UL 80

STANDARD FOR SAFETY

Steel Tanks for Oil-Burner Fuels and Other Combustible Liquids

UL Standard for Safety for Steel Tanks for Oil-Burner Fuels and Other Combustible Liquids, UL 80

Twelfth Edition, Dated September 21, 2007

SUMMARY OF TOPICS

This revision of ANSI/UL 80 dated April 26, 2019 is being issued to reflect the reaffirmation of the ANSI approval of the Standard. No technical changes have been made to the document.

Text that has been changed in any manner or impacted by UL's electronic publishing system is marked with a vertical line in the margin.

The requirements are substantially in accordance with Proposal(s) on this subject dated February 15, 2019.

The first and second editions were titled Design and Construction of Inside Tank Equipment for Oil Burners. The third edition was titled Inside Storage Tanks for Oil Burners. The fourth and fifth editions were titled Inside Tanks for Oil-Burner Fuel. The sixth through ninth editions were titled Steel Inside Tanks for Oil-Burner Fuel. The tenth and eleventh editions were titled Steel Tanks for Oil-Burner Fuel.

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This ANSI/UL Standard for Safety consists of the Twelfth Edition including revisions through April 26, 2019. The most recent designation of ANSI/UL 80 as a Reaffirmed American National Standard (ANS) occurred on April 26, 2019. ANSI approval for a standard does not include the Cover Page, Transmittal Pages, and Title Page.

The Department of Defense (DoD) has adopted UL 80 on January 2, 1992. The publication of revised pages or a new edition of this Standard will not invalidate the DoD adoption.

Comments or proposals for revisions on any part of the Standard may be submitted to UL at any time. Proposals should be submitted via a Proposal Request in UL's On-Line Collaborative Standards Development System (CSDS) at https://csds.ul.com.

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CONTENTS

INTRODUCTION

1 Scope 5
2 Components 5
3 Glossary 6
4 Units of Measurement 8
5 References 8
6 Tank Components 8
7 Tank Accessories 8

CONSTRUCTION

8 Size and Form 9
9 Materials 11
10 Shell Seams 12
11 Head Joints 14
12 All Tank-To-Pipe Connections 18
13 Top Fill, Vent, and Gauge Connections 20
14 Bottom Supply or Drain Connection 21
15 Protection of Openings 21
16 Painting 21

HYDROSTATIC PRESSURE TEST

17 Physical Abuse Tests 21
18 Handle/Lug Strength 22
19 Tank Stability 22
20 Support Load 22
21 Top Load 22
22 Tank Buoyancy 22
23 Hydrostatic Pressure Test 23

MANUFACTURING AND PRODUCTION TESTS

24 General 23

MARKING AND INSTRUCTIONS

25 General Marking Information 24
26 Engineering Markings 24
26.1 All tanks 24
26.2 Primary containment tanks 25
26.3 Secondary containment tanks and double bottom tanks 25
26.4 Diked tanks 25
26.5 Tank accessories 25
27 Marking Methods 26
28 Instructions 26

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INTRODUCTION

1 Scope

1.1 These requirements cover steel primary, steel secondary, and steel diked type atmospheric storage tanks from 60 to 660 gallons (227 to 2500 L) 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.

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

1.3 These shop fabricated 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 Each tank shall be permitted to be fabricated as a double bottom tank as covered in this Standard.

1.5 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 Motor Fuel Dispensing Facilities and Repair Garages, NFPA 30A, the Uniform Fire Code, ANSI/NFPA 1, and the International Fire Code published by the International Code Council.

1.6 These requirements do not apply to tanks covered by the Standard for Steel Underground Tanks for Flammable and Combustible Liquids, UL 58, the Standard for Steel Aboveground Tanks for Flammable and Combustible Liquids, UL 142, the Standard for Fire Resistant Tanks for Flammable and Combustible Liquids, UL 2080, the Standard for Protected Aboveground Tanks for Flammable and Combustible Liquids, UL 2085, or the Outline of Investigation for Non-Metallic Oil Burner Fuel Tanks, SU 2258.

1.7 These requirements do not apply to tanks covered by the Specification for Field-Welded Tanks for Storage of Production Liquids, API 12D; and the Specification for Shop-Welded Tanks for Storage of Production Liquids, API 12F or the Standard for Welded Steel Tanks for Oil Storage, API 650.

1.8 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, and do not cover fuel blends with more than 20 percent of bio diesel fuel. These requirements do not cover storage of flammable liquids.

