



U.S. Department
of Transportation

**Research and
Special Programs
Administration**

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

MAY 1 1998

Mr. Bobby Roper
26521 Cardenio
Mission Viejo, CA 92691

Dear Mr. Roper:

This is in response to your letter requesting clarification of proper descriptions and testing of certain types of intermediate bulk containers (IBC's) to be used in transporting solid materials. I apologize for the delay and regret any inconvenience it may have caused. Your questions have been paraphrased and answered as follows.

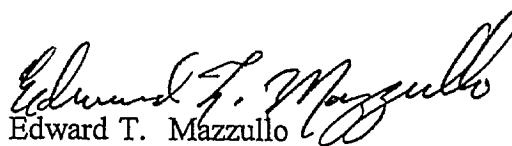
- Q. Is either 11HZ2 or 21HZ2 intermediate bulk container the appropriate description for an open top collapsible or rigid walled plastic multi-trip bin with a flexible plastic bag liner and a lid?
- A. As stated in § 178.707(a)(2), the marking must be completed by replacing the Z with the appropriate capital letter for the material used as the outer packaging. Based on your descriptions, the IBC's in your letter would most likely be described as 11HH2 or 21HH2 IBC's.
- Q. What is the proper marking and testing for a composite IBC constructed as described above, that is loaded by gravity but discharged by either gravity or vacuum?
- A. A composite IBC with a flexible plastic liner that is discharged by vacuum would be considered a UN11HH2 IBC. Discharge by vacuum is not considered discharge under pressure. An IBC discharged by pressure has a potential safety impact of blowing the contents outward in case of rupture. When discharged by vacuum, the failure mode would be the inward collapse of the IBC; no release of hazardous material outside of the IBC would occur. Testing would be as for any other 11HH2 IBC.
- Q. What are the maximum permissible reductions in container dimensions allowed without requiring retesting under the provisions of selective testing? Are shorter or narrower versions of the originally tested and qualified container design permitted as long as it meets the capacity requirement of an IBC?
- A. The maximum allowable reduction in IBC exterior dimensions has not been established at this time. All requests for selective testing will be handled on a case by case basis until those limits are defined. However, it is the responsibility of the IBC manufacturer to assure that each IBC is capable of passing all prescribed tests. The

manufacturer may conduct tests on the design type, or the manufacturer may receive approval for selective testing from the Office of Hazardous Materials Approvals.

- Q. Would a shorter and/or narrower variation container differ from the original tested container design if the width of the container was reduced but the width of the forklift openings remained the same?
- A. Based on the limited information presented, the container appears to be acceptable as a variation under selective testing; however, a formal request for approval would need to be submitted. Additionally, in order for the Office of Hazardous Materials Approvals to conduct a thorough evaluation, the request should provide greater design detail.
- Q. Should the distance or spacing between and the depth of any external and/or internal bosses or ribs be scaled down proportionately to the overall dimensional reduction in order to be considered the same design?
- A. Section 178.801(c)(7) provides that different intermediate bulk container design type is one that differs from a previously qualified intermediate bulk container design type in structural design, size, material of construction, wall thickness, or manner of construction. If internal or external bosses or ribs are scaled down to meet a smaller size, and it affects the structural design, the IBC must be tested as a new design type. Once again, the Office of Hazardous Materials Approvals must approve the qualification of a container using selective testing.

I hope this answers your questions. If we can be of further assistance, please do not hesitate to contact us.

Sincerely,



Edward T. Mazzullo
Director, Office of Hazardous
Materials Standards

26521 Cardenio
Mission Viejo, CA 92691

Male
File 178,700
SC 362, 330
Report

July 12, 1996

The U.S. Dept. of Transportation
Office of Hazardous Materials Standards
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Washington, D.C. 20590
Tel. (202) 366-4488 / Fax (202) 366-8700

RE: Desired clarification concerning the proper classification and testing of certain types of IBCs intended for use in transporting solid materials.

Dear Ladies and Gentlemen:

When I spoke with Bill Gramer yesterday over the telephone, he suggested that I submit my questions in writing and request a formal written interpretation from RSPA. Hence, I have listed my questions below, and I would like you to provide me with the necessary clarification.

