



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

1200 New Jersey Ave., S.E.  
Washington, DC 20590

AUG 18 2008

Ms. Charlotte A Lent  
Chief, USAMC LOGSA Packaging  
Storage and Containerization Center  
11 Hap Boulevard  
Tobyhanna, PA 18466-5097

Ref. No.: 08-0184

Dear Ms. Lent

This is in response to your July 10, 2008 letter regarding non-bulk performance-oriented package testing under the Hazardous Materials Regulations (HMR; 49 CFR Parts 171-180). Specifically, you ask if the HMR restrict test substances for non-bulk packages designed to contain a liquid hazardous material to liquids having the same or higher specific gravity than water and prohibit the substitution of solid materials as a replacement test product for liquids.

According to § 178.602(c), it is permissible to use additives, such as bags of lead shot, to achieve the requisite total package mass so long as they are placed so that the test results are not affected. You suggest that bags of lead shot cannot be placed in a way that will not affect drop test results because load distribution and shock absorption are affected and the physical properties of bags lead shot and other solids are materially different than a liquid.

If a packaging passes the drop test when tested with bags of lead shot and liquid, but would fail if tested with water or a liquid substance with the same properties as the material to be transported, the results of the test have been affected. Thus, bags of lead shot are not a suitable additive.

You may petition for a rule change if you believe that a modification should be considered. Procedures for submitting a petition for rulemaking are in § 106.95.

I hope this answers your inquiry.

Sincerely,

Susan Gorsky  
Acting Chief, Standards Development  
Office of Hazardous Materials Standards



DEPARTMENT OF THE ARMY

USAMC LOGISTICS SUPPORT ACTIVITY  
REDSTONE ARSENAL, AL 35898-7466

REPLY TO  
ATTENTION OF

July 10, 2008

Leary  
§178.602  
Testing  
08-0184

Logistics Testing and Applications Division

Mr. Edward T. Mazzulo  
Director, Office of Standards  
US Department of Transportation  
Pipeline and Hazardous Materials Safety Administration  
East Building, 2<sup>nd</sup> Floor, PHH-10  
1200 New Jersey Avenue SE  
Washington, DC 20590

Dear Mr. Mazzulo:

This letter of inquiry for interpretation is written on behalf of the US Army Materiel Command Logistics Support Activity Packaging, Storage, and Containerization Center (USAMC LOGSA PSCC), Tobyhanna, Pennsylvania. The USAMC LOGSA PSCC Packaging Applications Testing Facility is a packaging test facility for the U.S. Department of Defense (DoD) where military and commercial packaging testing, including, hazardous materials packaging UN certification testing, has been performed to military, industry, commercial, and item or material test methods for 60 years.

This letter is being written for a clarification/interpretation of the requirements of the Hazardous Materials Regulations (HMR) stated below. It is asked that an interpretation be provided that **restricts test substances for liquid lading to only liquids having the same or higher Specific Gravity as water ( $SG \geq 1.0$ ), and that solids not be permitted as a replacement test product for liquids.**

**§178.602(b)**

*"For the drop and stacking test, inner and single-unit receptacles must be filled to not less than 95% of maximum capacity in the case of solids and not less than 98% of maximum in the case of liquids. The material to be transported in the packagings may be replaced by a non-hazardous material, except for chemical compatibility testing or where this would invalidate the results of the tests."*

**§178.602(c)**

*"If the material to be transported is replaced for test purposes by a non-hazardous material, the material used must be of the same or higher specific gravity as the material to be carried, and its other physical properties (grain, size, viscosity) which might influence the results of the required tests must correspond as closely as possible to those of the hazardous material to be transported. Water may also be used for the liquid drop test under the conditions specified in §178.603(e) of this subpart. It is permissible to use additives, such as bags of lead shot, to*

*achieve the requisite total package mass, so long as they are placed so that the test results are not affected."*

This facility routinely uses either water or antifreeze and water solutions for all packaging testing containing liquids. However, it is common practice in private industry to use lead shot and/or other solids in place of, or along with, liquids for testing. In the aforementioned paragraphs of the HMR it is permissible to use *bags of lead shot, to achieve the requisite total package mass, so long as they are placed so that the test results are not affected.* However, from this facility's 60 years of experience in packaging testing for DoD, it can be stated that--

Bags of lead shot cannot be placed in such a way so as to *not affect drop test results.* The load distribution and/or center of gravity are different than when only liquid is used, and

Bags of lead shot cannot be placed in such a way so as to *not affect drop test results,* inasmuch as the bags of lead shot (other loose materials) absorb shock before the inner packaging sees the shock, and

Lead shot or other solids, such as steel bolts, do not have the same *physical properties* as liquids and should not be used as a replacement test lading for liquids. A solid is not a liquid, and does not behave as such.

When using water or other liquids having a Specific Gravity  $\geq 1.0$ , the drop heights and stacking top load already incorporate the Specific Gravity of the intended lading in the calculations for the drop and stack test parameters per the applicable paragraphs in the HMR.

Point of contact for this matter is Ms. Charlotte A. Lent, (570) 895-7160, fax (570) 895-7823, or e-mail [charlotte.lent@us.army.mil](mailto:charlotte.lent@us.army.mil). All correspondence responding to this memorandum should be sent to Chief, USAMC LOGSA Packaging, Storage, and Containerization Center (AMXLS-AT/Ms. Charlotte A. Lent), 11 Hap Arnold Boulevard, Tobyhanna, PA 18466-5097.

Sincerely,



JAMES R. BRYANT  
Chief, Logistics and  
Engineering Center