UL 142A

STANDARD FOR SAFETY

Special Purpose Aboveground Tank for Specific Flammable or Combustible Liquids

UL Standard for Safety for Special Purpose Aboveground Tank for Specific Flammable or Combustible Liquids, UL 142A

First Edition, Dated May 25, 2018

SUMMARY OF TOPICS

This revision to ANSI/UL 142A dated January 21, 2021 includes the addition of Flange Top Process Tanks to the standard; 1.1, 3.16, Section 5.5A, 5.6.3, 6.2.2.1, 7.4, 10.6

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 new and revised requirements are substantially in accordance with Proposal(s) on this subject dated August 7, 2020 and November 13, 2020.

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UL 142A

Standard for Special Purpose Aboveground Tanks for Specific Flammable or Combustible Liquids

First Edition

May 25, 2018

This ANSI/UL Standard for Safety consists of the First Edition including revisions through January 21, 2021.

The most recent designation of ANSI/UL 142A as an American National Standard (ANSI) occurred on January 21, 2021. ANSI approval for a standard does not include the Cover Page, Transmittal Pages, and Title Page.

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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INTRODUCTION

1 Scope

1.1 These requirements cover special purpose steel aboveground tanks for specific fuels or liquids and/or use applications as indicated for each special purpose tank type, which are intends to address the specific designs, features, limitations, use factors and other unique characteristics of each type. These requirements are not covered by UL 142 for general purpose steel aboveground tanks for flammable and combustible liquids, as each special purpose tank deviates from them by construction, performance and/or markings for the intended use. The basic types of different special purpose tanks covered by this Standard are:

a) Generator base tanks are designed for combined combustible fuel storage and structural support for diesel or turbine engine power generators, and are intended to be installed in accordance with the Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines, NFPA 37, or Standard for Emergency and Standby Power Systems, NFPA 110. Generator base tanks are limited to Combustible Class II or III fuels, such as diesel, kerosene, turbine oils or heavy oils. Covered options may include fire resistance, damage resistance and/or tank support evaluations.

b) Work top tanks are designed for combined combustible liquid storage and structural working surface, and are intended to be installed in accordance with NFPA 30, Code for Flammable and Combustible Liquids, NFPA 30A, Code for Motor Fuel Dispensing Facilities and Repair Garages, or NFPA 31, Standard for Installation of Oil-Burning Equipment. Work top tanks are limited to Combustible Class III liquids, such as heavy fuel oils, new/used lube oils, hydraulic/transmission oils, or similar working fluids. Covered options may include racks, shelves and/or tank support evaluations.

c) Lube oil tanks are designed for storage of unused lubricating oils and similar combustible liquids, and are intended to be installed in accordance with NFPA 30, Code for Flammable and Combustible Liquids, NFPA 30A, Code for Motor Fuel Dispensing Facilities and Repair Garages, or NFPA 31, Installation of Oil-Burning Equipment. Lube oil tanks are limited to Combustible Class IIIB oils, such as motor crankcase oils, hydraulic/transmission oils, machine/cutting oils, or similar fluids. Covered options may include dispensing equipment and/or tank support evaluations.

d) Used oil tanks are designed for storage of used lubricating oils and similar combustible liquids, and are intended to be installed in accordance with NFPA 30, Code for Flammable and Combustible Liquids, NFPA 30A, Code for Motor Fuel Dispensing Facilities and Repair Garages, or NFPA 31, Installation of Oil-Burning Equipment. Used oil tanks are limited to Combustible Class IIIB oils, such as motor crankcase oils, hydraulic/transmission oils, machine/cutting oils, or similar fluids. Covered options may include recycling equipment and/or tank support evaluations.

e) Day tanks are designed for a small temporary or backup supply of fuel for engine-driven equipment, such as pumps or generators, and fuel-burning appliances such as furnaces or heaters, or other portable equipment typically used in farm, construction, mining, forestry, or similar applications, and are intended to be installed in accordance with NFPA 30, Code for Flammable and Combustible Liquids, NFPA 30A, Code for Motor Fuel Dispensing Facilities and Repair Garages, NFPA 31, Standard for the Installation of Oil-Burning Equipment, NFPA 37, Installation and Use of Stationary Combustion Engines and Gas Turbines, or NFPA 110, Standard for Emergency and Standby Power Systems. Day Tanks are limited to specific fuels as marked, such as Flammable Class I gasoline or Combustible Class II kerosene, diesel fuel or heating oil. Covered options may include dispensing equipment and/or tank support evaluations.

f) Process Tanks are designed for mixing of different flammable or combustible liquid(s) and/or other materials which are typically added/monitored through a top hatch and dispensed through bottom hose outlets. These smaller tanks have easily removable tops, such as bolted flanges, for

frequent cleaning and maintenance, and are intended for installation and use in accordance with NFPA 30, Code for Flammable and Combustible Liquids. Covered options may include attached accessories and equipment, such as pumps, gauges and valves, and/or tank support evaluations.