To begin with, the type of containers that I am referring to are collapsible and fixed-wall open-top rigid plastic multi-trip bins with provisions for fork truck entry and a lid of some kind that would be secured to the base of the container using plastic or metal strapping, which would be tested and qualified for use in transporting solid hazardous materials in pellet or powder form. The containers would make use of one or two-ply, two mil or thicker flexible plastic bag liners (i.e., seamed polyethylene bags serving as the inner receptacles) in order to perform part of the containment function (i.e., in order to prevent fine particles from spilling out of the containers). Hence, these containers would be classified as either 11HZ2 or 21HZ2-type composite Intermediate Bulk Containers (IBCs) based on their volumetric capacities and manner in which the contents are emptied (i.e., by gravity or under pressure), and some of the smaller containers could perhaps be classified as 6HH5-type composite non-bulk packagings because they would not meet the lower definitional limits for IBCs (i.e., their capacities are less than 0.45 cubic meters, 450 liters, 119 gallons, or 15.9 cubic feet) that are presently found in 49 CFR 178.700(c)(1). Alternatively, Bill indicated that competent authority approval could be sought from RSPA allowing one to classify certain containers with lesser capacities as IBCs because they would be subjected to the same mechanical handling practices of slightly larger capacity containers that meet the definitional limits of IBCs. However, competent authority approval would be contingent upon the ability to demonstrate that the containers would endure three additional drop tests (i.e., impacting the container flat on the most vulnerable or weakest side section, flat on its top surface, and

diagonally on the most vulnerable or weakest bottom corner section using separate containers for each drop if desired), in accordance with Chapter 16 of the UN Recommendations.

Firstly, I require some clarification concerning the proper classification of 11HZ2 and 21HZ2-type composite IBCs, based on the method in which the containers are intended to be emptied of their contents. 49 CFR 178.707(a)(1)(ii) simply states that 11HZ2-type composite IBCs are intended for use in transporting solid materials which are loaded or discharged by gravity; whereas, 49 CFR 178.707(a)(1)(iv) states that 21HZ2-type composite IBCs are intended for solids which are loaded or discharged under pressure. One must reference 49 CFR 178.705(a)(2) in order to get an indication of what is meant by the word "pressure" (i.e., that the contents are loaded or discharged at a gauge pressure greater than 1.45 psi or 10 kPa). However, no distinction is made between positive pressure and negative pressure (i.e., vacuum); which has led me to question whether the previously mentioned containers should be classified, tested, and marked as 21HZ2-type composite IBCs because they would frequently be unloaded using pneumatic conveying equipment that would draw the material out of the container under vacuum (i.e., negative pressure). Yet at other times, these containers would be manually unloaded using shovels, tractor scoops, and etc., which leads one to question if they shouldn't be classified, tested, and marked as 11HZ2-type composite IBCs. To the best of my knowledge, many bulk transferring and conveying systems for pelletized and powdered solids utilize positive displacement or peripheral vacuum pumps that generate somewhere between 8 and 15 inches of mercury (i.e., 3.9 to 7.3 psi or 27 to 50 kPa) of vacuum in transfer lines, hoses, storage vessels, and etc. while operating under normal conditions. However, most all vacuum conveyor systems are vented to atmosphere (e.g., they have air intake or inlet holes which have spring-loaded vacuum relieving valves to prevent various parts of the system from imploding or collapsing inwardly under vacuum). If the containers are to be classified as 21HZ2-type composite IBCs, then 49 CFR 178.801(f) would require the inner receptacles to be production leakproofness tested in accordance with section 178.813 using at least 2.9 psi or 20 kPa of air pressure, in addition to conducting the leakproofness test as part of the initial design qualification and the annual periodic design requalification tests. Needless to say, production leakproofness testing each and every inner receptacle for composite IBCs that are intended to contain solid materials would be cumbersome, and I would tend to question its effectiveness and worth. How should these containers be classified, tested, and marked based on the preceding information? What is the proper classification if the container is loaded under pressure, but discharged by gravity (e.g., a bin which is filled by blowing the solid contents into the container under pressure, and utilizes a hopper gate valve on the bottom of the container to discharge contents)?

