

NONMETALLIC TANKS FOR OIL-BURNER FUELS AND OTHER COMBUSTIBLE LIQUIDS

2258

1 Scope

1.1 These requirements cover nonmetallic or composite primary, secondary and diked type atmospheric storage tanks from 60 - 660 gallons (227 - 2500 L) intended primarily for the storage and supply of heating fuel for oil burning equipment, or alternately for the storage of diesel fuels for compression ignition engines and motor oils (new and used) for automotive service stations, in aboveground applications.

Section 1 effective August 9, 2011

1.2 Each tank type is permitted to be fabricated in a combination of various shapes (cylindrical, rectangular or obround), orientations (horizontal, vertical) and may have integral options (tank supports or accessories) as covered in this Outline of Investigation.

1.3 These shop built tanks are completely fabricated, inspected, and tested for leakage before shipment from the factory as completely assembled vessels except for options intended for field assembly in accordance with the manufacturers instructions.

1.4 These tanks are intended for installation and use in accordance with the Standard for the Installation of Oil-Burning Equipment, ANSI/NFPA 31; the Flammable and Combustible Liquids Code, ANSI/NFPA 30; the Code for Fuel Dispensing Facilities and Repair Garages, NFPA 30A; and the International Fire Code published by the International Code Council.

1.5 These requirements do not apply to steel tanks covered by the Standard for Steel Underground Tanks for Flammable and Combustible Liquids, UL 58; the Standard for Steel Tanks for Oil-Burner Fuels and Other Combustible Liquids, UL 80; or the Standard for Steel Aboveground Tanks for Flammable and Combustible Liquids, UL 142.

1.6 These requirements do not apply to nonmetallic tanks covered by the Standard for Glass-Fiber-Reinforced Plastic Underground Storage Tanks for Petroleum Products, Alcohols, and Alcohol-Gasoline Mixtures, UL 1316; or the Standard for External Corrosion Protection Systems for Steel Underground Storage Tanks, UL 1746.

1.7 These requirements do not cover storage of waste oils or other combustible liquids with different fire, physical or material compatibility properties with respect to the



intended liquids in 1.1, but do cover 100 percent bio diesel and bio diesel blends up to 20 percent. These requirements do not cover storage of flammable liquids.

1.8 These requirements do not cover special evaluations for resistance to hurricanes, tornadoes, earthquakes, floods, fires or other natural disasters; or resistance to vehicle impact.

NFPA 31: DOCUMENT SCOPE

1.1 Scope. 1.1.1 This standard shall apply to the installation of stationary oil-burning equipment and appliances, including but not limited to industrial-, commercial-, and residential-type steam, hot water, or warm air heating plants; domestic-type range burners and space heaters; and portable oil-burning equipment. 1.1.2 This standard shall also apply to all accessory equipment and control systems, whether electric, thermostatic, or mechanical, and all electrical wiring connected to oil-fired equipment. 1.1.3 This standard shall also apply to the installation of oil storage and supply systems connected to oil-fired equipment and appliances. 1.1.4 This standard shall also apply to those multi-fueled appliances in which fuel oil is one of the optional fuels. 1.1.5* This standard shall not apply to internal combustion engines, oil lamps, or portable devices not specifically covered in this standard. (See Chapter 11 for portable devices that are covered in this standard.)

NFPA 30: DOCUMENT SCOPE

1.1 Scope. 1.1.1* This code shall apply to the storage, handling, and use of flammable and combustible liquids, including waste liquids, as herein defined and classified. 1.1.2 This code shall not apply to the following: (1)* Any liquid that has a melting point of 100°F (37.8°C) or greater (2)* Any liquid that does not meet the criteria for fluidity given in the definition of liquid in Chapter 3 and in the provisions of Chapter 4 (3) Any cryogenic fluid or liquefied gas, as defined in Chapter 3 (4)* Any liquid that does not have a flash point, but which is capable of burning under certain conditions (5)* Any aerosol product (6) Any mist, spray, or foam (7)* Transportation of flammable and combustible liquids as governed by the U.S. Department of Transportation (8)* Storage, handling, and use of fuel oil tanks and containers connected with oil-burning equipment A.1.1.1 This code is recommended for use as the basis for legal regulations. Its provisions are intended to reduce the hazard to a degree consistent with reasonable public safety, without undue interference with public convenience and necessity, of operations that require the use of flammable and combustible liquids. Compliance with this code does not eliminate all hazards in the use of flammable and combustible liquids. (See the Flammable and Combustible Liquids Code Handbook for additional explanatory information.) A.1.1.2(1) Liquids that are solid at 100°F (37.8°C) or above,



but are handled, used, or stored at temperatures above their flash points, should be reviewed against pertinent sections of this code. A.1.1.2(2) The information in A.1.1.2(1) also applies here. A.1.1.2(4) Certain mixtures of flammable or combustible liquids and halogenated hydrocarbons either do not exhibit a flash point using the standard closedcup test methods or will exhibit elevated flash points. However, if the halogenated hydrocarbon is the more volatile component, preferential evaporation of this component can result in a liquid that does have a flash point or has a flash point that is lower than the original mixture. In order to evaluate the fire hazard of such mixtures, flash point tests should be conducted after fractional evaporation of 10, 20, 40, 60, or even 90 percent of the original sample or other fractions representative of the conditions of use. For systems such as open process tanks or spills in open air, an open-cup test method might be more appropriate for estimating the fire hazard. A.1.1.2(5) See NFPA 30B, Code for the Manufacture and Storage of Aerosol Products. A.1.1.2(7) Requirements for transportation of flammable and combustible liquids can be found in NFPA 385, Standard for Tank Vehicles for Flammable and Combustible Liquids, and in the U.S. Department of Transportation's Hazardous Materials Regulations, Title 49, Code of Federal Regulations, Parts 100–199. A.1.1.2(8) See NFPA 31, Standard for the Installation of Oil-Burning Equipment.

