

Future Synthesis and Annealing Program in CMPMSD



- Manufacturer: American Isostatic Presses, Inc
- Gas pressure to 100,000 psi, up to 20% Oxygen
- Installation: Chemistry, Site specifically configured for HIP
- Acceptance testing at BNL ongoing

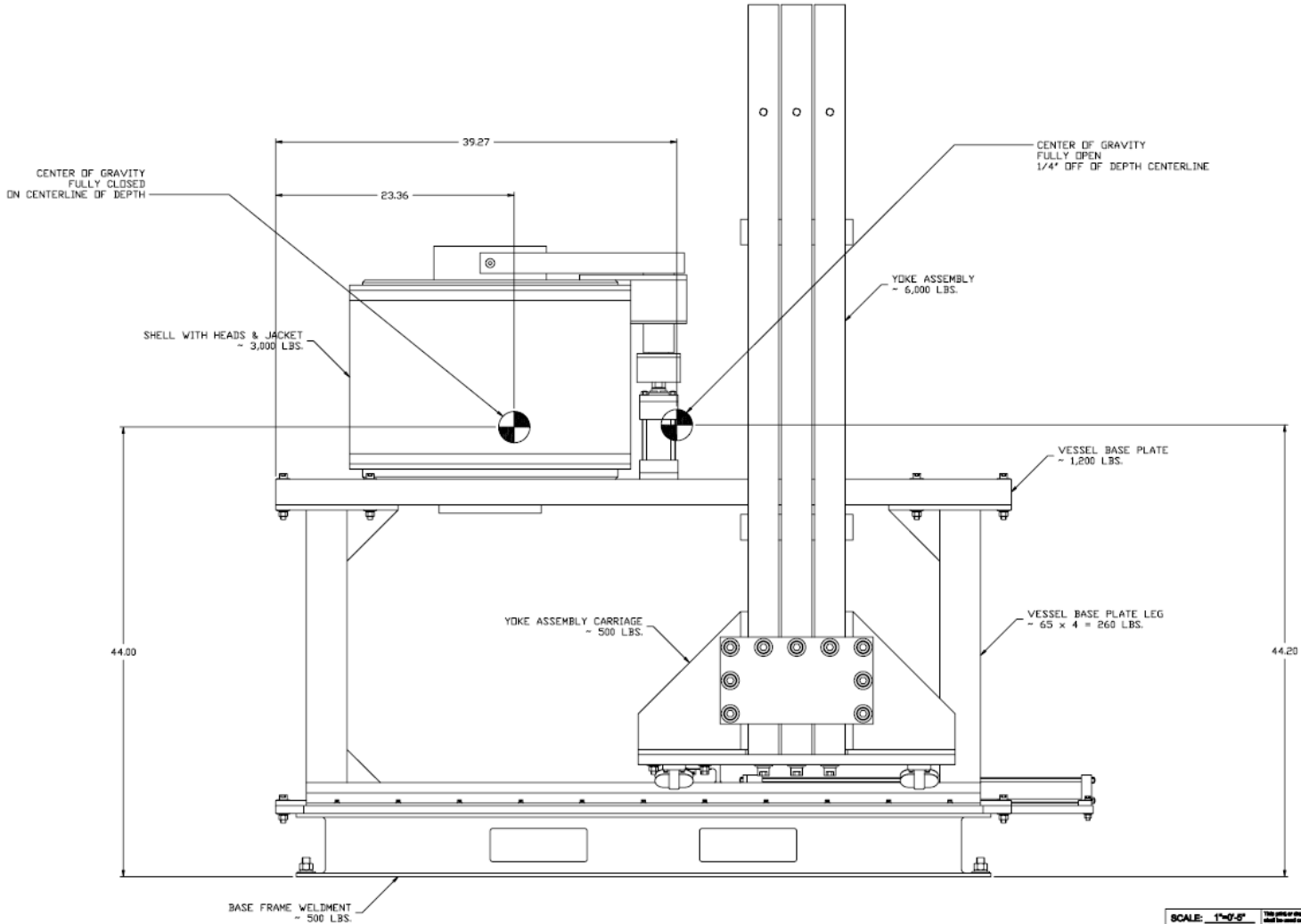
Motivations for Hot Isostatic Press

- Oxygen Annealing for High Temperature Superconductors and for High Pressure Single Crystal Growth.
- Is High T_c primarily a 2D Phenomena occurring in CuO Planes?
- Can T_c be increased by Oxygen Annealing?
- Stored Energy Required ASME, Boiler and Pressure Vessel Code, Section VIII, Division 3

Overview of AIP Hot Isostatic Press

▪ Design Pressure	110,000 psi at 400° F
▪ Operating Pressure	100,000 psi at 400° F
▪ Hydrotest Pressure	137,500-144,375 psi
▪ Furnace	1200° C
▪ Oxygen Annealing	to 20% Oxygen
▪ Vessel Temp Range	40 - 400° F
▪ Inside Diameter	4.998"/5.000"
▪ Inside Length	16" Nominal
▪ Internal Volume	0.18 cubic feet
▪ Vessel Weight	3000 lbs
▪ Yoke Weight	6,000 lbs
▪ Stored Energy	2.5 Mega Joules ~ 1 stick of dynamite

REVISIONS			
REV	DESCRIPTION	DATE	BY
1	ADDED CENTERS OF GRAVITY	9/16/2008	DGT



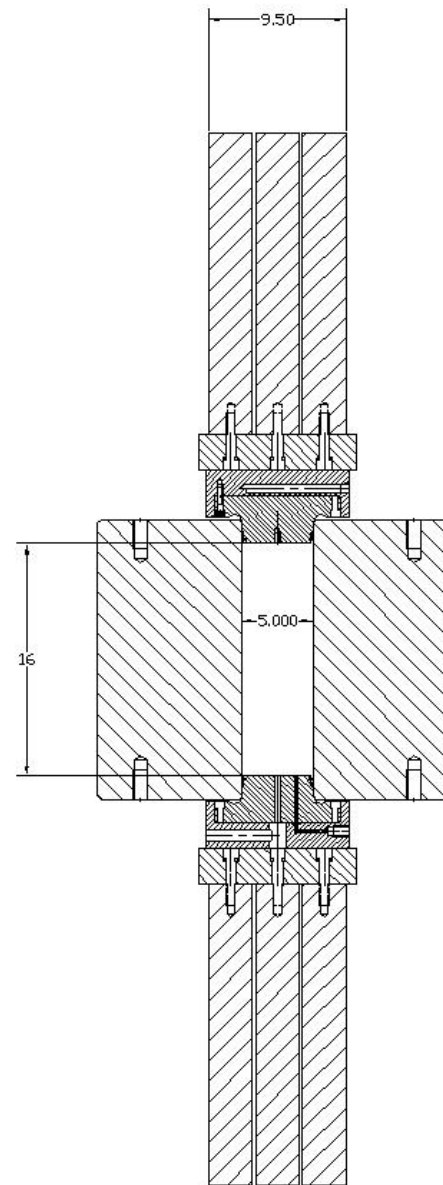
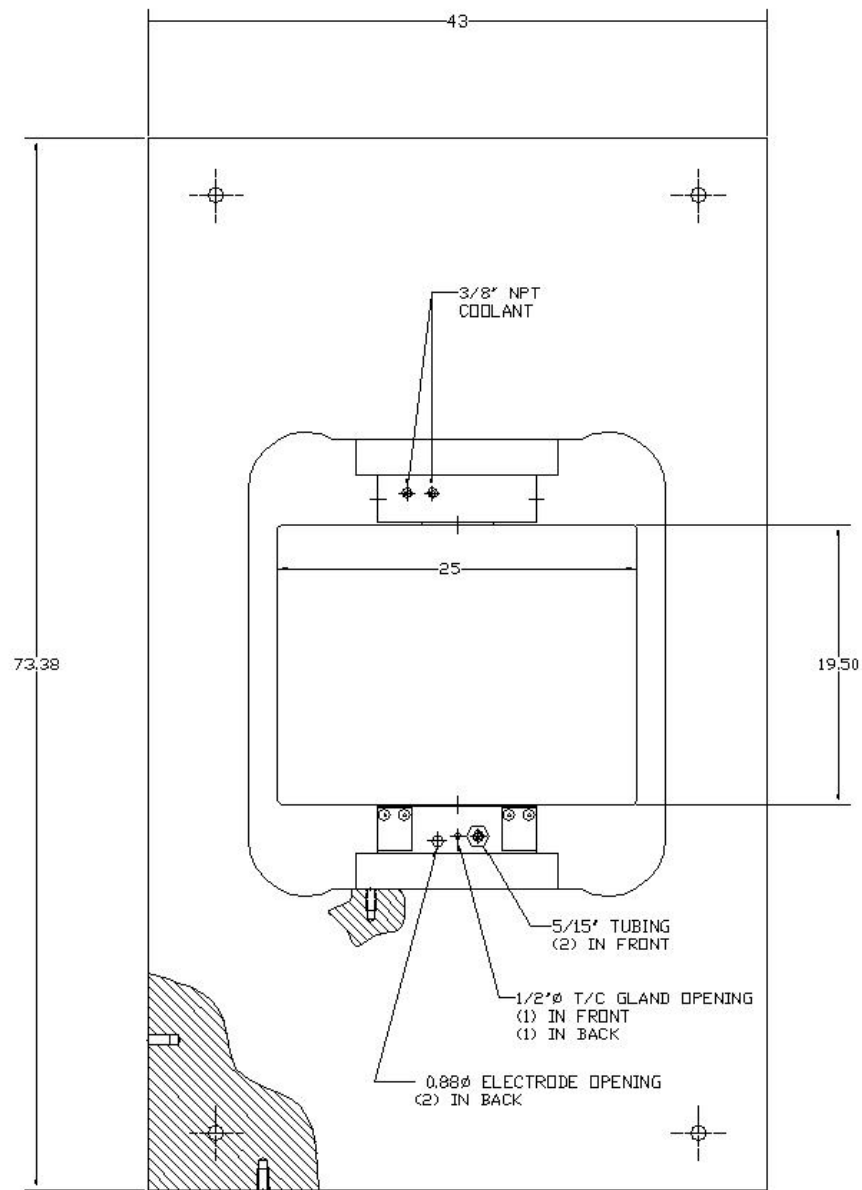
1176H - WEIGHTS + CENTERS OF GRAVITY

