

Standard DOT 7A Type A Packaging Compliance Checklist

Prepared for the U.S. Department of Energy
Assistant Secretary for Environmental Management

Contractor for the U.S. Department of Energy
under Contract DE-AC06-08RL14788

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DOT 7A TYPE A PACKAGING COMPLIANCE CHECKLIST FOR: _____

1.0 PURPOSE AND SCOPE

The purpose of this compliance checklist is to ensure DOT 7A Type A packages procured for use on the Hanford Site comply with the U.S. Department of Transportation (DOT) regulations provided in 49 CFR Subchapter C, "Hazardous Materials Regulations." This checklist identifies the applicable requirements from the regulations and provides the supplier an effective method to reference the necessary documentation for compliance.

This DOT 7A Type A packaging compliance checklist does not include requirements for the following types of packaging options:

- Fissile material: 49 CFR §173.417, §173.465(c)(2)
- Special form material: 49 CFR §173.469
- Packages designed for liquids and/or gases: 49 CFR §173.412(k), §173.412(l), §173.466
- Transportation by aircraft: 49 CFR §173.27
- Tank cars, or cargo tanks: 49 CFR §173.31, §173.32, §173.33, §173.35

2.0 AUTHORIZED CONTENTS

2.1 Radiological

The shipping container is authorized to contain up to an A₂ quantity or radioactive material in accordance with 49 CFR §173, or can be used for onsite shipments in accordance with DOE/RL-2001-0036, Hanford Sitewide Transportation Safety Document (TSD).

2.2 Weight/Density

Identify the total weight in kilograms for the material in which the radioactivity is distributed.

Total weight of the contents _____ kilograms

Identify the density of the contents and if any concentrated loads are acceptable.

Density of the contents _____ (kg/m³)

Density of authorized concentrated loads _____ (kg/m³)

Notes:

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2.2.1 Payload Material Description

Determine the physical form of the allowable contents. When solids are authorized, identify the acceptable form 1, 2, or 3 as described below. For heavy, bulky materials (e.g., concrete chunks, motors, and pumps), equipment/materials with sharp corners or protrusions, or material/equipment geometries that could result in highly localized forces, ensure that the contents are securely fastened/positioned within the package to prevent damage to the packaging.

Physical Form:

Allowable Contents	Representative Contents During Testing	Possible Package Contents as Authorized by Shipper After Analysis
<input type="checkbox"/>	Material Form No. 1 Solids—any particle size	Includes all solid particulate contamination. A packaging qualified for use with this material form is expected to contain radioactive contents of any representative particulate form (from the smallest physically possible particle size to the largest particle that will fit within the packaging).
<input type="checkbox"/>	Material Form No. 2 Solids—large particle size only (i.e., sand, concrete, debris, soil)	Contents of a corresponding particle size, such as soil or construction debris. As a cautionary note when loading the packaging, if the content has sharp edges the shipper/offeree should ensure the sharp edges are covered with cushioning material so as not to puncture the packaging [49 CFR 173.24a(a)]. Glass or plastic laboratory ware having fine particulates available for dispersion would not fit this category and would require a packaging qualified for fine particulate, Form No. 1.
<input type="checkbox"/>	Material Form No. 3 Solids—material with no removable or dispersible contamination (see 49 CFR 173.443)	(1) Metals with activation products; (2) forms of metals/alloys/compounds of uranium and thorium; (3) solid materials with the radioactive material firmly fixed in place, possibly by the application of a fixing medium such as paint; (4) solidified material. As a cautionary note when loading the packaging, if the content has sharp edges the shipper/offeree should ensure the sharp edges are covered with cushioning material so as not to puncture the packaging [49 CFR 173.24a(a)].

Additional Description:

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2.2.2 Thermal

If evaluated, provide the maximum decay heat and/or total heat load allowed in the container.

Total wattage from decay heat: _____ (watts/package)

Total wattage from other sources: _____ (watts/package)

Total wattage of contents: _____ (watts/package)

Notes:

2.2.3 Chemical

Identify any non-radioactive hazardous materials that have been evaluated for shipment in the container. This list of hazardous materials could include the identification of materials that are explosive, flammable, poisonous, combustible, dangerous when wet, oxidizers, corrosives, irritants, or another hazard. If no hazardous materials have been evaluated for acceptability, state that. If certain hazardous materials or other materials are known to be incompatible with the packaging, identify those materials. Chemical Compatibility

List the chemical properties that may make the material being shipped incompatible with common packaging materials.