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

2 Components

2.1 Except as indicated in 2.2, a component of a product covered by this standard shall comply with the requirements for that component.

2.2 A component is not required to comply with a specific requirement that:

a) Involves a feature or characteristic not required in the application of the component in the product covered by this standard, or

b) Is superseded by a requirement in this standard.

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2.3 A component shall be used in accordance with its rating established for the intended conditions of use.

2.4 Specific components are incomplete in construction features or restricted in performance capabilities. Such components are intended for use only under limited conditions, such as certain temperatures not exceeding specified limits, and shall be used only under those specific conditions.

3 Glossary

3.1 For the purposes of this Standard, the following definitions apply.

3.2 ABOVEGROUND TANK (also known as ABOVEGROUND STORAGE TANK or AST) – A storage tank that is intended for installation above grade, at grade or below grade without backfill.

3.3 ATMOSPHERIC TANK – A storage tank that has been designed to operate at pressures from atmospheric through a gauge pressure of 1.0 psig (6.9 kPa) measured at the top of the tank.

3.4 BIO DIESEL – General description of various Class II to IIIB range of long chain fatty acid ester fuels complying with ASTM D6751 processed from vegetable oils or animal fats in pure form (B100). Bio diesel may also be blended with heating fuels or diesel fuels (B1-B99) denoting the percent volume of bio diesel in the mix.

3.5 BOTTOM SUPPLY CONNECTION – A storage tank bottom opening that is intended to provide a means to supply fuel to oil burning equipment or oil to a dispensing device by gravity in addition to providing a means to automatically drain water from the tank.

3.6 DIESEL FUELS – General description of various Class II petroleum distillate grades complying with ASTM D975 including No. 1 and No. 2 Diesel Fuel (also known as on-road diesel, including low sulfur diesel, ultra low sulfur diesel, and bio diesel blends) typically intended for powering compression ignition engines.

3.7 DIKE – A single wall construction forming a bottom and high sides with open or closed top intended to provide integral support and secondary containment of an aboveground tank or tanks but not capable of being pressurized for leak testing. Dikes types include combinations of rectangular or cylindrical shapes or horizontal or vertical orientations. Open top dike constructions do not have covers to prevent precipitation or debris from entering the dike area. Closed top dike constructions have covers to resist precipitation or debris from entering the dike area.

3.8 DIKED PRIMARY TANK – An aboveground primary tank within an open or closed dike intended to provide at least 110 percent containment capacity of the primary tank or tanks and spill containment.

3.9 DIKED SECONDARY TANK – An aboveground secondary tank within an open or closed dike intended to provide at least 110 percent containment capacity of the primary tank or tanks and spill containment.

3.10 DOUBLE BOTTOM TANK – A primary tank with an additional bottom capable of being pressurized and has means for venting and monitoring for leaks in the interstitial space, but does not provide complete secondary containment.

3.11 HEATING FUELS – General description of various Class II petroleum distillate grades complying with ASTM D396 or ASTM D3699, including No. 1 and No. 2 Fuel Oils or K1 Kerosene (also known as oil burner fuel, including low sulfur distillates and bio diesel blends), typically intended for use in oil burning equipment.

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3.12 INTERSTITIAL SPACE – The volume between two tank walls that is capable of communicating fluid from a leak in the primary tank to a collection point for purposes of monitoring and venting.

3.13 MOTOR OILS – General description of various Class III petroleum distillate or synthetic grades including lube oils, hydraulic oils or transmission oils typically used as lubricating, cooling, or working fluids in motor vehicle applications.

3.14 OBROUND – Obround tanks are cylindrical tanks with flat portions of the shell and head on two opposing sides, as shown in Figure 12.2.

3.15 PERFORMANCE TESTS – A complete evaluation conducted on a limited quantity of representative "worst case" tanks intended to verify compliance with all applicable performance requirements in a Standard. Performance tests are typically destructive.

3.16 PRIMARY CONTAINMENT – The ability of an enclosed design or construction to contain a liquid while in normal use without leakage.

3.17 PRIMARY CONTAINMENT TANK (also known as PRIMARY TANK or SINGLE WALL TANK) – A single wall tank construction that provides primary containment. Primary containment tank types include cylindrical, rectangular or obround shapes and vertical or horizontal orientations.

