

2. A specific tensile strength exceeding 23.5×10^4 m;

1013. 10. b. Carbon "fibrous or filamentary materials" with:
1. A specific modulus exceeding 12.7×10^6 m; and
2. A specific tensile strength exceeding 23.5×10^4 m;

Technical Note:

Properties for materials described in 1013.10.b. should be determined using SACMA recommended methods SRM 12 to 17, or national equivalent tow tests, such as Japanese Industrial Standard JIS-R-7601, Paragraph 6.6.2., and based on lot average.

NOTE:

1013.10.b. does not embargo fabric made from "fibrous or filamentary materials" for the repair of aircraft structures or laminates, in which the size of individual sheets does not exceed 50 cm x 90 cm.

1013. 10. c. Inorganic "fibrous or filamentary materials" with:
1. A specific modulus exceeding 2.54×10^6 m; and
2. A melting, decomposition or sublimation point exceeding 1,922 K (1,649°C) in an inert environment;

NOTE:

1013.10.c. does not embargo:

1. Discontinuous, multiphase, polycrystalline alumina fibres in chopped fibre or random mat form, containing 3 weight percent or more silica, with a specific modulus of less than 10×10^6 m;
2. Molybdenum and molybdenum alloy fibres;
3. Boron fibres;
4. Discontinuous ceramic fibres with a melting, decomposition or sublimation point lower than 2,043 K (1,770°C) in an inert environment.

1013. 10. d. "Fibrous or filamentary materials":
1. Composed of any of the following:
a. Polyetherimides embargoed by 1013.8.a; or
b. Materials embargoed by 1013.8.b., c., d., e. or f.; or
2. Composed of materials embargoed by 1013.10.d.1.a. or b. and "commingled" with other fibres embargoed by 1013.10.a., b. or c.;

1013. 10. e. Resin- or pitch-impregnated fibres (prepregs), metal or carbon-coated fibres (preforms) or "carbon fibre preforms", as follows:

1. Made from "fibrous or filamentary materials" embargoed by 1013.10.a., b. or c.;
2. Made from organic or carbon "fibrous or filamentary materials":
 - a. With a specific tensile strength exceeding 17.7×10^4 m;
 - b. With a specific modulus exceeding 10.15×10^6 m;
 - c. Not embargoed by 1013.10.a. or b.; and
 - d. When impregnated with materials embargoed by 1013.8. or 1013.9.b., or with phenolic or epoxy resins, having a glass transition temperature (T_g) exceeding 383 K (110°C) ;

NOTE:

1013.10.e. does not embargo epoxy resin matrix impregnated carbon "fibrous or filamentary materials" (prepregs) for the repair of aircraft structures or laminates, in which the size of individual sheets of prepreg does not exceed 50 cm x 90 cm.

1013. 10. Technical Notes:

1. Specific modulus: Young's modulus in pascals, equivalent to N/m^2 divided by specific weight in N/m^3 , measured at a temperature of (296 ± 2) K ($(23 \pm 2)^\circ C$) and a relative humidity of $(50 \pm 5)\%$.
2. Specific tensile strength: ultimate tensile strength in pascals, equivalent to N/m^2 divided by specific weight in N/m^3 , measured at a temperature of (296 ± 2) K ($(23 \pm 2)^\circ C$) and a relative humidity of $(50 \pm 5)\%$.

(See Technical Note 2 to the Atomic Energy List (Group 3)).

1014. SOFTWARE

1014. 1. "Software" specially designed or modified for the "development", "production" or "use" of equipment embargoed by 1012.;
1014. 2. "Software" for the "development" of organic "matrix", metal "matrix" or carbon "matrix" laminates or "composites".

1015. TECHNOLOGY

1015. 1. Technology according to the General Technology Note for the "development" or "production" of equipment or materials embargoed by 1011.1.b., 1011.1.c., 1011.2., 1011.3., 1012. or 1013.;
1015. 2. Other technology:
1015. 2. a. Technology for the "development" or "production" of polybenzothiazoles or polybenzoxazoles;
1015. 2. b. Technology for the "development" or "production" of fluoroelastomer compounds containing at least one vinyl ether monomer;
1015. 2. c. Technology for the design or "production" of the following base materials or non-"composite" ceramic materials:
1015. 2. c. 1. Base materials having all of the following characteristics:
1015. 2. c. 1. a. Any of the following compositions:
1. Single or complex oxides of zirconium and complex oxides of silicon or aluminium;
 2. Single nitrides of boron (cubic crystalline forms);
 3. Single or complex carbides of silicon or boron; or
 4. Single or complex nitrides of silicon;
1015. 2. c. 1. b. Total metallic impurities, excluding intentional additions, of less than:
1. 1,000 ppm for single oxides or carbides; or
 2. 5,000 ppm for complex compounds or single nitrides; and
1015. 2. c. 1. c. 1. Average particle size equal to or less than 5 micrometre and no more than 10% of the particles larger than 10 micrometre; or
NOTE:
For zirconia, these limits are 1 micrometre and 5 micrometre respectively;
1015. 2. c. 1. c. 2. a. Platelets with a length to thickness ratio exceeding 5;
- b. Whiskers with a length to diameter ratio exceeding 10 for diameters less than 2 micrometre; and
- c. Continuous or chopped fibres less than 10 micrometre in diameter;
1015. 2. c. 2. Non-"composite" ceramic materials (except abrasives) composed of the materials described in 1015.2.c.1.;
1015. 2. d. Technology for the "production" of aromatic polyamide fibres;
1015. 2. e. Technology for the installation, maintenance or repair of materials embargoed by 1013.1.;
1015. 2. f. Technology for the repair of "composite" structures, laminates or materials embargoed by 1011.2., C.7.c. or C.7.d.

NOTE:

1015. 2. f. does not embargo technology for the repair of "civil aircraft" structures using carbon "fibrous or filamentary materials" and epoxy resins, contained in aircraft manufacturers' manuals.

NOTE:

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. "Composite" structures or laminates embargoed by 1011.2.a., when specially designed for stealth or space applications, or by 1011.2.b.;
 - b. Filament winding machines embargoed by 1012.1.a.;
 - c. Tape-laying machines embargoed by 1012.1.b.;
 - d. "Fibrous or filamentary materials" embargoed by 1013.10.a., 1013.10.c., 1013.10.d. or 1013.10.e.;
 - e. "Software" specially designed and technology "required" for the equipment or materials described in a., b., c. or d. above, embargoed by 1014 or 1015.

1020. MATERIALS PROCESSING

1021. EQUIPMENT, ASSEMBLIES AND COMPONENTS

1021. Anti-friction bearings or bearing systems, as follows, and components therefor: