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Letter dated 5 September 2017 from the Chair of the Security Council Committee established pursuant to resolution 1718 (2006) addressed to the President of the Security Council

On behalf of the Committee established pursuant to resolution 1718 (2006), I have the honour to transmit herewith the report of the Committee dated 5 September 2017, submitted in accordance with paragraph 5 of Security Council resolution 2371 (2017) (see annex).

I would appreciate it if the present letter and its annex were brought to the attention of the members of the Security Council and issued as a document of the Council.

(*Signed*) Sebastiano **Cardi**
Chair
Security Council Committee established
pursuant to resolution 1718 (2006)

Annex

Report of the Security Council Committee established pursuant to resolution 1718 (2006) prepared in accordance with paragraph 5 of resolution 2371 (2017)

On 5 August 2017, the Security Council, by its resolution 2371 (2017), decided to adjust the measures imposed by paragraph 7 of resolution 2321 (2016) through the designation of additional conventional arms-related items, materials, equipment, goods and technology, and directed the Committee to undertake its tasks to this effect and to report to the Council within 30 days of the adoption of resolution 2371 (2017).

In order to fulfil those tasks, the Committee considered a list of conventional arms-related items, materials, equipment, goods and technology.

On 5 September 2017, the Committee acted in line with the directive of the Security Council and approved the following list:

Special materials and related equipment[1]

Systems, equipment and components

"Composite" structures or laminates[i]

1. "Composite" structures or laminates consisting of an organic "matrix" and materials as follows:

(a) Inorganic "fibrous or filamentary materials" that have a "specific modulus" exceeding 2.54×10^6 m and a melting, softening, decomposition or sublimation point exceeding 1,649°C in an inert environment.[ii]

(b) "Fibrous or filamentary materials" having any of the following:

1. Materials composed of aromatic polyetherimides having a glass transition temperature (Tg) exceeding 290°C,

2. Polyarylene ketones,

3. Polyarylene sulphides where the arlylene group is biphenylene, triphenylene or combinations thereof,

4. Polybiphenylenethersulphone having a Tg exceeding 290°C, or

5. Any of the above materials "commingled" with any of the following:

a. Organic "fibrous or filamentary materials", with a "specific modulus" exceeding 12.7×10^6 m and a "specific tensile strength" exceeding 23.5×10^4 m.[iii]

b. Carbon "fibrous or filamentary materials", having a "specific modulus" exceeding 14.65×10^6 m; and specific tensile strength exceeding 26.82×10^4 m.[iv]

c. Inorganic "fibrous or filamentary materials", having a "specific modulus" exceeding 2.54×10^6 m; and a melting, softening, decomposition or sublimation point exceeding 1,649°C in an inert environment.[v]

[1] The agreement of the Committee on the list shall not be considered as a precedent for the future work of Security Council committees, including the Committee established pursuant to resolution 1718 (2006), or for other subsidiary bodies of the Security Council or multilateral mechanisms.

(c) Organic "fibrous or filamentary materials" with a "specific modulus" exceeding 12.7 x 10^6 m and with a "specific tensile strength" exceeding 23.5 x 10^4 m.

(d) Carbon "fibrous or filamentary materials" having a "specific modulus" exceeding 14.65 x 10^6 m and a specific tensile exceeding 26.82 x 10^4 m.

(e) Fully or partially resin-impregnated or pitch-impregnated "fibrous or filamentary materials" (prepregs), metal or carbon-coated "fibrous or filamentary materials" (preforms) or carbon fibre preforms having any of the following "fibrous or filamentary materials" and resins:

1. Inorganic "fibrous or filamentary materials" with a "specific modulus" exceeding 2.54 x 10^6 m and a melting, softening, decomposition or sublimation point exceeding 1,649°C in an inert environment, or

2. Organic or carbon "fibrous or filamentary materials", having all of the following:

a. "Specific modulus" exceeding 10.15 x 10^6 m; and

b. "Specific tensile strength" exceeding 17.7 x 10^4 m; and

3. Resin or pitch, from unprocessed fluorinated compounds such as:

a. Fluorinated polyimides containing 10 per cent by weight or more of combined fluorine;

b. Fluorinated phosphazene elastomers containing 30 per cent by weight or more of combined fluorine; or

4. Phenolic resins with Dynamic Mechanical Analysis glass transition temperature (DMA Tg) equal to, or exceeding, 180°C and having a phenolic resin; or

5. Other resin or pitch with Dynamic Mechanical Analysis glass transition temperature (DMA Tg) equal to, or exceeding, 232°C.[vi]

Metals and alloys[vii]

"Fibrous or filamentary materials" having any of the following:

(a) Materials composed of aromatic polyetherimides having a glass transition temperature (Tg) exceeding 290°C,

(b) Polyarylene ketones,

(c) Polyarylene sulphides where the arylene group is biphenylene, triphenylene or combinations thereof,

(d) Polybiphenylenethersulphone having a Tg exceeding 290°C, or

(e) Any of the above materials commingled with any of the following:

1. Organic "fibrous or filamentary materials", with a "specific modulus" exceeding 12.7 x 10^6 m and "specific tensile strength" exceeding 23.5 x 10^4 m,[viii]

2. Carbon "fibrous or filamentary materials", having a "specific modulus" exceeding 14.65 x 10^6 m and "specific tensile strength" exceeding 26.82 x 10^4 m,[ix]

3. Inorganic "fibrous or filamentary materials", having a "specific modulus" exceeding 2.54 x 10^6 m and melting, softening, decomposition or sublimation point exceeding 1,649°C in an inert environment.[x]

Software

"Software" for the "development" of the materials listed above.

Technology

"Technology" for the "development" or "production" of the equipment or materials listed above.

Test, inspection and production equipment

1. Equipment for the "production" or inspection of "composite" structures or laminates previously specified under the "Composite structures or laminates" and the "metals and alloys" sections of this document; and

2. Specially designed components and accessories to include:

(a) Filament winding machines, of which the motions for positioning, wrapping and winding fibres are coordinated and programmed in three or more "primary servo positioning" axes, specially designed for the manufacture of "composite" structures or laminates, from "fibrous or filamentary materials".

(b) "Tape-laying machines", of which the motions for positioning and laying tape are coordinated and programmed in five or more "primary servo positioning" axes, specially designed for the manufacture of "composite" airframe or missile structures.[xi]

(c) Multidirectional, multidimensional weaving machines or interlacing machines, including adapters and modification kits, specially designed or modified for weaving, interlacing or braiding fibres for "composite" structures.[xii]

(d) Equipment specially designed or adapted for the "production" of reinforcement fibres, as follows:

1. Equipment for converting polymeric fibres (such as polyacrylonitrile, rayon, pitch or polycarbosilane) into carbon fibres or silicon carbide fibres, including special equipment to strain the fibre during heating;

2. Equipment for the chemical vapor deposition of elements or compounds, on heated filamentary substrates, to manufacture silicon carbide fibres;

3. Equipment for the wet-spinning of refractory ceramics (such as aluminium oxide);

4. Equipment for converting aluminium containing precursor fibres into alumina fibres by heat treatment;

5. Equipment for producing prepregs specified in section 10, paragraph "d", under "Materials", by the hot melt method;

6. Non-destructive inspection equipment specially designed for "composite" materials, as follows:

a. X-ray tomography systems for three dimensional defect inspection;

b. Numerically controlled ultrasonic testing machines of which the motions for positioning transmitters or receivers are simultaneously coordinated and programmed in four or more axes to follow the three dimensional contours of the component under inspection.

