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RSPA-01-10318-1

July 18, 2001

Ms. J. Suzanne Hedgepeth
Director, Office of Hazardous Materials
Exemptions and Approvals
Hazardous Materials Safety
Department of Transportation
Washington, D.C. 20590-0001

Dear Ms. Hedgepeth:

NEW EXEMPTION APPLICATION

On behalf of **Air Liquide America Corporation**, and pursuant to the provisions of 49 CFR § 107.105, this is to request an exemption from 173.301(g)(1), to authorize cylinder valve protection caps which are made of a material other than metal, for DOT specification cylinders charged with the gases specified in that section. The requirements of 173.301(g)(1) are as follows:

> *173.301 (g) Container valve protection. Containers charged with flammable, corrosive, or noxious gases, must have their valves protected by one of the following methods:*
>
> > *(1) By equipping the containers with securely attached <u>metal</u> caps of sufficient strength to protect the valves from injury during transit.*

Air Liquide proposes to use protective caps made of plastic which meet the requirements for valve protection on cylinders containing poisonous materials, as required under 173.40(d)(2). That section states:

> *173.40(d)(2) Each cylinder equipped with a valve, if not overpacked in a box in accordance with paragraph (d)(1) of this section, must be equipped with a protective cap or other means of valve protection sufficient to protect the valve from deformation and breakage resulting from a drop of 2.0m (7 ft.) or more onto a concrete floor, impacting at an orientation most likely to cause damage.*

Air Liquide notes that for poisonous materials, the regulations do not specify the material that the protective cap must be made of, but rather require that the cap provide sufficient protection to the valve to prevent deformation and breakage when the cylinder is dropped from a height of 7 feet. Air Liquide believes that plastic protective caps which meet the requirements of 173.40(d)(2) and which are authorized on cylinders containing poisonous materials, would provide a level of safety equivalent to the metal caps required on cylinders containing flammable, corrosive or noxious gases, as specified in 173.301(g)(1).

1. **Applicant:** Air Liquide America Corporation, 2700 Post Oak, Houston, Texas, 77056, Contact person: Ralph Diaz, telephone: 713-499-6867. Please direct any questions concerning this application to the undersigned at 202-463-3511.

2. **Hazardous Materials Description:**

   Those Division 2.1 and 2.2 compressed gases, authorized in DOT specification cylinders under 49 CFR 172.101.

3. **Regulations from Which Exempted:**

   49 CFR § 173.301(g)(1), in that protective caps made of plastic, are also authorized.

4. **Modes of Transportation Authorized:** Highway

5. **Equivalent Level of Safety:**

Air Liquide, through an approved DOT cylinder tester, has run a series of drop tests in accordance with 173.40(d)(2), using a cylinder valve protection cap made of plastic material. The cap is designed with a metal threaded base within the plastic housing that is threaded onto a cylinder neck ring. A copy of the test reports from Arrowhead Industrial Services, Inc., are enclosed, including pictures of each cylinder tested. In summary, six cylinders equipped with the plastic valve cap were dropped from a height of seven feet at an angle that would cause the greatest damage upon impact. The tests revealed that the cylinders exhibited minor damage to the protective collars and slight damage to several of the cylinder valves which was limited strictly to the hand wheel. In no case were the valves broken, nor was there any pressure loss or leakage detected from any of the cylinders tested. Air Liquide believes the tests results have demonstrated that the plastic protective caps provide adequate protection to the cylinder valve and would comply with the requirements under 173.40(d)(2) for cylinders transporting poisonous materials. The applicant also believes that use of the plastic caps would provide a level of safety

equivalent to the metal caps required under 173.301(g)(1), in that the plastic caps would provide sufficient strength in protecting the valves on cylinders containing flammable, corrosive and noxious gases.

In summary, for the reasons outlined above, Air Liquide submits that the packaging proposed herein will ensure that transport under the requested exemption will afford a level of safety in transport at least equivalent to that afforded by the regulations from which exemption is sought. Therefore, the applicant respectfully requests that the exemption sought be issued at the earliest possible time.

If you have any questions, please contact the writer at (202)463-3511.

Sincerely,

Patricia A. Quinn

Enclosures

ARROWHEAD INDUSTRIAL SERVICES, INC.
3537 SNC HWY 119
GRAHAM NC, 27253

REPORT OF FINDINGS

CLIENT:

AIR LIQUIDE

TESTING PERFORMED:

Drop tests performed in accordance with 173.40 (d),(2) and additional in house guidelines.

PROCEDURE:

Testing was performed on six (6) cylinders approximately nine inches in diameter and fifty-five inches in height. Cylinders were filled with water to a weight of 209.5 lbs and then a valve was installed. After installing valves, cylinders were filled with nitrogen to a pressure of 30 pounds per square inch. A leak check solution was then applied to the valve and neck to verify the absence of leaks. Protective collars were then threaded onto the neck of each cylinder and secured in place.

Each cylinder was suspended at a height of 7 feet at an angle of 30°. The orientation of each cylinder was such as to cause the maximum amount of damage to the valve and collared portion of each cylinder when dropped onto a concrete of similar surface. (See orientation diagram below.) After each test, photographs were taken of each collar and valve and damage, if any was noted. (See attachments)

CONCLUSION:

All six test units exhibited some minor collar damage and valve damage, limited to the hand wheel. All six test units were examined for pressure loss approximately 30 minutes after each test was conducted. There was no evidence of pressure loss in any of the specimens. It should be concluded that the valve protection device (scandina cap) provided adequate protection when dropped from this height.

SIDE →

FRONT →

← REAR

Raymond Crouch (Technical Representative)

Chris Martin (Quality Assurance Director)

ARROWHEAD

PHOTOGRAPHIC RECORD OF TESTS

CYLINDER CHARACTERISTICS
Drop Test #1
Serial Number: 40445
Orientation: front impact
*Minor collar damage

Date: 6-8-01	Inspector: R Crawford

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PHOTOGRAPHIC RECORD OF TESTS

CYLINDER CHARACTERISTICS

Drop test #2
Serial Number: TX-36222
Orientation: Side impact
*Minor callar and valve damage

Date: 6-8-01	Inspector: R Crawl

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PHOTOGRAPHIC RECORD OF TESTS

CYLINDER CHARACTERISTICS

Drop Test #3
Serial Number: 2256
Orientation: Rear impact
*Minor collar and valve damage

Date: 6-8-01	Inspector:

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PHOTOGRAPHIC RECORD OF TESTS

CYLINDER CHARACTERISTICS

Drop Test #4
Serial Number: 40081
Orientation: Side impact
*Minor collar and valve damage

Date: 6-8-01	Inspector:

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PHOTOGRAPHIC RECORD OF TESTS

CYLINDER CHARACTERISTICS

Drop Test #5
Serial Number: 113369
Orientation: Front impact
*Minor collar damage

Date: 6-8-01	Inspector:

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PHOTOGRAPHIC RECORD OF TESTS

CYLINDER CHARACTERISTICS

Drop Test #6
Serial Number: SPZ-3194
Orientation: Side Impact
*Minor collar and valve damage

Date: 6-8-01	Inspector: R. Crawford

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