

US EPA ARCHIVE DOCUMENT

Equivalent Containment Standards for the Remanufacturing Exclusion:

Background Document in Support of the Definition of Solid Waste Rule

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June 16, 2011

Equivalent Containment Standards for DSW Re-Manufacturing Exclusion

For the DSW Re-Manufacturing Exclusion, containment is proposed to be achieved through complying with RCRA Subtitle C hazardous waste containment requirements at 40 CFR Parts 264/265, Subpart I and J, or through complying with equivalent standards.

DRAFT DSW REGULATORY TEXT

§260.10 Definitions

* * * *

Contained means a unit that (1) is in good condition and has no leaks or other continuing or intermittent releases to the environment; (2) is properly labeled or otherwise has a system (such as a log) to immediately identify the hazardous secondary material in the unit; (3) does not hold incompatible materials and addresses an potential risks of fires or explosions; (4) has systems in place to prevent and to respond to releases to the environment, which may include but are not limited to runoff, releases to groundwater, wind-blown dust, fugitive hazardous air emissions, and catastrophic unit failures; or (5) meets the applicable requirements of 40 CFR Parts 264 or 265.

DSW PREAMBLE

Eligibility condition for re-manufacturing exclusion

5(d) Prior to re-manufacturing, store the hazardous spent solvents in tanks or containers that meet technical standards that would be the same as those found in 40 CFR Part 264 Subparts I and J, with the tanks and containers being labeled or otherwise having an immediately available record of the material being stored; During re-manufacturing, and during storage of the hazardous secondary materials prior to re-manufacturing, ensure that there is effective control of hazardous air emissions by complying with all applicable NESHAP standards, and with the requirements of 40 CFR Part 264 or 265 Subparts AA, BB, CC;

1. Equivalency for Tank and Container Storage Requirements

EPA regulates tank and container storage requirements (40 CFR 264 Subparts I and J) under RCRA authority. EPA also requires containment at 40 CFR 112 under the Oil Pollution Act amendment to the Clean Water Act (40 CFR 112 covers n-hexane, one of the 18 chemicals listed in the proposed Re-Manufacturing Exclusion). Other entities using their authorities to issue containment requirements include the U.S. Occupational Safety and Health Administration (mirroring fire protection codes), the U.S. Department of Transportation, and various nonprofit and trade organizations. Collectively, the containment standards number over a hundred. There are so many industry standards that commentators observe it is difficult to make sure the list is complete. Although industry standards are subject to change, they will tend to get more protective, not less. More importantly, for purposes of the proposed Re-Manufacturing Exclusion, 40 CFR 264 Subparts I and J will remain constant reference points.

A critical few industry standards can be used to satisfy the main technical requirements for tank systems and containers under 40 CFR Parts 264 Subparts I and J. These critical few standards are organized below according to new tank design, operations, maintenance, and closure.

- **New aboveground tank system design and construction standards** (API 620, API 2000, UL 142, STI F921, ASME Boiler and Pressure Vessel Code VIII Division 1; see also OSHA installation and venting requirements at 29 CFR 1910.106).

Standards and regulations commonly classify tanks by the internal pressure the tank is to operate under. Sources of internal pressure are the vapor pressure of the liquid itself, which increases with rising temperature, and any inert-gas blanketing system in use to pressurize the vapor space of a tank to perform such functions as keeping oxygen out of reactive liquids.¹ All three tank types below are relevant to the proposed Re-Manufacturing Exclusion, given the range in vapor pressure of the 18 chemicals covered. Selection of tank type is dependent on many factors to be considered by the responsible engineering designer.²

- Atmospheric tanks operate at internal pressures slightly above atmospheric pressure; fire codes define them as operating from atmospheric up to ½ psig (pound-force per square inch gauge) above atmospheric pressure. Atmospheric storage tank design and construction standards consist of --
 - Underwriters Laboratory (UL) Standard 142 for Steel Aboveground Tanks for Flammable and Combustible Liquids;
 - Steel Tank Institute (STI) Standard F921 for Aboveground Tanks with Integral Secondary Containment.
 - API Standard 2000 Venting Atmospheric and Low-Pressure Storage Tanks.
 - Note: 29 CFR 1910.106 is OSHA’s requirement for the design of atmospheric tanks, which requires them to be built in accordance with acceptable good standards of design.
- Low-pressure tanks operate at internal pressures up to 15 psig. These are actually higher-pressure tanks. Low-pressure tank design and construction standards consist of --
 - American Petroleum Institute (API) Standard 620 Design and Construction of Large, Welded, Low-pressure Storage Tanks;
 - API Standard 2000 Venting Atmospheric and Low-Pressure Storage Tanks.
 - Note: 29 CFR 1910.106 is OSHA’s requirement for the design of low pressure tanks, which requires them to be built in accordance with acceptable good standards of design.
- Pressure vessels operate at the highest internal pressures, that is, above 15 psig. The term high-pressure tank is not used because these are actually vessels, a specialized form of container.³ If chloromethane, one of the 18 chemicals, is stored as compressed gas, this would require a pressure vessel. The pressure vessel design and construction standard consists of --
 - American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code – Division 1 Rules for Construction of Pressure Vessels.
 - Note: 29 CFR 1910.106 is OSHA’s requirement for the design of pressure vessels, which requires them to be built in accordance with the ASME Boiler and Pressure Vessel Code.
- **Operations and maintenance:**
 - Tank and piping integrity and recordkeeping –
 - Either API 653 or Steel Tank Institute (STI) SP001 as appropriate for tank integrity;