3.18 PRODUCTION TESTS – A limited evaluation conducted by the tank manufacturer on each tank after complete assembly but prior to shipping intended to verify compliance with critical production requirements in a Standard, such as leakage. Production tests are not destructive.

3.19 SECONDARY CONTAINMENT – The ability of a design or construction to contain a liquid to a minimum of 300 degrees (for cylindricals and obrounds), 95 percent height (for rectangulars and verticals), or 110 percent primary capacity (for dikes) only in abnormal use (from primary containment leakage or rupture)without leakage.

3.20 SECONDARY CONTAINMENT TANK (also known as SECONDARY TANK or DOUBLE WALL TANK) – A double wall tank construction with interstitial space that provides secondary containment that is capable of being pressurized for leak testing. Secondary containment tank types include cylindrical, rectangular or obround shapes, and vertical or horizontal orientations.

3.21 STORAGE TANK (also known as TANK) – A vessel having a liquid capacity of at least 60 gal (230 L), is intended for fixed installation, and is not used for processing.

3.22 TANK ACCESSORY – Optional devices or components of an aboveground tank intended to provide a specific function, such as venting, heating, load bearing, or special containment. Tank accessories are either integrally connected or field assembled to the tank and may be emergency vents, hot wells, lift lugs, spill containers or other types.

3.23 TANK ORIENTATIONS – General description of the position of an aboveground tank. Horizontal tanks typically are longer and wider than high. Vertical tanks typically are higher than wide.

3.24 TANK SHAPES – General description of the geometry of an aboveground tank. Cylindrical tanks are tubes formed with rolled shells and equivalent circular heads. Rectangular tanks are boxes formed with flat right angled sides. Obround tanks are cylindrical tanks with flat portions of the shell and head on 2 opposing sides.

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3.25 TANK SUPPORT – Optional structural members of an aboveground tank intended to bear the weight of, raise above grade and/or stabilize the tank and its contents. Tank supports are integrally connected to the tank by welds, bolts, or threaded pipe, and may be saddle, leg, flat, skid, or other types.

3.26 USED OILS – General description of oils such as those drained from motor vehicles or cooking appliances after use that do not contain water, gas or other contaminants that change the oil Class or may adversely affect the storage tank.

3.27 VENT OPENING – A storage tank top opening that is intended to provide both normal venting (equalizing pressure from fill, withdraw or atmospheric changes typically up to 1.0 psig) and emergency venting (relief of excessive pressure from external fire exposure typically not to exceed 2.5 psig).

3.28 WASTE OIL – General description of oils such as those drained from motor vehicles or cooking appliances after use that contain some amounts of water, gasoline, diesel, or other contaminants that change the oil Class or may adversely affect the storage tank.

4 Units of Measurement

4.1 Values stated without parentheses are the requirement. Values in parentheses are explanatory or approximate information.

5 References

5.1 Any undated reference to a code or standard appearing in the requirements of this standard shall be interpreted as referring to the latest edition of that code or standard.

6 Tank Components

6.1 The following tank components shall be permitted to be provided as either an attached part of a complete tank, or packed with a tank for assembly per the manufacturers instructions at the installation site. When provided, these components shall comply with all applicable requirements of the Standards identified below:

a) Fuel Filters or Oil Deairators in accordance with the Standard for Strainers for Flammable Fluids and Anhydrous Ammonia, UL 331, rated at least 25 psig, for use with combustible liquids described in the Scope, and intended for connection to the burner supply.

b) Fusible Link Valves or Shutoff Valves in accordance with the Standard for Valves for Flammable Fluids, UL 842, rated at least 25 psig, for use with the combustible liquids described in the Scope, and intended for connection to the burner supply.

c) Liquid Level Gauges in accordance with the Standard for Liquid-Level Indicating Gauges for Oil Burner Fuels, UL 180, rated at least 25 psig, for use with the combustible liquids described in the Scope, and intended for use in top openings.

7 Tank Accessories

7.1 The following tank accessories shall be permitted to be provided as either an attached part of a complete tank, or packed with a tank for assembly per the manufacturers instructions at the installation site. When provided, these accessories shall comply with all applicable requirements identified below:

a) Spill Containers shall be steel leak tight constructions integral to the tank with attached covers, and shall have a minimum 1 gallon (3.8 L) capacity for use around top openings such as fill and vents.

b) Piping for leg supports shall be minimum schedule 40 ASME B36.10M black pipe in sizes and threads to fit the integral leg brackets and shall comply with the requirements in Sections 17 – 22.

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