

**Comment 2 of 2 of the  
Semiconductor Industry Association**

**In Response to the Request for Comments about**

**Areas and Priorities for US and EU Export Control Cooperation  
under the Trade and Technology Council**

**Ref: 86 Fed. Reg. 67904 (Nov. 30, 2021);  
Docket No. 211123-0244; XRIN 0694-XC088**

**Uploaded to: <https://www.regulations.gov/document/BIS-2021-0044-0001>**

**January 14, 2022**

In the above-captioned Notice of Inquiry, the Bureau of Industry and Security (BIS) asked for comments to help it with its review of relevant regulatory developments pertaining to dual-use export controls in third countries. For the sake of efficiency and readability, the Semiconductor Industry Association (SIA) responds to this part of the Notice's request in this separate document. As described in the first half our comments to the Notice, SIA has long been committed to provide background information to help get the facts necessary to develop and implement tailored and effective export control policy. This document continues that tradition. SIA is willing to respond to any further questions from the U.S. Government or others about the information in this document to help with the Government's and the public's analysis of the issues described in the Notice.

In order to provide context to our response, and also to help public understanding of the export control issues pertaining to BIS question, Section I is a summary description of the primary similarities and differences between the U.S. and allied country export control systems. Section II contains a summary of the multilateral export control system and the types of semiconductor-related items identified by the regimes. Most such items are described in the list of dual-use items maintained by the Wassenaar Arrangement. Annex 1 contains the relevant text of the Arrangement's mandate and Annex 2 describes the semiconductor-related items on Wassenaar's list of dual-use items. Section III is directly responsive to BIS's request. It contains general descriptions of and commentary on the export control systems of the countries with significant semiconductor industries (in alphabetical order): France, Germany, Israel, Japan, the Netherlands, Singapore, South Korea, Taiwan, and the United Kingdom.

This document is intended to be a "living document" that incorporates, in subsequent versions SIA will publish, new developments in policy thinking within the export control authorities of these countries. We encourage additions and corrections to the summaries.

## **I. Overview of the Similarities and Differences Between the U.S. and Other Allied Country Export Control Systems**

The United States dual-use export control system is based upon the same multilateral system that governs the domestic systems of most of its foreign partners. This system was designed near the end of the Cold War to stem the proliferation of missiles, chemical and biological weapons, nuclear weapons, conventional military items, and specific commodities, software, and technologies required for their development, production, or use. U.S. export control authorities, however, generally allow greater national discretion to create and impose controls outside of the scope of the multilateral export control regimes than is provided under foreign partner domestic authorities. The U.S. Government has and is willing to use its unique authorities to impose unilateral controls to address national security and foreign policy, including human rights, concerns. In addition, when controls on specifically listed items are ineffective, the U.S. system has greater flexibility than its allies to impose controls on exports of unlisted items to specific end-users and end-uses.

Foreign partners' unilateral control authorities, by contrast, are much more limited. For example, they do not generally allow for the use of export controls to address issues specific to countries of concern that are not subject to comprehensive economic embargoes (e.g., Iran and North Korea) that are not directly related to weapons of mass destruction or conventional military items. In addition, none has the flexibility to create general end-user and end-use controls on exports of unlisted items for reasons unrelated to proliferation concerns. With the exception of some technology controlled by South Korea and Taiwan in connection with outbound investments, foreign partners' controls concerning certain types of semiconductor-specific items are all within the scope of the Wassenaar Arrangement's list of dual-use items, which are those identified by the regime members as being required to produce, develop, or use weapons of mass destruction, conventional military items, or items for use by terrorists. Most of these partners' export control laws and policies can be summarized as follows: If a commodity, software, or technology is on one of the regime lists, then a license is required to export it, with some exceptions for regime members. If there is no information to suggest that the item will be diverted for a military- or WMD-related application, or for a sanctioned destination, then it will generally be approved. If a commodity, software, or technology is not identified on a regime list, it does not, with rare exceptions involving potential WMD-related applications, require a license to export. This means that that only a small fraction of applications for a license to export dual-use items are denied, including those to China.

South Korea and Taiwan have the authority to limit exports of technology for economic security considerations in connection with outbound investments. Taiwan investment and technology transfer controls are a function of the country's unique relationship with mainland China. Taiwan's laws prohibit certain types of mainland Chinese investments in Taiwan to prevent the transfer of semiconductors and other technologies. Similarly, the South Korean government has an "industrial protection" law that requires domestic firms to seek approval from the relevant regulators upon the transfer of various semiconductor technology to foreign countries if government funding contributed to the development of the technology. South Korea has invoked this law on numerous occasions to prevent firms transferring to mainland China technology deemed detrimental to the industrial competitive capabilities of Korean companies even in the absence of direct links to national security

concerns associated with WMD's or conventional weapons. These laws are, however, not a part of Taiwanese and South Korean export control systems and do not apply to direct sales and transfers of commodities or software.

In addition, many foreign partners do not share similar policy concerns about the novel national security or foreign policy issues that certain countries present. Even if decision-makers in the semiconductor-producing partners agreed that new types of items should be added to the Wassenaar dual-use control list to address given country-specific issues, the list cannot be amended unless all 43 member states agreed to the change. The primary reason most other members would not agree to such a change is that regime's mandates are focused on controlling items only if materially related to weapons of mass destruction or conventional military applications. This means that the traditional practice of annually modifying the multilateral export control lists cannot address country-specific threats to U.S. national security, economic security, and foreign policy (including human rights) objectives that do not have a direct relationship to the development, production, or use of WMDs or conventional military items. These challenges have led to discussions on a new approach that negotiates the territory between unilateral controls and the traditional multilateral regime-based controls.

Midway between unilateral and multilateral controls, a "plurilateral" approach involves groups of nations, each individually deciding to coordinate on export control licensing of already-listed items or unilaterally listing items outside of the traditional export control multilateral regime structure. Plurilateralism has its set of own challenges, which emerges from inevitable variances in partners' commercial, economic, national security and foreign policy concerns, as well as in export control laws and policies. To succeed a plurilateral approach must find consensus among the specified group of nations amidst all these constraints in tandem. The purpose of this paper is to serve as a resource for policymakers navigating this challenging but important approach.

## **II. Summary of the Multilateral Export Control Regimes**

### **A. The Traditional Multilateral Export Control System is Focused on Non-Proliferation Objectives**

The four primary export control regimes that are the foundations for the export control rules of the United States and its partners are the Nuclear Suppliers Group (NSG),<sup>1</sup> the Australia Group (AG)<sup>2</sup> (for chemical and biological-related items), the Missile Technology Control Regime (MTCR),<sup>3</sup> and the Wassenaar Arrangement (WA).<sup>4</sup> The primary mandate of these regimes is to identify and list (i) weapons of mass destruction and their delivery systems (i.e., missiles, nuclear items, and chemical/biological weapons items); (ii) conventional weapons; and (iii) commodities, software, or technology (collectively “items”) that have some clear relationship to their development, production, or use. The lists of items identified by each of the regimes is determined by consensus of the regime’s members.

Each year,<sup>5</sup> the regime members meet to update these lists. The member states then amend their domestic export control rules to align with the changes agreed to at the regimes. Each member state subsequently determines whether a proposed export of a covered item would be consistent with the non-proliferation objectives of the regimes and its domestic law, and will decide to grant or deny the proposed export. Many non-member countries adopt the regime controls in their domestic export control systems. These countries share the non-proliferation objectives of regime members, but are unable to formally join. A country’s decision to grant or deny a license to export a controlled dual-use item is, with exceptions not relevant here, in its “national discretion,” which means that it is based on its export control officials’ assessment of whether the item could be diverted to military or WMD-related applications. There are also situations in which nations may informally coordinate licensing decisions. However, this is rare and often not reported. The multilateral and domestic lists of controlled items of allied countries generally avoid overtly factoring in any country-specific concerns, economic security or trade considerations, supply chain security issues, technology leadership objectives, or human rights issues. The control lists are created based on the inherent characteristics of specific commodities, software, and technologies – i.e., not for broader strategic considerations pertaining to a country.

