

## Application area of wire end ferrules with plastic collar

Dear ladies and gentleman,

the purpose of this technical information is to inform about the intended use of wire end ferrules with plastic collar.

Wire end ferrules with plastic collar offer additional ease of insertion due to the conical shape that is integrated in the inner diameter of the collar. Additionally, avoids that the rough insulation edges of the conductor getting caught when connecting at the clamping point. The different color codes offer a visual aid for cross-section identification.

The requirements for wire end ferrules are defined in DIN 46228. Therefore, this standard is decisive for basic conditions and key parameters.

Contrary to the common opinion the plastic collar of the wire end ferrule does not offer kink protection, unlike insulated cable lugs. Neither is the plastic collar of the ferrule a mechanical insulation support and therefore should not be stressed by excessive pulling or bending. Additionally to this, during the assembly, all relevant standards must always be complied with. According to DIN VDE 0298-300 conductors must only be installed in certain bending radius. For instance a PVC insulated wire with conductor diameter  $\leq 20$  mm should have a bend radius of no less than 6 times that of the conductor diameter. In practice this means that no significant pull should stress the plastic collar of the wire end ferrule!



Img. 1: exemplary description for clarification of bending radius

**Example calculation** a 2.5mm<sup>2</sup> (AWG20), according to installation method, has a recommended bend radius of 6D. With a conductor diameter of 2.57mm this leads to:  $6D = 6 \times 2,57\text{mm} = 15,4$  mm

In order to create an optimal crimped connection the standard DIN 46228 recommends to use tools and contacts of the same supplier (e.g. Weidmüller). Only by doing this can a constantly high processing quality be guaranteed. Weidmüller offers a matching product portfolio that enables you to process conductors from an electrical and a mechanical point of view providing safe, long-lasting and reliable connections.

Start with a clean, non-squeezed and burr-free cut (e.g. with *KT 8*; Art.: [9002650000](#)), then the conductor needs to be perfectly stripped (e.g. with *Stripax*; Art.: [9005000000](#)) in order to guarantee that the entire cross-section is being crimped in the tube of the ferrule. In case of fanned out conductor ends and referring to DIN EN 60352 it is only allowed to twist the single strands slightly (re-establishing the original condition).



Img. 2: clean, squeeze- and burr-free cut



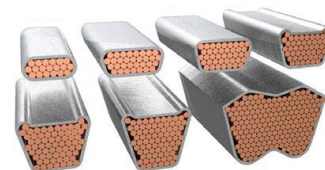
Img. 3: perfectly stripped conductor

During crimp process it must also be noted that wire end ferrules are only meant for the usage of fine-stranded conductors according to VDE 0295 class 5. Deviations must be evaluated. For crimped connections with wire end ferrules and conductors with a cross-section up to 6 mm<sup>2</sup> (AWG 10) it is recommended that the single strands should be visible 1 mm out of the copper tube. For cross-sections larger than > 6 mm<sup>2</sup> up to 2mm. (compare *Img. 4*).

Additionally, it is essential to select the crimping tool with a suitable crimping shape for the connection point (compare *Img 5*; e.g. *PZ 6 ROTO L*; Art.: [1444050000](#)). When conducting the crimp it is important to note that the crimp should be placed close to the plastic collar (*Img. 6*).



Img. 4: strands looking out of the tube



Img. 5: examples of different crimp geometries



Img. 6: positioning of the crimp

When considering all aspects of this technical information a high quality, non-detachable connection is established between conductor and wire end ferrule.

With best regards,

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## Technical Data Sheet for Weidmüller Wire end ferrules with plastic collar

The Materials of the wire ferrules manufactured by Weidmüller Interface GmbH & Co. KG, can be described as follows:

- Production: „Made in Germany“
- Hazardous Substances: The materials used for production are classified as not noxious.
- Materials:  
Insulating Collar Polypropylene-fluoropolymer (UL-File No. E108112)  
Flame class HB  
Copper Tube Copper (E-Cu 57), galvanically tinned, shiny
- Additional materials: compliant with RoHS directive 2011/65/EU and 2003/11/EG as well as the REACH regulation (EG) no. 1907/2006
- Thermostability: heat resistant from -5°C to + 105°C
- Standards, certificates, directives:
  - DIN 46228 Part 4:2020
  - UL certificate  
Certificate no. E354986 / E499744 from the 23<sup>th</sup> March 2018 / 24<sup>th</sup> June 2019
  - CSA-US / ANSI-UL, CSA-US certificate  
Certificate no. 1176867 from the 19<sup>th</sup> September 2012  
Master Contract No. 209623
  - RoHS directive  
2011/65/EU and 2003/11/EG
  - REACH regulation (EG) No. 1907/2006
  - Conflict minerals according to 1502 DFA

Please note that our pre-products are manufactured industrially and therefore traces of course cannot be ruled out. According to the suppliers, the absence of these substances was not detected by tests. The company Weidmüller Interface GmbH & Co. KG is in constant dialogue with your suppliers in the supply chain with regard to RoHS, REACH and conflict minerals. These are also obligated by the legislature to inform Weidmüller immediately as soon as the conformity can no longer be guaranteed.

Detmold, January 2020

