



ANSI/CAN/UL 3741:2020 JOINT CANADA-UNITED STATES NATIONAL STANDARD

STANDARD FOR SAFETY

Photovoltaic Hazard Control





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.

UL Standard for Safety for Photovoltaic Hazard Control, ANSI/CAN/UL 3741

First Edition, Dated December 8, 2020

Summary of Topics

This First Edition of ANSI/CAN/UL 3741, Standard for Photovoltaic Hazard Control, has been issued to reflect the latest ANSI and SCC approval dates, and to incorporate the proposals dated March 6, 2020 and September 18, 2020.

The new requirements are substantially in accordance with Proposal (s) on this subject dated March 6, 2020 and September 18, 2020.

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



DECEMBER 8, 2020



1

ANSI/CAN/UL 3741:2020

Standard for Photovoltaic Hazard Control

First Edition

December 8, 2020

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

The most recent designation of ANSI/UL 3741 as an American National Standard (ANSI) occurred on December 8, 2020. 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 December 8, 2020.

COPYRIGHT © 2020 UNDERWRITERS LABORATORIES INC.

No Text on This Page

CONTENTS

Preface		9
INTRO	DUCTION	
1	Scope	9
·	1.1 Introduction	
	1.2 Equipment and conditions included in scope	
	1.3 Equipment and conditions excluded from scope ¹	
2	Components and Equipment	
3	Units of Measurement	
4	Undated References	
5	Referenced Publications	
6	Glossary	
CONST	RUCTION	
7	Array Component Requirements – PVHCS Requirements	. 15
8	Protection Requirements	
	8.1 Basis of requirements	. 17
	8.2 Application of requirements	.17
9	Protective Elements	.18
	9.1 General	.18
	9.2 PV circuit-interrupting device	.18
	9.3 System or equipment ground circuit interrupting or attenuation	. 18
	9.4 Protection by enhanced protection from live parts	. 18
	9.5 Limited access to live parts of different voltages	
10	Fire Fighter (FF) Current Path Resistance Determination	. 19
	10.1 Body resistance	
	10.2 Personal protective equipment (PPE) resistance	
	10.3 Water spray conductivity	
11	Indication Systems	
12	Safety Analysis	
	12.1 General	
	12.2 Safety analysis steps	
	12.3 Fire fighter (FF) PV array interactions	.27
PERFO	RMANCE	
13	General	
14	PVHC System Conditioning	
	14.1 Potential damage from FF operations	
	14.2 Damage from FF tool	
	14.3 Damage from falling FF	
	14.4 Damage from FF step, walk or crawl	
15	Hazard Exposure	
	15.1 FF impedance circuits	
	15.2 Source test circuits	
	15.3 Leakage current tests	.40
MANUF	ACTURING AND PRODUCTION TESTS	
16	General	.44

MARKING	GS	
17	General	4
INSTRUC	TIONS	
18	General	44
ANNEX A	(Normative) – SAFETY ANALYSIS	
	3 (Normative) – COMMON CONSTRUCTION DETAILS INCLUDING ASSOCIATED RISK LEVELS	
ANNEX C	(Informative) – FRENCH TRANSLATIONS FOR MARKING	
ANNEX D	(Normative) – Resistance Tables	
ANNEX E	(Informative) – EXAMPLE WORKSHEETS FOR PERFORMING A RISK ASSESSMENT	
ANNEX F	(Informative) – PVHC SAFETY ANALYSIS EXAMPLES	
F.2 F.3	General Part 1, section 12.2.2 Part 2, section 12.2.3 Example	6 6

Preface

This is the First Edition of ANSI/CAN/UL 3741 Standard for Photovoltaic Hazard Control.

UL is accredited by the American National Standards Institute (ANSI) and 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 3741 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.

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.

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.

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 Photovoltaic Hazard Control, STP 3741.

This list represents the STP 3741 membership when the final text in this standard was balloted. Since that time, changes in the membership may have occurred.

STP 3741 Membership

Name	Representing	Interest Category	Region
Albee, Hans	ReVision Energy	Supply Chain	USA
Archer, Brock	IE Response	General	USA
Ball, Greg	Tesla	Producer	USA
Berdner, John	Enphase Energy	Producer	USA
Bobruk, Jason	SolarEdge Technologies	Producer	USA
Bower, Ward	Ward Bower Innovations L L C	General	USA
Brooks, William	Brooks Engineering	General	USA
Coddington, Michael	National Renewable Energy Laboratory	Government	USA

STP 3741 Membership Continued on Next Page