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P2.149 Manufacturing Study of Lower Cryostat Thermal Shield Cylinder Component for ITER Tokamak

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This paper describes the manufacturing study of ITER Lower Cryostat Thermal Shield (LCTS) cylinder components, which were delivered to ITER site. Fabrication of LCTS cylinder had been proceeded according to the following processes: 1) plate cutting, 2) shell to flange welding, 3) cooling pipe welding, 4) flange final machining, 5) pre-assembly of 60 degree sector, 6) silver coating, 7) final acceptance test. All LCTS cylinder 20 degree sectors will be assembled at the ITER site by the flange joints, which are welded to the shells. Reliability of cooling pipe welding is checked by two inspection methods: endoscopy and leak test. Pre-assembly of three 20 degree sectors is one of the important step to ensure dimensional tolerance and its process is described in details. Dimensional inspection is performed for the pre-assembled 60 degree sector by a laser tracker. Flow test result is discussed for the cooling pipe routing of single sector of LCTS cylinder. Silver coating qualification is carried out using LCTS cylinder mock-up to check operating conditions of the electroplating and its coating jig design. Technical efforts to improve silver coating quality are also presented. Coating thickness and emissivity are measured for the test coupons and their results are summarized for typical LCTS cylinder sectors. Finally, packing design of LCTS cylinder for delivery is briefly described in this paper.

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