NFPA 30A: DOCUMENT SCOPE

1.1* Scope. 1.1.1 This code shall apply to motor fuel dispensing facilities; marine/motor fuel dispensing facilities; and motor fuel dispensing facilities located inside buildings, at fleet vehicle motor fuel facilities, and at farms and isolated construction sites. This code shall also apply to motor vehicle repair garages. 1.1.2* This code shall not apply to those motor fuel dispensing facilities where only liquefied petroleum gas (LP-Gas), liquefied natural gas (LNG), or compressed natural gas (CNG) is dispensed as motor fuel. A.1.1.2 See NFPA 52, Vehicular Fuel Systems Code, and NFPA 58, Liquefied Petroleum Gas Code, for requirements for facilities where only these fuels are dispensed. A.1.1 This code, known as the Code for Motor Fuel Dispensing Facilities and Repair Garages, is recommended for use as the basis for legal regulations. Its provisions are intended to reduce the hazards of motor fuels to a degree consistent with reasonable public safety, without undue interference with public convenience and necessity. Thus, compliance with this code does not eliminate all hazards in the use of these fuels. See the Flammable and Combustible Liquids Code Handbook for additional explanatory information.



Excerpt from NFPA website on FAQ's:

Q: NFPA 30A defines both "service station" and "fleet vehicle service station", but the differences between the two are not always clear. What exactly is covered by the latter definition? A: Simply, at a fleet vehicle service station, the fueling operation and the vehicles being refueled are under common control or ownership. So, a charter bus service, for example, can have its own fuel storage and dispensing operation and a garage for minor repairs **and take advantage of several lenient provisions in NFPA 30A.** Conversely, any situation where fuel is dispensed to vehicles that are not owned or directly controlled by the same entity, including farm co-ops, is treated the same as a traditional service station.

Excerpt from Rhino Tuff literature. Note that Rhino Tuff specifically notes compliance with certain sections of the Code.

Primary Tank Applications & Specs:

Rhino Tuff Tanks are constructed from virgin HDPE (High Density Polyethylene) for optimum surface clarity, UV stabilization, and superior ESCR (Environmental Stress Crack Resistance) and are designed for use with polyethylene tolerant fluids and accessories.

RTT tanks meet the standard requirements in compliance with NFPA 30 code when used to store class IIB liquids with flash points higher than 200 degrees Farenheit, in accordance to 2008 Edition of NFPA 30 Code; 9.4.2, 9.4.3 (T), 9.6.1, 9.6.2.1, 9.13.4, 12.3.7ex., 12.6.2.2, 12.8.1, 16.5.2.2-.8, 21.3.

Resins used in Rhino Tuff Tanks are listed with the NSF as meeting the NSF 51 requirements and meet or exceed specifications contained in FDA Regulation 21CFR 177.1520 (2) 3.1 and may be used as an article or as a component of articles for use in contact with food, subject to any limitations of the regulations.

Any use of a Rhino Tuff Tank with incompatible fluids, sealers, hoses, fittings, valves or any other incompatible accessories may cause a tank failure and will immediately void any and all manufacturer's warranty associated with the product (s) supplied by Rhino Tuff Tanks.



EFNI.GuideInfo

Nonmetallic Tanks for Oil-burner Fuels and Other Combustible Liquids

View Listings

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[Containment Products for Flammable and Combustible Liquids] (Fixed and Stationary Storage Tanks) Nonmetallic Tanks for Oil-burner Fuels and Other Combustible Liquids

See General Information for Fixed and Stationary Storage Tanks

USE AND INSTALLATION

This category covers nonmetallic atmospheric-type storage tanks from 60 to 600 gallons, intended primarily for the storage and supply of heating fuels for oil-burning equipment, or alternately, for the storage of diesel fuels for compression-ignition engines and motor oils (new and used) for automotive service stations, in aboveground applications.

Heating fuels include various Class II petroleum distillate grades complying with ANSI/ASTM D396, "Standard Specification for Fuel Oils," or ANSI/ASTM D3699, "Standard Specification for Kerosine," with up to 100% biodiesel blends* complying with ANSI/ASTM D6751, "Standard Specification for Biodiesel Fuel Blend Stock (B100) for Middle Distillate Fuels," typically intended for use in oil-burning equipment.

Diesel fuels include various Class II petroleum distillate grades complying with ANSI/ASTM D975, "Standard Specification for Diesel Fuel Oils," with up to 100% biodiesel blends* complying with ANSI/ASTM D6751, typically intended for powering compression-ignition engines.

Motor oils include various Class III petroleum distillate or synthetic grades, such as lube oils, hydraulic oils or transmission oils, typically used in motor vehicle applications.

* Although these tanks are suitable for a wide variety of fuel types, and up to 100% biodiesel blends, this does not in any way imply that utilization equipment directly or indirectly supplied by any of the fuels in these tanks (such as oil burners, heaters, generators, motors, etc.) are also suitable for these fuels. The manufacturer or certification ratings should be referenced for acceptable fuel types and blends, and Authorities Having Jurisdiction should be consulted prior to installation and use.

These tanks are intended for installation and use in accordance with ANSI/NFPA 30, "Flammable and Combustible Liquids Code," ANSI/NFPA 31, "Standard for the Installation of Oil-Burning Equipment," ANSI/NFPA 30A, "Code for Motor Fuel Dispensing Facilities and Repair Garages," ANSI/NFPA 1, "Uniform Fire Code," and the "International Fire Code."

PRODUCT TYPES AND RATINGS

The types of nonmetallic tanks for oil-burner fuels and other combustible liquids constructions and ratings, as indicated in the individual Listings, are defined as follows:

Primary Tanks — These are single-wall tanks with integral pipe connections, combined normal and emergency venting and supply connection that provides primary containment of the stored liquid. These tanks may have optional tank supports or other accessories as identified in the Listing Report.

Secondary Tanks — These are double-wall tanks (primary tank with an additional tank shell that is capable of being pressurized) that provides full secondary containment of the stored liquid (to at least the normal fill level), interstitial leakage monitoring and interstitial emergency venting. These tanks may have optional tank supports or other accessories as identified in the Listing Report.

Diked Tanks — These are tanks (primary or secondary) in an integral open- or closed-top compartment that provides leak monitoring and at least 110% containment of liquids from a leak or rupture of the tank stored within it, but is not capable of being pressurized. These tanks may have optional tank supports or other accessories as identified in the Listing Report.

