



December 27, 2010

[ ]  
[ ]  
[ ]  
[ ]

**RE: Advisory Opinion Regarding Technology for the Development or Production of Carbon Fiber / Organic Resin Items**

Dear [ ]:

This is in response to your December 22, 2010 request for an Advisory Opinion issued pursuant to 15 C.F.R. § 748.3(c) (2010) that answers the following questions:

- I. Is the definition of “required” in the Export Administration Regulations (EAR) applicable to determinations of whether technology is controlled under Export Control Classification Number (ECCN) 1E001? In particular, please answer the question of whether the absence of a reference to Category 1 in the parenthetical after the EAR’s definition of “required” creates a negative implication that the term is not applicable to an analysis of whether technology is covered by ECCN 1E001, which is in Category 1.
- II. If so, what are the rules for determining when technology is and is not “required” for the development or production of carbon fiber / organic matrix structures, laminates, or prepregs? In particular, please specifically address the issue of whether ECCN 1E001 *per se* controls all technology that in any way relates to the production or development of composite items, all technology that it is any way capable for use in producing or developing controlled composite end-items, or only that technology peculiarly responsible for achieving or exceeding the controlled performance levels, characteristics or functions of any of the ECCNs listed as controlled in the heading to ECCN 1E001.
- III. What are the rules for determining which performance levels, characteristics, and functions would cause unpublished technology to be controlled under ECCN 1E001 (as opposed to ECCN 1E994 or EAR99) if for (i) 1C010.e-controlled items containing carbon fibers and an organic matrix, (ii) 1A002.a-controlled items containing 1C010.e-controlled materials, (iii) 1C010.b-controlled carbon fibers, or (iv) 1C210-controlled items containing carbon fibers and an organic matrix?



- IV. Is published composite-related technology and other information for the production or development of structures or laminates controlled by ECCN 1A002.a subject to the EAR? Examples of such information often include material property data sheets, marketing materials, technical articles and papers, and other information placed into data sharing services such as AGATE. Please also specifically answer the question of whether the EAR prohibits a company or individual that owns and otherwise controls all rights to 1E001-controlled technology from publishing it, including on the Internet, without a license.

Each of your questions is addressed below in turn.

I. **The EAR's Definition of "Required" Must be Applied When Determining Whether Technology is Controlled Under ECCN 1E001**

ECCN 1E001 controls 1E001 "technology" according to the *General Technology Note* for the 'development' or 'production' of items controlled by 1A001.b, 1A001.c, 1A002, 1A003, 1A004, 1A005, 1A006.b, 1A007, 1A008, 1A101, 1B (except 1B999), or 1C (except 1C355, 1C980 to 1C984, 1C988, 1C990, 1C991, 1C995 to 1C999)." 15 C.F.R. Part 774 (emphasis supplied). The EAR's General Technology Note states that the "export of 'technology' that is 'required' for the 'development,' 'production,' or 'use' of items on the Commerce Control List is controlled according to the provisions in each Category. 'Technology' 'required' for the 'development,' 'production,' or 'use' of a controlled product remains controlled even when applicable to a product controlled at a lower level." Id. Supplement No. 2 to EAR Part 774 (emphasis supplied).

Consistent with the rules for applying the definitions of terms used in the EAR set out in the introduction to EAR section 772.1, BIS inserted in the EAR's definition of "required" the parenthetical references to Categories 4, 5, 6, and 9 to confirm that the term applied to all technology ECCNs in those Categories. ("Parenthetical references following the terms in quotation marks (i.e., (Cat 5)) refer to the CCL category in which that term is found.") BIS, therefore, did not intend with the specific category references in the definition of "required" to imply that the General Technology Note, which includes the term "required," was not fully applicable to the technology ECCNs such as 1E001 that incorporate the General Technology Note by reference but which are not in Categories 4, 5, 6, or 9. Thus, the EAR's definition of "required" must be applied when determining whether technology is controlled under ECCN 1E001.

II. **Rules for Determining When Technology Is and Is Not "Required"**

Under the EAR's definition of "required," the word "refers to only that portion of 'technology' . . . which is *peculiarly responsible for achieving or exceeding the controlled performance levels, characteristics or functions*. Such 'required' 'technology' . . . may be shared by different products." Id. § 772.1 (emphasis supplied). Thus, in light of the citations and conclusions in the previous section of this letter, one must determine whether information is "development" or "production" information "peculiarly responsible for achieving or exceeding the controlled performance levels, characteristics or functions" of any of the ECCNs listed as controlled in the

heading to ECCN 1E001 to know whether the information is controlled technology under ECCN 1E001. This means that ECCN 1E001 does not purport to control *all* technology that in any way relates to or that is merely capable for use in the “production” or “development” of composite items. As described above and in the next section of this letter, other questions must be asked and answered when making a determination about whether ECCN 1E001 controls a particular item of information.

### **III. Performance Levels, Characteristics, and Functions That Would Cause Unpublished Technology for an Item to be Controlled under ECCN 1E001**

The following is a description of the performance levels, characteristics, and functions that would cause unpublished technology for an item to be controlled under ECCN 1E001 when the item is controlled under ECCN 1A002.a (as ECCN 1A002.a relates to ECCN 1C010.e-controlled items), ECCN 1C010.e, ECCN 1C010.b (carbon fibers only), ECCN 1C210, ECCN 1E994 (as it relates to ECCN 1C990 items) or is an EAR99 item.

#### **A. ECCNs 1A002.a and 1C010.e<sup>1</sup>**

The “performance levels, characteristics or functions” of organic matrix / carbon fiber composite structures, laminates or materials peculiarly responsible for causing them to be controlled under ECCNs 1A002.a or 1C010.e are whether they are:

1. Resin impregnated fibers or preforms having carbon fibers with a specific modulus exceeding  $10.15 \times 10^6$  m and specific tensile strength exceeding  $17.7 \times 10^4$  m and impregnated with a resin system otherwise controlled by 1C008 or 1C009.b, or impregnated with a phenolic and having a  $T_g$  equal to or exceeding  $180^\circ\text{C}$ , or impregnated with another resin system and having a glass transition temperature equal to or exceeding  $232^\circ\text{C}$  (1C010.e); or
2. Laminates or structures “consisting of” the materials listed above (1A002.a).

The relevant performance level, characteristic, or function of a structure or laminate controlled under ECCN 1A002.a is whether it “consists of” a prepreg controlled by ECCN 1C010.e. ECCN 1A002.a does not list as a basis for controlling a composite structure or laminate the issue of whether it contains 1C010.b-controlled carbon fibers. Thus, additional parameters – specifically, those identified above regarding ECCN 1C010.e – must be met for a structure or laminate to be controlled under ECCN 1A002.a.

---

<sup>1</sup> This Advisory Opinion does not refer to related ECCNs 1C010.c, 1C010.d, and 1A002.b because the request for an advisory opinion did not ask questions regarding technology for items controlled by these ECCNs, i.e., inorganic fibers, fibers made out of polyetherimides, or other non-fluorinated polymeric substances, or carbon-carbon composite structures.

Technology peculiarly responsible for achieving or exceeding these characteristics is equivalent to Technologies “D” and “E” in the EAR’s definition of “required.”<sup>2</sup> That is, they are the technologies “required” to give carbon fiber / organic matrix composite materials, structures, or laminates their controlled characteristics under ECCNs 1A002.a or 1C010.e. Technology for the “production” or “development” of carbon fiber / organic matrix composite materials, structures, or laminates that does not contain any such information is not controlled under ECCN 1E001, even if it is generally capable for use in the “development” or “production” of 1A002.a- or 1C010.e-controlled structures or materials. Such technology would be equivalent to Technologies A, B, and C in the EAR’s definition of what is *not* “required” technology. Technologies A, B, and C are capable for use in the “production” or “development” of controlled Product X, but are not “required” to develop or produce it.

#### **B. ECCN 1C010.b**

The general “performance levels, characteristics or functions” of carbon fibers causing them to be controlled under ECCN 1C010.b are their specific modulus and their specific tensile strength. The specific levels that would need to be “achieved or exceeded” for a carbon fiber to be controlled under ECCN 1C010.b are (a) a specific modulus equal to or exceeding  $14.65 \times 10^6$  m and (b) a specific tensile strength equal to or exceeding  $26.82 \times 10^4$  m. “Development” or “production” technologies that are “peculiarly responsible” for achieving or exceeding the performance thresholds for ECCN 1C010.b are “required” technology. Conversely, technology for the “development” or “production” of carbon fibers that does not contain any information “peculiarly responsible for achieving or exceeding” such characteristics is not controlled under ECCN 1E001. That technology would also be equivalent to Technologies A, B, and C in the EAR’s definition of what is *not* “required” technology.

#### **C. ECCN 1C210**

The “performance levels, characteristics or functions” of a material peculiarly responsible for causing it to be controlled under ECCN 1C210 are its status as a continuous monofilament, yarn, roving, tow, or tape as specifically defined in ECCN 1C210 and its status as either (a) a carbon “fibrous or filamentary material” having a specific modulus equal to or exceeding  $12.7 \times 10^6$  m, or specific tensile strength equal to or exceeding  $235 \times 10^3$  m or (b) a thermoset resin impregnated continuous yarns, rovings, tows, or tapes, as defined in ECCN 1C210, with a width no greater than 15 mm (prepregs), made from carbon “fibrous or filamentary materials” controlled by ECCN 1C210.a.