¹ Myers, P.E. 1997. Aboveground Storage Tanks. New York: McGraw-Hill. (Myers 1997, 10-12)

² Myers 1997, 24-26.

³ Myers 1997, 11.

- API 570 for piping system integrity.
- Container integrity –
 - OSHA 1910.101 (chloromethane if stored as a compressed gas);
 - OSHA 1910.106 (for 16 of our 18 solvents);
 - OSHA 1910.119 (for chloromethane gas if not compressed); and,
 - Occupational Safety and Health Act, General Duty Clause (for chloroform).
- Addressing incompatible materials and the potential risks of fires or explosions –
 - National Fire Protection Association (NFPA) 30 – Flammable and Combustible Liquids Code.
- Systems to prevent and respond to releases –
 - NFPA 30 and API 2350 are mutually consistent for overfill protection.
- **Closure:**
 - NFPA 30-21.7.4.1 Closure of Storage Tanks;
 - API Standard 2015 Safe Entry and Cleaning of Petroleum Storage Tanks and related API recommended practices and publications;
 - OSHA confined space requirements at 29 CFR 1910.146 and OSHA Guidance on Major Work Activities for Tank Cleaning Operations with API cross-references.

Equivalency to 40 CFR Part 264 or 265 Subparts AA, BB, and CC.

EPA amended RCRA Subparts AA, BB, and CC rules more than a decade ago to exempt any hazardous waste management unit that the owner or operator certifies is equipped with and operating air emission controls in accordance with an applicable Clean Air Act regulation codified under 40 CFR Part 60, Part 61, or Part 63. It is important to note that these exemptions only apply to those units, process vents, or equipment using organic air emission controls to comply with an applicable CAA regulation.

Description of Appendices

1. Table 1 showing the classification of the 18 Re-Manufacturing Exclusion chemicals as flammable or combustible liquids.

This is included immediately below.

2. List of Frequently Utilized Tank Storage Standards (separate file).

This list, edited only slightly from what Pennsylvania makes available on its portal regarding organizations referenced in state law, provides an example of what could be issued as guidance for the DSW Re-Manufacturing Exclusion.

Appendix 1.

Table 1. 18 Re-Manufacturing Exclusion chemicals classified as flammableⁱ or combustible liquids.

Chemical	Classification ⁱⁱ
Toluene	Flammable liquid – Class IB
Xylenes (mixed isomers) ⁱⁱⁱ	Flammable liquid – Class IC
Ethylbenzene	Flammable liquid – Class IB
1,2,4-trimethylbenzene	Combustible liquid – Class II
Chlorobenzene	Flammable liquid – Class IC
n-hexane	Flammable liquid – Class IB
Cyclohexane	Flammable liquid – Class IB
Methyl tert-butyl ether (MTBE) ^{iv}	Flammable liquid – Class IB
Acetonitrile	Flammable liquid – Class IB
Chloroform	Non-combustible liquid
Chloromethane	Flammable gas
Dichloromethane	Combustible liquid
Methyl isobutyl ketone	Flammable liquid – Class IB
N,N-dimethylformamide	Combustible liquid – Class II
Tetrahydrofuran	Flammable liquid – Class IB
Ethanol	Flammable liquid – Class IB
n-butyl alcohol	Flammable liquid – Class IC
Methanol	Flammable liquid – Class IB

ⁱ Flammable liquids can catch fire at regular working temperatures, and combustible liquids can catch fire above normal working temperatures. OSHA definitions (29 CFR 1910.106(a)) are below; NFPA definitions are the same. *Flammable Liquids* (except mixtures with components with flash points at/above 100 °F, which are 99 percent by volume or more of the mixture):

- Class IA Liquids: Flash points below 73 °F (22.8 °C); boiling point below 100 °F (37.8 °C);
- Class IB Liquids: Flash points below 73 °F (22.8 °C); boiling point at/above 100 °F (37.8 °C);
- Class IC Liquids: Flash points at/above 73 °F (22.8 °C) and below 100 °F (37.8 °C).