Hazardous Materials Acceptable for Shipment in Container:
Hazardous or Other Materials Known to be Incompatible with Container:

3.0 REGULATORY REQUIREMENTS

All regulations applicable to DOT 7A Type A packagings that are applicable to container manufacturers are listed below (excluding those items identified in Section 1.0). In the spaces provided, please indicate how each regulatory requirement is met for the container. If the requirement is met by reference to other tests, copies of those test reports, as well as a detailed evaluation that provides the basis for utilizing the conclusions of those other tests is required.

Many sections of these 49 CFR 173 sections only apply to the shippers, and these sections have been removed to reduce the size of this listing. However, some parts of the listed regulations may still not apply to manufacturers of specific items. In those instances, please indicate that these regulations are “not applicable” and justify that conclusion.

3.1 49 CFR §173.24 General Requirements for Packagings and Packages

3.1.1 173.24(b) Containment

(b) Each package used for the shipment of hazardous materials under this subchapter shall be designed, constructed, maintained, filled, its contents so limited, and closed, so that under conditions normally incident to transportation--

- (1) Except as otherwise provided in this subchapter, there will be no identifiable (without the use of instruments) release of hazardous materials to the environment;*
- (2) The effectiveness of the package will not be substantially reduced; for example, impact resistance, strength, packaging compatibility, etc. must be maintained for the minimum and maximum temperatures, changes in humidity and pressure, and shocks, loadings and vibrations, normally encountered during transportation;*

These requirements apply to DOT 7A Type A packagings. Documentation of the ability of the packaging to meet the more severe requirements of 49 CFR §173, Subpart I, can be used to document compliance. Indicate below the type of documentation that shows these requirements are met and where the documentation can be found.

- Addressed in:
- | | |
|------------------------------------------------|------------------------------------------|
| <input type="checkbox"/> Drawing | <input type="checkbox"/> Analysis Report |
| <input type="checkbox"/> Specification | <input type="checkbox"/> Test Report |
| <input type="checkbox"/> Operating Instruction | <input type="checkbox"/> Other |

Specify:

3.1.2 173.24(d) Specification Packagings and UN Standard Packagings Manufactured Outside the U.S.--

(d) Specification packagings and UN standard packagings manufactured outside the U.S.--

- (1) Specification packagings. A specification packaging, including a UN standard packaging manufactured in the United States, must conform in all details to the applicable specification or standard in part 178 or part 179 of this subchapter.*

A DOT 7A Type A packaging is a specification packaging. Documentation of the ability of the package to meet the packaging requirements identified in 49 CFR §173.415(a) will document compliance with this requirement. Indicate below the type of documentation that shows this requirement is met and where the documentation can be found.

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Addressed in: Drawing Analysis Report
 Specification Test Report
 Operating Instruction Other

Specify:

(2) *UN standard packagings manufactured outside the United States.* This is assumed to not apply. If a foreign-built packaging is utilized, this section must be completed.

3.1.3 173.24(f) Closures

(f) *Closures.*

(1) *Closures on packagings shall be so designed and closed that under conditions (including the effects of temperature, pressure and vibration) normally incident to transportation--*

(i) *Except as provided in paragraph (g) of this section, there is no identifiable release of hazardous materials to the environment from the opening to which the closure is applied; and*

(ii) *The closure is leakproof and secured against loosening. For air transport, stoppers, corks or other such friction closures must be held in place by positive means.*

(2) *Except as otherwise provided in this subchapter, a closure (including gaskets or other closure components, if any) used on a specification packaging must conform to all applicable requirements of the specification and must be closed in accordance with information, as applicable, provided by the manufacturer's notification required by §178.2 of this subchapter.*

These requirements apply to DOT 7A Type A packagings. Indicate below the type of documentation that shows the requirements are met and where the documentation can be found.

Addressed in: Drawing Analysis Report
 Specification Test Report
 Operating Instruction Other

Specify:

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3.1.4 173.24(g) Venting

(g) Venting. Venting of packagings, to reduce internal pressure which may develop by the evolution of gas from the contents, is permitted only when--

- (1) Except for shipments of cryogenic liquids as specified in § 173.320(c) and of carbon dioxide, solid (dry ice), transportation by aircraft is not involved;*
- (2) Except as otherwise provided in this subchapter, the evolved gases are not poisonous, likely to create a flammable mixture with air or be an asphyxiant under normal conditions of transportation;*
- (3) The packaging is designed so as to preclude an unintentional release of hazardous materials from the receptacle;*
- (4) For bulk packagings, other than IBCs, venting is authorized for the specific hazardous material by a special provision in the §172.101 table or by the applicable bulk packaging specification in part 178 of this subchapter; and*
- (5) Intermediate bulk packagings (IBCs) may be vented when required to reduce internal pressure that may develop by the evolution of gas subject to the requirements of paragraphs (g)(1) through (g)(3) of this section. The IBC must be of a type that has successfully passed (with the vent in place) the applicable design qualification tests with no release of hazardous material.*

These requirements apply to DOT 7A Type A packagings that are vented. The requirements are not applicable to nonvented DOT 7A Type A packagings. Based on the design, determine if the requirements apply or do not apply. If the requirements apply, indicate below the type of documentation that shows the requirements are met and where the documentation can be found.

