



ULC Standards
Normes ULC



ANSI/CAN/UL/ULC 1389:2021

JOINT CANADA-UNITED STATES
NATIONAL STANDARD

STANDARD FOR SAFETY

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



ANSI/UL 1389-2021



ULNORM.COM: click to view the full PDF of UL 1389 2021

SCC FOREWORD

National Standard of Canada

A National Standard of Canada is a standard developed by a Standards Council of Canada (SCC) accredited Standards Development Organization, in compliance with requirements and guidance set out by SCC. More information on National Standards of Canada can be found at www.scc.ca.

SCC is a Crown corporation within the portfolio of Innovation, Science and Economic Development (ISED) Canada. With the goal of enhancing Canada's economic competitiveness and social well-being, SCC leads and facilitates the development and use of national and international standards. SCC also coordinates Canadian participation in standards development, and identifies strategies to advance Canadian standardization efforts.

Accreditation services are provided by SCC to various customers, including product certifiers, testing laboratories, and standards development organizations. A list of SCC programs and accredited bodies is publicly available at www.scc.ca.

ULNORM.COM : Click to view the full PDF of UL 1389 2021

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

First Edition, Dated November 25, 2019

Summary of Topics

This revision of ANSI/CAN/UL/ULC 1389 dated December 2, 2021 includes an editorial correction to change "Class 1" to "Class I" in [46.3 \(a\) and \(f\)\(4\)](#).

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.

These corrections are substantially in accordance with Proposal(s) on this subject dated March 12, 2021 and June 25, 2021.

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form by any means, electronic, mechanical photocopying, recording, or otherwise without prior permission of UL.

UL provides this Standard "as is" without warranty of any kind, either expressed or implied, including but not limited to, the implied warranties of merchantability or fitness for any purpose.

In no event will UL be liable for any special, incidental, consequential, indirect or similar damages, including loss of profits, lost savings, loss of data, or any other damages arising out of the use of or the inability to use this Standard, even if UL or an authorized UL representative has been advised of the possibility of such damage. In no event shall UL's liability for any damage ever exceed the price paid for this Standard, regardless of the form of the claim.

Users of the electronic versions of UL's Standards for Safety agree to defend, indemnify, and hold UL harmless from and against any loss, expense, liability, damage, claim, or judgment (including reasonable attorney's fees) resulting from any error or deviation introduced while purchaser is storing an electronic Standard on the purchaser's computer system.

No Text on This Page

ULNORM.COM : Click to view the full PDF of UL 1389 2021



ANSI/UL 1389-2021

NOVEMBER 25, 2019
(Title Page Reprinted: December 2, 2021)



1

ANSI/CAN/UL/ULC 1389:2021

**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 including revisions through December 2, 2021.

The most recent designation of ANSI/UL 1389 as an American National Standard (ANSI) occurred on November 15, 2021. 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 15, 2021.

COPYRIGHT © 2021 UNDERWRITERS LABORATORIES INC.

No Text on This Page

ULNORM.COM : Click to view the full PDF of UL 1389 2021

CONTENTS

Preface7

INTRODUCTION

1 Scope 11
 2 Units of Measurement 12
 3 Undated References 12
 3A Referenced Publications..... 12
 4 Glossary..... 14
 5 Components 15
 6 Normative References..... 15
 6A Schedule of Limitations on Components 15

PART I – PLANT OIL EXTRACTORS

CONSTRUCTION

7 General 15
 8 Pressure Vessels 16
 9 DOT Storage Cylinders..... 17
 10 Piping, Hose, Tubing and Fittings 17
 11 Gauges..... 18
 12 Power-Operated Pumps and Bypass Valves 18
 13 Meters..... 18
 14 Valves 19
 14.1 General..... 19
 14.2 Safety relief valves..... 19
 14.3 Excess flow/backflow/check valves 20
 14.4 Hydrostatic relief valves 20
 14.5 Positive shutoff valves..... 21
 14.6 Pressure-limiting device 21
 15 Regulators 22
 16 Tube Fittings..... 22
 17 Wiring..... 22
 18 Grounding and Bonding 22
 18A Support and Securement of Live Parts 22
 18B Spacings 23
 18C Insulating Barriers 23
 18D Insulating Materials 23
 18E Accessibility of Uninsulated Live Parts, Film-Coated Wire, and Moving Parts 23
 18F Guards 28
 18G Protection Against Risk of Fire, Electric Shock, or Injury to Persons 28
 18H Sharp Edges 29
 19 Specific Risk of Ignition Requirements for Hazardous Locations Rated Equipment 29
 19.1 General..... 29
 19.2 EPL Gb or Class I, Zone 1 or Class I, Division 1 31
 19.3 EPL Gc or Class I, Zone 2 or Class I, Division 2 31
 20 Materials..... 32
 21 Cooling Systems 34
 21.1 Aqueous systems 34
 21.2 Refrigerant base cooling systems 34