Tank Location Ratings — "Indoor Use Only" rated tanks are intended for installation and use in enclosed buildings, such as a basement, garage or shed that protect the tank from rain and sun exposure. "Indoor or Outdoor Use" rated tanks are intended for installation and use in either enclosed buildings, or outdoors were exposed to rain and sun.

ADDITIONAL INFORMATION

For additional information, see Fixed and Stationary Storage Tanks (<u>EDQX</u>), Containment Products for Flammable and Combustible Liquids (<u>ECPR</u>) and Flammable and Combustible Liquids and Gases Equipment (<u>AAPQ</u>).

REQUIREMENTS

http://database.ul.com/cgi-bin/XYV/template/LISEXT/1FRAME/showpage.html?name=EF... 4/1/2013

The basic requirements used to investigate products in this category are contained in <u>UL Subject 2258</u>, "Outline of Investigation for Nonmetallic Tanks for Oil-Burner Fuels and Other Combustible Liquids."

UL MARK

The Listing Mark of UL on the product is the only method provided by UL to identify products manufactured under its Listing and Follow-Up Service. The Listing Mark for these products includes the UL symbol (as illustrated in the Introduction of this Directory) together with the word "LISTED," a control number, and the product name "Nonmetallic Tank for Oil Burner Fuel" or "Nonmetallic Tank for Oil Burner Fuels and Other Combustible Liquids," with the appropriate tank type(s) and rating(s) (specified under **PRODUCT TYPES AND RATINGS**) as shown in the individual Listings.

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NYS Department of Environmental Conservation

6 NYCRR Part 613

October 2015

Regulations for Petroleum Bulk Storage

Excerpt- Nonmetallic Tanks

Subpart 613-4 AST Systems

613-4.1 AST systems: design, construction, and installation

(a) *Applicability*. The provisions of this Subpart apply to every AST system that is part of a facility.

(b) *Equipment standards for Category 2 and 3 AST systems*. In order to prevent releases due to structural failure, corrosion, or spills and overfills, any facility containing a Category 2 or 3 AST system must meet the following requirements.

(1) Tanks.

(i) Every AST with a design capacity of 60 gallons or greater must be constructed of steel and must be designed and utilized according to one of the following codes of practice (refer to section 1.10 of this Part for complete citation of references), as applicable:

- (*a*) For Category 2 ASTs:
 - (*1*) UL 142, January 1985;
 - (2) API Standard 620, September 1982 (revised April

1985);

- (3) API Standard 650, February 1984;
- (4) CAN4-S601-M84, 1984; or
- (5) CAN4-S630-M84, 1984.
- (*b*) For Category 3 ASTs:
 - (*1*) UL 142, December 2006;
 - (2) UL 80, September 2007;
 - (*3*) UL 2258, August 2010;
 - (4) API Standard 620, February 2008;
 - (5) API Standard 650, March 2013; or
 - (*6*) ULC-S601-07, 2007.
- (ii) Every AST must have a surface coating designed to prevent

corrosion and deterioration.

(iii) Every AST, if in contact with the ground, must be protected from corrosion. Any Category 3 AST in contact with the ground must be protected from corrosion in accordance with API Standard 651, January 2007.

(iv) ASTs storing Class IIIB petroleum are not required to be constructed of steel if installed in areas that would not be exposed to a spill or leak of Class I or Class II petroleum. The classes of petroleum are described in NFPA 30, 2012 edition (refer to section 1.10 of this Part for complete citation of references).

Note: The Department recognizes that some petroleum mixtures cannot be safely stored in steel ASTs. A facility owner seeking to store such petroleum mixtures should, pursuant to the provisions of section 1.8 of this Part, request a variance from the requirements of subparagraph (i) of this paragraph.

(v) Secondary containment.

(*a*) Any AST that has a design capacity of 10,000 gallons or more must have secondary containment that meets the following requirements:

(1) be able to contain petroleum leaked from any portion of the AST until it is detected and removed; and

(2) be able to prevent the release of petroleum.

(b) Any AST that has a design capacity of less than 10,000 gallons and is in close proximity to sensitive receptors is required to either have secondary containment as described in clause (a) of this subparagraph or utilize a design/technology such that a release is not reasonably expected to occur. ASTs within 500 horizontal feet of the following resources are considered to be in close proximity to sensitive receptors:

- (1) a perennial or intermittent stream;
- (2) a public or private well;

(*3*) a primary or principal aquifer as defined in USGS Water Resource Investigation Reports 87-4274, 87-4275, 87-4276, 87-4122, 88-4076, and Appendix C;

- (4) a wetland as defined in Part 664 of this Title;
- (5) a lake/pond, estuary, or other similar surface water

body; or

(6) a storm drain.





TB 026-15

Nonmetallic Oil Storage Tanks and NFPA 30, 30A

Product: Roth DWT Lube Oil Storage Tanks

Date: January 26, 2015

Purpose:

The purpose of this bulletin is to address regulatory questions regarding the use of non-metallic oil storage tanks, certified to UL SU 2258 in installations subject to NFPA 30, Flammable and Combustible Liquids Code and NFPA 30A Code for Motor Fuel Dispensing Facilities and Repair Garages.

Applicability of the standard: From UL SU 2258 scope statement:

UL SU 2258, Outline of investigation for Nonmetallic Tanks for Oil-Burner Fuels and other Combustible Liquids:

1.4 These tanks are intended for installation and use in accordance with the Standard for Installation of Oil-Burning Equipment, ANSI/NFPA 31; the Flammable and Combustible Liquids Code, ANSI/NFPA 30; the Code for Motor Fuel Dispensing Facilities and Repair Garages, NFPA 30A; and the International Fire Code published by the International Code Council.

