

U.S. Department of Transportation **Pipeline and Hazardous Materials Safety Administration** 

August 22, 2022

Jim McManus Entegris Inc. 7 Commerce Drive Danbury, CT 06810

Reference No. 22-0046

Dear Mr. McManus:

This letter is in response to your April 21, 2022, letter requesting clarification of the Hazardous Materials Regulations (HMR; 49 CFR Parts 171-180) applicable to shipping paper and hazard communication requirements. You describe a package that is intended for transport by cargo only aircraft containing a Division 4.2 hazardous material, "UN2881, Metal catalyst, dry, 4.2, PG II," covered under DOT Special Permit (DOT-SP) 11447 and Competent Authority Approval (CA1995070006). You further describe the package as a gas purification system that consists of two non-DOT specification stainless steel pressure vessels—though the contents are not under pressure subject to the HMR—with component parts (e.g., piping), and a welded steel frame to secure the pressure vessels. You seek clarification on how to properly describe on the shipping paper the type of package and the quantity of material contained in the pressure vessels, and how to properly mark and label the assembled package.

It is the shipper's responsibility to properly classify and describe a hazardous material and provide the required hazard communication, such as shipping paper information, in accordance with Part 172 of the HMR, to alert emergency response personnel to the presence, form and manner of hazardous materials offered into transportation. For instance, the HMR require the total net mass per package and the number and type of package(s) be indicated on the shipping paper. However, the unique circumstances of the containment device in DOT-SP 11447—i.e., a gas purification system—makes it more difficult to describe than a standalone package (e.g., a drum). PHMSA notes that both DOT-SP 11447 and CA1995070006 provide details about the hazardous material, the package, and the transport requirements—and that the special permit is required to accompany the shipment and be given to the air carrier. Finally, PHMSA also notes that for purposes of hazard communication, the HMR require that packages placed in overpacks have markings and labels displayed on the overpack unless otherwise visible. See §§ 172.202(a)(6) and (7), and 173.25(a)(2), respectively.

1200 New Jersey Avenue, SE Washington, DC 20590

Given this information, it is the opinion of this Office that all three examples that you provided regarding the description of the quantity and type of package are acceptable under the HMR. However, the indication of "pressure vessels" when described on a shipping paper may be misunderstood as containing contents under pressure subject to specific HMR requirements. Further, it is acceptable to place the required marking and labeling on the exterior of the gas purification system—such as an access panel door—with the understanding that this will be obscured by the wooden crate overpack, thus requiring the overpack to also have the required marking and labeling displayed.

I hope this information is helpful. Please contact us if we can be of further assistance.

Sincerely,

Might

Dirk Der Kinderen Chief, Standards Development Branch Standards and Rulemaking Division

### Baker

22-0046

From:	INFOCNTR (PHMSA)
То:	Hazmat Interps
Subject:	FW: Entegris Request for Interpretation
Date:	Thursday, May 5, 2022 1:27:00 PM
Attachments:	image001.png
	image002.png
	Entegris Request for Interpretation - DOT-SP 11447.pdf
	Entegris Request for Interpretation - DOT-SP 11447-Redacted Version.pdf

See attached/below request for interpretation.

Thanks, Jonathon, HMIC

From: Jim McManus 
Jim.McManus@entegris.com>
Sent: Thursday, April 21, 2022 4:56 PM
To: INFOCNTR (PHMSA) 
INFOCNTR.INFOCNTR@dot.gov>
Cc: Nicks, Michael (PHMSA) 
michael.nicks@dot.gov>; Stefanie Reichel 
Stefanie.Reichel@entegris.com>
Subject: Entegris Request for Interpretation

**CAUTION:** This email originated from outside of the Department of Transportation (DOT). Do not click on links or open attachments unless you recognize the sender and know the content is safe.

Dear Standards and Rulemaking Division:

Pursuant to 49 CFR § 105.20, this letter is being submitted to PHMSA to request a formal letter of interpretation in order to clarify several questions Entegris, Inc. has related to the Hazardous Materials Regulations (HMR) and the International Civil Aviation Organization's Technical Instructions for the Safe Transport of Dangerous Goods by Air (ICAO TI). More specifically, the questions pertain to shipments of packages covered under **DOT-SP 11447** and Competent Authority Approval **CA1995070006** by cargo only aircraft.

As this letter includes information of a proprietary nature (e.g. trade secrets), Entegris is requesting confidential treatment in accordance with 49 CFR § 105.30 and has provided a second copy of this letter with the confidential information redacted.

Regards,

Jim

Jim McManus Sr. Principal Engineer Dangerous Goods Safety Advisor (DGSA) M 203-482-1606 T 203-207-9307 E jim.mcmanus@entegris.com

## Entegris | PURE ADVANTAGE

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7 Commerce Drive Danbury, CT 06810 USA



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#### ENTEGRIS PROPRIETARY AND CONFIDENTIAL - INTERNAL





#### April 21, 2022

Standards and Rulemaking Division Pipeline and Hazardous Materials Safety Administration, Attn: PHH-10 U.S. Department of Transportation East Building 1200 New Jersey Avenue, SE Washington, DC 20590-0001 infocntr@dot.gov

#### **Re: Request for Interpretation**

Dear Standards and Rulemaking Division:

Pursuant to 49 CFR § 105.20, this letter is being submitted to PHMSA to request a formal letter of interpretation in order to clarify several questions Entegris, Inc. has related to the Hazardous Materials Regulations (HMR) and the International Civil Aviation Organization's Technical Instructions for the Safe Transport of Dangerous Goods by Air (ICAO TI). More specifically, the questions pertain to shipments of packages covered under **DOT-SP 11447** and Competent Authority Approval **CA1995070006** by cargo only aircraft.

This request is a result of discussions I have had with Mr. Michael Nicks of the General Approvals and Permits Division, PHH-13, who advised me to submit a formal request for interpretation to address the questions Entegris has raised.

As this letter includes information of a proprietary nature (e.g. trade secrets), Entegris is requesting confidential treatment in accordance with 49 CFR § 105.30 and has provided a second copy of this letter with the confidential information redacted.

#### **Background**

**DOT-SP 11447** is a special permit granted to Entegris, Inc. (formerly Saes Pure Gas, Inc.) which authorizes the transport in commerce of a *"Gas Purification System"* containing certain Division 4.1 (flammable solids) and 4.2 (spontaneously combustible solids) materials in non-DOT specification stainless steel pressure vessels.

DOT-SP 11447 authorizes several exemptions from the HMR as described in Section 4 of the special permit, and are summarized as follows:

- non-DOT specification stainless steel pressure vessels are authorized as a packaging.
- The maximum quantities for UN 2881, PG II and UN 3089, PG II listed in column 9B of the Hazardous Materials Table may be exceeded.
- The materials are not subject to the "away from" segregation requirement in § 176.83 for the storage of Division 4.1 and 4.2 materials in the same cargo hold.

**CA1995070006** is a United States Competent Authority Approval granted to Entegris, Inc. This approval serves as an "exemption" as defined in Part 1, paragraph 3.1.1 of the ICAO TI and in Chapter 7.9, Section 7.9.2 of the IMDG Code and as a "Competent Authority Approval" as defined in 49 CFR § 107.1.

CA1995070006 is used in conjunction with DOT-SP 11447 for international shipments by air and vessel. CA1995070006 waives several requirements of the ICAO TI and IMDG Code when offering for

transportation in commerce certain Division 4.1 and Division 4.2 solids in non-DOT specification stainless steel pressure vessels that conform to the requirements of DOT-SP 11447.

This request for interpretation seeks to clarify how the quantity and type of <u>packaging</u> should be described on the shipping paper when transporting the DOT-SP 11447 packages by cargo only aircraft.

The requirements for the description of the quantity and type of packaging on the shipping paper are specified in 49 CFR § 172.202 and ICAO TI 4.1.5.

### How should the packaging specified in DOT-SP 11447 be described on the shipping paper?

Entegris has received several differing interpretations on how the DOT-SP 11447 packaging should be described on the shipping paper. The packaging description should align with the regulatory definitions of packaging:

#### **Regulatory Definitions for Packaging:**

49 CFR § 171.8 defines *Packaging* as follows:

"means a receptacle and any other components or materials necessary for the receptacle to perform its containment function in conformance with the minimum packing requirements of this subchapter."

The ICAO TI defines *Packaging* as follows:

"One or more receptacles and any other components or materials necessary for the receptacles to perform their containment and other safety functions."

#### Packaging Specified in DOT-SP 11447 and CA1995070006:

DOT-SP 11447 states the detailed packaging requirements in paragraph 7.a. for the Division 4.2 material and paragraph 7.b. for the Division 4.1 material. The following is the packaging description given in DOT-SP 11447 for the Division 4.2 material:

7. <u>SAFETY CONTROL MEASURES</u>:

PACKAGING: The Division 4.2 metal catalyst is contained a. within one to eight non-DOT specification stainless steel pressure vessels under a nitrogen or argon blanket not exceeding 25 psig. The pressure vessels and associated components must be arranged and securely affixed within a welded steel frame as shown in SAES Pure Gas, Inc. drawings on file with the Office of Hazardous Materials Safety Approvals and Permits Division (OHMSAPD). The pressure vessels must be designed, constructed, and tested in accordance with Section VIII, Division I of the ASME Boiler and Pressure Vessel Code. The maximum allowable working pressure of each pressure vessel may not be less than 225 psig at 250 °C. (1) Pressure vessels not for export must be "U" stamped.

(2) Pressure vessels <u>for export only</u> to a country not recognizing the ASME Code "U" symbol stamp may alternatively be stamped as required by the governing design code of the accepting country.

**CA1995070006** describes the prescribed packaging in paragraph 5.b. as follows:

b. <u>Packaging</u>: Packagings prescribed are non-DOT specification stainless steel pressure vessels conforming to the requirements in DOT-SP 11447.

### Example DOT-SP 11447 Package for Division 4.2 Material:

The *questions* Entegris has are based on the following DOT-SP 11447 package:

*Note: See Annex 1 & 2, which include drawings and pictures of the example* DOT-SP 11447 package.

The example DOT-SP 11447 package is a **"Gas Purification System"** with the packaging being that described in paragraph 7.a. of DOT-SP 11447, containing 60 Kg of UN 2881 – Metal catalyst, dry – PG II, equally divided by mass in two (2) non-DOT specification stainless steel pressure vessels under a nitrogen blanket not exceeding 25 psig, and with the pressure vessels and associated components arranged and securely affixed within a welded steel frame as shown in drawings on file with OHMSAPD. The pressure vessels are designed, constructed and tested in accordance with Section VIII of the ASME Boiler and Pressure Vessel Code. The maximum allowable working pressure of the pressure vessels is not less than 225 psig at 250 °C.

This entire "Gas Purification System" is encapsulated inside several bags, including a non-transparent moisture barrier bag (e.g. Mylar) and then further packed in a strong wooden crate to protect the "Gas Purification System" from environmental and cosmetic damage during shipment and to form one handling unit for convenience of handling and storage. This wooden crate is not specified as a requirement in the special permit. Entegris considers this wooden crate to be an overpack for the packaging described in paragraph 7.a. of the special permit.

For the above DOT-SP 11447 example package, Entegris has received several interpretations from other expert parties as to how the packaging should be described on the shipping paper. The interpretations are as follows:

- Interpretation 1: The packaging is two (2) non-DOT specification stainless steel pressure vessels. An aircraft operator has suggested this description, using the term "cylinder" to describe the pressure vessels, as cylinders is listed as a single packaging in packing instruction 473. This interpretation may be based on the packaging description given in CA1995070006, which states the packagings are non-DOT specification stainless steel pressure vessels.
- Interpretation 2: The packaging is all materials and components listed in paragraph 7.a. of DOT-SP 11447, including; the non-DOT specification stainless steel pressure vessels under a nitrogen blanket not exceeding 25 psig, with the pressure vessels and associated components arranged and securely affixed within a welded steel frame. (This description adds significant complexity to the shipping paper description and may cause shipment delays)

Since conflicting interpretations have been provided by several experts, Entegris requests PHMSA to clarify which items listed in paragraph 7.a. constitutes the packaging and how the quantity and type of packaging should be described on the shipping paper when shipped by air.

#### Marking and Labelling Questions:

Additionally, there is a concern as to where the marking and labels required by the HMR and the ICAO TI should be placed.

The HMR states that markings must be printed on or affixed to the surface of a package or on a label, tag, or sign and § 172.406 states labels must be printed on or affixed to the surface of a package or on a label, tag, or sign. The ICAO TI has similar requirements for the location of marks and labels.

Annex 2 shows pictures of the example purification system. After the system is fully assembled, the pressure vessels are not visible as they are covered with heating jackets and are also obscured by the metal doors affixed to the welded steel frame.

From a practical standpoint it seems the best location for the marks and labels would be on an external surface of the gas purification system, such as the front doors as shown in the example in Annex 2.

### **Questions:**

- 1. For the example DOT-SP 11447 package, which of the following components comprise the packaging?
  - a. two (2) non-DOT specification stainless steel pressure vessels
  - b. Nitrogen blanket not exceeding 25 psig
  - c. Associated components (e.g. piping, valves and fittings)
  - d. Welded steel frame
- 2. Assuming Interpretation 1 is correct and only the two (2) non-DOT specification stainless steel pressure vessels comprise the packaging, is the following description (highlighted in yellow) of the quantity and type of packaging acceptable for shipment by air?



3. Assuming Interpretation 1 is correct, where should the labels and marks required by Part 172 subpart F and E be affixed?

Note: Due to the design of the gas purification system, the surface of the pressure vessels are not visible as they are covered with heating jackets which cannot be removed for transport. Entegris suggests the marks be placed as shown in the picture in Annex 2.

4. Assuming Interpretation 2 is correct and all 4 items listed in Question 1 comprise the packaging, which of the following descriptions of the quantity and type of packaging are acceptable:

#### Interpretation 2 – Description for quantity and type of packaging – Option 1

NATUR	E AND QUANTITY OF DANGEROUS GOOD	S				
Dangerous Goods Identification						
UN or ID No.	Proper Shipping Name	Class or Division (Subsidiary Risk)	Pack- ing Group	Quantity and type of packing	Packing Inst.	Authorization
UN2881	Metal catalyst, dry, (Contains: Nickel)	4.2	II	2 Pressure vessels and associated components arranged and securely affixed to a welded steel frame x 30 kg Overpack used Total quantity per overpack 60 kg	473	DOT-SP11447 & CA1995070006 "Attached"

#### Interpretation 2 – Description for quantity and type of packaging – Option 2

NATURE AND QUANTITY OF DANGEROUS GOODS						
Dangerous Goods Identification						
UN or ID No.	Proper Shipping Name	Class or Division (Subsidiary Risk)	Pack- ing Group	Quantity and type of packing	Packing Inst.	Authorization
UN2881	Metal catalyst, dry, (Contains: Nickel)	4.2	"	1 Gas Purification System x 60 kg Overpack used	473	DOT-SP11447 & CA1995070006 "Attached"

If both of the above options are incorrect, Entegris would appreciate PHMSA's guidance on what the appropriate description of the quantity and type of packaging is.

 Assuming Interpretation 2 is correct, where should the labels and marks required by Part 172 subpart F and E be affixed? (Refer to Annex 2 for pictures showing different locations labels and marks can be affixed to)

Entegris greatly appreciates PHMSA's attention to this matter and looks forward to a response that further clarifies our understanding of the Hazardous Materials Regulations.

Should PHMSA require additional information to process the interpretation, please contact me at your convenience.

Sincerely,

amer V. Mc Manus

James (Jim) V. McManus Sr. Principal Engineer Dangerous Goods Safety Advisor (DGSA) Entegris Inc. Mobile Phone: 203-482-1606



Annex 1 Drawing for Example Gas Purification System

This page includes confidential information

Annex 2 Pictures of Gas Purification System



Page 7





#### April 21, 2022

Standards and Rulemaking Division Pipeline and Hazardous Materials Safety Administration, Attn: PHH-10 U.S. Department of Transportation East Building 1200 New Jersey Avenue, SE Washington, DC 20590-0001 infocntr@dot.gov

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#### Interpretation 2 – Description for quantity and type of packaging – Option 2

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James (Jim) V. McManus Sr. Principal Engineer Dangerous Goods Safety Advisor (DGSA) Entegris Inc. Mobile Phone: 203-482-1606

# This page includes confidential information

## Annex 1 Drawing for Example Gas Purification System



# This page includes confidential information

Annex 2 Pictures of Gas Purification System