Lastly, I require some clarification concerning the permissible reductions in container dimensions, which can be made and do not require one to retest the smaller (i.e., shorter, narrower, and etc.) version or versions of the originally tested and qualified container design type. 49 CFR 178.801(c)(7) defines a different intermediate bulk container design type as follows:

"...One that differs from a previously qualified intermediate bulk container design type in structural design; size; material of construction, wall thickness, or manner of construction, but does not include:

- (i) a packaging which differs in surface treatment;

- (ii) a rigid plastic intermediate bulk container or composite intermediate bulk container which differs with regard to additives;
- (iii) a packaging which differs only in its lesser external dimensions (i.e., height, width, length) provided materials of construction and material thicknesses or fabric weight remain the same;
- (iv) a packaging which differs in service equipment."

However, it does not specify a maximum dimensional reduction (e.g., 25%) like 49 CFR 178.601(g)(3), and the word "or" has been omitted. Consequently, I was wondering whether all of the dimensions (e.g., the length, width, and height of the container) had to be scaled down proportionately? In the absence of the word "or" or "and", it would appear that someone could reduce any one or more of these dimensions to any extent, as long as the capacity of the variation container design types still exceeded the 0.45 cubic meter (i.e., 450 liter, 119 gallon, or 15.9 cubic feet) lower definitional limit for IBCs. Would a shorter and/or narrower variation container differ from the original tested container design type with respect to its structural design, if for example, the overall width of the container was reduced but the width of the fork tine openings along that axis was left their original size? Similarly, would the distance or spacing between and the depth of any external and/or internal bosses or ribs that are intended to strengthen and add rigidity to the container need to be scaled down proportionately to the overall dimensional reduction, in order for a variation container not to be considered a different container design type (please reference the attached illustrations for a better understanding of the nature and magnitude of the container design variations that I am referring to)? Would the same rules apply to the determining whether a non-bulk container is considered to be a different design type or whether it meets the definition of a Variation 3 packaging in accordance with 49 CFR 178.601(g)(3) which reads as follows?

"...Packagings other than combination packagings which are produced with reductions in external dimensions (i.e., length, width, or diameter) up to 25 percent of the dimensions of a tested packaging may be used without further testing provided that an equivalent level of performance is maintained. The packagings must, in all other respects (including wall thicknesses), be identical to the tested design-type."

Please address each of the preceding questions in writing, and feel free to telephone me at (714) 582-6289 if you require any additional information while preparing your response. Otherwise, I will look forward to your receiving your reply.

Sincerely,



Bobby Roper

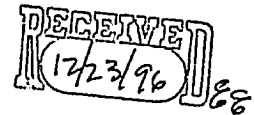
Attachments - Illustrations of container design and dimensional variations.

cc: Bill Gramer

26521 Cardenio
Mission Viejo, CA 92691

Gale

December 9, 1996



Eileen Martin
The U.S. Dept. of Transportation
Office of Hazardous Materials Standards
400 Seventh St., Southwest, Room No. 8102
Washington, D.C. 20590
Tel. (202) 366-8553 / Fax (202) 366-8700

RE: Status of various DOT interpretations that were requested several months ago.

Dear Eileen:

I wanted to take a moment to follow up with you, in order to see what progress your office has made with respect to answering and replying to the more than a half dozen different written request for interpretations that you have received from me over the past several months.

I am directing this correspondence to you, because you have been extremely helpful to me in the past and because I spoke with you on prior occasions about a few of these matters.

