

Singapore Customs

Amendments to Strategic
Goods (Control) Order (SGCO)

Published in September 2020

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Introduction

As part of Singapore's international obligation to prevent the proliferation of weapons of mass destruction, Singapore Customs regularly updates our Strategic Goods Control List ("Control List") prescribed in the Schedule to the Strategic Goods (Control) Order (SGCO). With effect from 1 November 2020, the SGCO 2020 will replace the SGCO 2019.

The SGCO 2020 brings our Control List up to date with 2019 Wassenaar Arrangement Munition List ("WAML") and 2019 European Union List of Dual-Use Items ("EUDL").

This document presents the amendments to the SGCO 2019 in a table with side by side comparison of the legal text in the 2019 and 2020 versions.

List of Military Goods

Definitions

Category Code	SGCO 2019	SGCO 2020
“cyber incident response” (ML21)	-	“cyber incident response” (ML21) means the process of exchanging necessary information on a cybersecurity incident with individuals or organisations responsible for conducting or coordinating remediation to address the cybersecurity incident;
“digital computer” (ML21)	-	<p>“digital computer” (ML21) means equipment which can, in the form of one or more discrete variables, perform all of the following:</p> <ol style="list-style-type: none"> Accept data; Store data or instructions in fixed or alterable (writable) storage devices; Process data by means of a stored sequence of instructions which is modifiable; <u>and</u> Provide output of data; <p><i>Technical Note</i> <i>Modifications of a stored sequence of instructions include replacement of fixed storage devices, but not a physical change in wiring or interconnections.</i></p>
“equivalent standards” (ML6, ML13)	-	“equivalent standards” (ML6, ML13) means comparable national or international standards recognised by one or more “participating states” and applicable to the relevant entry;
“satellite navigation system” (ML11)	“satellite navigation system” (ML11) means a system consisting of ground stations, a constellation of satellites, and receivers, that enables receiver locations to be calculated on the basis of signals received from the satellites. It includes Global Navigation Satellite Systems (GNSS) and Regional Navigation Satellite Systems (RNSS).	“satellite navigation system” (ML11) means a system consisting of ground stations, a constellation of satellites, and receivers, that enables receiver locations to be calculated on the basis of signals received from the satellites. It includes Global Navigation Satellite Systems and Regional Navigation Satellite Systems;

“unmanned aerial vehicle” (ML10)	“unmanned aerial vehicle” (“UAV”) (ML10) means any “aircraft” capable of initiating flight and sustaining controlled flight and navigation without any human presence on board.	“unmanned aerial vehicle” (“UAV”) (ML10) means any “aircraft” capable of initiating flight and sustaining controlled flight and navigation without any human presence on board;
“vulnerability disclosure” (ML21)	-	“vulnerability disclosure” (ML21) means the process of identifying, reporting or communicating a vulnerability to, or analysing a vulnerability with, individuals or organisations responsible for conducting or coordinating remediation for the purpose of resolving the vulnerability.
AMPS	-	AMPS Aircraft Missile Protection System
EMP	-	EMP Electromagnetic Pulse
NIJ	-	NIJ National Institute of Justice

ML1

Category Code	SGCO 2019	SGCO 2020
ML1.a. Note	<p>Smooth bore weapons with a calibre of less than 20 mm, other arms and automatic weapons with a calibre of 12.7 mm (calibre 0.5 inches) or less and accessories, as follows, and specially designed components therefor:</p> <p>---</p> <p>a. Rifles and combination guns, handguns, machine, sub machine and volley guns;</p> <p><u>Note</u> <i>Category Code ML1.a. does not apply to the following:</i></p> <p>a. <i>Rifles and combination guns, manufactured earlier than 1938;</i></p> <p>b. <i>Reproductions of rifles and combination guns, the originals of which were manufactured earlier than 1890;</i></p> <p>c. <i>Handguns, volley guns and machine guns, manufactured earlier than 1890, and their reproductions;</i></p> <p>d. <i>Rifles or handguns, specially designed to discharge an inert projectile by compressed air or CO₂.</i></p>	<p>Smooth bore weapons with a calibre of less than 20 mm, other arms and automatic weapons with a calibre of 12.7 mm (calibre 0.5 inches) or less and accessories, as follows, and specially designed components therefor:</p> <p>---</p> <p>a. Rifles and combination guns, handguns, machine, sub machine and volley guns;</p> <p><u>Note</u> <i>Category Code ML1.a. does not apply to the following:</i></p> <p>a. <i>Rifles and combination guns, manufactured earlier than 1938;</i></p> <p>b. <i>Reproductions of rifles and combination guns, the originals of which were manufactured earlier than 1890;</i></p> <p>c. <i>Handguns, volley guns and machine guns, manufactured earlier than 1890, and their reproductions;</i></p> <p>d. <i>Rifles or handguns, specially designed to discharge an inert projectile by compressed air or CO₂;</i></p> <p>e. <i>Handguns specially designed for either of the following:</i></p> <ol style="list-style-type: none"> 1. <i>Slaughtering of domestic animals; <u>or</u></i> 2. <i>Tranquilising of animals.</i>

ML2

Category Code	SGCO 2019	SGCO 2020
ML2	Smooth-bore weapons with a calibre of 20 mm or more, other weapons or armament with a calibre greater than 12.7 mm (calibre 0.5 inches), projectors and accessories, as follows, and specially designed components therefor:	Smooth bore weapons with a calibre of 20 mm or more, other weapons or armament with a calibre greater than 12.7 mm (calibre 0.5 inches), projectors specially designed or modified for military use and accessories, as follows, and specially designed components therefor:
ML2.a.	Smooth-bore weapons with a calibre of 20 mm or more, other weapons or armament with a calibre greater than 12.7 mm (calibre 0.5 inches), projectors and accessories, as follows, and specially designed components therefor: --- a. Guns, howitzers, cannon, mortars, anti-tank weapons, projectile launchers, military flame throwers, rifles, recoilless rifles, smooth-bore weapons and signature reduction devices therefor;	Smooth bore weapons with a calibre of 20 mm or more, other weapons or armament with a calibre greater than 12.7 mm (calibre 0.5 inches), projectors specially designed or modified for military use and accessories, as follows, and specially designed components therefor: --- a. Guns, howitzers, cannon, mortars, anti-tank weapons, projectile launchers, military flame throwers, rifles, recoilless rifles and smooth-bore weapons;
- ML2.b. - ML2.b.1. - ML2.b.2. - ML2.b.3.	Smooth-bore weapons with a calibre of 20 mm or more, other weapons or armament with a calibre greater than 12.7 mm (calibre 0.5 inches), projectors and accessories, as follows, and specially designed components therefor: --- b. Smoke, gas and pyrotechnic projectors or generators, specially designed or modified for military use;	Smooth bore weapons with a calibre of 20 mm or more, other weapons or armament with a calibre greater than 12.7 mm (calibre 0.5 inches), projectors specially designed or modified for military use and accessories, as follows, and specially designed components therefor: --- b. Projectors, specially designed or modified for military use, as follows: 1. Smoke canister projectors; 2. Gas canister projectors; 3. Pyrotechnics projectors;

<ul style="list-style-type: none"> - ML2.c. - ML2.c.1. - ML2.c.2. - ML2.c.3. - ML2.c.4. 	<p>Smooth-bore weapons with a calibre of 20 mm or more, other weapons or armament with a calibre greater than 12.7 mm (calibre 0.5 inches), projectors and accessories, as follows, and specially designed components therefor:</p> <p>---</p> <p>c. Weapon sights and weapon sight mounts, having both of the following characteristics:</p> <ol style="list-style-type: none"> 1. Specially designed for military use; <u>and</u> 2. Specially designed for weapons specified in Category Code ML2.a.; 	<p>Smooth bore weapons with a calibre of 20 mm or more, other weapons or armament with a calibre greater than 12.7 mm (calibre 0.5 inches), projectors specially designed or modified for military use and accessories, as follows, and specially designed components therefor:</p> <p>---</p> <p>c. Accessories specially designed for the weapons specified in Category Code ML2.a., as follows:</p> <ol style="list-style-type: none"> 1. Weapon sights and weapon sight mounts, specially designed for military use; 2. Signature reduction devices; 3. Mountings; 4. Detachable cartridge magazines;
ML2.d.	<p>Smooth-bore weapons with a calibre of 20 mm or more, other weapons or armament with a calibre greater than 12.7 mm (calibre 0.5 inches), projectors and accessories, as follows, and specially designed components therefor:</p> <p>---</p> <p>d. Mountings and detachable cartridge magazines, specially designed for the weapons specified in Category Code ML2.a.</p>	<p>Smooth bore weapons with a calibre of 20 mm or more, other weapons or armament with a calibre greater than 12.7 mm (calibre 0.5 inches), projectors specially designed or modified for military use and accessories, as follows, and specially designed components therefor:</p> <p>---</p> <p>d. Not used.</p>

ML6

Category Code	SGCO 2019	SGCO 2020
<ul style="list-style-type: none"> - ML6.b.1.a. - ML6.b.1.b. 	<p>Ground vehicles and components, as follows:</p> <p>---</p> <p>b. Other ground vehicles and components, as follows:</p> <p>1. Vehicles having all of the following characteristics:</p> <p>a. Manufactured or fitted with materials or components to provide ballistic protection equal to or better than level III (NIJ 0108.01, September 1985, or comparable national standard);</p> <p>b. Have a transmission to provide drive to both front and rear wheels simultaneously, including those vehicles having additional wheels for load bearing purposes whether driven or not;</p>	<p>Ground vehicles and components, as follows:</p> <p>---</p> <p>b. Other ground vehicles and components, as follows:</p> <p>1. Vehicles having all of the following characteristics:</p> <p>a. Manufactured or fitted with materials or components to provide ballistic protection equal to or better than level III (NIJ 0108.01, September 1985), or “equivalent standards”;</p> <p>b. Have a transmission to provide drive to both front and rear wheels simultaneously, including those for vehicles having additional wheels for load bearing purposes whether driven or not;</p>
ML6.b.2.b.	<p>Ground vehicles and components, as follows:</p> <p>---</p> <p>b. Other ground vehicles and components, as follows:</p> <p>---</p> <p>2. Components having both of the following characteristics:</p> <p>---</p> <p>b. Providing ballistic protection equal to or better than level III (NIJ 0108.01, September 1985, or comparable national standard).</p>	<p>Ground vehicles and components, as follows:</p> <p>---</p> <p>b. Other ground vehicles and components, as follows:</p> <p>---</p> <p>2. Components having both of the following characteristics:</p> <p>---</p> <p>b. Providing ballistic protection equal to or better than level III (NIJ 0108.01, September 1985), or “equivalent standards”.</p>

ML8

Category Code	SGCO 2019	SGCO 2020
ML8.a.39.	<p>“Energetic materials” and related substances, as follows:</p> <p>---</p> <p>a. “Explosives” as follows, and ‘mixtures’ thereof:</p> <p>---</p> <p>39. Energetic ionic materials melting between 343 K (70°C) and 373 K (100°C) and with detonation velocity exceeding 6,800 m/s or detonation pressure exceeding 18 GPa (180 kbar);</p>	<p>“Energetic materials” and related substances, as follows:</p> <p>---</p> <p>a. “Explosives” as follows, and ‘mixtures’ thereof:</p> <p>---</p> <p>39. Energetic ionic materials melting between 343 K (70 °C) and 373 K (100 °C) and with detonation velocity exceeding 6,800 m/s or detonation pressure exceeding 18 GPa (180 kbar);</p>
<p>- ML8.b.1.a.</p> <p>- ML8.b.1.b.</p> <p>- ML8.b.1.c.</p> <p>- ML8.b.4.</p> <p>- ML8.b.5.</p>	<p>“Energetic materials” and related substances, as follows:</p> <p>---</p> <p>b. “Propellants” as follows:</p> <p>1. Any solid “propellant” with a theoretical specific impulse (under standard conditions) of more than:</p> <p>a. 240 seconds for non-metallised, non halogenised “propellant”;</p> <p>b. 250 seconds for non-metallised, halogenised “propellant”; <u>or</u></p> <p>c. 260 seconds for metallised “propellant”;</p> <p>---</p> <p>4. “Propellants” that can sustain a steady state linear burning rate of more than 38 mm/s under standard conditions (as measured in the form of an inhibited single strand) of 6.89 MPa (68.9 bar) pressure and 294 K (21°C);</p> <p>5. Elastomer Modified Cast Double Base (EMCDB) “propellants” with extensibility at maximum stress of more than 5% at 233 K (-40°C);</p>	<p>“Energetic materials” and related substances, as follows:</p> <p>---</p> <p>b. “Propellants” as follows:</p> <p>1. Any solid “propellant” with a theoretical specific impulse (under standard conditions) of more than:</p> <p>a. 240 s for non-metallised, non halogenised “propellant”;</p> <p>b. 250 s for non-metallised, halogenised “propellant”; <u>or</u></p> <p>c. 260 s for metallised “propellant”;</p> <p>---</p> <p>4. “Propellants” that can sustain a steady state linear burning rate of more than 38 mm/s under standard conditions (as measured in the form of an inhibited single strand) of 6.89 MPa (68.9 bar) pressure and 294 K (21 °C);</p> <p>5. Elastomer Modified Cast Double Base (EMCDB) “propellants” with extensibility at maximum stress of more than 5% at 233 K (-40 °C);</p>

ML8.c.10.b.	<p>“Energetic materials” and related substances, as follows: --- c. “Pyrotechnics”, fuels and related substances, as follows, and ‘mixtures’ thereof: --- 10. Liquid high energy density fuels not specified in Category Code ML8.c.1., as follows: --- b. Other high energy density fuels and fuel additives (e.g. cubane, ionic solutions, JP-7, JP-10), having a volume-based energy density of 37.5 GJ per cubic metre or greater, measured at 293 K (20°C) and one atmosphere (101.325 kPa) pressure;</p>	<p>“Energetic materials” and related substances, as follows: --- c. “Pyrotechnics”, fuels and related substances, as follows, and ‘mixtures’ thereof: --- 10. Liquid high energy density fuels not specified in Category Code ML8.c.1., as follows: --- b. Other high energy density fuels and fuel additives (e.g. cubane, ionic solutions, JP-7, JP-10), having a volume-based energy density of 37.5 GJ per cubic metre or greater, measured at 293 K (20 °C) and one atmosphere (101.325 kPa) pressure;</p>
ML8.e.12.	<p>“Energetic materials” and related substances, as follows: --- e. Binders, plasticisers, monomers and polymers, as follows: --- 12. HTPB (hydroxyl terminated polybutadiene) with a hydroxyl functionality equal to or greater than 2.2 and less or equal to 2.4, a hydroxyl value of less than 0.77 meq/g, and a viscosity at 30°C of less than 47 poise (69102-90-5);</p>	<p>“Energetic materials” and related substances, as follows: --- e. Binders, plasticisers, monomers and polymers, as follows: --- 12. HTPB (hydroxyl terminated polybutadiene) with a hydroxyl functionality equal to or greater than 2.2 and less or equal to 2.4, a hydroxyl value of less than 0.77 meq/g, and a viscosity at 30 °C of less than 47 poise (69102-90-5);</p>

ML9

Category Code	SGCO 2019	SGCO 2020
<ul style="list-style-type: none"> - ML9.h. - ML9.h. Technical Note - ML9.h. Note 	<p>Vessels of war (surface or underwater), special naval equipment, accessories, components and other surface vessels, as follows:</p> <p>---</p> <p>h. Naval nuclear equipment and related equipment and components, as follows:</p> <p>1. Nuclear power generating equipment or propulsion equipment, specially designed for vessels specified in Category Code ML9.a. and components therefor specially designed or ‘modified’ for military use.</p> <p><u>Technical Note</u> <i>For the purpose of Category Code ML9.h.1., ‘modified’ means any structural, electrical, mechanical, or other change that provides a non-military item with military capabilities equivalent to an item which is specially designed for military use.</i></p> <p><u>Note</u> <i>Category Code ML9.h.1. includes “nuclear reactors”.</i></p>	<p>Vessels of war (surface or underwater), special naval equipment, accessories, components and other surface vessels, as follows:</p> <p>---</p> <p>h. Nuclear power generating equipment or propulsion equipment, specially designed for vessels specified in Category Code ML9.a. and components therefor specially designed or ‘modified’ for military use.</p> <p><u>Technical Note</u> <i>For the purpose of Category Code ML9.h., ‘modified’ means any structural, electrical, mechanical, or other change that provides a non-military item with military capabilities equivalent to an item which is specially designed for military use.</i></p> <p><u>Note</u> <i>Category Code ML9.h. includes “nuclear reactors”.</i></p>

ML13

Category Code	SGCO 2019	SGCO 2020
ML13.d.2.	<p>Armoured or protective equipment, constructions and components, as follows:</p> <p>---</p> <p>d. Body armour or protective garments, and components therefor, as follows:</p> <p>---</p> <p>2. Hard body armour plates providing ballistic protection equal to or greater than level III (NIJ 0101.06, July 2008) or national equivalents.</p>	<p>Armoured or protective equipment, constructions and components, as follows:</p> <p>---</p> <p>d. Body armour or protective garments, and components therefor, as follows:</p> <p>---</p> <p>2. Hard body armour plates providing ballistic protection equal to or greater than level III (NIJ 0101.06, July 2008), or “equivalent standards”.</p>

ML17

Category Code	SGCO 2019	SGCO 2020
ML17.e.2.	<p>Miscellaneous equipment, materials and “libraries”, as follows, and specially designed components therefor:</p> <p>---</p> <p>e. “Robots”, “robot” controllers and “robot” “end effectors”, having any of the following characteristics:</p> <p>---</p> <p>2. Incorporating means of protecting hydraulic lines against externally induced punctures caused by ballistic fragments (e.g. incorporating self-sealing lines) and designed to use hydraulic fluids with flash points higher than 839 K (566°C); <u>or</u></p>	<p>Miscellaneous equipment, materials and “libraries”, as follows, and specially designed components therefor:</p> <p>---</p> <p>e. “Robots”, “robot” controllers and “robot” “end effectors”, having any of the following characteristics:</p> <p>---</p> <p>2. Incorporating means of protecting hydraulic lines against externally induced punctures caused by ballistic fragments (e.g. incorporating self-sealing lines) and designed to use hydraulic fluids with flash points higher than 839 K (566 °C); <u>or</u></p>

ML18

Category Code	SGCO 2019	SGCO 2020
ML18	‘Production’ equipment and components, as follows:	‘Production’ equipment, environmental test facilities and components, as follows:

ML20

Category Code	SGCO 2019	SGCO 2020
ML20.a.	<p>Cryogenic and “superconductive” equipment, as follows, and specially designed components and accessories therefor:</p> <p>a. Equipment specially designed or configured to be installed in a vehicle for military ground, marine, airborne or space applications, capable of operating while in motion and of producing or maintaining temperatures below 103 K (-170°C);</p>	<p>Cryogenic and “superconductive” equipment, as follows, and specially designed components and accessories therefor:</p> <p>a. Equipment specially designed or configured to be installed in a vehicle for military ground, marine, airborne or space applications, capable of operating while in motion and of producing or maintaining temperatures below 103 K (-170 °C);</p>

ML21

Category Code	SGCO 2019	SGCO 2020
<p>- ML21.b.5.</p> <p>- ML21.b.5. Note 1</p> <p>- ML21.b.5. Note 2</p>	<p>“Software” as follows:</p> <p>---</p> <p>b. Specific “software”, other than that specified in Category Code ML21.a., as follows:</p> <p>---</p> <p>-</p>	<p>“Software” as follows:</p> <p>---</p> <p>b. Specific “software”, other than that specified in Category Code ML21.a., as follows:</p> <p>---</p> <p>5. “Software” specially designed or modified for the conduct of military offensive cyber operations;</p> <p><u>Note 1</u></p> <p><i>Category Code ML21.b.5. includes “software” designed to destroy, damage, degrade or disrupt systems, equipment or “software”, specified in this Division, cyber reconnaissance and cyber command and control “software”, therefor.</i></p> <p><u>Note 2</u></p> <p><i>Category Code ML21.b.5. does not apply to “vulnerability disclosure” or to “cyber incident response”, limited to non-military defensive cybersecurity readiness or response.</i></p>

ML21.c. N.B.	<p>“Software” as follows:</p> <p>---</p> <p>c. “Software”, not specified in Category Code ML21.a. or ML21.b., specially designed or modified to enable equipment not specified in this Division to perform the military functions of equipment specified in this Division.</p> <p>-</p>	<p>“Software” as follows:</p> <p>---</p> <p>c. “Software”, not specified in Category Code ML21.a. or ML21.b., specially designed or modified to enable equipment not specified in this Division to perform the military functions of equipment specified in this Division.</p> <p><u>N.B.</u></p> <p><i>See systems, equipment or components specified in this Division for general purpose “digital computers” with installed “software” specified by Category Code ML21.c.</i></p>
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List of Dual-Use Goods

Definitions

Category Code	SGCO 2019	SGCO 2020
“bias” (gyro) (Category 7)	“bias” (gyro) (Category 7) means the average over a specified time of gyro output, measured at specified operating conditions, that has no correlation with input rotation or acceleration. “Bias” (gyro) is typically expressed in degrees per hour (deg/hr). (Ref. IEEE Std 528-2001);	“bias” (gyro) (Category 7) means the average over a specified time of gyro output, measured at specified operating conditions, that has no correlation with input rotation or acceleration. “Bias” (gyro) is typically expressed in degrees per hour (degrees/hr). (Ref. IEEE Std 528-2001);
“CEP” (Category 7)	“Circular Error Probable” (“CEP”) (Category 7) means in a circular normal distribution, the radius of the circle containing 50% of the individual measurements being made, or the radius of the circle within which there is a 50% probability of being located;	“CEP” (Category 7) means “Circular Error Probable” - In a circular normal distribution, the radius of the circle containing 50% of the individual measurements being made, or the radius of the circle within which there is a 50% probability of being located;
“cryptography” (Category 5)	<p>“cryptography” (Category 5) means the discipline which embodies principles, means and methods for the transformation of data in order to hide its information content, prevent its undetected modification or prevent its unauthorised use. “Cryptography” is limited to the transformation of information using one or more ‘secret parameters’ (e.g. crypto variables) or associated key management;</p> <p><u>Note</u> “Cryptography” does not include ‘fixed’ data compression or coding techniques.</p> <p><u>Technical Note</u> ‘Fixed’ means the coding or compression algorithm cannot accept externally supplied parameters (e.g. cryptographic or key variables) and cannot be modified by the user.</p>	<p>“cryptography” (Category 5) means the discipline which embodies principles, means and methods for the transformation of data in order to hide its information content, prevent its undetected modification or prevent its unauthorised use. “Cryptography” is limited to the transformation of information using one or more ‘secret parameters’ (e.g. crypto variables) or associated key management;</p> <p><u>Note 1</u> “Cryptography” does not include ‘fixed’ data compression or coding techniques.</p> <p><u>Technical Note</u> ‘Fixed’ means the coding or compression algorithm cannot accept externally supplied parameters (e.g. cryptographic or key variables) and cannot be modified by the user.</p> <p><u>Note 2</u> “Cryptography” includes decryption.</p>

“CW laser” (Category 6)	“CW laser” (Category 6) means a “laser” that produces a nominally constant output energy for greater than 0.25 seconds;	“CW laser” (Category 6) means a “laser” that produces a nominally constant output energy for greater than 0.25 s;
“linearity” (Category 2)	-	“linearity” (Category 2) (usually measured in terms of non-linearity) means the maximum deviation of the actual characteristic (average of upscale and downscale readings), positive or negative, from a straight line so positioned as to equalise and minimise the maximum deviations;
“pulsed laser” (Category 6)	“pulsed laser” (Category 6) means a “laser” having a “pulse duration” that is less than or equal to 0.25 seconds;	“pulsed laser” (Category 6) means a “laser” having a “pulse duration” that is less than or equal to 0.25 s;
“sample rate” (Category 3)	“Sample rate” (Category 3), in the case of an Analogue-to-Digital Converter (ADC) that is not an oversampling ADC, means the maximum number of samples that are measured at the analogue input over a period of one second. For an oversampling ADC, the “sample rate” is taken to be its output word rate. “Sample rate” may also be referred to as sampling rate (usually specified in Mega Samples Per Second (MSPS) or Giga Samples Per Second (GSPS)) or conversion rate (usually specified in Hertz (Hz));	“sample rate” (Category 3), in the case of an Analogue-to-Digital Converter (ADC) that is not an oversampling ADC, means the maximum number of samples that are measured at the analogue input over a period of 1 s. For an oversampling ADC, the “sample rate” is taken to be its output word rate. “Sample rate” may also be referred to as sampling rate (usually specified in Mega Samples Per Second (MSPS) or Giga Samples Per Second (GSPS)) or conversion rate (usually specified in Hertz (Hz));
“satellite navigation system” (Categories 5, 7)	-	“satellite navigation system” (Categories 5, 7) means a system consisting of ground stations, a constellation of satellites, and receivers, that enables receiver locations to be calculated on the basis of signals received from the satellites. It includes Global Navigation Satellite Systems (GNSS) and Regional Navigation Satellite Systems (RNSS);
“specific modulus” (Categories 0, 1, 9)	“specific modulus” (Categories 0, 1, 9) means 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 $((23 \pm 2)^{\circ}\text{C})$ and a relative humidity of $(50 \pm 5)\%$;	“specific modulus” (Categories 0, 1, 9) means 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 $((23 \pm 2)^{\circ}\text{C})$ and a relative humidity of $(50 \pm 5)\%$;

