

## **SIMPLE TECHNIQUE FOR FABRICATION OF TOROIDAL SURFACE WITH A BENDER AND CYLINDRICAL POLISHING MACHINE**

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### **ABSTRACT**

Toroidal surfaces are required as optical elements for the mirrors which are used as grazing incidence for focusing x-ray beams in synchrotron- radiation beam lines. Toroidal surface has two radii of curvature in perpendicular planes. We present a simple technique to fabricate a toroidal surface by designing a bender and using conventional cylindrical grinding/polishing machine. A bender is designed to hold a glass strip in a stressed condition to form a curved surface. Long radius is generated by the bender and short radius of curvature is generated by grinding using cast iron tools. Jigs and fixtures are designed to hold the bender and fix the tool on the cylindrical polishing machine (CPM). After generating the toroidal surface, it is polished by using pitch polishing tool. The profile was measured using a coordinate measuring machine.

**KEYWORDS:** Design of Bender, Fabrication of Synchrotron Mirror, Grinding, Overhanging Beam and Polishing