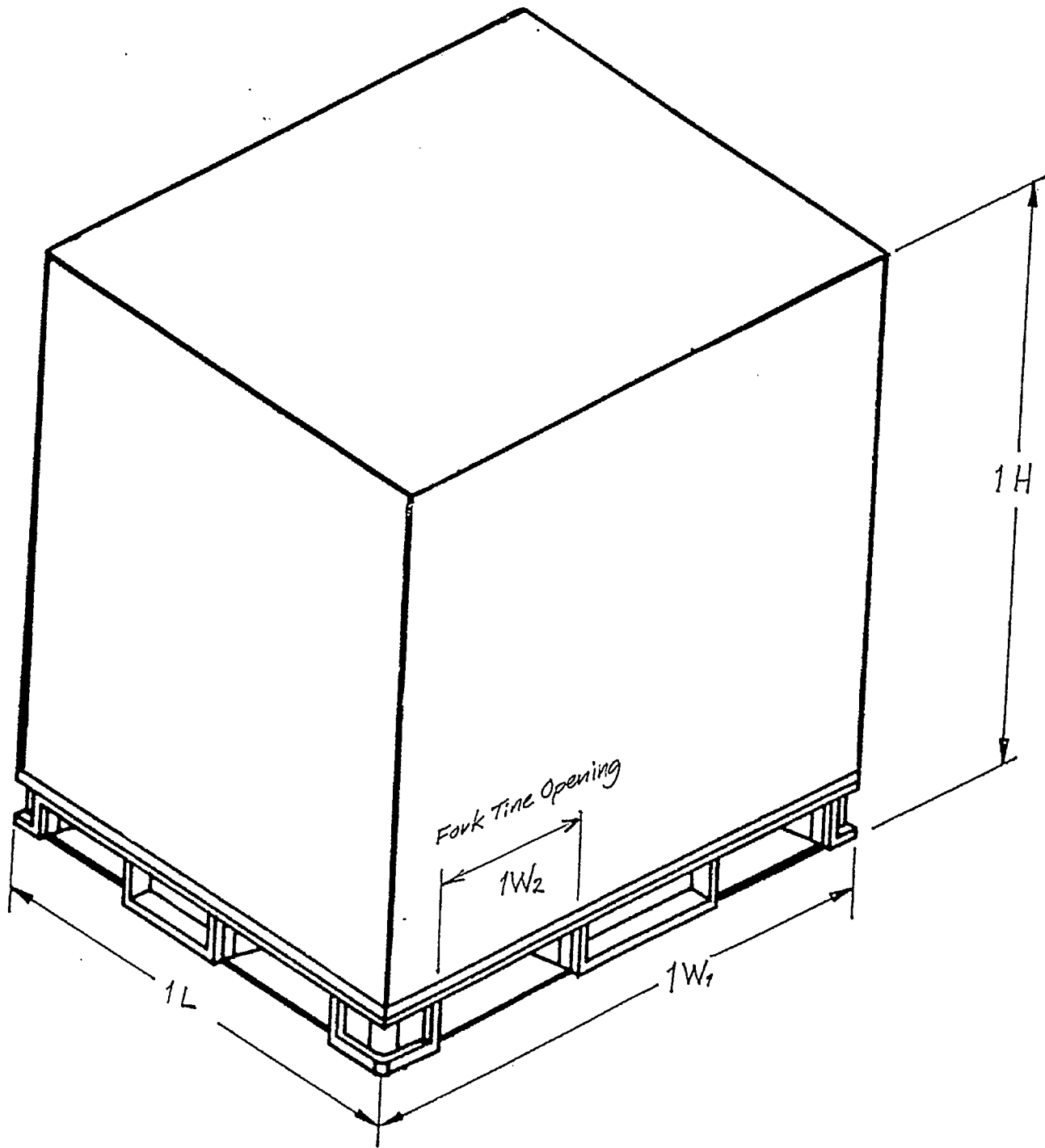
As always, your assistance is greatly appreciated. Please do not hesitate to telephone me at (714) 582-6289, if you should need to reach me for any reason. Best wishes to you and your family, for a terrific holiday season.

Yours truly,

A handwritten signature in cursive script, appearing to read "Bobby Roper".

