DEPARTMENT OF COMMERCE

Bureau of Industry and Security

15 CFR Parts 732, 734, 736, 740, 742, 744, 746, 758, 762, 772, and 774

[Docket No. 241126–0302]

RIN 0694–AJ74

Foreign-Produced Direct Product Rule Additions, and Refinements to Controls for Advanced Computing and Semiconductor Manufacturing Items

AGENCY: Bureau of Industry and Security, Commerce.

ACTION: Interim final rule.

SUMMARY: In this interim final rule (IFR), the Bureau of Industry and Security (BIS) makes changes to the Export Administration Regulations (EAR) controls for certain advanced computing items, supercomputers, and semiconductor manufacturing equipment, which includes adding new controls for certain semiconductor manufacturing equipment and related items, creating new Foreign Direct Product (FDP) rules for certain commodities to impair the capability to produce ''advanced-node integrated circuits'' (''advanced-node ICs'') by certain destinations or entities of concern, adding new controls for certain high bandwidth memory important for advanced computing, and clarifying controls on certain software keys that allow for the use of items such as software tools. This IFR publishes concurrently with another BIS final rule entitled, ''Additions and Modifications to the Entity List; and Removals from the Validated End-User (VEU) Program'' (Entity List rule) that adds to and modifies the Entity List to ensure appropriate EAR controls are in place for certain critical technologies and to minimize the risk of diversion to entities of concern.

DATES:

Effective date: This rule is effective December 2, 2024.

Compliance dates: Although this rule is effective December 2, 2024, exporters, reexporters, and transferors are not required to comply with the changes made in the following amendatory instructions until the compliance dates specified below for the respective amendatory instructions. If no compliance date is provided, the parties must comply with those requirements as of the effective date of this IFR.

- The changes made in this IFR in amendatory instructions 2 (*Red Flags*) and 6 (§ 734.19) have a compliance date of December 2, 2024.
- The changes made in this IFR in amendatory instructions 4, 5, 15, 16, 17, 19, 20, 21, 23, 25, 29, and 31 (ECCNs 3B001, 3B002, 3B991, 3B992, 3B993, 3B994, 3A090, 3D001 (related to 3A090.c and 3B commodities), 3D002, 3D992, 3D993, 3D994, 3E001 (related to 3A090.c and 3B commodities) (HBM controls and related changes), 3E992, 3E993, and 3E994) FN5, and FDP rules, and related changes, and DRAM definition changes) have a compliance date of December 31, 2024.

Comments due date: Comments must be received by BIS no later than January 31, 2025.

ADDRESSES: Comments on this IFR may be submitted to the Federal rulemaking portal at: *www.regulations.gov.* The *regulations.gov* ID for this IFR is BIS–2024–0028. Please refer to RIN 0694–AJ74 in all comments.

All filers using the portal should use the name of the person or entity submitting the comments as the name of their files, in accordance with the instructions below. Anyone submitting business confidential information should clearly identify the business confidential portion at the time of submission, file a statement justifying nondisclosure and referring to the specific legal authority claimed, and provide a non-confidential version of the submission.

For comments submitted electronically containing business confidential information, the file name of the business confidential version should begin with the characters ''BC.'' Any page containing business confidential information must be clearly marked ''BUSINESS CONFIDENTIAL'' on the top of that page. The corresponding non-confidential version of those comments must be clearly marked ''PUBLIC.'' The file name of the non-confidential version should begin with the character ''P.'' Any submissions with file names that do not begin with either a ''BC'' or a ''P'' will be assumed to be public and will be made publicly available at: *https://www.regulations.gov.* Commenters submitting business confidential information are encouraged to scan a hard copy of the non-confidential version to create an image of the file, rather than submitting a digital copy with redactions applied, to avoid inadvertent redaction errors which could enable the public to read business confidential information.

FOR FURTHER INFORMATION CONTACT:

- For general questions, contact Regulatory Policy Division, Office of Exporter Services, Bureau of Industry and Security, U.S. Department of Commerce at 202–482–2440 or by email: *RPD2@bis.doc.gov.*
- For Category 3 technical questions, contact Carlos Monroy at 202–482–3246 or by email: *Carlos.Monroy@bis.doc.gov.*

SUPPLEMENTARY INFORMATION:

I. Background

A. BIS's Implementation of Export Controls To Address National Security Risks and Foreign Policy Objectives Associated With the People's Republic of China (PRC)'s Use of Advanced Computing, Supercomputer, and Semiconductor Manufacturing

PRC leadership at the highest levels has stressed the importance of building an indigenous and self-sufficient semiconductor ecosystem, referring to ICs in particular as critical to PRC national security strategy. Reporting from PRC state-owned media outlets has even referred to integrated circuits (ICs) as the ''main battlefield'' of the PRC's Military-Civil Fusion (MCF) National Strategy to eliminate barriers between the PRC's civilian research and commercial sectors and its military and defense industrial sectors to ensure that innovations in the civilian sector simultaneously advance the PRC's military capabilities. The Chinese Communist Party (CCP) aims to achieve a world class military by 2049 through MCF. Due to the significance of semiconductors to that strategy and the PRC's technology ambitions, PRC political and scientific leaders have sought to develop an ''independent and controllable'' semiconductor industry for decades—one that is fully within the government's control and not reliant on foreign suppliers. The PRC has also mandated and incentivized relevant domestic firms to dedicate significant resources to realizing these strategic objectives, demonstrating the top-down, hands-on approach that the PRC is taking to shape this ecosystem to benefit itself, with a related detriment to the technology leadership of the United States and its allies.

Export controls on semiconductor manufacturing equipment (SME) and related parts and components are central to countering the PRC's goal of furthering its ''advanced-node ICs'' production capacity in support of its military modernization and weapons of mass destruction (WMD) programs. Since October 2022, BIS has published a series of IFRs imposing controls on advanced computing and supercomputing items and SME, starting with an IFR that was issued on October 7, 2022, ''Implementation of Additional Export Controls: Certain Advanced Computing and

Semiconductor Manufacturing Items; Supercomputer and Semiconductor End Use; Entity List Modification'' (October 7 IFR) (87 FR 62186, October 13, 2022). The October 7 IFR amended the EAR to implement controls on advanced computing ICs, computer commodities that contain such ICs, and certain SME and parts and components needed to produce those and other advanced ICs, and to make other EAR changes to implement appropriate related controls, including on certain ''U.S. person'' activities that 'support' (as defined in § 744.6 of the EAR) the ''development'' or ''production'' of certain ICs in the PRC.

The October 7 IFR explained that these controls were aimed at limiting the PRC's ability to engage in activities that would pose significant threats to U.S. national security and foreign policy. Specifically, BIS determined that certain advanced computing ICs and related computing items—many of which originated in the United States or were produced with U.S. technology, software, or tools—could enable the PRC to develop certain enhanced data processing and analysis capabilities, including through AI applications because of the high processing power of the advanced ICs and related computing items. Additionally, BIS determined that the capability to produce advanced computing ICs for advanced computing systems, such as AI systems, through the use of certain SME, presented significant national security and foreign policy concerns because indigenous production is another means to obtain ''advanced computing ICs'' and other advanced computing systems. These capabilities could be used by the PRC to further its military modernization efforts, improve calculations in weapons design and testing (including for WMD), and violate basic human rights through comprehensive surveillance programs. As previously stated, these activities are contrary to U.S. national security and foreign policy as set forth in the Export Control Reform Act of 2018 (ECRA) (codified, as amended, at 50 U.S.C. 4801–4852), which directs BIS to control items subject to the jurisdiction of the United States when those items could be used in ''military programs that pose a threat to the security of the United States or its allies,'' could lead to ''the proliferation of weapons of mass destruction or of conventional weapons,'' or could undermine the ''foreign policy of the United States, including the protection of human rights and the promotion of democracy'' (50 U.S.C. 4811(2)).

To effectuate its controls under the October 7 IFR—and, consequently, to help reduce the risk that U.S. technology would contribute to activities that threaten U.S. national security and foreign policy—BIS added new Export Control Classification Numbers (ECCNs) 3A090 (specified high-performance ICs), 4A090 (related computing items), and 3B090 (specified SME essential to produce ''advanced-node ICs'').

Because many of the advanced computing ICs and related computing items controlled by the October 7 IFR are produced by manufacturers outside the United States relying on U.S. software, technology, or tools, the October 7 IFR also imposed two additional foreign direct product (FDP) rules. As a general matter, the EAR asserts jurisdiction over certain foreign-produced items made with the use of U.S. technology, software, or tools, as described under the various FDP rules in § 734.9 of the EAR. The FDP rules do not apply to all items and end users. Instead, FDP rules are targeted to cover specific combinations of items, destinations, end users, or end uses. Accordingly, the October 7 IFR implemented two new FDP rules related to advanced computing items and ''supercomputers'' to extend jurisdiction over certain items produced in foreign countries and destined to the PRC or certain entities in the PRC. BIS also expanded the scope of an existing FDP rule that covers items destined for certain entities on the Entity List.

In 2023, BIS issued two rules imposing additional controls on advanced computing and semiconductor manufacturing items. In the IFR, ''Export Controls on Semiconductor Manufacturing Items'' (SME IFR) (88 FR 73424, October 25, 2023), BIS added controls for additional SME essential to producing ''advanced-node ICs'' and required licenses for such SME, as well as for SME previously controlled under ECCN 3B090 (now 3B001 and 3B002), when destined to Macau and Country Group D:5. The same day it issued the SME IFR, BIS issued a second rule to address advanced computing chips. The IFR, ''Implementation of Additional Export Controls: Certain Advanced Computing Items; Supercomputer and Semiconductor End Use; Updates and Corrections'' (AC/S IFR) (88 FR 73458, October 25, 2023), adjusted parameters for advanced computing ICs that are critical for advanced computing and AI applications, and imposed new measures to address the risk of circumvention of the controls, including expanding the license requirement for advanced computing ICs to apply to Country Groups D:1, D:4, and D:5.

Like the October 7 IFR, the SME IFR described the national security rationale for expanding controls on SME. The SME IFR noted that the controls protect U.S. national security by restricting the PRC's military modernization efforts and degrading the PRC's ability to violate human rights. The SME IFR further noted that the controlled SME has profound implications for U.S. national security, including production of the advanced computing ICs that could further development of weapons of mass destruction and emerging technologies, such as advanced artificial intelligence systems, autonomous weapons, cyberweapons, hypersonics, and high-tech surveillance applications. The PRC's statements and activities suggest it would use its next generation military capabilities to engage in activities contrary to U.S. and allied national security interests.

B. In Order Address the Continuing Threat Posed by the PRC's Efforts To Acquire Advanced Computing Items, Supercomputing Items, and SME, This IFR Imposes Additional Controls Related to Such Items

There is substantial open source and unclassified information detailing the PRC's efforts to respond to the impact of current restrictions on SME, including key parts and components, through supporting semiconductor research and development, building additional facilities as alternate suppliers to fabrication facilities, and funding indigenous producers of SME.

As such, to address the continued threat from the PRC's efforts to develop an ''independent and controllable'' semiconductor industry to produce ''advanced-node ICs'' to help achieve a world-class military, BIS is imposing additional controls on certain types of SME and related items that are used to produce ''advanced-node ICs.'' BIS is also establishing new foreign FDP controls for certain SME items that originate in foreign countries but are produced with U.S. technology, software, or tools, as well as SME items that contain essential components, like ICs, that could not be produced without U.S. technology, software, or tools. These changes, and the related national security and foreign policy considerations, are described below under sections III.A and III.B. The addition of new FDP rules also requires certain additional revisions to parts 734 and 736, which are described below under sections III.A.4 (regarding the FDP rules) and III.B.1 (regarding de minimis changes) of this preamble.

Additionally, BIS is imposing new controls on certain high-bandwidth

memory (HBM) commodities that provide necessary memory capacity and bandwidth needed for advanced artificial intelligence (AI) models and supercomputing applications. Such applications can enable advanced military and intelligence applications, lower the barriers to entry for non-experts to develop WMD, support powerful offensive cyber operations, and assist in using mass surveillance to commit human rights abuses. In accordance with the policy goals described in § 1752(1)(A) and (2)(D), imposing controls on certain HBM is necessary to restrict items that can make a ''significant contribution to the military potential of any other country'' and to ''carry out the foreign policy of the United States, including the protection of human rights.''

Finally, this IFR also adds new paragraph (b) to 734.19 to specify that software keys, also called software license keys, which allow users the ability to use ''software'' or hardware by providing access to it, and software keys that renew existing ''software'' or hardware use licenses, are classified and controlled under the same ECCNs on the Commerce Control List (CCL) (15 CFR part 744) as the corresponding ''software'' or hardware to which they provide access, or in the case of hardware, the software key would be classified under the corresponding ECCN in the software group (*e.g.,* a software license key that allows the use of hardware classified under ECCN 5A992 would be classified under ECCN 5D992). This clarification applies to, among other items, software keys for electronic computer-aided design (ECAD) tools that are important to the development and production of ''advanced-node ICs'' and thus can have a significant impact on military programs posing a threat to the security of the United States and its allies (see § 1752(2)(A)(iv) of ECRA). Additionally, as noted under § 1752(7) of ECRA, administering export controls in an effective manner ''requires a clear understanding both inside and outside the U.S. Government of which items are controlled.'' This clarification enhances the exporting community's understanding to prevent unauthorized access to controlled ''software'' or hardware.

C. Additional Changes and Relation of This IFR With the Accompanying BIS Rule, ''Additions and Modifications to the Entity List; and Removals From the Validated End-User (VEU) Program.''

The controls implemented since October 2022 have also added or expanded end-use controls under part 744 of the EAR. In particular, the addition of § 744.23 and the expansion of the ''U.S. person'' control under § 744.6 have supplemented the CCL-based controls to address the national security and foreign policy concerns with these items. Public comments on both the SME and AC/S IFRs published since October 2022 in this area have requested the U.S. Government to publicly identify ''production'' ''facilities'' for ''advanced-node ICs,'' or entities engaged in the indigenization of SME. In the SME IFR and AC/S IFR, BIS noted its support of identifying such entities to enhance compliance by exporters, reexporters, and transferors and to improve the effectiveness of the controls.

Consequently, BIS is publishing concurrently with this IFR the Entity List rule. The Entity List rule adds entities to the Entity List because of specific national security or foreign policy concerns regarding those entities, which are described in that rule. The addition and modification of certain entities on the Entity List are designed to impair their current or potential ''development'' or ''production'' of ''advanced-node ICs.'' The addition of other entities on the Entity List are designed to impair their ability to produce SME and related items. The Entity List rule publishes concurrently with this IFR as part of the larger effort to ensure appropriate EAR controls are in place on these items, including in connection with transactions destined to, or otherwise involving, the entities being added to the Entity List, as well as for existing entries on the Entity List that this final rule modifies.

The Entity List rule publishing concurrently with this IFR adds entities to the Entity List and modifies certain existing entries on the Entity List. As part of that Entity List rule, BIS has included a Footnote 5 (which extends EAR jurisdiction to certain foreign-produced items pursuant to § 734.9(e)(3)) designation for certain entities being added to the Entity List and to certain entities already on the Entity List. While the Entity List rule adds Footnote 5 designations to specific entities, this IFR adds FDP rules, license requirements, license exceptions, and Temporary General Licenses (TGLs) that pertain to exports, exports from abroad, reexports, and transfers (in-country) when these entities are involved in the transaction. See the Entity List rule publishing concurrently with this IFR for an identification of which new and modified entities on the Entity List will receive a Footnote 5 designation.

As BIS identifies additional entities that warrant being subject to these controls, they will be added to the Entity List. However, exporters, reexporters, and transferors must continue to conduct due diligence, including by reviewing transactions for Red Flags (*i.e.,* circumstances in a transaction that indicate that the export may be destined for an inappropriate end use, end user, or destination). To assist parties in identifying Red Flags, this IFR adds eight new Red Flags to supplement no. 3 to part 732. The Red Flags are discussed in section III.C.5 of this preamble.

The controls implemented since October 2022 are calibrated to impact ''advanced-node IC'' production (and related development) activities without significantly impacting global commercial supply chains. However, calibrated controls by their nature tend to be more complex than broader controls. BIS has evaluated the effectiveness of these controls and has identified revisions to enhance clarity and to ensure the controls are effectively addressing national security and foreign policy concerns. BIS is still in the process of reviewing and responding to the comments received on the SME IFR and AC/S IFR, as well as comments on another IFR, ''Implementation of Additional Export Controls: Certain Advanced Computing Items; Supercomputer and Semiconductor End Use; Updates and Corrections; and Export Controls on Semiconductor Manufacturing Items; Corrections and Clarifications'' (April 4 IFR) (88 FR 23876, April 4, 2024). However, at this time, BIS has identified additional changes that will be implemented in this IFR. BIS is soliciting comments on these changes and will address any such comments along with comments on the three earlier IFRs as needed in a subsequent rule.

The controls enacted by this IFR, as described in section III below, are consistent with ECRA. The underlying purpose of ECRA encompasses restricting the products of U.S. ''technology,'' ''software,'' and ''commodities'' that could be used to undermine U.S. national security and foreign policy. As explained above, the PRC's goal of achieving a world class military by 2049 is a critical concern to U.S. national security and foreign policy. ECRA provides that the policy of the United States is ''to restrict the export of items which would make a significant contribution to the military potential of any other country or combination of countries which would prove detrimental to the national security of the United States; and to restrict the export of items if necessary to further significantly the foreign

policy of the United States . . .'' (50 U.S.C. 4811(1)). Because the development of a PRC ''independent and controllable'' semiconductor industry is a critical factor in the PRC's ability to achieve its goal, ECRA authorizes the implementation of sufficient controls to prevent the PRC's possession of sensitive items and is necessary to advance the U.S. national security and foreign policy interests.

II. Overview of This Interim Final Rule

In this IFR, BIS makes changes to EAR controls for advanced computing items, supercomputers, and SME. The five categories of changes implemented by this IFR are described in section III as follows:

A. Addition of two new FDP rules in § 734.9 of the EAR for certain types of advanced SME and for entities on the Entity List involved in the production of ''advanced-node ICs'';

B. Additional revisions related to the production of semiconductors and other conforming changes, including revisions to *de minimis* provisions that correlate to the new FDP rules, establishment of new License Exception Restricted Fabrication ''Facility'' (RFF), addition of eight new Red Flags, clarifications to § 744.23, and revisions and conforming changes to other parts of the EAR;

C. Addition of HBM controls, including addition of new ECCN 3A090.c and License Exceptions HBM;

D. Clarification to software keys to address when authorization is required; *and*

E. Revisions to the CCL in supplement no. 1 to part 774, including revisions to eight existing ECCNs and addition of eight new ECCNs.

III. Changes to the EAR

A. Addition of Two New Foreign Direct Product Rules Related to the Production of ''Advanced-Node ICs''

1. National Security and Foreign Policy Considerations for New FDP Rule for Entities on the Entity List Involved in the Production of ''Advanced-Node ICs'' in Countries of Concern

This IFR implements a new FDP rule for certain SME that are essential to, or support, producing ''advanced-node ICs,'' which have important military applications (SME FDP). This interim final rule also implements a new FDP rule for entities on the Entity List designated with new Footnote 5 (FN5 FDP). The entities added to the Entity List with a Footnote 5 designation are being added because of specific national security or foreign policy concerns described in the Entity List rule, including supporting, or having the potential to support, the PRC's efforts to develop and produce ''advanced-node ICs,'' including for military end uses.

As explained in the October 7 IFR, the SME IFR, and above in this IFR, the capability to produce ''advanced-node ICs'' is a force-multiplying technology that has critical implications for national security and foreign policy. SME is needed to produce ''advanced-node ICs,'' and the ability to produce ''advanced-node ICs'' has impacts across various technology ecosystems critical to national security. For example, ''advanced-node ICs'' improve computing power and efficiency relative to older IC technology, enabling the compute miniaturization necessary for the next generation of autonomous weapons systems, as well as the compute scaling necessary for exascale supercomputing and advanced AI capabilities, both of which can directly contribute to development of WMD, advanced weapons systems, and high-tech surveillance applications.

In particular, advancements in large-scale AI models have shown striking performance improvements and can be utilized for advanced military and intelligence applications. These large-scale AI models have the ability to rapidly review large volumes of information and synthesize it into digestible and actionable points, making them well-suited for battlefield capabilities and thus having the potential to alter the nature of warfare. They may also pose threats to national security and foreign policy by diffusing dangerous capabilities by lowering the barrier to develop cyberweapons or chemical, biological, radiological, or nuclear weapons, developing tools with increasingly autonomous capabilities relevant to national security applications, and utilizing facial and voice recognition to surveil minorities and political dissidents.

As discussed, BIS continues to advance U.S. national security and foreign policy interests by imposing controls that reduce the risk U.S. technology will contribute to the PRC's ability to carry out those activities. Specifically, BIS has imposed controls on the SME and related parts and components used to produce ''advanced-node ICs.'' BIS has also added several FDP rules to § 734.9 to extend the jurisdiction of the EAR to additional foreign-made items, including revisions to § 734.9(e) to add a new product scope and end-user scope for certain entities on the Entity List. This IFR also revises the § 734.9(e) (Entity List FDP rule) introductory text to reference this new FN5 FDP and to also revise the paragraph heading, so it references Entity List FDP rules to reflect that there is more than one Entity List FDP rule described under paragraph (e).

Although those controls have been effective, BIS has found that PRC entities of concern have continued purchasing SME items produced outside the United States that include SME items produced with the use of U.S. technology, software, or tools, as well as SME items using components, such as ICs, necessary for the function of the SME items and also produced with the use of U.S. technology, software, or tools. U.S. technology, software, and tools therefore remain key to the production or function of the SME items being purchased by PRC entities of concern.

Based on these findings, this IFR implements the SME FDP and FN5 FDP, which will impose additional controls on certain SME items—which are used for the production of ''advanced-node ICs''—as described further in section 2 below. Both FDPs will regulate the products of tools, ''technology,'' and ''software'' that are made or developed using U.S.-origin ''technology'' or ''software,'' or which contain a foreign product made from tools that are a product of U.S.-origin ''technology'' or ''software.'' As with the controls previously imposed by the October 7 IFR and the SME IFR, the purpose of the SME FDP and FN5 FDP rules is to reduce the risk that U.S. technology will contribute to the PRC's efforts to produce ''advanced-node ICs'' that threaten U.S. national security and foreign policy interests. As detailed below, the SME FDP and FN5 FDP rules simply recognize that certain SME items—which are already subject to comprehensive restrictions when destined for advanced fabrication facilities in Country Group D:5 or Macau when they originate from the United States—should also be subject to controls when destined for such entities when produced abroad, if they are directly produced with U.S. ''technology'' or otherwise contain a critical component that could not have been produced without U.S. ''technology.''

2. Scope of FN5 FDP

Specifically, this interim final rule implements a new FDP rule for entities on the Entity List designated with FN5 FDP. The entities added to the Entity List with a Footnote 5 designation are being added because of specific national security or foreign policy concerns described in the Entity List rule, such as their involvement in supporting the PRC's military modernization through

their potential to produce ''advanced-node ICs,'' including for military end uses.

Because of the critical national security implications of these technologies and the need to enhance the effectiveness of the Entity List designations to address foreign availability concerns, this rule implements the FN5 FDP to make certain foreign-produced items subject to the EAR, and requires a license if the exporter, reexporter, or transferor has ''knowledge'' (which includes reason to know) that (i) such foreign-produced commodities will be incorporated in any ''part,'' ''component,'' or ''equipment'' produced, purchased, or ordered by an entity with a Footnote 5 designation; or (ii) any entity with a Footnote 5 designation is a party to any transaction involving such foreign-produced commodities.

The foreign-produced commodities subject to the FN5 FDP rule are commodities most relevant to semiconductor production and related activities and thus covers foreign-produced commodities meeting the descriptions in 3B001 (except 3B001.a.4, c, d, f.1, f.5, g, h, k to n, p.2, p.4, r), 3B002 (except 3B002.c), 3B903, 3B991 (except 3B991.b.2.a through 3B991.b.2.b), 3B992, 3B993, or 3B994. The commodities covered include certain ''equipment'' as well as certain ''specially designed'' ''parts,'' ''components,'' and ''accessories,'' as described within the scope of each ECCN. If a foreign-produced commodity does not meet any of the descriptions in those Category 3 ECCNs, then the FN5 FDP does not apply.

The foreign-produced commodities described in the Category 3 ECCNs described above meet the product scope prong of the FN5 FDP rule if they are: (i) a ''direct product'' of ''technology'' or ''software'' subject to the EAR and specified in ECCN 3D001 (for 3B commodities), 3D901, 3D991 (for 3B991 and 3B992), 3D993, 3D994, 3E001 (for 3B commodities), 3E901 (for 3B903), 3E991 (for 3B991 and 3B992), 3E993, or 3E994 (see § 734.9(e)(3)(i)(A)); (ii) produced by a complete plant or 'major component' of a plant (located outside the United States) when the complete plant or 'major component,' whether made in the United States or a foreign country, is itself a ''direct product'' of U.S.-origin ''technology'' or ''software'' specified in ECCN 3D001 (for 3B commodities), 3D901, 3D991 (for 3B991 and 3B992), 3D992, 3D993, 3D994, 3E001 (for 3B commodities), 3E901 (for 3B903), 3E991 (for 3B991 and 3B992), 3E992, 3E993, or 3E994 (see § 734.9(e)(3)(i)(B)(1)); or (iii) contain an commodity that is produced by a complete plant or 'major component' of a plant (located outside the United States) when the complete plant or 'major component,' whether made in the United States or a foreign country, is itself a ''direct product'' of U.S.-origin ''technology'' or ''software'' specified in ECCN 3D001 (for 3B commodities), 3D901, 3D991 (for 3B991 and 3B992), 3D992, 3D993, 3D994, 3E001 (for 3B commodities), 3E901 (for 3B903), 3E991 (for 3B991 and 3B992)), 3E992, 3E993, or 3E994 (see § 734.9(e)(3)(i)(B)(2)).

With respect to § 734.9(e)(3)(i)(B)(2), this IFR adds Note 3 to provide additional guidance on its product scope. Note 3 clarifies that if a foreign-produced item contains an IC, and that IC was produced with the use of a tool that itself was a ''direct product'' of U.S.-origin technology or software specified in the ECCNs in § 734.9(e)(3)(i)(B)(2), then the product scope would be met. In line with BIS's application of its FDP rules concerning integrated circuits, the note also specifies that the production of an integrated circuit includes fabrication of the integrated circuit in a wafer, as well as assembly, testing, and packaging of the integrated circuit.

In addition to the note, BIS is also adding a Red Flag to assist parties in determining whether their products fall within § 734.9(e)(3)(i)(B)(2). Specifically, based in part on its assessment of supply chain data, BIS has found that there is a significant prevalence of certain types of U.S.-origin tools (or foreign-produced tools that are subject to the EAR) in fabrication facilities for the production of integrated circuits. It can thus be presumed that any integrated circuit has been produced using at least one U.S. tool qualifying as a 'major component' under § 734.9(e)(3)(i)(B) of the FN5 FDP. Therefore, as explained in greater detail below, this IFR adds Red Flag 26 to supplement no. 3 to part 732 stating that there is a Red Flag that the product scope of the FN5 FDP is met if the foreign-produced item contains at least one integrated circuit.

Importantly, as described above, the scope of the FN5 FDP is calibrated in multiple places to ensure the rule captures those transactions of national security and foreign policy concern. First, the FN5 FDP captures only the products of the U.S. tools, technology, and software that are relevant to the production of items (*e.g.,* ''advanced-node ICs'') of national security and foreign policy concern by, for, or involving specific parties, who are identified on the Entity List as involved in relevant activities of concern. The FN5 FDP does not generally apply to the destinations identified in new supplement no. 4 to part 742. U.S. national security and foreign policy interests inform this approach. Governments in those destinations are members of multilateral export control regimes (*e.g.,* the Wassenaar Arrangement on Export Controls for Conventional Arms and Dual-use Goods and Technologies) and have the authority to control key SME items of concern. Lastly, this IFR provides varying compliance dates to provide parties time to comport with the new controls where possible consistent with U.S. national security and foreign policy concerns. Parties need not apply for a license, for example, until the compliance date or the effective date, whichever is later. In so doing, this IFR calibrates the pertinent restrictions to provide notice of this IFR's provisions as well as time for parties to ensure they can properly classify their items and otherwise comply with this IFR's new requirements.

3. Scope of SME FDP Rule

Under the SME FDP rule, specified foreign-produced commodities of national security concern meet the destination scope of SME FDP if there is ''knowledge'' that the foreign-produced commodity is destined to Macau or a destination in Country Group D:5 of supplement no. 1 to part 740 of the EAR.

The product scope of the SME FDP applies to: (i) a foreign-produced commodity specified in 3B001.a.4, c, d, f.1, f.5, k to n, p.2, p.4, r, or 3B002.c that is the ''direct product'' of ''technology'' or ''software'' subject to the EAR and specified in 3D992 or 3E992 of the CCL; (ii) a foreign-produced commodity that is produced by any complete plant or 'major component' of a plant that is located outside the United States, when the plant or 'major component' of a plant, whether made in the United States or a foreign country, itself is a ''direct product'' of U.S.-origin ''technology'' or ''software'' that is specified in ECCN 3D001 (for 3B commodities), 3D901, 3D991 (for 3B991 and 3B992), 3D992, 3D993, 3D994, 3E001 (for 3B commodities), 3E901 (for 3B903), 3E991 (for 3B991 or 3B992), 3E992, 3E993, or 3E994 of the CCL; or (iii) contains a commodity produced by any complete plant or 'major component' of a plant that is located outside the United States, when the complete plant or 'major component' of a plant, whether made in the U.S. or a foreign country, itself is a ''direct product'' of U.S.-origin ''technology'' or ''software'' that is specified in ECCN

3D001 (for 3B commodities), 3D901, 3D991 (for 3B991 and 3B992), 3D992, 3D993, 3D994, 3E001 (for 3B commodities), 3E901 (for 3B903), 3E991 (for 3B991 or 3B992), 3E992, 3E993, or 3E994 of the CCL. For example, the product scope of paragraph (k)(1) is met if a foreign-produced commodity contains an integrated circuit that is produced by a complete plant or 'major component' of a plant that itself is a ''direct product'' of U.S.-origin ''technology'' or ''software'' specified in the ECCNs described in paragraph (k)(1)(ii)(B).

The license requirements and exclusions to the license requirements associated with this SME FDP rule are found in §§ 742.4(a)(4) and 742.6(a)(6) of the EAR. See §§ 742.4(b)(2) and 742.6(b)(10) for license review policy applicable to foreign-produced items that are subject to the EAR under this SME FDP rule. These license review policies are each clarified by this IFR by adding ''however if § 744.23 does not apply'' to make clear when the case-by-case license review policy applies.

4. License Requirements and License Review Policy for Commodities Subject to the EAR Pursuant to the FN5 FDP or SME FDP Rules (FDPR)

i. FN5 FDPR as Well as License Requirements in § 744.11(a)(2)(v)

This IFR adds § 744.11(a)(2)(v) to impose a license requirement for entities listed on the Entity List (supplement no. 4 to part 744) that are designated with new Footnote 5 (FN5 entities). This IFR adds § 744.11(a)(2)(v)(A) (License requirement) to specify that a license is required for foreign-produced commodities to or within any destination or to any end user or party, subject to the EAR pursuant to §§ 734.4(a)(9) or 734.9(e)(3), if any of the license requirements under § 744.11(a)(2)(v)(A)(*1*) through (A)(*4*) applies. See Section B.1 regarding § 734.4 provisions.

This IFR adds § 744.11(a)(2)(v)(A)(*1*) for exports from abroad or reexports from all countries. Specifically, a license is required for commodities specified in ECCN 3B993 when exported from abroad or reexported by an entity whose ultimate parent company is headquartered in either Macau or a destination specified in Country Group D:5.

This IFR adds § 744.11(a)(2)(v)(A)(*2*) for exports from abroad or reexports from countries in Country Group A:5 that are not in supplement no. 4 to part 742. Specifically, a license is required for commodities specified in ECCN 3B993 if the commodity is not subject to equivalent controls by the relevant country.

This IFR adds § 744.11(a)(2)(v)(A)(*3*) for exports from abroad or reexports from all countries not listed in Country Group A:5. These license requirements apply under two scenarios. First, under § 744.11(a)(2)(v)(A)(*3*)(*i*), a license is required for commodities specified in ECCN 3B001 (except 3B001.a.4, c, d, f.1, f.5, k to n, p.2, p.4, r), 3B002 (except 3B002.c), 3B611, 3B903, 3B991 (except 3B991.b.2.a through 3B991.b.2.b), 3B992, 3B993, or 3B994 to be exported from abroad or reexported by an entity that is headquartered or whose ultimate parent company is headquartered in a country not specified in supplement no. 4 to part 742. Second, under § 744.11(a)(2)(v)(A)(*3*)(*ii*), a license is required for commodities specified in ECCN 3B993 to be exported from abroad or reexported by an entity headquartered in or whose ultimate parent company is headquartered in a country described in supplement no. 4 to part 742.

