chart (See Supp. No. 1 to part 738).*
MT applies to entire entry	MT Column 1
AT applies to entire entry	AT Column 1

List Based License Exceptions (See Part 740 for a description of all license exceptions)

CIV: N/A
TSR: N/A

List of Items Controlled

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 commodities or software "subject to the ITAR" (see 22 CFR parts 120 through 130) in 9A004 to 9A011, 9A101.b, 9A104, 9A105, 9A106.a to .c, 9A107 to 9A111, 9A115 to 9A119, 9B115, 9B116, 9D103, specified software in 9D104, and 9D105 is "subject to the ITAR" (see 22 CFR parts 120 through 130).
Related Definitions: N/A
Items:

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

9E610 Technology "required" for the "development," "production," operation, installation, maintenance, repair, overhaul, or refurbishing of military aircraft and related commodities controlled by 9A610, equipment controlled by 9B610, materials controlled by 9C610, or software controlled by 9D610 (see List of Items Controlled).

License Requirements

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

Control(s)	*Country Chart (See Supp. No. 1 to part 738).*
NS applies to entire entry except 9E610.y	NS Column 1
RS applies to entire entry except 9E610.y	RS Column 1
MT applies to "technology" "required" for the "development," "production," operation, installation, maintenance, repair, overhaul, or refurbishing of commodities or software controlled for MT reasons in 9A610, 9B610, or 9D610 for MT reasons	MT Column 1
AT applies to entire entry	AT Column 1
UN applies to entire entry except 9E610.y	See § 746.1(b) for UN controls

List Based License Exceptions (See Part 740 for a description of all license exceptions)

CIV: N/A
TSR: N/A

Special Conditions for STA

STA: (1) Paragraph (c)(1) of License Exception STA (§ 740.20(c)(1) of the EAR) may not be used for 9E610.b. (2) Paragraph (c)(2) of License Exception STA (§ 740.20(c)(2) of the EAR) may not be used for any technology in 9E610.

List of Items Controlled

Related Controls: Technical data directly related to articles enumerated or otherwise described in USML Category VIII are subject to the control of USML paragraph VIII(i).

Related Definitions: N/A

Items:

a. "Technology" (other than technology controlled by paragraphs .b or .y of this entry) "required" for the "development," "production," operation, installation, maintenance, repair, overhaul, or refurbishing of commodities or software controlled by ECCN 9A610, 9B610, 9C610, or 9D610.

Note: *"Build-to-print technology" "required" for the "production" of items described in paragraphs b.1 through b.15 of this entry is classified under 9E610.a.*

b. "Technology" (other than "build-to-print technology") "required" for the "development" or "production" of any of the following:

b.1. Static structural members;

b.2. Exterior skins, removable fairings, non-removable fairings, radomes, access doors and panels, and in-flight opening doors;

b.3. Control surfaces, leading edges, trailing edges, and leading edge flap seals;

b.4. Leading edge flap actuation system commodities (i.e., power drive units, rotary geared actuators, torque tubes, asymmetry brakes, position sensors, and angle gearboxes)

"specially designed" for fighter, attack, or bomber aircraft controlled in USML Category VIII;

b.5. Engine inlets and ducting;

b.6. Fatigue life monitoring systems "specially designed" to relate actual usage to the analytical or design spectrum and to compute amount of fatigue life "specially designed" for aircraft controlled by either USML subcategory VIII(a) or ECCN 9A610.a, except for Military Commercial Derivative Aircraft;

b.7. Landing gear, and "parts" and "components" "specially designed" therefor, "specially designed" for use in aircraft weighing more than 21,000 pounds controlled by either USML subcategory VIII(a) or ECCN 9A610.a, except for Military Commercial Derivative Aircraft;

b.8. Conformal fuel tanks and "parts" and "components" "specially designed" therefor;

b.9. Electrical "equipment," "parts," and "components" "specially designed" for electro-magnetic interference (EMI) – i.e., conducted emissions, radiated emissions, conducted susceptibility and radiated susceptibility – protection of aircraft that conform to the requirements of MIL-STD-461;

b.10. HOTAS (Hand-on Throttle and Stick) controls, HOCAS (Hands on Collective and Stick), Active Inceptor Systems (i.e., a combination of Active Side Stick Control Assembly, Active Throttle Quadrant Assembly, and Inceptor Control Unit), rudder pedal assemblies for digital flight control systems, and parts and components "specially designed" therefor;

b.11. Integrated Vehicle Health Management Systems (IVHMS), Condition Based Maintenance (CBM) Systems, and Flight Data Monitoring (FDM) systems;

b.12. Equipment "specially designed" for system prognostic and health management of aircraft;

b.13. Active Vibration Control Systems; or

b.14. Self-sealing fuel bladders "specially designed" to pass a .50 caliber or larger gunfire test (MIL-DTL-5578, MIL-DTL-27422).

c. through x. [RESERVED]

y. Specific "technology" "required" for the "production," "development," operation, installation, maintenance, repair, overhaul, or refurbishing of commodities or software enumerated in ECCN 9A610.y or 9D610.y.

9E619 "Technology" "required" for the "development," "production," operation, installation, maintenance, repair, overhaul, or refurbishing of military gas turbine engines and related commodities controlled by 9A619, equipment controlled by 9B619, materials controlled by 9C619, or software controlled by 9D619 (see List of Items Controlled).