Materials

1. Everything previously listed under the "Composite structures or laminates" and the "Metals and alloys" sections of this document.

2. Metal alloys, metal alloy powder and alloyed materials including the following:

(a) Aluminides, including:

1. Nickel aluminides containing a minimum of 15 per cent by weight aluminium, a maximum of 38 per cent by weight aluminium and at least one additional alloying element;

2. Titanium aluminides containing 10 per cent by weight or more aluminium and at least one additional alloying element.

(b) Metal alloys made from the powder or particulate material including:

1. Nickel alloys having a stress-rupture life of 10,000 hours or longer at 650°C at a stress of 676 MPa or a low cycle fatigue life of 10,000 cycles or more at 550°C at a maximum stress of 1,095 MPa;

2. Niobium alloys having a stress-rupture life of 10,000 hours or longer at 800°C at a stress of 400 MPa or a low cycle fatigue life of 10,000 cycles or more at 700°C at a maximum stress of 700 MPa;

3. Titanium alloys having a stress-rupture life' of 10,000 hours or longer at 450°C at a stress of 200 MPa or a low cycle fatigue life of 10,000 cycles or more at 450°C at a maximum stress of 400 MPa;

4. Aluminium alloys having a tensile strength of 240 MPa or more at 200°C or a tensile strength of 415 MPa or more at 25°C;

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

6. Metal alloy powder or particulate material, having all of the following and made from any of the following composition systems:

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 µm 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)

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

a. "Vacuum atomization"

b. "Gas atomization"

c. "Rotary atomization"

d. "Splat quenching"

e. "Melt spinning and comminution"

f. “Melt extraction and comminution”

g. “Mechanical alloying”

h. “Plasma atomization”

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

(a) Initial relative permeability of 120,000 or more and a thickness of 0.05 mm or less

(b) Magnetostrictive alloys having any of the following:

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 or “nanocrystalline” alloy strips, having all of the following:

1. A composition having a minimum of 75 per cent by weight of iron, cobalt or nickel;

2. A saturation magnetic induction (Bs) of 1.6 T or more; and any of the following:

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

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

4. Uranium titanium alloys or tungsten alloys with a “matrix” based on iron, nickel or copper, having all of the following:

(a) A density exceeding 17.5 g/cm^3;

(b) An elastic limit exceeding 880 MPa;

(c) An ultimate tensile strength exceeding 1,270 MPa; and

(d) An elongation exceeding 8 per cent.

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

(a) “Superconductive” “composite” conductors containing one or more niobium-titanium “filaments”, having all of the following:

1. Embedded in a “matrix” other than a copper or copper-based mixed “matrix”; and

2. Having a cross-section area less than 0.28 x 10^{-4} mm^2 (6 µm in diameter for circular “filaments”);

(b) “Superconductive” “composite” conductors consisting of one or more “superconductive” “filaments” other than niobium-titanium, having all of the following:

1. A “critical temperature” at zero magnetic induction exceeding -263.31°C; and

2. Remaining in the “superconductive” state at a temperature of -268.96°C when exposed to a magnetic field oriented in any direction perpendicular to the longitudinal axis of conductor and corresponding to a magnetic induction of 12 T with critical current density exceeding 1,750 A/mm^2 on overall cross-section of the conductor.

(c) “Superconductive” “composite” conductors consisting of one or more “superconductive” “filaments”, which remain “superconductive” above -158.16°C

6. Fluids and lubricating materials, as follows:

(a) Lubricating materials containing, as their principal ingredients, any of the following:

1. Phenylene or alkylphenylene ethers or thio-ethers, or their mixtures, containing more than two ether or thio-ether functions or mixtures thereof; or

2. Fluorinated silicone fluids with a kinematic viscosity of less than 5,000 mm^2/s (5,000 centistokes) measured at 25°C;

(b) Damping or flotation fluids having all of the following:

1. Purity exceeding 99.8 per cent;

2. Containing less than 25 particles of 200 µm or larger in size per

3. 100 ml; and

4. Made from at least 85 per cent of any of the following:

a. Dibromotetrafluoroethane (CAS 25497-30-7, 124-73-2, 27336-23-8);

b. Polychlorotrifluoroethylene (oily and waxy modifications only); or

c. Polybromotrifluoroethylene

(c) Fluorocarbon electronic cooling fluids having all of the following:[xiii]

1. Containing 85 per cent by weight or more of any of the following, or mixtures thereof:

a. Monomeric forms of perfluoropolyalkylether-triazines or perfluoroaliphatic-ethers;

b. Perfluoroalkylamines;

c. Perfluorocycloalkanes; or

d. Perfluoroalkanes

e. Density at 298 K (25°C) of 1.5 g/ml or more;

f. In a liquid state at 273 K (0°C); and

g. Containing 60 per cent or more by weight of fluorine

7. Ceramic powders, non-“composite” ceramic materials, ceramic-“matrix” “composite” materials and precursor materials, as follows:

(a) Ceramic powders of single or complex borides of titanium, having total metallic impurities, excluding intentional additions, of less than 5,000 ppm, an average particle size equal to or less than 5 µm and no more than 10 per cent of the particles larger than 10 µm;

(b) Non-“composite” ceramic materials in crude or semi-fabricated form, composed of borides of titanium with a density of 98 per cent or more of the theoretical density;[xiv]

(c) Ceramic-ceramic “composite” materials with a glass or oxide-“matrix” and reinforced with fibres having all of the following:

1. Made from any of the following materials:

a. Si-N;

b. Si-C;

c. Si-A1-O-N; or

d. Si-O-N; and

2. Having a “specific tensile strength” exceeding 12.7 x 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 specified above, 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:[xv]

1. Al_2O_3 (CAS 1344-28-1); or

2. Si-C-N.

8. Non-fluorinated polymeric substances as follows:

(a) Imides as follows:[xvi]

1. Bismaleimides;

2. Aromatic polyamide-imides (PAI) having a “glass transition temperature (Tg)” exceeding 290°C;

3. Aromatic polyimides having a “glass transition temperature (Tg)” exceeding 232°C;

4. Aromatic polyetherimides having a “glass transition temperature (Tg)” exceeding 290° C;

(b) Polyarylene ketones;

(c) Polyarylene sulphides, where the arylene group is biphenylene, triphenylene or combinations thereof;

(d) Polybiphenylenethersulphone having a “glass transition temperature (Tg)” exceeding 290° C.