This IFR adds § 744.11(a)(2)(v)(A)(*4*) for transfers (in-country) within the country of the entity specified by § 734.9(e)(3)(ii). These license requirements apply under two scenarios. First, under § 744.11(a)(2)(v)(A)(*4*)(*i*), a license is required for transfers by an entity whose ultimate parent company is headquartered in a country not described in supplement no. 4 to part 742 and the entity is transferring a commodity specified in ECCN 3B001 (except 3B001.a.4, c, d, f.1, f.5, g, h, k to n, p.2, p.4, or r), 3B002 (except 3B002.c), 3B611, 3B903, 3B991 (except 3B991.b.2.a through 3B991.b.2.b), 3B992, 3B993, or 3B994. Second, under § 744.11(a)(2)(v)(A)(*4*)(*ii*), a license is required for transfers by an entity whose ultimate parent company is headquartered in a country described in supplement no. 4 to part 742 and the entity is transferring a commodity specified in ECCN 3B993. With respect to the scope of the license requirements under § 744.11(a)(2)(v)(A)(*4*), note that under the definition of transfer (in-country) in § 734.16, an in-country transfer is ''a change in end use or end user of an item within the same foreign country.'' Thus, if a tool has already been exported to a warehouse and will later be moved to and installed in a production facility that was the intended end user at the time of the export, the movement from the warehouse to the production facility within the same country is not an in-country transfer and would not be subject to the license requirements under § 744.11(a)(2)(v)(A)(*4*).

ii. New SME FDP as Well as Amendments to the National Security and Regional Stability Controls

The license requirements for the new SME FDP in § 734.9(k) are in §§ 742.4(a)(4) and 742.6(a)(6)(i) (national security (NS) and regional stability (RS) controls, respectively), which correspond to the reasons for control for the commodities that may be subject to the EAR under the SME FDP. The license requirements are identical in §§ 742.4(a)(4) and 742.6(a)(6)(i). Changes to each of those provisions is discussed below.

This rule updates the NS controls in § 742.4(a)(4) to designate the regulations at § 742.4(a)(4)(i) as the scope of the license requirement and § 742.4(a)(4)(ii) for exclusions to the license requirement. Under § 742.4(a)(4)(i), the current license requirement remains for exports, reexports, or transfers (in-country) to or within either Macau or a destination specified in Country Group D:5 of items specified in 3B001.a.4, c, d, f.1, f.5, k to n, p.2, p.4, r, 3B002.c and related ''software'' and ''technology.''

Similarly, for RS controls, this rule also updates § 742.6(a)(6)(i) to describe the scope of license requirements in § 742.6(a)(6)(i)(A)(1) and exclusions from the license requirement in § 742.6(a)(6)(i)(A)(2). Under § 742.6(a)(6)(i)(A)(1), the current license requirement remains for exports, reexports, or transfers (in-country) to or within Macau or a destination specified in Country Group D:5.

The NS and RS sections also have identical exclusion paragraphs. The existing exclusion from license requirements for deemed exports or deemed reexports for both sets of controls is moved to new §§ 742.4(a)(4)(ii) and 742.6(a)(6)(i)(A)(2), respectively. Under those provisions, commodities subject to the EAR under §§ 734.4(a)(8) or the SME FDP do not require a license if the commodity is reexported or exported from abroad by an entity located in a country specified in supplement no. 4 to part 742, and the entity is not headquartered or have an ultimate parent company headquartered in Macau or a destination specified in Country Group D:5. Also, subject to the EAR under §§ 734.4(a)(8) or the SME FDP do not require a license if the commodity is reexported or exported from abroad by an entity located in a country that has implemented equivalent controls for items specified in paragraph (a)(4)(i) of this section, and the entity is not headquartered or have an ultimate parent company

headquartered in Macau or a destination specified in Country Group D:5.

For license requirements for in-country transfers, note that under the definition of transfer (in-country) in § 734.16, an in-country transfer is ''a change in end use or end user of an item within the same foreign country.'' Thus, if a tool has already been exported to a warehouse and will later be moved to and installed in a production facility that was the intended end user at the time of the export, the movement from the warehouse to the production facility within the same country is not an in-country transfer and would not be subject to the license requirements in §§ 742.4(a)(4)(i) and 742.6(a)(6)(i)(A)(1).

iii. License Review Policy

Lastly, this IFR adds § 744.11(a)(2)(v)(B) (*License review policy)* to specify the license review policy for each entity with a Footnote 5 designation in the Entity List in supplement no. 4 to part 744. Unless specified otherwise in the license review policy column of the applicable entity with a Footnote 5 designation, there is a case-by-case license review policy for items subject to the license requirements of this section where there is a foreign-made item that is not subject to the license requirements of this section and performs the same function as an item subject to the EAR license requirements of this section.

B. Additional Revisions Related to the Production of Semiconductors and Other Conforming Changes

1. Addition of New De Minimis Provisions Corresponding to the FN5 and SME FDP Rules and a Conforming Change

To address the national security and foreign policy concerns described above regarding the production of ''advanced-node ICs,'' this interim final rule adds new *de minimis* provisions in §§ 734.4(a)(8) and 734.4(a)(9) of the EAR. Section 734.4(a)(8) specifies that there is no *de minimis* threshold level of U.S. controlled content for commodities specified in ECCNs 3B001.a.4, c, d, f.1, f.5, k to n, p.2, p.4, r, or 3B002.c when the commodity is incorporated in a U.S.-origin IC or contains a U.S.-origin IC specified under Category 3, 4, or 5 of the CCL, and the commodity is destined for Macau or a destination specified in Country Group D:5, unless excluded from the national security license requirement in § 742.4(a)(4) or the regional stability license requirement in § 742.6(a)(6) of the EAR.

Section 734.4(a)(9) specifies that there is no *de minimis* level for an item meeting the parameters in ECCNs specified in Category 3B (except 3B001.a.4, c, d, f.1, f.5, k to n, p.2, p.4, r, or 3B002.c) of the CCL in supplement no. 1 to part 774 of the EAR, when the commodity is incorporated in a U.S.-origin integrated circuit or contains a U.S.-origin integrated circuit specified under Category 3, 4, or 5 of the CCL, and the commodity is destined for an entity with a Footnote 5 designation in the license requirement column of the Entity List in supplement no. 4 to part 744 of the EAR.

These new provisions ensure that foreign-produced SME containing U.S.-origin ICs (or other components) are controlled to the same extent as foreign-produced SME containing items controlled by the SME FDP rule and the FN5 FDP rule.

This IFR makes a conforming change to § 734.4(a)(3) by replacing ECCN 3B001.f.1.b.2.b with 3B993.f.1 because this is the new location of the control.

2. Addition of New License Exception Restricted Fabrication Facility (RFF)

The new License Exception RFF will allow certain items, including specified SME, to be exported, reexported, exported from abroad, or transferred (in-country) to certain fabrication facilities that are subject to end user-based license requirements but that are not currently producing ''advanced node ICs.'' This license exception is available for these fabrication facilities to obtain legacy equipment and related items to produce non-''advanced node ICs'' through a framework that establishes guardrails and monitoring to address U.S. national security concerns. This includes terms and conditions on the use of License Exception RFF, such as excluding from eligibility items essential for producing ''advanced-node ICs,'' as well as requiring pre-shipment notifications, end-use monitoring, and annual reporting. The license exception also has restrictions related to the operation, installation, maintenance, repair, overhaul, or refurbishing of items ineligible under RFF that may already be part of the entity's installed base. BIS believes that these restrictions, along with existing countrywide license requirements for SME and related items that cannot be overcome by RFF, will further U.S. national security and foreign policy objectives. Under the concurrently published EL rule, one entity is eligible for this license exception.

License Exception RFF, found in new § 740.26, only overcomes license requirements in the license requirements column of a specific entity when § 740.26 is referenced in that Entity List entry. This license exception does not overcome destination-based license requirements, end-use based license requirements in other sections of part 744, or license requirements that apply to other entities on the Entity List if other listed entities are a party to the transaction. License Exception RFF authorizes the export, reexport, export from abroad, and transfer (in-country) of items not specified in ECCN 3B001, 3B002, 3B993, 3B994, 3D992, 3D993, 3D994, 3E992, 3E993, or 3E994. For commodities exported, reexported, or transferred prior to December 5, 2024. License Exception RFF may not be used for the operation, installation, maintenance, repair, overhaul, or refurbishing of commodities specified in ECCN 3B001.a.4, c, d, f.1, f.5, k to n, p.2, p.4, r, or 3B002.c, or 3B993, or 3B994. Also, any item exported, exported from abroad, reexported, or transferred under License Exception RFF may not be used to produce ''advanced-node ICs.'' There is also a notification that must be sent to BIS 45 days prior to exporting, reexporting, exporting from abroad, or transferring (in-country) that includes the end-user's name and address, description of item(s), purchase price, and anticipated shipping date of export, reexport, or transfer (in-country). These changes are expected to result in an increase of 306 prior notifications under § 740.26(d)(1) to BIS under License Exception RFF.

In addition, a notification must be sent to BIS within one business day of gaining ''knowledge'' that the end use has changed to ''advance-node IC'' ''production.'' These changes are expected to not result in an annual increase of ''one-business day'' notifications under § 740.26(d)(2) to BIS under License Exception RFF or a minimal number of one business day notifications, provided the other terms and conditions of License Exception RFF are being followed.

There is also a reporting requirement for installation of SME that must be sent to BIS within 30 days of installation. These changes are expected to result in an annual increase of 306 installation reports under § 740.26(e)(1) to BIS under License Exception RFF.

In addition, there is an annual end-use confirmation report that must be sent to BIS by the exporter, reexporter, or transferor that confirms that the installed equipment is not being used in the productions of ''advanced-node ICs.'' These changes are expected to result in an annual increase of 102 installation reports under § 740.26(e)(2) to BIS under License Exception RFF.

As a conforming change for the addition of License Exception RFF, in § 762.2 (Records to be retained) this IFR revises paragraph (b) (Records retention references) to add a new paragraph (b)(57) to reference § 740.26, License Exception RFF as a new records retention reference. This change is a conforming change with the addition of License Exception RFF and the new notification and reporting requirements under § 740.26(d) and (e), respectively, which are considered ''export control records'' for purposes of the EAR and must be kept in accordance with the requirements of part 762 of the EAR.

3. Addition of Eight New Red Flags To Assist With Compliance

In supplement no. 3 to part 732 (BIS's ''*Know Your Customer*'' Guidance and Red Flags), this IFR adds eight new Red Flags under paragraphs (b)(20) through (27) that are intended to provide additional compliance guidance to assist exporters, reexporters, and transferors as part of their compliance programs. These eight new Red Flags are in addition to the five Red Flags that were added by the AC/S IFR. As specified in the ''*Know Your Customer*'' Guidance and Red Flags, various requirements of the EAR are dependent upon a person's knowledge of the end use, end user, ultimate destination, or other facts relating to a transaction or activity. BIS provides the ''*Know Your Customer*'' Guidance and Red Flags to advise how individuals and firms should act under this knowledge standard.

New Red Flag 20 identifies a scenario where a non-advanced fabrication facility orders equipment designed for ''advanced-node IC'' production (*e.g.,* § 742.4(a)(4) ECCNs). This scenario raises a Red Flag because this technology mismatch indicates the fabrication facility produces or intends to produce ''advanced-node ICs.'' The exporter, reexporter, or transferor must resolve this Red Flag before proceeding with the transaction.

New Red Flag 21 identifies a scenario where an exporter, reexporter, or transferor receives an order for which the ultimate owner or user of the items is uncertain, such as a request to ship equipment for the ''development'' or ''production'' of ICs to a distributor without a manufacturing operation, when the item is ordinarily customized for the end user or installed by the supplier. Under this scenario the distributor would never be the end user of such equipment, which means that the ultimate owner or beneficiary is unknown to the exporter, reexporter, or transferor. This uncertainty raises a Red Flag that needs to be resolved before the exporter, reexporter, or transferor proceeds with the transaction. New Red Flag 21 specifies this uncertainty requires the need for due diligence particularly for items where such information would typically be known to an exporter, reexporter, or transferor, such as for advanced computing items, supercomputers, or SME.

New Red Flag 22 identifies a scenario where an order or request related to an item that would require an export, reexport, or in-country transfer license from BIS or another jurisdiction (*i.e.,* from another foreign government) that maintains controls on the item and the exporter, reexporter, or transferor has uncertainty about the license history for the item—meaning the exporter, reexporter, or transferor is not sure whether the export, reexport, or transfer (in-country) was properly authorized in accordance with the EAR and/or by the respective foreign government. New Red Flag 22 provides an example where there is information known to the exporter, reexporter, or transferor indicating that a license was not, or was not likely to have been, obtained by the end user, such as where the end user or end use, or the ECCN and end-user destination triggers a license review policy of a presumption of denial. New Red Flag 22 specifies that these uncertainties raise a Red Flag that needs to be resolved before the exporter, reexporter, or transferor proceeds with further transactions related to the item to avoid the risk of violating § 764.2(e), which includes acting on requests to service, install, upgrade, or otherwise support the item of concern.

New Red Flag 23 identifies a scenario where an exporter, reexporter, or transferor receives a request to service, install, upgrade, or otherwise maintain an item that was altered after export by a third-party for a more advanced end use that would normally require a license for the destination. New Red Flag 23 specifies that this scenario would raise a Red Flag that the item is employed in a prohibited end use that would need to be resolved before proceeding further with the transaction.

New Red Flag 24 identifies another scenario related to a request for an item or service from a new customer whose senior management or technical leadership (*e.g.,* process engineers that are team leaders or otherwise leading development or production activities) overlaps with an entity on the Entity List, particularly if the supplier previously provided the same or substantially similar item or service to the Entity List entity, most likely prior to the listed entity being added to the Entity List. New Red Flag 24 specifies that this scenario would raise a Red Flag that the entity requesting the item or service is engaged in or supporting the same prohibited end use as the Entity List entity. The exporter, reexporter, or transferor would need to conduct additional due diligence before proceeding with the transaction with the new customer.

New Red Flag 25 identifies another scenario related to servicing a request from a new customer for an item or service that was designed or modified for an existing or former customer that is now designated on the Entity List. New Red Flag 25 specifies that this scenario would raise a Red Flag that the new customer has assumed the operations for which the item or service is still needed to engage in or support the same prohibited end use for which the Entity List entity was listed. This Red Flag would need to be resolved by the exporter, reexporter, or transferor before proceeding.

New Red Flag 26 provides additional guidance that will assist exporters, reexporters, and transferors in complying with the two new FDP rules added to the EAR in this IFR. See section III.A of this preamble for a description of the two new FDP rules related to the production of ''advanced-node ICs'' implemented by this IFR. Red flag 26 specifies that when analyzing the scope of the Entity List FDP rules for Footnote 5 entities, if a foreign-produced item is described in the relevant Category 3B ECCN in §§ 734.9(e)(3)(i) or 734.9(k)(1) and contains at least one IC, then there is a Red Flag that the foreign-produced item meets the product scope of the applicable FDP rule and the exporter, reexporter, or transferor must resolve the Red Flag before proceeding. Key components, including ICs, are key to the functioning of SME, and such components are dependent on U.S. technology and software as well as on tools derived from U.S. technology and software. BIS has concluded, based on assessments of supply chain data, that there is a significant prevalence of certain types of U.S.-origin tools (or foreign-produced tools that are the direct product of U.S.-origin technology or software) in fabrication facilities for the production of ICs. As with all Red Flags, exporters, reexporters, and in-country transferors will need to conduct due diligence before continuing with the transaction. Such additional diligence is necessary in order to ensure that items produced with the use of U.S. technology, software, or tools, including ICs that are contained in the specified foreign-produced commodities being

controlled, are not sent to end users contrary to U.S. national security and foreign policy interests.

New Red Flag 27 identifies a scenario where the end user is a ''facility'' that is physically connected to a ''facility'' where ''production'' of ''advanced-node ICs'' occurs. Each building is considered a separate ''facility,'' but if multiple buildings are connected in such a way that allows for the ''production'' of the integrated circuits across the physically connected buildings, this raises a Red Flag that ''production'' of ''advanced-node ICs'' occurs in each one of the connected facilities. The Note to Number 27 states that, for example, if an exporter, reexporter, or transferor receives an equipment order from a company that is engaged in ''production'' of non-''advanced-node ICs'' in one building, and this building is physically connected to another building where the ''production'' of ''advanced-node ICs'' occurs, then both buildings would be subject to the controls under § 744.23 of the EAR, unless the exporter can demonstrate that the destination facility is not engaged in the ''production'' of ''advanced-node ICs.'' The Note to Number 27 provides that to resolve the red flag, the exporter should submit an advisory opinion to BIS. Otherwise, the two buildings are treated as a single ''facility'' for purposes of license requirements under § 744.23 of the EAR.

4. Revisions to the Definition of ''Advanced-Node Integrated Circuit'' Related to DRAM

In § 772.1 (Definitions of terms as used in the Export Administration Regulations (EAR)), this IFR revises the definition of ''Advanced-Node Integrated Circuits (Advanced-Node IC)'' by revising the criteria for how DRAM ICs is defined. In paragraph 3 of the definition, this IFR removes the criterion using a ''production'' 'technology node' of '18 nanometer half pitch or less' and adds in its place two different criteria. When either of these two criteria are met, the commodity would be considered a DRAM integrated circuit for purposes of this definition. Specifically, this IFR specifies that DRAM integrated circuits meet the definition of ''Advanced-Node Integrated Circuits (Advanced-Node IC)'' when the integrated circuit either has a memory cell area of less than 0.0019 square micrometers (μm^2); or a memory density greater than 0.288 gigabits per square mm.

For additional context on the reason for this change, in parts 734 and 744 of the EAR, ''advanced-node ICs'' include logic, DRAM, and NAND ICs that meet certain technical parameters. This IFR updates the technical parameters defining advanced-node DRAM ICs. The previous definition used half-pitch to characterize advanced-node DRAM ICs. However, that definition allowed fabrication facilities to make substantial improvements in memory density by using more compact memory cell architectures, as well as by stacking DRAM in three dimensions, without meeting the definition, thereby avoiding controls. Furthermore, the previous definition did not capture HBM, which is crucial to frontier AI training and inference and is typically co-packaged with advanced logic chips for datacenter AI and supercomputing.

The definition in this IFR uses a memory density and memory cell area standard that captures both advances in memory cell miniaturization as well as HBM and other memory devices that stack layers of DRAM vertically to achieve greater densities without reducing half-pitch. A technical note also defines the cell area. The intent of this change in the definition of advanced-node DRAM ICs is not to change the current impact of the end-user controls, but to prevent possible future workarounds, especially the production of high bandwidth memory for advanced computing ICs. As a conforming change, the reference to paragraph three is removed from Note 1 to the definition.

This IFR also removes the Technical Note to the definition, as it is no longer needed because of the other clarifying changes made to this definition, in particular the addition of new Note 2 to the definition of ''Advanced-Node Integrated Circuits.'' This IFR adds a new Note 2 to the definition of ''Advanced-Node Integrated Circuits (Advanced-Node IC)'' to specify that memory density is measured in gigabytes (GB) of memory capacity of the package or stack, divided by the footprint of the package or stack measured in square millimeters. Note 2 also clarifies that in the case where a stack is contained in a package, the area of the package should be used in the classification. Finally, Note 2 specifies that cell area is defined as Wordline*Bitline (which takes into consideration both transistor and capacitor dimensions).

5. Clarifications to Section 744.23

(i) Revisions To Address Support for ''Development'' and ''Production'' of Advanced-Node ICs

This IFR adds new paragraph (a)(2)(iii) in § 744.23 to clarify that § 744.23(a)(2) restricts the provision of Electronic Computer Aided Design (ECAD) and Technology Computer Aided Design (TCAD) ''software'' and ''technology'' subject to the EAR when you ''know'' it will be used in the design of ''advanced-node IC'' whose subsequent ''production'' will be in Macau or a destination in Country Group D:5.

This IFR also adds new paragraph (a)(2)(iv) in § 744.23 to add an ''advanced node IC'' exclusion to specify the license requirements for items specified in paragraphs (a)(2)(i) and (ii) destined to entities designated with a Footnote 5 are not subject to the license requirements in this section. This IFR adds this exclusion because the Entity List license requirements for these Footnote 5 entities will already impose a license requirement for these items, so the additional license requirement under § 744.23(a)(2)(i) and (ii) is not needed to protect U.S. national security and foreign policy interests for these entities.

(ii) Revisions To Address Support for Indigenization of Semiconductor Manufacturing Supply Chains

BIS continues to evaluate public comments received on the AC/S IFR, the SME IFR, and the April 4 IFR. BIS intends to address those comments in a future rulemaking. In the meantime, in this IFR, BIS is revising § 744.23(a)(4) to address several specific questions and concerns about the application of § 744.23(a)(4)(ii)(B), added in the April 4 IFR, to both the initial and intermediate ''development'' or ''production'' of Category 3B SME specified in § 744.23(a)(4). Specifically, BIS is revising § 744.23(a)(4)(ii) to make clear that the end-use control may apply to any item subject to the EAR and specified on the CCL when: (1) the item (either in its original form or as subsequently incorporated into a foreign-made item) is for the ''development'' or ''production'' of any foreign-made item specified in the end-use control; and (2) the ''development'' or ''production'' is by an entity headquartered in or whose ultimate parent is headquartered in Macau or a destination specified in Country Group D:5. Because of this clarification to paragraph (a)(4)(ii), paragraph (B) is no longer needed, so this IFR removes paragraph (a)(4)(ii)(B) and redesignates paragraph (a)(4)(ii)(C) as paragraph (B).

BIS is also adding the parenthetical phrase ''(and not excepted by that paragraph)'' to paragraph (A) of § 744.23(a)(4)(ii)(A) to clarify that the exclusions (*e.g.,* for masks) to the ECCNs listed in § 744.23(a)(4)(i) also apply in the controls under § 744.23(a)(4)(ii).

Further, BIS is eliminating the qualification for 'front-end integrated circuit ''production'' equipment' in current Note 1 to § 744.23(a)(4). BIS believes this approach will simplify compliance with the end-use control by eliminating questions about whether an end-use involves ''development'' or ''production'' of a 'front-end' versus 'back-end' item, and it will reduce the risk that items subject to the EAR are diverted from purported ''development'' or ''production'' of back-end items to front-end items specified in the same ECCNs. As noted in the SME IFR, BIS continues to welcome feedback from industry on specific ECCNs that are not used in front-end production of ICs and could be excluded from the ECCN scope of § 744.23(a)(4).

BIS is also adding ECCN 3B903 to the list of qualifying ECCNs to reflect updates to Category 3B under the IFR, ''Commerce Control List Additions and Revisions; Implementation of Controls on Advanced Technologies Consistent with Controls Implemented by International Partners'' (89 FR 72926, September 6, 2024).

SME specified in ECCNs 3B903, 3B992, 3B993, and 3B994 are added to the end-use license requirement in § 744.23(a)(4)(i). Accordingly, a license is now required to export, reexport, transfer (in-country) any item subject to the EAR and specified on the CCL when destined to or within either Macau or a destination specified in Country Group D:5 for the ''development'' or ''production'' of ''equipment,'' ''components,'' ''assemblies,'' or ''accessories'' specified in ECCNs 3B903, 3B992, 3B993, and 3B994.

Additional changes to § 744.23 are discussed in section III.C.2 of the preamble.

6. Conforming and Clarifying Revisions to General Prohibition Three

In § 736.2 (General prohibitions and determination of applicability), this IFR revises paragraph (b)(3)(i) (*General Prohibition Three—Foreign-direct product (FDP) rules*), to clarify that the prohibition extends to any foreign-produced items that are subject to the EAR pursuant to § 734.9 if such items are subject to a license requirement in part 736, 742, 744, 746, or 764 of the EAR. The existing Entity List FDP rules under § 734.9(e)(1) and (2) already extend to foreign-''direct products'' and certain other foreign-produced items, and the new FN5 FDP will do the same. This revision to § 736.2(b)(3)(i) is a conforming and clarifying change.

7. Revision to General Order No. 4 Temporary General License

The Temporary General License (TGL) in supplement no. 1 to part 736, General Order no. 4, is amended by adding newly added SME ECCNs (*i.e.,* 3B001.c.4, 3B993.b.1, c.2, c.3, d.4, f.2, f.3, o.2, q.1, q.2, 3B994, 3D993.a (for commodities specified in paragraph (d)(1)(i)(B)), 3D993.b through .d, 3D994, 3E993.a (for commodities specified in paragraph (d)(1)(i)(B)), 3E993.b, and 3E994) to this authorization in paragraph (d)(1)(i). Paragraph (d)(2)(ii) is revised by adding 3A090.c when destined to or within Macau or a destination in Country Group D:5 and cascading the paragraph into three separate paragraphs (d)(2)(ii)(A)(1) through (3). See Section C.2 for more details regarding the addition of 3A090.c (high bandwidth memory). In addition, a new paragraph (d)(2)(ii)(B) is added to add an additional ultimate end use for 3A090.c. This IFR also revises the paragraph (d)(3) validity date to extend it as follows: (1) for SME items controlled only for AT reasons, until December 31, 2026; (2) for SME items added to the CCL in this rule (*i.e.,* excluding items that were moved from 3B001 to 3B993, but not previously eligible for paragraph (d)(1)) until December 31, 2026; (3) for items specified in paragraph (d)(2)(i)(A), until December 2025; and (4) for HBM items specified in paragraph (d)(2)(i)(B), until December 2026. In order to not disrupt IC supply chains and from discussions with industry, BIS is extending the validity period for AT only items for one additional year (December 31, 2026). BIS is setting the validity period for SME items added to the CCL to one year (December 31, 2026). BIS is not extending the validity deadline for advanced compute items because it is no longer needed because of new licenses and new additions to the VEU for these companies. The validity for the new HBM items is set at one year (December 31, 2026) to allow for adjustment to the new controls.

8. Revisions to ''U.S. Persons'' Restrictions in § 744.6

This IFR revises paragraph (c)(2)(iii) of § 744.6 to synchronize the product scope with the license requirement product scope in §§ 742.4(a)(4) and 742.6(a)(6) of the EAR.

9. Revisions to § 770.2

This IFR revises § 770.2 to make conforming changes to paragraph (o)(2)(i) by adding ECCNs 3D992, 3D993, 3E992, and 3E993.

10. Conforming Changes to Foreign Direct Product Rules

This IFR adds ECCNs 3D901, 3D992, 3D993, 3D994, 3E901, 3E992, 3E993, and 3E994 to the following foreign direct product rules in § 734.9: Entity List FDP: Footnote 1 (§ 734.9(e)(1)(i)(A) and (B)), Entity List FDP: Footnote 4 (§ 734.9(e)(2)(i)(A) and (B)), Advanced Computing FDP rule (§ 734.9(h)(1)(i)(A) introductory text, (h)(1)(ii)(A)), Supercomputer FDP rule § 734.9(i)(1)(i) and (ii)).

11. Conforming Changes to Section 742.4

This IFR corrects a paragraph designation in § 742.4 under paragraph (a)(5) to redesignate the second reference to paragraph (a)(5)(ii)(B)(i) and (ii) as paragraphs (a)(5)(ii)(B)(*1*) and (*2*) as intended. This IFR does not change the first reference to paragraph (a)(5)(ii) in § 742.4, which is correct.

C. Addition of High Bandwidth Memory (HBM) Controls

1. Addition of New 3A090.c

Control of advanced memory chips is key to national security because of their military, intelligence, and surveillance applications. In particular, advanced AI models rely on a type of advanced memory called HBM, which is found in almost all advanced computing ICs destined for advanced AI data centers. As the speed of advanced logic increases, a similar increase in memory capacity and bandwidth is required; otherwise, the full capabilities of the processor cannot be realized. In advanced AI and supercomputing, advanced logic chips must be paired with advanced memory to avoid this memory bottleneck. As such, HBM is critical to both AI training and inference at scale and a key component of advanced computing ICs.

Based on the importance of HBM described above, BIS is adding a new ECCN control on HBM stacks with a specific memory bandwidth density to ECCN 3A090.c. HBM units are optimized for very high memory bandwidth, unlike general consumer-grade dynamic random access memory (DRAM) chips, so this threshold will narrowly target controls at HBM. BIS uses the bandwidth density—rather than just the bandwidth—to ensure controls will still apply if an IC uses a larger quantity of smaller HBM chips at little additional cost. As indigenous PRC advanced computing ICs rely upon imported HBM, new ECCN 3A090.c implements restrictions to slow PRC attempts to indigenize advanced AI chip production, which, as explained above,

raises national security and foreign policy concerns.

Under ECCN 3A090, this IFR adds a new items paragraph .c to impose a new CCL-based control for certain HBM commodities. Also, under the advanced computing FDP rule in § 734.9(h), foreign-produced 3A090.c items will be subject to the EAR if they meet the scope of that FDP rule. Under new 3A090.c, this IFR will control HBM having a 'memory bandwidth density' greater than 2 GB per second per square millimeter (mm). All HBM stacks currently in production exceed this threshold.

This IFR also adds a technical note to 3A090.c to define for purposes of this ECCN that 'memory bandwidth density' is the memory bandwidth of the package or stack measured in GB per second divided by the area of the package or stack measured in square mm. The new technical note to 3A090.c includes a sentence to clarify that where a stack is contained in a package, the item should be classified using the memory bandwidth of the packaged device and the area of the package. The new technical note to 3A090.c also includes a sentence highlighting that high bandwidth memory includes dynamic random access memory integrated circuits, regardless of whether they conform to the JEDEC standards for high bandwidth memory, provided they have a 'memory bandwidth density' greater than 2 GB per second per square mm. Lastly, technical note to 3A090.c specifies that certain co-packaged integrated circuits are excluded from the scope of 3A090.c, as this control does not cover co-packaged integrated circuits with both HBM and logic, where the dominant function of the co-packaged integrated circuit is processing. The technical note further clarifies that this control does include HBM permanently affixed to a logic integrated circuit designed as a control interface and incorporating a physical layer (PHY) function. Advanced computing ICs containing co-packaged logic and HBM are not controlled by 3A090.c, though they may be controlled by other ECCNs such as 3A090.a or 3A090.b depending on their Total Processing Performance (TPP) and performance density.

This IFR imposes these new controls on HBM stacks under ECCN 3A090.c because these commodities are an important part of the ''production'' process for making advanced computing ICs, which prior to this IFR were not being controlled under ECCN 3A090. In order to more effectively address the national security and foreign policy concerns which are being addressed under ECCN 3A090, BIS added a control on HBM to prevent the PRC, as well as other destinations of concern, from producing advanced computing ICs incorporating HBM.

If these HBM stacks are incorporated into an IC or a higher-level commodity, such as a computer or electronic assembly, then ECCN 3A090.a, .b, 4A090.a or .b, or the respective .z controls may impose controls on the commodities containing HBM. The national security and foreign policy concerns are focused on HBM, as covered under 3A090.c, that is exported as a stand-alone commodity (*i.e.,* when not incorporated into a higher-level commodity). When a 3A090.c commodity is incorporated into another commodity, such as a 3A090.a, .b, or another commodity, the EAR controls applicable to those other commodities are sufficient to address the export control concerns with these 3A090.c commodities.

This IFR also redesignates and revises Note 2 to 3A090 as new Note 1 to 3A090.a and 3A090.b, including adding references to 3A090.a and 3A090.b in the note and repositioning the note, so it appears immediately after 3A090.a and .b. This IFR also redesignates Note 1 to 3A090 as Note 2 to 3A090 to reflect the reordering of the notes in ECCN 3A090.

2. Conforming Changes for Addition of 3A090.c

This IFR also makes the following eight conforming changes to other parts of the EAR to address the addition of 3A090.c:

In supplement no. 1 to part 736—General Orders, this IFR revises General Order No. 4 under paragraph (d)(2) (TGL—Advanced computing items) to redesignate the introductory text of (d)(2)(ii) (End-use scope), except for the heading that is added by this rule, as new paragraph (d)(2)(ii)(A) (*For all items under paragraph (d)(2)(i)).* This IFR also adds a new paragraph (d)(2)(ii)(B) (*Additional permitted ultimate end use for 3A090.c.*) to clarify the application of the ultimate end use requirement for 3A090.c commodities that are authorized under the TGL. As described in new paragraph (d)(2)(ii)(A), for other items, the TGL requires the ultimate end use of these other items to be outside of destinations specified in Country Groups D:1, D:4, or D:5 (and not specified in Country Groups A:5 or A:6) by entities not headquartered in or whose ultimate parent company is not headquartered in Macau or a destination specified in Country Group D:5 in all cases. The first sentence under new paragraph (d)(2)(ii)(B) specifies that the ultimate end use of 3A090.c commodities allows for use in any destination once the 3A090.c commodity is incorporated into another commodity, provided that higher-level commodity is not a commodity that is identified under paragraph (d)(2)(i) of this General Order No. 4. This sentence is needed because 3A090.c in certain cases may be incorporated into consumer electronics that would not otherwise be of concern for advanced AI, so therefore the ultimate end-use restriction is qualified with the addition of this sentence. The second sentence under new paragraph (d)(2)(ii)(B) specifies that if the higher level commodity is identified under paragraph (d)(2)(i), of this General Order No. 4, then the ultimate end use of these items is authorized under paragraph (d)(2)(ii) for destinations other than those specified in Country Groups D:1, D:4, or D:5 (and not specified in Country Groups A:5 or A:6) by entities not headquartered in or whose ultimate parent company is not headquartered in Macau or a destination specified in Country Group D:5. Lastly, the third sentence under new paragraph (d)(2)(ii)(B) clarifies that any subsequent export, reexport, or transfer (in-country) of a 3A090.c commodity (regardless of whether it was incorporated into a higher-level commodity) would also need to comply with any other applicable EAR license requirements that may be applicable, such as those based on the classification (including, if relevant, of the higher-level commodity) and the end use and parties to the transaction.

This IFR revises the introductory text in § 740.8 (Notified Advanced Computing (NAC) and Advanced Computing Authorized (ACA)), paragraph (a) (Eligibility requirements) to specify that ECCN 3A090.c is not eligible for License Exception NAC or ACA. This exclusion is made because of concerns that HBM classified under 3A090.c could be diverted for incorporation into other items that would be of national security and foreign policy concern for advanced AI model training applications. However, if the HBM is incorporated into another commodity, those concerns are sufficiently addressed through the export controls imposed under the EAR for the higher-level commodity. Based on the same rationale, this IFR does not extend the .z controls to items that meet or exceed the controls parameters under 3A090.c, because if a 3A090.c item is incorporated into a higher-level commodity, the classification and controls for the higher-level commodity

applies. Lastly, if a 3A090.c commodity were incorporated into a commodity that is eligible for License Exception NAC or ACA, that higher-level commodity (*e.g.,* a 3A090.b commodity) would not be precluded from being authorized under License Exception NAC or ACA. See § 770.2 (Item interpretations) under paragraph (b) (*Interpretation 2: Classification of ''parts'' of machinery, equipment, or other items*). As an additional conforming change for this exclusion of 3A090.c from NAC and ACA, this IFR also revises the NAC/ACA paragraph in the License Exceptions section of ECCN 3A090 to specify that NAC/ACA is N/A for 3A090.c.

This IFR makes a third conforming change in § 742.6 (Regional stability). Paragraph (a)(6)(i) (*Exports, reexports, transfers (in-country) to or within Macau or Country Group D:5)* is revised to designate the text in paragraph (a)(6)(i) as paragraph (a)(6)(i)(A) and add a new paragraph (a)(6)(i)(B) to set forth license requirements for high bandwidth memory (HBM) items specified in ECCNs 3A090.c, 3D001 (for 3A090.c), and 3E001 (for 3A090.c) when exported, reexported, or transferred (in-country) to or within Macau or a destination specified in Country Group D:5 in supplement no. 1 to part 740 of the EAR.

This IFR also revises, as a conforming change, paragraph (a)(6)(iii) (Exports, reexports, transfers (in-country) to or within destinations specified in Country Groups D:1, D:4, and D:5, excluding destinations also specified in Country Groups A:5 or A:6) to specify that 3A090.c, 3D001 (for 3A090.c), and 3E001 (for 3A090.c) are excluded from the license requirements in this paragraph. These conforming changes are needed because the license requirements described in paragraph (a)(6)(iii) that apply for 3A090 and for the related software and technology controls for 3A090 will not apply for 3A090.c, which will have narrower RS license requirements than the rest of 3A090, as this IFR specifies in paragraph (a)(6)(i).

This IFR also revises paragraph (b)(10)(i) to update the reference to newly designated paragraph (a)(6)(i)(A), in alignment with the change made to that paragraph. This IFR redesignates paragraph (b)(10)(ii) as paragraph (b)(10)(iii), and new paragraph (b)(10)(ii) now sets forth the license review policy for new paragraph (a)(6)(i)(B) (for HBM). There is a presumption of approval review policy for license applications for items specified in paragraph (a)(6)(i)(B) to or within Macau or a destination specified in Country Group D:5 in supplement no. 1 to part 740 of the EAR for entities neither headquartered in, nor whose ultimate parent company is headquartered in, either Macau or a destination specified in Country Group D:5. There is a presumption of denial policy for all other license applications.

This IFR also revises former paragraph (b)(10)(ii) (*License review policy for paragraph (a)(6)(iii)*) to cascade it into two new paragraphs (b)(10)(iii)(A) for presumption of approval policy and paragraph (b)(10)(iii)(B) for presumption of denial and case-by-case policy. The presumption of approval policy in paragraph (b)(10)(iii)(A) and the presumption of denial policy in paragraph (b)(10)(iii)(B) is unchanged by this IFR. BIS has added a case-by-case license review policy for paragraphs (b)(10)(iii)(B)(i) and (ii), which are those that would qualify for License Exception NAC in § 740.8 of the EAR.

This IFR makes a fourth and fifth conforming change in § 744.23 (''Supercomputer,'' ''advanced-node ICs,'' and SME end use controls). This IFR makes a conforming change to paragraph (a)(3)(i) to account for the RS license requirement for 3A090.c items destined to Macau or destinations specified in Country Group D:5, requiring a different destination scope for the end-use control under § 744.23(a)(3)(i) compared to the other items referenced in this paragraph. This IFR addresses this needed end-use control conforming change by making the following changes. In § 744.23(a)(3)(i), this IFR adds a heading to paragraph (i) (*ECCNs 3A090, 4A090, and .z items destined to entities headquartered in, or whose ultimate parent company is headquartered in, either Macau or a destination specified in Country Group D:5 in certain destinations*) and removes the text from paragraph (i) and adds that text to new paragraph (a)(3)(i)(A). BIS also amends that paragraph by excluding 3A090.c from the scope of this end-use license requirement and revising the parenthetical phrase at the end of the paragraph to make that example easier to understand. In another conforming change related to 3A090.c, this IFR adds a new paragraph (a)(3)(i)(B) to impose an end-use license requirement for ECCN 3A090.c commodities when there is ''knowledge'' these commodities are destined to any destination other than Macau or those specified in Country Group D:5, for an entity that is headquartered in, or whose ultimate parent company is headquartered in, either Macau or a destination specified in Country Group D:5. Lastly, this IFR adds a parenthetical phrase with an application example under new paragraphs (a)(3)(ii) to provide a better understanding of this provision.

In addition, paragraph (a)(3)(ii) introductory text and paragraph (a)(ii)(D) of § 744.23 are revised to add an exclusion for 3E001 technology for 3A090.c, because the intent of this end-use control for certain 3E001 technology is focused, for example, on preventing a PRC company located in PRC from sending its designs to a logic foundry in a third country to manufacture 3A090 chips under 3A090.a or .b for the PRC company. The license review policy for 3A090.c and related ''technology'' and ''software'' destined to Macau, destinations specified in Country Group D:5, or any entity headquartered in, or with an ultimate parent headquartered in, either Macau or a destination specified in Country Group D:5 will be consistent with the current policy for ECCN 3A090 pursuant to § 744.23(d)(1) of the EAR. Additional changes to § 744.23 are discussed in section III.B.5 of this preamble.

This IFR makes a sixth conforming change related to 3A090.c in § 758.6 (Destination control statement and other information furnished to consignees). The last sentence of paragraph (a)(2) is revised by adding .c to the reference to 3A090.a or .b, so it is clear that, for tangible exports of ECCN 3A090 commodities, 3A090.c needs to be identified on the commercial invoice, in the same way as 3A090.a or .b needs to be identified on the commercial invoice.

As the seventh and eighth conforming changes related to 3A090.c, this IFR revises two ECCNs in the Commerce Control List, 3D001 and 3E001, for the related software and technology controls for 3A090.c to conform with the revisions to § 742.6 for the RS controls that are applicable to these related software and technology ECCNs.

Under ECCN 3D001, this IFR revises the RS Controls paragraph in the License Requirements section to exclude software for 3A090.c from RS license requirements under § 742.6(a)(6)(iii), consistent with the exclusion of 3A090.c and 3E001 technology for 3A090.c from the scope of § 742.6(a)(6)(iii). In addition, this IFR also adds an RS Controls paragraph in the License Requirements section to reference § 742.6(a)(6)(i), including adding 3A090.c to this RS license requirement because software for 3A090.c is included in the scope of § 742.6(a)(6)(i). Previously, this RS Controls paragraph that references § 742.6(a)(6)(i) was not included in the License Requirements section. To conform with the RS license

requirements in § 742.6(a)(6)(i), this IFR corrects that omission by adding this intended RS Controls paragraph, along with including a reference to new ECCN 3A090.c.

Under ECCN 3E001, this IFR revises the RS Controls paragraph in the License Requirements section that references § 742.6(a)(6)(iii), to exclude 3A090.c from this RS license requirement because 3E001 technology for 3A090.c is excluded from the scope of § 742.6(a)(6)(iii). In addition, this IFR adds a new RS Controls paragraph in the License Requirements section of ECCN 3E001 for 3A090.c to impose a RS license requirement under § 742.6(a)(6)(i)(B) for exports, reexports, and transfers to or within Macau or a destination specified in Country Group D:5 of supplement no. 1 to part 740.

3. Addition of New License Exception HBM for 3A090.c

In part 740 (License Exceptions), this IFR adds a new License Exception HBM under § 740.25. This IFR adds License Exception HBM to authorize certain exports, reexports, and transfers (in-country) for some of the new HBM commodities that this IFR adds to ECCN 3A090.c. License Exception HBM consists of paragraphs (a) through (e), which specify the terms and conditions of this new license exception and create a more efficient authorization for certain exports, reexports, or transfers (in-country) of these new ECCN 3A090.c commodities that are in U.S. national security and foreign policy interests. This license exception authorizes exports, reexports, and transfers (in-country) when both: (1) the export, reexport, or transfer (in-country) is completed by and to packaging sites that, even if located within a country of concern, are owned and operated by U.S. or allied headquartered companies, alleviating the national security concerns about those destinations; and (2) where the U.S. or allied headquartered company carefully tracks the HBM being sent and returned by the packaging site and resolves discrepancies or report them to BIS. As a result, the exception helps ensure that national security and foreign policy considerations are addressed without delaying the ability of U.S. and allied headquartered companies to continue operations that do not raise national security or foreign policy concerns.

Specifically, this IFR adds paragraph (a) (Scope) to specify that License Exception HBM authorizes the export, reexport, or transfer (in-country) of items specified in ECCN 3A090.c on the CCL if all terms and conditions within this section are met.

This IFR adds paragraph (b) (Exporter, reexporter, transferor) to impose requirements on who may be an exporter, reexporter or transferor under License Exception HBM. This IFR specifies under paragraph (b) that the exporter, reexporter, or transferor must be headquartered in the United States or a destination specified in Country Group A:5 of supplement no. 1 to part 740, without an ultimate parent headquartered in Macau or a destination specified in Country Group D:5 of supplement no. 1 to part 740. No other exporter, reexporter, or transferor may use License Exception HBM.

This IFR adds paragraph (c) (Conditions) to specify that exports, reexports, or transfers (in-country) are authorized under this License Exception HBM only when the 3A090.c item has a memory bandwidth density less than 3.3 GB/s/mm^2. Only HBM at less than this parameter may be authorized under License Exception HBM. HBM at equal to or greater than this parameter referenced under paragraph (c) are of greater sensitivity, so those HBM of greater sensitivity are not eligible for HBM to ensure U.S. national security and foreign policy interests are protected. In order to export, reexport, or transfer (in-country) such HBM, both of the conditions that are specified under paragraphs (c)(1) and (c)(2) must be met.

New paragraph (c)(1) of License Exception HBM specifies that the 3A090.c items exported, reexported, or transferred to or within Macau or a destination specified in Country Group D:5 must be directly purchased by the designer of the co-packaged commodity. Because of the greater export control concerns with shipments through distributors related to diversion, this condition ensures that the exporter, reexporter, or transferor must know who the designer of the co-packaged commodity is and that the designer is the entity that the co-packaged commodity is being exported, reexported, or transferred (in-country) to under License Exception HBM.

New paragraph (c)(2) of License Exception HBM specifies that the 3A090.c items must be shipped directly to the packaging site, which is included to prevent diversion. HBM are used at packaging sites, so this condition is intended to further ensure that the HBM are being exported, reexported, or transferred (in-country) directly to the end user and not to other parties that would pose a greater risk of diversion.

Paragraph (c)(2)(i) of License Exception HBM applies to 3A090.c items that are destined for packaging at a U.S.- or Country Group A:5 or A:6-headquartered packaging site without an ultimate parent headquartered in Macau or a destination specified in Country Group D:5 and meet the additional conditions this IFR adds under paragraph (c)(2)(i)(A) and (B). New paragraph (c)(2)(i)(A) specifies that the packaging site must confirm in writing to the producer of the chips that the 3A090.c item was packaged and exported, reexported, or transferred (in-country) to the specified designer of the co-packaged commodity. The second sentence to paragraph (c)(2)(i)(A) specifies that this confirmation is considered an ''export control document'' and is subject to recordkeeping requirements in part 762. New paragraph (c)(2)(i)(B) specifies that the co-packaged commodities must not exceed the technical thresholds in ECCN 3A090, unless packaging the item is permitted under the TGL specified in paragraph (d) of General Order No. 4 in of supplement no. 1 to part 736. This condition under paragraph (c)(2)(i)(B) is excluded because there is greater export control concern if a 3A090.c item is being incorporated into a 3A090.a or 3A090.b commodity, unless that activity is within the scope of the TGL.

Paragraph (c)(2)(ii) of License Exception HBM specifies that if the 3A090.c items are destined for packaging at any other packaging site, then the co-packaged commodities must be sent back to the exporter, reexporter, or transferor for export, reexport, or transfer (in-country) to the purchaser and meet the additional conditions under new paragraphs (c)(2)(ii)(A) and (B). New paragraph (c)(2)(ii)(A) specifies that upon receipt of the co-packaged commodities, the exporter, reexporter, or transferor must confirm the number of 3A090.c units contained within the co-packaged chips received from the packaging site matches the number of 3A090.c items exported, reexported, or transferred (in-country) to the packaging site. Similar to the text this IFR adds to paragraph (c)(2)(i)(A), this IFR adds a second sentence to paragraph (c)(2)(ii)(A) to specify that this confirmation is considered an ''export control document'' and is subject to recordkeeping requirements in part 762. As with all export control records, the IFR specifies under paragraph (c)(2)(ii)(A) that a copy of this record must be provided to BIS upon request. Paragraph (c)(2)(ii)(B) specifies that the co-packaged commodity must not exceed the technical thresholds in ECCN 3A090.a or 3A090.b. This is necessary because the logic die co-packaged with the HBM may still

exceed the TPP or performance density thresholds in 3A090.a or 3A090.b.

This IFR adds paragraph (d) (Restrictions) to specify certain exports, reexports, or transfers (in-country) of 3A090.c items that are not authorized under this License Exception HBM when specified under paragraphs (d)(1), (2), or (3). New paragraph (d)(1) excludes exports, reexports or transfers (in-country) to distributors. New paragraph (d)(2) excludes exports, reexports, or transfers (in-country) to intermediate consignees, unless hired by the packaging site for freight forwarding or customs clearance. New paragraph (d)(3) excludes exports, reexports, or transfers (in-country) to co-packaging at a ''facility'' located in Macau or a destination specified in Country Group D:5 where ''production'' of ''advanced-node ICs'' occurs. These three restrictions specified under paragraphs (d)(1) through (3) are needed to ensure the exports, reexports, and transfers (in-country) authorized under License Exception HBM will not be diverted contrary to U.S. national security and foreign policy interests.

This IFR adds paragraph (e) (Reporting requirement) to specify that in the event that the exporter, reexporter, or transferor identifies a discrepancy of greater than 1 percent between the number of 3A090.c units exported, reexported, or transferred (in-country) to the packaging site and the number of 3A090.c units contained within the co-packaged commodities received from the packaging site under paragraph (c)(2)(A) of this section, this generates a 'Red Flag' that must be resolved before exporting, reexporting, or transferring (in-country) the co-packaged commodities to the designer of the co-packaged commodities or engaging in any further exports, reexports, or transfers (in-country) of 3A090.c items to the designer of the co-packaged commodities or packaging site involved in the transaction that raised the Red Flag. The IFR adds a second sentence to the introductory text of paragraph (e) to specify that if the Red Flag cannot be resolved, then within 60 days of identifying the discrepancy, the exporter, reexporter, or transferor must report the information in new paragraph (e)(1) to BIS on the unresolved Red Flag, following the requirements under paragraph (e)(2).

New paragraph (e)(1) (Information required) specifies under paragraphs (e)(1)(i) through (vi) the information that needs to be reported to BIS. Specifically, paragraphs (e)(1)(i) through (e)(vi) specifies that the following information must be reported to BIS: (i) the date of shipment; (ii) the quantity shipped, and quantity returned; (iii) the name of Consignee or designer of the co-packaged commodities; (iv) the name and address of the packaging site; (v) the end use; and (6) an explanation of measures already taken or planned to resolve the Red Flag.

New paragraph (e)(2) (Submission requirements) specifies that reports must be provided in electronic form. Paragraph (e)(2) specifies that the recommended file formats for electronic submission include spreadsheets, tabular text, or structured text. Paragraph (e)(2) allows for submitters of such reports to request other reporting arrangements with BIS to better reflect their business models. Lastly, paragraph (e)(2) specifies that reports are to be sent electronically to BIS at the email address: *HBMReports@bis.doc.gov* with the email subject line Attn: LE HBM Discrepancy Reports. These changes are expected to result annually in an increase of 10 notifications to BIS under License Exception HBM.

As a conforming change for the addition of License Exception HBM, this IFR revises section 740.2(a)(9)(ii) to add the phrase ''HBM under the provisions of § 740.25'' to specify this is an additional EAR license exception that may overcome the general restriction, even though License Exception HBM is only available for ECCN 3A090.c. This IFR also adds a new Note to paragraph (a)(9)(ii) to provide guidance on why ECCN 3A090.c is included within the scope of this paragraph even though the destination scope referenced in this paragraph is broader than the destination scope of license requirements for 3A090.c. This new Note specifies under the first sentence that ECCN 3A090.c requires a license for exports, reexports, transfers (in-country) to or within Macau or Country Group D:5 but is still included within the scope of this paragraph because it generally shares the same EAR license exception eligibility as other 3A090 commodities. The last sentence of this note specifies that an export, reexport, or transfer (in-country) of an ECCN 3A090.c commodity to a destination specified in Country Groups D:1 or D:4 that is not specified in Country Group D:5, may be made under the No License Required (NLR) designation, provided no part 744 or 746 license requirements are applicable.

As a conforming change for the addition of License Exception HBM, in § 762.2 (Records to be retained) this IFR revises paragraph (b) (Records retention references) to add a new paragraph (b)(56) to reference § 740.25, License Exception HBM as a new record retention reference. This change is a conforming change with the addition of License Exception HBM and the new reporting requirement under § 740.25(e), which is considered an ''export control record'' for purposes of the EAR and must be kept in accordance with the requirements of part 762 of the EAR.

D. Clarification to the EAR: Software Keys

This IFR also clarifies the export controls that apply to the export, reexport, and transfer (in-country) of software keys that allow access to the use of certain software and hardware. This IFR revises existing § 734.19 (Transfer of access information) by redesignating the existing introductory text of the section as new paragraph (a) and adding a new paragraph (b), including adding a new Note 2 to paragraph (b), to describe the export control treatment of software license keys.

This clarification adds software keys, or software license keys, to new paragraph (b) in § 734.19(b). These keys allow the use of specific ''software'' (*e.g.,* to ''unlock'' the use of the software or hardware) and software keys that allow the renewal of existing software and hardware use licenses, thereby allowing the use of the ''software'' or hardware by the licensed end user.

Prior to this rule, the introductory text to § 734.19 described the transfer of ''access information'' only and did not otherwise address the export control status of software license keys that allow access but are not ''access information'' as defined in part 772 of the EAR. In this IFR, BIS is clarifying the scope of § 734.19 by adding a new paragraph (b) to specify the EAR treatment of software keys. To implement these changes, this IFR makes the following revisions:

To reflect the clarification of the intended scope of § 734.19, this IFR revises the heading of the section to read as ''Transfer of access information and export, reexport, and transfer (in-country) of software keys,'' so that it is clear that this section applies to both transfer of access information now described under paragraph (a) and the export, reexport, and transfer (in-country) of software keys described under new paragraph (b) that this IFR adds to this section.

This IFR redesignates the existing text of § 734.19 as new paragraph (a). This IFR as a conforming change redesignates Note 1 to § 734.19 as new Note 1 to § 734.19(a).

New paragraph (b) is added to specify that software keys, also called software license keys, which allow users the ability to use ''software'' or hardware by

providing access to it, and software keys that renew existing ''software'' or hardware use licenses, are classified and controlled under the same ECCNs on the CCL as the corresponding ''software'' or hardware to which they provide access, or in the case of hardware, the software key would be classified under the corresponding ECCN in the software group (*e.g.,* a software license key that allows the use of hardware classified under ECCN 5A992 would be classified under ECCN 5D992). This clarification is needed to inform exporters, reexporters, and transferors of the EAR's approach to software keys.

If authorization is required for the export, reexport, or transfer (in-country) of the ''software'' or hardware, authorization is likewise required for the software key. For example, if a license is required to export ECCN 5D992 software to an entity listed on the Entity List (*see* supplement no. 4 to part 744 of the EAR), a license is also required to release the associated software key that allows the entity access to that ''software.'' Importantly, this would apply even if the listed entity already had previous access to the ''software'' in question but needs a software key for current or future access to the ''software.''

Additionally, if authorization via an export license is obtained for the export, reexport, or transfer (in-country) of the ''software'' or hardware, that license also authorizes the export, reexport, or transfer (in-country) to the corresponding software license key, consistent with the terms and conditions set forth in the license. The license would continue to authorize access to the use of the ''software'' or hardware (not upgrades) until the license expires, provided the license did not specifically exclude such a release of the software license key, or require separate authorization for the software key.

If no authorization was required for the initial export of the ''software'' or hardware and the associated software key, but a license requirement is later imposed on the ''software'' or hardware (*e.g.,* a license requirement is imposed because the end user becomes listed on the Entity List), then subsequent exports, reexports, or transfers (in-country) of the ''software,'' hardware, and the software license key are subject to the new license requirement. This clarifies the application of paragraph (b) requirements when a change in the license requirement occurs between the initial export, reexport, or transfer (in-country) of the ''software'' or hardware, and the release of the software license key to access it.

Note 2 to paragraph (b) is added in § 734.19 to clarify that paragraph (b) does not impact keys that unlock dormant functionality in a controlled item. Note 2 to paragraph (b) addresses items with dormant functionality that can be activated using a license key. This typically occurs when an item is already activated and useable, but a customer wants to purchase and add additional features. In some cases, those additional features take an item from an uncontrolled to a controlled state, or from a lower to a higher control (*e.g.,* an AT-controlled item becomes NS-controlled). BIS has existing policies on the way it treats such a scenario that vary by category. The purpose of Note 2 to paragraph (b) is to make it clear that this rule is not intended to impact those existing policies.

As a conforming change, this IFR also revises the definition of ''access information'' in part 772 to specify that the definition of ''access information'' applies only to § 734.19(a), and not to § 734.19(b).

Instructions for submission of comments, including comments that contain business confidential information, are found in the **ADDRESSES** section of this IFR. BIS is requesting comments on whether the revisions promulgated in this IFR effectively describe the treatment of software keys, that allow users the ability to use the ''software'' and hardware, and software keys that renew existing ''software'' use licenses. Additionally, whether BIS should address the export control status of other types of keys and software access control mechanisms under the EAR. BIS will also accept comments on the relationship between the treatment of software keys as described in new § 734.19(b) and the treatment of keys that activate new dormant functionality in ''software'' or hardware that has already been activated.

E. Revisions to the Commerce Control List

1. Revisions to 3B001

This rule revises 3B001 by adding ''oxygen'' to paragraph 3B001.a.2 to implement a revision of a WA agreement. Oxygen is added due to recent developments in the epitaxial growth rate of gallium oxide in metal organic chemical vapor deposition (MOCVD) systems. Double quotes are added around the word ''production'' in Technical Note 1 to paragraph 3B001.e to indicate it is a defined term in § 772.1 of the EAR.

This section discusses the amendments to ECCN 3B001 other than the commodities moved to new ECCN 3B993, discussion of which is found in Section D.4 of the rule. No changes were made to ECCN 3B001 paragraphs .b, or .g through .n.

The ECCN 3B001 paragraphs amended and added in this rule are controlled for NS and RS reasons, as identified in §§ 742.4(a)(4) (NS) and 742.6(a)(6) (RS), which applies only to Macau and destinations specified in Country Group D:5. The entire entry is also controlled for anti-terrorism (AT) reasons and subject to an AT:1 license requirement. The License Requirement table is revised as needed to identify these reasons for control.

3B001.a.4 is updated as follows. The list of epitaxy materials is updated to only specify silicon and silicon germanium, but not carbon doped silicon. Carbon doped silicon epitaxy is still included under silicon epitaxy. The parameter specifying the chamber atmosphere has been removed. The parameter specifying temperature is updated to reflect that it refers to the chamber temperature, and the temperature value is converted from degrees Celsius to Kelvin. These changes are made to ensure that all systems capable of achieving similar epitaxial performance are specified regardless of their architecture or configuration. These changes are not intended to alter the original scope of control as published in October 2023, and BIS welcomes feedback on whether any fewer or additional systems are specified by the updated control text.

3B001.c.3 controls the etch equipment used to package a chip containing a through-silicon via (TSV) (*e.g.,* a HBM chip). The equipment specified by 3B001.c.3 performs a ''reveal etch,'' which removes silicon from the backside of the wafer and ''reveals'' the vias for subsequent packaging steps. To perform this process in high-volume manufacturing and at a high yield, this equipment employs endpoint detection to remove a highly precise thickness of material as well as ''process uniformity tuning,'' which is defined in the Technical Note to 3B001.c.3 to refer to the ability to compensate for incoming wafer thickness variation caused by the wafer grinding process.

3B001.c.4 controls etch equipment designed to create TSVs, which are formed by first etching a high-aspect ratio hole. This control specifies equipment designed for TSV etch with an aspect ratio of greater than or equal to 10:1, which BIS believes describes the TSVs used in advanced packaging applications, but not the TSVs used in legacy processes. The control further specifies that the equipment produces low non-uniformity (less than 2%) and

a high etch rate (greater than 7 microns per minute), which are important to maintain the throughput and yield necessary for high-volume manufacturing. BIS notes that 3B001.c.4 items are listed under 3B001 to reflect that they are subject to a destination-based license requirement for destinations specified in Country Group D:5 or Macau. If § 744.23 does not apply, applications will be reviewed on a case-by-case basis if no license would be required under any other provision of part 744 of the EAR.

3B001.d.3 is updated to specify that the plasma process described in d.3.b is a surface treatment.

3B001.d.4 and 3B001d.12 are updated to remove the specification that the transfer chamber or wafer handling system must maintain high vacuum (equal to or less than 0.01 Pascal (Pa)) or inert environment between process steps. This change is made to ensure relevant systems are specified based on their performance criteria (listed in the ECCN sub-paragraphs), rather than transfer pressure, which may vary from system to system.

3B001.d.5 is updated to change the specification of the carbon hard mask to being more than 2 µm thick and have a density greater than 1.7 grams per cubic centimeter (g/cm^3).

3B001.d.11: The parameters in this paragraph do not control the targeted SME, but 3B001.d.7, 3B001.d.8 and 3B001.10 do. Therefore, the control text is removed, and the paragraph is reserved.

3B001.d.14 has been updated to control a narrower set of equipment by specifying that the properties of the deposited film must have a lower dielectric constant and be deposited in features with a smaller lateral opening and smaller feature-to-feature pitch. As described below, the new paragraph 3B993.d.1 is created to be largely similar to the former paragraph 3B001.d.14.

The control text for former paragraph 3B001.d.16 has been moved to the new paragraph 3B993.d.2, as described below. Therefore, the control text is removed, and the paragraph is reserved.

New paragraph 3B001.d.17 controls equipment used for depositing dielectric material between the metal lines of advanced ICs. This material must have very low dielectric constant (low-k). Unlike control 3B001.d.15—which controls equipment that produces low-k films as-deposited—3B001.d.17 controls films that achieve a low k after curing with ultraviolet (UV) light. This UV curing is typically necessary for achieving the dielectric constants necessary for ''advanced-node ICs.'' This equipment uses a plasma-enhanced chemical vapor deposition process, which allows the substrate to be kept at a temperature below 500 degrees Celsius (°C). The most advanced equipment also includes the curing capability in the same platform as the deposition chamber to avoid exposing the deposited film to moisture in-transit between different platforms. Finally, this control specifies the geometry of the deposited film to be consistent with the advanced metal layers of advanced IC production nodes (thickness between 6 nanometers (nm) and 20 nm at an aspect ratio greater than or equal to 1:1.8, and a metal pitch less than 24 nm).

New paragraph 3B001.d.18 expands on the existing controls on equipment that deposits low-resistivity metals used in advanced memory integrated circuits. Namely, this expands on the controls on molybdenum and ruthenium beyond controls 3B001.d.12.b and 3B001.d.13, respectively. 3B001.d.18 includes deposition techniques that utilize a reducing agent, rather than keeping the chamber under vacuum. Additionally, the control does not specify the type of precursor, but instead specifies a precursor temperature above 75°C. 3B001.d.18 also includes a note to specify that the metal precursor could be located on the tool or elsewhere in the facility in a sub-fab. In some cases, a fabrication facility will separate out toxic materials from the main fabrication facility, instead placing them in a dedicated ''sub-fab.''

The new 3B001.d.19 controls equipment designed or modified for depositing insulators used in advanced DRAM. As memory cells shrink, the DRAM cell's capacitor needs to use an insulator with a higher dielectric constant to compensate for its decreased size. 3B001.d.19 controls equipment that deposits material in very high aspect ratio features (greater than 200:1, characteristic of 3D DRAM technology). Additionally, 3B001.d.19 specifies the materials and processes used in practice to achieve this deposition in high volume manufacturing. Namely, the control specifies materials that require two metal precursors and result in a film with a very high dielectric constant (greater than 40). It further specifies that the two metal precursors are delivered through direct liquid injection, which is a technique that allows low-volatility precursors to achieve sufficient vapor pressure to efficiently deposit on the large surface areas present in high aspect ratio features. Also see the related control in the new paragraph 3B993.d.4.

The new 3B001.d.20 is created to control certain physical deposition equipment having electromagnets and being ''specially designed'' for depositing tungsten into features with a specified geometry. This equipment enables the creation of pure tungsten metal contacts to overcome resistance challenges in the production of ''advanced-node ICs.''

3B001.e.1 is updated to include 3B001.a., .b, and .c and .d, because all of these 'semiconductor processing tools' all have the same configuration.

3B001.f.1.b is updated to remove the parameter f.1.b.2.b. Items previous controlled by this parameter are now controlled under the new 3B993.f.1.b.

The new 3B001.f.5 controls nanoimprint lithography equipment capable of producing ''advanced-node ICs.'' To accomplish this, the equipment must have a small overlay accuracy, in this control an overlay accuracy less than 1.5nm. BIS has also created a related new control on less advanced nanoimprint lithography, paragraph 3B993.f.2, described below.

3B001.o.1 and 3B001.o.2 are moved to the new paragraphs 3B993.o.1.a and o.1.b. Therefore, the control text is removed, and the paragraph is reserved.

New paragraph 3B001.p.4 controls single wafer cleaning equipment, which is required for advanced processes due to the need for higher control over variables like contamination compared to batch cleaning systems. 3B001.p.4 expands on former 3B001.p.3 (current 3B993.p.3) by removing the ''surface modification drying'' parameter. That technique can be challenging to use for the most advanced processes due to pattern collapse from surface tensions. 3B001.p.4 controls an alternative technique, supercritical or sublimination drying using carbon dioxide (CO_2).

3B001.r.is created to control equipment designed for deposition or removal processes that improve the overall patterning achieved by EUV lithography. See the Crosswalk for ECCN 3B001 commodities that moved to New ECCN 3B993 under section III.D.4 for additional context on these movements.

2. Revisions to 3B002

ECCN 3B002 is amended by removing 3B002.b from certain license requirements in the license requirements table. The License Exception LVS paragraph is revised by removing the exclusion for 3B002.b. Additionally, ECCN 3B993 is added to the related controls for ECCN 3B002.

3. Revision of ECCNs 3B991 and 3B992

This IFR revises the headings of ECCN 3B991 and 3B992 to add ECCNs 3B993 and 3B994 to the equipment not

controlled by ECCNs 3B991 or 3B992. While ECCNs 3B993 and 3B994 may have similar control parameters, they have a higher RS reason for control than ECCNs 3B991 and 3B992, which are controlled for AT reasons. Therefore, these revisions were made in order to maintain the correct order of review.

4. Addition of ECCN 3B993

This IFR adds new ECCN 3B993 to specify items that enable ''advanced-node IC'' production, but which BIS believes also have legitimate applications in non-advanced-node production, and thus do not warrant nationwide license requirements or a presumption of denial. These items are differentiated from those in the ECCN 3B001 item paragraphs described above, which now specify items that are not only enabling ''advanced-node IC'' production but used exclusively or designed specifically for that purpose.

