



Brookhaven National Laboratory

FOCUS - Robotics

Guidance for Determining the ECCN for: Robotics and Associated Software/Technology

Purpose

This document provides guidance for identifying the correct Export Control Classification Number (ECCN) for robots, robotic end-effectors, controllers, remote manipulators, and associated software and technology under the U.S. Department of Commerce Export Administration Regulations (EAR). It focuses on Category 2 robot controls, including ECCNs 2B007, 2B207, 2B225, and 2B997, while requiring review of military/600-series and other platform-specific controls when applicable.

What's Controlled? – The Big Picture

Under the EAR, "robot" is a defined Category 2/8 definition. In general, the device must be multifunctional; able to position or orient material, parts, tools, or special devices through variable movement in three-dimensional space; use three or more closed-or open-loop servo-devices (including stepping motors); and be programmable by the user. The final classification depends on both that definition and the criteria in the applicable ECCN.

When reviewing robotics, look at the full system and what it does. The robot, controller, end-effector, remote manipulator, software, source code, and technology may not all have the same classification; review each separately. Also consider military design, nuclear or high-explosive use, radiation hardening, hot-cell applications, sensor-feedback capability, and the operating domain since any of these can affect the classification.

ECCN 2B007 - Controlled Robots, Controllers, and End-Effectors

2B007 controls "robots" having any of the characteristics listed below, and "*specially designed*" controllers and "end-effectors" for those robots. Under the current CCL, paragraph 2B007.a is reserved:

- 2B007.a – Reserved
- 2B007.b – "Specially designed" to comply with national safety standards applicable to potentially explosive munitions environments. (Robots "specially designed" for paint-spraying booths are excluded from this paragraph.)
- 2B007.c – "Specially designed" or rated as radiation-hardened to withstand a total radiation dose greater than 5×10^3 Gy (silicon) without operational degradation
- 2B007.d – "Specially designed" to operate at altitudes exceeding 30,000 m.

Reason for Control: NS, NP, AT. NP applies to equipment that meets or exceeds the criteria in ECCN 2B207.

ECCN 2B207 - High-Explosive Handling Robots

2B207 controls robots or end-effectors, other than those controlled by 2B007, that are "specially designed" to meet national safety standards for handling high explosives. It also covers control units "specially designed" for those robots or end-effectors. Robots "specially designed" for non-nuclear industrial uses, such as automobile paint-spraying booths are not controlled by this entry. *Reason for Control:* NP, AT.

ECCN 2B225 - Remote Manipulators for Hot Cells

2B225 covers remote manipulators used for remote actions in radiochemical separation operations or hot cells when they meet the entry's wall-penetration or wall-bridging criteria. Because this is a nuclear nonproliferation control, check ECCN 2B225 whenever robotic manipulation is intended for hot-cell or radiochemical work.

ECCN 2B997 - Sensor-Feedback Robots

2B997 covers robots that are not controlled by 2B007 or 2B207 and can use real-time sensor feedback to generate or modify "programs" or numerical program data. *Reason for Control:* AT.

Applicable Software and Technology Controls

The hardware classification does not automatically classify the robot's software, source code, manuals, engineering files, or other technical information. Review the applicable software and technology ECCNs separately. For Category 2 robotics, entries may apply:

- 2D001 - "Software" specially designed or modified for the "development" or "production" of equipment controlled by 2B001 through 2B009, and for the "use" of equipment specified in 2B003 through 2B009, including applicable 2B007 robots.
- 2D201 - Review for software associated with NP-controlled equipment, including equipment controlled under 2B207, as specified in the current ECCN.
- 2D991 - Review as applicable for lower-level Category 2 equipment, including software associated with 2B997 where specified by the current CCL.
- 2E001 - "Technology" according to the General Technology Note for the "development" of specified Category 2 equipment or software.
- 2E002 - "Technology" according to the General Technology Note for the "production" of specified Category 2 equipment.
- 2E101 – Review as applicable for “use” technology associated with software controlled under 2D001, as specified in the current CCL.
- 2E201 - "Technology" according to the General Technology Note for the "use" of specified NP-controlled equipment/software, including 2B007.b, 2B007.c, 2B207, and 2B225.
- 2E991 - Review as applicable for "use" technology associated with 2B997 and other specified Category 2 equipment.

Important - EAR "use" definition: Under 15 CFR 772.1, "use" means operation, installation (including on-site installation), maintenance (checking), repair, overhaul, and refurbishing. **If an ECCN specifies only one or more of these six elements in its heading or control text, only the elements actually specified are classified under that ECCN.**

Military / 600-Series Screening

If the item may be a defense article or a "600 series" item, do not start with a standard Category 2 robot ECCN. First apply the appropriate jurisdiction analysis and CCL Order of Review. For robots, robot controllers, and robot end-effectors with military design or integration, review the USML and applicable 600-series ECCNs (including 0A606 for certain military ground vehicles) before deciding that a standard dual-use Category 2 entry applies.

Also check the platform or operating domain. An autonomous or remotely operated system may be classified based on what the platform is, rather than as a Category 2 "robot." For example, marine/submersible systems and UAV/aerospace systems require review of the applicable Category 8 or Category 9 entries. Do not assign a Category 2 robotics ECCN just because a system is autonomous, remotely operated, or commonly called a robot.

How to Determine the Correct Robotics ECCN

1. Start by confirming the device meets the EAR definition of "robot." If it does not, classify it based on what it actually does.
2. Apply jurisdiction and the CCL Order of Review. If military design or integration may be involved, check the USML and applicable 600-series ECCNs first. Also check platform/domain-specific CCL entries for vehicles, submersible, UAV, or other autonomous platform.
3. Check 2B007.b, .c, and .d for explosive-munitions design, radiation hardening, and extreme-altitude operation.
4. If 2B007 does not apply, evaluate 2B207 for high-explosive handling, 2B225 for qualifying hot-cell/radiochemical remote manipulators, and 2B997 for real-time sensor-feedback program generation/modification.
5. Classify controllers, end-effectors, software, source code, and technology separately. For technology, use the General Technology Note and the EAR definitions of "development," "production," and "use."
6. If the item is subject to the EAR and is not described by an ECCN after completing the applicable CCL Order of Review, classify it as EAR99. Then check the destination, end user, end use, restricted-party/entity restrictions, Part 744 controls, Part 746 embargo/sanctions rules, and any applicable authorization before export, reexport, transfer, or foreign-person release.

Key Terms:

Term	Definition
ECCN	Export Control Classification Number, a code identifying items subject to U.S. export control
Robot	An EAR-defined Category 2/8 term for certain multifunctional, user-programmable manipulation mechanisms capable of variable movement in three-dimensional space and incorporating three or more closed- or open-loop servo-devices.
End-effector	The device attached to the end of a robot arm that interacts with the workpiece or environment; specially designed end-effectors may be controlled with certain robots.
Specially Designed	A defined EAR term requiring application of the sequential analysis in 15 CFR 772.1, including the applicable paragraph (a) "catch" criteria and paragraph (b) "release" provisions. See also CCL Order of Review in Supplement No. 4 to Part 774.
Technology	Specific information necessary for the "development," "production," or "use" of a product, as defined in the EAR and specified by an applicable ECCN.
Dual-Use	Items used for both civilian and potentially sensitive or military applications.
Use	Activities that include operation, installation, maintenance (checking) repair, overhaul, and refurbishing. If an ECCN specifies only one or more of these elements, only the specified elements are classified under that ECCN.
Reasons for Control	NS: National Security NP: Nuclear Nonproliferation AT: Anti-Terrorism

Key Takeaways:

- **STOP** - Do not share controlled robotic hardware, software, source code, engineering data, or controlled technology internationally or with foreign persons until classification and authorization requirements are confirmed.
- Document the technical basis and source documentation used for each ECCN determination.
- Revisit the classification when the robot's design, environment rating, software, sensors, end-effector, integration, or intended use changes.

References and Contacts:

- 15 CFR Part 772.1 - Definitions (including "robot," "specially designed," "technology," and "use")
- Supplement No. 1 to Part 774 - Commerce Control List (including ECCNs 2B007, 2B207, 2B225, 2B997 and related 2D/2E entries)
- Supplement No. 4 to Part 774 - Commerce Control List Order of Review
- 15 CFR Part 748 - License application instructions, including robot-specific information requirements in section 748.8(m)
- 15 CFR Parts 744 and 746 - End-use/end-user and embargo/sanctions controls
- BIS EAR: <https://www.bis.gov/regulations/ear>

For export classification assistance, contact the BNL Export Control Office @ export@bnl.gov

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Note: Export control regulations are subject to change. Always refer to the current applicable regulations and agency guidance.