Stainless Steel UHV Chamber for SSRF Storage Ring

Jiang Dikui Chen Yonglin Li Wei Wu Dezhong Liu Yiyong

Shanghai Institute of Applied physic, Chinese Academy of Sciences

2019 Jia Luo Rd., Jia Ding District, Shanghai, CHINA

Stainless steel is adopted as the main material of the 3.5GeV electron storage ring UHV chamber for Shanghai Synchrotron Radiation Facility. The design of chambers is finished. The complex structure and high dimensional accuracy requirements are the features of these chambers. The finite element method is used to analyze the deformation under atmospheric pressure and the thermal situation under synchrotron radiation. The numerical control folding and the TIG welding are the main techniques in fabrication. The manufacture and test of three typical chamber prototypes were finished. Many problems on the structure design and fabrication technique were revealed and suitable solving methods were found. Based on the prototype manufacture, the necessary techniques for engineering construction have been prepared. One standard cell chamber has been successfully finished. The detail design, techniques and test results are presented in this paper.