Combustible Liquids:

- Class II Liquids: Flash points at/above 100 °F (37.8 °C) and below 140 °F (60 °C), except mixtures with components with flash points of 200 °F (93.3 °C) or higher, which are 99 percent by volume or more of the mixture;
- Class IIIA Liquids: Flash points above 140 °F (60 °C) and below 200 °F (93.3 °C), except mixtures with components with flash points of 200 °F (93.3 °C) or higher, which are 99 percent by volume or more of mixture;
- Class IIIB Liquids: Flash points at or above 200 °F (93.3 °C).

ⁱⁱ Column 2 classifications are from NIOSH Pocket Guide <http://www.cdc.gov/niosh/npg/default.html>. The NIOSH Pocket Guide classifies chloroform, chloromethane, and dichloromethane separately, and does not cover MTBE.

ⁱⁱⁱ EPA based the classification of xylenes (mixed isomers) on the class of each xylene isomer (ortho-, meta-, and para-xylene are all Class IC).

^{iv} To get the classification “Class IB flammable liquid” for MTBE, EPA used its flash point (-27 °C) and boiling point (55 °C) from an MSDS (Mallinckrodt Baker, Inc.; <http://www.jtbaker.com/msds/englishhtml/b7222.htm>).

APPENDIX 2

**Equivalent Containment Standards for the Remanufacturing Exclusion:
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Below is a list of frequently used storage tank standards and practices from organizations that are referenced in 25 PA Code, Chapter 245. These provide an example of what could be referenced in guidance for the DSW Remanufacturing Exclusion, where it would be noted that the most recent version of a publication should be used.

American Petroleum Institute

Construction Standards:

- API Std. 620 Design and Construction of Large, Welded, Low Pressure Storage Tanks
- API Std. 650 Welded Steel Tanks for Oil Storage (Replaced several API 12 series Spec's)
- API Std. 2000 Venting Atmospheric and Low-pressure Storage Tanks
- API Std. 2610 Design, Construction, Operation, Maintenance, and Inspection of Terminal &

Tank Facilities Inspection Standards: (Includes Construction Alteration, and Reconstruction Standards)

- API Std. 510 Pressure Vessel Inspection Code (Maintenance Inspection, Rating, Repair & Alteration)
- API Std. 570 Inspection, Repair, Alteration, and Rerating of In-Service Piping Systems
- API Std. 653 Tank Inspection, Repair, Alteration, and Reconstruction
- API Std. 2015 Requirements for Safe Entry & Cleaning of Petroleum Storage Tanks

Recommended Practices:

- API RP 12H Installation of New Bottoms in Old Storage Tanks
- API RP 12R Setting, Maintenance, Inspection, Operation, & Repair of Tanks in Production Service
- API RP 574 Inspection Practices for Piping System Components
- API RP 575 Inspection of Atmospheric and Low Pressure Storage Tanks
- API RP 580 Risk Based Inspection
- API RP 651 Cathodic Protection of Aboveground Petroleum Storage Tanks
- API RP 652 Lining of Aboveground Petroleum Storage Tank Bottoms
- API RP 1107 Pipeline Maintenance Welding Practices
- API RP 1604 Closure of Underground Petroleum Storage Tanks
- API RP 2003 Protection against Ignitions Arising Out of Static, Lightning and Stray Currents
- API RP 2016 Guidelines for Entering and Cleaning Petroleum Storage Tanks
- API RP 2027 Ignition Hazards Involved in Abrasive Blasting of Atmospheric Storage Tanks in Hydrocarbon Service
- API RP 2350 Overfill Protection for Storage Tanks in Petroleum Facilities

Other Publications:

- API – 334 A Guide to Leak Detection for Aboveground Storage Tanks
- API Pub 2009 Safe Welding, Cutting and Hot Work Practices in the Petroleum and Petrochemical Industries
- API – 2207 Preparing Tank Bottoms for Hot Work
- API Pub 2217A Guidelines for Work in Inert Confined Spaces in the Petroleum Industry

NACE International – The Corrosion Society

Recommended Practices:

- NACE 1/SSPC-SP5 Steel Structures Painting Council: "White Metal Blast Cleaning"
- NACE 2/SSPC-SP10 Steel Structures Painting Council: "Near White Metal Blast Cleaning"
- NACE 3/SSPC-SP6 Steel Structures Painting Council: "Commercial Blast Cleaning"

Appendix 2 Technical Document: Equivalent Containment Standards for DSW Remanufacturing
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NACE 4/SSPC-SP7	Steel Structures Painting Council: "Brush Off Cleaning"
NACE 10/SSPC-PA6	Steel Structures Painting Council: "Fiberglass-Reinforced Plastic (FRP) Linings Applied to Bottoms of Carbon Steel Aboveground Storage Tanks"
NACE RP 0172	Surface Preparation of Steel and Other Hard Materials by Water Blasting Prior to Coating or Recoating
NACE SP 0177	Mitigation of Alternating Current and Lightning Effects on Metallic Structures and Corrosion Control Systems
NACE RP 0178	Design, Fabrication, and Surface Finish of Metal Tanks and Vessels to be lined for Chemical Immersion Service
NACE RP 0184	Repair of Lining Systems
NACE RP 0187	Design Considerations for Corrosion Control of Reinforcing Steel in Concrete
NACE RP 0193	External Cathodic Protection of On-Grade Carbon Steel Storage Tank Bottoms

National Fire Protection Association

Construction Standards:

NFPA 70 (NEC) National Electric Code®

NFPA 30 Flammable and Combustible Liquids Code

Recommended Practices:

NFPA 77 Static Electricity

NFPA 326 Safeguarding Tanks and Containers for Entry, Cleaning or Repair

Underwriters Laboratories

Construction Standards:

UL Std. 142 Standard for Steel Aboveground Tanks for Flammable and Combustible Liquids

UL Std. 842 Standard for Valves for Flammable Fluids

UL Std. 860 Standard for Pipe Unions for Flammable/Combustible Fluids and Fire Protection Service

UL Std. 971 Standard for Nonmetallic Underground Piping for Flammable Liquids

UL Std. 2085 Standard for Protected Aboveground Tanks for Flammable & Combustible Liquids

UL Std. 2245 Standard for Below-grade Vaults for Flammable Liquid Storage Tanks

American National Standards Institute

Construction Standards:

ASME B31.3 American Society of Mechanical Engineers: "Process Piping"

ASME B31.4 American Society of Mechanical Engineers: "Liquid Transportation Systems for Hydrocarbons, Liquid Petroleum Gas, Anhydrous Ammonia and Alcohols"

Recommended Practices:

ASSE Z117.1 American Society of Safety Engineers: "Safety Requirements for Confined Spaces"

American Society for Testing and Materials

Construction Standards:

A182/A182M ASTM Standard Specification for Forged or Rolled Alloy Stainless Steel Pipe Flanges, Forged Fittings and Valves and Parts for High-Temperature Service

Recommended Practices:

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ASTM D2794 Standard Test Method for Resistance of Organic Coatings on the Effects of Rapid Deformation (Impact)

Steel Tank Institute

Construction Standards:

STI F921[®] F921[®] Standard for Aboveground Tanks with Integral Secondary Containment
STI F922 Specification for Permatank[®]
STI F941 Standards for Fireguard[®] Thermally Insulated Aboveground Storage Tanks
STI R951 Specification for Tanks Using Low Levels of Pressure in the Tanks Interstice

Inspection Standards:

STI SP001 Standard for Inspection of In-Service Shop Fabricated Aboveground Tanks for Storage of Combustible and Flammable Liquids

Recommended Practices:

STI SP031 Standard for Repair of In-Service Shop Fabricated Aboveground Tanks for Storage of Combustible & Flammable Liquids
STI R821 STI-P3 Installation Instructions
STI R891 RP for Hold Down Strap Isolation
STI R892 RP for Corrosion Protection of Underground Piping Networks Associated with Liquid Storage and Dispensing Systems
STI R912 Installation Instructions for Shop Fabricated Aboveground Storage Tanks for Flammable, Combustible Liquids
STI R913 Act-100[®] Installation Instructions
STI R923 Permatank[®] Installation Instructions
STI R931 F921[®] Installation Instructions
STI R942 Fireguard[®] Installation & Testing Instructions for Thermally Insulated, Lightweight, Double Wall Fireguard Aboveground Storage Tanks
STI R971 ACT-100-U[®] Installation Instructions

Steel Structures Painting Council

see also NACE International

Recommended Practices:

SSPC Painting Manual volume I
SSPC Painting Manual volume II

American Concrete Institute

Recommended Practices:

ACI 350 Environmental Engineering Concrete Structures