

or from metal "matrix" "composite", ceramic "matrix", intermetallic or intermetallic reinforced materials embargoed by 1011.2. or 1013.7.;

5. Uncooled turbine blades, vanes, tip-shrouds or other components designed to operate at gas path temperatures of 1,323 K (1,050°C) or more;
6. Cooled turbine blades, vanes or tip-shrouds, other than those described in 1095.3.a.1. and 2., exposed to gas path temperatures of 1,643 K (1,370°C) or more;
7. Airfoil-to-disk blade combinations using solid state joining;
8. Gas turbine engine components using "diffusion bonding" technology embargoed by 1025.3.b.;
9. Damage tolerant gas turbine engine rotating components using powder metallurgy materials embargoed by 1013.2.b.;
10. FADEC for gas turbine and combined cycle engines and their related diagnostic components, sensors and specially designed components;
11. Adjustable flow path geometry and associated control systems for:
 - a. Gas generator turbines;
 - b. Fan or power turbines;
 - c. Propelling nozzles;

NOTES:

1. Adjustable flow path geometry and associated control systems do not include inlet guide vanes, variable pitch fans, variable stators or bleed valves for compressors.
2. 9.e.3.a.11. does not embargo "development" or "production" technology for adjustable flow path geometry for reverse thrust.
12. Rotor blade tip clearance control systems employing active compensating casing technology limited to a design and development data base;
13. Gas bearings for gas turbine engine rotor assemblies;
14. Wide chord hollow fan blades without part-span support;

1095. 3. b. Technology "required" for the "development" or "production" of:
1. Wind tunnel aero-models equipped with non-intrusive sensors capable of transmitting data from the sensors to the data acquisition system;
 2. "Composite" propeller blades or propfans capable of absorbing more than 2,000 kW at flight speeds exceeding Mach 0.55;

1095. 3. c. Technology "required" for the "development" or "production" of gas turbine engine components using "laser", water jet or ECM/EDM hole drilling processes to produce holes with:

1. a. Depths more than four times their diameter;
- b. Diameters less than 0.76 mm; and
- c. Incidence angles equal to or less than 25°; or
2. a. Depths more than five times their diameter;
- b. Diameters less than 0.4 mm; and
- c. Incidence angles of more than 25°;

Technical Note:

For the purposes of 1095.3.c., incidence angle is measured from a plane tangential to the airfoil surface at the point where the hole axis enters the airfoil surface.

1095. 3. d. Technology "required" for the "development" or "production" of helicopter power transfer systems or tilt rotor or tilt wing "aircraft" power transfer systems:
1. Capable of loss-of-lubrication operation for 30 minutes or more; or
 2. Having an input power-to-weight ratio equal to or more than 8.87 kW/kg.

1095. 3. e. 1. Technology for the "development" or "production" of reciprocating diesel engine ground vehicle propulsion systems having all of the following:
- a. A box volume of 1.2 m³ or less;
 - b. An overall power output of more than 750 kW based on 80/1269/EEC, ISO 2534 or national equivalents; and
 - c. A power density of more than 700 kW/m³ of box volume;

Technical Note:

Box volume: 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 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 the following:

- a. The dimension of the crankshaft centre-line to the top plane of the valve cover (or cylinder head) plus twice the stroke; or
- b. The diameter of the flywheel housing.

1095. 3. e. 2. Technology "required" for the "production" of specially designed components, as follows, for high output diesel engines:

- a. Technology "required" for the "production" of engine systems having all of the following components employing ceramics materials embargoed by 1013.7:
 1. Cylinder liners;
 2. Pistons;
 3. Cylinder heads; and
 4. One or more other components (including exhaust ports, turbochargers, valve guides, valve assemblies or insulated fuel injectors);
- b. Technology "required" for the "production" of turbocharger systems, with single-stage compressors having all of the following:
 1. Operating at pressure ratios of 4:1 or higher;
 2. A mass flow in the range from 30 to 130 kg per minute; and
 3. Variable flow area capability within the compressor or turbine sections;
- c. 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)), having both of the following:
 1. Injection amount in excess of 230 mm³ per injection per cylinder; and
 2. Specially designed electronic control features for switching governor characteristics automatically depending on fuel property to provide the same torque characteristics by using the appropriate sensors;

1095. 3. e. 3. 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, 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: 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.

NOTES:

1. Governments may permit, as administrative exceptions, the shipment to the Czech Republic, Poland, and Slovak Republic of everything embargoed by this Category except:
 - a. "Spacecraft", space launch vehicles and components embargoed by 1091.4. to 1091.10.;
 - b. Test facilities or equipment embargoed by Category 1092.1, 1092.2., 1092.3., 1092.5. or 1092.8;
 - c. "Software" specially designed and technology "required" for the equipment described in a. or b. embargoed by 1094 or 1095.
 - d. Other technology embargoed by 1095.3.a. and "software" specially designed therefor embargoed by 1094.
2. Governments may permit, as administrative exceptions, the shipment of marine gas turbine engines embargoed by 1091.2., for installation in civil marine vessels for civil end-use, provided their specific fuel consumption exceeds 0.23 kg/kWh and their continuous ISO rating is less than 20,000 kW.