

NCSX

**Product Requirements List
For the
Vacuum Vessel System Thermocouples**

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Controlled Document

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Record of Revisions

Revision	Date	ECP	Description of Change
Rev. 0	8/24/2006		Initial Release
Rev 1	10/17/2007	058	Update to clarify electrical isolation requirements in Sections 2.1 and 2.2.

1.0 Scope

This requirements list covers the procurement of thermocouples (TC) 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 TCs and constituent components to the Princeton Plasma Physics Laboratory (Laboratory).

2.0 Requirements

2.1 Item Definition

- a. There are 2 different lengths of TC, 3 feet and 10 feet.
- b. TC shall be Type E
- c. TC shall have an isolated, electrically floating junction (>1.5 MOhms at a minimum of 500V)
- d. TC shall be supplied with end connectors.

2.2 Characteristics

Recommended source:

Omega Engineering Inc.

Product:

Similar to type XCIB-E, Style 4 (Ungrounded)

2.2.1 TC Material

All TC cover braid shall be Inconel alloy 600.

All connector end fittings shall be subminiature ceramic construction, similar to Omega type SHX.

2.2.2 Permeability

Permeability of the TC and constituent component shall not exceed 1.02 as measured with a Severn gauge.

2.2.3 TC Construction

The TC shall be covered by a single layer braided jacket and fitted with a junction end fitting with holes which permit attachment with # 6 screws.

2.3 Operation Parameters

2.3.1 Media

Dry nitrogen gas.

2.3.2 Pressure

Ambient

2.3.3 Temperature

Junction operation from 20 C to 350 C

Leads and connectors 77K to 350 C.

3.0 Preparation for Delivery

Labeling

TCs shall be provided with tags at the connector end, marked with Manufacturer's name, address, unique serial numbers, and TC type to provide positive identification.

Packing and Skidding

All components shall be sealed, packaged, and skidded to provide protection against contamination, deterioration and damage during shipment. A plan shall be provided to the Laboratory prior to shipment which includes a description of methods to be used to preserve, package, skid, and identify equipment. The Seller shall contact the Laboratory ten days prior to shipment of the machine to confirm shipping method and route.

Marking

Each shipping skid shall be marked with the name of the Seller, Laboratory Purchase Order Number, the component name, and gross weight. Boxes containing loose parts, attachments, and accessories shall be marked identifying the assembly to which they belong, and where possible, boxes are to be secured to the skid of the unit.