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

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

MAY 27 2003

Ms. Robin J. Eddy Bolte
Safety and Regulatory Compliance Manager
Allied Universal Corp.
3901 N.W.115th Avenue
Miami, Florida 33178

Ref No.: 03-0057

Dear Ms. Eddy Bolte:

This is in response to your letter dated January 23,2003, concerning cargo tank requirements in the Hazardous Materials Regulations (HMR; 49 CFR Parts 171-180). Specifically, you request clarification on the use of MC 312 or 412 cargo tankers for transporting hypochlorite solutions and other hazard class 8 hazardous materials.

Q1. What is the definition of a lading retention system?

A1. Although the HMR does not currently define "lading retention system", it is our opinion that a "lading retention system" consists of the basic containment (e.g., tank) and any associated appurtenances or equipment (e.g., piping and valves) that, if seriously damaged, could result in the release of the contents of the package.

Q2. Is the use of non-metallic (PVC) piping, connections and valves permitted after the first valve outside of the cargo tanker. Your understanding is that piping, connections, and valves before the first valve must be as strong as the material used in the body of the cargo tanker. In your example you stated that your fiberglass cargo tanker's pipe, connections and valves up to the first valve outside of the body of the cargo tanker must be made of fiberglass or similar strength material. After the first valve, PVC piping, connections and valves, could the fiberglass fittings be used provided it meets all other regulatory and material compatibility requirements?

A2. Performance requirements for pumps, piping, hoses, and connections on cargo tanks intended to contain liquids are located in §178.345-9. The equipment used in the loading and unloading process is part of a DOT specification 406, 407, or 412 cargo tank and must meet all the requirements set forth in §178.345-9. Non-metallic pipes, valves or connections used on these specification cargo tanks must be as strong and heat resistant as the cargo tank. If not, these attachments must be located outside of the lading retention part of the cargo tank (§178.345-9(h)). Requirements for piping, valves, hoses and fittings on cargo tanks intended to contain compressed gasses such as MC 331 and MC 338 cargo tanks are found under the cargo tank specifications (§178.337-9 for MC 331, and §178.338-8 for MC-338).

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Q3. What is the definition of a slip joint?

A3. The slip joint referred to in 49 CFR §178.345-9(d) is described as follows. A slip joint in a piping system is an expansion device wherein the end of one pipe is closely fitted into another pipe or sleeve of slightly larger diameter, but no threaded or welded connection of the pipes is made. This allows the smaller pipe to slide inside the larger one to relieve or prevent stress in the pipe system due to expansion or contraction. Fluid flow between the pipes is prevented by use of a gasket or packing material.

Q4. With no bottom damage protection as outlined in 49 CFR§178.337-10 and §178.345-8(b), must the piping system on the cargo tanker be emptied, containing only residual of the lading material during transportation?

A4. Yes. DOT specification cargo tanks used for the transportation of any material that is a Division 6.1 (poisonous liquid) material, oxidizer liquid, liquid organic peroxide or corrosive liquid (corrosive to skin only) may not be transported with hazardous materials lading retained in the piping, unless the cargo tank motor vehicle is equipped with bottom damage protection devices meeting the requirements of §178.337-10 or §178.345-8(b), or the accident damage protection requirements of the specification under which it was manufactured. This requirement does not apply to a residue which remains after the piping is drained. A sacrificial device (see §178.345-1) may not be used to satisfy the accident damage protection requirements of this paragraph.

Q5. Can a cargo tanker be transported under pressure as long as the sum of the vapor pressure, head pressure of liquid and air padding pressure is below the cargo tanker design pressure or maximum allowable working pressure?

A5. Yes. In accordance with §173.33 (c) (i) thru(vi), prior to loading and offering a cargo tank motor vehicle for transportation with material that requires the use of a specification cargo tank, the person must confirm that the cargo tank motor vehicle conforms to the specification required for the lading and that the MAWP of the cargo tank is greater than or equal to the largest pressure obtained under the following conditions:

(1) For compressed gases and certain refrigerated liquids that are not cryogenic liquids, the pressure prescribed in §173.315.

(2) For cryogenic liquids, the pressure prescribed in §173.318.

(3) For liquid hazardous materials loaded in DOT specification cargo tanks equipped with a 1 psig normal vent, the sum of the tank static head plus 1 psig. In addition, for hazardous materials loaded in these cargo tanks, the vapor pressure of the lading at 115° F must not be greater than 1 psig, except for gasoline transported in accordance with Special Provision B33 in §172.102(c)(3).

(4) For liquid hazardous materials not covered in paragraph (c)(1)(i), (ii), or (iii) in §173.33, the sum of the vapor pressure of the lading at 115° F, plus the tank static head exerted by the lading, plus any pressure exerted by the gas padding, including air in the ullage space or dome.

(5) The pressure prescribed in subpart B, D, E, F, or G, of Part 173, as applicable.

(6) The maximum pressure in the tank during loading or unloading.

I hope this information is helpful. Please contact us if you require additional assistance

Sincerely,

Delmer F. Billings
Chief, Standards Development
Office of Hazardous Materials Standards

Reference
Cargo Tanks
§178.345
03-0057

ALLIED UNIVERSAL CORP., 3901 N.W. 115th Avenue, Miami, Florida 33178
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Mr. Edward Mazzullo, Director for Hazardous Materials Standards
U.S. Department of Transportation
400 Seventh Street, S.W., DHM-10
Washington, D.C. 20590-0001

February 24, 2002

Subject: Interpretation, various rules and regulations for MC 312 or 412 cargo tankers

Dear Mr. Mazzullo:

After several discussions with a Research and Special Programs Administration Engineer (Phil Olson), it has been decided that a written interpretation is needed in order to resolve several questions regarding the use of MC 312 or 412 cargo tankers to transport hypochlorite solutions and other hazard class eight hazardous materials.

Question 1, 49 CFR §178.345-9[g][h]: please provide us with a definition of the lading retention system.

Question 2, 49 CFR §178.345-9[h]: is the use of non-metallic (PVC) piping, connections and valves permitted after the first valve outside of the cargo tanker. Our understanding is that piping, connections, valves before the first valve must be as strong as the material used in the body of the cargo tanker. For example, our fiberglass cargo tankers, the pipe, connections and valves up to the first valve outside of the body of the cargo tanker must be made of fiberglass or similar strength material. After the first valve, PVC piping, connections and valves could be used provided it meets all other regulatory and material compatibility requirements.

Question 3, 49 CFR §178.345-9[d]: please provide us with a definition of a slip joint. In the definition please indicate whether or not a slip joint refers to a style of connection for pipe fittings or some other type of joint that is designed to control expansion and contraction of piping systems.

Question 4, 49 CFR §173.33[e]: with no bottom damage protection as outlined in 49 CFR §178.337-10 and .345-8[b], the piping system on the cargo tanker must be emptied, containing only residual of the lading during transport.

Question 5, 49 CFR §173.33[c][iv]: may a cargo tanker be transported under pressure as long as the sum of the vapor pressure, head pressure of liquid and air padding pressure was below the cargo tanker design pressure or maximum allowable working pressure.

If you should have any questions, please call me at 800-437-8715, extension 183.

Thank you.

Sincerely,

Robin J. Eddy Bolte
Safety and Regulatory Compliance Manager
Allied Universal Corp.

cc: J. Palmer, COO/General Manager
R. Bunkley, N. Regional Operations Manager
T. Tucker, S. Regional Operations Manager
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