

STANDARD INFORMATION

Standard: ANSI/CAN/UL/ULC 1389

Standard ID:

Plant Oil Extraction Equipment for Installation and Use in Ordinary (Unclassified) Locations and Hazardous (Classified) Locations [ANSI/CAN/UL/ULC 1389:2019 Ed.1+R:20Apr2023]

Previous Standard ID:

Plant Oil Extraction Equipment for Installation and Use in Ordinary (Unclassified) Locations and Hazardous (Classified) Locations [ANSI/CAN/UL/ULC 1389:2019 Ed.1+R:02Dec2021]

Plant Oil Extraction Equipment for Installation and Use in Ordinary (Unclassified) Locations and Hazardous (Classified) Locations [ANSI/CAN/UL/ULC 1389:2019 Ed.1+R:13Oct2020]

Plant Oil Extraction Equipment for Installation and Use in Ordinary (Unclassified) Locations and Hazardous (Classified) Locations [ANSI/CAN/UL/ULC 1389:2019 Ed.1]

EFFECTIVE DATE OF NEW/REVISED REQUIREMENTS

Effective Date: **June 20, 2025**

IMPACT, OVERVIEW, AND ACTION REQUIRED

Impact Statement: Per our accreditation, Intertek is required to review reports against the standard revisions to confirm compliance. Once compliance is confirmed, the standard reference in the report is updated to show continued compliance to the technical requirements of the standard. Reports not updated to this version by the effective date above will be withdrawn.

All products must be certified to the April 20, 2023 revision prior to the effective date.

Overview of Changes:

October 13, 2020:

- Addition of Shutoff Valve
- Addition of New Sections 18A-18H
- Revisions to Mechanical Strength Tests for Sight Glass
- Revisions to Permanence of Marking
- Revisions to the Manual
- Revisions to Plant Oil Extraction Booths

December 21, 2021:

- Conditions of Acceptability for Components
- Equipment Protection by Pressurized Room “p” and Artificially Ventilated Room “v”
- Applicable Hazardous Locations Requirements for Booths
- Applicable Ordinary and Hazardous Locations Requirements for Pre- and Post-Processing Equipment
- ASME Certified Rupture Disk
- Modification to harmonize with ASME Section VIII, UG-99



April 20, 2023:

- Addition of requirements for UL 508
- Revisions to markings

Specific details of new/revised requirements are found in table below.

Current Listings Not Active? – Please immediately identify any current Listing Reports or products that are no longer active and should be removed from our records. We will do this at no charge as long as Intertek is notified in writing prior to the review of your reports.



STANDARD INFORMATION

CLAUSE	VERDICT	COMMENT
		<i>Additions to existing requirements are <u>underlined</u> and deletions are shown lined-out below.</i>
		The following changes reflect the October 13, 2020 revision:
	Info	CONSTRUCTION
7	Info	General
		<i>New clause added;</i>
7.5		Plant oil extraction equipment using flammable solvents that has its own potential source of release, either under normal or abnormal conditions, shall be provided with area classification documentation addressing the potential source of release. This classification documentation shall be in accordance with NFPA 497.
		<i>New clause added;</i>
7.6		Control panels which form a portion of machines intended for General Use shall, either alone or in conjunction with the machinery, comply with the following requirements as applicable: a) For CE Code-based installations: CSA-C22.2 No. 14 or CSA-C22.2 No. 286. b) For NEC-based installations: UL 508A.
14	Info	Valves
14.1	Info	General
		<i>New clause added;</i>
14.1.5		A handle, knob, or other operating means provided for manual manipulation that could release solvent to atmosphere shall be protected from unintentional manipulation. The hazard and position of such operating means shall be marked, if necessary, as a guide for proper operation. Controls that are to be adjusted only at the time of installation, during servicing, or seasonally, shall be judged with respect to the foregoing requirement. A handle, knob, or other operating means provided for manual manipulation that is provided with a locking mechanism or within an enclosure that is only tool accessible is considered protected from unintentional manipulation. The handle, knob, or other operating means shall also be marked "Do Not Open, Under Pressure" or equivalent.



CLAUSE	VERDICT	COMMENT
14.3	Info	Excess flow/backflow/check valves <i>New clause added;</i>
14.3.3.A		An excess flow check valve is required to be installed when a clamp connects pressurized piping, hose or tubing to other piping, hose or tubing. Exception: If the clamp requires a tool to disconnect, an excess flow check valve is not required if the clamp connection point is marked “Do Not Unclamp, Under Pressure” or the equivalent.
14.5	Info	Positive shutoff valves
14.5.3		Ethanol, up to 85%, shutoff valves shall be provided with an attached hand wheel, lever, handle, or the like. <u>The valve shall comply with the requirements in UL 842A. Stainless steel positive shutoff valves with polytetrafluoroethylene seals shall comply with the requirements in UL 125, UL 842 or UL 842A.</u> <i>New section added;</i>
18A		Support and Securement of Live Parts Provisions shall be made for securely mounting components to a supporting surface. A bolt, screw, or other fastener used to secure a part of a component shall not also be used to secure the component or another component to the supporting surface. See standard for details.
18B		<i>New section added;</i> Spacings The electrical spacings in machinery for line-voltage parts shall comply with the spacings requirements in the Standard for Industrial Control Panels, UL 508A. See standard for details.
18C	Info	Insulating Barriers <i>New clause added;</i>
18C.1		Insulating barriers in machinery shall comply with the insulating barriers requirements in the Standard for Industrial Control Panels, UL 508A.
18D	Info	Insulating Materials <i>New clause added;</i>
18D.1		Insulating materials in machinery shall comply with the insulating materials requirements in the Standard for Industrial Control Panels, UL 508A.



CLAUSE	VERDICT	COMMENT
		<i>New section added;</i>
		Accessibility of Uninsulated Live Parts, Film-Coated Wire, and Moving Parts
18E		To reduce the risk of unintentional contact that may involve a risk of electric shock from an uninsulated live part or film-coated wire or injury to persons from a moving part, an opening in an enclosure shall comply with either (a) or (b): See standard for details.
18F	Info	Guards
		<i>New clause added;</i>
18F.1		A guard shall be provided over a part that is in motion during servicing and that presents a risk of injury, such as pinching, snagging, cutting, or the like, to maintenance or service personnel when a cover, door, panel, or other closure is opened or removed during servicing.
		<i>New section added;</i>
		Protection Against Risk of Fire, Electric Shock, or Injury to Persons
18G		If the normal operation involves a risk of fire, electric shock, or injury to persons, means shall be provided to reduce such a risk. See standard for details.
18H	Info	Sharp Edges
		<i>New clause added;</i>
18H.1		An edge, a projection, a corner, an opening, a frame, a guard, a handle, or the like shall be smooth and not be sufficiently sharp to constitute a risk of injury to persons during intended use or servicing of the appliance. Exception: This requirement does not apply to a part or portion of a part that is sharp in order to perform a working function.
20	Info	Materials
		<i>New clause added;</i>
20.3		All elastomeric materials shall be subjected to: 34.2, Volume change test; 34.3, Weight loss test.



CLAUSE	VERDICT	COMMENT
		<i>New clause added;</i>
20.3A		A synthetic rubber part shall not show any signs of cracking or other damage following exposure to minus 40°F (minus 40°C). See the Low Temperature Test, Section 35.
		The exposed surfaces of metallic parts shall be resistant to atmospheric corrosion if this corrosion will lead to leakage of the fluid or if it will impair the function of the device. Iron and steel parts shall be protected against corrosion by enameling, galvanizing, plating, or other equivalent means. <u>This applies to all springs and other parts required for proper mechanical operation.</u>
20.5		Exception: This requirement does not apply to: <u>a) Bearings, thermal elements, sliding surfaces of a hinge, shaft, or similar part, where such protection is impracticable;</u> <u>b) Small parts of iron or steel, such as washers, screws, bolts, or similar parts, when the parts are not current carrying or relied upon to support or maintain the relative position of uninsulated live parts or components; and</u> <u>c) Parts made of stainless steel.</u>
22	Info	Deformation Test
22.2		The sample pump used in this test is to be rigidly anchored or otherwise supported. A section of NPT Schedule 80 pipe whose threads have been lubricated with SAE No. 10 machine oil and of sufficient length for wrench engagement is to be connected to a female pipe threaded section of the pump. Each pipe then is to be <u>tightened to the torque specified length sufficient to provide for wrench engagement, is to be connected to each female pipe threaded section of the body. The male threads shall have pipe joint sealing compound or polytetrafluoroethylene (PTFE) tape applied to them first or be coated as specified by the manufacturer. Each pipe is then to be tightened across the valve body to the torque specified by the manufacturer or in Table 22.1.</u>
24	Info	Endurance Test
24.2	Info	Pressure vessel body and cover locking mechanism
24.2.1		<u>An ordinary user shall not be capable of manually defeating the holding action of the clamping device without a tool unless there is no pressure in the pressure vessel.</u> The body and a removable cover of a pressure vessel assembly shall not leak after the vessel has been subjected to the test described in 24.2.2.
24.2.2		The body and cover locking mechanism is to be operated through 6000 cycles. Each cycle shall completely lock and unlock the cover. <u>The cover does not need to be opened or removed from the body if the locking mechanism can be cycled without performing this function.</u>
24.2.4		<i>New clause added;</i> A lid or a cover shall have a means to prevent unintentional closing.



