(a) Bottom part of the cavity while polishing. (b) Top part of the cavity after polishing.

Figure 1: Polishing of the inner surface of cavity.

0.1 Manifacturing

Manifacturing of the rhodotron cavity has been ongoing, planned to be completed in the following months.

The cavity itself was manifactured as 5 main parts, using 5mm thick stainless steel sheet.

Elastic version of the 304, 304L was chosen to be the production material for ease of bending. These sheets were then pressed to achieve the shapes of the parts. Several flanges were then machined, including

- 4.5in EIA RF flange for RF input
- ISO100-KF vacuum connector flanges for vacuum pumps
- ISO-63 KF flange for probe insertion
- KF40 flanges for beam line vacuum gauges

After desired shapes were produced inside surface of the sheets were polished with 2000 grits. 304 stainless steel sheet bars of different sizes were then added by TIG welding to achieve pressure resistance.

Because the main body of the cavity was 5mm thick and 304L was used, deformations on cylinderical symmetry were encountered. This problem was solved by welding 6 10mm thick toroidal sheets between the coaxial cylinders, which would be removed after the heat treatment.

(a) Bottom part of the cavity with the exposed beam line in inner cylinder.

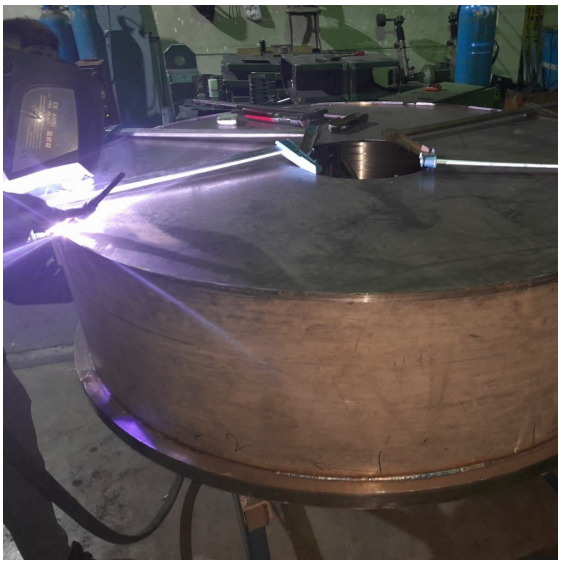
(b) Bottom part of the cavity with the beam line assembled.

Figure 2: Deformation prevention measure, 10 mm thick toroidal sheets.

Figure 3: Welded sheet bars.

Figure 4: Middle part of the cavity containing the beam line.

(a) Welding sheet bars.



(b) Welding toroidal sheets.

Figure 5: TIG welding.

Figure 6: Assembled cavity as the current stage.