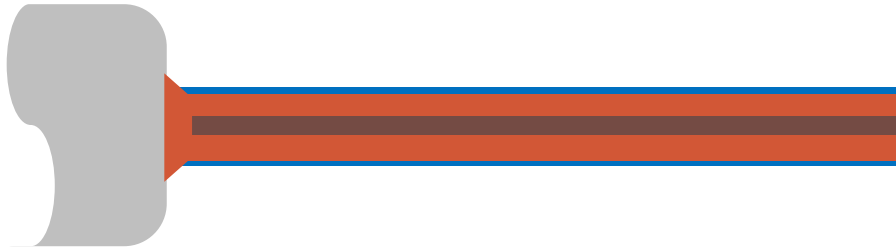


Technical Note TN011: Advice on Solderability of W20 Series Resistors

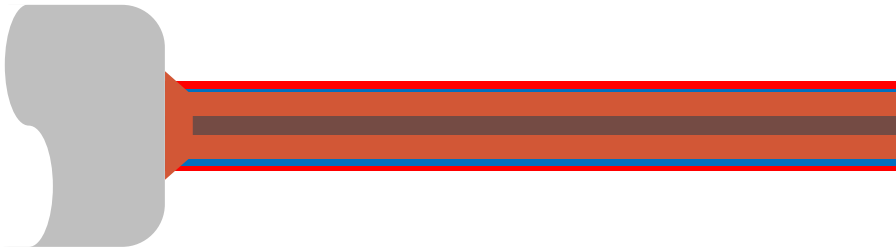
W20 Terminal Structure and Process Stages

W20 Series resistor terminals are nickel-plated copper-clad steel wires. These become heavily oxidised during the firing of the vitreous enamel coating and so must be cleaned by shotblasting prior to solder coating. The terminal structure after each major process stage is shown below:

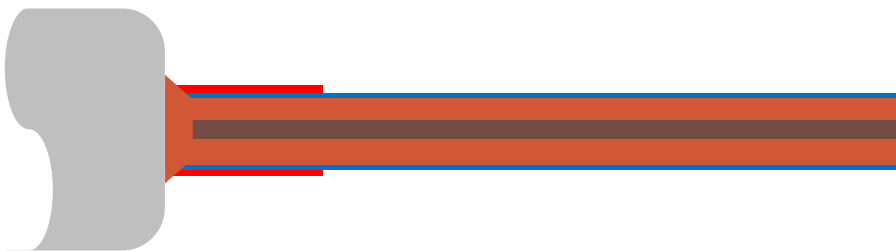
1. After welding to cap: nickel-plated copper-clad steel terminal wire



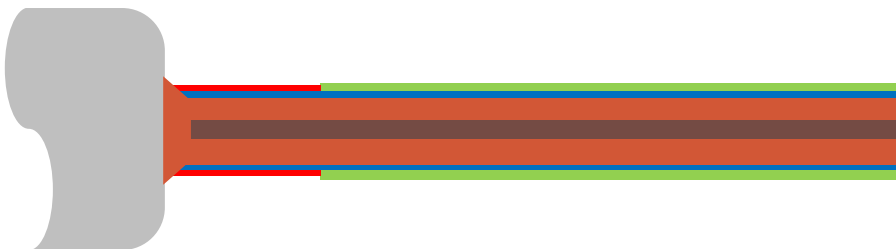
2. After coating furnace: nickel surface is heavily oxidised



3. After shotblasting: terminal wires are cleaned of oxide to <4mm of cap



4. After solder dip: cleaned nickel is solder coated



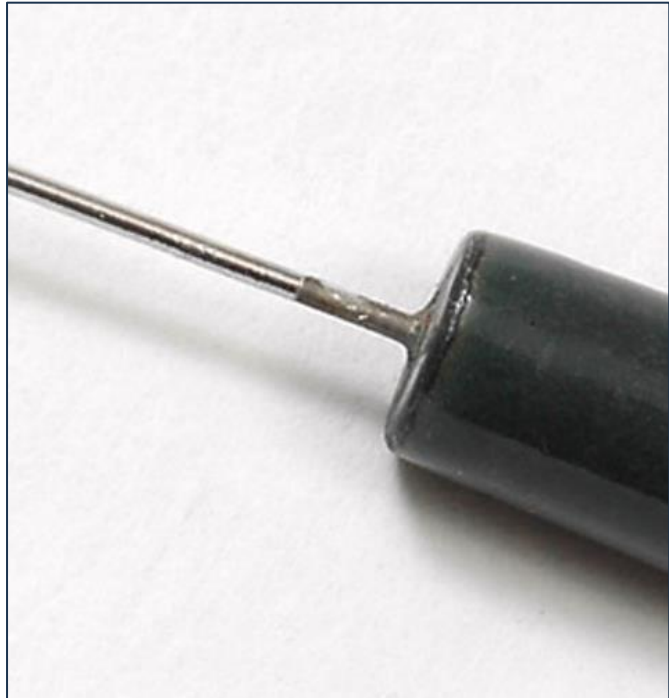
W20 Terminal Appearance

As a result of the process stages described above, the terminal wire within 4mm of the cap at the end of the resistor body is not part of the solderable termination. The appearance (see image) is dull grey, in contrast to the shiny solder finish on the rest of the terminal.

The datasheet refers to this feature under Application Notes, which state “The terminations are solderable to within 4mm from the body.”

<https://www.ttelectronics.com/TTElectronics/media/ProductFiles/Datasheet/w20.pdf>

This appearance sometimes gives rise to concerns about contamination threatening the solderability of terminals. However, the non-solderable region is a normal outcome of manufacturing processes and its extent is controlled.



W20 Terminal Variants

In some applications it is required to have a shorter non-solderable region. For the W21 size the option exists to have terminations solderable to within 1mm from the resistor body, and this is coded as W21B. However, care should be taken that solder joints are not overheated in operation at full power or anticipated overloads when they are formed so close to the body.

W20 End of Body Appearance

Another result of the process stages described here is that the uncoated, bare metal areas at the ends of the body also have a heavily oxidised appearance, as they too are not cleaned after passing through the coating furnace. This contrasts with the bright and shiny appearance typical for wirewound axial resistors using coating materials processed at much lower temperatures like silicone cement. This is regarded as a normal, cosmetic feature and does not indicate ongoing corrosion at operating temperatures.