---

<sup>2</sup> The example in the EAR’s definition of “required” is the following: “For example, assume product ‘X’ is controlled if it operates at or above 400 MHz and is not controlled if it operates below 400 MHz. If production technologies ‘A’, ‘B’, and ‘C’ allow production at no more than 399 MHz, then technologies ‘A’, ‘B’, and ‘C’ are not ‘required’ to produce the controlled product ‘X’. If technologies ‘A’, ‘B’, ‘C’, ‘D’, and ‘E’ are used together, a manufacturer can produce product ‘X’ that operates at or above 400 MHz. In this example, technologies ‘D’ and ‘E’ are ‘required’ to make the controlled product and are themselves controlled under the General Technology Note. (see the General Technology Note.)” 15 C.F.R. § 772.1.

For the reasons described above, any particular item of technology capable for use in the “production” or “development” of 1C210-controlled materials cannot be controlled by ECCN 1E001 unless it is also technology that is “peculiarly responsible” for achieving or exceeding these characteristics.

**D. ECCN 1C990**

Technology, under the General Technology Note, for the “production” or “development” of composite materials controlled under ECCN 1C990 is not controlled under ECCN 1E001. ECCN 1E994 controls technology for the “production,” “development,” or “use” of 1C990-controlled materials. The performance levels, characteristics, and functions of an organic matrix / carbon fiber composite material that would cause it to be controlled under ECCN 1C990 are its specific modulus and specific tensile strength. However, specific technology that is “required” to develop or produce a fiber or a prepreg controlled by an ECCN identified in ECCN 1E001 remains 1E001-controlled even if it is, for example, subsequently “spun” back and used for the “production” or “development” of fibers or a prepreg controlled by ECCN 1C990. This observation addresses the second sentence of the General Technology Note that technology is controlled at the higher level even when it is applicable to a product controlled at a lower level.

**IV. Published Composite-Related Technology is Not Subject to the EAR**

Composite-related technology and other information for the production or development of structures or laminates controlled by ECCN 1A002.a that has been “published,” as defined by EAR section 734.7, is not “subject to the EAR.” Id. § 734.3(b)(3). Thus, if the material property data sheets, marketing materials, technical articles and papers, and other information placed into data sharing services such as AGATE referred to in your question are “generally accessible to the interested public in any form,” then they are not “subject to the EAR.” Section 734.3(b)(3) also states that such technology would not be “subject to the EAR” if it arose during, or results from, fundamental research as described in section 734.8, was “educational” as defined in section 734.9, or was included in certain patent applications as described in section 734.10. However, unpublished technology or a combination of published and unpublished technology associating items that constitutes a recipe or part of a recipe peculiarly responsible for achieving a 1A002.a-controlled structure or laminate is considered to be “required” technology subject to the EAR unless that association itself is also published.

In response to the second part of your question, the EAR does not prohibit a company or individual that owns and otherwise controls all rights to 1E001-controlled technology from “publishing” (as defined in EAR section 734.7) it, including on the Internet, without a license for such technology.

\* \* \*

This Advisory Opinion does not amend the EAR. It responds to the questions asked in the Advisory Opinion request based on the EAR provisions in effect as of the date of this letter. Because the EAR is periodically amended, anyone engaged in a classification analysis pertaining to the items at issue in this Advisory Opinion must refer to and rely upon a then-current version of the EAR when making a final classification or licensing determination. BIS encourages such persons to submit commodity classification requests under 15 C.F.R. § 748.3(b) for the types of items described in this request. The issues, analysis, and technology are complex. Small changes in facts can have a significant impact on the classification status of and licensing obligations pertaining to any particular composite-related technology.

This Advisory Opinion does not pertain to any technical data that is subject to the jurisdiction of the International Traffic in Arms Regulations, 22 C.F.R. Parts 120-130, under, for example, U.S. Munitions List Category XIII(l), which controls technical data “directly related to” “structural materials, including carbon/carbon and metal matrix composites, plate, forgings, castings, welding consumables and rolled and extruded shapes that have been specifically designed, developed, configured, modified or adapted for defense articles.”

If you have any additional questions, do not hesitate to contact me or Mr. Gene Christiansen at [gchristi@bis.doc.gov](mailto:gchristi@bis.doc.gov).

Sincerely yours,



Kevin Wolf