Bobby Roper

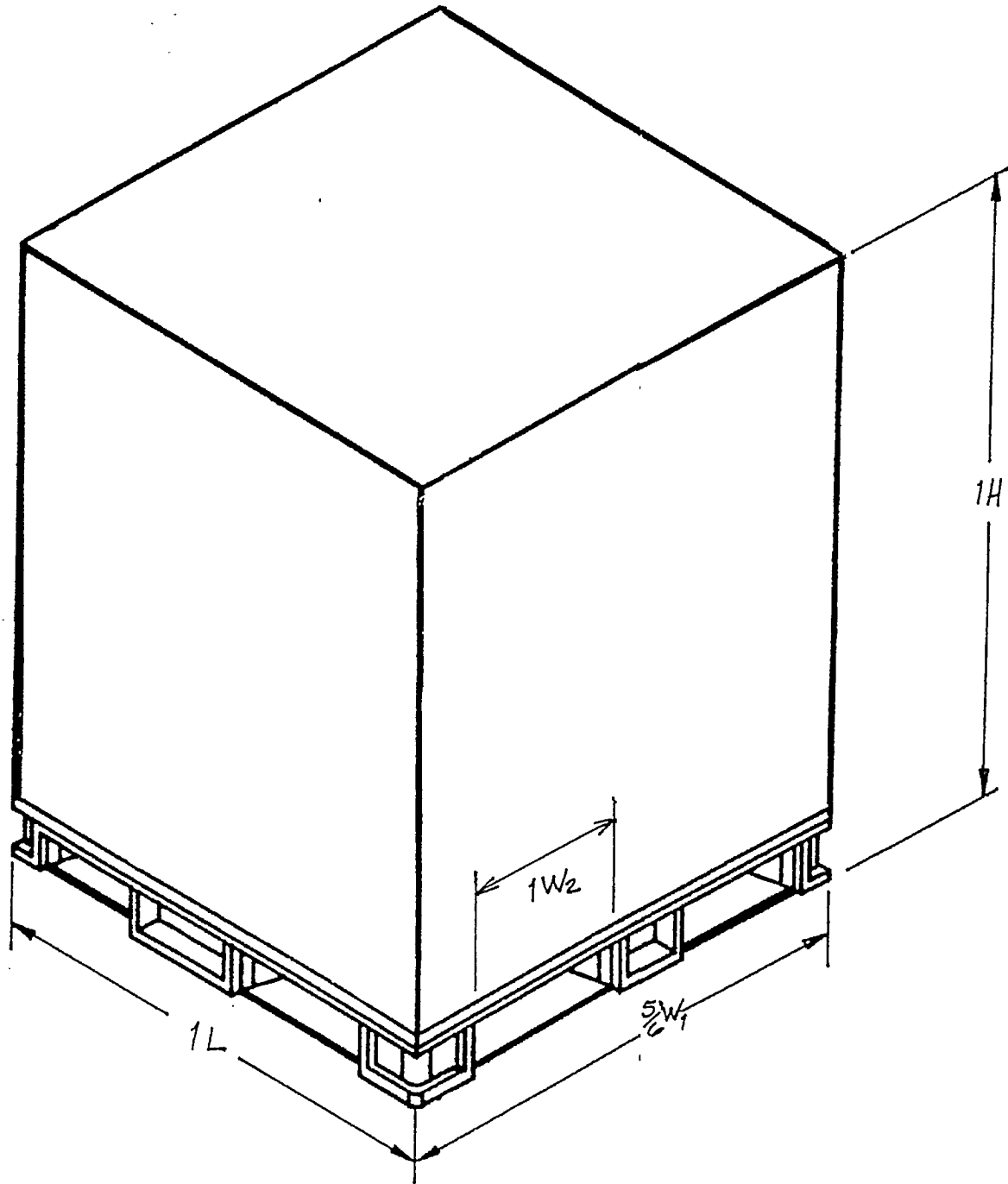
Original tested and qualified container design type.



The letter "L" is used to represent the length dimension,
"W" is used to signify the width, and "H" to denote the height.

Example No. 2

Container which only differs with respect to its lesser width from the originally tested and qualified container design type.



No. 3

Container which differs from the originally tested container design type with regards to its lesser length, width, and height dimensions.

(All dimensions were scaled down to 75% of the dimensions of the originally tested contained design type.)