9. Unprocessed fluorinated compounds as follows:

(a) Fluorinated polyimides containing 10 per cent by weight or more of combined fluorine;

(b) Fluorinated phosphazene elastomers containing 30 per cent by weight or more of combined fluorine.

10. “Fibrous or filamentary materials” as follows:

(a) Organic “fibrous or filamentary materials”, having all of the following:[xvii]

1. “specific modulus” exceeding 12.7 x 10^6 m; and

2. “specific tensile strength” exceeding 23.5 x 10^4 m;

(b) Carbon “fibrous or filamentary materials”, having all of the following:[xviii]

1. “specific modulus” exceeding 14.65 x 10^6 m; and

2. “specific tensile strength” exceeding 26.82 x 10^4 m;

(c) Inorganic “fibrous or filamentary materials”, having all of the following:[xix]

1. “Specific modulus” exceeding 2.54 x 10^6 m; and

2. Melting, softening, decomposition or sublimation point exceeding 1,649°C in an inert environment

(d) “Fibrous or filamentary materials”, having any of the following:

1. Composed of any of the following:

a. Polyetherimides specified in section 8 above

b. Other materials specified in section 8 above

2. Composed of materials specified above and commingled with other fibres specified in section 10.

(e) Fully or partially resin-impregnated or pitch-impregnated fibrous or filamentary materials (prepregs), metal or carbon-coated “fibrous or filamentary materials” (preforms) or carbon fibre preforms, having all of the following:[xx]

1. Having any of the following:

a. Inorganic “fibrous or filamentary materials” specified above

b. Organic or carbon “fibrous or filamentary materials”, having all of the following:

1. “Specific modulus” exceeding 10.15 x 10^6 m; and

2. “Specific tensile strength” exceeding 17.7 x 10^4 m; and

2. Having any of the following:

a. Resin or pitch, specified in previous sections;

b. “Dynamic Mechanical Analysis glass transition temperature (DMA Tg)” equal to or exceeding 180°C and having a phenolic resin; or

c. “Dynamic Mechanical Analysis glass transition temperature (DMA Tg)” equal to or exceeding 232°C and having a resin or pitch, not specified earlier and not being a phenolic resin.

11. Metals and compounds, as follows:[xxi]

(a) Metals in particle sizes of less than 60 µm whether spherical, atomized, spheroidal, flaked or ground, manufactured from material consisting of 99 per cent or more of zirconium, magnesium and alloys thereof;

(b) Boron or boron alloys, with a particle size of 60 µm or less, as follows:

1. Boron with a purity of 85 per cent by weight or more;

2. Boron alloys with a boron content of 85 per cent by weight or more;

(c) Guanidine nitrate (CAS 506-93-4);

(d) Nitroguanidine (NQ) (CAS 556-88-7)

Other technology

“Technology” for the repair of “composite” structures, laminates or materials specified by the “systems, equipment and components” section of this document.[xxii]

Materials processing equipment

Software

"Software" specially designed for the "development" or "production" of equipment as follows:

(a) Machine tools for turning having two or more axes which can be coordinated simultaneously for "contouring control" having any of the following:

1. "Unidirectional positioning repeatability" equal to or less (better) than 0.9 µm along one or more linear axis with a travel length less than 1.0 m; or

2. "Unidirectional positioning repeatability" equal to or less (better) than 1.1 µm along one or more linear axis with a travel length equal to or greater than 1.0 m.

(b) Machine tools for milling having any of the following:

1. Three linear axes plus one rotary axis which can be coordinated simultaneously for "contouring control" having any of the following:

a. "Unidirectional positioning repeatability" equal to or less (better) than 0.9 µm along one or more linear axis with a travel length less than 1.0 m; or

b. "Unidirectional positioning repeatability" equal to or less (better) than 1.1 µm along one or more linear axis with a travel length equal to or greater than 1.0 m.

2. Five or more axes which can be coordinated simultaneously for "contouring control" having any of the following:

(a) "Unidirectional positioning repeatability" equal to or less (better) than 0.9 µm along one or more linear axis with a travel length less than 1.0 m;

(b) "Unidirectional positioning repeatability" equal to or less (better) than 1.4 µm along one or more linear axis with a travel length equal to or greater than 1 m and less than 4 m;

(c) "Unidirectional positioning repeatability" equal to or less (better) than 6.0 µm along one or more linear axis with a travel length equal to or greater than 4 m;

3. A "unidirectional positioning repeatability" for jig boring machines equal to or less (better) than 1.1 µm along one or more linear axis.

4. Electrical discharge machines of the non-wire type which have two or more rotary axes which can be coordinated simultaneously for "contouring control".

5. Deep-hole-drilling machines and turning machines modified for deep-hole-drilling, having a maximum depth-of-bore capability exceeding 5 m.

6. "Numerically controlled" or manual machine tools, and specially designed components, controls and accessories therefor, specially designed for the shaving, finishing, grinding or honing of hardened (Rc = 40 or more) spur, helical and double-helical gears with a pitch diameter exceeding 1,250 mm and a face width of 15 per cent of pitch diameter or larger finished to a quality of AGMA 14 or better (equivalent to ISO 1328 class 3).

Computers

Systems, equipment and components

Electronic computers and related systems, equipment and components, or "electronic assemblies" having any of the following:

(a) Specially designed to have any of the following:

1. Radiation hardened to exceed any of the following specifications:

a. Total dose 5×10^3 Gy (Si);

b. Dose rate upset 5×10^6 Gy (Si)/s; or

c. Single event upset 1×10^{-8} error/bit/day.

Note: Does not apply to computers specially designed for "civil aircraft" applications.

Telecommunications

Systems, equipment and components

1. Telecommunication systems and equipment, and specially designed components and accessories therefor, having any of the following characteristics, functions or features:

(a) Being radio equipment employing "spread spectrum" techniques, including "frequency hopping" techniques, and having any of the following:

1. User programmable spreading codes; or

2. A total transmitted bandwidth which is 100 or more times the bandwidth of any one information channel and in excess of 50 kHz.

Note: Does not apply to radio equipment specially designed for use with any of the following:

(a) Civil cellular radio-communications systems; or

(b) Fixed or mobile satellite earth stations for commercial civil telecommunications.

Note: Does not apply to equipment designed to operate at an output power of 1 watt or less.

(b) Being digitally controlled radio receivers having all of the following:

1. More than 1,000 channels;

2. A "channel switching time" of less than 1 ms;

3. Automatic searching or scanning of a part of the electromagnetic spectrum; and

4. Identification of the received signals or the type of transmitter.

Note: Does not apply to radio equipment specially designed for use with civil cellular radio-communications systems.

Technical note:

"Channel switching time": the time (i.e., delay) to change from one receiving frequency to another, to arrive at or within ±0.05 per cent of the final specified

receiving frequency. Items having a specified frequency range of less than ±0.05 per cent around their centre frequency are defined to be incapable of channel frequency switching.

2. Telecommunication test, inspection and production equipment and specially designed components or accessories therefor, specially designed for the "development" or "production" of telecommunication equipment, functions or features.

