

e.1.b. Electron beam; *or*  
 e.1.c. "Laser" beam; *and*  
 e.2. Having two or more rotary axes which:  
 e.2.a. Can be coordinated simultaneously for "contouring control"; *and*  
 e.2.b. Have a positioning accuracy of less (better) than 0.003°;  
 f. Deep-hole-drilling machines and turning machines modified for deep-hole-drilling, having a maximum depth-of-bore capability exceeding 5,000 mm and specially designed components therefor.

**2B003 "Numerically controlled" or manual machine tools, and specially designed components, controls and accessories therefor, specially designed for the shaving, finishing, grinding or honing of hardened ( $R_c = 40$  or more) spur, helical and double-helical gears with a pitch diameter exceeding 1,250 mm and a face width of 15% of pitch diameter or larger finished to a quality of AGMA 14 or better (equivalent to ISO 1328 class 3).**

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**2B006 Dimensional inspection or measuring systems and equipment, as follows (see List of Items Controlled).**

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#### List of Items Controlled

Unit: \* \* \*

Related Controls: \* \* \*

Related Definitions: \* \* \*

ECCN Controls: \* \* \*

Items:

a. Computer controlled, "numerically controlled" or "stored program controlled" dimensional inspection machines, having a three dimensional length (volumetric) "measurement uncertainty" equal to or less (better) than  $(1.7 + L/1,000) \mu\text{m}$  (L is the measured length in mm) tested according to ISO 10360-2;

b. Linear and angular displacement measuring instruments, as follows:

b.1. Linear displacement measuring instruments having any of the following:

**Technical Note:** For the purpose of 2B006.b.1 "linear displacement" means the change of distance between the measuring probe and the measured object.

b.1.a. Non-contact type measuring systems with a "resolution" equal to or less (better) than  $0.2 \mu\text{m}$  within a measuring range up to 0.2 mm;

b.1.b. Linear voltage differential transformer systems having all of the following characteristics:

b.1.b.1. "Linearity" equal to or less (better) than 0.1% within a measuring range up to 5 mm; *and*

b.1.b.2. Drift equal to or less (better) than 0.1% per day at a standard ambient test room temperature  $\pm 1 \text{ K}$ ; *or*

b.1.c. Measuring systems having all of the following:

b.1.c.1. Containing a "laser"; *and*

b.1.c.2. Maintaining, for at least 12 hours, over a temperature range of  $\pm 1 \text{ K}$  around a standard temperature and at a standard pressure, all of the following:

b.1.c.2.a. A "resolution" over their full scale of  $0.1 \mu\text{m}$  or less (better); *and*

b.1.c.2.b. A "measurement uncertainty" equal to or less (better) than  $(0.2 + L/2,000) \mu\text{m}$  (L is the measured length in mm);

**Note:** 2B006.b.1 does not control measuring interferometer systems, without closed or open loop feedback, containing a "laser" to measure slide movement errors of machine-tools, dimensional inspection machines or similar equipment.

b.2. Angular displacement measuring instruments having an "angular position deviation" equal to or less (better) than 0.00025°;

**Note:** 2B006.b.2 does not control optical instruments, such as autocollimators, using collimated light to detect angular displacement of a mirror.

c. Equipment for measuring surface irregularities, by measuring optical scatter as a function of angle, with a sensitivity of 0.5 nm or less (better).

10. In Supplement No. 1 to part 774 (the Commerce Control List), Category 3—Electronics, the following Export Control Classification Numbers (ECCNs) are amended by:

(a) Revising the *Items* paragraph in the List of Items Controlled section of ECCN 3A001;

(b) Revising the *Related Definitions* and the *Items* paragraphs in the List of Items Controlled section of ECCN 3A002;

(c) Revising the heading, and the *Items* paragraph in the List of Items Controlled section of ECCN 3B001;

(d) Revising the *Related Definitions* and the *Items* paragraphs in the List of Items Controlled section of 3B991;

(e) Revising the *Related Controls* and the *Items* paragraphs in the List of Items Controlled section of 3C004;

(f) Revising the *Items* paragraph in the List of Items Controlled section of 3E001;

(g) Revising the heading and the *Items* paragraph in the List of Items Controlled section of 3E002; *and*

(h) Revising the *TSR* paragraph in the License Exceptions section and revising the *Related Controls* and the *Items* paragraphs in the List of Items Controlled section of 3E003, to read as follows:

**3A001 Electronic components, as follows (see List of Items Controlled).**

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#### List of Items Controlled

Unit: \* \* \*

Related Controls: \* \* \*

Related Definitions: \* \* \*

Items:

a. General purpose integrated circuits, as follows:

**Note 1:** The control status of wafers (finished or unfinished), in which the function has been determined, is to be evaluated against the parameters of 3A001.a.

**Note 2:** Integrated circuits include the following types:

Monolithic integrated circuits";  
 "Hybrid integrated circuits";  
 "Multichip integrated circuits";  
 "Film type integrated circuits", including silicon-on-sapphire integrated circuits;  
 "Optical integrated circuits".

a.1. Integrated circuits, designed or rated as radiation hardened to withstand any of the following:

a.1.a. A total dose of  $5 \times 10^3 \text{ Gy}$  (Si), or higher; *or*

a.1.b. A dose rate upset of  $5 \times 10^6 \text{ Gy}$  (Si)/s, or higher;

a.2. "Microprocessor microcircuits", "microcomputer microcircuits", microcontroller microcircuits, storage integrated circuits manufactured from a compound semiconductor, analog-to-digital converters, digital-to-analog converters, electro-optical or "optical integrated circuits" designed for "signal processing", field programmable logic devices, neural network integrated circuits, custom integrated circuits for which either the function is unknown or the control status of the equipment in which the integrated circuit will be used is unknown, Fast Fourier Transform (FFT) processors, electrical erasable programmable read-only memories (EEPROMs), flash memories or static random-access memories (SRAMs), having any of the following:

a.2.a. Rated for operation at an ambient temperature above 398 K (125°C); *or*

a.2.b. Rated for operation at an ambient temperature below 218 K (&minus; 55°C); *or*

a.2.c. Rated for operation over the entire ambient temperature range from 218 K (− 55°C) to 398 K (125°C);

**Note:** 3A001.a.2 does not apply to integrated circuits for civil automobile or railway train applications.

a.3. "Microprocessor microcircuits", "micro-computer microcircuits" and microcontroller microcircuits, having any of the following characteristics:

**Note:** 3A001.a.3 includes digital signal processors, digital array processors and digital coprocessors.

a.3.a. [Reserved]

a.3.b. Manufactured from a compound semiconductor and operating at a clock frequency exceeding 40 MHz; *or*  
 a.3.c. More than one data or instruction bus or serial communication port that provides a direct external interconnection between parallel "microprocessor microcircuits" with a transfer rate exceeding 150 Mbyte/s;

a.4. Storage integrated circuits manufactured from a compound semiconductor;

a.5. Analog-to-digital and digital-to-analog converter integrated circuits, as follows:

a.5.a. Analog-to-digital converters having any of the following:

a.5.a.1. A resolution of 8 bit or more, but less than 12 bit, with a total conversion time of less than 5 ns;

a.5.a.2. A resolution of 12 bit with a total conversion time of less than 200 ns; *or*

a.5.a.3. A resolution of more than 12 bit with a total conversion time of less than 2  $\mu\text{s}$ ;

a.5.b. Digital-to-analog converters with a resolution of 12 bit or more, and a "settling time" of less than 10 ns;