

SUMMARY OF TOPICS

The following changes in requirements to the Standard for Bare and Covered Ferrules, UL 486F, are being proposed for preliminary review and comment only:

- 1. For Preliminary Review Only: Addition of Marking Requirement***
- 2. For Preliminary Review Only: Correction to Figure 1***
- 3. For Preliminary Review Only: Updates to Tables 1 - 6***
- 4. For Preliminary Review Only: Clarification to Dielectric Voltage Withstand Test***
- 5. For Preliminary Review Only: Make "Plastic Sleeve" Colors Optional***
- 6. For Preliminary Review Only: Add Wire Gauge to Marking Requirements***
- 7. For Preliminary Review Only: Expand Scope to Include Wire Ranges Covered by Standard***
- 8. For Preliminary Review Only: Addition of Clarification Regarding AWG and the Metric Conversion***
- 9. For Preliminary Review Only: Expansion of Tables 1 and 4 to Include Smaller Conductor Sizes***

COMMENTS DUE: November 2, 2018

This proposal is for review and comment only (no ballot at this time). Please note that comments on a preliminary review document will not receive a response from the proposal author through CSDS. Instead, the proposal author will be asked to review the comments and adjust the proposals and/or supporting rationale as the author determines to be appropriate. The preliminary review process is an informal mechanism that provides authors with the opportunity to refine their proposals before they advance to the next stage in UL's standards development process.

In some cases, the author of the proposals may choose to discontinue them. In this case, the author need not do anything after preliminary review has ended. Normally, the next step in the process is the more formal STP ballot and stakeholder review process. Only comments posted during the STP ballot and stakeholder review process will be provided with a response in CSDS.

UL's goal is to have no interest category comprise more than one-third of the STP membership balance. To improve the current balance for STP XXX, UL is looking for participants in the following interest categories: AHJ, Commercial/Industrial User, Consumer, General Interest, Government, Supply Chain, Testing & Standards. Definitions for these interest categories are available on the Standards STP Internet site:

<http://ulstandards.ul.com/develop-standards/participation/interest-categories/>

If you are interested in applying for STP 486 membership or are aware of potential candidates for this STP, please contact the STP Project Manager at Mitchell.Gold@ul.com.

For your convenience in review, proposed additions to existing requirements are shown underlined and proposed deletions are shown ~~lined-out~~.

1. For Preliminary Review Only: Addition of Marking Requirement

RATIONALE

Proposal submitted by: CANENA THC 99

A marking requirement was added to Clause 10.1.1 item (g) to acknowledge that covered ferrules are not recognized for insulation.

PROPOSAL

10.1 General

10.1.1 The following shall appear on or with the smallest package:

- a) manufacturer's name, trademark or trade name;
- b) a distinctive catalog number or the equivalent;
- c) wire type, CU or Copper;
- d) stranding type, (ie. Class B, C...);
- e) installation tool, manufacturer's name and catalog number; ~~and~~
- f) strip length; and

g) for covered ferrules only: "Plastic sleeve for covered ferrules is for identification purposes only and it is not electrical insulation", or equivalent

2. For Preliminary Review Only: Correction to Figure 1

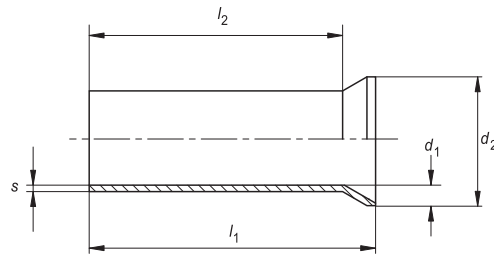
RATIONALE

Proposal submitted by: Robert Osborne, UL LLC

The below diagram fixes a dimensional mistake presently in Figure 1 of the UL 486F standard.

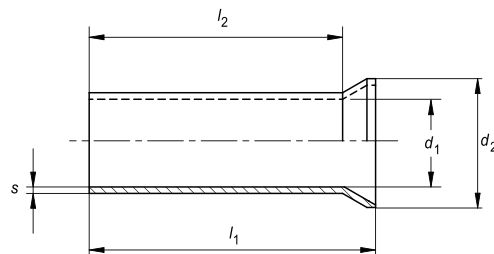
PROPOSAL

Figure 1 – Tubular ferrules without plastic sleeve, Form A
(DELETED)



su0878

Figure 1 – Tubular ferrules without plastic sleeve, Form A
(NEW)



su0878a

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3. For Preliminary Review Only: Updates to Tables 1 - 6

RATIONALE

Proposal submitted by: Robert Osborne, UL LLC and Hanan Attia, Panduit

This proposal includes multiple revisions to Tables 1 – 5, as well as revisions to Clause 6.1.2:

1. Metal parts which are critical for the performance of the ferrule are provided with “±” tolerances to ensure adequate control over their dimensions.
2. Plastic parts (for “sleeves”) which are for identification purposes and are not critical for the performance of the ferrule are provided with a “-” tolerance only. This is to ensure the plastic sleeve will still fit over the insulation of most wire insulations, but allow for designs that accommodate thicker plastic sleeves or wider wire entry ports.
3. Ferrule lengths, which may require various lengths to accommodate end-use strip lengths, are provided with a “-” tolerance only. This ensures a standardized minimum length is provided but allows for designs that accommodate longer lengths of ferrules. It should be noted that this is already permitted as indicated in Clause 6.1.2, which states “Intermediate lengths and longer lengths are permissible”. Removing the “+” tolerance resolves a conflict between Clause 6.1.2 and the Tables.
4. Clause 6.1.2 is updated to reflect the provisions noted in “2” and “3” above.
5. The heading for Tables 2 and 2A are revised to include references to the Figures which are applicable to each Table (Figures 2, 2A, 2B, and 2C).
6. Values in Table 1 for “l2” are revised to align with how other lengths are covered (as a minimum value). In making this change, existing tolerances for similar dimensions are applied, and the existing “minimum” value is increased by the newly added tolerance to result in the same “minimum value” as exists today.
7. Tables 2A and 3A are revised to match the format for all other Tables. Specifically, columns are added for “Conductor Cross Section”, and the “AWG” values are removed from the “Nominal Size” column.
8. All tables are revised to ensure “AWG” is in the first column to reflect the North American value as the predominate unit.
9. Table 5 is revised to include tolerances appropriate for each value (rather than a “generic” tolerance of 0.4 mm, which in some cases is too large, other cases too small).
13. A correction was made to Table 5. There is an error in the 2x6 conductor cross-section. The mm² column reading 2x10 should read 2x6.
10. Table 6 is revised to separate values for mm² and AWG, with AWG being in the first column. Wire size “8 AWG” is added to reflect the size most closely aligned with 10 mm².
11. Multiple corrections are made to remove superfluous “0”s throughout the Tables as well as other corrections.
12. Table 6 is expanded to include conductor wire sizes 26, 24, and 22 AWG, and to include Tensile (pullout) force in “lb”, and to eliminate generic terms (smaller and larger).

Please note, additional changes appear in these Tables, and are the result of proposals 5 and 9. These changes will be explained with rationales as separate items under those topic numbers.

PROPOSAL



Table 1 – Ferrules without plastic sleeve, Form A

Nominal size		Conductor cross-section		d_1		d_2		l_1		l_2		s	
Conductor cross-section, <u>mm²</u>	Length l_1	AWG	mm ²		Tolerance		Tolerance		Tolerance	min:	<u>Tolerance</u>		Tolerance
<u>0.25</u>	<u>5</u> <u>7</u>	<u>24</u>	<u>0.25</u>	<u>0.8</u>	+0,14 $\emptyset$	<u>1.7</u>		<u>5</u> <u>7</u>		<u>4.7</u> <u>6.7</u>	<u>-0.4</u>	0,15	$\pm 0,05$
<u>0.34</u>	<u>5</u> <u>7</u>	<u>22</u>	<u>0.34</u>	<u>0.9</u>		<u>1.8</u>		<u>5</u> <u>7</u>		<u>4.7</u> <u>6.7</u>			
0,5	6 <u>8</u> 10	20	0,5	1		2,1		6 <u>8</u> 10		5, <u>73</u> <u>7.7</u> 9, <u>73</u>			
	6 10							5, <u>73</u> 9, <u>73</u>					
	6 10							5, <u>73</u> 9, <u>73</u>					
0,75	6 10	18	0,75	1,2		2,3		6 10		5, <u>73</u> 9, <u>73</u>			
1	6 10	–	1	1,4	2,5	6 10	5, <u>73</u> 9, <u>73</u>						
1,5	7 10 12 18	16	1,5	1,7	2,8		$\pm$ 0,4	7 10 12 18	6, <u>4</u> <u>9.4</u> 11, <u>4</u> 17, <u>4</u>				
	7 10							6, <u>4</u> <u>9.4</u>					
	12 18							11, <u>4</u> 17, <u>4</u>					
	7 10 12 18							6, <u>4</u> <u>9.4</u> 11, <u>4</u> 17, <u>4</u>					
2,5	7 10 12 18	14	2,5	2,2	+0,25 $\emptyset$	3,4	$\emptyset$ -0,2	7 10 12 18	6, <u>4</u> <u>9.4</u> 11, <u>4</u> 17, <u>4</u>				

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Table 1 – Ferrules without plastic sleeve, Form A Continued

Nominal size		Conductor cross-section		d_1		d_2		l_1		l_2		s	
Conductor cross-section, <u>mm²</u>	Length l_1	AWG	mm ²		Tolerance		Tolerance		Tolerance	min:	<u>Tolerance</u>		Tolerance
4	9	12	4	2,8		4	-0,2	9	$\pm \text{ } 0,4$	<u>8,4</u>	<u>-0,4</u>	0,2	$\pm 0,05$
	12							11,4					
	15							14,4					
	18							17,4					
6	10	10	6	3,5		4,7		10		9,4			
	12							11,4					
	15							14,4					
	18							17,4					
10	12	8	10	4,5	$+0,3$ $\varnothing$	5,8		12		<u>11,2</u>			
	15							<u>10,8</u>					
	18							<u>14,2</u>					
								<u>13,8</u>					
16	12	6	16	5,8				7,5	12	<u>17,2</u>			
	15								<u>16,8</u>				
	18								<u>10,95</u>				
	25								<u>13,95</u>				
	32								<u>16,95</u>				
25	15	4	25	7,3		$+0,4$ $\varnothing$	9,5	$\varnothing$ -0,5	$\pm \text{ } 0,4$	<u>23,95</u>			
	18									<u>20,8</u>			
	25				$\pm \text{ } 0,6$				<u>23,95</u>				
	32				<u>30,95</u>								
35	18	2	35	8,3	11		-0,5		18	<u>16,4</u>			
	25								$\pm \text{ } 0,4$	<u>23,4</u>			
	32								$\pm \text{ } 0,6$	<u>30,4</u>			
	50								18	1/0		50	
25		$\pm \text{ } 0,4$	<u>22,4</u>										
32		$\pm \text{ } 0,6$	<u>29,4</u>										

Note – All dimensions in mm unless otherwise stated.

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