

Ministerial Order Specifying Goods and Technologies Pursuant to the Provisions of Appended Table 1 of the Cabinet Order on Export Trade Control and the Appended Table of the Foreign Exchange Order (Part 1)

(Order of the Ministry of International Trade and Industry of No. 49 of November 14, 1991)

This Ministerial Order Specifying Goods and Technologies Pursuant to the Provisions of Appended Table 1 of the Cabinet Order on Export Trade Control and the Appended Table of the Foreign Exchange Control Order is enacted as follows, pursuant to the provisions of the Cabinet Order on Export Trade Control (Cabinet Order No. 378, 1949) and the Appended Table of the Foreign Exchange Control Order (Cabinet Order No. 260, 1980).

(Re: Appended Table 1 of the Cabinet Order on Export Trade Control)

Article 1 The goods with specifications prescribed by Order of the Ministry of Economy, Trade and Industry that are referred to in row 2 of Appended Table 1 of the Cabinet Order on Export Trade Control (referred to hereinafter as "the Export Order") are goods falling under any of the following:

- (i) nuclear fuel materials or nuclear source materials falling under any of the following:
 - (a) uranium or uranium compounds;
 - (b) thorium or thorium compounds;
 - (c) plutonium or plutonium compounds;
 - (d) those that include one, or more than one, of the goods referred to in (a) through (c);
- (ii) nuclear reactors, their components, or auxiliary equipment; or power-generating or propulsion equipment specially designed for use in the nuclear reactors of vehicles, vessels, or aircraft, or in the nuclear reactors of flying objects used in outer space or in launches;
- (iii) deuterium or deuterium compounds with a hydrogen to deuterium atom number ratio exceeding 1/5,000;
- (iv) artificial graphite weighing 1 kilogram or more with a boron content level of less than 5/1,000,000 of the total weight and apparent specific gravity exceeding 1.50 at a temperature of 20 °C, which constitutes any of the following:
 - (a) those for use in nuclear reactors;

- (b) those that can be used in nuclear reactors (excluding those falling under (a));
- (v) equipment designed for separating or reprocessing irradiated nuclear fuel materials or nuclear source materials, or the components of such equipment or devices to control it;
- (vi) equipment for separating lithium isotopes, or equipment for fabricating nuclear fuel materials;
- (vii) equipment for separating uranium or plutonium isotopes which falls under any of the following, or auxiliary equipment for, or components of, such equipment:
 - (a) equipment that uses gaseous diffusion;
 - (b) equipment that uses centrifugation;
 - (c) equipment that uses nozzle separation;
 - (d) equipment that uses a vortex process;
 - (e) equipment that uses chemical exchange;
 - (f) equipment that uses laser separation;
 - (g) equipment that uses a plasma method;
 - (h) equipment that uses magnetic separation;
- (viii) frequency changers, or their components, falling under any of the following:
 - (a) frequency changers for gas centrifuges that fall under the following 1 and 2, or their components:
 - 1. frequency changers with an output of three or more phases and a frequency of 600 hertz or more;
 - 2. frequency changers that can control output frequency with an accuracy of within plus or minus 0.2%;
 - (b) frequency changers that can be used for variable or fixed frequency motor driving, and that fall under all of the following 1 through 3 (excluding those falling under (a), and excluding those that are used in industrial machinery or consumer goods and that, if removed from that machinery or those goods, come to no longer have the properties specified in the following 1 through 3 due to hardware or software restrictions):
 - 1. frequency changers with an output of three or more phases capable of yielding an output of 40 volt-amperes or more;
 - 2. frequency changers operating with an output frequency of 600 hertz or more;
 - 3. frequency changers that can control output frequency with an accuracy of within plus or minus 0.2%;
- (ix) nickel powders with grain sizes whose average diameter is less than 10 micrometers and whose weight-based purity level is at least 99%, or porous metals produced using them;

- (x) equipment used in the production of deuterium or deuterium compounds, its components, or auxiliary equipment, which fall under any of the following:
 - (a) deuterium or deuterium compound production equipment (including concentration equipment), its components, or auxiliary equipment;
 - (b) equipment used in the production of heavy water, its components, or auxiliary equipment, which fall under any of the following (excluding those falling under (a)):
 1. Deleted
 2. distillation columns that are used at low temperatures and that fall under all of the following i. through iv.:
 - i. those that use fine-grain stainless steel that is without hydrogen embrittlement;
 - ii. those with an internal diameter of 30 centimeters or more and an effective length of 4 meters or more;
 - iii. those designed to be usable at -238°C or less;
 - iv. those designed to be usable within a pressure range from 0.5 megapascals or more to 5 megapascals or less;
 3. filling materials that are designed to be usable in a vacuum distillation column, that are made of phosphor bronze which has been subjected to a process that chemically improves wettability, and that are mesh-shaped;
 4. turboexpanders designed to be usable at -238°C or less with a hydrogen emission level of 1,000 kilograms per hour or more;
 5. Deleted
 6. pumps capable of circulating liquid ammonia containing potassium amide, which fall under all of the following i. through iii.:
 - i. those with a sealed structure;
 - ii. those usable within a pressure range from 1.5 megapascals or more to 60 megapascals or less;
 - iii. those with discharge amount exceeding 8.5 m^3 per hour;
- (x)-2 uranium trioxide, uranium hexafluoride, uranium dioxide, uranium tetrafluoride, metallic uranium, or uranium tetrachloride production equipment falling under any of the following; or its auxiliary equipment or components:
 - (a) equipment used to produce uranium trioxide that has uranium concentrate as a raw material;
 - (b) equipment used to produce uranium hexafluoride that has uranium trioxide or uranium tetrafluoride as a raw material;
 - (c) equipment used to produce uranium dioxide that has uranium trioxide or uranium hexafluoride as a raw material;
 - (d) equipment used to produce uranium tetrafluoride that has uranium dioxide or uranium hexafluoride as a raw material;

- (e) equipment used to produce metallic uranium that has uranium tetrafluoride as a raw material;
- (f) equipment used to produce uranium tetrachloride that has uranium dioxide as a raw material;
- (x)-3 plutonium dioxide, plutonium oxalate, plutonium peroxide, plutonium trifluoride, plutonium tetrafluoride, or metallic plutonium production equipment; or its auxiliary equipment or components;
- (xi) flow-forming machines, or their components, which fall under any of the following:
 - (a) flow-forming machines that that can be controlled by numerical control device or computers and that have three or more rollers;
 - (b) mandrels designed to be able to form cylindrical rotors with an internal diameter exceeding 75 millimeters and less than 400 millimeters;
- (xii) Deleted
- (xiii) Deleted
- (xiv) machine tools (limited to those that can process metals, ceramics, and composite materials) to which it is possible to attach an electronic controller with two or more axes that can perform contour control, which fall under any of the following (a) through (d):
 - (a) machine tools capable of lathe turning that fall under the following 1. and 2. (excluding those falling under 3.):
 - 1. machine tools in which the precision of positioning of the linear axis is 0.006 millimeters or less when the whole length of the linear axis is measured by the measurement method specified by the International Standards Organization (ISO) (hereinafter referred to as "International Standard") ISO 230-2:1988;
 - 2. machine tools capable of processing items with a diameter exceeding 35 millimeters;
 - 3. bar work lathes into which materials are inserted from a spindle hole for processing, which fall under the following i and ii:
 - i. bar work lathes that can process materials with a maximum diameter of 42 millimeters or less;
 - ii. bar work lathes to which a chuck cannot be attached;
 - (b) machine tools capable of milling and that fall under any of the following 1. through 3. (excluding those falling under 4.):
 - 1. machine tools in which the precision of positioning of the linear axis is 0.006 millimeters or less when the whole length of the linear axis is measured by the measurement method specified by International Standard ISO 230-2:1998
 - 2. machine tools with two or more rotational axes capable of controlling contour;

3. machine tools with five or more axes capable of controlling contour;
 4. milling machines falling under the following i. and ii.:
 - i. milling machines exhibiting a range of motion in the X-axis direction exceeding 2 meters specified by International Standard ISO 841 (numerical control machine tools - axis and motion nomenclature);
 - ii. milling machines in which the precision of positioning of the X-axis specified by International Standard ISO 841 exceeds 0.03 millimeters when the whole length of the X-axis is measured by the measurement method specified by International Standard ISO 230-2:1998;
- (c) machine tools capable of grinding that fall under any of the following 1. through 3. (excluding those falling under 4. or 5.):
1. machine tools in which the precision of positioning of the linear axes is 0.004 millimeters or less when the whole length of the linear axis is measured by the measurement method specified by International Standard ISO 230-2:1998;
 2. machine tools with two or more rotational axes capable of controlling contour;
 3. machine tools with five or more axes capable of controlling contour;
 4. a cylindrical exterior grinding machine, a cylindrical interior grinding machine, or a cylindrical interior-exterior grinding machine that falls under the following i. and ii.:
 - i. a machine designed to grind objects with an external diameter or length of 150 millimeters or less;
 - ii. a machine possessing only X-axis, Z-axis, and C-axis specified by International Standard ISO 841;
 5. jig grinding machines that do not fall under the following i. and ii.:
 - i. those possessing Z-axis specified by International Standard ISO 841 with the precision of positioning of the Z-axis that is less than 0.004 millimeters when the whole length of the Z-axis is measured by the measurement method specified by International Standard ISO 230-2: 1998;
 - ii. those possessing W-axis specified by International Standard ISO 841 with the precision of positioning of the W-axis that is less than 0.004 millimeters when the whole length of the W-axis is measured by the measurement method specified by International Standard ISO 230-2: 1998;
- (d) machine tools capable of performing electrical discharge machining (excluding wire electrical discharge machining), with two or more rotational axes capable of contour control;
- (e) machine tools designed only for the production of any of the following:
1. gears;
 2. crank shafts or cam shafts;
 3. tools or blades;

- 4. extruder worms;
- (xv) Deleted
- (xvi) Deleted
- (xvii) measuring device (including machine tools usable as a measuring device) that falls under any of the following (excluding those falling under item (xiv)):
 - (a) measuring device controlled by computers or numerical control device, which falls under any of the following:
 - 1. measuring device that has two or more measurement axes which, when the precision of measurement is measured using a method specified by International Standard, show a numerical value, expressed in micrometers, for the maximum permissible error for measuring length at any of the points of measurement within the limits of operation, that is less than the numerical value arrived at when the length of the measurement axis, expressed in millimeters, is multiplied by 0.001 and a value of 1.25 is added;
 - 2. measuring device that has three or more measurement axes which, when the spatial measurement accuracy is measured using a method specified by International Standard, show a numerical value, expressed in micrometers, for the maximum permissible error for measuring length at any of the points of measurement within the limits of operation, that is less than what is arrived at when 1.7 is added to the numerical value arrived at when the length of that measurement axis expressed in millimeters is multiplied by 0.00125;
 - (b) measuring device that measures displacement along a straight line, which falls under any of the following:
 - 1. non-contact type measuring device with a resolution of 0.2 micrometers or less in a measurement range of up to 0.2 millimeters;
 - 2. measuring device using linear variable differential transformers (LVDT) that falls under the following i and ii:
 - i. measuring device with a linear variable differential transformer (LVDT) that falls under any of the following:
 - a. an LVDT with the maximum operating range of plus or minus 5 millimeters or less and a linearity of 0.1% or less for the range of zero to the maximum operating range;
 - b. an LVDT with the maximum operating range of more than plus or minus 5 millimeters and a linearity of 0.1% or less for the range of zero to plus or minus 5 millimeters;
 - ii. measuring device that exhibits a drift of 0.1% or less per 24 hours when measured within a temperature range of 19 °C or more to 21 °C or less;
 - 3. measuring device falling under the following i. and ii. (excluding

interferometers which have no feedback function and with which slide movement errors of machine tools, measurement equipment, or those similar to them are measured by using lasers):

- i. measuring device capable of measurement using a laser beam;
 - ii. measuring device capable of maintaining the properties in the following
 - a. and b. for 12 hours within a temperature range of 19 °C or more to 21 °C or less:
 - a. measuring device with a resolution of 0.1 micrometers or less for the maximum measurable range;
 - b. measuring device with the numerical value expressed in micrometers of measurement uncertainty for the measurement axis, when it is corrected by a refractive index of air at any one point in the measurement range, is less than the numerical value obtained by multiplying the length of the measurement axis expressed in millimeters by 0.0005, and then adding 0.2;
- (c) measuring device that measures angular displacement, and has a maximum angular location deviation of 0.00025 degrees or less (excluding optical instruments that measure angular displacement using parallel light beams);
- (d) measuring device that is capable of simultaneously measuring the length and angle of objects having curved shapes, and that falls under the following 1. and 2.:
1. measuring device with the numerical value for the measurement uncertainty for the measurement axis of 3.5 micrometers or less per 5 millimeters of measurement distance;
 2. measuring device with a maximum angular position deviation of 0.02 degrees or less;
- (xviii) induction furnaces, arc furnaces, plasma melting furnaces, or electron-beam melting furnaces, or components or auxiliary equipment of these, which fall under any of the following:
- (a) vacuum induction furnaces or induction furnaces that utilize non-volatile gases (excluding those used for process of semiconductor wafers) that fall under all of the following 1. through 3., or power units for these with output of 5 kilowatts or more:
 1. furnaces whose interior can be heated to a temperature exceeding 850 °C;
 2. furnaces having an induction coil with a diameter of 600 millimeters or less;
 3. furnaces with input from the power units of 5 kilowatts or more;
 - (b) arc melting furnaces, arc re-melting furnaces, or arc melting casting furnaces that melt and cast metal in a vacuum or inert gas, which have consumable electrodes with a capacity of over 1,000 cm³ and less than

- 20,000 cm³, and which are capable of melting metal at temperatures exceeding 1,700 °C;
- (c) electron-beam melting furnaces, plasma atomization furnaces, or plasma melting furnaces that melt and cast metal in a vacuum or inert gas, whose output is 50 kilowatts or more, and which are capable of melting metal at a temperature exceeding 1,200 °C;
 - (d) controllers or monitors using a computer for a furnace falling under (b) or (c);
 - (e) plasma torches that are specially designed for furnaces falling under (c), whose output is 50 kilowatts or more, and that are capable of melting metal at a temperature exceeding 1,200 °C; or
 - (f) electron beam guns specially designed for furnaces falling under (c), whose output is 50 kilowatts or more.
- (xix) isostatic presses falling under the following (a) and (b) or controllers for these, or molds designed to be capable of being used in isostatic presses:
- (a) those with a maximum pressure of 69 megapascals or more;
 - (b) those with hollow cavities possessing an internal diameter exceeding 152 millimeters;
- (xx) robots (excluding operating robots and sequence robots) or end effectors that fall under any of the following, or controllers for these:
- (a) those with explosion-proof structure specified by Japan Industrial Standard based on the Industrial Standardization Act (Act No. 185, 1949) (hereinafter simply referred to as "Japan Industrial Standard") JIS C 60079-0 (Electrical apparatus for explosive gas atmospheres Part 0: General requirements) (excluding those used for painting);
 - (b) those designed to be able to withstand radiation exposure exceeding 50,000 grays on a silicon conversion basis for the total absorption dose;
- (xxi) vibration test equipment, or its components, which fall under any of the following:
- (a) vibration test equipment digitally controlled and electrically powered which fall under the following 1. and 2.:
 - 1. equipment with an excitation force of 50 kilonewtons or more in the absence of a test object, which is capable of generating vibrations with an effective value of acceleration exceeding 98 meters per second squared within a frequency range from 20 hertz to 2,000 hertz;
 - 2. equipment utilizing feedback control technology or closed-loop control technology;
 - (b) components of vibration test equipment, which fall under any of the following:
 - 1. components designed to be used in controlling vibration test equipment falling under (a), which use programs for vibration tests, and perform

- digital control of vibration tests in real time in a bandwidth exceeding 5 kilohertz;
2. vibration generators usable in vibration test equipment falling under (a), with an excitation force of 50 kilonewtons or more in the absence of a test object;
 3. components of vibration tables or vibration generators that can be used in vibration test equipment falling under (a), which is designed to be used by connecting two or more vibration generators in order to generate vibrations with an exciting force of 50 kilonewtons or more in the absence of a test object;
- (xxii) structural materials used in gas centrifuge rotors that fall under any of the following:
- (a) aluminum alloys (including forged alloy) with a tensile strength of 460 megapascals or more at a temperature of 20 °C, which are rod-shaped or have a cylindrical shape with an external diameter exceeding 75 millimeters;
 - (b) carbon fibers, aramid fibers or glass fibers, or prepreg made from carbon fibers or glass fibers, or molded products made with carbon fibers or aramid fibers, which fall under any of the following:
 1. carbon fibers or aramid fibers that fall under any of the following:
 - i. fibers with a specific elastic modulus of 12,700,000 meters or more;
 - ii. fibers with a specific strength of 235,000 meters or more;
 2. glass fibers falling under the following i. and ii.:
 - i. glass fibers with a specific elastic modulus of 3,180,000 meters or more;
 - ii. glass fibers with a specific strength of 76,200 meters or more;
 3. prepreg consisting of carbon fibers or glass fibers falling under 1. or 2., which is impregnated with thermosetting resin and falls under any of the following:
 - i. fibrous prepreg;
 - ii. tape-shaped prepreg with a width of 15 millimeters or less;
 4. cylindrical formed molded products utilizing fibers falling under 1. or prepreg falling under 3. (limited to those utilizing carbon fiber) with an internal diameter exceeding 75 millimeters and less than 400 millimeters;
 - (c) maraging steels with a tensile strength of 1,950 megapascals or more at a temperature of 20 °C, with the largest dimension value exceeding 75 millimeters;
 - (d) titanium alloys (including forged alloys) with a tensile strength of 900 megapascals or more at a temperature of 20 °C with a shaft-like or cylindrical shape and an external diameter exceeding 75 millimeters;
- (xxiii) metals, waste, or scrap of beryllium, and beryllium alloys (limited to those with a beryllium content exceeding 50% of the total weight) or

- beryllium compounds, or their primary or semi-finished products;
- (xxiv) substances used as alpha sources for the detonation of nuclear weapons, or their raw materials, which fall under any of the following:
- (a) bismuth with a weight-based purity level of 99.99% or more and a silver content of less than 0.001% of the total weight;
 - (b) radium 226, radium 226 alloys, radium 226 compounds, or radium 226 mixtures, or their primary or semi-finished products (excluding those incorporated into and installed in medical devices, for which the total radioactivity per device is less than 0.37 gigabecquerels);
 - (c) radionuclide suitable for alpha-neutron reaction to generate neutron sources, or compounds or mixtures of these (excluding those installed in equipment, for which the total radiation per device due to decay is less than 3.7 gigabecquerels), and with a total radiation per kilogram due to decay of 37 gigabecquerels or more;
- (xxv) boron, boron compounds, or boron mixtures, or their primary or semi-finished products, comprised of concentrated boron with a boron 10 to boron 10 and boron 11 ratio greater than the ratio in nature, or anything containing such boron;
- (xxvi) substances used as reducing or oxidizing agents for the production of nuclear fuel materials, which fall under any of the following:
- (a) calcium falling under the following 1. and 2.:
 - 1. calcium with a content of metals other than calcium or magnesium of less than 0.1% of the total weight;
 - 2. calcium with a boron content of less than 0.001% of the total weight;
 - (b) chlorotrifluorine;
 - (c) magnesium falling under the following 1. and 2.:
 - 1. magnesium with a content of metals other than magnesium or calcium of less than 0.02% of the total weight;
 - 2. magnesium with a boron content of less than 0.001% of the total weight;
- (xxvii) crucibles made with materials corrosion resistant against actinide, which fall under any of the following:
- (a) crucibles with a capacity exceeding 0.15 liters and less than 8 liters, made from the following materials or a combination of these (limited to those with a ratio of the total weight of impurities to the total weight of the relevant crucible of 2% or less), or coated with any of those materials:
 - 1. calcium fluoride;
 - 2. calcium metazirconate;
 - 3. cerium sulfide;
 - 4. erbium oxide;
 - 5. hafnium oxide;
 - 6. magnesium oxide;

- 7. alloys containing niobium, titanium and tungsten, which are nitrided;
- 8. yttrium oxide;
- 9. zirconium oxide;
- (b) crucibles with a capacity exceeding 0.05 liters and less than 2 liters, made from or lined with tantalum with a weight-based purity level of 99.9% or more;
- (c) crucibles with a capacity exceeding 0.05 liters and less than 2 liters, made from or lined with tantalum with a weight-based purity level of 98% or more, which are coated with tantalum carbide, tantalum nitride, tantalum boride, or a combination of these;
- (xxviii) metals, waste, or scrap of hafnium and hafnium alloys (limited to those with a hafnium content exceeding 60% of the total weight) or hafnium compounds (limited to those with hafnium content level exceeding 60% of the total weight), or their primary or semi-finished products;
- (xxix) metals or waste of lithium or lithium alloys, or lithium compounds or mixtures, or their primary or semi-finished products, composed of concentrated lithium with a lithium 6 to lithium 6 and lithium 7 ratio that is greater than the ratio in nature, or containing the lithium (excluding lithium compounds or lithium mixtures incorporated into thermo-luminescence dosimeters);
- (xxx) tungsten, tungsten carbide, or alloys with a tungsten content exceeding 90% of the total weight, weighing more than 20 kilograms, with a cylindrical shape and internal diameter exceeding 100 millimeters and less than 300 millimeters, or with a hollow hemispherical shape, or combinations of those shapes (excluding those designed for weight or gamma ray collimators);
- (xxxii) metals or waste of zirconium or zirconium alloys (limited to alloys with a zirconium content exceeding 50% of the total weight), or zirconium compounds (limited to those with a hafnium content of less than 1/500 of the zirconium content), and their primary or semi-finished products (excluding leaf with a thickness of 0.1 millimeters or less);
- (xxxiii) electrolytic cells for fluorine production with a production capability exceeding 250 grams per hour;
- (xxxiiii) equipment for the production or assembly of gas centrifuge rotors, or its components, which fall under any of the following:
 - (a) equipment used for assembly of gas centrifuge rotor tubes, baffles, and end caps;
 - (b) equipment used to adjust the center axis of gas centrifuge rotor tubes;
 - (c) mandrels or molds used for manufacturing bellows falling under all of the following 1. through 3. (limited to those made from aluminum alloys, maraging steel, or fiber-reinforced composite materials):
 - 1. those with an internal diameter exceeding 75 millimeters and less than

- 400 millimeters;
 - 2. those with a groove pitch of 12.7 millimeters or more;
 - 3. those with a groove depth exceeding 2 millimeters;
- (xxxiv) centrifugal balancing machines (excluding single-plane balancing machines) that fall under any of the following (excluding those falling under Article 3, item (xvii)-3, (b)):
- (a) centrifugal balancing machines designed to be capable of testing elastic rotors with a length of 600 millimeters or more, which fall under all of the following 1. through 3.:
 - 1. those capable of testing elastic rotors with an external diameter exceeding 75 millimeters or those with a journal diameter exceeding 75 millimeters;
 - 2. those capable of testing elastic rotors with a weight of 0.9 kilograms or more and 23 kilograms or less;
 - 3. those capable of testing elastic rotors with a speed exceeding 5,000 rotations per minute;
 - (b) centrifugal balancing machines designed to be capable of testing cylindrical rotors, which fall under all of the following 1. through 4.:
 - 1. those with a journal diameter exceeding 75 millimeters;
 - 2. those capable of testing rotors weighing 0.9 kilograms or more and 23 kilograms or less;
 - 3. those with a minimum achievable residual unbalance on the balancing plane of 10 gram millimeters or less per kilogram;
 - 4. those with a belt drive mechanism;
- (xxxv) filament winding machines falling under the following (a) and (b), or their controllers or mandrels:
- (a) those that perform positioning of filaments and carry out their wrapping and winding operations, with 2 or more axes capable of controlling those operations in coordination;
 - (b) those capable of manufacturing cylindrical tubes with an internal diameter exceeding 75 millimeters and less than 650 millimeters and a length of 300 millimeters or more;
- (xxxvi) gas laser oscillators, solid-state laser oscillators, or dye laser oscillators that fall under any of the following:
- (a) metal vapor laser oscillators (limited to copper laser oscillators) designed for use within a wavelength range that exceeds 500 nanometers but is less than 600 nanometers, with an average output of 30 watts or more;
 - (b) argon ion laser oscillators designed for use within a wavelength range that exceeds 400 nanometers but is less than 515 nanometers, with an average output exceeding 40 watts;
 - (c) carbon dioxide laser oscillators designed for use within a wavelength

range that exceeds 9,000 nanometers but is less than 11,000 nanometers which are designed to generate a pulse, and which fall under all of the following 1. through 3.:

1. those with a pulse repetition frequency exceeding 250 hertz;
 2. those with an average output exceeding 500 watts;
 3. those with a pulse width of 200 nanoseconds or less;
- (d) excimer laser oscillators designed for use within a wavelength range that exceeds 240 nanometers but is less than 360 nanometers which are designed to generate a pulse, and which fall under the following 1. and 2.:
1. those with a pulse repetition frequency exceeding 250 hertz;
 2. those with an average output exceeding 500 watts;
- (e) raman laser oscillators utilizing parahydrogen and designed for use in a wavelength of 16 micrometers, with a pulse repetition frequency exceeding 250 hertz;
- (f) alexandrite laser oscillators designed for use within a wavelength range that exceeds 720 nanometers but is less than 800 nanometers, which fall under all of the following 1. through 3.:
1. those with a pulse repetition frequency exceeding 125 hertz;
 2. those with an average output exceeding 30 watts;
 3. those with a laser beam spectral line width of 0.005 nanometers or less;
- (g) fixed laser oscillators with neodymium added, designed for use within a wavelength range that exceeds 1,000 nanometers but is less than 1,100 nanometers, which fall under any of the following (excluding neodymium glass laser oscillators):
1. those utilizing pulse excitation and a Q-switch and emitting a pulse with a pulse width of 1 nanosecond or more, which fall under any of the following:
 - i. those emitting a single transverse mode pulse, and with an average output exceeding 40 watts;
 - ii. those emitting a multi transverse mode pulse, and with an average output exceeding 50 watts;
 2. those designed to generate second harmonics within the frequency range exceeding 500 nanometers and less than 550 nanometers, and with an average output exceeding 40 watts;
- (h) dye laser oscillators designed for use within a wavelength range that exceeds 300 nanometers but is less than 800 nanometers, which fall under any of the following:
1. variable wavelength laser oscillators emitting a single-mode pulse (excluding equipment that only performs laser beam amplification), which fall under all of the following i. through iii.:
 - i. those with a pulse repetition frequency exceeding 1 kilohertz;

- ii. those with an average output exceeding 1 watt;
- iii. those with a pulse width less than 100 nanoseconds;
- 2. variable wavelength oscillator emitting a pulse that fall under all of the following i. through iii. (excluding those falling under 1.):
 - i. those with a pulse repetition frequency exceeding 1 kilohertz;
 - ii. those with an average output exceeding 30 watts;
 - iii. those with a pulse width less than 100 nanoseconds;
- (i) carbon monoxide laser oscillators designed for use within a wavelength range that exceeds 5,000 nanometers but is less than 6,000 nanometers and designed to generate a pulse, which fall under all of the following 1. through 3.:
 - 1. those with a pulse repetition frequency exceeding 250 hertz;
 - 2. those with an average output exceeding 200 watts;
 - 3. those with a pulse width of 200 nanoseconds or less;
- (xxxvii) mass spectrometers capable of measuring ions with a mass of 230 or more expressed in unified atomic mass units and having the resolution to distinguish ions with a mass of 230 when a difference of atomic mass between those ions is less than 2, which fall under any of the following (a) through (e) (excluding those falling under (f)) or ion sources usable for such mass spectrometers:
 - (a) those utilizing inductively-coupled plasma;
 - (b) those utilizing glow discharge;
 - (c) those utilizing thermal ionization;
 - (d) those possessing an ion source that ionizes by bombarding the materials under analysis with electrons, which fall under the following 1. and 2.:
 - 1. those with equipment that delivers parallel beams of molecules of the materials under analysis to the area of an ion source where molecules are ionized using electron beams;
 - 2. those with one or more cold traps capable of attaining temperatures at -80°C or less to capture molecules that are not ionized using electron beams in parallel beams of molecules of the materials under analysis;
 - (e) those possessing an ion source designed for ionization of actinides or their fluorides;
 - (f) those that fall under all of the following 1. through 5.:
 - 1. those capable of measuring ions with a mass of 320 or more expressed in atomic weight units, which have a resolution of more than 320 expressed in atomic weight units;
 - 2. those possessing an ion source made from, or protected with, nickel copper alloys or nickel chrome alloys with a nickel content of 60% or more of the total weight;
 - 3. those possessing an ion source that ionizes by bombarding the materials

- under analysis with electrons;
 - 4. those possessing a collector usable for isotope analysis;
 - 5. those designed to be capable of taking samples without stopping the flow of uranium hexafluoride gas;
- (xxxviii) pressure gauges or bellows valves that fall under any of the following:
- (a) pressure gauges capable of measuring absolute pressure that fall under all of the following 1. through 3. (excluding 2. for those not using a seal to tightly close the sensor):
 - 1. those utilizing a sensor made from, or protected with, aluminum, aluminum alloys, aluminum oxide, nickel, nickel alloys with a nickel content exceeding 60% of the total weight, or fluorinated hydrocarbon polymers;
 - 2. those indispensable to tightly close the sensor and which utilize a seal that come into direct contact with the contents, and made from, or protected with, aluminum, aluminum alloys, aluminum oxide, nickel, nickel alloys with a nickel content exceeding 60% of the total weight, or fluorinated hydrocarbon polymers;
 - 3. those that fall under any of the following:
 - i. when the full scale is less than 13 kilopascals, those with a precision of less than plus or minus 1% of the full scale, in any full scale;
 - ii. when the full scale is 13 kilopascals or more, those with a precision of less than plus or minus 130 pascals at 13 kilopascals;
 - (b) bellows valves with a nominal diameter of 5A or more, which have all parts that come into contact with the contents composed of, lined with, or coated with aluminum, aluminum alloys, nickel, or nickel alloys (limited to those with a nickel content exceeding 60% of the total weight);
- (xxxix) superconducting solenoid electromagnets that fall under all of the following (a) through (d) (excluding those designed to be used in clinical magnetic resonance imaging apparatus):
- (a) those with magnetic flux density exceeding 2 teslas;
 - (b) those with a value obtained by dividing its coil length by the internal diameter exceeding 2;
 - (c) those with a coil internal diameter exceeding 300 millimeters;
 - (d) those with a magnetic field homogeneity of less than 1% within the range of a circle with the radius of 35% of the internal diameter centered on the center of the coil axis and which is perpendicular to the coil axis;
- (xl) vacuum pumps whose intake port has an internal diameter of 38 centimeters or more, with an exhaust speed of 15,000 liters or more per second and an ultimate pressure of less than 13.3 millipascals;
- (xl)-2 scroll-type compressors or vacuum pumps that use bellows seals, which fall under all of the following (a) through (c):

- (a) those that have an intake volume of 50 m³ or more per hour;
- (b) those that have a pressure ratio of 2 or more;
- (c) those in which all surfaces that come into contact with the process gas are composed of, lined with, or coated with any of the following materials:
 1. aluminum or aluminum alloys;
 2. aluminum oxide;
 3. stainless steel;
 4. nickel or nickel alloys;
 5. phosphorus bronze;
 6. fluoropolymers;
- (xli) direct current power supply devices falling under any of the following:
 - (a) those with an output current of 500 amperes or more, with a current or voltage fluctuation rate of less than 0.1%, and capable of being used continuously for more than 8 hours with an output voltage of 100 volts or more;
 - (b) those with an output voltage of 20,000 volts or more, with a current or voltage fluctuation rate of less than 0.1%, and capable of being used continuously for more than 8 hours with an output current of 1 ampere or more;
- (xlii) electron accelerators or flash discharge X-ray equipment falling under any of the following (excluding electron microscope components or medical equipment):
 - (a) those with a peak value for electron kinetic energy of 0.5 megaelectron volts or more and less than 25 megaelectron volts, which fall under any of the following:
 1. those with a beam pulse duration of 1 microsecond or less, and with a value of 0.25 or more when 1,700 is multiplied by the product of multiplying the peak value of electron kinetic energy expressed in megaelectron volts by 2.65 and further multiplied by the total charge quantity of accelerated electrons expressed in coulombs;
 2. those with a beam pulse duration exceeding 1 microsecond, and with a value of 0.25 or more when 1,700 is multiplied by the product of multiplying the peak value of electron kinetic energy expressed in megaelectron volts by 2.65 and further multiplied by the maximum charge quantity of electrons accelerated for 1 microsecond, expressed in coulombs;
 - (b) those with a peak electron kinetic energy of 25 megaelectron volts or more and a peak output exceeding 50 megawatts;
- (xliii) impact testing machines capable of causing a projectile to move with a maximum velocity of 1.5 kilometers or more per second;
- (xliv) high speed cameras, or their components, which fall under any of the following:

- (a) streak cameras, or their components, which fall under any of the following:
 - 1. streak cameras with a photographing speed exceeding 0.5 millimeters per microsecond;
 - 2. electronic streak cameras with a time resolution of 50 nanoseconds or less;
 - 3. streak tubes for cameras that fall under 2.;
 - 4. plug-in units that are designed to be used in streak cameras with modular structures, and that are needed in order for those cameras to attain or exceed the function or characteristics of goods falling under 1. or 2.;
 - 5. assemblies of rotating reflectors composed of turbines, reflectors, and bearings, or synchronizing electronic equipment designed for cameras that fall under 1.;
- (b) framing cameras, or their components, which fall under any of the following:
 - 1. framing cameras with a photographing speed exceeding 225,000 frames per second;
 - 2. framing cameras with a shutter speed of 50 nanoseconds or less;
 - 3. framing tubes or solid-state image sensors designed for cameras falling under 1. or 2., with a shutter speed of less than 50 nanoseconds;
 - 4. plug-in units that are designed to be used in framing cameras with modular structures, and that are needed in order for those cameras to attain or exceed the function or characteristics of goods falling under 1. or 2.;
 - 5. assemblies of rotating reflectors composed of turbines, reflectors, and bearings, or synchronizing electronic equipment designed for cameras that fall under 1. or 2.;
- (c) solid-state cameras or electron tube cameras, or their components, which fall under any of the following (excluding those falling under (a) or (b)):
 - 1. solid-state cameras or electron tube cameras with a shutter speed of 50 nanoseconds or less;
 - 2. solid-state image sensors or image intensifier tubes designed for cameras falling under 1., with a shutter speed of 50 nanoseconds or less;
 - 3. electrically triggered shutters utilizing Kerr cells or Pockel cells, with a shutter speed of 50 nanoseconds or less;
 - 4. plug-in units that are designed to be used in cameras with modular structures, and that are needed in order for those cameras to attain or exceed the function or characteristics of goods falling under 1.;
- (xlv) interferometers for measuring fluid velocity or pressure gauges capable of measuring fluid pressure, or pressure transducers that use quartz

- piezoelectric pressure sensor, which fall under any of the following:
- (a) interferometers for measuring fluid velocity which fall under the following 1. and 2.:
 1. interferometers capable of measuring speeds exceeding 1 kilometer per second;
 2. interferometers capable of measuring speeds at intervals less than 10 microseconds;
 - (b) pressure gauges capable of measuring pressures exceeding 10 gigapascals;
 - (c) pressure transducers that use quartz piezoelectric pressure sensors capable of measuring pressures exceeding 10 gigapascals;
 - (xlvi) cold-cathode tubes having three or more electrodes, which fall under all of the following (a) through (c):
 - (a) those with a peak anode voltage of 2,500 volts or more;
 - (b) those with a peak anode current of 100 amperes or more;
 - (c) those with an anode delay time of 10 microseconds or less;
 - (xlvii) trigger spark gaps with an anode delay time of 15 microseconds or less, with a peak current of 500 amperes or more;
 - (xlviii) assemblies having switching capabilities, which fall under all of the following (a) through (c):
 - (a) those with a peak anode voltage exceeding 2,000 volts;
 - (b) those with a peak anode current of 500 amperes or more;
 - (c) those with a turn-on time of 1 microsecond or less;
 - (xlix) pulse capacitors falling under any of the following:
 - (a) pulse capacitors with a rated voltage exceeding 1,400 volts, which fall under all of the following 1. through 3.:
 1. those with a total energy exceeding 10 joules;
 2. those with a nominal capacitance exceeding 0.5 microfarads;
 3. those with series inductance of less than 50 nanohenries;
 - (b) pulse capacitors with a rated voltage exceeding 750 volts, which fall under the following 1. and 2.:
 1. those with a nominal capacitance exceeding 0.25 microfarads;
 2. those with series inductance of less than 10 nanohenries;
 - (l) pulse generators or xenon flashlamp drivers that fall under any of the following:
 - (a) modular pulse generators or light-emitting device for xenon flash lamps that fall under all of the following:
 1. those capable of supplying a pulse for less than 15 microseconds against a resistance load of less than 40 ohms;
 2. those with an output exceeding 100 amperes;
 3. those having the largest dimension value of 30 centimeters or less;

- 4. those with a weight less than 30 kilograms;
- 5. those designed to be usable in temperatures from below $-50\text{ }^{\circ}\text{C}$ to over $100\text{ }^{\circ}\text{C}$, or designed to be usable in space;
- (b) pulse generators or pulse heads that generate pulses with a voltage exceeding 6 volts against a resistance load less than 55 ohms, and require a pulse rise time of less than 500 picoseconds (excluding those falling under (a));
- (li) components of detonators that fall under all of the following:
 - (a) those capable of controlling the ignition of explosives through electric signals;
 - (b) those that have stripline structure;
 - (c) those with a rated voltage exceeding 2 kilovolts;
 - (d) those with an inductance path of less than 20 nanohenries;
- (lii) photomultiplier tubes with photocathode area exceeding 20 square centimeters, with an anode pulse rise time of less than 1 nanosecond;
- (liii) neutron generators utilizing electrostatic acceleration to induce a tritium-deuterium or deuterium-deuterium nuclear reaction, which fall under any of the following:
 - (a) neutron generators utilizing electrostatic acceleration to induce a tritium-deuterium nuclear reaction designed to be capable of being operated without using a vacuum pump;
 - (b) neutron generators utilizing electrostatic acceleration to induce a deuterium-deuterium nuclear reaction that are capable of producing 3 giga-neutrons or more per second, and that are designed to be capable of being operated without using a vacuum pump;
- (liv) remote manipulators used for the prevention of radioactive exposure, and capable of being operated behind a radiation shielding wall with a thickness of 0.6 meters or more;
- (lv) windows designed to shield radiation which fall under all of the following
 - (a) through (c), or their frames:
 - (a) those with an area exceeding 0.09 m^2 for the surface that protrudes into the cold area;
 - (b) those made from materials with a density exceeding 3 grams per cubic centimeters;
 - (c) those with a thickness of 100 millimeters or more;
- (lvi) TV cameras or their lenses designed for protection from the impact of radiation, and are capable of withstanding radiation exposure exceeding 50,000 grays on a silicon conversion basis for the total absorbed dose;
- (lvii) tritium, tritium compounds, or tritium mixtures, with a ratio of tritium atomicity to hydrogen atomicity exceeding 1/1,000 (excluding those installed in equipment for which the total radioactivity per piece of equipment is less

- than 1,480 gigabecquerels);
- (lviii) equipment used in the production, collection, or storage of tritium, or components of equipment used in the production of tritium, which fall under any of the following:
 - (a) equipment designed for use in the production of tritium (including for use in its concentration) or for use in its collection or preservation;
 - (b) equipment used in the production (including purification), collection, or preservation of tritium, which falls under any of the following (excluding equipment falling under (a)):
 - 1. freezing equipment capable of cooling hydrogen or helium to a temperature of $-250\text{ }^{\circ}\text{C}$ or less, with a freezing capacity exceeding 150 watts;
 - 2. equipment for the storage or purification of hydrogen isotopes that utilizes metal hydrides as a storage or purification catalyst;
 - (c) equipment used in the production of tritium which constitutes an assembly that becomes a target containing lithium (limited to those composed of enriched isotopes of lithium-6) that is specially designed to produce tritium by irradiation (including irradiation in a nuclear reactor) (excluding equipment falling under (a) and (b));
 - (d) components of equipment used in the production of tritium which is specially designed for goods falling under (c);
 - (lix) platinized catalysts that are for collecting tritium from heavy water or for producing heavy water, and that are designed to promote hydrogen isotope exchange between hydrogen and water;
 - (lx) helium with a mixing ratio of helium-3 greater than the mixing ratio in nature (excluding helium-3 sealed in containers or equipment with a weight less than 1 gram);
 - (lxi) rhenium, alloys with a rhenium content of 90% or more of the total weight, or alloys with a rhenium or tungsten content of 90% or more of the total weight, weighing more than 20 kilograms, with a cylindrical shape and internal diameter exceeding 100 millimeters and less than 300 millimeters, or with a hollow hemispherical shape, or combinations of these;
 - (lxii) explosion-proof containers designed to be used for the test of explosives or explosive devices, which fall under the following (a) and (b):
 - (a) explosion-proof containers designed to fully contain explosions equivalent to 2 kilograms or more of trinitrotoluene;
 - (b) explosion-proof containers that have a structure or properties that can transmit analysis data or measurement data obtained by the test.

Article 2 (1) The goods specified by Order of the Ministry of Economy, Trade and Industry that are referred to in row 3 (i) of Appended Table 1 of the Export

Order are goods falling under any of the following:

(i) substances for raw materials of chemical warfare agents falling under any of the following or mixtures containing the substances, in which the content of any of the substances exceeds 30% of the total weight:

- (a) 3-hydroxy-1-methylpiperidine;
- (b) potassium fluoride;
- (c) ethylene chlorohydrin;
- (d) dimethylamine;
- (e) dimethylamine hydrochloride;
- (f) hydrogen fluoride;
- (g) methyl benzilate;
- (h) 3-quinuclidinone;
- (i) pinacolone;
- (j) potassium cyanide;
- (k) potassium bifluoride;
- (l) ammonium bifluoride;
- (m) sodium bifluoride;
- (n) sodium fluoride;
- (o) sodium cyanide;
- (p) phosphorous pentasulfide;
- (q) diisopropylamine;
- (r) 2-diethylamino ethanol;
- (s) sodium sulfide;
- (t) triethanolamine hydrochloride;
- (u) phosphorous acid triisopropyl;
- (v) diethyl thiophosphoric acid;
- (w) diethyl dithio phosphoric acid;
- (x) sodium hexafluorosilicic acid;
- (y) diethylamine;

(ii) substances having equivalent toxicity as chemical warfare agents falling under any of the following or mixtures containing the substances (for mixtures containing a substance falling under (a) through (g), limited to those for which the content of the substance falling under any of (a) through (c) exceeds 1% of the total weight, or those for which the content of the substance falling under any of (d) through (g) exceeds 30% of the total weight):

- (a) O,O-diethyl = S-[2-(diethylamino)ethyl] = phosphorothiolate and alkylate salts and protonate salts of these;
- (b) 1,1,3,3,3-pentafluoro-2-(trifluoromethyl)-1-propane;
- (c) 3-quinuclidinyl = benzilate;
- (d) carbonyl dichloride;

- (e) cyanogen chloride;
 - (f) hydrogen cyanide;
 - (g) trichloronitromethane;
- (iii) substances having equivalent toxicity as chemical warfare agents falling under any of the following or mixtures containing the substances (for mixtures containing substances falling under (f) through (cc), limited to those for which the content of any of the substances falling under (f) through (p) exceeds 10% of the total weight, or those for which the content of any of the substances falling under (f) through (cc) exceeds 30% of the total weight):
- (a) alkyl phosphonyl difluoride (limited to those having an alkyl group carbon number of three or less);
 - (b) O-alkyl = O-2-dialkylaminoethyl = alkyl phosphonite (including those O-alkyl alkyl group of which is a cycloalkyl group, and limited to those whose O-alkyl alkyl group carbon number is ten or less and whose O-2-dialkylaminoethyl or alkyl phosphonite alkyl group carbon number is three or less) as well as alkylate salts and protonate salts of these;
 - (c) O-2-dialkylaminoethyl = hydrogen = alkyl phosphonite (limited to those whose O-2-dialkylaminoethyl or alkyl phosphonite alkyl group carbon number is three or less) as well as alkylate salts and protonate salts of these;
 - (d) O-isopropyl = methyl phosphonochloridate;
 - (e) O-pinacolyl = methyl phosphonochloridate;
 - (f) compounds containing phosphorus atoms having no bond with a carbon atom other than a bond with one alkyl group carbon number of which is three or less;
 - (g) N,N-dialkyl phosphoramidic = dihalide (limited to those with alkyl group carbon number of three or less);
 - (h) dialkyl = N,N-dialkyl phosphoramidate (limited to those with dialkyl or N,N-dialkyl phosphoramidate alkyl group carbon number of three or less);
 - (i) arsenic trichloride;
 - (j) 2,2-diphenyl-2-hydroxyacetic acid;
 - (k) quinuclidine-3-ol;
 - (l) N,N-dialkylaminoethyl-2-chloride (limited to those whose alkyl group carbon number is three or less) and protonate salts of these;
 - (m) N,N-dialkyl aminoethane-2-ol (limited to those whose alkyl group carbon number is three or less) and protonate salts of these;
 - (n) N,N-dialkyl aminoethane-2-thiol (limited to those whose alkyl group carbon number is three or less and including 2-diisopropylamino ethanethiol) and its protonated salts (including 2-diisopropylamino ethanethiol hydrochloride);
 - (o) bis(2-hydroxyethyl) sulfide;

- (p) 3,3-dimethylbutane-2-ol;
 - (q) phosphoryl chloride;
 - (r) phosphorous trichloride;
 - (s) phosphorous pentachloride;
 - (t) trimethyl phosphite;
 - (u) triethyl phosphite;
 - (v) dimethyl phosphite;
 - (w) diethyl phosphite;
 - (x) sulfur monochloride;
 - (y) sulfur bichloride;
 - (z) thionyl chloride;
 - (aa) ethyl diethanol amine;
 - (bb) methyl diethanol amine;
 - (cc) triethanolamine.
- (2) The goods with specifications prescribed by Order of the Ministry of Economy, Trade and Industry that are referred to in row 3 (ii) of Appended Table 1 of the Export Order are goods falling under any of the following:
- (i) reactors having a capacity exceeding 0.1 m³ and less than 20 m³ which have all parts that come into contact with the contents composed of, lined with, or coated with materials falling under any of the following:
 - (a) nickel or alloys with a nickel content exceeding 40% of the total weight;
 - (b) alloys with a nickel content exceeding 25% of the total weight and a chrome content exceeding 20% of the total weight;
 - (c) fluoropolymers;
 - (d) glass;
 - (e) tantalum or tantalum alloys;
 - (f) titanium or titanium alloys;
 - (g) zirconium or zirconium alloys;
 - (h) niobium or niobium alloys;
 - (ii) storage containers having a capacity exceeding 0.1 m³, which have all parts that come into contact with the contents composed of, lined with, or coated with materials falling under any of the following:
 - (a) nickel or alloys with a nickel content exceeding 40% of the total weight;
 - (b) alloys with a nickel content exceeding 25% of the total weight and a chrome content exceeding 20% of the total weight;
 - (c) fluoropolymers;
 - (d) glass;
 - (e) tantalum or tantalum alloys;
 - (f) titanium or titanium alloys;
 - (g) zirconium or zirconium alloys;
 - (h) niobium or niobium alloys;

- (iii) heat exchangers or condensers having a heat transfer area exceeding 0.15 m² and less than 20 m², or tubes, plates, coils or blocks designed as components of these, which have all parts that come into contact with the contents composed of, lined with, or coated with materials falling under any of the following:
 - (a) nickel or alloys with a nickel content exceeding 40% of the total weight;
 - (b) alloys with a nickel content exceeding 25% of the total weight and a chrome content exceeding 20% of the total weight;
 - (c) fluoropolymers;
 - (d) glass;
 - (e) graphite or carbon graphite;
 - (f) tantalum or tantalum alloys;
 - (g) titanium or titanium alloys;
 - (h) zirconium or zirconium alloys;
 - (i) silicon carbide;
 - (j) titanium carbide;
 - (k) niobium or niobium alloys;
- (iv) distillation or absorption columns whose internal diameter exceeds 0.1 meter, or liquid dispensers, vapor dispensers, or liquid collectors designed as components of these, which have all parts that come into contact with the contents composed of or lined or coated with materials falling under any of the following:
 - (a) nickel or alloys with a nickel content exceeding 40% of the total weight;
 - (b) alloys with a nickel content exceeding 25% of the total weight and a chrome content exceeding 20% of the total weight;
 - (c) fluoropolymers;
 - (d) glass;
 - (e) graphite or carbon graphite;
 - (f) tantalum or tantalum alloys;
 - (g) titanium or titanium alloys;
 - (h) zirconium or zirconium alloys;
 - (i) niobium or niobium alloys;
- (v) filling equipment capable of remote operation which has all parts that come into contact with the contents composed of, lined with, or coated with materials falling under any of the following:
 - (a) nickel or alloys with a nickel content exceeding 40% of the total weight;
 - (b) alloys with a nickel content exceeding 25% of the total weight and a chrome content exceeding 20% of the total weight;
- (vi) agitators used in the goods falling under item (i), or impellers, blades, or shafts designed as components of these, which have all parts that come into contact with the contents composed of, lined with, or coated with materials

- falling under any of the following:
- (a) nickel or alloys with a nickel content exceeding 40% of the total weight;
 - (b) alloys with a nickel content exceeding 25% of the total weight and chrome content exceeding 20% of the total weight;
 - (c) fluoropolymers;
 - (d) glass;
 - (e) tantalum or tantalum alloys;
 - (f) titanium or titanium alloys;
 - (g) zirconium or zirconium alloys;
 - (h) niobium or niobium alloys;
- (vii) valves, or their components, which fall under any of the following:
- (a) valves whose nominal diameter is over 10 A, which have all parts that come into contact with the contents composed of, lined with, or coated with materials falling under any of the following:
 1. nickel or alloys with a nickel content exceeding 40% of the total weight;
 2. alloys with a nickel content exceeding 25% of the total weight and a chrome content exceeding 20% of the total weight;
 3. fluoropolymers;
 4. glass;
 5. tantalum or tantalum alloys;
 6. titanium or titanium alloys;
 7. zirconium or zirconium alloys;
 8. niobium or niobium alloys; or
 9. ceramics that fall under any of the following:
 - i. ceramics with a silicon carbide content of 80% or more of the total weight;
 - ii. ceramics with an aluminum oxide content of 99.9% or more of the total weight; or
 - iii. zirconium oxide;
 - (b) valves whose nominal diameter is 25 A or more and 100 A or less, which fall under all of the following (excluding those falling under (a)):
 1. casings or casing liners other than for shut-off parts, which have all parts that come into contact with the contents composed of, lined with, or coated with any of the materials specified in (a), 1 through 9; and
 2. those whose shut-off parts are designed to be exchangeable;
 - (c) casings or casing liners designed as components of valves that fall under (a) or (b), which have all parts that come into contact with the contents composed of, lined with, or coated with any of the materials specified in (a), 1. through 9.;
- (viii) multi-walled piping outfitted with a port for equipment for detecting content leaks, which has all parts that come into contact with the contents

- composed of, lined with, or coated with materials falling under any of the following:
- (a) nickel or alloys with a nickel content exceeding 40% of the total weight;
 - (b) alloys with a nickel content exceeding 25% of the total weight and a chrome content exceeding 20% of the total weight;
 - (c) fluoropolymers;
 - (d) glass;
 - (e) graphite or carbon graphite;
 - (f) tantalum or tantalum alloys;
 - (g) titanium or titanium alloys;
 - (h) zirconium or zirconium alloys;
 - (i) niobium or niobium alloys;
- (ix) pumps with axes that are sealed by two or more layers, or seal-less pumps, with a maximum specified discharge volume exceeding 0.6 m³ per hour; vacuum pumps with a maximum specified discharge volume exceeding 5 m³ per hour; or casings, casing liners, impellers, rotors, or jet pump nozzles designed as components of these; which have all parts that come into contact with the contents composed of, lined with, or coated with materials falling under any of the following:
- (a) nickel or alloys with a nickel content exceeding 40% of the total weight;
 - (b) alloys with a nickel content exceeding 25% of the total weight and a chrome content exceeding 20% of the total weight;
 - (c) fluoropolymers;
 - (d) glass;
 - (e) graphite or carbon graphite;
 - (f) tantalum or tantalum alloys;
 - (g) titanium or titanium alloys;
 - (h) zirconium or zirconium alloys;
 - (i) ceramics;
 - (j) ferrosilicon;
 - (k) niobium or niobium alloys;
- (x) incinerators for which the average temperature of the incineration chamber during use exceeds 1,000 °C, which have all parts that supply the substance to be incinerated that come into contact with the contents composed of or coated with materials falling under any of the following:
- (a) nickel or alloys with a nickel content exceeding 40% of the total weight;
 - (b) alloys with a nickel content exceeding 25% of the total weight and a chrome content exceeding 20% of the total weight;
 - (c) ceramics;
- (xi) gas monitoring systems that fall under any of the following:
- (a) systems capable of detecting substances set forth in the preceding

- paragraph even when the concentration in the air is less than 0.3 milligrams per cubic meter, and designed for continuous use;
- (b) systems designed for detecting compounds having an anticholinesterase effect;
- (xii) components of substances set forth in the preceding item, which fall under any of the following:
- (a) detectors;
- (b) sensor devices;
- (c) sensor cartridges.
- (3) The goods with the specifications prescribed by Order of the Ministry of Economy, Trade and Industry that are referred to in row (3), (iii) of Appended Table 1 of the Export Order are goods falling under any of the following:
- (i) reactors falling under item (i) of the preceding paragraph, which are assemblies used to repair reactors for which all parts that come into contact with the contents lined or coated with glass, or components specially designed for those assemblies, whose metal parts that come into contact with the contents are composed of tantalum or tantalum alloys; or
- (ii) storage containers falling under item (ii) of the preceding paragraph, which are assemblies used to repair storage containers for which all parts that come into contact with the contents lined or coated with glass, or components specially designed for those assemblies whose metal parts that come into contact with the contents are composed of tantalum or tantalum alloys.