“specific tensile strength” (Categories 0, 1, 9)	“specific tensile strength” (Categories 0, 1, 9) means Ultimate Tensile Strength (UTS) 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 $(50 \pm 5)\%$;	“specific tensile strength” (Categories 0, 1, 9) means Ultimate Tensile Strength (UTS) 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 $(50 \pm 5)\%$;
“superalloys” (Categories 2, 9)	“superalloys” (Categories 2, 9) means nickel-, cobalt- or iron-base alloys having strengths superior to any alloys in the AISI 300 series at temperatures over 922 K $(649^\circ C)$ under severe environmental and operating conditions;	“superalloys” (Categories 2, 9) means nickel-, cobalt- or iron-base alloys having strengths superior to any alloys in the AISI 300 series at temperatures over 922 K $(649^\circ C)$ under severe environmental and operating conditions;
“total control of flight” (Category 7)	“total control of flight” (Category 7) means an 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”;	“total control of flight” (Category 7) means an 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”;
“vacuum electronic devices” (Category 3)	-	“vacuum electronic devices” (Category 3) means electronic devices based on the interaction of an electron beam with an electromagnetic wave propagating in a vacuum circuit or interacting with radio-frequency vacuum cavity resonators. “Vacuum electronic devices” include klystrons, travelling-wave tubes, and their derivatives;
ENOB	-	ENOB Effective Number of Bits
EUV	-	EUV Extreme UltraViolet
HEMT	HEMT High Electron Mobility Transistors	HEMT High Electron Mobility Transistor
PDK	-	PDK Process Design Kit
QE	-	QE Quantum Efficiency
rms	-	rms Root Mean Square
ROIC	-	ROIC Read-out Integrated Circuit

Category 0

0B001

Category Code	SGCO 2019	SGCO 2020
0B001.b.11.	<p>Plant for the separation of isotopes of “natural uranium”, “depleted uranium” or “special fissile materials”, and specially designed or prepared equipment and components therefor, as follows:</p> <p>---</p> <p>b. Gas centrifuges and assemblies and components, specially designed or prepared for gas centrifuge separation process, as follows:</p> <p>---</p> <p>11. Centrifuge housing/recipient to contain the rotor tube assembly of a gas centrifuge, consisting of a rigid cylinder of wall thickness up to 30 mm with precision machined ends that are parallel to each other and perpendicular to the cylinder’s longitudinal axis to within 0.05 degrees or less;</p>	<p>Plant for the separation of isotopes of “natural uranium”, “depleted uranium” or “special fissile materials”, and specially designed or prepared equipment and components therefor, as follows:</p> <p>---</p> <p>b. Gas centrifuges and assemblies and components, specially designed or prepared for gas centrifuge separation process, as follows:</p> <p>---</p> <p>11. Centrifuge housing/recipient to contain the rotor tube assembly of a gas centrifuge, consisting of a rigid cylinder of wall thickness up to 30 mm with precision machined ends that are parallel to each other and perpendicular to the cylinder’s longitudinal axis to within 0.05 degree or less;</p>
0B001.c.3.	<p>Plant for the separation of isotopes of “natural uranium”, “depleted uranium” or “special fissile materials”, and specially designed or prepared equipment and components therefor, as follows:</p> <p>---</p> <p>c. Equipment and components, specially designed or prepared for gaseous diffusion separation process, as follows:</p> <p>---</p> <p>3. Compressors or gas blowers with a suction volume capacity of 1 m³/min or more of UF₆, discharge pressure up to 500 kPa and having a pressure ratio of 10:1 or less, and made of or protected by “materials resistant to corrosion by UF₆”;</p>	<p>Plant for the separation of isotopes of “natural uranium”, “depleted uranium” or “special fissile materials”, and specially designed or prepared equipment and components therefor, as follows:</p> <p>---</p> <p>c. Equipment and components, specially designed or prepared for gaseous diffusion separation process, as follows:</p> <p>---</p> <p>3. Compressors or gas blowers with a suction volume capacity of 1 m³/min or more of UF₆, with a discharge pressure up to 500 kPa, and having a pressure ratio of 10:1 or less, and made of or protected by “materials resistant to corrosion by UF₆”;</p>

<ul style="list-style-type: none"> - 0B001.d.7.a. - 0B001.d.7.b. 	<p>Plant for the separation of isotopes of “natural uranium”, “depleted uranium” or “special fissile materials”, and specially designed or prepared equipment and components therefor, as follows:</p> <p>---</p> <p>d. Equipment and components, specially designed or prepared for aerodynamic separation process, as follows:</p> <p>---</p> <ol style="list-style-type: none"> 7. Process systems for separating UF₆ from carrier gas (hydrogen or helium) to 1 parts per million (ppm) UF₆ content or less, including: <ol style="list-style-type: none"> a. Cryogenic heat exchangers and cryoseparators capable of temperatures of 153 K (-120°C) or less; b. Cryogenic refrigeration units capable of temperatures of 153 K (-120°C) or less; 	<p>Plant for the separation of isotopes of “natural uranium”, “depleted uranium” or “special fissile materials”, and specially designed or prepared equipment and components therefor, as follows:</p> <p>---</p> <p>d. Equipment and components, specially designed or prepared for aerodynamic separation process, as follows:</p> <p>---</p> <ol style="list-style-type: none"> 7. Process systems for separating UF₆ from carrier gas (hydrogen or helium) to 1 parts per million (ppm) UF₆ content or less, including: <ol style="list-style-type: none"> a. Cryogenic heat exchangers and cryoseparators capable of temperatures of 153 K (-120 °C) or less; b. Cryogenic refrigeration units capable of temperatures of 153 K (-120 °C) or less;
<ul style="list-style-type: none"> - 0B001.e.1. - 0B001.e.2. 	<p>Plant for the separation of isotopes of “natural uranium”, “depleted uranium” or “special fissile materials”, and specially designed or prepared equipment and components therefor, as follows:</p> <p>---</p> <p>e. Equipment and components, specially designed or prepared for chemical exchange separation process, as follows:</p> <ol style="list-style-type: none"> 1. Fast-exchange liquid-liquid pulse columns with stage residence time of 30 seconds or less and resistant to concentrated hydrochloric acid (e.g. made of or protected by suitable plastic materials such as fluorinated hydrocarbon polymers or glass); 2. Fast-exchange liquid-liquid centrifugal contactors with stage residence time of 30 seconds or less and resistant to concentrated hydrochloric acid (e.g. made of or protected by suitable plastic materials such as fluorinated hydrocarbon polymers or glass); 	<p>Plant for the separation of isotopes of “natural uranium”, “depleted uranium” or “special fissile materials”, and specially designed or prepared equipment and components therefor, as follows:</p> <p>---</p> <p>e. Equipment and components, specially designed or prepared for chemical exchange separation process, as follows:</p> <ol style="list-style-type: none"> 1. Fast-exchange liquid-liquid pulse columns with stage residence time of 30 s or less and resistant to concentrated hydrochloric acid (e.g. made of or protected by suitable plastic materials such as fluorinated hydrocarbon polymers or glass); 2. Fast-exchange liquid-liquid centrifugal contactors with stage residence time of 30 s or less and resistant to concentrated hydrochloric acid (e.g. made of or protected by suitable plastic materials such as fluorinated hydrocarbon polymers or glass);

<ul style="list-style-type: none"> - 0B001.f.1. - 0B001.f.2. 	<p>Plant for the separation of isotopes of “natural uranium”, “depleted uranium” or “special fissile materials”, and specially designed or prepared equipment and components therefor, as follows:</p> <p>---</p> <p>f. Equipment and components, specially designed or prepared for ion exchange separation process, as follows:</p> <ol style="list-style-type: none"> 1. Fast reacting ion-exchange resins, pellicular or porous macro reticulated resins in which the active chemical exchange groups are limited to a coating on the surface of an inactive porous support structure, and other composite structures in any suitable form, including particles or fibres, with diameters of 0.2 mm or less, resistant to concentrated hydrochloric acid and designed to have an exchange rate half time of less than 10 seconds and capable of operating at temperatures in the range of 373 K (100°C) to 473 K (200°C); 2. Ion exchange columns (cylindrical) with a diameter greater than 1,000 mm, made of or protected by materials resistant to concentrated hydrochloric acid (e.g. titanium or fluorocarbon plastics) and capable of operating at temperatures in the range of 373 K (100°C) to 473 K (200°C) and pressures above 0.7 MPa; 	<p>Plant for the separation of isotopes of “natural uranium”, “depleted uranium” or “special fissile materials”, and specially designed or prepared equipment and components therefor, as follows:</p> <p>---</p> <p>f. Equipment and components, specially designed or prepared for ion exchange separation process, as follows:</p> <ol style="list-style-type: none"> 1. Fast reacting ion-exchange resins, pellicular or porous macro reticulated resins in which the active chemical exchange groups are limited to a coating on the surface of an inactive porous support structure, and other composite structures in any suitable form, including particles or fibres, with diameters of 0.2 mm or less, resistant to concentrated hydrochloric acid and designed to have an exchange rate half time of less than 10 s and capable of operating at temperatures in the range of 373 K (100 °C) to 473 K (200 °C); 2. Ion exchange columns (cylindrical) with a diameter greater than 1,000 mm, made of or protected by materials resistant to concentrated hydrochloric acid (e.g. titanium or fluorocarbon plastics) and capable of operating at temperatures in the range of 373 K (100 °C) to 473 K (200 °C) and pressures above 0.7 MPa;
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0B001.g.3.	<p>Plant for the separation of isotopes of “natural uranium”, “depleted uranium” or “special fissile materials”, and specially designed or prepared equipment and components therefor, as follows:</p> <p>---</p> <p>g. Equipment and components, specially designed or prepared for laser-based separation processes using atomic vapour laser isotope separation, as follows:</p> <p>---</p> <p>3. Product and tails collector assemblies for uranium metal in liquid or solid form, made of or protected by materials resistant to the heat and corrosion of uranium metal vapour or liquid, such as yttria-coated graphite or tantalum;</p>	<p>Plant for the separation of isotopes of “natural uranium”, “depleted uranium” or “special fissile materials”, and specially designed or prepared equipment and components therefor, as follows:</p> <p>---</p> <p>g. Equipment and components, specially designed or prepared for laser-based separation processes using atomic vapour laser isotope separation, as follows:</p> <p>---</p> <p>3. Product and tails collector assemblies for collecting uranium metal in liquid or solid form, made of or protected by materials resistant to the heat and corrosion of uranium metal vapour or liquid, such as yttria coated graphite or tantalum;</p>
<p>- 0B001.h.1. - 0B001.h.5.a. - 0B001.h.5.b.</p>	<p>Plant for the separation of isotopes of “natural uranium”, “depleted uranium” or “special fissile materials”, and specially designed or prepared equipment and components therefor, as follows:</p> <p>---</p> <p>h. Equipment and components, specially designed or prepared for laser-based separation processes using molecular laser isotope separation, as follows:</p> <p>1. Supersonic expansion nozzles for cooling mixtures of UF₆ and carrier gas to 150 K (-123°C) or less and made from “materials resistant to corrosion by UF₆”;</p> <p>---</p> <p>5. Process systems for separating UF₆ from carrier gas (e.g. nitrogen, argon or other gas) including:</p> <p>a. Cryogenic heat exchangers and cryoseparators capable of temperatures of 153 K (-120°C) or less;</p> <p>b. Cryogenic refrigeration units capable of temperatures of 153 K (-120°C) or less;</p>	<p>Plant for the separation of isotopes of “natural uranium”, “depleted uranium” or “special fissile materials”, and specially designed or prepared equipment and components therefor, as follows:</p> <p>---</p> <p>h. Equipment and components, specially designed or prepared for laser-based separation processes using molecular laser isotope separation, as follows:</p> <p>1. Supersonic expansion nozzles for cooling mixtures of UF₆ and carrier gas to 150 K (-123 °C) or less and made from “materials resistant to corrosion by UF₆”;</p> <p>---</p> <p>5. Process systems for separating UF₆ from carrier gas (e.g. nitrogen, argon or other gas) including:</p> <p>a. Cryogenic heat exchangers and cryoseparators capable of temperatures of 153 K (-120 °C) or less;</p> <p>b. Cryogenic refrigeration units capable of temperatures of 153 K (-120 °C) or less;</p>

0B002

Category Code	SGCO 2019	SGCO 2020
<ul style="list-style-type: none"> - 0B002.g.2. - 0B002.g.3. - 0B002.g.4. 	<p>Specially designed or prepared auxiliary systems, equipment and components, as follows, for isotope separation plant specified in Category Code 0B001, made of or protected by “materials resistant to corrosion by UF₆”:</p> <p>---</p> <p>g. UF₆ mass spectrometers/ion sources capable of taking on line samples from UF₆ gas streams and having all of the following characteristics:</p> <p>---</p> <ul style="list-style-type: none"> 2. Have ion sources constructed of or protected by nickel, nickel copper alloys with a nickel content of 60% or more by weight, or nickel chrome alloys; 3. Have electron bombardment ionisation sources; <u>and</u> 4. Have a collector system suitable for isotopic analysis. 	<p>Specially designed or prepared auxiliary systems, equipment and components, as follows, for isotope separation plant specified in Category Code 0B001, made of or protected by “materials resistant to corrosion by UF₆”:</p> <p>---</p> <p>g. UF₆ mass spectrometers/ion sources capable of taking on line samples from UF₆ gas streams and having all of the following characteristics:</p> <p>---</p> <ul style="list-style-type: none"> 2. Ion sources constructed of or protected by nickel, nickel copper alloys with a nickel content of 60% or more by weight, or nickel chrome alloys; 3. Electron bombardment ionisation sources; <u>and</u> 4. Having a collector system suitable for isotopic analysis.

0B004

Category Code	SGCO 2019	SGCO 2020
- 0B004.b.2. - 0B004.b.6.	<p>Plant for the production or concentration of heavy water, deuterium and deuterium compounds and specially designed or prepared equipment and components therefor, as follows:</p> <p>---</p> <p>b. Equipment and components, as follows:</p> <p>---</p> <p>2. Single stage, low head (i.e. 0.2 MPa) centrifugal blowers or compressors for hydrogen sulphide gas circulation (i.e. gas containing more than 70% H₂S) with a throughput capacity greater than or equal to 56 m³/second when operating at pressures greater than or equal to 1.8 MPa suction and having seals designed for wet H₂S service;</p> <p>---</p> <p>6. Infrared absorption analysers capable of on line hydrogen/deuterium ratio analysis where deuterium concentrations are equal to or greater than 90%;</p>	<p>Plant for the production or concentration of heavy water, deuterium and deuterium compounds and specially designed or prepared equipment and components therefor, as follows:</p> <p>---</p> <p>b. Equipment and components, as follows:</p> <p>---</p> <p>2. Single stage, low head (i.e. 0.2 MPa) centrifugal blowers or compressors for hydrogen sulphide gas circulation (i.e. gas containing more than 70% by weight of hydrogen sulphide, H₂S) with a throughput capacity greater than or equal to 56 m³/s when operating at pressures greater than or equal to 1.8 MPa suction and having seals designed for wet H₂S service;</p> <p>---</p> <p>6. Infrared absorption analysers capable of on line hydrogen/deuterium ratio analysis where deuterium concentrations are equal to or greater than 90% by weight;</p>

0C005

Category Code	SGCO 2019	SGCO 2020
0C005	<p>Specially prepared compounds or powders for the manufacture of gaseous diffusion barriers, resistant to corrosion by UF₆ (e.g. nickel or alloy containing 60% or more nickel by weight, aluminium oxide and fully fluorinated hydrocarbon polymers), having a purity of 99.9% by weight or more and a particle size less than 10 µm measured by American Society for Testing and Materials (ASTM) B330 standard and a high degree of particle size uniformity.</p>	<p>Specially prepared compounds or powders for the manufacture of gaseous diffusion barriers, resistant to corrosion by UF₆ (e.g. nickel or alloy containing 60% by weight or more of nickel, aluminium oxide and fully fluorinated hydrocarbon polymers), having a purity of 99.9% by weight or more and a particle size less than 10 µm measured by American Society for Testing and Materials (ASTM) B330 standard and a high degree of particle size uniformity.</p>

Category 1**1A227**

Category Code	SGCO 2019	SGCO 2020
1A227 Technical Note	<p>High-density (lead glass or other) radiation shielding windows, having all of the following characteristics, and specially designed frames therefor:</p> <p>---</p> <p><u>Technical Note</u> <i>In Category Code 1A227, 'cold area' means the viewing area of the window exposed to the lowest level of radiation in the design application.</i></p>	<p>High-density (lead glass or other) radiation shielding windows, having all of the following characteristics, and specially designed frames therefor:</p> <p>---</p> <p><u>Technical Note</u> <i>In Category Code 1A227, 'cold area' means the viewing area of the window exposed to the lowest level of radiation in the design application.</i></p>

1B101

Category Code	SGCO 2019	SGCO 2020
1B101.a.	<p>Equipment, other than that specified in Category Code 1B001, for the "production" of structural composites as follows; and specially designed components and accessories therefor:</p> <p>---</p> <p>a. Filament winding machines or fibre placement machines, of which the motions for positioning, wrapping and winding fibres can be coordinated and programmed in three or more axes, designed to fabricate composite structures or laminates from fibrous or filamentary materials, and coordinating and programming controls;</p>	<p>Equipment, other than that specified in Category Code 1B001, for the "production" of structural composites as follows; and specially designed components and accessories therefor:</p> <p>---</p> <p>a. Filament winding machines or fibre placement machines, of which the motions for positioning, wrapping and winding fibres can be coordinated and programmed in three or more axes, designed to fabricate composite structures or laminates from "fibrous or filamentary materials", and coordinating and programming controls;</p>

1B116

Category Code	SGCO 2019	SGCO 2020
1B116	Specially designed nozzles for producing pyrolytically derived materials formed on a mould, mandrel or other substrate from precursor gases which decompose in the 1,573 K (1,300°C) to 3,173 K (2,900°C) temperature range at pressures of 130 Pa to 20 kPa.	Specially designed nozzles for producing pyrolytically derived materials formed on a mould, mandrel or other substrate from precursor gases which decompose in the 1,573 K (1,300 °C) to 3,173 K (2,900 °C) temperature range at pressures of 130 Pa to 20 kPa.

1B117

Category Code	SGCO 2019	SGCO 2020
1B117.d. Note	<p>Batch mixers having all of the following characteristics, and specially designed components therefor:</p> <p>---</p> <p>d. At least one ‘mixing/kneading shaft’ mounted off centre.</p> <p><i>Note</i> In Category Code 1B117.d., ‘mixing/kneading shaft’ does not refer to deagglomerators or knife-spindles.</p>	<p>Batch mixers having all of the following characteristics, and specially designed components therefor:</p> <p>---</p> <p>d. At least one ‘mixing/kneading shaft’ mounted off centre.</p> <p><i>Note</i> In Category Code 1B117.d., ‘mixing/kneading shaft’ does not refer to deagglomerators or knife-spindles.</p>

1B228

Category Code	SGCO 2019	SGCO 2020
1B228.a.	<p>Hydrogen cryogenic distillation columns having all of the following characteristics:</p> <p>a. Designed for operation with internal temperatures of 35 K (-238°C) or less;</p>	<p>Hydrogen cryogenic distillation columns having all of the following characteristics:</p> <p>a. Designed for operation with internal temperatures of 35 K (-238 °C) or less;</p>

1B231

Category Code	SGCO 2019	SGCO 2020
1B231.b.1.	<p>Tritium facilities or plants, and equipment therefor, as follows:</p> <p>---</p> <p>b. Equipment for tritium facilities or plants, as follows:</p> <p>1. Hydrogen or helium refrigeration units capable of cooling to 23 K (-250°C) or less, with heat removal capacity greater than 150 W;</p>	<p>Tritium facilities or plants, and equipment therefor, as follows:</p> <p>---</p> <p>b. Equipment for tritium facilities or plants, as follows:</p> <p>1. Hydrogen or helium refrigeration units capable of cooling to 23 K (-250 °C) or less, with heat removal capacity greater than 150 W;</p>

1B232

Category Code	SGCO 2019	SGCO 2020
1B232.a.	<p>Turboexpanders or turboexpander compressor sets having both of the following characteristics:</p> <p>a. Designed for operation with an outlet temperature of 35 K (-238°C) or less; <u>and</u></p>	<p>Turboexpanders or turboexpander compressor sets having both of the following characteristics:</p> <p>a. Designed for operation with an outlet temperature of 35 K (-238 °C) or less; <u>and</u></p>

1B234

Category Code	SGCO 2019	SGCO 2020
1B234.b.	<p>High explosive containment vessels, chambers, containers and other similar containment devices designed for the testing of high explosives or explosive devices and having both of the following characteristics:</p> <p>---</p> <p>b. Having design elements or features enabling real time or delayed transfer of diagnostic or measurement information.</p>	<p>High explosive containment vessels, chambers, containers and other similar containment devices designed for the testing of high explosives or explosive devices and having both of the following characteristics:</p> <p>---</p> <p>b. Having design elements or features enabling real-time or delayed transfer of diagnostic or measurement information.</p>

1C001

Category Code	SGCO 2019	SGCO 2020
1C001.a. Note 1	<p>Materials specially designed for absorbing electromagnetic radiation, or intrinsically conductive polymers, as follows:</p> <p>---</p> <p>a. Materials for absorbing frequencies exceeding 2×10^8 Hz but less than 3×10^{12} Hz;</p> <p><u>Note 1</u> Category Code 1C001.a. does not include:</p> <p>---</p> <p>c. Planar absorbers, having all of the following characteristics:</p> <p>1. Made from either of the following:</p> <p>a. Plastic foam materials (flexible or non-flexible) with carbon-loading, or organic materials, including binders, providing more than 5% echo compared with metal over a bandwidth exceeding $\pm 15\%$ of the centre frequency of the incident energy, and not capable of withstanding temperatures exceeding 450 K (177°C); <u>or</u></p> <p>b. Ceramic materials providing more than 20% echo compared with metal over a bandwidth exceeding $\pm 15\%$ of the centre frequency of the incident energy, and not capable of withstanding temperatures exceeding 800 K (527°C);</p>	<p>Materials specially designed for absorbing electromagnetic radiation, or intrinsically conductive polymers, as follows:</p> <p>---</p> <p>a. Materials for absorbing frequencies exceeding 2×10^8 Hz but less than 3×10^{12} Hz;</p> <p><u>Note 1</u> Category Code 1C001.a. does not include:</p> <p>---</p> <p>c. Planar absorbers, having all of the following characteristics:</p> <p>1. Made from either of the following:</p> <p>a. Plastic foam materials (flexible or non-flexible) with carbon-loading, or organic materials, including binders, providing more than 5% echo compared with metal over a bandwidth exceeding $\pm 15\%$ of the centre frequency of the incident energy, and not capable of withstanding temperatures exceeding 450 K (177 °C); <u>or</u></p> <p>b. Ceramic materials providing more than 20% echo compared with metal over a bandwidth exceeding $\pm 15\%$ of the centre frequency of the incident energy, and not capable of withstanding temperatures exceeding 800 K (527 °C);</p>

1C001.a. Note 1	<p>Materials specially designed for absorbing electromagnetic radiation, or intrinsically conductive polymers, as follows:</p> <p>---</p> <p>a. Materials for absorbing frequencies exceeding 2×10^8 Hz but less than 3×10^{12} Hz;</p> <p><u>Note 1</u> Category Code 1C001.a. does not include:</p> <p>---</p> <p>d. Planar absorbers made of sintered ferrite, having both of the following characteristics:</p> <p>---</p> <p>2. A maximum operating temperature of 548 K (275°C);</p>	<p>Materials specially designed for absorbing electromagnetic radiation, or intrinsically conductive polymers, as follows:</p> <p>---</p> <p>a. Materials for absorbing frequencies exceeding 2×10^8 Hz but less than 3×10^{12} Hz;</p> <p><u>Note 1</u> Category Code 1C001.a. does not include:</p> <p>---</p> <p>d. Planar absorbers made of sintered ferrite, having both of the following characteristics:</p> <p>---</p> <p>2. A maximum operating temperature of 548 K (275 °C);</p>
1C001.a. Note 1	<p>Materials specially designed for absorbing electromagnetic radiation, or intrinsically conductive polymers, as follows:</p> <p>---</p> <p>a. Materials for absorbing frequencies exceeding 2×10^8 Hz but less than 3×10^{12} Hz;</p> <p><u>Note 1</u> Category Code 1C001.a. does not include:</p> <p>---</p> <p>-</p>	<p>Materials specially designed for absorbing electromagnetic radiation, or intrinsically conductive polymers, as follows:</p> <p>---</p> <p>a. Materials for absorbing frequencies exceeding 2×10^8 Hz but less than 3×10^{12} Hz;</p> <p><u>Note 1</u> Category Code 1C001.a. does not include:</p> <p>---</p> <p>e. Planar absorbers having no magnetic loss and fabricated from 'open-cell foam' plastic material with a density of 0.15 g/cm³ or less.</p> <p><u>Technical Note</u> 'Open-cell foams' are flexible and porous materials, having an inner structure open to the atmosphere. 'Open-cell foams' are also known as reticulated foams.</p>

1C002

Category Code	SGCO 2019	SGCO 2020
<ul style="list-style-type: none"> - 1C002.a.1. - 1C002.a.2. 	<p>Metal alloys, metal alloy powder and alloyed materials, as follows:</p> <p>---</p> <p>a. Aluminides, as follows:</p> <ol style="list-style-type: none"> 1. Nickel aluminides containing a minimum of 15% by weight aluminium, a maximum of 38% by weight aluminium and at least one additional alloying element; 2. Titanium aluminides containing 10% by weight or more aluminium and at least one additional alloying element; 	<p>Metal alloys, metal alloy powder and alloyed materials, as follows:</p> <p>---</p> <p>a. Aluminides, as follows:</p> <ol style="list-style-type: none"> 1. Nickel aluminides containing a minimum of 15% by weight of aluminium, a maximum of 38% by weight of aluminium and at least one additional alloying element; 2. Titanium aluminides containing 10% by weight or more of aluminium and at least one additional alloying element;