SCALE: 1"=1'-0"
 STANDARD TOLERANCES UNLESS OTHERWISE SPECIFIED
 FINANCIAL: ± .100
 2.000 DECIMALS: ± .005
 3.000 DECIMALS: ± .002
 4.000 DECIMALS: ± .001
 5.000 DECIMALS: ± .0005
 6.000 DECIMALS: ± .0002

AIP
 AMERICAN ISOSTATIC PASSES, INC.
 1205 SOUTH COLUMBUS AIRPORT ROAD
 COLUMBUS, OHIO 43207-4304 USA

1176H - WEIGHTS + CENTER OF GRAVITY
 60" INCOEL FURNACE
 BROOKHAVEN NATIONAL LABS

DATE: 8/7/09 DRN. BY: JAM. SIZE: D
 DWG. NO.: 1176H - WEIGHTS-CG REV.: 1

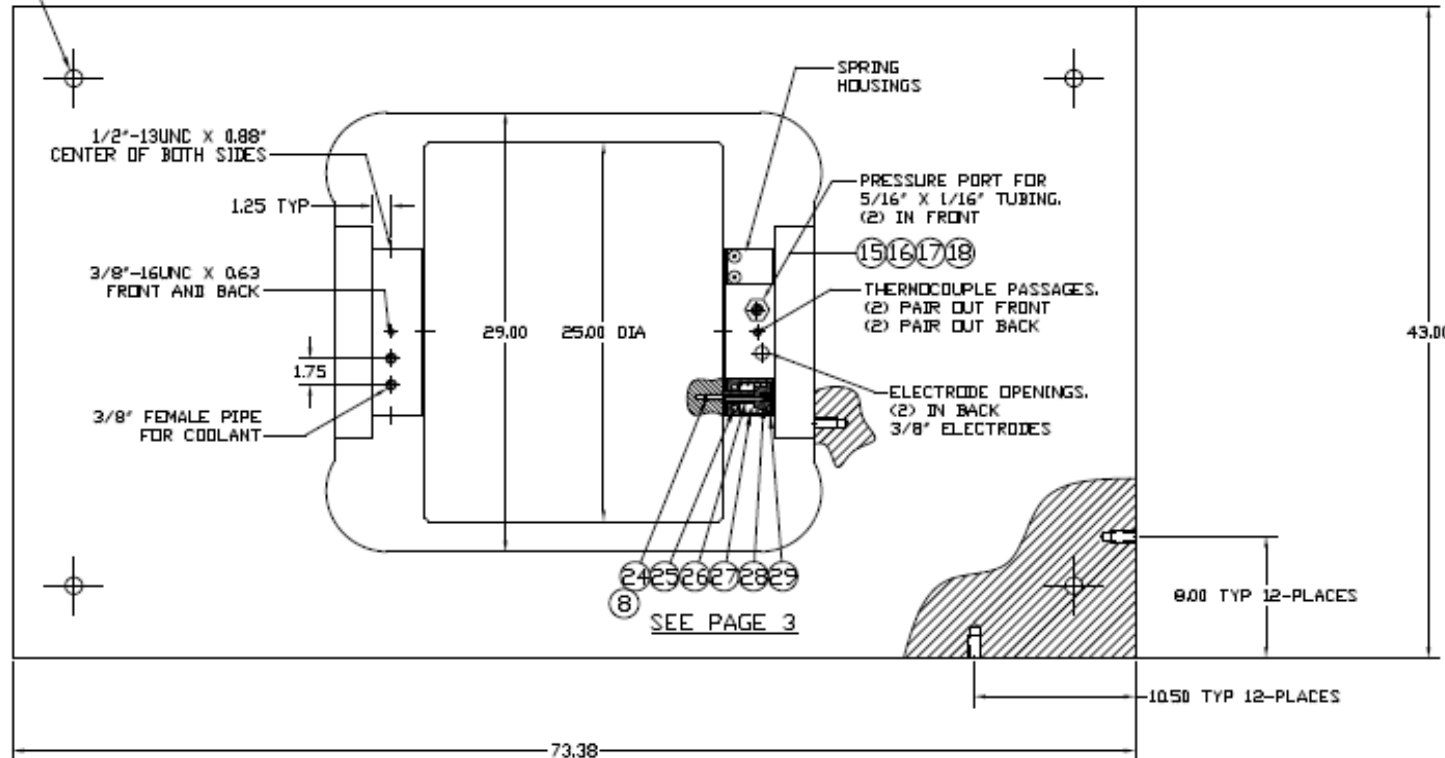


REVISIONS

REV	DESCRIPTION	DATE	DRAWN
①	SWITCH DESIGN + DP PRESS	2/26/2009	DGT

ASME CODE COMPLIANCE
REQUIRED

②③
②③
②③
WASHERS MAY BE GRIND TO
CORRECT FOR PLATE THICKNESS.
SNUG TIGHTNESS IS SUFFICIENT.



FRONT
VIEW

TOLERANCES	related drawings:	scale	size
