



UL 486F

STANDARD FOR SAFETY

Bare and Covered Ferrules

UL COPYRIGHTED MATERIAL –
NOT AUTHORIZED FOR FURTHER REPRODUCTION OR
DISTRIBUTION WITHOUT PERMISSION FROM UL



Documents

Document Sharing Hub

UL Standard for Safety for Bare and Covered Ferrules, UL 486F

Second Edition, Dated September 9, 2019

Summary of Topics

The Second Edition ANSI/UL 486F dated September 9, 2019 includes the following:

Addition of Marking Requirement

Correction to Figure 1

Updates to Tables 1 – 6

Clarification to Dielectric Voltage Withstand Test

Make "Plastic Sleeve" Colors Optional

Add Wire Gauge to Marking Requirements

Expand Scope to Include Wire Ranges Covered by Standard

Addition of Clarification Regarding AWG and the Metric Conversion

Expansion of Tables 1 and 4 to Include Smaller Conductor Sizes

The revised requirements are substantially in accordance with Proposal(s) on this subject dated February 8, 2019 and June 7, 2019.

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.

UL COPYRIGHTED MATERIAL –
NOT AUTHORIZED FOR FURTHER REPRODUCTION OR
DISTRIBUTION WITHOUT PERMISSION FROM UL

 **Documents**
Document Sharing Hub

No Text on This Page

UL COPYRIGHTED MATERIAL –
NOT AUTHORIZED FOR FURTHER REPRODUCTION OR
DISTRIBUTION WITHOUT PERMISSION FROM UL



Documents

Document Sharing Hub



CSA Group
CSA C22.2 No. 291:19
Second Edition



Underwriters Laboratories Inc.
UL 486F
Second Edition

Bare and Covered Ferrules

September 9, 2019



ANSI/UL 486F-2019



Documents

Document Sharing Hub

Commitment for Amendments

This standard is issued jointly by the Canadian Standards Association (operating as “CSA Group”) and Underwriters Laboratories Inc. (UL). Comments or proposals for revisions on any part of the standard may be submitted to CSA Group or UL at anytime. Revisions to this standard will be made only after processing according to the standards development procedures of CSA Group and UL. CSA Group and UL will issue revisions to this standard by means of a new edition or revised or additional pages bearing their date of issue.

ISBN 978-1-4883-2063-7 © 2019 Canadian Standards Association

All rights reserved. No part of this publication may be reproduced in any form whatsoever without the prior permission of the publisher.

This Standard is subject to review within five years from the date of publication, and suggestions for its improvement will be referred to the appropriate committee. To submit a proposal for change, please send the following information to inquires@csagroup.org and include "Proposal for change" in the subject line: Standard designation (number); relevant clause, table, and/or figure number; wording of the proposed change; and rationale for the change.

To purchase CSA Group Standards and related publications, visit CSA Group's Online Store at store.csagroup.org or call toll-free 1-800-463-6727 or 416-747-4044.

Copyright © 2019 Underwriters Laboratories Inc.

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.

This ANSI/UL Standard for Safety consists of the Second Edition. The most recent designation of ANSI/UL 486F as an American National Standard (ANSI) occurred on September 9, 2019. ANSI approval for a standard does not include the Cover Page, Transmittal Pages, Title Page (front and back), or the Preface.

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>.

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

CONTENTS

PREFACE	5
1 Scope	7
2 Reference Publications.....	7
2.1 Normative references.....	7
3 Units of Measurement	8
4 Definitions	8
5 Symbols and Abbreviations.....	8
6 Construction	9
6.1 General.....	9
6.2 Materials	9
6.3 Flammability.....	9
6.4 Thermal properties.....	9
7 Test Requirements	9
7.1 General	9
7.2 Tensile test	10
7.3 Mold stress relief.....	10
7.4 Dielectric voltage-withstand	10
8 Sampling Requirements	10
8.1 General.....	10
8.2 Tensile test	10
8.3 Mold stress test	10
8.4 Dielectric voltage-withstand	10
9 Test Methods	10
9.1 General.....	10
9.2 Tensile test	11
9.3 Mold stress test	11
9.4 Dielectric voltage withstand test	11
10 Marking, Labeling, and Packaging.....	11
10.1 General.....	11
TABLES	11
FIGURES	20

No Text on This Page

UL COPYRIGHTED MATERIAL –
NOT AUTHORIZED FOR FURTHER REPRODUCTION OR
DISTRIBUTION WITHOUT PERMISSION FROM UL



Documents

Document Sharing Hub

PREFACE

This is the harmonized CSA Group and UL standard for Bare and Covered Ferrules. It is the second edition of CSA C22.2 No. 291 and the second edition of UL 486F. This edition of CSA C22.2 No. 291 supersedes the previous edition published in 2014.