1.2 All special purpose tanks are atmospheric types, but may be of primary, secondary or diked containment designs; constructed in cylindrical or rectangular shapes; oriented horizontally or vertically, and have additional features or options, as described for each tank type.

1.3 All special purpose tanks are shop fabricated, but may be either completely assembled at the factory, or allow for limited field assembly. However, only the optional accessories which are described in this Standard and have been evaluated to applicable requirements are covered items for each tank type.

1.4 These requirements cover only the accessories, components and features specifically identified in this Standard. Any other accessories or components that are shipped with the tanks, attached to the tanks, or added to the tanks are not included in the scope of the tank evaluation. It is intended that the AHJ approve the use and/or installation of any such accessories or components independent of the evaluated tank.

1.5 For some special purpose tank types, it is expected that generators, engines, pumps or other equipment may be mounted on or connected to the tank. However, these devices are not covered or evaluated by the requirements of this Standard, other than the structural integrity of the tank at rated loads.

1.6 These requirements do not cover portable tanks intended for transporting flammable or combustible liquids (such as by truck, rail, ship or air), or mobile use applications (such as on vehicles or trailers). These types of products are covered by separate UN, DOT, or other specific end product standards.

1.7 These requirements do not cover special evaluations for resistance to hurricanes, tornadoes, earthquakes, floods, or other natural disasters; or fire and damage resistance, except for generator base tank options. However, assessment of any damage for continued use after such events are not included in the evaluation.

1.8 These requirements do not cover general purpose tanks, which are found in the Standard for Steel Aboveground Tanks for Flammable and Combustible Liquids, UL 142, or fuel oil tanks, which are found in the Standard for Steel Tanks for Oil Burner Fuel and Other Combustible Liquids, UL 80.

1.9 The common fuel, oil and other liquid terms referenced in this Standard are intended to be those which are commercially available, and which meet a recognized industry specification, such as ASTM or SAE.

2 General

2.1 Units of measurement

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

2.2 Undated references

2.2.1 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.

3 Glossary

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

3.2 Aboveground Tank – 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 minus 0.5 psig to 1.0 psig (minus 3.4 kPa to 6.9 kPa) at the top of the tank.

3.4 Diked Containment – A single wall construction with bottom, sides, and an open or closed top intended to provide secondary containment of aboveground tank(s). The dike area is capable of being monitored for leakage, but can't be pressurized.

3.5 Diked Containment Tank (Dike Tank) – A primary or secondary containment tank within a steel open or closed dike intended to provide at least 110 percent spill containment of the primary tank(s). Open top dikes do not have covers to prevent precipitation or debris from entering the dike area. Closed top dikes have covers to resist precipitation or debris from entering the dike area.

3.6 Fuel – A flammable or combustible liquid which is commercially available as an energy source for spark ignition or compression ignition engines, generators, turbines, heaters, or similar equipment; and meet appropriate ASTM Fuel Specifications, such as:

a) **Gasoline** – General description of various Flammable Class I petroleum distillates and alcohol blends compliant with ASTM D4814 or ASTM D5798 in a range of E0 to E83 typically used in spark ignition engines.

b) **Diesel** – General description of various Combustible Class II petroleum distillates and biodiesel blends compliant with ASTM D975 or ASTM D7467 in a range of B0 to B20 typically used in compression ignition engines.

c) **Fuel Oil/Heating Oil** – General description of various Combustible Class II petroleum distillates and biodiesel compliant with ASTM D396 in a range of B0-B5 typically used in heating equipment.

d) **Kerosene** – General description of various Combustible Class II petroleum distillates compliant with ASTM D3699 typically used in cooking, heating, lighting or similar equipment.

e) **Turbine Oil** – General description of various Combustible Class II petroleum distillates compliant with ASTM D2880 typically used in turbine type engines or generators.