Article 2-2 (1) The goods specified by Order of the Ministry of Economy, Trade and Industry that are referred to in row 3-2 (i) of Appended Table 1 of the Export Order are goods falling under any of the following:

- (i) viruses (excluding vaccines): the African horse sickness virus, the African swine fever virus, the Andean potato latent virus, the Andes virus, all viruses of the genus Ebola virus, the yellow fever virus, the Omsk hemorrhagic fever virus, the Oropouche virus, the Guanarito virus, the Kyasanur Forest disease virus, the cattle plague virus, the Crimean-Congo hemorrhagic fever virus, the foot-and-mouth disease virus, the highly pathogenic avian influenza virus (limited to those having an H antigen of H5 or H7), the SARS coronavirus, the reconstructed 1918 influenza virus, the Sabia virus, the monkeypox virus, the peste des petits ruminants virus, the Sin Nombre virus, the vesicular stomatitis virus, the western equine encephalitis virus, the Saint Louis encephalitis virus, the Seoul virus, the tick-borne encephalitis virus (limited to the Far Eastern type), the Chikungunya virus, the Chapare virus, the louping ill virus, the Choclo virus, the smallpox virus, the eastern equine encephalitis virus, the Dobrava-Belgrade virus, the Nipah virus, the Japanese encephalitis virus, the

- Newcastle disease virus, the Hantan virus, the swine fever virus, the swine vesicular virus, the porcine teschovirus, the Suid herpesvirus 1, the Junin virus, the blue tongue virus, the Venezuelan equine encephalitis virus, the Hendra virus, the potato spindle tuber viroid, the Powassan virus, the Machupo virus, all viruses of the genus Marburg virus, the Murray Valley encephalitis virus, the goat pox virus, the sheep pox virus, the Laguna Negra virus, the Lassa virus, the lumpy skin disease virus, viruses of the genus Lyssavirus (including the rabies virus), the Rift Valley fever virus, the lymphocytic choriomeningitis virus, the Lujo virus, or the Rocio virus;
- (ii) bacteria (excluding vaccines): *Clostridium argentinense* (limited to botulinum neurotoxin producing strains), *Clostridium perfringens* (limited to types producing epsilon toxins), *Brucella abortus*, *Chlamydia psittaci*, *Mycoplasma mycoides* (small colony), *Coxiella burnetii*, the cholera bacillus, *Shigella dysenteriae*, *Bacillus anthracis*, the typhoid bacillus, enterohemorrhagic *Escherichia coli* (serotype O26, O45, O103, O104, O111, O121, O145, and O157), *Rickettsia prowazekii*, *Clostridium baratii* (limited to botulinum neurotoxin producing strains), *Actinobacillus mallei*, *Brucella suis*, *Clostridium butyricum* (limited to botulinum neurotoxin producing strains), *Bacillus pestis*, *Bacillus botulinus*, *Brucella melitensis*, *Mycoplasma capricolum* subspecies *capripneumoniae* (strain F38), *Bacillus tularensis*, or *Pseudomonas pseudomallei*;
- (iii) toxins (excluding immunotoxins): aflatoxin, abrin, clostridium welchii toxin (limited to alpha, beta 1, beta 2, epsilon, or iota toxins), HT-2 toxin, staphylococcal enterotoxin (enterotoxin, alpha-toxin, and toxic shock syndrome toxin), conotoxin, cholera toxin, Shiga toxin, diacetoxyscirpenol, T-2 toxin, tetrodotoxin, viscumin, botulin toxin, Volkensin, microcystin, or modeccin;
- (iv) subunits of those falling under the preceding item;
- (v) bacteria or fungi: *Clavibacter michiganensis* subspecies *sepedonicus*, *Coccidioides immitis*, *Coccidioides posadasii*, *Cochliobolus miyabeanus*, *Colletotrichum kahawae*, *Xanthomonas axonopodis* pv. *citri*, *Xanthomonas albilineans*, *Xanthomonas oryzae* pv. *oryzae*, *Synchytrium endobioticum*, *Sclerophthorarayssiae* var. *zeae*, *Thecaphora solani*, *Tilletia indica*, *Puccinia graminis* var. *graminis*, *Puccinia striiformis*, *Peronosclerospora philippinensis*, *Magnaporthe oryzae*, *Microcyclus ulei*, or *Ralstonia solanacearum* race 3, and biovar 2;
- (vi) genetically-modified organisms (including those with nucleic acid whose base sequence has been formed or modified by intentional molecular manipulation) which have any of the following or genetic elements (including chromosomes, genomes, plasmids, transposons, vectors, and inactivated organisms, including restorable nucleic acid fragments) which have any of

the following base sequences:

- (a) genes falling under item (i);
 - (b) genes falling under item (ii) or the preceding item which cause serious harm to the health of humans, animals, or plants (including those which cause harm through transcribed or translated products) or those capable of giving or increasing pathogenicity (excluding genes other than those which have the base sequence of the nucleic acid of a colon bacillus with a serotype to produce Shiga toxins, such as those with serotype O26, O45, O103, O104, O111, O121, O145 and O157 (limited to those which have genetic elements of Shiga toxins or their subunits)); or
 - (c) those which fall under item (iii) or (iv).
- (2) The goods with specifications prescribed by Order of the Ministry of Economy, Trade and Industry that are referred to in row 3-2 (ii) of Appended Table 1 of the Export Order are goods falling under any of the following:
- (i) equipment used for physical containment falling under any of the following:
 - (a) equipment with a physical containment level of P3 or P4
 - (b) equipment that is designed to be installed in a facility with a physical containment level of P3 or P4 and that falls under any of the following:
 1. high-pressure steam sterilizers with doors on both sides;
 2. shower device for decontaminating protective suits; or
 3. airtight doors with a mechanical seal or inflatable pressure seal;
 - (ii) fermenters, or their components, which fall under any of the following:
 - (a) non-disposable fermenters, or their components, which fall under any of the following:
 1. hermetically sealed fermenters with an internal cubic volume of 20 liters or more, which are capable of internal sterilization or disinfection in a fixed state;
 2. culture vessels designed to be used for fermenters falling under 1., which are capable of internal sterilization or disinfection in a fixed state; or
 3. controllers designed to be used for fermenters falling under 1., which are capable of simultaneously monitoring and controlling two or more parameters for controlling fermentation equipment;
 - (b) disposable fermenters, or their components, which fall under any of the following:
 1. hermetically sealed fermenters with an internal cubic volume of 20 liters or more;
 2. containers for disposable culture vessels designed to be used for fermenters that fall under 1.;
 3. controllers which are designed to be used for fermenters that fall under 1. and capable of simultaneously monitoring and controlling two or more parameters for controlling fermentation equipment;

- (iii) continuous centrifuges falling under all of the following (a) through (d):
 - (a) those with a flow volume exceeding 100 liters per hour;
 - (b) those comprised of polished stainless steel or titanium;
 - (c) those whose shaft is sealed by a mechanical seal; and
 - (d) those capable of internal sterilization using vapor when they are in a fixed state and in a closed state;
- (iv) cross-flow filtration equipment falling under the following (a) and (b) (excluding those using a reverse penetration membrane and those designed to purify blood):
 - (a) equipment with a total effective filtering area of 1 m² or more; and
 - (b) equipment that falls under the following 1. or 2.:
 - 1. equipment capable of internal sterilization or disinfection in a fixed state; or
 - 2. equipment that use disposable components;
- (iv)-2 components designed to be used in equipment set forth in the preceding item with an effective filtering area of 0.2 m² or more;
- (v) freeze-drying equipment falling under the following (a) and (b):
 - (a) equipment having the capacity to create 10 kilogram or more and less than 1,000 kilograms of ice per 24 hours; and
 - (b) equipment capable of internal sterilization using vapor or gas;
- (v)-2 spray-drying equipment that falls under all of the following (a) through (c):
 - (a) equipment with a moisture evaporation of 0.4 kilograms or more and 400 kilograms or less per hour;
 - (b) equipment capable of manufacturing products with an average particle diameter of 10 micrometers or less, or equipment, by replacing its smallest components, capable of producing products with an average particle diameter of 10 micrometers or less; and
 - (c) equipment capable of internal sterilization or disinfection in a fixed state;
- (vi) protective equipment used in physical containment facilities or equipment used for physical containment, which falls under any of the following:
 - (a) whole or half body clothing or hoods with airline-type ventilation equipment, which are capable of maintaining a positive internal pressure; or
 - (b) physical containment chambers, isolators, or safety cabinets which fall under all of the following 1. through 4. (including Class III safety cabinets and excluding those specially designed for caring for or carrying infected patients):
 - 1. those which have a working space in which the operator is completely isolated by physical barriers;
 - 2. those capable of being operated in a negative pressure state;

- 3. those equipped with means of operating an object safely in a working space; and
- 4. those which use a HEPA filter in the working space's air supply and exhaust;
- (vii) equipment that is designed to be used for testing the inhalation of particulate matter and that falls under any of the following:
 - (a) equipment with an inhalation chamber that is capable of exposing the whole body of an animal to the particulate matter and that has a capacity of 1 m³ or more; or
 - (b) equipment that allows the noses of 12 or more rodents, or two or more animals other than rodents, to be exposed to the particulate matter by directly flowing aerosol, and that has sealed holders to bind the animals which are designed for use in this; or
- (viii) spraying or fogging machines, or their components, which fall under any of the following:
 - (a) spraying or fogging machines designed to be mounted in aircraft, airship, balloon, or unmanned aerial vehicles capable of dispersing droplets whose initial particles have a volume medium diameter of less than 50 microns from a liquid device on board at a rate exceeding 2 liters per minute;
 - (b) a spray boom or nozzle for an aerosol generator designed to be mounted in aircraft, airship, balloon, or unmanned aerial vehicles capable of dispersing droplets whose initial particles have a volume medium diameter of less than 50 microns from a liquid device on board at a rate exceeding 2 liters per minute;
 - (c) aerosol generators designed to be used in a device capable of dispersing droplets whose initial particles have a volume medium diameter of less than 50 microns from a liquid device on board at a rate exceeding 2 liters per minute.
- (ix) equipment that is for synthesizing nucleic acid or combining nucleic acids, that is fully or partially automatized, and that is designed to form nucleic acid with a continuous length exceeding 1.5 kilobases at an error rate of less than five percent in one operation.

Article 3 The goods with the specifications prescribed by Order of the Ministry of Economy, Trade and Industry that are referred to in row 4 of Appended Table 1 of the Export Order are goods falling under any of the following:

- (i) rockets or equipment or tools (including molds; hereinafter the same applies in this Article) or test equipment for manufacturing rockets capable of transporting payloads over a distance of 300 kilometers or more, or their components;
- (i)-2 unmanned aircraft capable of transporting payloads over a distance of 300

- kilometers or more, equipment or tools for manufacturing it, equipment for testing it, or its components;
- (i)-3 unmanned aircraft that is designed to spray aerosol, that is designed to be capable of transporting a payload exceeding 20 liters in a particulate or liquid form in addition to fuel, and that falls under any of the following (excluding those falling under the preceding item or model aircraft used for entertainment or sports):
 - (a) vehicles having an autonomous flight control and navigation capability;
or
 - (b) vehicles having a function enabling flight control by a person exceeding the visible range;
 - (ii) goods falling under any of the following; or equipment or tools for manufacturing them, equipment for testing them, or components of these:
 - (a) goods that can be used in rockets capable of transporting payloads over a distance of 300 kilometers or more, and falling under any of the following:
 - 1. individual stages of multiple-stage rockets;
 - 2. solid rocket propulsion units or hybrid rocket propulsion units with a total impulse of 841,000 newton-seconds or more; or
 - 3. liquid rocket propulsion units or gelatinous fuel rocket propulsion units with a total impulse of 841,000 newton-seconds or more; or liquid rocket engines or gelatinous fuel rocket motors designed to be integrated into these units;
 - (b) goods that can be used in rockets or unmanned aircraft capable of transporting a payload of 500 kilograms or more over a distance of 300 kilometers or more, falling under any of the following:
 - 1. reentry vehicles;
 - 2. thermal shields (limited to those using ceramic or abrasion materials) for reentry vehicles, or their components;
 - 3. heat sinks for reentry vehicles, or their components;
 - 4. electronic parts designed for use in reentry vehicles;
 - 5. guidance equipment with a ratio of circular error probability to flight distance of 3.33% or less; or
 - 6. thrust vector controllers;
 - (iii) propulsion units or components, motor case linings, or insulation materials for these which fall under any of the following, equipment or tools or test equipment for their manufacture, or the components of these:
 - (a) turbojet engines or turbo fan engines falling under any of the following:
 - 1. those which fall under all of the following i. through iv.:
 - i. engines whose maximum thrust exceeds 400 newtons (excluding those whose maximum thrust exceeds 8,890 newtons and whose use in civilian aircraft has been authorized by a Japanese governmental organization);

- ii. engines whose fuel consumption rate is 0.15 kilograms or less per newton of thrust per hour;
 - iii. engines which are less than 750 kilograms in dry weight; and
 - iv. engines with a rotor for the first stage of less than 1 meter in diameter;
2. those designed or altered to be used for rockets capable of transporting a payload of 500 kilograms or more over a distance of 300 kilometers or more or unmanned aircraft capable of transporting payloads over a distance of 300 kilometers or more (excluding those falling under 1);
- (b) ramjet engines, scramjet engines, pulse jet engines, detonation engines, or combined cycle engines (limited to those usable in rockets capable of transporting a payload of 500 kilograms or more over a distance of 300 kilometers or more or unmanned aerial vehicles capable of transporting payloads over a distance of 300 kilometers or more) or their components;
 - (c) motor cases for solid rockets usable in rockets or unmanned aerial vehicles capable of transporting payloads over a distance of 300 kilometers or more;
 - (d) motor case linings for solid rockets (limited to those in which the propellant and motor case or insulation can be combined) usable in rockets or unmanned aerial vehicles capable of transporting a payload of 500 kilograms or more over a distance of 300 kilometers or more or designed for use in rockets or unmanned aerial vehicles capable of transporting a payload of less than 500 kilograms over a distance of 300 kilometers or more;
 - (e) motor case insulation for solid rockets, usable in rockets or unmanned aerial vehicles capable of transporting a payload of 500 kilograms or more over a distance of 300 kilometers or more or designed for use in rockets or unmanned aerial vehicles capable of transporting a payload of less than 500 kilograms over a distance of 300 kilometers or more;
 - (f) motor case nozzles for solid rockets usable in rockets or unmanned aerial vehicles capable of transporting payloads for 300 kilometers or more;
 - (g) controllers for propellants in a liquid, slurry, or gel state, whose frequency range is 20 hertz or more and 2,000 hertz or less and designed to be capable of withstanding vibrations with an effective acceleration rate exceeding 98 meters per second squared (limited to controllers which can be used in rockets or unmanned aerial vehicles capable of transporting a payload of 500 kilograms or more over a distance of 300 kilometers or more) and their components (excluding servo valves, pumps, and gas turbines);
 - (h) components of hybrid rocket propulsion units that fall under (a), 2 of the preceding item;
 - (i) tanks for liquid or gelatinous propellants which are designed to be used in

propellants falling under any of the following:

1. propellants falling under item (vii) or their raw materials;
 2. liquid or gelatinous propellants (excluding those falling under 1.) used in rockets capable of transporting a payload of 500 kilograms or more over a distance of 300 kilometers or more;
- (j) turboprop engines designed for use in unmanned aerial vehicles capable of transporting payloads over a distance of 300 kilometers or more, whose maximum output is 10 kilowatts or more in standard atmospheric conditions above the sea specified by the International Civil Aviation Organization (excluding those certified for use in civilian aircraft by a Japanese governmental organization) or their components;
- (k) combustion chambers or nozzles for liquid rocket propulsion units or gelatinous fuel rocket propulsion units which are usable for goods falling under (a), 3 of the preceding item;
- (iv) separation mechanisms or staging mechanisms for multiple-stage rockets (limited to those usable for a rocket capable of transporting a payload of 500 kilograms or more over a distance of 300 kilometers or more), equipment or tools for their manufacture, test equipment, or their components;
- (v) flow forming machines that are capable of manufacturing propulsion units used for rockets or unmanned aerial vehicles capable of transporting a payload of 500 kilograms or more over a distance of 300 kilometers or more, and that fall under the following (a) and (b) or components of such flow forming machines:
- (a) those which can be controlled by a numerical control device or computer; and
 - (b) those which have more than two axes capable of controlling contour;
- (vi) servo valves, pumps, or gas turbines used for controllers for propellants that fall under the following (a) and (b), and which fall under any of (c), (d), or (e):
- (a) pumps designed for use in controllers for propellants in liquid, slurry, or gel state; and
 - (b) pumps whose frequency range is 20 hertz or more and 2,000 hertz or less and designed to be able to withstand vibrations with an effective acceleration rate exceeding 98 meters per second squared;
 - (c) servo valves designed to allow a flow of 0.024 m³ or more per minute in a state in which the absolute pressure is 7,000 kilopascals or more and the actuator response time is less than 100 milliseconds;
 - (d) pumps for liquid propellant with an axis that rotates 8,000 times or more per minute or whose discharge pressure is 7,000 kilopascals or more, at the maximum operating time; or
 - (e) gas turbines for turbo pumps for liquid propellant with an axis that

- rotates 8,000 times or more per minute at the maximum operating time;
- (vi)-2 radial ball bearings usable for pumps used for controllers for propellants whose precision is class 2 or higher specified in Japanese Industrial Standard (JIS) B1514-1, which fall under all of the following (a) through (c):
 - (a) those with an internal diameter of the inner wheel of 12 millimeters or more and 50 millimeters or less;
 - (b) those with an external diameter of the outer wheel of 25 millimeters or more and 100 millimeters or less;
 - (c) those with a width of 10 millimeters or more and 20 millimeters or less;
 - (vii) propellants, or their raw materials, which fall under any of the following:
 - (a) hydrazine with concentration exceeding 70%;
 - (b) a derivative of hydrazine;
 - (c) ammonium perchlorate;
 - (d) ammonium dinitramide;
 - (e) aluminum powder whose particles are globular or spheroidal and have a diameter of less than 200 micrometers, which has a weight-based purity level of 97% or more, and which has particles with a diameter of less than 63 micrometers, as measured by measurement method specified in International Standard ISO 2591: 1988 or equivalent standards, accounting for 10% or more of the total weight;
 - (f) zirconium (including hafnium contained in the zirconium at a natural ratio), beryllium, or magnesium with a weight-based purity level of 97% or more, or its powdered alloys, which has particles with a diameter of less than 60 micrometers as measured using a sieve, laser diffraction, optical scanning, or other means accounting for 90% or more of the total volume or total weight;
 - (g) boron with a weight-based purity level of 85% or more or its powdered alloys, which has particles with a diameter of less than 60 micrometers as measured using a sieve, laser diffraction, optical scanning or other means accounting for 90% or more of the total volume or total weight;
 - (h) fuel or oxidizer falling under any of the following:
 - 1. perchlorate, chlorate, or chromate in which powdered metal or fuel constituent is mixed;
 - 2. hydroxylammonium nitrate;
 - (i) carborane, decaborane, or pentaborane, or a derivative of these;
 - (j) a liquid oxidizer falling under any of the following:
 - 1. dinitrogen trioxide;
 - 2. nitrogen dioxide or dinitrogen tetroxide;
 - 3. dinitrogen pentoxide;
 - 4. a mixture of nitrogen oxide;
 - 5. red fuming nitric acid having resistance to corrosion;

- 6. a compound made from fluorine or other halogens, oxygen, or nitrogen (excluding nitrogen trifluoride gas);
- (k) polybutadiene having a carboxyl group at its terminal;
- (l) polybutadiene having a hydroxyl group at its terminal;
- (m) a glycidyl azide polymer (including those which have a hydroxyl group at its terminal);
- (n) a polymer of butadiene and acrylic acid;
- (o) a polymer of butadiene, acrylonitrile, and acrylic acid;
- (p) a propellant falling under any of the following:
 1. solid and liquid blended fuel with heating value of 40,000,000 per kilogram;
 2. fuel or fuel additives (excluding those produced by using fuels manufactured by using fossil fuels or organic substances derived from plants as raw materials) with a heating value of 37,500,000,000 joules per cubic meter when measured at a temperature of 20 °C and 1 atmosphere of pressure;
- (q) tris-1- (2-methyl) aziridinyl phosphine oxide;
- (r) a reaction product of tetraethylenepentamine, acrylonitrile, and glycidol;
- (s) a reaction product of tetraethylenepentamine and acrylonitrile;
- (t) a multi-functional aziridineamide having an isophthal-, trimesin-, isocyanur-, or trimethyladipin- skeleton having a 2-methylaziridine group or a 2-ethylaziridine group;
- (u) triphenylbismuth;
- (v) a ferrocene derivative;
- (w) triethylene glycol dinitrate;
- (x) trimethylolethane trinitrate;
- (y) 1,2,4-butanetrioltrinitrate;
- (z) diethylene glycol dinitrate;
- (aa) polytetrahydrofuran polyethylene glycol;
- (bb) 4,5-diazidomethyl-2-methyl-,2,3-triazole;
- (cc) methyl-nitrate ethyl nitramine;
- (dd) ethyl-nitrate ethyl nitramine;
- (ee) butyl-nitrate ethyl nitramine;
- (ff) bis (2,2-dinitropropyl) acetal;
- (gg) bis (2,2-dinitropropyl) formal;
- (hh) dimethylaminoethyl azide;
- (ii) polyglycidyl nitrate;
- (jj) gelatinous propellant specially prepared in rockets or unmanned aerial vehicles capable of transporting payloads over a distance of 300 kilometers or more;
- (viii) equipment or tools to produce propellants or their raw materials, or test

- equipment or their components which fall under any of the following (excluding those falling under any of the following item through item (x)-2):
- (a) goods falling under the preceding item;
 - (b) octogen or hexagen;
 - (c) a composite propellant;
 - (d) 2-nitrodiphenylamine or N-methyl-p-nitroaniline;
 - (e) hydrazine nitroformate;
 - (f) hexanitrohexaazaisowurtzitane;
- (ix) batch mixers (excluding those for liquid) that fall under all of the following
- (a) through (d) or their components:
 - (a) those designed or altered for mixing at an absolute pressure of not less than 0 kilopascals and not more than 13.326 kilopascals;
 - (b) those capable of controlling the temperature in their mixing containers;
 - (c) those with a total volume of 110 liters or more; and
 - (d) those having at least one mixing axis or a kneading axis separated from the center axis;
- (ix)-2 continuous mixers (excluding those for liquid) that fall under all of the following (a) through (c), or their components:
- (a) those designed or altered for mixing at an absolute pressure of 0 kilopascals or more and 13.326 kilopascals or less;
 - (b) those capable of controlling the temperature in their mixing containers;
 - (c) those which fall under any of the following:
 1. those having two or more mixing axes or kneading axes; or
 2. those falling under the following i. and ii.:
 - i. those having one rotation axis with vibration function; and
 - ii. those having projections for kneading in their mixing containers and on the rotation axis;
- (x) jet mills capable of pulverizing propellants falling under any of item (vii) or item (viii), (b) through (f) or their raw materials, or their components;
- (x)-2 equipment for producing powder (limited to atomized powders, globular powders, or spheroidal powders) of metals falling under any of item (vii), (e) through (g), or their components;
- (xi) equipment for producing composites, fibers, prepregs, or preforms (limited to those usable in rockets or unmanned aerial vehicles capable of transporting payloads over a distance of 300 kilometers or more) and that falls under any of the following, or their components or accessories:
- (a) filament winding machines, fiber placement machines, or tow placement machines that are for positioning fibers and carrying out wrapping operations and winding operations, and that have three or more axes capable of controlling those operations in a correlated manner, or their controllers;

- (b) tape-laying machines that are for carrying out operations of positioning and laminating tape to manufacture airframes of aircrafts or structures of rockets that are composed of composites, and that have two or more shafts capable of controlling those operations in a correlated manner;
- (c) weaving machines or interlacing machines capable of three-dimensional weaving;
- (d) equipment for producing fibers that falls under any of the following:
 1. equipment for producing other fibers from polymer fibers;
 2. equipment for vapor depositing elements or compounds on base materials in a heated filament form;
 3. wet spinning apparatus for fire-resistant ceramics;
- (e) equipment designed for surface treating of fibers or the production of prepregs or preforms;
- (xii) nozzles used in fixing substances generated from the thermal decomposition of source gas onto base materials (limited to that carried out in the range of temperature between 1,300 °C or more and 2,900 °C or less and the absolute pressure range from 130 pascals or more to 20,000 pascals or less);
- (xiii) equipment that is for producing nozzle of rocket propulsion systems or reentry vehicle nose tips, and that falls under any of the following, or controllers for this:
 - (a) equipment for the densification of carbon of structural materials;
 - (b) equipment for fixing carbon generated from the thermal decomposition of source gas onto base materials;
- (xiv) isostatic presses falling under all of the following (a) through (c), or controllers for these:
 - (a) those with a maximum pressure of 69 megapascals or more;
 - (b) those capable of temperature control in hollow cavities (limited to the case in which the temperature of hollow cavities is 600 °C or more);
 - (c) those with an internal diameter of hollow cavities of 254 millimeters or more;
- (xv) furnaces designed for the densification of carbon of composites using carbon or carbon fibers, which are for chemical vapor deposition, or controllers for these;
- (xvi) structural materials falling under any of the following:
 - (a) composites (excluding prepregs with glass transition points of 145 °C or less) made from organic substances reinforced with fibers with a specific strength exceeding 76,200 meters and specific elastic modulus exceeding 3,180,000 meters or those with metal in the matrix phase, or molded products made from these (limited to those designed for use in rockets or unmanned aerial vehicles capable of transporting payloads over a distance

- of 300 kilometers or more, or for goods falling under item (ii), (a) or (b));
- (b) composites using carbon and carbon fibers designed for use in rockets or molded products made from these (limited to those usable in rockets capable of transporting payloads over a distance of 300 kilometers or more);
- (c) artificial graphite falling under any of the following (limited to artificial graphite usable for rocket nozzles or reentry vehicle's nose tips):
1. artificial graphite whose bulk density measured at 15 °C is 1.72 grams per cubic centimeter or more and the particle diameter is 100 micrometers or less, which is capable of being processed into any of the following:
 - i. cylinders with a diameter of 120 millimeters or more and a height of 50 millimeters or more, or tubes with an inner diameter of 65 millimeters or more, a thickness of 25 millimeters or more, and a height of 50 millimeters or more;
 - ii. a rectangular parallelepiped, each of the dimensions of which is 120 millimeters or more, 120 millimeters or more, and 50 millimeters or more, respectively;
 2. pyrolytic graphite (limited to that usable in rockets capable of transporting payloads over a distance of 300 kilometers or more, or unmanned aerial vehicles capable of transporting a payload of 500 kilograms or more over a distance of 300 kilometers or more);
 3. graphite strengthened with fibers (limited to that usable in rockets capable of transporting payloads over a distance of 300 kilometers or more or unmanned aerial vehicles capable of transporting a payload of 500 kilograms or more over a distance of 300 kilometers or more);
- (d) composites of ceramics (limited to those with relative permittivity of less than 6 in frequencies within the range of 100 megahertz or more to 100 gigahertz or less) for use in radomes (limited to those usable in rockets capable of transporting payloads over a distance of 300 kilometers or more or unmanned aerial vehicles capable of transporting a payload of 500 kilograms or more over a distance of 300 kilometers or more) of rockets or unmanned aerial vehicles;
- (e) unfired ceramics reinforced by silicon carbide or reinforced silicon carbide ceramic composites usable for nose tips of rockets or unmanned aerial vehicles, reentry vehicles, or nozzle flaps (limited to those usable in rockets capable of transporting payloads over a distance of 300 kilometers or more or unmanned aerial vehicles capable of transporting a payload of 500 kilograms or more over a distance of 300 kilometers or more);
- (f) ceramic composites that can be used in the components (including the nose tips, reentry vehicles, the leading edges of wings, thrust deflectors, control surfaces, or the nozzle throats of rocket motors) of rockets or

unmanned aerial vehicles capable of transporting payloads over a distance of 300 kilometers or more, and that are composed of a matrix of ultra-high temperature ceramics (including titanium diboride, zirconium diboride, niobium diboride, hafnium diboride, tantalum diboride, titanium carbide, zirconium carbide, niobium carbide, hafnium carbide, and tantalum carbide) that is reinforced with fibers or filaments;

- (g) powder whose main constituents are tungsten, molybdenum, or their alloys which fall under any of the following, or lumps of the powder (limited to those usable as structural materials for rockets or unmanned aerial vehicles capable of transporting payloads over a distance of 300 kilometers or more):
1. tungsten or powder with a tungsten content of 97% or more of the total weight of alloys, with a particle diameter of 50 micrometers or less;
 2. molybdenum or powder with a molybdenum content of 97% or more of the total weight of alloys, with a particle diameter of 50 micrometers or less;
 3. tungsten or lumps of powder with a tungsten content of 97% or more of the total weight of the alloys (for those impregnated with copper or silver, with a tungsten content of 80% or more of the total weight of the alloys), and which are capable of being processed into any of the following:
 - i. cylinders with a diameter of 120 millimeters or more and a height of 50 millimeters or more, or tubes with an inner diameter of 65 millimeters or more, a thickness of 25 millimeters or more, and a height of 50 millimeters or more;
 - ii. a rectangular parallelepiped, each of the dimensions of which is 120 millimeters or more, 120 millimeters or more, and 50 millimeters or more, respectively;
- (h) maraging steels usable in rockets capable of transporting payloads over a distance of 300 kilometers or more or unmanned aerial vehicles capable of transporting a payload of 500 kilograms or more over a distance of 300 kilometers or more, which fall under the following 1. and 2.:
1. maraging steels falling under any of the following:
 - i. those that have a maximum tensile strength of of 900,000,000 pascals or more measured at the solution heat treatment stage at a temperature of 20 °C;
 - ii. those that have a maximum tensile strength of 1,500,000,000 pascals or more measured at the precipitation hardening heat treatment stage at a temperature of 20 °C;
 2. maraging steels falling under any of the following:
 - i. those that are plates or tubes with a thickness of 5 mm or less;
 - ii. those that are tubes with a thickness of 50 mm or less and with an

- internal diameter of 270 millimeters or more;
- (i) austenitic-ferritic stainless steels stabilized by titanium, which fall under the following 1. and 2. (limited to those usable in rockets capable of transporting payloads over a distance of 300 kilometers or more or unmanned aerial vehicles capable of transporting a payload of 500 kilograms or more over a distance of 300 kilometers or more):
 - 1. those falling under all of the following i. through iii.:
 - i. those with a chrome content of 17% or more and 23% or less of the total weight and a nickel content of 4.5% or more and 7% or less of the total weight;
 - ii. those with a titanium content exceeding 0.1% of the total weight;
 - iii. steels with parts indicating an austenite structure of 10% or more of the total volume;
 - 2. austenitic-ferritic stainless steels falling under any of the following:
 - i. those that are ingots or rods with the smallest dimension value of 100 millimeters or more;
 - ii. those that are sheets with a width of 600 millimeters or more and a thickness of 3 millimeters or less;
 - iii. those that are tubes with an external diameter of 600 millimeters or more and a thickness of 3 millimeters or less;
 - (xvii) accelerometers or gyroscopes, or equipment, navigation equipment, or magnetic director sensors using them, which fall under any of the following (limited to those usable in rockets or unmanned aerial vehicles), or their components:
 - (a) navigation equipment designed for use in rockets or unmanned aerial vehicles capable of transporting payloads over a distance of 300 kilometers or more and designed to be used together with a gyrostabilizer or automated flight controller;
 - (b) gyro-astro compasses, or devices that derive the position or course by means of automatically tracking celestial bodies or artificial satellites;
 - (c) linear accelerometers designed for use in inertial navigation systems or guidance systems with scale factor reproducibility of less than 0.125% per year and bias reproducibility of less than 0.012263 meters per second squared per year (limited to those usable in rockets or unmanned aerial vehicles capable of transporting payloads over a distance of 300 kilometers or more);
 - (d) gyroscopes with a drift rate stability of less than 0.5 degrees per hour in a state of linear acceleration of 9.81 meters per second squared (limited to those usable in rockets or unmanned aerial vehicles capable of transporting payloads over a distance of 300 kilometers or more);
 - (e) accelerators or gyroscopes designed for use in inertial navigation systems

- or guidance systems, which are designed to be capable of being used at a linear acceleration exceeding 981 meters per second squared;
- (f) equipment using an accelerometer falling under (c) or (e), or a gyroscope falling under (d) or (e) (including attitude and heading reference system, gyrocompasses, inertial measurement units, inertial navigation systems, and inertial reference systems);
- (g) magnetic director sensors that fall under all of the following 1. through 3., with three or more axes:
1. magnetic director sensors with an internal tilt compensation in pitch angle (plus or minus 90 degrees) and roll angle (plus or minus 180 degrees);
 2. magnetic director sensors for which the effective value of the azimuthal precision at the point of plus or minus 80 degrees latitude is less than 0.5 degrees, relative to the local magnetic field;
 3. magnetic director sensors designed for integration with flight control or navigation systems;
- (xvii)-2 integrated navigation systems designed for use in rockets or unmanned aerial vehicles capable of transporting payloads over a distance of 300 kilometers or more, and with precision of circular error probability of 200 meters or less;
- (xvii)-3 equipment or tools for the production of accelerometers or gyroscopes, of equipment, navigation equipment, or magnetic director sensors using these, or of navigation systems; test equipment, calibration equipment, or alignment equipment; or components of these, which fall under any of the following:
- (a) production equipment or tools for those falling under preceding two items, or test equipment, calibration equipment, or alignment equipment (excluding those falling under any of the following (b) through (f)), or their components;
 - (b) centrifugal balancing machines (excluding those designed for testing dental equipment or medical equipment) falling under all of the following 1. through 4.:
 1. those that are not capable of testing rotors exceeding 3 kilograms in weight;
 2. those capable of testing rotors with speed exceeding 12,500 rotations per minute;
 3. those capable of testing unbalance on two or more planes;
 4. those with residual unbalance with respect to the rotor weight of 0.2 gram-millimeters or less per kilogram;
 - (c) display equipment designed to be capable of being used in machines falling under (b);

- (d) motion simulators or rate tables falling under all of the following 1. through 3. (excluding those designed to be usable for machine tools or medical devices):
 - 1. motion simulators or rate tables with two or more axes;
 - 2. motion simulators or rate tables that use a slip ring or non-contact type equipment capable of supplying electric power or transmitting signal information;
 - 3. motion simulators or rate tables falling under any of the following:
 - i. those that have one of the axis with an angular velocity of 400 degrees or more or 30 degrees or less per second and the resolution of the angular velocity is 6 degrees or less per second, with the precision of the angular velocity of 0.6 degrees or less per second;
 - ii. those that have one of the axis with an angular velocity that is stabilized at the precision of 0.05 % or less when its rotation is 10 degrees or more;
 - iii. those with an angular positioning precision of 5 seconds or less;
- (e) positioning tables falling under the following 1. and 2. (excluding those designed for use in machine tools or medical devices):
 - 1. those with two or more axes;
 - 2. those with an angular positioning precision of 5 seconds or less;
- (f) centrifugal accelerator testing machines capable of applying an acceleration rate exceeding 980 meters per second squared and that uses a slip ring or non-contact-type equipment capable of supplying electricity and transmitting signal information;
- (xviii) flight controllers or attitude controllers designed for use in a rocket or unmanned aerial vehicle capable of transporting a payload of 500 kilograms or more over a distance of 300 kilometers or more;
- (xviii)-2 servo valves designed for use for those set forth in the preceding item, and designed to be able to withstand vibrations with the effective rate of acceleration exceeding 98 meters per second squared within the frequency range from 20 hertz to 2,000 hertz;
- (xviii)-3 test equipment, calibration equipment, or alignment equipment for those set forth in preceding two items;
- (xix) avionics equipment falling under any of the following:
 - (a) radars (limited to those usable for rockets or unmanned aerial vehicles capable of transporting a payload of 500 kilograms or more over a distance of 300 kilometers or more);
 - (b) passive sensors for detecting the direction of a specific electromagnetic wave source or landform characteristics (limited to those designed for use in rockets or unmanned aerial vehicles capable of transporting a payload of 500 kilograms or more over a distance of 300 kilometers or more);

- (c) equipment for receiving radio waves from a satellite navigation system (including a global navigation satellite system and an area navigation satellite system) which falls under the following 1. or 2., or components specially designed for such equipment:
 - 1. equipment designed for use in rockets or unmanned aerial vehicles capable of transporting a payload of 500 kilograms or more over a distance of 300 kilometers or more;
 - 2. equipment designed for use in mobile objects that navigate or fly, which falls under any of the following:
 - i. equipment capable of providing information related to navigation while flying at a speed exceeding 600 meters per second;
 - ii. equipment designed or improved for the purpose of use by the military forces or a governmental organization, and which has a function for decoding codes for accessing encoded signals or data used in a satellite navigation system (including a global navigation satellite system and an area navigation satellite system) (excluding those designed to receive navigational data for civilian use or for ensuring the safety of human life and physical safety);
 - iii. equipment designed to have a null-steerable antenna, an antenna capable of electronic scanning, or other interference elimination function for the purpose of functioning in an environment in which there is intentional interference (excluding those designed to receive navigational data for civilian use or for ensuring the safety of human life and physical safety);
- (d) umbilical electrical connectors or interstage electrical connectors (including electrical connectors between payloads and rockets) designed for use in rockets capable of transporting payloads over a distance of 300 kilometers or more;
- (xix)-2 thermal batteries designed for use in rockets or unmanned aerial vehicles capable of transporting payloads over a distance of 300 kilometers or more, which contain solid non-conducting inorganic salt as electrolyte;
- (xx) gravimeters for mounting on aircraft or ships that are precise to within 0.7 milligals or less and that have a time required for measurement of within 2 minutes (limited to those usable in rockets or unmanned aerial vehicles capable of transporting a payload of 500 kilograms or more over a distance of 300 kilometers or more), or their components;
- (xx)-2 gravity gradiometers for mounting on aircraft or ships (limited to those usable in rockets or unmanned aerial vehicles capable of transporting a payload of 500 kilograms or more over a distance of 300 kilometers or more), or their components;
- (xxi) launch pads or ground launch support equipment for rockets or unmanned

- aerial vehicles falling under any of the following:
- (a) equipment designed for handling, controlling, operating, or launching rockets or unmanned aerial vehicles capable of transporting payloads over a distance of 300 kilometers or more;
 - (b) vehicles designed for transporting, handling, controlling, operating, or launching rockets or unmanned aerial vehicles capable of transporting a payload of 500 kilograms or more over a distance of 300 kilometers or more;
- (xxii) radio telemetry equipment or radio remote controllers (including ground equipment) designed for use in rockets or unmanned aerial vehicles capable of transporting payloads over a distance of 300 kilometers or more, which do not fall under any of the following:
- (a) equipment designed for use in manned aircraft or artificial satellites;
 - (b) equipment designed for use in mobile objects used on land or sea;
 - (c) equipment designed to receive information from satellite navigational systems that provide navigational data for civilian use or for ensuring the safety of human life and physical safety;
- (xxii)-2 tracking devices usable in rockets or unmanned aerial vehicles capable of transporting payloads over a distance of 300 kilometers or more, which fall under any of the following:
- (a) tracking devices using code converters mounted in rockets or unmanned aerial vehicles and capable of instantly measuring flight position and speed data in mutual coordination with linked devices on ground, the sea, or flying objects, or with a satellite navigational system;
 - (b) radar for distance measurement having a tracking device using light, which falls under all of the following 1. through 3.:
 1. radar with angular resolution of less than 1.5 milliradians;
 2. radar with the mean square of distance resolution of less than 10 meters, which is capable of measuring a distance of 30 kilometers or more;
 3. radar with speed resolution of less than 3 meters per second;
- (xxiii) analog computers or digital computers designed for use in rockets capable of transporting a payload of 500 kilograms or more over a distance of 300 kilometers or more, which fall under any of the following:
- (a) those designed to be usable at temperatures from below -45°C to over 55°C ;
 - (b) those designed to be able to withstand radiation exposure exceeding 500,000 rads or more on a silicon conversion basis for the total absorbed dose;
- (xxiv) integrated circuits for analog-to-digital conversion or analog-to-digital converters (limited to those usable in rockets or unmanned aerial vehicles capable of transporting a payload of 500 kilograms or more over a distance of

300 kilometers or more), which fall under any of the following:

- (a) integrated circuits for analog-to-digital conversion which are designed to be able to withstand radiation exposure exceeding 500,000 rads on a silicon conversion basis for the total absorbed dose, or which fall under the following 1. and 2.:
 - 1. those designed to be usable in a temperature from below -54°C to a temperature exceeding 125°C ;
 - 2. those that are sealed airtight;
- (b) assemblies or modules for electric input-type analog-to-digital conversion which fall under the following 1. and 2.:
 - 1. those designed to be usable in a temperature from below -45°C to a temperature exceeding 80°C ; and
 - 2. those that incorporates integrated circuits falling under (a);
- (xxv) vibration test equipment or their components, aerodynamic test equipment, combustion test equipment, environmental test equipment, electron accelerators, or equipment using them, which fall under any of the following:
 - (a) vibration test equipment or their components, which fall under any of the following (limited to those usable in rockets or unmanned aerial vehicles capable of transporting payloads over a distance of 300 kilometers or more, or in the development or testing of goods falling under item (ii)):
 - 1. digitally controlled vibration test equipment that falls under the following i. and ii.:
 - i. equipment with exciting force of 50 kilonewtons or more in the absence of a test object and capable of generating vibrations with an effective rate of acceleration of 98 meters or more per second squared at any frequency of 20 hertz or more and 2,000 hertz or less;
 - ii. equipment using feedback control technology or closed-loop control technology;
 - 2. components of vibration test equipment, which fall under any of the following (limited to those usable in rockets or unmanned aerial vehicles capable of transporting a payload of 300 kilometers or more, or in the development or testing of goods falling under item (ii)):
 - i. components designed for use in controlling the vibration test equipment falling under 1. and use a program for vibration testing, and which digitally control vibration testing in real time in a bandwidth exceeding 5 kilohertz;
 - ii. vibration generators usable for vibration test equipment falling under 1., with an exciting force of 50 kilonewtons or more in the absence of a test object;
 - iii. components of vibration tables or vibration generators usable for

- vibration test equipment falling under 1. and designed for use by connecting two or more vibration generators in order to generate vibrations with an exciting force of 50 kilonewtons or more in the absence of a test object;
- (b) aerodynamic test equipment for creating a state in which the speed is Mach 0.9 or more (limited to those usable in rockets or unmanned aerial vehicles capable of transporting payloads over a distance of 300 kilometers or more, or in the development or testing of unmanned aerial vehicles falling under item (i)-3, or goods falling under item (ii); excluding wind tunnels with a speed of Mach 3 or less and the length for the cross section of the measuring part is not more than 250 millimeters, and those falling under (f));
 - (c) combustion test equipment capable of testing solid rockets, liquid rockets with thrust exceeding 68 kilonewtons, or rocket propulsion units, or one capable of measuring the thrust components in three axial directions simultaneously (limited to those usable in rockets or unmanned aerial vehicles capable of transporting payloads over a distance of 300 kilometers or more, or in the development or testing of goods falling under item (ii));
 - (d) environmental test equipment capable of simulating the flying state, which falls under the following 1. and 2. (limited to those usable in rockets or unmanned aerial vehicles capable of transporting payloads over a distance of 300 kilometers or more, or in the development or testing of unmanned aerial vehicles falling under item (i)-3, or goods falling under item (ii)):
 - 1. equipment capable of simulating the condition in which the altitude is 15,000 meters or more or all the conditions in the temperature range of $-50\text{ }^{\circ}\text{C}$ to $125\text{ }^{\circ}\text{C}$;
 - 2. equipment capable of generating vibrations in the condition in which the frequency range is 20 hertz to 2,000 hertz and the effective rate of acceleration is 98 meters or more per second squared in the absence of a test object (limited to those with an exciting force of 5 kilonewtons or more), those capable of generating sounds with the sound pressure level of 140 decibels or more when the reference sound pressure is 20 micropascals, or those with the total rated sound output of 4 kilowatts or more;
 - (e) electron accelerators capable of emitting electromagnetic waves by means of a breaking radiation from accelerated electrons having an energy of 2 mega electron volts or more or equipment using these (excluding those designed for medical use and limited to those usable in rockets or unmanned aerial vehicles capable of transporting payloads over a distance of 300 kilometers or more, or in the development or testing of goods falling under item (ii));

- (f) aerothermodynamic test equipment (including plasma arcjet equipment and plasma wind tunnels for investigating the thermal and mechanical effects of airflow around an object) that falls under any of the following (limited to those usable in rockets or unmanned aerial vehicles capable of transporting payloads over a distance of 300 kilometers or more, or in the development or testing of goods falling under item (ii), (a) or (b)):
 1. those capable of supplying electricity of 5 megawatts or more;
 2. those capable of supplying gas with a pressure of 3 megapascals or more;
- (xxv)-2 hybrid computers for designing rockets capable of transporting a payload of 500 kilograms or more over a distance of 300 kilometers or more, goods falling under item (ii), (a) (limited to those usable in rockets capable of transporting a payload of 500 kilograms or more) or goods falling under item (ii), (b) (limited to those that have programs falling under Article 16, paragraph (1), item (xi));
- (xxvi) material or equipment using stealth technology that reduce the level of the reflection or emission of radio waves, sound waves (including ultrasonic waves), or light (limited to ultraviolet rays and infrared rays), which is usable in rockets or unmanned aerial vehicles capable of transporting payloads over a distance of 300 kilometers or more, unmanned aerial vehicles falling under item (i)-3, or goods falling under item (ii), or test equipment for these;
- (xxvii) integrated circuits, detectors, or radomes (limited to those usable in rockets or unmanned aerial vehicles capable of transporting a payload of 500 kilograms or more over a distance of 300 kilometers or more), which fall under any of the following:
 - (a) integrated circuits designed to be able to withstand radiation exposure exceeding 500,000 rads on a silicon conversion basis for the total absorbed dose, and usable for protecting rockets or unmanned aerial vehicles from nuclear impact;
 - (b) detectors designed to protect rockets or unmanned aerial vehicles from nuclear impact;
 - (c) radomes designed to be able to withstand a thermal shock exceeding 4,184 kilojoules per square meter at a pressure exceeding 50 kilopascals and usable for protecting rockets or unmanned aerial vehicles from nuclear impact.