PERFORMANCE

22	Deformation Test	34
23	Leakage Test – Pneumatically-Powered Pump	35
24	Endurance Test	36
	24.1 Mechanical and pneumatically-powered pumps	36
	24.2 Pressure vessel body and cover locking mechanism	36
25	Leakage Test – System.....	36
26	Hydrostatic Strength Test – Vessel.....	36
27	Hydrostatic Strength Test – Piping and Operating Parts.....	37
28	Mechanical Strength Tests for Sight Glass.....	37
29	Overflow Test	38
30	Temperature Test	38
31	Dielectric Voltage-Withstand Test	40
32	Tests for Butane and Carbon Dioxide Hoses.....	40
	32.1 General.....	40
	32.2 Exposure test	40
	32.3 Hydrostatic strength test.....	41
	32.4 Thermal cycling test	41
	32.5 Oil aging test	41
	32.6 Vibration test	41
	32.7 Pull test.....	41
	32.8 Permeation tests.....	41
33	Tip Stability Test	43
34	Tests for Synthetic Rubber Parts.....	43
	34.1 General.....	43
	34.2 Volume change test	43
	34.3 Weight loss test	44
35	Low Temperature Test	44
36	Accelerated Aging Test	45
37	Solvent Vapor Release Test – Vessel Disconnection	45
38	Solvent Vapor Release Test – Vessel Opening.....	45
39	Moist Ammonia Air Stress Cracking Test	46

PERFORMANCE TESTS FOR HYDRAULIC PUMPS

40	Directional Valve Endurance Test	46
41	Pressure Relief and Automatic Limiting Device Endurance Test	46
42	Hydraulic Pump Endurance Tests	47
	42.1 Hydraulic pump endurance test No. 1	47
	42.2 Hydraulic pump endurance test No. 2	47
43	Fitting Pull Test	47
44	Hydrostatic Strength Test	47

MANUFACTURING AND PRODUCTION TESTS

45	General	47
----	---------------	----

MARKINGS

46	Details	47
----	---------------	----

INSTRUCTIONS

47	Manual	51
----	--------------	----

PART II – PLANT OIL EXTRACTION BOOTHS**CONSTRUCTION**

48	General	54
49	Area Classification.....	55
	49.1 General.....	55
	49.2 EPL Gb or Class I, Zone 1 or Class I, Division 1 within booth.....	55
	49.3 EPL Gc or Class I, Zone 2 or Class I, Division 2 within booth	56
50	Key Factors Investigated.....	57
	50.1 Electrical equipment and associated factory-provided interconnections	57
	50.2 Fire suppression system	59
	50.3 Ventilation	59
	50.4 Vapor detection	60
	50.5 Smoke detection.....	60
	50.6 Working spaces.....	60
51	Field Assembly, Installation and Use.....	61

MARKINGS

52	Details	61
----	---------------	----

INSTRUCTIONS

53	Manual	62
----	--------------	----

PART III – PLANT OIL EXTRACTION PREPARATORY AND POST-PROCESSING EQUIPMENT

54	General	64
----	---------------	----

ANNEX A – (INFORMATIVE) – Safety Marking Translations

ULNORM.COM : Click to view the full PDF of UL 1389 2021

No Text on This Page

ULNORM.COM : Click to view the full PDF of UL 1389 2021

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.

UL's Standards for Safety are copyrighted by UL. Neither a printed nor electronic copy of a Standard should be altered in any way. All of UL's Standards and all copyrights, ownerships, and rights regarding those Standards shall remain the sole and exclusive property of UL.

To purchase UL Standards, visit the UL Standards Sales Site at <http://www.shopulstandards.com/HowToOrder.aspx> or call tollfree 1-888-853-3503.

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 Gas & Electric Inspection Div	AHJ	Saskatchewan
Bihler, Sheryl	Eurofins E&E North America	Testing & Standards Org.	USA
Casals, Tomas	Viridios Systems	Producer	USA
Chisholm, Jim	Toronto Fire Services	AHJ	Toronto
Drage, Tyler	Front Range Fire Rescue	AHJ	USA
Haferkorn, James	Rockwell Automation	Supply Chain	USA
Hartung, Vaughn	Swell Companies	Producer	USA
Havelick, Linn	HAL Extraction Technology Ltd.	Producer	USA
Kaiman, Sarah	Green Hygiene Consulting	Commercial / Industrial User	USA
Kwong, Philip	3 Carbon	General Interest	British Columbia
Laberge, Todd	Lawrence Berkeley National Laboratory	AHJ	USA
Laidlaw, Edward	Arcata Fire Protection District	AHJ	USA
Laks, David	Hub International	General Interest	Ontario
Lohf, Lloyd	Spokane Industries	Producer	USA
Lowrey, David	Boulder Fire Rescue	AHJ	USA
Manning, Stefan	Colorado Springs Fire Dept.	AHJ	USA
Mega, Dan	Emerson Fluid & Motion Control	Supply Chain	USA
Monsour, John	Precision Extraction Solutions	Producer	USA
Naito, Jack	Luna Technologies	Producer	USA
Nicoletti, Megan	Codenext Inc.	Supply Chain	Ontario
Olmstead, David	YA Engineering Services LLC	General Interest	USA
Ricks, Luke	Exveritas North America LLC	Testing & Standards Org.	USA
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
Wolf, Kevin	Intertek	Testing & Standards Org.	USA
Wolff-Klammer, Edgar	UL LLC	Testing & Standards Org.	USA
Wade, John A.	ULC Standards	Chair (Non-Voting)	Canada
Werner, Laura	ULC Standards	STP Project Manager (Non-Voting)	Canada

International Classification for Standards (ICS): 29.260.20

For further information on UL standards, please contact:

Underwriters Laboratories Inc.
171 Nepean Street, Suite 400
Ottawa, Ontario K2P 0B4
Phone: 1-613.755.2729
E-mail: ULCStandards@ul.com
Web site: ul.org

This Standard is intended to be used for conformity assessment.

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.

CETTE NORME NATIONALE DU CANADA EST DISPONIBLE EN VERSIONS FRANÇAISE ET ANGLAISE.

ULNORM.COM : Click to view the full PDF of UL 1389-2021

No Text on This Page

ULNORM.COM : Click to view the full PDF of UL 1389 2021