CROSSWALK FOR ECCN 3B001 COMMODITIES THAT MOVED TO NEW ECCN 3B993

3B001	Description	3B993
c.1.b	High-aspect ratio etch	c.1.
d.14	Remotely-generated radical assisted dielectric deposition	d.1.
d.16	Dielectric deposition	d.2.
f.1.b.2.b	Less-advanced DUV photolithography equipment	f.1.b.2.
o.1 and o.2	Annealing equipment	o.1 and o.2.
p.1 and p.3	Cleaning equipment	p.1 and p.3.

Seven commodities are moved from former ECCN 3B001 paragraphs into the new ECCN 3B993, due to their node-agnostic nature and established usage in non-advanced-node fabrication applications. These include commodities in former paragraphs 3B001.c.1.b (high-aspect ratio etch), 3B001.d.14 (remotely-generated radical assisted dielectric deposition), 3B001.d.16 (dielectric deposition), 3B001.f.1 (less-advanced DUV photolithography equipment), 3B001.o.1 (annealing equipment), and 3B001.p.1 and p.3 (cleaning equipment). BIS has also added several other commodities to new 3B993 ECCNs.

New paragraph 3B993.b.1 augments existing controls on ion implantation in 2B005.b, 3B001.b, and 3B991.b.1.g. 3B993.b.1 controls equipment that performs ''plasma doping,'' which enables dopant atoms to be deposited into the sidewalls of 3D structures like FinFETs and GAAFETs. This control also specifies several properties of the equipment, including the wafer size it can accept (300 mm diameter), power sources it uses (at least one radio frequency source and at least one pulsed direct current source), and the atomic species it can implant (namely, n-type or p-type dopants, which are the atomic species used to tune the electrical properties of semiconductor material).

3B993.c.1 (formerly 3B001.c.1.b) controls certain equipment designed or modified for anisotropic dry etching. Atomic layer etching enhanced by the features described in 3B993.c.1 produce the vertical edges required in high-quality, leading-edge advanced devices and structures, including GAAFET and similar 3D structures. This control includes a Note to inform the public that 3B993.c.1 includes etching by 'radicals', ions, sequential reactions, or non-sequential reactions. In addition, it includes a Technical Note to define the term 'radical' used in the Note.

3B993.c.2 controls etch equipment used in the fabrication of dynamic random access memory (DRAM) chips. As the size of DRAM cells decrease, the lateral dimensions of all the features within the memory cell also need to shrink. Crucially, this involves shrinking the diameter of the capacitor used to store the bit of information contained in the cell. One step in fabricating this capacitor is etching a high-aspect ratio feature into a dielectric material. Accordingly, the control focuses on equipment that can etch dielectric materials to an aspect ratio of greater than 30:1. Furthermore, it specifies the equipment can create openings with a lateral dimension less than 40 nm (necessary for capacitors that fit in a single advanced DRAM memory cell). This control also contains a Note to specify that it does not apply to equipment designed for wafer diameters less than 300 mm.

3B993.c.3 expands on the control in 3B001.c.1.c by broadening the scope of the fast gas switching time (from 300 milliseconds (ms) to 500 ms), and the individually controllable variable temperature elements in the electrostatic chuck (from 20 to 10). 3B993.c.3 will not control equipment already controlled by 3B001.c.1.c.

3B993.d.1 (derived from former 3B001.d.14) controls equipment for depositing films in features with certain geometry and a specified dielectric constant. This is an update to the former 3B001.d.14 control by redesignating this equipment specified under new 3B001.d.14 and specifying that the aspect ratio in 3B993.d.1.b describes the features. These changes are made to differentiate license requirements for more (3B001.d.14) versus less (3B993.d.1) advanced dielectric deposition equipment.

3B993.d.2 (formerly 3B001.d.16) controls deposition for silicon and carbon containing films while meeting certain temperature requirements, having the capability to hold multiple vertically stacked wafers, and having certain injector configurations, as specified.

3B993.d.3 controls equipment designed for chemical vapor deposition (CVD) of carbon hard masks. This expands on 3B001.d.5—which controls plasma-enhanced CVD (PECVD) of carbon hard masks—to encompass other CVD techniques and resulting film properties. Carbon hard masks are critical for multipatterning processes, with higher density masks providing better etch selectivity and pattern fidelity, enabling the creation of smaller features on the wafer.

3B993.d.4 (related to new 3B001.d.19) controls equipment designed for depositing the insulators used in advanced DRAM production. As memory cells shrink, the DRAM cell's capacitor needs to use an insulator with a higher dielectric constant to compensate for its decreased size. It further specifies that this equipment can deposit material on very high aspect ratio features (greater than 50:1, characteristic of advanced DRAM). Additionally, 3B993.d.4 specifies the materials and processes used in practice to achieve this deposition in high volume manufacturing. Namely, the control specifies materials that require two metal precursors and result in a film with a high dielectric constant (greater than 35). It further specifies that the two metal precursors are delivered through direct liquid injection.

3B993.f.1 (formerly part of 3B001.f.1) reflects the scope of former 3B001.f.1.b.2.b, which specified certain

less-advanced DUV photolithography equipment. Equipment meeting the parameters in 3B993.f.1 is not eligible for *de minimis* treatment, with one exception as set forth in § 734.4(a)(3) of the EAR, as described below in Section B.1.

3B993.f.2 controls nanoimprint lithography equipment capable of producing ''advanced-node ICs.'' This control specifies it controls equipment with an overlay accuracy between 1.5 nm and 4.0 nm. Also see the related new control on nanoimprint lithography, 3B001.f.5.

3B993.f.3 specified commodities designed or modified to improve the productivity of controlled DUV photolithography equipment. BIS has also added similar controls in 3D993 and 3E993 that cover ''software'' and ''technology'' for the ''development'' or ''production'' of commodities specified by 3B993, which is intended to restrict ''software'' or technology'' that could modify or improve DUV photolithography equipment.

3B993.o.1 (formerly 3B001.o) controls certain annealing equipment for reflow of copper, cobalt, and tungsten. The scope of control is unchanged.

3B993.o.2 is created to control certain equipment designed for annealing semiconductors. Annealing is an essential step used to modify the electrical properties of semiconductor material to be useful in transistors. This control is targeted at the ''millisecond spike annealing'' technology, which is used in advanced node semiconductor fabrication. Millisecond spike annealing allows for precise control of dopant activation and diffusion, with the ''spike'' referring to the extremely short duration during which the wafer is heated to the desired temperature. This brief, intense heating allows for dopant activation while minimizing unwanted diffusion, which is critical for creating advanced semiconductors. This control covers both lamp-based and laser-based millisecond spike annealing systems, as both can achieve rapid heating and cooling required for this process. 3B993.o.2 includes a Technical Note that 'duration' is the period of time (*i.e.,* total elapsed time) the wafer is above the stated temperature.

3B993.p is created to control removal and cleaning equipment 3B993.p.1 (formerly 3B001.p.1) controls equipment designed for removing polymeric residue and copper oxide film and enabling deposition of copper metal in a vacuum (equal to or less than 0.01 Pa) environment. 3B993.p.3 (formerly 3B001.p.3) controls equipment designed for dry surface oxide removal preclean or dry surface decontamination. BIS notes that this control does not capture deposition equipment not elsewhere specified, but which may also have the capability described in the control.

3B993.q.1 is created to control metrology and inspection equipment for use with patterned 300 mm semiconductor wafers, including equipment employing either optical or electron beam techniques. It specifies the equipment must be designed or modified to detect defects equal to or smaller than 21nm, which BIS believes is critical for advanced-node production applications. This control also specifies properties of the source. For optical equipment (including broadband plasma equipment), it specifies the wavelength must be less than 400 nm, but BIS notes that this requirement would be met by equipment that can be tuned to a wavelength both below and above 400 nm. For electron beam equipment, it specifies the system must have a resolution less than or equal to 1.65nm, or certain properties for its electron beam source (*i.e.,* a cold field emission source, or two sources of any type).

3B993.q.2 controls metrology equipment that can improve the overlay accuracy of photolithography equipment. Overlay accuracy is important for multipatterning, a process which enables legacy photolithography machines to create ''advanced-node ICs.'' 3B993.q.2 focuses on two types of machines. 3B993.q.2.a controls machines that measure wafer shape (typically used to feedforward measurements to lithography machines). 3B993.q.2.b controls machines that measure focus and overlay after resist development (typically used for feedback to a lithography machines). 3B993.q.2.a controls only standalone equipment (not equipment integrated into the lithography machines itself), whereas 3B993.q.2.b controls machines designed for integration to a track (which maximizes throughput). 3B993.q.2.b also specifies that the machine must have fast wavelength switching functionality and an overlay measurement accuracy better than 0.5 nm. 3B993.q.2 also includes Technical Notes to clarify the terminology in the control. Namely, these specify that, for the purposes of 3B993.q.2, a 'track' is equipment designed for coating and developing photoresist formulated for lithography, and 'fast wavelength switching functionality' means the equipment can the change the measurement wavelength and acquire a measurement in less than 25 ms.

5. Addition of ECCN 3B994

Similar to ECCN 3B993, BIS has added new ECCN 3B994 to specify items that can support ''advanced-node IC'' ''production,'' but which BIS believes also have legitimate applications in non-advanced-node production, and thus do not warrant nationwide license requirements or a presumption of denial. ECCN 3B994 will be continually evaluated to determine if additions, revisions, or removals are needed. ECCN 3B994 is controlled for RS and AT reasons; for the former, see § 742.6(a)(11) and (b)(12) of the EAR.

3B994.b.2 controls certain ion implantation equipment. 3B994.b.2.a controls low- and medium-current ion implantation equipment. This equipment is used in advanced processes to maintain low damage and high uniformity on the smallest transistors fabricated in advanced production. 3B994.b.2.b controls high energy, low current systems which can implant dopants at a shallow depth below the surface of the wafer, which is used in some advanced processes. 3B994.b.2.c. controls systems that can maintain a high angular accuracy between the ion beam and the substrate, which is used to implant the non-planar transistor structures used in ''advanced-node ICs.''

3B994.q.3 controls equipment that uses optical measurement techniques and advanced software to determine the three-dimensional structure of patterns on a semiconductor wafer. Such techniques can be used to monitor and optimize process to fabricate the non-planar transistors used in ''advanced-node ICs.''

6. Revision to ECCN 3D002

This IFR is removing the SME previously added to the license requirements of ECCN 3D002 and revising it to align with typical controls applied to Wassenaar Dual-Use List entries. The NS column 1 license requirement no longer only applies to certain SME, but now applies to the entire entry. The NS and RS license requirements for 3B001.a.4, c, d, f.1. b, j to p, 3B002.b and c, to Macau and destinations in Country Group D:5 are removed, because the WA control is broader. The RS control is not necessary, because this entry is controlled by a multilateral regime.

7. Addition of ECCN 3D992

BIS has added new ECCN 3D992 to control software for specified SME. 3D992.a controls ''software'' for the ''development'' or ''production,'' of

commodities specified in 3B001.a.4, c, d, f.1, f.5, k to n, p.2, p.4, r, or 3B002.c. In addition, 3D992.b is added to control electronic computer-aided design (ECAD) software for advanced semiconductor packaging involving multiple chips or chiplets co-packaged in a single device. This software must support complex 3D floorplans and must conduct advanced simulations to detect and mitigate potential signal degradation and electromagnetic interference. The control also includes a Technical Note to specify that 'multi-chip' includes both multi-die and multi-chiplet.

8. Addition of ECCN 3D993

ECCN 3D993.a is added to control ''software'' for the ''production'' and ''development'' of commodities in ECCN 3B993. Paragraph 3D993.b controls 'Electronic Computer-Aided Design' ('ECAD') ''software'' designed or modified for the ''development'' or ''production'' of integrated circuits using multipatterning. Paragraph 3B993.c controls computational lithography software, which enables fabrication facilities to decrease their minimum resolvable feature size through techniques such as optical proximity correction, inverse lithography, and hotspot correction. In some cases, this software acts as a digital model of the fabrication facility, allowing for very precise optimization of the fabrication process. Existing controls are limited to computational lithography equipment specifically for EUV, but computational lithography software that is not currently controlled can improve the minimum feature size achievable with DUV to less than 40nm and can facilitate the complex mask decomposition necessary for multipatterning. ECCN 3B993.d is added to control software designed or modified to improve the productivity of controlled DUV photolithography equipment. This addition addresses that potential workaround. 3D993 also includes a technical note which defines 'computational lithography'.

9. Addition of ECCNs 3E992 and 3E993

This IFR adds ECCN 3E992 to control ''technology'' for the ''production'' or ''development'' of commodities specified in 3B001.a.4, c, d, f.1, f.5, k to n, p.2, p.4, r; and 3B002.c to or within Macau or a destination specified in Country Group D:5 of supplement no. 1 to part 740 of the EAR (see § 742.4(a)(4) and § 742.6(a)(6)(i) of the EAR). This rule also moves the worldwide NS and RS controls for ''software'' for equipment controlled by 3B001.c.1.a or c.1.c from ECCN 3E001 to ECCN 3E992, as well as the License Exception IEC paragraph.

This rule adds ECCN 3E993.a to control ''technology'' for the ''development'' or ''production'' of commodities specified in 3B993 (see § 742.6(a)(11) and (b)(12) of the EAR). ECCN 3E993.b is added to control ''technology'' designed or modified to improve the productivity of controlled DUV photolithography equipment.

10. Addition of ECCNs 3D994 and 3E994

This IFR adds ECCNs 3D994 and 3E994 to the CCL to control ''software'' and ''technology'' for the ''development'' or ''production'' of commodities specified in ECCN 3B994. These ECCNs will be controlled for RS and AT reasons; for the former, see § 742.6(a)(11) and (b)(12) of the EAR.

IV. Public Comments

BIS welcomes comments from the public on these additional changes and clarifications made to § 744.23(a)(4), as well as for any of the other changes included in this IFR.

V. Savings Clauses

- *Savings clause for amendatory instructions* 4, 5, 15, 16, 17, 19, 20, 21, 23, 25, 29, and 31: For changes in amendatory instructions 4, 5, 15, 16, 17, 19, 20, 21, 23, 25, 29, and 31, shipments of items removed from eligibility for a License Exception or export, reexport, or transfer (in-country) without a license (NLR) as a result of this regulatory action that were en route aboard a carrier to a port of export, reexport, or transfer (in-country), on January 6, 2025, pursuant to actual orders for export, reexport, or transfer (in-country) to or within a foreign destination, may proceed to that destination under the previous eligibility for a License Exception or export, reexport, or transfer (in-country) without a license (NLR), provided the export, reexport, or transfer (in-country) is completed no later than on February 3, 2025.
- *There is no savings clause for other amendatory instructions in this IFR.*

VI. Export Control Reform Act of 2018

On August 13, 2018, the President signed into law the John S. McCain National Defense Authorization Act for Fiscal Year 2019, which included the ECRA (codified, as amended, at 50 U.S.C. 4801–4852). ECRA provides the legal basis for BIS's principal authorities and serves as the authority under which BIS issues this rule. In particular, and as noted elsewhere, Section 1753 of ECRA (50 U.S.C. 4812) authorizes the regulation of exports, reexports, and transfers (in-country) of items subject to U.S. jurisdiction. Further, Section 1754(a)(1)–(16) of ECRA (50 U.S.C. 4813(a)(1)–(16)) authorizes, *inter alia,* the establishment of a list of controlled items; the prohibition of unauthorized exports, reexports, and transfers (in-country); the requirement of licenses or other authorizations for exports, reexports, and transfers (in-country) of controlled items; apprising the public of changes in policy, regulations, and procedures; and any other action necessary to carry out ECRA that is not otherwise prohibited by law. Pursuant to Section 1762(a) of ECRA (50 U.S.C. 4821(a)), these changes can be imposed in a final rule without prior notice and comment.

VII. Rulemaking Requirements

1. Executive Orders 12866, 13563, and 14094 direct agencies to assess all costs and benefits of available regulatory alternatives and, if regulation is necessary, to select regulatory approaches that maximize net benefits (including potential economic, environmental, public health and safety effects and distributive impacts and equity). Executive Order 13563 emphasizes the importance of quantifying both costs and benefits and of reducing costs, harmonizing rules, and promoting flexibility. Pursuant to Executive Order 12866, as amended, this final rule has not been determined to be a ''significant regulatory action.''

2. Notwithstanding any other provision of law, no person is required to respond to, nor shall any person be subject to a penalty for failure to comply with, a collection of information subject to the requirements of the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 *et seq.*) (PRA), unless that collection of information displays a currently valid Office of Management and Budget (OMB) Control Number.

This rule involves the following OMB-approved collections of information subject to the PRA:

- 0694–0088, ''Multi-Purpose Application,'' which carries a burden hour estimate of 29.4 minutes for a manual or electronic submission;
- 0694–0096 ''Five Year Records Retention Period,'' which carries a burden hour estimate of less than 1 minute;
- 0694–0122, ''Licensing Responsibilities and Enforcement;'' which carries a burden hour estimate of 10 minutes per electronic submission;
- 0694–0137, ''License Exceptions and Exclusions;'' which carries a burden hour estimate of 5 minutes per electronic submission; and

• 0607–0152 ''Automated Export System (AES) Program,'' which carries a burden hour estimate of 3 minutes per electronic submission.

This IFR will affect the collection under control number 0694–0088, for the multipurpose application because of the addition of HBM controls to ECCN 3A090.c, the eight new Red Flags added to supplement no. 3 to part 732, and the addition of the new FDP rules under § 734.9(e)(3) and (k), which will result in additional license applications. BIS estimates that the changes included in this IFR will result in an increase of 75 multi-purpose applications (*i.e.,* an increase of 75 license applications) submitted annually to BIS. However, the additional burden falls within the existing burden estimates currently associated with these control numbers.

This regulation also involves a collection previously approved by the OMB under control number 0694–0122, ''Licensing Responsibilities and Enforcement'' because this rule under the revision to § 758.6(a)(2) will require the items level classification for ECCN(s) 3A090.c to be included on the commercial invoice, similar to the previous requirement to include this classification information on the commercial invoice, which will now require identifying new 3A090.c when applicable on the commercial invoice. BIS does not anticipate a change in the total burden hours associated with the PRA and OMB control number 0694–0122 as a result of this rule.

This IFR also involves a collection previously approved by the OMB under control number 0694–0137, ''License Exceptions and Exclusions'' because this rule includes the addition of two new EAR license exceptions, which each include new notification or reporting requirements that are being added to this BIS information collection under OMB Control Number 0694–0137. Specifically, this IFR adds new reporting requirements with the addition of License Exception HBM under § 740.25 of the EAR and adds new notification and reporting requirements for the addition of License Exception RFF under § 740.26 of the EAR. These changes are expected to result in an increase of 10 notifications to BIS under License Exception HBM. BIS estimates that the time needed to submit each notification to BIS is 20 minutes, resulting in an increase in burden hours of 3 hours. This collection of information fits within the scope of this IC. These changes are expected to result in an increase of 306 prior notifications under § 740.26(d)(1) to BIS under License Exception RFF. BIS estimates that the time needed to submit each notification to BIS is 5 minutes, resulting in an increase in burden hours of 26 hours. This collection of information fits within the scope of this IC.

These changes are expected to result in an increase of not more than 3 notifications within one business day under § 740.26(d)(2) to BIS under License Exception RFF. BIS estimates that the time needed to submit each notification to BIS is 5 minutes, resulting in an increase in burden hours of no more than 15 minutes. This collection of information fits within the scope of this IC. These changes are expected to result in an increase of 306 installation reports under § 740.26(e)(1) to BIS under License Exception RFF. BIS estimates that the time needed to submit each notification to BIS is 5 minutes, resulting in an increase in burden hours of 26 hours. These changes are expected to result in an increase of 306 annual end-use confirmation reports under § 740.26(e)(2) to BIS under License Exception RFF. BIS estimates that the time needed to submit each notification to BIS is 5 minutes, resulting in an increase in burden hours of 26 hours. This collection of information fits within the scope of this IC.

Additional information regarding these collections of information—including all background materials—can be found at *https://www.reginfo.gov/public/do/PRAMain* by using the search function to enter either the title of the collection or the OMB Control Number.

3. This rule does not contain policies with federalism implications as that term is defined in Executive Order 13132.

4. Pursuant to Section 1762 of ECRA (50 U.S.C. 4821), this action is exempt from the Administrative Procedure Act (APA) (5 U.S.C. 553) requirements for notice of proposed rulemaking, opportunity for public participation, and delay in effective date. While Section 1762 of ECRA provides sufficient authority for such an exemption, this action is also independently exempt from these APA requirements because it involves a military or foreign affairs function of the United States (5 U.S.C. 553(a)(1)). However, BIS is accepting comments on this IFR.

5. Because a notice of proposed rulemaking and an opportunity for public comment are not required to be given for this rule under the APA (5 U.S.C. 553) or by any other law, the analytical requirements of the Regulatory Flexibility Act (5 U.S.C. 601, *et seq.*) are not applicable. Accordingly, no regulatory flexibility analysis is required, and none has been prepared.

List of Subjects

15 CFR Parts 732

Administrative practice and procedure, Exports, Reporting and recordkeeping requirements.

15 CFR Part 734

Administrative practice and procedure, Exports, Inventions and patents, Research, Science and technology.

15 CFR Parts 740 and 758

Administrative practice and procedure, Exports, Reporting and recordkeeping requirements.

15 CFR Part 742

Exports, Terrorism.

15 CFR Part 744

Exports, Reporting and recordkeeping requirements, Terrorism.

15 CFR Parts 736, 770, and 772

Exports.

15 CFR Part 762

Administrative practice and procedure, Business and industry, Confidential business information, Exports, Reporting and recordkeeping requirements.

15 CFR Part 774

Exports, Reporting and recordkeeping requirements.

For the reasons stated in the preamble, parts 732, 734, 736, 740, 742, 744, 758, 762, 770, 772, and 774 of the Export Administration Regulations (15 CFR parts 730 through 774) are amended as follows:

PART 732—STEPS FOR USING THE EAR

■ 1. The authority citation for part 732 continues to read as follows:

Authority: 50 U.S.C. 4801–4852; 50 U.S.C. 4601 *et seq.;* 50 U.S.C. 1701 *et seq.;* E.O. 13026, 61 FR 58767, 3 CFR, 1996 Comp., p. 228; E.O. 13222, 66 FR 44025, 3 CFR, 2001 Comp., p. 783.

■ 2. In supplement no. 3 to part 732 amend paragraph (b) by adding paragraphs 20 through 27 to read as follows:

Supplement No. 3 to Part 732—BIS's ''Know Your Customer'' Guidance and Red Flags

* * * * *

(b) * * *

20. A non-advanced fabrication facility orders equipment designed for ''advanced-

node IC'' production, (*e.g.,* § 742.4(a)(4) ECCNs) that it would not need given its technology level. This technology mismatch indicates the fabrication facility produces or intends to produce ''advanced-node ICs,'' and it requires resolution before the exporter, reexporter, or transferor proceeds with the transaction.

21. An exporter, reexporter, or transferor receives an order for which the ultimate owner or user of the items is uncertain, such as a request to ship equipment for developing or producing integrated circuits to a distributor without a manufacturing operation, when the item is ordinarily customized for the end user or installed by the supplier. Because the distributor would never be the end user of such equipment, the ultimate owner or beneficiary is unknown to the exporter, reexporter, or transferor. This uncertainty raises a Red Flag that needs to be resolved before the exporter, reexporter, or transferor proceeds with the transaction, in particular for items where such information would typically be known to an exporter, reexporter, or transferor, such as for advanced computing items, supercomputers, or SME.

22. An exporter, reexporter, or transferor receives an order or request related to an item that would require an export, reexport, or in-country transfer license from BIS or another jurisdiction that maintains controls on the item, and there is uncertainty about the license history for the item. For example, there is information known to the exporter, reexporter, or transferor indicating that a required license was not, or would not have likely been obtained by the end user, such as where the end user or end use, or the ECCN and end-user destination triggers a license review policy of a presumption of denial. These uncertainties raise a Red Flag that needs to be resolved before the exporter, reexporter, or transferor proceeds with further transactions related to the item to avoid the risk of violating § 764.2(e) (''Acting with knowledge of a violation.''). This would include acting on requests to service, install, upgrade, or otherwise maintain the item of concern.

23. An exporter, reexporter, or transferor receives a request to service, install, upgrade, or otherwise maintain an item that was altered after export, reexport, or transfer by a third-party for a more advanced end use that would normally require a license for the destination. This scenario raises a Red Flag that the item is employed in a prohibited end use that would need to be resolved before proceeding further with the transaction.

24. An exporter, reexporter, or transferor receives a request for an item or service from a new customer. The new customer's senior management or technical leadership (*e.g.,* process engineers that are team leaders or otherwise leading development or production activities) overlaps with an entity on the Entity List in supplement no. 4 to part 744 of the EAR, particularly if the supplier previously provided the same or substantially similar item or service to the Entity List entity, most likely prior to the listed entity being added to the Entity List. This scenario would raise a Red Flag that the entity requesting the item or service is engaged in or supporting the same prohibited end use as the Entity List entity, and the supplier would need to conduct additional due diligence before proceeding with the transaction with the new customer.

25. An exporter, reexporter, or transferor receives a request from a new customer for an item or service that was designed or modified for an existing or former customer that is now designated on the Entity List. This scenario would raise a Red Flag that the new customer has assumed the operations for which the item or service is still needed to engage in or support the same prohibited end-use for which the Entity List entity was listed. The exporter, reexporter, or transferor must resolve this Red Flag before proceeding with the transaction.

26. For purposes of analyzing the scope of the Entity List FDP rule for Footnote 5 entities described in § 734.9(e)(3) and the SME FDP rule in § 734.9(k), if a foreign-produced item is described in the relevant Category 3B ECCN in § 734.9(e)(3)(i) or § 734.9(k)(1) and contains at least one integrated circuit, then there is a Red Flag that the foreign-produced item meets the product scope of the applicable FDP rule. The exporter, reexporter, or transferor must resolve this Red Flag before proceeding.

27. The end user is a ''facility'' that is physically connected to a ''facility'' where ''production'' of ''advanced-node ICs'' occurs. This scenario raises a Red Flag that the end user is also a ''facility'' where the ''production'' of ''advanced-node ICs'' occurs, and the supplier would need to conduct additional due diligence before proceeding with the transaction. For example, if an exporter, reexporter, or transferor receives an equipment order from a company that is engaged in ''production'' of non-''advanced-node ICs'' in a building with a bridge, tunnel, or other connection to another building where the ''production'' of ''advanced-node ICs'' occurs, then both buildings would be subject to the controls under § 744.23 of the EAR. However, if the exporter or fabrication facility has received an Advisory Opinion from BIS confirming that the ''production'' technology node for the relevant facility does not qualify as an ''advanced-node IC'' technology node, that would resolve the Red Flag of the connection to the advanced facility. Unless the Red Flag is resolved through an Advisory Opinion, the two buildings are treated as a single ''facility'' for purposes of § 744.23 of the EAR.

PART 734—SCOPE OF THE EXPORT ADMINISTRATION REGULATIONS

■ 3. The authority citation for part 734 is revised to read as follows:

Authority: 50 U.S.C. 4801–4852; 50 U.S.C. 4601 *et seq.;* 50 U.S.C. 1701 *et seq.;* E.O. 12938, 59 FR 59099, 3 CFR, 1994 Comp., p. 950; E.O. 13020, 61 FR 54079, 3 CFR, 1996 Comp., p. 219; E.O. 13026, 61 FR 58767, 3 CFR, 1996 Comp., p. 228; E.O. 13222, 66 FR 44025, 3 CFR, 2001 Comp., p. 783; E.O. 13637, 78 FR 16129, 3 CFR, 2014 Comp., p. 223; Notice of November 7, 2024, 89 FR 88867 (November 8, 2024).

■ 4. Section 734.4 is amended by:

■ a. Revising paragraph (a)(3); and

■ b. Adding paragraphs (a)(8) and (9).

The revision and additions read as follows:

§ 734.4 *De minimis* U.S. content.

(a) * * *

(3) There is no *de minimis* level for equipment meeting the parameters in ECCN 3B993.f.1 of the Commerce Control List in supplement no. 1 to part 774 of the EAR, when the equipment is destined for use in the ''development'' or ''production'' of ''advanced-node integrated circuits'' and the ''advanced-node integrated circuits'' meet the parameter specified in paragraph (1) of that definition in § 772.1 of the EAR, unless the country from which the foreign-made item was first exported [1] has a commodity specified on an export control list.

* * * * *

(8) There is no *de minimis* level related to the SME FDP rule for a commodity meeting the parameters in ECCNs 3B001.a.4, c, d, f.1, f.5, k to n, p.2, p.4, r, or 3B002.c of the Commerce Control List (CCL) in supplement no. 1 to part 774 of the EAR, when the commodity contains a U.S.-origin integrated circuit specified under Category 3, 4, or 5 of the CCL, and the commodity is destined for Macau or a destination specified in Country Group D:5, unless excluded from the national security license requirement in § 742.4(a)(4) or the regional stability license requirement in § 742.6(a)(6) of the EAR.

(9) There is no *de minimis* level related to the Footnote 5 FDP rule for an item meeting the parameters in ECCNs specified in Category 3B (except 3B001.a.4, c, d, f.1, f.5, k to n, p.2, p.4, r, or 3B002.c) of the Commerce Control List (CCL) in supplement no. 1 to part 774 of the EAR, when the commodity contains a U.S.-origin integrated circuit specified under Category 3, 4, or 5 of the CCL, and the commodity is destined for an entity with a Footnote 5 designation in the license requirement column of the Entity List in supplement no. 4 to part 744 of the EAR.

* * * * *

[1] The Government of Japan added ArF-wet lithography equipment and other advanced semiconductor manufacturing equipment to its control list for all regions on July 23, 2023.

* * * * *

■ 5. Section 734.9 is amended by:

■ a. Revising the introductory text;

■ b. Revising paragraphs (e) introductory text, (e)(1)(i)(A) and (B), and (e)(2)(i)(A) and (B);

■ c. Adding paragraph (e)(3);

■ d. Revising paragraphs (h)(1)(i)(A) introductory text, (h)(1)(ii)(A), and (i)(1)(i) and (ii); and

■ e. Adding paragraph (k).

The revisions and additions read as follows:

§ 734.9 Foreign-Direct Product (FDP) Rules.

Foreign-produced items located outside the United States are subject to the EAR when they are a ''direct product'' of specified ''technology'' or ''software,'' produced by a complete plant or 'major component' of a plant that itself is a ''direct product'' of specified ''technology'' or ''software,'' or, for specified foreign-produced items in paragraph (e)(3)(i)(B)(2) of this section, contain an item produced by a complete plant or 'major component' of a plant that itself is a ''direct product'' of specified ''technology'' or ''software.'' If a foreign-produced item is subject to the EAR, then you should separately determine the license requirements that apply to that foreign-produced item (*e.g.,* by assessing the item classification, destination, end-use, and end-user in the relevant transaction). Not all transactions involving foreign-produced items that are subject to the EAR require a license. Those transactions that do require a license may be eligible for a license exception.

* * * * *

(e) *Entity List FDP rules.* A foreign-produced item is subject to the EAR if it meets the product scope and end-user scope in either Entity List FDP rule footnote 1 provision in paragraph (e)(1) of this section; the Entity List FDP rule footnote 4 provision in paragraph (e)(2) of this section; or the Entity List FDP rule Footnote 5 provision in paragraph (e)(3) of this section.

(1) * * *

(i) * * *

(A) ''*Direct product*'' *of* ''*technology*'' *or* ''*software.*'' A foreign-produced item meets the product scope of this paragraph (e)(1)(i)(A) if the foreign-produced item is a ''direct product'' of ''technology'' or ''software'' subject to the EAR and specified in ECCN 3D001, 3D901, 3D991, 3D992, 3D993, 3D994, 3E001, 3E002, 3E003, 3E901, 3E991, 3E992, 3E993, 3E994, 4D001, 4D993, 4D994, 4E001, 4E992, 4E993, 5D001, 5D991, 5E001, or 5E991 of the Commerce Control List (CCL) in supplement no. 1 to part 774 of the EAR; or

(B) *Product of a complete plant or 'major component' of a plant that is a* ''*direct product.*'' A foreign-produced item meets the product scope of this paragraph if the foreign-produced item is produced by any complete plant or 'major component' of a plant that is located outside the United States, when the complete plant or 'major component' of a plant, whether made in the U.S. or a foreign country, itself is a ''direct product'' of U.S.-origin ''technology'' or ''software'' that is specified in ECCN 3D001, 3D901, 3D991, 3D992, 3D993, 3D994, 3E001, 3E002, 3E003, 3E901, 3E991, 3E992, 3E993, 3E994, 4D001, 4D993, 4D994, 4E001, 4E992, 4E993, 5D001, 5D991, 5E001, or 5E991 of the CCL.

Note 2 to paragraph (e)(1)(i): A foreign-produced item includes any foreign-produced wafer whether finished or unfinished.