<p>ANGLES 1 = 30°</p> <p>UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS ARE TO BE TO SHARP EDGES</p>	<p>AMERICAN ISOSTATIC PRESSES, INC.</p>	1/8 SCALE	VESSEL, VH3100-05-16CY PROJECT 1176H
DATE 9/17/2008 DRAWN DGT CHECKED DGT APPROVED DGT	DATE 9/17/2008 DRAWN DGT CHECKED DGT APPROVED DGT	AMERICAN ISOSTATIC PRESSES, INC. 1205 S. COLUMBUS AIRPORT RD. COLUMBUS, OHIO 43207	PAGE 2 OF 3 9005-001 1

NOTES:

1. PROTECT THIS VESSEL WITH A PRESSURE RELIEVING DEVICE SET TO OPERATE AT A PRESSURE NOT GREATER THAN THE DESIGN PRESSURE AT OPERATING TEMPERATURE AND WITH A CAPACITY (CONSIDERING THE EFFECT OF DILEY AND VENT POPPING) SUFFICIENT TO LIMIT THE MAXIMUM OVERPRESSURE TO NOT MORE THAN 30% ABOVE THE DESIGN PRESSURE. CONSULT THE ASME CODE, PED AND/OR LOCAL AUTHORIZED DISCRETOR FOR DETAILED REQUIREMENTS.

