



U.S. Department
of Transportation

**Pipeline and
Hazardous Materials Safety
Administration**

400 Seventh Street, S.W.
Washington, D.C. 20590

MAR 15 2005

Mr. Donald E. Burke, Jr.
Packaging Engineer
Raytheon – SAS
P.O. Box 902
El Segundo, CA 90245

Reference No.: 05-0002

Dear Mr. Burke:

This responds to your letter to Mr. Frits Wybenga requesting clarification of the pressure requirements for air shipments under the Hazardous Materials Regulations (HMR; 49 CFR Parts 171-180). Your questions are based on a letter of interpretation to Haas TCM (Ref. No. 04-0023) which addressed means to obtain the vapor pressure for the tests in § 173.27. Specifically, you ask if the vapor pressure of the material to be packaged must be determined at either 50 or 55 ° C to calculate the pressure retention capability of a packaging in accordance with § 173.27(c)(2)(ii).

The answer is yes. When calculating the required vapor pressure capability as specified in § 173.27(c)(2)(ii), the vapor pressure of the packaged material must first be determined in order to utilize the formulas to calculate the pressure retention capability of the packaging.

As provided by § 173.27, each packaging must be capable of withstanding certain pressure requirements for transportation by air. This section does not require testing of each packaging; rather, it requires that packaging must be “capable” of meeting the pressure requirement without leakage. If past testing or transportation experience indicates that a packaging can withstand the pressure requirement without leakage, testing need not be performed. The test report or packaging certification should note the rationale behind the determination that the packaging meets the pressure requirements.

I trust this satisfies you request.

Sincerely,

Hattie L. Mitchell
Chief, Regulator Review and Reinvention
Office of Hazardous Materials Standards



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Air
05-0002

August 5, 2004

Fritz Wybenga
Deputy Associate Administrator
U.S. Department of Transportation
DHM-1
400 7th St. S.W.
Washington, DC 20590-0001

Dear Deputy Wybenga:

My question is in regards to Hattie L. Mitchell's answer of May 5, 2004 Ref. No. 04-0023 to Mr. Larry Holcombe of Haas TCM (Attached).

Q1. In A2. Of the above referenced answer it was stated, "The vapor pressure may be determined by testing or empirically. Any test method that leads to the determination that the package is capable of withstanding the pressure requirements in 173.27 without leakage may be used". Am I correct based upon the above answer in stating that a vapor pressure at 50 or 55 degrees C must be established to use 2 of the 3 methods described in 173.27(c)(2)(ii) prior to offering a regulated liquid material for air transportation or if I do not I am in violation of the regulations and subject to fines?

Q2. If the answer to Q1 is no, then please define the acceptable documented requirements necessary to meet the requirements other than those stated in 173.27 or advise me that if the container minimum pressure requirement is not documented under the prescribed three methods in 173.27 then this is not a violation of the regulations subject to fines.

Thank you,

Sincerely,



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U.S. Department
of Transportation
**Research and
Special Programs
Administration**

400 Seventh Street, S.W.
Washington, D.C. 20590

MAY 5 2004

Mr. Larry Holcombe
Account Manager
Haas TCM
1646 West Chester Pike
West Chester, PA 19382

Ref. No.: 04-0023

Dear Mr. Holcombe:

This responds to your letter concerning determination of the vapor pressure to calculate the test pressure for packages intended for air transportation in § 173.27 of the Hazardous Materials Regulations (HMR; 49 CFR Parts 171-180). Your questions are paraphrased and answered below:

Q1. Is it correct to obtain the vapor pressure from engineering tables if the liquid consists of a single chemical component?

A1. Yes, obtaining the vapor pressure for a liquid that consists of a single chemical component from engineering tables is acceptable.

Q2. For liquids with multiple chemical components, you propose to use vapor pressure from engineering tables for the most volatile component at the specified temperature and set a vapor pressure threshold limit equal to 50% of minimum test pressure for the package. If the vapor pressure of the mixture exceeds the threshold limit, you further propose to measure the vapor pressure by laboratory testing. You ask if this approach is suitable.

A2. We are unable to determine the suitability of your approach. The Hazardous Materials Regulations do not prescribe specific methods for determining the vapor pressure. The vapor pressure may be determined by testing or empirically. Any test method that leads to the determination that the package is capable of withstanding the pressure requirements in § 173.27 without leakage may be used.

I hope this determination is helpful.

Sincerely,

Hattie L. Mitchell
Chief, Regulatory Review and Reinvention
Office of Hazardous Materials Standards



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Corbin
§ 173.27
Air
04-0023

January 23, 2004

Frits Wybenga
Deputy Associate Administrator
U.S. Department of Transportation
DHM-1
400 7th St., S.W.
Washington, DC 20590-0001

202-366-0656

RE: 49 CFR 173.27 General requirements for transportation by aircraft

Dear Deputy Wybenga:

Part 173.27 of 49 Code of Federal Regulations requires that shippers ensure that containers of regulated liquids do not leak under conditions of air shipment. The methods stated in the regulations include using the vapor pressure of the liquid at specified temperatures (50 or 55 degrees Celsius) to determine container pressure capacities.

We request your Department's advice on the suitability of our proposed approach, below, for obtaining the needed vapor pressure data.

1. Where the liquid consists of a single chemical component we propose to use engineering tables to obtain the vapor pressure of the component at the specified temperatures.
2. Where the liquid consists of multiple chemical components we propose to select the most volatile component and use engineering tables to obtain the vapor pressure of that component at the specified temperatures.
 - a. Since the regulations specify a minimum packaging capacity (14 psig or 11 psig depending on the liquid, 49 CFR 173.27 e) 2) i), we propose to set a threshold limit on our vapor pressure estimates equal to 50% of the minimum value for packaging requirements.
 - b. Any engineering estimate of a mixture that exceeds the threshold limit vapor pressure will automatically be set aside for laboratory testing to measure the vapor pressure.
3. We propose to run a pilot program to test the suitability of this approach. A sub-sample of the liquids where engineering estimates are made (per steps 1. and 2. above), and which were below the threshold limit will also be tested in the lab for the vapor pressure. The vapor pressure determined by the two methods, i.e., engineering estimate and lab test, will be used to calculate the required packaging.