3.7 General Purpose Tank – A steel aboveground tank type covered by the requirements of UL 142, which are intended for a broad range of applications for storage of flammable and combustible liquids.

3.8 Interstitial Space (Interstice) – A space between the walls of a multiple wall tank that is capable of communicating fluid from a leak in an adjacent wall to a collection point for monitoring.

3.9 Oil – A combustible liquid which is commercially available as a lubricating oil or working fluid for engines, machines, or similar equipment; and meet appropriate SAE or Similar Specifications, such as:

a) **Motor Oil or Lube Oil** – General description of various Class IIIB petroleum distillate or synthetic type oils with higher viscosity typically used as lubricants in engines or machinery applications.

b) **Hydraulic Oil or Transmission Oil** – General description of various Class IIIB petroleum distillate or synthetic type lower viscosity oils typically used as working fluids in engine or machinery applications.

c) **Unused Oils** – General description of Class IIIB motor, lube, hydraulic, transmission or similar oils that have not been transferred to motor vehicles, engines or machinery, and do not adversely affect the tank.

d) **Used Oils** – General description of Class IIIB motor, lube, hydraulic, transmission or similar oils drained from motor vehicles, engines or machinery after use, that may contain small amounts of contaminants, but do not adversely affect the tank.

3.10 Performance Tests – A complete evaluation conducted on a limited quantity of representative tanks. These tests are intended to verify compliance with all applicable performance requirements in a standard.

3.11 Primary Containment – The ability of a tank design and construction to contain a liquid while in normal use (intended storage).

3.12 Primary Containment Tank (Primary Tank) – The wall of a tank construction that provides primary containment.

3.13 Production Tests – A limited evaluation conducted on each tank prior to shipping. These tests are intended to verify compliance with production requirements in a standard, such as leakage.

3.14 Secondary Containment – The ability of a tank design or construction to contain a liquid only in abnormal use (from primary containment leakage or rupture).

3.15 Secondary Containment Tank (Secondary Tank) – A primary containment aboveground tank contained within a steel secondary containment shell forming an interstitial space to the greater of 330 degrees or 95 percent fill, and which is capable of being pressurized and monitored for leakage from either the interior or exterior walls.

3.16 Special Purpose Tank – A steel aboveground tank covered by the requirements of this Standard, which are intended for specific applications and/or fuels or liquids as indicated by each special purpose tank type.

a) **Generator Base Tank** – A special purpose tank with structural supports for mounting of power generators (such as diesel or turbine engines) or similar equipment, and intended only for storage of diesel, kerosene, turbine oil or similar combustible Class II or III fuels to supply these engines.

b) **Work Top Tank** – A special purpose tank with a structural top working surface and optional racks/shelves, intended only for storage of heavy fuel oils, new/used lube oils, hydraulic/transmission oils, or similar maximum Combustible Class III liquids.

c) **Lube Oil Tank** – A special purpose tank with optional dispensing equipment, intended only for storage of unused lubricating oils, hydraulic/transmission oils, machine/cutting oils, or similar maximum Combustible Class IIIB liquids.

d) **Used Oil Tank** – A special purpose tank with optional recycling equipment, intended only for storage of used lubricating oils, hydraulic/transmission oils, machine/cutting oils, or similar maximum Combustible Class IIIB liquids.

e) **Day Tank** – A special purpose tank with optional fuel supply or dispensing equipment, intended for a small temporary or backup supply of fuel for engine-driven equipment, such as pumps or generators, and fuel-burning appliances such as furnaces or heaters. These tanks are limited to

the specific fuels as marked, such as flammable Class I gasoline or combustible Class II kerosene, diesel fuel or heating oil.

f) **Process Tank** – A special purpose tank with easily removable top, access hatch, bottom outlets and optional accessories and equipment, intended for small batch mixing of different flammable or combustible liquid(s) and/or other materials. These tanks may be limited to a specific liquid Class that the equipment and accessories are rated for.

3.17 Storage Tank (Tank) – A vessel having a liquid capacity that typically exceeds 60 gal (230 L), is primarily intended for stationary installation, and is not used for processing.

3.18 Tank Accessory – Optional aboveground tank devices or components intended to provide a specific function, such as walking or climbing access, load bearing support, spill containment, venting or heating.

3.19 Tank Support – Optional aboveground tank steel load bearing members intended to provide tank stability and structural support without creating hazardous shell stresses. Typical supports designs include saddles, beams and legs.

