

# Commerce Department Adopts Sweeping Changes in U.S. Export Controls

by Lawrence Ward, Justin T. Huff, Dave Townsend, and T. Augustine Lo

On September 6, the Bureau of Industry and Security (“BIS”) in the U.S. Commerce Department issued an interim final rule (“IFR”)[[1](#)] under the Export Administration Regulations (“EAR”) to add new export controls on semiconductor, quantum computing, and additive manufacturing items for national security and foreign policy reasons. The IFR’s effective date was September 6, 2024, subject to certain exceptions. The new IFR includes a number of novel export license requirements as well as the creation of an entirely new type of license exception that apply to countries that have adopted comparable export controls, which may signal a new turn by the United States toward plurilateral controls rather than traditional multilateral export control regimes among U.S. allies that agree with and support such measures.

The BIS announcement of the IFR included this statement from Alan Estevez, Under Secretary of Commerce: “Today’s action ensures our national export controls keep step with rapidly evolving technologies and are more effective when we work in concert with international partners, ... Aligning our controls on quantum and other advanced technologies makes it significantly more difficult for our adversaries to develop and deploy these technologies in ways that threaten our collective security.” BIS is inviting public comment on the IFR through the U.S. Government’s online comment portal[[2](#)], and the official comment period will expire on November 5, 2024.

The IFR adds new Export Control Classification Numbers (“ECCNs”) to the EAR’s Commerce Control List (“CCL”), amends several existing ECCNs, creates a new license exception to authorize exports and reexports to and by other nations that have adopted comparable export controls for such added items, and adopts two new worldwide license requirements based upon national security and regional stability reasons. The IFR also includes new rules on deemed exports and deemed reexports[[3](#)] of related “technology” and computer source code related to the newly added hardware export controls.

Companies will need to review the IFR and immediately consider whether revisions or adjustments to their export control policies are needed, particularly with respect to the

## Related People

- Lawrence Ward
- Justin T. Huff
- Dave Townsend
- T. Augustine Lo

## Related Capabilities

- National Security Law

controls that will now apply to new or different hardware, software, or technology. In particular, U.S. and non-U.S. companies involved in quantum computing, semiconductor manufacturing, high-performance computing, and additive manufacturing should assess whether the new controls will limit their sales of hardware or software or whether non-U.S. person employees or partners must refrain from accessing source code and “technology” under the IFR.

### **Scope of New Export Controls**

The IFR places worldwide export license requirements on specific items, including:

- **Quantum Computing Items:** Quantum computers, related equipment, components, materials, software, and “technology” applicable to the development or maintenance of quantum computers;
- **Advanced Semiconductor Manufacturing Equipment:** Tools and machines that are essential for the production of advanced semiconductor devices;
- **Gate All-Around Field-Effect Transistor (“GAAFET”) Technology:** “Technology” that produces or develops high-performance computing chips that can be used in supercomputers; and
- **Additive Manufacturing Items:** Equipment, components and related “technology” and software designed to produce metal or metal alloy components through “3-D printing” or other similar additive manufacturing techniques.

It is significant that, beyond the newly enumerated hardware-focused export controls, the IFR emphasizes that these new export license requirements also apply to “technology” and source code under the EAR’s existing deemed export and deemed reexport requirements. The IFR then also spells out new exceptions and exclusions from those deemed export and deemed reexport rules as well as a general license, all of which will add to the complex compliance challenges for U.S. and non-U.S. companies in these particular technology sectors, especially those that operate on a multinational basis and that have multinational workforces, suppliers or customers.

### **Multilateral Approach & New License Exception IEC**

BIS had previously announced earlier EAR changes in these same technology sectors beginning with two major rounds in October 2022 and October 2023, aiming to curb the advancement of advanced semiconductors, supercomputers, and artificial intelligence (“AI”) in certain nations, including the People’s Republic of China (“PRC”).<sup>[4]</sup> From the outset of those EAR changes, both industry and analysts had asked whether the United States would impose such expanded export controls on a purely unilateral basis while other advanced industrial nations with similar or comparable or even superior technology in Europe and Asia would allow their companies to continue their own unregulated exports to the PRC.

