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SPACE PROPULSION SYMPOSIUM (C4)
Electric Propulsion (4)

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CHARACTERIZATION OF DISPENSER HOLLOW CATHODE EMITTER FOR ITS ACCEPTANCE IN HOLLOW CATHODE ASSEMBLY.

Abstract

The next generation, high power communication satellite of Indian Space Research Organization (ISRO) will be using Stationary Plasma Thruster (SPT) based Electrical Propulsion System (EPS) as backup and augmenting the chemical propulsion system. At Liquid Propulsion Systems Centre (LPSC) in ISRO, a high efficient SPT operating at about a power level of 1.0 kW is being developed. A 411 tungsten dispenser hollow cathode with 5A discharge current, was designed and developed for the same.This paper presents the various inward acceptance tests which shall be carried out on the dispenser emitter to use in the hollow cathode assembly to meet all the design criteria.The emitter acceptance tests shall include metallurgical properties ,emitting surface properties ,mechanical macro proprieties and functional tests such as emission current density etc.,.In-situ measurement of the emission current density and the workfuction of the emitter at various operating temperature also have been proposed under the functional characterization of the emitter .These tests will provide a data bank for acceptance of the emitter as a product by its own, before it is assembled with the hollow cathode assembly.Any micro /macro defects in the emitter arises during the process of the manufacturing of the emitter or during storing of the emitter in shelf shall be identified before assembly into the cathode by these acceptance tests.