Article 4 The goods with specifications prescribed by Order of the Ministry of Economy, Trade and Industry that are referred to in row (5) of Appended Table 1 of the Export Order are goods falling under any of the following:

- (i) fluorine compound products designed to be used in aircraft or artificial satellites, or other flying objects for use in space pioneering, which are seals,

- gaskets, sealants, or fuel storage bags with a content of fluorine compounds falling under item (xiv), (b) or (c) exceeding 50% of the total weight;
- (ii) molded products that use fibers (including semi-finished products; hereinafter the same applies in this item) that fall under any of the following:
 - (a) molded products manufactured using prepreg or preform falling under item (xv), (e);
 - (b) molded products manufactured using fibers that fall under any of the following and whose matrix is metal or carbon:
 - 1. carbon fibers that fall under any of the following i. or ii.:
 - i. those with a specific elastic modulus exceeding 10,150,000 meters;
 - ii. those with a specific strength exceeding 177,000 meters;
 - 2. carbon fibers that fall under item (xv), (c);
 - (iii) products of aromatic polyimide (limited to those for which polymerization or cross-linking by action through heat, radiation, or catalysts or other external action is impossible and which do not melt without pyrolysis) (limited to films, sheets, tapes, or ribbon shaped products), which fall under any of the following (excluding those which are coated or laminated with copper and are for printed boards of electronic circuits):
 - (a) those with a thickness exceeding 0.254 millimeters;
 - (b) those coated or laminated with carbon, graphite, metal, or magnetic materials;
 - (iv) devices for manufacturing objects that fall under item (ii), item (xv), or Article 14, item (i), which fall under any of the following, or their components or accessories (excluding those falling under Article 3, item (xi)):
 - (a) filament winding devices that perform fiber positioning, wrapping operations, or winding operations, which have three or more primary axes (limited to those that operate by servocontrol), and are capable of controlling those operations in a correlated manner;
 - (b) devices for manufacturing the airframes of aircraft or the structure of rockets made of fibers, which position tapes and perform laminating operations, and have five or more primary axes (limited to those that operate by servocontrol) capable of controlling those operations in a correlated manner;
 - (c) looms or interlacing machines capable of three-dimensional weaving, which are specially designed or altered to weave, knit, or braid fiber for molded products;
 - (d) fiber manufacturing devices that fall under any of the following:
 - 1. devices that manufacture carbon fibers or silicon carbide fibers from polymer fibers;
 - 2. devices that manufacture silicon carbide fibers and that chemically

- vapor deposit elements or compounds on heated filament-shaped base materials;
3. wet spinning equipment for fire resistant ceramics;
 4. devices that manufacture alumina fibers from precursor fibers containing aluminum by heat treatment;
- (e) devices that manufacture prepregs that fall under item (xv), (e) by using a hot melt method;
- (f) non-destructive inspection devices designed for inspecting composite materials, which fall under any of the following:
1. X-ray tomography system for three-dimensional defect inspections;
 2. ultrasonic testing machines capable of numerical control in which the motions for positioning transmitters or receivers, or positioning transceivers are simultaneously controlled and which are programmed to measure the three-dimensional contours of objects by four or more axes during inspections;
- (g) devices that are for manufacturing airframes for aircrafts or the structure of rockets made of fibers that position tows and perform laminating operations, and that have two or more primary axes (limited to those that operate by servocontrol) capable of controlling those operations in a correlated manner;
- (v) devices designed for the manufacture of alloy powders or alloy particulate matter, which fall under (a) and (b);
- (a) those specially designed to prevent contamination;
 - (b) those designed specifically for use in the methods that fall under any of items (vii), (c) 2., i. through viii.;
- (vi) tools (including molds) for super plastic forming or diffusion bonding of titanium, aluminum, or their alloys, which are designed to manufacture things that fall under any of the following:
- (a) structures of aircraft, artificial satellites, and other types of flying objects for use in space pioneering;
 - (b) engines for aircraft, artificial satellites and other types of flying objects for use in space pioneering;
 - (c) components of those falling under (a) or (b);
- (vii) alloys, or their powders, which fall under any of the following (excluding those specially prepared to be used for coating):
- (a) alloys that have become aluminum compounds and that fall under any of the following:
 1. nickel alloys with a content of aluminum of 15% or more and 38% or less of the total weight, which contain alloy elements other than aluminum or nickel;
 2. titanium alloys with a content of aluminum of 10% or more of the total

- weight, which contain alloy elements other than aluminum or titanium;
- (b) alloys made of alloy powders that fall under (c), which fall under any of the following:
1. nickel alloys that fall under any of the following:
 - i. nickel alloys with a stress breakage time of 10,000 hours or more when a load is added that generates a stress of 676 megapascals at a temperature of 650 °C;
 - ii. nickel alloys with a low cycle fatigue life of 10,000 cycles or more when a load is added that generates a stress of 1,095 megapascals at a temperature of 550 °C;
 2. niobium alloys that fall under any of the following:
 - i. niobium alloys with a stress breakage time of 10,000 hours or more when a load is added that generates a stress of 400 megapascals at a temperature of 800 °C;
 - ii. niobium alloy with a low cycle fatigue life of 10,000 cycles or more when a load is added that generates a stress of 700 megapascals at a temperature of 700 °C;
 3. titanium alloys that fall under any of the following:
 - i. titanium alloys with a stress breakage time of 10,000 hours or more when a load is added that generates a stress of 200 megapascals at a temperature of 450 °C;
 - ii. titanium alloys with a low cycle fatigue life of 10,000 cycles or more when a load is added that generates a stress of 400 megapascals at a temperature of 450 °C;
 4. aluminum alloys with a tensile strength falling under any of the following:
 - i. aluminum alloys with a tensile strength of 240 megapascals or more at a temperature of 200 °C;
 - ii. aluminum alloys with a tensile strength of 415 megapascals or more at a temperature of 25 °C;
 5. magnesium alloys with a tensile strength of 345 megapascals or more, which has a corrosion rate of less than 1 millimeter per year when immersed in 3 percent saline water;
- (c) alloy powders that fall under all of the following 1. through 3.:
1. alloy powders made of materials that fall under any of the following:
 - i. nickel alloys with a number of particles other than metals that become mixed during the manufacturing process is less than three per 1,000,000,000 particles (limited to those with a diameter exceeding 100 micrometers), which are made of three or more types of elements including aluminum and nickel;
 - ii. niobium alloys composed of three or more types of elements which

- include niobium and any of the elements of aluminum, silicon or titanium;
- iii. titanium alloys composed of three or more types of elements including aluminum or titanium;
- iv. aluminum alloys composed of three or more types of elements that include aluminum and any of the elements of magnesium, zinc or iron;
- v. magnesium alloys composed of three or more types of elements including aluminum and magnesium;
- 2. alloy powders manufactured by any of the following methods:
 - i. vacuum atomization method;
 - ii. gas atomization method;
 - iii. rotary atomization method;
 - iv. splat-quenching method;
 - v. melt spinning method and pulverization method;
 - vi. melt extraction method and pulverization method;
 - vii. mechanical alloying method;
 - viii. plasma atomization method;
- 3. alloy powders that can manufacture those that fall under (a) or (b);
- (d) alloy materials that fall under all of the following 1. through 3.:
 - 1. those made of alloy powders that fall under any of (c) 1., i. through v.;
 - 2. those that are not finely pulverized but flake shaped, ribbon shaped, or in a shape of a thin rod;
 - 3. those manufactured by any of the following methods:
 - i. splat-quenching method;
 - ii. melt spinning method;
 - iii. melt extraction method;
- (viii) metallic magnetic materials that fall under any of the following:
 - (a) those with an initial relative permeability of 120,000 or more and with a thickness of 0.05 millimeters or less;
 - (b) magnetostrictive alloys that fall under any of the following:
 - 1. those with a saturated magnetostriction exceeding 0.0005;
 - 2. those with an electromechanical coupling coefficient exceeding 0.8;
 - (c) strip-shaped amorphous alloys or nano crystal alloys that fall under the following 1. and 2.:
 - 1. those whose iron, cobalt, or nickel content, individually or combined, is 75% or more of the total weight;
 - 2. those with a saturated magnetic flux density of 1.6 teslas or more that fall under any of the following:
 - i. those with a thickness of 0.02 millimeters or less;
 - ii. those with an electrical resistivity of 2 microohm-meters or more;
- (ix) uranium-titanium alloys or tungsten alloys whose matrix is of iron, nickel or copper, which fall under all of the following (a) through (d):

- (a) those with a density exceeding 17.5 gram per cubic centimeter;
- (b) those with an elastic limit exceeding 880 megapascals;
- (c) those with a tensile strength exceeding 1,270 megapascals;
- (d) those with an elongation percentage exceeding 8%;
- (x) superconductive materials that fall under any of the following (limited to those with a length exceeding 100 meters or with the total weight exceeding 100 grams):
 - (a) superconductive materials which have multiple filaments that include niobium titanium filaments, which fall under the following 1. and 2.:
 - 1. those whose filaments are embedded in a matrix other than copper or copper alloy;
 - 2. those with a filament cross-section area of less than 28/1,000,000 square millimeters;
 - (b) superconductive materials composed of superconductive filaments other than niobium titanium, which fall under all of the following 1. through 3.:
 - 1. those with a critical temperature exceeding $-263.31\text{ }^{\circ}\text{C}$ when a magnetic field is not applied;
 - 2. Deleted
 - 3. those that can maintain a superconductive state at a temperature of $-268.96\text{ }^{\circ}\text{C}$ when exposed to a magnetic field oriented in any direction perpendicular to the vertical axis of the material and of a magnetic flux density of 12 tesla, with a critical current density exceeding 300 amperes per square millimeter in all cross sections;
 - (c) superconductive materials composed of superconductive filaments, which can maintain a superconductive state at a temperature exceeding $-158.16\text{ }^{\circ}\text{C}$;
- (xi) materials that can be used as lubricant, liquids that can be used for vibration prevention, or liquids for refrigerants, which fall under any of the following:
 - (a) deleted;
 - (b) materials that can be used as lubricant that has substances falling under any of the following as its primary component:
 - 1. phenylene ether, alkylphenylene ether, phenylene thioether, alkyl phenylene thioether or mixtures of these, in which the total number of ether groups, or thioether groups, or of their functional groups is three or more;
 - 2. fluorinated silicone oils with dynamic viscosity measured at a temperature of $25\text{ }^{\circ}\text{C}$ of less than 5,000 square millimeters per second;
 - (c) liquids that can be used for vibration prevention with a purity exceeding 99.8% and in which the number of particle impurities that have a diameter larger than 200 micrometers is less than 25 per 100 milliliters, with a total

- content of substances that fall under any of the following that is 85% or more of the total weight:
1. dibromo tetrafluoro ethane;
 2. polychloro trifluoro ethylene;
 3. polybromo trifluoro ethylene;
- (d) liquids designed to be used as refrigerants for electronic devices and made of fluorocarbons, which fall under the following 1. and 2.:
1. liquids that include substances that fall under any of the following, whose total content is 85% or more of the total weight:
 - i. monomers of perfluoro polyalkyl ether triazine;
 - ii. monomers of perfluoro aliphatic ether;
 - iii. perfluoro alkylamine;
 - iv. perfluoro cycloalkane;
 - v. perfluoro alkane;
 2. liquids that fall under all of the following i through iii:
 - i. those with a density at a temperature of 25 °C of 1.5 grams or more per milliliter;
 - ii. those that are liquids at the temperature of 0 °C;
 - iii. those that have a fluorine content of 60% or more of the total weight;
- (xii) ceramic powder, ceramic composite materials, or precursor substance of materials for ceramics that fall under any of the following:
- (a) ceramic powder manufactured using titanium diboride with a content of metallic impurities less than 0.5% of the total weight, with an average diameter of particles of 5 micrometers or less and a total weight of the particles with diameters exceeding 10 micrometers are 10% or less of the total weight;
 - (b) Deleted
 - (c) ceramic composite materials that have glass or oxides as a matrix, which fall under any of the following:
 1. those reinforced with continuous fiber composed of any of the following (excluding those with a tensile strength less than 700 megapascals at a temperature of 1,000 °C or those with a creep distortion exceeding 1% when a load that generates a stress of 100 megapascals is added for 100 hours at a temperature of 1,000 °C):
 - i. aluminum oxide; or
 - ii. silicon, carbon, and nitrogen;
 2. those reinforced with fiber falling under the following i. and ii.:
 - i. those composed of any of the following combinations of elements:
 - a. silicon and nitrogen;
 - b. silicon and carbon;
 - c. silicon, aluminum, oxygen, and nitrogen; or

- d. silicon, oxygen, and nitrogen;
- ii. those with a specific strength exceeding 12,700 meters;
- (d) ceramic composite materials whose matrix is silicon, zirconium, or boron carbide or nitride;
- (e) precursor substance that will become materials for ceramics used to manufacture any of the substances referred to in (c) or (d), which fall under any of the following:
 - 1. polydiorgano silane;
 - 2. polysilazane; or
 - 3. polycarbo silazane;
- (xiii) non-fluorinated compounds or non-fluorinated polymers for which polymerization is possible, which fall under any of the following:
 - (a) bismaleimide, aromatic polyamideimide with a glass transition point exceeding 290 °C, aromatic polyimide with a glass transition point exceeding 232 °C, or aromatic polyetherimides with a glass transition point exceeding 290 °C;
 - (b) Deleted
 - (c) Deleted
 - (d) polyallylene ketone;
 - (e) polyallylene sulfide having allylene groups comprised of biphenylene, triphenylene or a combination of these;
 - (f) polybiphenylene ether sulfone with a glass transition point exceeding 290 °C;
- (xiv) fluorine compounds that fall under any of the following:
 - (a) Deleted
 - (b) fluorinated polyimides with a content of bonded fluorine of 10% or more of the total weight;
 - (c) elastic bodies of fluorinated phosphazenes with a content of bonded fluorine of 30% or more of the total weight;
- (xv) fibers or prepregs or preforms that use the fibers, which fall under any of the following:
 - (a) organic fibers (excluding polyethylene fibers) that fall under any of the following 1. and 2.:
 - 1. those with a specific elastic modulus exceeding 12,700,000 meters;
 - 2. those with a specific strength exceeding 235,000 meters;
 - (b) carbon fibers that fall under the following 1. and 2.:
 - 1. those with a specific elastic modulus exceeding 14,650,000 meters;
 - 2. those with a specific strength exceeding 268,200 meters;
 - (c) inorganic fibers that fall under the following 1. and 2.:
 - 1. those falling under either of the following:
 - i. those with a silicon dioxide content that is 50% or more of the total

- weight and with a specific elastic modulus exceeding 2,540,000 meters; or
- ii. those with a specific elastic modulus exceeding 600,000 meters (excluding those falling under i.).
2. those with melting points, softening points, decomposition points, or sublimating temperature exceeding 1,649 °C in an inert environment; provided, however, that those falling under any of the following are excluded:
- i. those with a specific elastic modulus of less than 10,000,000 meters which are the short fibers of multiphase polycrystalline alumina fibers with a content of silica of 3% or more of the total weight, and which are cut up in short pieces or in random mat form;
 - ii. molybdenum fibers or molybdenum alloy fibers;
 - iii. boron fibers;
 - iv. short fibers of ceramic fibers with melting points, softening points, decomposition points, or sublimating temperature exceeding 1,770 °C in an inert environment;
- (d) fibers made of those that fall under any of the following, or fibers woven by mixing those fibers and fibers that fall under any of (a) through (c):
- 1. aromatic polyetherimides that fall under item (xiii), (a);
 - 2. fibers that fall under any of item (xiii), (d) through (f);
- (e) prepregs or preforms that use the following 1. and 2.:
- 1. those which fall under the following i. or ii.:
 - i. inorganic fibers that fall under (c);
 - ii. organic fibers or carbon fibers that fall under the following a. and b.:
 - a. those with a specific elastic modulus exceeding 10,150,000 meters;
 - b. those with a specific strength exceeding 177,000 meters;
 - 2. resins that fall under any of the following:
 - i. those that fall under item (xiii) or item (xiv), (b);
 - ii. phenol resin with a glass transition point of 180 °C or more when measured by dynamic mechanical analysis;
 - iii. those with a glass transition point of 232 °C or more when measured by dynamic mechanical analysis (excluding phenol resin and those falling under i.);
- (xvi) boron with a particle diameter of 60 micrometers or less and with a weight-based purity level of 85% or more boron, or a mixture of these, boron alloy with a particle diameter of 60 micrometers or less and with a weight-based purity level of 85% or more boron, or guanidine nitrate or nitro guanidine.

Article 5 The goods with specifications prescribed by Order of the Ministry of Economy, Trade and Industry that are referred to in row 6 of Appended Table 1

of the Export Order are goods falling under any of the following:

- (i) bearings or their components that fall under any of the following:
 - (a) ball bearings or roller bearings (excluding tapered roller bearings) whose inner rings, outer rings, and rolling elements are all made of monel or beryllium and whose precision grade specified by Japanese Industrial Standard (JIS) B1514-1 is Class 2 or Class 4 or higher;
 - (b) Deleted
 - (c) active magnetic bearing systems that fall under any of the following or components that were specially designed for that purpose:
 - 1. those composed of materials with a magnetic flux density of 2 teslas or more and a yield point exceeding 414 megapascals;
 - 2. those that are entirely electromagnetic and use a three-dimensional homopolar bias excitation actuator;
 - 3. those that have a position detector that can be used at temperatures of 177 °C and higher;
- (ii) machine tools (limited to those that can process metals, ceramics, or composite materials) to which an electronic controller can be attached, which fall under any of the following (a) through (e) (excluding those that fall under (f) and optical finishing machine tools):
 - (a) machine tools that are capable of lathe turning and that have two or more axes capable of contouring control, which fall under any of the following (excluding those falling under 3.):
 - 1. machine tools that have straight axes whose movement is less than 1 meter, at least one of which has 0.0009 millimeters or less of repeatability in its unidirectional positioning;
 - 2. machine tools that have straight axes whose movement is 1 meter or more, at least one of which has 0.0011 millimeters or less of repeatability in its unidirectional positioning;
 - 3. lathes used to work on bars in which materials are inserted into a spindle hole for processing, which fall under the following i and ii:
 - i. those capable of processing materials with a maximum diameter of 42 millimeters;
 - ii. those to which a chuck cannot be attached;
 - (b) machine tools capable of milling, which fall under any of the following:
 - 1. machine tools that have three straight axes capable of contouring control and one rotating axis capable of contouring control, which fall under any of the following:
 - i. machine tools that have straight axes whose movement is less than 1 meter, at least one of which has 0.0009 millimeters or less of repeatability in its unidirectional positioning; or
 - ii. machine tools that have straight axes whose movement is 1 meter or

- more, at least one of which has 0.0011 millimeters or less of repeatability in its unidirectional positioning;
- 2 machine tools that have five or more axes capable of controlling contour, which fall under any of the following:
- i. machine tools that have straight axes whose movement is less than 1 meter, at least one of which has 0.0009 millimeters or less of repeatability in its unidirectional positioning;
 - ii. machine tools that have straight axes whose movement is 1 meter or more but less than 4 meters, at least one of which has 0.0014 millimeters or less of repeatability in its unidirectional positioning; or
 - iii. machine tools that have straight axes whose movement is 4 meters or more, at least one of which has 0.006 millimeters or less of repeatability in its unidirectional positioning;
3. jig boring machines with at least one straight axis that has 0.0011 millimeters or less of repeatability in its unidirectional positioning;
4. machine tools exclusively designed for fly cutting, which fall under any of the following i. and ii.:
- i. those for which both the radial direction deflection and axial direction deflection are less than 0.0004 millimeters per single rotation of the spindle;
 - ii. those with straightness of less than 2 seconds over a moving distance exceeding 300 millimeters;
- (c) machine tools capable of grinding, which fall under any of the following (excluding those which fall under any of the following 3. through 5.):
1. those that have one or more straight axes with 0.0011 millimeters or less of repeatability in its unidirectional positioning, which have three or four axes capable of contouring control;
 2. those that have five or more axes capable of controlling contour, which fall under any of the following:
 - i. machine tools that have straight axes whose movement is less than 1 meter, at least one of which has 0.0011 millimeters or less of repeatability in its unidirectional positioning;
 - ii. machine tools that have straight axes whose movement is 1 meter or more but less than 4 meters, any one of which has 0.0014 millimeters or less of repeatability in its unidirectional positioning; or
 - iii. machine tools that have straight axes whose movement is 4 meters or more, any one of which has 0.006 millimeters or less of repeatability in its unidirectional positioning;
 3. external cylindrical grinders, internal cylindrical grinders, or internal-external cylindrical grinders designed to grind a cylinder with an external diameter or length of less than 150 millimeters;

- 4. machine tools that are designed to be used as jig grinding machines and that do not have a Z axis or W axis with less than 0.0011 millimeters of repeatability in its unidirectional positioning;
- 5. flat surface grinders;
- (d) machine tools capable of electrical discharge machining (excluding wire electrical discharge machining) with two or more rotational axes capable of controlling contour;
- (e) machine tools, electron beam machines, or laser beam machines capable of liquid jet processing, with two or more rotational axes that fall under the following 1. and 2.:
 - 1. those capable of controlling contour;
 - 2. those whose rotating axis has a positioning precision of less than 0.003 degrees;
- (f) machine tools that are designed exclusively for manufacturing any of the following:
 - 1. gears;
 - 2. crankshafts or camshafts;
 - 3. tools or blades;
 - 4. extruder worms;
 - 5. gemstones;
 - 6. dentures;
- (iii) machine tools (limited to those that can process metals, ceramics, or composite materials) to which an electronic controller can be attached, which are capable of deep bore drilling or lathe turning (limited to those that are capable of deep hole drilling), and can bore a hole to a depth exceeding 5,000 millimeters;
- (iv) optical finishing machine tools capable of numerical control and capable of processing nonspherical optical surfaces by selectively removing materials, which fall under all of the following (a) through (d):
 - (a) those with a finishing shape and dimensional tolerances of less than 1.0 micrometers;
 - (b) those that produce a finished surface roughness whose root mean square is less than 100 nanometers;
 - (c) those with four or more axes capable of controlling contour;
 - (d) those that use any of the following methods:
 - 1. magnetorheological finishing;
 - 2. electrorheological finishing;
 - 3. energetic particle beam finishing;
 - 4. inflatable membrane tool finishing;
 - 5. fluid jet finishing;
- (v) machine tools capable of numerical control that are designed for performing

- finishing processing of spur gears, helical gears, or double-helical gears with a Rockwell hardness of 40 or greater as measured by the C scale according to the measurement methods specified in Japanese Industrial Standard (JIS) Z2245 (Rockwell hardness test method), which are capable of processing those falling under all of the following (a) through (c):
- (a) those with a pitch diameter exceeding 1,250 millimeters;
 - (b) those with a face width that is 15% or more of the pitch diameter;
 - (c) those with a precision grade specified by International Standard ISO 1328 (Cylindrical Gears - ISO System of Accuracy) of Class 3 or higher;
- (vi) isostatic presses that fall under any of the following (a) and (b), or their components or accessories:
- (a) isostatic presses that have hollow cavities with an internal diameter of 406 millimeters or more and capable of controlling temperature inside the hollow cavities;
 - (b) isostatic presses that fall under any of the following:
 - 1. those with a maximum pressure exceeding 207 megapascals;
 - 2. those capable of controlling temperatures exceeding 1,500 °C in hollow cavities;
 - 3. those that have devices to inject hydrocarbons and devices to remove gaseous decomposition products;
- (vii) coating devices for non-electronic substrates which utilize the coating method set forth in column 2 of Appended Table 3, which perform the coating set forth in column 4 of that table on base materials set forth in column 3 of that table, and which fall under any of the following, or components specially designed for their automatic operation:
- (a) coating devices that employ the method of fixing coating materials that are produced by the chemical reaction of source gases to the surface of base materials, which fall under the following 1. and 2.:
 - 1. those that use any of the following methods:
 - i. pulse method;
 - ii. controlled nucleation thermochemical deposition method;
 - iii. methods that fix coating materials to the surface of base materials under plasma discharge;
 - 2. those that fall under any of the following:
 - i. those incorporating rotational axis seals that can be used at 10 millipascals or less;
 - ii. those that have internal film thickness control functions;
 - (b) those that employ ion implantation method, with a beam current of 5 milliamperes or more;
 - (c) coating devices that employ methods of fixing coating materials that have been vaporized by electron beams to the surface of base materials and

- incorporate power supply devices with a capacity exceeding 80 kilowatts, which have the equipment falling under any of the following:
1. devices that implement the level control of molten liquid by using laser light, to control ingot feeding;
 2. deposition rate monitoring devices capable of achieving control by using computers, which utilize the principle of photo-luminescence of ionized atoms in the evaporant stream to control the deposition rate in coating two or more elements;
- (d) plasma spray coating devices that fall under any of the following:
1. those that can reduce pressure in vacuum chambers to 10 millipascals prior to plasma spraying, which can be used at a pressure of 10 kilopascals or less (meaning plasma spraying measured within 30 centimeters from the mouth of the nozzle);
 2. those with internal film thickness control function;
- (e) coating devices that use the sputtering method, which have a current density of 10 milliamperes or more per square centimeter for deposition rate of 15 micrometers or more per hour;
- (f) coating devices that use methods to fix coating materials ionized by arc discharge to the surface of base materials, which have a magnetic field to control arc spots on the cathodes;
- (g) ion plating production equipment that can measure any of the following during coating process:
1. thickness and deposition rate of coating materials fixed to the surface of base materials;
 2. optical characteristics of the surface of base materials;
- (viii) measuring devices (including machine tools that can be used as measuring devices; hereinafter the same applies in this Article) or feedback devices for positions, or assemblies of measuring devices, which fall under any of the following (excluding those falling under item (ii) or item (iii)):
- (a) coordinate measuring machines that are controlled by computer or numerical control device and which, when the spatial measurement accuracy is measured according to the measurement method specified by the International Standard, at any of the point of measurement within the operation scope, have a maximum permissible error of length measurement of the axis expressed in micrometers that is equal to or less than the numerical value obtained by multiplying the length of the measured axis expressed in millimeters by 0.001 and then adding 1.7;
 - (b) devices for measuring linear displacement, feedback devices for positions on a straight line, or assemblies of measuring devices, which fall under any of the following (excluding laser interferometers and optical encoders that use a laser in the cases of 1. and 2.):

1. non-contact type measurement devices with a resolution of 0.2 micrometers or less in a measurement range of up to 0.2 millimeters;
 2. feedback devices for positions on a straight line which are specifically designed for machine tools and whose precision is less than a numerical value obtained by adding 0.0008 millimeters to 6/100,000 percent of the effective measurement length of those devices expressed in millimeters;
 3. devices falling under all of the following:
 - i. those capable of measurement using a laser beam;
 - ii. those with a resolution of 0.2 nanometers or less in the maximum measurable range;
 - iii. those for which the numerical value, expressed in nanometers, representing the inaccuracy of the measurement axis' measurement at any one point in the measurement range, when corrected by the refractive index of air, is not more than the numerical value arrived at when the length of that measurement axis, in millimeters, is multiplied by 0.0005 and 1.6 is added to the product; and which are capable of taking measurements for over 30 seconds at a temperature range of between 19.99 °C and 20.01 °C;
 4. assemblies of measuring devices falling under 3., which are designed to add a feedback function to the device;
- (c) rotational displacement feedback devices or devices for measuring angle displacement which are specially designed for machine tools whose angle precision is 0.9 arc seconds or less (excluding optical instruments for measuring the displacement of the angle of a mirror using parallel rays);
- (d) measuring devices that measure surface roughness by treating the scattering of light as function of angles, which have a sensitivity of 0.5 nanometers or less;
- (ix) robots (excluding operating robots and sequence robots) that fall under any of the following, or control equipment or end effectors for these:
- (a) those with explosion-proof construction specified in Japanese Industrial Standard (JIS) C60079-0 (excluding those used for painting);
 - (b) those designed to withstand radiation exposure exceeding 5,000 grays on a silicon conversion basis for the total absorbed dose;
 - (c) those designed for use at altitudes exceeding 30,000 meters;
- (x) compound rotary tables or spindles that can change angles of centerline to other axes during processing, which are designed for machine tools, and which fall under any of the following:
- (a) Deleted
 - (b) Deleted
 - (c) compound rotary tables that fall under the following 1. and 2.:
 1. those designed for machine tools capable of lathe turning, milling, or

- grinding; and
- 2. those which have two rotating axes designed to be capable of simultaneous control for contouring control;
- (d) spindles that can change angles of centerline to other axes during processing, which fall under the following 1. and 2.:
 - 1. those designed for machine tools capable of lathe turning, milling, or grinding;
 - 2. those designed to be capable of simultaneous control for contouring control;
- (xi) spin-forming machines that fall under all of the following (a), (b), and (c):
 - (a) those that can be controlled by numerical control device or computers;
 - (b) those with three or more axes capable of controlling contour;
 - (c) those with a roller welding force exceeding 60 kilonewtons.

Article 6 The goods with specifications prescribed by Order of the Ministry of Economy, Trade and Industry in row 7 of Appended Table 1 of the Export Order are goods that fall under any of the following:

- (i) integrated circuits (including monolithic integrated circuits, hybrid integrated circuits, multichip integrated circuits, film integrated circuits (including silicon-on-sapphire integrated circuits), optical integrated circuits, three-dimensional integrated circuits, and monolithic microwave integrated circuits) that fall under any of the following:
 - (a) integrated circuits designed to withstand any of the following radiation exposure:
 - 1. radiation exposure of 5,000 grays or more on a silicon conversion basis for the total absorbed dose;
 - 2. radiation exposure of 5,000,000 grays or more on a silicon conversion basis per second for the absorbed dose;
 - 3. a neutron flux corresponding to 1 megaelectron volt (integrated value) of 50 trillion or more per square centimeter (excluding MIS type);
 - (b) microprocessors, microcomputers, microcontrollers, integrated circuits for storage elements using compound semiconductors, integrated circuits for analog-to-digital conversion, integrated circuits having an analog-to-digital conversion function that are capable of recording or processing digitized data, integrated circuits for digital-to-analog conversion, electrooptical integrated circuits or optical integrated circuits for signal processing, field programmable logic devices, custom integrated circuits (excluding those for which it is possible to determine whether or not they are goods that fall under any of (c) through (h) or (k) through (m), or those for which it is possible to determine whether they are designed to be used for goods falling under any of the middle column of rows (5) through (15) of

Appended Table 1 of the Export Order; hereinafter the same applies in this Article), FFT processors, static RAM or nonvolatile memories, which fall under any of the following (excluding integrated circuits designed for civilian automobiles or civilian railway vehicles):

1. those designed for use at temperatures exceeding 125 °C;
2. those designed for use at temperatures of lower than -55 °C;
3. those designed for use at all temperatures ranging from -55 °C or more to 125 °C or less;

(c) microprocessors, microcomputers or microcontrollers employing compound semiconductors with a maximum clock frequency that exceeds 40 megahertz;

(d) Deleted

(e) integrated circuits for analog-to-digital conversion or digital-to-analog conversion, which fall under any of the following (excluding those falling under (m)):

1. those for analog-to-digital conversion that fall under any of the following:
 - i. those with a resolution of 8 bits or more but less than 10 bits and a sample rate that exceeds 1.3 gigasamples per second
 - ii. those with a resolution of 10 bits or more but less than 12 bits and a sample rate that exceeds 600 megasamples per second;
 - iii. those with a resolution of 12 bits or more but less than 14 bits and a sample rate that exceeds 400 megasamples per second;
 - iv. those with a resolution of 14 bits or more but less than 16 bits and a sample rate that exceeds 250 megasamples per second;
 - v. those with a resolution of 16 bits or more but a sample rate that exceeds 65 megasamples per second;
2. those for digital-to-analogue conversion which fall under any of the following:
 - i. those with a resolution of 10 bits or more but less than 12 bits and a coordinated update rate that exceeds 3,500 megasamples per second;
 - ii. those with a resolution of 12 bits or more which fall under any of the following:
 - a. those with a coordinated update rate that exceeds 1,250 megasamples per second and 3,500 megasamples or less per second, which fall under any of the following:

1 those whose settling time in which the analog output level changes to a level within 0.024 % of full scale from the full-scale level is less than nine nanoseconds when they operate at a resolution of 12 bits;

2 those with a spurious free dynamic range exceeding 68 decibels when a full-scale output is made by digital input signals of 100 megahertz or when

the maximum full-scale output is made by digital input signals of less than 100 megahertz;

- b. those with a coordinated update rate that exceeds 3,500 megasamples per second;
- (f) electro-optical integrated circuits or optical integrated circuits used for signal processing that fall under all of the following 1. through 3.:
 - 1. integrated circuits possessing laser oscillators;
 - 2. integrated circuits possessing light receiving elements;
 - 3. integrated circuits possessing optical waveguides;
- (g) field programmable logic devices (including complex programmable logic devices, field programmable gate arrays, field programmable logic arrays, or integrated circuits for field programmable interconnections), which fall under any of the following (excluding those falling under (m)):
 - 1. those with a maximum number of single-ended digital input and output that exceeds 700;
 - 2. those with serial transceivers that have a total maximum data speed of 500 gigabits or more per second;
- (h) devices using neural networks;
- (i) custom integrated circuits that fall under any of the following:
 - 1. those with a number of terminals exceeding 1,500;
 - 2. those with a basic gate propagation delay time of less than 0.02 nanoseconds;
 - 3. those with an operating frequency that exceeds 3 gigahertz;
- (j) digital devices using compound semiconductors, which fall under any of the following (excluding those which fall under any of (c), (e) through (i), and (k)):
 - 1. those with a number of equivalent gates that exceeds 3,000 on a dual-entry gate conversion basis;
 - 2. those with a toggle frequency that exceeds 1.2 gigahertz;
- (k) FFT processors with the execution time of fast Fourier transformation expressed in milliseconds which is less than the value calculated by the following formula: (number of complex points) \log_2 (number of complex points) divided by 20,480;
- (l) direct digital synthesizer (DDS) integrated circuits that fall under any of the following:
 - 1. those with a digital-to-analog conversion clock frequency of 3.5 gigahertz or more and with a digital-to-analog conversion resolution of 10 bits or more and less than 12 bits;
 - 2. those with a digital-to-analog conversion clock frequency of 1.25 gigahertz or more and with a digital-to-analog conversion resolution of or more than 12 bits;

- (m) devices that fall under the following 1. and 2. or that can be programmed to run them:
 - 1. devices that have an analog-to-digital conversion function and fall under any of the following:
 - i. those with a resolution of 8 bits or more but less than 10 bits and a sample rate that exceeds 1.3 gigasamples per second;
 - ii. those with a resolution of 10 bits or more but less than 12 bits and a sample rate that exceeds 1 gigasamples per second;
 - iii. those with a resolution of 12 bits or more but less than 14 bits and a sample rate exceeding 1 gigasamples per second;
 - iv. those with a resolution of 14 bits or more but less than 16 bits and a sample rate that exceeds 400 megasamples per second;
 - v. those with a resolution of 16 bits or more and a sample rate that exceeds 180 megasamples per second;
 - 2. devices that fall under any of the following:
 - i. those for recording digitized data;
 - ii. those for processing digitized data;
- (ii) components of microwave equipment or of millimeter wave equipment, which fall under any of the following:
 - (a) vacuum electronic devices (including klystrons and traveling wave tubes and derivatives of these; hereinafter the same applies in (b)), which fall under any of the following (excluding those falling under 4):
 - 1. traveling wave vacuum electronic devices that fall under any of the following:
 - i. those with an operating frequency that exceeds 31.8 gigahertz;
 - ii. those that have a hot cathode for which the time from the heating of the filament to attainment of the rated output is less than 3 seconds;
 - iii. cavity coupled traveling wave that has the value for the instantaneous bandwidth divided by the center frequency that exceeds 7% or with a maximum output exceeding 2.5 kilowatts;
 - iv. helical form-shaped devices, folded waveguide-shaped devices, or serpentine waveguide circuit-shaped devices, which fall under any of the following:
 - a. devices having an instantaneous bandwidth exceeding 1 octave, and for which the value obtained by multiplying the average output value expressed in kilowatts by the operating frequency value expressed in gigahertz exceeds 0.5;
 - b. devices having an instantaneous bandwidth of 1 octave or less, and for which the value obtained by multiplying the average output value expressed in kilowatts by the operating frequency value expressed in gigahertz exceeds 1;

- c. devices designed for use in space;
- d. devices that have a grid electron gun;
- v. devices for which the value arrived at when instantaneous bandwidth is divided by center frequency is 10% or more, and which have any of the following:
 - a. an annular electron beam;
 - b. a non-axisymmetric electron beam; or
 - c. multiple electron beams;
- 2. crossfield amplifier vacuum electronic devices with a gain that exceeds 17 decibels;
- 3. devices which can be operated in a dual mode;
- 4. devices designed to be used in frequency bands allotted for wireless transmission by the International Telecommunication Union (excluding frequency bands allotted for wireless positioning), which fall under any of the following:
 - i. those with an operating frequency of 31.8 gigahertz or less;
 - ii. those other than devices designed exclusively for use in space that have an average output of 50 watts or less and an operating frequency that exceeds 31.8 gigahertz but is 43.5 gigahertz or less;
- (b) thermionic cathodes designed to be used for vacuum electronic devices whose radiation current density exceeds 5 amperes per square centimeter in a rated operating condition or whose pulse radiation current density exceeds 10 amperes per square centimeter in a rated operating condition;
- (c) monolithic microwave integrated circuit amplifiers which fall under any of the following (excluding monolithic microwave integrated circuit amplifiers that have an integrated phase shifter falling under (n)):
 - 1. devices that have an operating frequency that exceeds 2.7 gigahertz but is 6.8 gigahertz or less, for which the value of the instantaneous bandwidth divided by the center frequency exceeds 15%, which fall under any of the following:
 - i. those with an operating frequency that exceeds 2.7 gigahertz but is 2.9 gigahertz or less and with a peak saturation output value that exceeds 75 watts (48.75 dBm) but is 300 watts (54.8 dBm) or less;
 - ii. those with an operating frequency that exceeds 2.9 gigahertz but is 3.2 gigahertz or less and with a peak saturation output value that exceeds 55 watts (47.4 dBm) but is 300 watts (54.8 dBm) or less;
 - iii. those with an operating frequency that exceeds 3.2 gigahertz but is 3.7 gigahertz or less and with a peak saturation output value that exceeds 40 watts (46 dBm) but is 300 watts (54.8 dBm) or less;
 - iv. those with an operating frequency that exceeds 3.7 gigahertz but is 6.8 gigahertz or less and with a peak saturation output value that exceeds 20

- watts (43 dBm) but is 300 watts (54.8 dBm) or less;
- v. those with an operating frequency that exceeds 2.7 gigahertz but is 3.7 gigahertz or less and with a peak saturation output value that exceeds 300 watts (54.8 dBm);
- vi. those with an operating frequency that exceeds 3.7 gigahertz but is 6.8 gigahertz or less and with a peak saturation output value that exceeds 120 watts (50.8 dBm);
2. devices with an operating frequency that exceeds 6.8 gigahertz but is 16 gigahertz or less and for which the value of the instantaneous bandwidth divided by the center frequency exceeds 10%, which fall under any of the following:
- i. those with an operating frequency that exceeds 6.8 gigahertz but is 8.5 gigahertz or less and with a peak saturation output value that exceeds 10 watts (40 dBm) but is 25 watts (44 dBm) or less;
- ii. those with an operating frequency that exceeds 8.5 gigahertz but is 12 gigahertz or less, with a peak saturation output value that exceeds 5 watts (37 dBm) but is 25 watts (44 dBm) or less, or those with an operating frequency that exceeds 12 gigahertz but is 16 gigahertz or less, with a peak saturation output value that exceeds 5 watts (37 dBm);
- iii. those with an operating frequency that exceeds 6.8 gigahertz but is 12 gigahertz or less and with a peak saturation output value that exceeds 25 watts (44 dBm);
3. devices with an operating frequency that exceeds 16 gigahertz but is 31.8 gigahertz or less, and with a peak saturation output value that exceeds 3 watts (34.77 dBm), for which the value of the instantaneous bandwidth divided by the center frequency exceeds 10%;
4. devices with an operating frequency that exceeds 31.8 gigahertz but is 37 gigahertz or less, and with a peak saturation output value that exceeds 0.1 nanowatts (-70 dBm);
5. devices with an operating frequency that exceeds 37 gigahertz but is 43.5 gigahertz or less and with a peak saturation output value that exceeds 1.0 watts (30 dBm), for which the value of the instantaneous bandwidth divided by the center frequency exceeds 10%;
6. devices with an operating frequency that exceeds 43.5 gigahertz but is 75 gigahertz or less and with a peak saturation output value that exceeds 31.62 milliwatts (15 dBm), for which the value of the instantaneous bandwidth divided by the center frequency exceeds 10%;
7. devices with an operating frequency that exceeds 75 gigahertz but is 90 gigahertz or less and with a peak saturation output value that exceeds 10 milliwatts (10 dBm), for which the value of the instantaneous bandwidth divided by the center frequency exceeds 5%;

8. devices with an operating frequency that exceeds 90 gigahertz, and a peak saturation output value that exceeds 0.1 nanowatts (-70 dBm);
- (d) microwave discrete transistors that fall under any of the following:
1. devices with an operating frequency that exceeds 2.7 gigahertz but is 6.8 gigahertz or less, which fall under any of the following:
 - i. those with an operating frequency that exceeds 2.7 gigahertz but is 2.9 gigahertz or less and with a peak saturation output value that exceeds 400 watts (56 dBm) but is 600 watts (57.8 dBm) or less;
 - ii. those with an operating frequency that exceeds 2.9 gigahertz but is 3.2 gigahertz or less and with a peak saturation output value that exceeds 205 watts (53.12 dBm) but is 600 watts (57.8 dBm) or less;
 - iii. those with an operating frequency that exceeds 3.2 gigahertz but is 3.7 gigahertz or less and with a peak saturation output value that exceeds 115 watts (50.61 dBm) but is 600 watts (57.8 dBm) or less;
 - iv. those with an operating frequency that exceeds 3.7 gigahertz but is 6.8 gigahertz or less and with a peak saturation output value that exceeds 60 watts (47.78 dBm) but is 130 watts (51.2 dBm) or less;
 - v. those with an operating frequency that exceeds 2.7 gigahertz but is 3.7 gigahertz or less and with a peak saturation output value exceeding 600 watts (57.8 dBm);
 - vi. those with an operating frequency that exceeds 3.7 gigahertz but is 6.8 gigahertz or less and with a peak saturation output value that exceeds 130 watts (51.2 dBm);
 2. devices with an operating frequency that exceeds 6.8 gigahertz but is 31.8 gigahertz or less, which fall under any of the following:
 - i. those with an operating frequency that exceeds 6.8 gigahertz but is 8.5 gigahertz or less and with a peak saturation output value that exceeds 50 watts (47 dBm) but is 130 watts (51.2 dBm) or less;
 - ii. those with an operating frequency that exceeds 8.5 gigahertz but is 12 gigahertz or less and with a peak saturation output value that exceeds 15 watts (41.76 dBm) but is 60 watts (47.8 dBm) or less;
 - iii. those with an operating frequency that exceeds 6.8 gigahertz but is 8.5 gigahertz or less and with a peak saturation output value that exceeds 130 watts (51.2 dBm);
 - iv. those with an operating frequency that exceeds 8.5 gigahertz but is 12 gigahertz or less and with a peak saturation output value that exceeds 60 watts (47.8 dBm);
 - v. those with an operating frequency that exceeds 12 gigahertz but is 16 gigahertz or less and with a peak saturation output value that exceeds 40 watts (46 dBm);
 - vi. those with an operating frequency that exceeds 16 gigahertz but is 31.8

