

reduce the water consumption for electroplating activities to a greater extent.

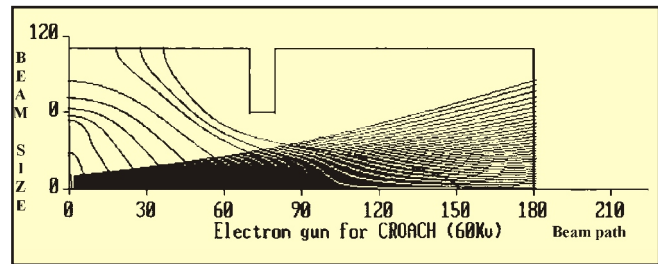
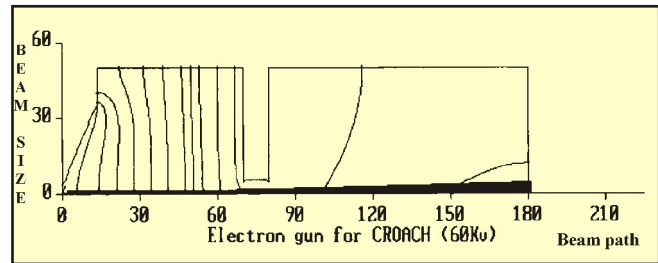
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### A.6 Electron Gun Test Setup for Indus-2 crotch assemblies

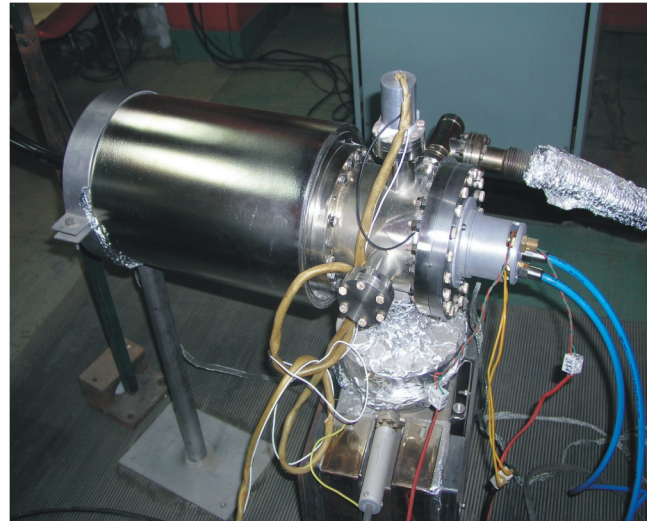
High power density absorbers called crotches are used to absorb the radiations in dipole chambers of Synchrotron Radiation Sources. The power density to be absorbed, ranges from 800 to 1000 W/cm<sup>2</sup>. These crotches are tested with an alternate power source, simulating identical power density in UHV environment. A test setup (fig.A.6.2) including electron gun has been developed to test the crotch assemblies of Indus-2. For these crotches, the beam size required is 150 mm x 5 mm having a power of 5 kW. A pierce type electron gun has been designed and fabricated to simulate the required test conditions. The crotch assembly has been assembled with the gun and the gun has been coupled with the power supply. Testing of the first crotch assembly is in progress. Table lists the specifications of the electron gun. We have achieved a power level of about 3 kW with the first crotch assembled with the gun. This test was carried out to assess the radiation level around the test area. As suggested by health physics experts, further tests will be carried out after providing lead shielding around the gun and crotch assembly. simulate the required test conditions. The crotch assembly has been assembled with the gun and the gun has been coupled with the power supply. Testing of the first crotch assembly is in progress. Table 2 lists the specifications of the electron gun. We have achieved a power level of about 3 kW with the first crotch assembled with the gun. This test was carried out to assess the radiation level around the test area. As suggested by health physics experts, further tests will be carried out after providing lead shielding around the gun and crotch assembly.

**Table 2** Specifications of Electron Gun

Type of gun	Modified pierce gun
Gun rating	60 kV, 100 mA
Mode of heating	Direct
Material of filament	Thoriated tungsten of diameter 0.5 mm
Length of filament	54 mm
Beam size at the crotch	Rectangular beam size 150 mm x 5 mm
Perveance	0.02 $\mu$ P



*Fig.A.6.1 Simulated beam trajectories for the crotch gun using EGUN*



*Fig.A.6.2 Test setup for crotch assembly*

The design parameters were simulated and optimized using SLAC-EGUN code for electron gun. The beam size is optimized in the transverse plane. Fig. A.6.1 shows the simulated trajectories for the crotch gun and Fig. A.6.2 shows the test setup.

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