

# PS-490

## Process Specification – Part Serialization Requirements

### 65678 PPPL NCSX Vacuum Vessel Sub Assembly

#### 1. PURPOSE

This specification establishes the procedure to ensure all NCSX SE120-002 Vacuum Vessel Sub Assembly details and components are identified and serialized in a manner to provide absolute traceability and ensure proper field assembly of loose components / sub-assemblies as required by PPPL product specification NCSX-CSPEC-121-02

#### 2. SCOPE

This specification defines the minimum identification / serialization requirements for all detail components, assemblies, and sub-assemblies when required by MTM MIT 65678.

#### 3. DEFINITIONS

PPPL – Princeton Plasma Physics Laboratory  
MTM – Major Tool & Machine, Inc.  
NCSX – National Compact Stellarator Experiment  
VVSA - Vacuum Vessel Sub Assembly  
MIT – Manufacturing, Inspection, and Test plan (MTM Mfg. Routing)  
IDC – MTM Inspection Data Checklist system  
QAP – MTM Quality Assurance Planning system  
NCR – Non-Conformance Report

#### 4. REFERENCE DOCUMENTS

QA-SOP-01 Non-Conformance Control  
MTM Mfg. Routing / Inspection Plan / Quality Assurance Plan 65678  
PS483 – Cleanliness Control

#### 5. SERIALIZATION REQUIREMENTS

- 5.1. All beginning and in-process part identification / traceability will be maintained via MTM's Quality System.
- 5.2. At the point of completion of each major component and/or sub-assembly, the MIT will require additional part identification. The component and/or assembly will be permanently serialized to provide an absolute trace to the specific MIT segment from which it evolved. The serial number will provide an exact reference to the work order number, manufacturing sub identification number, operation sequence number.
- 5.3. The serial number for each component / sub-assembly will be provided in the applicable MIT operation instructions (via QAP record).
- 5.4. Specific marking location / orientation direction will be provided (e.g. drawing, sketch, or descriptive text).
- 5.5. Marking method and font size / depth (where applicable) will be included within the operation instruction.
- 5.6. Once established, all following MIT required documentation will include reference to the applicable component serial number.
- 5.7. Prior to removing serialized Port Extension Sub-Assemblies, the applicable serial number will be transferred to the vessel wall using (Inconel 625) tags. The tags will be metal stamped with the serial number and tack welded to the outer vessel surface near the port opening.

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#### **6. QUALITY ASSURANCE / DOCUMENTATION**

- 6.1. The MTM MIT will specify all in-process and final inspection documentation requirements. All quality documentation will be compiled electronically utilizing MTM's integrated IDC and QAP systems
  - 6.1.1. At a minimum, the MTM MIT will require documentation for all contractual features and/or physical requirements (e.g. final component features / final material condition).
  - 6.1.2. To ensure compliance is maintained throughout the manufacturing process, interim / additional documentation requirements will be provided within the associated MTM IDC, and QAP system
  - 6.1.3. When an IDC record, or QAP document is completed, reference to the specific area being tested will be clearly discernable. The record will include the following information (as applicable):
    - MTM Work Order Number
    - Part Identification Number
    - Part Description
    - Part Serial Number
    - Date of Inspection
    - Gage Serial Number
    - Reference Standard Serial Number
    - Inspector Signature / Acknowledgement, Initials, or Stamp
  - 6.1.4. For all MIT operation sequences that include this document as a task requisite, but do not specify physical inspection records or documentation, the electronic completion ("clocking out") of each sequential manufacturing operation within the MTM (Visual Manufacturing®) routing confirms compliance to the applicable requirements. The MTM employee completing the electronic transaction (which completes and closes the operation sequence) personally acknowledges completeness and compliance to the routing instructions.
- 6.2. All un-authorized exceptions / out of tolerance conditions according to MTM MIT will be documented within the MTM Non-Conformance system per QA-SOP-01.