- gigahertz or less and with a peak saturation output value that exceeds 7 watts (38.45 dBm);
3. devices with an operating frequency that exceeds 31.8 gigahertz but is 37 gigahertz or less and with a peak saturation output value that exceeds 0.5 watts (27 dBm);
 4. devices with an operating frequency that exceeds 37 gigahertz but is 43.5 gigahertz or less and with a peak saturation output value that exceeds 1 watt (30 dBm);
 5. devices with an operating frequency that exceeds 43.5 gigahertz, and a peak saturation output value that exceeds 0.1 nanowatts (−70 dBm);
 6. devices with a peak saturation output value that exceeds 5 watts (37 dBm) in all frequency bands with an operating frequency that exceeds 8.5 gigahertz but is 31.8 gigahertz or less (excluding those falling under any of Article 6, item (ii), (d) 1. through 5.);
- (e) solid-state microwave amplifiers (excluding monolithic microwave integrated circuit amplifiers and harmonic mixers or converters) or assemblies or modules including them (excluding transmitter and receiver modules and transmitter modules), which fall under any of the following:
1. devices with an operating frequency that exceeds 2.7 gigahertz but is 6.8 gigahertz or less, for which the value of the instantaneous bandwidth divided by the center frequency exceeds 15%, which fall under any of the following:
 - i. those with an operating frequency that exceeds 2.7 gigahertz but is 2.9 gigahertz or less and with a peak saturation output value that exceeds 500 watts (57 dBm);
 - ii. those with an operating frequency that exceeds 2.9 gigahertz but is 3.2 gigahertz or less and with a peak saturation output value that exceeds 270 watts (54.3 dBm);
 - iii. those with an operating frequency that exceeds 3.2 gigahertz but is 3.7 gigahertz or less and with a peak saturation output value that exceeds 200 watts (53 dBm);
 - iv. those with an operating frequency that exceeds 3.7 gigahertz but is 6.8 gigahertz or less and with a peak saturation output value that exceeds 90 watts (49.54 dBm);
 2. devices with an operating frequency that exceeds 6.8 gigahertz but is 31.8 gigahertz or less, for which the value of the instantaneous bandwidth divided by the center frequency exceeds 10%, which fall under any of the following:
 - i. those with an operating frequency that exceeds 6.8 gigahertz but is 8.5 gigahertz or less and with a peak saturation output value that exceeds 70 watts (48.54 dBm);

- ii. those with an operating frequency that exceeds 8.5 gigahertz but is 12 gigahertz or less and with a peak saturation output value that exceeds 50 watts (47 dBm);
- iii. those with an operating frequency that exceeds 12 gigahertz but is 16 gigahertz or less and with a peak saturation output value that exceeds 30 watts (44.77 dBm);
- iv. those with an operating frequency that exceeds 16 gigahertz but is 31.8 gigahertz or less and with a peak saturation output value that exceeds 20 watts (43 dBm);
- 3. devices with an operating frequency that exceeds 31.8 gigahertz but is 37 gigahertz or less, and a peak saturation output value that exceeds 0.5 watts (27 dBm);
- 4. devices with an operating frequency that exceeds 37 gigahertz but is 43.5 gigahertz or less and with a peak saturation output value that exceeds 2 watts (33 dBm), for which the value of the instantaneous bandwidth divided by the center frequency exceeds 10%;
- 5. devices with an operating frequency that exceeds 43.5 gigahertz which fall under any of the following:
 - i. those with an operating frequency that exceeds 43.5 gigahertz but is 75 gigahertz or less and with a peak saturation output value that exceeds 0.2 watts (23 dBm), for which the value of the instantaneous bandwidth divided by the center frequency exceeds 10%;
 - ii. those with an operating frequency that exceeds 75 gigahertz but is 90 gigahertz or less and with a peak saturation output value that exceeds 20 milliwatts (13 dBm), for which the value of the instantaneous bandwidth divided by the center frequency exceeds 5%;
 - iii. those with an operating frequency that exceeds 90 gigahertz and with a peak saturation output value that exceeds 0.1 nanowatts (-70 dBm);
- (f) electronically or magnetically tunable bandpass filters that fall under the following 1. and 2.:
 - 1. those having six or more variable frequency resonators capable of tuning across a half-octave frequency band in less than 10 microseconds;
 - 2. those capable of passing a band that exceeds 0.5% of the center frequency;
- (g) electronically or magnetically tunable band elimination filters that fall under the following 1. and 2.:
 - 1. those having six or more variable frequency resonators capable of tuning across a half-octave frequency band in less than 10 microseconds;
 - 2. those capable of eliminating a band less than 0.5% of the center frequency;
- (h) Deleted

- (i) harmonic mixers or converters that fall under any of the following:
 1. those designed to broaden the frequency band of a spectrum analyzer to over 90 gigahertz;
 2. those designed to extend the operating range of a signal generator, which fall under any of the following:
 - i. those with a frequency band that exceeds 90 gigahertz; or
 - ii. those with a frequency band that exceeds 43.5 gigahertz but is 90 gigahertz or less, whose output exceeds 100 milliwatts (20 dBm);
 3. those designed to extend the operating range of a network analyzer, which fall under any of the following:
 - i. those with a frequency band that exceeds 110 gigahertz;
 - ii. those with a frequency band that exceeds 43.5 gigahertz but is 90 gigahertz or less, whose output exceeds 31.62 milliwatts (15 dBm); or
 - iii. those with a frequency band that exceeds 90 gigahertz but is 110 gigahertz or less, whose output exceeds 1 milliwatt (0 dBm);
 4. those designed to broaden the frequency band of a microwave test receiver to over 110 gigahertz;
- (j) microwave power amplifiers that incorporate a vacuum electronic device falling under (a) and that fall under the following 1. and 2. (excluding those designed to be used in frequency bands allotted for wireless transmission by the International Telecommunication Union (excluding frequency bands allotted for wireless positioning)):
 1. those with an operating frequency that exceeds 3 gigahertz;
 2. those with the mass ratio of average power output that exceeds 80 watts per kilogram and with a volume of less than 400 cm³;
- (k) microwave power modules which have a traveling wave vacuum electronic device, a monolithic microwave integrated circuit, and a power supply, which fall under all of the following 1. through 3.:
 1. those having a time from fully off to fully operational in less than 10 seconds;
 2. those whose volume is less than the numerical value obtained by multiplying the maximum rated output value expressed in watts by 10 cm³ per watt;
 3. those having an instantaneous bandwidth of 1 octave or more, which fall under any of the following:
 - i. for those with a frequency of 18 gigahertz or less, those with a radio frequency output that exceeds 100 watts;
 - ii. those with a frequency that exceeds 18 gigahertz;
- (l) oscillators or assemblies having an oscillation function for which the ratio of single sideband phase noise per hertz to carrier waves in any frequency band of 10 hertz or more and less than 10 kilohertz where the difference

between the operating frequency and the offset frequency is less than the value calculated using the following formula: $20\log_{10}$ (operating frequency expressed in megahertz) – $20\log_{10}$ (difference between operating frequency and offset frequency expressed in hertz) – 126;

(m) assemblies employing frequency synthesizers which fall under any of the following:

1. those that take less than 143 picoseconds to vary the frequency;
2. those that take less than 100 microseconds to vary any frequency exceeding 2.2 gigahertz in the combined output frequency range exceeding 4.8 gigahertz to less than 31.8 gigahertz;

3. Deleted

4. those that take less than 500 microseconds to vary any frequency exceeding 550 megahertz in the combined output frequency range exceeding 31.8 gigahertz to less than 37 gigahertz;

5. those that take less than 100 microseconds to vary any frequency exceeding 2.2 gigahertz in the combined output frequency range exceeding 37 gigahertz to less than 90 gigahertz;

6. Deleted

7. those that take less than 1 millisecond to vary the frequency in the combined output frequency range exceeding 90 gigahertz;

(n) transmitter and receiver modules, monolithic microwave integrated circuits for transmission and reception, transmitter modules, and monolithic microwave integrated circuits for transmission whose operating frequency exceeds 2.7 gigahertz, which fall under all of the following:

1. those whose peak saturation output level expressed in watts exceeds the value arrived at when 505.62 is divided by the square of the maximum operating frequency expressed in gigahertz, on any channel;
2. those for which the value arrived at when the instantaneous bandwidth is divided by the center frequency is 5% or more, on any channel;
3. those for which the value of the length of any side of the plane expressed in centimeters is less than the value arrived at when the product of the number of transmitting channels or transmitting and receiving channels and 15 is divided by the minimum operating frequency expressed in gigahertz; and

4. those capable of causing an electronic phase shift for each channel;

(iii) signal processing equipment that uses elastic waves or acousto-optic effects and falls under any of the following (excluding equipment solely having any of the functions of specific band pass, low band pass, high band pass, band elimination, or resonance), or its components:

(a) signal processing equipment that uses surface elastic waves or pseudo-surface elastic waves, which falls under any of the following:

1. signal processing equipment with a carrier frequency that exceeds 6 gigahertz;
2. signal processing equipment with a carrier frequency that exceeds 6 gigahertz but is 2.5 gigahertz or less that falls under any of the following:
 - i. equipment with a main lobe to side lobe power ratio that exceeds 65 decibels;
 - ii. equipment for which the numeric value of the maximum delay time expressed in microseconds multiplied by the value of the bandwidth expressed in megahertz exceeds 100;
 - iii. equipment with a bandwidth that exceeds 250 megahertz;
 - iv. equipment for which the distributed delay time (meaning the difference between the maximum and minimum delay time values according to frequency) exceeds 10 microseconds;
3. signal processing equipment with a carrier frequency of 1 gigahertz or less that falls under any of the following:
 - i. equipment for which the numeric value obtained by multiplying the maximum delay time expressed in microseconds by the value of the bandwidth expressed in megahertz exceeds 100;
 - ii. equipment for which the distributed delay time exceeds 10 microseconds;
 - iii. equipment with a main lobe to side lobe power ratio exceeding 65 decibels and with a bandwidth that exceeds 100 megahertz;
- (b) equipment that utilizes bulk elastic waves and is capable of performing direct processing of signals at frequencies exceeding 6 gigahertz;
- (c) signal processing that utilizes the interaction of elastic waves and light waves and capable of performing direct processing of signals or images;
- (iv) devices which use superconductive material and constitute electron devices or electronic circuits with components using superconductive materials, which are designed to be used at temperatures lower than the critical temperature of the superconductive materials used and fall under any of the following:
 - (a) devices possessing a current switching function for digital circuits with superconducting gates for which the value obtained by multiplying the delay time per gate by the power consumption per gate is less than 1/100 billion millijoules;
 - (b) devices that have frequency separation function and have resonant circuits with a Q-value exceeding 10,000;
- (v) cells (excluding those incorporated in batteries (including single cell batteries)) that fall under any of the following:
 - (a) primary cells whose energy density and power density at a temperature of 20 °C fall under any of the following:

1. those with an energy density exceeding 550 watt-hours per kilogram and a continuous power density exceeding 50 watts per kilogram;
 2. cells with an energy density exceeding 50 watt-hours per kilogram and a continuous power density exceeding 350 watts per kilogram;
- (b) secondary cells with an energy density exceeding 350 watt-hours per kilogram at a temperature of 20 °C;
- (vi) high voltage capacitors that fall under any of the following:
- (a) those with a repeated cycle of less than 10 hertz that fall under all of the following 1. through 3.:
 1. those with a rated voltage of 5 kilovolts or more;
 2. those with an energy density of 250 joules per kilogram or more;
 3. those with a total energy of 25 kilojoules or more;
 - (b) capacitors with a repetitive cycle of 10 hertz or more and that fall under all of the following 1. through 4.:
 1. those with a rated voltage of 5 kilovolts or more;
 2. those with an energy density of 50 joules per kilogram or more;
 3. those with a total energy of 100 joules or more;
 4. those designed to be capable of being charged and discharged for 10,000 times or more;
- (vii) superconducting magnets (including solenoid coil types) designed to fully generate or dissipate a complete magnetic field in less than one second, which fall under all of the following (a) through (c):
- (a) those that discharge energy exceeding 10 kilojoules in the first second of demagnetization;
 - (b) those whose coil has an internal diameter exceeding 250 millimeters;
 - (c) those with a rated maximum current density exceeding 300 amperes per square millimeter or with a rated magnetic flux density exceeding 8 teslas;
- (vii)-2 solar batteries, cell-interconnect-coverglass (CIC) assemblies, solar panels, or solar arrays which are designed for use in space, for which the minimum average conversion efficiency when irradiated by 1,367 watts per square meter under air mass zero conditions exceeds 20% at an operating temperature of 28 °C;
- (viii) rotary input-type absolute encoders for which the absolute value of the conversion error of angles is 1 second or less, and rings, disks, or scales designed for those encoders;
- (viii)-2 thyristor devices or thyristor modules which convert pulse output and use a conversion method controlled electronically or optically or a conversion method with a controlled electron emission, which fall under any of the following (excluding those incorporated into a device designed to be used in railway vehicles or aircraft for civilian use):
- (a) those with a maximum turn-on current exceeding 30,000 amperes per

- microsecond, and off-state voltage exceeding 1,100 volts;
- (b) those with a maximum turn-on current exceeding 2,000 amperes per microsecond, which fall under the following 1. and 2.:
 - 1. those with an off-state voltage of 3,000 volts or more;
 - 2. those with a maximum current of 3,000 amperes or more;
- (viii)-3 semiconductor devices or semiconductor modules that control electric power or rectify electric signals, which fall under all of the following (a) through (c) (excluding those incorporated into a device designed to be used in automobiles, railway vehicles, or aircraft for civilian use):
 - (a) those designed for a maximum operating junction temperature that exceeds 215 °C;
 - (b) those with a repetitive peak off-state voltage that exceeds 300 volts;
 - (c) those with a continuous current that exceeds one ampere;
- (viii)-4 optical modulators which use electrooptic effects to operate the intensity, amplitude, or phases of light designed for analog signals, which fall under any of the following (including those which have an optical input and output connector):
 - (a) those with a maximum operating frequency that exceeds 10 gigahertz but is less than 20 gigahertz and with an optical insertion loss of 3 decibels or less, which fall under any of the following:
 - 1. those with a half-wave voltage of less than 2.7 volts when it is measured at frequencies of 1 gigahertz or less;
 - 2. those with a half-wave voltage of less than 4 volts when it is measured at frequencies exceeding 1 gigahertz;
 - (b) those with a maximum operating frequency of 20 gigahertz or more and with an optical insertion loss of 3 decibels or less, which fall under any of the following:
 - 1. those with a half-wave voltage of less than 3.3 volts when it is measured at frequencies of 1 gigahertz or less;
 - 2. those with a half-wave voltage of less than 5 volts when it is measured at frequencies exceeding 1 gigahertz;
- (ix) sampling oscilloscopes using the method of real-time sampling, which, if the input 3-decibel bandwidth of any channel is 60 gigahertz or more, the root-mean-square of noise voltage at the longitudinal axis range in which the noise of the channel is the smallest is less than 2% of the full scale;
- (x) analog-digital converters that constitute modules, assemblies, or devices with the function of performing analog-to-digital conversions (including analog-to-digital conversion cards, waveform digitizers, data acquisition cards, signal acquisition boards, and transient recorders), which fall under the following (a) and (b) (excluding digital method recording devices, sampling oscilloscopes, spectrum analyzers, signal generators, network

analyzers, and microwave test receivers):

- (a) modules, assemblies, or devices whose resolution and sample rate fall under any of the following:
 - 1. those with a resolution of 8 bits or more and less than 10 bits, whose sample rate exceeds 1.3 gigasamples per second;
 - 2. those with a resolution of 10 bits or more and less than 12 bits, whose sample rate exceeds 1 gigasamples per second;
 - 3. those with a resolution of 12 bits or more and less than 14 bits, whose sample rate exceeds 1 gigasamples per second;
 - 4. those with a resolution of 14 bits or more and less than 16 bits, whose sample rate exceeds 400 megasamples per second; or
 - 5. those with a resolution of 16 bits or more, whose sample rate exceeds 180 megasamples per second;
- (b) modules, assemblies, or devices which have any of the following functions:
 - 1. those that output digitized data;
 - 2. those that record digitized data; or
 - 3. those that process digitized data;
- (xi) digital method recording devices that fall under the following (a) and (b):
 - (a) those capable of maintaining the speed of continuously recording data on disk memory or solid-state drive memory at over 6.4 gigabits per second; and
 - (b) those capable of performing signal processing of radio frequency signal data being recorded;
- (xii) spectrum analyzers that fall under any of the following:
 - (a) those for which the resolution bandwidth for 3 decibels in any frequency band that exceeds 31.8 gigahertz but is 37 gigahertz or less exceeds 40 megahertz;
 - (b) those whose displayed average noise level in any frequency band that exceeds 43.5 gigahertz but is 90 gigahertz or less is less than -150 dBm per hertz;
 - (c) those capable of analyzing frequencies that exceeds 90 gigahertz; or
 - (d) those that fall under the following 1. and 2.:
 - 1. those with a real time bandwidth that exceeds 170 megahertz; and
 - 2. those that fall under any of the following:
 - i. those that detect signals with a length of 15 microseconds or less with a probability of 100%, with an attenuation, due to gap or window effect, of less than 3 decibels from the total amplitude; or
 - ii. those with a frequency mask trigger function that detects signals with a length of 15 microseconds or less with a probability of 100%;
- (xiii) signal generators which fall under any of the following (excluding generators which set output frequencies by values obtained by adding or

subtracting the frequencies of two or more crystal oscillators or values obtained by multiplying those values):

- (a) signal generators which generate, in any frequency band that exceeds 31.8 gigahertz but is 37 gigahertz or less, pulse modulated signals that fall under the following 1. and 2.:
 - 1. those with a pulse width of less than 25 nanoseconds; and
 - 2. those with the on and off ratio of 65 decibels or more;
- (b) signal generators with an output exceeding 100 milliwatts (20 dBm), in any frequency band that exceeds 43.5 gigahertz but is 90 gigahertz or less;
- (c) signal generators that fall under any of the following:
 - 1. Deleted
 - 2. those that take less than 100 microseconds to vary any frequency exceeding 2.2 gigahertz in the output frequency band that exceeds 4.8 gigahertz but is 31.8 gigahertz or less;
 - 3. Deleted
 - 4. those that take less than 500 microseconds to vary any frequency exceeding 550 megahertz in the output frequency band that exceeds 31.8 gigahertz but is 37 gigahertz or less; or
 - 5. those that take less than 100 microseconds to vary any frequency exceeding 2.2 gigahertz in the output frequency band that exceeds 37 gigahertz but is 90 gigahertz or less;
- (d) signal generators for which the ratio of single side band phase noise per hertz to carrier waves falls under any of the following:
 - 1. those for which the difference between operating frequency and offset frequency in any output frequency band that exceeds 3.2 gigahertz but is 90 gigahertz or less is less than the value calculated using the following formula in any frequency band of 10 hertz or more and 10 kilohertz or less: $20\log_{10}(\text{operating frequency expressed in megahertz}) - 20\log_{10}(\text{difference between operating frequency and offset frequency expressed in hertz}) - 126$; or
 - 2. those for which the difference between operating frequency and offset frequency in any output frequency band that exceeds 3.2 gigahertz but is 90 gigahertz or less is less than the value calculated using the following formula in any frequency band of that exceeds 10 kilohertz but is 100 kilohertz or less: $20\log_{10}(\text{operating frequency expressed in megahertz}) - 206$;
- (e) signal generators having a function to perform vector modulation of digital baseband signals, for which the vector modulation bandwidth falls under any of the following:
 - 1. vector modulation bandwidth exceeding 2.2 gigahertz in the output frequency band that exceeds 4.8 gigahertz but is 31.8 gigahertz or less;

- 2. vector modulation bandwidth exceeding 550 megahertz in the output frequency band that exceeds 31.8 gigahertz but is 37 gigahertz or less;
- 3. vector modulation bandwidth exceeding 2.2 gigahertz in the output frequency band that exceeds 37 gigahertz but is 90 gigahertz or less;
- (f) signal generators with a maximum output frequency that exceeds 90 gigahertz;
- (xiv) network analyzers that fall under any of the following:
 - (a) those with an output exceeding 31.62 milliwatts (15 dBm) in any operating frequency band that exceeds 43.5 gigahertz but is 90 gigahertz or less;
 - (b) those with an output exceeding 1 milliwatt (0 dBm) in any operating frequency band that exceeds 90 gigahertz but is 110 gigahertz or less;
 - (c) those with a function of non-linear vector measurement within the frequency band that exceeds 50 gigahertz but is 110 gigahertz or less (excluding those which fall under (a) or (b));
 - (d) those with a maximum operating frequency that exceeds 110 gigahertz;
- (xv) microwave test receivers that fall under the following (a) and (b):
 - (a) those designed to be capable of being used at frequencies exceeding 110 gigahertz;
 - (b) those that can simultaneously measure amplitude and phase;
- (xvi) atomic frequency standard devices that fall under any of the following:
 - (a) those that do not use rubidium, with a stability of less than 1/100 billion when oscillated continuously for 30 days;
 - (b) those designed for use in space;
 - (c) those that are not designed for use in space, which fall under all of the following 1. through 3.:
 - 1. those that use rubidium;
 - 2. those with a stability of less than 1/100 billion when oscillated continuously for 30 days;
 - 3. those with a power consumption of less than 1 watt;
- (xvi)-2 spray cooling method temperature control devices which are capable of cyclical use of coolant in a hermetically sealed device, which have atomizing nozzles specifically designed to spray dielectric coolant on electric components and keep the components' temperature within a certain range, or components specially designed for that purpose;
- (xvii) equipment for manufacturing or testing semiconductor devices, integrated circuits, or semiconductor materials (referred to as "semiconductor manufacturing equipment" in (e)), or masks or reticles for manufacturing integrated circuits, which fall under any of the following, or their components or accessories:
 - (a) crystal epitaxial growth systems that fall under any of the following:

1. those designed or altered to form films other than silicon whose absolute value of the allowable tolerance of film thickness is less than 2.5 percent for a length of 75 millimeters or more;
 2. metal-organic chemical vapor deposition reactors that epitaxially grow compound semiconductors containing two or more elements among aluminum, gallium, indium, arsenic, phosphor, antimony, and nitrogen;
 3. molecular beam epitaxial growth systems using gas sources or solid sources;
- (b) ion implanters that fall under any of the following:
1. Deleted
 2. those designed and optimized to operate when implanting hydrogen, heavy hydrogen, or helium, at beam energies of 20 kiloelectron volts or more and a beam current of 10 milliamperes or more;
 3. those that are capable of direct writing;
 4. those that have beam energies of 65 kiloelectron volts or more and beam currents of 45 milliamperes or more, when implanting oxygen on a heated semiconductor material substrate;
 5. those designed and optimized to operate at beam energies of 20 kiloelectron volts or more and a beam current of 10 milliamperes or more, when implanting silicon on a semiconductor material substrate heated to a temperature of 600 °C or more;
- (c) Deleted
- (d) Deleted
- (e) automatic loading multi-chamber central wafer handling systems that fall under the following 1. and 2.:
1. semiconductor manufacturing equipment that falls under any of (a), 1. through 3. or (b), 2. through 5. with wafer input and output connectors designed to be capable of connecting three or more units of different equipment (limited to those capable of connecting equipment with different functions);
 2. equipment designed to form an integrated system in a vacuum environment for consecutively performing multiple wafer processing;
- (f) lithography equipment that falls under any of the following:
1. step and repeat method or step and scan method exposure apparatus for wafer processing which use optical method or X-rays, and which falls under any of the following:
 - i. equipment with a light source wavelength shorter than 193 nanometers;
 - ii. equipment for which the value obtained by multiplying the exposure light source wavelength expressed in nanometers by 0.35, and then dividing that value by the numerical aperture is 45 or less;
 2. imprint lithography equipment capable of producing a line width of 45

- nanometers or less;
3. equipment that is designed to be capable of manufacturing masks; that uses electron beams, ion beams, or laser beams; and that falls under any of the following:
 - i. equipment for which the full width at half the maximum of the irradiation face is less than 65 nanometers in diameter and whose image position error (value obtained by adding 3 sigmas to the mean value) is less than 17 nanometers;
 - ii. Deleted
 - iii. equipment for which a second layer overlay error (value obtained by adding 3 sigmas to the mean value) on the mask is less than 23 nanometers;
 4. equipment designed to be capable of manufacturing semiconductor elements or integrated circuits by the direct writing method, which uses an electron beam, and falls under any of the following:
 - i. equipment whose irradiation face is 15 nanometers or less in diameter; or
 - ii. equipment with an overlay error (value obtained by adding 3 sigmas to the mean value) of 27 nanometers or less;
- (g) masks or reticles for manufacturing integrated circuits that fall under any of the items (i) through (viii)-4;
- (h) multilayer masks with a phase shift layer that are designed to be used in lithography equipment with a light source wavelength shorter than 245 nanometers (excluding those which fall under (g) and those designed to manufacture storage elements that do not fall under any of the items (i) through (viii)-4):
- (i) imprint lithography templates for manufacturing integrated circuits which fall under any of items (i) through (viii)-4;
- (j) test equipment for testing semiconductor devices or integrated circuits or their semi-finished products, which falls under any of the following:
 1. test equipment designed to be capable of testing the S-parameters of goods falling under item (ii), (d);
 2. Deleted
 3. test equipment designed to be capable of testing goods falling under item (ii), (c);
- (xvii)-2 base materials used for manufacturing masks which are mask blanks that have a reflection structure of a multilayer film composed of molybdenum and silicon, which fall under the following (a) and (b):
- (a) those specially designed for devices for manufacturing integrated circuits using extreme ultraviolet; and
 - (b) those that conform to the specifications of the SEMI Standards P37

- established by the Semiconductor Equipment and Materials International;
- (xviii) substrates that have on them multilayer film crystals which are of a substance falling under any of the following and which have been formed through epitaxial growth; that can be used as a hetero epitaxial material (excluding those that have one or more P-type epitaxial layers of compounds falling under (d) (limited to gallium nitride, indium gallium nitride, aluminum gallium nitride, indium aluminum nitride, indium aluminum gallium nitride, gallium phosphide, gallium arsenide, aluminum gallium arsenide, indium phosphide, indium gallium phosphide, aluminum indium phosphide, or indium gallium aluminum phosphide), in which the P-type epitaxial layers are not sandwiched between N-type layers):
- (a) silicon;
 - (b) germanium;
 - (c) silicon carbide;
 - (d) III-V compounds (limited to gallium or indium compounds);
- (xix) resists that fall under any of the following or substrates to which they have been applied:
- (a) resists used in semiconductor lithography that fall under any of the following:
 - 1. positive resists optimized to be used with light with a wavelength of 15 nanometers or more and less than 193 nanometers; or
 - 2. resists optimized to be used with light with a wavelength exceeding 1 nanometer and less than 15 nanometers;
 - (b) resists that are designed for use in electron beams or ion beams and have a sensitivity of 0.01 microcoulombs or less per square millimeter;
 - (c) Deleted
 - (d) resists optimized for surface imaging technology;
 - (e) resists designed or optimized to be used for imprint lithography equipment falling under item (xvii), (f) 2, which are thermoplastic or photocurable;
- (xx) organic metallic compounds or organic compounds that fall under any of the following:
- (a) aluminum, gallium, or indium organic compounds with a purity exceeding 99.999%;
 - (b) phosphorus, arsenic, or antimony organic compounds with a purity exceeding 99.999%;
- (xxi) phosphorus, arsenic, or antimony hydrides with a purity exceeding 99.999% (excluding those that contain 20 mole percent or more of inert gasses or hydrogen);
- (xxii) semiconductor substrates or ingots, boules, or other preforms of silicon carbide, gallium nitride, aluminum nitride, or aluminum gallium nitride

whose electrical resistivity at the temperature of 20 °C exceeds 10,000 ohm centimeters;

(xxiii) polycrystalline substrates or polycrystalline ceramic substrates whose electrical resistivity at the temperature of 20 °C exceeds 10,000 ohm centimeters, which have on their surface at least one non-epitaxial single crystal layer of silicon, silicon carbide, gallium nitride, aluminum nitride, or aluminum gallium nitride;

(xxiv) substrates that fall under either of the preceding two items and have on those substrates at least one epitaxial layer of silicon carbide, gallium nitride, aluminum nitride, or aluminum gallium nitride (excluding those falling under item (xviii)).

Article 7 The goods with specifications prescribed by Order of the Ministry of Economy, Trade and Industry that are referred to in row 8 of Appended Table 1 of the Export Order are goods falling under any of the following:

(i) computers, or their auxiliary equipment, which fall under any of the following, or components of these:

(a) computers, or their auxiliary equipment, which is designed to be capable of being used at temperatures exceeding 85 °C or below -45 °C;

(b) computers, or their auxiliary equipment, which is designed to prevent the impact of radiation, and fall under any of the following:

1. those designed to withstand radiation exposure exceeding 5,000 grays on a silicon conversion basis for the total absorbed dose;

2. those designed not to malfunction from radiation exposure exceeding 5 million grays per second on a silicon conversion basis for the absorbed dose;

3. computers, or their auxiliary equipment, which is designed to have an error of rate of less than 1/100 million per 1 bit per day from a single event error;

(ii) Deleted

(iii) digital computers, their auxiliary equipment, or components designed to improve the functions of digital electronic computers, which fall under any of the following (b), (c), or (g); or the components of these (excluding goods and components that fall under any of the following (h) through (j)):

(a) Deleted

(b) digital computers whose adjusted peak performance exceeds 29 Weighted TeraFLOPS;

(c) components designed to improve the functions of digital computers whose adjusted peak performance exceeds 29 Weighted TeraFLOPS through assembling computational elements (excluding digital computers whose maximum performance does not exceed 29 Weighted TeraFLOPS or those

- specifically designed for computers in this family);
- (d) Deleted
 - (e) Deleted
 - (f) Deleted
 - (g) auxiliary equipment of digital computer designed to transfer data among several digital computers for the purpose of improving the arithmetic processing capacity of digital computers, which has a transfer rate of data transferred exceeding 2.0 gigabytes per second;
 - (h) devices that are built into another device and that are indispensable for operating that device, but that are not key elements of that device;
 - (i) devices that are built into another device and that are indispensable for operating that device, but whose functions are limited to signal processing or image enhancement of that device;
 - (j) devices built into goods set forth in row (9), (i) through (iii), or (v) through (v)-5 of Appended Table 1 of the Export Order and that are indispensable for operating those devices;
 - (iv) computers that fall under any of the following, or their auxiliary equipment or components:
 - (a) systolic array computers;
 - (b) neural computers;
 - (c) optical computers;
 - (v) computers, or their auxiliary equipment or components, which are specially designed or altered to create, command and control, or distribute hacking programs.

Article 8 The goods with specifications prescribed by Order of the Ministry of Economy, Trade and Industry that are referred to in row 9 of Appended Table 1 of the Export Order are goods falling under any of the following:

- (i) telecommunication transmission equipment, electronic changers, telecommunication optical fibers, phased array antennas, direction finder for monitoring, radio communication interception equipment, communication jamming equipment, equipment that monitors the operation of radio communication interception equipment or communication jamming equipment, equipment capable of detecting the position of objects by observing the interference of radio waves or other electromagnetic waves, without transmitting radio waves or other electromagnetic waves, or equipment that monitors communication by the method of using the internet, which fall under any of the following:
 - (a) equipment that is designed to be able to prevent transient radiation electronic effects or influence of pulses caused by nuclear explosions;
 - (b) equipment that is designed to prevent the effects of gamma rays, neutron

- beams, or heavy charged particle rays (excluding equipment designed or altered for mounting on artificial satellites);
- (c) equipment that is designed to be usable at temperatures of lower than -55°C and has electronic circuits (excluding those designed or altered for mounting on artificial satellites);
- (d) equipment that is designed to be usable at temperatures exceeding 124°C and has electronic circuits (excluding those designed or altered for mounting on artificial satellites);
- (ii) telecommunication transmission equipment, or its components or accessories, which fall under any of the following:
- (a) radio transmitters or radio receivers that fall under any of the following:
1. those that can be used within a frequency range from 1.5 megahertz to 87.5 megahertz, which fall under the following i. and ii.:
 - i. those that are capable of automatically estimating and selecting the optimum transmission frequency and the optimum general transfer rate per channel;
 - ii. those that use linear amplifiers that fall under all of the following a. through d.:
 - a. those that are capable of amplifying two or more signals simultaneously;
 - b. those that have output characteristics of 1 kilowatts or more within a frequency range from 1.5 megahertz to less than than 30 megahertz, and of 250 watts or more within a frequency range from 30 megahertz to 87.5 megahertz;
 - c. those that have an instantaneous bandwidth of 1 octave or more;
 - d. those for which the ratio of high frequency or distortion component to signal waves is less than -80 decibels;
 2. those that use spread spectrum (including frequency hopping) and fall under any of the following (excluding those falling under 3 or with an output of 1.0 watts or less):
 - i. those for which spreading codes can be rewritten by the user;
 - ii. those that have a transmission bandwidth of 100 times or more of the bandwidth of the information channel and that exceeds 50 kilohertz (excluding those designed to be used for public cellular radio communications, or for fixed or mobile satellite communication earth stations for civilian commercial communications);
 3. those which use ultra wideband modulation technology, for which channeling codes, scrambling codes, or network identification codes can be rewritten by the user, and falls under any of the following:
 - i. those with a bandwidth exceeding 500 megahertz;
 - ii. those for which the value obtained by dividing the instantaneous bandwidth by the center frequency is 20% or more;

- (b) those that have a digital signal processing function and use voice band compression technology, whose coding speed is less than 700 bits per second;
- (c) communications equipment designed for underwater use that falls under any of the following (limited to those not connected by wire):
 1. equipment that utilizes sound waves (including ultrasonic waves) having a carrier frequency of less than 20 kilohertz or that exceeds 60 kilohertz;
 2. equipment which utilizes electromagnetic waves and has a carrier frequency of less than 30 kilohertz;
 3. equipment that have a function in which beams are scanned electronically;
 4. equipment that uses laser oscillators or light-emitting diodes, which has an output wavelength that exceeds 400 nanometers but is 700 nanometers or less, and is used in local area networks;
- (iii) Deleted
- (iv) communication optical fibers with a length exceeding 500 meters, which have a tensile strength of 2 giganewtons per square meter or more;
- (v) phased array antennas that can conduct electronic scanning and designed to be usable for a device referred to in any of the following (a) through (d) (excluding those for microwave landing systems (MLS) which conform to the standards of the International Civil Aviation Organization and those specially designed for a device falling under any of (e) through (g));
 - (a) devices whose frequencies exceed 31.8 gigahertz but are 57 gigahertz or less and whose effective radiated power (ERP) is 20 dBm (equivalent isotropic radiated power (EIRP) is 22.15 dBm) or more;
 - (b) devices whose frequencies exceed 57 gigahertz but are 66 gigahertz or less and whose effective radiated power (ERP) is 24 dBm (equivalent isotropic radiated power (EIRP) is 26.15 dBm) or more;
 - (c) devices whose frequencies exceed 66 gigahertz but are 90 gigahertz or less and whose effective radiated power (ERP) is 20 dBm (equivalent isotropic radiated power (EIRP) is 22.15 dBm) or more;
 - (d) devices whose frequencies exceed 90 gigahertz;
 - (e) cellular radio communications or wireless local area networks for civilian use;
 - (f) IEEE 802.15 or wireless high-definition multimedia interfaces;
 - (g) fixed or mobile satellite communication earth stations for civilian commercial communications;
- (v)-2 direction finder for monitoring with an operating frequency exceeding 30 megahertz, which falls under the following (a) and (b), or its components:
 - (a) direction finder that has an instantaneous bandwidth of 10 megahertz or more;

- (b) direction finder that can find a bearing line to radio transmitters that are not in coordination with a signal duration of less than 1 millisecond;
- (v)-3 radio communication interception equipment or communication jamming equipment, or equipment that monitors their operation, which falls under any of the following, or components of these:
 - (a) radio communication interception equipment designed to extract voices or data transmitted through radio communications;
 - (b) radio communication interception equipment designed to extract identification information, control signals, or other metadata needed to identify mobile communication devices or subscribers that are transmitted through radio communications;
 - (c) communication jamming equipment designed to intentionally and selectively interfere with or intentionally or selectively inhibit, block, reduce, or induce mobile communication, which falls under any of the following:
 1. equipment that simulates the functions of radio access networks;
 2. equipment that detects and exploits the mobile communications protocol used;
 3. equipment that exploits the mobile communications protocol used (excluding one that falls under 2.);
 - (d) equipment designed to monitor operations of equipment that falls under any of (a) through (c);
- (v)-4 equipment capable of detecting the position of objects by observing the interference of radio waves or other electromagnetic waves without transmitting radio waves or other electromagnetic waves, and which is designed to detect and track moving targets by measuring the reflections of ambient radio frequency emissions transmitted by non-radar transmitters;
- (v)-5 equipment for monitoring communications by a means that involves use of the internet, or its components, which fall under the following (a) and (b) (excluding equipment designed for marketing activities, quality management of network services, or quality management of user experience):
 - (a) equipment that realizes all of the functions referred to in the following 1. through 3. on carrier-class IP networks:
 1. analysis of the application layer;
 2. extraction of selected metadata and content of applications;
 3. indexing of extracted data;
 - (b) equipment designed to conduct the following 1. and 2.:
 1. retrieval based on hard selector;
 2. analysis of relationship between specific individuals or groups;
- (vi) equipment for designing, manufacturing, measuring, or testing goods that fall under item (ii), (a) 2., Article 14, item (v) or item (v)-2, or its components

- or accessories;
- (vii) beyond what is set forth in the preceding item, equipment for designing, manufacturing, measuring, or testing goods (excluding optical fiber testing equipment and measuring equipment) that fall under any of item (i), item (ii), item (iv), or items (v) through (v)-5, or its components or accessories;
- (viii) Deleted
- (viii)-2 equipment for designing telecommunication transmission equipment or electronic changers which falls under any of the following, or its components or accessories (excluding those that fall under item (vi)):
- (a) equipment using laser oscillators that falls under any of the following:
1. those that use laser light having a wavelength of more than 1,750 nanometers;
 2. Deleted
 3. Deleted
 4. those that use an analog transmission system with a bandwidth exceeding 2.5 gigahertz (excluding television broadcasting (including cable television broadcasting) equipment);
- (b) radio transmitters or radio receivers that use quadrature amplitude modulation technology for value that exceeds 1,024;
- (ix) cryptographic equipment, or components for enabling cryptographic functionality, which falls under any of the following (a) through (e) (excluding those falling under Article 3, item (xix), (c) 2., ii, (f) of this item, item (xi), or Article 10, item (v), (a)):
- (a) those that use a symmetric algorithm with a symmetric key of over 56 bits in length, or that use an asymmetric algorithm (limited to an asymmetric algorithm for which the security of the algorithm is based on the difficulty falling under any of the following 1. through 6.; hereinafter the same applies in this item) and are designed or altered to have a cryptographic functionality for securing data confidentiality (limited to those capable of using that cryptographic functionality (including those whose cryptographic functionality has been activated) or those capable of activating cryptographic functionality by means other than cryptographic functionality activation with a safe mechanism); which fall under any of the following 7. through 10. (excluding those falling under 11. through 20.):
1. prime factorization of integers greater than 512 bits;
 2. computation of discrete logarithms in a multiplicative group of a finite field of size greater than 512 bits;
 3. computation of discrete logarithms in a group other than that prescribed in 2. of size greater than 112 bits;
 4. a problem of the shortest vector or the closest vector associated with the grid;

5. exploration of homogeneous images between supersingular elliptical curves;
6. random code decryption;
7. those which have a security management function for information systems as the main function;
8. digital communication devices or devices for constructing, managing, or operating telecommunication lines using a wired or wireless network, or their components (excluding those falling under 7.);
9. computers, or devices which have the main function of recording and storing or processing information, or their components (excluding those falling under 7. or 8.):
10. those that fall under the following i. and ii. (excluding those falling under 7. through 9.):
 - i. goods whose cryptographic functionality is used to support functions other than the goods' main function; and
 - ii. goods whose cryptographic functionality is enabled through an item that has been incorporated into those goods (limited to those falling under any item from this item to item (xii)) or a program falling under any of Article 21, paragraph (1), item (vii), (vii)-2, (viii)-2, (viii)-3, (ix), (ix)-2, or (xvii) (excluding those open to the public);
11. smart cards with cryptographic functionality or reader-writer for them, which fall under any of the following; or their components:
 - i. those that are smart cards, which fall under any of the following:
 - a. those that are used only in equipment or components falling under any of the following, and whose program cannot be rewritten for other uses:
 - 1 those not falling under any of 7. through 10.;
 - 2 those other than those that use a symmetric algorithm that have a symmetric key over 56 bits in length, or that use an asymmetric algorithm, which are designed to have cryptographic functionality for securing data confidentiality;
 - 3 those falling under 12. through 16.;
 - b. smart cards on which data containing personal information (meaning information about a living individual that contains a name, date of birth, or other statements that can be used to identify a specific individual (including information which can be readily cross-checked against other information and then used to identify a specific individual (including information concerning authentication and monetary claims or other similar information)); the same applies in 11.) or organization information (including information about a corporation or other organizations which concerns authentication and monetary claims or other similar information; the same applies in 11.) have been recorded or which are designed to have

personal information or organization information recorded on them; and which fall under all of the following 1 through 3:

1 those whose cryptographic functionality is used exclusively for protecting personal information or organization information recorded on the smart card;

2 those used exclusively at public facilities or commercial facilities, or for authentication of the personal information data or organization information data recorded on the smart card;

3 those that do not allow the person using the smart card to change the cryptographic functionality that it has:

ii. reader-writer exclusively designed or altered to read personal information data or organization information data that has been recorded on smart cards falling under i. or to record personal information data or organization information data on those smart cards (including those which read or record data through a telecommunications line);

12. cryptographic equipment designed to be used for banking services or settlement (including services involving the collection and calculation of fees or the intermediation of comprehensive credit purchases as defined in Article 2, paragraph (3) of the Installment Sales Act (Act No. 159 of 1961)) or their components;

13. cellular phone terminals (meaning telephones for use with mobile phone networks or other telephones for use with wireless networks; the same applies in 15.) or mobile phone terminals (meaning those exclusively designed to be used in automobiles or other such mobile objects; the same applies in 15.) for civilian use, which fall under the falling i. and ii., or their components:

i. those incapable of transmitting encrypted data directly to another telephone terminal or other such device (excluding radio access network equipment);

ii. those incapable of conveying data encrypted through a radio network controller, base station controller, or other radio access network equipment;

14. cordless telephone equipment which does not have an encryption function between cordless phone terminals, and whose maximum effective radio wave range is less than 400 meters in one radio section if there is no radio repeater between the cordless phone terminal and the home base station, or its components;

15. cellular phone terminals or mobile phone terminals for civilian use or radio terminals equivalent to them, which employ only published or commercial cryptographic standards (including those for preventing unauthorized reproduction and not opened to the public); whose cryptographic functionality cannot be changed by users; which are

designed so that it is unnecessary to have technical assistance from suppliers or dealers at the time of use; and whose design has been changed for specific civilian industrial use (limited to those whose cryptographic functionality has not been changed), or their components;

16. equipment that is used for wireless personal area networks and that employs only published or commercial cryptographic standards; or its components;

17. wireless access network devices used for mobile communication and designed for civilian use, whose cryptographic functionality cannot be changed by users, which are designed so that it is unnecessary to have technical assistance from suppliers or dealers at the time of use, whose radio frequency output is 0.1 watts (20 dBm) or less, and which are connectable with sixteen or fewer devices simultaneously; or their components;

18. routers, switches, gateways, or relays in which the security management functions for the information systems are limited to those connected to the operation, management, or maintenance of the devices, and which employ only published or commercial cryptographic standards; or their components;

19. devices or servers which have a generalized computing function and in which the security management functions for the information systems fall under the following i. and ii.; or their components:

i. those which employ only published or commercial cryptographic standards;

ii. those which fall under any of the following:

a. those which are actualized in a central processing unit falling under (f);

b. those which are actualized in an operating system (excluding those falling under any of Article 21, paragraph (1), item (vii), item (vii)-2, item (viii)-2, item (viii)-3, item (ix), item (ix)-2, or item (xvii)); or

c. those that are limited to the operation, management, or maintenance of devices;

20. those that are designed for civilian industrial use to be connected to a network, which fall under the following i. and ii., or their components:

i. those that fall under any of the following:

a. terminals that can be connected to a network and fall under any of the following:

1 those in which the security management functions for the information systems are limited to the concealment, operation, management, or maintenance of data that is not arbitrary data;

2 those limited to specific civilian industrial use to be connected to a network;

- b. network devices that fall under the following 1 and 2:
 - 1 those designed for communicating with a terminal falling under above a.;
 - 2 those in which the security management functions for the information systems are limited to support for civilian industrial use to be connected to the network of a terminal falling under above a., or are limited to the operation, management, or maintenance of the relevant network device or other goods falling under (a), 20 of this item;
 - ii. those in which the security management functions for the information systems use only published or commercial cryptographic standards, and whose cryptographic functionality cannot be changed by the person using the goods;
- (b) those that activate the cryptographic functionality of certain goods or programs only by using a means of cryptographic functionality activation, and which fall under any of the following:
 - 1. those designed or altered to convert certain goods (limited to those that do not fall under this item through item (xii)) into goods falling under (a) of this item (limited to those that do not fall under (f) of this item), or to convert certain programs (limited to those that do not fall under Article 21, paragraph (1), item (vii), (vii)-2, (viii)-2, (viii)-3, (ix), (ix)-2, or (xvii)) into programs falling under Article 21, paragraph (1), item (ix) (limited to those relating to Article 8, item (ix), (a), or (c) through (e));
 - 2. those designed or altered to be capable of adding a function equivalent to the function of the goods falling under (a) of this item to those falling under any of this item through item (xii) or to the programs falling under Article 21, paragraph (1), item (vii), item (vii)-2, item (viii)-2, item (viii)-3, item (ix), or item (ix)-2,;
- (c) those that are designed or altered to use quantum cryptography;
- (d) those that are designed or altered to use cryptographic processing technology to generate channelizing codes, scrambling codes, or network identification codes for ultra-wideband modulation technology, which fall under any of the following:
 - 1. those whose bandwidth exceeds 500 megahertz; or
 - 2. those for which the value arrived at when the instantaneous bandwidth is divided by the center frequency is 20% or more;
- (e) those that are designed or altered to use cryptographic processing technology to generate the spreading code for spread spectrum (including generation of the hopping code for frequency hopping) (excluding those that fall under (d));
- (f) those that fall under either of the following 1. or 2. (limited to those for which the fact that they fall under either of 1. or 2. can be confirmed in writing by the manufacturer, seller or, exporter of the goods):

1. those that fall under all of the following i. through iii.:
 - i. those that can be purchased without any restrictions and are sold in stores, or from the stock of stores by placing orders by mail, by correspondence delivery prescribed in Article 2, paragraph (2) of the Act on Correspondence Delivery by Private Business Operators (Act No. 99 of 2002) by a general correspondence delivery operator prescribed in paragraph (6) of that Article or a specified correspondence delivery operator prescribed in paragraph (9) of that Article, or through input-output equipment connected to public telecommunication lines (including telephones);
 - ii. those whose cryptographic functionality cannot be changed by the person using the goods;
 - iii. those whose cryptographic functionality can be used without technical support by the supplier or distributor of the goods;
 2. components that are designed for goods falling under 1., and fall under all of the following i through iii:
 - i. those in which the security management functions for the information systems do not constitute the main function of the component; or
 - ii. those that do not allow the cryptographic functionality of goods falling under 1. to be changed, and do not allow any new cryptographic functionality to be added to those goods;
 - iii. components whose functions are fixed and are not designed or altered for specific users;
- (x) equipment or components for actualizing security management functions for information systems other than cryptographic equipment or components for realizing a cryptographic functionality, which fall under any of the following:
- (a) communication cable systems that have eavesdropping detection function, or their components (limited to components designed or altered to actualize eavesdropping detection function); or
 - (b) equipment designed or altered to prevent leakage of signals that transmit information (excluding equipment designed or altered to prevent leakage of signals for the purpose of preventing harm to the human body or malfunctions of other equipment due to radiation of electromagnetic waves, or equipment designed or altered to prevent leakage of signals in conformity with electromagnetic wave interference prevention standards), or its components (limited to components designed or altered to realize functions to prevent leakage of signals that transmit information);
- (xi) cryptographic equipment or components intended to actualize cryptographic functionality, which are for deactivating, degrading, or circumventing the security management function for information systems, which fall under any of the following:

- (a) those designed or altered to perform cryptanalysis (including those designed or altered to perform cryptanalysis functions by means of reverse engineering);
- (b) those that extract raw data from computer terminals or communication terminals (excluding items that fall under (a) or Article 7, item (v)) that are designed to bypass the authentication or authorization control of computer terminals or communication terminals in order for the terminals to function (excluding systems or devices specially designed for designing or manufacturing computer terminals or communication terminals, or those that are listed in the following (1) through (4)):
 1. debuggers and hypervisors;
 2. those that have been restricted to logical data extraction;
 3. those that extract data using chip-off or JTAG; and
 4. those specially designed for jailbreaking or rooting.
- (xii) equipment for designing or manufacturing goods that fall under any item from item (ix) to the preceding item, measuring equipment that fall under this item, or measuring equipment for evaluating or verifying the security management function for information systems which the goods falling under any item from item (ix) to the preceding item have (including the function which any program referred to in Article 21, paragraph (1), item (vii), item (vii)-2, item (viii)-2, item (viii)-3, item (ix), or item (ix)-2 has).