---

<sup>1</sup> <https://www.nuclearsuppliersgroup.org/en/>

<sup>2</sup> <https://www.dfat.gov.au/publications/minisite/theaustraliagroupnet/site/en/index.html>

<sup>3</sup> <https://mtcr.info>

<sup>4</sup> <https://www.wassenaar.org>

<sup>5</sup> The regimes did not meet in 2020 as a result of the global pandemic. The extent to which some portion of normal meetings will occur in 2021 is uncertain.











While economic considerations may have informed the proposal and approval of controls over the decades, stated and written objectives – in law, regulation, and regime mandate – do not include economic objectives as justifications for the use of export controls. Economic benefits to companies were intended to accrue from efficient management of the licensing system and regular maintenance of the control lists aimed at precisely controlling relevant to WMDs or conventional military items.

## B. Semiconductor-Related Controls in the Four Multilateral Export Control Regimes Including the Wassenaar Arrangement

The Wassenaar Arrangement was established in 1996 to replace the Cold War-era COCOM system. Current Participating States are as follows: Argentina, Australia, Austria, Belgium, Bulgaria, Canada, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, India, Ireland, Italy, Japan, Latvia, Lithuania, Luxembourg, Malta, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Republic of Korea, Romania, Russian Federation, Slovakia, Slovenia, South Africa, Spain, Sweden, Switzerland, Turkey, Ukraine, United Kingdom, and United States. Countries with material semiconductor industries, primarily Taiwan, and Singapore, and Israel, are not members of Wassenaar. However, the scope of their domestic export controls on semiconductors closely tracks the agreement and other regime controls. The standards Wassenaar (in its “Initial Elements”) uses to identify an item on its control list are in Annex 1.<sup>6</sup> A detailed list of items related to semiconductors on Wassenaar’s dual-use list is in Annex 2.

### III. Country-Specific Export Controls Pertaining to Semiconductors

Below is a chart summarizing the basic elements of each country's export control laws:

S I A		COUNTRY-SPECIFIC EXPORT CONTROLS PERTAINING TO SEMICONDUCTORS									
SEMI-CONDUCTOR INDUSTRY ASSOCIATION		E.U.	FRANCE	GERMANY	ISRAEL	JAPAN	THE NETHERLANDS	SINGAPORE	KOREA	TAIWAN	U.K.
											
REGIME MEMBER		Tracks 4 Regimes	Of All 4 Regimes	Of All 4 Regimes	Non-Member: Legislative Adoption of 4 Lists	Of All 4 Regimes	Of All 4 Regimes	Non-Member: Administrative Adoption of 4 Lists	Of All 4 Regimes	Non-Member: Legislative Adoption of WA & EU Dual Use	Of All 4 Regimes
AUTHORITY		European Commission, DC Trade – Trade and Security	Service des Biens à Double-Usage	Bundesamt für Wirtschaft und Außenkontrollen	Ministry of Economy and Industry; Ministry of Defense	Ministry of Economy, Trade, and Industry; Ministry of Defense; Ministry of Foreign Affairs	Centrale Dienst voor In- en Uitvoer & Ministerie van Buitenlandse Zaken	Singapore Customs & Immigration and Checkpoints Authority	Ministry of Trade, Industry and Energy & KOSTI	Bureau of Foreign Trade	Export Control Joint Unit
UNILATERAL ACTION (other than WMD catch-alls)		Allowed for Public Security, Human Rights	None on Semiconductor Items	None on Semiconductor Items	Allowed by Item; Not Allowed by Country	None on Semiconductor Items	None on Semiconductor Items	None on Semiconductor Items	Allowed; None on Semiconductor Items	Temporary Unilateral Action Possible	None on Semiconductor Items
OTHER CONSIDERATIONS		Implement Multilateral Export Control Commitments	<ul style="list-style-type: none"> <li>International Export Controls</li> <li>Sanctions</li> <li>National Security</li> <li>End Use &amp; Diversion Risk</li> <li>Human Rights</li> </ul>	<ul style="list-style-type: none"> <li>International Export Controls</li> <li>Sanctions</li> <li>National Security</li> <li>End Use &amp; Diversion Risk</li> <li>Human Rights</li> <li>Public Security</li> </ul>	"Contribution to world peace"	<ul style="list-style-type: none"> <li>International Peace &amp; Security</li> <li>Economic Considerations Possible</li> </ul>	<ul style="list-style-type: none"> <li>International Export Controls</li> <li>Sanctions</li> <li>National Security in Certain Circumstances</li> <li>End Use &amp; Diversion Risk</li> <li>Human Rights</li> </ul>	N/A	<ul style="list-style-type: none"> <li>Peaceful Purpose of Use</li> <li>National Security</li> <li>Credibility of Parties to Transaction</li> <li>Human Right Considered but Not Used</li> </ul>	<ul style="list-style-type: none"> <li>Specific Restrictions to Entities on Taiwan Entity List</li> <li>Undefined National Security</li> <li>International Agreements</li> <li>Economics</li> <li>Human Rights</li> <li>*proposed</li> </ul>	<ul style="list-style-type: none"> <li>International Export Controls</li> <li>Sanctions</li> <li>National Security</li> <li>End Use &amp; Diversion Risk</li> <li>Human Rights</li> <li>Public Security</li> </ul>

<sup>6</sup> <https://www.wassenaar.org/app/uploads/2019/12/WA-DOC-19-Public-Docs-Vol-I-Founding-Documents.pdf>

The following are general descriptions of and commentary on export controls in countries with significant semiconductor industries (in alphabetical order): France, Germany, Israel, Japan, the Netherlands, Singapore, South Korea, Taiwan, and the United Kingdom:

#### **A. General Comments about the EU Members**

- EU regulations governing mandatory member state export controls are focused on implementing international agreements and regimes. The scope of semiconductor-related controls is identical to those of the multilateral regimes.
- On June 11, 2021, the EU published an update to its dual-use controls – the “Recast Dual-Use Regulations.” Among the changes is a new catch-all control on cyber-surveillance items that is not within the scope of the multilateral regime structure. The catch-all applies to “dual-use items specially designed to enable the covert surveillance of natural persons by monitoring, extracting, collecting or analyzing data from information and telecommunications systems” when the end-use is in connection with “internal repression and/or the commission of serious violations of human rights and international humanitarian law.”
- The EU does not have any authority to require the imposition of any other controls on items outside the scope of those identified the multilateral regime lists. If, however, an EU country wanted to impose controls on semiconductor or any other specific items not on a regime control list for export to a country of concern, it would have to implement domestic regulations on the basis that such controls are necessary for “reasons of public security, including the prevention of acts of terrorism,” or for “human rights considerations.” Such license requirements must be notified to the EU Commission for publication in the EU Official Journal (Article 9).
- EU member states are entitled to interpret these provisions as they see fit. If an EU member state chooses to impose controls on an emerging or foundational technology that the United States had identified as a country-specific concern (unrelated to human rights or terrorism issues), the member state would have to deem such a control as necessary for “public security.” Member states’ laws and regulations do not define or comment on the scope of “public security” or how it could be interpreted to address the issues described in this paper. No broader, explicit authority exists to factor in general national security or economic considerations into individual state export control decisions.
- If a member state were going to justify country-specific unilateral controls on unlisted items for reasons of “public security,” it could, for example, issue a decree or otherwise declare that the risk of a serious disturbance to a member state’s foreign relations or to the peaceful coexistence of nations may affect the public security of a member state. This would be a basis for adopting a unilateral control – i.e., a list of non-Annex I dual-use items - subject to a license for export to a country of concern on the basis of, *inter alia*, human rights violations, or regional expansive assertion of military power. No EU country has done this, however.
- European export authorities are afforded significant discretion with respect to the



denial of a license. Most European jurisdictions allow exporters to appeal a license denial. Appeals are typically conducted within the export agency by an officer not involved in the original decision. If this appeal is also denied, exporters must seek a formal judicial review to overturn the decision. Formal reviews are rare and intended to ensure that the correct regulatory procedure has been followed, as opposed to providing the exporter with an avenue through which to secure damages.

