



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

1200 New Jersey Ave. SE  
Washington, D.C. 20590

**APR 19 2011**

Ms. Claire Matlon  
Honeywell Inc.  
101 Columbia Road  
Morristown, NJ 07962

Reference No.: 11-0052

Dear Ms. Matlon:

This responds to your letter requesting clarification of the Hazardous Materials Regulations (HMR; 49 CFR Parts 171-180) applicable to the internal capacity limits for a specification Department of Transportation (DOT) 39 cylinder intended to contain a Division 2.1 liquefied compressed gas.

In your letter, you state that the material you plan to ship is a new molecule, used as a replacement refrigerant for Refrigerant gas R134a in the automotive air conditioning market. Your material has a boiling point greater than  $-50^{\circ}\text{C}$ , and a critical point above  $65^{\circ}\text{C}$ . In accordance with § 173.115, your material is considered a low pressure Division 2.1 liquefied compressed gas, and you have classified your material as “UN 3161, Liquefied gas, flammable, n.o.s. (2,3,3,3-Tetrafluoroprop-1-ene).” You request confirmation of your conclusion that it is permissible to ship a Division 2.1 flammable gas in a DOT 39 specification cylinder with no restrictions on the internal volume.

In accordance with § 173.302a, for “a DOT 39 cylinder filled with a Division 2.1 material, the internal volume of the cylinder may not exceed 1.23 L (75 cubic inches).” This internal volume limitation only applies to Division 2.1 non-liquefied materials.

The filling requirements for liquefied compressed gases in DOT specification cylinders are based on the type of gas contained in the cylinder and are found in § 173.304a of the HMR. In addition, § 173.304a(a)(2) provides a table listing various types of liquefied gases and their corresponding maximum permitted filling densities. As you note in your incoming letter, the material you wish to ship is not specifically listed in the table in this section. For gases not specifically listed in the table in § 173.304a(a)(2), the filling density can be determined using the

formula provided in "Note 1" to that table. Therefore, the filling density for any cylinder containing your material, including a DOT specification 39, can be determined by calculating the percent ratio of the weight of the gas in the packaging to the weight of the water the container will hold at 16 °C (60 °F).

It should also be noted that cylinders built to meet a DOT 39 specification may not have a maximum water capacity that exceeds 55 pounds (1,526 cubic inches) for cylinders with service pressure of 500 p.s.i.g. or less, and 10 pounds (277 cubic inches) for cylinders with service pressure in excess of 500 p.s.i.g.

I hope this satisfies your inquiry. Please contact us if we can be of further assistance.

Sincerely,

A handwritten signature in cursive script, appearing to read "T. Glenn Foster".

T. Glenn Foster  
Chief, Regulatory Review and Reinvention Branch  
Standards and Rulemaking Division

**Drakeford, Carolyn (PHMSA)**

Benedict  
§ 173.304a  
Cylinders  
11-0052

**From:** INFOCNTR (PHMSA)  
**Sent:** Tuesday, March 08, 2011 12:25 PM  
**To:** Drakeford, Carolyn (PHMSA)  
**Subject:** FW: Hazmat Information Center Feedback: Shippers-General Requirements for Shipments and Packagings (Sections 173.1 & 173.476)

Hi Carolyn,

We received the following request for a formal letter of interpretation at the Info Center.

Thanks,  
Victoria

Victoria Lehman  
Hazmat Information Center (HMIC)  
Pipeline & Hazardous Materials Safety Administration 1200 New Jersey Avenue, SE,  
E21-119 Washington, D.C. 20590  
<http://phmsa.dot.gov/hazmat/info-center>  
(202) 366-1035

-----Original Message-----

**From:** PHMSA-Feedback [mailto:PHMSA-Feedback]  
**Sent:** Monday, March 07, 2011 3:41 PM  
**To:** PHMSA HM InfoCenter; PHMSA Webmaster  
**Subject:** Hazmat Information Center Feedback: Shippers-General Requirements for Shipments and Packagings (Sections 173.1 & 173.476)

Recently I had a phone conversation with a PHMSA employee, Andrew, at the Information Center to clarify whether it is permitted to ship a Class 2.1 flammable gas in a DOT 39 specification cylinder with an internal capacity exceeding 75 cubic inches capacity. After reviewing the pertinent parts of the regulations, we concluded that it is acceptable to ship a class 2.1 flammable gas in a DOT 39 specification cylinder with no restrictions on the internal volume. I would like confirmation of this conclusion in writing for our records.

**Background:** The material to be shipped is a new molecule which will be used as a replacement refrigerant for R134a in the automotive air conditioning market. It has a boiling point greater than -50°C and critical point above 65°C, which is by definition in 173.115(a) and (e), a low pressure liquefied flammable gas.

173.304 must be followed for non-bulk packaging information. 173.304 (a) General requirements. Says that we must meet the applicable requirement of 173.304a.

173.304a (a) Says we have to follow 173.301 and 173.304. We agree. 301 says that DOT 39 cylinders used for Division 2.1 gases must have a metal pressure relief device. Additionally, cylinders must be shipped in the vertical position, so that the PRD is in communication with the vapor space. These points are acceptable.

173.304a (a)(2): This new material is not in the table so there are not requirements placed on it from here.

I look forward to your written confirmation that DOT 39 cylinder, regardless of internal volume, are acceptable for shipment of low pressure, liquefied flammable gases.

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