<ul style="list-style-type: none"> - 1C002.b.1.a. - 1C002.b.1.b. - 1C002.b.2.a. - 1C002.b.2.b. - 1C002.b.3.a. - 1C002.b.3.b. - 1C002.b.4.a. - 1C002.b.4.b. 	<p>Metal alloys, metal alloy powder and alloyed materials, as follows:</p> <p>---</p> <p>b. Metal alloys, as follows, made from the powder or particulate material specified in Category Code 1C002.c.:</p> <ol style="list-style-type: none"> 1. Nickel alloys having either of the following characteristics: <ol style="list-style-type: none"> a. A 'stress-rupture life' of 10,000 hours or longer at 923 K (650°C) at a stress of 676 MPa; <u>or</u> b. A 'low cycle fatigue life' of 10,000 cycles or more at 823 K (550°C) at a maximum stress of 1,095 MPa; 2. Niobium alloys having either of the following characteristics: <ol style="list-style-type: none"> a. A 'stress rupture life' of 10,000 hours or longer at 1,073 K (800°C) at a stress of 400 MPa; <u>or</u> b. A 'low cycle fatigue life' of 10,000 cycles or more at 973 K (700°C) at a maximum stress of 700 MPa; 3. Titanium alloys having either of the following characteristics: <ol style="list-style-type: none"> a. A 'stress rupture life' of 10,000 hours or longer at 723 K (450°C) at a stress of 200 MPa; <u>or</u> b. A 'low cycle fatigue life' of 10,000 cycles or more at 723 K (450°C) at a maximum stress of 400 MPa; 4. Aluminium alloys having either of the following characteristics: <ol style="list-style-type: none"> a. A tensile strength of 240 MPa or more at 473 K (200°C); <u>or</u> b. A tensile strength of 415 MPa or more at 298 K (25°C); 	<p>Metal alloys, metal alloy powder and alloyed materials, as follows:</p> <p>---</p> <p>b. Metal alloys, as follows, made from the powder or particulate material specified in Category Code 1C002.c.:</p> <ol style="list-style-type: none"> 1. Nickel alloys having either of the following characteristics: <ol style="list-style-type: none"> a. A 'stress-rupture life' of 10,000 hours or longer at 923 K (650 °C) at a stress of 676 MPa; <u>or</u> b. A 'low cycle fatigue life' of 10,000 cycles or more at 823 K (550 °C) at a maximum stress of 1,095 MPa; 2. Niobium alloys having either of the following characteristics: <ol style="list-style-type: none"> a. A 'stress rupture life' of 10,000 hours or longer at 1,073 K (800 °C) at a stress of 400 MPa; <u>or</u> b. A 'low cycle fatigue life' of 10,000 cycles or more at 973 K (700 °C) at a maximum stress of 700 MPa; 3. Titanium alloys having either of the following characteristics: <ol style="list-style-type: none"> a. A 'stress rupture life' of 10,000 hours or longer at 723 K (450 °C) at a stress of 200 MPa; <u>or</u> b. A 'low cycle fatigue life' of 10,000 cycles or more at 723 K (450 °C) at a maximum stress of 400 MPa; 4. Aluminium alloys having either of the following characteristics: <ol style="list-style-type: none"> a. A tensile strength of 240 MPa or more at 473 K (200 °C); <u>or</u> b. A tensile strength of 415 MPa or more at 298 K (25 °C);
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1C002.d. Technical Notes	<p>Metal alloys, metal alloy powder and alloyed materials, as follows:</p> <p>---</p> <p>d. Alloyed materials having all of the following characteristics:</p> <p>---</p> <p><u>Technical Notes</u></p> <p>---</p> <p>10. 'Solidify rapidly' is a process involving the solidification of molten material at cooling rates exceeding 1,000 K/sec.</p>	<p>Metal alloys, metal alloy powder and alloyed materials, as follows:</p> <p>---</p> <p>d. Alloyed materials having all of the following characteristics:</p> <p>---</p> <p><u>Technical Notes</u></p> <p>---</p> <p>10. 'Solidify rapidly' is a process involving the solidification of molten material at cooling rates exceeding 1,000 K/s.</p>
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1C005

Category Code	SGCO 2019	SGCO 2020
<p>- 1C005.b.1.</p> <p>- 1C005.b.2.</p>	<p>"Superconductive" "composite" conductors in lengths exceeding 100 m or with a mass exceeding 100 g, as follows:</p> <p>---</p> <p>b. "Superconductive" "composite" conductors consisting of one or more "superconductive" 'filaments' other than niobium titanium, having both of the following characteristics:</p> <ol style="list-style-type: none"> 1. A "critical temperature" at zero magnetic induction exceeding 9.85 K (-263.31°C); <u>and</u> 2. Remaining in the "superconductive" state at a temperature of 4.2 K (-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/mm² on overall cross-section of the conductor; 	<p>"Superconductive" "composite" conductors in lengths exceeding 100 m or with a mass exceeding 100 g, as follows:</p> <p>---</p> <p>b. "Superconductive" "composite" conductors consisting of one or more "superconductive" 'filaments' other than niobium titanium, having both of the following characteristics:</p> <ol style="list-style-type: none"> 1. A "critical temperature" at zero magnetic induction exceeding 9.85 K (-263.31 °C); <u>and</u> 2. Remaining in the "superconductive" state at a temperature of 4.2 K (-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/mm² on overall cross-section of the conductor;

1C005.c.	<p>“Superconductive” “composite” conductors in lengths exceeding 100 m or with a mass exceeding 100 g, as follows:</p> <p>---</p> <p>c. “Superconductive” “composite” conductors consisting of one or more “superconductive” ‘filaments’ which remain “superconductive” above 115 K (-158.16°C).</p>	<p>“Superconductive” “composite” conductors in lengths exceeding 100 m or with a mass exceeding 100 g, as follows:</p> <p>---</p> <p>c. “Superconductive” “composite” conductors consisting of one or more “superconductive” ‘filaments’ which remain “superconductive” above 115 K (-158.16 °C).</p>
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1C006

Category Code	SGCO 2019	SGCO 2020
1C006.b.2.	<p>Fluids and lubricating materials, as follows:</p> <p>---</p> <p>b. Lubricating materials containing, as their principal ingredients, either of the following:</p> <p>---</p> <p>2. Fluorinated silicone fluids with a kinematic viscosity of less than 5,000 mm²/s (5,000 centistokes) measured at 298 K (25°C);</p>	<p>Fluids and lubricating materials, as follows:</p> <p>---</p> <p>b. Lubricating materials containing, as their principal ingredients, either of the following:</p> <p>---</p> <p>2. Fluorinated silicone fluids with a kinematic viscosity of less than 5,000 mm²/s (5,000 centistokes) measured at 298 K (25 °C);</p>
- 1C006.d.2. - 1C006.d.3.	<p>Fluids and lubricating materials, as follows:</p> <p>---</p> <p>d. Fluorocarbon electronic cooling fluids having all of the following characteristics:</p> <p>---</p> <p>2. Density at 298 K (25°C) of 1.5 g/ml or more;</p> <p>3. In a liquid state at 273 K (0°C); <u>and</u></p>	<p>Fluids and lubricating materials, as follows:</p> <p>---</p> <p>d. Fluorocarbon electronic cooling fluids having all of the following characteristics:</p> <p>---</p> <p>2. Density at 298 K (25 °C) of 1.5 g/ml or more;</p> <p>3. In a liquid state at 273 K (0 °C); <u>and</u></p>

1C007

Category Code	SGCO 2019	SGCO 2020
1C007.c.1.a. Note	<p>Ceramic powders, ceramic-“matrix” “composite” materials and ‘precursor materials’, as follows:</p> <p>---</p> <p>c. Ceramic-“matrix” “composite” materials as follows:</p> <ol style="list-style-type: none"> 1. Ceramic-ceramic “composite” materials with a glass or oxide-“matrix” and reinforced with either of the following: <ol style="list-style-type: none"> a. Continuous fibres made from either of the following materials: <p>---</p> <p><i>Note</i> Category Code 1C007.c.1.a. does not apply to “composites” containing fibres with a tensile strength of less than 700 MPa at 1,273 K (1,000°C) or tensile creep resistance of more than 1% creep strain at 100 MPa load and 1,273 K (1,000°C) for 100 hours.</p>	<p>Ceramic powders, ceramic-“matrix” “composite” materials and ‘precursor materials’, as follows:</p> <p>---</p> <p>c. Ceramic-“matrix” “composite” materials as follows:</p> <ol style="list-style-type: none"> 1. Ceramic-ceramic “composite” materials with a glass or oxide-“matrix” and reinforced with either of the following: <ol style="list-style-type: none"> a. Continuous fibres made from either of the following materials: <p>---</p> <p><i>Note</i> Category Code 1C007.c.1.a. does not apply to “composites” containing fibres with a tensile strength of less than 700 MPa at 1,273 K (1,000 °C) or tensile creep resistance of more than 1% creep strain at 100 MPa load and 1,273 K (1,000 °C) for 100 hours.</p>

1C008

Category Code	SGCO 2019	SGCO 2020
- 1C008.a.2. - 1C008.a.3. - 1C008.a.4.	<p>Non fluorinated polymeric substances as follows:</p> <ol style="list-style-type: none"> a. Imides, as follows: <p>---</p> <ol style="list-style-type: none"> 2. Aromatic Polyamide-imides (PAI) having a ‘glass transition temperature (T_g)’ exceeding 563 K (290°C); 3. Aromatic polyimides having a ‘glass transition temperature (T_g)’ exceeding 505 K (232°C); 4. Aromatic polyetherimides having a ‘glass transition temperature (T_g)’ exceeding 563 K (290°C); 	<p>Non fluorinated polymeric substances as follows:</p> <ol style="list-style-type: none"> a. Imides, as follows: <p>---</p> <ol style="list-style-type: none"> 2. Aromatic Polyamide-imides (PAI) having a ‘glass transition temperature (T_g)’ exceeding 563 K (290 °C); 3. Aromatic polyimides having a ‘glass transition temperature (T_g)’ exceeding 505 K (232 °C); 4. Aromatic polyetherimides having a ‘glass transition temperature (T_g)’ exceeding 563 K (290 °C);

1C008.f.	Non fluorinated polymeric substances as follows: --- f. Polybiphenylenethersulphone having a ‘glass transition temperature (T_g)’ exceeding 563 K (290°C).	Non fluorinated polymeric substances as follows: --- f. Polybiphenylenethersulphone having a ‘glass transition temperature (T_g)’ exceeding 563 K (290 °C).
1C008 Technical Notes	Non fluorinated polymeric substances as follows: --- <u>Technical Notes</u> 1. The ‘glass transition temperature (T_g)’ for Category Code 1C008.a.2. thermoplastic materials, Category Code 1C008.a.4. materials and Category Code 1C008.f. materials is determined using the method described in Ref. ISO 11357 2 (1999) or national equivalents.	Non fluorinated polymeric substances as follows: --- <u>Technical Notes</u> 1. The ‘glass transition temperature (T_g)’ for Category Code 1C008.a.2. thermoplastic materials, Category Code 1C008.a.4. materials and Category Code 1C008.f. materials is determined using the method described in Ref. ISO 11357 2:1999 or national equivalents.

1C010

Category Code	SGCO 2019	SGCO 2020
1C010 Technical Notes	“Fibrous or filamentary materials”, as follows: --- <u>Technical Notes</u> 1. For the purpose of calculating “specific tensile strength”, “specific modulus” or specific weight of “fibrous or filamentary materials” in Category Code 1C010.a., 1C010.b., 1C010.c. or 1C010.e.1.b., the tensile strength and modulus should be determined by using Method A described in Ref. ISO 10618 (2004) or national equivalents.	“Fibrous or filamentary materials”, as follows: --- <u>Technical Notes</u> 1. For the purpose of calculating “specific tensile strength”, “specific modulus” or specific weight of “fibrous or filamentary materials” in Category Code 1C010.a., 1C010.b., 1C010.c. or 1C010.e.1.b., the tensile strength and modulus should be determined by using Method A described in Ref. ISO 10618:2004 or national equivalents.

1C010.c.2.	<p>“Fibrous or filamentary materials”, as follows:</p> <p>---</p> <p>c. Inorganic “fibrous or filamentary materials”, having both of the following characteristics:</p> <p>---</p> <p>2. Melting, softening, decomposition or sublimation point exceeding 1,922 K (1,649°C) in an inert environment;</p>	<p>“Fibrous or filamentary materials”, as follows:</p> <p>---</p> <p>c. Inorganic “fibrous or filamentary materials”, having both of the following characteristics:</p> <p>---</p> <p>2. Melting, softening, decomposition or sublimation point exceeding 1,922 K (1,649 °C) in an inert environment;</p>
1C010.c. Note	<p>“Fibrous or filamentary materials”, as follows:</p> <p>---</p> <p>c. Inorganic “fibrous or filamentary materials”, having both of the following characteristics:</p> <p>---</p> <p><u>Note</u> Category Code 1C010.c. does not include:</p> <p>---</p> <p>a. <i>Discontinuous, multiphase, polycrystalline alumina fibres in chopped fibre or random mat form, containing 3% by weight or more silica, with a “specific modulus” of less than 10×106 m;</i></p> <p>---</p> <p>d. <i>Discontinuous ceramic fibres with a melting, softening, decomposition or sublimation point lower than 2,043 K (1,770°C) in an inert environment.</i></p>	<p>“Fibrous or filamentary materials”, as follows:</p> <p>---</p> <p>c. Inorganic “fibrous or filamentary materials”, having both of the following characteristics:</p> <p>---</p> <p><u>Note</u> Category Code 1C010.c. does not include:</p> <p>---</p> <p>a. <i>Discontinuous, multiphase, polycrystalline alumina fibres in chopped fibre or random mat form, containing 3% by weight or more of silica, with a “specific modulus” of less than 10×106 m;</i></p> <p>---</p> <p>d. <i>Discontinuous ceramic fibres with a melting, softening, decomposition or sublimation point lower than 2,043 K (1,770 °C) in an inert environment.</i></p>

- 1C010.e.2.b. - 1C010.e.2.c.	“Fibrous or filamentary materials”, as follows: --- 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 both of the following characteristics: --- 2. Having any of the following characteristics: --- b. ‘Dynamic Mechanical Analysis glass transition temperature (DMA T_g)’ equal to or exceeding 453 K (180°C) and having a phenolic resin; <u>or</u> c. ‘Dynamic Mechanical Analysis glass transition temperature (DMA T_g)’ equal to or exceeding 505 K (232°C) and having a resin or pitch, not specified in Category Code 1C008 or 1C009.b., and not being a phenolic resin.	“Fibrous or filamentary materials”, as follows: --- 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 both of the following characteristics: --- 2. Having any of the following characteristics: --- b. ‘Dynamic Mechanical Analysis glass transition temperature (DMA T_g)’ equal to or exceeding 453 K (180 °C) and having a phenolic resin; <u>or</u> c. ‘Dynamic Mechanical Analysis glass transition temperature (DMA T_g)’ equal to or exceeding 505 K (232 °C) and having a resin or pitch, not specified in Category Code 1C008 or 1C009.b., and not being a phenolic resin.
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1C107

Category Code	SGCO 2019	SGCO 2020
1C107.a.	Graphite and ceramic materials, other than those specified in Category Code 1C007, as follows: a. Fine grain graphites with a bulk density of 1.72 g/cm ³ or greater, measured at 288 K (15°C), and having a grain size of 100 µm or less, usable for rocket nozzles and re-entry vehicle nose tips, which can be machined to any of the following products:	Graphite and ceramic materials, other than those specified in Category Code 1C007, as follows: a. Fine grain graphites with a bulk density of 1.72 g/cm ³ or greater, measured at 288 K (15 °C), and having a grain size of 100 µm or less, usable for rocket nozzles and re-entry vehicle nose tips, which can be machined to any of the following products:

1C107.f.	<p>Graphite and ceramic materials, other than those specified in Category Code 1C007, as follows:</p> <p>---</p> <p>f. Bulk machinable ceramic composite materials consisting of an ‘Ultra High Temperature Ceramic (UHTC)’ matrix with a melting point equal to or greater than 3,000°C and reinforced with fibres or filaments, usable for missile components (such as nose tips, re-entry vehicles, leading edges, jet vanes, control surfaces or rocket motor throat inserts) in “missiles”, space launch vehicles specified in Category Code 9A004, sounding rockets specified in Category Code 9A104 or ‘missiles’.</p>	<p>Graphite and ceramic materials, other than those specified in Category Code 1C007, as follows:</p> <p>---</p> <p>f. Bulk machinable ceramic composite materials consisting of an ‘Ultra High Temperature Ceramic (UHTC)’ matrix with a melting point equal to or greater than 3,000 °C and reinforced with fibres or filaments, usable for missile components (such as nose tips, re-entry vehicles, leading edges, jet vanes, control surfaces or rocket motor throat inserts) in “missiles”, space launch vehicles specified in Category Code 9A004, sounding rockets specified in Category Code 9A104 or ‘missiles’.</p>
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1C111

Category Code	SGCO 2019	SGCO 2020
1C111.a.5.b.	<p>Propellants and constituent chemicals for propellants, other than those specified in Category Code 1C011, as follows:</p> <p>a. Propulsive substances:</p> <p>---</p> <p>5. High energy density materials, other than that specified in Division 2 of Part 1 of this Schedule, usable in ‘missiles’ or unmanned aerial vehicles specified in Category Code 9A012 or 9A112.a., as follows:</p> <p>---</p> <p>b. Other high energy density fuels and fuel additives (e.g. cubane, ionic solutions, JP-10) having a volume-based energy density of $37.5 \times 10^9 \text{ J/m}^3$ or greater, measured at 20°C and one atmosphere (101.325 kPa) pressure;</p>	<p>Propellants and constituent chemicals for propellants, other than those specified in Category Code 1C011, as follows:</p> <p>a. Propulsive substances:</p> <p>---</p> <p>5. High energy density materials, other than that specified in Division 2 of Part 1 of this Schedule, usable in ‘missiles’ or unmanned aerial vehicles specified in Category Code 9A012 or 9A112.a., as follows:</p> <p>---</p> <p>b. Other high energy density fuels and fuel additives (e.g. cubane, ionic solutions, JP-10) having a volume-based energy density of $37.5 \times 10^9 \text{ J/m}^3$ or greater, measured at 20 °C and one atmosphere (101.325 kPa) pressure;</p>

1C116

Category Code	SGCO 2019	SGCO 2020
1C116.a.	<p>Maraging steels, usable in ‘missiles’, having both of the following characteristics:</p> <p>---</p> <p>a. An Ultimate Tensile Strength (UTS), measured at 293 K (20°C), equal to or greater than:</p>	<p>Maraging steels, usable in ‘missiles’, having both of the following characteristics:</p> <p>---</p> <p>a. An Ultimate Tensile Strength (UTS), measured at 293 K (20 °C), equal to or greater than:</p>

1C202

Category Code	SGCO 2019	SGCO 2020
1C202.a.1.	<p>Alloys, other than those specified in Category Code 1C002.b.3. or .b.4., as follows:</p> <p>a. Aluminium alloys having both of the following characteristics:</p> <ol style="list-style-type: none"> 1. ‘Capable of’ an Ultimate Tensile Strength (UTS) of 460 MPa or more at 293 K (20°C); <u>and</u> 	<p>Alloys, other than those specified in Category Code 1C002.b.3. or .b.4., as follows:</p> <p>a. Aluminium alloys having both of the following characteristics:</p> <ol style="list-style-type: none"> 1. ‘Capable of’ an Ultimate Tensile Strength (UTS) of 460 MPa or more at 293 K (20 °C); <u>and</u>
1C202.b.1.	<p>Alloys, other than those specified in Category Code 1C002.b.3. or .b.4., as follows:</p> <p>---</p> <p>b. Titanium alloys having both of the following characteristics:</p> <ol style="list-style-type: none"> 1. ‘Capable of’ an Ultimate Tensile Strength (UTS) of 900 MPa or more at 293 K (20°C); <u>and</u> 	<p>Alloys, other than those specified in Category Code 1C002.b.3. or .b.4., as follows:</p> <p>---</p> <p>b. Titanium alloys having both of the following characteristics:</p> <ol style="list-style-type: none"> 1. ‘Capable of’ an Ultimate Tensile Strength (UTS) of 900 MPa or more at 293 K (20 °C); <u>and</u>

1C216

Category Code	SGCO 2019	SGCO 2020
1C216	<p>Maraging steel, other than that specified in Category Code 1C116, ‘capable of’ an Ultimate Tensile Strength (UTS) of 1,950 MPa or more, at 293 K (20°C).</p>	<p>Maraging steel, other than that specified in Category Code 1C116, ‘capable of’ an Ultimate Tensile Strength (UTS) of 1,950 MPa or more, at 293 K (20 °C).</p>

1C241

Category Code	SGCO 2019	SGCO 2020
1C241	Rhenium, and alloys containing 90% by weight or more rhenium; and alloys of rhenium and tungsten containing 90% by weight or more of any combination of rhenium and tungsten, other than those specified in Category Code 1C226, having both of the following characteristics:	Rhenium, and alloys containing 90% by weight or more of rhenium; and alloys of rhenium and tungsten containing 90% by weight or more of any combination of rhenium and tungsten, other than those specified in Category Code 1C226, having both of the following characteristics:

1C353

Category Code	SGCO 2019	SGCO 2020
1C353	‘Genetic elements’ and ‘genetically-modified organisms’, as follows: --- -	‘Genetic elements’ and ‘genetically-modified organisms’, as follows: --- b. Not used.

1E104

Category Code	SGCO 2019	SGCO 2020
1E104	“Technology” for the “production” of pyrolytically derived materials formed on a mould, mandrel or other substrate from precursor gases which decompose in the 1,573 K (1,300°C) to 3,173 K (2,900°C) temperature range at pressures of 130 Pa to 20 kPa.	“Technology” for the “production” of pyrolytically derived materials formed on a mould, mandrel or other substrate from precursor gases which decompose in the 1,573 K (1,300 °C) to 3,173 K (2,900 °C) temperature range at pressures of 130 Pa to 20 kPa.

Category 2
2A001

Category Code	SGCO 2019	SGCO 2020
2A001 Note	Anti-friction bearings and bearing systems, as follows, and components therefor: --- <u>Note</u> <i>Category Code 2A001 does not include balls with tolerances specified by the manufacturer in accordance with Ref. ISO 3290 as grade 5 (or national equivalents) or worse.</i>	Anti-friction bearings and bearing systems, as follows, and components therefor: --- <u>Note</u> <i>Category Code 2A001 does not include balls with tolerances specified by the manufacturer in accordance with Ref. ISO 3290:2001 as grade G5 (or national equivalents) or worse.</i>
2A001.a.	Anti-friction bearings and bearing systems, as follows, and components therefor: --- a. Ball bearings and solid roller bearings, having all tolerances specified by the manufacturer in accordance with Ref. ISO 492 Tolerance Class 4 (or national equivalents), or better, and having both ‘rings’ and ‘rolling elements’, made from monel or beryllium;	Anti-friction bearings and bearing systems, as follows, and components therefor: --- a. Ball bearings and solid roller bearings, having all tolerances specified by the manufacturer in accordance with Ref. ISO 492 Tolerance Class 4 or Class 2 (or national equivalents), or better, and having both ‘rings’ and ‘rolling elements’, made from monel or beryllium;
2A001.c.3.	Anti-friction bearings and bearing systems, as follows, and components therefor: --- c. Active magnetic bearing systems using any of the following: --- 3. High temperature (450 K (177°C) and above) position sensors.	Anti-friction bearings and bearing systems, as follows, and components therefor: --- c. Active magnetic bearing systems using any of the following: --- 3. High temperature (450 K (177 °C) and above) position sensors.

2B003

Category Code	SGCO 2019	SGCO 2020
- 2B003.a. - 2B003.b. - 2B003.c.	“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 ($R_c = 40$ or more) spur, helical and double helical gears with a pitch diameter exceeding 1,250 mm and a face width of 15% of pitch diameter or larger finished to a quality of AGMA 14 or better (equivalent to Ref. ISO 1328 class 3).	“Numerically controlled” machine tools, specially designed for the shaving, finishing, grinding or honing of hardened ($R_c = 40$ or more) spur, helical and double helical gears having all of the following characteristics: a. A pitch diameter exceeding 1,250 mm; b. A face width of 15% of pitch diameter or larger; <u>and</u> c. A finished quality of AGMA 14 or better (equivalent to Ref. ISO 1328 class 3).

2B004

Category Code	SGCO 2019	SGCO 2020
2B004.b.2.	Hot “isostatic presses” having both of the following characteristics, and specially designed components and accessories therefor: --- b. Having any of the following characteristics: --- 2. A controlled thermal environment exceeding 1,773 K (1,500°C); <u>or</u>	Hot “isostatic presses” having both of the following characteristics, and specially designed components and accessories therefor: --- b. Having any of the following characteristics: --- 2. A controlled thermal environment exceeding 1,773 K (1,500 °C); <u>or</u>

2B006

Category Code	SGCO 2019	SGCO 2020
- 2B006.b.1. - 2B006.b.1. Technical Note	Dimensional inspection or measuring systems, equipment, position feedback units and “electronic assemblies”, as follows: --- b. Linear displacement measuring instruments or systems, linear position feedback units, and “electronic assemblies”, as follows: --- 1. ‘Non-contact type measuring systems’ with a “resolution” equal to or less (better) than 0.2 µm within a measuring range up to 0.2 mm; <u>Technical Note</u> <i>For the purpose of Category Code 2B006.b.1., ‘non-contact type measuring systems’ are designed to measure the distance between the probe and measured object along a single vector, where the probe or measured object is in motion.</i>	Dimensional inspection or measuring systems, equipment, position feedback units and “electronic assemblies”, as follows: --- b. Linear displacement measuring instruments or systems, linear position feedback units, and “electronic assemblies”, as follows: --- 1. ‘Non-contact type measuring systems’ with a “resolution” equal to or less (better) than 0.2 µm within 0 to 0.2 mm of the ‘measuring range’; <u>Technical Note</u> <i>For the purpose of Category Code 2B006.b.1.:</i> 1. ‘Non-contact type measuring systems’ are designed to measure the distance between the probe and measured object along a single vector, where the probe or measured object is in motion. 2. ‘Measuring range’ means the distance between the minimum and maximum working distance.