The major differences between this edition and the previous edition include editorial updates to Tables 1 – 6, clarification to dielectric voltage withstand test, addition of wire gauge to marking requirements, expansion of the scope to include wire ranges covered by this standard and updates to the referenced publications.

This harmonized standard was prepared by CSA Group and Underwriters Laboratories Inc. (UL). The efforts and support of the Technical Harmonization Subcommittee, CANENA Technical Harmonization Committee 99 – Electrical Connectors of the Council on the Harmonization of Electrotechnical Standards of the Nations of the Americas (CANENA), are gratefully acknowledged.

This standard is considered suitable for use for conformity assessment within the stated scope of the standard.

This standard was reviewed by the CSA Integrated Committee on Electrical Connectors, under the jurisdiction of the CSA Technical Committee on Wiring Products and the CSA Strategic Steering Committee on Requirements for Electrical Safety, and has been formally approved by the CSA Technical Committee. This Standard has been developed in compliance with Standards Council of Canada requirements for National Standards of Canada. It has been published as a National Standard of Canada by CSA Group.

Application of Standard

Where reference is made to a specific number of samples to be tested, the specified number is to be considered a minimum quantity.

Note: Although the intended primary application of this standard is stated in its scope, it is important to note that it remains the responsibility of the users of the standard to judge its suitability for their particular purpose.

Level of Harmonization

This standard uses the IEC format but is not based on, nor is it considered equivalent to, an IEC standard.

This standard is published as an equivalent standard for CSA Group and UL.

An equivalent standard is a standard that is substantially the same in technical content, except as follows: Technical national differences are allowed for codes and governmental regulations as well as those recognized as being in accordance with NAFTA Article 905, for example, because of fundamental climatic, geographical, technological, or infrastructural factors, scientific justification, or the level of protection that the country considers appropriate. Presentation is word for word except for editorial changes.

Reasons for differences from IEC

At present there is no IEC standard for bare and covered ferrules. Therefore, this standard does not employ any IEC standard for base requirements.

Interpretations

The interpretation by the standards development organization of an identical or equivalent standard is based on the literal text to determine compliance with the standard in accordance with the procedural rules of the standards development organization. If more than one interpretation of the literal text has been identified, a revision is to be proposed as soon as possible to each of the standards development organizations to more accurately reflect the intent.

1 Scope

1.1 These requirements cover bare and covered ferrules intended for field wiring and factory wiring for use in accordance with the National Electrical Code, ANSI/NFPA-70 and Canadian Electrical Code, Part I, CSA C22.1.

1.2 These ferrules are intended to facilitate the connection of stranded wire on to devices, such as terminal blocks. Their purpose is to treat stripped wire and prevent turned back strands during installation. They are intended to be used to attach to one stranded copper conductor or two stranded copper conductors of the same size.

1.3 When intended for use with one conductor, these ferrules are suitable for use with 1/0 – 26 AWG, 50 – 0.14 mm², stranded copper conductors.

1.4 When intended for use with two conductors, these ferrules are suitable for use with (2) 6 – (2) 26 AWG, (2) 16 – (2) 0.25 mm², stranded copper conductors.

1.5 These ferrules are intended to be terminated in wire connection devices rated for solid conductors.

1.6 Ferrules are not intended for use in IDC (insulation displacement connection) terminal blocks.

1.7 This standard does not apply to wire connectors such as pin adapters covered in CSA C22.2 No. 65 or UL 486A-486B.

1.8 In Canada, general requirements applicable to this Standard are provided in CAN/CSA-C22.2 No. 0.

2 Reference Publications

2.1 Normative references

Where reference is made to any Standards, such reference shall be considered to refer to the latest editions and revisions thereto available at the time of printing, unless otherwise specified.

2.1.1 CSA Group Standards

C22.1-18
Canadian Electrical Code, Part I

CAN/CSA-C22.2 No. 0-10 (R2015)
General Requirements – Canadian Electrical Code, Part II

CAN/CSA-C22.2 No. 0.17-00 (R2018)
Evaluation of Properties of Polymeric Materials