NFPA 30 language referencing tank construction standards for atmospheric tanks:

NFPA 30 Chapter 21 Storage of Liquids in Tanks-Requirements for all Storage Tanks:

21.4.2 Design Standards for Storage Tanks

21.4.2.1 Design Standards for Atmospheric Tanks

21.4.2.1.1 Atmospheric tanks shall be designed and constructed in accordance with recognized engineering standards. Atmospheric tanks that meet any of the following standards shall be deemed as meeting the requirements of 21.4.2.1 1) API Specification 12B, Bolted tanks for Storage of Production Liquids 2) API Specification 12D, Field Welded Tanks for Storage of Production Liquids 3) API Specification 12F, Shop Welded Tanks for Storage of Production Liquids 4) API Standard 650, Welded Steel Tanks for Oil Storage 5) UL 58, Standard for Steel Underground Tanks for Flammable and Combustible Liquids 6) ANSI/UL 80, Standard for Steel Tanks for Oil-Burner Fuels and Other Combustible Liquids 7) ANSI/UL 142, Standard for Steel Aboveground Tanks for Flammable and Combustible Liquids 8) UL 1316, Standard for Glass-Fiber Reinforced Plastic Underground Storage Tanks for Petroleum Products, Alcohols, and Alcohol/Gasoline Mixtures 9) ANSI/UL 1746, Standard for External Corrosion Protection Systems for Steel Underground Storage Tanks 10) UL 2080, Standard for Fire Resistant Tanks for Flammable and Combustible Liquids 11) UL 2085, Standard for Protected Aboveground Tanks for Flammable and Combustible Liquids





TB 026-15

Nonmetallic Oil Storage Tanks and NFPA 30, 30A

When considering the Roth DWT for Lube Oil Storage applications the following may apply:

- While the standards referenced under 21.4.2.1.1 do not currently include UL SU 2258, the language includes the requirement that tanks be "designed and constructed in accordance with recognized engineering standards" which UL SU 2258 is considered to be.
- The standards referenced are referred to as "any of the following" which does not specifically exclude recognized engineering standards not referenced.

NFPA 30/30A language addressing non-metallic tanks:

Excerpts from NFPA 30 Chapter 21, Storage of Liquids in Tanks-Requirements for all Storage Tanks:

21.4 Design and Construction of Storage Tanks

21.4.1 Materials of Construction

21.4.1.2 Tanks shall be permitted to be constructed of combustible materials when approved. Tanks constructed of combustible materials shall be limited to any of the following:

(1) Underground installation

(2) Use where required by the properties of the liquid stored.

(3) Aboveground storage of Class IIIB liquids in areas not exposed to a spill or leak of Class 1 or Class II liquid

(4) Storage of Class IIIB liquids inside a building protected by an approved automatic fire extinguishing system

When considering the Roth DWT for Lube Oil Storage applications, (2) through (4) above may apply:

- Fluid properties may influence the use of non-metallic materials based on compatibility
- Lube oil storage areas are not typically in the spill perimeter or leak path of Class I or Class II Liquids
- Many automotive service facilities are required to include automatic fire suppression systems by local building codes or as detailed in NFPA 30A as follows:

Excerpts from NFPA 30A Chapter 7 Building Construction Requirements

7.4 Repair Garages

7.4.6 Fixed Fire Protection. Automatic sprinkler protection installed in accordance with the requirements of NFPA 13, *Standard for the Installation of Sprinkler Systems,* shall be provided in major repair garages, as herein defined, when any of the following conditions exist:

(1) The major repair garage is two or more stories in height, including basements, and any one of the floors exceeds 930 m² (10,000 ft²)

(2) The major repair garage is one story and exceeds 1115 m² (12,000 ft²)



TB 026-15 Nonmetallic Oil Storage Tanks and NFPA 30, 30A

- 7.4.6 Fixed Fire Protection (continued)
- (3) The major repair garage is servicing vehicles parked in the basement of the building

Summary-

1) The scope of UL SU 2258 clearly defines the standard as qualifying certified products for use in installations subject to NFPA 30/30A.

2) NFPA 30 does not specifically exclude products certified to UL SU 2258 from use in installations subject to NFPA 30/30A.

3) NFPA 30 includes language that provides for AHJ acceptance and use of nonmetallic tanks in installations subject to NFPA 30/30A.

For any inquiries or questions regarding this Technical Bulletin, please contact Roth Industries Technical Department at: 315.475.0100 or 315.755.1011 then menu selection 9, (315) 475-0200 FAX



TB 269-14-1 (Supersedes TB117146) Liquid Compatibility Reference- DWT

Product: DWT Eco Plus 3 Storage Tank Date: September 26, 2014

The Roth DWT Eco Plus 3 Double Wall storage tank is certified to UL SU2258 which includes combustible liquids addressed by the following material classes outlined in NFPA Standards 30, 30A and 31.

Class II Liquid– Any liquid that has a flash point at or above 100°F (37.8°C) and below 140°F (60°C)

Class III Liquid– Any liquid that has a flash point at or above 140°F (60°C)

- (a) Class IIIA Liquid- Any liquid that has a flash point at or above 140°F (60°C), but below 200°F (93°C)
- (b) Class IIIB Liquid– Any liquid that has a flash point at or above 200°F (93°C)

These classes include the following liquids commonly encountered in fuel oil fired heating systems, automotive and fleet service facilities, drive through oil change locations as well as any facility storing or dispensing automotive fluids or lubricants:

-#2 Fuel oil for use as diesel or heating fuel including associated stabilizers, inhibiters and biofuel constituents

-Kerosene

-Motor and gear-case lubricating oil

-Transmission or other hydraulic fluids

- -Brake and power steering fluids
- -Ethylene/propylene glycol based anti-freezes
- -DEF-Diesel Emissions Fluid-

Warning-The Roth DWT Eco Plus 3 is not designed for or certified to store flammable liquids; Classes IA, IB or IC.

