



U.S. Department
of Transportation

**Pipeline and Hazardous
Materials Safety
Administration**

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

SEP 14 2011

Mr. Randolph Martin
Hazardous Materials Distribution Consultant
DuPont Company
4417 Lancaster Pike, BMP22/2222
Wilmington, DE 19375

Reference No. 11-0062

Dear Mr. Martin:

This is in response to your March 4, 2011 e-mail and March 23, 2011 telephone conversation with a member of my staff concerning "UN 3161, Liquefied gas, flammable, n.o.s. (2,3,3,3-Tetrafluoropropene), 2.1 (flammable gas)" and Specification DOT 39 steel cylinders. Specifically, you ask if this refrigerant gas is permitted in a DOT 39 cylinder under the Hazardous Materials Regulations (HMR; 49 CFR Parts 171-180).

The answer is yes. The Column 8B entry for "UN 3161, Liquefied gas, flammable, n.o.s." under the Hazardous Materials Table (HMT; § 172.101) permits "2,3,3,3-Tetrafluoropropene" Division 2.1 gas to be placed in a non-bulk cylinder prescribed in § 173.304. Under the HMR, DOT specification cylinders must meet the requirements prescribed in §§ 173.301, 173.301a, 173.304a, and 173.305, as applicable (see § 173.304(a)). Section 173.304(a)(1) permits liquefied gases, except gas in solution, to be placed in a DOT 39 steel cylinder provided the cylinders are not filled and shipped with a mixture that contains a pyrophoric liquid, carbon bisulfide (disulfide), ethyl chloride, ethylene oxide, nickel carbonyl, spirits of nitroglycerin, or toxic material (Division 2.3 (gas poisonous by inhalation) or Division 6.1 (poisonous materials)), unless specifically authorized in 49 CFR Part 173. Based on the information provided in your letter, the gas you described does not contain these materials.

You also ask if § 173.304(d) prohibits "2,3,3,3-Tetrafluoropropene" refrigerant gas from being placed in a DOT 39 steel cylinder because this section states non-toxic and non-flammable gases must be offered for transportation in cylinders prescribed in § 173.304a. The answer is no. Section 173.304(d) does not apply to your material because it prescribes packaging requirements for non-toxic and non-flammable refrigerant or dispersant gases only.

Further, you ask if the maximum permitted filling density limitations for "NA 1954, Refrigerant gases, n.o.s., 2.1 (flammable gas)" prescribed in the § 173.304a(a)(2) Table apply to "2,3,3,3-Tetrafluoropropene" refrigerant gas. If "2,3,3,3-Tetrafluoropropene" is being shipped under the proper shipping name "Liquefied gas, flammable, n.o.s.," the answer is no. If "2,3,3,3-Tetrafluoropropene" is being shipped under the proper shipping

description "NA 1954, Refrigerant gases, n.o.s., 2.1," the answer is yes. The filling limits prescribed in § 173.304(b) only apply to refrigerant gases being shipped as "NA 1954, Refrigerant gas, n.o.s." Section 173.304(b) states the liquid portion of a liquefied gas may not completely fill the packaging at any temperature up to and including 55 °C (131 °F). In addition, the filling density can be determined using the formula provided in "Note 1" to the Table in § 173.304a(a)(2). The filling density for any cylinder containing your material, including a DOT specification 39 cylinder, can be determined by calculating the percent ratio of the weight of the gas in the cylinder to the weight of the water the cylinder will hold at 16 °C (60 °F).

I hope this satisfies your request.

Sincerely,

A handwritten signature in cursive script, appearing to read "T. Glenn Foster", with a long horizontal flourish extending to the right.

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

Edmonson
§ 173.301
§ 173.304

Drakeford, Carolyn (PHMSA)

From: Lehman, Victoria (PHMSA)
Sent: Thursday, March 10, 2011 3:42 PM
To: Drakeford, Carolyn (PHMSA)
Subject: FW: Request for Interpretation

Cylinders
11-0062

From: Randolph Martin [<mailto:Randolph.Martin@USA.dupont.com>]
Sent: Friday, March 04, 2011 1:22 PM
To: INFOCNTR (PHMSA)
Cc: Mark H Christman; Michael E McCord
Subject: Request for Interpretation

Office of Hazardous Materials Standards
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

We are requesting a written confirmation from PHMSA that DOT 39 cylinders are authorized for the transport of product properly classified as follows:

UN3161
Liquefied Gas, Flammable, N.O.S. (2,3,3,3-Tetrafluoropropene)
2.1

Non-bulk shipments of UN3161 are governed by 49CFR 173.304, 173.301, and in addition, 173.301a, 173.304a and 173.305, as applicable. In our interpretation, none of these references specifically limit or prohibit the use of DOT 39 cylinders for UN3161, and in fact clearly allow this product to be shipped in DOT 39 cylinders.

This was discussed and confirmed verbally by Scott in the Hazardous Materials Information Center on Mar 4, 2011.

Please call me if you have any questions.

Looking forward to your reply.

Randolph Martin
DuPont Company
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