General

Intrinsic's BR series of heat shrinkable metal rings are used to clamp cable shielding braids onto specially designed connector backshells. This document lays out the performance specifications for braid terminations made using the BR rings. Drawing PD BR, tabulates the dimensional specifications of the BR series rings.

Applicable Government Documents
MIL-STD-202 Test Methods for Electronic and Electrical Component Parts
A-A-59569 Braid, Wire (Copper, Tin-Coated or Silver Coated, Tubular or Flat, superseding QQ-B-575C))

Intrinsic Devices Documents
PD BR "Heat Shrinkable Braid Termination Rings"
PD012 "Braid Termination Barrel Drawing"
PD013 "Braid Ring Selection Guide"
PD014 "Braid Ring Installation Procedure"
Test Report "Testing of UniLok BR Series Braid Terminations" Nov. 15, 2022

Requirements

The braid-to-adapter joint created with BR series rings shall meet the following requirements.

Braid to adapter contact resistance – less than one milliohm
Joint tensile strength – sizes 04 & 06 150 pounds minimum
sizes 08 and larger 200 pounds minimum
If the braid breaks, rather than the ring and braid pulling off, it is considered a pass.

These requirements are to be satisfied when tested at 25C+/- 5C, -65C +0C/-3C and 150C+/-2C. The requirements shall also be met when tested at 25C +/- 5C following thermal shock conditioning per MIL-STD-202, Method 107, Test Condition F-2.

Braid terminations will meet the requirements above when:

The braid size and ring size are selected per PD013 "Braid Ring Selection Guide".
The adapter termination barrel meets the requirements of PD012 "Braid Termination Barrel Drawing".
The braid and ring are installed on the backshell in accordance with PD014 "Braid Ring Installation Procedure".

Demonstration of Conformance

Sampling
Rings of 3 entry sizes shall be tested. The sizes shall be one of the two smallest sizes manufactured, one of the two largest sizes manufactured and one size nominally in the middle of those. Of the three sizes selected, three nominally identical samples shall be tested for contact resistance and tensile strength at each of the specified conditions, for a total of 12 samples per size.

Sample configuration
Samples shall be assembled using backshells previously inspected to the requirements of PD012. The spin nut should be removed to allow easy electrical contact for the current and voltage probes used to measure the contact resistance. The test braid for each size shall be per A-A-59569 and PD013. The braid and ring shall be installed on the backshell per PD014. The free end of the braid shall be fluxed and dipped in a solder pot to fuse all the wire ends together. The free length of the braid from the inboard edge of the solder to the ring shall be 6" to 8". For all samples of a particular entry size, this length should be consistent +/-.75".

Measurements
The contact resistance of the joints shall be measured with a Kelvin double bridge or an equivalent 4-terminal bridge. One set of current & voltage contacts shall be made on the adapter body. The other set on the braid at the inside edge of the solder dip. Since the resistance measurement includes 6 to 8 inches of braid along with the braid to adapter contact resistance, the resistance of the braid needs to be determined and subtracted out of the total. This shall be done by cutting samples of the braids used and solder dipping the ends such that the length between solder dips is equal to the average length of braids attached to the adapters of each size. The resistance of the braid samples shall be measured at each test temperature, 25C, -65C and 150C. These measured braid resistances shall be subtracted from the assembly measurements as appropriate for the particular test temperature. All measurements shall be made at a current of 1 amp.

Tensile strength shall be measured by gradually increasing load until the braid breaks or the ring and braid pull off the adapter. The peak load measured shall be reported as the tensile strength.

Resistance and tensile strength measurements shall be made with the samples stabilized at temperature in an environmental chamber.

Thermal shock conditioning shall be performed in accordance with per MIL-STD-202, Method 107, Test Condition F-2. If sample temperatures are monitored and it is demonstrated that they come to temperature in less time than called for in the MIL-STD, the exposure times on each cold and hot cycle may be shortened.

Qualification Testing on Intrinsic Devices BR Series Rings
See the November 15, 2022 report “Testing of UniLok BR Series Braid Terminations” for demonstration of compliance with this specification.