# UL486F Scope and White book ZMLF Category on Bare and Covered Ferrules

**Standard Number: UL 486F**
**Standard Title: Standard for Safety for Bare and Covered Ferrules**
**Edition Date: December 9, 2024**
**Edition Number: 3**
**Section / Paragraph Reference: Section 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, NFPA 70 and Canadian Electrical Code, Part I, CSA C22.1.

1.2 This standard applies to ferrules that 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 777 kcmil – 26 AWG, 380 – 0.14 mm2, stranded copper conductors. For conductor sizes 8 AWG, 10 mm2 or larger, these ferrules are suitable for use with stranded copper conductors that are more finely stranded than Class B or C conductors.

NOTE: Examples of stranding classes more finely stranded than class B or C are classes G, H, I, K, M, 5, and 6. In addition, Type DLO cable is more finely stranded than Class B or C.

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 This standard applies to ferrules that are intended to be terminated in wire connection devices rated for:
a) Solid copper conductors; and/or

b) Stranded copper Class B and C conductors – applicable to wire connection devices rated to terminate conductor sizes 8 AWG, 10 mm2 or larger.

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

1.7 This Standard applies to Ferrules rated for use with conductor sizes 2/0 AWG, 70 mm2 or larger that are intended for use in aluminum and copper body mechanical connectors with dome and conical shaped screws that apply direct pressure to the conductor being terminated.

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

1.9 Ferrules covered by this standard may be used with equipment having short circuit ratings of:

a) 85,000 A maximum, or

b) 100,000 A maximum if supplied by an overcurrent protective device, and the equipment short circuit current rating, divided by the number of conductors per phase, results in a current of 50,000 A or less per conductor.

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**UL White Book on ZMLF Category Bare and Covered Ferrules**

**USE**

This category covers bare and covered ferrules for use in installations covered by NFPA 70, "National Electrical Code." They are intended to be used to attach to one or two stranded copper conductors of the same size. Ferrules are intended to facilitate the connection of stranded wire onto devices, with the purpose to treat stripped wire and prevent stray strands during installation.

They are suitable for use with stranded copper conductors and are intended to be terminated in wire□connection devices rated for:

Solid conductors; and/or Copper Class B and Class C conductors (applicable to wire-connection devices rated for termination of conductor sizes 8 AWG, 10 mm2 or larger)

Ferrules may be investigated for conductors within the following ranges:
Single conductors, 750 kcmil - 26 AWG, 380 - 0.14 mm2
Two conductors of the same wire gauge (twin ferrules), each 6 - 24 AWG, 16 - 0.25 mm2
A covered ferrule is provided with a nonconductive plastic material that is used for identification purposes. The plastic sleeve is not considered electrical insulation.

Ferrules rated for use with conductor sizes 2/0 AWG, 70 mm2 or larger are intended for use in aluminum and copper body mechanical connectors with dome and conical shaped screws that apply direct pressure to the conductor being terminated.

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

**PRODUCT MARKINGS**

The following markings appear on or with the smallest package:

Manufacturer's name, trademark or trade name

A distinctive catalog number or the equivalent

Wire type, "CU" or "Copper"

Wire size (AWG/mm2)

Stranding type, (e.g., B, C)

Installation tool, manufacturer's name and catalog number

Strip length

The statement "Plastic sleeve for covered ferrules is for identification purposes only and is not electrical insulation," or equivalent (applicable only to covered ferrules).

For ferrules rated for use with 2/0 AWG, 70 mm2 or larger, the statement “When used in equipment with short circuit ratings, refer to the ferrules installation instructions”, or equivalent.

**PRODUCT IDENTITY**
One of the following product identities appears on the product:

Bare Ferrule

Covered Ferrule

**RELATED PRODUCTS**
Single-polarity wire connectors for use with all alloys of copper, aluminum, or copper-clad aluminum conductors, or all three, for the purpose of providing contact between current-carrying parts are covered under Wire Connectors and Soldering Lugs (ZMVV).

Electrical connectors of either a male tab or a female connector that can be readily engaged or disengaged without the use of a tool are covered under Electrical Quick-connect Terminals (RFWV). Wire-connector adapters installed on the end of a conductor prior to their subsequent connection to certified wire connectors or to connectors used in certified equipment are covered under Wire-connector Adapters (ZMOW).

**ADDITIONAL INFORMATION**
For additional information, see Electrical Equipment for Use in Ordinary Locations (AALZ).

**REQUIREMENTS**
The basic standards used to investigate products in this category are UL 486F, "Bare and Covered Ferrules."

**UL MARK**

The Certification Mark of UL on the smallest unit container in which the product is packaged, with or without the UL symbol on the product, is the only method provided by UL to identify products manufactured under its Certification and Follow-Up Service. The Certification Mark for these products includes the UL symbol, the words "CERTIFIED" and "SAFETY," the geographic identifier(s), and a file number.

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References: UL LLC, NEC CODE, NFPA.
Please find more information at ULStandards.com and NFPA.org