3.20 Vent Opening – A tank top opening that is intended to provide separate or combined normal venting and/or emergency venting. The vent opening(s) may be either a fitting on the shell or short pipe stub attached to the fitting or shell.

a) **Emergency Vent** – A vent opening or device that automatically relieves excessive internal pressure due to an external fire exposure or blockage of the normal vent. Emergency vents are designed and sized not to exceed a tank pressure of 2.5 psi (17.2 kPa), and are provided with a CFH flow rating at this value.

b) **Normal Vent** – A vent opening or device that automatically relieves internal pressure or vacuum during normal storage (atmospheric pressure equalization) and during normal operations (fill or withdraw). Normal vents are designed and sized not to exceed a tank pressure or vacuum of 1.0 psig or minus 0.5 psig (6.9 kPa to minus 3.4 kPa).

CONSTRUCTION

4 General Construction for All Special Purpose Tanks

4.1 Containment type, shape, orientation, dimensions and capacity

4.1.1 The minimum steel thicknesses and other general construction requirements shall comply with applicable parts of UL 142 below for the tank design, unless otherwise indicated by the specific construction requirements for each special purpose tank. Any special purpose tank limitations in containment type, shape, orientation, dimension, capacity, and required and optional features are also indicated by the specific construction requirements for each special purpose tank in Section 5.

a) Primary Horizontal Cylindrical – Per UL 142, Section 15.

b) Primary Vertical Cylindrical – Per UL 142, Section 17.

c) Primary Rectangular – Per UL 142, Section 19.

d) Secondary Horizontal Cylindrical – Per UL 142, Sections 21 and 23.

e) Secondary Vertical Cylindrical – Per UL 142, Sections 21 and 25.

f) Secondary Rectangular and Diked – Per UL 142, Sections 21 and 27.

g) Diked – Per UL 142, Sections 29 and 30.

4.1.2 For all tanks, the total (actual) capacity of a tank, or each compartment of a multi-compartment tank shall not be:

a) Less than the rated nominal capacity; and

b) More than 105 percent of the rated nominal capacity.

4.2 Materials and joints

4.2.1 The tank and any structural part of the tank (tank or equipment supports or accessories) shall be constructed of commercial or structural grade carbon or stainless steel grades as identified in UL 142, Section 5. Only new material shall be used.

4.2.2 Welding of steel plates to fabricate the tank shall use the joint types identified in UL 142, Section 6, Table 6.1 for the specific tank geometry, and shall comply with the construction referenced in the appropriate Figures.

4.3 Openings and connections

4.3.1 The tank, or each compartment of a compartment tank shall have at least fill, withdraw, gauge and vent openings, but other optional openings may also be provided. All openings shall be made through fittings connected to the tank shell.

4.3.2 Fittings for tank openings and connection to pipes, or other devices or equipment shall be constructed in accordance with UL 142, Section 7. See Sections 8 – 10 for required markings on or near the fitting to identify the intended opening function.

4.3.3 Except for reduced or combined normal/emergency vents permitted by a special purpose tank type, separate normal and emergency vent openings shall be sized and located in accordance with UL 142, Section 8.

Exception: Long bolt manway vents are not permitted on special purpose tanks.

4.3.4 Except for special types permitted by a specific special purpose tank type, separate openings for fill, withdraw and gauging shall be sized and located in accordance with UL 142, Section 10.

4.3.5 If provided, other optional openings shall be made through fittings connected to the tank shell. Any openings terminating below the normal liquid level, such as drains, shall be provided with a threaded plug or cap.

4.3.6 All opening fittings or pipe connections shall be protected with wooden or plastic plugs, metal covers, or their equivalent, to protect threads and exclude foreign matter while in storage or in transit.

4.4 Interstitial spaces

4.4.1 Interstitial spaces formed by a secondary containment shell or between compartments of a compartment tanks shall be provided with openings for emergency venting and leakage monitoring per 4.3.3.

4.5 Manways

4.5.1 Manways shall comply with the applicable requirements of UL 142.

4.6 Painting

4.6.1 After complete fabrication and leak testing, carbon steel tanks shall be given at least one coat of paint on exposed surfaces to resist corrosion during factory storage and transit to the installation site.

5 Specific Construction of Special Purpose Tanks

5.1 Generator base tanks

5.1.1 Generator base tanks intended for attachment of generators, turbines, heaters or similar standby or emergency equipment shall be designed to withstand the rated top load (s), as required by the applicable Performance Tests in this Standard.