Liquids that cannot be stored in the DWT Eco Plus 3 commonly found in the automotive and fleet service industries:

- -Gasoline or any Class I flammable liquid
- -Windshield washer fluid- (30% methyl alcohol, class IB flammable liquid)

To inquire about the compatibility of any liquid not included in the above listing, please contact Roth Industries Technical Department at: 315.475.0100 or 315.755.1011 then menu selection 9, or bruces@roth-usa.com

MINNESOTA STATE DEPARTMENT OF PUBLIC SAFETY



State Fire Marshal Division

444 Cedar Street, Suite 145, St. Paul, Minnesota 55101-5145 Phone: 651/201-7200 FAX: 651/215-0525 TTY: 651/282/6555 Internet: http://www.fire.state.mn.us

NONMETALLIC TANKS FOR STORING COMBUSTIBLE LIQUIDS INFORMATION SHEET

This fire safety information sheet is based on the 2007 Minnesota State Fire Code (MSFC) Section 3404.2.7 and 102.7. This contains information for authorities having jurisdiction (AHJ) for the use of nonmetallic storage tanks listed to UL's SU2258 to store Class II, IIIA and IIIB combustible liquids.

It was brought to our attention that there are issues with existing steel tanks corroding from the inside with the number of additives in combustible liquids today. A solution for this is the use of listed nonmetallic tanks. UL has Subject 2258 "Outline of Investigation for Nonmetallic Tanks for Oil Burner Fuels" which has been under engineering review since the late 1990's. At the time nonmetallic tanks could be listed for oil burner fuels and SU2258 was added to NFPA 31 in 2006. Since then UL has added the words "and Other Combustible Liquids" to SU2258. Their continued review of SU2258 determined that the nonmetallic tanks could be used for storing Class II, IIIA and IIIB combustible liquids. Therefore new nonmetallic tanks could be listed to SU2258 for all combustible liquids. UL allows products to be listed to a Subject in its current edition. While the subject is under engineering review it can change and new products can be listed to the latest edition. The latest edition is not retroactive to previously listed products. When the Subject is completed it is sent on to the next process to develop the actual UL standard. SU2258 will be proceeding soon for final development and publishing of the standard.

What are the steps for approving a nonmetallic tank listed to SU2258 in the 2007 MSFC?

- 1. MSFC Section 3404.2.7 states tanks shall be designed to 2008 edition NFPA 30.
- 2. NFPA 30 Section 21.4.2.1.1 states tanks shall be designed to one of the standards for above ground tanks or designed and constructed in accordance with recognized engineering standards. SU2258 is a recognized engineering design standard by UL.
- 3. MSFC Section 102.7 allows AHJ to accept this standard.



More information is available from the Minnesota State Fire Marshal Division at 651-201-7200. Email questions to firecode@state.mn.us or view our web page at www.fire.state.mn.us for the latest information on fire in Minnesota.

Alcohol & Gambling Enforcement

Bureau of Criminal Apprehension

Capitol Security

Crime Victim Services

Driver & Vehicle Services

Emergency Management / Emergency Response Commission

State Fire Marshal / Pipeline Safety

State Patrol

Traffic Safety



TB 029-15 Lube Oil Storage Tanks-Fire Testing

Product: Roth DWT Lube Oil Storage Tank Date: January 29, 2015 (Supersedes Tech Data Sheet)

Purpose-

This bulletin describes fire testing requirements and methods used to qualify nonmetallic tanks for the UL SU 2258 standard and additional general information regarding tank fire testing.

Section

- 1) Above ground storage tank product standards
- 2) Product standards that incorporate of fire testing into performance testing requirements.
- 3) Types of fire test methods in use
- 4) Comparison of test methods
- 5) Fire test protocols for metallic and non-metallic tanks

1) Above ground storage tank product standards-

The most frequently applied standards for the testing and certification of above ground storage tanks are those developed by UL or Underwriters Laboratories. Most local and national codes regulating the installation of AST's reference UL standards.

Steel Tanks-

UL 80- Steel Tanks for Oil-Burner Fuels and Other Combustible Liquids.

- UL 142- Steel Aboveground Tanks for Flammable and Combustible Liquids
- UL 2080- Fire Resistant Tanks for Flammable and Combustible Liquids

UL 2085- Protected Aboveground Tanks for Flammable and Combustible Liquids

Nonmetallic Tanks-

UL SU 2258- Nonmetallic tanks for oil-burner fuels and other combustible liquids

2) Standards that include fire testing or equivalent tests

Steel Tanks-

UL 2080 and UL 2085 use a 2 hour high temperature oven test to simulate an actual pool fire test environment and the heat flux associated with a fully developed hydrocarbon pool fire. The high temperature oven is used rather than an actual pool fire test for repeatability and as a safety precaution.

Nonmetallic Tanks-

UL SU 2258- teste requirements include a 30 minute hydrocarbon pool fire test



TB 029-15 Lube Oil Storage Tanks-Fire Testing

3) Tank fire test methods

Pool fire test-

The fire test method included in UL SU 2258: The pool fire test apparatus consists of a primary and secondary fire pan and a tank support plate. It may also include a back wall to simulate tank installation in an indoor installation against a wall or bulkhead. The primary pan depth is typically 8 inches deep and exceeds the tank footprint by 6 inches in length and width. The secondary pan is 12 inches deep and is used as a safety containment in case of primary pan failure or spill-over of fuel from the tank. It is normally 8 x 10 ft in length and width and may be partially filled with aggregate or absorbent to control the spread of any fuel spilled during the test. The following sketch illustrates a typical pool fire test rig in cross section.



The primary pan is partially filled with water and then a volume equal to approximately 1/8 inches of level of fuel is added and accumulates on the surface. The test tank is filled to 50% capacity with the same fuel. An accelerant i.e. heptane is used to ignite the fuel in the primary pan, and fuel can be added to the pan throughout the test duration to maintain flame temperature and burning rate. At the end of the prescribed test duration, the fire is extinguished and the test tank evaluated. Sensors are used to monitor tank temperature, flame temperature and tank pressure during the test. Test rig dimensions and configuration may vary with tank shape.

Crib Fire Test-

In Europe and other locations outside of North America, a wood crib fire test is used by product testing and certifying agencies. This test is based on installing the tank in a test chamber and placing stacked cribs of wood directly adjacent to the long side of the tank.

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TB 029-15 Lube Oil Storage Tanks-Fire Testing

3) Tank fire test methods continued

Crib fire testing continued-

Wood species is selected according to test protocol and is dimensioned and dried to a prescribed moisture level. The following test rig configuration is from a comparative test run in Canada between a Roth DWT and an obround UL 80 single wall steel tank in the late 1990's.