- For dual-use items not on a multilateral regime list, if an exporter knows or is told by the authorities (or, if implemented at a national EU member state level, suspects that) an item is for a (a) WMD end-use or (b) military end-use in an arms embargoed country, the exporter must notify their authorities who may then impose a license requirement (Article 4). This is a “catch all” control. China is subject to an arms embargo (although not clearly defined whether applicable to all military items or just lethal weapons) under an EU Council Ministerial Declaration from 1989 following the events in Tiananmen Square.

## **B. France**

- French dual-use export controls track the Wassenaar and other regime controls, which are described in EU Dual-use Regulation.
- France does not have national authority to exercise unilateral controls on semiconductor-related items.
- The des Biens à Double-Usage (SBDU), mandated by Ministry of Economy and Finance, administers the controls.
- The EU Dual-use Regulation requires Member States, including France, to consider (a) the obligations and commitments they have each accepted as members of the relevant international non-proliferation regimes and export control arrangements, or by ratification of relevant international treaties; (b) their obligations under sanctions imposed by a decision or a common position adopted by the Council or by a decision of the OSCE or by a binding resolution of the Security Council of the United Nations; (c) considerations of national foreign and security policy, including those covered by Council Common Position 2008/944/CFSP<sup>7</sup> of 8 December 2008 defining common rules governing control of exports of military technology and equipment; and (d) considerations about intended end-use and the risk of diversion, in licensing decisions.
- License applications are processed by SBDU. All licenses are examined by the Inter-ministerial Commission (CIBDU) monthly.
- The SBDU may deny licenses for reasons such as international export control obligations and commitments, sanctions obligations, and traditional national security policy concerns. Economic and trade protection reasons are not among those

<sup>7</sup> <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:L:2021:206:FULL&from=EN>

provided but can fall under other considerations. License denials can be appealed but success is limited. SBDU will also notify other EU Member States of its decision to refuse an export license.

- The applicant has two months to appeal the decision. This appeal may be ex gratia, hierarchical, or contentious before the administrative court.
- Due to public policy and national security concerning the authorizations, regulations stipulate that a non-response within five months after issuance of the admissibility certificate be deemed a refusal. The applicant can contest this implicit refusal within two months or appeal against the refusal by emailing the head of the dual-use goods department continue the case. The latter will result in an explicit decision at the end of the process, which opens a new appeal period.
- Export controls-related end-use controls imposed by France are solely those based on the EU Dual-use Regulation, namely the WMD end-use control, the military end-use control, and the human rights/public security end-use control. Sanctions legislation can impose additional controls, but typically those specific to a particular regime.
- Addressing human rights issues is one of the conditions included in the Council Common Position 2008/944 (“respect for human rights in the country of final destination as well as respect by that country of international humanitarian law”). Licenses for controlled dual-use items can be denied because of human rights considerations. Non-controlled dual-use items can also be subjected to an export license requirement and possible denial because of human rights considerations.

### **C. Germany**

- German dual-use export controls implement the Wassenaar Agreement and other regime controls, which are described in Regulation (EC) 428/2009 (Annex I).
- Germany does not have national authority to exercise unilateral controls on semiconductor-related items.
- The Bundesamt für Wirtschaft und Ausfuhrkontrolle (BAFA), which is part of the Ministry of Economy and Energy, administers the controls.
- The EU Dual-use Regulation requires Member States to consider (a) the obligations and commitments they have each accepted as members of the relevant international non-proliferation regimes and export control arrangements, or by ratification of relevant international treaties; (b) their obligations under sanctions imposed by a decision or a common position adopted by the Council or by a decision of the OSCE or by a binding resolution of the Security Council of the United Nations; (c) considerations of national foreign and security policy, including those covered by



Council Common Position 2008/944/CFSP<sup>8</sup> of 8 December 2008 defining common rules governing control of exports of military technology and equipment; and (d) considerations about intended end-use and the risk of diversion, in licensing decisions.

- BAFA processes and decides the approval of applications for export control licenses. Licenses may be denied for many reasons, such international export controls obligations and commitments, sanctions obligations, and national security policy objectives. Economic objectives are not identified. License denials can be appealed but the success of an appeal is very limited, particularly if the denial is based on national security grounds.
- In addition to WMD issues, Germany also imposes the military end-use control and human rights/public security end-use controls as referenced in the EU Dual-use Regulation. Sanctions legislation can impose additional controls.
- Human rights is one of the conditions included in the Council Common Position 2008/944 (“respect for human rights in the country of final destination as well as respect by that country of international humanitarian law”). Licenses for controlled dual-use items can be denied because of human rights considerations. Non-controlled dual-use items can also be subjected to an export license requirement and possible denial because of human rights considerations. Germany has created its own national control list on these grounds.<sup>9</sup>

#### **D. Israel**

- Israel is not a member of any of the export control regimes. However, it adopted the multilateral regime export control lists into domestic law under an Export and Import Order and pursuant to a decree. An act of the Knesset is required to update the military control list.
- Israel does not have national authority to exercise controls on the export of semiconductor-related or other items beyond those identified in the regime control lists.
- The Export Control Agency of the Ministry of Economy and Industry (MOE) administers controls on dual-use items concerning non-military end-users. The Ministry of Defense (MOD) administers military export controls and dual-use export controls concerning military end-users. The Export Control Agency of the Ministry of Economy and Industry (MOE) and the Ministry of Defense (MOD) administers controls on dual-use items concerning non-military and military end-users, respectively. The Ministry of Foreign Affairs approves exports.
- The policy objective of the dual-use decrees is to “contribute to world peace.”

<sup>8</sup> <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:L:2021:206:FULL&from=EN>

<sup>9</sup> See [https://trade.ec.europa.eu/doclib/docs/2020/january/tradoc\\_158576.pdf](https://trade.ec.europa.eu/doclib/docs/2020/january/tradoc_158576.pdf), page 17.

- The MOE has the authority to impose a unilateral control on semiconductors and other items without the approval of the Knesset. However, Israeli law requires a license for exports to all countries. It cannot tailor a unilateral control to a specific country, such as China, or create exceptions for specific countries without modification of the Import and Export Order.
- If the MOE imposes a unilateral control to achieve country-specific objectives unrelated to clear military or WMD concerns, the government can be sued for imposing a control outside of its mandate and inflicting harm on a domestic company's competitiveness.
- Israel has comprehensive embargoes against countries, such as Iran and Syria, but does not have the authority to impose end-use controls unrelated to WMDs or end-user controls.
- It does not have the authority to impose controls purely for human rights reasons.
- The government is working to update its controls, but none of the specific issues in this paper are under consideration. The Export Control Decrees may be changed with approval of a Knesset committee without legislation.

