

Dan Edmunds: 04-19-06 (email converted by S. Pordes)

This note is a short report about the resistance of the Fort Wayne Metals `4 mil' 304V SS wire before and after stress relief heat treatment. These measurements were done on a sample of the 4 mil wire that I obtained from Stephen on March 20th.

Resistance before stress relief heat treatment

Room Temp 123.8 Ohm/m LN2 Temp 110.5 Ohm/m

Resistance after stress relief heat treatment

Room Temp 105.1 Ohm/m LN2 Temp 90.1 Ohm/m

Resistance based on the FWM specified bulk resistivity of

720 micro Ohm - mm and a 3.85 mil diameter wire

95.8 Ohm/m

Notes:

- The heat treatment lasted for 24.5 hours at 397 C in a quarts tube with a flow of Helium gas through the tube. At the end of this time the furnace was turned off and allowed to cool at its natural rate while the Helium gas flow was maintained.
- As one would expect the resistance ratio (room temp resistance divided by cold resistance) increased a little bit after the heat treatment. Resistance ratio before the heat treatment was 1.121 and after heat treatment it is 1.166
- All of the other notes about making these measurements are the same as before and are in the detailed report.
- The heat treated sample of wire is available if folks want to make any other tests on it.

I assume that Fort Wayne Metals could supply officially heat treated stress relieved SS wire if we want it.

Do I understand correctly that this wire is stronger after the heat treatment? Are there any post heat treatment mechanical properties of this wire that make it less suitable for use in the detector?