CLAUSE	VERDICT	COMMENT
27	Info	Hydrostatic Strength Test – Piping and Operating Parts <i>New clause added;</i> Pneumatic-handling parts of the system or component shall comply with one of the following: a) Withstand, without rupture, a hydrostatic pressure of five times the maximum air inlet pressure applied for one minute; or b) Comply with ASME Section VIII Div 1.
28	Info	Mechanical Strength Tests for Sight Glass A sample shall be tested as it is normally mounted on the system. A push force of 110 N shall be gradually applied and maintained for 1 min by means of a 12.7 mm (1/2 in) diameter steel hemisphere to the external surface most likely to impair the operation of the device, or create leakage. <u>If the sight glass is small enough that the 12.7 mm (1/2 in) diameter steel sphere cannot contact the visible signaling device, the test is not conducted.</u> <i>New clause added;</i> A sample shall be tested as it is normally mounted on the system. One impact of 7 J (5 ft-lb) shall be applied by means of a solid, smooth, steel sphere 50 mm (2 in.) in diameter, with a mass of 540 g (1.19 lb) onto or into the signaling device or the covering that protects the signaling device from impacts. The sphere shall be dropped from a sufficient height (usually 1300 mm from the bottom of the ball to the surface to be impacted) or swung through a pendulum arc from a sufficient height to apply an impact force of 7 J (5 ft-lb) of energy to the external surface most likely to impair the operation of the device, or create leakage. If the sight glass is small enough that the 50 mm (2 in) diameter steel sphere cannot contact the visible signaling device, the test is not conducted. Note: Unless specified, the same sample may be reused for each of the above applied forces. It is not prohibited to use a different sample for the application of each force.
28.2		
28.2A		
30	Info	Temperature Test The temperature of any surface of an extractor for use in a hazardous location that might be exposed to the explosive atmosphere, for both electrical and non-electrical parts of the overall extractor, shall be considered. The maximum measured temperature on any such surface shall not exceed the auto ignition temperature of the marked flammable solvents as noted below: 30.7 a) Butane – 288°C (Temperature classification – T2). b) Ethanol – 363°C (Temperature classification – T1). <u>c) n-Hexane – 225°C (Temperature classification – T2 or T2C).</u> cd) LP Gas – 405°C (Temperature classification – T1). de) Pentane – 243°C (Temperature classification – T2 or T2B). ef) Propane – 450°C (Temperature classification – T1).



CLAUSE	VERDICT	COMMENT
	Info	MARKINGS
46	Info	Details
		<i>New clause added;</i>
		A marking that is required to be permanent shall be:
46.1A		a) Molded, b) Die-stamped, c) Stamped or etched metal that is permanently secured (such as, with screws or rivets) to the surface to which it is affixed, d) Indelibly stamped lettering, or e) Printed on a pressure-sensitive label.
		<i>New clause added;</i>
46.1B		For markings required by this section, a pressure-sensitive label, or a label secured by cement or adhesive, shall comply with the applicable requirements for indoor- or indoor- and outdoor-use labels specified in the following, as applicable: a) For CE Code-based installations: CSA C22.2 No. 0.15. b) For NEC-based installations Standard for Marking and Labeling Systems, UL 969, as appropriate to the installation location of the device, and, when required, the exposure conditioning described for Class I, Division 1 applications.
46.2		The overall extractor shall be marked with the following, or equivalent: <u>n) The statement “Instructions Available At _____” where the internet link to instructions is identified for compliance with 47.1A(c)(ii).</u>
	Info	INSTRUCTIONS
47	Info	Manual
		<i>New section added;</i>
47.1A		The instructions mentioned in 47.1 shall be: See standard for details.
		<i>New clause added;</i>
47.6	Info	When required by clause 7.5 an area classification drawing shall be included in the manual. If the manufacturer has an area classification drawing in the manual it shall also be reviewed to NFPA 497.