## **E. Japan**

- Japan is a member of the four multilateral regimes. Under the authority of the Foreign Exchange and Foreign Trade Act, Japan implements the control lists of the foreign multilateral control regimes in the Ministerial Order Specifying Goods and Technologies Pursuant to Provisions of the Appended Table 1 of the Export Control Order and the Appended Table of the Foreign Exchange Order.<sup>10</sup>
- Japan does not currently exercise unilateral controls on semiconductor-related items.
- The Ministry of Economy, Trade, and Industry (METI) administers the export control system, with input from the Ministry of Defense and the Ministry of Foreign Affairs.
- The Act allows restrictions on items that “undermine the maintenance of international peace and security.” The Act also authorizes restrictions when it is necessary to “enable Japan's faithful performance of its obligations under a treaty or other international agreement it has signed,” or to “allow Japan to contribute to international efforts towards world peace” or to “maintain peace and security in Japan.” Traditionally, Japan has only denied exports clearly linked to military applications.

---

<sup>10</sup> Order of the Ministry of International Trade and Industry No. 49 of October 14, 1991, as amended (<https://elaws.e-gov.go.jp/document?lawid=403M50000400049>) (English translation, outdated, available at <http://www.japaneselawtranslation.go.jp/law/detail/?id=2851&vm=04&re=01&new=1>).

- However, given the ambiguity in the Act, Japanese officials may exercise some discretion in imposing unilateral controls on items for reasons that align with U.S. policy objectives – a broad and undefined standard.
- Some exporters believe that METI has been applying this standard when making licensing decisions broader than traditional concerns about potential military or WMD applications, as well as to include economic considerations. Such concerns have pertained to shipments to China.
- In addition to restrictions based on control lists, Japan implements end-use or end-user controls concerning weapons of mass destruction or conventional weapons.
- Beyond implementing UN Security Council resolutions, METI implements unilateral comprehensive import/export controls against North Korea.
- METI officials have been known to informally inform (known as “administrative guidance”) particular companies to not export items that are not explicitly controlled in export control laws. Given the informal nature of such discussions, it is difficult to comment on their scope and enforcement.
- METI is aware of export issues involving human rights concerns but has not taken action to impose or create controls over such exports. The Diet would likely have to modify the law to impose controls for human rights objectives on dual-use items and items that are not on the control list.
- An external advisory committee to METI has recommended the Japanese government to seek a new agile plurilateral regime that supplement existing multilateral regimes to address export control policy objectives beyond traditional non-proliferation reasons.<sup>11</sup> Subsequently, on June 18, 2021, the Japanese cabinet authorized a strategy which contains an export control and economic security agenda, including the establishment of such new regime.<sup>12</sup> The effort is in its early stages and will likely take some years to complete and implement.
- Consistent with this recommendation, Japanese government officials have said<sup>13</sup> in public settings that they are concerned about the limitations of the multilateral regime process in addressing China’s civil-military fusion policies. They have also expressed concerns about the impact of unilateral US and Chinese export controls on the ability of Japanese companies to have predictability with respect to benign trade. They have also said that they do not believe unilateral controls are effective.
- There is an informal understanding, based on discussions in public conferences and other meetings, that the governments of Japan, the Netherlands, and the United States are working together to align their licensing policies on the export of Extreme

<sup>11</sup> [https://www.meti.go.jp/shingikai/sankoshin/tsusho\\_boeki/anzen\\_hosho/pdf/20210610\\_1.pdf](https://www.meti.go.jp/shingikai/sankoshin/tsusho_boeki/anzen_hosho/pdf/20210610_1.pdf)

<sup>12</sup> <https://www.cas.go.jp/jp/seisaku/seicho/pdf/ap2021.pdf>

<sup>13</sup> [https://www.rieti.go.jp/en/events/bbl/21090601\\_kazeki.pdf](https://www.rieti.go.jp/en/events/bbl/21090601_kazeki.pdf)

Ultraviolet (EUV) tools and specific EUV tool components to China. Because the export control laws in each country are based on “national discretion” regarding national security concerns, such informal arrangements are not illegal under each country’s laws. However, the arrangements are only with respect to items that are already identified on the Wassenaar Arrangement list.

## **F. The Netherlands**

- The Netherlands’ dual-use export controls implement the Wassenaar Agreement and other regime controls, which are described in Regulation (EC) 428/2009 (Annex I).
- The Centrale Dienst voor In- en Uitvoer (CDIU), Groningen administers the controls and the Ministerie van Buitenlandse Zaken (Ministry of Foreign Affairs) provides input.
- The Netherlands has not imposed unilateral controls on semiconductor-related items.
- Dutch law states that licenses may be denied for reasons such as international export controls obligations and commitments, sanctions obligations, national security policies. Economic objectives are not identified. The issue of whether the Dutch government would grant licenses for the export of advanced semiconductor production equipment to China has received substantial public attention. Rather than denying the license, the government (in coordination with the United States) commonly does not respond to license application requests or includes conditions on the use of the license that renders the export unviable.
- The EU Dual-use Regulation requires Member States to consider (a) the obligations and commitments they have each accepted as members of the relevant international non-proliferation regimes and export control arrangements, or by ratification of relevant international treaties; (b) their obligations under sanctions imposed by a decision or a common position adopted by the Council or by a decision of the OSCE or by a binding resolution of the Security Council of the United Nations; (c) considerations of national foreign and security policy, including those covered by Council Common Position 2008/944/CFSP<sup>14</sup> of 8 December 2008 defining common rules governing control of exports of military technology and equipment; and (d) considerations about intended end-use and the risk of diversion, in licensing decisions.
- Dutch authorities recently have indicated that the inclusion of recipients on the BIS Entity List and other U.S. government lists may serve as an indication of potential military end-use and thus a potential cause to impose a “catch all” decision with respect to the listed items and items not on a multilateral control list.

---

<sup>14</sup> <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:L:2021:206:FULL&from=EN>

- The CDIU processes license applications with input from the Ministry of Foreign Affairs, which can consult the Minister of Foreign Affairs on the approval of licenses.
- License denials can be appealed but success is limited, particularly if a license denial is based on national security and similar considerations.
- Export controls related to end-use controls are those based solely on the EU Dual-Use Regulation, namely the WMD end-use control, the military end-use control, and the human rights/public security end-use control.
- Human rights is one of the conditions included in the Council Common Position 2008/944 (“respect for human rights in the country of final destination as well as respect by that country of international humanitarian law”). Licenses for controlled dual-use items can be denied because of human rights considerations. Non-controlled dual-use items can also be subjected to an export license requirement and possible denial because of human rights considerations.

#### **G. Singapore**

- Singapore is not a Wassenaar member. There is no legal citation that articulates or requires the implementation of the Wassenaar Agreement list in domestic law, but the government has done so in the Strategic Goods (Control) Act, or the Strategic Goods (Control) Order. Singapore Customs states on its website that controls include those items on the four multilateral lists.
- Singapore does not exercise export controls on semiconductor-related items that are not on the control lists.
- Singapore Customs administers the export control system, with input from the Immigration & Checkpoints Authority (ICA) and Singapore Police Force to enforce the SGCA.
- Wassenaar Category 3 items are listed in the Strategic Goods (Control) Order (SGCO) as “strategic goods,” covered under Section 4A – Strategic Goods and strategic goods technology within the Act.
- Singapore does not have the authority to impose controls for economic or human rights-related reasons. The Singapore Parliament must agree to modify the Strategic Goods (Control) Act (SGCA) to allow such controls. The Ministry of Foreign Affairs (MFA), Ministry of Trade and Industry (MTI), Singapore Customs and other agencies must review and clear any changes. The Minister for Trade and Industry grants the final approval.

