

## 1013.7. con't

- b. Non-"composite" ceramic materials in crude or semi-fabricated form, composed of borides of titanium with a density of 98% or more of the theoretical density;  
**Note:**  
 Item 1013.7.b. does not control abrasives.
7. c. Ceramic-ceramic "composite" materials with a glass or oxide-"matrix" and reinforced with fibres made from any of the following systems:
1. Si-N;
  2. Si-C;
  3. Si-Al-O-N; or
  4. Si-O-N;
- having a specific tensile strength exceeding  $12.7 \times 10^3$  m;
- d. Ceramic-ceramic "composite" materials, with or without a continuous metallic phase, incorporating particles, whiskers or fibres, where carbides or nitrides of silicon, zirconium or boron form the "matrix";
- e. Precursor materials (i.e., special purpose polymeric or metallo-organic materials) for producing any phase or phases of the materials controlled by 1013.7.c., as follows:
1. Polydiorganosilanes (for producing silicon carbide);
  2. Polysilazanes (for producing silicon nitride);
  3. Polycarbosilazanes (for producing ceramics with silicon, carbon and nitrogen components);
- f. Ceramic-ceramic "composite" materials with an oxide or glass "matrix" reinforced with continuous fibres from any of the following systems:
1.  $Al_2O_3$ ; or
  2. Si-C-N.
- Note:**  
 1013.7.f. does not control "composites" containing fibres from these systems with a fibre tensile strength of less than 700 MPa at 1,273 K (1,000° C) or fibre tensile creep resistance of more than 1% creep strain at 100 MPa load and 1,273 K (1,000° C) for 100 hours.
8. Non-fluorinated polymeric substances, as follows:
- a.
    1. Bismaleimides;
    2. Aromatic polyamide-imides;
    3. Aromatic polyimides;
    4. Aromatic polyetherimides having a glass transition temperature ( $T_g$ ) exceeding 513 K (240°C) as measured by the wet method;

**Note:**  
 1013.8.a. does not control non-fusible compression moulding powders or moulded forms.
  - b. Thermoplastic liquid crystal copolymers having a heat distortion temperature exceeding 523 K (250°C) measured according to ASTM D-648, method A, or national equivalents, with a load of 1.82 N/mm<sup>2</sup> and composed of:
    1. Any of the following:
      - a) Phenylene, biphenylene or naphthalene; or
      - b) Methyl, tertiary-butyl or phenyl substituted phenylene, biphenylene or naphthalene; and
    2. Any of the following acids:
      - a) Terephthalic acid;
      - b) 6-hydroxy-2 naphthoic acid; or
      - c) 4-hydroxybenzoic acid;
  - c. Polyarylene ether ketones, as follows:
    1. Polyether ether ketone (PEEK);
    2. Polyether ketone ketone (PEKK);
    3. Polyether ketone (PEK);
    4. Polyether ketone ether ketone ketone (PEKEKK);

- d. Polyarylene ketones;
- e. Polyarylene sulphides, where the arylene group is biphenylene, triphenylene or combinations thereof;
- f. Polybiphenylenethersulphone.

**Technical Note:**

The glass transition temperature ( $T_g$ ) for 1013.8 materials is determined using the method described in ASTM D 3418 using the dry method.

9. Unprocessed fluorinated compounds, as follows:
- a. Copolymers of vinylidene fluoride having 75% or more beta crystalline structure without stretching;
  - b. Fluorinated polyimides containing 10% or more of combined fluorine;
  - c. Fluorinated phosphazene elastomers containing 30% or more of combined fluorine.
10. "Fibrous and filamentary materials" which may be used in organic "matrix", metallic "matrix" or carbon "matrix" "composite" structures or laminates, as follows:
- a. Organic "fibrous or filamentary materials" having all of the following:
    1. A specific modulus exceeding  $12.7 \times 10^6$  m; and
    2. A specific tensile strength exceeding  $23.5 \times 10^4$  m;

**Note:**  
 1013.10.a. does not control polyethylene.
  - b. Carbon "fibrous or filamentary materials", having all of the following:
    1. A specific modulus exceeding  $12.7 \times 10^6$  m; and
    2. A specific tensile strength exceeding  $23.5 \times 10^4$  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 control 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.
  - c. Inorganic "fibrous or filamentary materials", having all of the following:
    1. A specific modulus exceeding  $2.54 \times 10^6$  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 control:

    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  $10 \times 10^6$  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.
  - d. "Fibrous or filamentary materials":
    1. Composed of any of the following:
      - a) Polyetherimides controlled by 1013.8.a; or
      - b) Materials controlled by 1013.8.b. to 1013.8.f.; or
    2. Composed of materials controlled by 1013.10.d.1.a. or 1013.10.d.1.b). and "commingled" with other fibres controlled by 1013.10.a., 1013.10.b. or 1013.10.c.;
  - e. Resin-impregnated or pitch-impregnated fibres (prepregs), metal or carbon-coated fibres (preforms) or "carbon fibre preforms", as follows:
    1. Made from "fibrous or filamentary materials" controlled by 1013.10.a., 1013.10.b. or 1013.10.c.;