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JOINT CANADA-UNITED STATES
NATIONAL STANDARD

ANSI/CAN/UL/ULC 1389:2019

STANDARD FOR SAFETY

Plant Oil Extraction Equipment for
Installation and Use in Ordinary
(Unclassified) Locations and
Hazardous (Classified) Locations



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UL Standard for Safety for Plant Oil Extraction Equipment for Installation and Use in Ordinary (Unclassified) Locations and Hazardous (Classified) Locations, ANSI/CAN/UL/ULC 1389:2019

First Edition, Dated November 25, 2019

Summary of Topics

This First Edition of ANSI/CAN/UL/ULC 1389:2019, has been issued to reflect the latest ANSI and SCC approval dates, and to incorporate the proposal dated August 2, 2019 and October 18, 2019.

The new requirements are substantially in accordance with Proposal on this subject dated August 2, 2019 and October 18, 2019.

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ANSI/UL 1389-2019

NOVEMBER 25, 2019



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ANSI/CAN/UL/ULC 1389:2019

**Standard for Plant Oil Extraction Equipment for Installation and Use in
Ordinary (Unclassified) Locations and Hazardous (Classified) Locations**

First Edition

November 25, 2019

This ANSI/CAN/UL/ULC Safety Standard consists of the First Edition.

The most recent designation of ANSI/UL 1389 as an American National Standard (ANSI) occurred on November 25, 2019. ANSI approval for a standard does not include the Cover Page, Transmittal Pages, Title Page, Preface or SCC Foreword.

This standard has been designated as a National Standard of Canada (NSC) on November 25, 2019.

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ANNEX A – (INFORMATIVE) – Safety Marking Translations

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Preface

This is the First Edition of the ANSI/CAN/UL/ULC 1389, Standard for Safety for Plant Oil Extraction Equipment for Installation and Use in Ordinary (Unclassified) Locations and Hazardous (Classified) Locations.

UL is accredited by the American National Standards Institute (ANSI) and the Standards Council of Canada (SCC) as a Standards Development Organization (SDO). ULC Standards is accredited by the Standards Council of Canada (SCC) as a Standards Development Organization (SDO).

This Standard has been developed in compliance with the requirements of ANSI and SCC for accreditation of a Standards Development Organization.

This ANSI/CAN/UL/ULC 1389 Standard is under continuous maintenance, whereby each revision is approved in compliance with the requirements of ANSI and SCC for accreditation of a Standards Development Organization. In the event that no revisions are issued for a period of four years from the date of publication, action to revise, reaffirm, or withdraw the standard shall be initiated.

Annex A, identified as Informative, is for information purposes only.

In Canada, there are two official languages, English and French. All safety warnings must be in French and English. Attention is drawn to the possibility that some Canadian authorities may require additional markings and/or installation instructions to be in both official languages.

This First Edition Joint American National Standard and National Standard of Canada is based on, and now supersedes, the First Issue of UL 1389 Outline of Investigation and the First Edition of ULC/ORD-C1389-19.

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 <http://csds.ul.com>.

Requests for interpretation of this Standard should be sent to ULC Standards. The requests should be worded in such a manner as to permit a "yes" or "no" answer based on the literal text of the requirement concerned.

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This Edition of the Standard has been formally approved by the UL Standards Technical Panel (STP) on Plant Oil Extraction Equipment, STP 1389.

This list represents the STP 1389 membership when the final text in this standard was balloted. Since that time, changes in the membership may have occurred.