In this test, the wood cribs were set in a pan and heptane was used as an accelerant to facilitate ignition. The tanks were filled 75-100% with a 50/50 mixture of water and fuel. Sensors were used to measure tank shell temperature and pressure. After ignition, considerable time elapses before the heat source temperatures reach their maximum levels and later as the majority of the fuel is consumed, the monitored temperatures indicate that cooling has commenced.

4) Comparison of test methods-

Industry and the regulatory community generally find the pool fire test to be more rigorous and better representative of actual installed conditions than the crib fire test.

Test Method Attribute	Hydrocarbon Pool Fire Test	Wood Crib Fire Test
High uniform test temperature exposure, entire tank surface area	Yes, Fuel under and around tank	No, "one-sided" heat source, large temp gradient
Consistent temperatures and heat flux throughout the duration of test	Yes, test rig replenishes fuel supply as it is consumed	No, fuel supply not likely replenished during test
Maximize test temperature based on monitoring and not controlling combustion	Yes, consistent fuel properties	No, difficult due to inconsistent fuel properties
Possible to obtain consistent, repeatable test results	Yes, consistent fuel properties	No, difficult due to inconsistent fuel properties
Confidence in distinguishing betw een suitable and unsuitable materials of const.	Yes, consistent fuel properties	No, difficult due to inconsistent fuel properties





TB 029-15 Lube Oil Storage Tanks-Fire Testing

5) Fire test protocols for metallic and non-metallic tanks

Steel Tanks-

Interestingly, neither UL 80 or UL 142 steel tanks standards incorporate a fire testing requirement.

UL 2080 (Fire Resistant Tanks) and UL 2085 (Protected Tanks) standards include the requirement for the product to demonstrate capability to withstand the heat flux associated with a 2-hour hydrocarbon pool fire. Rather than an actual pool fire test like that associated with UL SU 2258, the test protocol requires placement of the tank in a test oven maintained at 2000 Def F for two hours. The inner tank is instrumented with temperature sensors, with limits for maximum temperature increase over the test duration.

Non-metallic Tanks-

The Roth DWT as certified is subject to and has successfully completed a pool fire test with a 30 minute duration with the following pass/fail criterion

- The test tank shall contain all of the test fuel, even if distortion or melting is present
- The test tank shall not sustain damage which would result in a hazard, such as tip-over or adding fuel to the pool fire
- The primary tank pressure shall not exceed 2.5 psig

The comparative tank testing referred to in section 3 crib fire testing did yield some interesting results concerning the Roth DWT vs. the UL 80 single wall steel tank:

Property	Roth	Steel Tank
External maximum wall temperature (Deg F)	89.6	343
Internal liquid maximum temperature (Deg F)	131	199.4
Noise emitted due to heat stress	No	Yes
Still usable after test	Yes with gauge replacement	Yes with gauge replacement

The Roth DWT maintained significantly lower surface and fluid temperatures than the single wall steel tank during this test!





TB 029-15 Lube Oil Storage Tanks-Fire Testing



For any questions or inquiries regarding this Technical Bulletin, please contact the Roth Technical Department per the contact information below.





TB 090-14 Windshield Washer Fluid Bulk Storage

Product: Roth DWT Lube Tanks Date: March 31, 2014

Purpose:

This bulletin is intended to provide guidance on the application and use of the Roth DWT for storage of Windshield Washer Fluid.

Background:

WWF Concentrate:

There are instances where bulk WWF is shipped in a non-diluted form which is essentially pure methanol with small percentage volumes of additives such as corrosion inhibitors and glycols. This product is then blended with water and perhaps additional constituents at the garage or service depot. The non-diluted product is clearly a flammable liquid and cannot be stored in the Roth DWT as it is designed and certified for storage of combustible liquids only.

WWF Blended products:

Blended WWF typically contains methanol at a 1:1 mix ratio or less. A brief survey of blended WWF product manufacturers MSDSs indicates that there are some blended WWF products classified as Class IC flammable liquid and others Class II combustible liquid dependent on the level of protection against freezing and other factors.

Recommendations:

Roth DWT products-Blended WWF storage in Roth DWT products.

Roth DWT products are tested and certified to UL SU 2258, a standard that defines the requirements for nonmetallic tanks for general use combustible liquids only, no flammable liquids can be stored in Roth DWT products. Given the number of variables involved, it is impossible for Roth Industries to determine the classification of any WWF in the field. It is therefore the responsibility of the system designer, installer, authority having jurisdiction or other local authorities involved with a planned tank installation to determine if the liquid intended to be stored is classified as flammable or combustible. If the liquid is deemed to be flammable (NFPA Class IA, IB or IC) it cannot be stored in the Roth DWT product.

For any inquiries or questions regarding this technical bulletin, please contact the Roth Technical Department per the contact information below.



TB 234-14 Roth DWT for DEF Storage and Dispensing

Product: Roth DWT Double Wall Tank

Date: August 22, 2014

Roth Industries, Inc. has approved the Roth DWT for use in storage and dispensing of DEF (Diesel Emissions Fluid) applications. The DWT HDPE inner tank is a material recognized for suitability for storage of DEF. The galvanized steel outer tank has been exposure tested to ensure durability.

Tank Connections-

The Roth DWT is equipped with (4) 2 inch top mounted FNPT connections usable for filling, venting, pump connections and level indication.

Tank Siting and Installation-

DEF tanks will normally be installed indoors. All product siting and installation requirements as indicated in the Installation Instructions for Lubricating and Hydraulic Oil Storage and Dispensing shall apply.

Warranty-Roth DWT standard warranty will be in effect based on adherence to proper installation procedures.

For specific DEF storage and handling requirements, please contact the manufacturer directly.