Note: Does not apply to optical fibre characterization equipment.

Sensors and "lasers"

Systems, equipment and components

1. Hydrophones having any of the following:[xxiii]

(a) Incorporating continuous flexible sensing elements

(b) Incorporating flexible assemblies of discrete sensing elements with either a diameter or length less than 20 mm and with a separation between elements of less than 20 mm;

(c) Having any of the following sensing elements:

1. Optical fibres;

2. "Piezoelectric polymer" films other than polyvinylidene-fluoride (PVDF) and its co-polymers {P(VDF-TrFE) and P(VDF-TFE)};

3. "Flexible piezoelectric composites"

4. Lead-magnesium-niobate/lead-titanate (i.e., Pb(Mg 1/3 Nb 2/3)O3-PbTiO3, or PMN-PT) piezoelectric single crystals grown from solid solution; or

5. Lead-indium-niobate/lead-magnesium niobate/lead-titanate (i.e., Pb(In ½ Nb 1/2)O3–Pb(Mg1/3 Nb2/3)O3–PbTiO3, or PIN-PMN-PT) piezoelectric single crystals grown from solid solution;

(d) Designed to operate at depths exceeding 35 m with acceleration compensation; or

€ Designed for operation at depths exceeding 1,000 m.

2. Towed acoustic hydrophone arrays having any of the following:

(a) Hydrophone group spacing of less than 12.5 m or "able to be modified" to have hydrophone group spacing of less than 12.5 m;

(b) Designed or "able to be modified" to operate at depths exceeding 35 m;

(c) Heading sensors specified below in section 3;

(d) Longitudinally reinforced array hoses;

(e) An assembled array of less than 40 mm in diameter;

(f) Hydrophone characteristics specified by section 1 above or a hydrophone with a hydrophone sensitivity better than 180 dB at any depth with no acceleration, or

(g) Accelerometer-based hydro-acoustic with the following:

1. Composed of three accelerometers arranged along three distinct axes;

2. Having an overall "acceleration sensitivity" better than 48 dB (reference 1,000 mV rms per 1g);

3. Designed to operate at depths greater than 35 metres; and

4. Operating frequency below 20 kHz.

3. Heading sensors having all of the following:

(a) An "accuracy" of better than 0.5°; and

(b) Designed to operate at depths exceeding 35 m or having an adjustable or removable depth sensing device in order to operate at depths exceeding 35 m;

4. Bottom or bay-cable hydrophone arrays having any of the following:

(a) Incorporating hydrophones specified by section 1 above or a hydrophone with a hydrophone sensitivity better than 180 dB at any depth with no acceleration.

(b) Incorporating multiplexed hydrophone group signal modules having all of the following characteristics:

1. Designed to operate at depths exceeding 35 m or having an adjustable or removable depth sensing device in order to operate at depths exceeding 35 m; and

2. Capable of being operationally interchanged with towed acoustic hydrophone array modules; or

(c) Incorporating accelerometer based hydro-acoustic sensors.[xxiv]

Optical Sensors

"Monospectral imaging sensors" and "multispectral imaging sensors", designed for remote sensing applications and having any of the following:

(a) An Instantaneous-Field-Of-View (IFOV) of less than 200 μrad (microradians);[xxv] or

(b) Specified for operation in the wavelength range exceeding 400 nm but not exceeding 30,000 nm and having all the following;

1. Providing output imaging data in digital format; and

2. Having any of the following characteristics:

a. "Space-qualified"; or

b. Designed for airborne operation, using other than silicon detectors, and having an IFOV of less than 2.5 mrad (milliradians);

Optics

1. "Space-qualified" components for optical systems, as follows:

(a) Components lightweighted to less than 20 per cent "equivalent density" compared with a solid blank of the same aperture and thickness;

(b) Raw substrates, processed substrates having surface coatings (single-layer or multi-layer, metallic or dielectric, conducting, semiconducting or insulating) or having protective films;

(c) Segments or assemblies of mirrors designed to be assembled in space into an optical system with a collecting aperture equivalent to or larger than a single optic 1 m in diameter;

(d) Components manufactured from "composite" materials having a coefficient of linear thermal expansion equal to or less than 5×10^{-6} in any coordinate direction;

2. Optical control equipment as follows:

(a) Equipment specially designed to maintain the surface figure or orientation of the “space-qualified” components specified above under “Optics”.

(b) Steering, tracking, stabilization and resonator alignment equipment as follows:

1. Beam steering mirror stages designed to carry mirrors having diameter or major axis length greater than 50 mm and having all of the following, and specially designed electronic control equipment therefor:

a. A maximum angular travel of ±26 mrad or more;

b. A mechanical resonant frequency of 500 Hz or more; and

c. An angular “accuracy” of 10 µrad (microradians) or less (better);

2. Resonator alignment equipment having bandwidths equal to or more than 100 Hz and an accuracy of 10 µrad or less (better);

(c) Gimbals having all of the following:

1. A maximum slew exceeding 5°;

2. A bandwidth of 100 Hz or more;

3. Angular pointing errors of 200 µrad (microradians) or less; and

4. Having any of the following:

a. Exceeding 0.15 m but not exceeding 1 m in diameter or major axis length and capable of angular accelerations exceeding 2 rad (radians)/s^2; or

b. Exceeding 1 m in diameter or major axis length and capable of angular accelerations exceeding 0.5 rad (radians)/s^2.

Magnetic and electric field sensors

1. “Magnetometers” using superconductive technology (SQUID) and having any of the following:

(a) SQUID systems designed for stationary operation, without specially designed subsystems designed to reduce in-motion noise, and having a “sensitivity” equal to or lower (better) than 50 fT (rms) per square root Hz at a frequency of 1 Hz; or

(b) SQUID systems having an in-motion-magnetometer “sensitivity” lower (better) than 2 pT (rms) per square root Hz at a frequency of 1 Hz and specially designed to reduce in-motion noise;

2. “Magnetometers” using optically pumped or nuclear precession (proton/Overhauser) “technology” having a “sensitivity” lower (better) than 2 pT (rms) per square root Hz at a frequency of 1 Hz;

3. “Magnetic gradiometers” using multiple “magnetometers” specified in the “Magnetic and electric field sensors” section;

4. “Compensation systems” for the following:

(a) “Magnetometers” using optically pumped or nuclear precession (proton/ Overhauser) “technology” having a “sensitivity” lower (better) than 20 pT (rms) per square root Hz at a frequency of 1 Hz, and using optically pumped or nuclear precession (proton/Overhauser) “technology” that will permit these sensors to realize a “sensitivity” lower (better) than 2 pT rms per square root Hz.

(b) Underwater electric field sensors having a "sensitivity" lower (better) than 8 nanovolt per meter per square root Hz when measured at 1 Hz.

(c) "Magnetic gradiometers" specified in section 1 "Magnetic and electric field sensors" [xxvi] that will permit these sensors to realize a "sensitivity" lower (better) than 3 pT/m rms per square root Hz.