The new IFR provides a somewhat novel answer to that important question as BIS noted that several other nations have already adopted new export controls on quantum computing and advanced semiconductor manufacturing. Moreover, BIS said it expects more like-minded nations would soon also join in the adoption of comparable controls on

a plurilateral basis but did not say such measures would be implemented through any multilateral control regime. Although these new U.S. controls were not adopted under an existing multilateral regime, the United States will now advocate for addition of these technologies to the list of items controlled by such a multilateral export control regime.

Significantly, BIS adds in this IFR a wholly new license exception in EAR § 740.24 that will be called “Implemented Export Controls” or simply “IEC.” Other nations that adopt measures compliant with the conditions of IEC will benefit because U.S. exporters of these newly controlled items will not need to file BIS export license applications to export such controlled items to other IEC-compliant nation. The stated goal of the new license exception IEC is to promote and encourage innovation among and between such like-minded nations that align their export controls with the United States and, in effect, to offer some “carrots” to offset the new “sticks” within this IFR.

Items eligible for export under license exception IEC will all be identified in the 900 series of ECCNs in the CCL. That is, IEC-eligible items will have ECCNs for which the third digit is the number 9 and the fourth digit is a number from 0 to 7 (for example, ECCN 3A901). Such items will have a worldwide license requirement and will be eligible for fewer conventional EAR license exceptions as compared to ECCNs that carry out multilateral regime controls.

BIS has posted on its website a table listing the IEC eligibility status for exports of certain items that are controlled by the new 900-series ECCNs and that are already deemed by BIS to be qualified for IEC license-free shipments as of September 6, 2024. A version of that BIS table with descriptions of the items controlled is shown below:

| <b>ITEMS CONTROLLED</b>                                                                                      | <b>ECCNs</b> | <b>ELIGIBLE DESTINATIONS</b> |
|--------------------------------------------------------------------------------------------------------------|--------------|------------------------------|
| Additive manufacturing equipment for metal or metal alloy components                                         | 2B910        | Italy, United Kingdom        |
| “Software” n.s.e. “specially designed” or modified for “production” or “development” of ECCN 2B910 equipment | 2D910        | Italy, United Kingdom        |
| “Technology” n.s.e. for “production” or “development” of “coating systems”                                   | 2E903        | Italy, United Kingdom        |
| “Technology” n.s.e. “specially designed” or modified for                                                     | 2E910        | Italy, United Kingdom        |

|                                                                                                                                                                                                                                                                                                                                                                                                   |             |                                                                                                                              |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|------------------------------------------------------------------------------------------------------------------------------|
| “development” or “production” of ECCN 2B910 equipment                                                                                                                                                                                                                                                                                                                                             |             |                                                                                                                              |
| Electronic items not specified by ECCN 3A001                                                                                                                                                                                                                                                                                                                                                      | 3A901       | Australia (ECCN 3A901.a only), Canada, France (ECCN 3A901.a only), Germany (ECCN 3A901.a & b.13 only), Italy, United Kingdom |
| Cryogenic cooling systems & components                                                                                                                                                                                                                                                                                                                                                            | 3A904       | Germany, Italy, United Kingdom                                                                                               |
| Equipment designed or modified for isotropic dry etching, having a largest ‘silicon germanium-to-silicon (SiGe:Si) etch selectivity’ of greater than or equal to 100:1                                                                                                                                                                                                                            | 3B001.c.1.a | Australia, Germany, Canada, France, Italy, Japan, Spain, United Kingdom                                                      |
| Equipment designed or modified for anisotropic dry etching, having all of the following:<br><br>c.1.c.1. Radio Frequency (RF) power source(s) with at least one pulsed RF output;<br><br>c.1.c.2. One or more fast gas switching valve(s) with switching time < 300 milliseconds; and<br><br>c.1.c.3. Electrostatic chuck with 20 or more individually controllable variable temperature elements | 3B001.c.1.c | Australia, Germany, Canada, France, Italy, Japan, Spain, United Kingdom,                                                     |
| “EUV” masks and “EUV” reticles, designed for integrated circuits, not specified by 3B001.g, and having a mask “substrate                                                                                                                                                                                                                                                                          | 3B001.q     | Italy, United Kingdom                                                                                                        |

|                                                                                                                                      |       |                                                                                                              |
|--------------------------------------------------------------------------------------------------------------------------------------|-------|--------------------------------------------------------------------------------------------------------------|
| blank” specified by ECCN 3B001                                                                                                       |       |                                                                                                              |
| Scanning Electron Microscope (“SEM”) equipment designed for imaging semiconductor devices or integrated circuits                     | 3B903 | Australia, Canada, France, Germany, Italy, Spain, United Kingdom                                             |
| Cryogenic wafer probing equipment                                                                                                    | 3B904 | Germany, Italy, United Kingdom                                                                               |
| Epitaxial materials consisting of a “substrate” having at least one epitaxially grown layer and containing other specified materials | 3C907 | Italy, United Kingdom                                                                                        |
| Fluorides, hydrides, chlorides, of silicon or germanium, containing other specified materials                                        | 3C908 | Italy, United Kingdom                                                                                        |
| Silicon, silicon oxides, germanium or germanium oxides, containing any other specified materials                                     | 3C909 | Italy, United Kingdom                                                                                        |
| “Software” “specially designed” for “development” or “production” of items controlled by ECCNs 3B001.c.1.a, 3B001.c.1.c, or 3B001.q  | 3D001 | Japan (for ECCN 3B001.c.1.a and c.1.c only), Germany, Italy, United Kingdom                                  |
| “Software” “specially designed” for the “use” of equipment controlled by ECCN 3B001.a to .f and .j to .p, or 3B002                   | 3D002 | Australia, Japan (For ECCN 3b001.c.1.ac & c.1.c only), Canada, France, Germany, Italy, Spain, United Kingdom |
| “Software” n.s.e. “specially designed” or modified for                                                                               | 3D901 | Australia (for ECCN 3B903 only), Germany, Italy, United Kingdom                                              |

|                                                                                                                                                                                                                                                                                                                                 |       |                                                                                                                                                                       |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| “development,”<br>“production,” of items<br>controlled by ECCNs<br>3A901.b, 3B903, or 3B904                                                                                                                                                                                                                                     |       |                                                                                                                                                                       |
| “Software” designed to<br>extract “GDSII” or<br>equivalent standard layout<br>data & perform layer-to-<br>layer alignment from SEM<br>images, & generate multi-<br>layer “GDSII” data or<br>circuit netlist                                                                                                                     | 3D907 | Australia, Canada, France,<br>Germany, Italy, Spain,<br>United Kingdom                                                                                                |
| “Technology” according to<br>EAR General Technology<br>Note for “development” or<br>“production” of items<br>controlled by any 3A<br>ECCN (except 3A901,<br>3A904, 3A980, 3A981,<br>3A991, 3A992, or 3A999),<br>any 3B ECCN (except<br>3B903, 3B904, 3B991 or<br>3B992) or 3C ECCN<br>(except 3C907, 3C908,<br>3C909, or 3C992) | 3E001 | Australia (for ECCN<br>3B001.c.1.a or c.1.c only),<br>Canada, France (for ECCN<br>3B001.c.1.a or c.1.c only),<br>Italy, United Kingdom                                |
| “Technology” according to<br>EAR General Technology<br>Note for “development” or<br>“production” of items<br>controlled by ECCNs<br>3A901, 3A904, 3B903,<br>3B904, 3C907, 3C908, or<br>3C909                                                                                                                                    | 3E901 | Australia (for ECCNs<br>3A901.a and 3B903 only),<br>Canada, France, Germany<br>(only for ECCN<br>3A901.a.1), Spain (only for<br>ECCN 3B903), Italy,<br>United Kingdom |
| “Technology” according to<br>EAR General Technology<br>Note for “development” or<br>“production” of integrated<br>circuits or devices, using<br>“Gate all-around Field-<br>Effect Transistor<br>(“GAAFET”) structures                                                                                                           | 3E905 | Australia, Canada, France,<br>Germany, Italy, Spain,<br>United Kingdom                                                                                                |

|                                                                                                                                                                                                            |       |                                                                                        |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|----------------------------------------------------------------------------------------|
| Quantum computers & related “electronic assemblies” and “components” therefor                                                                                                                              | 4A906 | Australia, Canada, France, Germany, Italy, Spain, United Kingdom                       |
| “Software” “specially designed” or modified for “development” or “production”, of items controlled by ECCN 4A906.b or 4A906.c                                                                              | 4D906 | Australia, Canada, France, Germany, Italy, United Kingdom                              |
| “Technology” for “development” or “production” of items controlled by ECCNs 4A906.b, 4A906.c, or 4D906 or by and to control by ECCN 4E906.b; “technology” for “use” of “software” controlled by ECCN 4D906 | 4E906 | Australia, Canada, France, Germany, Spain (only for ECCN 4A906), Italy. United Kingdom |