2B006.b.3.c.	<p>Dimensional inspection or measuring systems, equipment, position feedback units and “electronic assemblies”, as follows:</p> <p>---</p> <p>b. Linear displacement measuring instruments or systems, linear position feedback units, and “electronic assemblies”, as follows:</p> <p>---</p> <p>3. Measuring systems having all of the following characteristics:</p> <p>---</p> <p>c. Capable of achieving a “measurement uncertainty” equal to or less (better) than $(1.6 + L/2,000)$ nm (L is the measured length in mm) at any point within a measuring range, when compensated for the refractive index of air and measured over a period of 30 seconds at a temperature of $20 \pm 0.01^\circ\text{C}$; <u>or</u></p>	<p>Dimensional inspection or measuring systems, equipment, position feedback units and “electronic assemblies”, as follows:</p> <p>---</p> <p>b. Linear displacement measuring instruments or systems, linear position feedback units, and “electronic assemblies”, as follows:</p> <p>---</p> <p>3. Measuring systems having all of the following characteristics:</p> <p>---</p> <p>c. Capable of achieving a “measurement uncertainty” equal to or less (better) than $(1.6 + L/2,000)$ nm (L is the measured length in mm) at any point within a measuring range, when compensated for the refractive index of air and measured over a period of 30 s at a temperature of $20 \pm 0.01^\circ\text{C}$; <u>or</u></p>
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2B104

Category Code	SGCO 2019	SGCO 2020
2B104.b.	<p>“Isostatic presses”, other than those specified in Category Code 2B004, having all of the following characteristics:</p> <p>---</p> <p>b. Designed to achieve and maintain a controlled thermal environment of 873 K (600°C) or greater; <u>and</u></p>	<p>“Isostatic presses”, other than those specified in Category Code 2B004, having all of the following characteristics:</p> <p>---</p> <p>b. Designed to achieve and maintain a controlled thermal environment of 873 K (600 °C) or greater; <u>and</u></p>

2B109

Category Code	SGCO 2019	SGCO 2020
2B109.a.1.	<p>Flow-forming machines, other than those specified in Category Code 2B009, usable in the “production” of propulsion components and equipment (e.g. motor cases and interstages) for “missiles”, and specially designed components as follows:</p> <p>---</p> <p>a. Flow forming machines having both of the following characteristics:</p> <ol style="list-style-type: none"> Equipped with, or according to the manufacturer's technical specification are capable of being equipped with, “numerical control” units or computer control; <u>and</u> 	<p>Flow-forming machines, other than those specified in Category Code 2B009, usable in the “production” of propulsion components and equipment (e.g. motor cases and interstages) for “missiles”, and specially designed components as follows:</p> <p>---</p> <p>a. Flow forming machines having both of the following characteristics:</p> <ol style="list-style-type: none"> Equipped with, or, according to the manufacturer's technical specification, are capable of being equipped with, “numerical control” units or computer control; <u>and</u>

2B120

Category Code	SGCO 2019	SGCO 2020
<p>- 2B120.c.1.</p> <p>- 2B120.c.2.</p>	<p>Motion simulators or rate tables having all of the following characteristics:</p> <p>---</p> <p>c. Having any of the following characteristics:</p> <ol style="list-style-type: none"> For any single axis having both of the following characteristics: <ol style="list-style-type: none"> Capable of rates of 400 degrees/s or more, or 30 degrees/s or less; and A rate resolution equal to or less than 6 degrees/s and an accuracy equal to or less than 0.6 degrees/s; 	<p>Motion simulators or rate tables having all of the following characteristics:</p> <p>---</p> <p>c. Having any of the following characteristics:</p> <ol style="list-style-type: none"> For any single axis having both of the following characteristics: <ol style="list-style-type: none"> Capable of rates of 400 degrees per second or more, or 30 degrees per second or less; and A rate resolution equal to or less than 6 degrees per second and an accuracy equal to or less than 0.6 degree per second;

2B206

Category Code	SGCO 2019	SGCO 2020
<ul style="list-style-type: none"> - 2B206.a.1. - 2B206.a.2. - 2B206.a. <p>Technical Note</p>	<p>Dimensional inspection machines, instruments or systems, other than those specified in Category Code 2B006, as follows:</p> <p>a. Computer controlled or numerically controlled Coordinate Measuring Machines (CMM) having either of the following characteristics:</p> <ol style="list-style-type: none"> 1. Having only two axes and having a maximum permissible error of length measurement along any axis (one dimensional), identified as any combination of $E_{0x,MPE}$, $E_{0y,MPE}$, or $E_{0z,MPE}$, equal to or less (better) than $(1.25 + L/1,000) \mu m$ (where L is the measured length in mm) at any point within the operating range of the machine (i.e. within the length of the axis), according to Ref. ISO 10360-2(2009); <u>or</u> 2. Three or more axes and having a three dimensional (volumetric) maximum permissible error of length measurement ($E_{0,MPE}$) equal to or less (better) than $(1.7 + L/800) \mu m$ (where L is the measured length in mm) at any point within the operating range of the machine (i.e. within the length of the axis), according to Ref. ISO 10360-2(2009); <p><u>Technical Note</u> <i>The $E_{0,MPE}$ of the most accurate configuration of the CMM specified according to Ref. ISO 10360-2(2009) by the manufacturer (e.g. best of the following: probe, stylus, length, motion parameters, environments) and with all compensations available must be compared to the $(1.7 + L/800) \mu m$ threshold.</i></p>	<p>Dimensional inspection machines, instruments or systems, other than those specified in Category Code 2B006, as follows:</p> <p>a. Computer controlled or numerically controlled Coordinate Measuring Machines (CMM) having either of the following characteristics:</p> <ol style="list-style-type: none"> 1. Having only two axes and having a maximum permissible error of length measurement along any axis (one dimensional), identified as any combination of $E_{0x,MPE}$, $E_{0y,MPE}$, or $E_{0z,MPE}$, equal to or less (better) than $(1.25 + L/1,000) \mu m$ (where L is the measured length in mm) at any point within the operating range of the machine (i.e. within the length of the axis), according to Ref. ISO 10360-2:2009; <u>or</u> 2. Three or more axes and having a three dimensional (volumetric) maximum permissible error of length measurement ($E_{0,MPE}$) equal to or less (better) than $(1.7 + L/800) \mu m$ (where L is the measured length in mm) at any point within the operating range of the machine (i.e. within the length of the axis), according to Ref. ISO 10360-2:2009; <p><u>Technical Note</u> <i>The $E_{0,MPE}$ of the most accurate configuration of the CMM specified according to Ref. ISO 10360-2:2009 by the manufacturer (e.g. best of the following: probe, stylus, length, motion parameters, environments) and with all compensations available must be compared to the $(1.7 + L/800) \mu m$ threshold.</i></p>

2B206.c.2.	<p>Dimensional inspection machines, instruments or systems, other than those specified in Category Code 2B006, as follows:</p> <p>---</p> <p>c. 'Linear displacement' measuring systems having both of the following characteristics:</p> <p>---</p> <p>2. Capable of maintaining, for at least 12 hours, at a temperature of ± 1 K ($\pm 1^{\circ}\text{C}$), around a standard temperature and standard pressure, both of the following:</p>	<p>Dimensional inspection machines, instruments or systems, other than those specified in Category Code 2B006, as follows:</p> <p>---</p> <p>c. 'Linear displacement' measuring systems having both of the following characteristics:</p> <p>---</p> <p>2. Capable of maintaining, for at least 12 hours, at a temperature of ± 1 K ($\pm 1^{\circ}\text{C}$), around a standard temperature and standard pressure, both of the following:</p>
<p>- 2B206.d.1.a.</p> <p>- 2B206.d.1.b.</p> <p>- 2B206.d.2.</p>	<p>Dimensional inspection machines, instruments or systems, other than those specified in Category Code 2B006, as follows:</p> <p>---</p> <p>d. Linear variable differential transformer (LVDT) systems having both of the following characteristics:</p> <p>---</p> <p>1. Having either of the following:</p> <p>---</p> <p>a. 'Linearity' equal to or less (better) than 0.1% measured from 0 to the full operating range, for LVDTs with an operating range up to 5 mm; or</p> <p>b. 'Linearity' equal to or less (better) than 0.1% measured from 0 to 5 mm, for LVDTs with an operating range greater than 5 mm; <u>and</u></p> <p>2. Drift equal to or better (less) than 0.1% per day at a standard ambient test room temperature ± 1 K ($\pm 1^{\circ}\text{C}$).</p>	<p>Dimensional inspection machines, instruments or systems, other than those specified in Category Code 2B006, as follows:</p> <p>---</p> <p>d. Linear variable differential transformer (LVDT) systems having both of the following characteristics:</p> <p>---</p> <p>1. Having either of the following:</p> <p>---</p> <p>a. "Linearity" equal to or less (better) than 0.1% measured from 0 to the full operating range, for LVDTs with an operating range up to 5 mm; or</p> <p>b. "Linearity" equal to or less (better) than 0.1% measured from 0 to 5 mm, for LVDTs with an operating range greater than 5 mm; <u>and</u></p> <p>2. Drift equal to or better (less) than 0.1% per day at a standard ambient test room temperature ± 1 K ($\pm 1^{\circ}\text{C}$).</p>

2B206 Technical Note	<p>Dimensional inspection machines, instruments or systems, other than those specified in Category Code 2B006, as follows:</p> <p>---</p> <p><u>Technical Notes</u></p> <ol style="list-style-type: none"> 1. All parameters of measurement values in Category Code 2B206 represent plus/minus i.e. not total band. 2. 'linearity' (usually measured in terms of non-linearity) means the maximum deviation of the actual characteristic (average of upscale and downscale readings), positive or negative, from a straight line so positioned as to equalise and minimise the maximum deviations. 	<p>Dimensional inspection machines, instruments or systems, other than those specified in Category Code 2B006, as follows:</p> <p>---</p> <p><u>Technical Note</u></p> <p>All parameters of measurement values in Category Code 2B206 represent plus/minus i.e. not total band.</p>
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2B226

Category Code	SGCO 2019	SGCO 2020
2B226.a.1.	<p>Controlled atmosphere (vacuum or inert gas) induction furnaces, other than those specified in Category Codes 3B001 and 9B001 and power supplies therefor, as follows:</p> <p>---</p> <p>a. Furnaces having all of the following characteristics:</p> <ol style="list-style-type: none"> 1. Capable of operation above 1,123 K (850°C); 	<p>Controlled atmosphere (vacuum or inert gas) induction furnaces, other than those specified in Category Codes 3B001 and 9B001, and power supplies therefor, as follows:</p> <p>---</p> <p>a. Furnaces having all of the following characteristics:</p> <ol style="list-style-type: none"> 1. Capable of operation above 1,123 K (850 °C);

2B227

Category Code	SGCO 2019	SGCO 2020
2B227.a.2.	<p>Vacuum or other controlled atmosphere metallurgical melting and casting furnaces and related equipment as follows:</p> <p>a. Arc remelt furnaces, arc melt furnaces and arc melt and casting furnaces having both of the following characteristics:</p> <p>---</p> <ol style="list-style-type: none"> 2. Capable of operating with melting temperatures above 1,973 K (1,700°C); 	<p>Vacuum or other controlled atmosphere metallurgical melting and casting furnaces and related equipment as follows:</p> <p>a. Arc remelt furnaces, arc melt furnaces and arc melt and casting furnaces having both of the following characteristics:</p> <p>---</p> <ol style="list-style-type: none"> 2. Capable of operating with melting temperatures above 1,973 K (1,700 °C);

Category Code	SGCO 2019	SGCO 2020
2B227.b.2.	<p>Vacuum or other controlled atmosphere metallurgical melting and casting furnaces and related equipment as follows:</p> <p>---</p> <p>b. Electron beam melting furnaces, plasma atomisation furnaces and plasma melting furnaces, having both of the following characteristics:</p> <p>---</p> <p>2. Capable of operating with melting temperatures above 1,473 K (1,200°C);</p>	<p>Vacuum or other controlled atmosphere metallurgical melting and casting furnaces and related equipment as follows:</p> <p>---</p> <p>b. Electron beam melting furnaces, plasma atomisation furnaces and plasma melting furnaces, having both of the following characteristics:</p> <p>---</p> <p>2. Capable of operating with melting temperatures above 1,473 K (1,200 °C);</p>
2B227.d.2.	<p>Vacuum or other controlled atmosphere metallurgical melting and casting furnaces and related equipment as follows:</p> <p>---</p> <p>d. Plasma torches specially designed for furnaces specified in Category Code 2B227.b. having both of the following characteristics:</p> <p>---</p> <p>2. Capable of operating above 1,473 K (1,200°C);</p>	<p>Vacuum or other controlled atmosphere metallurgical melting and casting furnaces and related equipment as follows:</p> <p>---</p> <p>d. Plasma torches specially designed for furnaces specified in Category Code 2B227.b. having both of the following characteristics:</p> <p>---</p> <p>2. Capable of operating above 1,473 K (1,200 °C);</p>

2B230

Category Code	SGCO 2019	SGCO 2020
2B230.b.	<p>All types of 'pressure transducers' capable of measuring absolute pressures and having all of the following:</p> <p>---</p> <p>b. Seals, if any, essential for sealing the pressure sensing element, and in direct contact with the process medium, made of or protected by aluminium, aluminium alloy, aluminum oxide (alumina or sapphire), nickel, nickel alloy with more than 60% nickel by weight, or fully fluorinated hydrocarbon polymers; <u>and</u></p>	<p>All types of 'pressure transducers' capable of measuring absolute pressures and having all of the following:</p> <p>---</p> <p>b. Seals, if any, essential for sealing the pressure sensing element, and in direct contact with the process medium, made of or protected by aluminium, aluminium alloy, aluminium oxide (alumina or sapphire), nickel, nickel alloy with more than 60% nickel by weight, or fully fluorinated hydrocarbon polymers; <u>and</u></p>

2B350

Category Code	SGCO 2019	SGCO 2020
2B350.i.	<p>Chemical manufacturing facilities, equipment and components, as follows:</p> <p>---</p> <p>i. Multiple seal and seal less pumps, with manufacturer's specified maximum flow rate greater than 0.6 m³/hour, or vacuum pumps with manufacturer's specified maximum flow rate greater than 5 m³/hour (under standard temperature (273 K (0°C)) and pressure (101.3 kPa) conditions), other than those specified in Category Code 2B233; and casings (pump bodies), preformed casing liners, impellers, rotors or jet pump nozzles designed for such pumps, in which all surfaces that come in direct contact with the chemical(s) being processed are made from any of the following materials:</p>	<p>Chemical manufacturing facilities, equipment and components, as follows:</p> <p>---</p> <p>i. Multiple seal and seal less pumps, with manufacturer's specified maximum flow rate greater than 0.6 m³/hour, or vacuum pumps with manufacturer's specified maximum flow rate greater than 5 m³/hour (under standard temperature (273 K (0 °C)) and pressure (101.3 kPa) conditions), other than those specified in Category Code 2B233; and casings (pump bodies), preformed casing liners, impellers, rotors or jet pump nozzles designed for such pumps, in which all surfaces that come in direct contact with the chemical(s) being processed are made from any of the following materials:</p>
2B350.j.	<p>Chemical manufacturing facilities, equipment and components, as follows:</p> <p>---</p> <p>j. Incinerators designed to destroy chemicals specified in Category Code 1C350, having specially designed waste supply systems, special handling facilities and an average combustion chamber temperature greater than 1,273 K (1,000°C), in which all surfaces in the waste supply system that come into direct contact with the waste products are made from or lined with any of the following materials:</p>	<p>Chemical manufacturing facilities, equipment and components, as follows:</p> <p>---</p> <p>j. Incinerators designed to destroy chemicals specified in Category Code 1C350, having specially designed waste supply systems, special handling facilities and an average combustion chamber temperature greater than 1,273 K (1,000 °C), in which all surfaces in the waste supply system that come into direct contact with the waste products are made from or lined with any of the following materials:</p>

2E003

Category Code	SGCO 2019	SGCO 2020
2E003.b.2. Technical Notes	<p>Other “technology” as follows:</p> <p>---</p> <p>b. “Technology” for metal working manufacturing processes, as follows:</p> <p>---</p> <p>2. Technical data consisting of process methods or parameters as listed below used to control:</p> <p>---</p> <p><u>Technical Notes</u></p> <p>2. ‘Hot isostatic densification’ is a process of pressurising a casting at temperatures exceeding 375 K (102°C) in a closed cavity through various media (gas, liquid, solid particles, etc.) to create equal force in all directions to reduce or eliminate internal voids in the casting.</p>	<p>Other “technology” as follows:</p> <p>---</p> <p>b. “Technology” for metal working manufacturing processes, as follows:</p> <p>---</p> <p>2. Technical data consisting of process methods or parameters as listed below used to control:</p> <p>---</p> <p><u>Technical Notes</u></p> <p>2. ‘Hot isostatic densification’ is a process of pressurising a casting at temperatures exceeding 375 K (102 °C) in a closed cavity through various media (gas, liquid, solid particles, etc.) to create equal force in all directions to reduce or eliminate internal voids in the casting.</p>

Deposition Techniques

Category Code	SGCO 2019	SGCO 2020
Deposition Techniques – Note 6.	6. The term ‘aluminium alloys’ refers to alloys having an Ultimate Tensile Strength (UTS) of 190 MPa or more measured at 293 K (20°C).	6. The term ‘aluminium alloys’ refers to alloys having an Ultimate Tensile Strength (UTS) of 190 MPa or more measured at 293 K (20 °C).
Deposition Techniques – Note 13.	13. ‘Titanium alloys’ refers only to aerospace alloys having an Ultimate Tensile Strength (UTS) of 900 MPa or more measured at 293 K (20°C).	13. ‘Titanium alloys’ refers only to aerospace alloys having an Ultimate Tensile Strength (UTS) of 900 MPa or more measured at 293 K (20 °C).
Deposition Techniques – Note 14.	14. ‘Low-expansion glasses’ refers to glasses which have a coefficient of thermal expansion of $1 \times 10^{-7} \text{ K}^{-1}$ or less measured at 293 K (20°C).	14. ‘Low-expansion glasses’ refers to glasses which have a coefficient of thermal expansion of $1 \times 10^{-7} \text{ K}^{-1}$ or less measured at 293 K (20 °C).

Deposition Techniques – Note 19.	19. Ceramic substrates, as used in this Table, does not include ceramic materials containing 5% by weight, or greater, clay or cement content, either as separate constituents or in combination.	19. Ceramic substrates, as used in this Table, does not include ceramic materials containing 5% by weight, or greater, of clay or cement content, either as separate constituents or in combination.
Deposition Techniques – Technical Note b.4.	<p>b. Thermal Evaporation-Physical Vapour Deposition (TE-PVD) is an overlay coating process conducted in a vacuum with a pressure less than 0.1 Pa wherein a source of thermal energy is used to vaporise the coating material. This process results in the condensation, or deposition, of the evaporated species onto appropriately positioned substrates.</p> <p>The addition of gases to the vacuum chamber during the coating process to synthesise compound coatings is an ordinary modification of the process.</p> <p>The use of ion or electron beams, or plasma, to activate or assist the coating's deposition is also a common modification in this technique. The use of monitors to provide in-process measurement of optical characteristics and thickness of coatings can be a feature of these processes.</p> <p>Specific TE-PVD processes are as follows:</p> <p>---</p> <p>4. Cathodic Arc Deposition employs a consumable cathode of the material which forms the coating and has an arc discharge established on the surface by a momentary contact of a ground trigger. Controlled motion of arcing erodes the cathode surface creating a highly ionised plasma. The anode can be either a cone attached to the periphery of the cathode, through an insulator, or the chamber. Substrate biasing is used for non-line-of-sight deposition.</p>	<p>b. Thermal Evaporation-Physical Vapour Deposition (TE-PVD) is an overlay coating process conducted in a vacuum with a pressure less than 0.1 Pa wherein a source of thermal energy is used to vaporise the coating material. This process results in the condensation, or deposition, of the evaporated species onto appropriately positioned substrates.</p> <p>The addition of gases to the vacuum chamber during the coating process to synthesise compound coatings is an ordinary modification of the process.</p> <p>The use of ion or electron beams, or plasma, to activate or assist the coating's deposition is also a common modification in this technique. The use of monitors to provide in-process measurement of optical characteristics and thickness of coatings can be a feature of these processes.</p> <p>Specific TE-PVD processes are as follows:</p> <p>---</p> <p>4. Cathodic Arc Deposition employs a consumable cathode of the material which forms the coating and has an arc discharge established on the surface by a momentary contact of a ground trigger. Controlled motion of arcing erodes the cathode surface creating a highly ionised plasma. The anode can be either a cone attached to the periphery of the cathode, through an insulator, or the chamber. Substrate biasing is used for non-line-of-sight deposition;</p>

Deposition Techniques – Technical Note c.	<p>c. Pack Cementation is a surface modification coating or overlay coating process wherein a substrate is immersed in a powder mixture (a pack), that consists of:</p> <p>---</p> <p>The substrate and powder mixture is contained within a retort which is heated to between 1,030 K (757°C) and 1,375 K (1,102°C) for sufficient time to deposit the coating.</p>	<p>c. Pack Cementation is a surface modification coating or overlay coating process wherein a substrate is immersed in a powder mixture (a pack), that consists of:</p> <p>---</p> <p>The substrate and powder mixture is contained within a retort which is heated to between 1,030 K (757 °C) and 1,375 K (1,102 °C) for sufficient time to deposit the coating.</p>
Deposition Techniques – Technical Note d. Note 2	<p>d. Plasma Spraying is an overlay coating process wherein a gun (spray torch) which produces and controls a plasma accepts powder or wire coating materials, melts them and propels them towards a substrate, whereon an integrally bonded coating is formed. Plasma spraying constitutes either low pressure plasma spraying or high velocity plasma spraying.</p> <p>---</p> <p><u>Note 2</u> <i>High velocity refers to nozzle exit gas velocity exceeding 750 m/s calculated at 293 K (20°C) at 0.1 MPa.</i></p>	<p>d. Plasma Spraying is an overlay coating process wherein a gun (spray torch) which produces and controls a plasma accepts powder or wire coating materials, melts them and propels them towards a substrate, whereon an integrally bonded coating is formed. Plasma spraying constitutes either low pressure plasma spraying or high velocity plasma spraying.</p> <p>---</p> <p><u>Note 2</u> <i>High velocity refers to nozzle exit gas velocity exceeding 750 m/s calculated at 293 K (20 °C) at 0.1 MPa.</i></p>

Category 3**3A**

Category Code	SGCO 2019	SGCO 2020
3A Note 3	<p>Systems, Equipment and Components</p> <p>---</p> <p>-</p>	<p>Systems, Equipment and Components</p> <p>---</p> <p><u>Note 3</u></p> <p><i>Category Code 3A001.a., 3A001.b., 3A001.d., 3A001.e.4., 3A001.g., 3A001.h., or 3A001.i. includes wafers (finished or unfinished), in which the function has been determined, if it comes within the parameters set out therein.</i></p>

3A001

Category Code	SGCO 2019	SGCO 2020
3A001.a Note	<p>Electronic items as follows:</p> <p>a. General purpose integrated circuits, as follows:</p> <p><u>Note 1</u></p> <p><i>Category Code 3A001.a. includes wafers (finished or unfinished), in which the function has been determined, if it comes within the parameters set out therein.</i></p> <p><u>Note 2</u></p> <p><i>Integrated circuits include the following types:</i></p> <ul style="list-style-type: none"> – “Monolithic integrated circuits”; – “Hybrid integrated circuits”; – “Multichip integrated circuits”; – “Film type integrated circuits”, including silicon-on-sapphire integrated circuits; – “Optical integrated circuits”; – “Three dimensional integrated circuits”; – “Monolithic Microwave Integrated Circuits” (“MMICs”). 	<p>Electronic items as follows:</p> <p>a. General purpose integrated circuits, as follows:</p> <p><u>Note</u></p> <p><i>Integrated circuits include the following types:</i></p> <ul style="list-style-type: none"> – “Monolithic integrated circuits”; – “Hybrid integrated circuits”; – “Multichip integrated circuits”; – “Film type integrated circuits”, including silicon-on-sapphire integrated circuits; – “Optical integrated circuits”; – “Three dimensional integrated circuits”; – “Monolithic Microwave Integrated Circuits” (“MMICs”).

