



A.11: Forming of 650 MHz SRF cavity half-cells

We are reporting the work done on the development of cavity half-cell forming for the 650 MHz, $\beta = 0.9$ SRF cavities.

This work is done under Indian Institutions and Fermilab Collaboration for development of super-conducting RF technology for future high intensity proton accelerators. Five cell, 650 MHz elliptical cavities, as shown in Fig. A.11.1, are proposed for beam accelerator in the medium energy range for such accelerators. The cavity half-cell geometry and dimensions being pursued are illustrated in Fig. A.11. 2 and Table A.12.1.

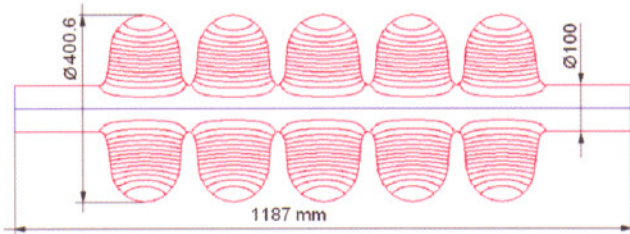


Fig. A.11.1: Layout of beta 0.9, 650 MHz cavity

The dies were designed for the forming and the manufacturing of prototype dies was done with indigenous aluminium alloy on a vertical turning lathe (see Fig. A.11.3) at RRCAT.

Inspection was done on CMM (Make: LK, UK) and the profile was found to be within 0.1 mm. The designed cavity thickness was 4 mm.

The cavity cell forming trials were done on a 120 Ton hydraulic press. The dies were aligned using a Teflon alignment block.

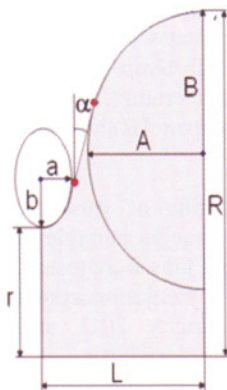


Fig. A.11.2: Half-cell geometry

Table A.11.1: Dimensional details of the half-cell geometry

Dimension mm	Cell type	
	Regular	End
R	50	50
R	200.3	200.3
L	103.8	107.0
A	82.5	82.5
B	84	84.5
a	18	20
b	38	39.5



Fig. A.11.3: 650 MHz forming dies

We have formed many half cells in aluminium and OFE copper, (see Fig. A.11.4) and gained important experimental data for fine tuning the die design. Niobium half-cell forming will be the next stage of this work.



Fig. A.11.4: Formed half cell-inside view with inspection template also in view.

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