- This requirement: Does not apply. Applies; indicate the following.
- Addressed in: Drawing Analysis Report
- Specification Test Report
- Operating Instruction Other

Specify:

3.2 49 CFR §173.24a Additional General Requirements for Non-bulk Packagings and Packages

3.2.1 173.24a(a) Packaging design

(a) *Packaging design. Except as provided in §172.312 of this subchapter:*

(2) *Friction. The nature and thickness of the outer packaging must be such that friction during transportation is not likely to generate an amount of heat sufficient to alter dangerously the chemical stability of the contents.*

This requirement applies to non-bulk DOT 7A Type A packagings. Indicate below the type of documentation that shows this requirement is met and where the documentation can be found.

Addressed in: Drawing Analysis Report
 Specification Test Report
 Operating Instruction Other

Specify:

(3) *Securing and cushioning. Inner packagings of combination packagings must be so packed, secured and cushioned to prevent their breakage or leakage and to control their shifting within the outer packaging under conditions normally incident to transportation. Cushioning material must not be capable of reacting dangerously with the contents of the inner packagings or having its protective properties significantly weakened in the event of leakage.*

This requirement applies to DOT 7A Type A packagings that meet the definition of a combination packaging. The requirement does not apply to non-combination packagings. Based on the packaging type, indicate if the requirement applies or does not apply. If the requirement applies, indicate below the type of documentation that shows the requirement is met and where the documentation can be found.

This requirement: Does not apply. Applies; indicate the following.
Addressed in: Drawing Analysis Report
 Specification Test Report
 Operating Instruction Other

Specify:

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(4) Metallic devices. Nails, staples and other metallic devices shall not protrude into the interior of the outer packaging in such a manner as to be likely to damage inner packagings or receptacles.

This requirement applies to DOT 7A Type A packagings that use devices that could protrude into the interior of the outer packaging. Based on the packaging design, indicate if the requirement applies or does not apply. If the requirement applies, indicate below the type of documentation that shows the requirement is met and where the documentation can be found.

This requirement: Does not apply. Applies; indicate the following.
Addressed in: Drawing Analysis Report
 Specification Test Report
 Operating Instruction Other

Specify:

(5) Vibration. Each non-bulk package must be capable of withstanding, without rupture or leakage, the vibration test procedure specified in §178.608 of this subchapter.

This requirement applies to non-bulk DOT 7A Type A packagings. Indicate below the type of documentation that shows this requirement is met and where the documentation can be found.

Addressed in: Drawing Analysis Report
 Specification Test Report
 Operating Instruction Other

Specify:

3.3 49 CFR §173.24b Additional General Requirements for Bulk Packagings

3.3.1 173.24b(c) Pressurized Loading

(c) Air pressure in excess of ambient atmospheric pressure may not be used to load or unload any lading which may create an air-enriched mixture within the flammability range of the lading in the vapor space of the tank.

This requirement applies to IP-1 packagings that meet the definition of bulk packaging. Based on the packaging design and load, indicate if the requirement applies or does not apply. If the

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requirement applies, indicate below the type of documentation that shows the requirement is met and where the documentation can be found.

This requirement: Does not apply. Applies; indicate the following.
Addressed in: Drawing Analysis Report
 Specification Test Report
 Operating Instruction Other

Specify:

3.3.2 173.24b(e) Stacking of IBCs and Large Packagings

(e) Stacking of IBCs and Large Packagings.

(1) IBCs and Large Packagings not designed and tested to be stacked. No packages or freight (hazardous or otherwise) may be stacked upon an IBC or a Large Packaging that was not designed and tested to be stacked upon.

(2) IBCs and Large Packagings designed and tested to be stacked. The superimposed weight placed upon an IBC or a Large Packaging designed to be stacked may not exceed the maximum permissible stacking test mass marked on the packaging.

The requirements are intended to cover the use of Intermediate Bulk Containers and Large packagings, and are not necessarily intended for DOT -7A Type A packagings. Consideration of the above restrictions should be given.

This requirement: Does not apply. Applies; indicate the following.
Addressed in: Drawing Analysis Report
 Specification Test Report
 Operating Instruction Other

Specify:

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3.4 49 CFR §173.410 General Design Requirements

3.4.1 173.410(a) Handling and Securing

In addition to the requirements of subparts A and B of this part, each package used for the shipment of Class 7 (radioactive) materials must be designed so that--

(a) The package can be easily handled and properly secured in or on a conveyance during transport.