2. THIS VESSEL IS DESIGNED FOR AUTOMATIC OPENING. THE INSTALLER MUST PROVIDE LOCKOUTS SO THAT THE VESSEL CAN NOT BE OPENED UNLESS THE VESSEL IS FULLY VENTED AND CAN NOT BE PRESSURIZED UNLESS FULLY CLOSED. THE VESSEL SHALL BE PROVIDED WITH A PRESSURE INDICATING DEVICE VISIBLE FROM THE OPERATING STATION.

3. TO BE SAFE, PRESSURE VESSELS MUST BE EXAMINED ON A REGULAR SCHEDULE BASED ON THE PREDICTED LIFE AND ACTUAL OPERATIONAL HISTORY. REEVALUATE THE SCHEDULE AT ANY TIME THAT REPAIRS OR ACCELERATED WEAR ARE NOTED.

VESSEL SPECIFICATIONS

MODEL	VH3100-05-16CY
DESIGN PRESSURE	110,000 PSI AT 400° F
OPERATING PRESSURE	100,000 PSI AT 400° F
DESIGN CODE	SECTION VIII, DIVISION 2
HIGHEST PRESSURE	132,000 PSI MAXIMUM AT AMBIENT
	- 144,000 PSI MAXIMUM AT AMBIENT WITHOUT RECALCULATION
DESIGN VOLUME	OUR CUL ET. APPROX. TOTAL
VESSEL WEIGHT	2,000 LBS APPROXIMATE EMPTY
	2,000 LBS APPROXIMATE FULL
TIP HEAD	120 LBS APPROXIMATE
WEEKS	6,000 LBS APPROXIMATE TOTAL

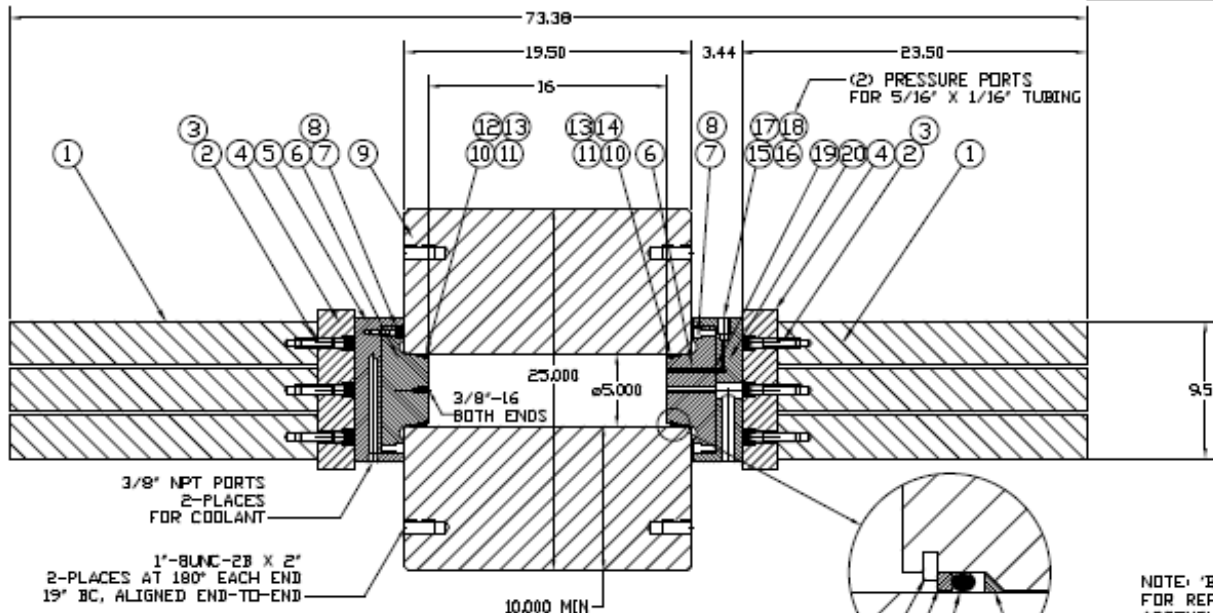
REVISIONS

REV	DESCRIPTION	DATE	DRAWN
①	SWITCH DESIGN + DP PRESS	2/26/2009	DGT

ASME CODE COMPLIANCE REQUIRED

ASME CODE COMPLIANCE REQUIRED

TOP END



FRONT

BOTTOM END

BACK

NOTE: 'BACK' AND 'FRONT' ARE FOR REFERENCE ONLY. HEAD ASSEMBLIES MAY POINT EITHER DIRECTION

CODE STAMPING:

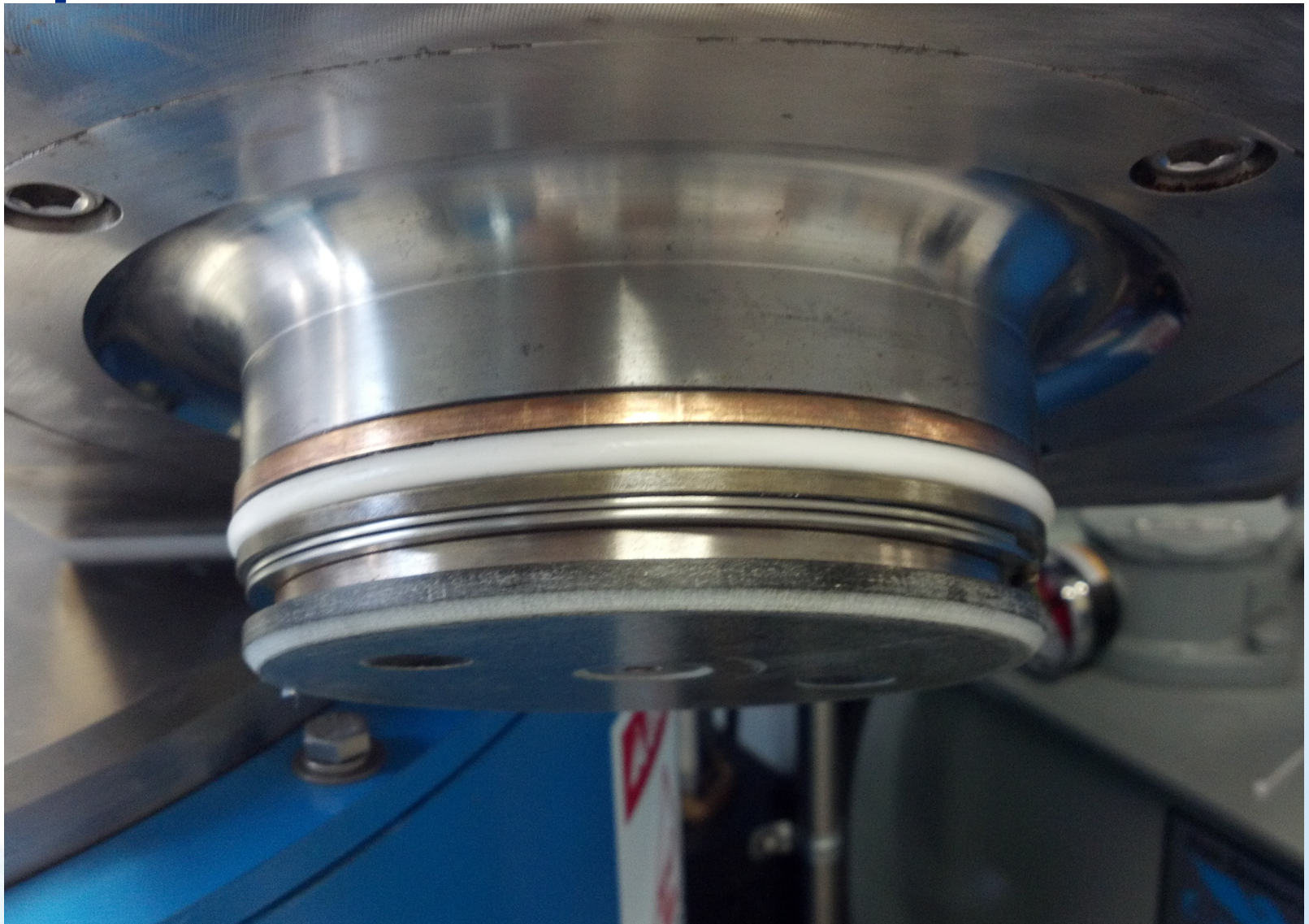
(*NB* STAMP + SERIAL NUMBER)
 CERTIFIED BY AIP
 110,000 PSI AT 400 DEG F
 NDMT +40 DEG F
 MFG SER 1176H-01
 YR 2008
 PS



