



# 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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<b>Tank Drop Test-</b> Drop Tank assy. onto concrete surface from 3 ft. No leakage or hazardous condition may result.	
<b>Tank Handle/Lift Lug Strength Test-</b> 2X empty tank weight subjected for 1 minute on lifting handles/lugs, no damage or-leakage may result.	<b>Lift Lug Test-</b> 2X empty tank weight for 1 minute on lifting lugs, no damage or leakage may result
<b>Pipe and Fitting Torque Test-</b> 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.	
<b>Tank Impact Test-</b> 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.	
<b>Tank Stability and Support Load Test-</b> 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.	<b>Tank Support Load Test-</b> 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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<b>Rain Test-</b> 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.	
<b>Tank Top Load Test-</b> 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	<b>Top Load Test-</b> 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.
<b>Tank Stability Test-</b> 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 <sup>o</sup> incline then filled to rated capacity with water. May not tip-over or sustain damage that would result in a hazard.	
<b>Interstitial Communication Test-</b> 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.	
<b>Buoyancy Test-</b> 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.	<b>Buoyancy Test-</b> 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.
<b>Freeze/Thaw Cycle Test-</b> 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.	



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<b>Proof of Design and Hydrostatic Load Tests-</b> 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.	<b>Hydrostatic Strength Test-</b> 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 or secondary shall rupture or leak when subject to this test.
<b>Pool Fire Test-</b> 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.	



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<b>Comparative Small Scale Fire Test-</b> 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



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UL SU 2258 Outline of Investigation for Nonmetallic UL 142 Standard for Steel Tanks for Flammable Tanks for Oil Burner Fuels and other Combustible and Combustible Liquids Liquids Leakage Test-Tanks capable of being visually Tank Leakage Test-Primary containment tanks-Air test inspected before or after assy., subject to 3-5 psig 3-5 psig, horizontal or rectangular tank. 1-1/2-2-1/2 (20-35 kpa) air or water for 1 minute Tanks not psig, vertical tanks OR fill the primary containment with capable of being visually inspected, there will be no water and subject above test pressures. Secondary pressure change after subjecting the tank to 5 in Hg containment tank-is to be leak tested using the above (127mm Hg) or 3-5 psig (20-35 kpa) air or water for procedures. After secondary containment is tested, the primary must be tested again using the same method. 15 minutes. For diked tanks, there shall be no Additional details are provided for performance and leakage as demonstrated by filling with water to evaluate all bottom and side seams, or using one of production testing. the pressure or vacuum methods 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