License Requirements

Reason for Control: NS, RS, AT, UN

Control(s)	*Country Chart (See Supp. No. 1 to part 738).*
NS applies to entire entry except 9E619.y	NS Column 1
RS applies to entire entry except 9E619.y	RS Column 1
AT applies to entire entry	AT Column 1
UN applies to entire entry except 9E619.y	See § 746.1(b) for UN controls

List Based License Exceptions (See Part 740 for a description of all license exceptions)

CIV: N/A
TSR: N/A

Special Conditions for STA

STA: (1) Paragraph (c)(1) of License Exception STA (§ 740.20(c)(1) of the EAR) may not be used for 9E619.b. or .c. (2) Paragraph (c)(2) of License Exception STA (§ 740.20(c)(2) of the EAR) may not be used for any technology in ECCN 9E619.

List of Items Controlled

Related Controls: (1) Technical data directly related to articles enumerated or otherwise described in USML Category XIX are subject to the control of USML Category XIX(g).(2) Technology described in ECCN 9E003 is controlled by that ECCN.
Related Definitions: N/A
Items:

a. "Technology" (other than "technology" controlled by paragraphs .b and .c of this entry) "required" for the "development," "production," operation, installation, maintenance, repair, overhaul, or refurbishment of items controlled by ECCN 9A619 (except 9A619.y), ECCN 9B619 (except 9B619.y), ECCN 9C619, or ECCN 9D619 (except 9D619.y).

Note: *"Build-to-print technology" "required" for the "production" of items described in paragraphs b.1 through b.9 of this entry is classified under 9E619.a.*

b. "Technology" (other than "build-to-print technology") "required" for the "development" or "production" of any of the following:

b.1. Front, turbine center, and exhaust frames;

b.2. Low pressure compressor (i.e., fan) "components" and "parts" as follows: nose cones and casings;

b.3. High pressure compressor "components" and "parts" as follows: casings;

b.4. Combustor "components" and "parts" as follows: casings, fuel nozzles, swirlers, swirler cups, deswirlers, valve injectors, and igniters;

b.5. High pressure turbine "components" and "parts" as follows: casings;

b.6. Low pressure turbine "components" and "parts" as follows: casings;

b.7. Augmentor "components" and "parts" as follows: casings, flame holders, spray bars, pilot burners, augmentor fuel controls, flaps (external, convergent, and divergent), guide and syncronization rings, and flame detectors and sensors;

b.8. Mechanical "components" and "parts" as follows: fuel metering units and fuel pump metering units, valves (fuel throttle, main metering, oil flow management), heat exchangers (air/air, fuel/air, fuel/oil), debris monitoring (inlet and exhaust), seals (carbon, labyrinth, brush, balance piston, and "knife-edge"), permanent magnetic alternator and generator, eddy current sensors; or

b.9. Torquemeter assembly (i.e., housing, shaft, reference shaft, and sleeve).

c. "Technology" "required" for the "development" or "production" of any of the following:

c.1. Low pressure compressor (i.e., fan) "components" and "parts" as follows: blades, vanes, spools, shrouds, blisks, shafts and disks;

c.2. High pressure compressor "components" and "parts" as follows: blades, vanes, spools,

shrouds, blisks, shafts, disks, and impellers;

c.3. Combustor "components" and "parts" as follows: diffusers, liners, chambers, cowlings, domes and shells;

c.4. High pressure turbine "components" and "parts" as follows: shafts and disks, blades, vanes, nozzles, tip shrouds;

c.5. Low pressure turbine "components" and "parts" as follows: shafts and disks, blades, vanes, nozzles, tip shrouds;

c.6. Digital engine control systems (e.g., Full Authority Digital Engine Controls (FADEC) and Digital Electronic Engine Controls (DEEC)) "specially designed" for gas turbine engines controlled in this ECCN; or

c.7. Engine monitoring systems (i.e., prognostics, diagnostics, and health) "specially designed" for gas turbine engines and components controlled in this ECCN.

d. through x. [RESERVED]

y. Specific "technology" "required" for the "development," "production," operation, installation, maintenance, repair, overhaul, or refurbishment of commodities controlled by 9A619.y or 9B619.y, or "software" controlled by ECCN 9D619.y.

9E990 "Technology", n.e.s., for the "development" or "production" or "use" of equipment controlled by 9A990 or 9B990.

License Requirements

Reason for Control: AT

Control(s)	*Country Chart (See Supp. No. 1 to part 738).*
AT applies to "technology" for equipment under 9A990 and 9B990 except 9A990.a	AT Column 1
AT applies to "technology" for equipment under 9A990.a only	AT Column 2

List Based License Exceptions (See Part 740 for a description of all license exceptions)

CIV: N/A
TSR: N/A

List of Items Controlled

Related Controls: N/A
Related Definitions: N/A
Items:

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

9E991 "Technology", for the "development", "production" or "use" of equipment controlled by 9A991 or 9B991.

License Requirements

Reason for Control: AT

Control(s)	*Country Chart (See Supp. No. 1 to part 738).*
AT applies to entire entry	AT Column 1

List Based License Exceptions (See Part 740 for a description of all license exceptions)

CIV: N/A
TSR: N/A

List of Items Controlled

Related Controls: N/A

Related Definitions: N/A
Items:

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

9E993 Other "technology", not described by 9E003, as follows (see List of Items Controlled).

License Requirements

Reason for Control: AT

Control(s)	*Country Chart (See Supp. No. 1 to part 738).*
AT applies to entire entry	AT Column 1

List Based License Exceptions (See Part 740 for a description of all license exceptions)

CIV: N/A
TSR: N/A

List of Items Controlled

Related Controls: N/A
Related Definitions: N/A
Items:

a. Rotor blade tip clearance control systems employing active compensating casing "technology" limited to a design and development data base; *or*

b. Gas bearing for turbine engine rotor assemblies.

EAR99 Items subject to the EAR that are *not* elsewhere specified in this CCL Category *or* in any other category in the CCL are designated by the number *EAR99*.