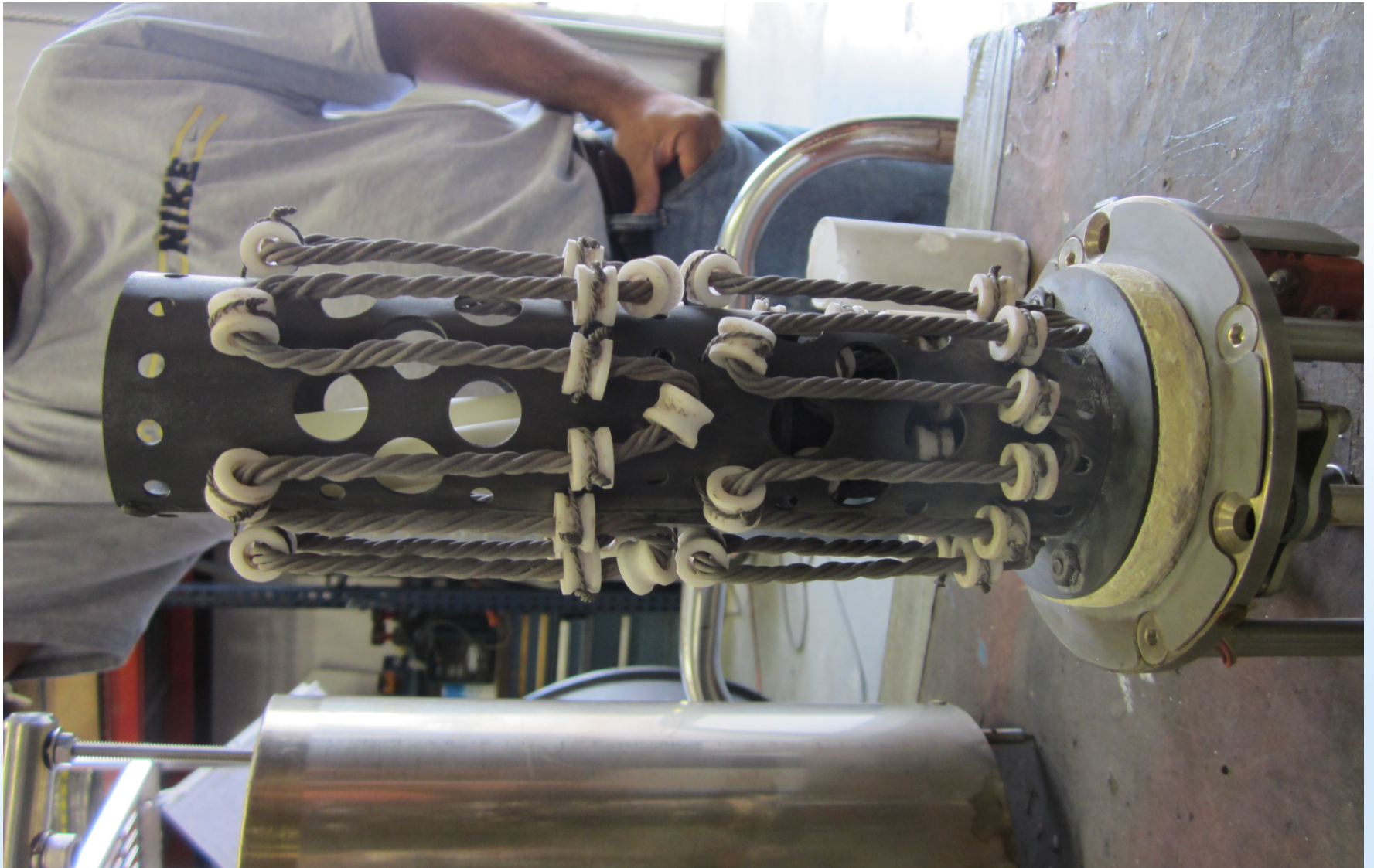
TOLERANCES	related drawings:	scale 1/8 SCALE	no. VESSEL, VH3100-05-16CY
		date 9/17/2008	proj PROJECT 1176H
		draw DGT	sheet PAGE 1 OF 3
		designed DGT	9005-001
		checked	1
		approved	



Top Platen



Furnace



Bottom Platen, Electrodes, TC's