5. Underwater electromagnetic receivers incorporating "magnetometer" specified by section 1 or 2 "Magnetic and electric field sensors".

Software

"Software" specially designed for the "development" or "production" of items in the "Optics" section.

Technology

"Technology" for the "development" or "production" of any item on this list.

Marine systems, equipment and components

Systems, equipment and components

1. Air independent power systems specially designed for underwater use, as follows:

(a) Brayton or Rankine cycle engine air independent power systems having any of the following:

1. Chemical scrubber or absorber systems, specially designed to remove carbon dioxide, carbon monoxide and particulates from recirculated engine exhaust;

2. Systems specially designed to use a monoatomic gas;

3. Devices or enclosures, specially designed for underwater noise reduction in frequencies below 10 kHz, or special mounting devices for shock mitigation; or

4. Systems having all of the following:

a. Specially designed to pressurise the products of reaction or for fuel reformation;

b. Specially designed to store the products of the reaction; and

c. Specially designed to discharge the products of the reaction against a pressure of 100 kPa or more;

2. Diesel cycle engine air independent systems having all of the following:

(a) Chemical scrubber or absorber systems, specially designed to remove carbon dioxide, carbon monoxide and particulates from recirculated engine exhaust;

(b) Systems specially designed to use a monoatomic gas;

(c) Devices or enclosures, specially designed for underwater noise reduction in frequencies below 10 kHz, or special mounting devices for shock mitigation; and

(d) Specially designed exhaust systems that do not exhaust continuously the products of combustion;

3. Fuel cell air independent power systems with an output exceeding 2kW and having any of the following:

(a) Devices or enclosures, specially designed for underwater noise reduction in frequencies below 10 kHz, or special mounting devices for shock mitigation; or

(b) Systems having all of the following:

1. Specially designed to pressurise the products of reaction or for fuel reformation;

2. Specially designed to store the products of the reaction; and

3. Specially designed to discharge the products of the reaction against a pressure of 100 kPa or more;

4. Stirling cycle engine air independent power systems having all of the following:

(a) Devices or enclosures, specially designed for underwater noise reduction in frequencies below 10 kHz, or special mounting devices for shock mitigation; and

(b) Specially designed exhaust systems which discharge the products of combustion against a pressure of 100 kPa or more;

5. Pumpjet propulsion systems having all of the following:

(a) Power output exceeding 2.5 MW; and

(b) Using divergent nozzle and flow conditioning vane techniques to improve propulsive efficiency or reduce propulsion-generated underwater-radiated noise.

Software

"Software" for marine systems, equipment, components, test, inspection and "production" equipment and other related technology.

Technology

"Technology" for marine systems, equipment, components, test, inspection and "production" equipment and other related technology.

Aerospace and propulsion

Systems, equipment and components

1. Equipment, tooling or fixtures, specially designed for manufacturing gas turbine engine blades, vanes or "tip shrouds", as follows:

(a) Directional solidification or single crystal casting equipment;

(b) Casting tooling, manufactured from refractory metals or ceramics, as follows:

1. Cores

2. Shells (moulds)

3. Combined core and shell (mould) units

(c) Directional-solidification or single-crystal additive-manufacturing equipment.

Additional items of military significance

1. Body armour and components therefor, as follows:

(a) Soft body armour not manufactured to military standards or specifications, or to their equivalents, and specially designed components therefor;

(b) Hard body armour plates providing ballistic protection equal to or less than level IIIA (NIJ 0101.06, July 2008) or national equivalents.

Note: this paragraph does not apply to body armour when accompanying its user for the user's own personal protection, to body armour designed to provide frontal protection only from both fragment and blast from non-military explosive devices, and to body armour designed to provide protection only from knife, spike, needle or blunt trauma.

2. Accelerometers as follows and specially designed components therefor:

(a) Linear accelerometers having any of the following:

1. Specified to function at linear acceleration levels less than or equal to 15 g and having any of the following:

a. A "bias" "stability" of less (better) than 130 micro g with respect to a fixed calibration value over a period of one year; or

b. A "scale factor" "stability" of less (better) than 130 ppm with respect to a fixed calibration value over a period of one year;

2. Specified to function at linear acceleration levels exceeding 15 g but less than or equal to 100 g and having all of the following:

a. A "bias" "repeatability" of less (better) than 1,250 micro g over a period of one year; and

b. A "scale factor" "repeatability" of less (better) than 1,250 ppm over a period of one year; or

3. Designed for use in inertial navigation or guidance systems and specified to function at linear acceleration levels exceeding 100 g;

Note: paragraphs above do not apply to accelerometers limited to measurement of only vibration or shock.

(b) Angular or rotational accelerometers, specified to function at linear acceleration levels exceeding 100 g.

3. Gyros or angular rate sensors, having any of the following and specially designed components therefor:

(a) Specified to function at linear acceleration levels less than or equal to 100 g and having any of the following:

1. A rate range of less than 500 degrees per second and having any of the following:

a. A "bias" "stability" of less (better) than 0.5 degree per hour, when measured in a 1 g environment over a period of one month, and with respect to a fixed calibration value; or

b. An "angle random walk" of less (better) than or equal to 0.0035 degree per square root hour; or

Note: this paragraph does not apply to "spinning mass gyros".

2. A rate range greater than or equal to 500 degrees per second and having any of the following:

a. A "bias" "stability" of less (better) than 4 degrees per hour, when measured in a 1 g environment over a period of three minutes, and with respect to a fixed calibration value; or

b. An "angle random walk" of less (better) than or equal to 0.1 degree per square root hour; or

Note: this paragraph does not apply to "spinning mass gyros".

(b) Specified to function at linear acceleration levels exceeding 100 g.

4. "Inertial measurement equipment or systems", having any of the following:

Note 1: "Inertial measurement equipment or systems" incorporate accelerometers or gyroscopes to measure changes in velocity and orientation in order to determine or maintain heading or position without requiring an external reference once aligned. "Inertial measurement equipment or systems" include:

– Attitude and Heading Reference Systems (AHRSs);

– Gyrocompasses;

– Inertial Measurement Units (IMUs);

– Inertial Navigation Systems (INSs);

– Inertial Reference Systems (IRSs);

– Inertial Reference Units (IRUs).

Note 2: This paragraph does not apply to "inertial measurement equipment or systems" which are certified for use on "civil aircraft" by civil aviation authorities of one or more Member States.