5.1.2 Generator base tank construction parameters and limitations are as follows:

a) Stored Liquids – Combustible Fuels Only, such as Class II Diesel Fuel, Kerosene, Heating Oil, or Class III #4 or #6 Fuel Oil.

b) Containment Types and Sizes – Primary, Secondary or Diked types with or without compartments, with capacity limits per UL 142.

c) Shapes and Orientations – Only Horizontal Cylindrical, Rectangular or Horizontal Obrounds with a tank height to base (tank bottom or integral supports) ratio of ≤ 1:1.

5.1.3 Required special features for generator base tanks are as follows:

a) Equipment Mounts – Integral brackets or pads located on the tank top or top side for the intended equipment and evaluated for the rated loads. Also see 5.6.

b) Tank Supports – Integral supports for horizontal cylindrical or obround tanks connected to the bottom shell, and evaluated for the rated loads. Also see 5.6.

c) Lift Lugs – Integral lift lugs rated for 2 times the empty tank plus rated equipment loads. Also see 5.6.

5.1.4 Optional components for generator base tanks covered by this Standard are:

a) Tank Supports – Integral supports for rectangular tanks connected to the bottom shell, and evaluated for the rated loads. Also see 5.6.

b) Access Devices – Integral ladders, stairs and runways are permitted, provided they are separate from the equipment mounts and evaluated. Also see 5.6.

c) Minor Accessories – Integral heating coils, sumps and brackets are permitted. Also see 5.6.

d) Thermal Insulation – Integral thermal insulation is permitted for optional fire resistance or fire protection ratings per 6.1.

e) Pumps – Integral pumps are permitted if they comply with the Standard for Power Operated Pumps, UL 79, or the Standard for Safety Pumps for Oil-Burning Appliances, UL 343, or the Outline of Investigation for Hand Operated Pumps for Flammable and Combustible Liquids, UL 124 and rated for petroleum products.

5.1.5 All general and special markings for generator base tanks are found in Section 9 and paragraph 10.1.

5.2 Work top tanks

5.2.1 Work top tanks intended as a functional working surface shall be designed to withstand the rated top loads, as required by the applicable Performance Tests in this Standard.

5.2.2 Work top tank parameters and limitations are as follows:

a) Stored Liquids – Only Class III Combustible Fuels such as #4 or #6 Fuel Oils, and Oils such as Motor and Hydraulic Oils.

b) Containment Types and Sizes – Only Primary or Secondary types with or without compartments, with capacity limits per UL 142.

c) Shapes and Orientations – Only Horizontal Cylindrical, Rectangular or Horizontal Obrounds with a tank height to base (tank bottom or integral supports) ratio of ≤ 1:1.

d) Reduced Emergency Venting – E-Vent opening nominal size and venting capacity may be lower than required by UL 142, Section 8, Table 8.1 for Class III Fuels and Oils as follows:

For tanks ≤ 330 gal (1,250 L), up to 15 percent e-venting reduction.

For tanks ≤ 660 gal (2,500 L), up to 10 percent e-venting reduction.

For tanks ≤ 1,250 gal (4,730 L), up to 5 percent e-venting reduction.

5.2.3 Required special features for work top tanks are as follows:

a) Working Surface – Integral tank top working surface 30 – 42 inches (762 – 1,067 mm) high of at least 3 x 2 ft (0.9 x 0.6 m) area accessible at one edge and evaluated for the rated loads. Also see 5.6.

b) Tank Supports – Integral supports for horizontal cylindrical or obround tanks connected to the bottom shell, and evaluated for the rated loads. Also see 5.6.

c) Tank Openings – Shall be located along tank edges away from the working surface, tool racks, storage shelves and equipment brackets.

5.2.4 Optional components for work top tanks covered by this standard are:

a) Tank Supports – Integral supports for rectangular tanks connected to the bottom shell, and evaluated for the rated loads. Also see 5.6.

b) Access Devices – Integral stairs to tool racks or equipment brackets are permitted, provided they are separate from the working area. Also see 5.6.

c) Minor Accessories – Integral heating coils, sumps, lift lugs and tool racks, storage shelves or equipment brackets are permitted. Also see 5.6.

5.2.5 All general and special markings for work top tanks are found in Section 9 and paragraph 10.2.

5.3 Lube oil tanks

5.3.1 Lube oil tanks intended for storage of unused lubricating oils, hydraulic/transmission oils or similar liquids shall be designed to meet the applicable Performance Tests in this Standard.