<ul style="list-style-type: none"> - 3A001.a.2.a. - 3A001.a.2.b. - 3A001.a.2.c. - 3A001.a.2. Note 	<p>Electronic items as follows:</p> <p>a. General purpose integrated circuits, as follows:</p> <p>---</p> <p>2. “Microprocessor microcircuits”, “microcomputer microcircuits”, microcontroller microcircuits, storage integrated circuits manufactured from a compound semiconductor, Analogue to Digital Converters (ADCs), integrated circuits that contain ADCs and store or process the digitised data, Digital to Analogue Converters (DACs), electro optical or “optical integrated circuits” designed for “signal processing”, field programmable logic devices, custom integrated circuits for which either the function is unknown or the control status of the equipment in which the integrated circuit will be used is unknown, Fast Fourier Transform (FFT) processors, Static Random Access Memories (SRAMs), or ‘non-volatile memories’, having any of the following characteristics:</p> <p>a. Rated for operation at an ambient temperature above 398 K (125°C);</p> <p>b. Rated for operation at an ambient temperature below 218 K (-55°C); <u>or</u></p> <p>c. Rated for operation over the entire ambient temperature range from 218 K (-55°C) to 398 K (125°C);</p> <p><i><u>Note</u></i> <i>Category Code 3A001.a.2. does not include integrated circuits for civil automobiles or railway train applications.</i></p>	<p>Electronic items as follows:</p> <p>a. General purpose integrated circuits, as follows:</p> <p>---</p> <p>2. “Microprocessor microcircuits”, “microcomputer microcircuits”, microcontroller microcircuits, storage integrated circuits manufactured from a compound semiconductor, Analogue to Digital Converters (ADCs), integrated circuits that contain ADCs and store or process the digitised data, Digital to Analogue Converters (DACs), electro optical or “optical integrated circuits” designed for “signal processing”, field programmable logic devices, custom integrated circuits for which either the function is unknown or the control status of the equipment in which the integrated circuit will be used is unknown, Fast Fourier Transform (FFT) processors, Static Random Access Memories (SRAMs), or ‘non-volatile memories’, having any of the following characteristics:</p> <p>a. Rated for operation at an ambient temperature above 398 K (125 °C);</p> <p>b. Rated for operation at an ambient temperature below 218 K (-55 °C); <u>or</u></p> <p>c. Rated for operation over the entire ambient temperature range from 218 K (-55 °C) to 398 K (125 °C);</p> <p><i><u>Note</u></i> <i>Category Code 3A001.a.2. does not include integrated circuits designed for civil automobiles or railway train applications.</i></p>
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<ul style="list-style-type: none"> - 3A001.a.5.b.1. - 3A001.a.5.b.2. - 3A001.a.5.b.2.a. - 3A001.a.5.b.2.a.1. - 3A001.a.5.b.2.a.2. - 3A001.a.5.b.2.b. - 3A001.a.5.b. <p>Technical Notes</p>	<p>Electronic items as follows:</p> <p>a. General purpose integrated circuits, as follows:</p> <p>---</p> <p>5. Analogue to Digital Converter (ADC) and Digital to Analogue Converter (DAC) integrated circuits, as follows:</p> <p>---</p> <p>b. Digital to Analogue Converters (DACs) having either of the following characteristics:</p> <ol style="list-style-type: none"> 1. A resolution of 10 bit or more with an 'adjusted update rate' of greater than 3,500 MSPS; or 2. A resolution of 12 bit or more with an 'adjusted update rate' of greater than 1,250 MSPS and having either of the following characteristics: <ol style="list-style-type: none"> a. A 'settling time' less than 9 ns to arrive at or within 0.024% of full scale from a full scale step; <u>or</u> b. A 'Spurious Free Dynamic Range' (SFDR) greater than 68 dBc (carrier) when synthesising a full scale analogue signal of 100 MHz or the highest full scale analogue signal frequency specified below 100 MHz; <p><u>Technical Notes</u></p> <ol style="list-style-type: none"> 1. 'Spurious Free Dynamic Range' (SFDR) is defined as the ratio of the RMS value of the carrier frequency (maximum signal component) at the input of the DAC to the RMS value of the next largest noise or harmonic distortion component at its output. 	<p>Electronic items as follows:</p> <p>a. General purpose integrated circuits, as follows:</p> <p>---</p> <p>5. Analogue to Digital Converter (ADC) and Digital to Analogue Converter (DAC) integrated circuits, as follows:</p> <p>---</p> <p>b. Digital to Analogue Converters (DACs) having either of the following characteristics:</p> <ol style="list-style-type: none"> 1. A resolution of 10 bit or more but less than 12 bit with an 'adjusted update rate' exceeding 3,500 MSPS; or 2. A resolution of 12 bit or more and having either of the following characteristics: <ol style="list-style-type: none"> a. An 'adjusted update rate' exceeding 1,250 MSPS but not exceeding 3,500 MSPS and having either of the following characteristics: <ol style="list-style-type: none"> 1. A 'settling time' less than 9 ns to arrive at or within 0.024% of full scale from a full scale step; <u>or</u> 2. A 'Spurious Free Dynamic Range' (SFDR) greater than 68 dBc (carrier) when synthesising a full scale analogue signal of 100 MHz or the highest full scale analogue signal frequency specified below 100 MHz; <u>or</u> b. An 'adjusted update rate' exceeding 3,500 MSPS; <p><u>Technical Notes</u></p> <ol style="list-style-type: none"> 1. 'Spurious Free Dynamic Range' (SFDR) is defined as the ratio of the rms value of the carrier frequency (maximum signal
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		<i>component) at the input of the DAC to the rms value of the next largest noise or harmonic distortion component at its output.</i>
3A001.b. Technical Note	<p>Electronic items as follows:</p> <p>---</p> <p>b. Microwave or millimetre wave items, as follows:</p> <p><u>Technical Notes</u></p> <ol style="list-style-type: none"> 1. <i>For purpose of Category Code 3A001.b., the parameter peak saturated power output may also be referred to on product data sheets as output power, saturated power output, maximum power output, peak power output, or peak envelope power output.</i> 2. <i>For purpose of Category Code 3A001.b.1., 'vacuum electronic devices' are electronic devices based on the interaction of an electron beam with an electromagnetic wave propagating in a vacuum circuit or interacting with Radio Frequency (RF) vacuum cavity resonators. 'Vacuum electronic devices' include klystrons, travelling-wave tubes, and their derivatives.</i> 	<p>Electronic items as follows:</p> <p>---</p> <p>b. Microwave or millimetre wave items, as follows:</p> <p><u>Technical Note</u></p> <p><i>For purpose of Category Code 3A001.b., the parameter peak saturated power output may also be referred to on product data sheets as output power, saturated power output, maximum power output, peak power output, or peak envelope power output.</i></p>

<ul style="list-style-type: none"> - 3A001.b.1. - 3A001.b.1. Note 1 - 3A001.b.1. Note 2 	<p>Electronic items as follows:</p> <p>---</p> <p>b. Microwave or millimetre wave items, as follows:</p> <p>---</p> <p>1. 'Vacuum electronic devices' and cathodes, as follows:</p> <p><u>Note 1</u></p> <p><i>Category Code 3A001.b.1. does not include 'vacuum electronic devices' designed or rated for operation in any frequency band and having both of the following characteristics:</i></p> <p>---</p> <p><u>Note 2</u></p> <p><i>Category Code 3A001.b.1. does not include non "space qualified" 'vacuum electronic devices' having both of the following characteristics:</i></p>	<p>Electronic items as follows:</p> <p>---</p> <p>b. Microwave or millimetre wave items, as follows:</p> <p>---</p> <p>1. "Vacuum electronic devices" and cathodes, as follows:</p> <p><u>Note 1</u></p> <p><i>Category Code 3A001.b.1. does not include "vacuum electronic devices" designed or rated for operation in any frequency band and having both of the following characteristics:</i></p> <p>---</p> <p><u>Note 2</u></p> <p><i>Category Code 3A001.b.1. does not include non "space qualified" "vacuum electronic devices" having both of the following characteristics:</i></p>
<ul style="list-style-type: none"> - 3A001.b.1.a. - 3A001.b.1.a.2. 	<p>Electronic items as follows:</p> <p>---</p> <p>b. Microwave or millimetre wave items, as follows:</p> <p>---</p> <p>1. 'Vacuum electronic devices' and cathodes, as follows:</p> <p>a. Travelling wave 'vacuum electronic devices', pulsed or continuous wave, as follows:</p> <p>---</p> <p>2. Devices having a cathode heater with a turn on time to rated RF power of less than 3 seconds;</p>	<p>Electronic items as follows:</p> <p>---</p> <p>b. Microwave or millimetre wave items, as follows:</p> <p>---</p> <p>1. "Vacuum electronic devices" and cathodes, as follows:</p> <p>a. Travelling wave "vacuum electronic devices", pulsed or continuous wave, as follows:</p> <p>---</p> <p>2. Devices having a cathode heater with a turn on time to rated RF power of less than 3 s;</p>

<ul style="list-style-type: none"> - 3A001.b.1.b. - 3A001.b.1.c. - 3A001.b.1.d. - 3A001.b.1.d. <p>Technical Note</p>	<p>Electronic items as follows:</p> <p>---</p> <p>b. Microwave or millimetre wave items, as follows:</p> <p>---</p> <p>1. “Vacuum electronic devices” and cathodes, as follows:</p> <p>---</p> <p>b. Crossed-field amplifier ‘vacuum electronic devices’ with a gain of more than 17 dB;</p> <p>c. Thermionic cathodes designed for ‘vacuum electronic devices’ producing an emission current density at rated operating conditions exceeding 5 A/cm² or a pulsed (non-continuous) current density at rated operating conditions exceeding 10 A/cm²;</p> <p>d. ‘Vacuum electronic devices’ with the capability to operate in a ‘dual mode’;</p> <p><u>Technical Note</u></p> <p><i>‘Dual mode’ means the ‘vacuum electronic device’ beam current can be intentionally changed between continuous-wave and pulsed mode operation by use of a grid and produces a peak pulse output power greater than the continuous wave output power.</i></p>	<p>Electronic items as follows:</p> <p>---</p> <p>b. Microwave or millimetre wave items, as follows:</p> <p>---</p> <p>1. “Vacuum electronic devices” and cathodes, as follows:</p> <p>---</p> <p>b. Crossed-field amplifier “vacuum electronic devices” with a gain of more than 17 dB;</p> <p>c. Thermionic cathodes designed for “vacuum electronic devices” producing an emission current density at rated operating conditions exceeding 5 A/cm² or a pulsed (non-continuous) current density at rated operating conditions exceeding 10 A/cm²;</p> <p>d. “Vacuum electronic devices” with the capability to operate in a ‘dual mode’;</p> <p><u>Technical Note</u></p> <p><i>‘Dual mode’ means the “vacuum electronic device” beam current can be intentionally changed between continuous-wave and pulsed mode operation by use of a grid and produces a peak pulse output power greater than the continuous wave output power.</i></p>
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<ul style="list-style-type: none"> - 3A001.b.3.d. - 3A001.b.3.e. - 3A001.b.3.f. 	<p>Electronic items as follows:</p> <p>---</p> <p>b. Microwave or millimetre wave items, as follows:</p> <p>---</p> <p>3. Discrete microwave transistors having any of the following characteristics:</p> <p>---</p> <p>d. Rated for operation with a peak saturated power output greater than 1 W (30 dBm) at any frequency exceeding 37 GHz up to and including 43.5 GHz; <u>or</u></p> <p>e. Rated for operation with a peak saturated power output greater than 0.1 nW (-70 dBm) at any frequency exceeding 43.5 GHz;</p>	<p>Electronic items as follows:</p> <p>---</p> <p>b. Microwave or millimetre wave items, as follows:</p> <p>---</p> <p>3. Discrete microwave transistors having any of the following characteristics:</p> <p>---</p> <p>d. Rated for operation with a peak saturated power output greater than 1 W (30 dBm) at any frequency exceeding 37 GHz up to and including 43.5 GHz;</p> <p>e. Rated for operation with a peak saturated power output greater than 0.1 nW (-70 dBm) at any frequency exceeding 43.5 GHz; <u>or</u></p> <p>f. Other than those specified in Category Codes 3A001.b.3.a. to 3A001.b.3.e., and rated for operation with a peak saturated power output greater than 5 W (37.0 dBm) at all frequencies exceeding 8.5 GHz up to and including 31.8 GHz;</p>
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<ul style="list-style-type: none"> - 3A001.b.8. - 3A001.b.9. - 3A001.b.9.a. 	<p>Electronic items as follows:</p> <p>---</p> <p>b. Microwave or millimetre wave items, as follows:</p> <p>---</p> <p>8. Microwave power amplifiers containing ‘vacuum electronic devices’ specified in Category Code 3A001.b.1. and having all of the following characteristics:</p> <p>---</p> <p>9. Microwave Power Modules (MPM), consisting of, at least, a travelling wave ‘vacuum electronic device’, a “Monolithic Microwave Integrated Circuit” (“MMIC”) and an integrated electronic power conditioner and having all of the following characteristics:</p> <p>a. A ‘turn-on time’ from off to fully operational in less than 10 seconds;</p>	<p>Electronic items as follows:</p> <p>---</p> <p>b. Microwave or millimetre wave items, as follows:</p> <p>---</p> <p>8. Microwave power amplifiers containing “vacuum electronic devices” specified in Category Code 3A001.b.1. and having all of the following characteristics:</p> <p>---</p> <p>9. Microwave Power Modules (MPM), consisting of, at least, a travelling wave “vacuum electronic device”, a “Monolithic Microwave Integrated Circuit” (“MMIC”) and an integrated electronic power conditioner and having all of the following characteristics:</p> <p>a. A ‘turn-on time’ from off to fully operational in less than 10 s;</p>
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<ul style="list-style-type: none"> - 3A001.e.1.a. - 3A001.e.1.b. - 3A001.e.3. - 3A001.e.4. 	<p>Electronic items as follows:</p> <p>---</p> <p>e. High energy devices, as follows:</p> <ol style="list-style-type: none"> 1. 'Cells', as follows: <ol style="list-style-type: none"> a. 'Primary cells' having either of the following characteristics at 20°C; --- b. 'Secondary cells' having an 'energy density' exceeding 350 Wh/kg at 20°C; --- 3. "Superconductive" electromagnets and solenoids, specially designed to be fully charged or discharged in less than one second and having all of the following characteristics: --- 4. Solar cells, cell-interconnect-coverglass (CIC) assemblies, solar panels, and solar arrays, which are "space-qualified", having a minimum average efficiency exceeding 20% at an operating temperature of 301 K (28°C) under simulated 'AM0' illumination with an irradiance of 1,367 watts per square metre (W/m²); 	<p>Electronic items as follows:</p> <p>---</p> <p>e. High energy devices, as follows:</p> <ol style="list-style-type: none"> 1. 'Cells', as follows: <ol style="list-style-type: none"> a. 'Primary cells' having either of the following characteristics at 20 °C; --- b. 'Secondary cells' having an 'energy density' exceeding 350 Wh/kg at 20 °C; --- 3. "Superconductive" electromagnets and solenoids, specially designed to be fully charged or discharged in less than 1 s and having all of the following characteristics: --- 4. Solar cells, cell-interconnect-coverglass (CIC) assemblies, solar panels, and solar arrays, which are "space-qualified", having a minimum average efficiency exceeding 20% at an operating temperature of 301 K (28 °C) under simulated 'AM0' illumination with an irradiance of 1,367 watts per square metre (W/m²);
3A001.h.1.	<p>Electronic items as follows:</p> <p>---</p> <p>h. Solid-state power semiconductor switches, diodes, or 'modules', having all of the following characteristics:</p> <ol style="list-style-type: none"> 1. Rated for a maximum operating junction temperature greater than 488 K (215°C); 	<p>Electronic items as follows:</p> <p>---</p> <p>h. Solid-state power semiconductor switches, diodes, or 'modules', having all of the following characteristics:</p> <ol style="list-style-type: none"> 1. Rated for a maximum operating junction temperature greater than 488 K (215 °C);

3A002

Category Code	SGCO 2019	SGCO 2020
3A002.a.6.b.	<p>General purpose “electronic assemblies”, modules and equipment, as follows:</p> <p>a. Recording equipment and oscilloscopes, as follows:</p> <p>---</p> <p>6. Digital data recorders having both of the following characteristics:</p> <p>---</p> <p>b. A processor that performs analysis of Radio Frequency (RF) signal data while it is being recorded;</p>	<p>General purpose “electronic assemblies”, modules and equipment, as follows:</p> <p>a. Recording equipment and oscilloscopes, as follows:</p> <p>---</p> <p>6. Digital data recorders having both of the following characteristics:</p> <p>---</p> <p>b. “Signal processing” of the radio frequency signal data while it is being recorded;</p>
3A002.d.4.b.	<p>General purpose “electronic assemblies”, modules and equipment, as follows:</p> <p>---</p> <p>d. Signal generators having any of the following characteristics:</p> <p>---</p> <p>4. Single Sideband (SSB) phase noise, in dBc/Hz, specified as being either of the following:</p> <p>---</p> <p>b. Less (better) than $-(206 - 20\log_{10}f)$ anywhere within the range of $10 \text{ kHz} < F \leq 100 \text{ kHz}$ anywhere within the frequency range exceeding 3.2 GHz but not exceeding 90 GHz; <u>or</u></p>	<p>General purpose “electronic assemblies”, modules and equipment, as follows:</p> <p>---</p> <p>d. Signal generators having any of the following characteristics:</p> <p>---</p> <p>4. Single Sideband (SSB) phase noise, in dBc/Hz, specified as being either of the following:</p> <p>---</p> <p>b. Less (better) than $-(206 - 20\log_{10}f)$ anywhere within the range of $10 \text{ kHz} < F \leq 100 \text{ kHz}$ anywhere within the frequency range exceeding 3.2 GHz but not exceeding 90 GHz;</p>

<ul style="list-style-type: none"> - 3A002.d.5. - 3A002.d.5.a. - 3A002.d.5.b. - 3A002.d.5.c. - 3A002.d.5. Technical Note - 3A002.d.6. 	<p>General purpose “electronic assemblies”, modules and equipment, as follows:</p> <p>---</p> <p>d. Signal generators having any of the following characteristics:</p> <p>---</p> <p>5. A maximum frequency exceeding 90 GHz;</p> <p>-</p>	<p>General purpose “electronic assemblies”, modules and equipment, as follows:</p> <p>---</p> <p>d. Signal generators having any of the following characteristics:</p> <p>---</p> <p>5. An ‘RF modulation bandwidth’ of digital baseband signals as specified by any of the following:</p> <ul style="list-style-type: none"> a. Exceeding 2.2 GHz within the frequency range exceeding 4.8 GHz but not exceeding 31.8 GHz; b. Exceeding 550 MHz within the frequency range exceeding 31.8 GHz but not exceeding 37 GHz; or c. Exceeding 2.2 GHz within the frequency range exceeding 37 GHz but not exceeding 90 GHz; or <p><u>Technical Note</u></p> <p><i>‘RF modulation bandwidth’ is the Radio Frequency (RF) bandwidth occupied by a digitally encoded baseband signal modulated onto an RF signal. It is also referred to as information bandwidth or vector modulation bandwidth. I/Q digital modulation is the technical method for producing a vector-modulated RF output signal, and that output signal is typically specified as having an ‘RF modulation bandwidth’.</i></p> <p>6. A maximum frequency exceeding 90 GHz;</p>
<p>3A002.d.</p> <p>Technical Notes</p>	<p>General purpose “electronic assemblies”, modules and equipment, as follows:</p> <p>---</p> <p>d. Signal generators having any of the following characteristics:</p> <p>---</p> <p><u>Technical Notes</u></p> <p>1. <i>The maximum frequency of an arbitrary waveform or function generator is calculated by dividing the sample rate, in samples/second, by a factor of 2.5.</i></p>	<p>General purpose “electronic assemblies”, modules and equipment, as follows:</p> <p>---</p> <p>d. Signal generators having any of the following characteristics:</p> <p>---</p> <p><u>Technical Notes</u></p> <p>1. <i>The maximum frequency of an arbitrary waveform or function generator is calculated by dividing the sample rate, in samples per second, by a factor of 2.5.</i></p>

3A229

Category Code	SGCO 2019	SGCO 2020
3A229.b.6.	<p>High current pulse generators as follows:</p> <p>---</p> <p>b. Modular electrical pulse generators (pulsers) having all of the following characteristics:</p> <p>---</p> <p>6. Specified for use over an extended temperature range 223 K (-50°C) to 373 K (100°C) or specified as suitable for aerospace applications;</p>	<p>High current pulse generators as follows:</p> <p>---</p> <p>b. Modular electrical pulse generators (pulsers) having all of the following characteristics:</p> <p>---</p> <p>6. Specified for use over an extended temperature range 223 K (-50 °C) to 373 K (100 °C) or specified as suitable for aerospace applications;</p>

3A233

Category Code	SGCO 2019	SGCO 2020
3A233.d.2	<p>Mass spectrometers, other than those specified in Category Code 0B002.g., capable of measuring ions of 230 u or greater and having a resolution of better than 2 parts in 230 u, as follows, and ion sources therefor:</p> <p>---</p> <p>d. Electron bombardment mass spectrometers having both of the following features:</p> <p>---</p> <p>2. One or more 'cold traps' that can be cooled to a temperature of 193 K (-80°C);</p>	<p>Mass spectrometers, other than those specified in Category Code 0B002.g., capable of measuring ions of 230 u or greater and having a resolution of better than 2 parts in 230 u, as follows, and ion sources therefor:</p> <p>---</p> <p>d. Electron bombardment mass spectrometers having both of the following features:</p> <p>---</p> <p>2. One or more 'cold traps' that can be cooled to a temperature of 193 K (-80 °C);</p>

3B001

Category Code	SGCO 2019	SGCO 2020
3B001.b.5.	<p>Equipment for the manufacturing of semiconductor devices or materials, as follows and specially designed components and accessories therefor:</p> <p>---</p> <p>b. Equipment designed for ion implantation and having any of the following characteristics:</p> <p>---</p> <p>5. Being designed and optimised to operate at a beam energy of 20 keV or more and a beam current of 10 mA or more for silicon implant into a semiconductor material “substrate” heated to 600°C or greater;</p>	<p>Equipment for the manufacturing of semiconductor devices or materials, as follows and specially designed components and accessories therefor:</p> <p>---</p> <p>b. Equipment designed for ion implantation and having any of the following characteristics:</p> <p>---</p> <p>5. Being designed and optimised to operate at a beam energy of 20 keV or more and a beam current of 10 mA or more for silicon implant into a semiconductor material “substrate” heated to 600 °C or greater;</p>
<p>- 3B001.f.1.b.</p> <p>- 3B001.f.1.b.</p> <p>Technical Note</p>	<p>Equipment for the manufacturing of semiconductor devices or materials, as follows and specially designed components and accessories therefor:</p> <p>---</p> <p>f. Lithography equipment as follows:</p> <p>1. Align and expose step and repeat (direct step on wafer) or step and scan (scanner) equipment for wafer processing using photo-optical or X-ray methods and having either of the following characteristics:</p> <p>---</p> <p>b. Capable of producing a pattern with a ‘Minimum Resolvable Feature size’ (MRF) of 45 nm or less;</p> <p><u>Technical Note</u> The ‘Minimum Resolvable Feature size’ (MRF) is calculated by the following formula:</p>	<p>Equipment for the manufacturing of semiconductor devices or materials, as follows and specially designed components and accessories therefor:</p> <p>---</p> <p>f. Lithography equipment as follows:</p> <p>1. Align and expose step and repeat (direct step on wafer) or step and scan (scanner) equipment for wafer processing using photo-optical or X-ray methods and having either of the following characteristics:</p> <p>---</p> <p>b. Capable of producing a pattern with a “Minimum Resolvable Feature size” (MRF) of 45 nm or less;</p> <p><u>Technical Note</u> The “Minimum Resolvable Feature size” (MRF) is calculated by the following formula:</p>

3B001.h.	<p>Equipment for the manufacturing of semiconductor devices or materials, as follows and specially designed components and accessories therefor:</p> <p>---</p> <p>h. Multi-layer masks with a phase shift layer not specified in Category Code 3B001.g. and having either of the following characteristics:</p> <ol style="list-style-type: none"> 1. Made on a mask “substrate blank” from glass specified as having less than 7 nm/cm birefringence; <u>or</u> 2. Designed to be used by lithography equipment having a light source wavelength less than 245 nm; 	<p>Equipment for the manufacturing of semiconductor devices or materials, as follows and specially designed components and accessories therefor:</p> <p>---</p> <p>h. Multi-layer masks with a phase shift layer not specified in Category Code 3B001.g. and designed to be used by lithography equipment having a light source wavelength less than 245 nm;</p>
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3C005

Category Code	SGCO 2019	SGCO 2020
- 3C005.a., - 3C005.b.	<p>High resistivity materials as follows:</p> <ol style="list-style-type: none"> a. Silicon carbide (SiC), gallium nitride (GaN), aluminium nitride (AlN) or aluminium gallium nitride (AlGaIn) semiconductor “substrates”, or ingots, boules, or other preforms of those materials, having resistivities greater than 10,000 ohm cm at 20°C; b. Polycrystalline “substrates” or polycrystalline ceramic “substrates”, having resistivities greater than 10,000 ohm-cm at 20°C and having at least one non epitaxial single crystal layer of silicon (Si), silicon carbide (SiC), gallium nitride (GaN), aluminium nitride (AlN), or aluminium gallium nitride (AlGaIn) on the surface of the “substrate”. 	<p>High resistivity materials as follows:</p> <ol style="list-style-type: none"> a. Silicon carbide (SiC), gallium nitride (GaN), aluminium nitride (AlN) or aluminium gallium nitride (AlGaIn) semiconductor “substrates”, or ingots, boules, or other preforms of those materials, having resistivities greater than 10,000 ohm cm at 20 °C; b. Polycrystalline “substrates” or polycrystalline ceramic “substrates”, having resistivities greater than 10,000 ohm-cm at 20 °C and having at least one non epitaxial single crystal layer of silicon (Si), silicon carbide (SiC), gallium nitride (GaN), aluminium nitride (AlN), or aluminium gallium nitride (AlGaIn) on the surface of the “substrate”.

3D005 (new category code)

Category Code	SGCO 2019	SGCO 2020
3D005	-	“Software” specially designed to restore normal operation of a microcomputer, “microprocessor microcircuit” or “microcomputer microcircuit” within 1 ms after an Electromagnetic Pulse (EMP) or Electrostatic Discharge (ESD) disruption, without loss of continuation of operation.

3E003

Category Code	SGCO 2019	SGCO 2020
3E003.g.	Other “technology” for the “development” or “production” of the following: --- g. ‘Vacuum electronic devices’ operating at frequencies of 31.8 GHz or higher.	Other “technology” for the “development” or “production” of the following: --- g. “Vacuum electronic devices” operating at frequencies of 31.8 GHz or higher.