Note: “n.s.e.” means “not specified elsewhere” within the Commerce Control List

### New Deemed Export & Deemed Reexport Rules

In this IFR, BIS adopts a limited number of new deemed export and deemed reexport export license requirements in regard to quantum computers, materials, and related electronic assemblies; aerospace technology; and integrated circuit “development” or “production.” To help cope with these new requirements, BIS is also providing new exclusion clauses for deemed exports and deemed reexports to allow U.S. and non-U.S. companies to maintain ongoing research and development (“R&D”) of these vital emerging technologies. In two remarkably candid and revealing paragraphs within the IFR notice in the Federal Register<sup>[5]</sup>, BIS writes:

The domestic development of quantum information science and technology (QIST) experts, including in quantum computing, is insufficient to fill the United States’ QIST strategic goals. The United States will continue to rely on foreign talent to fill critical workforce gaps. Currently, much of the QIST talent developed in the U.S. are foreign persons. Foreign persons are subject to visa requirements as administered by the Department of State. More than half of QIST-related degrees conferred in the U.S. are awarded to temporary U.S. residents. Additionally, stakeholders report that offshore companies are becoming increasingly attractive places to pursue a career in quantum computing, driven both by increases in public and private investments internationally, but also uncertainty in the ability to work in the United States due to immigration policies.

While the license requirements for deemed exports and deemed reexports of quantum technology and software only apply to foreign persons whose most recent country of citizenship or permanent residency is a destination specified in Country Group D:1 or D:5[6], this hardship would be devastating to the continued progress of future developments in the quantum field, which depends on foreign person employees from these destinations.

BIS is thus adding a new general license for deemed exports and deemed reexports of certain “technology” and software so that the new EAR export controls will be less disruptive to current R&D programs. However, reliance on that new general license will now entail some annual reporting to inform the U.S. Government so it can continue to monitor and oversee such deemed exports and reexports in regard to national security. Additionally, the IFR provides a 60-day delayed compliance date for quantum computing items to certain destinations so that U.S. exporters will have some limited time to file license applications with BIS and to update and amend their various internal compliance processes and policies in line with all these new requirements.

### **BIS Comment Requests**

BIS urges the public to offer its input on three particular aspects of the IFR: (1) the proposed IEC license exception mechanism, particularly as it may affect U.S. industry supply chains and U.S. corporate compliance programs; (2), the scope and clarity of the new 900-series ECCNs; and (3) the scope of the license exceptions that will be allowed under the IFR. BIS is also seeking public input on the new deemed export and deemed reexport requirements in the IFR and the potential impacts that such new controls would have if they were to be applied to the quantum items and the new general license in General Order No. 6 in paragraph (f)(3) in Supplement No. 1 to EAR Part 736 were removed in this IFR or at some future date.

[1] <https://www.bis.doc.gov/index.php/documents/federal-register-notices-1/3521-89-fr-72926-quantum-c-1-ifr-0694-aj60-9-6-2024/file>

[2] [www.regulations.gov](http://www.regulations.gov).

[3] EAR § 734.13(b) provides that “[a]ny release in the United States of ‘technology’ or source code to a foreign person is a deemed export to the foreign person’s most recent country of citizenship or permanent residency.” In addition, EAR § 734.14(b) states that “[a]ny release outside of the United States of ‘technology’ or source code subject to the EAR to a foreign person of another country is a deemed reexport to the foreign person’s most recent country of citizenship or permanent residency, except as described in § 734.20.”

[4] See *Biden Administration Restricts U.S. Exports of Advanced Computing and Semiconductor Manufacturing Equipment, Software, and Technology to China* | News &

[5] 89 Fed. Reg. 72926, -29 (Sept. 6, 2024).

[6] Country Group D:1 consists of those countries for which the EAR requires export licensing due to “national security” reasons, and Country Group D:5 is comprised of those countries for which the EAR mandates export licenses because they are subject to a U.S. arms embargo. Significantly, both Country Group D:1 and Country Group D:5 include the PRC.