Shimming for Lead End Clamp of DCA312

TS-SSC 91-141
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The lead end clamp of DCA312 should be installed with two layers of 5 mil kapton (10 mils radial change) added to the inner surfaces of the collet insulators. This is the same amount that was added to the lead end insulators of DCA310 and the return end of DCA311, without resulting in unreasonable installation pressure or abnormally large end clamp deflections.

The table below is a summary of end clamp installations done on 50 mm collider dipoles so far. The third column shows how much extra kapton (radial) was added to the inner surface of the collet insulators. The third column gives the hydraulic pressure (pump psi) required to install the end can. The fourth, fifth, and sixth columns give the vertical, horizontal, and pi-tape deflections from free to clamped of the end can diameter.

Preliminary Fuji Prescale tape results [1,2,3] show that vertical and pi-tape deflections of a +3 mils and greater indicate clamping pressures averaged over the inner and outer midplane surfaces and outer coil key surfaces inside the end clamp of 6 - 8 kpsi. The deflections in the table for installations with 10 mils of extra radial insulator, except for the DCA310 lead end, all imply reasonably high preload. It should be pointed out that the Fuji film tests have only been performed on return end clamps so far.

Magnet	Date	Extra Kapton (mils)	Hydraul. Pressure (psi)	dVert at 1.5" (mils)	dHoriz at 1.5" (mils)	dPi-tape at 1.5" (mils)
DCA310 Return	6/12/91	0	3400	+4	-3	+2
	6/13/91	5	4400	+5	-2	+3
DCA310 Lead	6/19/91	10	6500	+2	+5	+2
DCA311 Return	6/28/91	10	8000	+6	0	+5
	7/2/91	10	8100	—	—	—
	7/12/91	10	7900	+6	-3	+5

References

1. TS-SSC 91-133, "Instruction Manual for Fuji Film Densitometer FPD301 and Printer FPD303."

2. TS-SSC 91-134, " Calibration of Fuji Prescale Pressure Sensitive Film."

3. TS-SSC 91-135, "Fuji Film Tests on DSA322 End Clamp Pressure."