This requirement applies to DOT 7A Type A packagings. Indicate below the type of documentation that shows this requirement is met and where the documentation can be found.

- Addressed in:
- | | |
|------------------------------------------------|------------------------------------------|
| <input type="checkbox"/> Drawing | <input type="checkbox"/> Analysis Report |
| <input type="checkbox"/> Specification | <input type="checkbox"/> Test Report |
| <input type="checkbox"/> Operating Instruction | <input type="checkbox"/> Other |

Specify:

3.4.2 173.410(b) Lifting Attachments

(b) Each lifting attachment that is a structural part of the package must be designed with a minimum safety factor of three against yielding when used to lift the package in the intended manner, and it must be designed so that failure of any lifting attachment under excessive load would not impair the ability of the package to meet other requirements of this subpart. Any other structural part of the package which could be used to lift the package must be capable of being rendered inoperable for lifting the package during transport or must be designed with strength equivalent to that required for lifting attachments.

These requirements apply to DOT 7A Type A packagings. Indicate below the type of documentation that shows these requirements are met and where the documentation can be found.

- Addressed in:
- | | |
|------------------------------------------------|------------------------------------------|
| <input type="checkbox"/> Drawing | <input type="checkbox"/> Analysis Report |
| <input type="checkbox"/> Specification | <input type="checkbox"/> Test Report |
| <input type="checkbox"/> Operating Instruction | <input type="checkbox"/> Other |

Specify:

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3.4.3 173.410(c) External Surface Protrusions, Decontamination

(c) The external surface, as far as practicable, will be free from protruding features and will be easily decontaminated.

These requirements apply to DOT 7A Type A packagings. Indicate below the type of documentation that shows these requirements are met and where the documentation can be found.

- Addressed in:
- | | |
|------------------------------------------------|------------------------------------------|
| <input type="checkbox"/> Drawing | <input type="checkbox"/> Analysis Report |
| <input type="checkbox"/> Specification | <input type="checkbox"/> Test Report |
| <input type="checkbox"/> Operating Instruction | <input type="checkbox"/> Other |

Specify:

3.4.4 173.410(d) Outer Layer - Pockets, Crevices (Water Collection)

(d) The outer layer of packaging will avoid, as far as practicable, pockets or crevices where water might collect.

- Addressed in:
- | | |
|------------------------------------------------|------------------------------------------|
| <input type="checkbox"/> Drawing | <input type="checkbox"/> Analysis Report |
| <input type="checkbox"/> Specification | <input type="checkbox"/> Test Report |
| <input type="checkbox"/> Operating Instruction | <input type="checkbox"/> Other |

Specify:

3.4.5 173.410(e) Features Added at Time of Transport

(e) Each feature that is added to the package will not reduce the safety of the package.

This requirement applies to DOT 7A Type A packagings that have features added at the time of shipment. Based on the packaging design, indicate below if the requirement applies or does not apply. If the requirement applies, indicate the type of documentation that shows this requirement is met and where the documentation can be found.

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This requirement: Does not apply. Applies; indicate the following.

Addressed in: Drawing Analysis Report

Specification Test Report

Operating Instruction Other

Specify:

3.4.6 173.410(f) Acceleration, Vibration

(f) The package will be capable of withstanding the effects of any acceleration, vibration or vibration resonance that may arise under normal conditions of transport without any deterioration in the effectiveness of the closing devices on the various receptacles or in the integrity of the package as a whole and without loosening or unintentionally releasing the nuts, bolts, or other securing devices even after repeated use (see §§173.24, 173.24a, and 173.24b).

These requirements apply to DOT 7A Type A packagings. Indicate below the type of documentation that shows these requirements are met and where the documentation can be found.

Addressed in: Drawing Analysis Report

Specification Test Report

Operating Instruction Other

Specify:

3.4.7 173.410(g) Physical/Chemical Compatibility, Irradiation

(g) The materials of construction of the packaging and any components or structure will be physically and chemically compatible with each other and with the package contents. The behavior of the packaging and the package contents under irradiation will be taken into account.

This requirement applies to DOT 7A Type A packagings. The container manufacturer can only attest that the packaging and any components or structure are physically and chemically compatible with each other. The shipper is responsible for ensuring compatibility with the package contents. Indicate below the type of documentation that shows this requirement is met and where the documentation can be found.

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Addressed in: Drawing Analysis Report
 Specification Test Report
 Operating Instruction Other

Specify:

3.4.8 173.410(h) Valves - Protection, Enclosure

(h) All valves through which the package contents could escape will be protected against unauthorized operation.

