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Procedure 03-8083-P11

CMM Dimensions & Tolerance Verification



CMM DIMENSIONS & TOLERANCE VERIFICATION

1.0 Purpose:

To establish the standard method of inspection using a CMM for components pertaining to the Prototype Vacuum Vessel Segment (PVVS) for the National Compact Stellarator Experiment.

2.0 Scope:

Individual Die Ribs, Upper and Lower Die Assemblies, Die Rib Assemblies c/w Scab Plate and formed PVVS Segments shall be inspected and compared to the Engineering model for deviation. This procedure is specific to the Prototype Vacuum Vessel Segment for the National Compact Stellarator Experiment only.

3.0 References:

- National Compact Stellarator Experiment (NCSX) Specification NCSX-CSPEC-121-01-01.
- Operations Manual – Faro Gage.

4.0 Equipment:

- Portable CMM (Faro Gage).

5.0 Procedure:

5.1 Die Ribs:

- 5.1.1 Clean all Die Rib surfaces from metal filings, chips, dirt or any other foreign material.
- 5.1.2 Place Die Rib on granite table face down.
- 5.1.3 Establish CMM reference planes.
- 5.1.4 Trace profile of Rib with CMM probe to compare actual profile to Engineering model.
- 5.1.5 Profile shall not deviate from model more than 0.125”.
- 5.1.6 Print inspection report from CMM software.
- 5.1.7 Report any deviated results to Customer.

5.2 Upper and Lower Die Assemblies:

- 5.2.1 Clean all Die Assembly surfaces from metal filings, chips, dirt or any other foreign material.
- 5.2.2 Establish CMM reference planes.
- 5.2.3 Trace the profile of an outer Die Rib. Trace the next Die Rib in sequence and continue until all Die Ribs have been completed.
- 5.2.4 Utilizing the CMM software and Engineering model, compare the profiles.
- 5.2.5 Profile shall not deviate from model more than 0.125”.
- 5.2.6 Print inspection report from CMM software.
- 5.2.7 Report any deviated results to Customer.



5.3 Die Rib Assemblies c/w Scab Plate:

- 5.3.1 Clean the entire Scab Plate surface from metal filings, chips, dirt or any other foreign material.
- 5.3.2 Establish CMM reference planes.
- 5.3.3 Create a 6" x 6" grid over the entire surface.
- 5.3.4 Trace the grid lines to allow the CMM software to generate a profile.
- 5.3.5 Utilizing the CMM software and Engineering model, compare the profiles.
- 5.3.6 Profile shall not deviate from model more than 0.125".
- 5.3.7 Print inspection report from CMM software.
- 5.3.8 Report any deviated results to Customer.

5.4 Formed PVVS Segments:

- 5.4.1 Clean the entire PVVS Segment surface from metal filings, chips, dirt or any other foreign material.
- 5.4.2 Establish CMM reference planes.
- 5.4.3 Create a 6" x 6" grid over the entire surface.
- 5.4.4 Trace the grid lines to allow the CMM software to generate a profile.
- 5.4.5 Utilizing the CMM software and Engineering model, compare the profiles.
- 5.4.6 Profile shall not deviate from model more than 0.125".
- 5.4.7 Print inspection report from CMM software.
- 5.4.8 Repeat steps 5.4.1 – 5.4.7 for each PVVS Segment.
- 5.4.9 Report any deviated results to Customer.