STP 1389 Membership

Name	Representing	Interest Category	Region
Amyotte, Philip	Matheson	Commercial/Industrial User	Ontario
Anderson, Michael	Saskpower	AHJ	Saskatchewan
Casals, Tomas	Viridios Systems	Producer	USA
Chisholm, Jim	City of Toronto	AHJ	Toronto
Drage, Tyler	Front Range Fire Rescue	AHJ	USA
Gold, Mitchell	Underwriters Laboratories Inc.	STP Project Manager – Non-voting	USA
Haferkorn, James	Rockwell Automation	Supply Chain	USA
Hartung, Vaughn	Swell Companies	Producer	USA
Havelick, Linn	Hal Extraction Technology Ltd.	Producer	USA
Horn, Owen	Technical Safety BC	AHJ	British Columbia
Kaiman, Sarah	Green Hygiene Consulting	Commercial/Industrial User	USA
Laidlaw, Edward	Arcata Fire Protection District	AHJ	USA
Laks, David	Hub International	General Interest	Ontario
Lowrey, David	Boulder Fire Rescue	AHJ	USA
Mailvaganam, Miles	Self	General Interest	Ontario
Manning, Stefan	Colorado Springs Fire Dept.	AHJ	USA
Mega, Dan	Emerson Fluid & Motion Control	Supply Chain	USA
Myers, Randi	Underwriters Laboratories Inc.	STP Chair – Non-voting	USA
Naito, Jack	Luna Technologies	Producer	USA
Nicoletti, Megan	Codenext Inc.	Supply Chain	Ontario
Sasso, Nick	Clark County, Nevada	AHJ	USA
Sexton, Jeremy	Apeks Supercritical	Producer	USA
Watt, Stephen	Emergency Management BC	Government	British Columbia
Williams, Jason	Office of the Fire Marshal	Government	Ontario
Witherell, Christopher	Pressure Safety Inspectors LLC	General Interest	USA
Wolff-Klammer, Edgar	UL LLC	Testing & Standards	USA

International Classification for Standards (ICS): 29.260.20

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The intended primary application of this standard is stated in its scope. It is important to note that it remains the responsibility of the user of the standard to judge its suitability for this particular application.

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INTRODUCTION

1 Scope

1.1 This Standard covers commercial and industrial plant oil extraction equipment for installation and use indoors in an ordinary (unclassified) locations and hazardous (classified) locations. Based on the application, installation is in accordance with the manufacturer's installation instructions, together with the following, as applicable:

- a) CSA C22.1, Canadian Electrical Code, Part 1 (CE Code); ULC-S4400, Premises, Buildings and Equipment Utilized for the Cultivation, Processing and Production of Cannabis; National Fire Code of Canada (NFC); and CSA B149.1, Natural Gas and Propane Installation Code; and
- b) NFPA 70, National Electrical Code (NEC), International Fire Code (IFC), NFPA 1, Fire Code, NFPA 55 Compressed Gases and Cryogenic Fluids Code, and NFPA 58, Liquefied Petroleum Gas Code.

1.2 Plant oil extraction equipment includes:

- a) Preparatory equipment, for preparing the plant material for extraction of the oil, such as trimming, deseeding, and drying/curing;
- b) Extractors, for removing the oil from the plant material by the use of Liquefied Petroleum Gas (LPG), butane, propane solvents, ethanol or pentane (flammable solvents) and Carbon Dioxide (CO₂) (non-flammable solvent);
- c) Extraction booths or pods, for enclosing/protecting plant oil extraction equipment; and
- d) Post-processing equipment, for finalizing the plant oil extraction process such as vacuum ovens, rotary evaporators, and solvent recovery pumps.

1.3 This equipment, along with systems involving any combination of this equipment, is used for extracting oils from plants as instructed by the manufacturer.

1.4 The requirements in this standard do not cover the physiological or other attributes or effects that may result from the use of this equipment.

1.5 This standard does not apply to equipment involving the following risks of ignition:

- a) Exothermic reactions, including self-ignition of dusts.
- b) Mechanically generated sparks (generated intentionally).
- c) Flames and hot gases (including hot particles).

1.6 This standard does not apply to mechanical means of extraction of plant oils that do not use solvents.

1.7 This standard does cover the connection to external solvent containers or external solvent sources to the plant oil extraction equipment.