This requirement applies to DOT 7A Type A packagings that have valves. Based on the packaging design, determine if the requirement applies or does not apply. If the requirement applies, identify the type of documentation that shows this requirement is met and where the documentation can be found.

This requirement: Does not apply. Applies; indicate the following.
Addressed in: Drawing Analysis Report
 Specification Test Report
 Operating Instruction Other

Specify:

3.5 49 CFR §173.412 Additional Design Requirements for Type A Packages

3.5.1 173.412 Tamper Indication

In addition to meeting the general design requirements prescribed in §173.410, each Type A packaging must be designed so that--

(a) The outside of the packaging incorporates a feature, such as a seal, that is not readily breakable, and that, while intact, is evidence that the package has not been opened. In the case of packages shipped in closed transport vehicles in exclusive use, the cargo compartment, instead of the individual packages, may be sealed.

This requirement applies to DOT 7A Type A packagings. Indicate below the type of documentation that shows this requirement is met and where the documentation can be found.

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- Addressed in: Drawing Analysis Report
 Specification Test Report
 Operating Instruction Other

Specify:

3.5.2 173.412(b) Smallest External Dimension

(b) The smallest external dimension of the package is not less than 10 centimeters (4 inches);

This requirement applies to DOT 7A Type A packagings. Indicate below the type of documentation that shows this requirement is met and where the documentation can be found.

- Addressed in: Drawing Analysis Report
 Specification Test Report
 Operating Instruction Other

Specify:

3.5.3 173.412(c) Containment and Shielding

(c) Containment and shielding is maintained during transportation and storage in a temperature range of -40 °C (-40 °F) to 70 °C (158 °F). Special attention shall be given to liquid contents and to the potential degradation of the packaging materials within the temperature range.

This requirement applies to DOT 7A Type A packagings. Indicate below the type of documentation that shows this requirement is met and where the documentation can be found. Ensure that all packaging components and materials, not just the gasket system, are addressed by this documentation.

- Addressed in: Drawing Analysis Report
 Specification Test Report
 Operating Instruction Other

Specify:

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3.5.4 173.412(d) Secure Containment System

(d) The packaging must include a containment system securely closed by a positive fastening device that cannot be opened unintentionally or by pressure that may arise within the package during normal transport. Special form Class 7 (radioactive) material, as demonstrated in accordance with §173.469, may be considered as a component of the containment system. If the containment system forms a separate unit of the package, it must be securely closed by a positive fastening device that is independent of any other part of the package.

This requirement applies to DOT 7A Type A packagings. Indicate below the type of documentation that shows this requirement is met and where the documentation can be found.

- Addressed in: Drawing Analysis Report
 Specification Test Report
 Operating Instruction Other

Specify:

3.5.5 173.412(f) Reduction of Ambient Pressure

(f) The containment system will retain its radioactive contents under the reduction of ambient pressure to 25 kPa (3.6 psi).

This requirement applies to DOT 7A Type A packagings. Indicate below the type of documentation that shows this requirement is met and where the documentation can be found. If venting is authorized for the transportation mode, vents can be used to satisfy this requirement.

- Addressed in: Drawing Analysis Report
 Specification Test Report
 Operating Instruction Other

Specify:

3.5.6 173.412(g) Valve - Protection, Enclosure

(g) Each valve, other than a pressure relief device, is provided with an enclosure to retain any leakage.

This requirement applies to DOT 7A Type A packagings. Indicate below the type of documentation that shows this requirement is met and where the documentation can be found.

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Addressed in: Drawing Analysis Report
 Specification Test Report
 Operating Instruction Other

Specify:

3.5.7 173.412(h) Shielding (Enclosure)

(h) Any radiation shield that encloses a component of the packaging specified as part of the containment system will prevent the unintentional escape of that component from the shield.

This requirement applies to DOT 7A Type A packagings with features specifically applied for shielding purposes. Indicate below the type of documentation that shows this requirement is met and where the documentation can be found.

This requirement: Does not apply. Applies; indicate the following.
Addressed in: Drawing Analysis Report
 Specification Test Report
 Operating Instruction Other

Specify:

3.5.8 173.412(i) Tiedown (Failure)

(i) Failure of any tie-down attachment that is a structural part of the packaging, under both normal and accident conditions, must not impair the ability of the package to meet other requirements of this subpart.

This requirement applies to DOT 7A Type A packagings. Indicate below the type of documentation that shows this requirement is met and where the documentation can be found.

