



U.S. Department  
of Transportation

**Research and  
Special Programs  
Administration**

NOV 16 1998

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

Mr. Scott Chapman  
The Boeing Company  
Airline Logistics Support  
Dept. P62, MC:DOC6-0021  
3855 Lakewood Boulevard  
Long Beach, California 90846-0001

Ref. No. 98-0284

Dear Mr. Chapman:

This is in response to your letter of September 17, 1998 requesting clarification of the requirements for certification of a UN standard packaging under the Hazardous Materials Regulations (HMR; 49 CFR parts 171-180). Your questions are paraphrased and answered as follows:

Q1. A packaging is tested and certified to a UN standard. The materials of construction are now purchased from a different manufacturer than the originally tested packaging. Must the packagings now be tested and certified as a different packaging?

A. If the materials of construction are virtually identical to the materials in the originally tested packaging no new testing is required. For example, fiberboard that is manufactured by different companies but has identical burst strength, fluting, basis weight, edge crush, etc. may be used interchangeably in a packaging without any further testing regardless of who actually manufactures the materials.

Q2. A facility uses a test report to identify the specifications of the materials of construction requested from a manufacturer and specifies that it is mandatory that the materials of construction have exact or better physical properties. Who is responsible for ensuring that the materials of construction actually meet these standards?

A. Whoever is identified on the packaging as the manufacturer has the responsibility to ensure that the packaging meets the UN standard to which it is certified.

Q3. May the materials of construction be different from the originally tested design type if the materials of construction have stronger properties than those originally tested?

A. The answer is no. Unless it can be ascertained that the materials of construction are virtually identical it is considered a new packaging and subject to design qualification testing.

Q4. If a facility: (1) qualifies a design to a UN standard; (2) documents the packaging design; (3) submits to RSPA a detailed operating procedure outlining procurement and controlled Quality Assurance program could they be granted relief from the periodic retesting requirements of § 178.601(e)?

A. As provided by § 178.601(h) a packaging that is tested using test intervals other than those specified in Subpart M of Part 178 may be used if approved by the Associate Administrator for Hazardous Materials Safety. Instructions for applying for an approval are described in § 107.705.

I hope this information is helpful.

Sincerely,

A handwritten signature in cursive script, appearing to read "Delmer F. Billings".

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



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178.601

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178.601

9/17/98

LaValle  
§178.601

98-0284

**THE BOEING COMPANY  
AIRLINE LOGISTICS SUPPORT  
3855 Lakewood Boulevard  
Long Beach, California  
90846-0001**

**Packaging Engineering Group - Department P62  
Mail Code - MC: D0C6-0021**

DIANE L.

**TO: BOB RICHARD**

**FROM: S. W. CHAPMAN  
Sr. PACKAGING ENGINEER**

**DEPT.: US Department of Transportation  
Research and Special Programs Administration  
Office of Hazardous Materials Safety  
PHONE: (202) 366-0656  
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**SUBJECT: Forming shipments of hazardous materials using UN certified package designs involving packagings contained within packages certified by The Boeing Company and supplied by vendors or packaging material manufacturers, and considering shipments packed in " as tested condition " as required by law.**

BOB,

As per our telephone conversations, questions and answers received by your organization and paragraphs within ICAO technical instructions and CFR 49, I am faxing you this as requested to clarify the use of designed packagings and packages that have passed performance test requirements.

**References:**

ICAO technical instructions

CFR 49 Subpart M - Testing of Non-Bulk Packagings and Packages, Paragraph 178.601 and related paragraphs.

HAZMAT Packager & Shipper March/April 1998 issue page 57 article by Edward T. Mazzullo in reference to paragraph 178.601

Questions and answers replied to me, signed by you for Frits Wybenga June 24 1998 US D.O.T. RSPA - specifically questions 11, 12 and 13.

**Synopsis:** The Boeing Company performs P.O.P. testing for a variety of required package designs to meet and in many cases exceed minimum requirements for testing non-bulk packagings and packages proposed for use to ship regulated hazardous material. The Boeing Company also contracts to third party laboratories for testing of proposed package designs and maintains test reports issued by third party labs and tests reports generated by The Boeing Company. As you may know, mergers have occurred involving Boeing that has required the need to investigate the possibility to form a corporate hazardous material regulatory committee and standardize the way the corporation will regulate shipments of hazardous material. Currently, multiple locations within the US are performing tests and certifications for package designs to cover a variety of regulated hazardous materials. Currently this committee is considering regulating all package materials used to package Hazmat and issue those qualified materials out of one or more location(s). By forming a committee, with ultimate consolidation of efforts across the US, we are attempting to eliminate duplication of effort, streamline the process of formulating hazmat shipments and form common knowledge and understanding to ensure compliance in all respects to conform to Hazardous Materials Regulation.

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My understanding is that if Boeing tests and certifies package designs per the regulations, and we obtain materials used to ship hazardous materials that we ensure are equal to that of the originally UN tested design with regard to "material and thickness", "manner of construction", and in the case of fiberboard packaging materials, meets the Cobb test requirements, that we may do so and consider it to be in "as-tested" condition per the regulations. Regardless of what manufacturing entity, in the case of corrugated fiberboard products, converted the wood chips into paper, converted the paper into corrugated fiberboard sheet-stock, converted the sheet stock into a fiberboard container (4G) etc.... considering only, in the case of a regular slotted carton for instance the lap joint being stitched or glued or in the case of full-telescoping containers, the quantity of staples used to form the container.etc... These processes are considered standard practice in the corrugated container industry and as long as we (Boeing) consider, as in the case of a corrugated fiberboard product:

#### Material

- a) basis weight of the liner-medium combination stipulated in lbs. Per thousand square feet example: 69-42-69 in the case of 275 lb. test corrugated fiberboard,
- b) meets Cobb test requirements,
- c) quality of the paper products such that it will not crack or delaminate when used as intended,

#### Thickness

- d) caliper measurement for thickness of the liners and mediums, and ultimate caliper of the corrugated sheet combined liners and mediums,

#### Manner of construction:

- e) fiberboard formed with water-resistant adhesive, coatings or additives applied etc
- f) style of container
- g) means of joining together or forming of the container etc..

then we meet the requirements of the regulations to produce packaging equivalent to the originally tested package. This same philosophy would apply to all packaging materials used to package and ship Hazmat as well.