## H. South Korea

- South Korea is a member of the four multilateral regimes. The Ministry of Trade, Industry and Energy (MOTIE) exercises authority over the dual-use controls under Article 19 (2) of the Foreign Trade Act (excluding items used exclusively for nuclear power). KOSTI manages the export control system platform<sup>15</sup> and product classification of dual-use items.
- The Strategic Goods Export and Import Notification, Appendix 2 and Appendix 12 lists controlled dual-use items.<sup>16</sup> The list in Table 2 is the Wassenaar dual-use list, which adopts all of Category 3 of the Wassenaar list.<sup>17</sup>
- MOTIE is required to designate and publicly notify the items on which restrictions, such as export controls, is required for “maintaining international peace and security as well as national security,” in consultation with the head of the relevant administrative agency, “in accordance with the principles of the international export control system prescribed by Presidential Decree.” The Minister exercises discretion in defining “international peace,” “security,” and “national security.”
- The standards in the Foreign Trade Act are broad enough that the MOTIE may decide to unilaterally control the export of semiconductor and other items without the need for the National Assembly to change the Act. However, there are limited unilateral export controls currently in place on the transfer of technology to maintain South Korean industrial competitiveness. Such rules do not call out specific countries. We are also unaware of discussions on whether to develop unilateral export controls for country-specific and other reasons.
- Korean government officials apply a legal standard in the approval of licenses: whether (i) the item to be exported would be used for peaceful purposes; (ii) the item to be exported would affect international peace and national security through use in military applications; and (iii) whether the parties to the proposed transaction and the proposed end-uses are credible.
- The Foreign Trade Act is broad enough in scope and interpretation that legal authority exists to impose export control for human rights concerns. However, no such controls exist or are in consideration.
- Individual exporters can exercise the legal right to appeal license denials in court if the decision was not based on the legal process or standards. Appeals for export licensing can also be administrative and filed with the Anti-corruption & Civil Rights

<sup>15</sup> <https://www.yestrade.go.kr/>

<sup>16</sup> [https://www.law.go.kr/행정규칙/전략물자수출입고시/\(2020-94,20200619\)](https://www.law.go.kr/행정규칙/전략물자수출입고시/(2020-94,20200619))

<sup>17</sup>

[https://www.yestrade.go.kr/common/common.do?jPath=/it/itde023G&TOP\\_MENU\\_CODE=MENU0001&MENU\\_CODE=MENU0014](https://www.yestrade.go.kr/common/common.do?jPath=/it/itde023G&TOP_MENU_CODE=MENU0001&MENU_CODE=MENU0014)



Commission.

- Related to export control law, Korea's Act on Prevention of Divulgence and Protection of Industrial Technology<sup>18</sup> requires government approval for the export of the technology developed with financial support from the government or otherwise technology worthy of protection, such as those in connection with a merger. Given the robust financial support given to South Korean firms, most technology likely falls within this scope. The technology covered by this Act includes those in the multilateral export control lists and many that are not. The footnoted article<sup>19</sup> sets out the National Core Technology List in the Act. Such technologies are those that have "high technological and economic values in the Korean and overseas markets or brings high growth potential to its related industries and is feared as a technology to exert a significantly adverse effect on the national security and the development of the national economy in the event that it is divulged abroad."<sup>20</sup>
- The purpose of the Act "is to prevent undue divulgence of industrial technology and protect industrial technology in order to strengthen the competitiveness of Korean industries and contribute to national security and development of the national economy." Unlike export control laws, the Act permits controls on the export of technology but excludes commodities and goods.

## **I. Taiwan**

- Taiwan is not a member of but adheres to the multilateral export regimes, through domestic implementation of the EU's List of Dual-Use Items, i.e., Annex 1 Annex I to Regulation (EC) No. 428/2009).<sup>21</sup> It controls all the items on Wassenaar's Category 3.
- Article 13 of the Foreign Trade Act explicitly states the purpose of export controls on the Strategic High Tech Control (SHTC) list is to: "To ensure national security, fulfill international cooperation and agreements, enhance regulation of exportation/importation and flow of strategic high-tech goods, so as to facilitate the need of introducing high-tech goods [...]."

<sup>18</sup> [https://elaw.klri.re.kr/eng\\_service/lawView.do?hseq=24351&lang=ENG](https://elaw.klri.re.kr/eng_service/lawView.do?hseq=24351&lang=ENG)

<sup>19</sup>

[https://www.kimchang.com/newsletter/2017newsletter/ip/eng/newsletter\\_ip\\_en\\_spring\\_summer2017\\_article05.html](https://www.kimchang.com/newsletter/2017newsletter/ip/eng/newsletter_ip_en_spring_summer2017_article05.html)

<sup>20</sup> Examples of when the authority of the Act has been used are at:

<http://www.businesskorea.co.kr/news/articleView.html?idxno=19674>;  
<https://www.industryweek.com/technology-and-iiot/article/22026751/south-korea-charges-11-with-selling-samsung-technology-to-china>; <http://www.businesskorea.co.kr/news/articleView.html?idxno=56897>;  
[https://www.ip.kimchang.com/en/insights/detail.kc?sch\\_section=4&idx=20293](https://www.ip.kimchang.com/en/insights/detail.kc?sch_section=4&idx=20293); and  
[https://www.ip.kimchang.com/en/insights/detail.kc?sch\\_section=4&idx=21257](https://www.ip.kimchang.com/en/insights/detail.kc?sch_section=4&idx=21257)

<sup>21</sup> <https://www.bis.doc.gov/index.php/all-articles/220-eco-country-pages/1155-taiwan-export-control-information>

- The exportation/importation and flow of strategic high-tech goods in Taiwan are governed by the "Regulations Governing Export and Import of Strategic High-tech Commodities,"<sup>22</sup> which is a bylaw authorized by Article 13 of the Foreign Trade Act.
- The Bureau of Foreign Trade (BOFT) is responsible for formulating Taiwan's international trade policies, promoting trade, and managing trade-related activities. BOFT is responsible for establishing and updating the Export Control List for Dual-use Items and Technology and Common Military List. The BOFT has promulgated the "Export Control List for Dual-use Items and Technology and Common Military List."<sup>23</sup> According to the explanations provided by the BOFT, the "Common Military List" part of the SHTC list is similar to the list in the WA, while the "Export Control List for Dual-use Items and Technology" part of the SHTC list combines the lists in the WA, MCTR, NSG, AG, and the Convention on the Banning of Chemical Weapons (CWC).
- For items listed in the Wassenaar dual-use list, China is a "restricted" destination, along with Iran, Iraq, North Korea, Sudan, and Syria. "Export restrictions to China shall be limited to 12 categories of semiconductor wafer fabricating equipment for strategic high-tech commodities: chemical mechanical polishers, photo-resist strippers, photo-resist developers, rapid thermal processors, deposition apparatuses, cleaning equipment, dryers, electron microscopes, etchers, ion implanters, photo-resist coaters, and lithography equipment. For other strategic high-tech commodities to be exported to China, provisions of relevant laws and regulations for non-restricted areas shall apply."
- Article 15 of the SHTC Regulation stipulates that, for goods listed in the SHTC list, an export permit is generally required unless an exception provided in the same article applies.<sup>24</sup> Furthermore, Taiwan has promulgated its own restricted party screening list, the "Taiwan Entity List." An export permit is generally required for the commodities exported from Taiwan to the listed entities if such goods might have dual-use (as determined by BOFT), even if they are not officially listed in the SHTC list.<sup>25</sup>
- Article 5 of the Foreign Trade Act outlines the legal standard for imposing controls. It states: "For the purpose of safeguarding national security, the competent authority may, in conjunction with the appropriate government authority or authorities, propose to the Executive Yuan for an approval to the ban and control of trading activities with specific countries or territories provided that such prohibition or control shall be submitted to the Legislative Yuan within one month from the date of publication

<sup>22</sup> SHTC Regulation, <https://law.moj.gov.tw/ENG/LawClass/LawAll.aspx?pcode=J0090013>

<sup>23</sup> the SHTC list, last update: September 30, 2021

<sup>24</sup> <https://law.moj.gov.tw/ENG/LawClass/LawAll.aspx?pcode=J0090013>

<sup>25</sup> The official link to check the listed entities, including the standard and process for being listed: <https://icp.trade.gov.tw/ICP/Display.action?pageName=OList> (account and password required)

thereof for its ratification."