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Addressed in: Drawing Analysis Report
 Specification Test Report
 Operating Instruction Other

Specify:

3.5.9 173.412(j) Evaluation and Testing

(j) When evaluated against the performance requirements of this section and the tests specified in §173.465 or using any of the methods authorized by §173.461(a), the packaging will prevent--

- (1) Loss or dispersal of the radioactive contents; and*
- (2) A significant increase in the radiation levels recorded or calculated at the external surfaces for the condition before the test.*

NOTE: A significant increase may be defined as, "More than a 20% increase in the maximum radiation level at the external surface of the package." (IAEA 2005, para. 646).

This requirement applies to DOT 7A Type A packagings. Indicate below the type of documentation that shows this requirement is met and where the documentation can be found.

Addressed in: Drawing Analysis Report
 Specification Test Report
 Operating Instruction Other

Specify:

3.6 49 CFR §173.462 Preparation of Specimens for Testing

3.6.1 173.462(a) Inspection

(a) Each specimen (i.e., sample, prototype or scale model) must be examined before testing to identify and record faults or damage, including:

- (1) Divergence from the specifications or drawings;*
- (2) Defects in construction;*
- (3) Corrosion or other deterioration; and*
- (4) Distortion of features.*

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This requirement applies to DOT 7A Type A packagings. Indicate below the type of documentation that shows this requirement is met and where the documentation can be found.

Addressed in: Drawing Analysis Report
 Specification Test Report
 Operating Instruction Other

Specify:

3.6.2 173.462(b) Correction

(b) Any deviation found under paragraph (a) of this section from the specified design must be corrected or appropriately taken into account in the subsequent evaluation.

This requirement applies to DOT 7A Type A packagings. Indicate below the type of documentation that shows this requirement is met and where the documentation can be found.

Addressed in: Drawing Analysis Report
 Specification Test Report
 Operating Instruction Other

Specify:

3.6.3 173.462(c) Identify Containment System

(c) The containment system of the packaging must be clearly specified.

This requirement applies to DOT 7A Type A packagings. Indicate below the type of documentation that shows this requirement is met and where the documentation can be found.

Addressed in: Drawing Analysis Report
 Specification Test Report
 Operating Instruction Other

Specify:

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3.6.4 173.462(d) Identify External Features

(d) The external features of the specimen must be clearly identified so that reference may be made to any part of it.

This requirement applies to DOT 7A Type A packagings. Indicate below the type of documentation that shows this requirement is met and where the documentation can be found.

Addressed in: Drawing Analysis Report
 Specification Test Report
 Operating Instruction Other

Specify:

3.7 49 CFR §173.465 Type A Packaging Tests

3.7.1 173.465(a) Packaging Tests

(a) The packaging, with contents, must be capable of withstanding the water spray, free drop, stacking and penetration tests prescribed in this section. One prototype may be used for all tests if the requirements of paragraph (b) of this section are met.

This requirement applies to DOT 7A Type A packagings. Indicate below the type of documentation that shows this requirement is met and where the documentation can be found.

Addressed in: Drawing Analysis Report
 Specification Test Report
 Operating Instruction Other

Specify:

3.7.2 173.465(b) Water Spray

(b) Water spray test. The water spray test must precede each test or test sequence prescribed in this section. The water spray test must simulate exposure to rainfall of approximately 5 cm (2 inches) per hour for at least one hour. The time interval between the end of the water spray test and the beginning of the next test must be such that the water has soaked in to the maximum extent without appreciable drying of the exterior of the specimen. In the absence of evidence to the contrary, this interval may be assumed to be two hours if the water spray is applied from four

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different directions simultaneously. However, no time interval may elapse if the water spray is applied from each of the four directions consecutively.

This requirement applies to DOT 7A Type A packagings. Indicate below the type of documentation that shows this requirement is met and where the documentation can be found.

- Addressed in: Drawing Analysis Report
 Specification Test Report
 Operating Instruction Other

Specify:

3.7.3 173.465(c) Free Drop

(c) Free drop test. The specimen must drop onto the target so as to suffer maximum damage to the safety features being tested, and:

This requirement applies to DOT 7A Type A packagings. Indicate below the type of documentation that shows this requirement is met and where the documentation can be found.

- Addressed in: Drawing Analysis Report
 Specification Test Report
 Operating Instruction Other

Specify:

3.7.4 173.465(c)(1) Free Drop

(1) The height of the drop measured from the lowest point of the specimen to the upper surface of the target may not be less than the distance specified in table 10, for the applicable package mass. The target must be as specified in §173.465(c)(5). Table 10 is as follows:

Table 10.-- Free Drop Distance for testing Packages to Normal Conditions of Transport	
Packaging mass kilograms (pounds)	Free drop distance Meters (feet)
< mass 5000 (11,000)	1.2 (4)
5000 (11000) mass to 10,000 (22,000)	0.9 (3)

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<i>10,000 (22,000) mass to 15,000 (33,000)</i>	<i>0.6 (2)</i>
<i>> 15,000 (33,000) mass</i>	<i>0.3 (1)</i>

This requirement applies to DOT 7A Type A packagings. Indicate below the type of documentation that shows this requirement is met and where the documentation can be found.