CLAUSE	VERDICT	COMMENT
	Info	CONSTRUCTION
48	Info	General
		The booths covered under this standard (including modified shipping containers, or "pods") incorporate the following attributes:
48.1		<p>a) The extraction equipment enclosed by these booths use: flammable solvents such as butane, ethanol, LPG, pentane or propane solvents (flammable solvents);</p> <p><u>1) Where the area within the booth is an ordinary (unclassified) location, nonflammable materials to extract the oil such as carbon dioxide (CO2), or</u></p> <p><u>2) Where the area within the booth is a hazardous (classified) location, flammable solvents such as butane, ethanol, n-hexane, LPG, pentane or propane solvents;</u></p> <p><u>e) All plant oil extraction equipment to be used within these booths is intended to be certified in accordance with this standard; and</u></p> <p><u>f) These booths may be field assembled in accordance with instructions furnished by the manufacturer, and in accordance with marked information.</u></p>
		<i>New clause added;</i>
48.1A		<p>Where the area within the booth is an ordinary (unclassified) location, the booths shall comply with the requirements of the following standards, as applicable and as modified by this standard:</p> <p>a) For CE Code-based installations: CSA C22.2 No. 14; or</p> <p>b) For NEC-based installations: UL 2011 and UL 2755.</p>



CLAUSE	VERDICT	COMMENT
The following changes reflect the December 21, 2021 revision:		
6A		<i>New clause added;</i> Schedule of Limitations on Components
6A.1		<i>New clause added;</i> All conditions of acceptability associated with the components (sometimes referred to as the schedule of limitations) shall be addressed so as to determine compliance associated with the required risks of fire, electric shock, and injury to persons requirements, in addition to the risks of explosion requirements if applicable.
8	Info	Pressure Vessels
8.8		Pressure vessels 6 in (152 mm) and less inside diameter are not required to be designed, tested, and stamped in accordance with CSA B51 and the ASME Unfired Pressure Vessel Code and are subjected to the hydrostatic strength test Section 26.
13	Info	Meters
13.4		<i>New clause added;</i> Meters for extraction solvents in a vapor state or a liquid not addressed by UL 25 shall comply with the Hydrostatic Strength Test – Piping and Operating Parts, Section 27 and material requirements within this standard. If the meter incorporates a dynamic seal the endurance testing in UL 25 is applicable.
14	Info	Valves
14.2	Info	Safety relief valves
14.2.1		Pressure vessels shall be provided with one or more safety relief devices with sufficient flow capacity and relief pressure to safeguard against excessive pressure. The system shall be provided with additional safety relief devices as needed to reduce the risk of rupture of any part of the system. The devices shall comply with the requirements in the following standards, as applicable: <u>d) A pressure relief device shall comply with the Pressure Relief Device Standards – Part 1 – Cylinders for Compressed Gases, Compressed Gas Association Standard S-1.1.</u>
25	Info	Leakage Test – System
25.1		The liquid confining and pneumatic-handling parts of the container, piping and other operating parts shall not leak when subjected to a hydrostatic pressure of 1.5 <u>times the maximum operating pressure as specified in ASME Section VIII-1, UG-99.</u>



CLAUSE	VERDICT	COMMENT
34	Info	Tests for Synthetic Rubber Parts
34.2	Info	Volume change test
34.2.3		<u>Tests using liquid CO are to be conducted at a temperature of 23 ±2°C (73.4 ±3.6°F). The volume of each of three specimens is to be determined by weighing as described in 34.2.2.</u> For application where the CO ₂ is only in the gaseous state the testing can be conducted using CO ₂ gas. The volume of each of three specimens is to be determined by weighing as described in 34.2.2. After weighing, the specimens are to be wiped dry and placed in a closed chamber (bomb) having its inlet connected to a cylinder of anhydrous ammonia. With the discharge valve from the bomb open, liquid anhydrous ammonia is allowed to flow through the bomb until the air is displaced. The discharge valve is then to be closed. With the inlet connection to the cylinder open, exposure is to be continued for 70 hours. The specimens are then to be removed from the bomb and immediately placed in a stoppered flask. The specimens are to be removed one at a time and weighed in air (M3). The weight is to be obtained within 30 seconds after removal from the flask. The final weight in water (M4) is to be determined immediately thereafter. The percent change in volume is to be calculated as described in 34.2.2.
	Info	MARKINGS
46	Info	Details
		Extractors for hazardous locations applications shall additionally include the following markings, as applicable: f) For EPL Gc or Class I, Zone 2 or Class I, Division 2 applications, one of the following Warning markings: 3) For CE Code-based Class I, Division 2 installations, or EPL Gc installations: <u>WARNING – RISK OF EXPLOSION: Vessels containing flammable solvents, or material exposed to flammable solvents, only to be opened in a CSA C22.2 No. 60079-13 Type of Protection “Ex v” or “Ex pv”.</u> 4) For NEC-based Class 1, Division 2 installations, or Class I, Zone 2 installations: <u>WARNING – RISK OF EXPLOSION: Vessels containing flammable solvents, or material exposed to flammable solvents, only to be opened in a UL 60079-13 Type of Protection “AEx v” or “AEx pv”.</u> <u>NOTE: The 2020 edition of the National Electrical Code, NFPA 70, does not recognize Type of Protection “p” or “v” for pressurized rooms under UL 60079-13.</u>