- "National security" is not defined by statute or regulation. The export control regulations also do not provide criteria for which items are granted or denied.
- Government officials have applied traditional non-proliferation-focused concerns in decisions to grant or deny licenses. BOFT can internally consult the Industrial Development Bureau (IDB) of the MOEA or the other government agencies if BOFT is unfamiliar with the item description or specification in the license application.
- Although government officials have not stated that they take economic considerations into account when denying or granting licenses, Article 1 of the Foreign Trade Act states that its purpose is "expanding foreign trade and maintaining a sound trade order so as to enhance the economic benefits of this country." Thus, it is possible for BOFT to take economic considerations in account when deciding on individual licenses.
- License denials are appealable to the export control agency and, if warranted, an administrative court for a decision on the merits. The Foreign Trade Act and regulations state that license denials should not be made for reasons that are not described in the law. Thus, when denying a license, the export control agency will argue that it is within the scope of the laws and regulations. Decisions of the export control agency are subject to judicial review on the merits. However, the courts generally defer to the export control agency's decisions.
- Paragraph 1, Article 6 of the Foreign Trade Act grants government the authority to impose unilateral export and import controls temporarily when (i) "any natural disaster, incident, or war occurs; (ii) "national security is endangered or protection of public safety is hindered;" (iii) "the domestic or international market suffers a serious shortage of a specific material or the price thereof drastically fluctuates; (iv) "When serious imbalance is caused or threatened in international payments; (v) "When any international treaty, agreement, United Nations resolution or international cooperation calls for it; or (vi) "a foreign country impedes import/export with measures violating international agreements or principles of fairness and reciprocity."
- Although the EU's List of Dual-Use Items is not explicitly referenced in any regulation, the reference to conforming domestic controls to international treaties and agreements is the primary basis for how the export control regimes influence the lists of items controlled.
- Similarly, Article 11 of the Foreign Trade Act provides: "Export/import of goods shall be liberalized provided, however, that restriction thereof may be imposed by reason of the requirements of international treaty, trade agreement, national defense, social security, culture, hygiene, and environmental/ecological protection, or policy. Nomenclatures of goods subject to export/import restriction under the preceding paragraph and regulations governing export/import of such goods shall be

announced in public by the competent authority after consulting with government agencies concerned."

- Article 11 also gives the Taiwan government the authority to block the export of certain items not on the Wassenaar Arrangement dual-use list. The decision of the administrative branch is subject to the ratification of the legislative branch, which tends to respect the decision made or discretion exercised by the administrative branch.
- Human rights concerns are not identified in Taiwan's Foreign Trade Act as basis for export controls. However, on April 9, 2021, a bill to amend the Foreign Trade Act, to allow for human rights-related concerns was proposed.<sup>26</sup>
- Applications to invest in Mainland China are subject to the review of the Investment Commission (IC) of the MOEA. The IC internally consults other government agencies, such as the BOFT and IDB, in the review of an application. If the BOFT prohibits the export of semiconductor commodities, software, and technologies to Mainland China, the IC does not approve the investment application unless such commodities, software, and technologies are removed from the application or the other protective measures are taken to the satisfaction of BOFT and the IC.
- The IC also stipulates that specific types of semiconductors cannot be transferred. Notably, Taiwanese investment in Mainland China may not manufacture wafers that exceeds 12-inch, and the technologies used in mainland China shall be at least 1-generation behind those used in Taiwan. Furthermore, the old wafer-manufacturing equipment in Taiwan may not be transported to Mainland China without the special permit given by the BOFT.<sup>27</sup> On December 30, 2020, Taiwan further amended the "Regulations on the Approval on the Investment and Technological Collaboration in Mainland China" (在大陸地區從事投資或技術合作許可辦法) which broadens the concept of "investment" and requires that the export Taiwan's specialized technologies to China will be subject to rigorous scrutiny.<sup>28</sup>
- Outbound investment controls are not export control rules but allow the government to limit the types of technology that would be transferred as part of an outbound investment.

## **J. United Kingdom**

- UK dual-use export controls track the regime controls, which are described in the UK Dual-use Regulation.
- The UK does not exercise unilateral controls on semiconductor-related items.

<sup>26</sup> [https://www.lawbank.com.tw/news/NewsContent\\_print.aspx?NID=176553.00](https://www.lawbank.com.tw/news/NewsContent_print.aspx?NID=176553.00)

<sup>27</sup> <https://db.lawbank.com.tw/FLAW/FLAWDAT0202.aspx?lsid=FL021027&ldate=20150909>

<sup>28</sup> See: <https://www.taiwannews.com.tw/en/news/3995941>

- The agency that administers the controls is the Export Control Joint Unit (ECJU), which sits as part of the Department for International Trade. The ECJU administers the controls for both Great Britain and Northern Ireland.
- The UK Dual-use Regulation dictates that in decisions to grant or deny an individual or global export license, the Secretary of State shall take into account all relevant considerations including (a) the obligations and commitments the UK has accepted as a member of the relevant international non-proliferation regimes and export control arrangements, or by ratification of relevant international treaties; (b) Its obligations under sanctions imposed unilaterally or by a decision of the OSCE or by a binding resolution of the Security Council of the United Nations; (c) considerations of national foreign and security policy, including those covered by Council Common Position 2008/944/CFSP<sup>29</sup> of 8 December 2008 defining common rules governing control of exports of military technology and equipment; and (d) considerations about intended end-use and the risk of diversion. This Common Position continues to apply on an operational basis since the UK's departure from the EU on December 31, 2020.
- ECJU processes the license applications. The principal advisory departments are the Foreign & Commonwealth Office, the Ministry of Defence, and the Department for International Development. Together, they provide the ECJU with advice and analysis on foreign policy, defense, and development matters relevant to licensing. The licensing team considers, among other issues, whether an export: (i) would comply with the United Kingdom's international obligations and commitments and sanctions regimes; (ii) may be used for internal repression or in the commission of a serious violation of international humanitarian law; (iii) may provoke or prolong armed conflicts or affect regional peace and stability; or (iv) may be diverted to an undesirable user or purpose.
- License denials can be appealed but success is limited, particularly if a license denial is based on national security and similar considerations.
- The only export controls-related end-use controls imposed by the UK are those based on the UK Dual-use Regulation, namely the WMD end-use control, the military end-use control, and the human rights/public security end-use control. Sanctions legislation may impose additional controls but is typically specific to a particular regime.
- Human rights is one of the conditions included in the Council Common Position 2008/944 ("respect for human rights in the country of final destination as well as respect by that country of international humanitarian law"). Licenses for controlled dual-use items can be denied because of human rights considerations. Non-controlled dual-use items can also be subjected to an export license requirement and possible denial because of human rights considerations.