* * * * *

(2) * * *

(i) * * *

(A) ''*Direct product*'' *of* ''*technology*'' *or* ''*software.*'' The foreign-produced item is a ''direct product'' of ''technology'' or ''software'' subject to the EAR and specified in ECCN 3D001, 3D901 3D991, 3D992, 3D993, 3D994, 3E001, 3E002, 3E003, 3E901, 3E991, 3E992, 3E993, 3E994, 4D001, 4D993, 4D994, 4E001, 4E992, 4E993, 5D001, 5D002, 5D991, 5E001, 5E002, or 5E991 of the CCL; or

(B) *Product of a complete plant or 'major component' of a plant that is a* ''*direct product.*'' A foreign-produced item meets the product scope of this paragraph if the foreign-produced item is produced by any complete plant or 'major component' of a plant that is located outside the United States, when the complete plant or 'major component' of a plant, whether made in the U.S. or a foreign country, itself is a ''direct product'' of U.S.-origin ''technology'' or ''software'' that is specified in ECCN 3D001, 3D901, 3D991, 3D992, 3D993, 3D994, 3E001, 3E002, 3E003, 3E901, 3E991, 3E992, 3E993, 3E994, 4D001, 4D993, 4D994, 4E001, 4E992, 4E993, 5D001, 5D002, 5D991, 5E001, 5E002, or 5E991 of the CCL.

* * * * *

(3) *Entity List FDP rule: Footnote 5.* A foreign-produced commodity is subject to the EAR if it meets both the product scope in paragraph (e)(3)(i) of this section and the end-user scope in paragraph (e)(3)(ii) of this section. See § 744.11(a)(2)(v) of the EAR for license requirements, exclusion from license requirements, and license review policy, applicable to foreign-produced commodities that are subject to the EAR pursuant to this paragraph (e)(3).

(i) *Product Scope Entity List FDP rule: Footnote 5.* The product scope applies if a foreign-produced commodity is specified in ECCN 3B001 (except 3B001.a.4, c, d, f.1, f.5, g, h, k to n, p.2, p.4, r), 3B002 (except 3B002.c), 3B903, 3B991 (except 3B991.b.2.a through 3B991.b.2.b), 3B992, 3B993, or 3B994, and meets the conditions of either paragraph (e)(3)(i)(A) or (B) of this section.

(A) ''*Direct product*'' *of* ''*technology*'' *or* ''*software.*'' A foreign-produced item meets the product scope of this paragraph if the foreign-produced commodity is a ''direct product'' of ''technology'' or ''software'' subject to the EAR and specified in ECCN 3D001 (for 3B commodities), 3D901(for 3B903), 3D991 (for 3B991 and 3B992), 3D993, 3D994, 3E001 (for 3B commodities), 3E901 (for 3B903), 3E991 (for 3B991 and 3B992), 3E993, or 3E994 of the Commerce Control List (CCL) in supplement no. 1 to part 774 of the EAR; or

(B) *Product of a complete plant or 'major component' of a plant that is a* ''*direct product,*'' *or a commodity that contains a product of a complete plant or 'major component' of a plant that is a* ''*direct product.*'' A foreign-produced commodity meets the product scope of this paragraph if the foreign-produced commodity meets at least one of the following conditions:

(*1*) Is produced by any complete plant or 'major component' of a plant that is located outside the United States, when the complete plant or 'major component' of a plant, whether made in the United States or a foreign country, itself is a ''direct product'' of U.S.-origin ''technology'' or ''software'' that is specified in ECCN 3D001 (for 3B commodities), 3D901, 3D991 (for 3B991 and 3B992), 3D992, 3D993, 3D994, 3E001 (for 3B commodities), 3E901 (for 3B903), 3E991 (for 3B991 and 3B992), 3E992, 3E993, or 3E994 of the CCL; or

(*2*) Contains a commodity produced by any complete plant or 'major component' of a plant that is located outside the United States, when the complete plant or 'major component' of a plant, whether made in the United States or a foreign country, itself is a ''direct product'' of U.S.-origin ''technology'' or ''software'' that is specified in ECCN 3D001 (for 3B commodities), 3D901, 3D991 (for 3B991 and 3B992), 3D992, 3D993, 3D994, 3E001 (for 3B commodities), 3E901 (for 3B903), 3E991 (for 3B991 and 3B992)), 3E992, 3E993, or 3E994 of the CCL.

Note 3 to paragraph (e)(3)(i)(B)(*2*): The product scope of paragraph (e)(3)(i) is met if a foreign-produced commodity contains an integrated circuit that is produced by a complete plant or 'major component' of a plant that itself is a ''direct product'' of U.S.-origin ''technology'' or ''software'' specified in the ECCNs described in paragraph

(e)(3)(i)(B)(*2*). See Red Flag 26 in supplement no. 3 to part 732 for additional guidance on the scope of paragraph (e)(3)(i). Production of an integrated circuit includes fabrication of the integrated circuit in a wafer, as well as assembly, testing, and packaging of the integrated circuit.

(ii) *End-user scope of the Entity List FDP rule: Footnote 5.* A foreign-produced commodity meets the end-user scope of this paragraph (e)(3)(ii) if there is ''knowledge'' that:

(A) *Activities involving Footnote 5 designated entities.* The foreign-produced commodity will be incorporated into any ''part,'' ''component,'' or ''equipment'' produced, purchased, or ordered by any entity with a Footnote 5 designation in the license requirement column of the Entity List in supplement no. 4 to part 744 of the EAR; *or*

(B) *Footnote 5 designated entities as transaction parties.* Any entity with a Footnote 5 designation in the license requirement column of the Entity List in supplement no. 4 to part 744 of the EAR is a party to any transaction involving the foreign-produced commodity (*e.g.,* as a ''purchaser,'' ''intermediate consignee,'' ''ultimate consignee,'' or ''end-user'').

* * * * *

(h) * * *

(1) * * *

(i) * * *

(A) The foreign-produced item is the ''direct product'' of ''technology'' or ''software'' subject to the EAR and specified in ECCN 3D001, 3D901, 3D991, 3D992, 3D993, 3D994, 3E001, 3E002, 3E003, 3E901, 3E991, 3E992, 3E993, 3E994, 4D001, 4D090, 4D993, 4D994, 4E001, 4E992, 4E993, 5D001, 5D002, 5D991, 5E001, 5E991, or 5E002 of the CCL; and

* * * * *

(ii) * * *

(A) The foreign-produced item is produced by any complete plant or 'major component' of a plant that is located outside the United States, when the plant or 'major component' of a plant, whether made in the United States or a foreign country, itself is a ''direct product'' of U.S.-origin ''technology'' or ''software'' that is specified in ECCN 3D001, 3D901, 3D991, 3D992, 3D993, 3D994, 3E001, 3E002, 3E003, 3E901, 3E991, 3E992, 3E993, 3E994, 4D001, 4D090, 4D993, 4D994, 4E001, 4E992, 4E993, 5D001, 5D991, 5E001, 5E991, 5D002, or 5E002 of the CCL; and

* * * * *

(i) * * *

(1) * * *

(i) ''*Direct product*'' *of* ''*technology*'' *or* ''*software.*'' The foreign-produced item meets the product scope of this paragraph (i)(1)(i) if the foreign-produced item is a ''direct product'' of ''technology'' or ''software'' subject to the EAR and specified in ECCN 3D001, 3D901, 3D991, 3D992, 3D993, 3D994, 3E001, 3E002, 3E003, 3E901, 3E991, 3E992, 3E993, 3E994, 4D001, 4D993, 4D994, 4E001, 4E992, 4E993, 5D001, 5D002, 5D991, 5E001, 5E002, or 5E991 of the CCL; or

(ii) *Product of a complete plant or 'major component' of a plant that is a* ''*direct product.*'' A foreign-produced item meets the product scope of this paragraph if the foreign-produced item is produced by any complete plant or 'major component' of a plant that is located outside the United States, when the complete plant or 'major component' of a plant, whether made in the United States or a foreign country, itself is a ''direct product'' of U.S.-origin ''technology'' or ''software'' that is specified in ECCN 3D001, 3D901, 3D991, 3D992, 3D993, 3D994, 3E001, 3E002, 3E003, 3E901, 3E991, 3E992, 3E993, 3E994, 4D001, 4D994, 4E001, 4E992, 4E993, 5D001, 5D002, 5D991, 5E001, 5E002, or 5E991 of the CCL.

* * * * *

(k) *Semiconductor Manufacturing Equipment (SME) FDP rule.* A foreign-produced commodity is subject to the EAR if it meets both the product scope in paragraph (k)(1) of this section and the destination scope in paragraph (k)(2) of this section. See §§ 742.4(a)(4) and 742.6(a)(6)(i)(A) of the EAR for license requirements and exclusions to the license requirements and §§ 742.4(b)(2) and 742.6(b)(10) for license review policy applicable to foreign-produced commodities that are subject to the EAR under this paragraph (k).

(1) *Product scope.* The product scope applies to a foreign-produced commodity specified in ECCN 3B001.a.4, c, d, f.1, f.5, k to n, p.2, p.4, r, or 3B002.c that meets the conditions of either paragraph (k)(1)(i) or (ii) of this section.

(i) ''*Direct product*'' *of* ''*technology*'' *or* ''*software.*'' A foreign-produced commodity meets the product scope of this paragraph (k) if the foreign-produced commodity is the ''direct product'' of ''technology'' or ''software'' subject to the EAR and specified in 3D992 or 3E992 of the CCL; or

(ii) *Product of a complete plant or 'major component' of a plant that is a* ''*direct product.*'' A foreign-produced commodity meets the product scope of this paragraph if it meets either of the following conditions:

(A) Is produced by any complete plant or 'major component' of a plant that is located outside the United States, when the plant or 'major component' of a plant, whether made in the United States or a foreign country, itself is a ''direct product'' of U.S.-origin ''technology'' or ''software'' that is specified in ECCN 3D001 (for 3B commodities), 3D901, 3D991 (for 3B991 and 3B992), 3D992, 3D993, 3D994, 3E001 (for 3B commodities), 3E901 (for 3B903), 3E991 (for 3B991 or 3B992), 3E992, 3E993, or 3E994 of the CCL; or

(B) Contains a commodity produced by any complete plant or 'major component' of a plant that is located outside the United States, when the complete plant or 'major component' of a plant, whether made in the U.S. or a foreign country, itself is a ''direct product'' of U.S.-origin ''technology'' or ''software'' that is specified in ECCN 3D001 (for 3B commodities), 3D901, 3D991 (for 3B991 and 3B992), 3D992, 3D993, 3D994, 3E001 (for 3B commodities), 3E901 (for 3B903), 3E991 (for 3B991 or 3B992), 3E992, 3E993, or 3E994 of the CCL.

Note 3 to paragraph (k)(1)(ii)(B): The product scope of paragraph (k)(1) is met if a foreign-produced commodity contains an integrated circuit that is produced by a complete plant or 'major component' of a plant that itself is a ''direct product'' of U.S.-origin ''technology'' or ''software'' specified in the ECCNs described in paragraph (k)(1)(ii)(B). See Red Flag 26 in supplement no. 3 to part 732 for additional guidance on the scope of paragraph (k)(1). Production of an integrated circuit includes fabrication of the integrated circuit in a wafer, as well as assembly, testing, and packaging of the integrated circuit.

(2) *Destination scope of the SME FDP rule.* A foreign-produced item meets the destination scope of this paragraph (k)(2) if there is ''knowledge'' that the foreign-produced item is destined to Macau or a destination in Country Group D:5 of supplement no. 1 to part 740 of the EAR.

* * * * *

■ 6. Section 734.19 is revised to read as follows:

§ 734.19 Transfer of access information and export, reexport, and transfer (in-country) of software keys.

(a) To the extent an authorization would be required to transfer ''technology'' or ''software,'' a comparable authorization is required to transfer ''access information'' if done with ''knowledge'' that such transfer would result in the release of such ''technology'' or ''software'' without a required authorization.

Note 1 to paragraph (a): For purposes of this section, a release of ''software'' includes source code and object code.

(b) Software keys, also called software license keys, that allow users the ability to use the ''software'' or hardware, or software keys that renew existing ''software'' or hardware use licenses, are classified and controlled under the same ECCNs on the CCL as the corresponding ''software'' or hardware to which they provide access. If authorization is required for the export, reexport, or transfer (in-country) of the ''software'' or hardware, the same level of authorization is required for the software key. If authorization is obtained for the export, reexport, or transfer (in-country) of the ''software'' or hardware, that authorization also applies to the corresponding software license key. If no authorization was required for the initial export of the ''software'' or hardware and the associated software key, but a license requirement is later imposed on the ''software'' or hardware, (*e.g.,* a license requirement is imposed because the end user becomes listed on the Entity List in supplement no. 4 to part 744), then subsequent exports, reexports, or transfers (in-country) of both the ''software'' and hardware, and the associated software license key will be subject to the new license requirement.

Note 2 to paragraph (b): This paragraph does not apply to keys that unlock dormant functionality in an item. However, in some cases, changes to, or the addition of, features may impact the classification of the item.

PART 736—GENERAL PROHIBITIONS

■ 7. The authority citation for part 736 is revised to read as follows:

Authority: 50 U.S.C. 4801–4852; 50 U.S.C. 4601 *et seq.;* 50 U.S.C. 1701 *et seq.;* E.O. 12938, 59 FR 59099, 3 CFR, 1994 Comp., p. 950; E.O. 13020, 61 FR 54079, 3 CFR, 1996 Comp., p. 219; E.O. 13026, 61 FR 58767, 3 CFR, 1996 Comp., p. 228; E.O. 13222, 66 FR 44025, 3 CFR, 2001 Comp., p. 783; E.O. 13338, 69 FR 26751, 3 CFR, 2004 Comp., p. 168; Notice of May 8, 2024, 89 FR 40355 (May 9, 2024); Notice of November 7, 2024, 89 FR 88867 (November 8, 2024).

■ 8. Section 736.2 is amended by revising paragraph (b)(3)(i) to read as follows:

§ 736.2 General prohibitions and determination of applicability.

* * * * *

(b) * * *

(3) *General Prohibition Three—Foreign-direct product (FDP) rules.* (i) You may not, without a license or license exception, export from abroad, reexport, or transfer (in-country) foreign-''direct products'' or other foreign-produced items subject to the EAR pursuant to § 734.9 if such items are subject to a license requirement in part 736, 742, 744, 746, or 764 of the EAR.

* * * * *

■ 9. Supplement no. 1 to part 736 is amended by revising paragraphs (d)(1), (2), and (3), to read as follows:

Supplement No. 1 to Part 736—General Orders

* * * * *

(d) * * *

(1) *TGL—Less restricted SME ''parts,'' ''components,'' or ''equipment.''* This TGL only overcomes the license requirements described in § 744.23(a)(4) of EAR when:

(i) *Product scope.* The items subject to the EAR that are specified on the Commerce Control List (CCL) in supplement no. 1 to part 774 of the EAR, as follows:

(A) ECCNs that are designated as controlled on the CCL only for AT reasons (3A991, 3B992, and associated ''software'' and ''technology''); *or*

(B) ECCN 3B001.c.4, 3B993.b.1, c.2, c.3, d.4, f.2, f.3, o.2, q.1, q.2, 3B994, 3D993.a (for commodities specified in this paragraph), 3D993.b through d, 3D994, 3E993.a (for commodities specified in this paragraph), 3E993.b, or 3E994; *and*

(ii) *End-use scope.* The recipient is ''developing'' or ''producing'' ''parts,'' ''components,'' or ''equipment'' (as specified in §§ 744.23(a)(4) and 742.6(a)(11)) of the EAR) at the direction of a company that is headquartered in the United States or a destination specified in Country Group A:5 or A:6 and not majority-owned by an entity headquartered in either Macau or a destination specified in Country Group D:5.

(2) *TGL—Advanced computing items.* This TGL only overcomes the license requirements described in § 742.6(a)(6)(iii) of the EAR when the criteria in paragraphs (d)(2)(i) and either (d)(2)(ii)(A) or (d)(2)(ii)(B) are met.

(i) *Product scope.* The items subject to the EAR are specified in, either:

(A) ECCNs 3A001.z; 3A090.a and 3A090.b; 3D001 (for ''software'' for commodities controlled by 3A001.z, 3A090.a and 3A090.b); 3E001 (for ''technology'' for commodities controlled by 3A001.z, 3A090.a and .b); 4A003.z; 4A004.z; 4A005.z; 4A090; 4D001 (for ''software'' for commodities controlled by 4A003.z, 4A004.z, and 4A005.z); 4D090; 4E001 (for ''technology'' for commodities controlled by 4A003.z, 4A004.z, 4A005.z, 4A090 or ''software'' specified by 4D001 (for 4A003.z, 4A004.z, and 4A005.z); 4D090; 5A002.z; 5A004.z; 5A992.z; 5D002.z; 5D992.z; 5E002 (for ''technology'' for commodities controlled by 5A002.z or 5A004.z or ''software'' specified by 5D002 (for 5A002.z or 5A004.z commodities)); or 5E992 (for ''technology'' for commodities controlled by 5A992.z or ''software'' controlled by 5D992.z) of the Commerce Control List (CCL); or

(B) ECCN 3A090.c.

(ii) *End-use scope*—(A) *For all items under paragraph (d)(2)(i).* Any item identified under the paragraph (d)(2)(i) of this supplement, may be exported, reexported, or transferred (in-country) to or within a destination specified in Country Groups D:1, D:4, or D:5 (and not specified in Country Groups A:5 or A:6) or for 3A090.c to or within Macau or a destination specified in Country Group D:5 when either of the following apply:

(*1*) The end user is located in, but is not headquartered in, or whose ultimate parent company is not headquartered in, Macau or Country Group D:5 and the end use is to continue or engage in the following activities: integration, assembly (mounting), inspection, testing, quality assurance, and distribution of items covered by items specified in paragraph (d)(2)(i); *and*

(*2*) The ultimate end user of these items is located outside of destinations specified in Country Groups D:1, D:4, or D:5 (and not specified in Country Groups A:5 or A:6) by entities not headquartered in or whose ultimate parent company is not headquartered in Macau or a destination specified in Country Group D:5.

(B) *Additional permitted ultimate end use for 3A090.c.* ECCN 3A090.c commodities are authorized under this paragraph (d)(2)(ii) of this General Order No. 4 for use in any destination if the 3A090.c commodity is incorporated into another commodity, provided that the higher-level commodity is not identified in paragraph (d)(2)(i) of this General Order No. 4. If the higher-level commodity is identified under paragraph (d)(2)(i), of this General Order No. 4, then the ultimate end use of these items is authorized under this paragraph (d)(2)(ii) for destinations other than those specified in Country Groups D:1, D:4, or D:5 (and not specified in Country Groups A:5 or A:6) by entities not headquartered in, or whose ultimate parent company is not headquartered in, Macau or a destination specified in Country Group D:5. Any subsequent export, reexport, or transfer (in-country) of a 3A090.c commodity (regardless of whether it was incorporated into a higher-level commodity) would also need to comply with any other applicable EAR license requirements such as those based on the classification (including, if relevant, the higher-level commodity) and the end use and parties to the transaction.

(3) *Validity date* follows:

(i) Paragraph (d)(1)(i)(A) expires on December 31, 2026;

(ii) Paragraph (d)(1)(i)(B) expires on December 31, 2026;

(iii) Paragraph (d)(2)(i)(A) expires on December 31, 2025; and

(iv) Paragraph (d)(2)(i)(B) expires on December 31, 2026.

* * * * *

PART 740—LICENSE EXCEPTIONS

■ 10. The authority citation for part 740 continues to read as follows:

Authority: 50 U.S.C. 4801–4852; 50 U.S.C. 4601 *et seq.;* 50 U.S.C. 1701 *et seq.;* 22 U.S.C. 7201 *et seq.;* E.O. 13026, 61 FR 58767, 3 CFR, 1996 Comp., p. 228; E.O. 13222, 66 FR 44025, 3 CFR, 2001 Comp., p. 783.

■ 11. Section 740.2 is amended by:

■ a. Revising paragraph (a)(9)(i) and paragraph (a)(9)(ii) introductory text;

■ b. Adding a new note to paragraph (a)(9)(ii).

The revisions and addition read as follows:

§ 740.2 Restrictions on all License Exceptions.

* * * * *

(a) * * *

(9) * * *

(i) The item is controlled under ECCN 3B001.a.4, c, d, f.1, f.5, k to n, p.2, p.4, r, 3B002.c, 3B993, 3B994, or associated software and technology in ECCN 3D001, 3D002, 3D003, 3D992, 3D993, 3D994, 3E001, 3E992, 3E993, or 3E994 and is being exported, exported from abroad, reexported, or transferred (in-country) to or within either Macau or a destination specified in Country Group D:5 of supplement no. 1 to this part, and the license exception is other than License Exception GOV, restricted to eligibility under the provisions of § 740.11(b).

(ii) The item is identified in paragraph (a)(9)(ii)(A) or (B) of this section, is being exported, reexported, or transferred (in-country) to or within a destination specified in Country Group D:1, D:4, or D:5, excluding any destination also specified in Country Groups A:5 or A:6, or to an entity headquartered in or whose ultimate parent headquartered in, Macau or a destination specified in Country Group D:5, wherever located, and the license exception is other than: TMP, restricted to eligibility under the provisions of § 740.9(a)(6); NAC/ACA, under the provisions of § 740.8; RPL, under the provisions of § 740.10; GOV, restricted to eligibility under the provisions of § 740.11(b); TSU under the provisions of § 740.13(a) and (c); or HBM under the provisions of § 740.25. Items restricted to eligibility only for the foregoing license exceptions are:

* * * * *

Note 1 to paragraph (a)(9)(ii): ECCN 3A090.c requires a license for exports, reexports, and transfers (in-country) to or within Macau or destinations specified in Country Group D:5, but is still included within the scope of this paragraph because it generally shares the same EAR license exception eligibility as other 3A090 commodities, except for NAC/ACA, under the provisions of § 740.8., which ECCN 3A090.c is not eligible. An export, reexport, or transfer (in-country) of an ECCN 3A090.c commodity to a destination specified in Country Groups D:1 or D:4 that is not specified in Country Group D:5, may be made under the No License Required (NLR) designation, provided no part 744 or 746 license requirements are applicable.

* * * * *

■ 12. Section 740.8 is amended by revising paragraph (a) introductory text to read as follows:

§ 740.8 Notified Advanced Computing (NAC) and Advanced Computing Authorized (ACA).

(a) *Eligibility requirements.* License Exception NAC authorizes the export and reexport of any item classified in ECCN 3A090 (except for 3A090.c), 4A090, 3A001.z, 4A003.z, 4A004.z, 4A005.z, 5A002.z, 5A004.z, 5A992.z, 5D002.z, or 5D992.z, except for items designed or marketed for use in a datacenter and meeting the parameters of 3A090.a, to Macau and Country Group D:5 or an entity headquartered in, or whose ultimate parent headquartered in, Macau or a destination specified in Country Group D:5, wherever located. License Exception ACA authorizes the export, reexport, and transfer (in-country) of any item classified in ECCN 3A090 (except for 3A090.c), 4A090, 3A001.z, 4A003.z, 4A004.z, 4A005.z, 5A002.z, 5A004.z, 5A992.z, 5D002.z, or 5D992.z, except for items designed or marketed for use in a datacenter and meeting the parameters of 3A090.a, to or within any destination specified in Country Groups D:1 and D:4 (except Macau, a destination in Country Group D:5, or an entity headquartered in, or whose ultimate parent headquartered in, Macau or a destination specified in Country Group D:5, wherever located), as well as transfers (in-country) within Macau and destinations in Country Group D:5. These license exceptions may be used provided the export, reexport, or transfer (in-country) meets all of the applicable criteria identified under this paragraph (a) and none of the restrictions in paragraph (b) of this section.

* * * * *

■ 13. Sections 740.25 and 740.26 are added to read as follows:

§ 740.25 License Exception High Bandwidth Memory (HBM).

(a) *Scope.* This License Exception High Bandwidth Memory (HBM) authorizes the export, reexport, or transfer (in-country) of items specified in ECCN 3A090.c on the Commerce Control List (CCL) in supplement no. 1 to part 774 if all terms and conditions within this section are met.

(b) *Exporter, reexporter, transferor.* The exporter, reexporter, or transferor must be headquartered in the United States or a destination specified in Country Group A:5 of supplement no. 1 to this part, without an ultimate parent headquartered in Macau or a destination specified in Country Group D:5 of supplement no. 1 to this part.

(c) *Conditions.* The following exports, reexports, or transfers (in-country) are only authorized under this License Exception HBM if the 3A090.c item has a memory bandwidth density less than 3.3 GB/s/mm^2 and both of the following conditions apply:

(1) The 3A090.c items exported, reexported, or transferred to or within Macau or a destination specified in Country Group D:5 must be directly purchased by the designer of the co-packaged commodity not otherwise prohibited from receipt of the item; and

(2) The 3A090.c items must be exported, reexported, or transferred (in-country) directly to the packaging site.

(i) For 3A090.c items exported, reexported, or transferred (in-country) to a U.S., or Country Group A:5 or A:6-headquartered packaging site without an ultimate parent headquartered in Macau or a destination specified in Country Group D:5 of supplement no. 1 to part 740:

(A) The packaging site must confirm in writing to the producer of the chips that the 3A090.c item was packaged and exported, reexported, or transferred (in-country) to the specified designer of the co-packaged commodity. This confirmation is considered an ''export control document'' and is subject to recordkeeping requirements in part 762. A copy of this record must be provided to BIS upon request; and

(B) The finished, co-packaged commodities must not exceed the technical thresholds in ECCN 3A090, unless packaging the item is permitted under the Temporary General License (TGL) specified in paragraph (d) of General Order No. 4 in of supplement no. 1 to part 736.

(ii) For 3A090.c items exported, reexported, or transferred (in-country) to any other packaging site, the finished, co-packaged commodities must be sent back to the exporter, reexporter, or transferor for export, reexport, or transfer (in-country) to the purchaser:

(A) Upon receipt of the finished, co-packaged commodities, the exporter, reexporter, transferor must confirm the number of 3A090.c units contained within the finished, co-packaged chips received from the packaging site matches the number of 3A090.c items exported, reexported, or transferred (in-country) to the packaging site. This confirmation is considered an ''export control document'' and is subject to recordkeeping requirements in part 762. A copy of this record must be provided to BIS upon request; and

(B) The finished, co-packaged commodities must not exceed the technical thresholds in ECCN 3A090.a or 3A090.b.

(d) *Restrictions.* The following exports, reexports, or transfers (in-country) of 3A090.c items are not authorized under this License Exception HBM:

(1) To distributors.

(2) To intermediate consignees, unless hired by the packaging site for freight forwarding or customs clearance.

(3) To co-packaging at a ''facility'' located in Macau or a destination specified in Country Group D:5 where ''production'' of ''advanced-node ICs'' occurs.

(e) *Reporting requirement.* In the event that the exporter, reexporter, or transferor identifies a discrepancy of greater than 1 percent between the number of 3A090.c units exported, reexported, or transferred (in-country) to the packaging site and the number of 3A090.c units contained within the finished, co-packaged commodities received from the packaging site under paragraph (c)(2)(ii) of this section, this generates a 'Red Flag' that must be resolved before exporting, reexporting, or transferring (in-country) the finished, co-packaged commodities to the designer of the co-packaged commodity or engaging in any further exports, reexports, or transfers (in-country) of 3A090.c items to the designer of the co-packaged commodity or packaging site involved in the transaction that raised the Red Flag. If the Red Flag cannot be resolved, then within 60 days of identifying the discrepancy, the exporter, reexporter, or transferor must report the information in paragraph (e)(1) to BIS consistent with the requirements under paragraph (e)(2).

(1) *Information required.* (i) Date of shipment;

(ii) Quantity exported and quantity returned;

(iii) Name of Consignee or designer of the co-packaged commodity;

(iv) Name and address of the packaging site;

(v) End use; *and*

(vi) Explanation of measures already taken or planned to resolve the Red Flag.

(2) *Submission requirements. Reports must be provided in electronic form. Recommended file formats for electronic submission include spreadsheets, tabular text or structured text. Submitters may request other reporting arrangements with BIS to better reflect their business models. Reports are to be sent electronically to BIS at the email address: HBMReports@bis.doc.gov with the email subject line Attn: LE HBM Discrepancy Reports.*

§ 740.26 License Exception Restricted Fabrication "Facility" (RFF).

(a) *Scope.* License Exception Restricted Fabrication ''Facility'' (RFF) authorizes the export, reexport, export from abroad, and transfer (in-country) of items not specified in ECCNs 3B001, 3B002, 3B993, 3B994, 3D992, 3D993, 3D994, 3E992, 3E993, or 3E994. Additionally, this license exception does not overcome destination-based license requirements in part 742, end-use based license requirements in other sections of part 744, or license requirements that apply to other entities on the Entity List if other listed entities that are not eligible for this license exception are a party to the transaction.

(b) *Definition.* A restricted fabrication ''facility'' is an entity that is on the Entity List in supplement no. 4 to part 744 of the EAR that has a reference to § 740.26 in the license requirement column.

(c) *Restrictions.* License Exception RFF is subject to the following restrictions.

(1) Items may not be used for the operation, installation, maintenance, repair, overhaul, or refurbishing of items specified in ECCNs 3B001.a.4, c, d, f.1, f.5, k to n, p.2, p.4, r, 3B002.c, 3B993, or 3B994 at a 'restricted fabrication facility'.

(2) The item may not be used to produce ''advanced-node integrated circuits.''

(d) *Notification requirements.* Notifications must be sent to *EARReports@bis.doc.gov.* Subject line 'LE RFF Notification pursuant to (d)(1)' for notifications required under (d)(1) and with the subject line 'LE RFF Notification pursuant to (d)(2)' for notifications required under (d)(2) of this section.

(1) *45-Days Prior.* 45 days prior to exporting, reexporting, exporting from abroad, or transferring (in-country) items eligible under this license exception, a notification must be sent to BIS that includes the end-user's name and address, description of item(s), purchase price, and anticipated shipping date of shipment.

(2) *Within one business day.* If you gain ''knowledge'' that the end use has changed to ''advance-node integrated circuit'' ''production,'' you must notify BIS within one business day.

(e) *Reporting requirements.* Reports must be provided in electronic form. Recommended file formats for electronic submission include spreadsheets, tabular text, or structured text. Submitters may request other reporting arrangements with BIS to better reflect their business models. Reports are to be sent electronically to BIS at the email address: *EARReports@bis.doc.gov.* Subject line Attn: LE RFF Installation Reports for paragraph (e)(1) or Attn: LE RFF Annual Confirmation Report for paragraph (e)(2) of this section.

(1) *Installation.* Within 30 days of installation of semiconductor manufacturing equipment, you must submit a report to BIS that includes the end-user's name and address, description of equipment that was installed, and date of installation. This email should reference previous notifications sent to BIS, including notifications.

(2) *Annual end-use confirmation.* On February 1 of each year that the exporter, reexporter, or transferor is continuing to provide service or for at least for five years from the date of last service, you must submit a report to BIS that you have confirmed that the installed semiconductor manufacturing equipment is not being used in the production of ''advanced-node integrated circuits.''

* * * * *

PART 742—CONTROL POLICY—CCL BASED CONTROLS

■ 14. The authority citation for part 742 continues to read as follows:

Authority: 50 U.S.C. 4801–4852; 50 U.S.C. 4601 *et seq.;* 50 U.S.C. 1701 *et seq.;* 22 U.S.C. 3201 *et seq.;* 42 U.S.C. 2139a; 22 U.S.C. 7201 *et seq.;* 22 U.S.C. 7210; Sec. 1503, Pub. L. 108–11, 117 Stat. 559; E.O. 12058, 43 FR 20947, 3 CFR, 1978 Comp., p. 179; E.O. 12851, 58 FR 33181, 3 CFR, 1993 Comp., p. 608; E.O. 12938, 59 FR 59099, 3 CFR, 1994 Comp., p. 950; E.O. 13026, 61 FR 58767, 3 CFR, 1996 Comp., p. 228; E.O. 13222, 66 FR 44025, 3 CFR, 2001 Comp., p. 783; Presidential Determination 2003–23, 68 FR 26459, 3 CFR, 2004 Comp., p. 320; Notice of November 7, 2024, 89 FR 88867 (November 8, 2024).

■ 15. Section 742.4 is amended by:

(a) Revising paragraph (a)(4);

(b) Redesignating paragraphs (a)(5)(ii)(B)(i) and (ii) as paragraphs (a)(5)(ii)(B)(*1*) and (*2*); and

(c) Revising paragraph (b)(2).

The revisions read as follows:

§ 742.4 National security.

(a) * * *

(4) *Certain semiconductor manufacturing equipment and associated software and technology*—(i) *Scope.* A license is required for exports, reexports, exports from abroad, and transfers (in-country) to or within either Macau or a destination specified in Country Group D:5 in supplement no. 1 to part 740 of the EAR of items specified in 3B001.a.4, c, d, f.1, f.5, k to n, p.2, p.4, r, 3B002.c, 3D992, or 3E992.

(ii) *Exclusions.* The license requirements in this paragraph (a)(4) do not apply to any of the following:

(A) Deemed exports or deemed reexports.