5.3.2 Lube oil tank parameters and limitations are as follows:

a) Stored Liquids – Only Unused Class IIIB Combustible Motor Oils or Fluids, such as Lube/Motor Oils, Hydraulic/Transmission Oils, Machine/Cutting Oils.

b) Containment Types and Sizes – Only Primary or Secondary with or without compartments, with capacity limits per UL 142.

c) Shapes and Orientations – Horizontal or Vertical Cylindrical, Rectangular or Obrounds with a tank height to base (tank bottom or integral supports) ratio of ≤ 2:1.

d) Reduced Emergency Venting – E-Vent opening nominal size and venting capacity may be lower than required by UL 142, Section 8, Table 8.1 for Class IIIB Oils as follows:

For tanks ≤ 330 gal (1,250 L), up to 20 percent e-venting reduction.

For tanks ≤ 660 gal (2,500 L), up to 15 percent e-venting reduction.

For tanks ≤ 1,250 gal (4,730 L), up to 10 percent e-venting reduction.

For tanks ≤ 5,000 gal (18,900 L), up to 5 percent e-venting reduction.

5.3.3 Required special features for lube oil tanks are as follows:

a) Coupling Provisions – At least one opening shall be provided with a threaded, flanged or quick coupling for positive connection to oil supply delivery systems.

b) Tank Supports – Integral supports for horizontal cylindrical or obround tanks connected to the bottom shell, and evaluated for the rated loads. Also see 5.6.

5.3.4 Optional components for lube oil tanks covered by this Standard are:

a) Tank Supports – Integral supports for rectangular tanks connected to the bottom shell, and evaluated for the rated loads. Also see 5.6.

b) Access Devices – Integral stairs to access equipment and accessories are permitted. Also see 5.6.

c) Minor Accessories – Integral heating coils, sumps, lift lugs and equipment brackets for transfer pumps and hose reels are permitted. Also see 5.6.

d) Pumps – Integral pumps are permitted if they comply with the Standard for Power Operated Pumps, UL 79 or the Outline of Investigation for Hand Operated Pumps for Flammable and Combustible Liquids, UL 124 and rated for petroleum products.

e) Gauges – Integral gauges are permitted if they are compatible with oil burner fuel and other combustible liquids.

5.3.5 All general and special markings for lube oil tanks are found in Section 9 and paragraph 10.3.

5.4 Used oil tanks

5.4.1 Used oil tanks intended for storage of used lubricating oils, hydraulic/transmission oils or similar liquids shall be designed to meet the applicable Performance Tests in this Standard.

5.4.2 Used oil tank parameters and limitations are as follows:

a) Stored Liquids – Only Used Class IIIB Combustible Motor Oils or Fluids, such as Lube/Motor Oils, Hydraulic/Transmission Oils, Machine/Cutting Oils.

b) Containment Types and Sizes – Only Primary or Secondary types with or without compartments, with capacity limits per UL 142.

c) Shapes and Orientations – Horizontal or Vertical Cylindrical, Rectangular or Obrounds with a tank height to base (tank bottom or integral supports) ratio of ≤ 2:1.

d) Reduced Emergency Venting – E-Vent opening nominal size and venting capacity may be lower than required by UL 142, Section 8, Table 8.1 for Class IIIB Oils as follows:

For tanks ≤ 330 gal (1,250 L), up to 20 percent e-venting reduction.

For tanks ≤ 660 gal (2,500 L), up to 15 percent e-venting reduction.

For tanks ≤ 1,250 gal (4,730 L), up to 10 percent e-venting reduction.

For tanks ≤ 5,000 gal (18,900 L), up to 5 percent e-venting reduction.

5.4.3 Required special features for lube oil tanks are as follows:

a) Recycling Equipment – Oil pans/drain funnels or oversized openings for oil collection, or containment rings around the opening with or without lids.

b) Tank Supports – Integral supports for horizontal cylindrical or obround tanks connected to the bottom shell, and evaluated for the rated loads. Also see 5.6.