Note: Equipment is a general term including apparatus, fittings, devices, components, and the like used as a part of, or in connection with, an installation.

2 Units of Measurement

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

3 Undated References

3.1 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.

4 Glossary

4.1 ASTM IRM 903/IRM 903 – A high-swelling petroleum base oil described in ASTM D471, Standard Test Method for Rubber Property-Effect of Liquids.

4.2 AUTHORITY HAVING JURISDICTION – The governmental body responsible for the enforcement of any part of this Standard or the official or agency designated by that body to exercise such a function.

4.3 CLOSED LOOP SYSTEM – A system in which the solvent is being used without evaporation or exposure to the atmosphere.

4.4 HOSE ASSEMBLY – A segment of flexible, usually nonmetallic, tubing and having a threaded fitting at each end for the purpose of connecting two components

4.5 LIQUEFIED PETROLEUM GAS (LP-GAS OR LPG) – Any material having a vapor pressure not exceeding that allowed for commercial propane, as defined in Standard Specification for Liquefied Petroleum (LP) Gases, ASTM D1835, that is composed predominantly of the following hydrocarbons, either by themselves (excluding propylene) or as mixtures: propane, propylene, butane (normal butane or isobutane) and butylenes.

5 Components

5.1 Except as indicated in [5.2](#), a component of a product covered by this standard shall comply with the requirements for that component. Section [6](#) includes Normative References that may be used in the products covered by this Standard.

5.2 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.

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

5.4 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.

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6 Normative References

6.1 Products covered by this standard shall comply with the reference installation codes and standards noted in this section as appropriate for the country where the product is to be used. When the product is intended for use in more than one country, the product shall comply with the installation codes and standards for all countries where it is intended to be used.

6.2 The following standards are referenced in this standard, and portions of these referenced standards and codes identified in this standard may be essential for compliance as applicable.

American Society for Testing and Materials (ASTM)

ASTM D471 *Standard Test Method for Rubber Property-Effect of Liquids*

American Society of Mechanical Engineers (ASME)

ASME Boiler and Pressure Vessel Code (ASME/BPVC), Section VIII, Division 1, Rules for Construction of Pressure Vessels

ASME B31.3 *Process piping*

ASME B36.10M *Welded and Seamless Wrought Steel Pipe*

CSA Group

CSA 8.1 *Elastomeric Composite Hose and Hose Couplings for Conducting Propane and Natural Gas*

CSA 8.3 *Thermoplastic Hose and Hose Couplings for Conducting Propane and Natural Gas*

CSA B51 *Boiler, Pressure Vessel and Pressure Piping Code*

CSA B149 *Natural Gas and Propane Installation Code*

CSA C22.1 *Canadian Electrical Code, Part I (CE Code)*

CSA C22.2 No. 14 *Industrial Control Equipment*

CSA C22.2 No. 30 *Explosion-Proof Enclosures for Use in Class I Hazardous Locations*

CSA-C22.2 No. 120 *Refrigeration Equipment*

CSA C22.2 No. 137 *Electric Luminaires for Use in Hazardous Locations*

CSA C22.2 No. 139 *Electrically Operated Valves*

CSA C22.2 No. 145 *Electric Motors and Generators for Use in Hazardous (Classified) Locations*

CSA C22.2 No. 157 *Intrinsically Safe and Non-Incendive Equipment for Use in Hazardous Locations*

CSA C22.2 No. 213 *Nonincendive Electrical Equipment for Use in Class I and II, Division 2 and Class III, Divisions 1 and 2 Hazardous (Classified) Locations*

CSA C22.2 No. 60079 series (all parts) *Explosive Atmospheres*, specifically including:

- CSA C22.2 No. 60079-0 *Explosive Atmospheres – Part 0: Equipment – General Requirements*
- CSA C22.2 No. 60079-7 *Explosive Atmospheres – Part 7: Equipment Protection by Increased Safety "e"*