**Question 1:** If we (Boeing) test and certify a proposed package design to be used for shipment of hazardous material that is designed using corrugated fiberboard materials and we document components of the package configuration, to the detail as outlined above, to be contained within the body of the test report, could we procure corrugated products from any corrugated products manufacturing/distribution entity that we have qualified to produce their product equal to what is documented on our test report and use these corrugated fiberboard products for production runs or distribution of hazardous materials?

**Question 2:** If we were to use this test report as a procurement specification with a statement added to the effect that these materials to be purchased will be used to ship regulated hazardous materials and it is imperative that we receive their product in the form and with the exact or better physical properties described and contained therein, could we Boeing consider this binding in a court of law or is it still the responsibility of Boeing to maintain a quality control program to ensure shipping hazardous material using equal to or greater than the originally tested package.

**Question 3:** Could we extend the same principal to all packaging supplies obtained through what could be our D.O.T. (RSPA) approved quality assurance program and competitively bid all packaging from any qualified packaging product manufacturer?

I understand that packagings and packages used to ship hazardous materials must be configured, have the same structural integrity and physical properties as the originally tested package configuration. I also understand the regulation as written to not provide guidelines for using packages that are fabricated using stronger or thicker wall thickness to ship production runs/distribution of packages containing regulated hazardous materials.

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**Question 4:** Could we (Boeing) test and certify package designs that are fabricated and documented to have weaker properties or less-than or thinner wall thickness than the intended package to be used for production runs / distribution of hazardous material and actually ship a stronger container? (with respect to material and thickness as outlined above)

Example: Test and certify a corrugated fiberboard container using 200 lb test corrugated fiberboard consisting of 42 - 26 - 42 liner/medium combination but order and ship at our discretion using 275 lb test corrugated fiberboard container consisting of a 69 - 42 - 69 liner medium combination.

**Question 5:** If the answer to Question 4 is yes, how much stronger with regard to material and thickness is acceptable?

By not having a "greater than" defined specifically speaking about corrugated fiberboard products, and not allowing a built-in safety factor, a manufacturer/shipper of UN tested packages is sure to vary to the lesser-than category when using corrugated fiberboard products.

This concept would enable shippers of Hazmat to better control the variance within the corrugated fiberboard products industry. During the five years as a packaging engineer in the paperboard industry I was able to see some of the variances associated with procurement, manufacture and delivery of finished corrugated products made from paper roll stock. Right now I know companies are struggling with testing and certifying package designs that have passed previously but failed subsequently due to variance within corrugated fiberboard manufacturing and procurement process. This idea would enable Hazmat package manufacturers to ship with a confidence that a better than tested design is being used for production runs or distribution of hazardous materials.

Being in the Aerospace packaging industry, providing designs and performing testing, I also have seen the differences in cushioning mediums with regards to shock and vibration transmissibility. By building a stronger package, you could conceivably change shock and vibration mitigation ultimately changing levels transmitted to the inner packaging, specifically for the drop test, therefore, consideration in acceptable variance to greater-than should be reviewed.

**Question 6:** If Boeing qualifies a design as required by UN standards and documents to the detail outlined above for any proposed Hazmat packaging design and provides to the Department of Transportation (RSPA) a detailed operating procedure outlining procurement, controlled Quality Assurance program for all incoming packaging materials proposed to be used for shipment of Hazmat and copies of all proposed designs to be implemented and their intended use, could Boeing be granted relief from the periodic re-test requirements of two years for combination packages and one year for single or composite packagings used for non-bulk packaging as stated in 178.601 4(e)?

**Question 7:** Could periodic re-test requirements be waived until a design change or procurement function or quality assurance program changes?

**Question 8:** What is required and/or what is the process for obtaining relief from periodic re-testing of a documented, certified packaging design?

#### Conclusion:

If a design type is proven / certified to survive an environment normally incident to transportation, and it is a requirement to duplicate that certified package "as tested" for all subsequent use in shipments, and a sampling and vendor qualification process is maintained, what value is added to perform a test on what is in essence a 1 second to 5 minute run sampling of proposed to be used packaging components every one or two years? It is my opinion the requirement to qualify a vendors product by sampling received shipments and documenting specific physical properties regarding "material and thickness" and "manner of construction" would be more effective than re-testing an already proven design concept sampled every one or two years. We are required to ship "as-tested" condition packages of a proven design type. Variables would be more readily captured by sampling subsequent shipments if standard sampling procedure is adopted to check "manner of construction" and "material and thickness" for the specific packaging commodity proposed for use. Specific checks and balances could prove more reliable and ensure hazardous material is shipped in qualified packaging. A sampling procedure approved by the D.O.T. implemented by the UN certified package manufacturer would eliminate redundant design qualification and ensure design duplication for all subsequent use.

Thank you,

Sincerely