5.4.4 Optional components for used oil tanks covered by this Standard are:

a) Tank Supports – Integral supports for rectangular tanks connected to the bottom shell, and evaluated for the rated loads. Also see 5.6.

b) Access Devices – Integral stairs to access equipment and accessories are permitted. Also see 5.6.

c) Minor Accessories – Integral heating coils, sumps, lift lugs and equipment brackets for transfer pumps and hose reels are permitted. Also see 5.6.

d) Pumps – Integral pumps are permitted if they comply with the Standard for Power Operated Pumps, UL 79 or the Outline of Investigation for Hand Operated Pumps for Flammable and Combustible Liquids, UL 124 and rated for petroleum products.

e) Gauges – Integral gauges are permitted if they comply with the Standard for Liquid Level Gauges for Oil Burner Fuel or Other Combustible Liquids, UL 180.

5.4.5 All general and special markings for lube oil tanks are found in Section 9 and paragraph 10.4.

5.5 Day tanks

5.5.1 Day tanks intended for storage of small quantities of specific fuels as marked shall be designed to meet the applicable Performance Tests in this Standard.

5.5.2 Day tank parameters and limitations are as follows:

a) Stored Liquids – Only Fuels, such as Flammable Class I Gasoline or Combustible Class II Kerosene, Diesel Fuel or Heating Oil.

b) Containment Types and Sizes – Primary or Secondary with or without compartments, with a total capacity range of 20 to 1,320 gallons (75 to 5,000 L).

c) Shapes and Orientations – Horizontal or Vertical Cylindrical, Rectangular or Obrounds with a tank height to base (tank bottom or integral supports) ratio of ≤ 1.5:1.

5.5.3 Required special features for day tanks are as follows:

a) Lift Lugs – Integral lift lugs rated for 2 times the empty tank plus rated equipment loads. Also see 5.6.

b) Tank Supports – Integral supports for horizontal cylindrical or obround tanks connected to the bottom shell, and evaluated for the rated loads. Also see 5.6.

5.5.4 Optional components for day tanks covered by this Standard are:

a) Tank Supports – Integral supports for rectangular tanks connected to the bottom shell, and evaluated for the rated loads. Also see 5.6.

b) Minor Accessories – Integral equipment brackets for pumps, filters and hoses are permitted. Also see 5.6.

d) Pumps – Integral pumps are permitted if they comply with the Standard for Power Operated Pumps, UL 79, the Standard for Safety Pumps for Oil-Burning Appliances, UL 343, or the Outline of Investigation for Hand Operated Pumps for Flammable and Combustible Liquids, UL 124 and rated for petroleum products.

e) Gauges – Integral gauges are permitted if they comply with the Standard for Liquid Level Gauges for Oil Burner Fuel or Other Combustible Liquids, UL 180.

5.5.5 All general and special markings for day tanks are found in Section 9 and paragraph 10.5.

5.5A Process tanks

5.5A.1 Process tanks intended for storage of small quantities of flammable or combustible liquids as marked shall be designed to meet the applicable Performance Tests in this Standard.

5.5A.2 Process tank parameters and limitations are as follows:

a) Stored Liquids – Only the liquid Classes (Flammable Class I, Combustible Class II or specific fuel, etc.).

b) Containment Types and Sizes – Primary or Secondary with or without compartments, with a total capacity range of 20 to 1,320 gallons (75 to 5,000 L).

c) Shapes and Orientations – Horizontal or Vertical Cylindrical, Rectangular or Obrounds with a tank height to base (tank bottom or integral supports) ratio of ≤ 1.5:1.

5.5A.3 Required special features for process tanks are as follows:

a) Lift Lugs – Integral lift lugs rated for 2 times the empty tank plus rated equipment loads. Also see 5.6.

b) Tank Supports – Integral supports for horizontal cylindrical or obround tanks connected to the bottom or shell, and shall be evaluated for the rated loads including attached equipment. Also see 5.6.

c) Removable Tops – The tank top shall be capable of removing and replacing without damage, such as a gasketed cover bolted to a top flange. Gaskets shall comply with UL 142 Cl 9.5. The top design shall not leak when evaluated per UL 142 Sec 42, except minimum test values are 5.0 psi for cylindrical tanks and 3.0 psi for non-cylindrical tanks.