For assistance please contact the Roth Technical Department



TB 028-15 Regulatory Acceptance-Wisconsin Department of Agriculture, Trade and Consumer Protection

Product: Roth DWT Lube Oil Storage Tanks Date: January 28, 2015 (supersedes Tech Bulletin dated March 27, 2014)

Purpose:

This bulletin is to inform our sales channel members and customers of the acceptance of the UL SU 2258 product standard by the Wisconsin Department of Agriculture Trade and Consumer Protection and it's incorporation in the WI Administrative Code.

Explanation:

The Wisconsin Department of Agriculture Trade and Consumer Protection, (WI DATCP), has included UL SU 2258, the product standard to which the Roth DWT is certified, to the Wisconsin Administrative Code. A directory to this citation is as follows:

Wisconsin Administrative Code-Chapter ATCP 93 Flammable, Combustible and Hazardous Liquids

Subchapter II Adopted Standards and General Requirements

Section ATCP 93.250 Tank construction and marking

An excerpt from this section of the Wisconsin Administrative Code is shown below.

Construction. Tanks containing flammable or combustible liquids shall be constructed to one of the recognized design standards in NFPA 30 section 21.4.2, *or to another standard or design approved by the department,* except this requirement does not apply to any of the following tanks:

ATCP 93.250(2)(a) (a) Tanks that contain liquids which are also hazardous substances.

ATCP 93.250 Note Note: Section ATCP 93.350 requires hazardous substance tanks to be designed and constructed under the supervision of a qualified engineer.

ATCP 93.250(2)(b) (b) Tank wagons, farm tanks and tank vehicles used in accordance with the requirements in ss. ATCP 93.610 and 93.630, for fuel dispensing from aboveground tanks and at farms and construction projects.

ATCP 93.250 Note: Design standards recognized by NFPA 30 section 21.4.2 include API 12B, API 12D, API 12F, API 650, UL 58, UL 80, UL 142, UL 1316, UL 1746, UL 2080 and UL 2085. Another standard approved by the department is SU 2258 from Underwriters Laboratories Inc.



TB 028-15 Regulatory Acceptance

January 28, 2015

ATCP 93.250 Note Note: Tank wagons have construction requirements in section ATCP 93.610 (1). Farm tanks are required to meet the construction specifications in NFPA 30A section 13.2.3. Tank vehicles are required to meet the construction specifications in NFPA 385 chapters 2 and 3. Movable tanks covered under the dispensing requirements in section ATCP 93.610 (2) are not exempted from this requirement.

ATCP 93.250(2)(c) (c) Tanks which are custom built for a specific purpose and which are supported by a statement acceptable to the department, from a qualified engineer, as defined in s. ATCP 93.350 (2) (d), except the competency of the engineer shall relate to the purpose for the custom-built tank.

ATCP 93.250(2)(d) (d) Aboveground used-oil tanks at a scrap recycling or auto recycling facility that are exempted from these requirements under s. ATCP 93.300 (9).

Although the title of this code includes Flammable, Combustible and Hazardous Liquids, please remember that the Roth DWT is applicable to *combustible* liquid storage only.

For any questions or inquiries regarding this Technical Bulletin, please contact the Roth Technical Department per the contact information below





TB 035-15

Lube Tank Standards Testing Comparison

Product: Roth DWT Lube Oil Storage Tanks

Date: February 4, 2015

Purpose-

To provide a comparison of the testing descriptions included in UL SU 2258, Outline of Investigation for Nonmetallic Tanks for Oil Burner Fuels and other Combustible Liquids and UL 142, Standard for Steel Tanks for Flammable and Combustible Liquids.

UL SU 2258 Outline of Investigation for Nonmetallic Tanks for Oil Burner Fuels and other Combustible Liquids UL 142 Standard for Steel Tanks for Flammable and Combustible Liquids

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Tank Drop Test- Drop Tank assy. onto concrete surface from 3 ft. No leakage or hazardous condition may result.	
Tank Handle/Lift Lug Strength Test- 2X empty tank weight subjected for 1 minute on lifting handles/lugs, no damage or-leakage may result.	Lift Lug Test- 2X empty tank weight for 1 minute on lifting lugs, no damage or leakage may result
Pipe and Fitting Torque Test- Torque to 1.5X mfg. tank fitting torque specification, and torque fittings in accordance with industry torque standards per A.S.A. pipe size. No damage or potential for hazardous condition may result.	
Pipe and Fitting Bending Test- A force of 250 lbft. applied to pipe 36 in length in the most unfavorable direction, deformation limited to 30° from applied load. No damage resulting in leakage may result.	
Tank Impact Test- 5lb impact force applied with a 2 in. steel ball. Impact areas selected considered to be worst case with respect to material, shape, or thickness. No damage resulting in a hazardous condition may result.	
Tank Stability and Support Load Test- Tank system top loaded with a weight equivalent to 2X filled tank weight based on #2 oil, for one minute. No collapse, tip-over or leakage may result.	Tank Support Load Test- Tank is completely filled with water, an evenly distributed load equal to the weight of the filled tank is applied to the tank top for 2 minutes. No permanent deformation to the tank or supports may result.



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TB 035-15

Lube Tank Standards Testing Comparison

Product: Roth DWT Lube Oil Storage Tanks

Date: February 4, 2015

UL SU 2258 Outline of Investigation for Nonmetallic Tanks for Oil Burner Fuels and other Combustible Liquids	UL 142 Standard for Steel Tanks for Flammable and Combustible Liquids
Rain Test- Tanks and covers rated for outdoor use shall be subject to water test with UL specified spray nozzle. 15 min. 45° from tank top, 15 min. parallel with tank top. No water is allowed to enter the inside of the primary, secondary or diked tank areas.	
Tank Top Load Test- 250 lb. load evenly distributed over a 12in x 12in square plate on the tank top for one minute. No leakage, collapse, tip-over or other hazardous condition may result	Top Load Test- 1000 lb. load over a 1 sq. ft. area at the weakest part of the tank for 5 minutes. No permanent deformation or leakage may result.
Tank Stability Test- Tank subject to 1 minute of pushing and tilting. Pushing simulated by applying a horizontal force of 50lb to the highest part of the empty tank. Tilting-tank placed on a 15° incline then filled to rated capacity with water. May not tip-over or sustain damage that would result in a hazard.	
Interstitial Communication Test- Fill primary to 100% of rated capacity with water on a level surface. Inject a maximum of 2% of rated capacity into the interstitial at a point furthest from the leak detection point. Must show evidence of communicating leakage to the detection point within 24 hours.	
Buoyancy Test- Tank interstitial to be filled with water to maximum capacity with the primary empty and held for 1 hour. No uplifting, rotation, leakage or exhibit other damage resulting in a hazard.	Buoyancy Test- Diked area filled to capacity with water while tank remains empty. Condition maintained for 1 hour. No uplifting of the tank from the dike floor or evidence of structural damage shall result.
Freeze/Thaw Cycle Test- Tank system interstitial/diked area filled to 2% of capacity then subjected to the following temperature cycle: 24 hrs. @-20°C/-4°F, 24 hrs. @ 20°C/68°F, 24 hrs. @-20°C/-4°. No cracks, leaks or other damage resulting in a hazard may result.	