International Code Council (ICC)

International Fire Code (IFC)

International Mechanical Code (IMC)

National Fire Protection Association (NFPA)

NFPA 1 *Fire Code*

NFPA 10 *Portable Fire Extinguishers*

NFPA 13 *Installation of Sprinkler Systems*

NFPA 30 *Flammable and Combustible Liquids Code*

NFPA 33 *Spray Application Using Flammable or Combustible Materials*
NFPA 55 *Compressed Gases and Cryogenic Fluids Code*
NFPA 58 *Liquefied Petroleum Gas Code*
NFPA 70 *National Electrical Code (NEC)*
NFPA 72 *National Fire Alarm and Signaling Code*
NFPA 77 *Static Electricity*
NFPA 91 *Exhaust Systems for Air Conveying of Vapors, Gases, Mists, and Particulate Solids*
NFPA 496 *Purged and Pressurized Enclosures for Electrical Equipment*
NFPA 497 *Classification of Flammable Liquids, Gases, or Vapors and of Hazardous (Classified) Locations for Electrical Installations in Chemical Process Areas*

National Research Council of Canada (NRCC)

National Building Code of Canada (NBC)
National Fire Code of Canada (NFC)

Underwriters Laboratories (UL)

UL 21 *LP-Gas Hose*
UL 25 *Meters for Flammable and Combustible Liquids and LP-Gas*
UL 51 *Power-Operated Pumps and Bypass Valves for Anhydrous Ammonia, LP-Gas, and Propylene*
UL 109 *Tube Fittings for Flammable and Combustible Fluids, Refrigeration Service, and Marine Use*
UL 125 *Flow Control Valves for Anhydrous Ammonia*
UL 132 *Safety Relief Valves for Anhydrous Ammonia*
UL 252 *Compressed Gas Regulators*
UL 252A *Compressed Gas Regulator Accessories*
UL 305 *Egress Door Securing and Releasing Devices*
UL 330A *Hose and Hose Assemblies for Use With Dispensing Devices Dispensing Gasoline and Gasoline/Ethanol Blends With Nominal Ethanol Concentrations Up To 85 Percent (E0 – E85)*
UL 404 *Gauges, Indicating Pressure, for Compressed Gas Service*
UL 429 *Electrically Operated Valves*
UL 508 *Industrial Control Equipment*
UL 508A *Industrial Control Panels*
UL 536 *Flexible Metallic Hose*
UL 569 *Pigtails and Flexible Hose Connectors for LP-Gas*
UL 674 *Electric Motors and Generators for Use in Hazardous (Classified) Locations*
UL 698A *Industrial Control Panels Relating to Hazardous (Classified) Locations*
UL 779 *Electrically Conductive Floorings*
UL 783 *Electric Flashlights and Lanterns for Use in Hazardous (Classified) Locations*
UL 823 *Electric Heaters for Use in Hazardous (Classified) Locations*
UL 842A *Valves for Gasoline and Gasoline/Ethanol Blends with Nominal Ethanol Concentrations up to 85 Percent (E0 – E85)*
UL 842B *Valves for Gasoline and Gasoline/Ethanol Blends with Nominal Ethanol Concentrations up to 85 Percent (E0 – E85)*
UL 844 *Luminaries for Use in Hazardous (Classified) Locations*
UL 873 *Temperature-Indicating and -Regulating Equipment*
UL 1067 *Electrically Conductive Equipment and Materials for Use in Flammable Anesthetizing Locations*
UL 1203 *Explosion-Proof and Dust-Ignition-Proof Electrical Equipment for Use in Hazardous (Classified) Locations*
UL 1477 *Outline for Compressed Gas Shutoff Valves*
UL 1836 *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*
UL 1861 *Power Operated Chemical Pumps*
UL 1963 *Refrigerant Recovery/Recycling Equipment*
UL 2011 *Machinery*

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