Category 4**4A001**

Category Code	SGCO 2019	SGCO 2020
4A001.a.1.	<p>Electronic computers and related equipment, having the following characteristic, and “electronic assemblies” and specially designed components therefor:</p> <p>---</p> <p>a. Specially designed to have either of the following characteristics:</p> <p>1. Rated for operation at an ambient temperature below 228 K (-45°C) or above 358 K (85°C); <u>or</u></p>	<p>Electronic computers and related equipment, having the following characteristic, and “electronic assemblies” and specially designed components therefor:</p> <p>---</p> <p>a. Specially designed to have either of the following characteristics:</p> <p>1. Rated for operation at an ambient temperature below 228 K (-45 °C) or above 358 K (85 °C); <u>or</u></p>

4A102

Category Code	SGCO 2019	SGCO 2020
4A102	<p>“Hybrid computers” specially designed for modelling, simulation or design integration of space launch vehicles specified in Category Code 9A004 or sounding rockets specified in Category Code 9A104.</p>	<p>Hybrid computers specially designed for modelling, simulation or design integration of space launch vehicles specified in Category Code 9A004 or sounding rockets specified in Category Code 9A104.</p>

Category 5 Part 1

5A001

Category Code	SGCO 2019	SGCO 2020
- 5A001.a.3. - 5A001.a.4.	<p>Telecommunications systems, equipment, components and accessories, as follows:</p> <p>a. Any type of telecommunications equipment having any of the following characteristics, functions or features:</p> <p>---</p> <p>3. Specially designed to operate below 218 K (-55°C); <u>or</u></p> <p>4. Specially designed to operate above 397 K (124°C);</p>	<p>Telecommunications systems, equipment, components and accessories, as follows:</p> <p>a. Any type of telecommunications equipment having any of the following characteristics, functions or features:</p> <p>---</p> <p>3. Specially designed to operate below 218 K (-55 °C); <u>or</u></p> <p>4. Specially designed to operate above 397 K (124 °C);</p>
5A001.c. Technical Note	<p>Telecommunications systems, equipment, components and accessories, as follows:</p> <p>---</p> <p>c. Optical fibres of more than 500 m in length and specified by the manufacturer as being capable of withstanding a 'proof test' tensile stress of 2×10^9 N/m² or more;</p> <p>---</p> <p><u>Technical Note</u> 'Proof Test': on line or off line production screen testing that dynamically applies a prescribed tensile stress over a 0.5 m to 3 m length of fibre at a running rate of 2 m/s to 5 m/s while passing between capstans approximately 150 mm in diameter. The ambient temperature is a nominal 293 K (20°C) and relative humidity 40%. Equivalent national standards may be used for executing the proof test.</p>	<p>Telecommunications systems, equipment, components and accessories, as follows:</p> <p>---</p> <p>c. Optical fibres of more than 500 m in length and specified by the manufacturer as being capable of withstanding a 'proof test' tensile stress of 2×10^9 N/m² or more;</p> <p>---</p> <p><u>Technical Note</u> 'Proof Test': on line or off line production screen testing that dynamically applies a prescribed tensile stress over a 0.5 m to 3 m length of fibre at a running rate of 2 m/s to 5 m/s while passing between capstans approximately 150 mm in diameter. The ambient temperature is a nominal 293 K (20 °C) and relative humidity 40%. Equivalent national standards may be used for executing the proof test.</p>

Category 5 Part 2

5A002

Category Code	SGCO 2019	SGCO 2020
5A002 N.B.	<p>“Information security” systems, equipment and components, as follows:</p> <p><u>N.B.</u></p> <p><i>For Global Navigation Satellite Systems (GNSS) receiving equipment containing or employing decryption, see Category Code 7A005 and for related decryption “software” and “technology”, see Category Codes 7D005 and 7E001.</i></p>	<p>“Information security” systems, equipment and components, as follows:</p> <p><u>N.B.</u></p> <p><i>For “satellite navigation system” receiving equipment containing or employing decryption, see Category Code 7A005 and for related decryption “software” and “technology”, see Category Codes 7D005 and 7E001.</i></p>
<p>- 5A002.a. - 5A002.a.4.</p>	<p>“Information security” systems, equipment and components, as follows:</p> <p>---</p> <p>a. Designed or modified to use ‘cryptography for data confidentiality’ having ‘in excess of 56 bits of symmetric key length, or equivalent’, where that cryptographic capability is usable, has been activated, or can be activated by means of “cryptographic activation” not employing a secure mechanism, as follows:</p> <p>---</p> <p>4. Items, not specified in Category Codes 5A002.a.1. to 5A002.a.3., where the ‘cryptography for data confidentiality’ having ‘in excess of 56 bits of symmetric key length, or equivalent’ has both of the following characteristics:</p>	<p>“Information security” systems, equipment and components, as follows:</p> <p>---</p> <p>a. Designed or modified to use ‘cryptography for data confidentiality’ having a ‘described security algorithm’, where that cryptographic capability is usable, has been activated, or can be activated by means of “cryptographic activation” not employing a secure mechanism, as follows:</p> <p>---</p> <p>4. Items, not specified in Category Codes 5A002.a.1. to 5A002.a.3., where the ‘cryptography for data confidentiality’ having a ‘described security algorithm’ has both of the following characteristics:</p>

<p>5A002.a. Technical Notes</p>	<p>“Information security” systems, equipment and components, as follows:</p> <p>---</p> <p>a. Designed or modified to use ‘cryptography for data confidentiality’ having ‘in excess of 56 bits of symmetric key length, or equivalent’, where that cryptographic capability is usable, has been activated, or can be activated by means of “cryptographic activation” not employing a secure mechanism, as follows:</p> <p>---</p> <p><u>Technical Notes</u></p> <p>---</p> <p>2. <i>For the purpose of Category Code 5A002.a., ‘in excess of 56 bits of symmetric key length, or equivalent’ means either of the following:</i></p> <p>a. <i>A “symmetric algorithm” employing a key length in excess of 56 bits, not including parity bits; <u>or</u></i></p> <p>b. <i>An “asymmetric algorithm” where the security of the algorithm is based on any of the following:</i></p> <p>---</p> <p>3. <i>Discrete logarithms in a group other than those mentioned in paragraph b.2. in excess of 112 bits (e.g. Diffie Hellman over an elliptic curve).</i></p> <p>-</p>	<p>“Information security” systems, equipment and components, as follows:</p> <p>---</p> <p>a. Designed or modified to use ‘cryptography for data confidentiality’ having a ‘described security algorithm’, where that cryptographic capability is usable, has been activated, or can be activated by means of “cryptographic activation” not employing a secure mechanism, as follows:</p> <p>---</p> <p><u>Technical Notes</u></p> <p>---</p> <p>2. <i>For the purpose of Category Code 5A002.a., ‘described security algorithm’ means any of the following:</i></p> <p>a. <i>A “symmetric algorithm” employing a key length in excess of 56 bits, not including parity bits;</i></p> <p>b. <i>An “asymmetric algorithm” where the security of the algorithm is based on any of the following:</i></p> <p>---</p> <p>3. <i>Discrete logarithms in a group other than mentioned in paragraph b.2. in excess of 112 bits (e.g. Diffie-Hellman over an elliptic curve); <u>or</u></i></p> <p>c. <i>An “asymmetric algorithm” where the security of the algorithm is based on any of the following:</i></p> <p>1. <i>Shortest vector or closest vector problems associated with lattices (e.g. NewHope, Frodo, NTRUEncrypt, Kyber, Titanium);</i></p> <p>2. <i>Finding isogenies between Supersingular elliptic curves (e.g. Supersingular Isogeny Key Encapsulation); <u>or</u></i></p> <p>3. <i>Decoding random codes (e.g. McEliece, Niederreiter).</i></p> <p><u>Technical Note</u></p> <p><i>An algorithm described by Technical Note 2.c.</i></p>
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		<i>may be referred to as being post-quantum, quantum-safe or quantum-resistant.</i>
5A002.a. Note 2	<p>“Information security” systems, equipment and components, as follows:</p> <p>---</p> <p>a. Designed or modified to use ‘cryptography for data confidentiality’ having ‘in excess of 56 bits of symmetric key length, or equivalent’, where that cryptographic capability is usable, has been activated, or can be activated by means of “cryptographic activation” not employing a secure mechanism, as follows:</p> <p>---</p> <p><u>Note 2</u></p> <p>---</p> <p>a. <i>Smart cards and smart card ‘readers/writers’, as follows:</i></p> <p>1. <i>A smart card or an electronically readable personal document (e.g. token coin, e passport) that meets either of the following:</i></p> <p>a. <i>The cryptographic capability meets both of the following:</i></p> <p>1. <i>It is restricted for use in any of the following:</i></p> <p>---</p> <p>b. <i>Equipment or systems not using ‘cryptography for data confidentiality’ having ‘in excess of 56 bits of symmetric key length, or equivalent’; <u>or</u></i></p> <p>---</p> <p>h. <i>Routers, switches or relays, where the “information security” functionality is limited to the tasks of “Operations, Administration or Maintenance” (“OAM”) implementing only published or commercial</i></p>	<p>“Information security” systems, equipment and components, as follows:</p> <p>---</p> <p>a. Designed or modified to use ‘cryptography for data confidentiality’ having a ‘described security algorithm’, where that cryptographic capability is usable, has been activated, or can be activated by means of “cryptographic activation” not employing a secure mechanism, as follows:</p> <p>---</p> <p><u>Note 2</u></p> <p>---</p> <p>a. <i>Smart cards and smart card ‘readers/writers’, as follows:</i></p> <p>1. <i>A smart card or an electronically readable personal document (e.g. token coin, e passport) that meets either of the following:</i></p> <p>a. <i>The cryptographic capability meets both of the following:</i></p> <p>1. <i>It is restricted for use in any of the following:</i></p> <p>---</p> <p>b. <i>Equipment or systems not using ‘cryptography for data confidentiality’ having a ‘described security algorithm’; <u>or</u></i></p> <p>---</p> <p>h. <i>Routers, switches or relays, where the “information security” functionality is limited to the tasks of “Operations, Administration or Maintenance” (“OAM”) implementing only published or commercial cryptographic standards;</i></p>

	<p><i>cryptographic standards; <u>or</u></i></p> <p>i. <i>General purpose computing equipment or servers, where the “information security” functionality meets both of the following:</i></p> <p>---</p> <p>2. <i>Is any of the following:</i></p> <p>---</p> <p>c. <i>Limited to “OAM” of the equipment.</i></p> <p>-</p>	<p>i. <i>General purpose computing equipment or servers, where the “information security” functionality meets both of the following:</i></p> <p>---</p> <p>2. <i>Is any of the following:</i></p> <p>---</p> <p>c. <i>Limited to “OAM” of the equipment; <u>or</u></i></p> <p>j. <i>Items specially designed for a ‘connected civil industry application’, meeting both of the following:</i></p> <p>1. <i>Being either of the following:</i></p> <p>a. <i>A network-capable endpoint device meeting either of the following:</i></p> <p>1. <i>The “information security” functionality is limited to securing ‘non-arbitrary data’ or the tasks of “Operations, Administration or Maintenance” (“OAM”); <u>or</u></i></p> <p>2. <i>The device is limited to a specific ‘connected civil industry application’; <u>or</u></i></p> <p>b. <i>Networking equipment meeting both of the following:</i></p> <p>1. <i>Being specially designed to communicate with the devices specified in paragraph j.1.a. above; <u>and</u></i></p> <p>2. <i>The “information security” functionality is limited to supporting the ‘connected civil industry application’ of devices specified in paragraph j.1.a. above, or the tasks of “OAM” of this networking equipment or of other items specified in paragraph j. of this Note; <u>and</u></i></p>
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		<p>2. Where the “information security” functionality implements only published or commercial cryptographic standards, and the cryptographic functionality cannot easily be changed by the user.</p> <p><u>Technical Notes</u></p> <p>1. ‘Connected civil industry application’ means a network connected consumer or civil industry application other than “information security”, digital communication, general purpose networking or computing.</p> <p>2. ‘Non-arbitrary data’ means sensor or metering data directly related to the stability, performance or physical measurement of a system (e.g. temperature, pressure, flow rate, mass, volume, voltage, physical location, etc.), that cannot be changed by the user of the device.</p>
<p>- 5A002.b. - 5A002.b. Technical Note</p>	<p>“Information security” systems, equipment and components, as follows: --- b. Designed or modified for converting, by means of “cryptographic activation”, an item not specified in Category 5 – Part 2 into an item specified in Category Code 5A002.a. or 5D002.c.1., and not excluded by the Cryptography Note (Note 3 in Category 5 – Part 2), or for enabling, by means of “cryptographic activation”, additional functionality specified in Category Code 5A002.a. of an item already specified in Category 5 – Part 2;</p>	<p>“Information security” systems, equipment and components, as follows: --- b. Being a ‘cryptographic activation token’; <u>Technical Note</u> A ‘cryptographic activation token’ is an item designed or modified for either of the following:</p> <p>1. Converting, by means of “cryptographic activation”, an item not specified in Category 5 – Part 2 into an item specified in Category Code 5A002.a. or 5D002.c.1., and not excluded by the Cryptography Note (Note 3 in Category 5 – Part 2); or</p> <p>2. Enabling, by means of “cryptographic activation”, additional functionality specified in Category Code 5A002.a. of an item already specified in Category 5 – Part 2.</p>

5D002

Category Code	SGCO 2019	SGCO 2020
5D002.b.	<p>“Software” as follows:</p> <p>---</p> <p>b. “Software” designed or modified for converting, by means of “cryptographic activation”, an item not specified in Category 5 – Part 2 into an item specified in Category Code 5A002.a. or 5D002.c.1., and not excluded by the Cryptography Note (Note 3 in Category 5 – Part 2), or for enabling, by means of “cryptographic activation”, additional functionality specified in Category Code 5A002.a. of an item already specified in Category 5 – Part 2;</p>	<p>“Software” as follows:</p> <p>---</p> <p>b. “Software” having the characteristics of a ‘cryptographic activation token’ specified in Category Code 5A002.b.;</p>

5E002

Category Code	SGCO 2019	SGCO 2020
5E002.b.	<p>“Technology” as follows:</p> <p>---</p> <p>b. “Technology” for converting, by means of “cryptographic activation”, an item not specified in Category 5 – Part 2 into an item specified in Category Code 5A002.a. or 5D002.c.1., and not excluded by the Cryptography Note (Note 3 in Category 5 – Part 2), or for enabling, by means of “cryptographic activation”, additional functionality specified in Category Code 5A002.a. of an item already specified in Category 5 – Part 2;</p>	<p>“Technology” as follows:</p> <p>---</p> <p>b. “Technology” having the characteristics of a ‘cryptographic activation token’ specified in Category Code 5A002.b.</p>

Category 6

6A001

Category Code	SGCO 2019	SGCO 2020
<ul style="list-style-type: none"> - 6A001.a.1.c.1.a. - 6A001.a.1.c.1.b. - 6A001.a.1.c.1. Technical Note	<p>Acoustic systems, equipment and components, as follows:</p> <ul style="list-style-type: none"> a. Marine acoustic systems, equipment and specially designed components therefor, as follows: <ul style="list-style-type: none"> 1. Active (transmitting or transmitting-and-receiving) systems, equipment and specially designed components therefor, as follows: --- c. Acoustic projectors (including transducers), incorporating piezoelectric, magnetostrictive, electrostrictive, electrodynamic or hydraulic elements operating individually or in a designed combination, and having any of the following characteristics: --- 1. Operating at frequencies below 10 kHz and having either of the following characteristics: <ul style="list-style-type: none"> a. Not designed for continuous operation at 100% duty cycle and having a radiated 'free field Source Level (SL_{RMS})' exceeding $(10\log(f) + 169.77)$ dB (reference 1 μPa at 1 m) where f is the frequency in Hertz of maximum Transmitting Voltage Response (TVR) below 10 kHz; <u>or</u> b. Designed for continuous operation at 100% duty cycle and having a continuously radiated 'free-field Source Level (SL_{RMS})' at 100% duty cycle exceeding $(10\log(f) + 159.77)$ dB (reference 1 μPa at 1 m) where f is the frequency in Hertz of maximum 	<p>Acoustic systems, equipment and components, as follows:</p> <ul style="list-style-type: none"> a. Marine acoustic systems, equipment and specially designed components therefor, as follows: <ul style="list-style-type: none"> 1. Active (transmitting or transmitting-and-receiving) systems, equipment and specially designed components therefor, as follows: <ul style="list-style-type: none"> --- c. Acoustic projectors (including transducers), incorporating piezoelectric, magnetostrictive, electrostrictive, electrodynamic or hydraulic elements operating individually or in a designed combination, and having any of the following characteristics: --- 1. Operating at frequencies below 10 kHz and having either of the following characteristics: <ul style="list-style-type: none"> a. Not designed for continuous operation at 100% duty cycle and having a radiated 'free field Source Level (SL_{rms})' exceeding $(10\log(f) + 169.77)$ dB (reference 1 μPa at 1 m) where f is the frequency in Hertz of maximum Transmitting Voltage Response (TVR) below 10 kHz; <u>or</u> b. Designed for continuous operation at 100% duty cycle and having a continuously radiated 'free-field Source Level (SL_{rms})' at 100% duty cycle exceeding $(10\log(f) + 159.77)$ dB (reference 1 μPa at 1 m) where f is the frequency in Hertz of maximum

Category Code	SGCO 2019	SGCO 2020
	<p>Transmitting Voltage Response (TVR) below 10 kHz; or</p> <p><i>Technical Note</i> The 'free-field Source Level (SL_{RMS})' is defined along the maximum response axis and in the far field of the acoustic projector. It can be obtained from the Transmitting Voltage Response using the following equation: $SL_{RMS} = (TVR + 20\log V_{RMS})$ dB (reference 1 μPa at 1 m), where SL_{RMS} is the source level, TVR is the Transmitting Voltage Response and V_{RMS} is the Driving Voltage of the Projector.</p>	<p>Transmitting Voltage Response (TVR) below 10 kHz; or</p> <p><i>Technical Note</i> The 'free-field Source Level (SL_{rms})' is defined along the maximum response axis and in the far field of the acoustic projector. It can be obtained from the Transmitting Voltage Response using the following equation: $SL_{rms} = (TVR + 20\log V_{rms})$ dB (reference 1 μPa at 1 m), where SL_{rms} is the source level, TVR is the Transmitting Voltage Response and V_{rms} is the Driving Voltage of the Projector.</p>
6A001.a.2. Note	<p>Acoustic systems, equipment and components, as follows:</p> <p>a. Marine acoustic systems, equipment and specially designed components therefor, as follows:</p> <p>---</p> <p>2. Passive systems, equipment and specially designed components therefor, as follows:</p> <p>-</p>	<p>Acoustic systems, equipment and components, as follows:</p> <p>a. Marine acoustic systems, equipment and specially designed components therefor, as follows:</p> <p>---</p> <p>2. Passive systems, equipment and specially designed components therefor, as follows:</p> <p><i>Note</i> Category Code 6A001.a.2. also includes receiving equipment, whether or not related in normal application to separate active equipment, and specially designed components therefor.</p>

6A001.a.2.a. Technical Notes	<p>Acoustic systems, equipment and components, as follows:</p> <p>a. Marine acoustic systems, equipment and specially designed components therefor, as follows:</p> <p>---</p> <p>2. Passive systems, equipment and specially designed components therefor, as follows:</p> <p>a. Hydrophones having any of the following characteristics:</p> <p>---</p> <p><u>Technical Note</u> <i>Hydrophones consist of one or more sensing elements producing a single acoustic output channel. Those that contain multiple elements can be referred to as a hydrophone group.</i></p>	<p>Acoustic systems, equipment and components, as follows:</p> <p>a. Marine acoustic systems, equipment and specially designed components therefor, as follows:</p> <p>---</p> <p>2. Passive systems, equipment and specially designed components therefor, as follows:</p> <p>---</p> <p>a. Hydrophones having any of the following characteristics:</p> <p>---</p> <p><u>Technical Notes</u></p> <p>1. <i>Hydrophones consist of one or more sensing elements producing a single acoustic output channel. Those that contain multiple elements can be referred to as a hydrophone group.</i></p> <p>2. <i>For the purpose of Category Code 6A001.a.2.a., underwater acoustic transducers designed to operate as passive receivers are hydrophones.</i></p>
6A001.a.2.a.6.	<p>Acoustic systems, equipment and components, as follows:</p> <p>a. Marine acoustic systems, equipment and specially designed components therefor, as follows:</p> <p>---</p> <p>2. Passive systems, equipment and specially designed components therefor, as follows:</p> <p>a. Hydrophones having any of the following characteristics:</p> <p>---</p> <p>6. Designed for operation at depths exceeding 1,000 m;</p>	<p>Acoustic systems, equipment and components, as follows:</p> <p>a. Marine acoustic systems, equipment and specially designed components therefor, as follows:</p> <p>---</p> <p>2. Passive systems, equipment and specially designed components therefor, as follows:</p> <p>---</p> <p>a. Hydrophones having any of the following characteristics:</p> <p>---</p> <p>6. Designed for operation at depths exceeding 1,000 m and having a 'hydrophone sensitivity' better than -230 dB below 4 kHz;</p>

6A001.a. Note	<p>Acoustic systems, equipment and components, as follows:</p> <p>a. Marine acoustic systems, equipment and specially designed components therefor, as follows:</p> <p>---</p> <p><i>Note</i> <i>Category Code 6A001.a.2. also includes receiving equipment, whether or not related in normal application to separate active equipment, and specially designed components therefor.</i></p>	<p>Acoustic systems, equipment and components, as follows:</p> <p>a. Marine acoustic systems, equipment and specially designed components therefor, as follows:</p> <p>---</p> <p>-</p>
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6A002

Category Code	SGCO 2019	SGCO 2020
6A002.d.2.	<p>Optical sensors or equipment and components therefor, as follows:</p> <p>---</p> <p>d. Special support components for optical sensors, as follows:</p> <p>---</p> <p>2. Non-“space-qualified” cryocoolers having a cooling source temperature below 218 K (-55°C), as follows:</p>	<p>Optical sensors or equipment and components therefor, as follows:</p> <p>---</p> <p>d. Special support components for optical sensors, as follows:</p> <p>---</p> <p>2. Non-“space-qualified” cryocoolers having a cooling source temperature below 218 K (-55 °C), as follows:</p>

6A003

Category Code	SGCO 2019	SGCO 2020
- 6A003.a.4. - 6A003.a.5.b.	<p>Cameras, systems or equipment, and components therefor, as follows:</p> <p>---</p> <p>a. Instrumentation cameras and specially designed components therefor, as follows:</p> <p>---</p> <p>4. Electronic framing cameras having a speed exceeding 1,000,000 frames/s;</p> <p>5. Electronic cameras having both of the following characteristics:</p> <p>---</p> <p>b. A read out time allowing a framing rate of more than 125 full frames/s;</p>	<p>Cameras, systems or equipment, and components therefor, as follows:</p> <p>---</p> <p>a. Instrumentation cameras and specially designed components therefor, as follows:</p> <p>---</p> <p>4. Electronic framing cameras having a speed exceeding 1,000,000 frames per second;</p> <p>5. Electronic cameras having both of the following characteristics:</p> <p>---</p> <p>b. A read out time allowing a framing rate of more than 125 full frames per second;</p>
6A003.b.4. Note 3	<p>Cameras, systems or equipment, and components therefor, as follows:</p> <p>---</p> <p>b. Imaging cameras as follows:</p> <p>---</p> <p>4. Imaging cameras incorporating “focal plane arrays” having any of the following characteristics:</p> <p>---</p> <p><u>Note 3</u> Category Code 6A003.b.4.b. does not include imaging cameras having any of the following characteristics:</p> <p>---</p> <p>b. Having all of the following characteristics:</p> <p>1. Having a minimum horizontal or vertical ‘Instantaneous-Field-of-View (IFOV)’ of at least 10 mrad (milliradians);</p>	<p>Cameras, systems or equipment, and components therefor, as follows:</p> <p>---</p> <p>b. Imaging cameras as follows:</p> <p>---</p> <p>4. Imaging cameras incorporating “focal plane arrays” having any of the following characteristics:</p> <p>---</p> <p><u>Note 3</u> Category Code 6A003.b.4.b. does not include imaging cameras having any of the following characteristics:</p> <p>---</p> <p>b. Having all of the following characteristics:</p> <p>1. Having a minimum horizontal or vertical ‘Instantaneous-Field-of-View (IFOV)’ of at least 2 mrad (milliradians);</p>

6A004

Category Code	SGCO 2019	SGCO 2020
- 6A004.e. - 6A004.e. Note	<p>Optical equipment and components, as follows:</p> <p>---</p> <p>e. 'Aspheric optical elements' having all of the following characteristics:</p> <p>---</p> <p>3. Coefficient of linear thermal expansion's absolute magnitude less than $3 \times 10^{-6}/K$ at 25°C;</p> <p>---</p> <p><u>Note</u> Category Code 6A004.e. does not include 'aspheric optical elements' having any of the following characteristics:</p> <p>---</p> <p>d. Fabricated from borosilicate glass having a coefficient of linear thermal expansion greater than $2.5 \times 10^{-6}/K$ at 25°C; <u>or</u></p>	<p>Optical equipment and components, as follows:</p> <p>---</p> <p>e. 'Aspheric optical elements' having all of the following characteristics:</p> <p>---</p> <p>3. Coefficient of linear thermal expansion's absolute magnitude less than $3 \times 10^{-6}/K$ at 25 °C;</p> <p>---</p> <p><u>Note</u> Category Code 6A004.e. does not include 'aspheric optical elements' having any of the following characteristics:</p> <p>---</p> <p>d. Fabricated from borosilicate glass having a coefficient of linear thermal expansion greater than $2.5 \times 10^{-6}/K$ at 25 °C; <u>or</u></p>

6A005

Category Code	SGCO 2019	SGCO 2020
6A005 Note 6	<p>"Lasers", other than those specified in Category Code 0B001.g.5. or 0B001.h.6., components and optical equipment, as follows:</p> <p>---</p> <p>-</p>	<p>"Lasers", other than those specified in Category Code 0B001.g.5. or 0B001.h.6., components and optical equipment, as follows:</p> <p>---</p> <p><u>Note 6</u> For the purpose of Category Codes 6A005.a. and 6A005.b., 'single transverse mode' refers to "lasers" with a beam profile having an M^2-factor of less than 1.3, while 'multiple transverse mode' refers to "lasers" with a beam profile having an M^2-factor of 1.3 or higher.</p>

<ul style="list-style-type: none"> - 6A005.a.3.a. - 6A005.a.3.b. 	<p>“Lasers”, other than those specified in Category Code 0B001.g.5. or 0B001.h.6., components and optical equipment, as follows:</p> <p>---</p> <p>a. Non-“tunable” Continuous Wave “(CW) lasers” having any of the following characteristics:</p> <p>---</p> <p>3. Output wavelength exceeding 510 nm but not exceeding 540 nm, and having either of the following characteristics:</p> <ul style="list-style-type: none"> a. Single transverse mode output and output power exceeding 50 W; <u>or</u> b. Multiple transverse mode output and output power exceeding 150 W; 	<p>“Lasers”, other than those specified in Category Code 0B001.g.5. or 0B001.h.6., components and optical equipment, as follows:</p> <p>---</p> <p>a. Non-“tunable” Continuous Wave “(CW) lasers” having any of the following characteristics:</p> <p>---</p> <p>3. Output wavelength exceeding 510 nm but not exceeding 540 nm, and having either of the following characteristics:</p> <ul style="list-style-type: none"> a. ‘Single transverse mode’ output and output power exceeding 50 W; <u>or</u> b. ‘Multiple transverse mode’ output and output power exceeding 150 W;
<ul style="list-style-type: none"> - 6A005.a.5.a. - 6A005.a.5.b. 	<p>“Lasers”, other than those specified in Category Code 0B001.g.5. or 0B001.h.6., components and optical equipment, as follows:</p> <p>---</p> <p>a. Non-“tunable” Continuous Wave “(CW) lasers” having any of the following characteristics:</p> <p>---</p> <p>5. Output wavelength exceeding 800 nm but not exceeding 975 nm, and either of the following characteristics:</p> <ul style="list-style-type: none"> a. Single transverse mode output and output power exceeding 50 W; <u>or</u> b. Multiple transverse mode output and output power exceeding 80 W; 	<p>“Lasers”, other than those specified in Category Code 0B001.g.5. or 0B001.h.6., components and optical equipment, as follows:</p> <p>---</p> <p>a. Non-“tunable” Continuous Wave “(CW) lasers” having any of the following characteristics:</p> <p>---</p> <p>5. Output wavelength exceeding 800 nm but not exceeding 975 nm, and either of the following characteristics:</p> <ul style="list-style-type: none"> a. ‘Single transverse mode’ output and output power exceeding 50 W; <u>or</u> b. ‘Multiple transverse mode’ output and output power exceeding 80 W;

<ul style="list-style-type: none"> - 6A005.a.6.a. - 6A005.a.6.a.1 - 6A005.a.6.a.2. - 6A005.a.6.a.2.a. - 6A005.a.6.a.2.b. - 6A005.a.6.b. - 6A005.a.6.b.1. - 6A005.a.6.b. Note 1 - 6A005.a.6.b. Note 2 	<p>“Lasers”, other than those specified in Category Code 0B001.g.5. or 0B001.h.6., components and optical equipment, as follows:</p> <p>---</p> <p>a. Non-“tunable” Continuous Wave “(CW) lasers” having any of the following characteristics:</p> <p>---</p> <p>6. Output wavelength exceeding 975 nm but not exceeding 1,150 nm, and either of the following characteristics:</p> <p>a. Single transverse mode output and output power exceeding 500 W; <u>or</u></p> <p>b. Multiple transverse mode output, and either of the following characteristics:</p> <p>1. ‘Wall-plug efficiency’ exceeding 18% and output power exceeding 500 W; <u>or</u></p> <p>---</p> <p><u>Note 1</u> Category Code 6A005.a.6.b. does not include multiple transverse mode, industrial “lasers” with output power exceeding 2 kW and not exceeding 6 kW with a total mass greater than 1,200 kg. For the purpose of this Note, total mass includes all components required to operate the “laser”, e.g. “laser”, power supply, heat exchanger, but excludes external optics for beam conditioning or delivery.</p> <p><u>Note 2</u> Category Code 6A005.a.6.b. does not include multiple transverse mode, industrial “lasers” having any of the following characteristics:</p> <p>a. Output power exceeding 500 W but not exceeding 1 kW, and having both of the following characteristics:</p> <p>1. Beam Parameter Product (BPP) exceeding 0.7 mm•mrad; <u>and</u></p>	<p>“Lasers”, other than those specified in Category Code 0B001.g.5. or 0B001.h.6., components and optical equipment, as follows:</p> <p>---</p> <p>a. Non-“tunable” Continuous Wave “(CW) lasers” having any of the following characteristics:</p> <p>---</p> <p>6. Output wavelength exceeding 975 nm but not exceeding 1,150 nm, and either of the following characteristics:</p> <p>a. ‘Single transverse mode’ output, and either of the following characteristics:</p> <p>1. Average output power exceeding 1,000 W; <u>or</u></p> <p>2. Having both of the following characteristics:</p> <p>a. Average output power exceeding 500 W; <u>and</u></p> <p>b. Spectral bandwidth less than 40 GHz; <u>or</u></p> <p>b. ‘Multiple transverse mode’ output, and either of the following characteristics:</p> <p>1. ‘Wall-plug efficiency’ exceeding 18% and output power exceeding 1,000 W; <u>or</u></p> <p>---</p> <p><u>Note 1</u> Category Code 6A005.a.6.b. does not include ‘multiple transverse mode’, industrial “lasers” with output power exceeding 2 kW and not exceeding 6 kW with a total mass greater than 1,200 kg. For the purpose of this Note, total mass includes all components required to operate the “laser”, e.g. “laser”, power supply, heat exchanger, but excludes external optics for beam conditioning or delivery.</p> <p><u>Note 2</u> Category Code 6A005.a.6.b. does not include</p>
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	<p>2. 'Brightness' not exceeding $1,024 \text{ W}/(\text{mm}\cdot\text{mrad})^2$;</p> <p>b. Output power exceeding 1 kW but not exceeding 1.6 kW, and having a BPP exceeding $1.25 \text{ mm}\cdot\text{mrad}$;</p> <p>---</p> <p>e. Output power exceeding 3.3 kW but not exceeding 4 kW, and having a BPP exceeding $3.5 \text{ mm}\cdot\text{mrad}$;</p> <p>f. Output power exceeding 4 kW but not exceeding 5 kW, and having a BPP exceeding $5 \text{ mm}\cdot\text{mrad}$;</p> <p>g. Output power exceeding 5 kW but not exceeding 6 kW, and having a BPP exceeding $7.2 \text{ mm}\cdot\text{mrad}$;</p>	<p>'multiple transverse mode', industrial "lasers" having any of the following characteristics:</p> <p>a. Not used;</p> <p>b. Output power exceeding 1 kW but not exceeding 1.6 kW, and having a Beam Parameter Product (BPP) exceeding $1.25 \text{ mm}\cdot\text{mrad}$;</p> <p>---</p> <p>e. Output power exceeding 3.3 kW but not exceeding 6 kW, and having a BPP exceeding $3.5 \text{ mm}\cdot\text{mrad}$;</p> <p>f. Not used;</p> <p>g. Not used;</p>
<p>- 6A005.a.7.a. - 6A005.a.7.b.</p>	<p>"Lasers", other than those specified in Category Code 0B001.g.5. or 0B001.h.6., components and optical equipment, as follows:</p> <p>---</p> <p>a. Non-"tunable" Continuous Wave "(CW) lasers" having any of the following characteristics:</p> <p>---</p> <p>7. Output wavelength exceeding 1,150 nm but not exceeding 1,555 nm and either of the following characteristics:</p> <p>a. Single transverse mode output and output power exceeding 50 W; <u>or</u></p> <p>b. Multiple transverse mode output and output power exceeding 80 W;</p>	<p>"Lasers", other than those specified in Category Code 0B001.g.5. or 0B001.h.6., components and optical equipment, as follows:</p> <p>---</p> <p>a. Non-"tunable" Continuous Wave "(CW) lasers" having any of the following characteristics:</p> <p>---</p> <p>7. Output wavelength exceeding 1,150 nm but not exceeding 1,555 nm and either of the following characteristics:</p> <p>a. 'Single transverse mode' output and output power exceeding 50 W; <u>or</u></p> <p>b. 'Multiple transverse mode' output and output power exceeding 80 W;</p>

<ul style="list-style-type: none"> - 6A005.a.9.a. - 6A005.a.9.b. 	<p>“Lasers”, other than those specified in Category Code 0B001.g.5. or 0B001.h.6., components and optical equipment, as follows:</p> <p>---</p> <p>a. Non-“tunable” Continuous Wave “(CW) lasers” having any of the following characteristics:</p> <p>---</p> <p>9. Output wavelength exceeding 1,850 nm but not exceeding 2,100 nm, and either of the following characteristics:</p> <ul style="list-style-type: none"> a. Single transverse mode output and output power exceeding 1 W; <u>or</u> b. Multiple transverse mode output and output power exceeding 120 W; <u>or</u> 	<p>“Lasers”, other than those specified in Category Code 0B001.g.5. or 0B001.h.6., components and optical equipment, as follows:</p> <p>---</p> <p>a. Non-“tunable” Continuous Wave “(CW) lasers” having any of the following characteristics:</p> <p>---</p> <p>9. Output wavelength exceeding 1,850 nm but not exceeding 2,100 nm, and either of the following characteristics:</p> <ul style="list-style-type: none"> a. ‘Single transverse mode’ output and output power exceeding 1 W; <u>or</u> b. ‘Multiple transverse mode’ output and output power exceeding 120 W; <u>or</u>
<ul style="list-style-type: none"> - 6A005.b.3.a. - 6A005.b.3.b. 	<p>“Lasers”, other than those specified in Category Code 0B001.g.5. or 0B001.h.6., components and optical equipment, as follows:</p> <p>---</p> <p>b. Non-“tunable” “pulsed lasers” having any of the following characteristics:</p> <p>---</p> <p>3. Output wavelength exceeding 510 nm but not exceeding 540 nm, and either of the following characteristics:</p> <ul style="list-style-type: none"> a. Single transverse mode output, and either of the following characteristics: <p>---</p> <ul style="list-style-type: none"> b. Multiple transverse mode output, and either of the following characteristics: 	<p>“Lasers”, other than those specified in Category Code 0B001.g.5. or 0B001.h.6., components and optical equipment, as follows:</p> <p>---</p> <p>b. Non-“tunable” “pulsed lasers” having any of the following characteristics:</p> <p>---</p> <p>3. Output wavelength exceeding 510 nm but not exceeding 540 nm, and either of the following characteristics:</p> <ul style="list-style-type: none"> a. ‘Single transverse mode’ output, and either of the following characteristics: <p>---</p> <ul style="list-style-type: none"> b. ‘Multiple transverse mode’ output, and either of the following characteristics:

<ul style="list-style-type: none"> - 6A005.b.5.a.2. - 6A005.b.5.b.2. - 6A005.b.5.b.3. - 6A005.b.5.c.2. - 6A005.b.5.c.3. 	<p>“Lasers”, other than those specified in Category Code 0B001.g.5. or 0B001.h.6., components and optical equipment, as follows:</p> <p>---</p> <p>b. Non-“tunable” “pulsed lasers” having any of the following characteristics:</p> <p>---</p> <p>5. Output wavelength exceeding 800 nm but not exceeding 975 nm, and any of the following characteristics:</p> <p>a. “Pulse duration” less than 1 ps, and either of the following characteristics:</p> <p>---</p> <p>2. Single transverse mode output and “average output power” exceeding 20 W;</p> <p>b. “Pulse duration” equal to or exceeding 1 ps and not exceeding 1 μs, and any of the following characteristics:</p> <p>---</p> <p>2. Single transverse mode output and “average output power” exceeding 20 W; <u>or</u></p> <p>3. Multiple transverse mode output and “average output power” exceeding 50 W; <u>or</u></p> <p>c. “Pulse duration” exceeding 1 μs, and any of the following characteristics:</p> <p>---</p> <p>2. Single transverse mode output and “average output power” exceeding 50 W; <u>or</u></p> <p>3. Multiple transverse mode output and “average output power” exceeding 80 W;</p>	<p>“Lasers”, other than those specified in Category Code 0B001.g.5. or 0B001.h.6., components and optical equipment, as follows:</p> <p>---</p> <p>b. Non-“tunable” “pulsed lasers” having any of the following characteristics:</p> <p>---</p> <p>5. Output wavelength exceeding 800 nm but not exceeding 975 nm, and any of the following characteristics:</p> <p>a. “Pulse duration” less than 1 ps, and either of the following characteristics:</p> <p>---</p> <p>2. ‘Single transverse mode’ output and “average output power” exceeding 20 W;</p> <p>b. “Pulse duration” equal to or exceeding 1 ps and not exceeding 1 μs, and any of the following characteristics:</p> <p>---</p> <p>2. ‘Single transverse mode’ output and “average output power” exceeding 20 W; <u>or</u></p> <p>3. ‘Multiple transverse mode’ output and “average output power” exceeding 50 W; <u>or</u></p> <p>c. “Pulse duration” exceeding 1 μs, and any of the following characteristics:</p> <p>---</p> <p>2. ‘Single transverse mode’ output and “average output power” exceeding 50 W; <u>or</u></p> <p>3. ‘Multiple transverse mode’ output and “average output power” exceeding 80 W;</p>
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<ul style="list-style-type: none"> - 6A005.b.6.c.1. - 6A005.b.6.c.2. - 6A005.b.6.d.1. - 6A005.b.6.d.2. 	<p>“Lasers”, other than those specified in Category Code 0B001.g.5. or 0B001.h.6., components and optical equipment, as follows:</p> <p>---</p> <p>b. Non-“tunable” “pulsed lasers” having any of the following characteristics:</p> <p>---</p> <p>6. Output wavelength exceeding 975 nm but not exceeding 1,150 nm, and any of the following characteristics:</p> <p>---</p> <p>c. “Pulse duration” equal to or exceeding 1 ns but not exceeding 1 μs, and either of the following characteristics:</p> <p>1. Single transverse mode output, and any of the following characteristics:</p> <p>---</p> <p>2. Multiple transverse mode output, and any of the following characteristics:</p> <p>---</p> <p>d. “Pulse duration” exceeding 1 μs, and either of the following characteristics:</p> <p>1. Single transverse mode output, and any of the following characteristics:</p> <p>---</p> <p>2. Multiple transverse mode output, and any of the following characteristics:</p>	<p>“Lasers”, other than those specified in Category Code 0B001.g.5. or 0B001.h.6., components and optical equipment, as follows:</p> <p>---</p> <p>b. Non-“tunable” “pulsed lasers” having any of the following characteristics:</p> <p>---</p> <p>6. Output wavelength exceeding 975 nm but not exceeding 1,150 nm, and any of the following characteristics:</p> <p>---</p> <p>c. “Pulse duration” equal to or exceeding 1 ns but not exceeding 1 μs, and either of the following characteristics:</p> <p>1. ‘Single transverse mode’ output, and any of the following characteristics:</p> <p>---</p> <p>2. ‘Multiple transverse mode’ output, and any of the following characteristics:</p> <p>---</p> <p>d. “Pulse duration” exceeding 1 μs, and either of the following characteristics:</p> <p>1. ‘Single transverse mode’ output, and any of the following characteristics:</p> <p>---</p> <p>2. ‘Multiple transverse mode’ output, and any of the following characteristics:</p>
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<ul style="list-style-type: none"> - 6A005.b.7.a.2. - 6A005.b.7.a.3. - 6A005.b.7.b.2. - 6A005.b.7.b.3. 	<p>“Lasers”, other than those specified in Category Code 0B001.g.5. or 0B001.h.6., components and optical equipment, as follows:</p> <p>---</p> <p>b. Non-“tunable” “pulsed lasers” having any of the following characteristics:</p> <p>---</p> <p>7. Output wavelength exceeding 1,150 nm but not exceeding 1,555 nm, and either of the following characteristics:</p> <p>a. “Pulse duration” not exceeding 1 μs, and any of the following characteristics:</p> <p>---</p> <p>2. Single transverse mode output and “average output power” exceeding 20 W; <u>or</u></p> <p>3. Multiple transverse mode output and “average output power” exceeding 50 W; <u>or</u></p> <p>b. “Pulse duration” exceeding 1 μs, and any of the following characteristics:</p> <p>---</p> <p>2. Single transverse mode output and “average output power” exceeding 50 W; <u>or</u></p> <p>3. Multiple transverse mode output and “average output power” exceeding 80 W;</p>	<p>“Lasers”, other than those specified in Category Code 0B001.g.5. or 0B001.h.6., components and optical equipment, as follows:</p> <p>---</p> <p>b. Non-“tunable” “pulsed lasers” having any of the following characteristics:</p> <p>---</p> <p>7. Output wavelength exceeding 1,150 nm but not exceeding 1,555 nm, and either of the following characteristics:</p> <p>a. “Pulse duration” not exceeding 1 μs, and any of the following characteristics:</p> <p>---</p> <p>2. ‘Single transverse mode’ output and “average output power” exceeding 20 W; <u>or</u></p> <p>3. ‘Multiple transverse mode’ output and “average output power” exceeding 50 W; <u>or</u></p> <p>b. “Pulse duration” exceeding 1 μs, and any of the following characteristics:</p> <p>---</p> <p>2. ‘Single transverse mode’ output and “average output power” exceeding 50 W; <u>or</u></p> <p>3. ‘Multiple transverse mode’ output and “average output power” exceeding 80 W;</p>
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<ul style="list-style-type: none"> - 6A005.b.9.a. - 6A005.b.9.b. 	<p>“Lasers”, other than those specified in Category Code 0B001.g.5. or 0B001.h.6., components and optical equipment, as follows:</p> <p>---</p> <p>b. Non-“tunable” “pulsed lasers” having any of the following characteristics:</p> <p>---</p> <p>9. Output wavelength exceeding 1,850 nm but not exceeding 2,100 nm, and either of the following characteristics:</p> <p>a. Single transverse mode, and either of the following characteristics:</p> <p>---</p> <p>b. Multiple transverse mode, and either of the following characteristics:</p>	<p>“Lasers”, other than those specified in Category Code 0B001.g.5. or 0B001.h.6., components and optical equipment, as follows:</p> <p>---</p> <p>b. Non-“tunable” “pulsed lasers” having any of the following characteristics:</p> <p>---</p> <p>9. Output wavelength exceeding 1,850 nm but not exceeding 2,100 nm, and either of the following characteristics:</p> <p>a. ‘Single transverse mode’ output, and either of the following characteristics:</p> <p>---</p> <p>b. ‘Multiple transverse mode’ output, and either of the following characteristics:</p>
<p>6A005.d.1.b.</p>	<p>“Lasers”, other than those specified in Category Code 0B001.g.5. or 0B001.h.6., components and optical equipment, as follows:</p> <p>---</p> <p>d. Other “lasers”, not specified in Category Code 6A005.a., 6A005.b. or 6A005.c. as follows:</p> <p>1. Semiconductor “lasers” as follows:</p> <p>---</p> <p>b. Individual, multiple-transverse mode semiconductor “lasers” having any of the following characteristics:</p>	<p>“Lasers”, other than those specified in Category Code 0B001.g.5. or 0B001.h.6., components and optical equipment, as follows:</p> <p>---</p> <p>d. Other “lasers”, not specified in Category Code 6A005.a., 6A005.b. or 6A005.c. as follows:</p> <p>1. Semiconductor “lasers” as follows:</p> <p>---</p> <p>b. Individual multiple-transverse mode semiconductor “lasers” having any of the following characteristics:</p>

6A008

Category Code	SGCO 2019	SGCO 2020
6A008.1.4.	<p>Radar systems, equipment and assemblies, having any of the following characteristics, and specially designed components therefor:</p> <p>---</p> <p>1. Having data processing sub-systems, and having either of the following characteristics:</p> <p>---</p> <p>4. Configured to provide superposition and correlation, or fusion, of target data within six seconds from two or more ‘geographically dispersed’ radar sensors to improve the aggregate performance beyond that of any single sensor specified in Category Code 6A008.f. or 6A008.i.</p>	<p>Radar systems, equipment and assemblies, having any of the following characteristics, and specially designed components therefor:</p> <p>---</p> <p>1. Having data processing sub-systems, and having either of the following characteristics:</p> <p>---</p> <p>4. Configured to provide superposition and correlation, or fusion, of target data within 6 s from two or more ‘geographically dispersed’ radar sensors to improve the aggregate performance beyond that of any single sensor specified in Category Code 6A008.f. or 6A008.i.</p>

6A108

Category Code	SGCO 2019	SGCO 2020
6A108	Radar systems and tracking systems, other than those specified in Category Code 6A008, as follows:	Radar systems, tracking systems and radomes, other than those specified in Category Code 6A008, as follows:
6A108.b.2.c.	<p>Radar systems and tracking systems, other than those specified in Category Code 6A008, as follows:</p> <p>---</p> <p>b. Precision tracking systems, usable for ‘missiles’, as follows:</p> <p>---</p> <p>2. Range instrumentation radars including associated optical/infrared trackers with all of the following capabilities:</p> <p>---</p> <p>c. Velocity resolution better than 3 m/s.</p>	<p>Radar systems, tracking systems and radomes, other than those specified in Category Code 6A008, as follows:</p> <p>---</p> <p>b. Precision tracking systems, usable for ‘missiles’, as follows:</p> <p>---</p> <p>2. Range instrumentation radars including associated optical/infrared trackers with all of the following capabilities:</p> <p>---</p> <p>c. Velocity resolution better than 3 m/s;</p>

6A108.c.	<p>Radar systems and tracking systems, other than those specified in Category Code 6A008, as follows:</p> <p>---</p> <p>-</p>	<p>Radar systems, tracking systems and radomes, other than those specified in Category Code 6A008, as follows:</p> <p>---</p> <p>c. Radomes designed to withstand a combined thermal shock greater than 4.184×10^6 J/m² accompanied by a peak over pressure of greater than 50 kPa, and usable in “missiles” for protecting against nuclear effects (e.g. electromagnetic pulse (EMP), X-rays, combined blast and thermal effects).</p>
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6A225

Category Code	SGCO 2019	SGCO 2020
6A225	Velocity interferometers for measuring velocities exceeding 1 km/s during time intervals of less than 10 microseconds.	Velocity interferometers for measuring velocities exceeding 1 km/s during time intervals of less than 10 µs.

6B002 (new category code)

Category Code	SGCO 2019	SGCO 2020
6B002	-	Masks and reticles, specially designed for optical sensors specified in Category Code 6A002.a.1.b. or 6A002.a.1.d.

6C005

Category Code	SGCO 2019	SGCO 2020
6C005.b.1.b.	<p>“Laser” materials as follows:</p> <p>---</p> <p>b. Rare-earth-metal doped double clad fibres having either of the following characteristics:</p> <ol style="list-style-type: none"> Nominal “laser” wavelength of 975 nm to 1,150 nm, and having both of the following characteristics: <p>---</p> <p>b. Core ‘Numerical Aperture’ (‘NA’) less than 0.065; <u>or</u></p>	<p>“Laser” materials as follows:</p> <p>---</p> <p>b. Rare-earth-metal doped double clad fibres having either of the following characteristics:</p> <ol style="list-style-type: none"> Nominal “laser” wavelength of 975 nm to 1,150 nm, and having both of the following characteristics: <p>---</p> <p>b. Core ‘Numerical Aperture’ (‘NA’) less than 0.065; <u>or</u></p>

Category 7**7A002**

Category Code	SGCO 2019	SGCO 2020
- 7A002.a.1. - 7A002.a.2.	<p>Gyros or angular rate sensors, having either of the following characteristics, and specially designed components therefor:</p> <p>---</p> <p>a. Specified to function at linear acceleration levels less than or equal to 100 g, and having either of the following characteristics:</p> <p>1. A rate range of less than 500 degrees per second, and having either of the following characteristics:</p> <p>---</p> <p>2. A rate range greater than or equal to 500 degrees per second, and having either of the following characteristics:</p>	<p>Gyros or angular rate sensors, having either of the following characteristics, and specially designed components therefor:</p> <p>---</p> <p>a. Specified to function at linear acceleration levels less than or equal to 100 g, and having either of the following characteristics:</p> <p>1. An angular rate range of less than 500 degrees per second, and having either of the following characteristics:</p> <p>---</p> <p>2. An angular rate range greater than or equal to 500 degrees per second, and having either of the following characteristics:</p>

7A003

Category Code	SGCO 2019	SGCO 2020
7A003 Technical Note	<p>‘Inertial measurement equipment or systems’, having any of the following characteristics:</p> <p>---</p> <p><u>Technical Note</u></p> <p>‘Positional aiding references’ independently provide position, and include:</p> <p>a. Global Navigation Satellite Systems (GNSS);</p>	<p>‘Inertial measurement equipment or systems’, having any of the following characteristics:</p> <p>---</p> <p><u>Technical Note</u></p> <p>‘Positional aiding references’ independently provide position, and include:</p> <p>a. “Satellite navigation system”;</p>

- 7A003.c.1. - 7A003.c.2.	‘Inertial measurement equipment or systems’, having any of the following characteristics: --- c. Designed for “aircraft”, land vehicles or vessels, providing heading or True North determination and having either of the following characteristics: 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); <u>or</u> 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); <u>or</u>	‘Inertial measurement equipment or systems’, having any of the following characteristics: --- c. Designed for “aircraft”, land vehicles or vessels, providing heading or True North determination and having either of the following characteristics: 1. A maximum operating angular rate less (lower) than 500 degrees per second and a heading “accuracy” without the use of ‘positional aiding references’ equal to or less (better) than 0.07 degree second (Lat) (equivalent to 6 arc minutes rms at 45 degrees latitude); <u>or</u> 2. A maximum operating angular rate equal to or greater (higher) than 500 degrees per second and a heading “accuracy” without the use of ‘positional aiding references’ equal to or less (better) than 0.2 degree second (Lat) (equivalent to 17 arc minutes rms at 45 degrees latitude); <u>or</u>
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7A005

Category Code	SGCO 2019	SGCO 2020
7A005	Global Navigation Satellite Systems (GNSS) receiving equipment having either of the following characteristics and specially designed components therefor:	“Satellite navigation system” receiving equipment having either of the following characteristics and specially designed components therefor:

7A005.b. Note	<p>Global Navigation Satellite Systems (GNSS) receiving equipment having either of the following characteristics and specially designed components therefor:</p> <p>---</p> <p>b. Employing ‘adaptive antenna systems’.</p> <p><i>Note</i> <i>Category Code 7A005.b. does not include GNSS receiving equipment that only uses components designed to filter, switch or combine signals from multiple omni directional antennae that do not implement adaptive antenna techniques.</i></p>	<p>“Satellite navigation system” receiving equipment having either of the following characteristics and specially designed components therefor:</p> <p>---</p> <p>b. Employing ‘adaptive antenna systems’.</p> <p><i>Note</i> <i>Category Code 7A005.b. does not include “satellite navigation system” receiving equipment that only uses components designed to filter, switch or combine signals from multiple omni directional antennae that do not implement adaptive antenna techniques.</i></p>
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7A103

Category Code	SGCO 2019	SGCO 2020
7A103.c.	<p>Instrumentation, navigation equipment and systems, other than those specified in Category Code 7A003, as follows; and specially designed components therefor:</p> <p>---</p> <p>c. ‘Integrated navigation systems’, designed or modified for ‘missiles’ and capable of providing a navigational accuracy of 200 m Circle of Equal Probability or less;</p>	<p>Instrumentation, navigation equipment and systems, other than those specified in Category Code 7A003, as follows; and specially designed components therefor:</p> <p>---</p> <p>c. ‘Integrated navigation systems’, designed or modified for ‘missiles’ and capable of providing a navigational accuracy of 200 m “CEP” or less;</p>

7A116

Category Code	SGCO 2019	SGCO 2020
7A116	<p>Flight control systems and servo valves, as follows; designed or modified for use in space launch vehicles specified in Category Code 9A004 or sounding rockets specified in Category Code 9A104 or “missiles”:</p>	<p>Flight control systems and servo valves, as follows; designed or modified for use in space launch vehicles specified in Category Code 9A004, sounding rockets specified in Category Code 9A104 or “missiles”:</p>

7A117

Category Code	SGCO 2019	SGCO 2020
- 7A117 - 7A117 Technical Note	“Guidance sets”, usable in “missiles” capable of achieving system accuracy of 3.33% or less of the range (e.g. a “CEP” of 10 km or less at a range of 300 km).	“Guidance sets”, usable in “missiles” capable of achieving system accuracy of 3.33% or less of the range (e.g. ‘Circle of Equal Probability’ of 10 km or less at a range of 300 km). <i><u>Technical Note</u></i> <i>In Category Code 7A117, ‘Circle of Equal Probability’ is a measure of accuracy, defined as the radius of the circle centred at the target, at a specific range, in which 50% of the payloads impact.</i>

7D003

Category Code	SGCO 2019	SGCO 2020
7D003.b.2.	Other “software” as follows: --- b. “Source code” for hybrid integrated systems which improves the operational performance or reduces the navigational error of systems to the level specified in Category Code 7A003 or 7A008 by continuously combining heading data with any of the following: --- 2. Global Navigation Satellite Systems (GNSS) reference data; <u>or</u>	Other “software” as follows: --- b. “Source code” for hybrid integrated systems which improves the operational performance or reduces the navigational error of systems to the level specified in Category Code 7A003 or 7A008 by continuously combining heading data with any of the following: --- 2. “Satellite navigation system” reference data; <u>or</u>

7D005

Category Code	SGCO 2019	SGCO 2020
7D005	“Software” specially designed to decrypt Global Navigation Satellite Systems (GNSS) ranging code designed for government use.	“Software” specially designed to decrypt “satellite navigation system” ranging code designed for government use.

