U.S. Department
of Transportation

**Pipeline and Hazardous
Materials Safety
Administration**

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

JUN 0 2 2016

Andrew Gesford
Chief
LOGSA Packaging, Storage and Containerization Center
11 Hap Arnold Boulevard
Tobyhanna, PA 18466

Reference No. 16-0017

Dear Mr. Gesford:

This letter is in response to your January 13, 2016, letter requesting clarification of the Hazardous Materials Regulations (HMR; 49 CFR Parts 171-180) applicable to test requirements for Intermediate Bulk Containers (IBC). Specifically, you ask for further clarification of the term "rupture" as used in § 178.819(c) as criteria for an IBC to pass the vibration test. You describe two scenarios and provide accompanying photographs of fiberboard IBCs with damage resulting from the vibration test. The IBC in "Figure 1" shows the inner bag protruding from damage that extends along the full height of the fiberboard outer container. The IBC in "Figure 2" shows a tear—described as approximately 3 inches in height—to the fiberboard in the bottom corner, and while the damage penetrates the outer fiberboard wall, the inner bag is not visible. You further describe that leakage was not observed in either scenario. We have paraphrased and answered your questions as follows:

Q1. Does a rupture to a fiberboard IBC include any damage that results in separation or tearing of the outer fiberboard container which creates an opening?

A1. The answer is yes. Section 178.819(c) states that an IBC passes the vibration test if there is no rupture or leakage. The word "rupture" is defined by Webster's dictionary as a "state of being broken, the act of bursting." It is the opinion of this Office that any damage that creates an opening in an IBC would be considered a rupture and result in the failure of the vibration test. The entire side of the IBC in "Figure 1" has burst open, and although the damage to the IBC in "Figure 2" is less severe, the damage has still penetrated the outer fiberboard container, creating an opening. Therefore, the IBCs in both scenarios have failed the vibration test due to rupture.

Q2. Does a rupture to a fiberboard IBC include instances where the inner bag is exposed or protrudes from the box due to damage to the outer fiberboard container, but the inner bag remains intact and does not leak?

A2. The answer is yes. See A1.

Q3. Does a rupture to an IBC include instances of breakage of the IBC closure components, such as tape?

A3. Generally, the answer is yes. Typically, breakage of an IBC closure component is expected to result in failure of the vibration test due to leakage or due to a full or partial opening of the package (i.e. rupture). However, if the IBC remains fully closed and does not leak, then the breakage of an IBC closure component does not result in a failure of the vibration test.

Q4. Can an IBC fail the vibration test based on evaluation for criteria contained in other IBC test requirements, such as "deformation" or "unsafe for transportation," without the presence of the actual wording in the vibration test criteria in § 178.819? For example, the criteria for a fiberboard IBC to pass the stack test in § 178.815(e)(2), requires "no loss of contents and no permanent deformation, which renders the whole IBC, including the base pallet, unsafe for transportation."

A4. The answer is no. The vibration test is a pass or fail test determined only by whether the IBC withstands testing without leakage or rupture. The criteria for passing the vibration test in § 178.819(c) was incorporated into the HMR by a final rule entitled, "Intermediate Bulk Containers for Hazardous Materials (HM-181E)," published July 26, 1994. This requirement is generally harmonized with the United Nations Manual of Tests and Criteria, which specifies in 6.5.6.13.4, "No leakage or rupture shall be observed. In addition, no breakage or failure of structural components, such as broken welds or failed fastenings, shall be observed." It should be noted that the safety of a packaging for transportation depends on the cumulative effects of all packaging design, testing, and use requirements in the HMR. In addition to the vibration test, the IBC must meet all applicable design requirements in Part 178 Subpart N and all applicable test requirements in Part 178 Subpart O to be certified for transportation.

I hope this information is helpful. Please contact us if we can be of further assistance.

Sincerely,

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

Lehman
§178.819(c)
Packaging Specs.
16-0017

DEPARTMENT OF THE ARMY
USAMC LOGISTICS SUPPORT ACTIVITY
PACKAGING, STORAGE, AND CONTAINERIZATION CENTER
11 HAP ARNOLD BOULEVARD
TOBYHANNA, PA 18466-5097

REPLY TO
ATTENTION OF

January 13, 2016

Logistics Testing and Applications Division

Mr. Charles E. Betts
Director, Office of Hazardous Materials Standards
U.S. DOT/PHMSA (PHH-10)
1200 New Jersey Avenue
SE East Building, 2nd Floor
Washington, DC 20590

Dear Mr. Betts:

This letter of inquiry for interpretation is written on behalf of the US Army Materiel Command (USAMC) Logistics Support Activity Packaging, Storage, and Containerization Center (LOGSA PSCC), Tobyhanna, PA. It is being written for clarification/interpretation of the Title 49 Code of Federal Regulations (CFR), Part 178, Subpart O - Testing of intermediate bulk containers (IBCs), pertaining to the criteria for passing the vibration test, when testing a IBC.