Article 9 The goods with specifications prescribed by Order of the Ministry of Economy, Trade and Industry that are referred to in row 10 of Appended Table 1 of the Export Order are goods falling under any of the following:

- (i) underwater detection device or positioning devices for vessels using sound waves (including ultrasonic waves; hereinafter the same applies in this Article), or their components, which fall under any of the following:
 - (a) those having a transmission function, or their components, which fall under any of the following (excluding those used solely for ocean depth measurement, for measuring underwater objects or the distance to objects buried under water or for finding schools of fish, as well as acoustic beacons for emergencies, and pingers designed to be installed at any position under water, among those used solely in vertical direction and that do not have a scanning function exceeding plus or minus 20 degrees):
 1. hydrographic survey equipment using sound waves, which fall under any of the following:
 - i. hydrographic survey equipment for vessels intended for creating a bathymetric chart, which fall under all of the following a. through d.:
 - a. equipment designed for performing measurement at an angle that exceeds 20 degrees from the vertical direction;

- b. equipment designed to enable measuring submarine topography at depths exceeding 600 meters below water surface;
- c. equipment with a resolution at the time of scanning of less than 2;
- d. equipment that automatically adjusts all of the following 1 through 3 and improves precision of depth measurements:
 - 1 the operation of the sensor;
 - 2 the state of the sound waves used in scanning;
 - 3 the speed of sound waves perceived by the sensor;
- ii. hydrographic survey equipment intended for creating a bathymetric chart, which fall under any of the following:
 - a. those designed or altered to operate at depths exceeding 300 meters whose scanning efficiency exceeds 3,800 meters per second;
 - b. those which fall under all of the following 1 through 4 (excluding those which fall under a.):
 - 1 those designed or altered to operate at depths exceeding 100 meters;
 - 2 those designed to enable measurement at angles which exceed 20 degrees from the vertical direction;
 - 3 those with an operating frequency of less than 350 kilohertz, or those designed to enable measuring submarine topography of more than 200 meters away from the sensor;
 - 4 those which automatically adjust all of the following [i] through [iii] and improve the precision of depth measurements:
 - [i] the action of the sensor;
 - [ii] the state of the sound waves used in scanning;
 - [iii] the speed of the sound waves perceived by the sensor;
 - iii. side scan sonars or synthetic aperture sonars that are designed to create an image of the sea bed and that fall under all of the following a. through c., or acoustic transmitting-receiving arrays designed to be used for those devices:
 - a. those designed or altered to operate at depths exceeding 500 meters;
 - b. those whose scanning field exceeds 570 m² per second when operating at the maximum range in which they can be operated when the resolution in the traveling direction is less than 15 centimeters;
 - c. those with a resolution in the direction perpendicular to the traveling direction of less than 15 centimeters;
- 2. underwater detection device which falls under any of the following:
 - i. device in which the transmission frequency is less than 5 kilohertz or in which the operating frequency is 5 kilohertz or more but less than 10 kilohertz, and whose sound pressure level (level of 0 decibels when the sound pressure is 1 micropascal at a distance of 1 meter from the sound source; the same applies hereinafter) exceeds 224 decibels;

- ii. device with an operating frequency of 10 kilohertz or more but 24 kilohertz or less and with a sound pressure level that exceeds 224 decibels;
- iii. device with an operating frequency that exceeds 24 kilohertz but is less than 30 kilohertz and with a sound pressure level that exceeds 235 decibels;
- iv. device with an operating frequency that is less than 100 kilohertz and which is capable of forming an acoustic beam whose width is less than 1 degree;
- v. device that is designed for use at depths exceeding 1,000 meters, which falls under any of the following:
 - a. device that has a transducer which is capable of correcting water pressure;
 - b. device that has a transducer with built-in transmitting and receiving elements other than transmitting and receiving elements made of lead zirconate titanate;
- vi. device designed to measure a distance that exceeds 5,120 meters;
- 3. underwater detection device with a transmission frequency of less than 10 kilohertz (excluding those falling under above 2.);
- 4. acoustic transmitters (including transducers) that incorporate elements composed of individually moving piezoelectric substances or elements having magnetostriction, electrostriction, electric force, or liquid pressure, which fall under any of the following (excluding sound wave generators that are electronic (limited to those usable only in the vertical direction), mechanical, or chemical):
 - i. those capable of being used at frequencies of less than 10 kilohertz, which fall under any of the following:
 - a. those not designed to be continuously operated with a duty cycle of 100 percent, whose sound pressure level of the principal axis is at a reference distance from the effective acoustic center of the transmitters in a free sound field exceeds the value calculated using the following formula:
 $10\log(\text{frequency for which the wave transmission voltage sensitivity expressed in hertz of less than 10 kilohertz is maximized}) + 169.77$ decibels; or
 - b. those designed to be continuously operated with a duty cycle of 100 percent, whose sound pressure level of the principal axis at a reference distance from the effective acoustic center of the transmitters in a continuous free sound field exceeds the value calculated using the following formula:
 $10\log(\text{frequency whose wave transmission voltage sensitivity expressed in hertz of less than 10 kilohertz is maximized}) + 159.77$ decibels;
 - ii. Deleted

- iii. those in which power ratio of the main lobe to the side lobe exceeds 22 decibels;
- 5. positioning device for vessels which falls under the following i. and ii., or its components:
 - i. those capable of detecting equipment transmitting signals to be received to determine the position of vessels (referred to as a "transponder" in ii.), at a distance exceeding 1,000 meters;
 - ii. those whose root mean square of the position error of the position measured at a distance of 1,000 meters or less from a transponder and the position determined is less than 10 meters;
- 6. sonars designed to automatically detect the position of the person who conduct activities in water and fall under all of the following i. through iii., which are designed for transmitting and receiving acoustic arrays:
 - i. those capable of detecting the target object at a distance exceeding 530 meters;
 - ii. those whose root mean square of the position error when a person who is at a distance of 530 meters or less from the sonar is detected is less than 15 meters;
 - iii. those whose bandwidth of transmitted pulse exceeds 3 kilohertz;
- (b) those with a receiving function, or its components, which falls under any of the following:
 - 1. hydrophones that do not have a function for correcting the effects of acceleration, but have an acoustic compression sensitivity (0 decibels when it is 1 volt per micropascal), which exceeds -180 decibels (excluding fish finders designed to be installed in surface ships);
 - 2. signal processing equipment that are designed for towed hydrophone arrays, whose programs can be rewritten by the user, which can carry out processing or correlation of the time domain or frequency domain (including spectrum analysis, digital filtering, or beam formation) (excluding those that can carry out real-time processing);
 - 3. heading sensors designed to be used for towed hydrophone arrays which have an absolute precision value of less than 0.5 degrees, which are designed for use at depths exceeding 35 meters or have a depth sounding device which can be adjusted or removed so that the heading sensor can be used at depths exceeding 35 meters;
 - 4. hydrophone arrays for submarine or harbor cable with underwater acoustic wave sensors referred to in 6. built in;
 - 5. signal processing equipment that is designed for submarine or harbor cable systems, whose programs can be rewritten by the user, and that carry out processing or correlation of the time domain or the frequency domain (spectrum analysis, digital filtering, or beam formation), (excluding

- those that can carry out real-time processing);
6. underwater acoustic wave sensors with accelerometers, which fall under all of the following (excluding grain velocity sensors or geophones):
 - i. those composed of three-axis accelerometers;
 - ii. those with a total acceleration sensitivity exceeding 48 decibels;
 - iii. those designed to operate at depths exceeding 35 meters;
 - iv. those with an operating frequency of less than 20 kilohertz;
- (ii) equipment for measuring speed over the ground for ships (limited to those using acoustic waves), which fall under any of the following (a) or (b) (excluding those specially designed to be installed in surface ships, or those set forth in the following (c)):
- (a) those using a correlation velocity log, which fall under any of the following:
 1. those designed so that measurements can be carried out at a position exceeding 500 meters from the bottom of the water;
 2. those with a speed accuracy less than 1% of speed;
 - (b) those using a Doppler velocity log, with a speed accuracy of less than 1% of speed;
 - (c) echo sounding devices which cannot be used other than for ocean depth measurement, for measuring the distance to objects buried under water or those in the water, or for finding schools of fish;
- (iii) optical detectors, or their components, which fall under any of the following:
- (a) solid optical detectors designed for use in space, which fall under any of the following:
 1. those having a maximum sensitivity within a wavelength range that exceeds 10 nanometers but is 300 nanometers or less, and the sensitivity at wavelengths exceeding 400 nanometers is less than 0.1% of the maximum sensitivity;
 2. those having a maximum sensitivity within a wavelength range that exceeds 900 nanometers but is 1,200 nanometers or less, and with a response time constant of 95 nanoseconds or less;
 3. focal plane arrays with the number of elements exceeding 2,048, and a maximum sensitivity within the wavelength range exceeding 300 nanometers and 900 nanometers or less;
 - (b) image reinforcing tubes which fall under any of the following 1. and 2. (excluding non-imaging photomultiplier tubes having in the vacuum space an electron detection device consisting solely of a single metal anode or metal anodes in which the distance between the centers of two adjoining anodes exceeds 500 micrometers):
 1. imaging reinforcing tubes that fall under all of the following i through

- iii:
 - i. those having a maximum sensitivity within a wavelength range that exceeds 400 nanometers but is 1,050 nanometers or less;
 - ii. those having electron image multiplication function, which use any of the following:
 - a. micro-channel plates in which the distance between the centers of two adjoining channels is 12 micrometers or less;
 - b. electron detection devices are specially designed or altered to achieve charge multiplication other than by a microchannel plate, for which the distance between the center of two adjoining pixels is 500 micrometers or less;
 - iii. those that have a photocathode that falls under any of the following:
 - a. photocathode which uses multi-alkali as the main material and has a luminous sensitivity that exceeds 700 microamperes per lumen;
 - b. photocathode which uses gallium arsenide or indium gallium arsenide as the main material;
 - c. photocathodes which use a III-V compound semiconductor (excluding gallium arsenide or indium gallium arsenide) as the main material, with a maximum radiation sensitivity exceeding 10 milliamperes per watt;
- 2. image reinforcing tubes that fall under all of the following i. through iii.:
 - i. those having a maximum sensitivity within a wavelength range that exceeds 1,050 nanometers but is 1,800 nanometers or less;
 - ii. those having electron image multiplication function, which use any of the following:
 - a. micro-channel plates in which the distance between the centers of two adjoining channels is 12 micrometers or less;
 - b. electron detection devices which are specially designed or altered to achieve charge multiplication other than by a micro-channel plate, for which the distance between the centers of two adjoining pixels is 500 micrometers or less;
 - iii. photocathodes or transferred electron photocathodes using a III-V compound semiconductor (excluding gallium arsenide or indium gallium arsenide) as the main material and having a maximum radiation sensitivity exceeding 15 milliamperes per watt;
- (c) image reinforcing tubes, or their components, which fall under any of the following 1. and 2. (excluding non-imaging photomultiplier tubes that have an electron detection device consisting solely of a single metal anode or metal anodes in which the distance between the centers of two adjoining anodes exceeds 500 micrometers, in vacuum):
 - 1. image reinforcing tubes which fall under all of the following i. through iii.:

- i. those having a maximum sensitivity within a wavelength range that exceeds 400 nanometers but is 1,050 nanometers or less;
- ii. those having electron image multiplication function, which use any of the following:
 - a. micro-channel plates in which the distance between the centers of two adjoining channels is 12 micrometers or less;
 - b. electron detection devices which are specially designed or altered to achieve charge multiplication other than by a micro-channel plate, for which the distance between the centers of two adjoining pixels is 500 micrometers or less;
 - iii. those that have a photocathode which uses multi-alkali as the main material and the luminous sensitivity of the photocathode exceeds 350 microamperes per lumen and 700 microamperes per lumen or less;
- 2. components of image reinforcing tubes which fall under any of the following:
 - i. micro channel plates for which the distance between the centers of two adjoining channels is 12 micrometers or less;
 - ii. electron detection devices which are specially designed or altered to achieve charge multiplication other than by a micro-channel plate, for which the distance between the centers of two adjoining pixels is 500 micrometers or less;
 - iii. photocathodes using a III-V compound semiconductor (excluding gallium arsenide or indium gallium arsenide) as the main material (excluding photocathodes having a maximum sensitivity within a wavelength range that exceeds 400 nanometers but is 1,050 nanometers or less with a maximum radiation sensitivity of 10 milliamperes per watt or less, or photocathodes having a maximum sensitivity within a wavelength range that exceeds 1,050 nanometers but is 1,800 nanometers or less with a maximum radiant sensitivity of 15 milliamperes per watt or less) or transferred electron photocathodes;
- (e) focal plane arrays not designed for use in space, which fall under the following 1. and 2.:
 - 1. those that fall under any of the following:
 - i. focal plane arrays that are not thermal focal plane arrays, which fall under any of the following:
 - a. those in which the factor elements have a maximum sensitivity within a wavelength range that exceeds 900 nanometers but is 1,050 nanometers or less, which fall under any of the following:
 - 1 those with a response time constant of less than 0.5 nanoseconds;
 - 2 those specially designed or altered to achieve charge multiplication, which have a maximum radiation sensitivity that exceeds 10 milliamperes per watt;

- b. those in which the factor elements have a maximum sensitivity within a wavelength range that exceeds 1,050 nanometers but is 1,200 nanometers or less, and which fall under any of the following:
 - 1 those with a response time constant of 95 nanoseconds or less;
 - 2 those specially designed or altered to achieve charge multiplication, which have a maximum radiation sensitivity that exceeds 10 milliamperes per watt;
- c. those in which the factor elements are arrayed two-dimensionally and each factor element has a maximum sensitivity within a wavelength range that exceeds 1,200 nanometers but is 30,000 nanometers or less;
- d. those in which the factor elements are arrayed one-dimensionally and each factor element has a maximum sensitivity within a wavelength range that exceeds 1,200 nanometers but is 3,000 nanometers or less, which fall under any of the following (excluding those having factor elements that only use germanium, which has 32 or less factor elements):
 - 1 focal plane arrays in which the aspect ratio of the factor elements that have the array direction of the factor elements as a standard is less than 3.8;
 - 2 those that have a time delay and integrating function inside the same factor element;
 - e. those in which factor elements are arrayed one-dimensionally and each factor element has a maximum sensitivity within a wavelength range that exceeds 2,500 nanometers but is 30,000 nanometers or less;
 - f. those in which factor elements have a maximum sensitivity within a wavelength range that exceeds 400 nanometers but is 900 nanometers or less, which fall under the following 1 and 2:
 - 1 those specially designed or altered to achieve charge multiplication, which have a maximum radiation sensitivity exceeding 10 milliamperes per watt at wavelengths exceeding 760 nanometers;
 - 2 those with the number of factor elements exceeding 32:
 - ii. infrared thermal focal plane arrays in which the factor elements are arrayed two-dimensionally and each factor element has a sensitivity within a wavelength range of 8,000 nanometers or more but 14,000 nanometers or less in an unfiltered state;
 - 2. those which fall under any of the following:
 - i. those that use platinum silicon, which has less than 10,000 factor elements;
 - ii. those that use iridium silicon;
 - iii. those that use indium antimonide or lead selenide, which has less than 256 factor elements;
 - iv. those that use indium arsenide;
 - v. those that use lead sulfide;
 - vi. those that use indium gallium arsenide;

- vii. scanning arrays that use mercury cadmium telluride, which fall under any of the following:
 - a. those that do not have a time delay and integrating function inside the same detecting factor element, which have 30 or less factor elements;
 - b. those that have a time delay and integrating function inside the same detecting factor element, which have 2 or less factor elements;
- viii. steering arrays which use mercury cadmium telluride and have less than 256 factor elements;
- ix. quantum well focal plane arrays that use gallium arsenide or aluminum gallium arsenide, which have less than 256 factor elements;
- x. thermal focal plane arrays that have less than 8,000 factor elements;
- xi. focal plane arrays in which the factor elements are arrayed one-dimensionally and each factor element has a maximum sensitivity within a wavelength range that exceeds 400 nanometers but is 900 nanometers or less, which have 4,096 or less factor elements;
- xii. focal plane arrays in which factor elements are arrayed two-dimensionally and each factor element has a maximum sensitivity within a wavelength range that exceeds 400 nanometers but is 900 nanometers or less, whose maximum number of unidirectional factor elements is 4,096 or less and the number of all of the factor elements is 250,000 or less;
- (e) focal plane arrays not designed for use in space which fall under any of the following, other than those falling under (d):
 - 1. focal plane arrays that are not thermal focal plane arrays, which fall under any of the following:
 - i. focal plane arrays in which the factor elements have a maximum sensitivity within a wavelength range that exceeds 900 nanometers but is 1,050 nanometers or less, which fall under any of the following:
 - a. those with a response time constant of less than 0.5 nanoseconds;
 - b. those specially designed or altered to achieve charge multiplication, which have a maximum radiation sensitivity exceeding 10 milliamperes per watt;
 - ii. focal plane arrays in which the factor elements have a maximum sensitivity within a wavelength range that exceeds 1,050 nanometers but is 1,200 nanometers or less, which fall under any of the following:
 - a. those with a response time constant of 95 nanoseconds or less;
 - b. those specially designed or altered to achieve charge multiplication, which have a maximum radiation sensitivity exceeding 10 milliamperes per watt;
 - iii. focal plane arrays in which the factor elements are arrayed two-dimensionally and each factor elements has a maximum sensitivity within a wavelength range that exceeds 1,200 nanometers but is 30,000

- nanometers or less;
- iv. focal plane arrays in which the factor elements are arrayed one-dimensionally and each factor element has a maximum sensitivity within a wavelength range that exceeds 1,200 nanometers but is 3,000 nanometers or less, which fall under any of the following (excluding those having factor elements that only use germanium, which have 32 factor elements or less):
 - a. those in which the aspect ratio of the factor elements that have the array direction of the factor elements as a standard is less than 3.8;
 - b. those having a time delay and integrating function inside the same factor element;
 - v. focal plane arrays in which the factor elements are arrayed one-dimensionally and each factor element has a maximum sensitivity within a wavelength range that exceeds 2,500 nanometers but is 30,000 nanometers or less;
 - vi. focal plane arrays in which the factor elements have a maximum sensitivity within a wavelength range that exceeds 400 nanometers but is 900 nanometers or less, which fall under the following a. and b.:
 - a. those specially designed or altered to achieve charge multiplication, which have a maximum radiation sensitivity exceeding 10 milliamperes per watt at wavelengths exceeding 760 nanometers;
 - b. those that have the number of factor elements exceeding 32;
2. infrared thermal focal plane arrays in which factor elements are arrayed two-dimensionally and each factor element has a sensitivity within a wavelength range that exceeds 8,000 nanometers but is 14,000 nanometers or less in an unfiltered state;
- (iv) mono-spectrum image sensors or multi-spectrum image sensors designed for remote sensing, which fall under any of the following:
 - (a) those with an instantaneous field of view of less than 200 microradians;
 - (b) those designed to be used within a wavelength range that exceeds 400 nanometers but is 30,000 nanometers or less, which digitally outputs image data, and which fall under any of the following:
 - 1. those designed for use in space;
 - 2. those designed to be installed in aircraft, which use non-silicon detectors, whose instantaneous field of view is less than 2.5 milliradians;
 - (v) equipment that uses optical detectors and is a direct view equipment, which falls under any of the following (excluding medical equipment that do not have photocathodes that uses gallium arsenide or indium gallium arsenide as the main material built in):
 - (a) equipment with built-in optical detectors that fall under any of the following:
 - 1. image reinforcing tubes that fall under item (iii), (b);

2. focal plane arrays that fall under item (iii), (e);
 3. solid optical detectors that fall under item (iii), (a) or Article 14, item (vii);
- (b) equipment with built-in optical detectors that fall under any of the following (excluding those that fall under (a)):
1. image reinforcing tubes that fall under item (iii), (c), 1.;
 2. focal plane arrays that fall under item (iii), (d);
- (vi) coolers for optical detectors which fall under any of the following:
- (a) coolers for optical detectors designed for use in space;
- (b) coolers for optical detectors which are not designed for use in space, with the temperature of the contact surface used for cooling of less than -55°C , which fall under any of the following:
1. circulation type coolers, whose mean time to failure or mean time between failures exceeds 2,500 hours;
 2. self-regulating Joule Thomson coolers that have a diameter of less than 8 millimeters;
- (vii) optical fibers for sensors that are used to measure sound, temperature, acceleration, electromagnetism, or radioactive rays;
- (vii)-2 readout integrated circuits specially designed for focal plane arrays that fall under either of item (iii), (d) or (e) (excluding those specially designed for automobiles for civilian use);
- (viii) electronic cameras, or their components, which fall under any of the following:
- (a) cameras which fall under any of the following:
1. those with built-in image reinforcing tubes that fall under item (iii), (b), which fall under any of the following:
 - i. those not designed for underwater use;
 - ii. those designed for underwater use;
 2. those with built-in focal plane arrays that fall under item (iii), (e), which fall under any of the following:
 - i. those not designed for underwater use;
 - ii. those designed for underwater use;
 3. those with built-in solid optical detectors which fall under item (iii), (a) or Article 14, item (vii);
- (b) cameras that fall under any of the following (excluding those that fall under (a)):
1. Deleted
 2. Deleted
 3. electronic streak cameras with a time resolution of less than 50 nanoseconds;
 4. electronic framing cameras whose shooting speed exceeds 1 million

- frames per second;
5. electronic cameras that fall under the following i. and ii.:
 - i. electronic cameras whose shutter speed is less than 1 microsecond;
 - ii. electronic cameras that has a signal readout speed that exceeds 125 frames per second;
 6. plug-in units specially designed for electronic cameras with a module type structure (limited to those falling under 3. through 5.), which enable the camera to attain the functioning that the cameras falling under any of 3. through 5. have;
 7. video cameras with built-in solid-state image sensors, which have a maximum sensitivity within a wavelength range that exceeds 10 nanometer but is 30,000 nanometers or less, which fall under any of the following i. through iii. and also fall under any of the following iv. through vi.:
 - i. those for black and white photography, with solid-state image sensor whose number of effective pixels exceeds 4,000,000;
 - ii. those for color photography that have three solid-state image sensors built in and the number of effective pixels of each solid-state image sensor exceeds 4,000,000;
 - iii. those for color photography that have one solid-state image sensor built in, and the number of effective pixels of the solid-state image sensor exceeds 12, 000,000;
 - iv. those that have a reflector that falls under item (ix), (a);
 - v. those that have a control device for optical device or optical components that fall under item (ix), (d);
 - vi. those that have a function capable of internally processing tracking data for the object to be photographed by the camera and to annotate the data in the image information;
 8. scanning cameras or scanning camera equipment, which falls under all of the following i. through iii.:
 - i. those that have a maximum sensitivity within a wavelength range that exceeds 10 nanometers but is 30,000 nanometers or less;
 - ii. those that have built-in solid-state image sensor in which the pixels are arranged linearly and the number of the pixels exceeds 8,192;
 - iii. those that perform mechanical scanning in one direction;
 9. those with a built-in image reinforcing tube that falls under item (iii), (c), 1.;
 10. those with a built-in focal plane array that falls under item (iii), (d);
- (ix) optical equipment, or its components, which fall under any of the following:
- (a) reflectors that fall under any of the following:
 1. those that are capable of changing the shape of their mirror surface,

- whose active aperture exceeds 10 millimeters in diameter, and which fall under any of the following, or components of these:
- i. those whose mechanical resonance frequencies are 750 hertz or more and which have more than 200 actuators; or
 - ii. those whose laser damage threshold falls under any of the following:
 - a. one that exceeds 1 kilowatt per square centimeter when a continuous wave laser oscillator is used; or
 - b. one that exceeds 2 joules per square centimeter when a laser pulse with a pulse repetition frequency of 20 hertz and a pulse width of 20 nanoseconds is used;
2. those that do not have parts made of composite materials or foams, whose mirror surface has a mass per square meter of less than 30 kilograms, and whose total weight exceeds 10 kilograms (excluding reflectors designed for a heliostat installed on the ground to follow solar radiation);
3. those that have parts made of composite materials or foams, whose mirror surface has a mass per square meter of less than 30 kilograms, and whose total weight exceeds 2 kilograms (excluding reflectors designed for a heliostat installed on the ground to follow solar radiation);
4. those that are designed for reflector stages for scanning light which fall under (d), 2., i., whose flatness is 63.3 nanometers or less, and which fall under any of the following:
- i. those whose diameter or length of the major axis is 100 millimeters or more; or
 - ii. those that fall under the following a. and b.:
 - a. those whose diameter or length of the major axis exceeds 50 millimeters but is less than 100 millimeters; and
 - b. those whose laser damage threshold falls under any of the following:
 - 1 one that exceeds 10 kilowatts per square centimeter when a continuous wave laser oscillator is used; or
 - 2 one that exceeds 20 joules per square centimeter when a laser pulse with a pulse repetition frequency of 20 hertz and the pulse width of 20 nanoseconds is used;
- (b) optical components consisting of zinc selenide or zinc sulfide, which transmits light with a wavelength that exceeds 3,000 nanometers but is 25,000 nanometers or less, and fall under any of the following:
1. those with a volume exceeding 100 cubic centimeters;
 2. those whose diameter or major axis length exceeds 80 millimeters, and has a thickness that exceeds 20 millimeters;
- (c) those designed for use in space, which fall under any of the following:
1. those whose weight was reduced to less than 20% of the weight in a fully

- dense state;
 - 2. substrates (including coated substrates or substrates that have a protective film);
 - 3. reflectors that are designed to be assembled in outer space, and are components of reflectors for which the sum of the light receiving surface areas when assembled is equivalent to those with an aperture greater than 1 meter;
 - 4. those composed of composite materials whose linear coefficient of expansion in all directions is not more than $5/1,000,000$ per degree of temperature;
- (d) controllers for an optical device or optical components, which fall under any of the following:
- 1. those that are designed to maintain the surface shape or direction of optical components designed for use in space, which fall under (c), 1. or (c), 3.;
 - 2. those that scan, track, or stabilize light, or regulate optical resonators, which fall under any of the following:
 - i. reflector stages for scanning light that are designed to support a reflector whose diameter or length of the major axis exceeds 50 millimeters, which fall under all of the following a. through c.; or electronic controllers designed for them:
 - a. those whose maximal angular travel distance is plus or minus 26 milliradians or more;
 - b. those whose mechanical resonance frequencies are 500 hertz or more; and
 - c. those whose angular precision is 10 microradians or less;
 - ii. devices which are for regulating optical resonators and have a bandwidth of 100 hertz or more and precision of 10 microradians or less;
 - 3. gimbals with a maximum deflection angle exceeding 5 degrees, which can be used in bandwidths of 100 hertz or more, and fall under any of the following:
 - i. those with a length of diameter or major axis exceeding 0.15 meters and 1 meter or less, and with an angular acceleration exceeding 2 radians per second squared and with a precision of 200 microradians or less;
 - ii. those with a length of diameter or major axis exceeding 1 meter, and with an angular acceleration exceeding 0.5 radians per second squared and with a precision of 200 microradians or less;
- (ix)-2 aspherical optical elements that fall under all of (a) through (c):
- (a) those with the maximum measurement for the optical aperture exceeding 400 millimeters;
 - (b) those that have a root mean square surface roughness of less than 1

- nanometer at a sampling length of 1 millimeter or more;
- (c) those for which the absolute value of the linear coefficient of expansion at a temperature of 25 °C is less than 3/1,000,000;
 - (ix)-3 wave front measuring devices that fall under the following (a) and (b):
 - (a) those whose frame rate is 1 kilohertz or more; and
 - (b) those whose wavefront precision is one-twentieth or less at the designed wavelength;
 - (x) laser oscillators or their components, accessories, or test equipment which fall under any of the following:
 - (a) continuous wave laser oscillators other than variable wavelength laser oscillators, which fall under any of the following (excluding those falling under (d)):
 1. those designed for use within a wavelength range of less than 150 nanometers, with a rated output exceeding 1 watt;
 2. those designed for use within a wavelength range of 150 nanometers or more and 510 nanometers or less, with a rated output exceeding 30 watts (excluding argon laser oscillators with a rated output of 50 watts or less);
 3. those designed for use within a wavelength range that exceeds 510 nanometers but is 540 nanometers or less, which fall under any of the following:
 - i. those that oscillate in a single transverse mode with a rated output exceeding 50 watts;
 - ii. those that oscillate in a multiple transverse mode with a rated output exceeding 150 watts;
 4. those designed for use within a wavelength range that exceeds 540 nanometers but is 800 nanometers or less, with a rated output exceeding 30 watts;
 5. those designed for use within a wavelength range that exceeds 800 nanometers but is 975 nanometers or less, which fall under any of the following:
 - i. those that oscillate in a single transverse mode with a rated output exceeding 50 watts;
 - ii. those that oscillate in a multiple transverse mode with a rated output exceeding 80 watts;
 6. those designed for use within a wavelength range that exceeds 975 nanometers but is 1,150 nanometers or less, which fall under any of the following:
 - i. those that oscillate in a single transverse mode, which fall under any of the following:
 - a. those with a rated output exceeding 1,000 watts;
 - b. those that fall under the following 1 and 2:

- 1 those with a rated output exceeding 500 watts;
- 2 those with a spectral bandwidth of less than 40 gigahertz;
 - ii. those that oscillate in a multiple transverse mode, which fall under any of the following (excluding industrial laser oscillators with a rated output that exceeds 2 kilowatts but is 6 kilowatts or less and with a total weight greater than 1,200 kilograms):
 - a. those with a wall-plug efficiency exceeding 18%, and a rated output exceeding 1,000 watts;
 - b. those with a rated output exceeding 2 kilowatts;
7. those designed for use within a wavelength range that exceeds 1,150 nanometers but is 1,555 nanometers or less, which fall under any of the following:
 - i. those that oscillate in a single transverse mode with a rated output exceeding 50 watts;
 - ii. those that oscillate in a multiple transverse mode with a rated output exceeding 80 watts;
8. those designed for use within a wavelength range that exceeds 1,555 nanometers but is 1,850 nanometers or less with a rated output exceeding 1 watt;
9. those designed for use within a wavelength range that exceeds 1,850 nanometers but is 2,100 nanometers or less, which fall under any of the following:
 - i. those that oscillate in a single transverse mode with a rated output exceeding 1 watt;
 - ii. those that oscillate in a multiple transverse mode with a rated output exceeding 120 watts;
10. those designed for use within a wavelength range that exceeds 2,100 nanometers with a rated output exceeding 1 watt;
- (b) pulse laser oscillators other than variable wavelength laser oscillators, which fall under any of the following (excluding those falling under (d)):
 1. those designed for use within a wavelength range of less than 150 nanometers, which fall under any of the following:
 - i. those which oscillate pulses exceeding 50 millijoules per pulse with a peak output exceeding 1 watt;
 - ii. those with an average output exceeding 1 watt;
 2. those designed for use within a wavelength range of 150 nanometers or more and 510 nanometers or less, which fall under any of the following:
 - i. those that oscillate pulses exceeding 1.5 joules per pulse and with a peak output exceeding 30 watts;
 - ii. those with an average output exceeding 30 watts (excluding argon laser oscillators with an average output of 50 watts or less);

3. those designed for use within a wavelength range that exceeds 510 nanometers but is 540 nanometers or less, which fall under any of the following:
 - i. those that oscillate in a single transverse mode and fall under any of the following:
 - a. those that oscillate pulses exceeding 1.5 joules per pulse and with a peak output exceeding 50 watts;
 - b. those with an average output exceeding 50 watts;
 - ii. those that oscillate in a multiple transverse mode and fall under any of the following:
 - a. those that oscillate pulses exceeding 1.5 joules per pulse and with a peak output exceeding 150 watts;
 - b. those with an average output exceeding 150 watts;
4. those designed for use within a wavelength range that exceeds 540 nanometers but is 800 nanometers or less, which fall under any of the following:
 - i. those that oscillate pulses with a pulse width of less than 1 picosecond, which fall under any of the following:
 - a. those that oscillate pulses exceeding 0.005 joules per pulse, with a peak output exceeding 5 gigawatts;
 - b. those with an average output exceeding 20 watts;
 - ii. those that oscillate pulses with a pulse width of 1 picosecond or more, which fall under any of the following:
 - a. those that oscillate pulses exceeding 1.5 joules per pulse, with a peak output exceeding 30 watts;
 - b. those with an average output exceeding 30 watts;
5. those designed for use within a wavelength range that exceeds 800 nanometers but is 975 nanometers or less, which fall under any of the following:
 - i. those that oscillate pulses with a pulse width of 1 picosecond or less, which fall under any of the following:
 - a. those that oscillate pulses exceeding 0.005 joules per pulse with a peak output exceeding 5 gigawatts;
 - b. those that oscillate in a single transverse mode with an average output exceeding 20 watts;
 - ii. those that oscillate pulses with a pulse width of 1 picosecond or more and 1 microsecond or less, which fall under any of the following:
 - a. those that oscillate pulses exceeding 0.5 joules per pulse and with a peak output exceeding 50 watts;
 - b. those that oscillate in a single transverse mode with an average output exceeding 20 watts;

- c. those that oscillate in a multiple transverse mode with an average output exceeding 50 watts;
- iii. those that oscillate pulses with a pulse width of more than 1 microsecond, which fall under any of the following:
 - a. those that oscillate pulses exceeding 2 joules per pulse and with a peak output exceeding 50 watts;
 - b. those that oscillate in a single transverse mode with an average output exceeding 50 watts;
 - c. those that oscillate in a multiple transverse mode with an average output exceeding 80 watts;
- 6. those designed for use in a wavelength range that exceeds 975 nanometers but is 1,150 nanometers or less, which fall under any of the following:
 - i. those that oscillate pulses with a pulse width of less than 1 picosecond, which fall under any of the following:
 - a. those with a peak output exceeding 2 gigawatts per pulse;
 - b. those with an average output exceeding 30 watts;
 - c. those that oscillate pulses exceeding 0.002 joules per pulse;
 - ii. those that oscillate pulses with a pulse width of 1 picosecond or more and less than 1 nanosecond, which fall under any of the following:
 - a. those with a peak output exceeding 5 gigawatts per pulse;
 - b. those with an average output exceeding 50 watts;
 - c. those that oscillate pulses exceeding 0.1 joules per pulse;
 - iii. those that oscillate pulses with a pulse width of 1 nanosecond or more and 1 microsecond or less, which fall under any of the following:
 - a. those that oscillate in a single transverse mode and fall under any of the following:
 - 1 those with a peak output exceeding 100 megawatts;
 - 2 those with an average output exceeding 20 watts, whose maximum pulse repetition frequency is designed to be 1 kilohertz or less;
 - 3 those with a wall-plug efficiency exceeding 12% and an average output exceeding 100 watts, which operate at a pulse repetition frequency exceeding 1 kilohertz;
 - 4 those with an average output exceeding 150 watts, which operate at a pulse repetition frequency exceeding 1 kilohertz;
 - 5 those that oscillate pulses exceeding 2 joules per pulse;
 - b. those that oscillate in a multiple transverse mode and fall under any of the following:
 - 1 those with a peak output exceeding 400 megawatts;
 - 2 those with a wall-plug efficiency exceeding 18% with an average output exceeding 500 watts;

- 3 those with an average output exceeding 2 kilowatts;
- 4 those that oscillate pulses exceeding 4 joules per pulse;
 - iv. those that oscillate pulses with a pulse width exceeding 1 microsecond, which fall under any of the following:
 - a. those that oscillate in a single transverse mode, which fall under any of the following:
 - 1 those with a peak output exceeding 500 kilowatts;
 - 2 those with a wall-plug efficiency exceeding 12% and an average output exceeding 100 watts;
 - 3 those with an average output exceeding 150 watts;
 - b. those that oscillate in a multiple transverse mode, which fall under any of the following:
 - 1 those with a peak output exceeding 1 megawatt;
 - 2 those with a wall-plug efficiency exceeding 18% and an average output exceeding 500 watts;
 - 3 those with an average output exceeding 2 kilowatts;
 - 7. those designed for use within a wavelength range that exceeds 1,150 nanometers but is 1,555 nanometers or less, which fall under any of the following:
 - i. those that oscillate pulses with a pulse width of 1 microsecond or less, which fall under any of the following:
 - a. those that oscillate pulses exceeding 0.5 joules per pulse and with a peak output exceeding 50 watts;
 - b. those that oscillate in a single transverse mode with an average output exceeding 20 watts;
 - c. those that oscillate in a multiple transverse mode with an average output exceeding 50 watts;
 - ii. those that oscillate pulses with a pulse width exceeding 1 microsecond, which fall under any of the following:
 - a. those that oscillate pulses exceeding 2 joules per pulse and with a peak output exceeding 50 watts;
 - b. those that oscillate in a single transverse mode with an average output exceeding 50 watts;
 - c. those that oscillate in a multiple transverse mode with an average output exceeding 80 watts;
 - 8. those designed for use within a wavelength range that exceeds 1,555 nanometers but is 1,850 nanometers or less, which fall under any of the following:
 - i. those that oscillate pulses exceeding 100 millijoules per pulse and with a peak output exceeding 1 watt; or
 - ii. those with an average output exceeding 1 watt;

9. those designed for use within a wavelength range that exceeds 1,850 nanometers but is 2,100 nanometers or less, which fall under any of the following:
 - i. those that oscillate in a single transverse mode, which fall under any of the following:
 - a. those that oscillate pulses exceeding 100 millijoules per pulse and with a peak output exceeding 1 watt; or
 - b. those with an average output exceeding 1 watt;
 - ii. those that oscillate in a multiple transverse mode, which fall under any of the following:
 - a. those that oscillate pulses exceeding 100 millijoules per pulse and with a peak output exceeding 10 kilowatts; or
 - b. those with an average output exceeding 120 watts;
10. those designed for use within a wavelength range exceeding 2,100 nanometers, which fall under any of the following:
 - i. those that oscillate pulses exceeding 100 millijoules per pulse and with a peak output exceeding 1 watt;
 - ii. those with an average output exceeding 1 watt;
- (c) variable wavelength laser oscillators that fall under any of the following (excluding those falling under (d)):
 1. those designed for use in a wavelength range of less than 600 nanometers, which fall under any of the following:
 - i. those that oscillate pulses exceeding 50 joules per pulse and with a peak output exceeding 1 watt;
 - ii. those with an average output or continuous wave rated output exceeding 1 watt;
 2. those designed for use within a wavelength range that exceeds 600 nanometers but is 1,400 nanometers or less, which fall under any of the following:
 - i. those that oscillate pulses exceeding 1 joule per pulse and with a peak output exceeding 20 watts;
 - ii. those with an average output or continuous wave rated output exceeding 20 watts;
 3. those designed for use in a wavelength range exceeding 1,400 nanometers, which fall under any of the following:
 - i. those that oscillate pulses exceeding 50 millijoules per pulse and with a peak output exceeding 1 watt;
 - ii. those with an average output or continuous wave rated output exceeding 1 watt;
- (d) laser oscillators that fall under any of the following:
 1. semiconductor laser oscillators that fall under any of the following:

- i. a single semiconductor laser diode that oscillates in a single transverse mode, which falls under any of the following:
 - a. one that is designed for use within a wavelength range of 1,510 nanometers or less, with an average output or continuous wave rated output exceeding 1.5 watts;
 - b. one that is designed for use within a wavelength range exceeding 1,510 nanometers, with an average output or continuous wave rated output exceeding 500 milliwatts;
- ii. a single semiconductor laser diode that oscillates in a multiple transverse mode, which falls under any of the following:
 - a. one that is designed for use within a wavelength range of less than 1,400 nanometers, with an average output or continuous wave rated output exceeding 15 watts;
 - b. one that is designed for use within a wavelength range of 1,400 nanometers or more and less than 1,900 nanometers, with an average output or continuous wave rated output exceeding 2.5 watts;
 - c. one that is designed for use within a wavelength range of 1,900 nanometers or more, with an average output or continuous wave rated output exceeding 1 watt;
- iii. a single semiconductor laser bar that falls under any of the following (excluding those built into semiconductor laser stacked arrays referred to in iv. or v.):
 - a. one that is designed for use within a wavelength range of less than 1,400 nanometers, with an average output or continuous wave rated output exceeding 100 watts;
 - b. one that is designed for use within a wavelength range of 1,400 nanometers or more and less than 1,900 nanometer, with an average output or continuous wave rated output exceeding 25 watts;
 - c. one that is designed for use within a wavelength range of 1,900 nanometers or more, with an average output or a continuous wave rated output exceeding 10 watts;
- iv. semiconductor laser stacked arrays that fall under any of the following:
 - a. those designed for use within a wavelength range of less than 1,400 nanometers, which fall under any of the following:
 - 1 those with a total average output or total continuous wave rated output of less than 3 kilowatts, with an average output density or continuous wave rated output density exceeding 500 watts per square meter;
 - 2 those with a total average output or total rated output of continuous waves of 3 kilowatts or more and 5 kilowatts or less, and an average output density or continuous wave rated output density exceeding 350 watts per square meter;

3 those with a total average output or total continuous wave rated output exceeding 5 kilowatts;

4 those with a peak pulse output density exceeding 2,500 watts per square centimeter (excluding monolithic types formed by epitaxial growth);

5 those with a total average output of waves that enable stationary interference or total rated output of continuous waves that exceeds 150 watts;

b. those designed for use within a wavelength range of 1,400 nanometers or more and less than 1,900 nanometers, which fall under any of the following:

1 those with a total average output or total rated output of continuous waves of less than 250 watts, and an average output density or continuous wave rated output density exceeding 150 watts per square meter;

2 those with a total average output or total rated output of continuous waves of 250 watts or more and 500 watts or less, and an average output density or continuous wave rated output density exceeding 50 watts per square meter;

3 those with a total average output or total rated output of continuous waves exceeding 500 watts;

4 those with a peak pulse output density exceeding 500 watts per square centimeter (excluding monolithic types formed by epitaxial growth);

5 those with a total average output of waves that enable stationary interference or total rated output of continuous waves exceeding 15 watts;

c. those designed for use within a wavelength range of 1,900 nanometers or more, which fall under any of the following:

1 those with an average output density or continuous wave rated output density exceeding 50 watts per square meter;

2 those with a total average output or total rated output of continuous waves exceeding 10 watts;

3 those with a total average output of waves that enable stationary interference or total rated output of continuous waves exceeding 1.5 watts;

d. those that contain one or more semiconductor laser bars that fall under iii.;

v. semiconductor laser stacked arrays that are designed to be combined with other semiconductor laser stacked arrays, which have junctions for sharing electronic circuits and cooling units with other semiconductor laser stacked arrays (excluding those falling under iv.);

2. carbon monoxide laser oscillators that fall under any of the following:

i. those that oscillate pulses exceeding 2 joules per pulse and with a peak output exceeding 5 kilowatts;

ii. those with an average output or continuous wave rated output exceeding 5 kilowatts;

3. carbon dioxide laser oscillators that fall under any of the following:
 - i. those with a continuous wave rated output exceeding 15 kilowatts;
 - ii. those that oscillate pulses at a pulse width exceeding 10 microseconds, which fall under any of the following:
 - a. those with an average output exceeding 10 watts;
 - b. those with a peak output exceeding 100 kilowatts;
 - iii. those that oscillate pulses at a pulse width of 10 microseconds or less, which fall under any of the following:
 - a. those that oscillate pulses exceeding 5 joules per pulse;
 - b. those with an average output exceeding 2.5 kilowatts;
4. excimer laser oscillators that fall under any of the following:
 - i. those designed for use within a wavelength range of 150 nanometers or less, which fall under any of the following:
 - a. those that oscillate pulses exceeding 50 millijoules per pulse;
 - b. those with an average output exceeding 1 watt;
 - ii. those designed for use within a wavelength range that exceeds 150 nanometers but is 190 nanometers or less, which fall under any of the following:
 - a. those that oscillate pulses exceeding 1.5 joules per pulse;
 - b. those with an average output exceeding 120 watts;
 - iii. those designed for use within a wavelength range that exceeds 190 nanometers but is 360 nanometers or less, which fall under any of the following:
 - a. those that oscillate pulses exceeding 10 joules per pulse;
 - b. those with an average output exceeding 500 watts;
 - iv. those designed for use within a wavelength range exceeding 360 nanometers, which fall under any of the following:
 - a. those that oscillate pulses exceeding 1.5 joules per pulse;
 - b. those with an average output exceeding 30 watts;
 5. chemical laser oscillators that fall under any of the following:
 - i. hydrogen fluoride laser oscillators;
 - ii. deuterium fluoride laser oscillators;
 - iii. transfer laser oscillators that fall under any of the following:
 - a. iodine laser oscillators designed to be excited by excitation transfer from oxygen;
 - b. carbon dioxide laser oscillators designed to be excited by excitation transfer from deuterium fluoride;
 6. neodymium glass laser oscillators that oscillate non-repetitive pulses, which fall under any of the following:
 - i. those that oscillate pulses at a pulse width of 1 microsecond or less, and oscillate pulses exceeding 50 joules per pulse;

- ii. those that oscillate pulses at a pulse width exceeding 1 microsecond, and oscillate pulses exceeding 100 joules per pulse;
- (e) components for laser oscillators that fall under any of the following:
 - 1. reflectors that are designed to be cooled by using a heat pipe or by passing a fluid into a place that is less than 1 millimeter beneath the surface of the mirror;
 - 2. reflectors or optical components or electro-optical components that have permeability (including those that are partially permeable), which are designed to be used in laser oscillators that fall under any of (a) through (d) (excluding fused tapered fiber combiners and multilayer dielectric gratings);
 - 3. components of fiber laser oscillators that fall under any of the following:
 - i. fused tapered fiber combiners that use multimode fibers for both input and output, which fall under the following a. and b.:
 - a. those whose insertion loss at the total rated average output or the total rated output of continuous waves (excluding output transmitted through a single-mode core) exceeding 1,000 watts is maintained at 0.3 decibels or less;
 - b. those which have three or more input fibers;
 - ii. fused tapered fiber combiners that use single mode fibers for input and multimode fibers for output, which fall under all of the following:
 - a. those whose insertion loss at the total rated average output or the total rated output of continuous waves exceeding 4,600 watts is maintained at less than 0.5 decibels;
 - b. those that have three or more input fibers;
 - c. those that fall under any of the following:
 - 1 those that have five or less input fibers and whose beam parameter product at output is 1.5 millimeters-milliradians or less; or
 - 2 those which have more than five input fibers and whose beam parameter product at output is 2.5 millimeters-milliradians or less;
 - iii. multilayer dielectric gratings that fall under the following a. and b.:
 - a. those designed to spectrally or coherently combine beams of five or more fiber laser oscillators; and
 - b. those for which the threshold of continuous wave laser damage is 10 kilowatts or more per square centimeter;
 - (f) test equipment or accessories for laser oscillators, which fall under any of the following:
 - 1. Deleted
 - 2. test equipment for laser oscillators that is specially designed to measure errors in the beam deflection angle of an ultra-high-power laser oscillator (meaning laser oscillators that are capable of outputting energy exceeding