7E004

Category Code	SGCO 2019	SGCO 2020
<ul style="list-style-type: none"> - 7E004.b.7.b.1. - 7E004.b.7.b.4. 	<p>Other “technology” as follows:</p> <p>---</p> <p>b. “Development” “technology”, as follows, for “active flight control systems” (including “fly by wire systems” or “fly by light systems”):</p> <p>---</p> <p>7. “Technology” “required” for deriving the functional requirements for “fly-by-wire systems” having both of the following characteristics:</p> <p>---</p> <p>b. Having any of the following characteristics:</p> <ol style="list-style-type: none"> 1. Corrects an aerodynamically unstable airframe, measured at any point in the design flight envelope, that would lose recoverable control if not corrected within 0.5 seconds; <p>---</p> <ol style="list-style-type: none"> 4. Enables “aircraft” to have a stable controlled flight, other than during take-off or landing, at greater than 18 degrees angle of attack, 15 degrees side slip, 15 degrees/second pitch or yaw rate, or 90 degrees/second roll rate; 	<p>Other “technology” as follows:</p> <p>---</p> <p>b. “Development” “technology”, as follows, for “active flight control systems” (including “fly by wire systems” or “fly by light systems”):</p> <p>---</p> <p>7. “Technology” “required” for deriving the functional requirements for “fly-by-wire systems” having both of the following characteristics:</p> <p>---</p> <p>b. Having any of the following characteristics:</p> <ol style="list-style-type: none"> 1. Corrects an aerodynamically unstable airframe, measured at any point in the design flight envelope, that would lose recoverable control if not corrected within 0.5 s; <p>---</p> <ol style="list-style-type: none"> 4. Enables “aircraft” to have a stable controlled flight, other than during take-off or landing, at greater than 18 degrees angle of attack, 15 degrees side slip, 15 degrees per second pitch or yaw rate, or 90 degrees per second roll rate;

Category 8

8A001

Category Code	SGCO 2019	SGCO 2020
<ul style="list-style-type: none"> - 8A001.c. - 8A001.c.1. - 8A001.c.1.a. - 8A001.c.1.b. - 8A001.c.1.c. - 8A001.c.2. - 8A001.c.2.a. - 8A001.c.2.b. - 8A001.c.2.c. - 8A001.d. 	<p>Submersible vehicles and surface vessels, as follows:</p> <p>---</p> <p>c. Unmanned, tethered submersible vehicles designed to operate at depths exceeding 1,000 m and having either of the following characteristics:</p> <ol style="list-style-type: none"> 1. Designed for self-propelled manoeuvre using propulsion motors or thrusters specified in Category Code 8A002.a.2.; <u>or</u> 2. Fibre optic data link; <p>d. Unmanned, untethered submersible vehicles having any of the following characteristics:</p> <ol style="list-style-type: none"> 1. Designed for deciding a course relative to any geographical reference without real time human assistance; 2. Acoustic data or command link; <u>or</u> 3. Optical data or command link exceeding 1,000 m; 	<p>Submersible vehicles and surface vessels, as follows:</p> <p>---</p> <p>c. Unmanned submersible vehicles, as follows:</p> <ol style="list-style-type: none"> 1. Unmanned submersible vehicles having any of the following characteristics: <ol style="list-style-type: none"> a. Designed for deciding a course relative to any geographical reference without real-time human assistance; b. Acoustic data or command link; <u>or</u> c. Optical data or command link exceeding 1,000 m; 2. Unmanned submersible vehicles, not specified in Category Code 8A001.c.1., having all of the following characteristics: <ol style="list-style-type: none"> a. Designed to operate with a tether; b. Designed to operate at depths exceeding 1,000 m; <u>and</u> c. Having either of the following: <ol style="list-style-type: none"> 1. Designed for self-propelled manoeuvre using propulsion motors or thrusters specified in Category Code 8A002.a.2.; <u>or</u> 2. Fibre optic data link; <p>d. Not used;</p>

8A002

Category Code	SGCO 2019	SGCO 2020
<ul style="list-style-type: none"> - 8A002.d. - 8A002.d.1. - 8A002.d.2. - 8A002.d.2.a. - 8A002.d.2.b. 	<p>Marine systems, equipment and components, as follows:</p> <p>---</p> <p>d. Underwater vision systems specially designed or modified for remote operation with an underwater vehicle, employing techniques to minimise the effects of back scatter and including range-gated illuminators or “laser” systems;</p>	<p>Marine systems, equipment and components, as follows:</p> <p>---</p> <p>d. Underwater vision systems, having both of the following characteristics:</p> <ol style="list-style-type: none"> 1. Specially designed or modified for remote operation with an underwater vehicle; <u>and</u> 2. Employing either of the following techniques to minimise the effects of back scatter: <ol style="list-style-type: none"> a. Range-gated illuminators; <u>or</u> b. Range-gated laser systems;

8B001

Category Code	SGCO 2019	SGCO 2020
8B001	Water tunnels having a background noise of less than 100 dB (reference 1 µPa, 1 Hz) in the frequency range exceeding from 0 Hz to 500 Hz and designed for measuring acoustic fields generated by a hydro flow around propulsion system models.	Water tunnels designed to have a background noise of less than 100 dB (reference 1 µPa, 1 Hz) within the frequency range exceeding 0 Hz but not exceeding 500 Hz and designed for measuring acoustic fields generated by a hydro flow around propulsion system models.

Category 9**9A004**

Category Code	SGCO 2019	SGCO 2020
9A004	Space launch vehicles, “spacecraft”, “spacecraft buses”, “spacecraft payloads”, “spacecraft” on-board systems or equipment, and terrestrial equipment, as follows:	Space launch vehicles, “spacecraft”, “spacecraft buses”, “spacecraft payloads”, “spacecraft” on-board systems or equipment, terrestrial equipment and air-launch platforms, as follows:
- 9A004.f. - 9A004.f.2.	Space launch vehicles, “spacecraft”, “spacecraft buses”, “spacecraft payloads”, “spacecraft” on-board systems or equipment, and terrestrial equipment, as follows: --- f. Terrestrial equipment specially designed for “spacecraft”, as follows: --- 2. Simulators specially designed for ‘verification of operational procedures’ of “spacecraft”.	Space launch vehicles, “spacecraft”, “spacecraft buses”, “spacecraft payloads”, “spacecraft” on-board systems or equipment, terrestrial equipment and air-launch platforms, as follows: --- f. Terrestrial equipment specially designed for “spacecraft”, as follows: --- 2. Simulators specially designed for ‘verification of operational procedures’ of “spacecraft”;
9A004.g.	Space launch vehicles, “spacecraft”, “spacecraft buses”, “spacecraft payloads”, “spacecraft” on-board systems or equipment, and terrestrial equipment, as follows: --- -	Space launch vehicles, “spacecraft”, “spacecraft buses”, “spacecraft payloads”, “spacecraft” on-board systems or equipment, terrestrial equipment and air-launch platforms, as follows: --- g. “Aircraft” specially designed or modified to be air-launch platforms for space launch vehicles.

9A006

Category Code	SGCO 2019	SGCO 2020
9A006.b.	<p>Systems and components, specially designed for liquid rocket propulsion systems, as follows:</p> <p>---</p> <p>b. Cryogenic containers or closed-cycle refrigeration systems, capable of providing temperatures of 100 K (-173°C) or less for “aircraft” capable of sustained flight at speeds exceeding Mach 3, launch vehicles or “spacecraft”;</p>	<p>Systems and components, specially designed for liquid rocket propulsion systems, as follows:</p> <p>---</p> <p>b. Cryogenic containers or closed-cycle refrigeration systems, capable of providing temperatures of 100 K (-173 °C) or less for “aircraft” capable of sustained flight at speeds exceeding Mach 3, launch vehicles or “spacecraft”;</p>

9A010

Category Code	SGCO 2019	SGCO 2020
<p>- 9A010.d.</p> <p>- 9A010.d.</p> <p>Technical Note</p>	<p>Specially designed components, systems and structures, for launch vehicles, launch vehicle propulsion systems or “spacecraft”, as follows:</p> <p>---</p> <p>d. Pulsed liquid rocket engines with thrust-to-weight ratios equal to or more than 1 kN/kg and a response time (the time required to achieve 90% of total rated thrust from start up) of less than 30 ms.</p> <p>-</p>	<p>Specially designed components, systems and structures, for launch vehicles, launch vehicle propulsion systems or “spacecraft”, as follows:</p> <p>---</p> <p>d. Pulsed liquid rocket engines with thrust-to-weight ratios equal to or more than 1 kN/kg and a ‘response time’ of less than 30 ms.</p> <p><u>Technical Note</u></p> <p><i>For the purpose of Category Code 9A010.d., ‘response time’ is the time required to achieve 90% of total rated thrust from start-up.</i></p>

9A106

Category Code	SGCO 2019	SGCO 2020
9A106.b.	<p>Systems or components, other than those specified in Category Code 9A006 as follows, specially designed for liquid rocket propulsion or gel propellant rocket systems:</p> <p>---</p> <p>b. Rocket motor cases and insulation components and nozzles therefor, usable in rocket propulsion subsystems specified in Category Code 9A007 or 9A107;</p>	<p>Systems or components, other than those specified in Category Code 9A006 as follows, specially designed for liquid rocket propulsion or gel propellant rocket systems:</p> <p>---</p> <p>b. Not used;</p>

9A107

Category Code	SGCO 2019	SGCO 2020
9A107	Solid propellant rocket engines, usable in complete rocket systems or unmanned aerial vehicles, capable of a range of 300 km, other than those specified in Category Code 9A007, having total impulse capacity equal to or greater than 0.841 MNs.	Solid propellant rocket motors, usable in complete rocket systems or unmanned aerial vehicles, capable of a range of 300 km, other than those specified in Category Code 9A007, having total impulse capacity equal to or greater than 0.841 MNs.

9A108

Category Code	SGCO 2019	SGCO 2020
- 9A108 - 9A108.a. - 9A108.b.	<p>Components, other than those specified in Category Code 9A008, as follows, specially designed for solid rocket propulsion systems:</p> <p>a. Rocket motor cases and “insulation” components therefor, usable in sub-systems specified in Category Code 9A007 or Category Code 9A107;</p> <p>b. Rocket nozzles, usable in sub-systems specified in Category Code 9A007 or Category Code 9A107;</p>	<p>Components, other than those specified in Category Code 9A008, as follows, specially designed for solid and hybrid rocket propulsion systems:</p> <p>a. Rocket motor cases and “insulation” components therefor, usable in sub-systems specified in Category Code 9A007, 9A009, 9A107 or 9A109.a.;</p> <p>b. Rocket nozzles, usable in sub-systems specified in Category Code 9A007, 9A009, 9A107 or 9A109.a.;</p>

9A111

Category Code	SGCO 2019	SGCO 2020
- 9A111 - 9A111 Technical Note	Pulse jet engines, usable in “missiles” or unmanned aerial vehicles specified in Category Code 9A012 or 9A112.a., and specially designed components therefor. --- -	Pulse jet or detonation engines, usable in “missiles” or unmanned aerial vehicles specified in Category Code 9A012 or 9A112.a., and specially designed components therefor. --- <i>Technical Note</i> <i>In Category Code 9A111, detonation engines utilise detonation to produce a rise in effective pressure across the combustion chamber. Examples of detonation engines include pulse detonation engines, rotating detonation engines or continuous wave detonation engines.</i>

9A112

Category Code	SGCO 2019	SGCO 2020
9A112.b.2. Technical Note	<p>“Unmanned aerial vehicles” (“UAVs”), other than those specified in Category Code 9A012, as follows:</p> <p>---</p> <p>b. “Unmanned aerial vehicles” (“UAVs”) having both of the following characteristics:</p> <p>---</p> <p>2. Having either of the following characteristics:</p> <p><i>Technical Notes</i></p> <p>1. An aerosol consists of particulate or liquids other than fuel components, by products or additives, as part of the “payload” to be dispersed in the atmosphere. Examples of aerosols include pesticides for crop dusting and dry chemicals for cloud seeding.</p>	<p>“Unmanned aerial vehicles” (“UAVs”), other than those specified in Category Code 9A012, as follows:</p> <p>---</p> <p>b. “Unmanned aerial vehicles” (“UAVs”) having both of the following characteristics:</p> <p>---</p> <p>2. Having either of the following characteristics:</p> <p><i>Technical Notes</i></p> <p>1. An aerosol consists of particulate or liquids other than fuel components, by products or additives, as part of the payload to be dispersed in the atmosphere. Examples of aerosols include pesticides for crop dusting and dry chemicals for cloud seeding.</p>

9A120

Category Code	SGCO 2019	SGCO 2020
9A120	Liquid or gel propellant tanks, other than those specified in Category Code 9A006, specially designed for propellants specified in Category Code 1C111 or ‘other liquid or gel propellants’, used in rocket systems capable of delivering at least a 500 kg payload to a range of at least 300 km.	Liquid or gel propellant tanks, other than those specified in Category Code 9A006, specially designed for propellants specified in Category Code 1C111 or ‘other liquid or gel propellants’ used in rocket systems capable of delivering at least a 500 kg payload to a range of at least 300 km.

9B001

Category Code	SGCO 2019	SGCO 2020
- 9B001 - 9B001.a. - 9B001.b. - 9B001.c.	Equipment, tooling or fixtures, specially designed for manufacturing gas turbine engine blades, vanes or “tip shrouds”, as follows: --- a. Directional solidification or Single Crystal (SC) casting equipment; b. Casting tooling, manufactured from refractory metals or ceramics, as follows: --- c. Directional-solidification or Single Crystal (SC) additive manufacturing equipment.	Manufacturing equipment, tooling or fixtures, as follows: --- a. Directional solidification or Single Crystal (SC) casting equipment designed for “superalloys”; b. Casting tooling, specially designed for manufacturing gas turbine engine blades, vanes or “tip shrouds”, manufactured from refractory metals or ceramics, as follows: --- c. Directional-solidification or Single Crystal (SC) additive manufacturing equipment, specially designed for manufacturing gas turbine engine blades, vanes or “tip shrouds”.

9B002

Category Code	SGCO 2019	SGCO 2020
9B002	On-line (real time) control systems, instrumentation (including sensors) or automated data acquisition and processing equipment, having both of the following characteristics:	On-line (real-time) control systems, instrumentation (including sensors) or automated data acquisition and processing equipment, having both of the following characteristics:

9B003

Category Code	SGCO 2019	SGCO 2020
9B003	Equipment specially designed for the “production” or test of gas turbine brush seals designed to operate at tip speeds exceeding 335 m/s and temperatures in excess of 773 K (500°C), and specially designed components or accessories therefor.	Equipment specially designed for the “production” or test of gas turbine brush seals designed to operate at tip speeds exceeding 335 m/s and temperatures in excess of 773 K (500 °C), and specially designed components or accessories therefor.

9B005

Category Code	SGCO 2019	SGCO 2020
9B005	On line (real time) control systems, instrumentation (including sensors) or automated data acquisition and processing equipment, specially designed for use with any of the following:	On line (real-time) control systems, instrumentation (including sensors) or automated data acquisition and processing equipment, specially designed for use with any of the following:

9B006

Category Code	SGCO 2019	SGCO 2020
9B006	Acoustic vibration test equipment capable of producing sound pressure levels of 160 dB or more (referenced to 20 µPa) with a rated output of 4 kW or more at a test cell temperature exceeding 1,273 K (1,000°C), and specially designed quartz heaters therefor.	Acoustic vibration test equipment capable of producing sound pressure levels of 160 dB or more (referenced to 20 µPa) with a rated output of 4 kW or more at a test cell temperature exceeding 1,273 K (1,000 °C), and specially designed quartz heaters therefor.

9B008

Category Code	SGCO 2019	SGCO 2020
9B008	Direct measurement wall skin friction transducers specially designed to operate at a test flow total (stagnation) temperature exceeding 833 K (560°C).	Direct measurement wall skin friction transducers specially designed to operate at a test flow total (stagnation) temperature exceeding 833 K (560 °C).

9B009

Category Code	SGCO 2019	SGCO 2020
- 9B009.a. - 9B009.b.	Tooling specially designed for producing gas turbine engine powder metallurgy rotor components having both of the following characteristics: a. Designed to operate at stress levels of 60% of Ultimate Tensile Strength (UTS) or more measured at a temperature of 873 K (600°C); <u>and</u> b. Designed to operate at 873 K (600°C) or more.	Tooling specially designed for producing gas turbine engine powder metallurgy rotor components having both of the following characteristics: a. Designed to operate at stress levels of 60% of Ultimate Tensile Strength (UTS) or more measured at a temperature of 873 K (600 °C); <u>and</u> b. Designed to operate at 873 K (600 °C) or more.

9B106

Category Code	SGCO 2019	SGCO 2020
9B106.a.1.b.	Environmental chambers and anechoic chambers, as follows: a. Environmental chambers having both of the following characteristics: 1. Capable of simulating either of the following flight conditions: b. Temperature range from below 223 K (-50°C) to above 398 K (+125°C); <u>and</u>	Environmental chambers and anechoic chambers, as follows: a. Environmental chambers having both of the following characteristics: 1. Capable of simulating either of the following flight conditions: b. Temperature range from below 223 K (-50 °C) to above 398 K (+125 °C); <u>and</u>
9B106.b.2.b.	Environmental chambers and anechoic chambers, as follows: --- b. Environmental chambers capable of simulating both of the following flight conditions: --- 2. Having either of the following characteristics: --- b. Temperature range from below 223 K (-50°C) to above 398 K (+125°C).	Environmental chambers and anechoic chambers, as follows: --- b. Environmental chambers capable of simulating both of the following flight conditions: --- 2. Having either of the following characteristics: --- b. Temperature range from below 223 K (-50 °C) to above 398 K (+125 °C).

9C110

Category Code	SGCO 2019	SGCO 2020
9C110 Note	<p>Resin impregnated fibre prepregs and metal coated fibre preforms therefor, for composite structures, laminates and manufactures specified in Category Code 9A110, made either with organic matrix or metal matrix utilising fibrous or filamentary reinforcements having a “specific tensile strength” greater than 7.62×10^4 m and a “specific modulus” greater than 3.18×10^6 m.</p> <p>---</p> <p><u>Note</u></p> <p><i>The only resin impregnated fibre prepregs specified in Category Code 9C110 are those using resins with a glass transition temperature (T_g), after cure, exceeding 418 K (145 °C) as determined by ASTM D4065 or equivalent.</i></p>	<p>Resin impregnated fibre prepregs and metal coated fibre preforms therefor, for composite structures, laminates and manufactures specified in Category Code 9A110, made either with organic matrix or metal matrix utilising fibrous or filamentary reinforcements having a “specific tensile strength” greater than 7.62×10^4 m and a “specific modulus” greater than 3.18×10^6 m.</p> <p>---</p> <p><u>Note</u></p> <p><i>The only resin impregnated fibre prepregs specified in Category Code 9C110 are those using resins with a glass transition temperature (T_g), after cure, exceeding 418 K (145 °C) as determined by ASTM D4065 or equivalent.</i></p>

9D004

Category Code	SGCO 2019	SGCO 2020
9D004.b.2.a.	<p>Other “software” as follows:</p> <p>---</p> <p>b. “Software” for testing aero gas turbine engines, assemblies or components, having both of the following characteristics:</p> <p>---</p> <p>2. Specially designed for both of the following:</p> <p>a. Acquisition and processing of data, in real time; <u>and</u></p>	<p>Other “software” as follows:</p> <p>---</p> <p>b. “Software” for testing aero gas turbine engines, assemblies or components, having both of the following characteristics:</p> <p>---</p> <p>2. Specially designed for both of the following:</p> <p>a. Acquisition and processing of data, in real-time; <u>and</u></p>

9E003

Category Code	SGCO 2019	SGCO 2020
9E003.a.1.	<p>Other “technology” as follows:</p> <p>a. “Technology” “required” for the “development” or “production” of any of the following gas turbine engine components or systems:</p> <ol style="list-style-type: none"> 1. Gas turbine blades, vanes or “tip shrouds”, made from Directionally Solidified (DS) or Single Crystal (SC) alloys and having (in the 001 Miller Index Direction) a stress-rupture life exceeding 400 hours at 1,273 K (1,000°C) at a stress of 200 MPa, based on the average property values; 	<p>Other “technology” as follows:</p> <p>a. “Technology” “required” for the “development” or “production” of any of the following gas turbine engine components or systems:</p> <ol style="list-style-type: none"> 1. Gas turbine blades, vanes or “tip shrouds”, made from Directionally Solidified (DS) or Single Crystal (SC) alloys and having (in the 001 Miller Index Direction) a stress-rupture life exceeding 400 hours at 1,273 K (1,000 °C) at a stress of 200 MPa, based on the average property values;
<p>- 9E003.a.2.a.</p> <p>- 9E003.a.2.d.</p>	<p>Other “technology” as follows:</p> <p>a. “Technology” “required” for the “development” or “production” of any of the following gas turbine engine components or systems:</p> <p>---</p> <ol style="list-style-type: none"> 2. Combustors having any of the following characteristics: <ol style="list-style-type: none"> a. ‘Thermally decoupled liners’ designed to operate at ‘combustor exit temperature’ exceeding 1,883 K (1,610°C); <p>---</p> <ol style="list-style-type: none"> d. Liners designed to operate at ‘combustor exit temperature’ exceeding 1,883 K (1,610°C) and having holes that meet the parameters specified in Category Code 9E003.c.; 	<p>Other “technology” as follows:</p> <p>a. “Technology” “required” for the “development” or “production” of any of the following gas turbine engine components or systems:</p> <p>---</p> <ol style="list-style-type: none"> 2. Combustors having any of the following characteristics: <ol style="list-style-type: none"> a. ‘Thermally decoupled liners’ designed to operate at ‘combustor exit temperature’ exceeding 1,883 K (1,610 °C); <p>---</p> <ol style="list-style-type: none"> d. Liners designed to operate at ‘combustor exit temperature’ exceeding 1,883 K (1,610 °C) and having holes that meet the parameters specified in Category Code 9E003.c.;

9E003.a.3.a.	<p>Other “technology” as follows:</p> <p>a. “Technology” “required” for the “development” or “production” of any of the following gas turbine engine components or systems:</p> <p>---</p> <p>3. Components that are any of the following:</p> <p>a. Manufactured from organic “composite” materials designed to operate above 588 K (315°C);</p>	<p>Other “technology” as follows:</p> <p>a. “Technology” “required” for the “development” or “production” of any of the following gas turbine engine components or systems:</p> <p>---</p> <p>3. Components that are any of the following:</p> <p>a. Manufactured from organic “composite” materials designed to operate above 588 K (315 °C);</p>
9E003.a.4.	<p>Other “technology” as follows:</p> <p>a. “Technology” “required” for the “development” or “production” of any of the following gas turbine engine components or systems:</p> <p>---</p> <p>4. Uncooled turbine blades, vanes or “tip shrouds”, designed to operate at a ‘gas path temperature’ of 1,373 K (1,100°C) or more;</p>	<p>Other “technology” as follows:</p> <p>a. “Technology” “required” for the “development” or “production” of any of the following gas turbine engine components or systems:</p> <p>---</p> <p>4. Uncooled turbine blades, vanes or “tip shrouds”, designed to operate at a ‘gas path temperature’ of 1,373 K (1,100 °C) or more;</p>
9E003.a.5.	<p>Other “technology” as follows:</p> <p>a. “Technology” “required” for the “development” or “production” of any of the following gas turbine engine components or systems:</p> <p>---</p> <p>5. Cooled turbine blades, vanes, “tip shrouds” other than those described in Category Code 9E003.a.1., designed to operate at a ‘gas path temperature’ of 1,693 K (1,420°C) or more;</p>	<p>Other “technology” as follows:</p> <p>a. “Technology” “required” for the “development” or “production” of any of the following gas turbine engine components or systems:</p> <p>---</p> <p>5. Cooled turbine blades, vanes, “tip shrouds” other than those described in Category Code 9E003.a.1., designed to operate at a ‘gas path temperature’ of 1,693 K (1,420 °C) or more;</p>

9E003.a.7.	<p>Other “technology” as follows:</p> <p>a. “Technology” “required” for the “development” or “production” of any of the following gas turbine engine components or systems:</p> <p>---</p> <p>7. Gas turbine engine components using “diffusion bonding” “technology” specified in Category Code 2E003.b.;</p>	<p>Other “technology” as follows:</p> <p>a. “Technology” “required” for the “development” or “production” of any of the following gas turbine engine components or systems:</p> <p>---</p> <p>7. Not used;</p>
9E003.f.3.	<p>Other “technology” as follows:</p> <p>---</p> <p>f. “Technology” “required” for the “production” of specially designed components for high output diesel engines, as follows:</p> <p>---</p> <p>3. “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)) and having both of the following characteristics:</p>	<p>Other “technology” as follows:</p> <p>---</p> <p>f. “Technology” “required” for the “production” of specially designed components for high output diesel engines, as follows:</p> <p>---</p> <p>3. “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)) and having both of the following characteristics:</p>
9E003.g.	<p>Other “technology” as follows:</p> <p>---</p> <p>g. “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 and 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;</p>	<p>Other “technology” as follows:</p> <p>---</p> <p>g. “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 and 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;</p>

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