

## 85 Electrical machinery and equipment and parts thereof; sound recorders and reproducers, television image and sound recorders and reproducers, and parts and accessories of such articles

### Notes

1. This Chapter does not cover:
  - a) electrically warmed blankets, bed pads, foot-muffs or the like; electrically warmed clothing, footwear or ear pads and other electrically warmed articles worn on or about the person;
  - b) articles of glass of heading 7011;
  - c) machines and apparatus of heading 8486;
  - d) vacuum apparatus of a kind used in medical, surgical, dental or veterinary sciences (heading 9018); or
  - e) electrically heated furniture of Chapter 94.
2. Headings 8501 to 8504 do not apply to goods described in heading 8511, 8512, 8540, 8541 or 8542. However, metal tank mercury arc rectifiers remain classified in heading 8504.
3. For the purposes of heading 8507, the expression «electric accumulators» includes those presented with ancillary components which contribute to the accumulator's function of storing and supplying energy or protect it from damage, such as electrical connectors, temperature control devices (for example, thermistors) and circuit protection devices. They may also include a portion of the protective housing of the goods in which they are to be used.
4. Heading 8509 covers only the following electro-mechanical machines of the kind commonly used for domestic purposes:
  - a) floor polishers, food grinders and mixers, and fruit or vegetable juice extractors, of any weight;
  - b) other machines provided the weight of such machines does not exceed 20 kg. The heading does not, however, apply to fans or ventilating or recycling hoods incorporating a fan, whether or not fitted with filters (heading 8414), centrifugal clothes-driers (heading 8421), dish washing machines (heading 8422), household washing machines (heading 8450), roller or other ironing machines (heading 8420 or 8451), sewing machines (heading 8452), electric scissors (heading 8467) or to electro-thermic appliances (heading 8516).
5. For the purposes of heading 8517, the term «smartphones» means telephones for cellular networks, equipped with a mobile operating system designed to perform the functions of an automatic data processing machine such as downloading and running multiple applications simultaneously, including third-party applications, and whether or not integrating other features such as digital cameras and navigational aid systems.
6. For the purposes of heading 8523:
  - a) «solid-state non-volatile storage devices» (for example, «flash memory cards» or «flash electronic storage cards») are storage devices with a connecting socket, comprising in the same housing one or more flash memories (for example, «FLASH E<sup>2</sup>PROM») in the form of integrated circuits mounted on a printed circuit board. They may include a controller in the form of an integrated circuit and discrete passive components, such as capacitors and resistors;
  - b) the term «smart cards» means cards which have embedded in them one or more electronic integrated circuits (a microprocessor, random access memory (RAM) or read-only memory (ROM)) in the form of chips. These cards may contain contacts, a magnetic stripe or an embedded antenna but do not contain any other active or passive circuit elements.
7. For the purposes of heading 8524, «flat panel display modules» refer to devices or apparatus for the display of information, equipped at a minimum with a display screen, which are designed to be incorporated into articles of other headings prior to use. Display screens for flat panel display modules include, but are not limited to, those which are flat, curved, flexible, foldable or stretchable in form. Flat panel display modules may incorporate additional elements, including those necessary for receiving video signals and the allocation of those signals to pixels on the display. However, heading 8524 does not include display modules which are equipped with components for converting video signals (e.g., a scaler IC, decoder IC or application processor) or have otherwise assumed the character of goods of other headings.

For the classification of flat panel display modules defined in this Note, heading 8524 shall take precedence over any other heading in the Nomenclature.
8. For the purposes of heading 8534 «printed circuits» are circuits obtained by forming on an insulating base, by any printing process (for example, embossing, plating-up, etching) or by the «film circuit» technique, conductor elements, contacts or other printed components (for example, inductances, resistors, capacitors) alone or interconnected according to a pre-established pattern, other than ele-

ments which can produce, rectify, modulate or amplify an electrical signal (for example, semiconductor elements).

The expression «printed circuits» does not cover circuits combined with elements other than those obtained during the printing process, nor does it cover individual, discrete resistors, capacitors or inductances. Printed circuits may, however, be fitted with non-printed connecting elements.

Thin- or thick-film circuits comprising passive and active elements obtained during the same technological process are to be classified in heading 8542.

