

NCSX

Product Requirements List For the Vacuum Vessel System Heater Tapes

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NCSX-PRL-12-002 Vacuum Vessel System Heater Tapes

Record of Revisions

Revision	Date	ECP	Description of Change
Rev. 0	8/24/06		Initial Release
Rev 1	10/17/2007	058	Revised Section 2.3.3 to include the electrical isolation requirements.

1 SCOPE

This requirements list covers the procurement of flexible resistance heater tapes (Heaters) for the National Compact Stellarator Experiment (NCSX) Vacuum Vessel (VV), including the supply of all required labor and materials, machining, and fabrication. The Seller shall deliver the Heaters to the Princeton Plasma Physics Laboratory (Laboratory).

2 REQUIREMENTS

2.1 General

The Heaters are intended for baking of a vacuum vessel which is contained within a cryostat operated at liquid nitrogen temperatures (77K).

2.2 Recommended source

BriskHeat

BH Thermal Corp.

Columbus, OH

Briskheat product:

PPY491001

2.3 Characteristics

2.3.1 Magnetic Permeability

The Heater and connector components, with the exception of the hookup leads, shall not exceed 1.02.

2.3.2 Dimensions and Tolerances

The Heaters shall be nominally 1/2 inch wide by 0.19 compressed thickness, by 10 feet long

2.3.3 Heater Construction

The heater tapes shall be of a single ended construction terminated in a ceramic plug connector

The connector shall be a ceramic or polymer material capable of operating across the temperature range referenced under 2.5.3.

The over wrap insulation shall be of a braided fabric construction capable of >10.0 MOhms at a minimum of 600V.

2.3.4 Heater power requirements and output

The Heater wattage shall be 520 watts at 120 VAC, single phase.

2.4 Cleaning

The Heater surfaces shall be free of contaminants, include oils, greases, and lubricant residues resulting from handling and fabrication of the Heaters.

2.5 Operation Parameters

2.5.1 Media

Dry nitrogen gas.

2.5.2 Pressure

Atmospheric

2.5.3 Temperature

The heater tape shall be rated for 760 C maximum.

The leads and connector shall be capable of operation across a temperature range of 77 K to 350 C.

3 PREPARATION FOR DELIVERY

3.1 Labeling

Heaters shall be supplied with tags attached near the connector end marked with Manufacturer's name, address, unique lot/serial numbers, power requirements, and sizes and to provide positive identification.

3.2 Packing and Skidding

The Heater and its components shall be sealed and packaged to provide protection against contamination, deterioration and damage during shipment. The Seller shall contact the Laboratory ten days prior to shipment of the order to confirm shipping method and route.

3.3 Marking

Each shipment shall be marked with the name of the Seller, Laboratory Purchase Order Number, the component name, and gross weight.