- 1 kilojoule per 50 milliseconds or whose average output or continuous wave rated output exceeds 20 kilowatts; the same applies hereinafter), and whose precision is 10 microradians or less;
3. accessories for phased array ultra-high-power laser oscillators, which are specifically designed to synthesize coherent light, and which fall under any of the following:
- i. those whose precision at wavelengths exceeding 1 micrometer is 0.1 micrometers or less; or
 - ii. those whose precision at wavelengths of 1 micrometer or less is one-tenth or less of the wavelength used;
4. projection telescopes that are designed to be used in combination with ultra-high output laser oscillators;
- (x)-2 equipment to detect sounds by using laser beams, which falls under all of the following (a) through (e):
- (a) those for which the continuous wave rated output of the laser oscillator is 20 milliwatts or more;
 - (b) those for which the frequency stability of the laser oscillator is 10 megahertz or less;
 - (c) those for which the wavelength range of the laser oscillator is 1,000 nanometers or more and 2,000 nanometers or less;
 - (d) those for which the resolution of the optical system is less than 1 nanometer;
 - (e) those for which the signal-to-noise ratio is 1,000 or more;
- (xi) magnetometers, magnetic gradiometers (excluding those designed for medical use), or underwater electric field sensors (excluding those for the fishing industry), or calibration equipment or components of these, which fall under any of the following:
- (a) magnetometers that utilize superconducting technology, which fall under any of the following:
 1. those designed to be operated in a stationary state which do not have a device designed to reduce noise generated during operations, for which the sensitivity at a frequency of 1 hertz (the effective value expressed per square root of the band frequency; the same applies hereinafter) is 50 femtoteslas or less;
 2. those that have a device designed to reduce noise generated during operations, whose sensitivity during operations at a frequency of 1 hertz is less than 20 picoteslas;
 - (b) magnetometers that utilize an optical pump or nuclear magnetic resonance technology, for which the sensitivity at a frequency of 1 hertz is less than 2 picoteslas;
 - (c) magnetometers that utilize an optical pump or nuclear magnetic

- resonance technology, for which the sensitivity at a frequency of 1 hertz is 2 picoteslas or more and less than 20 picoteslas;
- (d) magnetometers that utilize triaxial fluxgate technology, for which the sensitivity at a frequency of 1 hertz is 10 picoteslas or less;
- (e) magnetometers using an induction coil, which fall under any of the following:
1. those for which the sensitivity at a frequency of less than 1 hertz is less than 0.05 nanoteslas;
 2. those for which the sensitivity at frequency of 1 hertz or more and 10 hertz or less is less than 0.001 nanoteslas;
 3. those for which the sensitivity at a frequency exceeding 10 hertz is less than 0.0001 nanoteslas;
- (f) magnetometers that use optical fibers, for which the sensitivity is less than 1 nanotesla;
- (g) underwater electric field sensors, for which the sensitivity measured at a frequency of 1 hertz is less than 8 nanovolts per meter;
- (h) magnetic gradiometers which use two or more magnetometers that fall under any of the above (a) through (f);
- (i) magnetic gradiometers that use optical fibers, and of an intrinsic type (those that have a single detection element per axis; hereinafter the same applies in this item), for which the sensitivity is less than 0.3 nanoteslas per meter;
- (j) magnetic gradiometers that do not use optical fibers, and of an intrinsic type, for which the sensitivity is less than 0.015 nanoteslas per meter;
- (k) calibration equipment for magnetometers, magnetic gradiometers, or underwater electric field sensors, that are designed for magnetometers, magnetic gradiometers, or underwater electric field sensors which have the functions equivalent to or greater than the functions possessed by the goods that fall under any of (a) through (j) (excluding goods falling under (l));
- (l) calibration equipment for magnetometers, magnetic gradiometers, or underwater electric field sensors, which are designed for goods falling under any of the following:
1. magnetometers that fall under (c) and utilize an optical pump or nuclear magnetic resonance technology that achieves a sensitivity of less than 2 picoteslas;
 2. underwater electric field sensors that fall under (g);
 3. magnetic gradiometers that fall under any of (h) through (j), which achieve a sensitivity of less than 3 picoteslas;
- (m) magnetic gradiometers which use magnetometers that fall under (a) or (b);

- (xi)-2 equipment to detect magnetic fields or electric fields underwater, which falls under any of the following:
 - (a) one that has magnetometers that fall under item (xi), (a) or (b) built in;
 - (b) one that has magnetometers that fall under any of item (xi), (c) through (f) or underwater electric field sensors that fall under (g) of that item built in;
- (xii) gravimeters that fall under any of the following, or gravity gradiometers:
 - (a) gravimeters designed for ground use with a precision of less than 10 microgals when gravity is measured in a stationary state (excluding Worden gravimeters);
 - (b) gravimeters designed to be mounted on mobile objects, which fall under the following 1. and 2.:
 - 1. those with the precision of less than 0.7 milligals when gravity is measured in a stationary state;
 - 2. those with the precision of less than 0.7 milligals when gravity is measured in a transitory condition, and the required measuring time is less than 2 minutes;
- (xiii) radar that falls under any of the following, or its components (excluding secondary surveillance radars, civil automotive radars, meteorological radars, precision approach radars that comply with the International Civil Aviation Organization Standards and their components (including components for a radar that are display equipment for air traffic control):
 - (a) radar that can be used within a frequency range of 40 gigahertz or more and 230 gigahertz or less, which fall under any of the following:
 - 1. one with an average output exceeding 100 milliwatts;
 - 2. one with a positional accuracy of 1 meter or less in range, and a positional accuracy of 0.2 degrees or less in azimuth;
 - (b) radar with a tunable bandwidth that exceeds the center frequency by 12.5%;
 - (c) radar that can use three or more carrier frequencies simultaneously;
 - (d) radar that can be used as synthetic aperture radar, reverse synthetic radar, or side looking airborne radar;
 - (e) radar with built-in array antennas that can perform electronic scanning;
 - (f) radar that can measure the altitude of a target;
 - (g) radar that is designed to be mounted on balloons or aircraft and which utilize the Doppler effect to detect a moving target;
 - (h) radar that utilizes any of the following technologies:
 - 1. spread spectrum;
 - 2. frequency agility;
 - (i) radar for ground use, with a measuring distance that exceeds 185 km (excluding fishing ground surveillance radar, and ground radar and

- meteorological balloon tracking radar designed for air traffic control);
- (j) laser radar (including lidars) that falls under any of the following:
1. one designed for use in space;
 2. one that utilizes heterodyne detection or homodyne detection technology, and has an angular resolution of less than 20 microradians;
 3. one designed for conducting coastal bathymetric surveys using aircraft, which has sufficient precision in light of the standard specified by the International Hydrographic Organization for hydrographic surveys, and which uses one or more laser oscillators to be used within a wavelength range that exceeds 400 nanometers but is 600 nanometers or less;
- (k) radar which utilizes pulse compression technology that falls under any of the following:
1. one with a pulse compression ratio exceeding 150;
 2. one with a compressed pulse width of less than 200 nanoseconds (excluding two-dimensional marine radar or two-dimensional radar for ship navigation services which falls under all of the following i. through v.):
 - i. one with a pulse compression ratio of less than 150;
 - ii. one with a compressed pulse width exceeding 30 nanoseconds;
 - iii. one with a single rotating mechanical scanning antenna;
 - iv. one with a peak output of less than 250 watts;
 - v. one that does not have a frequency hopping capability;
- (l) radar utilizing data processing technology that falls under any of the following (excluding equipment used for ship navigation services or its components):
1. automatic target tracking technology that can predict the future position of a target at the point of time ahead of the time when the next antenna beam passes (excluding collision prevention functions for air traffic control or marine radars);
 2. Deleted
 3. technology which carries out the overlaying, correlation, or fusion of target data obtained from two or more radars whose distance between them exceeds 1,500 meters or more within 6 seconds, for the purpose of improving the performance compared to that when using a single radar falling under item (xiii), (f) or (i);
 4. technology which carries out the overlaying, correlation, or fusion of target data obtained from two or more radars including radars installed on vehicles, vessels, aircraft, or artificial satellites, or other types of flying objects for use in space pioneering within 6 seconds, for the purpose of improving the performance compared to that when using a single radar falling under item (xiii), (f) or (i);
- (xiii)-2 masks or reticles specially designed for manufacturing optical sensors

- that fall under either of item (iii), (a), 2. or 3.:
- (xiv) optical measuring equipment that falls under any of the following:
 - (a) equipment for measuring reflection rate of light (limited to those which measure the absolute value of reflection rate), whose precision is 0.1 percent or less;
 - (b) equipment (limited to non-contact type equipment) for measuring the surface shape of lenses or reflectors, which uses a method other than measurement of light scattering and has an aperture diameter exceeding 10 centimeters, which is designed for measuring surface shapes that are not planar at a precision of 2 nanometers or less;
 - (xv) equipment for manufacturing gravimeters for ground use or calibration equipment for them (limited to those with the precision of less than 0.1 milligals when gravity is measured in a stationary state);
 - (xvi) substances that are materials for optical detectors and other optical components, or crystals for laser oscillators, which fall under any of the following:
 - (a) tellurium with a purity of 99.9995% or more;
 - (b) a single crystal of those that fall under any of the following or wafer that has epitaxial growth crystal:
 1. cadmium telluride of zinc telluride and cadmium zinc telluride with the mole ratio to zinc telluride of less than 6 %;
 2. cadmium telluride;
 3. cadmium mercury telluride;
 - (c) substrate material consisting of zinc selenide or zinc sulfide which is manufactured by the chemical vapor deposition method, which fall under any of the following:
 1. those with a volume that exceeds 100 cm³;
 2. those with a diameter that exceeds 80 millimeters and thickness of 20 millimeters or more;
 - (d) electro-chemical materials or non-linear optical materials which fall under any of the following:
 1. potassium titanyl arsenate;
 2. silver gallium selenide;
 3. arsenic thallium selenide;
 4. zinc germanium phosphide;
 5. gallium selenide;
 - (e) non-linear optical materials that fall under any of the following (excluding those that fall under (d)):
 1. those whose dynamic third-order non-linear susceptibility is greater than 1/1,000,000 per square meter per volt per volt and whose response time is less than 1 millisecond;

2. those whose second-order non-linear susceptibility expressed in meter per volt is $33/1,000,000,000,000$ or more;
- (f) substrate material consisting of materials that have beryllium deposited on beryllium or substrate material consisting of silicon carbide, which have a diameter or length of major axis that exceeds 300 millimeters;
- (g) optical glass that falls under all of the following 1. through 3.:
 1. one whose hydroxide ion content is less than 0.0005 % of the total weight;
 2. one whose metal impurities content is less than 0.0001 % of the total weight;
 3. one that has a refractive index variation of less than $5/1,000,000$;
- (h) artificial diamonds with absorption coefficient that is less than $1/100,000$ per centimeter within a wavelength range that exceeds 200 nanometers but is 14,000 nanometers or less;
- (i) artificial crystals for laser oscillators which are incomplete, which are sapphires with titanium added;
- (j) double clad fibers to which rare-earth elements have been added and fall under any of the following:
 1. those whose laser wavelengths have nominal values of 975 nanometers or more and 1,150 nanometers or less, which fall under the following i. and ii. (excluding those whose inner glass clad exceeds 150 micrometers but is 300 micrometers or less in diameter):
 - i. those whose core has a mean value of 25 micrometers or more in diameter; and
 - ii. those whose core has a numerical aperture of less than 0.065;
 2. those whose laser wavelengths have nominal values that exceed 1,530 nanometers, and which fall under the following i. and ii.:
 - i. those whose core has a mean value of 20 micrometers or more in diameter; and
 - ii. those whose core has a numerical aperture of less than 0.1;

Article 10 The goods with specifications prescribed by Order of the Ministry of Economy, Trade and Industry that are referred to in row 11 of Appended Table 1 of the Export Order are goods falling under any of the following:

- (i) accelerometers that fall under any of the following, or its components:
 - (a) linear accelerometers that fall under any of the following:
 1. those designed to be capable of being used at a linear acceleration of 147.15 meters per second squared, which fall under any of the following:
 - i. those with a bias stability (meaning stability after calibration; hereinafter the same applies in this Article) of less than 0.00128 meters per second squared per year;

- ii. those with a scale factor stability of less than 0.013 % per year;
- 2. those designed to be capable of being used at a linear acceleration that exceeds 147.15 meters per second squared and 981 meters per second squared or less, which fall under the following i. and ii.:
 - i. those with bias reproducibility of less than 0.0122625 meters per second squared per year;
 - ii. those with a scale factor reproducibility of less than 0.125% per year;
- 3. those designed for use in inertial navigation systems or inertial guidance systems, and designed to be capable of being used at a linear acceleration exceeding 981 meters per second squared;
- (b) angular accelerometers or rotary accelerometers designed to be capable of being used at a linear acceleration exceeding 981 meters per second squared;
- (ii) gyroscopes or angular velocity sensors, which fall under any of the following, or its components:
 - (a) those designed to be capable of being used at a linear acceleration of 981 meters per second squared or less, which fall under any of the following:
 - 1. those with an angular velocity measuring range of less than 500 degrees per second, which fall under any of the following:
 - i. those with a bias stability of less than 0.5 degrees per hour when measured in a state of 9.81 meters per second squared for a period of one month;
 - ii. those for which the effective value of the angular random walk expressed in degrees per square root of hours is 0.0035 degrees or less (excluding spinning mass gyros);
 - 2. those with an angular velocity measuring range of 500 degrees per second or more, which fall under any of the following:
 - i. those with bias stability of less than 4 degrees per hour when measured in a state of 9.81 meters per second squared for three minutes;
 - ii. those for which the effective value of the angular random walk expressed in degrees per square root of hours is 0.1 degrees or less (excluding spinning mass gyros);
 - (b) those designed to be capable of being used at a linear acceleration that exceeds 981 meters per second squared;
- (iii) inertial navigation systems and other systems utilizing inertial force (including attitude and heading reference systems, gyro compasses, inertial measurement units, and inertial reference systems) which fall under any of the following (excluding those certified for civil aviation use by a governmental organization of Japan or any governmental organization in the regions set forth in Appended Table 2):
 - (a) those designed for aircraft use, land vehicle use, or vessel use that

provide location information without relying on location reference information, which has an accuracy after normal alignment falling under any of the following:

1. those in which the circular error probability is 0.8 nautical miles per hour or less;
 2. those in which the circular error probability is 0.5% or less of moving distance;
 3. those in which the circular error probability is total drift of 1 nautical mile or less in a 24 hour period;
- (b) those designed for aircraft use, land vehicle use, or vessel use that has incorporated location reference information, which provide location information within 4 minutes after the loss of all location reference information, with the circular error probability of less than 10 meters;
- (c) those designed for aircraft use, land vehicle use, or vessel use that indicate the true north direction, which fall under any of the following:
1. those with a maximum operating angular velocity of less than 500 degrees per second and in which the accuracy of nose direction without using location reference information is the value obtained by dividing 0.07 degrees by the cosine of latitude or less, or six minutes or less at 45 degrees latitude;
 2. those with a maximum operating angular velocity of 500 degrees or more per second and in which the accuracy of nose direction without using location reference information is the value obtained by dividing 0.2 degrees by the cosine of latitude or less, or 17 minutes or less at 45 degrees latitude;
- (d) those which provide acceleration measurement values or angular velocity measurement values in two dimensions or more, which fall under any of the following:
1. those with specifications specified in item (i) or the preceding item, along any axis, without using any reference information;
 2. those designed for use in space for which the effective value of the angular random walk along any axis expressed in degrees per square root of hours is 0.1 degrees or less, and which provide angular velocity measurement values (excluding inertial navigation systems that only has incorporate spinning mass gyros built in and other systems utilizing inertial force);
- (iv) gyroscopes for celestial navigation, devices that can determine position or course by automatically tracking celestial bodies or artificial satellites, or their components, which fall under any of the following:
- (a) gyroscopes for celestial navigation or devices that can determine position or course by automatically tracking celestial bodies or artificial satellites,

- which have an azimuth accuracy of 20 seconds or less;
- (b) components designed for gyroscopes for celestial navigation or devices that can determine position or course by automatically tracking celestial bodies or artificial satellites that fall under (a), which fall under any of the following:
 1. optical heads or baffles;
 2. data processing units;
- (v) devices that receive radio waves from global navigation satellite systems and that fall under any of the following, or their components:
 - (a) those having a decryption algorithm to access the ranging code for position and time (excluding those designed for civilian use);
 - (b) those constituting an adaptive antenna system;
- (vi) aircraft altimeters that are designed for use at frequencies exceeding 4.4 gigahertz or at frequencies lower than 4.2 gigahertz, which fall under any of the following:
 - (a) those that have a transmission output control function;
 - (b) those that have a phase deviation modulation function;
- (vii) underwater sonar navigation systems that integrate a heading sensor and use Doppler velocity log or correlation velocity log, and that have a positioning accuracy of 3% or less of the distance travelled by circular error probability, or their components;
- (viii) test equipment, calibration equipment, alignment equipment, or manufacturing equipment that fall under any of items (i) through (vii);
- (ix) devices that are designed to confirm the characteristics of the mirror surface of a ring laser gyro, which fall under any of the following:
 - (a) scatterometers that have a measuring accuracy of 0.001% or less;
 - (b) profilometers that have a measuring accuracy of 0.5 nanometers or less.

Article 11 The goods with specifications prescribed by Order of the Ministry of Economy, Trade and Industry that are referred to in row 12 of Appended Table 1 of the Export Order are goods falling under any of the following:

- (i) manned and moored submersible vessels that are designed to be capable of being used at depths exceeding 1,000 meters;
- (i)-2 unmanned submersible vessels that fall under all of the following:
 - (a) those designed for use as moored vessels;
 - (b) those that are designed to be capable of being used at depths exceeding 1,000 meters;
 - (c) those that fall under any of the following:
 1. those using direct current propulsion electric motors or thrusters, which are designed to allow autonomous underwater navigation;
 2. those capable of transmitting and receiving data using optical fibers;

- (ii) equipment for recovering objects at depths exceeding 250 meters that have a cargo unloading capability exceeding 5 meganewtons, and which fall under any of the following:
 - (a) equipment having a dynamic positioning system that is capable of maintaining the position of vessels within a range of 20 meters from the point set by the navigation equipment;
 - (b) equipment that is capable of maintaining the position within a range of 10 meters from a point set in advance at depths exceeding 1,000 meters;
- (iii) Deleted
- (iv) components or auxiliary equipment of submersible vessels that falls under any of the following:
 - (a) components for submersible vessels that are designed to be capable of being used at depths exceeding 1,000 meters, which fall under any of the following:
 1. pressure-resistant containers or pressure-resistant shells in which the maximum internal dimension exceeds 1.5 meters;
 2. direct current propulsion electric motors or thrusters;
 3. umbilical cables or their connectors that use tension members made of optical fiber and synthetic materials;
 4. components using material that falls under item (xii);
 - (b) automatic control devices that are designed to be capable of being used in submersible vessels, which use navigation data and are servo control systems, which fall under the following 1. and 2.:
 1. those that can be used for submersible vessels that fall under item (i)-2 or Article 14, item (ix);
 2. those that fall under any of the following:
 - i. those that are capable of moving submersible vessels inside a water column having a radius of 10 meters from the center point set in advance in the water;
 - ii. those that are capable of holding a submersible vessel inside a water column having a radius of 10 meters from the center point set in advance in the water;
 - iii. those that are capable of holding a small submersible vessel at a place within 10 meters from the cable when moving the vessel along a cable which is at the bottom of the sea or beneath the sea floor;
 - (c) automatic control devices that are designed to be capable of being used in submersible vessels, which use navigation data and are servo control systems, which fall under 1. and 2. (excluding those falling under (b)):
 1. those that are designed to be capable of being used in submersible vessels that fall under item (i);
 2. those that fall under any of the following:

- i. those that are capable of moving submersible vessels inside a water column having a radius of 10 meters from the center point set in advance in the water;
- ii. those that are capable of holding submersible vessels inside a water column having a radius of 10 meters from the center point set in advance in the water;
- iii. those that are capable of holding submersible vessels inside a water column within 10 meters from the cable when moving the vessel along a cable which is at the bottom of the sea or beneath the sea floor;
- (d) pressure hull glands used to pull optical fiber into the hull of a ship;
- (e) observation devices for underwater use that fall under all of the following:
 - 1. those designed or altered to enable them to be loaded on a submersible vessel and operated by remote control;
 - 2. those falling under any of the following that have a function that reduces the effects of backscattering:
 - i. range gate illuminators;
 - ii. devices using a laser oscillator;
- (v) lighting systems for underwater use which fall under any of the following:
 - (a) those that use the stroboscopic method, in which the energy per flash exceeds 300 joules, which are capable of emitting light more than five times per second;
 - (b) those that use argon arcs, which are designed to be capable of being used at depths exceeding 1,000 meters;
- (vi) underwater robots (excluding operating robots and sequence robots) that fall under any of the following:
 - (a) those that exert control by using information from a sensor which measures the force or torque applied to an external object or the distance to the external object, or tactual sense with the external object;
 - (b) underwater robots that use titanium alloy or fiber reinforced composite materials as structural materials, which are capable of operating with a force of 250 newtons or more or at a torque of 250 newton meters or greater;
- (vii) remote control manipulators (limited to those with joints) which are designed to be capable of being used together with submersible vessels, which fall under any of the following:
 - (a) those that exert control by using information from a sensor which measures the force or torque applied to an external object, or the tactual sense upon the external object;
 - (b) those that exert control by using a master-slave system, with a degree of freedom of motion of 5 or more;
- (viii) power units that are capable of being used when they are shielded from

the atmosphere, which fall under any of the following:

(a) Brayton cycle engines or Rankine cycle engines having a device that falls under any of the following:

1. equipment that is designed to be capable of removing carbon monoxide, carbon dioxide, and minute particles from the exhaust air which is circulating;
2. equipment designed to be capable of using monotomic gases;
3. soundproofing equipment or enclosures designed to be capable of reducing underwater noise at frequencies of less than 10 kilohertz, or equipment that is designed to be capable of mitigating impact of collisions;
4. equipment designed to be capable of compressing reaction products or recycling them as fuel and storing the reaction products, and discharging the reaction products at a pressure of more than 100 kilopascals;

(b) diesel engines having equipment that falls under all of the following 1. through 4.:

1. equipment designed to be capable of removing carbon monoxide, carbon dioxide, and minute particles from exhaust air which is circulating;
2. equipment that is designed to be capable of utilizing monoatomic gases;
3. soundproofing equipment or enclosures that are designed to be capable of reducing underwater noise at frequencies of less than 10 kilohertz, or equipment that is designed to be capable of mitigating impact of collisions;
4. equipment that is designed to be capable of discharging combustion products intermittently;

(c) fuel cells with an output exceeding 2 kilowatts having a device that falls under any of the following:

1. soundproofing equipment or enclosures that are designed to be capable of reducing underwater noise at frequencies of less than 10 kilohertz or equipment designed to be capable of mitigating impact of collisions;
2. equipment that is designed to be capable of compressing reaction products or recycling them as fuel and storing the reaction products, and discharging reaction products at a pressure of more than 100 kilopascals;

(d) sterling cycle engines having equipment that falls under any of the following 1. and 2.:

1. soundproofing equipment or enclosures that are designed to be capable of reducing underwater noise at frequencies of less than 10 kilohertz, or equipment that is designed to be capable of mitigating impact of collisions;
2. equipment that is designed to be capable of discharging reaction products at a pressure of more than 100 kilopascals;

(ix) Deleted

(x) vessel components that fall under any of the following:

(a) variable pitch propellers, or their hubs, with a rated output exceeding 30

- megawatts;
- (b) internal liquid-cooling type electric propulsion engines whose output exceeds 2.5 megawatts;
- (c) superconductive propulsion engines or electric propulsion engines using a permanent magnet, which have an output exceeding 0.1 megawatts;
- (d) power transmission shaft equipment using a composite material, which is capable of transmitting output exceeding 2 megawatts;
- (e) screw propeller devices which are designed to discharge air from the propeller or to supply air to the propeller, with a rated output exceeding 2.5 megawatts;
- (f) soundproofing equipment that is capable of being used on vessels having a displacement of greater than 1,000 tons which reduces sound or vibration at frequencies of less than 500 hertz generated from diesel engines, diesel generators, gas turbine engines, gas turbine generators, propulsion electric motors, or reducers, which is made of a composite sound insulating base, and with the intermediate mass weight exceeding 30% of the weight of the equipment installed on it;
- (g) equipment that uses a divergent nozzle or technology relating to a straightening vane for improving the driving force of the screw propeller or reducing the underwater noise, which have an output exceeding 2.5 megawatts;
- (xi) a circulating water tank designed to measure noise generated from the water current around a model propeller, with a background noise of less than 100 decibels within a frequency range that exceeds 0 hertz but is 500 hertz or less when the standard sound pressure is 1 micropascal and the frequency width is 1 hertz;
- (xii) buoyant materials that fall under the following (a) and (b):
 - (a) those designed to be capable of being used at depths exceeding 1,000 meters;
 - (b) those whose density is less than 561 kilograms per cubic meter;
- (xiii) closed-circuit or semi-closed circuit type self-contained diving equipment;
- (xiv) equipment that obstructs human underwater activities by using acoustic waves, which is designed so that the acoustic waves used will have a sound pressure level of 190 decibels or more in frequencies of 200 hertz or less.

Article 12 The goods with specifications prescribed by Order of the Ministry of Economy, Trade and Industry that are referred to in row 13 of Appended Table 1 of the Export Order are goods falling under any of the following:

- (i) gas turbine engines for aircraft that fall under any of the following:
 - (a) those using technology (excluding programs) needed for designing or manufacturing items falling under any of Article 25, paragraph (3), item

- (ii), (a) through (g) and (j), item (iii) of that paragraph, or item (iv) of that paragraph, or technology needed for designing or manufacturing items falling under the items of Article 27, paragraph (6); provided, however, that those falling under any of the following 1. and 2. are excluded:
 - 1. those that fall under all of the following:
 - i. those certified by a governmental organization of Japan or in the region set forth in Appended Table 2;
 - ii. gas turbine engines for supplying power to manned aircraft for civilian use, mounted on an aircraft for which any of the following documents has been issued by a governmental organization of Japan or in the regions set forth in Appended Table 2:
 - a. a type certificate; or
 - b. a document equivalent to a type certificate, which has been approved by the International Civil Aviation Organization;
 - 2. gas turbine engines for aircraft that are designed for auxiliary power units and certified by the governmental organization of Japan or in the region set forth in Appended Table 2;
 - (b) those which are designed for use in aircraft designed with a cruising time that exceeds 30 minutes at a speed greater than Mach 1;
- (ii) gas turbine engines for vessels that are designed to use liquid fuel (including gas turbine engines suitable for power generation for or propulsion of vessels and are for industrial use or are derived from gas turbine engines for aircraft), which fall under the following (a) and (b), or assemblies or components specially designed for those gas turbine engines:
 - (a) those whose maximum continuous output is 24,245 kilowatts or more when they operate in a steady state in standard reference conditions set by the International Standard ISO 3977-2 (1997);
 - (b) those whose contingency fuel consumption rate is 0.219 kilograms per kilowatt hour or less at 35 percent of the maximum continuous output when they use liquid fuel;
- (iii) assemblies of gas turbine engines, or their components, which use technology (excluding programs) needed for designing or manufacturing items falling under any of Article 25, paragraph (3), item (ii), (a) through (g) and (j), item (iii) of that paragraph, or item (iv) of that paragraph or use technology needed for designing or manufacturing items falling under the items of Article 27, paragraph (6), and are designed to be used in gas turbine engines for aircraft that fall under any of the following:
 - (a)) those which fall under item (i);
 - (b) those designed or manufactured in a region other than Japan, in a region other than one set forth in Appended Table 2, or in a region that cannot be identified;

- (iv) flying objects for use in outer space or flying objects for use in launching them; or components of either of these that fall under any of the following:
 - (a) flying objects for use in launching flying objects for use in outer space;
 - (b) flying objects for use in outer space;
 - (c) buses for flying objects for use in outer space;
 - (d) payloads for flying objects for use in outer space into which goods falling under any of Article 6, item (ii), (a), 1., iv. or item (xvi), Article 8, item (i), (a), item (ii), (a), 2. or item (ix), (c) or (e), Article 9, item (iii), (a) or (b), item (iv), (vi) or (viii), item (ix), (a), item (ix)-2, item (xiii), (d), (e), (k) or (l) or item (x) are incorporated;
 - (e) devices that are designed to be loaded on a flying object for use in outer space, which have any of the following functions:
 1. remote command or remote measurement data processing;
 2. payload data processing;
 3. attitude and orbit control;
 - (f) flying objects for suborbital use.
- (iv)-2 aircraft specially designed or altered for the mid-air launching of flying objects that are used to launch flying objects for use in outer space;
- (iv)-3 devices that are necessary for controlling flying objects for use in outer space or flying objects for use in launching them, or for monitoring the operating status of either of these, and are designed to be installed on the ground, which fall under any of the following (limited to those designed to be used to control flying objects for use in outer space or flying objects for use in launching them, or to monitor the operating status of either of these):
 - (a) wireless remote controllers or radiotelemetering devices that are designed to have a data processing function set forth in any of the following:
 1. frame synchronization and error correction processing for radiotelemetering data for monitoring the operating status of the buses of flying objects for use in outer space; or
 2. formatting processing for command data transmitted to a flying object for use in outer space to control the bus of a flying object for use in outer space;
 - (b) simulators specially designed to verify procedures for operating a flying object for use in outer space;
- (v) liquid rocket propulsion units that have any of the items which fall under the following item built in;
- (vi) components of liquid rocket propulsion units that fall under any of the following:
 - (a) cryogenic cooling systems, Dewar vessels, heat pipes and other cryogenic devices that are designed for use in flying objects for use in outer space or for flying objects for launching them and with a loss of liquid at extremely

- low temperature of less than 30 % per year;
- (b) cryogenic containers or closed cycle cooling systems that can be used at temperatures of $-173\text{ }^{\circ}\text{C}$ or less which are designed to be capable of using in flying objects for use in outer space, flying objects for use in launches, or aircraft capable of cruising at speeds exceeding Mach 3;
 - (c) storage devices or transfer devices for hydrogen slush;
 - (d) turbine pumps with a discharge pressure of more than 17.5 megapascals, or their components, or gas generators for turbine pumps; or expander cycle turbine drive units;
 - (e) propulsion generators having a thrust exceeding 10.6 megapascals, or their nozzles;
 - (f) propellant storage equipment that utilizes capillary action or uses flexible bladders;
 - (g) liquid fuel injection devices in which the individual orifice areas are 0.114 square millimeters or less;
 - (h) thrust chambers or exit cones that are integrally formed using a composite material of carbon and carbon fiber, whose density exceeds 1.4 grams per cubic centimeter, which has a tensile strength exceeding 48 megapascals;
- (vii) solid rocket propulsion units that fall under any of the following:
- (a) those whose total impulse capacity exceeds 1.1 meganewton seconds or whose specific impulse is 2.4 kilonewton seconds per kilogram or more when the pressure inside the combustor is 7 megapascals and the outlet pressure of the nozzle is brought to sea-level atmospheric pressure;
 - (b) those in which the stage mass fraction exceeds 88% and the propellant solid ratio exceeds 86%;
 - (c) those that have an item that fall under the following item built in;
 - (d) those for joining the insulating material and propellant, which use direct bonding motor design methods in order to obtain a mechanical joining strength that is greater than the strength of the propellant or make a barrier for the chemical migration between the solid propellant and the insulating material of the motor case;
- (viii) components for solid rocket propulsion units that fall under any of the following:
- (a) those for joining insulating material and propellant, which use liners to obtain a mechanical bonding strength that is greater than the strength of the propellant and to make a barrier against chemical migration between the solid propellant and the insulating material for the motor case;
 - (b) motor cases that use composite materials formed using the filament winding method, which have a diameter greater than 0.61 meters or in which the structural efficiency ratio is greater than 25 km;

- (c) nozzles whose thrust is greater than 45 kilonewtons or in which the nozzle throat erosion ratio is less than 0.075 millimeters per second;
- (d) movable nozzle or secondary injection propulsion direction control equipment, which falls under any of the following:
 1. those in which absolute value for the deflection area in the direction of thrust exceeds 5 degrees;
 2. those in which the angular velocity in changing the direction of thrust is greater than 20 degrees per second;
 3. those in which the angular acceleration in changing the direction of thrust is greater than 40 degrees per second squared;
- (ix) hybrid rocket propulsion units that fall under any of the following:
 - (a) those whose total impulse capacity exceeds 1.1 meganewton seconds;
 - (b) those in which the thrust is greater than 220 kilonewtons when the outlet is in a vacuum;
- (x) components of flying objects for use in launches, their propulsion equipment, or flying objects for use in outer space, which fall under any of the following:
 - (a) components of flying objects for use in launches (for components other than nose cones, this is limited to those whose weight exceeds 10 kilograms) which fall under any of the following:
 1. composite materials composed of fibers falling under Article 4, item (xv), (e), or resins falling under item (xiii) or item (xiv), (b) of that Article;
 2. metal matrix composite materials reinforced with any of the following:
 - i. substances falling under Article 4, item (xii);
 - ii. fibers falling under Article 4, item (xv);
 - iii. aluminum compounds falling under Article 4, item (vii), (a);
 3. ceramic matrix composite materials falling under Article 4, item (xii);
 - (b) components of propulsion device of a flying object for use in a launch which are designed to be used for a propulsion device falling under any of item (v), item (vii), or the preceding items, which use any of the following:
 1. fibers falling under Article 4, item (xv), (e), or resins falling under item (xiii) or item (xiv), (b) of that Article;
 2. metal matrix composite materials reinforced with any of the following:
 - i. substances falling under Article 4, item (xii);
 - ii. fibers falling under Article 4, item (xv);
 - iii. aluminum compounds falling under Article 4, item (vii), (a);
 3. ceramic matrix composite materials falling under Article 4, item (xii);
 - (c) components of flying objects for use in outer space, which actively control dynamic response or torsion of structures;
 - (d) liquid pulse rocket engines that have thrust-to-weight ratio of 1 kilonewton per kilogram or more, whose response time is less than 0.030 seconds;

- (x)-2 unmanned aerial vehicles, their components, or auxiliary equipment, which fall under the following (a) or (b):
 - (a) unmanned aerial vehicles that are designed to fly in a controlled way without relying on the operator's sight, which fall under any of the following:
 - 1. those which fall under the following i. and ii.:
 - i. those whose maximum endurance is at least 30 minutes but less than 1 hour; and
 - ii. those capable of taking off in a gust of wind of at least 46.3 kilometers (25 knots) per hour and flying in a stable and controlled way;
 - 2. those whose maximum endurance is 1 hour or more;
 - (b) components or auxiliary equipment of unmanned aerial vehicles, which fall under any of the following:
 - 1. Deleted
 - 2. Deleted
 - 3. those designed to convert manned aerial vehicles to unmanned aerial vehicles that fall under (a);
 - 4. airbreathing reciprocating engines or internal combustion rotary engines that are designed or altered to be capable of flying unmanned aerial vehicles at altitudes above 15,240 meters;
- (xi) equipment or tools (including molds) that fall under any of the following:
 - (a) equipment designed to be used for superalloys, for unidirectional solidification or for casting single crystals;
 - (b) tools for casting made of refractory metal or ceramics that are designed for manufacturing blades, vanes, or tip shrouds for gas turbine engines, which fall under any of the following:
 - 1. cores;
 - 2. shells;
 - 3. those combined with 1. or 2.;
 - (c) equipment for unidirectional solidification or for laminating shaping of single crystals that are designed for manufacturing blades, vanes, or tip shrouds for gas turbine engines;
- (xii) real time controlling devices, measuring instruments (including sensors), or devices which collect and analyze data automatically, which fall under the following (a) and (b):
 - (a) those specially designed for designing gas turbine engines or their components;
 - (b) technology (excluding programs) needed for designing or manufacturing goods falling under Article 25, paragraph (3), item (iii) or item (iv);
- (xiii) devices for manufacturing brush seals for gas turbine engines whose peripheral speed when tipped exceeds 335 meters per second and are

- designed to be capable of being operated at temperatures exceeding 500 °C, test equipment, or their components;
- (xiv) tools used for solid phase joining of wing and disk parts of gas turbine engines made of intermetallic compounds, super alloys, or titanium;
 - (xv) devices that are designed to be used together with wind tunnels or devices that fall under any of the following, which are devices or measuring instruments (including sensors) that exert real-time control, or devices that automatically collect and analyze data:
 - (a) wind tunnels that are capable of creating a state in which the speed is Mach 1.2 or more;
 - (b) equipment that is capable of simulating a flow environment that exceeds Mach 5;
 - (c) wind tunnels or equipment that is capable of simulating the flow for a Reynolds number exceeding 25,000,000; provided, however, that this excludes test models that are restricted to two-dimensional section models;
 - (xvi) acoustic vibration test equipment that falls under all of the following (a) through (c), or its quartz heater:
 - (a) one whose sound pressure is greater than 160 decibels when the standard sound pressure is set at 20 micropascals;
 - (b) one whose rated output is greater than 4 kilowatts;
 - (c) one for which the temperature of the testing room exceeds 1,000 °C;
 - (xvii) equipment used to test rocket motors using non-destructive examination technology;
 - (xviii) converters which are designed to be capable of directly measuring the wall friction of a flow in which the stagnation temperature is greater than 560 °C;
 - (xix) tools for manufacturing components that are used for the rotating parts of gas turbine engines, which are manufactured by powder metallurgy and which can be used when an ultimate tensile strength of 60% or more is applied, at temperatures of 600 °C or more (excluding tools for manufacturing powder);
 - (xx) devices for manufacturing those falling under item (x)-2.

Article 13 (1) The goods with specifications prescribed by Order of the Ministry of Economy, Trade and Industry that are referred to in row 14 (i) of Appended Table 1 of the Export Order are goods falling under any of the following:

- (i) aluminum powder, the particles of which are globular with a diameter of 60 micrometers or less and with an aluminum purity of 99 % or more;
- (ii) iron powder with a particle diameter of 3 micrometers or less (limited to those manufactured using a method that reduces iron oxide using hydrogen) and with an iron purity of 99 % or more.

- (2) The goods specified by Order of the Ministry of Economy, Trade and Industry that are referred to in row 14 (ii) of Appended Table 1 of the Export Order are goods falling under any of the following:
- (i) substances that constitute principal components of gunpowder or explosive compounds, which fall under any of the following (including those co-crystallized):
- (a) anidine triamine nitrate;
 - (b) titanium subhydride with a theoretical mixture ratio of 0.65 or more and 1.68 or less;
 - (c) dinitroglycolyl;
 - (d) 3-nitro-1,2,4-triazole-5-one;
 - (e) Deleted
 - (f) Deleted
 - (g) hydroxylammonium nitrate;
 - (h) hydroxyl ammonium perchlorate;
 - (i) 2-(5-cyanotetrazolate) pentaamine cobalt (III) perchlorate;
 - (j) cis-bis (5-nitrotetrazolate) tetra amine cobalt (III) perchlorate;
 - (k) amino dinitrobenzofuroxan;
 - (l) diamino dinitrobenzofuroxane;
 - (m) bis (2,2,2-trinitro ethyl) nitramine;
 - (n) dihydroxyl ammonium 5,5'-bistetrazole-1,1'-diolate (TKX);
- (ii) substances which are additives or precursors of gunpowder or explosive compounds, which fall under any of the following (including those co-crystallized):
- (a) azide methyl methyl oxetane or its polymers;
 - (b) basic copper salicylate;
 - (c) lead salicylate;
 - (d) Deleted
 - (e) Deleted
 - (f) bis (2,fluoro-2,2-dinitroethyl) formal;
 - (g) bis (2-hydroxyethyl) glycol amide;
 - (h) bis (2-methyl aziridinyl) methyl amino phosphine oxide;
 - (i) 3,3-bis (azidomethyl) oxetane or its polymers;
 - (j) 3,3- bis (chloromethyl) oxetane;
 - (k) butadiene nitrile oxide;
 - (l) 1,2,3-butanetriol trinitrate;
 - (m) dinitro azetidine tertiary butyl salt;
 - (n) high energy monomers, plasticizer, and polymers having a nitro group, azide group, nitrate group, nitraza group or a difluoro amino group;
 - (o) poly-2,2,3,3,4,4-hexafluoro pentane-1,5-diol formal;
 - (p) poly-2,4,4,5,5,6,6-heptafluoro-2-trifluoro methyl-3-oxaheptane-1,7-diol

- formal;
- (q) derivatives of polymers of glycidyl azide;
 - (r) hexabenzylhexaazaisowurtzitane;
 - (s) ultrafine powdered ferric oxide whose surface area exceeds 250 m² per gram and the average particle diameter is 0.003 micrometers or less;
 - (t) beta-resorcylic acid lead or beta-resorcylic acid copper;
 - (u) lead stannate;
 - (v) lead maleate;
 - (w) lead citrate;
 - (x) chelate of beta lead resorcinatate or lead-copper lead salicylate;
 - (y) polymers of nitrate methyl methyl oxetane or 3-nitrate methyl-3-methyl oxetane;
 - (z) 3-nitrazo-1,5-pentane diisocyanate;
 - (aa) coupling agents for organic metal which are additive for propellant;
 - (bb) polycyano difluoroamino ethylene oxide;
 - (cc) polymers of polyglycidyl nitrate or nitrate methyl oxylane;
 - (dd) polynitro ortho carbonate;
 - (ee) propylene imine;
 - (ff) tetraacetyl benzyl hexaazoisoultrane;
 - (gg) cyanoethylated polyamine (excluding those set forth in Article 3, item (vii), (s)) or cyanoethylated polyamine salts;
 - (hh) cyanoethylated poly amine with added glycydol (excluding those set forth in Article 3, item (vii), (r)) or cyanoethylated poly amine salts with added glycydol;
 - (ii) derivatives of tris-1-(2-methyl) aziridinyl phosphine oxide;
 - (jj) adducts of 1,2,3-tris (1,2-bis (difluoro amine) ethoxy) propane or tris binoxypropane;
 - (kk) 1,3,5-trichlorobenzene;
 - (ll) 1,2,4-butane triol;
 - (mm) 1,3,5,7-tetraacetyl-1,3,5,7-tetraazocyclooctane;
 - (nn) 1,4,5,8-tetraazadecaline;
 - (oo) polyepichlorohydrin, polyepichlorohydrin diol, or polyepichlorohydrin triol having a low-molecular weight (molecular weight of 10,000 or less) and alcohol functional group.
- (3) The goods with specifications prescribed by Order of the Ministry, Trade and Industry that are referred to in row 14 (iii) of Appended Table 1 of the Export Order are diesel engines with an output of 37,3 kilowatts or more in which the weight of the part made of non-magnetic materials is more than 75% of the total weight, or components of these.
- (4) The goods with specifications prescribed by Order of the Ministry of Economy, Trade and Industry that are referred to in row 14 (v) of Appended Table 1 of

the Export Order are goods falling under any of the following:

- (i) closed-circuit type self-contained diving equipment or its components;
 - (ii) semi-closed circuit type self-contained diving equipment or its components;
 - (iii) components for self-contained diving equipment which are designed to be used for converting open circuit type self-contained diving equipment to closed circuit self-contained diving equipment or semi-closed circuit self-contained diving equipment.
- (5) The goods with the specifications prescribed by Order of the Ministry of Economy, Trade and Industry that are referred to in row 14 (vii) of Appended Table 1 of the Export Order are robots (excluding operating robots and sequence robots; hereinafter the same applies in this paragraph), or controllers or end effectors for robots, which fall under any of the following, or components of these (excluding end effectors for robots):
- (i) those that are designed to be capable of using pressure oil for which the ignition point exceeds 566 °C;
 - (ii) those that are designed to prevent the impact of electromagnetic pulses.
- (6) The goods with the specifications prescribed by Order of the Ministry of Economy, Trade and Industry that are referred to in row 14 (ix) of Appended Table 1 of the Export Order are goods falling under any of the following:
- (i) bromobenzyl cyanide;
 - (ii) chlorobenzal malononitrile;
 - (iii) chloroacetophenone;
 - (iv) dibenzo (b,f)-1,4-oxazabine;
 - (v) N-nonanoylmorpholine;
 - (vi) diphenyl chloroarsine;
 - (vii) diphenyl amine chloroarsine (Adamsite);
 - (viii) diphenyl cyanoarsine;
 - (ix) equipment for dispersal, protection, detection, or identification of substances that fall under any of the preceding items, or its components.
- (7) The goods with the specifications prescribed by Order of the Ministry of Economy, Trade and Industry that are referred to in row 14 (x) of Appended Table 1 of the Export Order are equipment that is specially designed to remove or dispose of improvised explosive devices, which falls under any of the following, or its components or accessories:
- (i) those which are vehicles that can be remotely operated;
 - (ii) those which prevent the operation of improvised explosive devices by projectiles.
- (8) Electronic equipment designed to automatically detect or identify explosives, which detects traces of explosives by utilizing any of the methods such as the measurement of surface acoustic waves, ion mobility spectrometry, differential mobility spectrometry, or mass spectrometry (limited to equipment capable of

detecting vapor with desity of less than 1 ppm, or less than 1 mg of solid or liquid, and excluding equipment designed exclusively for use as laboratory insrument or equipment designed to detect explosives without the target passing through the equipment on foot coming into contact with the equipment).

Article 14 The goods with the specifications prescribed by Order of the Ministry of Economy, Trade and Industry that are referred to in row 15 of Appended Table 1 of the Export Order are goods falling under any of the following:

- (i) molded products (including semi-finished goods) that are manufactured using fibers falling under Article 4, item (xv), (c) or (d), whose matrix is organic matter;
- (ii) radio wave absorbers or conductive polymers that fall under any of the following:
 - (a) those designed to be used as radio wave absorbers and have a frequency that exceeds 200 megahertz but is less than 3 terahertz; provided, however, that this excludes those falling under any of the following, which are not mixed into coating materials:
 - 1. non-magnetic fibrous absorbers;
 - 2. absorbers (excluding those that are plate shaped) which do not absorb radio waves through magnetic loss;
 - 3. plate-shaped absorbers that fall under all of the following i. through iii.:
 - i. those made of any of the following:
 - a. those that use plastic foams containing carbon or use organic matter, which fall under the following 1 or 2:
 - 1 those that have radio wave reflectivity of 5% or more of the electric wave reflectivity of a metal plate measured for frequencies other than the frequency range of plus or minus 15% centered on the radio wave frequency in which absorption is maximum;
 - 2 those that cannot be used in a temperature exceeding 177 °C;
 - b. those that use ceramics and fall under the following 1 and 2:
 - 1 those that have radio wave reflectivity of 20% or more of the electric wave reflectivity of a metal plate measured for frequencies other than the frequency range of plus or minus 15% centered on the radio wave frequency in which absorption is maximum,;
 - 2 those that cannot be used in a temperature exceeding 527 °C;
 - ii. those with a tensile strength of less than 7 meganewtons per square meter;
 - iii. those with a compression strength of less than 14 meganewtons per square meter;
 - 4. those made of sintered ferrites that fall under the following i. and ii.:

- i. those that have specific gravity exceeding 4.4;
- ii. those that cannot be used in a temperature exceeding 275 °C;
- 5. plate-shaped absorbers that are manufactured from open cell foam plastic materials with a density of 0.15 grams per cubic centimeter or less, which do not absorb radio waves through magnetic loss;
- (b) those specially designed to be used as absorbers for radio waves whose wavelengths exceed 810 nanometers but is less than 2,000 nanometers (meaning those whose frequencies exceed 150 terahertz but is less than 370 terahertz), which do not transmit visible light;
- (c) those that are conductive polymers, whose volume conductivity exceeds 10 kilosiemens per meter or whose surface electrical resistivity is less than 100 ohms, which are made up of any of the following polymers:
 - 1. polyaniline;
 - 2. polypyrrole;
 - 3. polythiophene;
 - 4. polyphenylene vinylene;
 - 5. polyethylene vinylene;
- (iii) pre-separated neptunium 237 with a weight exceeding 1 gram;
- (iv) Deleted
- (v) digitally controlled radio receivers that have more than 1,000 channels (excluding those designed to be used for public cellular wireless communications) or its components or accessories, which fall under all of the following (a) through (c):
 - (a) those capable of automatically scanning the electromagnetic spectrum;
 - (b) those capable of specifying the type of signals received and waves transmitted;
 - (c) those in which the time required for channel switching is less than 1 millisecond;
- (v)-2 equipment that prevents the operation of improvised explosive devices, or its auxiliary equipment, which falls under any of the following:
 - (a) radio transmitters designed to explode improvised explosive devices before they reach their target or to prevent their explosion (excluding those which fall under Article 8, item (v)-3);
 - (b) equipment which is used together with radio transmitters set forth in (a) and uses technology designed to be capable of maintaining radio lines with the same frequency as that of the transmitters;
- (vi) underwater detection device using sound waves (including ultrasonic waves), or its components, which fall under any of the following:
 - (a) hydrophones that fall under any of the following:
 - 1. those that have flexible sensors built in;
 - 2. those that have devices consisting of flexible sensors with less than 20

- millimeters in diameter or length which are connected at intervals less than 20 millimeters built in;
3. those that have any of the following detecting elements:
 - i. optical fibers;
 - ii. piezoelectric polymer membrane (excluding vinylidene fluoride resin and its copolymers);
 - iii. flexible piezoelectric composite materials;
 - iv. piezoelectric single crystals of lead magnesium niobate-lead titanate (those grown from solid solution);
 - v. piezoelectric single crystals of lead indium niobate-lead magnesium niobate -lead titanate (those grown from solid solution);
 4. those that have the function of correcting the effects of acceleration and designed to be capable of being used at water depths exceeding 35 meters;
 5. those that are designed to be capable of being used at water depths exceeding 1,000 meters and are designed so that the acoustic compression sensitivity at 4 kilohertz or less will exceed -230 decibels;
- (b) towed hydrophone arrays that fall under any of the following:
1. those in which the hydrophone group interval (meaning the distance between the centers of two adjacent hydrophone groups; hereinafter the same applies in this item) is less than 12.5 meters or those for which the interval can be changed to less than 12.5 meters;
 2. those designed to be capable of being used at water depths exceeding 35 meters or that can be so altered;
 3. those having a heading sensor that falls under Article 9, item (i), (b), 3.;
 4. those having array hoses reinforced in the major axis direction;
 5. those with a diameter of less than 40 millimeters;
 6. Deleted
 7. those that have hydrophones that fall under (a) or Article 9, item (i), (b), 1.;
 8. underwater acoustic wave sensors referred to in Article 9, item (i), (b), 6.;
- (c) signal processing apparatus designed for towed hydrophone arrays and capable of being reprogrammed by the user, which are capable of carrying out the processing or correlation (including spectral analysis, digital filtering, or beam formation) of the time domain or the frequency domain in real time;
- (d) hydrophone arrays for submarine or harbor cables, which fall under any of the following:
1. those that have hydrophones that fall under (a) or Article 9, item (i), (b), 1. built in;
 2. those that can carry out processing by multiplexing hydrophone group

- signals, which fall under the following i. and ii.:
- i. those designed to be capable of being used at water depths exceeding 35 meters or those that have a depth sounding device that can be adjusted or removed to be used at water depths exceeding 35 meters;
 - ii. those that can be converted into a towed hydrophone array;
- (e) signal processing apparatus designed for submarine or harbor cable systems and capable of being reprogrammed by the user, which are capable of carrying out processing or correlation (including spectrum analysis, digital filtering or beam formation) of the time domain or the frequency domain in real time;
 - (f) underwater detection devices having transmission functions and an operating frequency of 30 hertz or more and 2 kilohertz or less, whose sound pressure level exceeds 210 decibels;
 - (vii) solid optical detectors designed for use in space with the maximum sensitivity within the frequency range that exceeds 1,200 nanometers but is 30,000 nanometers or less;
 - (viii) pulse radar cross-section area measuring devices, which transmit pulse width of 100 nanoseconds or less, or their components;
 - (ix) untethered submersible vessels that fall under any of the following:
 - (a) manned submersible vessels that fall under any of the following:
 - 1. submersible vessels designed to be capable of autonomously going underwater, which possess a load lifting capability referred to in the following i. and ii.:
 - i. 10% or more of the weight in air of the submersible vessel;
 - ii. 15 kilonewtons or more;
 - 2. submersible vessels designed to be capable of being used at water depths exceeding 1,000 meters;
 - 3. submersible vessels that fall under the following i. and ii.:
 - i. those designed to be capable of autonomously going underwater continuously for 10 hours or more;
 - ii. those capable of going underwater for a distance of 50 nautical miles or more;
 - (b) unmanned submersible vessels that fall under any of the following:
 - 1. those designed to automatically determine their course over any terrain;
 - 2. those capable of transmitting and receiving data or command by acoustic waves;
 - 3. those capable of transmitting and receiving data or commands over a distance exceeding 1,000 meters by optical transmission;
 - (x) soundproofing equipment or magnetic bearings capable of being used for vessels whose displacement is 1,000 tons or more, which are designed to be capable of being used for transmission devices;

- (xi) ramjet engines, scramjet engines, combined cycle engines, or their components.

(Related to the Appended Table of the Foreign Exchange Order)

Article 15 (1) The technology specified by Order of the Ministry of Economy, Trade and Industry that is referred to in row 2 (i) of the Appended Table of the Foreign Exchange Order is technology falling under any of the following:

- (i) technology related to the designing, manufacture, or use of goods that fall under any of Article 1, items (i) through (v), item (vi) (limited to the devices for mold processing nuclear fuels), item (vii), item (viii), (a), item (x), (a), item (x)-2, or item (x)-3;
- (ii) programs designed to enable the use of goods that fall under any of Article 1, item (viii), (b), item (xi), item (xvii), item (xviii), (b) through (f), item (xix), item (xx), item (xxi), (a) or (b), 1. or 3., item (xxxiv), or item (xxxv); or technology (excluding programs) that is related to the designing, manufacture, or use of such programs and that is needed in order for the goods in question to attain or exceed the function or characteristics of goods falling under those clauses;
- (iii) programs designed to enable the designing, manufacture, or use of goods falling under Article 1, item (xiv); or technology (excluding programs) that is related to the designing, manufacture, or use of such programs and that is needed in order for the goods in question to attain or exceed the function or characteristic of goods falling under that item (excluding programs which are used to produce part programs that generate numerical-control codes, and which cannot directly use equipment to process various components);
- (iv) technology (excluding programs) related to the designing, manufacture, or use of goods falling under any of Article 1, item (viii), (b), item (ix), item (x), (b), item (xi), item (xiv), items (xvii) through (xxiv), items (xxvi) through (xxviii), items (xxx) through (lii), items (liv) through (lviii), or items (lx) through (lxii), which is needed in order for the goods in question to attain or exceed the functions or characteristics of goods falling under those clauses;
- (v) technology (excluding programs) related to the designing, manufacture or use of goods that fall under any of Article 1, item (vi) (limited to the device for separating lithium isotopes), item (xxv), item (xxix), item (liii), or item (lix);
- (vi) programs, or cryptographic keys, or cryptographic codes designed to enhance the performance characteristics, or deactivate functions of frequency converters (excluding those falling under Article 1, item (viii), (b)), so that they will fall under Article 1, item (viii), (b);
- (vii) programs designed to enhance or release the performance characteristics of frequency converters that fall under Article 1, item (viii), (b);

- (viii) programs, or cryptographic keys, or cryptographic codes designed to enhance the performance characteristics, or deactivate functions of high-speed cameras or their components (excluding those falling under Article 1, item (xliv)), so that the high speed cameras or their components will fall under Article 1, item (xliv);
 - (ix) programs, or cryptographic keys, or cryptographic codes designed to enhance the performance characteristics, or deactivate functions of high speed cameras or their components (limited to those falling under Article 1, item (xliv)).
- (2) The technology specified by Order of the Ministry of Economy, Trade and Industry that is referred to in row 2 (ii) of the Appended Table of the Foreign Exchange Order are programs that enable a device to function as numerical control device for machine tools with 5 or more axes capable of contour control, or technology (excluding programs) that is related to the designing, manufacture, or use of such programs, which is necessary for enabling the numerical control of 5 or more axes capable of contour control.

Article 15-2 The technology specified by Order of the Ministry of Economy, Trade and Industry that is referred to in row (3), (ii) of the Appended Table of the Foreign Exchange Order is technology that is related to the designing, manufacture, or use of goods falling under Article 2, paragraph (2) or (3), which is needed in order for the goods in question to attain or exceed the function or characteristics of goods falling under that paragraph.

Article 15-3 The technology specified by Order of the Ministry of Economy, Trade and Industry that is referred to in row 3-2 (ii) of the Appended Table of the Foreign Exchange Order is technology that is related to the designing, manufacture, or use of goods falling under Article 2-2, paragraph (2), which is needed in order for the goods in question to attain or exceed the function or characteristics of goods falling under that paragraph.

Article 16 (1) The technology specified by Order of the Ministry of Economy, Trade and Industry that is referred to in row 4 (i) of the Appended Table of the Foreign Exchange Order is technology that is related to the designing, manufacture, or use of goods falling under Article 3, which falls under any of the following and is needed in order for the goods in question to attain or exceed the function or characteristics of goods falling under that Article:

- (i) programs designed to enable the use of rockets capable of transporting a payload of 500 kilograms or more over a distance of 300 kilometers or more, equipment or tools (including molds; hereinafter the same applies in this Article) for manufacturing goods falling under Article 3, item (ii), (b), test

- equipment, or the components of these, or goods falling under any of (a), 2. or 3. of that item, or technology (excluding programs) related to the designing, manufacture, or use of such programs;
- (i)-2 programs designed for operating, maintaining, or inspecting goods falling under any of Article 3, item (ii), (b), 4. through 6., or technology (excluding programs) related to the designing, manufacture, or use of such programs;
 - (ii) programs designed to enable the use of rockets capable of transporting a payload of 500 kilograms or more over a distance of 300 kilometers or more, and which can adjust the functions of two or more goods (limited to those falling under Article 3, item (ii), (a), or (b)); or technology (excluding programs) related to the designing, manufacture, or use of such programs;
 - (iii) programs designed to enable the use of equipment, tools, test equipment, or components of these, for use in the manufacturing of goods falling under Article 3, item (ii), (a); or technology (excluding programs) related to the designing, manufacture, or use of such programs;
 - (iv) technology (excluding programs) related to the designing, manufacture, or use of rockets capable of transporting 500 kilograms or more of payload over a distance of 300 kilometers or more, or equipment or tools or test equipment for manufacturing those rockets, or their components, or goods falling under Article 3, item (ii);
 - (v) programs designed to enable the use of equipment, tools, test equipment, or components of these, for use in the manufacturing of goods falling under any of Article 3, item (iii), (a) through (i); programs designed to enable the use of goods falling under any of (a), (b), (g), (h) or (j) of the that item, or items (iv) through (vi), items (xvii) through (xix), item (xxi), (a), item (xxii), item (xxii)-2 or item (xxv); or technology (excluding programs) related to the designing, manufacture, or use of such programs;
 - (v)-2 programs designed to enable the operation, maintenance, or inspection of goods falling under Article 3, item (xi), or technology (excluding programs) related to the designing, manufacture, or use of such programs;
 - (vi) technology (excluding programs) related to the designing, manufacture, or use of rockets or unmanned aerial vehicles that are capable of transporting payloads over a distance of 300 kilometers or more (excluding those capable of transporting 500 kilograms or more of payload) or of goods falling under any of Article 3, items (iii) through (vi) or items (vii) through (xxvii);
 - (vii) programs designed to enable the designing of goods falling under Article 3, item (iii), (b), (c), (e) or (f), or item (iv); or technology (excluding programs) related to the designing, manufacture, or use of such programs;
 - (viii) programs designed to enable the operation, maintenance, or inspection of goods falling under any of Article 3, items (viii) through (x)-2;
 - (ix) programs designed to enable the designing, manufacture, or use of goods

- falling under any of Article 3, items (xiii) through (xv) or item (xxvi), or technology (excluding programs) related to the designing, manufacture, or use of such programs;
- (x) programs designed to enable the designing or manufacture of goods falling under Article 3, item (xvii), (a) or (f), or item (xvii)-2, or technology (excluding programs) related to the designing, manufacture, or use of such programs;
 - (xi) programs designed to enable the designing of rockets capable of transporting payloads over a distance of 300 kilometers or more, the designing of goods falling under Article 3, item (ii), (a), or the designing of goods falling under (b) of that item; or technology (excluding programs) related to the designing, manufacture, or use of such programs;
 - (xii) programs designed to enable the use of rockets or unmanned aerial vehicles capable of transporting payloads over a distance of 300 kilometers or more (for programs designed to enable the use of unmanned aerial vehicles, this includes programs designed or altered to enable manned aerial vehicles to operate as unmanned aerial vehicles), which are capable of regulating the functions of two or more goods (limited to those falling under Article 3, item (ii), (a) or (b)) (excluding those falling under item (ii));
- (2) The technology specified by Order of the Ministry of Economy, Trade and Industry that is referred to in row (4), (ii) of the Appended Table of the Foreign Exchange Order is technology (excluding programs) that is related to designing avionics devices for rockets or their components, which is meant to prevent the effects of electromagnetic pulses or electromagnetic interference.
- (3) The technology specified by Order of the Ministry of Economy, Trade and Industry that is referred to in row (4), (iii) of the Appended Table of the Foreign Exchange Order is technology falling under any of the following:
- (i) technology (excluding programs) for integrating the airframe, propulsion unit, and lift controlling surfaces, in order to optimize the in-flight aerodynamic performance of an unmanned aerial vehicle that is capable of transporting payloads over a distance of 300 kilometers or more;
 - (ii) technology (excluding programs) that integrates data on flight control, guidance, or propulsion into the flight control device, in order to optimize the orbit of a rocket that is capable of transporting payloads over a distance of 300 kilometers or more;
 - (iii) programs that make it possible to determine the position of an airframe over its entire route during flight by processing the data recorded during the flight (limited to programs that can be used for either rockets or unmanned aerial vehicles that are capable of transporting payloads over a distance of 300 kilometers or more) or technology (excluding programs) related to the designing, manufacture, or use of such programs.

- (4) The technology specified by Order of Ministry of Economy, Trade and Industry that is referred to in row 4 (iv) of the Appended Table of the Foreign Exchange Order is technology related to use of autoclaves, and the data or procedures to provide for the environment inside the autoclaves (limited to those for using goods that fall under Article 3, item (xvi)).
- (5) The technology specified by Order of the Ministry of Economy, Trade and Industry that is referred to in row 4 (v) of the Appended Table of the Foreign Exchange Order is technology used to fix substances generated by thermal decomposition of raw gas to base materials (limited to thermal decomposition conducted within the temperature range from 1,300 °C to 2,900 °C and absolute pressure range from 130 pascals to 20,000 pascals).

Article 17 (1) The technology specified by Order of the Ministry of Economy, Trade and Industry that is referred to in row 5 (i) of the Appended Table of the Foreign Exchange Order is technology falling under any of the following:

- (i) programs designed to enable the designing or manufacture of items falling under any of Article 4, items (iv) through (vi);
- (ii) technology (excluding programs) needed for designing or manufacturing items falling under Article 4, item (xii), (c) or (d) or item (xv), (c) or (d);
- (iii) technology (excluding programs) needed for designing or manufacturing items falling under any of Article 4, items (ii) through (xvi) (excluding those falling under the preceding item).
- (2) The technology specified by Order of the Ministry of Economy, Trade and Industry that is referred to in row 5 (ii) of the Appended Table of the Foreign Exchange Order is technology falling under any of the following:
- (i) programs designed to enable the use of an item that falls under any of Article 4, items (iv) through (vi);
- (ii) technology (excluding programs) related to the use of an item that falls under Article 4, item (ii) or item (xii), (c) or (d) or Article 14, item (i) (limited to use in repairs).
- (3) The technology specified by Order of the Ministry of Economy, Trade and Industry that is referred to in row (5), (iii) of the Appended Table of the Foreign Exchange Order is technology (excluding programs) related to designing or manufacturing of ceramic powder or ceramics (excluding composites) that fall under any of the following:
- (i) ceramic powder that falls under all of the following (a) through (c):
- (a) ceramic powder consisting of any of the following:
1. single or composite oxides of zirconium and silicon or aluminum composite oxides;
 2. single nitrides of boron (limited to cubic crystalline boron);
 3. single or composite carbides of silicon or boron;

- 4. single or composite nitrides of silicon;
- (b) items in which the proportion of the amount of metal impurities in the total weight is less than following numeric values:
 - 1. 0.1% for single oxides or single carbides;
 - 2. 0.5% for composite compounds or single nitrides;
- (c) items that fall under any of the following:
 - 1. zirconium oxides having particles whose diameter is 1 micrometer or less, in which the total weight of particles exceeding 5 micrometers in diameter is 10% or less of the total weight;
 - 2. those having particles whose average diameter is 5 micrometers or less, in which the total particle weight of particles exceeding 10 micrometers in diameter is 10% or less of the total weight (excluding those falling under 1.);
- (ii) ceramic made of substances referred to in the preceding item (excluding abrasives).
- (4) The technology specified by Order of the Ministry of Economy, Trade and Industry that is referred to in row 5 (iv) of the Appended Table of the Foreign Exchange Order is technology (excluding programs) related to designing or manufacturing of polybenzothiazole or polybenzoxazole.
- (5) The technology specified by Order of the Ministry of Economy, Trade and Industry that is referred to in row 5 (v) of the Appended Table of the Foreign Exchange Order means technology (excluding programs) related to designing or manufacturing of rubber-like fluorine compounds including vinyl ether monomers.
- (6) The technology specified by Order of the Ministry of Economy, Trade and Industry that is referred to in row (5), (vii) of the Appended Table of the Foreign Exchange Order is technology falling under any of the following:
 - (i) programs for designing items falling under Article 4, item (xii), (c) or (d), item (xv), (c) or (d), or Article 14, item (i);
 - (ii) programs for designing composite materials whose matrix is organic matter, metal, or carbon (excluding those falling under the preceding item).
- (7) The technology specified by Order of the Ministry of Economy, Trade and Industry that is referred to in row (5), (viii) of the Appended Table of the Foreign Exchange Order is technology (excluding programs) related to the use of radio wave absorbers or conductive polymers falling under Article 14, item (ii) (limited to use in installation, maintenance, or repair).

Article 18 (1) The technology specified by Order of the Ministry of Economy, Trade and Industry that is referred to in row (6), (i) of the Appended Table of the Foreign Exchange Order is technology falling under any of the following:

- (i) technology (excluding programs) needed for designing or manufacturing

- items that fall under any of the following:
- (a) items that fall under any of Article 5, item (ii), (a) or (b), 1. or 2. for which the repeatability in unidirectional positioning of at least one straight axis is 0.0009 millimeters or less; or
 - (b) items that fall under any of Article 5, item (ii), (b), 3. or (d), or item (iii) or (v);
- (ii) beyond what is set forth in the preceding item, technology (excluding programs) needed for designing or manufacturing goods that fall under Article 5;
- (iii) programs designed to enable the designing or manufacture of items falling under any of the following, or technology (excluding programs) needed for designing such programs:
- (a) items that fall under any of Article 5, item (ii), (a) or (b), 1. or 2. for which the repeatability in unidirectional positioning of at least one straight axis is 0.0009 millimeters or less; or
 - (b) items that fall under any of Article 5, item (ii), (b), 3. or (d) or item (iii) or (v);
- (iv) beyond what is listed in the preceding item, programs designed to enable the designing or manufacture of goods falling under Article 5, or technology (excluding programs) needed for designing such programs.
- (2) The technology specified by Order of the Ministry of Economy, Trade and Industry that is referred to in row 6 (ii) of the Appended Table of the Foreign Exchange Order is technology falling under any of the following:
- (i) programs designed to enable the use of items that fall under any of Article 5, item (i), (c), item (ii), item (iii), or items (v) through (xi);
 - (ii) programs designed or altered to operate items that fall under Article 5, item (iv), which convert optical design, workpieces sizes, and material removal functions to numerical control commands in order to process workpieces into any shape;
 - (iii) technology (excluding programs) needed for designing programs set forth in the preceding two items.
- (3) The technology specified by Order of the Ministry of Economy, Trade and Industry that is referred to in row 6 (iii) of the Appended Table of the Foreign Exchange Order is technology falling under any of the following:
- (i) programs that enable a device to function as numerical control device with 5 or more axes capable of controlling contour, or technology (excluding programs) needed for designing such programs;
 - (ii) Deleted
 - (iii) Deleted
 - (iv) technology (excluding programs) related to the designing of programs for integrating an expert system that supports decision-making into the

- numerical control device;
- (v) technology (excluding programs) for coating non-electronic substrates that use the coating method set forth in column 2 of Appended Table 3, which are related to coating set forth in column 4 of that table applied to base materials set forth in column 3 of that table.
- (4) The technology specified by Order of the Ministry of Economy, Trade and Industry that is referred to in row 6 (iv) of the Appended Table of the Foreign Exchange Order is technology falling under any of the following:
- (i) technology (excluding programs) related to the designing of tools (including molds) for processing metals by superplastic forming, diffusion bonding, or direct pressure hydraulic press;
- (ii) data for processing metals that falls under any of the following:
- (a) data related to processing of aluminum alloys, titanium alloys, or superalloys by superplastic forming, which concerns surface treatment, deformation rate, temperature, or pressure of processed materials;
- (b) data related to processing of superalloys or titanium alloys by diffusion bonding, which concerns surface treatment, deformation rate, temperature, or pressure of processed materials;
- (c) data related to processing of aluminum alloys or titanium alloys by direct pressure hydraulic press, which concerns pressure or cycle times;
- (d) data related to reduction of porosity inside the cast product of titanium alloy, aluminum alloy, or superalloy by applying the same pressure from all directions at a temperature exceeding 102 °C, which concerns temperature, pressure, or cycle times.
- (5) The technology specified by Order of the Ministry of Economy, Trade and Industry that is referred to in row 6 (v) of the Appended Table of the Foreign Exchange Order is technology (excluding programs) related to designing or manufacturing of hydraulic stretch forming machines (including their molds) for manufacturing aircraft materials.

Article 19 (1) The technology specified by Order of the Ministry of Economy, Trade and Industry that is referred to in row 7 (i) of the Appended Table of the Foreign Exchange Order is technology falling under any of the following:

- (i) technology (excluding programs) needed for designing or manufacturing items that fall under Article 6, item (ii), (c), 1., v. or vi., 2., iii., (d), 1., v. or vi., 2., iii. or iv., or item (xvi), (b);
- (ii) technology (excluding programs) needed for designing or manufacturing items that fall under Article 6 (excluding those falling under item (ii), (c), 1., v., or vi., 2., iii, (d), 1., v. or vi., 2. iii. or iv., or item (xvi), (b) of that Article), which does not fall under any of the following:
- (a) technology needed for manufacturing items that fall under item (xvi)-2 of

- that Article;
- (b) technology needed for designing or manufacturing integrated circuits that fall under any of item (i), (c) through (k) of that Article and fall under the following 1. and 2.:
 - 1. those whose minimum line width is 0.130 micrometers or more;
 - 2. those that have a multilayer structure (limited to those in which the number of metal layers is three or less);
 - (c) process design kits (excluding those containing a library in which the function or technology related to goods falling under any of items (i) through (viii)-4 of that Article is implemented);
 - (iii) programs designed to enable the designing or manufacture of integrated circuits falling under Article 6, item (xvi), (b);
 - (iv) programs designed to enable the designing of integrated circuits falling under Article 6, item (xvi)-2;
 - (v) programs designed to enable the designing or manufacture of integrated circuits falling under Article 6 (excluding those that fall under any of the preceding two items or item (i) or items (xviii) through (xxii) of that Article).
- (2) The technology specified by Order of the Ministry of Economy, Trade and Industry that is referred to in row 7 (ii) of the Appended Table of the Foreign Exchange Order is programs designed to enable the use of items falling under any of Article 6, item (xvii), (a), (b), (e), (f), or (j).
- (3) The technology specified by Order of the Ministry of Economy, Trade and Industry that is referred to in row 7 (iii) of the Appended Table of the Foreign Exchange Order is technology falling under any of the following:
- (i) computational lithography programs specially designed to design patterns for masks or reticles for equipment used to manufacture integrated circuits using extreme ultraviolet light;
 - (ii) technology (excluding programs) related to the designing or manufacturing of substrates of integrated circuits whose insulators are made of silicon dioxide and have silicon-on-insulator structure;
 - (iii) technology (excluding programs) needed for designing or manufacturing the cores of microprocessors, microcomputers, or microcontrollers with the bit count of the access width of the logic operation unit of 32 or more and fall under any of the following:
 - (a) vector arithmetic unit designed to be capable of simultaneously performing more than two vector arithmetic operations on floating-point numbers;
 - (b) those designed to be capable of performing more than four arithmetic operations on 64 bit or larger floating-point number per cycle;
 - (c) those designed to be capable of performing more than eight 16 bit fixed-point multiply-accumulate operations per cycle;

- (iv) programs specially designed to restore microcomputers or microprocessors to the normal state within 1 millisecond from an interruption due to electromagnetic pulses or electrostatic discharge without losing operational continuity.
 - (v) technology (excluding programs) that is for slicing, grinding, and polishing the surface of a silicon with a silicon wafer diameter of 300 millimeters and whose exclusion area of the periphery is 2 millimeters or less, which is necessary to achieve a flatness of 20 nanometers or less in any area divided into rectangles with a length of 26 millimeters and a width of 8 millimeters;
- (4) The technology specified by Order of the Ministry of Economy, Trade and Industry that is referred to in row (7), (iv) of the Appended Table of the Foreign Exchange Order is technology (excluding programs) related to designing or manufacturing of electronic elements using superconductive materials.
- (5) The technology specified by Order of the Ministry of Economy, Trade and Industry that is referred to in row 7 (v) of the Appended Table of the Foreign Exchange Order is technology falling under any of the following:
- (i) Deleted
 - (ii) technology (excluding programs) related to designing or manufacturing of vacuum microelectronics devices;
 - (iii) technology (excluding programs) related to designing or manufacturing of heterojunction semiconductor devices (excluding high electron mobility transistors or heterojunction bipolar transistors whose operating frequency is less than 31.8 gigahertz);
 - (iv) technology (excluding programs) related to designing or manufacturing of substrates used as components of electronic devices that use thin films made of diamond or silicon carbide;
 - (v) technology (excluding programs) related to designing or manufacturing of vacuum electronic devices (including klystrons and traveling wave tubes, and their derivatives) whose operating frequency is 31.8 gigahertz or more.

Article 20 (1) The technology specified by Order of the Ministry of Economy, Trade and Industry that is referred to in row 8 (i) of the Appended Table of the Foreign Exchange Order is technology that falls under any of the following (except for technology falling under items (i) through (vi) (excluding programs) and related to disclosure of security vulnerabilities or response to cyber attacks):

- (i) technology (excluding programs) needed for designing or manufacturing items falling under Article 7, item (i), (b) or item (iii), (b) of that Article;
- (ii) beyond what is set forth in the preceding item, technology (excluding programs) needed for designing or manufacturing goods that fall under the

- items of Article 7;
 - (iii) programs designed to enable the designing or manufacture of items falling under Article 7, item (i), (b) or item (iii), (b) of that Article or technology (excluding programs) needed for designing or manufacturing such programs;
 - (iv) technology (excluding programs) needed for using the programs referred to in the preceding item;
 - (v) beyond what is set forth in item (iii), programs designed to enable the designing or manufacture of goods falling under the items of Article 7, or technology (excluding programs) needed for designing, manufacturing, or using such programs;
 - (vi) technology (excluding programs) needed for using items falling under Article 7;
- (2) The technology specified by Order of the Ministry of Economy, Trade and Industry that is referred to in row 8 (ii) of the Appended Table of the Foreign Exchange Order is technology that falls under any of the following (excluding technology falling under items (iii) through (vii) (excluding programs) and related to disclosure of security vulnerabilities or response to cyber attacks):
- (i) technology (excluding programs) needed for designing or manufacturing digital computers falling under any of the following:
 - (a) those with an adjusted peak performance exceeding 15 Weighted TeraFLOPS and 16 Weighted TeraFLOPS or less; or
 - (b) those with an adjusted peak performance exceeding 16 Weighted TeraFLOPS and 29 Weighted TeraFLOPS or less;
 - (ii) technology (excluding programs) needed for designing or manufacturing components that are designed to improve the functions of digital computers and fall under items that achieve an adjusted peak performance exceeding 15 Weighted TeraFLOPS and 29 Weighted TeraFLOPS or less by aggregating calculation elements;
 - (iii) programs designed to enable the designing or manufacture of digital computers falling under any of the following, or technology (excluding programs) needed for designing or manufacturing such programs:
 - (a) those with an adjusted peak performance exceeding 15 Weighted TeraFLOPS and 16 Weighted TeraFLOPS or less; or
 - (b) those with an adjusted peak performance exceeding 16 Weighted TeraFLOPS and 29 Weighted TeraFLOPS or less;
 - (iv) technology (excluding programs) needed for using the programs referred to in the preceding item;
 - (v) programs designed to enable the designing or manufacture of components designed to improve the functions of digital computers and, by aggregating calculation elements, achieve an adjusted peak performance exceeding 15 Weighted TeraFLOPS and 29 Weighted TeraFLOPS or less; or technology

- (excluding programs) needed for designing, manufacturing, or using such programs;
- (vi) programs designed or altered to create, command and control, or distribute intrusion programs (for those that are specially designed to update or improve a program and operate only when permission of the owner or administrator of the system who receives the program is obtained, excluding those designed not to change the updated or improved program to a program falling under this item or a hacking program); or technology (excluding programs) needed for designing, manufacturing, or using such programs;
- (vii) technology (excluding programs) needed for designing intrusion programs;

Article 21 (1) The technology specified by Order of the Ministry of Economy, Trade and Industry that is referred to in row 9 (i) of the Appended Table of the Foreign Exchange Order is technology falling under any of the following:

- (i) technology (excluding programs) needed for designing or manufacturing items falling under Article 8, item (ii), (a), 2.;
- (ii) technology (excluding programs and items falling under the preceding item) needed for designing or manufacturing items falling under any of Article 8, item (i), item (ii), or items (iv) through (v)-5;
- (ii)-2 technology (excluding programs) needed for designing or manufacturing items falling under any of Article 8, items (ix) through (xii) (excluding those falling under item (xi), (b) of that Article);
- (iii) technology (excluding programs) needed for using items falling under any of Article 8, items (ix) through (xii) (excluding those falling under item (xi), (b) of that Article);
- (iv) technology (excluding programs) needed for using items falling under any of Article 8, item (i), item (ii), items (iv) through (v)-5 (excluding use in operations);
- (v) programs designed to enable the designing or manufacture of items falling under Article 8, item (ii), (a), 2.;
- (vi) programs designed to enable the designing or manufacture of items falling under any of Article 8, item (i), item (ii), items (iv) through (v)-5 (excluding those falling under the preceding item);
- (vii) programs designed to enable the designing or manufacture of items falling under any of Article 8, items (ix) through (xi), (a), or item (ix) of this paragraph;
- (vii)-2 programs designed or altered for the purpose of designing or manufacturing items falling under Article 8, item (xi), (b), or item (ix)-2 of this paragraph;
- (viii) programs designed to enable the use of items falling under any of Article 8, item (i), item (ii), or items (iv) through (v)-5;

- (viii)-2 programs designed to enable the use of items falling under any of Article 8, items (ix) through (xi), (a), or item (ix) of this paragraph;
- (viii)-3 programs designed or altered to enable the use of items falling under Article 8, item (xi), (b), or item (ix)-2 of this paragraph;
- (ix) programs that have functions equivalent to those of goods falling under any of Article 8, item (ix), (a) or (c) through (e), item (x) or item (xi), (a), those that are for actualizing the functions, or those which are capable of simulating the functions (for the goods connected with Article 8, item (ix), (a), or (c) through (e), excluding those which use only published or commercial cryptographic standards, whose functions are limited to those related to operation, management, or maintenance);
- (ix)-2 programs that have functions equivalent to those of goods falling under Article 8, item (xi), (b), those that are designed to actualize the functions, or those that are capable of simulating the functions (excluding intrusion programs);
- (x) Deleted
- (xi) technology (excluding programs) needed for designing or manufacturing the programs referred to in item (v);
- (xi)-2 technology (excluding programs) needed for using the programs referred to in item (v) (excluding use in operations);
- (xii) technology (excluding programs) needed for designing or manufacturing the programs referred to in item (vii), item (viii)-2, or item (ix);
- (xii)-2 technology (excluding programs) needed for using the programs referred to in item (vii), item (viii)-2, or item (ix);
- (xiii) technology (excluding programs) needed for designing, manufacturing, or using the programs referred to in item (vi) or item (viii) (excluding use in operations);
- (xiv) Deleted
- (xv) Deleted
- (xvi) technology (excluding programs) that have a function falling under Article 8, item (ix), (b) which activates the cryptographic functionality of certain goods or programs by means of cryptographic functionality activation;
- (xvii) programs having a function falling under Article 8, item (ix), (b) which activate the cryptographic functionality of certain goods or programs by means of cryptographic functionality activation;
- (2) The technology specified by Order of the Ministry of Economy, Trade and Industry that is referred to in row 9 (ii) of the Appended Table of the Foreign Exchange Order is technology that falls under any of the following:
 - (i) Deleted
 - (ii) programs designed to provide functions equivalent to those of goods falling under any of Article 8, item (i), item (ii), item (iv) through (vii), or item (viii)-

- 2;
- (iii) Deleted
- (iii)-2 programs for designing telecommunication transmission equipment or electronic changers that fall under (a), 1. or 5., or (d), 1., or technology (excluding programs) needed for designing or manufacturing items falling under any of the following:
- (a) Deleted
- (b) equipment using laser oscillators, which falls under any of the following:
1. one that uses laser light having a wavelength exceeding 1,750 nanometers;
 2. Deleted
 3. Deleted
 4. one that uses light wavelength multiplexing technology and whose optical carrier waves' spacing is less than 100 gigahertz;
 5. one that uses an analog transmission method whose bandwidth exceeds 2.5 gigahertz (excluding devices for television broadcasting (including cable television broadcasting));
- (c) equipment having an optical switching function with the time required for switching optical signals of less than 1 millisecond;
- (d) wireless transmitters or wireless receivers that fall under any of the following:
1. those that use quadrature amplitude modulation technology that exceeds the value of 1,024;
 2. those that can be used at frequencies that exceed 31.8 gigahertz (excluding those designed to be used at frequency bands allocated for wireless communication by the International Telecommunication Union (excluding the frequency bands allocated for wireless positioning));
 3. those that can be used within a frequency range of 1.5 megahertz or more and 87.5 megahertz or less and use adaptive technology for the suppression of an interfering signal, those which are designed to be capable of suppressing an interfering signal at a level exceeding 15 decibels;
- (e) Deleted
- (f) equipment exclusively designed for use in mobile bodies, which falls under the following 1. and 2.:
1. one that can be used at an optical wavelength of 200 nanometers or more and 400 nanometers or less;
 2. one used in local area networks;
- (iv) Deleted
- (v) technology (excluding programs) needed for designing or manufacturing telecommunication transmission equipment designed to be capable of being

- mounted on satellites;
 - (vi) technology (excluding programs) related to the designing or use of communication technology, which uses lasers and automatically receives or tracks signals and is capable of outer space communications or underwater communications;
 - (vii) Deleted
 - (viii) Deleted
 - (ix) Deleted
 - (x) Deleted
 - (xi) technology (excluding programs) related to the designing of a wireless base station receiver used for digital cellular wireless communication whose signal reception function can be changed in order to enable multi-band, multiple channel, multimode, multi-coding algorithm, or multi-protocol operation by switching programs;
 - (xii) Deleted
 - (xiii) Deleted
 - (xiv) technology (excluding programs) related to the designing of telecommunication transmission equipment and to the designing of spread spectrum (including frequency hopping);
 - (xi) programs that are specially designed or altered for surveillance or analysis to be carried out by law enforcement, which actualizes the functions referred to in the following (a) or (b) (excluding programs exclusively designed or altered for programs falling under paragraph (1), item (v), item (vi), or item (viii), item (ii) of this paragraph, or any of (c) through (g) of this item):
 - (a) those that perform searches based on a hard selector for communication content or metadata obtained from a communications service provider using a handover interface;
 - (b) those that analyze related human networks or track the movements of targeted individuals based on the content of communications, metadata, or search referred to in (a);
 - (c) billing purposes;
 - (d) service quality control (QoS) of network;
 - (e) quality of experience (QoE) of users;
 - (f) mediation devices;
 - (g) mobile payment or banking services;
 - (xvi) technology (excluding programs) needed for designing, manufacturing, or using the programs referred to in item (xv) (excluding use in operations).
- (3) The technology specified by Order of the Ministry of Economy, Trade and Industry that is referred to in row 9 (iii) of the Appended Table of the Foreign Exchange Order is technology (excluding programs) needed for designing or manufacturing monolithic microwave integrated circuit amplifiers that are

designed for communication and fall under any of the following:

- (i) microwave monolithic integrated circuit power amplifiers that have an operating frequency which exceeds 2.7 gigahertz but is 6.8 gigahertz or less, for which the value of the instantaneous bandwidth divided by the center frequency exceeds 15%, which fall under any of the following:
 - (a) those with an operating frequency that exceeds 2.7 gigahertz but is 2.9 gigahertz or less and with a peak saturation output value that exceeds 75 watts (48.75 dBm);
 - (b) those with an operating frequency that exceeds 2.9 gigahertz but is 3.2 gigahertz or less and with a peak saturation output value that exceeds 55 watts (47.4 dBm);
 - (c) those with an operating frequency that exceeds 3.2 gigahertz but is 3.7 gigahertz or less and with a peak saturation output value that exceeds 40 watts (46 dBm);
 - (d) those with an operating frequency that exceeds 3.7 gigahertz but is 6.8 gigahertz or less and with a peak saturation output value that exceeds 20 watts (43 dBm);
- (ii) microwave monolithic integrated circuit power amplifiers that have an operating frequency that exceeds 6.8 gigahertz but is 16 gigahertz or less, for which the value of the instantaneous bandwidth divided by the center frequency exceeds 10%, which fall under any of the following:
 - (a) those with an operating frequency that exceeds 6.8 gigahertz but is 8.5 gigahertz or less and with a peak saturation output value exceeding 10 watts (40 dBm);
 - (b) those with an operating frequency that exceeds 8.5 gigahertz but is 16 gigahertz or less, with a peak saturation output value exceeding 5 watts (37 dBm);
- (iii) microwave monolithic integrated circuit power amplifiers with an operating frequency that exceeds 16 gigahertz but is 31.8 gigahertz or less and with a peak saturation output value exceeding 3.0 watts (34.77 dBm), for which the value obtained by dividing the instantaneous bandwidth by the center frequency exceeds 10%;
- (iv) microwave monolithic integrated circuit power amplifiers with an operating frequency that exceeds 31.8 gigahertz but is 37 gigahertz or less, with a peak saturation output value exceeding 0.1 nanowatts (-70 dBm);
- (v) microwave monolithic integrated circuit power amplifiers with an operating frequency that exceeds 37 gigahertz but is 43.5 gigahertz or less and with a peak saturation output value exceeding 1.0 watt (30 dBm), for which the value obtained by dividing the instantaneous bandwidth by the center frequency exceeds 10%;
- (vi) microwave monolithic integrated circuit power amplifiers with an

- operating frequency that exceeds 43.5 gigahertz but is 75 gigahertz or less and with a peak saturation output value exceeding 31.62 milliwatts (15 dBm), for which the value obtained by dividing the instantaneous bandwidth by the center frequency exceeds 10%;
- (vii) microwave monolithic integrated circuit power amplifiers with an operating frequency that exceeds 75 gigahertz but is 90 gigahertz or less and with a peak saturation output value exceeding 10 milliwatts (10 dBm), for which the value obtained by dividing the instantaneous bandwidth by the center frequency exceeds 5%;
- (viii) microwave monolithic integrated circuit power amplifiers with an operating frequency exceeding 90 gigahertz with a peak saturation output value exceeding 0.1 nanowatts (-70 dBm).
- (4) The technology specified by Order of the Ministry of Economy, Trade and Industry that is referred to in row 9 (iv) of the Appended Table of the Foreign Exchange Order is technology (excluding programs) needed for designing or manufacturing telecommunications equipment using superconductive materials that is designed to enable use at temperatures below the critical temperature of the superconductive material used, and that falls under any of the following:
- (i) one having current switching function for digital circuits that have superconductive gates, with a value obtained by multiplying the delay time per gate by the power consumption per gate of less than 1/100,000,000,000 millijoules;
- (ii) one having a frequency separation function and resonant circuits with Q-values exceeding 10,000.

- Article 22 (1) The technology specified by Order of the Ministry of Economy, Trade and Industry that is referred to in row 10 (i) of the Appended Table of the Foreign Exchange Order is technology falling under any of the following:
- (i) technology (excluding programs) needed for designing items falling under Article 9;
- (ii) technology (excluding programs) needed for manufacturing items falling under Article 9, item (i), (a), 2. or 6. or (b), 3., item (iii), (a), (b), or (e), item (iv), item (v), (a), item (viii), (a), 1., i. or 2., i. or 3., item (ix), (c) or (d), item (xi), (a), (b), (l) or (m), item (xi)-2, (a), or item (xiii), (d), (h), or (k);
- (iii) technology (excluding programs) needed for manufacturing items falling under Article 9 (excluding those falling under the preceding item);
- (iv) programs designed to enable the designing or manufacture of items falling under Article 9, item (ix), (c) or (d) or item (xiii), (d), (h), or (k) or technology (excluding programs) needed for designing such programs;
- (v) programs designed to enable the designing or manufacture of items falling

- under Article 9, items (ix) through (x)-2 or item (xiii) (excluding those falling under the preceding item);
- (vi) technology (excluding programs) needed for designing the programs referred to in the preceding item;
 - (vii) programs designed or altered for cameras with focal plane arrays falling under Article 9, item (iii), (d), 1. ii. or (e), 2. built in, and designed or altered to remove the frame rate restriction of the camera and allow the camera to have a maximum frame rate that exceeds 9 hertz.
- (2) The technology specified by Order of the Ministry of Economy, Trade and Industry that is referred to in row 10 (ii) of the Appended Table of the Foreign Exchange Order is technology falling under any of the following:
- (i) programs designed to enable the use of items falling under Article 9, item (iv), Article 13, or Article 14, item (viii);
 - (ii) technology (excluding programs) needed for designing the programs referred to in the preceding item;
 - (iii) programs that fall under any of the following:
 - (a) programs for magnetometer, underwater electric field sensor, or magnetic field gradiometer calibrating equipment, which are designed to be mounted on vehicles, vessels, aircraft, artificial satellites, or other flying objects used for space pioneering;
 - (b) programs designed to detect abnormalities in the magnetic or underwater electric field on vehicles, vessels, aircraft, artificial satellites, or other flying objects used for space pioneering;
 - (c) programs designed to correct the effect of movement on gravimeters or gravity gradiometers;
 - (d) programs used for air traffic control, which are capable of accepting target data from five or more primary radars;
 - (e) programs or source code designed to process data related to magnetic or electric fields in real time by using items falling under Article 9, item (xi)-2;
 - (iv) technology (excluding programs) needed for designing the programs referred to in the preceding item.
- (3) The technology specified by Order of the Ministry of Economy, Trade and Industry that is referred to in row 10 (iii) of the Appended Table of the Foreign Exchange Order is technology falling under any of the following:
- (i) technology (excluding programs) needed for manufacturing optical coatings whose diameter or length of major axis is 500 millimeters or more, with loss due to absorption and scatter is less than 0.005, and with a uniformity of thickness is 99.5% or more;
 - (ii) technology (excluding programs) related to lathe turning using single point diamond tools, and for finishing the curved surface area exceeding 0.5 m² to

- have the root-mean-square value of less than 10 nanometers for surface accuracy.
- (iii) programs designed to maintain the angles and phases of a reflecting mirror system consisting of multiple reflecting mirrors whose diameter or length of major axis is 1 meter or more;
- (4) The technology specified by Order of the Ministry of Economy, Trade and Industry that is referred to in row 10 (iv) of the Appended Table of the Foreign Exchange Order is technology (excluding programs) needed for designing, manufacturing, or using test equipment for ultra-high power laser oscillators.
- (5) The technology specified by Order of the Ministry of Economy, Trade and Industry that is referred to in row 10 (vi) of the Appended Table of the Foreign Exchange Order is technology falling under any of the following:
- (i) programs for manufacturing radomes that fall under the following (a) and (b):
 - (a) those designed to protect array antennas capable of electronic scanning;
 - (b) those that produce antenna patterns with the output ratio of the main beam peak value to average side lobe peak value exceeding 40 decibels;
 - (ii) technology (excluding programs) needed for designing the programs referred to in the preceding item.
- (6) The technology specified by Order of the Ministry of Economy, Trade and Industry that is referred to in row 10 (vii) of the Appended Table of the Foreign Exchange Order is technology needed for designing, manufacturing, or using devices for performing tests of the durability of substances against laser beams output by ultra-high power laser oscillators or targets used for the test.

- Article 23 (1) The technology specified by Order of the Ministry of Economy, Trade and Industry that is referred to in row 11 (i) of the Appended Table of the Foreign Exchange Order is technology falling under any of the following:
- (i) technology (excluding programs) needed for designing or manufacturing items falling under Article 10;
 - (ii) programs designed to enable the designing or manufacture of items falling under Article 10;
 - (iii) technology (excluding programs) needed for designing the programs referred to in the preceding item.
- (2) The technology specified by Order of the Ministry of Economy, Trade and Industry that is referred to in row 11 (ii) of the Appended Table of the Foreign Exchange Order means technology falling under any of the following:
- (i) programs for using (limited to those related to operation or maintenance (inspection)) an attitude and heading reference system (excluding those using the gimbal method), inertial navigation system, and other inertial systems (limited to source-code programs) or technology (excluding

- programs) needed for designing such programs;
 - (ii) technology (excluding programs) needed for using items falling under any of Article 10, items (i) through (iv) (limited to use in repairs or overhauls);
 - (iii) technology (excluding programs) related to the designing of programs falling under any of Article 27, paragraphs (3) through (5);
 - (iv) programs designed to decode ranging codes (excluding those for civilian use) of satellite navigation systems.
- (3) The technology specified by Order of the Ministry of Economy, Trade and Industry that is referred to in row 11 (iv) of the Appended Table of the Foreign Exchange Order is technology falling under any of the following:
- (i) programs that are for items falling under any of the following (limited to source-code programs) and that use technology (excluding programs) related to the designing of an item falling under any of item (ii), (a) through (d) or item (iii), (a) through (d), (g), or (h):
 - (a) digital air traffic controllers for controlling the entire flight route;
 - (b) equipment to integrate propulsion control and flight control;
 - (c) fly-by-wire systems or fly-by-light systems;
 - (d) active flight controllers having a fault tolerance function or self-reconfiguring function;
 - (e) air data equipment that uses the static data of airframe surface as a basis;
 - (f) three-dimensional displays;
 - (ii) technology (excluding programs) related to designing or manufacturing of items that fall under any of the following:
 - (a) air data equipment that uses static data of airframe surface as a basis;
 - (b) three-dimensional display for aircraft;
 - (c) electric actuators designed for flight control;
 - (d) flight control optical sensor array designed for implementing active flight control;
 - (e) data-based referenced navigation system designed to be capable of being used in underwater navigation, which use a sonar or gravity database that provides a positioning accuracy of 0.4 nautical miles or less;
 - (iii) technology related to the designing of active flight controllers, which falls under any of the following:
 - (a) technology (excluding programs) related to optical communication for detection of the operating state of aircraft airframes or flight controller system equipment, transmission of flight control data, or instruction to actuators on operation which are needed for designing active flight controllers of fly-by-light systems;
 - (b) real-time algorithm to analyze information obtained from sensors of components of active flight controllers for forecasting and mitigating the

- degree of performance deterioration and failures of the components;
- (c) real-time algorithm to identify failures and reconfigure force and moment control of equipment for mitigating the degree of performance deterioration and failures of active flight controllers;
 - (d) technology (excluding programs) that integrates the data for digital flight control, navigation, and propulsion control into a digital flight traffic controller in order to control the entire flight route;
 - (e) CAD programs designed for active flight controllers that use technology that falls under any of (a) through (d), (g), or (h);
 - (f) technology (excluding programs) needed for designing the programs referred to in (e);
 - (g) technology (excluding programs) needed for attaining the functional requirements for fly-by-wire systems, which falls under the following 1. and 2.:
 - 1. inner loop airframe control that requires closed loop control frequencies of 40 hertz or more;
 - 2. technology that fall under any of the following:
 - i. technology which is capable of correcting the instability of an airframe that would lose the power to right or control itself if it is not corrected within 0.5 seconds, within the flight envelope;
 - ii. technology that combines control of two or more shafts in correcting abnormal changes in airframe conditions;
 - iii. technology that performs the functions specified in (d) (excluding autopilot); or
 - iv. technology for making the airframe fly in a stable and controlled way at an angle of attack of 18 degrees or more, an angle of slideslip of 15 degrees or more, a pitch rate of 15 degrees or more per second, a yaw rate of 15 degrees or more per second, or a roll rate of 90 degrees or more per second (except at takeoff and landing);
 - (h) technology (excluding programs) that is needed for attaining the functional requirements for fly-by-wire systems and whose purpose is achieving the things referred to in the following 1. and 2.:
 - 1. that control of the airframe will not be lost even if any two parts in the fly-by-wire system malfunction back-to-back;
 - 2. that the probability of control of the airframe being lost is not more than one-billionth of the failure rate per flight hour;
 - (iv) technology (excluding programs) related to the designing of devices for helicopters that fall under any of the following or CAD programs designed for items that fall under (a) or (b):
 - (a) multiaxial fly-by-wire systems or fly-by-light systems, which integrate two or more of the functions falling under the following:

1. collective control function;
 2. cyclic control function;
 3. yaw control function;
- (b) devices that control counter torque or direction, which use a circulation control method;
- (c) rotary wing that uses a variable shape wing in order to control each wing separately;
- (v) technology (excluding programs) needed for designing the programs referred to in the preceding item.

Article 24 (1) The technology specified by Order of the Ministry of Economy, Trade and Industry that is referred to in row 12 (i) of the Appended Table of the Foreign Exchange Order is technology falling under any of the following:

- (i) technology needed for designing or manufacturing items that fall under Article 11, item (i)-2, item (iv), (b), item (vi), item (viii), or item (x), (f), or (g);
- (ii) technology needed for designing or manufacturing items that fall under Article 11 (excluding those falling under the preceding item).
- (iii) technology (excluding programs) needed for designing or manufacturing air cushion ships, hydrofoil crafts, or vessels designed to reduce wave resistance by reducing the water-plane area, which fall under any of the following:
 - (a) skirt-shaped air cushion ships (limited to those with a flexible skirt attached around the periphery of the hull) which fall under all of the following:
 1. those that are designed so that the maximum value of their speed in a fully loaded condition will exceed 30 knots when the significant wave height is 1.25 meters or more;
 2. those with a cushion whose pressure exceeds 3,830 pascals; and
 3. those with a ratio of light displacement to full load displacement that is less than 70 percent;
 - (b) sidewall air cushion ships whose speed in a fully loaded condition has a maximum value exceeding 40 knots when the significant wave height is 3.25 meters or more;
 - (c) hydrofoil crafts that are designed so that the maximum value of their speed in a fully loaded condition will be 40 knots or more when the significant wave height is 3.25 meters or more, which have a device that automatically controls the hydrofoil by measuring the swaying of the hull, wave conditions, and other data; or
 - (d) vessels that are designed to reduce wave resistance by reducing the water-plane area, which fall under any of the following:
 1. those whose full load displacement exceeds 500 tons and designed so that the maximum value of their speed in a fully loaded condition will

- exceed 35 knots when the significant wave height is 3.25 meters or more;
2. those whose full load displacement exceeds 1,500 tons and designed so that the maximum value of their speed in a fully loaded condition will exceed 25 knots when the significant wave height is 4 meters or more;
- (2) The technology specified by Order of the Ministry of Economy, Trade and Industry that is referred to in row (12), (ii) of the Appended Table of the Foreign Exchange Order are programs designed to use the goods that fall under Article 11 or Article 14, item (ix) or item (x), or technology (excluding programs) related to the use (limited to use in repairs or overhauls) of goods that fall under any of Article 11, item (i), item (i)-2, item (ii), item (iv), (b) or (c), item (viii), item (x), or Article 14, item (ix) or item (x).
- (3) The technology specified by Order of the Ministry of Economy, Trade and Industry that is referred to in row 12 (iii) of the Appended Table of the Foreign Exchange Order is technology related to designing, manufacturing, or using (limited to use in repairs or overhauls) propellers designed for reducing underwater noise.

- Article 25 (1) The technology specified by Order of the Ministry of Economy, Trade and Industry that is referred to in row 13 (i) of the Appended Table of the Foreign Exchange Order is technology falling under any of the following:
- (i) technology (excluding programs) needed for designing items that fall under any of Article 12, item (i), (b), and items (iv) through (xx);
 - (i)-2 technology (excluding programs) needed for manufacturing items that fall under any of Article 12, item (i), (b), items (iv) through (x), or items (xi) through (xx);
 - (ii) programs designed to enable the designing or manufacture of items falling under Article 12, item (xi), (b);
 - (iii) technology (excluding programs) needed for designing the programs referred to in the preceding item;
 - (iv) programs designed to enable the designing or manufacture of items falling under Article 12 (excluding those falling under item (ii));
 - (v) technology (excluding programs) needed for designing the programs referred to in the preceding item.
- (2) The technology specified by Order of the Ministry of Economy, Trade and Industry that is referred to in row 13 (ii) of the Appended Table of the Foreign Exchange Order is technology falling under any of the following:
- (i) programs into which technology (excluding programs) falling under paragraph (3), item (iii) is incorporated, and are used in full authority digital engine control systems for goods falling under Article 12;
 - (ii) technology (excluding programs) needed for designing the programs referred to in the preceding item;

- (iii) programs that fall under any of the following:
 - (a) programs for two dimensional or three dimensional viscous flows verified by the data for wind tunnel tests or flight tests, and for modeling the flow inside engines;
 - (b) programs for testing gas turbine engines for aircraft, their assemblies, or their components, which fall under the following 1. and 2. (excluding those for operating test equipment, for ensuring worker safety, or for acceptance test for manufacture, repair, or maintenance (meaning a test for determining whether products have been assembled or repaired appropriately)):
 - 1. programs specially designed for testing items that fall under any of the following:
 - i. gas turbine engines for aircraft, or their assemblies or components, which use technology falling under any of item (ii), (a) through (g), (j), or (l) of the following paragraph, item (iii) or item (iv) of that paragraph, or Article 27, paragraph (6), item (i);
 - ii. multistage compressors that provide bypass flow channels or core flow channels, which are specially designed for gas turbine engines for aircraft that use technology falling under any of item (ii), (a) through (g), (j), or (l) of the following paragraph, item (iii) of that paragraph, or Article 27, paragraph (6), item (i);
 - 2. programs specially designed to perform the functions referred to in the following i. and ii.:
 - i. gathering and processing data in real time;
 - ii. feedback control of test articles or test conditions during a test;
 - (c) programs that are used for goods falling under Article 12, item (xi), (a) or (c) and are designed to control the growth of unidirectional solidification materials or single crystal materials;
 - (d) Deleted
 - (e) programs designed to enable the use of items falling under Article 12, item (x)-2 (limited to use in operation);
 - (f) programs designed for designing the internal cooling passages of blades, vanes, or tip shrouds for aircraft gas turbine engines;
 - (g) programs falling under the following 1. and 2.:
 - 1. programs designed to predict the thermal state, aerodynamic state, or combustion state of air in aircraft gas turbine engines;
 - 2. programs for theoretical model prediction of the thermal state, aerodynamic state or combustion state of air based on the actual performance data for aircraft gas turbine engines ;
- (iv) technology (excluding programs) needed for designing the programs referred to in the preceding item;

- (v) programs designed or altered to enable the use of items falling under Article 12, item (iv), (e) or item (iv)-3 of that Article (limited to use in operations).
- (3) The technology specified by Order of the Ministry of Economy, Trade and Industry that is referred to in row 13 (iii) of the Appended Table of the Foreign Exchange Order is technology falling under any of the following:
 - (i) technology (excluding programs) related to the use of gas turbine engines, or their components, that fall under any of Article 12, item (i), (b), items (iv) through (x), or items (xi) through (xix) (limited to use in repairs or overhauls);
 - (ii) technology (excluding programs) needed for designing or manufacturing components of gas turbine engines that fall under any of the following, or programs for designing such technology:
 - (a) combustors equipped with items that fall under any of the following:
 1. heat shield liners whose combustor outlet temperature exceeds 1,610 °C;
 2. non-metallic liners;
 3. non-metallic shells;
 4. liners that are equipped with cooling holes falling under (k), and whose combustor outlet temperature exceeds 1,610 °C;
 - (b) components manufactured using metal matrix composite materials reinforced by a substance falling under Article 4, item (xii), fiber falling under item (xv) of that Article, aluminum compound falling under item (vii), (a) of that Article, or using ceramic matrix composite materials falling under item (xii) of that Article, as raw materials;
 - (c) uncooled turbine blades, vanes, or chip shrouds designed to be used at a gas passage temperature of 1,100 °C or more;
 - (d) cooling type blades, vanes, or tip shrouds designed to operate in a gas passage temperature of 1,420 °C or more (excluding those that fall under Article 27, paragraph (6), item (i));
 - (e) components that join the wing part and the disk part using the solid phase bonding method;
 - (f) Deleted
 - (g) rotating components that are designed to be damage tolerant and use powder metallurgy materials (limited to those that fall under Article 4, item (vii), (b));
 - (h) Deleted
 - (i) Deleted
 - (j) fan blades that fall under the following 1. and 2.:
 1. those with one or more closed cavities comprised of only vacuum or gas in which the sum of the volume of the closed cavities is 20% or more of the total volume of the fan blade; and

- 2. those with one or more closed cavities with a volume of 5 cm³ or more;
- (k) technology necessary for drilling cooling holes in components of gas turbine engines that use any technology (excluding programs) that falls under (d) of this item or Article 27, paragraph (6), item (i) which fall under any of the following:
 - 1. those with the minimum cross-sectional area of less than 0.45 square millimeters and an aspect ratio exceeding 4.52, whose drilling angle is 25 degrees or less;
 - 2. those with the minimum cross-sectional area of less than 0.12 square millimeters and an aspect ratio exceeding 5.65, whose drilling angle exceeds 25 degrees;
- (l) a stator, vane, blade, chip seal, chip shroud, rotary bling, rotary blisk, or splitter ducts that falls under all of the following:
 - 1. one that does not fall under Article 27, paragraph (6), item (i), (b);
 - 2. one designed for compressors or fans;
 - 3. one manufactured using a substance falling under Article 4, item (xv), (e) and resin falling under item (xiii) of that Article as a raw material;
- (iii) technology (excluding programs) that is related to designing or manufacturing of components of gas turbine engines constituting full authority digital engine control systems for gas turbine engines, which falls under any of the following, or programs for designing such technology:
 - (a) technology that is related to the designing of components of gas turbine engines and that is for furnishing the components of gas turbine engines with the functions for regulating engine thrust or shaft power;
 - (b) technology that is related to the designing or manufacturing of components that control and diagnose engines, which are used to regulate engine thrust or shaft power;
 - (c) technology that is related to the designing of control law algorithms (including source codes), which are used to regulate engine thrust or shaft power;
- (iv) technology (excluding programs) related to designing or manufacturing of equipment that enables the flow path shapes to be variable which has been designed to maintain the stability of engines for gas generator turbines, fan turbines, power turbines, or propelling nozzles, which fall under any of the following, or programs for designing such technology:
 - (a) technology related to designing of equipment whose purpose is to enable components that maintain engine stability to fulfill their function;
 - (b) technology related to designing or manufacturing of components that are for equipment whose purpose is to enable the flow path shapes to be variable, which maintain engine stability;
 - (c) technology related to designing of control law algorithms (including

- source codes) that are for equipment whose purpose is to enable the flow path shapes to be variable, which maintain the stability of engines.
- (4) The technology specified by Order of the Ministry of Economy, Trade and Industry that is referred to in row 13 (iv) of the Appended Table of the Foreign Exchange Order is technology falling under any of the following, or programs for designing such technology:
- (i) technology (excluding programs) needed for designing or manufacturing models for wind tunnels that use sensors with a shape that does not affect flow conditions and that are capable of transmitting data from sensors to data collecting devices;
 - (ii) technology (excluding programs) needed for designing or manufacturing propeller blades or prop fans that use composite materials and that are capable of absorbing loads exceeding 2,000 kilowatts at speeds exceeding Mach 0.55;
 - (iii) technology (excluding programs) needed for designing or manufacturing power transmission devices for helicopters or aircraft that use tilt rotors or tilt wings;
 - (iv) technology (excluding programs) needed for designing a wing folding system designed for fixed-wing aircraft equipped with a gas turbine engine.
- (5) The technology specified by Order of the Ministry of Economy, Trade and Industry that is referred to in row 13 (v) of the Appended Table of the Foreign Exchange Order is technology falling under any of the following, or programs for designing such technology:
- (i) technology (excluding programs) related to designing or manufacturing of reciprocating diesel engines for vehicles that fall under all of the following (a) through (c):
 - (a) those with the engine volume of 1.2 m³ or less;
 - (b) those with a gross brake power exceeding 750 kilowatts;
 - (c) those for which the value arrived at by dividing the gross brake power expressed in kilowatts by the engine volume expressed in cubic meters exceeds 700;
 - (ii) technology (excluding programs) needed for manufacturing the components of high-output diesel engines (meaning diesel engines in which the rated rotational speed is 2,300 or more rotations per minute and the brake mean effective pressure is 1.8 megapascals or more when the number of rotations is 2,300 rotations per minute; hereinafter the same applies in this Article), which falls under any of the following:
 - (a) technology needed for manufacturing engines in which all of the components falling under the following 1. through 3. are made of ceramics that fall under Article 4, item (xii) (excluding those in which all of the components other than the following are made of materials other than

- those ceramics):
1. cylinder liners;
 2. pistons;
 3. cylinder heads;
- (b) technology needed for manufacturing turbochargers whose compressor falls under all of following 1. through 3.:
1. those whose pressure ratio per stage is 4 or more;
 2. those whose flow volume per minute is 30 kilograms or more and 130 kilograms or less;
 3. those that make it possible to modify the flow area of the compressor or of its turbine parts;
- (c) technology needed for manufacturing fuel injection devices which are designed so that they can use any fuel whose dynamic viscosity at 37.8 °C is 0.5 centistokes or more and 2.5 centistokes or less, and which fall under the following 1. and 2.:
1. fuel injection devices in which the injection amount exceeds 230 mm³ per cylinder injection;
 2. fuel injection devices that are controlled electronically so that characteristics of speed regulators can be automatically switched in order to obtain the same torque characteristics according to fuel characteristics;
- (iii) technology (excluding programs) needed for designing or manufacturing high output diesel engines for which the cylinder wall temperature measured at the top dead center of the piston top ring exceeds 450 °C and which use solid, gas phase, or liquid lubricants on cylinder walls.

Article 26 The technology specified by Order of the Ministry of Economy, Trade and Industry that is referred to in row 14 of the Appended Table of the Foreign Exchange Order is technology falling under any of the following:

- (i) technology (excluding programs) needed for designing, manufacturing, or using items that fall under Article 13;
- (ii) programs designed to enable the designing, manufacture, or use of items falling under Article 13, or technology (excluding programs) needed for designing, manufacturing, or using such programs;
- (iii) technology specially designed to enable certain goods to use that technology to perform the functions of goods falling under Article 13, paragraph (8).

Article 27 (1) The technology specified by Order of the Ministry of Economy, Trade and Industry that is referred to in row (15), (i) of the Appended Table of the Foreign Exchange Order is technology falling under any of the following:

- (i) technology (excluding programs) needed for designing or manufacturing

- items that fall under any of Article 14, items (i) through (iii);
 - (ii) technology (excluding programs) needed for designing or manufacturing items that fall under Article 14, item (vi) or item (vii);
 - (iii) technology needed for designing or manufacturing items that fall under Article 14, item (v) or item (v)-2;
 - (iv) technology needed for designing or manufacturing items that fall under Article 14, item (ix) or item (x);
 - (v) technology (excluding programs) needed for designing or manufacturing programs that fall under item (iii);
 - (vi) technology needed for designing or manufacturing items that fall under Article 14, item (viii) or item (xi);
 - (vii) technology (excluding programs) needed for designing programs that fall under the preceding item.
- (2) The technology specified by Order of the Ministry of Economy, Trade and Industry that is referred to in row (15), (iii) of the Appended Table of the Foreign Exchange Order is program that fall under any of the following or technology that is needed to design the program:
- (i) program designed to perform acoustic beamforming for real-time processing of sound data received by using towed hydrophone arrays;
 - (ii) source code for performing real-time processing of sound data received by using towed hydrophone arrays;
 - (iii) program designed to perform acoustic beamforming for real-time processing of sound data received by using submarine or harbor cable systems;
 - (iv) source code for performing real-time processing of sound data received by using submarine or harbor cable systems;
 - (v) program (including source codes) falling under the following (a) and (b):
 - (a) one that performs real-time processing of sound data obtained from devices falling under Article 9, item (i), (a), 6.;
 - (b) one that processes data in order to automatically detect the position of persons who conduct activities underwater.
- (3) The technology specified by Order of the Ministry of Economy, Trade and Industry that is referred to in row 15 (iv) of the Appended Table of the Foreign Exchange Order is technology falling under any of the following:
- (i) program designed to enable the inertial navigation systems or other inertial systems to fall under Article 10, item (iii) by using those systems;
 - (ii) program that enables the inertial navigation systems or other inertial systems to fall under Article 10, item (iii) by continuously integrating the heading data and navigation data that falls under any of the following and using those systems (limited to programs with source codes):
 - (a) speed data from radars that utilize Doppler effects;

- (b) navigation data from GPS or GLONASS;
 - (c) data from data-based referenced navigation systems.
- (4) The technology specified by Order of the Ministry of Economy, Trade and Industry that is referred to in row 15 (v) of the Appended Table of the Foreign Exchange Order is a program that is designed to be able, when used in a gyro-astro compass or device that is able to measure position or course by automatically tracking celestial bodies or artificial satellites, to enable those devices to fall under Article 10, item (iv).
- (5) The technology specified by Order of the Ministry of Economy, Trade and Industry that is referred to in row 15 (v)-2 of the Appended Table of the Foreign Exchange Order is technology falling under any of the following:
- (i) program designed to enable the underwater sonar navigation equipment to fall under Article 10, item (vii) by using the equipment;
 - (ii) program that enables the underwater sonar navigation equipment to fall under Article 10, item (vii) by continuously integrating the heading data and the navigation data that falls under any of the following and using the equipment (limited to programs with source codes):
 - (a) speed data from sonars that utilize Doppler effects;
 - (b) navigation data from GPS or GLONASS;
 - (c) data from data-based referenced navigation systems.
- (6) The technology specified by Order of the Ministry of Economy, Trade and Industry that is referred to in row 15 (vi) of the Appended Table of the Foreign Exchange Order is technology falling under any of the following:
- (i) technology (excluding programs) needed for designing or manufacturing gas turbine engine components that fall under any of the following:
 - (a) gas turbine blades, vanes, or tip shrouds cast by unidirectional solidification or single crystal alloy, whose stress rupture time is 400 hours or more when a load that generates a stress of 200 megapascals is applied in the vertical direction to the single crystal at a temperature of 1,000 °C;
 - (b) components that are manufactured using, as a raw material, an organic composite designed to be capable of using at temperatures exceeding 315 °C;
 - (ii) programs needed for designing technology that falls under the preceding item.

Article 28 The technology specified by Order of the Ministry of Economy, Trade and Industry that is referred to in row 16 of the Appended Table of the Foreign Exchange Order is technology related to designing, manufacturing, or using of goods that exclusively fall under Classes 25 through 40, Classes 54 through 59, Class 63, Classes 68 through 93, or Class 95 of the Appended Table of the Custom Tariff Act (Act No. 54 of 1910).

Supplementary Provisions

This Ministerial Order comes into effect as of November 14, 1991.

Supplementary Provisions [Order of the Ministry of International Trade and Industry No. 12 of March 27, 1992]

This Ministerial Order comes into effect as of April 1, 1992.

Supplementary Provisions [Order of the Ministry of International Trade and Industry No. 85 of December 9, 1992]

- (1) This Ministerial Order comes into effect as of December 31, 1992.
- (2) Prior laws continue to govern the applicability of penal provisions to conduct that a person engaged in before this Ministerial Order comes into effect.

Supplementary Provisions [Order of the Ministry of International Trade and Industry No. 30 of June 18, 1993]

This Ministerial Order comes into effect as of July 16, 1993; provided, however, that the amended provisions of Article 3 and Article 16, paragraph (2) come into effect as of July 1, 1993.

Supplementary Provisions [Order of the Ministry of International Trade and Industry No. 85 of December 1, 1993]

- (1) In this Ministerial Order, the provisions of Article 1 come into effect as of the date of promulgation, and the provisions of Article 2 come into effect as of December 22, 1993.
- (2) Prior laws continue to govern the applicability of penal provisions to conduct that a person engaged in before this Ministerial Order comes into effect.

Supplementary Provisions [Order of the Ministry of International Trade and Industry No. 3 of January 28, 1994]

This Ministerial Order comes into effect as of the date of promulgation.

Supplementary Provisions [Order of the Ministry of International Trade and Industry No. 10 of March 14, 1994]

- (1) This Ministerial Order comes into effect as of March 28, 1994; provided, however, that the amended provisions of Article 2, the amended provisions of Article 7 (in item (iii), (ii) of that Article, "equipment which corresponds to any of the following" is amended to "equipment in which the composite theoretical performance exceeds 260 mega calculations per seconds by aggregating calculation elements", and excluding the part that deletes 1. and 2.) and the amended provisions of Article 8 come into effect as of the date of promulgation.
- (2) Prior laws continue to govern the applicability of penal provisions to conduct that a person engaged in before this Ministerial Order comes into effect.

Supplementary Provisions [Order of the Ministry of International Trade and Industry No. 49 of June 24, 1994]

- (1) (1) This Ministerial Order comes into effect as of July 6, 1994; provided, however, that the amended provisions of Article 7 (limited to the part deleting item (v) and item (vi) of that Article) and the amended provisions of Article 20 (excluding the part deleting paragraph (1), items (v) through (ix) of that Article) come into effect as of the date of promulgation.
- (2) Prior laws continue to govern the applicability of penal provisions to conduct that a person engaged in before this Ministerial Order comes into effect.

Supplementary Provisions [Order of the Ministry of International Trade and Industry No. 2 of February 27, 1995]

- (1) This Ministerial Order comes into effect as of the date of promulgation.
- (2) Prior laws continue to govern the applicability of penal provisions to conduct that a person engaged in before this Ministerial Order comes into effect.

Supplementary Provisions [Order of the Ministry of International Trade and Industry No. 43 of May 10, 1995]

- (1) This Ministerial Order comes into effect as of May 22, 1995.
- (2) Prior laws continue to govern the applicability of penal provisions to conduct that a person engaged in before this Ministerial Order comes into effect.

Supplementary Provisions [Order of the Ministry of International Trade and Industry No. 66 of August 9, 1995]

- (1) This Ministerial Order comes into effect as of August 23, 1995.
- (2) Prior laws continue to govern the applicability of penal provisions to conduct that a person engaged in before this Ministerial Order comes into effect.

Supplementary Provisions [Order of the Ministry of International Trade and Industry No. 106 of December 20, 1995]

- (1) This Ministerial Order comes into effect as of January 3, 1996; provided, however, that the amended provisions of Article 1, the amended provisions of Article 2-2 (limited to the parts in which "Fresh vaccine ingredients" in paragraph (1), item (i) and item (ii) of that Article is amended to "vaccine" and "(excluding immune toxin)" is added after "toxin" in item (iii) of that Article), and the amended provisions of Article 5, the amended provisions of Article 15 and the amended provisions of Article 18 come into effect as of the date of promulgation.
- (2) Prior laws continue to govern the applicability of penal provisions to conduct that a person engaged in before this Ministerial Order comes into effect.

Supplementary Provisions [Order of the Ministry of International Trade and Industry No. 18 of March 28, 1996]

This Ministerial Order comes into effect as of October 1, 1996.

Supplementary Provisions [Order of the Ministry of International Trade and Industry No. 60 of August 28, 1996] [Extract]

(Effective Date)

- (1) This Ministerial Order comes into effect as of September 13, 1996.

(Transitional Measures for Penal Provisions)

- (2) Prior laws continue to govern the applicability of penal provisions to conduct that a person engaged in before this Ministerial Order comes into effect.

Supplementary Provisions [Order of the Ministry of International Trade and Industry No. 65 of April 3, 1997]

This Ministerial Order comes into effect as of April 29, 1997.

Supplementary Provisions [Order of the Ministry of International Trade and Industry No. 9 of March 12, 1998]

This Ministerial Order comes into effect as of April 1, 1998.

Supplementary Provisions [Order of the Ministry of International Trade

and Industry No. 13 of March 25, 1998]

(Effective Date)

- (1) This Ministerial Order comes into effect as of April 1, 1998.

(Transitional Measures for Penal Provisions)

- (2) Prior laws continue to govern the applicability of penal provisions to conduct that a person engaged in before this Ministerial Order comes into effect.

Supplementary Provisions [Order of the Ministry of International Trade and Industry No. 78 of August 26, 1998]

(Effective Date)

- (1) This Ministerial Order comes into effect as of the date of promulgation.

(Transitional Measures for Penal Provisions)

- (2) Prior laws continue to govern the applicability of penal provisions to conduct that a person engaged in before this Ministerial Order comes into effect.

Supplementary Provisions [Order of the Ministry of International Trade and Industry No. 83 of November 5, 1998]

This Ministerial Order comes into effect as of November 12, 1998.

Supplementary Provisions [Order of the Ministry of International Trade and Industry No. 64 of June 18, 1999]

(Effective Date)

- (1) This Ministerial Order comes into effect as of the date of promulgation; provided, however, that the provisions set forth in each of the following item come into effect on the date specified in each item:
- (i) the amended provisions of Article 1, the amended provisions of Article 4, item (ix), the amended provisions of Article 5, item (vii), the amended provisions of Article 6, item (xvii), (a) and (f), the amended provisions of Article 9, item (x), (b), the amended provisions of Article 14-2, item (ii), the amended provisions of Article 19, paragraph (3) and paragraph (5), the amended provisions of Article 21, paragraph (1), item (x)-2, item (xi)-2, item (xiii) and item (xv), and paragraph (2), item (iv), item (iv)-2 and item (xi) of that Article, and the amended provisions of the Appended Table 3: July 2, 1999;
 - (ii) the amended provisions of Article 2, paragraph (1) and the additional

provisions of Article 14-2, items (li)-2 through (li)-4: July 18, 1999.

(Transitional Measures for Penal Provisions)

- (2) Prior laws continue to govern the applicability of penal provisions to conduct that a person engaged in before this Ministerial Order comes into effect.

Supplementary Provisions [Order of the Ministry of International Trade and Industry No. 115 of June 23, 2000]

- (1) This Ministerial Order comes into effect as of July 7, 2000; provided, however, that the following comes into effect as of the date of promulgation: the amended provisions of Article 1, item (viii), item (ix), item (xi), item (xiv), item (xviii), item (xxi), item (xxii), item (xxiv), (a) and (c), item (xxvii), and item (xxxiii); the amended provisions of item (xxxiv) of that Article (limited to the part in which "those that are 75 millimeters or more" in (a), 1. and (b), 2. of that item is amended to "those that exceed 75 millimeters"); the amended provisions of item (xxxv), item (xxxvi), item (xxxviii), item (xl), item (xliv) and item (lvii) of that Article, Article 3, item (vii), (e), item (xvi), (a) and (g), item (xx) and item (xxii); the amended provisions of Article 6, item (i) (excluding the part in which "parallel processors" in (c), 3. of that item is amended to "devices designed for parallel processors"); the amended provisions of item (ii), (b), item (iv) and item (viii) of that Article, Article 7, Article 8, Article 9, item (i), (a), Article 12, Article 13, item (v), Article 14, item (v), item (vi), (a) and (d), Article 14-2, item (lxxiv), Article 19, Article 20, and Article 21; the amended provisions of Article 25 (limited to the part in which paragraph (3), item (ii), (j) of that Article is deleted and (k) is changed to (j), and (l) is changed to (k)).

(Transitional Measures for Penal Provisions)

- (2) Prior laws continue to govern the applicability of penal provisions to conduct that a person engaged in before this Ministerial Order comes into effect.

Supplementary Provisions [Order of the Ministry of International Trade and Industry No. 265 of October 31, 2000]

This Ministerial Order comes into effect as of January 6, 2001.

Supplementary Provisions [Order of the Ministry of International Trade and Industry No. 408 of December 27, 2000]

(Effective Date)

- (1) This Ministerial Order comes into effect as of the date of promulgation.

(Transitional Measures for Penal Provisions)

- (2) Prior laws continue to govern the applicability of penal provisions to conduct that a person engaged in before this Ministerial Order comes into effect.

Supplementary Provisions [Order of the Ministry of Economy, Trade and Industry No. 163 of May 16, 2001]

(Effective Date)

- (1) This Ministerial Order comes into effect as of the date of promulgation; provided, however, that the amended provisions of Article 1, item (x), (b), Article 2-2, Article 4, Article 5, item (ii), (b), item (viii), and item (x), Article 6, item (ii), item (v), item (xvii) and item (xviii); the amended provisions of Article 9, item (viii) (excluding the part in which "built-in devices" in (b), 6. of that item is amended to "built-in video cameras"); and the amended provisions of Article 10, Article 21, paragraph (2), item (iii)-2, (d) and item (xvi) of the remarks of the Appended Table 3 come into effect as of May 30, 2001.

(Transitional Measures for Penal Provisions)

- (2) Prior laws continue to govern the applicability of penal provisions to conduct that a person engaged in before this Ministerial Order comes into effect.

Supplementary Provisions [Order of the Ministry of Economy, Trade and Industry No. 247 of December 28, 2001]

(Effective Date)

- (1) This Ministerial Order comes into effect as of April 1, 2002.

(Transitional Measures for Penal Provisions)

- (2) Prior laws continue to govern the applicability of penal provisions to conduct that a person engaged in before this Ministerial Order comes into effect.

Supplementary Provisions [Order of the Ministry of Economy, Trade and Industry No. 85 of June 14, 2002]

(Effective Date)

- (1) This Ministerial Order comes into effect as of July 15, 2002.

(Transitional Measures for Penal Provisions)

- (2) Prior laws continue to govern the applicability of penal provisions to conduct that a person engaged in before this Ministerial Order comes into effect.

Supplementary Provisions [Order of the Ministry of Economy, Trade and Industry No. 108 of October 21, 2002]

(Effective Date)

- (1) This Ministerial Order comes into effect as of November 1, 2002; provided, however, that the amended provisions of Article 2 come into effect as of January 1, 2003.

(Transitional Measures for Penal Provisions)

- (2) Prior laws continue to govern the applicability of penal provisions to conduct that a person engaged in before this Ministerial Order comes into effect.

Supplementary Provisions [Order of the Ministry of Economy, Trade and Industry No. 52 of April 1, 2003]

This Ministerial Order comes into effect as of the date of promulgation.

Supplementary Provisions [Order of the Ministry of Economy, Trade and Industry No. 159 of December 24, 2003]

(Effective Date)

- (1) This Ministerial Order comes into effect as of January 20, 2004.

(Transitional Measures for Penal Provisions)

- (2) Prior laws continue to govern the applicability of penal provisions to conduct that a person engaged in before this Ministerial Order comes into effect.

Supplementary Provisions [Order of the Ministry of Economy, Trade and Industry No. 104 of November 10, 2004]

(Effective Date)

- (1) This Ministerial Order comes into effect as of January 1, 2005.

(Transitional Measures for Penal Provisions)

- (2) Prior laws continue to govern the applicability of penal provisions to conduct that a person engaged in before this Ministerial Order comes into effect.

Supplementary Provisions [Order of the Ministry of Economy, Trade and Industry No. 116 of December 2, 2005]

(Effective Date)

(1) This Ministerial Order comes into effect as of January 1, 2006.

(Transitional Measures for Penal Provisions)

(2) Prior laws continue to govern the applicability of penal provisions to conduct that a person engaged in before this Ministerial Order comes into effect.

Supplementary Provisions [Order of the Ministry of Economy, Trade and Industry No. 97 of November 17, 2006]

This Ministerial Order comes into effect as of January 1, 2007.

Supplementary Provisions [Order of the Ministry of Economy, Trade and Industry No. 21 of March 26, 2008]

(Effective Date)

(1) This Ministerial Order comes into effect as of May 15, 2008.

(Transitional Measures for Penal Provisions)

(2) Prior laws continue to govern the applicability of penal provisions to conduct that a person engaged in before this Ministerial Order comes into effect.

Supplementary Provisions [Order of the Ministry of Economy, Trade and Industry No. 55 of August 27, 2008]

This Ministerial Order comes into effect as of November 1, 2008.

Supplementary Provisions [Order of the Ministry of Economy, Trade and Industry No. 46 of August 28, 2009]

This Ministerial Order comes into effect as of October 1, 2009.

Supplementary Provisions [Order of the Ministry of Economy, Trade and Industry No. 6 of March 5, 2010] [Extract]

(Effective Date)

Article 1 This Ministerial Order comes into effect as of April 1, 2010.

(Transitional Measures)

Article 2 Prior laws continue to govern the applicability of penal provisions to conduct that a person engaged in before this Ministerial Order comes into

effect.

Supplementary Provisions [Order of the Ministry of Economy, Trade and Industry No. 26 of May 18, 2011]

(Effective Date)

Article 1 This Ministerial Order comes into effect as of July 1, 2011.

(Transitional Measures for Penal Provisions)

Article 2 Prior laws continue to govern the applicability of penal provisions to conduct that a person engaged in before this Ministerial Order comes into effect.

Supplementary Provisions [Order of the Ministry of Economy, Trade and Industry No. 56 of July 19, 2012]

(Effective Date)

(1) This Ministerial Order comes into effect as of August 1, 2012.

(Transitional Measures for Penal Provisions)

(2) Prior laws continue to govern the applicability of penal provisions to conduct that a person engaged in before this Ministerial Order comes into effect.

Supplementary Provisions [Order of the Ministry of Economy, Trade and Industry No. 51 of September 27, 2013]

(Effective Date)

(1) This Ministerial Order comes into effect as of October 15, 2013.

(Transitional Measures for Penal Provisions)

(2) Prior laws continue to govern the applicability of penal provisions to conduct that a person engaged in before this Ministerial Order comes into effect.

Supplementary Provisions [Order of the Ministry of Economy, Trade and Industry No. 41 of August 14, 2014]

(Effective Date)

(1) This Ministerial Order comes into effect as of September 15, 2014.

(Transitional Measures for Penal Provisions)

(2) Prior laws continue to govern the applicability of penal provisions to conduct

that a person engaged in before this Ministerial Order comes into effect.

Supplementary Provisions [Order of the Ministry of Economy, Trade and Industry No. 60 of August 11, 2015]

(Effective Date)

(1) This Ministerial Order comes into effect as of October 1, 2015.

(Transitional Measures for Penal Provisions)

Prior laws continue to govern the applicability of penal provisions to conduct that a person engaged in before this Ministerial Order comes into effect.

Supplementary Provisions [Order of the Ministry of Economy, Trade and Industry No. 107 of November 18, 2016]

(Effective Date)

(1) This Ministerial Order comes into effect as of January 7, 2017; provided, however, that, in Article 1, the amended provisions of Article 5, item (ii) and Article 18 of the Ministerial Order Specifying Goods and Technologies Pursuant to the Provisions of Appended Table 1 of the Cabinet Order on Export Trade Control and the Appended Table of the Foreign Exchange Order, come into effect as of June 1, 2017.

(Transitional Measures for Penal Provisions)

(2) Prior laws continue to govern the applicability of penal provisions to conduct that a person engaged in before this Ministerial Order (or the amended provisions provided for in the proviso of the preceding paragraph, if applicable) comes into effect.

Supplementary Provisions [Order of the Ministry of Economy, Trade and Industry No. 87 of December 6, 2017]

(Effective Date)

(1) This Ministerial Order comes into effect as of January 22, 2018.

(Transitional Measures for Penal Provisions)

(2) Prior laws continue to govern the applicability of penal provisions to conduct that a person engaged in before this Ministerial Order comes into effect.

Supplementary Provisions [Order of the Ministry of Economy, Trade and Industry No. 63 of November 16, 2018]

(Effective Date)

(1) This Ministerial Order comes into effect as of January 9, 2019.

(Transitional Measures for Penal Provisions)

(2) Prior laws continue to govern the applicability of penal provisions to conduct that a person engaged in before this Ministerial Order comes into effect.

Appended Table 1

Deleted

Appended Table 2 (Re: Articles 10 and 12)

Argentina, Australia, Austria, Belgium, Bulgaria, Canada, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, India, Ireland, Italy, Republic of Korea, Latvia, Lithuania, Luxembourg, Malta, Mexico, The Netherlands, New Zealand, Norway, Poland, Portugal, Romania, Russia, Slovenia, Republic of South Africa, Spain, Slovakia, Sweden, Switzerland, Turkey, Ukraine, United Kingdom, and United States of America

Appended Table 3 (Re: Articles 5 and 18)

	Coating Method	Base Material	Coating
1	Method of fixing the coating material generated by chemical reaction of raw material gas onto the base material surface.	Super alloy	Aluminum compounds
		Ceramics or low-thermal expansion glasses	Silicon compounds, carbides, dielectric film, diamonds and non-crystalline diamond-like carbon films
		Composite material using carbon and carbon fibers (referred to hereinafter as "carbon-carbon"), ceramic composites and metal matrix composites	Silicon compounds, carbides, refractory metals, and mixtures that come from combining these; dielectric film, aluminum compounds, aluminum alloy compounds and boron nitride
		Tungsten carbide alloys and silicon carbide	Carbides, tungsten, mixtures of carbides and tungsten, and dielectric film
		Molybdenum and molybdenum alloys	Dielectric film
		Beryllium and beryllium alloys	Dielectric film, diamonds and non-crystalline diamond-like carbon films

		Sensor window material	Dielectric film, diamonds and non-crystalline diamond-like carbon films
2	Method of fixing coating material volatilized by electronic beam onto the base material surface	Super alloys	Silicon alloy compounds, aluminum alloy compounds, chromium-aluminum alloy compounds, improved zirconia, silicon compounds, aluminum compounds and mixtures combining thereof
		Ceramics or low-thermal expansion glasses	Dielectric film
		Alloy steel with corrosion resistance	Chromium-aluminum alloys, improved zirconia and mixtures of chromium-aluminum alloys and improved zirconia
		Carbon-carbon, ceramic composites and metal matrix composites	Silicon compounds, carbides, refractory metals, and mixtures that come from combining them; dielectric film and boron nitride
		Tungsten carbide alloys and silicon carbide	Carbides, tungsten, mixtures of carbides and tungsten, and dielectric film
		Molybdenum and molybdenum alloys	Dielectric film
		Beryllium and beryllium alloys	Dielectric film, boron alloys and beryllium
		Sensor window material	Dielectric film
		Titanium alloys	Boron compounds and nitrides
3	Method of fixing coating material volatilized by electric resistance heating onto the base material surface (Method of ion plating)	Ceramics or low-thermal expansion glasses	Dielectric film and non-crystalline diamond-like carbon film
		Carbon-carbon, ceramic composites and metal matrix composites	Dielectric film
		Tungsten carbide alloys and silicon carbide	Dielectric film

		Molybdenum and molybdenum alloys	Dielectric film
		Beryllium and beryllium alloys	Dielectric film
		Sensor window material	Dielectric film and non-crystalline diamond-like carbon film
4	Method of fixing coating material volatilized by laser onto the base material surface	Ceramics or low-thermal expansion glasses	Silicon compounds, dielectric film and non-crystalline diamond-like carbon film
		Carbon-carbon, ceramic composites and metal matrix composites	Dielectric film
		Tungsten carbide alloys and silicon carbide	Dielectric film
		Molybdenum and molybdenum alloys	Dielectric film
		Beryllium and beryllium alloys	Dielectric film
		Sensor window material	Dielectric film and non-crystalline diamond-like carbon film
5	Method of fixing coating material volatilized by arc discharge onto the base material surface	Super alloys	Silicon alloy compounds, aluminum alloy compounds and chromium-aluminum alloys
		Composite material with polymer or organic compound matrix	Boron compounds, carbides, nitrides and non-crystalline diamond-like carbon film
6	Method of fixing the coating material onto the base material surface by placing powdered coating material and the base material into a container and heating to 757 degrees centigrade or more	Carbon-carbon, ceramic composites or metal matrix composites	Silicon compounds, carbides and mixtures of silicon compounds and carbides
		Titanium alloys	Silicon compounds, aluminum compounds and aluminum alloy compounds
		Metals and metal alloys with fire resistance	Silicon compounds and oxides

7	Method using plasma spray coating	Super alloys	Chromium-aluminum alloys, improved zirconia, mixtures of chromium-aluminum alloys and improved zirconia, nickel-graphite alloys capable of being polished, substances containing nickel-chromium-aluminum capable of being polished, and aluminum-silicon polyester alloys and aluminum alloy compounds capable of being polished
		Aluminum alloys	Chromium-aluminum alloys, improved zirconia, silicon compounds and mixtures that come from combining them
		Metals and metal alloys with fire resistance	Aluminum compound, silicon compounds and carbides
		Alloy steel with corrosion resistance	Chromium-aluminum alloys, improved zirconia and mixtures of chromium-aluminum alloys and improved zirconia
		Titanium alloys	Carbides, aluminum compounds, silicon compounds, aluminum alloy compounds, nickel-graphite alloys capable of being polished, substances containing nickel-chromium-aluminum capable of being polished, and aluminum-silicon polyester alloys capable of being polished
8	Method of fixing slurried coating material onto the surface of base material	Metals and metal alloys with fire resistance	Molten silicon compounds and molten aluminum compounds
		Carbon-carbon, ceramic composites and metal matrix composites	Silicon compounds, carbides and mixtures of silicon compounds and carbides

9	Method of sputtering	Super alloys	Silicon alloy compounds, aluminum alloy compounds, aluminum compounds containing precious metals, chromium-aluminum alloys, improved zirconia, platinum and mixtures that come from combining them
		Ceramics or low-thermal expansion glasses	Silicon compounds, platinum, mixtures of silicon compounds and platinum, dielectric film and non-crystalline diamond-like carbon film
		Titanium alloys	Boron compounds, nitrides, oxides, silicon compounds, aluminum compounds, aluminum alloy compounds and carbides
		Carbon-carbon, ceramic composites and metal matrix composites	Silicon compounds, carbides, refractory metals and mixtures that come from combining them; dielectric film and boron nitride
		Tungsten carbide alloys and silicon carbide	Carbides, tungsten and mixtures of carbides and tungsten; dielectric film and boron nitride
		Molybdenum and molybdenum alloys	Dielectric film
		Beryllium and beryllium alloys	Boron compounds, dielectric film and beryllium
		Sensor window material	Dielectric film and non-crystalline diamond-like carbon film
		Metals and metal alloys with fire resistance	Aluminum compounds, silicon compounds, oxides and carbides
10	Method of ion implantation	High temperature bearing steel	Chromium, tantalum and niobium additives
		Titanium alloys	Boron compounds and nitrides
		Beryllium and beryllium alloys	Boron compounds

		Tungsten carbide alloys	Carbides and nitrides
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Remarks

- (i) Coating methods include repair and refurbishing coating in addition to initial coating.
- (ii) Aluminum alloy compound coatings include single or multiple-step coatings in which certain elements are coated prior to the coating of aluminum compounds; provided, however, that the multiple use of a method of fixing the coating material onto the surface of base materials by putting the powdered coating material together with the base material into a container and heating them to a temperature of 757 °C or more to obtain aluminum alloy compounds, is not included in aluminum alloy compound coating.
- (iii) The coatings of aluminum compounds using noble metals include multiple-step coatings in which noble metals are coated prior to the coating of aluminum compounds.
- (iv) The term "mixtures" mean mixtures that include impregnated materials, graded composition materials, co-deposits, or multilayer deposits, which are obtained by the coating methods specified in this table.
- (v) The term "chromium-aluminum alloy coating" means a coating alloy including cobalt, iron, nickel, or combinations of these, as well as hafnium, yttrium, silicon, tantalum or other additives exceeding 0.01 weight percent by various proportions and combinations; provided, however, that coatings falling under any of the following (a) through (c) are excluded:
 - (a) alloy coatings consisting of cobalt, chromium, aluminum, and yttrium which contain less than 22 weight percent of chromium, less than 7 weight percent of aluminum, and less than 2 weight percent of yttrium;
 - (b) alloy coatings consisting of cobalt, chromium, aluminum, and yttrium which contain 22 weight percent or more and 24 weight percent or less of chromium, 10 weight percent or more and 12 weight percent or less of aluminum, and 0.5 weight percent or more and 0.7 weight percent or less of yttrium;
 - (c) alloy coatings consisting of nickel, chromium, aluminum and yttrium which contain 21 weight percent or more and 23 weight percent or less of chromium, 10 weight percent or more and 12 weight percent or less of aluminum, and 0.9 weight percent or more and 1.1 weight percent or less of yttrium.
- (vi) The term "aluminum alloy substrate" means alloys having an ultimate tensile strength of 190 megapascals or more measured at a temperature of 20 °C.
- (vii) The term "alloy steel substrate with corrosion resistance" means AISI (American Iron and Steel Institute) Standards 300 series or equivalent

- national standard steels.
- (vii)-2 Metals and metal alloys with fire resistance include niobium, molybdenum, tungsten or tantalum, or alloys of these metals.
 - (viii) The sensor window materials mean alumina, silicon, germanium, zinc sulphide, zinc selenide, gallium arsenide, diamond, gallium phosphide, or sapphire, or those consisting of metal halides consisting of zirconium fluoride and hafnium fluoride, with a diameter of more than 40 mm.
 - (ix) The method of fixing the coating material onto the surface of base materials by putting the powdered coating material together with the base material into a container and heating them to a temperature of 757 °C or more does not include the single-step coating method of solid wings.
 - (x) The term "polymers" means polyimide, polyester, polysulphide, polycarbonates, or polyurethanes.
 - (xi) The term "improved zirconia" means zirconia whose crystallographic phases and phase compositions have been stabilized, by adding calcium oxide, magnesium oxide, yttrium oxide, hafnium oxide, rare earth oxide and other metal oxides to zirconia; provided, however, that thermal barrier coatings using zirconia improved by calcium oxide or magnesium oxide, are excluded.
 - (xii) The term "titanium alloy substrate" means aerospace alloys having an ultimate tensile strength of 900 megapascals or more measured at a temperature of 20 °C.
 - (xiii) The term "low-thermal expansion glass substrate" means glass which has a coefficient of a thermal expansion of 0.0000001 or less measured at a temperature of 20 °C.
 - (xiv) The term "dielectric film" means dielectric film with four layers or film made of metal composite material.
 - (xv) The term "tungsten carbide alloy substrate" does not include alloys consisting of tungsten carbide and cobalt or nickel, alloys consisting of titanium carbide and cobalt or nickel, alloys consisting of chromium carbide and nickel chrom alloy, and materials for cutting tools and plastic forming tools consisting of chromium carbide and nickel.
 - (xvi) Coatings on non-crystalline diamond-like carbon films do not include coatings on magnetic disk drives, magnetic heads, equipment for the manufacture of disposable containers, valves for faucets, acoustic diaphragms for speakers, engine parts used for automobiles, cutting tools, cutting or molding dies, office equipment, microphones, or medical devices, or molding dies for resins made from alloys containing less than 5% beryllium.
 - (xvii) Silicon carbide base materials do not include materials for cutting and plastic forming tools.

(xviii) Ceramic basic materials do not include ceramic materials containing 5 weight percent or more of a clay or cement (including their compounds).