9. For the purpose of heading 8536, «connectors for optical fibres, optical fibre bundles or cables» means connectors that simply mechanically align optical fibres end to end in a digital line system. They perform no other function, such as the amplification, regeneration or modification of a signal.
10. Heading 8537 does not include cordless infrared devices for the remote control of television receivers or other electrical equipment (heading 8543).
11. For the purposes of heading 8539, the expression «light-emitting diode (LED) light sources» covers:
  - a) «Light-emitting diode (LED) modules» which are electrical light sources based on light-emitting diodes (LED) arranged in electrical circuits and containing further elements like electrical, mechanical, thermal or optical elements. They also contain discrete active elements, discrete passive elements, or articles of heading 8536 or 8542 for the purposes of providing power supply or power control. Light-emitting diode (LED) modules do not have a cap designed to allow easy installation or replacement in a luminaire and ensure mechanical and electrical contact.
  - b) «Light-emitting diode (LED) lamps» which are electrical light sources containing one or more LED modules containing further elements like electrical, mechanical, thermal or optical elements. The distinction between light-emitting diode (LED) modules and light-emitting diode (LED) lamps is that lamps have a cap designed to allow easy installation or replacement in a luminaire and ensure mechanical and electrical contact.
12. For the purposes of headings 8541 and 8542:
  - a) 1) «semiconductor devices» are semiconductor devices the operation of which depends on variations in resistivity on the application of an electric field or semiconductor-based transducers. Semiconductor devices may also include assembly of plural elements, whether or not equipped with active and passive device ancillary functions.

«Semiconductor-based transducers» are, for the purposes of this definition, semiconductor-based sensors, semiconductor-based actuators, semiconductor-based resonators and semiconductor-based oscillators, which are types of discrete semiconductor-based devices, which perform an intrinsic function, which are able to convert any kind of physical or chemical phenomena or an action into an electrical signal or an electrical signal into any type of physical phenomenon or an action.

All the elements in semiconductor-based transducers are indivisibly combined, and may also include necessary materials indivisibly attached, that enable their construction or function.

The following expressions mean:

    1. «Semiconductor-based» means built or manufactured on a semiconductor substrate or made of semiconductor materials, manufactured by semiconductor technology, in which the semiconductor substrate or material plays a critical and unreplaceable role of transducer function and performance, and the operation of which is based on semiconductor properties including physical, electrical, chemical and optical properties.
    2. «Physical or chemical phenomena» relate to phenomena, such as pressure, acoustic waves, acceleration, vibration, movement, orientation, strain, magnetic field strength, electric field strength, light, radioactivity, humidity, flow, chemicals concentration, etc.
    3. «Semiconductor-based sensor» is a type of semiconductor device, which consists of microelectronic or mechanical structures that are created in the mass or on the surface of a semiconductor and that have the function of detecting physical or chemical quantities and converting these into electric signals caused by resulting variations in electric properties or displacement of a mechanical structure.
    4. «Semiconductor-based actuator» is a type of semiconductor device, which consists of microelectronic or mechanical structures that are created in the mass or on the surface of a semiconductor and that have the function of converting electric signals into physical movement.
    5. «Semiconductor-based resonator» is a type of semiconductor device, which consists of microelectronic or mechanical structures that are created in the mass or on the surface of a semiconductor and that have the function of generating a mechanical or electrical oscillation of a predefined frequency that depends on the physical geometry of these structures in response to an external input.
    6. «Semiconductor-based oscillator» is a type of semiconductor device, which consists of microelectronic or mechanical structures that are created in the mass or on the surface of a