Addressed in: Drawing Analysis Report
 Specification Test Report
 Operating Instruction Other

Specify:

3.7.5 173.465(c)(3) Free Drop

(3) For fiberboard or wood rectangular packages with a mass of 50 kg (110 pounds) or less, a separate specimen must be subjected to a free drop onto each corner from a height of 0.3 m (1 foot).

This requirement applies to rectangular DOT 7A Type A packagings constructed of fiberboard or wood that have a gross weight of 50 kilograms (110 pounds) or less. Based on the materials of construction and the gross weight of the package, indicate below if the requirement applies or not. If the requirement applies, identify the type of documentation that shows this requirement is met and where the documentation can be found.

This requirement: Does not apply. Applies; indicate the following.
Addressed in: Drawing Analysis Report
 Specification Test Report
 Operating Instruction Other

Specify:

3.7.6 173.465(c)(4) Free Drop

(4) For cylindrical fiberboard packages with a mass of 100 kg (220 pounds) or less, a separate specimen must be subjected to a free drop onto each of the quarters of each rim from a height of 0.3 m (1 foot).

This requirement applies to cylindrical DOT 7A Type A packagings constructed of fiberboard having a gross weight of 100 kilograms (220 pounds) or less. Based on the shape and the gross weight of the package, indicate below if the requirement applies or not. If the requirement

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applies, identify the type of documentation that shows this requirement is met and where the documentation can be found.

This requirement: Does not apply. Applies; indicate the following.
Addressed in: Drawing Analysis Report
 Specification Test Report
 Operating Instruction Other

Specify:

3.7.7 173.465(c)(5) Free Drop

(5) The target for the free drop test must be a flat, horizontal surface of such mass and rigidity that any increase in its resistance to displacement or deformation upon impact by the specimen would not significantly increase the damage to the specimen.

This requirement applies to DOT 7A Type A packagings. Indicate below the type of documentation that shows this requirement is met and where the documentation can be found.

Addressed in: Drawing Analysis Report
 Specification Test Report
 Operating Instruction Other

Specify:

3.7.8 173.465(d) Stacking Test

(d) Stacking test.

(1) The specimen must be subjected for a period of at least 24 hours to a compressive load equivalent to the greater of the following:

- (i) Five times the mass of the actual package; or*
- (ii) The equivalent of 13 kilopascals (1.9 psi) multiplied by the vertically projected area of the package.*

(2) The compressive load must be applied uniformly to two opposite sides of the specimen, one of which must be the base on which the package would normally rest.

This requirement applies to DOT 7A Type A packagings. Indicate below the type of documentation that shows this requirement is met and where the documentation can be found.

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Addressed in: Drawing Analysis Report
 Specification Test Report
 Operating Instruction Other

Specify:

3.7.9 173.465(e) Penetration Test

(e) Penetration test. For the penetration test, the specimen must be placed on a rigid, flat, horizontal surface that will not move significantly while the test is being performed.

(1) A bar of 3.2 cm (1.25 inches) in diameter with a hemispherical end and a mass of 6 kg (13.2 pounds) must be dropped and directed to fall with its longitudinal axis vertical, onto the center of the weakest part of the specimen, so that, if it penetrates far enough, it will hit the containment system. The bar may not be significantly deformed by the test; and

(2) The height of the drop of the bar measured from its lower end to the intended point of impact on the upper surface of the specimen must be 1 m (3.3 feet) or greater.

This requirement applies to DOT 7A Type A packagings. Indicate below the type of documentation that shows this requirement is met and where the documentation can be found.

Addressed in: Drawing Analysis Report
 Specification Test Report
 Operating Instruction Other

Specify:

3.8 49 CFR §178.2 Applicability and Responsibility

3.8.1 178.2(c) Notification

(c) Notification.

(1) Except as specifically provided in §§ 178.337–18 and 178.345–10 of this part, the manufacturer or other person certifying compliance with the requirements of this part, and each subsequent distributor of that packaging must:

(i) Notify each person to whom that packaging is transferred—

(A) Of all requirements in this part not met at the time of transfer, and

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(B) With information specifying the type(s) and dimensions of the closures, including gaskets and any other components needed to ensure that the packaging is capable of successfully passing the applicable performance tests. This information must include any procedures to be followed, including closure instructions for inner packagings and receptacles, to effectively assemble and close the packaging for the purpose of preventing leakage in transportation. Closure instructions must provide for a consistent and repeatable means of closure that is sufficient to ensure the packaging is closed in the same manner as it was tested. For packagings sold or represented as being in conformance with the requirements of this subchapter applicable to transportation by aircraft, this information must include relevant guidance to ensure that the packaging, as prepared for transportation, will withstand the pressure differential requirements in § 173.27 of this subchapter.

