Procedure 03-8083-P07

Internal Surface Finishing

REVISION RECORD

Revision	Date of Issue	Description of Change	Prepared by	Reviewed by	Approved by
0	01/15/03	New	Elaine Steele	Tom Gilmore	Dave Rioux
1	01/12/04	Modified to address Rohwedder's comments	Gary Armstrong	Tom Gilmore	Dave Rioux
2	01/26/04	Modified to address Rohwedder's comments	Gary Armstrong	Tom Gilmore	Dave Rioux
3	03/03/04	Modified to address Rohwedder's comments	Gary Armstrong	Tom Gilmore	Dave Rioux

Purpose:

To establish a method for creating a uniform finish on interior for the Prototype Vacuum Vessel Segment for the National Compact Stellarator Experiment.

Scope:

The interior surface, including weld beads, shall be free from scratches, tooling marks and other surface imperfections resulting from fabrication.

References:

- National Compact Stellarator Experiment (NCSX) Specification NCSX-CSPEC-121-01-01.
- ASME B46.1.
- ASTM B-443.

Equipment:

- All equipment shall be nonferrous ceramics or nonmagnetic stainless steel and must be new or previously used on Inconel or austenitic stainless steel.

"Time Saver" metal polisher
Orbital sander
Red 'Scotch Brite' pads
60, 80, 100 and 120-grit sandpaper
Methyl hydrate
'A-Tork' wipes
Face visor
Particle/dust mask
White, one-sided sticky plastic
Yellow sealing tape
Pocket-Surf Electronic Surface Gauge

Procedure:

Flat Plate:

1. Ensure to wear a face visor and particle/dust mask at all times while finishing to protect against contact with eyes and mouth.
2. Feed flat Inconel plate through "Time Saver", polishing one (1) side only.
3. Visually inspect surface for any remaining scratches. If any exist repeat Step 2.
4. Use "A-Tork" wipes with methyl hydrate to wipe clean area for surface roughness inspection.
5. Test for roughness using the Pocket-Surf, as per Pocket-Surf Operator's Manual, to ensure finish is 32 RA or better.
6. Inspect surface for pitting that can not exceed the limitations set forth in ASTM B-443 (notify Quality Assurance for evaluation of any signs of pitting).
7. If surface is acceptable, proceed to Step 8. If surface is unacceptable, return to Step 2.
8. Cover surface with tape and white plastic to protect from exposure.

Formed Vessel:

1. Use Orbital Sander and/or red 'Scotch Brite' pads on nonconforming areas.
2. Use "A-Tork" wipes with methyl hydrate to wipe clean area for surface roughness inspection.
3. Test for roughness using the Pocket-Surf, as per Pocket-Surf Operator's Manual, to ensure finish is 32 RA or better.
4. Inspect surface for pitting that can not exceed the limitations set forth in ASTM B-443 (notify Quality Assurance for evaluation of any signs of pitting).
5. If surface is acceptable, proceed to Step 6. If surface is unacceptable, return to Step 1.
6. Cover surface with tape and white plastic to protect from exposure.

Welded Joints:

1. Use Orbital Sander and/or red 'Scotch Brite' pads to polish welded joints.
2. Use "A-Tork" wipes with methyl hydrate to wipe clean area for surface roughness inspection.
3. Test for roughness using the Pocket-Surf, as per Pocket-Surf Operator's Manual, to ensure finish is 32 RA or better.
4. If surface is acceptable, proceed to Step 5. If surface is unacceptable, return to Step 1.
5. Cover surface with tape and white plastic to protect from exposure.