Title 49 CFR §178.819(c) describes the criteria for passing the IBC vibration test as "An IBC passes the vibration test if there is no rupture or leakage." Without a definitive explanation for determining a rupture, it is LOGSA PSCC's opinion that a fiberboard IBC may be determined to be a failure based on damage that might be considered typical degradation of the packaging as it moves through the transportation cycle. Please review the following photographs for further discussion.

Figure 1. Test damage – full height of IBC

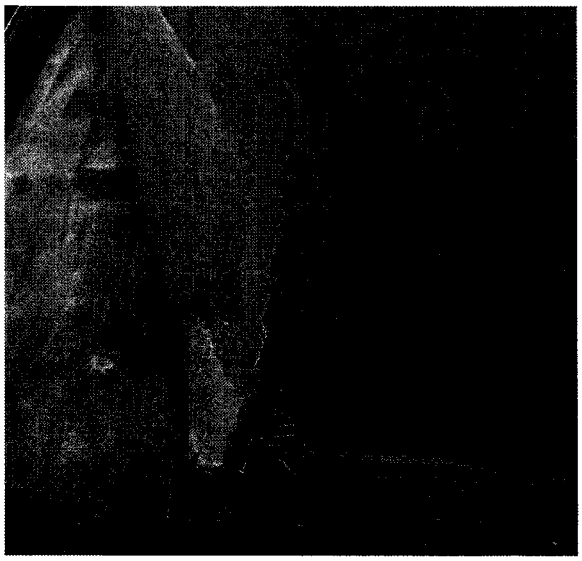

Figure 2. Test damage – approximately 3" high

Figure 1 shows significant damage of the fiberboard that runs the entire height of the IBC. The inner bag is exposed and is observed protruding from the box; no leakage is observed. Figure 2 shows less severe damage of the IBC. The damage is all the way through the fiberboard wall. The inner bag is not visible and no leakage is observed. The damage noted in Figure 2 is approximately 3" in height, and is similar to damage that we've seen in previous fiberboard IBC vibration tests.

Discussion. Both photographs show damage of some extent. Figure 1 shows significant damage and appears to no longer be safe for transportation. Figure 2 shows minor damage after the test. LOGSA PSCC's opinion is that at this point the IBC (Figure 2) could still be considered reasonably safe for transportation. However, based on current wording specified in 178.819 (c), Criteria for passing the test, we feel that both of these pictures show the same type of damage of the packagings (albeit to different extents) and, therefore, could potentially be considered failures to pass the vibration test. Without clarification of a rupture, damage that might be considered expected or normal degradation and, therefore, still reasonably safe for transportation (Figure 2.), would have to be declared a failure. In addition, there is no mention of evaluating a packaging for permanent deformation or transportation safety as described in other IBC tests (i.e., drop, stack, top lift, and bottom lift).

It is LOGSA PSCC's opinion that if the regulations contained a definition of a rupture, and included wording that allowed for evaluating an IBC with regards to safety, permanent deformation, packaging strength, etc., that fiberboard IBCs could be better evaluated for compliance with the vibration test.

Questions:

1. With regards to a fiberboard IBC, what determines, or defines, a rupture?
    a. Any damage that results in separation, or tearing, of the fiberboard container which creates an opening? If not, how do we differentiate between typical damage and damage that results in a failure of the test?
    b. If the inner bag is exposed due to damage to the fiberboard container, but the inner bag remains intact and does not leak, is that a failure?
    c. If the damage is such that the inner bag protrudes from the box, but does not leak, is that a failure?
    d. Is breakage of the closure components, such as tape, considered a rupture?
2. Can the IBC be evaluated for safety, permanent deformation, and/or packaging strength without the presence of the actual wording in the vibration test criteria?

Point of contact for this matter is Mr. Andrew Gesford, DSN 795-5967, (570) 615-5967, fax (570) 615-7823, or e-mail andrew.gesford.civ@mail.mil. Mailing address is: Chief, LOGSA Packaging, Storage, and Containerization Center (AMXLS-PT/Andrew Gesford), 11 Hap Arnold Boulevard, Tobyhanna, PA 18466-5097.

Sincerely,

John Fitzpatrick
Chief, Logistics Testing and
Applications Division