5.5A.4 Optional features or components for process tanks covered by this Standard are:

a) Minor Accessories – Integral equipment brackets for pumps, filters and hoses are permitted. Also see 5.6.

b)Tank Supports – Integral supports for rectangular tanks connected to the bottom shell, and shall be evaluated for the rated loads. Also see 5.6.

c) Top Hatches – Hatches on tank tops needed for quick access are permitted if < 20% of the top cover area or < 3.0 sqft. The hatch(es) shall be hinged to the cover and secured by quick connects (such as wing nuts, lock tabs or clamps), and provided with a lift handle. The top hatch may be modified to facilitate the 5.5A.3(c) leak test.

d) Special Fittings – Special fittings not covered by 4.3.2, such as sanitary or other quick hose connect types are acceptable if the fitting and connection to the hose are included in the 5.5A.3(c) leak test.

e) Gauges – Integral gauges are permitted if they comply with UL/ULC 180 Standard for Combustible Liquid Tank Accessories, or UL 2583 Outline of Investigation for Fuel Tank Accessories as applicable for the rated liquid(s).

f) Valves – Integral valves are permitted if they comply with UL 842 Standard for Valves for Flammable Fluids, UL 842A Standard for Valves for Gasoline…, or UL 842B Standard for Valves for Diesel… as applicable for the rated liquid(s).

g) Pumps – Integral pumps are permitted if they comply with UL 79 Standard for Power Operated Pumps for Petroleum…, UL 79A Standard for Power Operated Pumps for Gasoline… or UL 79B Standard for Power Operated Pumps for Diesel… as applicable for the rated liquid(s).

h) Motors – Integral motors for mixing or blending are permitted if they comply with UL 1004-1 Standard for Rotating Electrical Machines – General Requirements, plus motor protection per UL 1004-2 Standard for Impedence Protected Motors, UL 1004-2 Standard for Thermally Protected Motors, or UL 2111 Standard for Overheating Protection.

5.5A.5 If the process tank is rated for a flammable liquid or intended for use in a Classified area, the motor shall additionally comply with:

a) For Division 1 – UL 674 Standard for Electric Motors and Generators for Use in Division 1 Hazardous (Classified) Locations, or

b) For Division 2 – UL 1836 Outline of Investigation for Electric Motors and Generators for Use in Class I, Division 2, Class I, Zone 2, Class II, Division 2 and Zone 22 Hazardous (Classified) Locations.

5.5A.6 All general and special markings for process tanks are found in Section 9 and 10.1.

5.6 Supports, accessories and components

5.6.1 Tank supports, accessories and components as permitted by each special purpose tank type for required or optional attachment to the tank, shall meet the following construction requirements and applicable Performance Tests in this Standard.

5.6.2 Tank supports shall comply with the general construction requirements in Sections 32.2 and 33.1 of UL 142, and applicable requirements below for the specific support type, except the design shall also include rated generator, equipment or work top loads.

a) Horizontal Cylindrical – Per UL 142, Section 32.2;

b) Vertical Cylindrical – Per UL 142, Section 32.3; or

c) Rectangular or Diked – Per UL 142, Section 32.4.

5.6.3 Tank access devices shall comply with the general construction requirements in UL 142, Section 35, and applicable requirements below for the specific access device, if permitted by the special purpose tank construction.

a) Ladders – Per UL 142, Section 36;

b) Stairs and Runways – Per UL 142, Section 37;

c) Guardrails – Per UL 142, Section 38.

5.6.4 Tank accessories shall comply with the general construction requirements in UL 142, Section 35, and applicable requirements below for the specific accessory, if permitted by the special purpose tank construction.

a) Heating Coils and Hot Wells – Per UL 142, Section 39;

b) Bottom Sumps – Per UL 142, Section 40;

c) Equipment Brackets – Per UL 142, Section 41.

5.6.5 Tank lift lugs, if required or optionally covered by the special purpose tank Construction shall be connected to the tank by welding or bolting to the shell or other structural members, or by threading into a tank fitting.

PERFORMANCE

6 General Performance for All Special Purpose Tanks

6.1 General

6.1.1 All applicable tests for the specific special purpose tank shall be conducted on representative production samples of a completely assembled tank, in the recommended sequence specified in this Section.

6.1.2 A “worst case” sample, based on shape, capacity, dimensions, thickness, ratings, options and other factors with respect to a specific test, may be selected to represent construction and rating variations within a design series.

6.1.3 Assessment of damage to the tank, accessories and options shall be conducted after each loading, lifting or other physical test per the referenced UL 142 requirements, and any exceptions/additions for the special purpose tank type.

6.1.4 Any “Fire Resistant” rated Generator Base Tanks shall additionally comply with all required performance test, plus the vehicle impact and/or bullet resistance requirements if optionally “vehicle impact resistant” and/or “projectile resistant”, per UL 2080.