(a) Designed for "aircraft", land vehicles or vessels, providing position without the use of "positional aiding references", and having any of the following "accuracies" subsequent to normal alignment:

1. 0.8 nautical miles per hour (nm/hr) "Circular Error Probable" ("CEP") rate or less (better);

2. 0.5 per cent distanced travelled "CEP" or less (better); or

3. Total drift of 1 nautical mile "CEP" or less (better) in a 24 hr period;

(b) Designed for "aircraft", land vehicles or vessels, with an embedded "positional aiding reference" and providing position after loss of all "positional aiding references" for a period of up to 4 minutes, having an "accuracy" of less (better) than 10 metres "CEP";

(c) Designed for "aircraft", land vehicles or vessels, providing heading or True North determination and having any of the following:

1. A maximum operating angular rate less (lower) than 500 deg/s and a heading "accuracy" without the use of "positional aiding references" equal to or less (better) than 0.07 deg sec(Lat) (equivalent to 6 arc minutes rms at 45 degrees latitude); or

2. A maximum operating angular rate equal to or greater (higher) than 500 deg/s and a heading "accuracy" without the use of "positional aiding references" equal to or less (better) than 0.2 deg sec (Lat) (equivalent to 17 arc minutes rms at 45 degrees latitude);

(d) Providing acceleration measurements or angular rate measurements, in more than one dimension, and having any of the following:

1. Performance specified for accelerometers and gyros described above along any axis, without the use of any aiding references; or

2. Being "space-qualified" and providing angular rate measurements having an "angle random walk" along any axis of less (better) than or equal to 0.1 degree per square root hour.

5. Manned, tethered submersible vehicles designed to operate at depths exceeding 1,000 m.

6. Aero gas turbine engines, except aero gas turbine engines which meet all of the following:

(a) Certified by civil aviation authorities of one or more Member States; and

(b) Intended to power non-military manned "aircraft" for which any of the following has been issued by civil aviation authorities of one or more Member States for the "aircraft" with this specific engine type:

1. A civil type certificate; or

2. An equivalent document recognized by the International Civil Aviation Organization.

Definitions of terms used in the lists

This document contains the definitions of the terms used in the lists, in alphabetical order.

"Accuracy"

(Usually measured in terms of inaccuracy) is the maximum deviation, positive or negative, of an indicated value from an accepted standard or true value.

"Active flight control systems"

Function to prevent undesirable "aircraft" and missile motions or structural loads by autonomously processing outputs from multiple sensors and then providing necessary preventive commands to effect automatic control.

"Comminution"

A process to reduce a material to particles by crushing or grinding.

"Compensation systems"

Consist of the primary scalar sensor, one or more reference sensors (e.g. vector magnetometers) together with software that permit reduction of rigid body rotation noise of the platform.

"Composite"

A "matrix" and an additional phase or additional phases consisting of particles, whiskers, fibres or any combination thereof, present for a specific purpose or purposes.

"III/V compounds"

Polycrystalline or binary or complex monocrystalline products consisting of elements of groups IIIA and VA of Mendeleyev's periodic classification table (e.g., gallium arsenide, gallium-aluminium arsenide, indium phosphide).

"Contouring control"

Two or more "numerically controlled" motions operating in accordance with instructions that specify the next required position and the required feed rates to that position. These feed rates are varied in relation to each other so that a desired contour is generated (Ref. ISO/DIS 2806 - 1980).

"Critical temperature"

(sometimes referred to as the transition temperature) of a specific "superconductive" material is the temperature at which the material loses all resistance to the flow of direct electrical current.

"Data-Based Referenced Navigation" ("DBRN") Systems

Systems which use various sources of previously measured geo-mapping data integrated to provide accurate navigation information under dynamic conditions. Data sources include bathymetric maps, stellar maps, gravity maps, magnetic maps or 3-D digital terrain maps.

"Development"

Is related to all stages prior to serial production, such as: design, design research, design analyses, design concepts, assembly and testing of prototypes, pilot production schemes, design data, process of transforming design data into a product, configuration design, integration design, layouts.

"Diffusion bonding"

A solid state joining of at least two separate pieces of metals into a single piece with a joint strength equivalent to that of the weakest material, wherein the principal mechanism is interdiffusion of atoms across the interface.

"Electronic assembly"

A number of electronic components (i.e., "circuit elements", "discrete components", integrated circuits, etc.) connected together to perform (a) specific function(s), replaceable as an entity and normally capable of being disassembled.

"Equivalent Density"

The mass of an optic per unit optical area projected onto the optical surface.

"Fibrous or filamentary materials" Include:

(a) Continuous monofilaments;

(b) Continuous yarns and rovings;

(c) Tapes, fabrics, random mats and braids;

(d) Chopped fibres, staple fibres and coherent fibre blankets;

(e) Whiskers, either monocrystalline or polycrystalline, of any length;

(f) Aromatic polyamide pulp.

"Fly-by-light system"

A primary digital flight control system employing feedback to control the aircraft during flight, where the commands to the effectors/actuators are optical signals.

"Fly-by-wire system"

A primary digital flight control system employing feedback to control the aircraft during flight, where the commands to the effectors/actuators are electrical signals.

"Focal plane array"

A linear or two-dimensional planar layer, or combination of planar layers, of individual detector elements, with or without readout electronics, which work in the focal plane.

Note: This definition does not include a stack of single detector elements or any two, three or four element detectors provided time delay and integration is not performed within the element.

"Fractional bandwidth"

The "instantaneous bandwidth" divided by the centre frequency, expressed as a percentage.

"Frequency hopping"

A form of "spread spectrum" in which the transmission frequency of a single communication channel is made to change by a random or pseudo-random sequence of discrete steps.

"Gas atomisation"

A process to reduce a molten stream of metal alloy to droplets of 500 µm diameter or less by a high pressure gas stream.

"Magnetic gradiometers"

Are designed to detect the spatial variation of magnetic fields from sources external to the instrument. They consist of multiple "magnetometers" and associated electronics the output of which is a measure of magnetic field gradient. (See also "Intrinsic Magnetic Gradiometer")

"Magnetometers"

Are designed to detect magnetic fields from sources external to the instrument. They consist of a single magnetic field sensing element and associated electronics the output of which is a measure of the magnetic field.

"Matrix"

A substantially continuous phase that fills the space between particles, whiskers or fibres.

"Mechanical alloying"

An alloying process resulting from the bonding, fracturing and rebonding of elemental and master alloy powders by mechanical impact. Non-metallic particles may be incorporated in the alloy by addition of the appropriate powders.

"Melt extraction"

A process to "solidify rapidly" and extract a ribbon-like alloy product by the insertion of a short segment of a rotating chilled block into a bath of a molten metal alloy.

"Melt spinning"

A process to "solidify rapidly" a molten metal stream impinging upon a rotating chilled block, forming a flake, ribbon or rod-like product.

"Monospectral imaging sensors"

Are capable of acquisition of imaging data from one discrete spectral band.

"Multispectral imaging sensors"

Are capable of simultaneous or serial acquisition of imaging data from two or more discrete spectral bands. Sensors having more than twenty discrete spectral bands are sometimes referred to as hyperspectral imaging sensors.

"Numerical control"

The automatic control of a process performed by a device that makes use of numeric data usually introduced as the operation is in progress (Ref. ISO 2382).

"Plasma atomisation"

A process to reduce a molten stream or solid metal to droplets of 500 µm diameter or less, using plasma torches in an inert gas environment.

"Production"

Means all production stages, such as: product engineering, manufacture, integration, assembly (mounting), inspection, testing, quality assurance.