CLAUSE	VERDICT	COMMENT
	Info	CONSTRUCTION
48	Info	General
48.2		<p>Where the area within the booth is a hazardous (classified) location, the booths shall comply with the requirements of the following standards, as applicable and as modified by this standard:</p> <p>a) For CE Code-based installations: CSA C22.2 No. 14, NFPA 33, and the applicable Canadian CAN standards <u>for the Type of Protection permitted to be used in the involved area classification;</u></p> <p>b) For NEC-based installations: Parts 1 and 2 of UL 2011, UL 2755, NFPA 33, and the applicable NEC ANSI type of protection standards <u>for the permitted to be used in the involved area classification.</u></p> <p><u>In addition, the following requirements shall be applied, as applicable:</u></p> <p>1) <u>Type X or Y pressurized booths shall comply with NFPA 496;</u></p> <p>2) <u>Type of Protection “Ex v” or “Ex pv” booths shall comply with CSA C60079-13;</u> <u>and</u></p> <p>3) <u>Type of Protection “AEx v” or “AEx pv” booths shall comply with UL 60079-13.</u></p> <p><u>NOTE: The 2020 edition of the National Electrical Code, NFPA 70, does not recognize Type of Protection “p” or “v” for pressurized rooms under UL 60079-13.</u></p>
	Info	PART III – PLANT OIL EXTRACTION PREPARATORY AND POST-PROCESSING EQUIPMENT
54	Info	General
54.1		<p>Plant oil extraction preparatory and post-processing equipment for use in ordinary (unclassified) locations shall comply with <u>the requirements of the following standards:</u></p> <p>a) <u>For CE Code-based installations: the applicable Canadian CAN ordinary locations requirements based on the involved equipment.</u></p> <p>b) <u>For NEC-based installations: the applicable NEC ANSI ordinary locations requirements based on the involved equipment.</u></p>
54.2		<p>Plant oil extraction preparatory and post-processing equipment for use in hazardous (classified) locations shall comply with <u>the requirements of the following standards:</u></p> <p>a) <u>The applicable (unclassified) locations requirements in accordance with 54.1; and</u></p> <p>b) <u>The applicable specific risk of ignition requirements for hazardous locations rated equipment in accordance with Section 19, in Part I of this standard</u></p>



CLAUSE	VERDICT	COMMENT
The following changes reflect the April 20, 2023 revision:		
18	Info	Grounding and Bonding <i>New clause added;</i> All exposed dead-metal parts that are capable of becoming energized, and all dead-metal parts within the enclosure that are exposed to contact during normal operation or during operator servicing and that are capable of becoming energized, shall be reliably bonded together and to the grounding means in accordance with the following requirements, as applicable: a) For CE Code-based installations: CSA C22.2 No. 14. b) For NEC-based installations: UL 508.
18B	Info	Spacings The electrical spacings in machinery for line-voltage parts shall comply with the spacings requirements in the Standard for Industrial Control Panels, UL 508A following as applicable: a) For CE Code-based installations: CSA C22.2 No. 14. b) For NEC-based installations: UL 508.
18B.1		As an alternative to the spacing requirements specified in 18B.1, clearances and creepage distances may be evaluated in accordance with the following requirements as applicable: a) For CE Code-based applications: CSA C22.2 No. 0.2. b) For NEC-based installations: Clearance and Creepage Distances, in UL 508, together with the requirements in UL 840.
18B.2		
18C	Info	Insulating Barriers Insulating barriers in machinery shall comply with the insulating barriers requirements in UL 508A UL 508.
18C.1		
18D	Info	Insulating Materials Insulating materials in machinery shall comply with the insulating materials requirements in UL 508A UL 508.
18D.1		



CLAUSE	VERDICT	COMMENT
	Info	MARKINGS
46	Info	Details
		Extractors for hazardous locations applications shall additionally include the following markings, as applicable:
46.3		a) <u>For CE Code-based Zone installations: Ex * IIA; Class I, Zone 1, AEx * IIA; Ex * IIA; Class I, Zone 2, AEx * IIA; Class I, Division 1, Group D or Class I, Division 2, Group D, as applicable.</u> a1) <u>For NEC-based Zone installations: Zone 1, AEx * IIA; Zone 2, AEx * IIA; Class I, Division 1, Group D or Class I, Division 2, Group D, as applicable.</u>