Thickness of SSC1 and SSC2 Quench Protection Heaters

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This memo documents thickness measurements made on a set of four SSC design quench protection heaters designed for use in SSC model dipole magnets. These heaters consist of a .001" thick stainless steel strip held between layers of kapton insulator by an adhesive. All but the central 17" of the stainless steel strip are plated with copper. The overall length of each heater is about 65".

Two SSC1 (silicone based adhesive) and two SSC2 (polyimide-impregnated glass cloth adhesive) heaters were measured. The heaters were marked in 6" intervals, and the thickness of the heater was measured at each position with an electronic readout hand micrometer. At each position, the measurement was made as close as possible to the center of the stainless steel strip. Table 1 shows the measurement results.

Position Number	SSC1 a	SSC1 b	SSC2 a	SSC2 b
1	.00675	.00705	.00890	.00860
2	.00735	.00735	.00870	.00795
3	.00735	.00690	.00885	.00775
4	**.00705**	.00735	**.00855**	**.00785**
5	**.00690**	**.00700**	**.00840**	**.00780**
6	**.00680**	**.00695**	**.00840**	**.00790**
7	.00785	.00775	.00830	.00810
8	.00760	.00755	.00870	.00835
9	.00715	.00705	.00860	.00865
10	.00710	.01035	.00860	.00865
Mean Thickness	7.19 ± 0.33 mils	7.53 ± 1.03 mils	8.60 ± 0.19 mils	8.16 ± 0.35 mils

Table 1. Thickness of SSC1 and SSC2 Heater Strips from DSA325

The numbers in bold-face type correspond to measurements taken over the unplated portion of the stainless steel strip. In general, the thickness in this region is some fraction of a mil thinner than the rest of the heater, as expected.

The mean thicknesses of the four heaters are given in the last row of the table. The unplated portions are included in the average. The SSC2 heaters are about .001" thicker than the SSC1 heaters.