"Pulse compression"

The coding and processing of a radar signal pulse of long time duration to one of short time duration, while maintaining the benefits of high pulse energy.

"Radar frequency agility"

Any technique which changes, in a pseudo-random sequence, the carrier frequency of a pulsed radar transmitter between pulses or between groups of pulses by an amount equal to or larger than the pulse bandwidth.

"Radar spread spectrum"

Any modulation technique for spreading energy originating from a signal with a relatively narrow frequency band, over a much wider band of frequencies, by using random or pseudo-random coding.

"Radiant sensitivity"

Radiant sensitivity (mA/W) = 0.807 x (wavelength in nm) x Quantum Efficiency (QE)

Technical note

QE is usually expressed as a percentage; however, for the purposes of this formula QE is expressed as a decimal number less than one, e.g., 78 per cent is 0.78.

"Real-time processing"

The processing of data by a computer system providing a required level of service, as a function of available resources, within a guaranteed response time, regardless of the load of the system, when stimulated by an external event.

"Robot"

A manipulation mechanism, which may be of the continuous path or of the point-to-point variety, may use sensors, and has all the following characteristics:

(a) Is multifunctional;

(b) Is capable of positioning or orienting material, parts, tools or special devices through variable movements in three dimensional space;

(c) Incorporates three or more closed or open loop servo-devices which may include stepping motors; and

(d) Has "user-accessible programmability" by means of the teach/playback method or by means of an electronic computer which may be a programmable logic controller, i.e., without mechanical intervention.

Note: The above definition does not include the following devices:

1. Manipulation mechanisms which are only manually/tele-operator controllable;

2. Fixed sequence manipulation mechanisms which are automated moving devices, operating according to mechanically fixed programmed motions. The programme is mechanically limited by fixed stops, such as pins or cams. The sequence of motions and the selection of paths or angles are not variable or changeable by mechanical, electronic or electrical means;

3. Mechanically controlled variable sequence manipulation mechanisms which are automated moving devices, operating according to mechanically fixed programmed motions. The programme is mechanically limited by fixed, but adjustable stops, such as pins or cams. The sequence of motions and the selection of paths or angles are variable within the fixed programme pattern. Variations or modifications of the programme pattern (e.g., changes of pins or exchanges of cams) in one or more motion axes are accomplished only through mechanical operations;

4. Non-servo-controlled variable sequence manipulation mechanisms which are automated moving devices, operating according to mechanically fixed programmed motions. The programme is variable but the sequence proceeds only by the binary signal from mechanically fixed electrical binary devices or adjustable stops;

5. Stacker cranes defined as Cartesian coordinate manipulator systems manufactured as an integral part of a vertical array of storage bins and designed to access the contents of those bins for storage or retrieval.

"Rotary atomisation"

A process to reduce a stream or pool of molten metal to droplets to a diameter of 500 µm or less by centrifugal force.

"Signal processing"

The processing of externally derived information-bearing signals by algorithms such as time compression, filtering, extraction, selection, correlation, convolution or transformations between domains (e.g., fast Fourier transform or Walsh transform).

"Software"

A collection of one or more "programmes" or "microprogrammes" fixed in any tangible medium of expression.

"Source code"

A convenient expression of one or more processes which may be turned by a programming system into equipment executable form ("object code" (or object language)).

"Space-qualified"

Designed, manufactured, or qualified through successful testing, for operation at altitudes greater than 100 km above the surface of the Earth.

Note: A determination that a specific item is "space-qualified" by virtue of testing does not mean that other items in the same production run or model series are "space-qualified" if not individually tested.

"Specific modulus"

Young's modulus in pascals, equivalent to N/m^2, divided by specific weight in N/m3, measured at a temperature of 296 ± 2 K (23 ± 2°C) and a relative humidity of (50 ± 5) per cent.

"Specific tensile strength"

Ultimate tensile strength in pascals, equivalent to N/m^2, divided by specific weight in N/m3, measured at a temperature of 296 ± 2 K (23 ± 2°C) and a relative humidity of (50 ± 5) per cent.

"Splat quenching"

A process to "solidify rapidly" a molten metal stream impinging upon a chilled block, forming a flake-like product.

"Spread spectrum"

The technique whereby energy in a relatively narrow-band communication channel is spread over a much wider energy spectrum.

"Spread spectrum" radar — see "Radar spread spectrum"

"Superconductive"

Refers to materials,(i.e., metals, alloys or compounds) which can lose all electrical resistance (i.e., which can attain infinite electrical conductivity and carry very large electrical currents without Joule heating).

Technical note

The "superconductive" state of a material is individually characterised by a "critical temperature", a critical magnetic field, which is a function of temperature, and a critical current density which is, however, a function of both magnetic field and temperature.

"Superplastic forming"

A deformation process using heat for metals that are normally characterised by low values of elongation (less than 20 per cent) at the breaking point as determined at room temperature by conventional tensile strength testing, in order to achieve elongations during processing which are at least 2 times those values.

"Technology"

Specific information necessary for the "development", "production" or "use" of a product. The information takes the form of "technical data" or "technical assistance".

Technical notes

1. "Technical data" may take forms such as blueprints, plans, diagrams, models, formulae, tables, engineering designs and specifications, manuals and instructions written or recorded on other media or devices such as disk, tape, read-only memories.

2. "Technical assistance" may take forms such as instruction, skills, training, working knowledge, consulting services. "Technical assistance" may involve transfer of "technical data".

"Time constant"

The time taken from the application of a light stimulus for the current increment to reach a value of 1-1/e times the final value (i.e., 63 per cent of the final value).

"Tip shroud"

A stationary ring component (solid or segmented) attached to the inner surface of the engine turbine casing or a feature at the outer tip of the turbine blade, which primarily provides a gas seal between the stationary and rotating components.

"Total control of flight"

Automated control of "aircraft" state variables and flight path to meet mission objectives responding to real time changes in data regarding objectives, hazards or other "aircraft".

"Unidirectional positioning repeatability"

The smaller of values R↑ and R↓ (forward and backward), as defined by 3.21 of ISO 230-2:2014 or national equivalents, of an individual machine tool axis.

"Use"

Operation, installation (including on-site installation), maintenance (checking), repair, overhaul and refurbishing.

"User-accessible programmability"

The facility allowing a user to insert, modify or replace "programmes" by means other than:

(a) A physical change in wiring or interconnections; or

(b) The setting of function controls including entry of parameters.

"Vacuum atomisation"

A process to reduce a molten stream of metal to droplets of a diameter of 500 µm or less by the rapid evolution of a dissolved gas upon exposure to a vacuum.

[i] Does not apply to "composite" structures or laminates, made from epoxy resin impregnated carbon "fibrous or filamentary materials", for the repair of "civil aircraft" structures or laminates, having all of the following:

– An area not exceeding 1 m^2;

– A length not exceeding 2.5 m;

– A width exceeding 15 mm.

Does not apply to semi-finished items, specially designed for purely civilian applications as follows: sporting goods, automotive industry, machine tool industry, medical applications. Does not apply to finished items specially designed for a specific application.

