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# procedure

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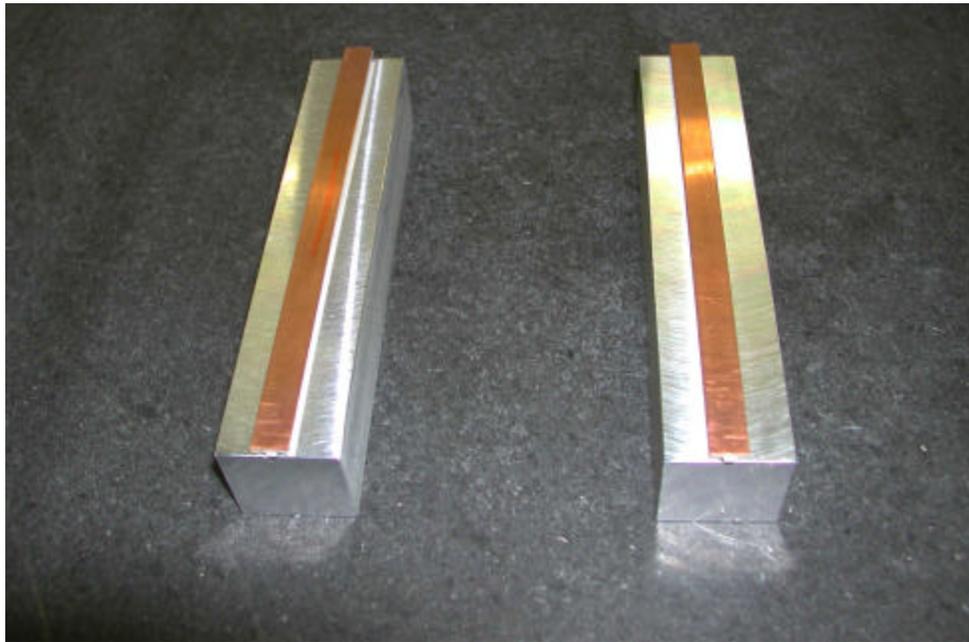
## **SNS CHOPPER MEANDER LINE GLUE JOINT STRENGTH TEST**

The Meander Line of the SNS Chopper is fixed to its Ground Plane using a two-part epoxy (Emerson & Cuming Eccobond Type 45). This is called a "Meander Line Assembly." The epoxy is mixed in proportions such that the maximum joint strength, about 2,500 #/in<sup>2</sup>, is achieved. The Meander Line is fabricated from Rogers Corporation RT/duroid 6002, a PTFE (polytetrafluoroethylene) composite material with an ultimate strength of 1000 #/in<sup>2</sup>.

As part of the manufacturing process it is necessary to perform in-process testing to assure that the glue joint has been properly made. In order to accomplish this, glue joint specimens are fabricated simultaneously with the gluing of the Meander Line to the Ground Plane. There are two glue joint specimens fabricated for each Meander Line Assembly. These are described on LANL Drawing # SK-AT1-519-D1 and are shown on Figure I. The test specimens have two components: a single strip of Meander Line and a one-inch square block of aluminum, four inches in length.

The glue joint specimens are fabricated using the same procedure (epoxy from the same mixed batch, thickness of epoxy applied, joint loading, and cure time) as their respective Meander Line Assembly. One specimen is tested immediately following the curing of the Meander Line Assembly. If this specimen passes the test, then the second specimen is archived as a witness sample. If the first specimen were to fail the strength test, then the second specimen would be tested as a measure to avoid false positives. This did not happen during the fabrication of the four Meander Line Assemblies for the Chopper and Anti-Chopper. Thus, there is an archived witness specimen for each of the four Meander Line Assemblies.

The strength test does not result in a quantitative measurement of the strength of the glue joint. Instead, the test measures whether the glue joint has achieved strength greater than that of the Meander Line substrate material. As noted in the first paragraph, the full strength of the epoxy is specified as 2.5X the ultimate strength of the Meander Line substrate material. So, the strength test determines whether the glue joint fails in the epoxy (FAIL) or in the Meander Line Assemblies (PASS).



**FIGURE I: GLUE JOINT TEST SPECIMENS**

The strength test utilizes a 3/8th inch wide flat head screwdriver blade mounted to a torque wrench. With the glue test specimen held in a vice, the screwdriver blade is torqued until the joint or the Meander Line substrate material fails. The data recorded are the torque at which failure occurred (usually about 7 in-#) and the location of the failure (in the epoxy or in the Meander Line substrate material. Testing is shown on Figure II. Each joint test specimen is tested in five locations: near each end and at three locations spaced equally between the ends.



**FIGURE II: STRENGTH TEST**