

***National Compact Stellarator Experiment (NCSX) SubC# S005243-F
Vacuum Vessel Sub Assembly Production***

Weekly Status Report 05/04/05 thru 05/11/05

Project Management

- Held meetings to review status and manufacturing plans.

Process Engineering

- Working on 120 deg fixtures (lot 12) and Port Ext Fixtures (lot 13).
- Technical Mfg. / QA support
- Final recommendations were incorporated into PS486 (Rev E) and PS493 (Rev B). The documents were submitted on April 29th.
- The Process Outline and VM Layout for Lots 1,2 & 3 was submitted for Approval on May 6th.

VVSA Fabrication

- All 20 dies and 10 inspection gages are complete.
- Continuing with 60 deg fixture fabrication.
- Development panel #4 at the press.
- Development panel #5 pressed then annealed, pressed again, back from second anneal will go through final press after panel #4.
- The production panel material arrived without the “skin” removed; the resolution for this has required some testing of samples.
-“Skin” material arrived annealed and pickled with a better than 125 finish that looks really good but when we try to polish the panel there’s obviously a tough layer that needs to be removed to achieve a 32 finish.

Test Samples

Rome Metals (time saver method)

Process would remove skin by sanding off the layer by using a vacuum chuck precision grinder. This would be ok if we had more stock but the stock thickness doesn’t allow for both sides being ground and their process doesn’t work for what we need with only grinding one side. This is no longer an option.

Chem-Mill

Four Test samples (raw material/formed cut-offs) sent these to a Chem-Mill vendor to remove .004, .006, .008 and .010 off the surface. Now that they are back we want to see what thickness would be the optimum amount to remove allowing for an easier polishing process. This testing will start tomorrow.

Anneal Effects

A sample piece (raw/formed cut-off) approximately 6 x 24 was polished on one half removing the “skin”. The piece was sand blasted and hardness tested. The piece went through the anneal process with panel five. Now that the piece is back it was blasted again. Tomorrow one half of the piece will be sanded again. The sanding will cross the raw and polished area (second time) leaving the other half raw and polished (one time). This will leave four sample areas. The goal here is to understand if the polishing prior to

pressing, blasting and annealing may be of little benefit if the annealing process creates another "skin" layer. After the second polish the hardness will be tested in all four sample areas.

Pickling vs Chem-Milling

Chem-Mill process would be a better process because pickling is used to remove the scale which is more like a "crusty" layer. The Chem-Mill process will remove material in .002 increments and those doing the pickling process are more geared toward removing impurities from the surface not removing material in increments. So pickling is no longer an option.

In-House Skin Removal

We removed the skin and polished development panel #1 after it was pressed, blasted, annealed, pressed and blasted. This took a couple of shifts with the majority of time spent removing the "skin". This process will be used if the others do not represent the best option.

DCMA

- Was in on Tuesday and looked at the data on a completed Die.
 - Reviewed the current magnetic permeability non-conformances.
 - Overview of latest MIT for source hold / customer notification provisions.

Quality Control, Drawings & Pictures

- Updated Magnetic Permeability NCs will be sent in this week. All CF flanges are in now and are being inspected.
- Picture - 60 Deg fixture plates (at inspection, then profile milling and final assembly)
- Picture - 60 Deg fixture legs (complete).

