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Investigation on the development of a condenser for a reverse Stirling cycle based cryogenerator

ABSTRACT:

The function of the cryogenic condenser is to liquefy nitrogen gas or gases like oxygen, methane etc. It has been possible to develop successfully such a critical low temperature condenser from electrolytic grade copper bar having diameter 150mm and length 300 mm. Fabrication is very complicated as its contain 160 slots of 0.5 mm length and depth 56 mm which is maintained within 70 mm diameter. The condenser was exposed to liquid nitrogen for a considerable time and then this special type heat exchanger was tested with ultrasound by 100% back reflection method (+6dB), as per ASTM A-388, for detecting any surface defect as well to detect any air bubbles inside the core of material. The result reported is satisfactory.

The present paper describes the details of the condenser development including material selection and testing for a indigenous cryogenerator based on reverse stirling cycle.

Keywords: Reverse Stirling Cycle, condenser, cryogenerator.

Primary author: Dr SARKAR, Swapan Chandra (Centre for Rural & Cryogenic Technologies, Jadavpur University Kolkata-700032, India)

Co-authors: Mr ROY CHOWDHURY, Debajyoti (centre for rural & cryogenic technologies, Jadavpur university, India); Mr CHAKROBORTY, Nathu Ram (CRCT, JU, Kolkata-32, India)

Presenters: Mr ROY CHOWDHURY, Debajyoti (centre for rural & cryogenic technologies, Jadavpur university, India); Mr CHAKROBORTY, Nathu Ram (CRCT, JU, Kolkata-32, India); Dr SARKAR, Swapan Chandra (Centre for Rural & Cryogenic Technologies, Jadavpur University Kolkata-700032, India)

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