---

<sup>29</sup> <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:L:2021:206:FULL&from=EN>

- On December 8, 2021, the UK Government announced revisions to its export controls regarding its (i) military end use (MEU) catch-all controls and (ii) licensing policy when an export would implicate human rights and other foreign policy concerns.
- As with many EU countries, the UK's existing MEU controls give the UK the authority to require a license for the export of an unlisted item to an arms embargoed country if (i) the item is intended for a military end use; or (ii) the government informs the exporter that it would be for a military end use.
  - Under the current law, "military end use" generally means that the unlisted item is intended to be (i) incorporated into (e.g., as a part or a component), into a military item identified on a munitions list or (ii) used in the production, development, testing or maintenance of a military item on a munitions list. In other words, for this MEU control to be effective, the unlisted item must be for a use connected with an item controlled on an existing list of items controlled as munitions items.
- The UK has said it intends to expand its definition of "military end-use" to allow the control, on a case-by-case basis, of unlisted items intended for *any* use by military, paramilitary, security forces, or police forces of an embargoed destination. The control would only be applied when the UK government informs the UK exporter that the proposed export of unlisted items is or may be intended for a military end-use. There will reportedly be exemptions for medical supplies and equipment, food, clothing, and other consumer goods generally available to the public via retail sale.
- The UK will also add China to the list of destinations subject to its military end-use controls. Under current law, China is subject to UK and EU partial arms embargoes which, due to an anomaly in the drafting, is not part of the UK's military end-use controls list. This change, when combined with the UK's current controls related to arms embargoed destinations, will mean the following with respect to exports to China from the UK:
  - Certain munitions list items subject to the partial arms embargo will be embargoed;
  - Certain other munitions list and dual use items (and related brokering and technical assistance) will require a license (note: licenses for these other military list items may be challenging to obtain); and
  - Unlisted items (and related brokering and technical assistance) will require a license when the UK government informs the exporter that the items may be intended for an end use by the military, security, or police forces.
- These changes, which require legislative amendments, are expected to take effect in the spring of 2022.
- In effect as of December 8, 2021, the UK has new licensing criteria regarding applications to export listed items. The new criteria are named The Strategic Export Licensing Criteria, replacing the previous criteria last revised in 2014. Certain changes related to human rights are summarized below:



- The expanded criteria allow the UK government to deny licenses when it has concerns about (i) human rights abuses; (ii) the general preservation of peace and security (now including national security interests, gender-based violence or acts against women or children); (iii) transnational organized crime (previously, this criterion focused on terrorism offenses); (iv) diversion to an undesirable end-user; or (v) whether the export may have a negative impact on international relations.
- The human rights-related criterion has been expanded and clarified to say that a license will not be granted if the UK government determines that there is a clear risk that the items to be exported might be used to commit or facilitate internal repression or a serious violation of international humanitarian law. Before, the “facilitation” element was not part of the criterion.
- The new policy also now explicitly states that the UK government will take into account the recipient country's attitude towards relevant principles of international humanitarian law.
- The definition of “internal repression” also has been broadened to include serious violations of human rights and fundamental freedoms. The previous definition applied only to major violations.

## **Annex 1: The Purpose and Scope of the Wassenaar Arrangement**

1. The Wassenaar Arrangement has been established in order to contribute to regional and international security and stability, by promoting transparency and greater responsibility in transfers of conventional arms and dual-use goods and technologies, thus preventing destabilizing accumulations [of such arms]. Participating States will seek, through their national policies, to ensure that transfers of these items do not contribute to the development or enhancement of military capabilities which undermine these goals and are not diverted to support such capabilities.
2. It will complement and reinforce, without duplication, the existing control regimes for weapons of mass destruction and their delivery systems, as well as other internationally recognised measures designed to promote transparency and greater responsibility, by focusing on the threats to international and regional peace and security which may arise from transfers of armaments and sensitive dual-use goods and technologies where the risks are judged greatest.
3. This Arrangement is also intended to enhance co-operation to prevent the acquisition of armaments and sensitive dual-use items for military end-uses, if the situation in a region or the behaviour of a state is, or becomes, a cause for serious concern to the Participating States.
4. This Arrangement will not be directed against any state or group of states and will not impede bona fide civil transactions. Nor will it interfere with the rights of states to acquire legitimate means with which to defend themselves pursuant to Article 51 of the Charter of the United Nations.
5. In line with the paragraphs above, Participating States will continue to prevent the acquisition of conventional arms and dual-use goods and technologies by terrorist groups and organisations, as well as by individual terrorists. Such efforts are an integral part of the global fight against terrorism.

In addition, the Wassenaar Arrangement has the following criteria<sup>30</sup> for the types of dual-use items that should be controlled:

1. Dual-use goods and technologies to be controlled are major or key elements for the indigenous development, production, use or enhancement of military capabilities. The dual-use items should also be evaluated against the following criteria: (i) foreign availability outside Participating States, (ii) ability to control effectively the export of the goods, (iii) ability to make a clear and objective specification of the item; and (iv) items controlled by another regime.

---

<sup>30</sup> [https://www.wassenaar.org/app/uploads/2019/consolidated/Criteria\\_for\\_selection\\_du\\_sl\\_vsl.pdf](https://www.wassenaar.org/app/uploads/2019/consolidated/Criteria_for_selection_du_sl_vsl.pdf)

2. Those items from the Dual-use List which are key elements directly related to the indigenous development, production, use or enhancement of advanced conventional military capabilities whose proliferation would significantly undermine the objectives of the Wassenaar Arrangement. General commercially applied materials or components should not be included. As appropriate, the relevant threshold parameters should be developed on a case-by-case basis. (Criteria for listing on the Sensitive List.)
3. Those items from the Sensitive List which are key elements essential for the indigenous development, production, use or enhancement of the most advanced conventional military capabilities whose proliferation would significantly undermine the objectives of the Wassenaar Arrangement. As appropriate, the relevant threshold parameters should be developed on a case-by-case basis. (Criteria for listing on the Very Sensitive List.)

## **Annex 2: Dual-Use Semiconductor Items Covered by the Wassenaar Arrangement**

In the control lists of the four regimes, there are multiple types of controls on semiconductors and other components, *regardless of technical characteristics*, that are for missiles (including unmanned aerial vehicles), items related to nuclear, chemical and biological weapons, and conventional military applications. The same types of controls exist in U.S. export control law.

Most of the controls on dual-use semiconductor-related items are in Category 3 of the Wassenaar Arrangement's Dual-Use List. The U.S. has adopted all controls in Category 3 into the Commerce Control List and imposed unilateral controls on less sensitive items. Category 3 includes many types of semiconductors, semiconductor production equipment, other electronic items, and software and technology required for their production, development, or use. These items are listed in the charts below, which are illustrative and not exhaustive, to be used for reference purposes only. The list includes technical details, notes, comments, and definitions that describe each item controlled.

The member states have identified items within the scope of the Wassenaar Arrangement's principles. They are items with primarily commercial applications or material relationship to the production, development, or use of WMDs or weapons. Consistent with the regime's mandate, the list of such items is destination agnostic, meaning that it was created not with specific country issues in mind but whether the item has some inherent and identifiable relationship to a WMD or a conventional military item.

With rare exceptions, the controls do not cover software or technology independent of the commodities to which they relate. Any type of software or technology required for the development, production, or use of a controlled commodity is also controlled. Moreover, the list does not control software or technology that is used in or related to a controlled commodity. For the software or technology to be controlled, it must be responsible for giving the commodity its controlled characteristics.

