



U.S. Department  
of Transportation

**Pipeline and Hazardous  
Materials Safety  
Administration**

1200 New Jersey Avenue, SE  
Washington, DC 20590

May 12, 2020

Mark B. Hawk  
Packaging Management Council Coordinator  
8116 Villa Grande Lane  
Knoxville, TN 37938

Reference No. 20-0018

Dear Mr. Hawk:

This letter is in response to your February 25, 2020, letter requesting clarification of the Hazardous Materials Regulations (HMR; 49 CFR Parts 171-180) applicable to Type A packaging free drop test requirements.

We have paraphrased and answered your questions as follows:

- Q1. You ask whether the reference to “safety features” in § 173.465(c) is referring to the parts of the Type A packaging that meet the performance requirements in § 173.412(j).
- A1. The answer is yes. Section 173.465 details the requirements for Type A packaging tests, and to be considered successful, the packaging must meet the requirements of § 173.412(j).
- Q2. You ask whether the requirement in § 173.412(j)(2) that the packaging prevent “a significant increase in radiation levels recorded or calculated at the external surfaces for the condition before the test” means that a significant decrease in radiation levels at the surface of the package does not need to be considered.
- A2. The answer is yes. Section 173.412(j)(2) requires that the packaging will prevent “a significant increase in radiation levels recorded or calculated at the external surfaces for the condition before the test.” If after the free drop test in § 173.465(c) there is not a significant increase in radiation levels at the external surface of the package, the package is considered to have met the requirements in § 173.412(j)(2).

- Q3. You ask whether the requirement in § 173.412(j)(2) that the packaging prevent “a significant increase in radiation levels recorded or calculated at the external surfaces for the condition before the test” means that a significant increase or decrease in radiation levels at 1 meter from the surface of the package does not need to be considered as a performance standard.
- A3. The answer is yes. See A2.
- Q4. You ask whether the safety features of the Type A packaging need to be clearly identified prior to performing the free drop test in § 173.465(c) and any damage to the packaging be described on the test report after conducting the free drop test.
- A4. The answer is yes, if testing a DOT Specification 7A packaging subject to § 173.465. Section 173.415(a)(1)(i) requires documentation of testing for packagings subjected to the physical tests of § 173.465, and if applicable, § 173.466. This documentation includes a detailed description of each test performed and the damage to each item of the containment system resulting from the test. For other Type A packaging, see §§ 173.415(b)-(d) for their requirements.
- Q5. You ask how it is expected to determine the worst-case drop orientation for the Type A packaging to suffer maximum damage in § 173.465(c). You also ask if multiple drop orientations might be needed.
- A5. As noted, § 173.465(c) requires that the Type A packaging be dropped onto the target so as to suffer maximum damage to the safety features. The Type A packaging and testing requirements are performance oriented and this Office is not able to determine the most appropriate orientation method for any one specific packaging configuration. There is no restriction to conducting multiple drop orientations to determine the worst-case drop orientation in order to meet § 173.465(c).
- Q6. You ask when testing a Type A packaging containing fissile material, whether after performing the § 173.465(c)(2) free drop test, the packaging needs to be evaluated for any damage and then determine the orientation for maximum damage prior to performing the free drop test in § 173.465(c)(1).

A6. As required in § 173.465(c)(2), for packages containing fissile material, the free drop test in § 173.465(c)(1) must be preceded by a free drop from a height of 0.3 m (1 ft.) on each corner, or in the case of cylindrical packages, onto each of the quarters of each rim. After this test is conducted, the free drop test in § 173.165(c)(1) must be performed and the package must be dropped onto the target so as to suffer maximum damage to the safety features.

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

Sincerely,

A handwritten signature in blue ink, appearing to read 'Dirk Der Kinderen', written in a cursive style.

Dirk Der Kinderen  
Chief, Standards Development Branch  
Standards and Rulemaking Division

Geller  
20-0018

**January, Ikeya CTR (PHMSA)**

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**From:** INFOCNTR (PHMSA)  
**Sent:** Wednesday, February 26, 2020 11:02 AM  
**To:** Hazmat Interps  
**Subject:** FW: Request for Clarification  
**Attachments:** Request for Clarification - Type A Testing 2-25-2020.pdf; Mark Hawk Letter.docx

Hello Alice and Ikeya,

Attached is a request for Letter of Interpretation.

Thanks,

Jonathon, HMIC

**From:** Mark Hawk [mailto:[hawkn14@gmail.com](mailto:hawkn14@gmail.com)]  
**Sent:** Tuesday, February 25, 2020 9:40 AM  
**To:** INFOCNTR (PHMSA) <INFOCNTR.INFOCNTR@dot.gov>  
**Subject:** Request for Clarification

To Whom It May Concern:

Attached is a request for clarification concerning Free Drop Testing of Type A packages.

If you have any questions, please contact me.

Best Regards,

Mark B. Hawk  
Packaging Management Council Coordinator  
8116 Villa Grande Lane  
Knoxville, TN 37938  
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February 25, 2020

Standards and Rulemaking Division  
Pipeline and Hazardous Materials Safety Administration (PHMSA)  
U.S. Department of Transportation (DOT)  
East Building  
1200 New Jersey Avenue, SE  
Washington, CE 20590-0001

Subject: Request for Clarification Concerning 49 CFR 173.465(c), Type A Packaging Free Drop Testing

Dear Sir/Madam:

Clarifications to the questions below are requested as to the method(s) allowed by the DOT/PHMSA for performing free drop testing of Type A packages in accordance with 49 CFR 173.465(c) and a question as to the result of the tests as stipulated in 173.412(j)(2).

Question 1:

Is the correct understanding of the term “safety features” in 49 CFR 173.465(c), those components of a packaging that provide reasonable assurance they will perform their intended safety function and prevent loss or disposal of the radioactive content and prevent an increase in radiation levels at the external surface, as stipulated in 173.412(j)?

Question 2:

49 CFR 173.412(j) states “When evaluated against the performance requirements...the packaging will prevent – (2) A significant *increase* in the radiation levels recorded or calculated *at the external surface* for the condition before the test.”

Is the explicit reference to a significant “increase” in radiation levels “at the external surface” intended to imply that:

- ...a significant *decrease* at the surface need not be considered as a performance standard?
- ...a significant *increase* or *decrease* at 1 meter need not be considered as a performance standard?

Either of these conditions may imply a change in the internal shielding configuration or could mean that a post-test (or en route or post-shipment) condition would require a different Transport Index or label.

Question 3:

Prior to performing testing described in 173.465(c)(1) and (c)(2), must the safety features (173.465(c)) be clearly identified and the resulting test report describe the damage, if any, to the safety features?

Question 4:

Prior to performing testing described in 173.465(c)(1) and (c)(2), how does DOT/PHMSA expect the tester to determine the worst-case drop orientation to suffer maximum damage to the safety features being tested? In 49 CFR 173.465(c)(1) and (c)(2), it appears to only require one test specimen; however, it seems as though it could take multiple test specimens and multiple drop orientations to actually challenge the safety features in question?

Question 5:

After performing the 1 foot free drop tests in 49 CFR 173.465(c)(2) and prior to performing the free drop test in 49 CFR 173.465(c)(1), does the tester have to evaluate the damage from the 1 foot drop tests, and then determine the worst case drop orientation (angle of drop, point of impact, etc.) that will cause the maximum damage to the safety features prior to performing the 49 CFR 173.465(c)(1) free drop test?

Your clarification of these issues will be appreciated.

Respectfully,

Mark B. Hawk  
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