- semiconductor and that have the function of generating a mechanical or electrical oscillation of a predefined frequency that depends on the physical geometry of these structures.
- 2) «Light-emitting diodes (LED)» are semiconductor devices based on semiconductor materials which convert electrical energy into visible, infra-red or ultra-violet rays, whether or not electrically connected among each other and whether or not combined with protective diodes. Light-emitting diodes (LED) of heading 8541 do not incorporate elements for the purposes of providing power supply or power control;
- b) "electronic integrated circuits» are:
- 1) monolithic integrated circuits in which the circuit elements (diodes, transistors, resistors, capacitors, inductances, etc.) are created in the mass (essentially) and on the surface of a semiconductor or compound semiconductor material (for example, doped silicon, gallium arsenide, silicon germanium, indium phosphide) and are inseparably associated;
  - 2) hybrid integrated circuits in which passive elements (resistors, capacitors, inductances, etc.), obtained by thin- or thick-film technology, and active elements (diodes, transistors, monolithic integrated circuits, etc.), obtained by semiconductor technology, are combined to all intents and purposes indivisibly, by interconnections or interconnecting cables, on a single insulating substrate (glass, ceramic, etc.). These circuits may also include discrete components;
  - 3) multichip integrated circuits consisting of two or more interconnected monolithic integrated circuits combined to all intents and purposes indivisibly, whether or not on one or more insulating substrates, with or without leadframes, but with no other active or passive circuit elements;
  - 4) multi-component integrated circuits (MCOs): a combination of one or more monolithic, hybrid, or multi-chip integrated circuits with at least one of the following components: silicon-based sensors, actuators, oscillators, resonators or combinations thereof, or components performing the functions of articles classifiable under heading 8532, 8533, 8541, or inductors classifiable under heading 8504, formed to all intents and purposes indivisibly into a single body like an integrated circuit, as a component of a kind used for assembly onto a printed circuit board (PCB) or other carrier, through the connecting of pins, leads, balls, lands, bumps, or pads.

For the purpose of this definition:

1. «Components» may be discrete, manufactured independently then assembled onto the rest of the MCO, or integrated into other components.
2. «Silicon based» means built on a silicon substrate, or made of silicon materials, or manufactured onto integrated circuit die.
3. a) «Silicon based sensors» consist of microelectronic or mechanical structures that are created in the mass or on the surface of a semiconductor and that have the function of detecting physical or chemical phenomena and transducing these into electric signals, caused by resulting variations in electric properties or displacement of a mechanical structure. «Physical or chemical phenomena» relates to phenomena, such as pressure, acoustic waves, acceleration, vibration, movement, orientation, strain, magnetic field strength, electric field strength, light, radioactivity, humidity, flow, chemicals concentration, etc.
- b) «Silicon based actuators» consist of microelectronic and mechanical structures that are created in the mass or on the surface of a semiconductor and that have the function of converting electrical signals into physical movement.
- c) «Silicon based resonators» are components that consist of microelectronic or mechanical structures that are created in the mass or on the surface of a semiconductor and have the function of generating a mechanical or electrical oscillation of a predefined frequency that depends on the physical geometry of these structures in response to an external input.
- d) «Silicon based oscillators» are active components that consist of microelectronic or mechanical structures that are created in the mass or on the surface of a semiconductor and that have the function of generating a mechanical or electrical oscillation of a predefined frequency that depends on the physical geometry of these structures.

For the classification of the articles defined in this Note, headings 8541 and 8542 shall take precedence over any other heading in the Nomenclature, except in the case of heading 8523, which might cover them by reference to, in particular, their function.

### Subheading notes

1. Subheading 8525.81 covers only high-speed television cameras, digital cameras and video camera recorders having one or more of the following characteristics:
  - writing speed exceeding 0.5 mm per microsecond;
  - time resolution 50 nanoseconds or less;
  - frame rate exceeding 225,000 frames per second.
2. In respect of subheading 8525.82, radiation-hardened or radiation-tolerant television cameras, digital cameras and video camera recorders are designed or shielded to enable operation in a high-

radiation environment. These cameras are designed to withstand a total radiation dose of at least  $50 \times 10^3$  Gy(silicon) ( $5 \times 10^6$  RAD (silicon)), without operational degradation.

3. Subheading 8525.83 covers night vision television cameras, digital cameras and video camera recorders which use a photocathode to convert available light to electrons, which can be amplified and converted to yield a visible image. This subheading excludes thermal imaging cameras (generally subheading 8525.89).
4. Subheading 8527.12 covers only cassette-players with built-in amplifier, without built-in loudspeaker, capable of operating without an external source of electric power and the dimensions of which do not exceed 170 mm x 100 mm x 45 mm.
5. For the purposes of subheadings 8549.11 to 8549.19, «spent primary cells, spent primary batteries and spent electric accumulators» are those which are neither usable as such because of breakage, cutting-up, wear or other reasons, nor capable of being recharged.