Roth

TB 035-15

Lube Tank Standards Testing Comparison

Product: Roth DWT Lube Oil Storage Tanks

Date: February 4, 2015

UL SU 2258 Outline of Investigation for Nonmetallic Tanks for Oil Burner Fuels and other Combustible Liquids UL 142 Standard for Steel Tanks for Flammable and Combustible Liquids

Proof of Design and Hydrostatic Load Tests- Primary tank test- Fill with water and bring to a pressure of 25 PSIG. Secondary tank test-fill with water and bring to a pressure of 25 PSIG while maintaining water in the primary, hold for one minute. Dike test- fill with water to max capacity with primary full. Hold for one minute. Pipe, gauges, fittings, fill limiting devices and tank system shall not rupture, leak, or have other damage which could cause a risk of injury after completion of the test.	Hydrostatic Strength Test- Primary tank test- completely fill with water, apply pressure increments of 2 PSI per minute. Hold pressure at each increment of 5PSI for two minutes until a gauge pressure of 25 PSIG is reached. Secondary tank test- completely fill the secondary with water, apply pressure as in the primary until 25 PSI is reached. Neither primary nor secondary shall rupture or leak when subject to this test.
Pool Fire Test- Tank sample with the greatest surface area per capacity is selected and equipped with piping and accessories per mfg'rs instructions. Tank is placed in a test fixture designed to provide a sustained fire source for the test duration. Tank is filled to 50% of capacity with #2 oil. Test fixture automatically fed with #2 oil and includes instrumentation for monitoring tank sample and test fixture function. For fixture details see Roth TB 029-15. After ignition, fuel is pumped to the fixtures primary fire pan to sustain test for 30 minutes. Upon conclusion of the test: The tank system shall contain all of the test fuel even if melting or distortion is present. The tank system shall not sustain damage which would result in a hazard, such as tip-over or adding fuel to the pool fire. The primary tank pressure shall not exceed 2.5 psig during the test.	



TB 035-15 Lube Tank Standards Testing Comparison

Product: Roth DWT Lube Oil Storage Tanks

Date: February 4, 2015

UL SU 2258 Outline of Investigation for Nonmetallic Tanks for Oil Burner Fuels and other Combustible Liquids UL 142 Standard for Steel Tanks for Flammable and Combustible Liquids

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Comparative Small Scale Fire Test- This test is intended to measure the flammability of as received plastic tank samples and compare them to plastic samples already subjected to the Thermal Compatibility Test, Fuel Compatibility Test, Fluids Compatibility Test and the UV Compatibility Test. Each of these requires a 90 day test duration. Burn rates of these samples may not exceed those of new samples by more than 20%	
Materials Compatibility Tests-Primary tests intended to test metallic components for corrosion based on samples subject to several of the following tests. Nonmetallic testing for permeation and property retention based on samples subject to several of the following tests. Metallic samples-no corrosion of base metal or delamination, blistering or cracking of coatings or plating. Nonmetallic samples are evaluated for permeation and retention of physical properties per the specific test limits.	
1) Permeation Test- Nonmetallic samples	
2) Material Property Tests-Nonmetallic samples	
3) Thermal Compatibility Test-Nonmetallic samples	
4) Fuel Compatibility Tests-Nonmetallic samples	
5) Fluids Compatibility Tests-Metallic samples	
6) UV Compatibility Tests-Nonmetallic samples	
7) Extreme Temperature Tests-Metallic and Nonmetallic samples	



TB 035-15 Lube Tank Standards Testing Comparison

Product: Roth DWT Lube Oil Storage Tanks

Date: February 4, 2015

UL SU 2258 Outline of Investigation for Nonmetallic Tanks for Oil Burner Fuels and other Combustible Liquids UL 142 Standard for Steel Tanks for Flammable and Combustible Liquids

Leakage Test-Tanks capable of being visually	Tank Leakage Test-Primary containment tanks-Air test 3-
inspected before or after assy., subject to 3-5 psig (20-	5 psig, horizontal or rectangular tank. 1-1/2-2-1/2 psig,
35 kpa) air or water for 1 minute Tanks not capable of	vertical tanks OR fill the primary containment with water
being visually inspected, there will be no pressure	and subject above test pressures. Secondary containment
change after subjecting the tank to 5 in Hg (127mm Hg)	tank-is to be leak tested using the above procedures.
or 3-5 psig (20-35 kpa) air or water for 15 minutes. For	After secondary containment is tested, the primary must
diked tanks, there shall be no leakage as demonstrated	be tested again using the same method. Additional
by filling with water to evaluate all bottom and side	details are provided for performance and production
seams, or using one of the pressure or vacuum methods	testing.
above.	

Important: The above abbreviated test descriptions are offered to provide a general sense of the nature of each test and requirements. For complete detailed test protocols and requirements, please consult the product standards referenced.

While the number and nature of the product tests included in UL SU 2258 is more diverse than the testing requirements for UL 142, in the tests that are common to both have the same or very similar requirements.

This demonstrates the suitability of tanks manufactured and listed to UL SU 2258 for installation and use in storage of combustible liquids.

For any questions or inquiries regarding this Technical Bulletin, please contact the Roth Technical Department per the contact information below