Below is a list of the types of semiconductor-related items controlled in the dual-use Category 3 of the Wassenaar Arrangement:

3.A SYSTEMS, EQUIPMENT AND COMPONENTS		S I A
3.A.1	General Purpose Integrated Circuits	
3.A.1.a	General Purpose Integrated Circuits: • Monolithic Integrated Circuits • Hybrid Integrated Circuits • Multichip Integrated Circuits • Film Type Integrated Circuits • Optical Integrated Circuits • Three Dimensional Integrated Circuits • Monolithic Microwave Integrated Circuits	3.A.1.a.1 Designed or rated as radiation hardened or tolerant
		3.A.1.a.2 Rated for operation in extreme temperatures, except if for use in civil applications
		3.A.1.a.3 Manufactured from a compound semiconductor and operating at specific clock frequencies
		3.A.1.a.5 Analogue-to-Digital Converter (ADC) or Digital-to-Analogue Converter (DAC) integrated circuits with specific resolutions and sample rates
		3.A.1.a.6 Electro-optical or optical integrated circuits designed for signal processing with specific capabilities and components
		3.A.1.a.7 Field programmable logic devices with specific technical capabilities
		3.A.1.a.9 Neural network integrated circuits
		3.A.1.a.10 Custom integrated circuits for which the function is unknown with specific technical capabilities
		3.A.1.a.11 Digital integrated circuits based upon any compound semiconductor with specific technical capabilities
		3.A.1.a.12 3.A.1.a.12 Fast Fourier Transform (FFT) processors with specific capabilities
		3.A.1.a.13 Direct Digital Synthesizer (DDS) integrated circuits with specific capabilities
		3.A.1.a.14 Perform or are programmable to perform specific analogue-to-digital conversions
		3.A.1.b.1 Vacuum electronic devices and cathodes
		3.A.1.b.1.a Traveling-wave vacuum electronic devices, pulsed or continuous wave, with specific characteristics
3.A.1.b	Microwave or millimeter wave items	3.A.1.b.1.b Crossed-field amplifier vacuum electronic devices, with specific gains
		3.A.1.b.1.c Thermionic cathodes designed for vacuum electronic devices" producing an emission current density at rated operating conditions exceeding specific characteristics
		3.A.1.b.1.d Vacuum electronic devices with the capability to operate in a dual mode
		3.A.1.b.2 Monolithic Microwave Integrated Circuit amplifiers of a specific type, with specific frequencies and fractional bandwidths
		3.A.1.b.3 Discrete microwave transistors rated for specific frequencies, with specific power capabilities
		3.A.1.b.4 Microwave solid state amplifiers and microwave assemblies/modules containing microwave solid state amplifiers, rated for certain frequencies, with specific fractional bandwidths
		3.A.1.b.5 Electronically or magnetically tunable band-pass or band-stop filters, with specific characteristics
		3.A.1.b.7 Converters and harmonic mixers with specific capabilities
		3.A.1.b.8 Microwave power amplifiers containing vacuum electronic devices, with particular operating frequencies and output power
		3.A.1.b.9 Microwave Power Modules consisting of, at least, a travelling-wave vacuum electronic device, a Monolithic Microwave Integrated Circuit, and an integrated electronic power conditioner, with various characteristics
3.A.1.c	Acoustic wave devices of certain types, or components for such devices	3.A.1.b.10 Oscillators or oscillator assemblies, with specific capabilities
		3.A.1.b.11 Frequency synthesizer electronic assemblies with frequency switching time at various levels
		3.A.1.b.12 Transmit/receive modules, transmit/receive MMICs, transmit modules, or transmit MMICs rated for operation at frequencies above 2.7 GHz, with specific power outputs and fractional bandwidths
3.A.1.d	Acoustic wave devices of certain types, or components for such devices	3.A.1.c.1 Surface acoustic wave and surface skimming (shallow bulk) acoustic wave devices with specific carrier frequencies
		3.A.1.c.2 Bulk (volume) acoustic wave devices which permit the direct processing of signals at frequencies exceeding 6 GHz
		3.A.1.c.3 Acoustic-optic signal processing devices employing interaction between acoustic waves (bulk wave or surface wave) and light waves which permit the direct processing of signals or images, including spectral analysis, correlation or convolution
3.A.1.d	Electronic devices and circuits containing components, manufactured from superconductive materials, specially designed for operation at temperatures below the critical temperature of at least one of the superconductive constituents, with various characteristics	
3.A.1.h	Solid-state power semiconductor switches, diodes, or modules, with specific capabilities	
3.A.1.i	Intensity, amplitude, or phase electro-optic modulators, designed for analogue signals, with specific characteristics	

Below is a list of the types of test, production, and inspection equipment – and specially designed parts and components – related to semiconductors controlled in Category 3:

<b>3.B TEST, INSPECTION AND PRODUCTION EQUIPMENT</b>		<b>S I A</b>
<b>3.B.1 Equipment for the manufacturing of semiconductor devices or materials, and specially designed components and accessories</b>		
3.B.1.a	Equipment designed for epitaxial growth	3.B.1.a.1 Equipment designed for epitaxial growth and designed to produce specific types of layers of material that is not silicon at various thicknesses
		3.B.1.a.2 Metal Organic Chemical Vapor Deposition (MOCVD) reactors designed for compound semiconductor epitaxial growth of material having two or more of the various elements
		3.B.1.a.3 Molecular beam epitaxial growth equipment using gas or solid sources
3.B.1.e	Automatic loading multi-chamber central wafer handling systems having specific capabilities	
3.B.1.f		3.B.1.f.1 Lithography equipment that can align and expose step and repeat or step and scan equipment for wafer processing using photo-optical or X-ray methods and having specific capabilities
		3.B.1.f.2 Imprint lithography equipment capable of producing features of 45 nm or less
		3.B.1.f.3 Equipment specially designed for mask making having specific technical capabilities
		3.B.1.f.4 Equipment designed for device processing using direct writing methods, having specific capabilities
3.B.1.g	Masks and reticles, designed for integrated circuits that are controlled	
3.B.1.h	Multi-layer masks with a phase shift layer and designed to be used by lithography equipment having a light source wavelength less than 245nm	
3.B.1.i	Imprint lithography templates designed for controlled integrated circuits	
3.B.1.j	Mask substrate blanks with multilayer reflector structure consisting of molybdenum and silicon, specially designed for Extreme Ultraviolet (EUV) lithography	
<b>3.B.2 Test equipment specially designed for testing specific types of finished or unfinished semiconductor devices</b>		

Below is a list of types of materials critical to producing semiconductors controlled in Category 3:

<b>3.C MATERIALS</b>	<b>S I A</b>
Hetero-epitaxial materials consisting of a substrate having stacked epitaxially grown multiple layers of various types of elements	
Resist materials and substrates coated with specific types of resists	
Specific organo-inorganic compounds	
Hydrides of phosphorus, arsenic or antimony, having a purity better than 99.999%, even diluted in inert gases or hydrogen	
Specific types of high resistivity materials	
Materials consisting of specific types of substrates with at least one epitaxial layer of silicon carbide, gallium nitride, aluminum nitride or aluminum gallium nitride	

Below is electronic computer-aided design (CAD) software critical to producing semiconductors controlled in Category 3:

<b>3.D SOFTWARE</b>	<b>S I A</b>
3.D.6	Electronic Computer-Aided Design (ECAD) software specially designed for the development of integrated circuits having any Gate-All-Around Field-Effect Transistor (GAAFET) structure that is specially designed for (i) implementing Register Transfer Level (RTL) to Geometrical Database Standard II (GDSII) or equivalent standard; or (ii) optimization of power or timing rules