1013. 1. a. 3. a. 2. Ceramic materials providing more than 20% echo compared with metal over a bandwidth exceeding ±15% of the centre frequency of the incident energy, and not capable of withstanding temperatures exceeding 800 K (527°C);

b. Tensile strength less than 7 x 10^6 N/m^2; *and*

c. Compressive strength less than 14 x 10^6 N/m^2;

4. Planar absorbers made of sintered ferrite, with:

a. A specific gravity exceeding 4.4; *and*

b. A maximum operating temperature of 548 K (275°C);

1013. 1. b. Materials for absorbing frequencies exceeding 1.5 x 10^{14} Hz but less than 3.7 x 10^{14} Hz and not transparent to visible light;

1013. 1. c. Intrinsically conductive polymeric materials with a bulk electrical conductivity exceeding 10,000 S/m (Siemens per metre) or a sheet (surface) resistivity of less than 100 ohms/square, based on any of the following polymers:

1. Polyaniline;
2. Polypyrrole;
3. Polythiophene;
4. Poly phenylene-vinylene; *or*
5. Poly thienylene-vinylene;

Technical Note:

Bulk electrical conductivity and sheet (surface) resistivity should be determined using ASTM D-257 or national equivalents.

1013. 2. Metal alloys, metal alloy powder or alloyed materials, as follows:

NOTE:

1013.2. does not embargo metal alloys, metal alloy powder or alloyed materials for coating substrates.

1013. 2. a. Metal alloys, as follows:

1. Nickel or titanium-based alloys in the form of aluminides, as follows, in crude or semi-fabricated forms:

a. Nickel aluminides containing 10 weight percent or more aluminium;

b. Titanium aluminides containing 12 weight percent or more aluminium;

1013. 2. a. 2. Metal alloys, as follows, made from metal alloy powder or particulate material embargoed by 1013.2.b.:

a. Nickel alloys with:

1. A stress-rupture life of 10,000 hours or longer at 923 K (650°C) at a stress of 550 MPa; *or*
2. A low cycle fatigue life of 10,000 cycles or more at 823 K (550°C) at a maximum stress of 700 MPa;

b. Niobium alloys with:

1. A stress-rupture life of 10,000 hours or longer at 1,073 K (800°C) at a stress of 400 MPa; *or*
2. A low cycle fatigue life of 10,000 cycles or more at 973 K (700°C) at a maximum stress of 700 MPa;

c. Titanium alloys with:

1. A stress-rupture life of 10,000 hours or longer at 723 K (450°C) at a stress of 200 MPa; *or*
2. A low cycle fatigue life of 10,000 cycles or more at 723 K (450°C) at a maximum stress of 400 MPa;

d. Aluminium alloys with a tensile strength of:

1. 240 MPa or more at 473 K (200°C); *or*
2. 415 MPa or more at 298 K (25°C);

e. Magnesium alloys with a tensile strength of 345 MPa or more and a corrosion rate of less than 1 mm/year in 3% sodium chloride aqueous solution measured in accordance with ASTM standard G-31 or national equivalents;

Technical Notes:

1. The metal alloys in 1013.2.a. are those containing a higher percentage by weight of the stated metal than of any other element.
2. Stress-rupture life should be measured in accordance with ASTM standard E-139 or national equivalents.
3. Low cycle fatigue life should be measured in accordance with ASTM Standard E-606 'Recommended Practice for Constant-Amplitude Low-Cycle Fatigue Testing' or national equivalents. Testing should be axial with an average stress ratio equal to 1 and a stress-concentration factor (K_t) equal to 1. The average stress is defined as maximum stress minus minimum stress divided by maximum stress.

1013. 2. b. Metal alloy powder or particulate material for materials embargoed by 1013.2.a., as follows:

1. Made from any of the following composition systems:

Technical Note:

X in the following equals one or more alloying elements.

a. Nickel alloys (Ni-Al-X, Ni-X-Al) qualified for turbine engine parts or components, i.e. with less than 3 non-metallic particles (introduced during the manufacturing process) larger than 100 micrometre in 10^9 alloy particles;

b. Niobium alloys (Nb-Al-X or Nb-X-Al, Nb-Si-X or Nb-X-Si, Nb-Ti-X or Nb-X-Ti);

c. Titanium alloys (Ti-Al-X or Ti-X-Al);

d. Aluminium alloys (Al-Mg-X or Al-X-Mg, Al-Zn-X or Al-X-Zn, Al-Fe-X or Al-X-Fe); *or*

e. Magnesium alloys (Mg-Al-X or Mg-X-Al); *and*

2. Made in a controlled environment by any of the following processes:

a. "Vacuum atomisation";

b. "Gas atomisation";

c. "Rotary atomisation";

d. "Splat quenching";

e. "Melt spinning" and "comminution";

f. "Melt extraction" and "comminution"; *or*

g. "Mechanical alloying";

c. Alloyed materials, in the form of uncomminuted flakes, ribbons or thin rods produced in a controlled environment by "splat quenching," "melt spinning" or "melt extraction", used in the manufacture of metal alloy powder or particulate material embargoed by 1013.2.b.;

1013. 3. Magnetic metals, of all types and of whatever form, having any of the following characteristics:

a. Initial relative permeability of 120,000 or more and a thickness of 0.05 mm or less ;

Technical Note:

Measurement of initial permeability must be performed on fully annealed materials.

b. Magnetostrictive alloys with:

1. A saturation magnetostriction of more than 5 x 10^{-4}; *or*
2. A magnetomechanical coupling factor (k) of more than 0.8; *or*

c. Amorphous alloy strips with:

1. A composition having a minimum of 75 weight percent of iron, cobalt or nickel; *and*
2. A saturation magnetic induction (B_s) of 1.6 T or more, *and*:

a. A strip thickness of 0.02 mm or less; *or*

b. An electrical resistivity of 2 x 10^{-4} ohm/cm or more;

1013. 4. Uranium titanium alloys or tungsten alloys with a "matrix" based on iron, nickel or copper, with:

a. A density exceeding 17.5 g/cm^3;

b. An elastic limit exceeding 1,250 MPa;

c. An ultimate tensile strength exceeding 1,270 MPa; *and*

d. An elongation exceeding 8%;

1013. 5. "Superconductive" "composite" conductors in lengths exceeding 100 m or with a mass exceeding 100 g, as follows:

a. Multifilamentary "superconductive" "composite" conductors containing one or more niobium-titanium filaments:

1. Embedded in a "matrix" other than a copper or copper- based mixed "matrix"; *or*
2. With a cross-section area less than 0.28 x 10^{-4} mm^2 (6 micrometre in diameter for circular filaments);

b. "Superconductive" "composite" conductors consisting of one or more "superconductive" filaments other than niobium- titanium:

1. With a "critical temperature" at zero magnetic induction exceeding 9.85 K (-263.31°C) but less than 24 K (-249.16°C);