(B) An item subject to the EAR pursuant to §§ 734.4(a)(8) or 734.9(k) if the item is reexported or exported from abroad by an entity located in a country specified in supplement no. 4 to this part, and the entity is not headquartered or have an ultimate parent company headquartered in either Macau or a destination specified in Country Group D:5.

(C) An item subject to the EAR pursuant to §§ 734.4(a)(8) or 734.9(k) if the item is reexported or exported from abroad by an entity located in a country that has implemented equivalent controls for items specified in paragraph (a)(4)(i) of this section, and the entity is not headquartered or have an ultimate parent company headquartered in either Macau or a destination specified in Country Group D:5. For the purposes of this paragraph, equivalent means the item is listed on the country's export control list and the country applies the same license review policy. To receive assistance in determining countries with equivalent controls, you may submit an advisory opinion in accordance with § 748.3(c) of the EAR.

* * * * *

(b) * * *

(2) License applications for items specified in paragraph (a)(4) of this section will be reviewed consistent with license review policies in § 744.23(d) of the EAR. However, if § 744.23 does not apply, applications will be reviewed on a case-by-case basis if no license would be required under part 744 of the EAR. applications will be reviewed on a case-by-case basis if no license would be required under part 744 of the EAR.

* * * * *

■ 16. Section 742.6 is amended by:

■ a. Revising paragraphs (a)(6)(i) and (a)(6)(iii);

■ c. Adding paragraph (a)(11);

■ d. Revising paragraph (b)(10); and

■ e. Adding paragraph (b)(12).

The additions and revisions read as follows:

§ 742.6 Regional stability.

(a) * * *

(6) *RS requirement that applies to advanced computing and semiconductor manufacturing items*—(i) *Exports, reexports, transfers (in-country) to or within Macau or Country Group D:5*—(A) *Certain semiconductor manufacturing equipment and associated software and technology*—(*1*) *Scope.* A license is required for exports, reexports, and transfers (in-country) to or within either Macau or a destination specified in Country Group D:5 in supplement no. 1 to part 740 of the EAR of items specified in 3B001.a.4, c, d, f.1, f.5, k to n, p.2, p.4, r, 3B002.c, 3D992, or 3E992.

(*2*) *Exclusions.* The license requirements in this paragraph (a)(6)(i)(A) do not apply to any of the following:

(*i*) Deemed exports or deemed reexports.

(*ii*) An item subject to the EAR pursuant to §§ 734.4(a)(8) or 734.9(k) if the item is reexported or exported from abroad by an entity located in a country specified in supplement. no. 4 to this part, and the entity is not headquartered or have an ultimate parent company headquartered in Country Group D:5 or Macau.

(*iii*) An item subject to the EAR pursuant to §§ 734.4(a)(8) or 734.9(k) if the item is reexported or exported from abroad by an entity located in a country that has implemented equivalent controls for items specified in paragraph (a)(6)(i)(A)(*1*) of this section, and the entity is not headquartered or have an ultimate parent company headquartered in Country Group D:5 or Macau. For the purposes of this paragraph, 'equivalent' means the item is listed on the country's export control list and the country applies the same license review policy. To receive assistance in determining countries with equivalent controls, you may submit an advisory opinion request in accordance with § 748.3(c) of the EAR.

(B) *High Bandwidth Memory (HBM).* A license is required for items specified in ECCNs 3A090.c, 3D001 (for 3A090.c), and 3E001 (for 3A090.c) when exported, reexported, or transferred (in-country) to or within Macau or a destination specified in Country Group D:5 in supplement no. 1 to part 740 of the EAR. The license requirements in this paragraph (a)(6)(i)(B) do not apply to deemed exports or deemed reexports.

* * * * *

(iii) *Exports, reexports, transfers (in-country) to or within destinations specified in Country Groups D:1, D:4, and D:5, excluding destinations also specified in Country Groups A:5 or A:6.* A license is required for items specified in ECCNs 3A001.z; 3A090 (except for 3A090.c); 3D001 (for ''software'' for commodities controlled by 3A001.z, 3A090 (except for 3A090.c)); 3E001 (for ''technology'' for commodities controlled by 3A001.z, 3A090 (except for 3A090.c)); 4A003.z; 4A004.z; 4A005.z; 4A090; 4D001 (for ''software'' for commodities controlled by 4A003.z, 4A004.z, and 4A005.z); 4D090 (for ''software'' for commodities controlled by 4A090); 4E001 (for ''technology'' for commodities controlled by 4A003.z, 4A004.z, 4A005.z, 4A090 or ''software'' specified by 4D001 (for 4A003.z, 4A004.z, and 4A005.z), 4D090 (for ''software'' for commodities controlled by 4A090)); 5A002.z; 5A004.z; 5A992.z; 5D002.z; 5D992.z; 5E002 (for ''technology'' for commodities controlled by 5A002.z or 5A004.z or ''software'' specified by 5D002 (for 5A002.z or 5A004.z commodities)); or 5E992 (for ''technology'' for commodities controlled by 5A992.z or ''software'' controlled by 5D992.z) being exported, reexported, or transferred (in-country) to or within a destination specified in Country Groups D:1, D:4, and D:5, excluding destinations also specified in Country Groups A:5 or A:6, in supplement no. 1 to part 740 of the EAR.

* * * * *

(11) *License requirement for ECCN 3B993, 3B994, 3D993, 3D994, 3E993, and 3E994.* A license is required for the export, reexport, or transfer (in-country) of items specified in ECCN 3B993, 3B994, 3D993, 3D994, 3E993, or 3E994 to a Footnote 5 designated entity listed on the Entity List in supplement no. 4 to part 744 of the EAR when the item is not subject to the EA pursuant to §§ 734.4(a)(9) or 734.9(e)(3) of the EAR. See § 744.11(a)(2)(v)(a) for license requirements for these items when subject to the EAR pursuant to §§ 734.4(a)(9) and 734.9(e)(3) of the EAR.

(b) * * *

(10) *Advanced computing and semiconductor manufacturing items*—(i) *License review policy for paragraphs (a)(6)(i)(A) and (ii) of this section.* License applications for items specified in paragraphs (a)(6)(i)(A) and (ii) of this section will be reviewed consistent with license review policies in § 744.23(d) of the EAR. However, if § 744.23 does not apply, applications will be reviewed on a case-by-case basis if no license would be required under part 744 of the EAR.

(ii) *License review policy for paragraph (a)(6)(i)(B) of this section (for 3A090.c).* There is a presumption of approval review policy for license applications for items specified in paragraph (a)(6)(i)(B) to or within Macau or a destination specified in Country Group D:5 in supplement no. 1 to part 740 of the EAR for entities neither headquartered in nor whose ultimate parent company is headquartered in either Macau or a destination specified in Country Group D:5. There is a

presumption of denial policy for all other license applications.

(iii) *License review policy for paragraph (a)(6)(iii) of this section.* (A) License applications will be reviewed under a presumption of approval for export, reexport, or transfer (in-country) of items specified in paragraph (a)(6)(iii) to or within destinations other than Country Group D:5 or Macau or to entities not headquartered in or whose ultimate parent company is not headquartered in destinations in Country Group D:5 or Macau. (B) License applications will be reviewed under a presumption of denial for the export, reexport, or transfer (in-country) of items specified in paragraph (a)(6)(iii) of this section to or within destinations in Country Group D:5 or Macau, or to an entity headquartered in or whose ultimate parent company is headquartered in a destination in Country Group D:5 or Macau, unless either of the following apply, in which case they will be subject to a case-by-case license review policy if either of the following apply:

(*1*) The commodity meets the parameters of 3A090.a and is not designed or marketed for use in a datacenter; or

(*2*) The commodity meets the parameters of 3A090.b and is designed or marketed for use in a datacenter.

* * * * *

(12) *License review policy for paragraph (a)(11).* The license review policy for items subject to a license pursuant to paragraph (a)(11) of this section will be reviewed as specified in the license review policy column for the listed entity. See also § 744.11(a)(2)(v) of the EAR.

* * * * *

■ 17. Supplement no. 4 to part 742 is added to read as follows:

Supplement No. 4 to Part 742—Countries Excluded From Certain Semiconductor Manufacturing Equipment License Requirements

Australia
Austria
Belgium
Bulgaria
Canada
Croatia
Czech Republic
Denmark
Estonia
Finland
France
Germany
Greece
Hungary
Iceland
Ireland
Italy
Japan
Latvia
Lithuania
Luxembourg
Netherlands
New Zealand
Norway
Poland
Portugal
Romania
Slovakia
Slovenia
Spain
Sweden
Switzerland
United Kingdom

* * * * *

PART 744—CONTROL POLICY: END-USER AND END-USE BASED

■ 18. The authority citation for part 744 is revised to read as follows:

Authority: 50 U.S.C. 4801–4852; 50 U.S.C. 4601 *et seq.;* 50 U.S.C. 1701 *et seq.;* 22 U.S.C. 3201 *et seq.;* 42 U.S.C. 2139a; 22 U.S.C. 7201 *et seq.;* 22 U.S.C. 7210; E.O. 12058, 43 FR 20947, 3 CFR, 1978 Comp., p. 179; E.O. 12851, 58 FR 33181, 3 CFR, 1993 Comp., p. 608; E.O. 12938, 59 FR 59099, 3 CFR, 1994 Comp., p. 950; E.O. 13026, 61 FR 58767, 3 CFR, 1996 Comp., p. 228; E.O. 13099, 63 FR 45167, 3 CFR, 1998 Comp., p. 208; E.O. 13222, 66 FR 44025, 3 CFR, 2001 Comp., p. 783; E.O. 13224, 66 FR 49079, 3 CFR, 2001 Comp., p. 786; Notice of September 18, 2024, 89 FR 77011 (September 20, 2024); Notice of November 7, 2024, 89 FR 88867 (November 8, 2024).

■ 19. Section 744.6 is amended by revising paragraph (c)(2)(iii) to read as follows:

§ 744.6 Restrictions on specific activities of "U.S. persons."

* * * * *

(c) * * *

(2) * * *

(iii) *Semiconductor manufacturing equipment.* To or within either Macau or a destination specified in Country Group D:5, any item not subject to the EAR and meeting the parameters of ECCNs 3B001.a.4, c, d, f.1, f.5, k to n, p.2, p.4, r, 3B002.c, 3D992, or 3E992 regardless of end use or end user.

* * * * *

■ 20. Section 744.11 is amended by adding paragraph (a)(2)(v), to read as follows:

§ 744.11 License requirements that apply to entities acting or at significant risk of acting contrary to the national security or foreign policy interests of the United States.

* * * * *

(a) * * *

(2) * * *

(v) *Footnote 5 entities*—(A) *License requirement.* You may not, without a license, reexport, export from abroad, or transfer (in-country) to or within any destination or to any end user or party any foreign-produced item subject to the EAR pursuant to §§ 734.4(a)(9) or 734.9(e)(3), for each of the following paragraphs (A)(*1*) through (A)(*4*):

(*1*) *Exports from abroad or reexports from all countries.* A license is required for commodities specified in ECCN 3B993 when exported from abroad or reexported by an entity headquartered in, or whose ultimate parent company is headquartered in, Macau or a destination specified in Country Group D:5.

(*2*) *Exports from abroad or reexports from countries in Country Group A:5 that are not in supplement no. 4 to part 742.* A license is required for the export from abroad or reexport from countries specified in Country Group A:5 that are not in supplement no. 4 to part 742 of commodities specified in ECCN 3B993 if the commodity is not subject to equivalent controls by the relevant country.

(*3*) *Exports from abroad or reexports from all countries not listed in Country Group A:5.* Exports from abroad or reexports from all countries not listed in Country Group A:5, as follows:

(*i*) A license is required for commodities specified in ECCNs 3B001 (except 3B001.a.4, c, d, f.1, f.5, g, h, k to n, p.2, p.4, r), 3B002 (except 3B002.c), 3B611, 3B903, 3B991 (except 3B991.b.2.a through 3B991.b.2.b), 3B992, 3B993, or 3B994 by an entity that is headquartered or whose ultimate parent company is headquartered in a country not specified in supplement no. 4 to part 742.

(*ii*) A license is required for commodities specified in ECCN 3B993 by an entity headquartered or whose ultimate parent company is headquartered in a country specified in supplement no. 4 to part 742 of this section.

(*4*) *Transfers (in-country).* The commodity is to be transferred within the country of the entity specified by § 734.9(e)(3)(ii):

(*i*) By an entity whose ultimate parent company is headquartered in a country not described in supplement no. 4 to part 742 and the entity is transferring a commodity specified in ECCNs 3B001 (except 3B001.a.4, c, d, f.1, f.5, g, h, k to n, p.2, p.4, or r), 3B002 (except 3B002.c), 3B611, 3B903, 3B991 (except 3B991.b.2.a through 3B991.b.2.b), 3B992, 3B993, or 3B994; or

(*ii*) By an entity whose ultimate parent company is headquartered in a country described in supplement no. 4 to part 742 destination and the entity is transferring a commodity specified in ECCN 3B993.

(B) *License review policy.* The license review policy is set forth in the entry of

the Entity List in supplement no. 4 to this part for each entity with a Footnote 5 designation. Unless otherwise stated in the license review policy column of the specific entity, there is a case-by-case license review policy for items subject to the license requirements of this section where there is a foreign-made item that is not subject to the license requirements of this section and performs the same function as an item subject to the EAR license requirements of this section.

* * * * *

■ 21. Section 744.23 is amended by:

■ a. Adding paragraph (a)(2)(iii) and (iv); and

■ b. Revising paragraphs (a)(3)(i), (a)(3)(ii) introductory text, (a)(3)(ii)(D). and (a)(4).

The additions and revisions read as follows:

§ 744.23 "Supercomputer," "advanced-node integrated circuits," and semiconductor manufacturing equipment end use controls.

* * * * *

(a) * * *

(2) * * *

(iii) *Design of "advanced-node ICs".* Any Electronic Computer Aided Design (ECAD) or Technology Computer Aided Design (TCAD) "software" and "technology" subject to the EAR when you "know" it will be used in the design of an "advanced-node integrated circuit" that will be "produced" in Macau or a destination specified in Country Group D:5 in supplement no. 1 to part 740 of the EAR.

(iv) *"Advanced Node IC" exclusion.* Items specified in paragraphs (a)(2)(i) and (ii) destined to entities designated with a Footnote 5 are not subject to the license requirements in this section.

(3) * * *

(i) *ECCNs 3A090, 4A090, and .z items destined to entities headquartered in, or whose ultimate parent company is headquartered in, either Macau or a destination specified in Country Group D:5 in certain destinations.*

(A) Any item subject to the EAR and specified in ECCNs 3A001.z, 3A090 (except for 3A090.c), 4A003.z, 4A004.z, 4A005.z, 4A090, 5A002.z, 5A004.z, 5A992.z, 5D002.z, or 5D992.z destined to any destination other than those specified in Country Groups D:1, D:4, or D:5 (excluding any destination also specified in Country Groups A:5 or A:6) for an entity that is headquartered in, or whose ultimate parent company is headquartered in, either Macau or a destination specified in Country Group D:5 (*e.g.,* a PRC-headquartered cloud or data server provider located outside of Country Groups D:1, D:4, or D:5 (excluding any destination also specified in Country Groups A:5 or A:6)), *or*

(B) Any item subject to the EAR and specified in ECCN 3A090.c destined to any destination other than Macau or those specified in Country Group D:5, for an entity that is headquartered in, or whose ultimate parent company is headquartered in, either Macau or a destination specified in Country Group D:5.

(ii) ECCN 3E001 (for 3A090, except for 3A090.c) "technology" when it meets all of the following:

* * * * *

(D) The "technology" is for the "production" of commodities or software specified in ECCN 3A001.z, 3A090 (except for 3A090.c), 4A003.z, 4A004.z, 4A005.z, 4A090, 5A002.z, 5A004.z, or 5A992.z.

(4) *Semiconductor manufacturing equipment (SME) and "components," "assemblies," and "accessories."* A license is required for export, reexport, or transfer (in-country) if paragraph (a)(4)(i) or (ii) of this section applies.

(i) *Directly destined to Macau and Country Group D:5.* Any item subject to the EAR and specified on the CCL when destined to or within either Macau or a destination specified in Country Group D:5 for the "development" or "production" of "equipment," "components," "assemblies," or "accessories" specified in ECCNs 3B001 (except 3B001.g and .h), 3B002, 3B611, 3B903, 3B991 (except 3B991.b.2.a through 3B991.b.2.b), 3B992, 3B993, 3B994 or associated "software" and "technology" in 3D or 3E of the CCL.

(ii) *Indirect exports, reexports, or transfers (in-country).* Any item subject to the EAR and specified on the CCL for export, reexport, or transfer (in-country), if all of the following apply:

(A) The item (either in its original form or as subsequently incorporated into a foreign-made item) is for "development" or "production" of a foreign-made item, whether subject to the EAR or not, that is specified in an ECCN listed in paragraph (a)(4)(i) of this section (and not excepted by that paragraph); and

(B) The "development" or "production" is by an entity headquartered in, or whose ultimate parent is headquartered in, Macau or a destination specified in Country Group D:5.

Note 1 to paragraph (a)(4): For transactions involving "development" or "production" in Macau or a destination specified in Country Group D:5 by an entity that is headquartered in Macau or a destination specified in Country Group D:5, but the "development" or "production" is undertaken at the direction of an entity headquartered in the United States or a destination specified in Country Group A:5 or A:6, refer to General Order No. 4 in supp. no. 1 to part 736 (Temporary General License—Less restricted SME "parts," "components," or "equipment").

* * * * *

PART 758—EXPORT CLEARANCE REQUIREMENTS

■ 22. The authority citation for part 758 continues to read as follows:

Authority: 50 U.S.C. 4801–4852; 50 U.S.C. 4601 *et seq.;* 50 U.S.C. 1701 *et seq.;* E.O. 13222, 66 FR 44025, 3 CFR, 2001 Comp., p. 783.

■ 23. Section 758.6 is amended by revising paragraph (a)(2) to read as follows:

§ 758.6 Destination control statement and other information furnished to consignees.

(a) * * *

(2) The ECCN(s) for any 3A001.z, 3A090, 4A003.z, 4A004.z, 4A005.z, 4A090, 5A002.z, 5A004.z, 5A992.z, 9x515 or "600 series" "items" being shipped (*i.e.,* exported in tangible form). For the seven ECCNs with a .z paragraph, the requirement to include the classification only applies to commodities specified under the .z paragraphs. If the commodity is specified under any other paragraph in one of those seven ECCNs, then the requirement under this paragraph is not applicable. For ECCN 3A090, identify the commodity as either 3A090.a, .b, or .c.

* * * * *

PART 762—RECORDKEEPING

■ 24. The authority citation for part 762 continues to read as follows:

Authority: 50 U.S.C. 4801–4852; 50 U.S.C. 4601 *et seq.;* 50 U.S.C. 1701 *et seq.;* E.O. 13222, 66 FR 44025, 3 CFR, 2001 Comp., p. 783.

■ 25. Section 762.2 is amended by adding paragraph (b)(56) and (57) to read as follows:

§ 762.2 Records to be retained.

* * * * *

(b) * * *

(56) § 740.25, License Exception HBM.

(57) § 740.26, License Exception RFF.

* * * * *

PART 770—INTERPRETATIONS

■ 26. The authority citation for part 770 continues to read as follows:

Authority: 50 U.S.C. 4801–4852; 50 U.S.C. 4601 *et seq.;* 50 U.S.C. 1701 *et seq.;* E.O.

13222, 66 FR 44025, 3 CFR, 2001 Comp., p. 783.

■ 27. Section 770.2 is amended by revising paragraph (o)(2)(i) to read as follows:

§ 770.2 Item interpretations.

* * * * *

(o) * * *

(2) * * *

(i) Any utilized existing commercial ''software'' or ''technology'' specified under ECCNs 3D991, 3D992, 3D993, 3E001, 3E991, 3E992, 3E993, 9D515.d, 9D515.e, 9E515.d or 9E515.e does not meet the ''required'' standard (as defined in part 772 of the EAR) of any other ECCN on the CCL; and

Note 1 to paragraph (o)(2)(i): The use of existing commercial ''software'' or ''technology'' by or for the USG for the purposes described in paragraph (o)(1) of this section does not, in and of itself, establish the ''required'' standard to meet the specifications of any ECCN on the CCL.

* * * * *

PART 772—DEFINITIONS OF TERMS

■ 28. The authority citation for part 772 continues to read as follows:

Authority: 50 U.S.C. 4801–4852; 50 U.S.C. 4601 *et seq.;* 50 U.S.C. 1701 *et seq.;* E.O. 13222, 66 FR 44025, 3 CFR, 2001 Comp., p. 783.

■ 29. Section 772.1 is amended by revising the definitions for ''access information'' and ''Advanced-Node Integrated Circuit'' to read as follows:

§ 772.1 Definitions of terms as used in the Export Administration Regulations (EAR).

* * * * *

Access information. For purposes of § 734.19(a), information that allows access to encrypted technology or encrypted software in an unencrypted form. Examples include decryption keys, network access codes, and passwords.

* * * * *

Advanced-Node Integrated Circuits (Advanced-Node IC). For parts 734 and 744 of the EAR, ''advanced-node integrated circuits'' include integrated circuits that meet any of the following criteria:

(1) Logic integrated circuits using a non-planar transistor architecture or with a ''production'' 'technology node' of 16/14 nanometers or less;

(2) NOT AND (NAND) memory integrated circuits with 128 layers or more; or

(3) Dynamic random-access memory (DRAM) integrated circuits having:

(i) A memory cell area of less than 0.0019 µm²; or

(ii) A memory density greater than 0.288 gigabits per square millimeter.

Note 1 to definition of ''Advanced-Node Integrated Circuits'': *For the purposes of paragraph (1) of this definition, the term technology node refers to the Logic Industry ''Node Range'' figure described in the International Roadmap for Devices and Systems, 2016 edition (''More Moore'' White Paper), available at: https://irds.ieee.org/images/files/pdf/2016_MM.pdf.*

Note 2 to definition of ''Advanced-Node Integrated Circuits'': *For the purposes of paragraph (3) of this definition, the term memory density refers to the capacity of the package or stack comprising the DRAM integrated circuit measured in gigabytes divided by the footprint of the package or stack measured in square millimeters. In the case where a stack is contained in a package, use the area of the package. Cell area is defined as Wordline*Bitline (which takes into consideration both transistor and capacitor dimensions).*

* * * * *

PART 774—THE COMMERCE CONTROL LIST

■ 30. The authority citation for part 774 continues to read as follows:

Authority: 50 U.S.C. 4801–4852; 50 U.S.C. 4601 *et seq.;* 50 U.S.C. 1701 *et seq.;* 10 U.S.C. 8720; 10 U.S.C. 8730(e); 22 U.S.C. 287c, 22 U.S.C. 3201 *et seq.;* 22 U.S.C. 6004; 42 U.S.C. 2139a; 15 U.S.C. 1824; 50 U.S.C. 4305; 22 U.S.C. 7201 *et seq.;* 22 U.S.C. 7210; E.O. 13026, 61 FR 58767, 3 CFR, 1996 Comp., p. 228; E.O. 13222, 66 FR 44025, 3 CFR, 2001 Comp., p. 783.

■ 31. Supplement no. 1 to part 774 is amended by:

■ a. Revising ECCNs 3A090, 3B001, 3B002, 3B991, and 3B992;

■ b. Adding ECCNs 3B993 and 3B994;

■ c. Revising ECCNs 3D001 and 3D002;

■ d. Adding ECCNs 3D992, 3D993, 3D994;

■ e. Revising ECCN 3E001; and

■ b. Adding ECCNs 3E992, 3E993, and 3E994.

The additions and revisions read as follows:

Supplement No. 1 to Part 774—the Commerce Control List

* * * * *

3A090 Integrated circuits as follows (see List of Items Controlled).

License Requirements

Reason for Control: RS, AT

Control(s)	*Country chart (see Supp. No. 1 to part 738)*
RS applies to entire entry, except 3A090.c.	To or within destinations specified in Country Groups D:1, D:4, and D:5 of supplement no. 1 to part 740 of the EAR, excluding any destination also specified in Country Groups A:5 or A:6. See § 742.6(a)(6)(iii) of the EAR.
RS applies to 3A090.c.	To or within Macau or a destination specified in Country Group D:5 of supplement no. 1 to part 740 of the EAR. See § 742.6(a)(6)(i)(B) of the EAR.
AT applies to entire entry.	AT Column 1.

List Based License Exceptions (See Part 740 for a Description of All License Exceptions)

LVS: N/A
GBS: N/A
NAC/ACA: Yes, for 3A090.a, if the item is not designed or marketed for use in datacenters and has a 'total processing performance' of 4800 or more; yes, for 3A090.b, if the item is designed or marketed for use in datacenters. N/A for 3A090.c.
HBM: Yes, for 3A090.c. See § 740.25 of the EAR.

List of Items Controlled

Related Controls: (1) See ECCNs 3D001, 3E001, 5D002.z, and 5D992.z for associated technology and software controls. (2) See ECCNs 3A001.z, 5A002.z, 5A004.z, and 5A992.z.
Related Definitions: N/A
Items:

a. Integrated circuits having one or more digital processing units having either of the following:

a.1. A 'total processing performance' of 4800 or more, *or*

a.2. A 'total processing performance' of 1600 or more and a 'performance density' of 5.92 or more.

b. Integrated circuits having one or more digital processing units having either of the following:

b.1. A 'total processing performance' of 2400 or more and less than 4800 and a 'performance density' of 1.6 or more and less than 5.92, *or*

b.2. A 'total processing performance' of 1600 or more and a 'performance density' of 3.2 or more and less than 5.92.

Note 1 to 3A090.a and 3A090.b: *3A090.a and 3A090.b do not apply to items that are not designed or marketed for use in datacenters and do not have a 'total processing performance' of 4800 or more. For 3A090.a and 3A090.b items that are not designed or marketed for use in datacenters and that have a 'total processing*

performance' of 4800 or more, see license exceptions NAC and ACA.

Note 2 to 3A090.a and 3A090.b: *Integrated circuits specified by 3A090 include graphical processing units (GPUs), tensor processing units (TPUs), neural processors, in-memory processors, vision processors, text processors, co-processors/accelerators, adaptive processors, field-programmable logic devices (FPLDs), and application-specific integrated circuits (ASICs). Examples of integrated circuits are in the Note to 3A001.a.*

Note 3 to 3A090.a and 3A090.b: *For integrated circuits (ICs) that are excluded from ECCN 3A090 under Note 2 or 3 to 3A090, those ICs are also not applicable for classifications made under ECCNs 3A001.z, 4A003.z, 4A004.z, 4A005.z, 4A090, 5A002.z, 5A004.z, 5A992.z, 5D002.z, or 5D992.z because those other CCL classifications are based on the incorporation of an integrated circuit (IC) that meets the control parameters under ECCN 3A090 or otherwise meets or exceeds the control parameters or ECCNs 3A090 or 4A090. The performance parameters under ECCN 3A090.c are not used for determining whether an item is classified in a .z ECCN. See the Related Controls paragraphs of ECCNs 3A001.z, 4A003.z, 4A004.z, 4A005.z, 4A090, 5A002.z, 5A004.z, 5A992.z, 5D002.z, or 5D992.z.*

Technical Notes to 3A090.a and 3A090.b: *1. 'Total processing performance' ('TPP') is 2 × 'MacTOPS' × 'bit length of the operation', aggregated over all processing units on the integrated circuit.*

a. For purposes of 3A090, 'MacTOPS' is the theoretical peak number of Tera (10^{12}) operations per second for multiply-accumulate computation ($D = A \times B + C$).

b. The 2 in the 'TPP' formula is based on industry convention of counting one multiply-accumulate computation, $D = A \times B + C$, as 2 operations for purpose of datasheets. Therefore, 2 × MacTOPS may correspond to the reported TOPS or FLOPS on a datasheet.

c. For purposes of 3A090, 'bit length of the operation' for a multiply-accumulate computation is the largest bit-length of the inputs to the multiply operation.

d. Aggregate the TPPs for each processing unit on the integrated circuit to arrive at a total. 'TPP' = TPP1 + TPP2 + ... + TPPn (where n is the number or processing units on the integrated circuit).

2. The rate of 'MacTOPS' is to be calculated at its maximum value theoretically possible. The rate of 'MacTOPS' is assumed to be the highest value the manufacturer claims in annual or brochure for the integrated circuit. For example, the 'TPP' threshold of 4800 can be met with 600 tera integer operations (or 2 × 300 'MacTOPS') at 8 bits or 300 tera FLOPS (or 2 × 150 'MacTOPS') at 16 bits. If the integrated circuit (IC) is designed for MAC computation with multiple bit lengths that achieve different 'TPP' values, the highest 'TPP' value should be evaluated against parameters in 3A090.

3. For integrated circuits specified by 3A090 that provide processing of both sparse and dense matrices, the 'TPP' values are the values for processing of dense matrices (e.g., without sparsity).

4. 'Performance density' is 'TPP' divided by 'applicable die area'. For purposes of 3A090, 'applicable die area' is measured in millimeters squared and includes all die area of logic dies manufactured with a process node that uses a non-planar transistor architecture.

c. High bandwidth memory (HBM) having a 'memory bandwidth density' greater than 2 gigabytes per second per square millimeter.

Technical note to 3A090.c: *'Memory bandwidth density' is the memory bandwidth measured in gigabytes per second divided by the area of the package or stack measured in square millimeters. In the case where a stack is contained in a package, use the memory bandwidth of the packaged device and the area of the package. High bandwidth memory (HBM) includes dynamic random access memory integrated circuits, regardless of whether they conform to the JEDEC standards for high bandwidth memory, provided they have a 'memory bandwidth density' greater than 2 gigabytes per second per square millimeter. This control does not cover co-packaged integrated circuits with both HBM and logic integrated circuit where the dominant function of the co-packaged integrated circuit is processing. It does include HBM permanently affixed to a logic integrated circuit designed as a control interface and incorporating a physical layer (PHY) function.*

* * * * *

3B001 Equipment for the manufacturing of semiconductor devices, materials, or related equipment, as follows (see List of Items Controlled) and "specially designed" "components" and "accessories" therefor.

License Requirements

Reason for Control: NS, RS, AT

Control(s)	*Country chart (see Supp. No. 1 to part 738)*
NS applies to 3B001.c.1.a, 3B001.c.1.c, and 3B001.q.	Worldwide control. See § 742.4(a)(5) and (b)(10) of the EAR.
RS applies to 3B001.c.1.a, 3B001.c.1.c, and 3B001.q.	Worldwide control. See § 742.6(a)(10) and (b)(11) of the EAR.
NS applies to 3B001.a.1 to a.3, b, e, f.2 to f.4, g to j.	NS Column 2.
NS applies to 3B001.a.4, c, d, f.1, f.5, k to n, p.2, p.4, r.	To or within Macau or a destination specified in Country Group D:5 of supplement no. 1 to part 740 of the EAR. See § 742.4(a)(4) of the EAR.
RS applies to 3B001.a.4, c, d, f.1, f.5, k to n, p.2, p.4, r.	To or within Macau or a destination specified in Country Group D:5 of supplement no. 1 to part 740 of the EAR. See § 742.6(a)(6) of the EAR.
AT applies to entire entry.	AT Column 1.

List Based License Exceptions (See Part 740 for a Description of All License Exceptions)

LVS: $500, except semiconductor manufacturing equipment specified in 3B001.a.4, c, d, f.1, f.5, k to n, p.2, p.4, r.

GBS: Yes, except a.3 (molecular beam epitaxial growth equipment using gas sources), c.1.a (Equipment designed or modified for isotropic dry etching), c.1.c (Equipment designed or modified for anisotropic dry etching), .e (automatic loading multi-chamber central wafer handling systems *only* if connected to equipment controlled by 3B001.a.3, or .f), .f (lithography equipment) and .q ("EUV" masks and reticles designed for integrated circuits, not specified by 3B001.g, and having a mask "substrate blank" specified by 3B001.j).

IEC: Yes, for 3B001.c.1.a, c.1.c, and .q, see § 740.2(a)(22) and § 740.24 of the EAR.

Special Conditions for STA

STA: License Exception STA may not be used to ship 3B001.c.1.a, c.1.c, and .q to any of the destinations listed in Country Group A:5 or A:6 (See supplement no. 1 to part 740 of the EAR).

List of Items Controlled

Related Controls: See also 3B903 and 3B991. See ECCNs 3D001, 3D992, 3E001, and 3E992 for related "software" and "technology" controls.

Related Definitions: N/A

Items:

a. Equipment designed for epitaxial growth as follows:

a.1. Equipment designed or modified to produce a layer of any material other than silicon with a thickness uniform to less than ±2.5% across a distance of 75 mm or more;

Note: *3B001.a.1 includes atomic layer epitaxy (ALE) equipment.*

a.2. Metal Organic Chemical Vapor Deposition (MOCVD) reactors designed for compound semiconductor epitaxial growth of material having two or more of the following elements: aluminum, gallium, indium, arsenic, phosphorus, antimony, oxygen, or nitrogen;

a.3. Molecular beam epitaxial growth equipment using gas or solid sources;

a.4. Equipment designed for epitaxial growth of silicon (Si) or silicon germanium (SiGe), and having all of the following:

a.4.a. At least one preclean chamber designed to provide a surface preparation means to clean the surface of the wafer; *and*

a.4.b. An epitaxial deposition chamber designed to operate at a temperature equal to or below 958 K (685 °C).

b. Semiconductor wafer fabrication equipment designed for ion implantation and having any of the following:

b.1. [Reserved]

b.2. Being designed and optimized to operate at a beam energy of 20 keV or more and a beam current of 10 mA or more for hydrogen, deuterium, or helium implant;

b.3. Direct write capability;

b.4. A beam energy of 65 keV or more and a beam current of 45 mA or more for high energy oxygen implant into a heated semiconductor material ''substrate''; *or*

b.5. Being designed and optimized to operate at beam energy of 20 keV or more and a beam current of 10mA or more for silicon implant into a semiconductor material ''substrate'' heated to 600 °C or greater;

c. Etch equipment.

c.1. Equipment designed for dry etching as follows:

c.1.a. 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; *or*

c.1.b. [Reserved]

c.1.c. Equipment designed or modified for anisotropic dry etching, having all of the following;

c.1.c.1. Radio Frequency (RF) power source(s) with at least one pulsed RF output;

c.1.c.2. One or more fast gas switching valve(s) with switching time less than 300 milliseconds; *and*

c.1.c.3. Electrostatic chuck with twenty or more individually controllable variable temperature elements;

c.2. Equipment designed for wet chemical processing and having a largest 'silicon germanium-to-silicon (SiGe:Si) etch selectivity' of greater than or equal to 100:1;

c.3. Equipment designed for anisotropic dry etching having all of following:

c.3.a Two or more RF independent sources;

c.3.b Two or more independent gas sources;

c.3.c 'Process uniformity tuning' for wafer thickness variation compensation; and

c.3.d Through Silicon Via (TSV) reveal Endpoint Detection (EPD);

c.4. Equipment designed for Through Silicon Via (TSV) etch having all of the following:

c.4.a. Silicon etch rate greater than 7 microns per minute;

c.4.b. Within wafer (WIW) etch depth non-uniformity of less than or equal 2 percent; *and*

c.4.c. A Through Silicon Via (TSV) aspect ratio greater than or equal to 10:1.

Note 1: *3B001.c includes etching by 'radicals', ions, sequential reactions, or non-sequential reaction.*

Note 2: *3B001.c.1.c includes etching using RF pulse excited plasma, pulsed duty cycle excited plasma, pulsed voltage on electrodes modified plasma, cyclic injection and purging of gases combined with a plasma, plasma atomic layer etching, or plasma quasi-atomic layer etching.*

Technical Notes:

1. *For the purposes of 3B001.c, 'silicon germanium-to-silicon (SiGe:Si) etch selectivity' is measured for a Ge concentration of greater than or equal to 30% ($Si_{0.70}Ge_{0.30}$).*

2. *For the purposes of 3B001.c Note 1 and 3B001.d.14, 'radical' is defined as an atom, molecule, or ion that has an unpaired electron in an open electron shell configuration.*

3. *For the purposes of 3B001.c.3, 'process uniformity tuning' is the process of compensating for incoming wafer thickness variations after grinding.*

d. Semiconductor manufacturing deposition equipment, as follows:

d.1. Equipment designed for cobalt (Co) electroplating or cobalt electroless-plating deposition processes;

Note: *3B001.d.1 controls semiconductor wafer processing equipment.*

d.2. Equipment designed for:

d.2.a. Chemical vapor deposition of cobalt (Co) fill metal; or

d.2.b. Selective bottom-up chemical vapor deposition of tungsten (W) fill metal;

d.3. Semiconductor manufacturing equipment designed to fabricate a metal contact by multistep processing within a single chamber by performing all of the following:

d.3.a. Deposition of a tungsten layer, using an organometallic compound, while maintaining the wafer substrate temperature greater than 100 °C and less than 500 °C; and

d.3.b. Surface treatment plasma process using hydrogen (H2), hydrogen and nitrogen (H2+N2), or ammonia (NH3).

d.4. Equipment or systems designed for multistep processing in multiple chambers or stations, as follows:

d.4.a. Equipment designed to fabricate a metal contact by performing all of the following processes:

d.4.a.1. Surface treatment plasma process using hydrogen (H_2), including hydrogen and nitrogen ($H_2 + N_2$) or ammonia (NH_3), while maintaining the wafer substrate at a temperature greater than 100 °C and less than 500 °C;

d.4.a.2. Surface treatment plasma process using oxygen (O_2) or ozone (O_3), while maintaining the wafer substrate at a temperature greater than 40 °C and less than 500 °C; *and*

d.4.a.3. Deposition of a tungsten (W) layer while maintaining the wafer substrate temperature greater than 100 °C and less than 500 °C;

d.4.b. Equipment designed to fabricate a metal contact by performing all of the following processes:

d.4.b.1 Surface treatment process using a remote plasma generator and an ion filter; *and*

d.4.b.2. Deposition of a cobalt (Co) layer selectively onto copper (Cu) using an organometallic compound;

Note: *This control does not apply to equipment that is non-selective.*

d.4.c. Equipment designed to fabricate a metal contact by performing all the following processes:

d.4.c.1. Deposition of a titanium nitride (TiN) or tungsten carbide (WC) layer, using an organometallic compound, while maintaining the wafer substrate at a temperature greater than 20 °C and less than 500 °C;

d.4.c.2. Deposition of a cobalt (Co) layer using a physical sputter deposition technique and having a process pressure greater than 133.3 mPa and less than 13.33 Pa, while maintaining the wafer substrate at a temperature below 500 °C; *and*

d.4.c.3. Deposition of a cobalt (Co) layer using an organometallic compound and having a process pressure greater than 133.3 Pa and less than 13.33 kPa, while maintaining the wafer substrate at a temperature greater than 20 °C and less than 500 °C;

d.4.d. Equipment designed to fabricate copper (Cu) interconnects by performing all of the following processes:

d.4.d.1. Deposition of a cobalt (Co) or ruthenium (Ru) layer using an organometallic compound and having a process pressure greater than 133.3 Pa and less than 13.33 kPa, while maintaining the wafer substrate at a temperature greater than 20 °C and less than 500 °C; *and*

d.4.d.2. Deposition of a copper layer using a physical vapor deposition technique and having a process pressure greater than 133.3 mPa and less than 13.33 Pa, while maintaining the wafer substrate at a temperature below 500 °C;

d.5. Equipment designed for plasma enhanced chemical vapor deposition of carbon hard masks more than 2 um thick and with density of greater than 1.7g/cc;

d.6. Atomic Layer Deposition (ALD) equipment designed for area selective deposition of a barrier or liner using an organometallic compound;

Note: *3B001.d.6 includes equipment capable of area selective deposition of a barrier layer to enable fill metal contact to an underlying electrical conductor without a barrier layer at the fill metal via interface to an underlying electrical conductor.*

d.7. Equipment designed for Atomic Layer Deposition (ALD) of tungsten (W) to fill an entire interconnect or in a channel less than 40 nm wide, while maintaining the wafer substrate at a temperature less than 500 °C.

d.8. Equipment designed for Atomic Layer Deposition (ALD) of 'work function metal' having all of the following:

d.8.a. More than one metal source of which one is designed for an aluminum (Al) precursor;

d.8.b. Precursor vessel designed and enabled to operate at a temperature greater than 30 °C; *and*

d.8.c. Designed for depositing a 'work function metal' having all of the following:

d.8.c.1. Deposition of titanium-aluminum carbide (TiAlC); *and*

d.8.c.2. Enabling a work function greater than 4.0 eV;

Technical Note: *For the purposes of 3B001.d.8, 'work function metal' is a material that controls the threshold voltage of a transistor.*

d.9. Spatial Atomic Layer Deposition (ALD) equipment having a wafer support platform that rotates around an axis having any of the following:

d.9.a. A spatial plasma enhanced atomic layer deposition mode of operation;

d.9.b. A plasma source; *or*

d.9.c. A plasma shield or means to confine the plasma to the plasma exposure process region;

d.10. Equipment designed for Atomic Layer Deposition (ALD) or Chemical Vapor Deposition (CVD) of plasma enhanced of low fluorine tungsten (FW) (fluorine (F) concentration less than 10^{19} atoms/cm^3) films;

d.11. [Reserved]

d.12. Equipment designed for depositing a metal layer, and having any of the following:

d.12.a. Selective tungsten (W) growth without a barrier; *or*

d.12.b. Selective molybdenum (Mo) growth without a barrier;

d.13. Equipment designed for depositing a ruthenium layer (Ru) using an organometallic compound, while maintaining the wafer substrate at a temperature greater than 20 °C and less than 500 °C;

d.14. Equipment designed for deposition assisted by remotely generated 'radicals', enabling the fabrication of a silicon (Si) and carbon (C) containing film, and having all of the following properties of the deposited film:

d.14.a. A dielectric constant (k) of less than 4.4;

d.14.b. In features with an aspect ratio greater than 5:1 with lateral openings of less than 35 nm; *and*

d.14.c. A feature-to-feature pitch of less than 45 nm;

d.15. Equipment designed for void free plasma enhanced deposition of a low-k dielectric layer in gaps between metal lines less than 25 nm and having an aspect ratio greater than or equal to 1:1 with a less than 3.3 dielectric constant;

d.16. [Reserved]

d.17. Equipment designed for plasma enhanced chemical vapor deposition (PECVD) or radical assisted chemical vapor deposition and UV curing in a single platform of a dielectric film, while maintaining a substrate temperature below 500 °C, having all of the following:

d.17.a. A thickness of more than 6 nm and less than 20 nm on metal features having less than 24 nm pitch and having an aspect ratio equal to or greater than 1:1.8; *and*

d.17.b. A dielectric constant less than 3.0;

d.18. Equipment designed or modified for Atomic Layer Deposition (ALD) of molybdenum (Mo), ruthenium (Ru), or combinations Mo or Ru, and having all of the following:

d.18.a. A metal precursor source designed or modified to operate at a temperature greater 75 °C; *and*

d.18.b. A process chamber (module) using a reducing agent containing hydrogen (H) at a pressure greater than or equal to 30 Torr (4 kPa).

Note: *For the purposes of paragraph d.18.a, the metal precursor source need not be integrated with the equipment. The metal precursor could be delivered by an on-tool source or from a sub-fab source.*

d.19. Deposition equipment having direct-liquid injection of more than two metal precursors, designed or modified to deposit a conformal dielectric film with a dielectric constant (K) greater than 40 in features with aspect ratio greater than 200:1 in a single deposition chamber.

d.20. Physical vapor deposition equipment having electromagnets for ion flux guidance, and ''specially designed'' to deposit tungsten (W) metal into features having an aspect ratio of 3:1 or greater.

e. Automatic loading multi-chamber central wafer handling systems having all of the following:

e.1. Interfaces for wafer input and output, to which more than two functionally different 'semiconductor process tools' controlled by 3B001.a, .b., .c, and .d are designed to be connected; *and*

e.2. Designed to form an integrated system in a vacuum environment for 'sequential multiple wafer processing';

Note: *3B001.e does not control automatic robotic wafer handling systems ''specially designed'' for parallel wafer processing.*

Technical Notes:

1. For the purposes of 3B001.e, 'semiconductor process tools' refers to modular tools that provide physical processes for semiconductor ''production'' that are functionally different, such as deposition, implant or thermal processing.

2. For the purposes of 3B001.e, 'sequential multiple wafer processing' means the capability to process each wafer in different 'semiconductor process tools', such as by transferring each wafer from one tool to a second tool and on to a third tool with the automatic loading multi-chamber central wafer handling systems.

f. Lithography equipment as follows:

f.1. Align and expose step and repeat (direct step on wafer) or step and scan (scanner) equipment for wafer processing using photo-optical or X-ray methods and having any of the following:

f.1.a. A light source wavelength shorter than 193 nm; *or*

f.1.b. A light source wavelength equal to or longer than 193 nm and having all of the following:

f.1.b.1. The capability to produce a pattern with a ''Minimum Resolvable Feature size'' (MRF) of 45 nm or less; *and*

f.1.b.2. A maximum 'dedicated chuck overlay' value of less than or equal to 1.50 nm;

Technical Notes: *For the purposes of 3B001.f.1.b:*

1. The 'Minimum Resolvable Feature size' (MRF) (i.e., resolution) is calculated by the following formula:

$$MRF = \frac{\text{(an exposure light source wavelength in nm)} \times \text{(K factor)}}{\text{maximum numerical aperture}}$$

where, for the purposes of 3B001.f.1.b, the K factor = 0.25 'MRF' is also known as resolution.

2. 'Dedicated chuck overlay' is the alignment accuracy of a new pattern to an existing pattern printed on a wafer by the same lithographic system. 'Dedicated chuck overlay' is also known as single machine overlay.

f.2. Imprint lithography equipment capable of production features of 45 nm or less;

Note: *3B001.f.2 includes:*

—Micro contact printing tools

—Hot embossing tools

—Nano-imprint lithography tools

—Step and flash imprint lithography (S–FIL) tools

f.3. Equipment ''specially designed'' for mask making having all of the following:

f.3.a. A deflected focused electron beam, ion beam or ''laser'' beam; *and*

f.3.b. Having any of the following:

f.3.b.1. A Full-Width Half-Maximum (FWHM) spot size smaller than 65 nm and an image placement less than 17 nm (mean + 3 sigma); *or*

f.3.b.2. [Reserved]

f.3.b.3. A second-layer overlay error of less than 23 nm (mean + 3 sigma) on the mask;

f.4. Equipment designed for device processing using direct writing methods, having all of the following:

f.4.a. A deflected focused electron beam; *and*

f.4.b. Having any of the following:

f.4.b.1. A minimum beam size equal to or smaller than 15 nm; *or*

f.4.b.2. An overlay error less than 27 nm (mean + 3 sigma);

f.5. Imprint lithography equipment having an overlay accuracy less (better) than 1.5;

g. Masks and reticles, designed for integrated circuits controlled by 3A001;

h. Multi-layer masks with a phase shift layer not specified by 3B001.g and designed to be used by lithography equipment having a light source wavelength less than 245 nm;

Note: *3B001.h does not control multi-layer masks with a phase shift layer designed for the fabrication of memory devices not controlled by 3A001.*

N.B.: *For masks and reticles, ''specially designed'' for optical sensors, see 6B002.*

i. Imprint lithography templates designed for integrated circuits by 3A001;

j. Mask ''substrate blanks'' with multilayer reflector structure consisting of molybdenum and silicon, and having all of the following:

j.1. ''Specially designed'' for ''Extreme Ultraviolet'' (''EUV'') lithography; *and*

j.2. Compliant with SEMI Standard P37;

k. Equipment designed for ion beam deposition or physical vapor deposition of a multi-layer reflector for ''EUV'' masks;

l. ''EUV'' pellicles;

m. Equipment for manufacturing ''EUV'' pellicles;

n. Equipment designed for coating, depositing, baking, or developing photoresist formulated for ''EUV'' lithography;

o. [Reserved]

p. Removal and cleaning equipment as follows:

p.1. [Reserved]

p.2. Single wafer wet cleaning equipment with surface modification drying; *or*

p.3. [Reserved]

p.4. Equipment designed for single wafer cleaning using supercritical CO_2 or sublimation drying;

q. ''EUV'' masks and ''EUV'' reticles, designed for integrated circuits, not specified by 3B001.g, and having a mask ''substrate blank'' specified by 3B001.j; *or*

Technical Notes: *For the purposes of 3B001.q, masks or reticles with a mounted pellicle are considered masks and reticles.*

r. Equipment designed for EUV 'pattern shaping.'

Technical Note: *For the purposes of 3B001.r, 'pattern shaping' is a deposition or removal process used to improve overall patterning by reshaping or trimming patterns produced using EUV lithography with non-vertical directed particles including ions, neutral particles, clusters, radicals, or light.*

3B002 Test or inspection equipment ''specially designed'' for testing or inspecting finished or unfinished semiconductor devices as follows (see List of Items Controlled) and ''specially designed'' ''components'' and ''accessories'' therefor.

License Requirements

Reason for Control: NS, RS, AT

Control(s)	*Country chart (see Supp. No. 1 to part 738)*
NS applies to 3B002.a and b.	NS Column 2.
NS applies to 3B002.c.	To or within Macau or a destination specified in Country Group D:5 of supplement no. 1 to part 740 of the EAR. See § 742.4(a)(4) of the EAR.
RS applies to 3B002.c.	To or within Macau or a destination specified in Country Group D:5 of supplement no. 1 to part 740 of the EAR. See § 742.6(a)(6) of the EAR.
AT applies to entire entry.	AT Column 1.

List Based License Exceptions (See Part 740 for a Description of All License Exceptions)

LVS: $500, except semiconductor manufacturing equipment specified in 3B002.c.
GBS: Yes

List of Items Controlled

Related Controls: See also 3A999.a, 3B992, and 3B993.
Related Definitions: N/A
Items:

a. For testing S-parameters of items specified by 3A001.b.3.

b. For testing microwave integrated circuits controlled by 3A001.b.2.

c. Inspection equipment designed for ''EUV'' mask blanks or ''EUV'' patterned masks.

* * * * *

3B991 Equipment not controlled by 3B001, 3B993, or 3B994, for the manufacture of electronic ''parts,'' ''components,'' and materials, and ''specially designed'' ''parts,'' ''components,'' and ''accessories'' therefor.

License Requirements

Reason for Control: AT

Control(s)	*Country chart (see Supp. No. 1 to part 738)*
AT applies to entire entry.	AT Column 1.

List Based License Exceptions (See Part 740 for a Description of All License Exceptions)

LVS: N/A
GBS: N/A

List of Items Controlled

Related Controls: N/A
Related Definitions: 'Sputtering' is an overlay coating process wherein positively charged ions are accelerated by an electric field towards the surface of a target (coating material). The kinetic energy of the impacting ions is sufficient to cause target surface atoms to be released and deposited on the substrate. Note: Triode, magnetron or radio frequency sputtering to increase adhesion of coating and rate of deposition are ordinary modifications of the process.
Items:

a. Equipment ''specially designed'' for the manufacture of electron tubes, optical elements, and ''specially designed'' ''parts'' and ''components'' therefor controlled by 3A001 or 3A991;

b. Equipment ''specially designed'' for the manufacture of semiconductor devices, integrated circuits and ''electronic assemblies,'' as follows, and systems incorporating or having the characteristics of such equipment:

Note: *3B991.b also controls equipment used or modified for use in the manufacture of other devices, such as imaging devices, electro-optical devices, acoustic-wave devices.*

b.1. Equipment for the processing of materials for the manufacture of devices, ''parts,'' and ''components'' as specified in the heading of 3B991.b, as follows:

Note: *3B991 does not control quartz furnace tubes, furnace liners, paddles, boats (except ''specially designed'' caged boats), bubblers, cassettes or crucibles ''specially designed'' for the processing equipment controlled by 3B991.b.1.*

b.1.a. Equipment for producing polycrystalline silicon and materials controlled by 3C001;

b.1.b. Equipment ''specially designed'' for purifying or processing III/V and II/VI semiconductor materials controlled by ECCNs 3C001, 3C002, 3C003, 3C004, or 3C005 except crystal pullers, for which see 3B991.b.1.c below;

b.1.c. Crystal pullers and furnaces, as follows:

Note: *3B991.b.1.c does not control diffusion and oxidation furnaces.*

b.1.c.1. Annealing or recrystallizing equipment other than constant temperature furnaces employing high rates of energy transfer capable of processing wafers at a rate exceeding 0.005 m^2 per minute;

b.1.c.2. ''Stored program controlled'' crystal pullers having any of the following characteristics:

b.1.c.2.a. Rechargeable without replacing the crucible container;

b.1.c.2.b. Capable of operation at pressures above 2.5×10^5 Pa; *or*

b.1.c.2.c. Capable of pulling crystals of a diameter exceeding 100 mm;

b.1.d. ''Stored program controlled'' equipment for epitaxial growth having any of the following characteristics:

b.1.d.1. Capable of producing silicon layer with a thickness uniform to less than ±2.5% across a distance of 200 mm or more;

b.1.d.2. Capable of producing a layer of any material other than silicon with a thickness uniformity across the wafer of equal to or better than ±3.5%; *or*

b.1.d.3. Rotation of individual wafers during processing;

b.1.e. Molecular beam epitaxial growth equipment;

b.1.f. Magnetically enhanced 'sputtering' equipment with ''specially designed'' integral load locks capable of transferring wafers in an isolated vacuum environment;

b.1.g. Equipment ''specially designed'' for ion implantation, ion-enhanced, or photo-enhanced diffusion, having any of the following characteristics:

b.1.g.1. Patterning capability;

b.1.g.2. Beam energy (accelerating voltage) exceeding 200 keV;

b.1.g.3 Optimized to operate at a beam energy (accelerating voltage) of less than 10 keV; *or*

b.1.g.4. Capable of high energy oxygen implant into a heated ''substrate'';

b.1.h. ''Stored program controlled'' equipment for the selective removal (*i.e.,* etching) by means of anisotropic dry methods (*e.g.,* plasma), as follows:

b.1.h.1. Batch types having either of the following:

b.1.h.1.a. End-point detection, other than optical emission spectroscopy types; *or*

b.1.h.1.b. Reactor operational (etching) pressure of 26.66 Pa or less;

b.1.h.2. Single wafer types having any of the following:

b.1.h.2.a. End-point detection, other than optical emission spectroscopy types;

b.1.h.2.b. Reactor operational (etching) pressure of 26.66 Pa or less; *or*

b.1.h.2.c. Cassette-to-cassette and load locks wafer handling;

Note 1: ''*Batch types*'' *refers to machines not* ''*specially designed*'' *for production processing of single wafers. Such machines can process two or more wafers simultaneously with common process parameters (e.g., RF power, temperature, etch gas species, flow rates).*

Note 2: ''*Single wafer types*'' *refers to machines* ''*specially designed*'' *for production processing of single wafers. These machines may use automatic wafer handling techniques to load a single wafer into the equipment for processing. The definition includes equipment that can load and process several wafers but where the etching parameters (e.g., RF power or end point) can be independently determined for each individual wafer.*

b.1.i. ''Chemical vapor deposition'' (CVD) equipment (*e.g.,* plasma-enhanced CVD (PECVD) or photo-enhanced CVD) for semiconductor device manufacturing, having either of the following capabilities, for deposition of oxides, nitrides, metals, or polysilicon:

b.1.i.1. ''Chemical vapor deposition'' equipment operating below 10^5 Pa; *or*

b.1.i.2. PECVD equipment operating either below 60 Pa (450 millitorr) or having automatic cassette-to-cassette and load lock wafer handling;

Note: *3B991.b.1.i does not control low pressure* ''*chemical vapor deposition*'' *(LPCVD) systems or reactive* ''*sputtering*'' *equipment.*

b.1.j. Electron beam systems ''specially designed'' or modified for mask making or semiconductor device processing having any of the following characteristics:

b.1.j.1. Electrostatic beam deflection;

b.1.j.2. Shaped, non-Gaussian beam profile;

b.1.j.3. Digital-to-analog conversion rate exceeding 3 MHz;

b.1.j.4. Digital-to-analog conversion accuracy exceeding 12 bit; *or*

b.1.j.5. Target-to-beam position feedback control precision of 1 micrometer or finer;

Note: *3B991.b.1.j does not control electron beam deposition systems or general purpose scanning electron microscopes.*

b.1.k. Surface finishing equipment for the processing of semiconductor wafers as follows:

b.1.k.1. ''Specially designed'' equipment for backside processing of wafers thinner than 100 micrometer and the subsequent separation thereof; *or*

b.1.k.2. ''Specially designed'' equipment for achieving a surface roughness of the active surface of a processed wafer with a two-sigma value of 2 micrometer or less, total indicator reading (TIR);

Note: *3B991.b.1.k does not control single-side lapping and polishing equipment for wafer surface finishing.*

b.1.l. Interconnection equipment which includes common single or multiple vacuum chambers ''specially designed'' to permit the integration of any equipment controlled by 3B991 into a complete system;

b.1.m. ''Stored program controlled'' equipment using ''lasers'' for the repair or trimming of ''monolithic integrated circuits'' with either of the following characteristics:

b.1.m.1. Positioning accuracy less than ±1 micrometer; *or*

b.1.m.2. Spot size (kerf width) less than 3 micrometer.

b.2. Masks, mask ''substrates,'' mask-making equipment and image transfer equipment for the manufacture of devices, ''parts'' and ''components'' as specified in the heading of 3B991, as follows:

Note: *The term* ''*masks*'' *refers to those used in electron beam lithography, X-ray lithography, and ultraviolet lithography, as well as the usual ultraviolet and visible photo-lithography.*

b.2.a. Finished masks, reticles and designs therefor, except:

b.2.a.1. Finished masks or reticles for the production of unembargoed integrated circuits; *or*

b.2.a.2. Masks or reticles, having both of the following characteristics:

b.2.a.2.a. Their design is based on geometries of 2.5 micrometer or more; *and*

b.2.a.2.b. The design does not include special features to alter the intended use by means of production equipment or ''software'';

b.2.b. Mask ''substrates'' as follows:

b.2.b.1. Hard surface (*e.g.,* chromium, silicon, molybdenum) coated ''substrates'' (*e.g.,* glass, quartz, sapphire) for the preparation of masks having dimensions exceeding 125 mm x 125 mm; *or*

b.2.b.2. ''Substrates'' ''specially designed'' for X-ray masks;

b.2.c. Equipment, other than general purpose computers, ''specially designed'' for computer aided design (CAD) of semiconductor devices or integrated circuits;

b.2.d. Equipment or machines, as follows, for mask or reticle fabrication:

b.2.d.1. Photo-optical step and repeat cameras capable of producing arrays larger than 100 mm x 100 mm, or capable of producing a single exposure larger than 6 mm x 6 mm in the image (*i.e.,* focal) plane, or capable of producing line widths of less than 2.5 micrometer in the photoresist on the ''substrate'';

b.2.d.2. Mask or reticle fabrication equipment using ion or ''laser'' beam lithography capable of producing line widths of less than 2.5 micrometer; *or*

b.2.d.3. Equipment or holders for altering masks or reticles or adding pellicles to remove defects;

Note: *3B991.b.2.d.1 and b.2.d.2 do not control mask fabrication equipment using photo-optical methods which was either commercially available before the 1st of January, 1980, or has a performance no better than such equipment.*

b.2.e. ''Stored program controlled'' equipment for the inspection of masks, reticles or pellicles with:

b.2.e.1. A resolution of 0.25 micrometer or finer; *and*

b.2.e.2. A precision of 0.75 micrometer or finer over a distance in one or two coordinates of 63.5 mm or more;

Note: *3B991.b.2.e does not control general purpose scanning electron microscopes except when* ''*specially designed*'' *and instrumented for automatic pattern inspection.*

b.2.f. Align and expose equipment for wafer production using photo-optical or X-ray methods (*e.g.,* lithography equipment) including both projection image transfer equipment and step and repeat (*i.e.,* direct step on wafer) or step and scan (scanner) equipment, capable of performing any of the following functions:

Note: *3B991.b.2.f does not control photo-optical contact and proximity mask align and expose equipment or contact image transfer equipment.*

b.2.f.1. Production of a pattern size of less than 2.5 micrometer;

b.2.f.2. Alignment with a precision finer than ±0.25 micrometer (3 sigma);

b.2.f.3. Machine-to-machine overlay no better than ±0.3 micrometer; *or*

b.2.f.4. A light source wavelength shorter than 400 nm;

b.2.g. Electron beam, ion beam or X-ray equipment for projection image transfer capable of producing patterns less than 2.5 micrometer;

Note: *For focused, deflected-beam systems(direct write systems), see 3B991.b.1.j or b.10.*

b.2.h. Equipment using ''lasers'' for direct write on wafers capable of producing patterns less than 2.5 micrometer.

b.3. Equipment for the assembly of integrated circuits, as follows:

b.3.a. ''Stored program controlled'' die bonders having all of the following characteristics:

b.3.a.1. ''Specially designed'' for ''hybrid integrated circuits'';

b.3.a.2. X–Y stage positioning travel exceeding 37.5 × 37.5 mm; *and*

b.3.a.3. Placement accuracy in the X–Y plane of finer than ±10 micrometer;

b.3.b. ''Stored program controlled'' equipment for producing multiple bonds in a single operation (*e.g.,* beam lead bonders, chip carrier bonders, tape bonders);

b.3.c. Semi-automatic or automatic hot cap sealers, in which the cap is heated locally to a higher temperature than the body of the package, ''specially designed'' for ceramic microcircuit packages controlled by 3A001 and that have a throughput equal to or more than one package per minute.

Note: *3B991.b.3 does not control general purpose resistance type spot welders.*

b.4. Filters for clean rooms capable of providing an air environment of 10 or less

particles of 0.3 micrometer or smaller per 0.02832 m³ and filter materials therefor.

3B992 Equipment not controlled by 3B002, 3B993, or 3B994, for the inspection or testing of electronic ''components'' and materials, (see List of Items Controlled) and ''specially designed'' ''parts,'' ''components'' and ''accessories'' therefor.

License Requirements

Reason for Control: AT

Control(s)	*Country chart (see Supp. No. 1 to part 738)*
AT applies to entire entry.	AT Column 1.

List Based License Exceptions (See Part 740 for a Description of All License Exceptions)

LVS: N/A
GBS: N/A

List of Items Controlled

Related Controls: See also 3A992.a.
Related Definitions: N/A
Items:

a. Equipment ''specially designed'' for the inspection or testing of electron tubes, optical elements and ''specially designed'' ''parts'' and ''components'' therefor controlled by 3A001 or 3A991;

b. Equipment ''specially designed'' for the inspection or testing of semiconductor devices, integrated circuits and ''electronic assemblies'', as follows, and systems incorporating or having the characteristics of such equipment:

Note: *3B992.b also controls equipment used or modified for use in the inspection or testing of other devices, such as imaging devices, electro-optical devices, acoustic-wave devices.*

b.1. ''Stored program controlled'' inspection equipment for the automatic detection of defects, errors or contaminants of 0.6 micrometer or less in or on processed wafers, ''substrates'', other than printed circuit boards or chips, using optical image acquisition techniques for pattern comparison;

Note: *3B992.b.1 does not control general purpose scanning electron microscopes, except when ''specially designed'' and instrumented for automatic pattern inspection.*

b.2. ''specially designed'' ''stored program controlled'' measuring and analysis equipment, as follows:

b.2.a. ''specially designed'' for the measurement of oxygen (O) or carbon (C) content in semiconductor materials;

b.2.b. Equipment for line width measurement with a resolution of 1 micrometer or finer;

b.2.c. ''specially designed'' flatness measurement instruments capable of measuring deviations from flatness of 10 micrometer or less with a resolution of 1 micrometer or finer.

b.3. ''Stored program controlled'' wafer probing equipment having any of the following characteristics:

b.3.a. Positioning accuracy finer than 3.5 micrometer;

b.3.b. Capable of testing devices having more than 68 terminals; *or*

b.3.c. Capable of testing at a frequency exceeding 1 GHz;

b.4. Test equipment as follows:

b.4.a. ''Stored program controlled'' equipment ''specially designed'' for testing discrete semiconductor devices and unencapsulated dice, capable of testing at frequencies exceeding 18 GHz;

Technical Note: *Discrete semiconductor devices include photocells and solar cells.*

b.4.b. ''Stored program controlled'' equipment ''specially designed'' for testing integrated circuits and ''electronic assemblies'' thereof, capable of functional testing:

b.4.b.1. At a 'pattern rate' exceeding 20 MHz; *or*

b.4.b.2. At a 'pattern rate' exceeding 10 MHz but not exceeding 20 MHz and capable of testing packages of more than 68 terminals.

Note: *3B992.b.4.b does not control test equipment ''specially designed'' for testing:*

1. memories;

2. ''Assemblies'' or a class of ''electronic assemblies'' for home and entertainment applications; and

3. Electronic ''parts,'' ''components,'' ''assemblies'' and integrated circuits not controlled by 3A001 or 3A991 provided such test equipment does not incorporate computing facilities with ''user accessible programmability.''

Technical Note: *For purposes of 3B992.b.4.b, 'pattern rate' is defined as the maximum frequency of digital operation of a tester. It is therefore equivalent to the highest data rate that a tester can provide in non-multiplexed mode. It is also referred to as test speed, maximum digital frequency or maximum digital speed.*

b.4.c. Equipment ''specially designed'' for determining the performance of focal-plane arrays at wavelengths of more than 1,200 nm, using ''stored program controlled'' measurements or computer aided evaluation and having any of the following characteristics:

b.4.c.1. Using scanning light spot diameters of less than 0.12 mm;

b.4.c.2. Designed for measuring photosensitive performance parameters and for evaluating frequency response, modulation transfer function, uniformity of responsivity or noise; *or*

b.4.c.3. Designed for evaluating arrays capable of creating images with more than 32 × 32 line elements;

b.5. Electron beam test systems designed for operation at 3 keV or below, or ''laser'' beam systems, for non-contactive probing of powered-up semiconductor devices having any of the following:

b.5.a. Stroboscopic capability with either beam blanking or detector strobing;

b.5.b. An electron spectrometer for voltage measurements with a resolution of less than 0.5 V; *or*

b.5.c. Electrical tests fixtures for performance analysis of integrated circuits;

Note: *3B992.b.5 does not control scanning electron microscopes, except when ''specially designed'' and instrumented for non-contactive probing of a powered-up semiconductor device.*

b.6. ''Stored program controlled'' multifunctional focused ion beam systems ''specially designed'' for manufacturing, repairing, physical layout analysis and testing of masks or semiconductor devices and having either of the following characteristics:

b.6.a. Target-to-beam position feedback control precision of 1 micrometer or finer; *or*

b.6.b. Digital-to-analog conversion accuracy exceeding 12 bit;

b.7. Particle measuring systems employing ''lasers'' designed for measuring particle size and concentration in air having both of the following characteristics:

b.7.a. Capable of measuring particle sizes of 0.2 micrometer or less at a flow rate of 0.02832 m³ per minute or more; *and*

b.7.b. Capable of characterizing Class 10 clean air or better.

* * * * *

3B993 Specified semiconductor manufacturing equipment as follows (see list of items controls).

License Requirements

Reason for Control: RS, AT

Control(s)	*Country chart (see Supp. No. 1 to part 738)*
RS applies to entire entry.	See § 742.6(a)(11) of the EAR.
AT applies to entire entry.	AT Column 1.

List Based License Exceptions (See Part 740 for a Description of All License Exceptions)

LVS: N/A
GBS: N/A

List of Items Controlled

Related Controls: (1) See ECCNs 3D993 and 3E993 for associated ''software'' and ''technology'' controls. (2) For additional controls that apply to this ECCN, see also § 744.11(a)(2)(v) and § 744.23(a)(4) of the EAR.
Related Definitions: N/A
Items:

a. [Reserved]

b. Semiconductor wafer fabrication equipment for 300 mm wafers designed for ion implantation and having any of the following:

b.1. Equipment designed for plasma doping, having all of the following:

b.1.a. One or more Radio Frequency (RF) power source(s);

b.1.b. One or more pulsed DC Power Source; *and*

b.1.c. One or more n-type or p-type dopant implants.

b.2 [Reserved]

c. Etch equipment as follows:

c.1. Equipment designed or modified for anisotropic etching of dielectric materials and enabling the fabrication of high aspect ratio features with aspect ratio greater than 30:1 and a lateral dimension on the top surface of less than 100 nm, and having all of the following:

c.1.a. Radio Frequency (RF) power source(s) with at least one pulsed RF output; *and*

c.1.b. One or more fast gas switching valve(s) with switching time less than 300 milliseconds.

Note: *3B993.c.1 includes etching by 'radicals', ions, sequential reactions, or non-sequential reaction.*

Technical Note: *For the purposes of the Note to 3B993.c.1, 'radical' is defined as an atom, molecule, or ion that has an unpaired electron in an open electron shell configuration.*

c.2. Equipment, not specified by 3B993.c.1, designed for anisotropic etching of dielectric material and enabling the fabrication of high aspect ratio features having all of the following:

c.2.a. An aspect ratio greater than 30:1; *and*

c.2.b. A lateral dimension on the top surface of less than 40 nm.

Note: *3B993.c.2 does not apply to equipment designed for wafer diameters less than 300 mm.*

c.3. Equipment, not specified by 3B001.c.1.c, designed or modified for anisotropic dry etching, having all of the following:

c.3.a. Radio Frequency (RF) power source(s) with at least one pulsed RF output;

c.3.b. One or more fast gas switching valve(s) with switching time less than 500 milliseconds; *and*

c.3.c. Electrostatic chuck with greater than or equal to 10 individually controllable variable temperature elements.

d. Semiconductor manufacturing deposition equipment as follows:

d.1. Equipment designed, not specified by 3B001.d.14, for deposition assisted by remotely generated 'radicals', enabling the fabrication of a silicon (Si) and carbon (C) containing film, and having all of the following properties of the deposited film:

d.1.a. A dielectric constant (k) of less than 5.3;

d.1.b. In features with an aspect ratio greater than 5:1 with lateral openings of less than 70 nm; *and*

d.1.c. A feature-to-feature pitch of less than 100 nm.

d.2. Equipment designed for deposition of a film, containing silicon and carbon, and having a dielectric constant (k) of less than 5.3, into lateral openings having widths of less than 70 nm and aspect ratios greater than 5:1 (depth: width) and a feature-to-feature pitch of less than 100 nm, while maintaining the wafer substrate at a temperature greater than 400 °C and less than 650 °C, and having all of the following:

d.2.a. Boat designed to hold multiple vertically stacked wafers;

d.2.b. Two or more vertical injectors; and

d.2.c. A silicon source and propene are introduced to a different injector than a nitrogen source or an oxygen source.

d.3. Equipment designed for chemical vapor deposition of a carbon material layer with a density more than 1.6 g/cm³.

d.4. Deposition equipment, not specified by 3B001.d.19, having direct-liquid injection of more than two metal precursors, designed or modified to deposit a conformal dielectric film with a dielectric constant (K) greater than 35 in features with aspect ratio greater than 50:1 in a single deposition chamber.

e. [Reserved]

f. Lithography equipment as follows:

f.1. Align and expose step and repeat (direct step on wafer) or step and scan (scanner) lithography equipment for wafer processing using photo-optical or X-ray methods and having all of the following:

f.1.a. [Reserved]

f.1.b. A light source wavelength equal to or longer than 193 nm and having all of the following:

f.1.b.1 The capability to produce a pattern with a 'Minimum Resolvable Feature size' ('MRF') of 45 nm or less; *and*

f.1.b.2. A maximum 'dedicated chuck overlay' value greater than 1.50 nm and less than or equal to 2.40 nm.

Technical Notes for paragraph 3B993.f.1:

1. The 'Minimum Resolvable Feature size' ('MRF') is calculated by the following formula:

$$\text{'MRF'} = \frac{\text{(an exposure light source wavelength in nm) x (K factor)}}{\text{maximum numerical aperture}}$$

where, for the purposes of 3B993.f.1, the K factor = 0.25.

'MRF' is also known as resolution.

2. 'Dedicated chuck overlay' is the alignment accuracy of a new pattern to an existing pattern printed on a wafer by the same lithographic system. 'Dedicated chuck overlay' is also known as single machine overlay.

f.2. Imprint lithography equipment having an overlay accuracy above 1.5 nm and less (better) than or equal to 4.0 nm.

f.3. Commodities designed or modified to increase the number of wafers processed per hour, averaged over any time interval, by greater than 1%, of equipment specified in 3B001.f.1 or 3B993.f.1.

g. through n. [Reserved]

o. Annealing equipment designed for 300 mm wafers as follows:

o.1 Annealing equipment, operating in a vacuum (equal to or less than 0.01 Pa) environment, performing any of the following:

o.1.a. Reflow of copper (Cu) to minimize or eliminate voids or seams in copper (Cu) metal interconnects; or

o.1.b. Reflow of cobalt (Co) or tungsten (W) fill metal to minimize or eliminate voids or seams;

o.2. Equipment designed to heat a semiconductor wafer to a temperature greater than 1000 °C (1832 °F) for a 'duration' less than 2 ms.

Technical Note: *For the purposes of 3B993.o.2, 'duration' is the period above stated temperature.*

p. Removal and cleaning equipment as follows:

p.1. Equipment designed for removing polymeric residue and copper oxide (CuO) film and enabling deposition of copper (Cu) metal in a vacuum (equal to or less than 0.01 Pa) environment.

p.2. [Reserved]

p.3. Equipment designed for dry surface oxide removal preclean or dry surface decontamination.

Note to 3B993.p.1 and p.3: *These controls do not apply to deposition equipment.*

q. Inspection and metrology equipment as follows:

q.1. Patterned wafer defect metrology or patterned wafer defect inspection equipment, designed or modified to accept wafers greater than or equal to 300 mm in diameter, and having all of the following:

q.1.a. Designed or modified to detect defects having a size equal to or less than 21 nm; *and*

q.1.b. Having any of the following:

q.1.b.1. A light source with an optical wavelength less than 400 nm;

q.1.b.2. An electron-beam source with a resolution less (better) than or equal to 1.65 nm;

q.1.b.3. A Cold Field Emission (CFE) electron-beam source; *or*

q.1.b.4. Two or more electron-beam sources.

q.2. Metrology equipment as follows:

q.2.a. Stand-alone equipment designed to measure wafer shape parameters prior to lithography exposure and utilize measurements to improve overlay or focus of a deep ultraviolet (DUV) lithography system having an immersion lens having a numerical aperture more than 1.3 or an Extreme Ultraviolet lithography (EUV) system; *or*

q.2.b. Metrology equipment designed to measure focus or overlay after resist development or after etch on product wafers using image-based overlay or diffraction-based measurements techniques, with an overlay measurement accuracy less (better) than or equal to 0.5 nm having any of the following:

q.2.b.1 designed for integration to a 'track'; *or*

q.2.b.2 'fast wavelength switching functionality';

Technical Notes:

1. *For the purposes of 3B993.q.2, a 'track' is equipment designed for coating and developing photoresist formulated for lithography.*

2. *For the purposes of 3B993.q.2, 'fast wavelength switching functionality' is defined as having the ability the change the measurement wavelength and acquire a measurement in less than 25 ms.*

* * * * *

3B994 Semiconductor manufacturing equipment that enables ''advanced-node integrated circuit'' production, as follows (see list of items controls).

License Requirements

Reason for Control: RS, AT

Control(s)	Country chart (see Supp. No. 1 to part 738)
RS applies to entire entry.	See § 742.6(a)(11) of the EAR.
AT applies to entire entry.	AT Column 1.

List Based License Exceptions (See Part 740 for a Description of All License Exceptions)

LVS: N/A
GBS: N/A

Special Conditions for STA

STA: License Exception STA may not be used to ship or transmit commodities specified in this ECCN to any of the destinations listed in Country Group A:5 or A:6 (See supplement no.1 to part 740 of the EAR).

List of Items Controlled

Related Controls: (1) See ECCNs 3D994 and 3E994 for associated software and technology controls. (2) For additional controls that apply to this ECCN, see also § 744.11(a)(2)(v) and § 744.23(a)(4) of the EAR.
Related Definitions: N/A
Items:

Note for 3B994: *Equipment specified in this ECCN 3B994 are limited to equipment designed for volume production, such as equipment designed to accept a SEMI standard wafer carrier such as a 200 mm or larger Front Opening Unified Pod or be connected to a multi-chamber wafer handling system.*

a. [Reserved]

b. Semiconductor wafer fabrication equipment designed for ion implantation of 300mm wafers as follows:

b.1. [Reserved]

b.2. Ion implantation equipment as follows:

b.2.a. Having all of the following:

b.2.a.1. Beam current greater than 1uA and less than 5mA; *and*

b.2.a.2. Beam energy greater than 5 keV and less than 300 keV; *or*

b.2.b. Having all of the following:

b.2.b.1. Beam current greater than 5 mA; *and*

b.2.b.2. Beam energy less than 5 keV; *or*

b.2.c. Having angular accuracy equal to or less (better) than 0.1 degrees.

c. through p. [Reserved]

q. Inspection and metrology equipment as follows:

q.1. and q.2. [Reserved]

q.3. Optical thin film metrology equipment or optical critical dimension metrology equipment designed for 300mm wafers and containing software designed for measuring non-planar transistors.

* * * * *

3D001 ''Software'' ''specially designed'' for the ''development'' or ''production'' of commodities controlled by 3A001.b to 3A002.h, 3A090, or 3B (except 3B001.a.4, c, d, f.1, f.5, k to n, p.2, p.4, r, 3B002.c, 3B903, 3B904, 3B991, 3B992, 3B993, or 3B994).

License Requirements

Reason for Control: NS, RS, AT

Control(s)	Country chart (see Supp. No. 1 to part 738)
NS applies to ''software'' for equipment controlled by 3B001.q.	Worldwide control. See § 742.4(a)(5) and (b)(10) of the EAR.
RS applies to ''software'' for equipment controlled by 3B001.q.	Worldwide control. See § 742.6(a)(10) and (b)(11) of the EAR.
NS applies to ''software'' for commodities controlled by 3A001.b to 3A001.h, 3A001.z, and 3B (except as specified in the heading).	NS Column 1.
RS applies to ''software'' for commodities controlled by 3A001.z and 3A090 (except for 3A090.c).	To or within destinations specified in Country Groups D:1, D:4, and D:5 of supplement no. 1 to part 740 of the EAR, excluding any destination also specified in Country Groups A:5 or A:6. See § 742.6(a)(6)(iii) of the EAR.
RS applies to ''software'' for commodities controlled by 3A090.c.	To or within Macau or a destination specified in Country Group D:5 of supplement no. 1 to part 740 of the EAR. See § 742.6(a)(6)(i) of the EAR.
AT applies to entire entry.	AT Column 1.

Reporting Requirements

See § 743.1 of the EAR for reporting requirements for exports under License Exceptions, and Validated End-User authorizations.

List Based License Exceptions (See Part 740 for a Description of All License Exceptions)

TSR: Yes, except for ''software'' ''specially designed'' for the ''development'' or ''production'' of Traveling Wave Tube Amplifiers described in 3A001.b.8 having operating frequencies exceeding 18 GHz; or commodities specified in 3A090.

Note: *See § 740.2(a)(9)(ii) of the EAR for license exception restrictions for ECCN 3D001 ''software'' for commodities controlled by 3A001.z and 3A090.*

IEC: Yes, for ''software'' for equipment controlled by 3B001.q, see § 740.2(a)(22) and § 740.24 of the EAR.

Special Conditions for STA

STA: License Exception STA may not be used to ship or transmit ''software'' ''specially designed'' for the ''development'' or ''production'' of equipment specified by 3B001.q to any of the destinations listed in Country Group A:5 or A:6 (See supplement no.1 to part 740 of the EAR); and 3A090, or 3A002.g.1 to any of the destinations listed in Country Group A:6.

List of Items Controlled

Related Controls: N/A
Related Definitions: N/A
Items:

The list of items controlled is contained in the ECCN heading.

3D002 ''Software'' ''specially designed'' for the ''use'' of equipment controlled by 3B001.a to .f, or 3B002.

License Requirements

Reason for Control: NS, RS, AT

Control(s)	Country chart (see Supp. No. 1 to part 738)
NS applies to entire entry.	NS Column 1.
NS applies to ''software'' for equipment controlled by 3B001.c.1.a or c.1.c.	Worldwide control. See § 742.4(a)(5) and (b)(10) of the EAR.
RS applies to ''software'' for equipment controlled by 3B001.c.1.a or c.1.c.	Worldwide control. See § 742.6(a)(10) and (b)(11) of the EAR.
AT applies to entire entry.	AT Column 1.

License Requirements Note: *See § 744.17 of the EAR for additional license requirements for microprocessors having a processing speed of 5 GFLOPS or more and an arithmetic logic unit with an access width of 32 bit or more, including those incorporating ''information security'' functionality, and associated ''software'' and ''technology'' for the ''production'' or ''development'' of such microprocessors.*

List Based License Exceptions (See Part 740 for a Description of All License Exceptions)

TSR: Yes, except N/A for RS.

IEC: Yes, for ''software'' for equipment controlled by 3B001.c.1.a and 3B001.c.1.c, see § 740.2(a)(22) and § 740.24 of the EAR.

Special Conditions for STA

STA: License Exception STA may not be used to ship or transmit ''software'' ''specially designed'' for the ''use'' of equipment specified by 3B001.c.1.a or c.1.b to any of the destinations listed in Country Group A:5 or A:6 (See supplement no.1 to part 740 of the EAR)

List of Items Controlled

Related Controls: Also see 3D991.
Related Definitions: N/A
Items: The list of items controlled is contained in the ECCN heading.

* * * * *

3D992 ''Software'' for the ''development'' or ''production'' of commodities specified in 3B001.a.4, c, d, f.1, f.5, k to n, p.2, p.4, r, or 3B002.c and ''software'' as follows (see List of Items Controlled).

License Requirements

Reason for Control: NS, RS, AT

Control(s)	Country chart (see Supp. No. 1 to part 738)
NS applies to the entire entry.	To or within Macau or a destination specified in Country Group D:5 of supplement no. 1 to part 740 of the EAR. *See* § 742.4(a)(4) of the EAR.
RS applies to the entire entry.	To or within Macau or a destination specified in Country Group D:5 of supplement no. 1 to part 740 of the EAR. See § 742.6(a)(6)(i) of the EAR.
NS applies to "software" for equipment controlled by 3B001.c.1.a or c.1.c.	Worldwide control. See § 742.4(a)(5) and (b)(10) of the EAR.
RS applies to "software" for equipment controlled by 3B001.c.1.a or c.1.c.	Worldwide control. See § 742.6(a)(10) and (b)(11) of the EAR.
AT applies to entire entry.	AT Column 1.

List Based License Exceptions (See Part 740 for a Description of All License Exceptions)

TSR: N/A
IEC: Yes, for ''software'' for equipment controlled by 3B001.c.1.a and 3B001.c.1.c, see § 740.2(a)(22) and § 740.24 of the EAR.

Special Conditions for STA

STA: License Exception STA may not be used to ship or transmit ''software'' specified in this ECCN to any of the destinations listed in Country Group A:5 or A:6 (See supplement no.1 to part 740 of the EAR).

List of Items Controlled

Related Controls: For additional controls that apply to this ECCN, see also § 744.11(a)(2)(v) and (a)(3) and § 744.23(a)(4)(iii) of the EAR.
Related Definitions: N/A
Items:

a. ''Software'' for the ''development'' or ''production,'' of commodities specified in 3B001.a.4, c, d, f.1, f.5, k to n, p.2, p.4, r, or 3B002.c; *and*

b. 'Electronic Computer-Aided Design' ('ECAD') ''software'' designed for the integration of multiple dies into a 'multi-chip' integrated circuit, and having all of the following:

b.1. Floor planning; *and*

b.2. Co-design or co-simulation of die and package.

Technical Note: *For the purposes of 3D992.b, 'multi-chip' includes multi-die and multi-chiplet.*

3D993 ''Software'' for the ''development'' or ''production'' of commodities specified in 3B993 and ''software'' as follows (see List of Items Controlled).

License Requirements

Reason for Control: RS, AT

Control(s)	Country chart (see Supp. No. 1 to part 738)
RS applies to entire entry.	See § 742.6(a)(11) of the EAR.
AT applies to entire entry.	AT Column 1.

List Based License Exceptions (See Part 740 for a Description of All License Exceptions)

TSR: N/A

Special Conditions for STA

STA: License Exception STA may not be used to ship or transmit ''software'' specified in this ECCN to any of the destinations listed in Country Group A:5 or A:6 (see supplement no.1 to part 740 of the EAR).

List of Items Controlled

Related Controls: For additional controls that apply to this ECCN, see also § 744.11(a)(2)(v) and (a)(3) and § 744.23(a)(4)(iii) of the EAR.
Related Definitions: N/A
Items:

a. ''Software'' for the ''development'' or ''production'' of commodities specified in 3B993.

b. 'Electronic Computer-Aided Design' ('ECAD') ''software'' designed or modified for the ''development'' or ''production'' of integrated circuits using multipatterning.

c. 'Computational lithography' ''software'' designed or modified for the ''development'' or ''production'' of patterns on DUV lithography masks or reticles.

d. ''Software'' designed or modified to increase the number of wafers processed per hour, averaged over any time interval, by greater than 1%, of equipment specified in 3B001.f.1 or 3B993.f.1.

Technical Note: *For the purposes of 3D993, 'computational lithography' is the use of computer modelling to predict, correct, optimize and verify imaging performance of the lithography process over a range of patterns, processes, and system conditions.*

* * * * *

3D994 ''Software'' for the ''development'' or ''production'' of commodities specified in 3B994 and ''software'' as follows (see List of Items Controlled).

License Requirements

Reason for Control: RS, AT

Control(s)	Country chart (see Supp. No. 1 to part 738)
RS applies to entire entry.	See § 742.6(a)(11) of the EAR.
AT applies to entire entry.	AT Column 1.

List Based License Exceptions (See Part 740 for a Description of All License Exceptions)

TSR: N/A

Special Conditions for STA

STA: License Exception STA may not be used to ship or transmit ''software'' specified in this ECCN to any of the destinations listed in Country Group A:5 or A:6 (see supplement no. 1 to part 740 of the EAR).

List of Items Controlled

Related Controls: For additional controls that apply to this ECCN, see also § 744.11(a)(2)(v) and (a)(3) and § 744.23(a)(4)(iii) of the EAR.
Related Definitions: N/A
Items: The list of items controlled is contained in the ECCN heading.

* * * * *

3E001 ''Technology'' according to the General Technology Note for the ''development'' or ''production'' of commodities controlled by 3A (except 3A901, 3A904, 3A980, 3A981, 3A991, 3A992, or 3A999), 3B (except 3B001.a.4, c, d, f.1, f.5, k to n, p.2, p.4, r, 3B002.c, 3B903, 3B904, 3B991, 3B992, 3B993, or 3B994) or 3C (except 3C907, 3C908, 3C909, or 3C992).

License Requirements

Reason for Control: NS, MT, NP, RS, AT

Control(s)	Country chart (see Supp. No. 1 to part 738)
NS applies to "technology" for commodities controlled by 3A001, 3A002, 3A003, 3B001 (except as noted in the heading), 3B002 (except 3B002.c), or 3C001 to 3C006.	NS Column 1.
MT applies to "technology" for commodities controlled by 3A001 or 3A101 for MT Reasons.	MT Column 1.

Control(s)	Country chart (see Supp. No. 1 to part 738)
NP applies to "technology" for commodities controlled by 3A001, 3A201, or 3A225 to 3A234 for NP reasons.	NP Column 1.
RS applies to "technology" for commodities controlled in 3A090, when exported from Macau or a destination specified in Country Group D:5.	Worldwide (see § 742.6(a)(6)(ii)).
RS applies to "technology" for commodities controlled by 3A001.z, 3A090 (except for 3A090.c).	To or within destinations specified in Country Groups D:1, D:4, and D:5 of supplement no. 1 to part 740 of the EAR, excluding any destination also specified in Country Groups A:5 or A:6. See § 742.6(a)(6)(iii) of the EAR.
RS applies to "technology" for commodities controlled by 3A090.c.	To or within Macau or a destination specified in Country Group D:5 of supplement no. 1 to part 740 of the EAR. See § 742.6(a)(6)(i)(B) of the EAR.
RS applies to "technology" for commodities controlled by 3A001.a.15 or b.13, 3A004, 3B003, 3C007, 3C008, or 3C009.	RS Column 2.
AT applies to entire entry.	AT Column 1.

License Requirements Note: *See § 744.17 of the EAR for additional license requirements for microprocessors having a processing speed of 5 GFLOPS or more and an arithmetic logic unit with an access width of 32 bit or more, including those incorporating "information security" functionality, and associated "software" and "technology" for the "production" or "development" of such microprocessors.*

Reporting Requirements

See § 743.1 of the EAR for reporting requirements for exports under License Exceptions, Special Comprehensive Licenses, and Validated End-User authorizations.

List Based License Exceptions (See Part 740 for a Description of All License Exceptions)

TSR: Yes, except N/A for MT, and "technology" for the "development" or "production" of: (a) vacuum electronic device amplifiers described in 3A001.b.8, having operating frequencies exceeding 19 GHz; (b) solar cells, coverglass-interconnect-cells or covered-interconnect-cells (CIC) "assemblies," solar arrays and/or solar panels described in 3A001.e.4; (c) "Monolithic Microwave Integrated Circuit" ("MMIC") amplifiers in 3A001.b.2; (d) discrete microwave transistors in 3A001.b.3; and (e) commodities described in 3A090.

Note: *See § 740.2(a)(9)(ii) of the EAR for license exception restrictions for ECCN 3E001 "technology" for commodities controlled by 3A001.z, 3A090.*

IEC: Yes, for "technology" for equipment controlled by 3B001.q, see § 740.2(a)(22) and § 740.24 of the EAR.

Special Conditions for STA

STA: License Exception STA may not be used to ship or transmit "technology" according to the General Technology Note for the "development" or "production" of equipment specified by ECCNs 3A002.g.1 or 3B001.a.2 to any of the destinations listed in Country Group A:6 (see supplement no.1 to part 740 of the EAR). License Exception STA may not be used to ship or transmit "technology" according to the General Technology Note for the "development" or "production" of components specified by ECCN 3A001.b.2, b.3, commodities specified in 3A090, to any of the destinations listed in Country Group A:5 or A:6 (see supplement no. 1 to part 740 of the EAR).

List of Items Controlled

Related Controls: (1) "Technology" according to the General Technology Note for the "development" or "production" of certain "space-qualified" atomic frequency standards described in Category XV(e)(9), MMICs described in Category XV(e)(14), and oscillators described in Category XV(e)(15) of the USML are "subject to the ITAR" (see 22 CFR parts 120 through 130). See also ECCNs 3E101, 3E201 and 9E515. (2) "Technology" for "development" or "production" of "Microwave Monolithic Integrated Circuits" ("MMIC") amplifiers in 3A001.b.2 is controlled in this ECCN 3E001; 5E001.d refers only to that additional "technology" "required" for telecommunications.
Related Definition: N/A
Items: The list of items controlled is contained in the ECCN heading.

Note 1: *3E001 does not control "technology" for equipment or "components" controlled by 3A003.*

Note 2: *3E001 does not control "technology" for integrated circuits controlled by 3A001.a.3 to a.14 or .z, having all of the following:*

(a) Using "technology" at or above 0.130 µm; and

(b) Incorporating multi-layer structures with three or fewer metal layers.

* * * * *

3E992 "Technology" for the "production" or "development" of commodities specified in 3B001.a.4, c, d, f.1, f.5, k to n, p.2, p.4, r; and 3B002.c.

License Requirements

Reason for Control: NS, RS, AT

Control(s)	Country chart (see Supp. No. 1 to part 738)
NS applies to the entire entry.	To or within Macau or a destination specified in Country Group D:5 of supplement no. 1 to part 740 of the EAR. See § 742.4(a)(4) of the EAR.
RS applies to the entire entry.	To or within Macau or a destination specified in Country Group D:5 of supplement no. 1 to part 740 of the EAR. See § 742.6(a)(6)(i) of the EAR.
NS applies to "software" for equipment controlled by 3B001.c.1.a or c.1.c.	Worldwide control. See § 742.4(a)(5) and (b)(10) of the EAR.
RS applies to "software" for equipment controlled by 3B001.c.1.a or c.1.c.	Worldwide control. See § 742.6(a)(10) and (b)(11) of the EAR.
AT applies to entire entry.	AT Column 1.

List Based License Exceptions (See Part 740 for a Description of All License Exceptions)

TSR: N/A
IEC: Yes, for "technology" for equipment controlled by 3B001.c.1.a, and 3B001.c.1.c, see § 740.2(a)(22) and § 740.24 of the EAR.

Special Conditions for STA

STA: License Exception STA may not be used to ship or transmit "technology" specified in this ECCN to any of the destinations listed in Country Group A:5 or A:6 (see supplement no. 1 to part 740 of the EAR).

List of Items Controlled

Related Controls: N/A
Related Definitions: N/A
Items: The list of items controlled is contained in the ECCN heading.

3E993 "Technology" for the "development" or "production" of commodities specified in 3B993 as follows.

License Requirements

Reason for Control: RS, AT

Control(s)	Country chart (see Supp. No. 1 to part 738)
RS applies to entire entry.	See § 742.6(a)(11) of the EAR.
AT applies to entire entry.	AT Column 1.

List Based License Exceptions (See Part 740 for a Description of All License Exceptions)

TSR: N/A

Special Conditions for STA

STA: License Exception STA may not be used to ship or transmit ''technology'' specified in this ECCN to any of the destinations listed in Country Group A:5 or A:6 (see supplement no. 1 to part 740 of the EAR).

List of Items Controlled

Related Controls: For additional controls that apply to this ECCN, see also § 744.11(a)(2)(v) and (a)(3) and § 744.23(a)(4)(iii) of the EAR.
Related Definitions: N/A
Items:

a. ''Technology'' for the ''development'' or ''production'' of commodities specified by 3B993.

b. ''Technology'' designed or modified to increase the number of wafers processed per hour, averaged over any time interval, by greater than 1%, of equipment specified in 3B001.f.1 or 3B993.f.1.

* * * * *

3E994 ''Technology'' for the ''development'' or ''production'' of commodities specified in 3B994 and ''technology'' as follows (see List of Items Controlled).

License Requirements

Reason for Control: RS, AT

Control(s)	Country chart (see Supp. No. 1 to part 738)
RS applies to entire entry.	See § 742.6(a)(11) of the EAR.
AT applies to entire entry.	AT Column 1.

List Based License Exceptions (See Part 740 for a Description of All License Exceptions)

TSR: N/A

Special Conditions for STA

STA: License Exception STA may not be used to ship or transmit ''technology'' specified in this ECCN to any of the destinations listed in Country Group A:5 or A:6 (see supplement no. 1 to part 740 of the EAR).

List of Items Controlled

Related Controls: For additional controls that apply to this ECCN, see also § 744.11(a)(2)(v) and (a)(3) and § 744.23(a)(4)(iii) of the EAR.
Related Definitions: N/A
Items: The list of items controlled is contained in the ECCN heading.

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Matthew S. Borman,

Principal Deputy Assistant Secretary for Strategic Trade and Technology Security.

[FR Doc. 2024–28270 Filed 12–2–24; 8:45 am]

BILLING CODE 3510–33–P

DEPARTMENT OF COMMERCE

Bureau of Industry and Security

15 CFR Parts 744 and 748

[Docket No. 241126–0303]

RIN 0694–AJ77

Additions and Modifications to the Entity List; Removals From the Validated End-User (VEU) Program

AGENCY: Bureau of Industry and Security, Commerce.

ACTION: Final rule.

SUMMARY: In this final rule, the Bureau of Industry and Security (BIS) amends the Export Administration Regulations (EAR) by adding 140 entities to the Entity List. These entries are listed on the Entity List under the destinations of China, People's Republic of (China), Japan, South Korea, and Singapore and have been determined by the U.S. Government to be acting contrary to the national security and foreign policy interests of the United States. This final rule also modifies 14 existing entries on the Entity List, consisting of revisions to 14 entries under China. This final rule publishes concurrently with BIS's interim final rule, ''Foreign-Produced Direct Product Rule Additions, and Refinements to Controls for Advanced Computing and Semiconductor Manufacturing Items'' (0694–AJ74), which makes additional changes to the EAR controls on advanced computing items and semiconductor manufacturing items. This final rule is part of this larger effort to ensure that appropriate EAR controls are in place on these items, including in connection with transactions destined to or otherwise involving the entities being added to the Entity List, as well as for existing entries on the Entity List that are being modified. All of these entities (those newly added and those being modified) are involved with the development and production of ''advanced-node integrated circuits'' (''advanced-node ICs'') and/or semiconductor manufacturing items, and/or have supported the Chinese government's Military-Civil Fusion (MCF) Development Strategy. Additionally, this final rule designates nine of these entities being added and seven of the entries being modified as entities for which entity-specific restrictions involving foreign-produced items apply. This final rule also amends the EAR by removing three entities from the Validated End-User (VEU) Program.

DATES:

Effective date: This rule is effective December 2, 2024.

Compliance date: The changes being made in this final rule that pertain to Entity List license requirements and other Entity List-related requirements linked to Footnote 5 designations have a compliance date of December 31, 2024.

FOR FURTHER INFORMATION CONTACT: For questions on the Entity List and VEU Program changes in this final rule, contact Chair, End-User Review Committee, Office of the Assistant Secretary for Export Administration, Bureau of Industry and Security, Department of Commerce, Phone: (202) 482–5991, Email: *ERC@bis.doc.gov.*

SUPPLEMENTARY INFORMATION:

I. Background

A. Entity List and End-User Review Committee (ERC)

The Entity List (supplement no. 4 to part 744 of the EAR (15 CFR parts 730 through 774)) identifies entities for which there is reasonable cause to believe, based on specific and articulable facts, that the entities have been involved, are involved, or pose a significant risk of being or becoming involved in activities contrary to the national security or foreign policy interests of the United States, pursuant to § 744.11(b). The EAR imposes additional license requirements on, and limit the availability of, most license exceptions for exports, reexports, and transfers (in-country) when an entity listed on the Entity List is a party to the transaction. The license review policy for each listed entity is identified in the ''License Review Policy'' column on the Entity List, and the impact on the availability of license exceptions is described in the relevant **Federal Register** document that added the entity to the Entity List. BIS places entities on the Entity List pursuant to parts 744 (Control Policy: End-User and End-Use Based) and 746 (Embargoes and Other Special Controls) of the EAR.

The ERC, composed of representatives of the Departments of Commerce (Chair), State, Defense, Energy and, where appropriate, the Treasury, makes all decisions regarding additions to, removals from, or other modifications to the Entity List. The ERC makes all decisions to add an entry to the Entity List by majority vote and makes all decisions to remove or modify an entry by unanimous vote.