[ii] Does not apply to :

– Discontinuous, multiphase, polycrystalline alumina fibres in chopped fibre or random mat form containing 3 per cent by weight or more silica with a "specific modulus" of less than 10 x 10^6 m

– Molybdenum and molybdenum alloy fibres

– Boron fibres

– Discontinuous ceramic fibres with a melting, softening, decomposition or sublimation point lower than 1,770°C in an inert environment.

[iii] Does not apply to polyethylene.

[iv] Does not apply to:

– "fibrous or filamentary materials", for the repair of civil aircraft structures or laminates, having an area not exceeding 1 m^2; a length not exceeding 2.5 m; and a width exceeding 15 mm.

– Mechanically chopped, milled or cut carbon "fibrous or filamentary materials" 25.0 mm or less in length.

[v] Does not apply to discontinuous, multiphase, polycrystalline alumina fibres in chopped fibre or random mat form, containing 3 per cent by weight or more silica, with a "specific modulus" of less than 10 x 10^6 m; molybdenum and molybdenum alloy fibres; boron fibres; discontinuous ceramic fibres with a melting, softening, decomposition or sublimation point lower than 1,770°C in an inert environment.

[vi] Does not apply to:

– Epoxy resin "matrix" impregnated carbon "fibrous or filamentary materials" (prepregs) for the repair of "civil aircraft" structures or laminates, having all of the following;

– An area not exceeding 1 m^2;

– A length not exceeding 2.5 m; and

– A width exceeding 15 mm

[vii] Unless provision to the contrary is made, the words "metals" and "alloys" cover crude and semi-fabricated forms.

Crude forms: anodes, balls, bars (including notched bars and wire bars), billets, blocks, blooms, brickets, cakes, cathodes, crystals, cubes, dice, grains, granules, ingots, lumps, pellets, pigs, powder, rondelles, shot, slabs, slugs, sponge, sticks. Semi-fabricated forms: Wrought or worked materials fabricated by rolling, drawing, extruding, forging, impact extruding, pressing, graining, atomising, and grinding, i.e.: angles, channels, circles, discs, dust, flakes, foils and leaf, forging, plate, powder, pressings and stampings, ribbons, rings, rods (including bare welding rods, wire rods, and rolled wire), sections, shapes, sheets, strip, pipe and tubes (including tube rounds, squares, and hollows), drawn or extruded wire. Cast material produced by casting in sand, die, metal, plaster or other types of moulds, including high pressure castings, sintered forms, and forms made by powder metallurgy.

[viii] Does not apply to polyethylene.

[ix] Does not apply to:

– “fibrous or filamentary materials”, for the repair of civil aircraft structures or laminates, having an area not exceeding 1 m^2; a length not exceeding 2.5 m; and a width exceeding 15 mm.

– Mechanically chopped, milled or cut carbon “fibrous or filamentary materials” 25.0 mm or less in length.

[x] Does not apply to discontinuous, multiphase, polycrystalline alumina fibres in chopped fibre or random mat form, containing 3 per cent by weight or more silica, with a “specific modulus” of less than 10 x 10^6 m; molybdenum and molybdenum alloy fibres; boron fibres; discontinuous ceramic fibres with a melting, softening, decomposition or sublimation point lower than 1,770°C in an inert environment.

[xi] For the purposes of this “tape-laying machines” have the ability to lay one or more “filament bands” limited to widths greater than 25 mm and less than or equal to 305 mm, and to cut and restart individual “filament band” courses during the laying process.

[xii] The technique of interlacing includes knitting.

[xiii] Does not apply to materials specified and packages as medical products.

[xiv] Does not apply to abrasives.

[xv] Does not apply to “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 per cent creep strain at 100 MPa load and 1,273 K (1,000°C) for 100 hours.

[xvi] Applies to the substances in liquid or solid “fusible” form, including resin, powder, pellet, film, sheet, tape, or ribbon.

[xvii] Does not apply to polyethylene.

[xviii] Does not apply to “fibrous or filamentary materials”, for the repair of “civil aircraft” structures or laminates, having all of the following:

1. An area not exceeding 1 m^2;

2. A length not exceeding 2.5 m; and

3. A width exceeding 15 mm.

Or to mechanically chopped, milled or cut carbon “fibrous or filamentary materials” 25.0 mm or less in length.

[xix] Does not apply to the following:

(a) Discontinuous, multiphase, polycrystalline alumina fibres in chopped fibre or random mat form, containing 3 per cent by weight or more silica, with a “specific modulus” of less than 10 x 10^6 m;

(b) Molybdenum and molybdenum alloy fibres;

(c) Boron fibres;

(d) Discontinuous ceramic fibres with a melting, softening, decomposition or sublimation point lower than 2,043 K (1,770°C) in an inert environment.

[xx] Does not apply to:

(a) Epoxy resin “matrix” impregnated carbon “fibrous or filamentary materials” (prepregs) for the repair of “civil aircraft” structures or laminates, having all of the following;

1. An area not exceeding 1 m^2;

2. A length not exceeding 2.5 m; and

3. A width exceeding 15 mm.

(b) Fully or partially resin-impregnated or pitch-impregnated mechanically chopped, milled or cut carbon “fibrous or filamentary materials” 25.0 mm or less in length when using a resin or pitch other than those specified previously

[xxi] The metals referred to here also refer to metals or alloys encapsulated in aluminium, magnesium, zirconium or beryllium.

[xxii] Does not apply to technology for the repair of civil aircraft structures using carbon “fibrous or filamentary materials” and epoxy resins, contained in aircraft manufacturers’ manuals.

[xxiii] The status of hydrophones specially designed for other equipment is determined by the status of the other equipment.

[xxiv] Accelerometer-based hydro-acoustic sensors having all of the following:

1. Composed of three accelerometers arranged along three distinct axes;

2. Having an overall “acceleration sensitivity” better than 48 dB (reference 1,000 mV rms per 1g);

3. Designed to operate at depths greater than 35 metres; and

4. Operating frequency below 20 kHz.

Note: Does not apply to particle velocity sensors or geophones.

Note: Also applies to receiving equipment, whether or not related in normal application to separate active equipment, and specially designed components therefor

[xxv] Does not apply to monospectral imaging sensors” with a peak response in the wavelength range exceeding 300 nm but not exceeding 900 nm and only incorporating any of the following non-“space-qualified” detectors or non-“space-qualified” “focal plane arrays”:

(a) Charge Coupled Devices not designed or modified to achieve “charge multiplication”; or

(b) Complementary Metal Oxide Semiconductor devices not designed or modified to achieve “charge multiplication”.

[xxvi] Fibre optic “intrinsic magnetic gradiometers” having a magnetic gradient field “sensitivity” lower (better) than 0.3 nT/m (rms) per square root Hz;

“Intrinsic magnetic gradiometers”, using “technology” other than fibre-optic “technology”, having a magnetic gradient field “sensitivity” lower (better) than 0.015 nT/m (rms) per square root Hz.