- (ii) Retain copies of each written notification for the amount of time that aligns with the packaging's periodic retest date, i.e., every 12 months for single or composite packagings and every 24 months for combination packagings; and*
- (iii) Make copies of all written notifications available for inspection by a representative of the Department.*

(2) The notification required in accordance with this paragraph (c) may be in writing or by electronic means, including e-mailed transmission or transmission on a CD or similar device. If a manufacturer or subsequent distributor of the packaging utilizes electronic means to make the required notifications, the notification must be specific to the packaging in question and must be in a form that can be printed in hard copy by the person receiving the notification.

This requirement applies to DOT 7A Type A packagings. Indicate below the type of documentation that shows this requirement is met and where the documentation can be found.

- Addressed in:
- | | |
|------------------------------------------------|------------------------------------------|
| <input type="checkbox"/> Drawing | <input type="checkbox"/> Analysis Report |
| <input type="checkbox"/> Specification | <input type="checkbox"/> Test Report |
| <input type="checkbox"/> Operating Instruction | <input type="checkbox"/> Other |

Specify:

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3.9 49 CFR §178.3 Marking of Packagings

3.9.1 178.3(a) Marking Requirements

(a) Each packaging represented as manufactured to a DOT specification or a UN standard must be marked on a non-removable component of the packaging with specification markings conforming to the applicable specification, and with the following:

- (1) In an unobstructed area, with letters, and numerals identifying the standards or specification (e.g. UN 1A1, DOT 4B240ET, etc.).
- (2) Unless otherwise specified in this part, with the name and address or symbol of the packaging manufacturer or, where specifically authorized, the symbol of the approval agency certifying compliance with a UN standard. Symbols, if used, must be registered with the Associate Administrator. Duplicative symbols are not authorized.
- (3) The markings must be stamped, embossed, burned, printed or otherwise marked on the packaging to provide adequate accessibility, permanency, contrast, and legibility so as to be readily apparent and understood.
- (4) Unless otherwise specified, letters and numerals must be at least 12.0 mm (0.47 inches) in height except that for packagings of less than or equal to 30 L (7.9 gallons) capacity for liquids or 30 kg (66 pounds) capacity for solids the height must be at least 6.0 mm (0.2 inches). For packagings having a capacity of 5 L (1 gallon) or 5 kg (11 pounds) or less, letters and numerals must be of an appropriate size.
- (5) For packages with a gross mass of more than 30 kg (66 pounds), the markings or a duplicate thereof must appear on the top or on a side of the packaging.

This requirement applies to DOT 7A Type A packagings. Indicate below the type of documentation that shows this requirement is met and where the documentation can be found.

- Addressed in:
- | | |
|------------------------------------------------|------------------------------------------|
| <input type="checkbox"/> Drawing | <input type="checkbox"/> Analysis Report |
| <input type="checkbox"/> Specification | <input type="checkbox"/> Test Report |
| <input type="checkbox"/> Operating Instruction | <input type="checkbox"/> Other |

Specify:

3.9.2 178.3(c) Multiple Markings

(c) Where a packaging conforms to more than one UN standard or DOT specification, the packaging may bear more than one marking, provided the packaging meets all the requirements of each standard or specification. Where more than one marking appears on a packaging, each marking must appear in its entirety.

This requirement applies to DOT 7A Type A packagings that also meet the requirements of a UN standard or another DOT specification. Based on the design of the package, indicate below if the

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requirement applies or not. If the requirement applies, identify the type of documentation that shows this requirement is met and where the documentation can be found.

- This requirement: Does not apply. Applies; indicate the following.
Addressed in: Drawing Analysis Report
 Specification Test Report
 Operating Instruction Other

Specify:

3.9.3 178.3(d) Marking Restrictions

(d) No person may mark or otherwise certify a packaging or container as meeting the requirements of a manufacturing special permit unless that person is the holder of or a party to that special permit, an agent of the holder or party for the purpose of marking or certification, or a third party tester.

This requirement applies to DOT 7A Type A packagings that have a manufacturing special permit. Based on the status of the package, indicate below if the requirement applies or not. If the requirement applies, identify the type of documentation that shows this requirement is met and where the documentation can be found.

- This requirement: Does not apply. Applies; indicate the following.
Addressed in: Drawing Analysis Report
 Specification Test Report
 Operating Instruction Other

Specify: