Workorder	Part ID	Qty	Drawing ID / Rev	Engineer
64880/1.0		1	SE121-003P / --	BLUE/DOUG MCCORKLE

NSCX PROTOTYPE VACUUM VESSEL SEGMENT
SCOPE OF WORK: NCSX-SOW-121-01-02
SPECIFICATION: NCSX-CSPEC-121-01-01

Sub ID	Part ID	Qty	Drawing ID / Rev
0	NSCX PROTOTYPE VACUUM VESSEL SEGMENT SCOPE OF WORK: N	1	SE121-003P / --

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 0 / Seq: 10	700-BLUE TEAM, ENGINEERING	1.00	1.00	1.00	SE121 / A
(F)	SOW 3.2.1 TASK 2				
	MIT/QA PLANS FOR PVVS FOR VVSA				

IDC Count : 0 Dwg Count: 5 Pgm Count: 0 QAP Count: 0 NDT Count: 0 WPS Count: 0

Piece #	Part ID	Qty	Drawing ID / Rev	Vendor	Dimensions
10	INCONEL625_062_GTAW-WELD WIRE/GTAW, .062 DIA	15.0		4434	
	Vendor Part ID: INCONEL625_062_GTAW				
	Mfg Part ID: INCONEL 625				
(F)	ASME/AWS SFA 5.14, ERNiCrCoMo-1				

INCONEL 625 WELD WIRE, CUT LENGTH
0.062" DIA. X 36" LONG.
SUPPLIED IN 10 LB TUBES.

EACH PIECE OF CUT LENGTH WIRE MUST BE IDENTIFIED AT MINIMUM WITH THE AWS WELD WIRE CLASS.

MATERIAL CERTIFICATION REQ'D WITH SHIPMENT

Material Certification: TRACE ID: 38561
Part Number: SE121-001P

QAP Count: 2

Piece #	Part ID	Qty	Drawing ID / Rev	Vendor	Dimensions
30	INCONEL625_093_GTAW-WELD WIRE/GTAW, .093 DIA	25.0		4434	
	Vendor Part ID: INCONEL625_093_GTAW				
	Mfg Part ID: INCONEL 625				
(F)	ASME/AWS SFA 5.14, ERNiCrCoMo-1				

INCONEL 625 WELD WIRE, CUT LENGTH
0.093" DIA. X 36" LONG.
SUPPLIED IN 10 LB TUBES.

Workorder	Part ID	Qty	Drawing ID / Rev	Engineer
64880/1.0		1	SE121-003P / --	BLUE/DOUG MCCORKLE

EACH PIECE OF CUT LENGTH WIRE MUST BE IDENTIFIED AT MINIMUM WITH THE AWS WELD WIRE CLASS.

MATERIAL CERTIFICATION REQ'D WITH SHIPMENT

Material Certification: Trace ID: 41171
Material Certification:
Part Number: SE121-001P

QAP Count: 3

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 0 / Seq: 11	700-BLUE TEAM, ENGINEERING	1.00	1.00	1.00	
(F)	SOW 3.1 TASK 1				
	3.1.1 METHODS FOR FABRICATING VVSA				
	3.1.2 DESIGN CHANGES				
	3.1.3 PRELIMINARY MIT/AQ FOR VVSA				
	3.1.4 BUDGETARY COST/SCHEDULE FOR VVSA				

IDC Count : 0 Dwg Count: 0 Pgm Count: 0 QAP Count: 0 NDT Count: 0 WPS Count: 0

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 0 / Seq: 12	700-BLUE TEAM, ENGINEERING	1.00	1.00	1.00	
(F)	SOW 3.3.1 & SOW 3.3.2 Task 8				
	3.3.1 FINAL MIT/QA FOR VVSA				
	3.3.2 FINAL COST/SCHEDULE FOR VVSA				

IDC Count : 0 Dwg Count: 0 Pgm Count: 0 QAP Count: 0 NDT Count: 0 WPS Count: 0

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 0 / Seq: 13	700-BLUE TEAM, ENGINEERING	1.00	1.00	1.00	
(F)	ENGINEERING, PLANNING & PROJECT MGT				
	TASK 9				

FOLLOWING IS A LIST STANDARD OPERATING PROCEDURES AND WORK INSTRUCTIONS THAT APPLY IN PART OR IN WHOLE TO THE EXECUTION OF THIS WORK ORDER.
ENGINEERING OPERATIONS WILL BE PERFORMED PER THE FOLLOWING STANDARD OPERATING PROCEDURES: ENGSOP01 - Mfg. Quality Plans; ENGSOP02 - Specification-Standard Control; ENGSOP03 - Internal Drawing Generation; ENGSOP04 - Drawing Control.
CAD / CAM OPERATIONS WILL BE PERFORMED PER THE FOLLOWING STANDARD OPERATING PROCEDURE: CADSOP01 - CNC Program Control;
MANUFACTURING OPERATIONS WILL BE PERFORMED PER THE FOLLOWING STANDARD OPERATING PROCEDURES: MFGSOP01 - Project Manufacturing; MFGSOP02 - Material Handling and Storage; MTLSOP01 - Material Storage; PCSOP01 - Production Control; QASOP01 - Nonconformance Control; QASOP03 - Traceability-Identification
QUALITY ASSURANCE AND INSPECTION OPERATIONS WILL BE PERFORMED PER THE FOLLOWING STANDARD OPERATING PROCEDURES: QASOP01 - Nonconformance Control; QASOP05 - Calibration

Workorder	Part ID	Qty	Drawing ID / Rev	Engineer
64880/1.0		1	SE121-003P / --	BLUE/DOUG MCCORKLE

RECEIVING INSPECTION OPERATIONS WILL BE PERFORMED PER THE FOLLOWING STANDARD OPERATING PROCEDURE: QASOP04 - Receiving Inspection
IN-PROCESS INSPECTION OPERATIONS WILL BE PERFORMED PER THE FOLLOWING STANDARD OPERATING PROCEDURE: QASOP02 - In Process Inspection
SHIPPING OPERATIONS WILL BE PERFORMED PER THE FOLLOWING STANDARD OPERATING PROCEDURE: SHSOP01 - Shipping-Packaging
MACHINING OPERATIONS WILL BE PERFORMED PER THE FOLLOWING STANDARD OPERATING PROCEDURE: TLGSOP01 - Cutting Tool Control
WELDING OPERATIONS WILL BE PERFORMED PER THE FOLLOWING STANDARD OPERATING PROCEDURES: WLDSOP02 - Qualification of Welders and WPS; WLDSOP03 - Welding Process Development; WLDSOP04 - Stores Control of Weld Wire; WLDSOP05 - Weld Mapping; WLDSOP06 - Welding Filler Metal and Flux Procurement
ENGINEERING OPERATIONS WILL BE PERFORMED PER THE FOLLOWING WORK INSTRUCTIONS: ENGWI001 - Material Card; ENGWI002 - Drawing Control; ENGWI003 - Bill of Manufacturing; ENGWI005 - Engineering Contract Review; ENGWI007 - Work Order Review Release; ENGWI008 - Operation Cards; ENGWI009 - Quality Planning; ENGWI010 - Service Cards; ENGWI013 - Work Order Header Card Maintenance; ENGWI014 - Inspection Fields; ENGWI019 - Nonconformance to Customers.
CAD / CAM OPERATIONS WILL BE PERFORMED PER THE FOLLOWING WORK INSTRUCTIONS: CADWI004 - Developing a CADCAM program; CADWI005 - Updating CADCAM Program or File
MANUFACTURING OPERATIONS WILL BE PERFORMED PER THE FOLLOWING WORK INSTRUCTIONS: MFGWI018 - Workmanship; PCWI001 - Use of MTM Routing; PCWI004 - Scheduling System Procedures
CLEANING / WASHING OPERATIONS WILL BE PERFORMED PER THE FOLLOWING WORK INSTRUCTION: MFGWI005 - High Pressure-High Temperature Water Cleaning of Parts
SUBCONTRACT OPERATIONS WILL BE PERFORMED PER THE FOLLOWING WORK INSTRUCTION: PCWI005 - Subcontract Procedure; PURWI002 - Vendor Setup and Assessment
NON-DESTRUCTIVE TESTING OPERATIONS WILL BE PERFORMED PER THE FOLLOWING WORK INSTRUCTIONS: NDTWI001 - NDT Exam Personnel Qualification; NDTWI011 - Visual Weld Inspection
QUALITY ASSURANCE, IN-PROCESS INSPECTION OPERATIONS AND/OR RECEIVING INSPECTION OPERATIONS WILL BE PERFORMED PER THE FOLLOWING WORK INSTRUCTIONS: QAWI001 - MTM Inspection Method Guidelines; QAWI006 - Sampling Inspection Criteria; QAWI008 - Receiving Ordered Material; QAWI010 - Calibration; QAWI015 - Checking Out and Returning Gauges; QAWI017 - Recording Inspection Results; QAWI018 - Quality Sign Off Control; QAWI020 - Organization and Control of Quality Records; QAWI021 - Quality Record Storage and Retention; QAWI023 - Nonconformance System Navigation; QAWI026 - Part Relocation with SMX; QAWI027 - SMX Part Inspection Checklist; QAWI028 - QAP Data Package Generation; QAWI029 - Scanning Certifications; QAWI031 - Material Certification Program.
SHIPPING OPERATIONS WILL BE PERFORMED PER THE FOLLOWING WORK INSTRUCTIONS: SHWI002 - Guidelines for Shipping Documentation; SHWI003 - General Guidelines for Building Containers; SHWI004 - Guidelines for Loading Parts for Shipment; SHWI005 - General Guidelines for Packaging Parts; SHWI007 - Guidelines for Coordinating Transport.
WELDING OPERATIONS WILL BE PERFORMED PER THE FOLLOWING WORK INSTRUCTIONS: WLDWI003 - Welding Personnel Training; WLDWI004 - Welder Performance Qualification; WLDWI005 - Storage and Maintenance of Welding Documents; WLDWI006 - Welding Engineering Work Order Review Process; WLDWI007 - Weld Wire and Stub Control; WLDWI008 - Assessment of Welder's Ability
BLAST BOOTH OPERATIONS WILL BE PERFORMED PER THE FOLLOWING WORK INSTRUCTIONS: SBWI001 - General Sandblast Guidelines;
MATERIAL PROCUREMENT OPERATIONS WILL BE PERFORMED PER THE FOLLOWING WORK INSTRUCTIONS: PURWI001 - Purchasing Data; PURWI002 - Vendor Setup and Assessment

IDC Count : 0 Dwg Count: 0 Pgm Count: 0 QAP Count: 0 NDT Count: 0 WPS Count: 0

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 0 / Seq: 15	805-INPROCESS INSPECTION - PLA	1.00	1.00	1.00	NCSX-SOW-121-01-02 / 02JU
(U)	QUALITY ENGINEERING REVIEW OF CUSTOMER PRODUCT SPECIFICATION AND STATEMENT OF WORK.				

IDC Count : 0 Dwg Count: 0 Pgm Count: 0 QAP Count: 0 NDT Count: 0 WPS Count: 0

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev

Workorder	Part ID			Qty	Drawing ID / Rev	Engineer
64880/1.0				1	SE121-003P / --	BLUE/DOUG MCCORKLE

Sub: 0 / Seq: 20	825-FINAL INSPECTION - PLANTS 1	1.00	1.00	1.00	SE121 / A

(F)
FINAL VISUAL INSPECTION (ENGINEERING CONCURRENCE REQUIRED).
FINAL CLEANLINESS VERIFICATION PER PP475 AND PREPARE CERTIFICATION / CLEANLINESS REPORT
COMPILE ELECTRONIC DATA BOOK INFORMATION PER MTM QAP.
TAKE SEVERAL PHOTOGRAPHS OF PART
PREPARE C OF C AND REQUEST FOR SHIPPING RELEASE (CONTACT ENGINEERING (DOUG McCORKLE) FOR RELEASE FORM IF NOT AVAILABLE ELECTRONICALLY.
WITNESS AND PHOTOGRAPH THE PACKAGING / PREPARATION FOR SHIPMENT (NEXT SEQUENTIAL OPERATION).
Test Certification: CLEANLINESS CERTIFICATION Rev:
Part Number: SE121-003P
Part Description: PVVS
Specification: PP475 Rev: 5

IDC Count : 0 Dwg Count: 5 Pgm Count: 0 QAP Count: 4 NDT Count: 0 WPS Count: 0

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 0 / Seq: 30	425-SHIPPING - PLANTS 1 & 2	1.00	1.00	1.00	SE121 / A

(F)
SHIP PER CUSTOMER RELEASE FORM
(CONTAINER MANUFACTURED IN SUB I.D. 28)
AT A MINIMUM ENSURE THE PART IS COMPLETELY WRAPPED WITH PLASTIC FOAM AND SHRINK WRAP.
DO NOT APPLY TAPE TO THE PART. THE PLASTIC FOAM CAN BE TAPED ONLY TO ITSELF TO HOLD POSITION UNTIL SHRINK WRAP IS APPLIED.
SPECIAL CRATE REQUIREMENTS:
CONTAINER MUST BE CLEARLY MARKED WITH THE FOLLOWING INFORMATION:
SUPPLIER:
MAJOR TOOL & MACHINE, INC.
1458 E. 19TH ST.
INDIANAPOLIS, IN 46218
CONTENTS:
SE121 NCSX PVVS
Specification: PP475 Rev: 3

IDC Count : 0 Dwg Count: 5 Pgm Count: 0 QAP Count: 1 NDT Count: 0 WPS Count: 0

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev	Service ID
Sub: 0 / Seq: 9876	601-AUTOMATED SCHEDULING BU	1.00	1.00	1.00		TESTNG/MISC

Drw N/A IDC N/A IDC Count : 0 Dwg Count: 0 Pgm Count: 0 QAP Count: 0 NDT Count: 0 WPS Count: 0

Sub ID	Part ID	Qty	Drawing ID / Rev
1	SE121 PROTOTYPE VACUUM VESSEL	1	SE121 / A Parent Sub:0 Op:20

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 1 / Seq: 10	230-FABRICATION - WEIDNER	1.00	1.00	1.00	SE121-001P / A

(F)
FABRICATION OPERATION # 1

Workorder	Part ID	Qty	Drawing ID / Rev	Engineer
64880/1.0		1	SE121-003P / --	BLUE/DOUG MCCORKLE

ACQUIRE THE FOLLOWING DIE FORMED PANELS:

SE121-001P-2 PANEL 1
SE121-001P-2 PANEL 2
SE121-001P-2 PANEL 3
SE121-001P-2 PANEL 4
SE121-001P-2 PANEL 5

PRIOR TO FITTING AND TRIMMING, DETERMINE WHICH PANELS ARE GOING TO BE GROUPED AND WELDED TOGETHER AS "SUB-SETS") TO MINIMIZE AND CONTROL WELDING DISTORTION. ENGINEERING CONCURRENCE REQUIRED.

THE PANEL FITTING / INSTALLATION SEQUENCE PLAN IS TO PRODUCE ONE TWO PANEL SUB-SET, AND ONE THREE PANEL SUB SET (ONE WELD AT A TIME). THIS WILL REDUCE THE FINAL ASSEMBLY WELDING DISTORTION FROM 5 TO 2 WELD JOINTS. IT WILL ALSO PROVIDE FOR EASIER ADJUSTMENTS / COMPENSATION AFTER INDIVIDUAL WELDS ARE COMPLETED. THE TWO PANEL SUB-SET WILL BE MADE BY FITTING AND WELDING TWO ADJACENT PANELS TOGETHER, LEAVING EXCESS TRIM STOCK ON EACH OUTER EDGE FOR FITTING THE NEXT PANEL / SUB-SET TO THEM. THE THREE PANEL SUB-SET WILL BEGIN AS A TWO PANEL SUB-SET WITH THE REMAINING INDIVIDUAL PANEL FIT AND WELDED IN PLACE AFTER THE FIRST WELD IS COMPLETED.

ONCE PANEL SUB-SETS AND WELD SEQUENCES HAVE BEEN ESTABLISHED, ALIGN, FIT, AND TRIM EACH PANEL ACCORDING TO THE BUILD FIXTURE REGISTER SURFACES, TRIM LINES, AND ADJACENT PANEL SURFACES.
GRIND WELD PREPS AND CLEAN THE WELD JOINT AND APPROXIMATELY THREE INCHES OF THE SURROUNDING AREA PER PP475.
START BY SETTING EACH PANEL INDIVIDUALLY ONTO THE MACHINED REGISTER OF THE BUILD FIXTURE BASE-PLATE (THE DATUM -B- SURFACE (10 DEGREE OFFSET) DOWN). TRIM THE MATING VERTICAL WELD JOINT OF EACH PANEL SET TO PLUS 0.03" (MINIMUM) FROM THE TRIM LINE. TRIM THE OUTER SURFACES OF THE EACH TWO PANEL SET AT LEAST 0.06" OUTSIDE THE TRIM LINE (TO ENSURE TRIM STOCK IS AVAILABLE FOR ADJACENT PANEL / PANEL SUB-SET).

EACH SUB-SET IS TO BE RELEASED FROM THE BUILD FIXTURE AFTER WELDING TO ENSURE STABILITY PRIOR TO TRIMMING, FITTING, AND WELDING SUBSEQUENT PANELS / SETS.

TRIM THE TOP AND BOTTOM EDGES OF EACH PANEL TO APPROXIMATELY 0.04" (MINIMUM) ABOVE THE FIXTURE RISER FACE (FOR SHRINKAGE AND FINAL TRIMMING ALLOWANCE).

NOTE THAT THE INTERIOR PROFILE FIXTURE REST STOP SURFACES ARE POSITIONED AT NOMINAL GEOMETRIC POSITION TO AVOID STARTING ANY LOWER THAN MID-TOLERANCE. SHIM IF NECESSARY TO MAINTAIN AN AVERAGE PROFILE STARTING POSITION OF (+.090"). ENSURE NO GAPS BETWEEN THE PRODUCTION PANELS AND FIXTURE REST STOPS ARE GREATER THAN (+.18") PRIOR TO TACK WELDING IN PLACE. (ENGINEERING CONCURRENCE REQUIRED)
ENSURE THE MATERIAL THICKNESS IS ADEQUATE TO ALLOW NORMAL REDUCTION THAT WILL OCCUR FROM GRINDING / BLENDING / POLISHING THE WELDS. INSPECT THICKNESS WITH A U-T GAGE. NOTIFY ENGINEERING (DOUG McCORKLE) IF CONCERNS EXIST.
ENSURE EACH PANEL IS ALIGNED (SMOOTH AND CONTINUOUS) TO ITS ADJACENT MEMBER AND MIS-MATCH IS MINIMIZED. CWI / ENGINEERING CONCURRENCE REQUIRED.

AS EACH PANEL IS POSITIONED, FIT AND TRIMMED, LAYOUT AND PRICK PUNCH THE APPROXIMATE INSPECTION POINTS PER DRAWING SE121-001P-1MTM. NOTE THAT THE SOLE PURPOSE OF THE PUNCH MARKS IS TO MAINTAIN REPEATABLE PROFILE INSPECTIONS THROUGHOUT THE FABRICATION PROCESS. THE DEPTH OF EACH PUNCH MARK NEEDS TO BE ONLY DEEP ENOUGH THAT IT WOULD NOT BE REMOVED BY NORMAL PREPARATION / WELDING / BLENDING / BLASTING, ETC.

Workorder	Part ID	Qty	Drawing ID / Rev	Engineer
64880/1.0		1	SE121-003P / --	BLUE/DOUG MCCORKLE

PREP, AND WELD PANEL SETS TOGETHER (SEQUENCING WELDS AND JOINTS TO MINIMIZE INDIVIDUAL AND OVERALL WELD DISTORTION)

ENSURE QUALITY ASSURANCE AND CERTIFIED WELDING INSPECTORS ARE CLOSELY INVOLVED, AND INTER-PASS PROFILE AND VISUAL INSPECTIONS ARE PERFORMED ON EACH SUB-ASSEMBLY AFTER TACK WELDING, ROOT PASS, EACH INTER-PASS, AND COVER PASS IS COMPLETED.

GRIND PREPS ON EACH PANEL WELD JOINT (*****FINAL WELD PREP CONFIGURATION UNDER DEVELOPMENT!!!!! WILL BE FINALIZED AFTER THE WELD TESTING PERFORMED UNDER TEST SUB ID *******).
***NOTE: THE WELD JOINT ROOT / FACE MUST BE ORIENTATED TO KEEP THE BEAD WIDTH ON THE INTERIOR SIDE OF THE VESSEL (VACUUM SIDE) AS NARROW AS POSSIBLE. INTERIOR SIDE WELD FACES SHOULD BE KEPT AS NARROW AS POSSIBLE (1 WELD BEAD WIDTH MAX).
PURGE EACH WELD JOINT WITH 100% ARGON. PURGE DAM MATERIAL MUST BE MADE FROM EITHER 625 INCONEL OR 300 SERIES STAINLESS STEEL. NOTE THAT THE PURGE IS TO BE MAINTAINED THROUGHOUT THE WELDING PROCESS ON ALL JOINTS.
ASSIST Q/A WITH PROFILE VERIFICATION.

Part Number: SE121-001P
Part Description: NCSX PVVS
Specification: PP475 Rev: 4

IDC Count : 7 Dwg Count: 1 Pgm Count: 0 QAP Count: 3 NDT Count: 0 WPS Count: 1

WPS291.5 Rev:0 GTAW MAN
GTAW - Manual Fillers: INCONEL625_035_GMAW / INCONEL625_062_GTAW / INCONEL625_093_GTAW
Notes: TIG WELD ONLY

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 1 / Seq: 20	817-SMX LASER	1.00	1.00	1.00	SE121-001P-1MTM / 2A
(F)	INSPECTION OPERATION # 1				

AFTER EACH SUB-SET IS COMPLETELY TACK WELDED, INSPECT / VERIFY POSITIONING, FITUP, AND PROFILE OF EACH TACK WELDED SUB-SET PER THE FOLLOWING:
INCLUDE AT LEAST THREE DATUM TARGETS IN EACH POINT CLOUD SCAN FOR ALIGMENT / VERIFICATION TO THE 3D MODEL.
ENSURE THE PART PROFILE IS WITHIN THE UPPER HALF OF THE APPLIED BI-LATERAL TOLERANCE AS FOLLOWS: VERIFY THAT NO INSPECTION POINT IS ABOVE THE HIGH LIMIT OF TOLERANCE (OUTWARD) OR BELOW NOMINAL (INWARD).
RECORD ACTUAL (HIGH/LOW RANGE) ON MTM IDC
REPORT ANY OUT OF TOLERANCE READINGS VIA MTM NCR
NOTIFY ENGINEERING (DOUG McCORKLE) FOR EVALUATION OF RESULTS PRIOR TO RELEASING THE PART BACK TO PRODUCTION.
INSPECTION POINT GRID: 6" CENTERS THROUGHOUT WITH 1" CENTERS AT AND NEAR WELD JOINTS.
ENSURE THE FIXTURE DATUM TARGETS ARE ADEQUATELY POSITIONED FOR THE REPOSITIONING AT THE NEXT SEQUENTIAL INSPECTION
INSPECT THE MAGNETIC PERMEABILITY AND MATERIAL THICKNESS AT EACH PROFILE INSPECTION POINT.
RECORD PROFILE, MAGNETIC PERMEABILITY, AND MATERIAL THICKNESS ON SE121-001P-1MTM, RESULTS MUST BE RECORDED, REVIEWED BY ENGINEERING, SCANNED AND LINKED PRIOR TO COMPLETING THE INSPECTION SEQUENCE.
Part Number: SE121-001P
Part Description: NCSX PVVS
Specification: PP476 Rev: --
Specification: PP477 Rev: --

Workorder	Part ID	Qty	Drawing ID / Rev	Engineer
64880/1.0		1	SE121-003P / --	BLUE/DOUG MCCORKLE

Specification: PP475 Rev: 4
Map(s): SE121-001P-1MTM Rev: 2A

IDC Count : 2 Dwg Count: 1 Pgm Count: 0 QAP Count: 6 NDT Count: 0 WPS Count: 0

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 1 / Seq: 30	230-FABRICATION - WEIDNER	1.00	1.00	1.00	SE121-001P / A
(F)	FABRICATION OPERATION # 2				

PRIOR TO BEGINNING, NOTIFY ENGINEERING / CFT THE PART IS READY AND AVAILABLE FOR POSSIBLE CUSTOMER HOLD / WITNESS POINT INSPECTION. HOLD FOR RESPONSE AND/OR FURTHER DIRECTION.

BACK PURGE THE WELD JOINT SURFACES WITH 100% ARGON. PURGE DAM MATERIAL MUST BE MADE FROM EITHER 625 INCONEL OR 300 SERIES STAINLESS STEEL.
WELD ROOT PASSES (INCREMENTALLY, USING BACK-STEPPING METHOD TO MINIMIZE SHRINKAGE) ON ALL FIVE WELD JOINTS.
NOTE THAT THE BACK SIDE OF THE JOINT MUST REMAIN PURGED UNTIL THE ENTIRE JOINT IS COMPLETELY FILLED.
NOTE BURN-THROUGH, AND BACK-WELD FACES SHOULD BE KEPT AS NARROW AS POSSIBLE.
CWI VISUAL INSPECT ROOT WELDS 100% UNDER 8X MAGNIFICATION PER ASME CODE ARTICLE 6, SECTION V. ACCEPTANCE PER AWS D1.6, 6.29.1.

Test Certification: CWI CERTIFICATE Rev:
Part Number: SE121-001P
Part Description: NCSX PVVS
Method: VT-PP-001 Rev: A
Specification: PP475 Rev: 4

IDC Count : 5 Dwg Count: 1 Pgm Count: 0 QAP Count: 5 NDT Count: 0 WPS Count: 1

WPS291.5 Rev:0 GTAW MAN
GTAW - Manual Fillers: INCONEL625_035_GMAW / INCONEL625_062_GTAW / INCONEL625_093_GTAW
Notes: TIG WELD ONLY

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 1 / Seq: 40	817-SMX LASER	1.00	1.00	1.00	SE121-001P-1MTM / 2A
(F)	INSPECTION OPERATION # 2				

AFTER THE ROOT WELDS ARE COMPLETE (FABRICATION DEPT. WILL COORDINATE); RE-INSPECT / VERIFY PART PROFILE IS WITHIN APPLIED TOLERANCE AND RECORD WELDING SHRINKAGE / DISTORTION REALIZED TO THIS POINT.
INSPECTION POINT GRID: 6" CENTERS THROUGHOUT WITH 1" CENTERS AT AND NEAR WELD JOINTS.
INCLUDE AT LEAST THREE DATUM TARGETS IN EACH POINT CLOUD SCAN FOR ALIGMENT / VERIFICATION TO THE 3D MODEL.
RECORD ACTUAL (INDIVIDUAL) MEASUREMENTS ON INSPECTION FORM (SE121-2MTM). RECORD ACTUAL (HIGH/LOW RANGE) ON MTM I.D.C.
INSPECT AND RECORD MAGNETIC PERMEABILITY.
REPORT ANY OUT OF TOLERANCE READINGS VIA MTM NCR.
NOTIFY ENGINEERING (DOUG McCORKLE) FOR EVALUATION OF RESULTS PRIOR TO RELEASING PART. NOTE THAT PROFILE READINGS SHOULD REMAIN NEAR TO ABOVE NOMINAL. INWARD DISTORTION APPROACHING THE LOW LIMIT OF TOLERANCE MUST BE ADDRESSED (AND CORRECTIVE ACTION IMPLEMENTED) PRIOR TO COMPLETING WELDING PROCESS.

Workorder	Part ID	Qty	Drawing ID / Rev	Engineer
64880/1.0		1	SE121-003P / --	BLUE/DOUG MCCORKLE

ENSURE THE FIXTURE DATUM TARGETS ARE ADEQUATELY POSITIONED FOR THE NEXT SEQUENTIAL INSPECTION.
RECORD PROFILE, MAGNETIC PERMEABILITY, AND MATERIAL THICKNESS ON SE121-001P-1MTM, RESULTS MUST BE RECORDED, REVIEWED BY ENGINEERING, SCANNED AND LINKED PRIOR TO COMPLETING THE INSPECTION SEQUENCE.
Part Number: SE121-001P
Part Description: NCSX PVVS
Specification: PP476 Rev: --
Specification: ASTM A800 Rev: 2001
Specification: PP475 Rev: 4
Specification: PP477 Rev: --
Map(s): SE121-001P-1MTM Rev: 2A

IDC Count : 2 Dwg Count: 1 Pgm Count: 0 QAP Count: 7 NDT Count: 0 WPS Count: 0

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 1 / Seq: 70	230-FABRICATION - WEIDNER	1.00	1.00	1.00	SE121-001P / A
(F)	FABRICATION OPERATION # 3				

AFTER OBTAINING ENGINEERING, Q/A PROFILE ACCEPTANCE, AND AUTHORIZATION TO PROCEED, WELD THE REMAINDER OF THE STRUCTURAL WELD JOINTS. SEQUENCE WELDING AND UTILIZE BACK-STEPPING METHODS TO MINIMIZE DISTORTION AND NUMBER OF INTER-PASSES.
WELDING (INCLUDING TACK-WELDING BRACING) WITHIN THE FINISH PART ENVELOP ON THE INTERIOR SIDE MUST BE ABSOLUTELY MINIMIZED. ANY TACKING AND/OR WELDING ON THIS SURFACE MUST BE APPROVED BY ENGINEERING.
CWI VISUAL INSPECT EACH WELD PASS 100% UNDER 8X MAGNIFICATION PER ASME CODE ARTICLE 6, SECTION V. ACCEPTANCE PER AWS D1.6, 6.29.1.
EACH WELD PREP / WELD INTER-PASS MUST BE CLEANED PER PP475 PRIOR TO WELDING THE NEXT SEQUENTIAL BEAD.
AFTER WELDING IS COMPLETE, REMOVE ANY TEMPORARY STIFFENING / SUPPORT / SHOP AID DEVICES. BLEND / TOUCH UP ATTACHMENT WELDS AS REQUIRED.
LAYOUT THE PORT ASSEMBLY LOCATION. (ANGULAR LOCATION, OVERALL LENGTH, AND OUTLINE ARE IDENTIFIED ON THE ASSEMBLY FIXTURE). UTILIZE THE LASER TRACKER TO ENSURE POSITION PRIOR TO TACK WELDING.
WELD THE PORT EXTENSION SUB-ASSEMBLY IN PLACE PER DRAWING.
BACK PURGE THE WELD JOINT SURFACES WITH 100% ARGON. PURGE DAM MATERIAL MUST BE MADE FROM EITHER 625 INCONEL OR 300 SERIES STAINLESS STEEL.
NOTE THAT THE BACK SIDE OF THE JOINT MUST REMAIN PURGED UNTIL THE ENTIRE JOINT IS COMPLETELY FILLED.
CWI VISUAL INSPECT THE PORT EXTENSION WELD 100% UNDER 8X MAGNIFICATION PER ASME CODE ARTICLE 6, SECTION V. ACCEPTANCE PER AWS D1.6, 6.29.1.
FINISH POLISHING (RESTORE TO A 32 MICRO-INCH SURFACE FINISH) AND CLEANING THE INTERIOR SURFACES OF THE PORT SUB-ASSEMBLY. REFER TO CLEANING PROCEDURE PP475
CWI NOTE: THE VISUAL INSPECTION CERTIFICATE SHOULD SPECIFY EACH WELD JOINT / STRINGER PASS. IT SHOULD ALSO CLEARLY DIFFERENTIATE BETWEEN THE STRUCTURAL WELDS AND THE PORT EXTENSION WELDS.
RECORD IDC DATA
NOTE: THE NEXT THREE MANUFACTURING SEQUENCES MUST BE CLOSELY COORDINATED (BAKE-OUT, PREPARATION FOR VACUUM TEST, AND VACUUM TEST). NOTIFY PRODUCTION CONTROL, AND CFT IN ADVANCE. COORDINATION TIMES AND DATES WILL BE PROVIDED.
Test Certification: CWI CERTIFICATE Rev:
Part Number: SE121-001P
Part Description: NCSX PVVS
Specification: ASNT 2055 SNT-TC-1A Rev: 1996

Workorder	Part ID	Qty	Drawing ID / Rev	Engineer
64880/1.0		1	SE121-003P / --	BLUE/DOUG MCCORKLE

Method: VT-PP-001 Rev: A
Specification: PP475 Rev: 5

IDC Count : 5 Dwg Count: 1 Pgm Count: 0 QAP Count: 6 NDT Count: 0 WPS Count: 1

WPS291.5 Rev:0 GTAW MAN
GTAW - Manual Fillers: INCONEL625_035_GMAW / INCONEL625_062_GTAW / INCONEL625_093_GTAW
Notes: TIG WELD ONLY

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 1 / Seq: 71	265-PAINT BOOTH	1.00	1.00	1.00	SE121 / A

(F) BAKE OUT AT 150 DEGREES C (302F) FOR 6 HOURS TO REMOVE MOISTURE IN PREPARATION FOR THE NEXT SEQUENTIAL OPERATION (VACUUM / LEAK TESTING). NOTE THAT THIS SEQUENCE MUST BE COORDINATED WITH THE VACUUM TESTING SERVICE OPERATION. CONTACT ENGINEERING (DOUG McCORKLE) AND SUBCONTRACT ADMINISTRATOR (BOB JOACHIM) PRIOR TO BEGINNING FOR TIMING AND COORDINATION. CYCLE START TIME WILL BE ADVISED.
Part Number: SE121-001P
Part Description: NCSX PVVS
Furnace charts: FURNACE CHART
Specification: PP475 Rev: 5

IDC Count : 0 Dwg Count: 5 Pgm Count: 0 QAP Count: 4 NDT Count: 0 WPS Count: 0

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 1 / Seq: 72	230-FABRICATION - WEIDNER	1.00	1.00	1.00	

(F) VACUUM TEST PREPARATION:

PRIOR TO BEGINNING, NOTIFY ENGINEEERING / CFT THE PART IS READY AND AVAILABLE FOR POSSIBLE CUSTOMER HOLD / WITNESS POINT INSPECTION. HOLD FOR RESPONSE AND/OR FURTHER DIRECTION.

SETUP AND PREPARE FOR SUBCONTRACT VACUUM TESTING (WHICH WILL BE PERFORMED AT SEQUENCE 73) AND RADIOGRAPHIC INSPECTION (WHICH WILL BE PERFORMED AT SEQUENCE 75) AS FOLLOWS:
INSTALL THE SEAL AND VACUUM TEST CAP TO THE CONFLAT FLANGE
INSTALL AND TORQUE THE FLANGE INSTALLATION BOLTS PER MANUFACTURERS INSTRUCTIONS.
LAYOUT ALL STRUCTURAL WELDS FOR 100% X-RAY.
ASSIST WITH THE VACUUM TEST AND ENSURE THE FOLLOWING PRECAUTIONS ARE OBSERVED:

Caution: The vacuum test procedure will subject the vessel to an internal vacuum that generates tremendous forces. Failure of any part of the vessel or test equipment could result in implosive/explosive reactions, ejected parts
and dangerous noise levels. Unnecessary personnel should vacate the test area whenever a vacuum is present in the vessel (Except essential personnel).

Specification: PP475 Rev: 2

IDC Count : 0 Dwg Count: 0 Pgm Count: 0 QAP Count: 1 NDT Count: 0 WPS Count: 0

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev	Service ID

Workorder	Part ID			Qty	Drawing ID / Rev	Engineer
64880/1.0				1	SE121-003P / --	BLUE/DOUG MCCORKLE
Sub: 1 / Seq: 73	450-SUBLET	1.00	1.00	1.00	SE121-003P / --	MISC/SUBLET

(F) VACUUM TEST THE PORT EXTENSION SUB-ASSEMBLY (WELDED TO THE VESSEL WALL) PER PP478

MTM CONTRACT ADMINISTRATOR NOTE: THIS SEQUENCE MUST BE COORDINATED WITH THE PRECEDING (BAKE OUT) OPERATION. PRODUCTION CONTROL WILL INIATE COORDINATION PRIOR TO BEGINNING THE BAKE OUT OPERATION.
Part Number: SE121-001P
Part Description: NCSX PVVS
Customer: PPPL
Test Certification: VACUUM TEST CERTIFICATE Rev:
Specification: ASTM E 498 Rev: 95
Specification: PP475 Rev: 2
Specification: PP478 Rev: --

IDC Count : 0 Dwg Count: 1 Pgm Count: 0 QAP Count: 7 NDT Count: 0 WPS Count: 0

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 1 / Seq: 75	818-MQS CONTRACTOR X-RAY	1.00	1.00	1.00	SE121-001P /

(F) 100% RADIOGRAPHIC INSPECT THE 5 STRUCTURAL WELDS (LOCATIONS IDENTIFIED ON PART) PER THE FOLLOWING:
ASME SECTION VIII, DIVISION 1, UW-51
MAP THE FILM NUMBERS AND FILM LOCATIONS ON PART DRAWING.
Specification: ASME SECTION VIII
Map(s): RADIOGRAPHIC INSPECTION MAP Rev:
Part Number: SE121-001P
Part Description: NCSX PVVS
Material Type: 625 INCONEL
Test Certification: RADIOGRAPHIC CERTIFICATE Rev:
Material Thickness: .375"
Specification: 20.A.100 Rev:
Specification: PP475 Rev: 4

IDC Count : 0 Dwg Count: 0 Pgm Count: 0 QAP Count: 9 NDT Count: 0 WPS Count: 0

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 1 / Seq: 80	817-SMX LASER	1.00	1.00	1.00	SE121-001P-1MTM / 2A

(F) INSPECTION OPERATION # 3

RE-INSPECT / VERIFY PART PROFILE IS WITHIN APPLIED TOLERANCE AND RECORD PRIMARY STRUCTURAL WELDING SHRINKAGE / DISTORTION.
INSPECTION POINT GRID: 6" CENTERS THROUGHOUT WITH 1" CENTERS AT AND NEAR WELD JOINTS.
INCLUDE AT LEAST THREE DATUM TARGETS IN EACH POINT CLOUD SCAN FOR ALIGMENT / VERIFICATION TO THE 3D MODEL.
RECORD ACTUAL (INDIVIDUAL) MEASUREMENTS ON INSPECTION FORM (SE121-2MTM). RECORD ACTUAL (HIGH/LOW RANGE) ON MTM IDC
INSPECT AND RECORD MAGNETIC PERMEABILITY.
REPORT ANY OUT OF TOLERANCE READINGS VIA MTM NCR.
NOTIFY ENGINEERING (DOUG McCORKLE) FOR EVALUATION OF RESULTS PRIOR TO RELEASING PART.
ENSURE THE FIXTURE DATUM TARGETS ARE ADEQUATELY POSITIONED FOR THE NEXT SEQUENTIAL INSPECTION.

Workorder	Part ID	Qty	Drawing ID / Rev	Engineer
64880/1.0		1	SE121-003P / --	BLUE/DOUG MCCORKLE

RECORD PROFILE, MAGNETIC PERMEABILITY, AND MATERIAL THICKNESS ON SE121-001P-1MTM, RESULTS MUST BE RECORDED, REVIEWED BY ENGINEERING, SCANNED AND LINKED PRIOR TO COMPLETING THE INSPECTION SEQUENCE.
Part Number: SE121-001P
Part Description: NCSX PVVS
Specification: PP475 Rev: 4
Specification: PP476 Rev: --
Specification: PP477 Rev: --
Map(s): SE121-001P-1MTM Rev: 2A

IDC Count : 2 Dwg Count: 1 Pgm Count: 0 QAP Count: 6 NDT Count: 0 WPS Count: 0

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 1 / Seq: 90	230-FABRICATION - WEIDNER	1.00	1.00	1.00	SE121-002P / --

(F)
LAYOUT AND PLASMA CUT THE PORT EXTENSION TUBE OFF THE VESSEL WALL (NORMAL TO VESSEL SURFACE) PER DRAWING.
PLASMA CUT THE PORT OPENING INTO THE VESSEL WALL PER DRAWING (CUT UNDERSIZE ALLOWING FOR GRINDING / SIZING TO PORT EXTENSION I.D.) USE A CIRCLE CUTTING DEVICE TO ENSURE PROPER SIZE AND ROUNDNESS.
REMOVE RECAST / HEAT AFFECTED ZONE FROM EACH CUT SURFACE BY GRINDING. GRIND / BLEND THE PORT EXTENSION EDGE AND VESSEL WALL OPENING SMOOTH (MAINTAINING PROPER SIZE AND RELATIONSHIP TO THE I.D. OF THE PORT EXTENSION TUBE).
PREP THE EDGES OF THE PORT STUB AND PORT EXTENSION TUBE FOR RE-INSTALLATION.
POSITION AND SKIP WELD THE BACKING RING (SE121-003P-4) IN PLACE (TO THE END OF THE DETACHED PORT EXTENSION TUBE) PER DRAWING SE121-003P
RE-INSTALL THE PORT EXTENSION ASSEMBLY TO THE PORT STUB AND WELD IN PLACE PER DRAWING SE121-003P.
GRIND AND BLEND THE PORT EXTENSION INTERIOR WELD SMOOTH.
CWI VISUAL INSPECT EACH WELD PASS 100% UNDER 8X MAGNIFICATION PER ASME CODE ARTICLE 6, SECTION V. ACCEPTANCE PER AWS D1.6, 6.29.1.
ENSURE ALL COSMETIC WELDING AND BLENDING IS COMPETE, ENSURE ALL INTERIOR SURFACES ARE POLISHED AND CLEANED, AND PREPARE PART FOR FINAL (EXTERIOR) BLAST AND FINAL INSPECTION.

Test Certification: VISUAL INSPECTION CERT Rev:
Part Number: SE121-003P
Part Description: PVVS
Specification: ASNT 2055 SNT-TC-1A Rev: 1996
Method: VT-PP-001 Rev: A
Specification: PP475 Rev: 2

IDC Count : 5 Dwg Count: 0 Pgm Count: 0 QAP Count: 6 NDT Count: 0 WPS Count: 1

WPS291.5 Rev:0 GTAW MAN
GTAW - Manual Fillers: INCONEL625_035_GMAW / INCONEL625_062_GTAW / INCONEL625_093_GTAW
Notes: TIG WELD ONLY

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 1 / Seq: 100	817-SMX LASER	1.00	1.00	1.00	SE121-001P-1MTM / 2A

(F)
INSPECT PROFILE IN THE AREA OF THE PORT STUB / PORT EXTENSION.
INCLUDE AT LEAST THREE DATUM TARGETS IN EACH POINT CLOUD SCAN FOR ALIGMENT / VERIFICATION TO THE 3D MODEL.
INSPECT MAGNETIC PERMEABILITY IN THE AREA OF THE PORT STUB / PORT EXTENSION WELDING.
INSPECT THE INTERIOR SURFACE FINISH OF THE PORT EXTENSION.

Workorder	Part ID	Qty	Drawing ID / Rev	Engineer
64880/1.0		1	SE121-003P / --	BLUE/DOUG MCCORKLE

RECORD IDC DATA
Part Number: SE121-003P
Part Description: NCSX PVVS
Specification: PP475 Rev: 4
Specification: PP476 Rev: --
Specification: PP477 Rev: --
Map(s): SE121-001P-1MTM Rev: 2A

IDC Count : 3 Dwg Count: 1 Pgm Count: 0 QAP Count: 6 NDT Count: 0 WPS Count: 0

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 1 / Seq: 105	230-FABRICATION - WEIDNER	1.00	1.00	1.00	

(U) INSTALL SUPPORT DEVICES TO LOCATE THE PART BACK ONTO THE FIXTURE SURFACE (UNRESTRAINED) FOR FINAL INSPECTION.

Drw N/A IDC N/A IDC Count : 0 Dwg Count: 0 Pgm Count: 0 QAP Count: 0 NDT Count: 0 WPS Count: 0

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 1 / Seq: 110	260-SANDBLAST	1.00	1.00	1.00	SE121 / A

(F) MASK THE INTERIOR SURFACES AND CONFLAT FLANGE FACE. BLAST THE OUTSIDE SURFACE 100% USING 220 GRIT VIRGIN ALUMINUM OXIDE.
Specification: PP475 Rev: 2

IDC Count : 0 Dwg Count: 5 Pgm Count: 0 QAP Count: 1 NDT Count: 0 WPS Count: 0

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 1 / Seq: 115	230-FABRICATION - WEIDNER	1.00	1.00	1.00	SE121 / A

(F) SET THE PVVS ONTO THE TEMPORARY SUPPORT DEVICES AND TACK WELD IN PLACE
REMOVE MASKING AND PROTECTIVE PLASTIC
CLEAN PART PER PP475
INSTALL NAMEPLATE
ENSURE ADEQUATE INERT GAS COVERAGE IS MAINTAINED (on both surfaces) THROUGHOUT THE WELDING AND COOLING PROCESS TO AVOID OXIDATION / DISCOLORATION)
Part Number: SE121-003P
Part Description: NCSX PVVS
Specification: PP475 Rev: 2

IDC Count : 5 Dwg Count: 5 Pgm Count: 0 QAP Count: 3 NDT Count: 0 WPS Count: 2

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 1 / Seq: 120	817-SMX LASER	1.00	1.00	1.00	SE121-001P / A

(F) FINAL DIMENSIONAL INSPECTION / POTENTIAL CUSTOMER SOURCE INSPECTION.

PRIOR TO BEGINNING, NOTIFY ENGINEEERING / CFT THE PART IS READY AND AVAILABLE FOR POSSIBLE CUSTOMER HOLD / WITNESS POINT INSPECTION. HOLD FOR RESPONSE AND/OR FURTHER DIRECTION.

Workorder	Part ID	Qty	Drawing ID / Rev	Engineer
64880/1.0		1	SE121-003P / --	BLUE/DOUG MCCORKLE

FINAL PROFILE INSPECTION. INSPECT AND RECORD THE VESSEL PROFILE, TRIM LINES (20 DEGREE SURFACES), AND PORT EXTENSION POSITION.
INCLUDE AT LEAST THREE DATUM TARGETS IN EACH POINT CLOUD SCAN FOR ALIGMENT / VERIFICATION TO THE 3D MODEL.
FINAL MAGNETIC PERMEABLITY VERIFICATION.
VERIFY MAGNETIC PERMEABILITY OF ALL STRUCTURAL WELDS (1" increments), VESSEL WALL (6" grid), PORT EXTENSION TUBE (6" grid), CONFLAT FLANGE, FLANGE TO TUBE WELD.
FINAL INTERIOR SURFACE FINISH VERIFICATION. VISUAL INSPECT THE ENTIRE INTERIOR. VERIFY THE ENTIRE SURFACE IS SMOOTH AND FREE OF PITS, DENTS, IRREGULARITIES, GRINDING / SANDING MARKS, ETC... ENSURE THE ENTIRE SURFACE CAN BE WIPED CLEAN WITH A LINT FREE WIPE WITHOUT SNAGGING.
INSPECT (APROXIMATE 6" GRID) WITH PROFILOMETER. REFERENCE PP479 RECORD FINAL SURFACE FINISH INFORMATION ON THE INSPECTION DRAWING
RECORD IDC DATA
Part Number: SE121-003P
Part Description: NCSX PVVS
Specification: ASME B46.1 Rev: 95
Certification: MAG. PERM. CERTIFICATION
Certification: PROFILE CERTIFICATION
Certification: INT. SURF. FINISH CERT.
Specification: PP475 Rev: 4
Specification: PP477 Rev: --
Specification: PP476 Rev: --
Specification: PP479 Rev: --
Map(s): SE121-001P-1MTM Rev: 2A

IDC Count : 5 Dwg Count: 1 Pgm Count: 0 QAP Count: 11 NDT Count: 0 WPS Count: 0

Sub ID	Part ID	Qty	Drawing ID / Rev
14	SE121-001P-2 PANEL # 1	1	SE121-001P / A
			Parent Sub:1 Op:10

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 14 / Seq: 10	820-RECEIVING INSPECTION	1.00	1.00	1.00	SE121-001P / A

(C)
INSPECT BLANK SIZE PER DEVELOPMENT DRAWING (AUDIT DIMENSIONS WILL BE PROVIDED BY DOUG McCORKLE)
INSPECT MATERIAL THICKNESS PER PP477
VISUAL INSPECT SURFACE FINISH (PANEL SURFACE SHOULD BE A SMOOTH MILL PRODUCED SURFACE, WITHOUT SCRAPES, GOUGES, HEAVY PITS, ETC... IT SHOULD BE IN A CONDITION THAT CAN BE READILY POLISHED WITHOUT EXCESSIVE MATERIAL REMOVAL (CONTACT ENGINEERING (DOUG McCORKLE IF FURTHER CLARIFICATION IS NEEDED)
SAMPLE INSPECT MAGNETIC PERMEABILITY PER PP476, AND ASTM A800, SUPPLIMENTARY REQUIREMENT S1 (BUT THE MEASUREMENT SHALL BE TAKEN IN RELATIVE PERMEABILITY RATHER THAN FERRITE CONTENT). SAMPLE LOT SIZE: AT LEAST 10 EVENLY SPACED LOCATIONS.
RECORD IDC DATA

Specification: ASTM A800 Rev: 01
Part Number: SE121-001P-2 PANEL 1
Part Description: DIE FORMED PANEL
Customer: PPPL
Specification: ASTM B443 Rev: 00
Specification: ASME B46.1 Rev: 95

Workorder	Part ID	Qty	Drawing ID / Rev	Engineer
64880/1.0		1	SE121-003P / --	BLUE/DOUG MCCORKLE

Specification: PP476 Rev: A
Specification: PP477 Rev: A
Specification: PP475 Rev: 2

IDC Count : 3 Dwg Count: 1 Pgm Count: 0 QAP Count: 9 NDT Count: 0 WPS Count: 0

Piece #	Part ID	Qty	Drawing ID / Rev	Vendor	Dimensions
10	SE121-001P-2 PANEL # 1-PANEL BLANK .375" THK INCONEL 625	1.0	SE121 / --	1810	

Vendor Part ID: SE121-001P-2 PANEL # 1

(C) PANEL BLANK AWJ CUT FROM .375" INCONEL 625 TO PROVIDED GEOMETRICAL SHAPE
(SE121-001P-2 PANEL # 1.DXF, REV. --)
MATERIAL REQUIREMENTS: INCONEL 625 (UNS N06625) PER ASTM B 443-00 ANNEALED
MAGNETIC PERMEABILITY SHALL NOT EXCEED 1.00 (REF. ASTM A800).
SURFACE MUST BE PROTECTED FROM CONTACT WITH IRON AND IRON ALLOY MATERIALS
CERTS & MILL TEST REPORTS REQ'D WITH SHIPMENT.
APPROXIMATE OVERALL SIZE: 54.97*76.37

Material Certification:
Part Number: SE121-001P-2 PANEL # 1
Part Description: DIE FORMED PANEL
Specification: ASTM A800 Rev: 01
Specification: ASTM B443 Rev: 00
Specification: ASTM B46.1 Rev: 95

QAP Count: 6

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 14 / Seq: 18	105-DEBURR PLT 1 LOW BAY	1.00	1.00	1.00	SE121-001P / A

(C) RADIUS ALL CUT EDGES PRIOR TO FORMING
Specification: PP475 Rev: 2

IDC Count : 0 Dwg Count: 1 Pgm Count: 0 QAP Count: 1 NDT Count: 0 WPS Count: 0

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 14 / Seq: 20	341-PACIFIC 750	1.00	1.00	1.00	SE121-001P / A

(F) 1ST FORM OPERATION:
LOAD, ALIGN, AND BOLT DIE SET # MTMFX-2883 - MTMFX-2884 INTO THE 750 TON HYDRAULIC PRESS.
ENSURE THE DIE SET FACES ARE CLEAN AND FREE OF DIRT, OIL, GRIME, FOREIGN MATTER, RAISED OR EMBEDDED MATERIAL, ETC....
ENSURE THE PANEL BLANK IS CLEAN AND FREE OF FOREIGN MATTER.
LOAD THE PANEL BLANK INTO THE DIE SET.
HYDRAULIC FORM THE PANEL TO ACHIEVE THE GEOMETRICAL SHAPE CONFORMING TO INSPECTION GAGE # MTMFX-2903.
NOTE THAT THE FINAL PANEL TO GAGE GAP TOLERANCE IS .094" MAX. IT IS DESIRED TO GET AS CLOSE TO THIS AS POSSIBLE PRIOR TO ANNEALING. CLOSELY WATCH THE FORMING, WRINKLING, AND SPRING-BACK CHARACTERISTICS OF THE MATERIAL DURING THE FORMING PROCESS. WHEN IT'S APPARENT THE MATERIAL IS WORK HARDENING TO A DEGREE THAT FORMING BECOMES DIFFICULT, OR THE PHYSICAL INTEGRITY OF THE MATERIAL IS AT RISK, PROCEED TO THE NEXT SEQUENTIAL OPERATION (BLAST AND ANNEAL). A FINAL FORMING SEQUENCE IS PROVIDED FOR "FINAL SIZING" AFTER THE MATERIAL HAS BEEN ANNEALED.

Workorder	Part ID	Qty	Drawing ID / Rev	Engineer
64880/1.0		1	SE121-003P / --	BLUE/DOUG MCCORKLE

ENSURE THE PANEL MATERIAL EXTENDS BEYOND THE PERIMETER OF THE GAGE (ENOUGH TO PROVIDE ADEQUATE STOCK ALLOWANCE FOR RE-POSITIONING, RE-STRIKING, AND ACCURATE TRIMMING AFTER ANNEALING).

Part Number: SE121-001P-2 PANEL 1
Part Description: DIE FORMED PANEL
Specification: PP475 Rev: 2

IDC Count : 0 Dwg Count: 1 Pgm Count: 0 QAP Count: 3 NDT Count: 0 WPS Count: 0

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 14 / Seq: 25	260-SANDBLAST	1.00	1.00	1.00	SE121-001P / A

(C) SHOT BLAST THE ENTIRE PANEL 100% USING 180-220 GRIT VIRGIN ALUMINUM OXIDE MEDIA TO REMOVE ANY RESIDUE / MARKINGS FROM THE INITIAL FORMING PROCESS.
MAINTAIN AN APPROXIMATE BLAST ANGLE OF 20 TO 40 DEGREES
Specification: PP475 Rev: 4

IDC Count : 0 Dwg Count: 1 Pgm Count: 0 QAP Count: 1 NDT Count: 0 WPS Count: 0

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev	Service ID
Sub: 14 / Seq: 30	520-SUBLET, EXOTIC HEAT TREAT	1.00	1.00	1.00	SE121-001P / A	THRML TR/NA SA

(C) SOLUTION ANNEAL FORMED PANEL PER THE FOLLOWING:
ATTACH A MINIMUM OF THREE EQUALLY SPACED THERMOCOUPLES TO THE FORMED PANEL
CHARGE FURNACE AND HEAT PART UNTIL THERMOCOUPE READINGS ARE WITHIN 1900 +/-15F.
HOLD PART TEMPERATURE AT 1900 DEGREES F. (+/- 15 DEGREES) HOLD FOR 45 MINUTES (+/ 5 MINUTES)
RAPID COOL (VIA. WATER QUENCHING OR FORCED AIR CIRCULATION) TO 1000 DEGREES F. OPEN AIR COOL TO AMBIENT TEMP.
Specification: AMS2774 Rev: JUL95
Certification: H/T CERTIFICATE
Part Number: SE121-001P-2 PANEL 1
Part Description: DIE FORMED PANEL
Customer: PPPL
Furnace charts: FURNACE CHART

IDC Count : 0 Dwg Count: 1 Pgm Count: 0 QAP Count: 6 NDT Count: 0 WPS Count: 0

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 14 / Seq: 31	820-RECEIVING INSPECTION	1.00	1.00	1.00	SE121-001P / A

(U) REVIEW HEAT TREAT CERTIFICATE AND FURNACE CHART

IDC Count : 1 Dwg Count: 1 Pgm Count: 0 QAP Count: 0 NDT Count: 0 WPS Count: 0

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 14 / Seq: 35	805-INPROCESS INSPECTION - PLA	1.00	1.00	1.00	SE121-001P / A

(C) VISUAL INSPECT SURFACE FOR DAMAGE, PITTING, GOUGES, SCRAPES ETC.....
ON THE INSIDE (CONCAVE SURFACE), LOOK FOR ANY SURFACE DEFECTS OR IRREGULARITIES THAT MAY INHIBIT ACHIEVING THE REQURIED 32 MICRO-INCH

Workorder	Part ID	Qty	Drawing ID / Rev	Engineer
64880/1.0		1	SE121-003P / --	BLUE/DOUG MCCORKLE

FINISH REQURIEMENT. ON THE OUTSIDE (CONVEX SURFACE), VERIFY THE SURFACE FINISH STILL MEETS THE REQUIREMENTS OF ASTM B 443-00.
NOTIFY ENGINEERING (DOUG McCORKLE) FOR CONCURRENCE
VERIFY MAGNETIC PERMEABILITY AND RECORD I.D.C. DATA
Part Number: SE121-001P-2 PANEL 1
Part Description: DIE FORMED PANEL
Specification: PP475 Rev: 2
Specification: ASTM B443 Rev: 00
Specification: PP476 Rev: --
Specification: PP479 Rev: --

IDC Count : 1 Dwg Count: 1 Pgm Count: 0 QAP Count: 6 NDT Count: 0 WPS Count: 0

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 14 / Seq: 40	341-PACIFIC 750	1.00	1.00	1.00	SE121-001P / A

(C) 2ND FORMING OPERATION
ENSURE THE DIE SET FACES ARE CLEAN AND FREE OF DIRT, OIL, GRIME, FOREIGN MATTER, RAISED OR EMBEDDED MATERIAL, ETC....
LOAD THE PREFORMED / ANNEALED PANEL INTO THE DIE SET.
"RE-STRIKE" HYDRAULIC FORM THE PANEL TO ACHIEVE THE GEOMETRICAL SHAPE CONFORMING TO INSPECTION GAGE # MTMFX-2903. PANEL TO GAGE GAP TOLERANCE: .094" MAX.
NOTIFY INSPECTOR FOR Q/A IDC VERIFICATION

Part Number: SE121-001P-2 PANEL 1
Part Description: DIE FORMED PANEL
Specification: PP475 Rev: 2

IDC Count : 1 Dwg Count: 1 Pgm Count: 0 QAP Count: 3 NDT Count: 0 WPS Count: 0

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 14 / Seq: 50	260-SANDBLAST	1.00	1.00	1.00	SE121-001P / A

(C) SHOT BLAST THE ENTIRE PANEL 100% USING 180-220 GRIT VIRGIN ALUMINUM OXIDE MEDIA TO REMOVE ANY RESIDUE / MARKINGS FROM THE FINAL FORMING PROCESS.
MAINTAIN AN APPROXIMATE 20 - 40 DEGREE BLAST ANGLE
Specification: PP475 Rev: 4

IDC Count : 0 Dwg Count: 1 Pgm Count: 0 QAP Count: 1 NDT Count: 0 WPS Count: 0

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 14 / Seq: 60	230-FABRICATION - WEIDNER	1.00	1.00	1.00	SE121-001P / A

(F) TRIM PERIMETER TO PROVIDED TRIM-LINES (LEAVING STOCK FOR POSITIONING AND FITTING ON THE FAB FIXTURE). NOTE THAT INSTALLING THE WELD PREP IS NOT REQUIRED AT THIS STAGE (ADDITIONAL FITTING / TRIMMING WILL BE REQUIRED AT INSTALLATION)
HIGH PRESSURE WASH PER PP475
NOTIFY Q/A FOR FINAL PANEL PROFILE CONFIRMATION PRIOR TO COMPLETING THE POLISHING AND INSTALLATION OF PROTECTIVE PLASTIC
SAND AND POLISH THE INSIDE SURFACE 100% TO ACHIEVE A 32 MICRO SURFACE FINISH (WITH THE EXCEPTION OF THE WELDING / TRIMMING ZONES).
CLEAN PANEL PER PP475

Workorder	Part ID	Qty	Drawing ID / Rev	Engineer
64880/1.0		1	SE121-003P / --	BLUE/DOUG MCCORKLE

APPLY PROTECTIVE PLASTIC FILM (CONTACT DOUG McCORKLE FOR MATERIAL)
STAGE PANEL FOR INSTALLATION
Specification: PP475 Rev: 3

IDC Count : 0 Dwg Count: 1 Pgm Count: 0 QAP Count: 1 NDT Count: 0 WPS Count: 0

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 14 / Seq: 70	805-INPROCESS INSPECTION - PLA	1.00	1.00	1.00	SE121-001P / A

(F)
VERIFY PROFILE TO INSPECTION GAGE # MTMFX-2903. GAP TOLERANCE: .094" MAX. RECORD ACTUAL GAP READINGS ON INSPECTION DRAWING
VERIFY PART PERIMETER EXCEEDS GAGE PERIMETER FOR TRIMMING AND FITTING AT ASSEMBLY
INSPECT AND RECORD INTERIOR SIDE SURFACE FINISH (LESS PERIMETER / WELD ZONES) AND RECORD ACTUAL READINGS ON INSPECTION DRAWING
INSPECT MAGNETIC PERMEABILITY PER PP476 AND ASTM A800, SUPPLEMENTARY REQUIREMENT S1 (BUT THE MEASUREMENT SHALL BE TAKEN IN RELATIVE PERMEABILITY RATHER THAN FERRITE CONTENT. THE SURFACES OF THE PVVS SHELL AND PORT EXTENSION SHALL BE CHECKED AND DOCUMENTED ON A 6" GRID. THE SURFACES AT AND NEAR WELDS WILL BE CHECKED ON A 1" GRID.
RECORD ACTUAL PERMEABILITY READINGS ON INSPECTION DRAWING
INSPECT MATERIAL THICKNESS PER PP477 (6" GRID)
RECORD ACTUAL MATERIAL THICKNESS ON INSPECTION DRAWING

Test Certification: SE121-001P-10MTM Rev: 2A
Part Number: SE121-001P-2 PANEL 1
Part Description: DIE FORMED PANEL
Specification: ASME B46.1 Rev: 95
Specification: ASTM A800
Specification: PP475 Rev: 2
Specification: PP476 Rev: --
Specification: PP477 Rev: --
Specification: PP479 Rev: --

IDC Count : 3 Dwg Count: 1 Pgm Count: 0 QAP Count: 9 NDT Count: 0 WPS Count: 0

Sub ID	Part ID	Qty	Drawing ID / Rev
15	SE121-001P-2 PANEL # 2	1	/
			Parent Sub:1 Op:10

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 15 / Seq: 10	820-RECEIVING INSPECTION	1.00	1.00	1.00	SE121-001P / A

(C)
INSPECT BLANK SIZE PER DEVELOPMENT DRAWING (AUDIT DIMENSIONS WILL BE PROVIDED BY DOUG McCORKLE)
INSPECT MATERIAL THICKNESS PER PP477
VISUAL INSPECT SURFACE FINISH (PANEL SURFACE SHOULD BE A SMOOTH MILL PRODUCED SURFACE, WITHOUT SCRAPES, GOUGES, HEAVY PITS, ETC... IT SHOULD BE IN A CONDITION THAT CAN BE READILY POLISHED WITHOUT EXCESSIVE MATERIAL REMOVAL (CONTACT ENGINEERING (DOUG McCORKLE IF FURTHER CLARIFICATION IS NEEDED)
SAMPLE INSPECT MAGNETIC PERMEABILITY PER PP476, AND ASTM A800, SUPPLIMENTARY REQUIREMENT S1 (BUT THE MEASUREMENT SHALL BE TAKEN IN RELATIVE PERMEABILITY RATHER THAN FERRITE CONTENT). SAMPLE LOT SIZE: AT LEAST 10 EVENLY SPACED LOCATIONS.
RECORD IDC DATA

Workorder	Part ID	Qty	Drawing ID / Rev	Engineer
64880/1.0		1	SE121-003P / --	BLUE/DOUG MCCORKLE

Part Number: SE121-001P-2 PANEL 2
Part Description: DIE FORMED PANEL
Specification: ASTM A800 Rev: 01
Customer: PPPL
Specification: ASTM B443 Rev: 00
Specification: ASME B46.1 Rev: 95
Specification: PP475 Rev: 2
Specification: PP476 Rev: A
Specification: PP477 Rev: A

IDC Count : 3 Dwg Count: 1 Pgm Count: 0 QAP Count: 9 NDT Count: 0 WPS Count: 0

Piece #	Part ID	Qty	Drawing ID / Rev	Vendor	Dimensions
10	SE121-001P-2 PANEL # 2-PANEL BLANK .375" THK INCONEL 625	1.0	SE121 / --	1810	

Vendor Part ID: SE121-001P-2 PANEL # 2

(C) PANEL BLANK AWJ CUT FROM .375" INCONEL 625 TO PROVIDED GEOMETRICAL SHAPE
(SE121-001P-2 PANEL # 2.DXF, REV. --)
MATERIAL REQUIREMENTS: INCONEL 625 (UNS N06625) PER ASTM B 443-00 ANNEALED
MAGNETIC PERMEABILITY SHALL NOT EXCEED 1.00 (REF. ASTM A800).
SURFACE MUST BE PROTECTED FROM CONTACT WITH IRON AND IRON ALLOY MATERIALS
CERTS & MILL TEST REPORTS REQ'D WITH SHIPMENT.
APPROXIMATE OVERALL SIZE: 35.07*44.03

Material Certification:
Part Number: SE121-001P-2 PANEL 2
Part Description: DIE FORMED PANEL
Specification: ASTM A800 Rev: 01
Specification: ASTM B443 Rev: 00
Specification: ASTM B46.1 Rev: 95

QAP Count: 6

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 15 / Seq: 18	105-DEBURR PLT 1 LOW BAY	1.00	1.00	1.00	SE121-001P / A

(C) RADIUS ALL CUT EDGES PRIOR TO FORMING
Specification: PP475 Rev: 2

IDC Count : 0 Dwg Count: 1 Pgm Count: 0 QAP Count: 1 NDT Count: 0 WPS Count: 0

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 15 / Seq: 20	341-PACIFIC 750	1.00	1.00	1.00	SE121-001P / A

(C) 1ST FORM OPERATION:
LOAD, ALIGN, AND BOLT DIE SET # MTMFX-2885 - MTMFX-2886 INTO THE 750 TON HYDRAULIC PRESS.
ENSURE THE DIE SET FACES ARE CLEAN AND FREE OF DIRT, OIL, GRIME, FOREIGN MATTER, RAISED OR EMBEDDED MATERIAL, ETC....
ENSURE THE PANEL BLANK IS CLEAN AND FREE OF FOREIGN MATTER.

Workorder	Part ID	Qty	Drawing ID / Rev	Engineer
64880/1.0		1	SE121-003P / --	BLUE/DOUG MCCORKLE

LOAD THE PANEL BLANK INTO THE DIE SET.
HYDRAULIC FORM THE PANEL TO ACHIEVE THE GEOMETRICAL SHAPE CONFORMING TO INSPECTION GAGE # MTMFX-2904.
NOTE THAT THE FINAL PANEL TO GAGE GAP TOLERANCE IS .094" MAX. IT IS DESIRED TO GET AS CLOSE TO THIS AS POSSIBLE PRIOR TO ANNEALING. CLOSELY WATCH THE FORMING, WRINKLING, AND SPRING-BACK CHARACTERISTICS OF THE MATERIAL DURING THE FORMING PROCESS. WHEN IT'S APPARENT THE MATERIAL IS WORK HARDENING TO A DEGREE THAT FORMING BECOMES DIFFICULT, OR THE PHYSICAL INTEGRITY OF THE MATERIAL IS AT RISK, PROCEED TO THE NEXT SEQUENTIAL OPERATION (BLAST AND ANNEAL). A FINAL FORMING SEQUENCE IS PROVIDED FOR "FINAL SIZING" AFTER THE MATERIAL HAS BEEN ANNEALED.
ENSURE THE PANEL MATERIAL EXTENDS BEYOND THE PERIMETER OF THE GAGE (ENOUGH TO PROVIDE ADEQUATE STOCK ALLOWANCE FOR RE-POSITIONING, RE-STRIKING, AND ACCURATE TRIMMING AFTER ANNEALING).

Part Number: SE121-001P-2 PANEL 2
Part Description: DIE FORMED PANEL
Specification: PP475 Rev: 2

IDC Count : 0 Dwg Count: 1 Pgm Count: 0 QAP Count: 3 NDT Count: 0 WPS Count: 0

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 15 / Seq: 22	230-FABRICATION - WEIDNER	1.00	1.00	1.00	

(C) CUT OUT A LIFTING EYE FROM THE EXCESS TRIM STOCK THAT WAS REMOVED DURING THE FORMING CYCLE. INSTALL AND WELD IT TO THE PERIPHERAL EDGE OF THE FORMED PANEL (WHICH STILL HAS EXCESS TRIM STOCK REMAINING).
POSITIONING CONSIDERATIONS:
1. POSITION TO SUIT NORMAL HANDLING AND LIFTING.
2. POSITION TO SUIT SETTING IN A VERTICAL STANCE IN THE HEAT TREAT OVEN (WIDE SIDE DOWN).
3. SHAPE AND POSITION THE LIFTING HOOK FOR A "QUICK AND EASY GAFF HOOK STYLE GRAB" WHEN REMOVING THE PARTS FROM THE HOT OVEN FOR A RAPID COOLING CYCLE.
Specification: PP475 Rev: 3

IDC Count : 0 Dwg Count: 0 Pgm Count: 0 QAP Count: 1 NDT Count: 0 WPS Count: 1

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 15 / Seq: 25	260-SANDBLAST	1.00	1.00	1.00	SE121-001P / A

(R) SHOT BLAST THE ENTIRE PANEL 100% USING 180-220 GRIT VIRGIN ALUMINUM OXIDE MEDIA TO REMOVE ANY RESIDUE / MARKINGS FROM THE INITIAL FORMING PROCESS.
MAINTAIN AN APPROXIMATE BLAST ANGLE OF 20 TO 40 DEGREES
Specification: PP475 Rev: 4

IDC Count : 0 Dwg Count: 1 Pgm Count: 0 QAP Count: 1 NDT Count: 0 WPS Count: 0

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev	Service ID
Sub: 15 / Seq: 30	520-SUBLET, EXOTIC HEAT TREAT	1.00	1.00	1.00	SE121-001P / A	THRML TR/NA SA

(R) SOLUTION ANNEAL FORMED PANEL PER THE FOLLOWING:
ATTACH A MINIMUM OF THREE EQUALLY SPACED THERMOCOUPLES TO THE FORMED PANEL
CHARGE FURNACE AND HEAT PART UNTIL THERMOCOUPE READINGS ARE WITHIN 1900 +/-15F.
HOLD PART TEMPERATURE AT 1900 DEGREES F. (+/- 15 DEGREES) HOLD FOR 45 MINUTES (+/ 5 MINUTES)

Workorder	Part ID	Qty	Drawing ID / Rev	Engineer
64880/1.0		1	SE121-003P / --	BLUE/DOUG MCCORKLE

RAPID COOL (VIA. WATER QUENCHING OR FORCED AIR CIRCULATION) TO 1000 DEGREES F. OPEN AIR COOL TO AMBIENT TEMP.
Specification: AMS2774 Rev: JUL95
Certification: H/T CERTIFICATE
Part Number: SE121-001P-2 PANEL 2
Part Description: DIE FORMED PANEL
Customer: PPPL
Furnace charts: FURNACE CHART
Specification: PP475 Rev: 2

IDC Count : 0 Dwg Count: 1 Pgm Count: 0 QAP Count: 7 NDT Count: 0 WPS Count: 0

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 15 / Seq: 31	820-RECEIVING INSPECTION	1.00	1.00	1.00	SE121-001P / A

(R) REVIEW HEAT TREAT CERTIFICATE AND FURNACE CHART

IDC Count : 1 Dwg Count: 1 Pgm Count: 0 QAP Count: 0 NDT Count: 0 WPS Count: 0

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 15 / Seq: 35	805-INPROCESS INSPECTION - PLA	1.00	1.00	1.00	SE121-001P / A

(R) VISUAL INSPECT SURFACE FOR DAMAGE, PITTING, GOUGES, SCRAPES ETC.....
ON THE INSIDE (CONCAVE SURFACE), LOOK FOR ANY SURFACE DEFECTS OR IRREGULARITIES THAT MAY INHIBIT ACHIEVING THE REQURIED 32 MICRO-INCH FINISH REQURIEMENT. ON THE OUTSIDE (CONVEX SURFACE), VERIFY THE SURFACE FINISH STILL MEETS THE REQUIREMENTS OF ASTM B 443-00.
NOTIFY ENGINEERING (DOUG McCORKLE) FOR CONCURRENCE
VERIFY MAGNETIC PERMEABILITY AND RECORD I.D.C. DATA
Part Number: SE121-001P-2 PANEL 1
Part Description: DIE FORMED PANEL
Specification: PP475 Rev: 2
Specification: ASTM B443 Rev: 00
Specification: PP476 Rev: --
Specification: PP479 Rev: --

IDC Count : 1 Dwg Count: 1 Pgm Count: 0 QAP Count: 6 NDT Count: 0 WPS Count: 0

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 15 / Seq: 40	341-PACIFIC 750	1.00	1.00	1.00	SE121-001P / A

(R) 2ND FORMING OPERATION
ENSURE THE DIE SET FACES ARE CLEAN AND FREE OF DIRT, OIL, GRIME, FOREIGN MATTER, RAISED OR EMBEDDED MATERIAL, ETC....
LOAD THE PREFORMED / ANNEALED PANEL INTO THE DIE SET.
"RE-STRIKE" HYDRAULIC FORM THE PANEL TO ACHIEVE THE GEOMETRICAL SHAPE CONFORMING TO INSPECTION GAGE # MTMFX-2904. PANEL TO GAGE GAP TOLERANCE: .094" MAX.
NOTIFY INSPECTOR FOR Q/A IDC VERIFICATION

Part Number: SE121-001P-2 PANEL 2
Part Description: DIE FORMED PANEL

Workorder	Part ID	Qty	Drawing ID / Rev	Engineer
64880/1.0		1	SE121-003P / --	BLUE/DOUG MCCORKLE

Specification: PP475 Rev: 2

IDC Count : 1 Dwg Count: 1 Pgm Count: 0 QAP Count: 3 NDT Count: 0 WPS Count: 0

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 15 / Seq: 50	260-SANDBLAST	1.00	1.00	1.00	SE121-001P / A

(F) SHOT BLAST THE ENTIRE PANEL 100% USING 180-220 GRIT VIRGIN ALUMINUM OXIDE MEDIA TO REMOVE ANY RESIDUE / MARKINGS FROM THE FINAL FORMING PROCESS.

Specification: PP475 Rev: 2

IDC Count : 0 Dwg Count: 1 Pgm Count: 0 QAP Count: 1 NDT Count: 0 WPS Count: 0

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 15 / Seq: 60	230-FABRICATION - WEIDNER	1.00	1.00	1.00	SE121-001P / A

(F) TRIM PERIMETER TO PROVIDED TRIM-LINES (LEAVING STOCK FOR POSITIONING AND FITTING ON THE FAB FIXTURE). NOTE THAT INSTALLING THE WELD PREP IS NOT REQUIRED AT THIS STAGE (ADDITIONAL FITTING / TRIMMING WILL BE REQUIRED AT INSTALLATION)
HIGH PRESSURE WASH PER PP475
NOTIFY Q/A FOR FINAL PANEL PROFILE CONFIRMATION PRIOR TO COMPLETING THE POLISHING AND INSTALLATION OF PROTECTIVE PLASTIC
SAND AND POLISH THE INSIDE SURFACE 100% TO ACHIEVE A 32 MICRO SURFACE FINISH (WITH THE EXCEPTION OF THE WELDING / TRIMMING ZONES).
CLEAN PANEL PER PP475
APPLY PROTECTIVE PLASTIC FILM (CONTACT DOUG McCORKLE FOR MATERIAL)
STAGE PANEL FOR INSTALLATION
Specification: PP475 Rev: 3

IDC Count : 0 Dwg Count: 1 Pgm Count: 0 QAP Count: 1 NDT Count: 0 WPS Count: 0

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 15 / Seq: 70	805-INPROCESS INSPECTION - PLA	1.00	1.00	1.00	SE121-001P / A

(F) VERIFY PROFILE TO INSPECTION GAGE # MTMFX-2904. GAP TOLERANCE: .094" MAX. RECORD ACTUAL GAP READINGS ON INSPECTION DRAWING
VERIFY PART PERIMETER EXCEEDS GAGE PERIMETER FOR TRIMMING AND FITTING AT ASSEMBLY
INSPECT AND RECORD INTERIOR SIDE SURFACE FINISH (LESS PERIMETER / WELD ZONES) AND RECORD ACTUAL READINGS ON INSPECTION DRAWING
INSPECT MAGNETIC PERMEABILITY PER PP476 AND ASTM A800, SUPPLEMENTARY REQUIREMENT S1 (BUT THE MEASUREMENT SHALL BE TAKEN IN RELATIVE PERMEABILITY RATHER THAN FERRITE CONTENT. THE SURFACES OF THE PVVS SHELL AND PORT EXTENSION SHALL BE CHECKED AND DOCUMENTED ON A 6" GRID. THE SURFACES AT AND NEAR WELDS WILL BE CHECKED ON A 1" GRID.
RECORD ACTUAL PERMEABILITY READINGS ON INSPECTION DRAWING
INSPECT MATERIAL THICKNESS PER PP477 (6" GRID)
RECORD ACTUAL MATERIAL THICKNESS ON INSPECTION DRAWING

Test Certification: SE121-001P-10MTM Rev: 2A
Part Number: SE121-001P-2 PANEL 2
Part Description: DIE FORMED PANEL
Specification: ASME B46.1 Rev: 95
Specification: ASTM A800
Specification: PP475 Rev: 2

Workorder	Part ID	Qty	Drawing ID / Rev	Engineer
64880/1.0		1	SE121-003P / --	BLUE/DOUG MCCORKLE

Specification: PP476 Rev: --
Specification: PP477 Rev: --
Specification: PP479 Rev: --

IDC Count : 3 Dwg Count: 1 Pgm Count: 0 QAP Count: 9 NDT Count: 0 WPS Count: 0

Sub ID	Part ID	Qty	Drawing ID / Rev
16	SE121-001P-2 PANEL # 3	1	/
			Parent Sub:1 Op:10

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 16 / Seq: 10	820-RECEIVING INSPECTION	1.00	1.00	1.00	SE121-001P / A

(C) INSPECT BLANK SIZE PER DEVELOPMENT DRAWING (AUDIT DIMENSIONS WILL BE PROVIDED BY DOUG McCORKLE)
INSPECT MATERIAL THICKNESS PER PP477
VISUAL INSPECT SURFACE FINISH (PANEL SURFACE SHOULD BE A SMOOTH MILL PRODUCED SURFACE, WITHOUT SCRAPES, GOUGES, HEAVY PITS, ETC... IT SHOULD BE IN A CONDITION THAT CAN BE READILY POLISHED WITHOUT EXCESSIVE MATERIAL REMOVAL (CONTACT ENGINEERING (DOUG McCORKLE IF FURTHER CLARIFICATION IS NEEDED)
SAMPLE INSPECT MAGNETIC PERMEABILITY PER PP476, AND ASTM A800, SUPPLIMENTARY REQUIREMENT S1 (BUT THE MEASUREMENT SHALL BE TAKEN IN RELATIVE PERMEABILITY RATHER THAN FERRITE CONTENT). SAMPLE LOT SIZE: AT LEAST 10 EVENLY SPACED LOCATIONS.
RECORD IDC DATA

Part Number: SE121-001P-2 PANEL 3
Part Description: DIE FORMED PANEL
Specification: ASTM A800 Rev: 01
Customer: PPPL
Specification: ASTM B443 Rev: 00
Specification: ASME B46.1 Rev: 95
Specification: PP475 Rev: 2
Specification: PP476 Rev: A
Specification: PP477 Rev: A

IDC Count : 3 Dwg Count: 1 Pgm Count: 0 QAP Count: 9 NDT Count: 0 WPS Count: 0

Piece #	Part ID	Qty	Drawing ID / Rev	Vendor	Dimensions
10	SE121-001P-2 PANEL # 3-PANEL BLANK .375" THK INCONEL 625	1.0	SE121 / --	1810	
	Vendor Part ID: SE121-001P-2 PANEL # 3				

(C) PANEL BLANK AWJ CUT FROM .375" INCONEL 625 TO PROVIDED GEOMETRICAL SHAPE (SE121-001P-2 PANEL # 1.DXF, REV. --)
MATERIAL REQUIREMENTS: INCONEL 625 (UNS N06625) PER ASTM B 443-00 ANNEALED
MAGNETIC PERMEABILITY SHALL NOT EXCEED 1.00 (REF. ASTM A800).
SURFACE MUST BE PROTECTED FROM CONTACT WITH IRON AND IRON ALLOY MATERIALS
CERTS & MILL TEST REPORTS REQ'D WITH SHIPMENT.
APPROXIMATE OVERALL SIZE: 54.97*76.37

Material Certification:
Part Number: SE121-001P-2 PANEL # 1

Workorder	Part ID	Qty	Drawing ID / Rev	Engineer
64880/1.0		1	SE121-003P / --	BLUE/DOUG MCCORKLE

Part Description: DIE FORMED PANEL
Specification: ASTM A800 Rev: 01
Specification: ASTM B443 Rev: 00
Specification: ASTM B46.1 Rev: 95

QAP Count: 6

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 16 / Seq: 18	105-DEBURR PLT 1 LOW BAY	1.00	1.00	1.00	SE121-001P / A
(C)	RADIUS ALL CUT EDGES PRIOR TO FORMING				
	Specification: PP475 Rev: 2				

IDC Count : 0 Dwg Count: 1 Pgm Count: 0 QAP Count: 1 NDT Count: 0 WPS Count: 0

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 16 / Seq: 20	341-PACIFIC 750	1.00	1.00	1.00	SE121-001P / A
(C)	1ST FORM OPERATION:				
	LOAD, ALIGN, AND BOLT DIE SET # MTMFX-2887 - MTMFX-2892 INTO THE 750 TON HYDRAULIC PRESS.				
	ENSURE THE DIE SET FACES ARE CLEAN AND FREE OF DIRT, OIL, GRIME, FOREIGN MATTER, RAISED OR EMBEDDED MATERIAL, ETC....				
	ENSURE THE PANEL BLANK IS CLEAN AND FREE OF FOREIGN MATTER.				
	LOAD THE PANEL BLANK INTO THE DIE SET.				
	HYDRAULIC FORM THE PANEL TO ACHIEVE THE GEOMETRICAL SHAPE CONFORMING TO INSPECTION GAGE # MTMFX-2905.				
	NOTE THAT THE FINAL PANEL TO GAGE GAP TOLERANCE IS .094" MAX. IT IS DESIRED TO GET AS CLOSE TO THIS AS POSSIBLE PRIOR TO ANNEALING. CLOSELY WATCH THE FORMING, WRINKLING, AND SPRING-BACK CHARACTERISTICS OF THE MATERIAL DURING THE FORMING PROCESS. WHEN IT'S APPARENT THE MATERIAL IS WORK HARDENING TO A DEGREE THAT FORMING BECOMES DIFFICULT, OR THE PHYSICAL INTEGRITY OF THE MATERIAL IS AT RISK, PROCEED TO THE NEXT SEQUENTIAL OPERATION (BLAST AND ANNEAL). A FINAL FORMING SEQUENCE IS PROVIDED FOR "FINAL SIZING" AFTER THE MATERIAL HAS BEEN ANNEALED.				
	ENSURE THE PANEL MATERIAL EXTENDS BEYOND THE PERIMETER OF THE GAGE (ENOUGH TO PROVIDE ADEQUATE STOCK ALLOWANCE FOR RE-POSITIONING, RE-STRIKING, AND ACCURATE TRIMMING AFTER ANNEALING).				

Part Number: SE121-001P-2 PANEL 3
Part Description: DIE FORMED PANEL
Specification: PP475 Rev: 2

IDC Count : 0 Dwg Count: 1 Pgm Count: 0 QAP Count: 3 NDT Count: 0 WPS Count: 0

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 16 / Seq: 22	230-FABRICATION - WEIDNER	1.00	1.00	1.00	
(C)	CUT OUT A LIFTING EYE FROM THE EXCESS TRIM STOCK THAT WAS REMOVED DURING THE FORMING CYCLE. INSTALL AND WELD IT TO THE PERIPHERAL EDGE OF THE FORMED PANEL (WHICH STILL HAS EXCESS TRIM STOCK REMAINING).				
	POSITIONING CONSIDERATIONS:				
	1. POSITION TO SUIT NORMAL HANDLING AND LIFTING.				
	2. POSITION TO SUIT SETTING IN A VERTICAL STANCE IN THE HEAT TREAT OVEN (WIDE SIDE DOWN).				
	3. SHAPE AND POSITION THE LIFTING HOOK FOR A "QUICK AND EASY GAFF HOOK STYLE GRAB" WHEN REMOVING THE PARTS FROM THE HOT OVEN FOR A				

Workorder	Part ID	Qty	Drawing ID / Rev	Engineer
64880/1.0		1	SE121-003P / --	BLUE/DOUG MCCORKLE

RAPID COOLING CYCLE.
Specification: PP475 Rev: 3

IDC Count : 0 Dwg Count: 0 Pgm Count: 0 QAP Count: 1 NDT Count: 0 WPS Count: 1

WPS291.5 Rev:1 GTAW MAN
GTAW - Manual Fillers: INCONEL625_035_GMAW / INCONEL625_062_GTAW / INCONEL625_093_GTAW
Notes: LIFTING DEVICE TO PANEL EDGE - ALL REMOVED, PWHT DOES NOT MATTER

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 16 / Seq: 25	260-SANDBLAST	1.00	1.00	1.00	SE121-001P / A

(C) SHOT BLAST THE ENTIRE PANEL 100% USING 180-220 GRIT VIRGIN ALUMINUM OXIDE MEDIA TO REMOVE ANY RESIDUE / MARKINGS FROM THE INITIAL FORMING PROCESS.
MAINTAIN AN APPROXIMATE BLAST ANGLE OF 20 TO 40 DEGREES
Specification: PP475 Rev: 4

IDC Count : 0 Dwg Count: 1 Pgm Count: 0 QAP Count: 1 NDT Count: 0 WPS Count: 0

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev	Service ID
Sub: 16 / Seq: 30	520-SUBLET, EXOTIC HEAT TREAT	1.00	1.00	1.00	SE121-001P / A	THRML TR/NA SA

(C) SOLUTION ANNEAL FORMED PANEL PER THE FOLLOWING:
ATTACH A MINIMUM OF THREE EQUALLY SPACED THERMOCOUPLES TO THE FORMED PANEL
CHARGE FURNACE AND HEAT PART UNTIL THERMOCOUPE READINGS ARE WITHIN 1900 +/-15F.
HOLD PART TEMPERATURE AT 1900 DEGREES F. (+/- 15 DEGREES) HOLD FOR 45 MINUTES (+/ 5 MINUTES)
RAPID COOL (VIA. WATER QUENCHING OR FORCED AIR CIRCULATION) TO 1000 DEGREES F. OPEN AIR COOL TO AMBIENT TEMP.
Specification: AMS2774 Rev: JUL95
Certification: H/T CERTIFICATE
Part Number: SE121-001P-2 PANEL 3
Part Description: DIE FORMED PANEL
Customer: PPPL
Furnace charts: FURNACE CHART
Specification: PP475 Rev: 2

IDC Count : 0 Dwg Count: 1 Pgm Count: 0 QAP Count: 7 NDT Count: 0 WPS Count: 0

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 16 / Seq: 31	820-RECEIVING INSPECTION	1.00	1.00	1.00	SE121-001P / A

(U) REVIEW HEAT TREAT CERTIFICATE AND FURNACE CHART

IDC Count : 1 Dwg Count: 1 Pgm Count: 0 QAP Count: 0 NDT Count: 0 WPS Count: 0

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 16 / Seq: 35	805-INPROCESS INSPECTION - PLA	1.00	1.00	1.00	SE121-001P / A

(R) VISUAL INSPECT SURFACE FOR DAMAGE, PITTING, GOUGES, SCRAPES ETC.....
ON THE INSIDE (CONCAVE SURFACE), LOOK FOR ANY SURFACE DEFECTS OR IRREGULARITIES THAT MAY INHIBIT ACHIEVING THE REQURIED 32 MICRO-INCH

Workorder	Part ID	Qty	Drawing ID / Rev	Engineer
64880/1.0		1	SE121-003P / --	BLUE/DOUG MCCORKLE

FINISH REQURIEMENT. ON THE OUTSIDE (CONVEX SURFACE), VERIFY THE SURFACE FINISH STILL MEETS THE REQUIREMENTS OF ASTM B 443-00.
NOTIFY ENGINEERING (DOUG McCORKLE) FOR CONCURRENCE
VERIFY MAGNETIC PERMEABILITY AND RECORD I.D.C. DATA
Part Number: SE121-001P-2 PANEL 1
Part Description: DIE FORMED PANEL
Specification: PP475 Rev: 2
Specification: ASTM B443 Rev: 00
Specification: PP476 Rev: --
Specification: PP479 Rev: --

IDC Count : 1 Dwg Count: 1 Pgm Count: 0 QAP Count: 6 NDT Count: 0 WPS Count: 0

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 16 / Seq: 40	341-PACIFIC 750	1.00	1.00	1.00	SE121-001P / A

(R) 2ND FORMING OPERATION
ENSURE THE DIE SET FACES ARE CLEAN AND FREE OF DIRT, OIL, GRIME, FOREIGN MATTER, RAISED OR EMBEDDED MATERIAL, ETC....
LOAD THE PREFORMED / ANNEALED PANEL INTO THE DIE SET.
"RE-STRIKE" HYDRAULIC FORM THE PANEL TO ACHIEVE THE GEOMETRICAL SHAPE CONFORMING TO INSPECTION GAGE # MTMFX-2905. PANEL TO GAGE GAP TOLERANCE: .094" MAX.
NOTIFY INSPECTOR FOR Q/A IDC VERIFICATION

Part Number: SE121-001P-2 PANEL 3
Part Description: DIE FORMED PANEL
Specification: PP475 Rev: 2

IDC Count : 1 Dwg Count: 1 Pgm Count: 0 QAP Count: 3 NDT Count: 0 WPS Count: 0

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 16 / Seq: 50	260-SANDBLAST	1.00	1.00	1.00	SE121-001P / A

(R) SHOT BLAST THE ENTIRE PANEL 100% USING 180-220 GRIT VIRGIN ALUMINUM OXIDE MEDIA TO REMOVE ANY RESIDUE / MARKINGS FROM THE FINAL FORMING PROCESS.
Specification: PP475 Rev: 2

IDC Count : 0 Dwg Count: 1 Pgm Count: 0 QAP Count: 1 NDT Count: 0 WPS Count: 0

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 16 / Seq: 60	230-FABRICATION - WEIDNER	1.00	1.00	1.00	SE121-001P / A

(R) TRIM PERIMETER TO PROVIDED TRIM-LINES (LEAVING STOCK FOR POSITIONING AND FITTING ON THE FAB FIXTURE). NOTE THAT INSTALLING THE WELD PREP IS NOT REQUIRED AT THIS STAGE (ADDITIONAL FITTING / TRIMMING WILL BE REQUIRED AT INSTALLATION)
HIGH PRESSURE WASH PER PP475
NOTIFY Q/A FOR FINAL PANEL PROFILE CONFIRMATION PRIOR TO COMPLETING THE POLISHING AND INSTALLATION OF PROTECTIVE PLASTIC
SAND AND POLISH THE INSIDE SURFACE 100% TO ACHIEVE A 32 MICRO SURFACE FINISH (WITH THE EXCEPTION OF THE WELDING / TRIMMING ZONES).
CLEAN PANEL PER PP475
APPLY PROTECTIVE PLASTIC FILM (CONTACT DOUG McCORKLE FOR MATERIAL)

Workorder	Part ID	Qty	Drawing ID / Rev	Engineer
64880/1.0		1	SE121-003P / --	BLUE/DOUG MCCORKLE

STAGE PANEL FOR INSTALLATION
Specification: PP475 Rev: 3

IDC Count : 0 Dwg Count: 1 Pgm Count: 0 QAP Count: 1 NDT Count: 0 WPS Count: 0

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 16 / Seq: 70	805-INPROCESS INSPECTION - PLA	1.00	1.00	1.00	SE121-001P / A

(R)
VERIFY PROFILE TO INSPECTION GAGE # MTMFX-2905. GAP TOLERANCE: .094" MAX. RECORD ACTUAL GAP READINGS ON INSPECTION DRAWING
VERIFY PART PERIMETER EXCEEDS GAGE PERIMETER FOR TRIMMING AND FITTING AT ASSEMBLY
INSPECT AND RECORD INTERIOR SIDE SURFACE FINISH (LESS PERIMETER / WELD ZONES) AND RECORD ACTUAL READINGS ON INSPECTION DRAWING
INSPECT MAGNETIC PERMEABILITY PER PP476 AND ASTM A800, SUPPLEMENTARY REQUIREMENT S1 (BUT THE MEASUREMENT SHALL BE TAKEN IN RELATIVE PERMEABILITY RATHER THAN FERRITE CONTENT. THE SURFACES OF THE PVVS SHELL AND PORT EXTENSION SHALL BE CHECKED AND DOCUMENTED ON A 6" GRID. THE SURFACES AT AND NEAR WELDS WILL BE CHECKED ON A 1" GRID.
RECORD ACTUAL PERMEABILITY READINGS ON INSPECTION DRAWING
INSPECT MATERIAL THICKNESS PER PP477 (6" GRID)
RECORD ACTUAL MATERIAL THICKNESS ON INSPECTION DRAWING

Test Certification: SE121-001P-10MTM Rev: 2A
Part Number: SE121-001P-2 PANEL 3
Part Description: DIE FORMED PANEL
Specification: ASME B46.1 Rev: 95
Specification: ASTM A800
Specification: PP475 Rev: 2
Specification: PP476 Rev: --
Specification: PP477 Rev: --
Specification: PP479 Rev: --

IDC Count : 3 Dwg Count: 1 Pgm Count: 0 QAP Count: 9 NDT Count: 0 WPS Count: 0

Sub ID	Part ID	Qty	Drawing ID / Rev
17	SE121-001P-2 PANEL # 4	1	/
			Parent Sub:1 Op:10

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 17 / Seq: 10	820-RECEIVING INSPECTION	1.00	1.00	1.00	SE121-001P / A

(C)
INSPECT BLANK SIZE PER DEVELOPMENT DRAWING (AUDIT DIMENSIONS WILL BE PROVIDED BY DOUG McCORKLE)
INSPECT MATERIAL THICKNESS PER PP477
VISUAL INSPECT SURFACE FINISH (PANEL SURFACE SHOULD BE A SMOOTH MILL PRODUCED SURFACE, WITHOUT SCRAPES, GOUGES, HEAVY PITS, ETC... IT SHOULD BE IN A CONDITION THAT CAN BE READILY POLISHED WITHOUT EXCESSIVE MATERIAL REMOVAL (CONTACT ENGINEERING (DOUG McCORKLE IF FURTHER CLARIFICATION IS NEEDED)
SAMPLE INSPECT MAGNETIC PERMEABILITY PER PP476, AND ASTM A800, SUPPLIMENTARY REQUIREMENT S1 (BUT THE MEASUREMENT SHALL BE TAKEN IN RELATIVE PERMEABILITY RATHER THAN FERRITE CONTENT). SAMPLE LOT SIZE: AT LEAST 10 EVENLY SPACED LOCATIONS.
RECORD IDC DATA

Workorder	Part ID	Qty	Drawing ID / Rev	Engineer
64880/1.0		1	SE121-003P / --	BLUE/DOUG MCCORKLE

Part Number: SE121-001P-2 PANEL 4
Part Description: DIE FORMED PANEL
Specification: ASTM A800 Rev: 01
Customer: PPPL
Specification: ASTM B443 Rev: 00
Specification: ASME B46.1 Rev: 95
Specification: PP475 Rev: 2
Specification: PP476 Rev: A
Specification: PP477 Rev: A

IDC Count : 3 Dwg Count: 1 Pgm Count: 0 QAP Count: 9 NDT Count: 0 WPS Count: 0

Piece #	Part ID	Qty	Drawing ID / Rev	Vendor	Dimensions
10	SE121-001P-2 PANEL # 4-PANEL BLANK .375" THK INCONEL 625	1.0	SE121 / --	1810	
	Vendor Part ID: SE121-001P-2 PANEL # 4				
(C)	PANEL BLANK AWJ CUT FROM .375" INCONEL 625 TO PROVIDED GEOMETRICAL SHAPE (SE121-001P-2 PANEL # 1.DXF, REV. --)				
	MATERIAL REQUIREMENTS: INCONEL 625 (UNS N06625) PER ASTM B 443-00 ANNEALED				
	MAGNETIC PERMEABILITY SHALL NOT EXCEED 1.00 (REF. ASTM A800).				
	SURFACE MUST BE PROTECTED FROM CONTACT WITH IRON AND IRON ALLOY MATERIALS				
	CERTS & MILL TEST REPORTS REQ'D WITH SHIPMENT.				
	APPROXIMATE OVERALL SIZE: 54.97*76.37				

Material Certification:
Part Number: SE121-001P-2 PANEL # 1
Part Description: DIE FORMED PANEL
Specification: ASTM A800 Rev: 01
Specification: ASTM B443 Rev: 00
Specification: ASTM B46.1 Rev: 95

QAP Count: 6

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 17 / Seq: 18	105-DEBURR PLT 1 LOW BAY	1.00	1.00	1.00	SE121-001P / A
(C)	RADIUS ALL CUT EDGES PRIOR TO FORMING				
	Specification: PP475 Rev: 2				

IDC Count : 0 Dwg Count: 1 Pgm Count: 0 QAP Count: 1 NDT Count: 0 WPS Count: 0

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 17 / Seq: 20	341-PACIFIC 750	1.00	1.00	1.00	SE121-001P / A
(C)	1ST FORM OPERATION:				
	LOAD, ALIGN, AND BOLT DIE SET # MTMFX-2888 - MTMFX-2889 INTO THE 750 TON HYDRAULIC PRESS.				
	ENSURE THE DIE SET FACES ARE CLEAN AND FREE OF DIRT, OIL, GRIME, FOREIGN MATTER, RAISED OR EMBEDDED MATERIAL, ETC....				
	ENSURE THE PANEL BLANK IS CLEAN AND FREE OF FOREIGN MATTER.				
	LOAD THE PANEL BLANK INTO THE DIE SET.				

Workorder	Part ID	Qty	Drawing ID / Rev	Engineer
64880/1.0		1	SE121-003P / --	BLUE/DOUG MCCORKLE

HYDRAULIC FORM THE PANEL TO ACHIEVE THE GEOMETRICAL SHAPE CONFORMING TO INSPECTION GAGE # MTMFX-2906.
NOTE THAT THE FINAL PANEL TO GAGE GAP TOLERANCE IS .094" MAX. IT IS DESIRED TO GET AS CLOSE TO THIS AS POSSIBLE PRIOR TO ANNEALING. CLOSELY WATCH THE FORMING, WRINKLING, AND SPRING-BACK CHARACTERISTICS OF THE MATERIAL DURING THE FORMING PROCESS. WHEN IT'S APPARENT THE MATERIAL IS WORK HARDENING TO A DEGREE THAT FORMING BECOMES DIFFICULT, OR THE PHYSICAL INTEGRITY OF THE MATERIAL IS AT RISK, PROCEED TO THE NEXT SEQUENTIAL OPERATION (BLAST AND ANNEAL). A FINAL FORMING SEQUENCE IS PROVIDED FOR "FINAL SIZING" AFTER THE MATERIAL HAS BEEN ANNEALED.
ENSURE THE PANEL MATERIAL EXTENDS BEYOND THE PERIMETER OF THE GAGE (ENOUGH TO PROVIDE ADEQUATE STOCK ALLOWANCE FOR RE-POSITIONING, RE-STRIKING, AND ACCURATE TRIMMING AFTER ANNEALING).

Part Number: SE121-001P-2 PANEL 4
Part Description: DIE FORMED PANEL
Specification: PP475 Rev: 2

IDC Count : 0 Dwg Count: 1 Pgm Count: 0 QAP Count: 3 NDT Count: 0 WPS Count: 0

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 17 / Seq: 22	230-FABRICATION - WEIDNER	1.00	1.00	1.00	

(C) CUT OUT A LIFTING EYE FROM THE EXCESS TRIM STOCK THAT WAS REMOVED DURING THE FORMING CYCLE. INSTALL AND WELD IT TO THE PERIPHERAL EDGE OF THE FORMED PANEL (WHICH STILL HAS EXCESS TRIM STOCK REMAINING).
POSITIONING CONSIDERATIONS:
1. POSITION TO SUIT NORMAL HANDLING AND LIFTING.
2. POSITION TO SUIT SETTING IN A VERTICAL STANCE IN THE HEAT TREAT OVEN (WIDE SIDE DOWN).
3. SHAPE AND POSITION THE LIFTING HOOK FOR A "QUICK AND EASY GAFF HOOK STYLE GRAB" WHEN REMOVING THE PARTS FROM THE HOT OVEN FOR A RAPID COOLING CYCLE.
Specification: PP475 Rev: 3

IDC Count : 0 Dwg Count: 0 Pgm Count: 0 QAP Count: 1 NDT Count: 0 WPS Count: 1

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 17 / Seq: 25	260-SANDBLAST	1.00	1.00	1.00	SE121-001P / A

(C) SHOT BLAST THE ENTIRE PANEL 100% USING 180-220 GRIT VIRGIN ALUMINUM OXIDE MEDIA TO REMOVE ANY RESIDUE / MARKINGS FROM THE INITIAL FORMING PROCESS.
MAINTAIN AN APPROXIMATE BLAST ANGLE OF 20 TO 40 DEGREES
Specification: PP475 Rev: 4

IDC Count : 0 Dwg Count: 1 Pgm Count: 0 QAP Count: 1 NDT Count: 0 WPS Count: 0

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev	Service ID
Sub: 17 / Seq: 30	520-SUBLET, EXOTIC HEAT TREAT	1.00	1.00	1.00	SE121-001P / A	THRML TR/NA SA

(C) SOLUTION ANNEAL FORMED PANEL PER THE FOLLOWING:
ATTACH A MINIMUM OF THREE EQUALLY SPACED THERMOCOUPLES TO THE FORMED PANEL
CHARGE FURNACE AND HEAT PART UNTIL THERMOCOUPE READINGS ARE WITHIN 1900 +/-15F.
HOLD PART TEMPERATURE AT 1900 DEGREES F. (+/- 15 DEGREES) HOLD FOR 45 MINUTES (+/ 5 MINUTES)
RAPID COOL (VIA. WATER QUENCHING OR FORCED AIR CIRCULATION) TO 1000 DEGREES F. OPEN AIR COOL TO AMBIENT TEMP.

Workorder	Part ID	Qty	Drawing ID / Rev	Engineer
64880/1.0		1	SE121-003P / --	BLUE/DOUG MCCORKLE

Specification: AMS2774 Rev: JUL95
Certification: H/T CERTIFICATE
Part Number: SE121-001P-2 PANEL 4
Part Description: DIE FORMED PANEL
Customer: PPPL
Furnace charts: FURNACE CHART
Specification: PP475 Rev: 2

IDC Count : 0 Dwg Count: 1 Pgm Count: 0 QAP Count: 7 NDT Count: 0 WPS Count: 0

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 17 / Seq: 31	820-RECEIVING INSPECTION	1.00	1.00	1.00	SE121-001P / A
(U)	REVIEW HEAT TREAT CERTIFICATE AND FURNACE CHART				

IDC Count : 1 Dwg Count: 1 Pgm Count: 0 QAP Count: 0 NDT Count: 0 WPS Count: 0

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 17 / Seq: 35	805-INPROCESS INSPECTION - PLA	1.00	1.00	1.00	SE121-001P / A
(R)	VISUAL INSPECT SURFACE FOR DAMAGE, PITTING, GOUGES, SCRAPES ETC.....				

ON THE INSIDE (CONCAVE SURFACE), LOOK FOR ANY SURFACE DEFECTS OR IRREGULARITIES THAT MAY INHIBIT ACHIEVING THE REQURIED 32 MICRO-INCH FINISH REQURIEMENT. ON THE OUTSIDE (CONVEX SURFACE), VERIFY THE SURFACE FINISH STILL MEETS THE REQUIREMENTS OF ASTM B 443-00.
NOTIFY ENGINEERING (DOUG McCORKLE) FOR CONCURRENCE
VERIFY MAGNETIC PERMEABILITY AND RECORD I.D.C. DATA
Part Number: SE121-001P-2 PANEL 1
Part Description: DIE FORMED PANEL
Specification: PP475 Rev: 2
Specification: ASTM B443 Rev: 00
Specification: PP476 Rev: --
Specification: PP479 Rev: --

IDC Count : 1 Dwg Count: 1 Pgm Count: 0 QAP Count: 6 NDT Count: 0 WPS Count: 0

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 17 / Seq: 40	341-PACIFIC 750	1.00	1.00	1.00	SE121-001P / A
(R)	2ND FORMING OPERATION				

ENSURE THE DIE SET FACES ARE CLEAN AND FREE OF DIRT, OIL, GRIME, FOREIGN MATTER, RAISED OR EMBEDDED MATERIAL, ETC....
LOAD THE PREFORMED / ANNEALED PANEL INTO THE DIE SET.
"RE-STRIKE" HYDRAULIC FORM THE PANEL TO ACHIEVE THE GEOMETRICAL SHAPE CONFORMING TO INSPECTION GAGE # MTMFX-2906. PANEL TO GAGE GAP TOLERANCE: .094" MAX.
NOTIFY INSPECTOR FOR Q/A IDC VERIFICATION

Part Number: SE121-001P-2 PANEL 4
Part Description: DIE FORMED PANEL
Specification: PP475 Rev: 2

Workorder	Part ID	Qty	Drawing ID / Rev	Engineer
64880/1.0		1	SE121-003P / --	BLUE/DOUG MCCORKLE

IDC Count : 1 Dwg Count: 1 Pgm Count: 0 QAP Count: 3 NDT Count: 0 WPS Count: 0

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 17 / Seq: 50	260-SANDBLAST	1.00	1.00	1.00	SE121-001P / A

(F) SHOT BLAST THE ENTIRE PANEL 100% USING 180-220 GRIT VIRGIN ALUMINUM OXIDE MEDIA TO REMOVE ANY RESIDUE / MARKINGS FROM THE FINAL FORMING PROCESS.
Specification: PP475 Rev: 2

IDC Count : 0 Dwg Count: 1 Pgm Count: 0 QAP Count: 1 NDT Count: 0 WPS Count: 0

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 17 / Seq: 60	230-FABRICATION - WEIDNER	1.00	1.00	1.00	SE121-001P / A

(F) TRIM PERIMETER TO PROVIDED TRIM-LINES (LEAVING STOCK FOR POSITIONING AND FITTING ON THE FAB FIXTURE). NOTE THAT INSTALLING THE WELD PREP IS NOT REQUIRED AT THIS STAGE (ADDITIONAL FITTING / TRIMMING WILL BE REQUIRED AT INSTALLATION)
HIGH PRESSURE WASH PER PP475
NOTIFY Q/A FOR FINAL PANEL PROFILE CONFIRMATION PRIOR TO COMPLETING THE POLISHING AND INSTALLATION OF PROTECTIVE PLASTIC
SAND AND POLISH THE INSIDE SURFACE 100% TO ACHIEVE A 32 MICRO SURFACE FINISH (WITH THE EXCEPTION OF THE WELDING / TRIMMING ZONES).
CLEAN PANEL PER PP475
APPLY PROTECTIVE PLASTIC FILM (CONTACT DOUG McCORKLE FOR MATERIAL)
STAGE PANEL FOR INSTALLATION
Specification: PP475 Rev: 3

IDC Count : 0 Dwg Count: 1 Pgm Count: 0 QAP Count: 1 NDT Count: 0 WPS Count: 0

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 17 / Seq: 70	805-INPROCESS INSPECTION - PLA	1.00	1.00	1.00	SE121-001P / A

(F) VERIFY PROFILE TO INSPECTION GAGE # MTMFX-2906. GAP TOLERANCE: .094" MAX. RECORD ACTUAL GAP READINGS ON INSPECTION DRAWING
VERIFY PART PERIMETER EXCEEDS GAGE PERIMETER FOR TRIMMING AND FITTING AT ASSEMBLY
INSPECT AND RECORD INTERIOR SIDE SURFACE FINISH (LESS PERIMETER / WELD ZONES) AND RECORD ACTUAL READINGS ON INSPECTION DRAWING
INSPECT MAGNETIC PERMEABILITY PER PP476 AND ASTM A800, SUPPLEMENTARY REQUIREMENT S1 (BUT THE MEASUREMENT SHALL BE TAKEN IN RELATIVE PERMEABILITY RATHER THAN FERRITE CONTENT. THE SURFACES OF THE PVVS SHELL AND PORT EXTENSION SHALL BE CHECKED AND DOCUMENTED ON A 6" GRID. THE SURFACES AT AND NEAR WELDS WILL BE CHECKED ON A 1" GRID.
RECORD ACTUAL PERMEABILITY READINGS ON INSPECTION DRAWING
INSPECT MATERIAL THICKNESS PER PP477 (6" GRID)
RECORD ACTUAL MATERIAL THICKNESS ON INSPECTION DRAWING

Test Certification: SE121-001P-10MTM Rev: 2A
Part Number: SE121-001P-2 PANEL 4
Part Description: DIE FORMED PANEL
Specification: ASME B46.1 Rev: 95
Specification: ASTM A800
Specification: PP475 Rev: 2
Specification: PP476 Rev: --

Workorder	Part ID	Qty	Drawing ID / Rev	Engineer
64880/1.0		1	SE121-003P / --	BLUE/DOUG MCCORKLE

Specification: PP477 Rev: --
Specification: PP479 Rev: --

IDC Count : 3 Dwg Count: 1 Pgm Count: 0 QAP Count: 9 NDT Count: 0 WPS Count: 0

Sub ID	Part ID	Qty	Drawing ID / Rev
18	SE121-001P-2 PANEL # 5	1	/
			Parent Sub:1 Op:10

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 18 / Seq: 10	820-RECEIVING INSPECTION	1.00	1.00	1.00	SE121-001P / A

(C) INSPECT BLANK SIZE PER DEVELOPMENT DRAWING (AUDIT DIMENSIONS WILL BE PROVIDED BY DOUG McCORKLE)
INSPECT MATERIAL THICKNESS PER PP477
VISUAL INSPECT SURFACE FINISH (PANEL SURFACE SHOULD BE A SMOOTH MILL PRODUCED SURFACE, WITHOUT SCRAPES, GOUGES, HEAVY PITS, ETC... IT SHOULD BE IN A CONDITION THAT CAN BE READILY POLISHED WITHOUT EXCESSIVE MATERIAL REMOVAL (CONTACT ENGINEERING (DOUG McCORKLE IF FURTHER CLARIFICATION IS NEEDED)
SAMPLE INSPECT MAGNETIC PERMEABILITY PER PP476, AND ASTM A800, SUPPLIMENTARY REQUIREMENT S1 (BUT THE MEASUREMENT SHALL BE TAKEN IN RELATIVE PERMEABILITY RATHER THAN FERRITE CONTENT). SAMPLE LOT SIZE: AT LEAST 10 EVENLY SPACED LOCATIONS.
RECORD IDC DATA

Part Number: SE121-001P-2 PANEL 5
Part Description: DIE FORMED PANEL
Specification: ASTM A800 Rev: 01
Customer: PPPL
Specification: ASTM B443 Rev: 00
Specification: ASME B46.1 Rev: 95
Specification: PP475 Rev: 2
Specification: PP476 Rev: A
Specification: PP477 Rev: A

IDC Count : 3 Dwg Count: 1 Pgm Count: 0 QAP Count: 9 NDT Count: 0 WPS Count: 0

Piece #	Part ID	Qty	Drawing ID / Rev	Vendor	Dimensions
10	SE121-001P-2 PANEL # 5-PANEL BLANK .375" THK INCONEL 625	1.0	SE121 / --	1810	
	Vendor Part ID: SE121-001P-2 PANEL # 5				

(C) PANEL BLANK AWJ CUT FROM .375" INCONEL 625 TO PROVIDED GEOMETRICAL SHAPE (SE121-001P-2 PANEL # 1.DXF, REV. --)
MATERIAL REQUIREMENTS: INCONEL 625 (UNS N06625) PER ASTM B 443-00 ANNEALED
MAGNETIC PERMEABILITY SHALL NOT EXCEED 1.00 (REF. ASTM A800).
SURFACE MUST BE PROTECTED FROM CONTACT WITH IRON AND IRON ALLOY MATERIALS
CERTS & MILL TEST REPORTS REQ'D WITH SHIPMENT.
APPROXIMATE OVERALL SIZE: 54.97*76.37

Material Certification:
Part Number: SE121-001P-2 PANEL # 1
Part Description: DIE FORMED PANEL

Workorder	Part ID	Qty	Drawing ID / Rev	Engineer
64880/1.0		1	SE121-003P / --	BLUE/DOUG MCCORKLE

Specification: ASTM A800 Rev: 01
Specification: ASTM B443 Rev: 00
Specification: ASTM B46.1 Rev: 95

QAP Count: 6

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 18 / Seq: 18	105-DEBURR PLT 1 LOW BAY	1.00	1.00	1.00	SE121-001P / A
(C)	RADIUS ALL CUT EDGES PRIOR TO FORMING				
	Specification: PP475 Rev: 2				

IDC Count : 0 Dwg Count: 1 Pgm Count: 0 QAP Count: 1 NDT Count: 0 WPS Count: 0

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 18 / Seq: 20	341-PACIFIC 750	1.00	1.00	1.00	SE121-001P / A
(F)	1ST FORM OPERATION:				

LOAD, ALIGN, AND BOLT DIE SET # MTMFX-2890 - MTMFX-2891 INTO THE 750 TON HYDRAULIC PRESS.
ENSURE THE DIE SET FACES ARE CLEAN AND FREE OF DIRT, OIL, GRIME, FOREIGN MATTER, RAISED OR EMBEDDED MATERIAL, ETC....
ENSURE THE PANEL BLANK IS CLEAN AND FREE OF FOREIGN MATTER.
LOAD THE PANEL BLANK INTO THE DIE SET.
HYDRAULIC FORM THE PANEL TO ACHIEVE THE GEOMETRICAL SHAPE CONFORMING TO INSPECTION GAGE # MTMFX-2907.
NOTE THAT THE FINAL PANEL TO GAGE GAP TOLERANCE IS .094" MAX. IT IS DESIRED TO GET AS CLOSE TO THIS AS POSSIBLE PRIOR TO ANNEALING. CLOSELY WATCH THE FORMING, WRINKLING, AND SPRING-BACK CHARACTERISTICS OF THE MATERIAL DURING THE FORMING PROCESS. WHEN IT'S APPARENT THE MATERIAL IS WORK HARDENING TO A DEGREE THAT FORMING BECOMES DIFFICULT, OR THE PHYSICAL INTEGRITY OF THE MATERIAL IS AT RISK, PROCEED TO THE NEXT SEQUENTIAL OPERATION (BLAST AND ANNEAL). A FINAL FORMING SEQUENCE IS PROVIDED FOR "FINAL SIZING" AFTER THE MATERIAL HAS BEEN ANNEALED.
ENSURE THE PANEL MATERIAL EXTENDS BEYOND THE PERIMETER OF THE GAGE (ENOUGH TO PROVIDE ADEQUATE STOCK ALLOWANCE FOR RE-POSITIONING, RE-STRIKING, AND ACCURATE TRIMMING AFTER ANNEALING).

Part Number: SE121-001P-2 PANEL 5
Part Description: DIE FORMED PANEL
Specification: PP475 Rev: 2

IDC Count : 0 Dwg Count: 1 Pgm Count: 0 QAP Count: 3 NDT Count: 0 WPS Count: 0

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 18 / Seq: 22	230-FABRICATION - WEIDNER	1.00	1.00	1.00	
(F)	CUT OUT A LIFTING EYE FROM THE EXCESS TRIM STOCK THAT WAS REMOVED DURING THE FORMING CYCLE. INSTALL AND WELD IT TO THE PERIPHERAL EDGE OF THE FORMED PANEL (WHICH STILL HAS EXCESS TRIM STOCK REMAINING).				

POSITIONING CONSIDERATIONS:
1. POSITION TO SUIT NORMAL HANDLING AND LIFTING.
2. POSITION TO SUIT SETTING IN A VERTICAL STANCE IN THE HEAT TREAT OVEN (WIDE SIDE DOWN).
3. SHAPE AND POSITION THE LIFTING HOOK FOR A "QUICK AND EASY GAFF HOOK STYLE GRAB" WHEN REMOVING THE PARTS FROM THE HOT OVEN FOR A RAPID COOLING CYCLE.

Workorder	Part ID	Qty	Drawing ID / Rev	Engineer
64880/1.0		1	SE121-003P / --	BLUE/DOUG MCCORKLE

Specification: PP475 Rev: 3

IDC Count : 0 Dwg Count: 0 Pgm Count: 0 QAP Count: 1 NDT Count: 0 WPS Count: 1

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 18 / Seq: 25	260-SANDBLAST	1.00	1.00	1.00	SE121-001P / A

(R) SHOT BLAST THE ENTIRE PANEL 100% USING 180-220 GRIT VIRGIN ALUMINUM OXIDE MEDIA TO REMOVE ANY RESIDUE / MARKINGS FROM THE INITIAL FORMING PROCESS.
MAINTAIN AN APPROXIMATE BLAST ANGLE OF 20 TO 40 DEGREES
Specification: PP475 Rev: 4

IDC Count : 0 Dwg Count: 1 Pgm Count: 0 QAP Count: 1 NDT Count: 0 WPS Count: 0

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev	Service ID
Sub: 18 / Seq: 30	520-SUBLET, EXOTIC HEAT TREAT	1.00	1.00	1.00	SE121-001P / A	THRML TR/NA SA

(R) SOLUTION ANNEAL FORMED PANEL PER THE FOLLOWING:
ATTACH A MINIMUM OF THREE EQUALLY SPACED THERMOCOUPLES TO THE FORMED PANEL
CHARGE FURNACE AND HEAT PART UNTIL THERMOCOUPE READINGS ARE WITHIN 1900 +/-15F.
HOLD PART TEMPERATURE AT 1900 DEGREES F. (+/- 15 DEGREES) HOLD FOR 45 MINUTES (+/ 5 MINUTES)
RAPID COOL (VIA. WATER QUENCHING OR FORCED AIR CIRCULATION) TO 1000 DEGREES F. OPEN AIR COOL TO AMBIENT TEMP.
Specification: AMS2774 Rev: JUL95
Certification: H/T CERTIFICATE
Part Number: SE121-001P-2 PANEL 5
Part Description: DIE FORMED PANEL
Customer: PPPL
Furnace charts: FURNACE CHART
Specification: PP475 Rev: 2

IDC Count : 0 Dwg Count: 1 Pgm Count: 0 QAP Count: 7 NDT Count: 0 WPS Count: 0

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 18 / Seq: 31	820-RECEIVING INSPECTION	1.00	1.00	1.00	SE121-001P / A

(U) REVIEW HEAT TREAT CERTIFICATE AND FURNACE CHART

IDC Count : 1 Dwg Count: 1 Pgm Count: 0 QAP Count: 0 NDT Count: 0 WPS Count: 0

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 18 / Seq: 35	805-INPROCESS INSPECTION - PLA	1.00	1.00	1.00	SE121-001P / A

(F) VISUAL INSPECT SURFACE FOR DAMAGE, PITTING, GOUGES, SCRAPES ETC.....
ON THE INSIDE (CONCAVE SURFACE), LOOK FOR ANY SURFACE DEFECTS OR IRREGULARITIES THAT MAY INHIBIT ACHIEVING THE REQURIED 32 MICRO-INCH FINISH REQURIEMENT. ON THE OUTSIDE (CONVEX SURFACE), VERIFY THE SURFACE FINISH STILL MEETS THE REQUIREMENTS OF ASTM B 443-00.
NOTIFY ENGINEERING (DOUG McCORKLE) FOR CONCURRENCE
VERIFY MAGNETIC PERMEABILITY AND RECORD I.D.C. DATA
Part Number: SE121-001P-2 PANEL 1

Workorder	Part ID	Qty	Drawing ID / Rev	Engineer
64880/1.0		1	SE121-003P / --	BLUE/DOUG MCCORKLE

Part Description: DIE FORMED PANEL
Specification: PP475 Rev: 2
Specification: ASTM B443 Rev: 00
Specification: PP476 Rev: --
Specification: PP479 Rev: --

IDC Count : 1 Dwg Count: 1 Pgm Count: 0 QAP Count: 6 NDT Count: 0 WPS Count: 0

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 18 / Seq: 40	341-PACIFIC 750	1.00	1.00	1.00	SE121-001P / A

(F) 2ND FORMING OPERATION
ENSURE THE DIE SET FACES ARE CLEAN AND FREE OF DIRT, OIL, GRIME, FOREIGN MATTER, RAISED OR EMBEDDED MATERIAL, ETC....
LOAD THE PREFORMED / ANNEALED PANEL INTO THE DIE SET.
"RE-STRIKE" HYDRAULIC FORM THE PANEL TO ACHIEVE THE GEOMETRICAL SHAPE CONFORMING TO INSPECTION GAGE # MTMFX-2907. PANEL TO GAGE GAP TOLERANCE: .094" MAX.
NOTIFY INSPECTOR FOR Q/A IDC VERIFICATION

Part Number: SE121-001P-2 PANEL 5
Part Description: DIE FORMED PANEL
Specification: PP475 Rev: 2

IDC Count : 1 Dwg Count: 1 Pgm Count: 0 QAP Count: 3 NDT Count: 0 WPS Count: 0

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 18 / Seq: 50	260-SANDBLAST	1.00	1.00	1.00	SE121-001P / A

(F) SHOT BLAST THE ENTIRE PANEL 100% USING 180-220 GRIT VIRGIN ALUMINUM OXIDE MEDIA TO REMOVE ANY RESIDUE / MARKINGS FROM THE FINAL FORMING PROCESS.
Specification: PP475 Rev: 2

IDC Count : 0 Dwg Count: 1 Pgm Count: 0 QAP Count: 1 NDT Count: 0 WPS Count: 0

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 18 / Seq: 60	230-FABRICATION - WEIDNER	1.00	1.00	1.00	SE121-001P / A

(F) TRIM PERIMETER TO PROVIDED TRIM-LINES (LEAVING STOCK FOR POSITIONING AND FITTING ON THE FAB FIXTURE). NOTE THAT INSTALLING THE WELD PREP IS NOT REQUIRED AT THIS STAGE (ADDITIONAL FITTING / TRIMMING WILL BE REQUIRED AT INSTALLATION)
HIGH PRESSURE WASH PER PP475
NOTIFY Q/A FOR FINAL PANEL PROFILE CONFIRMATION PRIOR TO COMPLETING THE POLISHING AND INSTALLATION OF PROTECTIVE PLASTIC
SAND AND POLISH THE INSIDE SURFACE 100% TO ACHIEVE A 32 MICRO SURFACE FINISH (WITH THE EXCEPTION OF THE WELDING / TRIMMING ZONES).
CLEAN PANEL PER PP475
APPLY PROTECTIVE PLASTIC FILM (CONTACT DOUG McCORKLE FOR MATERIAL)
STAGE PANEL FOR INSTALLATION
Specification: PP475 Rev: 3

IDC Count : 0 Dwg Count: 1 Pgm Count: 0 QAP Count: 1 NDT Count: 0 WPS Count: 0

Workorder	Part ID	Qty	Drawing ID / Rev	Engineer
64880/1.0		1	SE121-003P / --	BLUE/DOUG MCCORKLE

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 18 / Seq: 70	805-INPROCESS INSPECTION - PLA	1.00	1.00	1.00	SE121-001P / A

(F)
VERIFY PROFILE TO INSPECTION GAGE # MTMFX-2907. GAP TOLERANCE: .094" MAX. RECORD ACTUAL GAP READINGS ON INSPECTION DRAWING
VERIFY PART PERIMETER EXCEEDS GAGE PERIMETER FOR TRIMMING AND FITTING AT ASSEMBLY
INSPECT AND RECORD INTERIOR SIDE SURFACE FINISH (LESS PERIMETER / WELD ZONES) AND RECORD ACTUAL READINGS ON INSPECTION DRAWING
INSPECT MAGNETIC PERMEABILITY PER PP476 AND ASTM A800, SUPPLEMENTARY REQUIREMENT S1 (BUT THE MEASUREMENT SHALL BE TAKEN IN RELATIVE PERMEABILITY RATHER THAN FERRITE CONTENT. THE SURFACES OF THE PVVS SHELL AND PORT EXTENSION SHALL BE CHECKED AND DOCUMENTED ON A 6" GRID. THE SURFACES AT AND NEAR WELDS WILL BE CHECKED ON A 1" GRID.
RECORD ACTUAL PERMEABILITY READINGS ON INSPECTION DRAWING
INSPECT MATERIAL THICKNESS PER PP477 (6" GRID)
RECORD ACTUAL MATERIAL THICKNESS ON INSPECTION DRAWING

Test Certification: SE121-001P-10MTM Rev: 2A
Part Number: SE121-001P-2 PANEL 5
Part Description: DIE FORMED PANEL
Specification: ASME B46.1 Rev: 95
Specification: ASTM A800
Specification: PP475 Rev: 2
Specification: PP476 Rev: --
Specification: PP477 Rev: --
Specification: PP479 Rev: --

IDC Count : 3 Dwg Count: 1 Pgm Count: 0 QAP Count: 9 NDT Count: 0 WPS Count: 0

Sub ID	Part ID	Qty	Drawing ID / Rev
24	SURFACE FINISH TESTING TEST P	1	/
			Parent Sub:1 Op:10

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 24 / Seq: 10	410-BURNOUT TABLE	1.00	1.00	1.00	SE121 / A

(C)
BURNOUT TEST PLATES PER MATERIAL CARD.
DEBURR AND SAND EDGES SMOOTH (WITH UNCONTAMINATED GRINDING WHEEL ONLY).
FORWARD ONE PLATE TO ENGINEERING (DOUG McCORKLE) AND PROCESS THE OTHER PER THE FOLLOWING ROUTING STEPS.

IDC Count : 0 Dwg Count: 5 Pgm Count: 0 QAP Count: 0 NDT Count: 0 WPS Count: 0

Piece #	Part ID	Qty	Drawing ID / Rev	Vendor	Dimensions
10	INCONEL 625_670-SHEET,NICKEL ALLOY .25" THK	480.0			480

(C)
INCONEL 625 SHEET, .25" THICK PER
AMS 5599.
CERT AND MILL TEST REPORT REQ'D WITH SHIPMENT.

Material Certification: NONE REQ'D TEST SAMPLE

QAP Count: 1

Workorder	Part ID	Qty	Drawing ID / Rev	Engineer
64880/1.0		1	SE121-003P / --	BLUE/DOUG MCCORKLE

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 24 / Seq: 20	230-FABRICATION - WEIDNER	1.00	1.00	1.00	SE121 / A

(C) SAND AND POLISH THE TEST PIECE (ONE SIDE) TO A 32 RA MICRO SURFACE FINISH

IDC Count : 0 Dwg Count: 5 Pgm Count: 0 QAP Count: 0 NDT Count: 0 WPS Count: 0

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 24 / Seq: 25	260-SANDBLAST	1.00	1.00	1.00	SE121 / A

(C) MASK THE POLISHED SIDE AND BLAST THE OTHER SIDE WITH 180-220 GRIT VIRGIN ALUMINUM OXIDE.

Drw N/A IDC Count : 0 Dwg Count: 5 Pgm Count: 0 QAP Count: 0 NDT Count: 0 WPS Count: 0

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 24 / Seq: 28	230-FABRICATION - WEIDNER	1.00	1.00	1.00	PP475 / --

(C) CLEAN SAMPLE MATERIAL SURFACES PER PP475, 5.7 & 5.8. WRAP THE PART IN PLASTIC FOAM.

Drw N/A IDC Count : 0 Dwg Count: 0 Pgm Count: 0 QAP Count: 0 NDT Count: 0 WPS Count: 0

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 24 / Seq: 30	805-INPROCESS INSPECTION - PLA	1.00	1.00	1.00	SE121 / A

(C) VERIFY THE FOLLOWING TEST SAMPLE ATTIBUTES:
SURFACE FINISH (PER ASME B46.1-1995) POLISHED 32 MICRO ON ONE SIDE, SMOOTH BLASTED SURFACE SIDE OPPOSITE (NO PITS, SCRAPES, GOUGES, ETC...).
CLEANLINESS PER PP475.
MAGNETIC PERMEABILITY (1.01 MAX)
REPORT RESULTS TO ENGINEERING (DOUG McCORKLE).

IDC Count : 3 Dwg Count: 5 Pgm Count: 0 QAP Count: 0 NDT Count: 0 WPS Count: 0

Sub ID	Part ID	Qty	Drawing ID / Rev
26	SE121-001P-2 TEST PANEL NOTE:	1	/
			Parent Sub:1 Op:10

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 26 / Seq: 60	230-FABRICATION - WEIDNER	1.00	1.00	1.00	SE121-001P / A

(R) OBTAIN THE DIE SET NUMBER ONE DEVELPMENT PANEL (PRODUCED UNDER 64880/2, SUB ID 1)
SPLIT THE PANEL TO SIMULATE PRODUCTION WELD JOINT(S).
PREP, FIT AND WELD JOINTS TO DEVELOP WELDING SEQUENCES AND MINIMIZE WELDING DISTORTION. ENSURE THE PART IS RESTRAINED IN A MANNER SIMULATING PRODUCTION THROUGHOUT THE WELDING PROCESS.
MAXIMUM INTERIOR (CONCAVE) SURFACE WELD FACE: 1 BEAD WIDTH
CWI VISUAL INSPECT WELDS (CERTIFY EACH PASS) 100% UNDER 8X MAGNIFICATION PER ASME CODE ARTICLE 6, SECTION V. ACCEPTANCE PER AWS D1.6, 6.29.1. NO CERTIFICATE REQUIRED. THIS IS A TEST PIECE.
REVIEW RESULTS WITH ENGINEERING (DOUG McCORKLE)
SAND AND POLISH THE INSIDE (CONCAVE SIDE) SURFACE 100% TO ACHIEVE A 32 MICRO SURFACE FINISH.

Workorder	Part ID	Qty	Drawing ID / Rev	Engineer
64880/1.0		1	SE121-003P / --	BLUE/DOUG MCCORKLE

CLEAN TEST PANEL PER CLEANING PROCDURE PP475.
ENGINEERING / PRODUCTION REVIEW REQUIRED UPON COMPLETION.
Specification: PP475 Rev: 3

IDC Count : 0 Dwg Count: 1 Pgm Count: 0 QAP Count: 1 NDT Count: 0 WPS Count: 1

WPS291.5 Rev:1 GTAW MAN
GTAW - Manual Fillers: INCONEL625_035_GMAW / INCONEL625_062_GTAW / INCONEL625_093_GTAW
Notes:

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 26 / Seq: 70	805-INPROCESS INSPECTION - PLA	1.00	1.00	1.00	SE121-001P / A
(R)	VERIFY PROFILE TO INSPECTION GAGE # MTMFX-2903. GAP TOLERANCE: .188" MAX.				
	INSPECT AND RECORD INTERIOR SIDE SURFACE FINISH.				
	INSPECT AND RECORD MAGNETIC PERMEABILY.				
	Test Certification: SE121-001P-10MTM Rev: 2A				
	Part Number: SE121-001P-2 TEST PANEL				
	Part Description: DIE FORMED PANEL				
	Specification: PP475 Rev: 3				

IDC Count : 3 Dwg Count: 1 Pgm Count: 0 QAP Count: 4 NDT Count: 0 WPS Count: 0

Sub ID	Part ID	Qty	Drawing ID / Rev
30	PQR PROCESS	1	/
			Parent Sub:26 Op:60

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 30 / Seq: 10	410-BURNOUT TABLE	1.00	1.00	1.00	
(C)	BURN OUT TWO TEST PLATES 6 X 15 AND CLEANUP.				
	NOTIFY WELDING ENGINEERING WHEN PARTS ARE AVALIABLE				

IDC Count : 0 Dwg Count: 0 Pgm Count: 0 QAP Count: 0 NDT Count: 0 WPS Count: 0

Piece #	Part ID	Qty	Drawing ID / Rev	Vendor	Dimensions
10	INCONEL 625_5-PLATE,NICKEL ALLOY .375" THK	338.3		1810	15.375*22
	Vendor Part ID: INCONEL 625_5				
(C)	INCONEL 625 (UNS N06625) PER ASTM B 443-00				
	ANNEALED				
	MAGNETIC PERMEABILITY SHALL NOT EXCEED 1.00 (REF. ASTM A800).				
	SURFACE MUST BE PROTECTED FROM CONTACT WITH IRON AND IRON ALLOY MATERIALS				
	CERTS & MILL TEST REPORTS REQ'D WITH SHIPMENT.				

QAP Count: 2

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 30 / Seq: 20	230-FABRICATION - WEIDNER	1.00	1.00	1.00	
(C)	WELD PQR PLATE PER WELDING ENGINEERING DIRECTION.				

Workorder	Part ID	Qty	Drawing ID / Rev	Engineer
64880/1.0		1	SE121-003P / --	BLUE/DOUG MCCORKLE

IDC Count : 0 Dwg Count: 0 Pgm Count: 0 QAP Count: 0 NDT Count: 1 WPS Count: 0

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 30 / Seq: 30	705-WELD ENGINEERING/ CWI	1.00	1.00	1.00	

(C) CWI to visually inspect PQR test plate per the requirements of ASME Sect. IX, AWS D1.1, and AWS B2.1. MTM NDT certification form required

IDC Count : 0 Dwg Count: 0 Pgm Count: 0 QAP Count: 0 NDT Count: 0 WPS Count: 0

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 30 / Seq: 40	818-MQS CONTRACTOR X-RAY	1.00	1.00	1.00	

(C) Radiographically inspect PQR test plate per the requirements of ASME Sect. IX, AWS D1.1, and AWS B2.1. Reference acceptance to all three specifications on the reader sheet.

IDC Count : 0 Dwg Count: 0 Pgm Count: 0 QAP Count: 0 NDT Count: 0 WPS Count: 0

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev	Service ID
Sub: 30 / Seq: 50	450-SUBLET	1.00	1.00	1.00		TESTNG/MISC

(C)
* Perform destructive testing (ref: 2 tensile tests, 2 face bend tests, and 2 root bend tests) to the requirements of the following three specifications; ASME Sect. IX, AWS D1.1, and AWS B2.
* All test samples and remaining plate to be returned to Major Tool and Machine when complete.
* Separate test reports are required for each specification. Test reports are to reference the PQR number and must provide the tensile failure locations/characterss.
* All NDT has been performed by Major Tool and Machine. A copy of the radiographic report is included with the test plate for reference.
* A reference sheet with pertinent welding data is included with the test plate.
* Test plate info:
- One plate - 3/8" thick 304L stainless steel
- One plate - 3/8" thick Inconel 625
- Both plates butt welded using filler material ERNiCrMo-3 (Inconel 625)
- No post-weld heat treatment is required.
- Test plate is supplied in the as-welded condition.

IDC Count : 0 Dwg Count: 0 Pgm Count: 0 QAP Count: 0 NDT Count: 0 WPS Count: 0

Sub ID	Part ID	Qty	Drawing ID / Rev
37	PQR PROCESS	1	/
			Parent Sub:26 Op:60

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 37 / Seq: 20	230-FABRICATION - WEIDNER	1.00	1.00	1.00	

(C)
PLASMA CUT TWO TEST PIECES 7"*18*
CLEANUP, REMOVE HEAT AFFECTED ZONE.
INSPECT MAGNETIC PERMEABILITY AND RECORD IDC
PREP, WELD PQR PLATE PER WELDING ENGINEERING DIRECTION.

Workorder	Part ID	Qty	Drawing ID / Rev	Engineer
64880/1.0		1	SE121-003P / --	BLUE/DOUG MCCORKLE

IDC Count : 0 Dwg Count: 0 Pgm Count: 0 QAP Count: 0 NDT Count: 0 WPS Count: 0

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 37 / Seq: 30	705-WELD ENGINEERING/ CWI	1.00	1.00	1.00	

(C) CWI to visually inspect PQR test plate per the requirements of ASME Sect. IX, AWS D1.1, and AWS B2.1. MTM NDT certification form required

IDC Count : 0 Dwg Count: 0 Pgm Count: 0 QAP Count: 0 NDT Count: 1 WPS Count: 0

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 37 / Seq: 40	818-MQS CONTRACTOR X-RAY	1.00	1.00	1.00	

(C) Radiographically inspect PQR test plate per the requirements of ASME Sect. IX, AWS D1.1, and AWS B2.1. Reader sheet to state acceptance to all three specifications.

* PQR390
* Test plate material: .375" thick Inconel 625.
* Butt weld using Inconel 625 filler / GTAW process.

IDC Count : 0 Dwg Count: 0 Pgm Count: 0 QAP Count: 0 NDT Count: 0 WPS Count: 0

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev	Service ID
Sub: 37 / Seq: 50	450-SUBLET	1.00	1.00	1.00		TESTNG/MISC

(R)
* Perform destructive testing (ref: 2 tensile tests, 2 face bend tests, and 2 root bend tests) per the requirements of the following three specifications; ASME Sect. IX, AWS D1.1, and AWS B2.1
* All test samples and remaining plate to be returned to Major Tool and Machine when complete.
* Separate test reports are required for each specification. Test reports are to reference the PQR number and must provide the tensile failure locations/characteristics.
* All NDT has been performed by Major Tool and Machine. A copy of the radiographic report is included with the test plate for reference.
* A reference sheet with pertinent welding data is included with the test plate.
* Test plate info:

- Test plate number: PQR390
- One plate - 3/8" thick Inconel 625
- One plate - 3/8" thick Inconel 625
- Both plates butt welded using filler material ERNiCrMo-3 (Inconel 625)
- No post-weld heat treatment is required.
- Test plate is supplied in the as-welded condition.

IDC Count : 0 Dwg Count: 0 Pgm Count: 0 QAP Count: 0 NDT Count: 0 WPS Count: 0

Sub ID	Part ID	Qty	Drawing ID / Rev
34	SOURCE NOTIFICATION	1	/
			Parent Sub:1 Op:30

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 34 / Seq: 10	830-SOURCE WITNESS POINT -IN P	1.00	1.00	1.00	

(U) AFTER TACK WELDING, AND PRIOR TO WELDING SOURCE NOTIFICATION IS REQUIRED. CUSTOMER DECISION WILL FOLLOW. NOTIFICATION VIA CFT.

Workorder	Part ID	Qty	Drawing ID / Rev	Engineer
64880/1.0		1	SE121-003P / --	BLUE/DOUG MCCORKLE

IDC Count : 0 Dwg Count: 0 Pgm Count: 0 QAP Count: 0 NDT Count: 0 WPS Count: 0

Sub ID	Part ID	Qty	Drawing ID / Rev
19	SE121 PORT SUB-ASSEMBLY	1	/
			Parent Sub:1 Op:70

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 19 / Seq: 10	230-FABRICATION - WEIDNER	1.00	1.00	1.00	SE121 / A

(F)
POSITION, INSTALL AND WELD CONFLAT FLANGE TO TUBE PER DRAWING.
FIT AND TRIM THE LENGTH FOR INSTALLATION. PREP FOR WELDING IN PLACE.
GRIND / BLEND THE INTERIOR WELD SMOOTH.
POLISH THE ENTIRE INSIDE SURFACE SMOOTH TO ACHIEVE A 32 MICRO SURFACE FINISH. CLEAN PER PP475
CWI VISUAL INSPECT THE PORT EXTENSION TUBE TO CONFLAT FLANGE WELD 100% UNDER 8X MAGNIFICATION PER ASME CODE ARTICLE 6, SECTION V. ACCEPTANCE PER AWS D1.6, 6.29.1.
Part Number: SE212-003P-3
Specification: PP475 Rev: 4
Part Description: PORT EXTENSION
Certification: CWI CERTIFICATION

IDC Count : 5 Dwg Count: 5 Pgm Count: 0 QAP Count: 4 NDT Count: 0 WPS Count: 1

WPS328.5 Rev:0 GTAW MAN
GTAW - Manual Fillers: INCONEL625_035_GMAW / INCONEL625_062_GTAW / INCONEL625_093_GTAW
Notes: INCO TUBE TO SST FLNG.

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 19 / Seq: 20	805-INPROCESS INSPECTION - PLA	1.00	1.00	1.00	SE121 / A

(F)
VERIFY CLEANLINESS
INSPECT THE INTERIOR SURFACE FINISH OF THE PORT SUB-ASSY.
INSPECT THE MAGNETIC PERMEABILITY OF THE PORT EXTENSION TO FLANGE WELD AND SURROUNDING AREA.
RECORD IDC DATA
Part Number: SE212-003P-3
Part Description: PORT EXTENSION
Customer: PPPL
Specification: ASME B46.1 Rev: 95
Specification: A800 Rev: 2001
Specification: PP476 Rev: --
Specification: PP477 Rev: --
Specification: PP475 Rev: 4

IDC Count : 2 Dwg Count: 5 Pgm Count: 0 QAP Count: 8 NDT Count: 0 WPS Count: 0

Sub ID	Part ID	Qty	Drawing ID / Rev
20	CONFLAT FLANGE	1	/

Workorder	Part ID	Qty	Drawing ID / Rev	Engineer
64880/1.0		1	SE121-003P / --	BLUE/DOUG MCCORKLE

Parent Sub:19 Op:10

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 20 / Seq: 10	820-RECEIVING INSPECTION	1.00	1.00	1.00	SE121 / A

(C) RECEIVING INSPECTION
RECEIVE AND INSPECT THE FOLLOWING PARTS:
(THEY SHOULD ALL ARRIVE TOGETHER)
F10000000NC4
FG1000CI
FG1000VU
FB1000C12S
GC0275S
CONTACT ENGINEERING (DOUG McCORKLE) WHEN PARTS ARRIVE.

IDC N/A IDC Count : 0 Dwg Count: 5 Pgm Count: 0 QAP Count: 0 NDT Count: 0 WPS Count: 0

Piece #	Part ID	Qty	Drawing ID / Rev	Vendor	Dimensions
10	F10000000NC4-FLANGE, CONFLAT, NON-ROTATE, 10.00"	1.0			

(C) FLANGE, CONFLAT, NON-ROTATABLE
10.00 X BLANK X 0.97", CLEAR BOLT HOLES, 304L

Material Certification:
Part Number: F10000000NC4

QAP Count: 2

Piece #	Part ID	Qty	Drawing ID / Rev	Vendor	Dimensions
20	FG1000CI-GASKET KIT (10/PK), COPPER, FOR 10" CFF	1.0			

(C) GASKET KIT (10/PACK), COPPER, INDIVIDUAL SEAL, FOR 10" CONFLAT FLANGE
VARIAN VACUUM TECHNOLOGIES

Material Certification:
Part Number: FG1000CI

QAP Count: 2

Piece #	Part ID	Qty	Drawing ID / Rev	Vendor	Dimensions
30	FG1000VU-GASKET, VITON, FOR 10" CFF	1.0			

(C) GASKET, VITON, FOR 10" CONFLAT FLANGE
VARIAN VACUUM TECHNOLOGIES

Material Certification:
Part Number: FG1000VU

QAP Count: 2

Piece #	Part ID	Qty	Drawing ID / Rev	Vendor	Dimensions
40	FB1000C12S-BOLT AND NUT KIT, 12 PT, SILVER PLATED	1.0			

(C) BOLT AND NUT KIT (25/PACK), 12 POINT, ASTM A193 GR. B8 SILVER PLATED, FOR 10" CONFLAT FLANGE
VARIAN VACUUM TECHNOLOGIES

Workorder	Part ID	Qty	Drawing ID / Rev	Engineer
64880/1.0		1	SE121-003P / --	BLUE/DOUG MCCORKLE

Material Certification:
Part Number: FB1000C12S

QAP Count: 2

Piece #	Part ID	Qty	Drawing ID / Rev	Vendor	Dimensions
50	GC0275S-GASKET CLIP KIT (10/PK), FOR 10" CFF	1.0			
(C)	GASKET CLIP KIT (10/PACK) FOR 10" CONFLAT FLANGE VARIAN VACUUM TECHNOLOGIES				

Material Certification:
Part Number: GC0275S

QAP Count: 2

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 20 / Seq: 20	108-TOOL ROOM - PLANT 1	1.00	1.00	1.00	
(F)	**HOLD FOR ENGINEERING PROCESS DRAWING. MACHINE SPECIAL PORT FEATURE FOR VACUUM TESTING. SPOTFACE, DRILL A CENTER DRILL SPOT IN THE CENTER OF THE FLANGE (FOR INSTALLATION / POSITIONING AID).				

IDC Count : 0 Dwg Count: 0 Pgm Count: 0 QAP Count: 0 NDT Count: 0 WPS Count: 0

Sub ID	Part ID	Qty	Drawing ID / Rev
21	PORT EXTENSION TUBE	1	/ Parent Sub:19 Op:10

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 21 / Seq: 10	230-FABRICATION - WEIDNER	1.00	1.00	1.00	SE121 / A
(C)	INSPECT DIAMETERS AND LENGTH RECORD IDC INFORMATION NOTIFY ENGINEERING (DOUG McCORKLE) OF RESULTS WELD / BLEND MIS-ALIGNMENT OF MANUFACTURERS WELDS POLISH THE ENTIRE INSIDE SURFACE TO A 32 MICRO-INCH SURFACE FINISH. LAYOUT ONE AND CUT ONE END SQUARE FOR FLANGE INSTALLATION (REMOVE MINIMAL MATERIAL FOR LATER INSTALLATION 16" MINIMUM LENGTH)				

IDC Count : 0 Dwg Count: 5 Pgm Count: 0 QAP Count: 0 NDT Count: 0 WPS Count: 1

Piece #	Part ID	Qty	Drawing ID / Rev	Vendor	Dimensions
10	SE121-001P-5-INCO 625 TUBE 8.0" OD X .12" WA. X 18.0" Vendor Part ID: SE121-001P-5	1.0		5647	
(C)	TUBE, ROUND, INCONEL 625, SEAMLESS OR WELDED. ASTM B444 OR ASTM B705 MTM AUTHORIZATION OF WELDING PROCEDURE REQUIRED PRIOR TO STARTING WORK. NOTE THAT THE FOLLOWING REQUIREMENTS WILL BE PERFORMED / TESTED BY MAJOR TOOL & MACHINE AFTER DELIVERY. ALL EFFORTS TO ACCOMODATE / ENSURE SUCESS MUST BE MAINTAINED:				

Workorder	Part ID	Qty	Drawing ID / Rev	Engineer
64880/1.0		1	SE121-003P / --	BLUE/DOUG MCCORKLE

MAGNETIC PERMEABILITY REQUIREMENT: 1.01 MAX.
VACUUM INTEGRITY REQUIREMENT: TOTAL HELIUM LEAK RATE FOR THE TUBE SHALL BE LESS THAN OR EQUAL TO 1.7 X 10(-9) TORR-L/S
INTERIOR SURFACE FINISH REQUIREMENT: INTERIOR WELD BEADS WILL BE GROUND FLUSH. THE ENTIRE INTERIOR SURFACE WILL BE POLISHED TO A 32 MICRO SURFACE FINISH AND VERIFIED PER ASME B46.1.
EXTERIOR SURFACE FINISH: MILL SURFACE ACCEPTABLE. NO PITS, SCRAPES OR GOUGES.
MATERIAL CERTIFICATION AND TEST REPORTS REQ'D WITH SHIPMENT.
WPS291.5 Rev:0 GTAW MAN
GTAW - Manual Fillers: INCONEL625_035_GMAW / INCONEL625_062_GTAW / INCONEL625_093_GTAW
Notes: TIG WELD ONLY

QAP Count: 3

Sub ID	Part ID	Qty	Drawing ID / Rev
29	PORT EXTENSION TUBE (TAKE 2)	1	/
			Parent Sub:19 Op:10

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 29 / Seq: 10	805-INPROCESS INSPECTION - PLA	1.00	1.00	1.00	SE121 / --

(C) PRIOR TO CUTTING / FORMING, INSPECT AND RECORD THE MAGNETIC PERMEABILITY OF THE SHEET (COORDINATE WITH MATERIALS DEPT. AND INSPECT THE APPROXIMATE PART ENVELOPE WITHIN THE STOCK SHEET)
Part Number: SE121-001P-3
Part Description: PVVS PORT EXTENSION TUBE
Specification: PP476 Rev: A

IDC Count : 1 Dwg Count: 0 Pgm Count: 0 QAP Count: 3 NDT Count: 0 WPS Count: 0

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 29 / Seq: 20	415-ROLLING/SHEAR/BRAKE PRESS	1.00	1.00	1.00	

(C) 1. SHEAR RECTANGLE PER MATERIAL CARD DIMENSIONS
2. ROLL TO 8" O.D. =/-0.03" X 20" LONG. LEAVE TRIM STOCK OVERLAPPED (FABRICATOR WILL TRIM). ENSURE OVERLAP IS ADEQUATE TO TRIM AND FIT THE DIAMETER REMOVING ANY ROLL FLATS RESULTANT FROM STARTING AND FINISHING THE ROLLING SEQUENCE.
3. NOTIFY Q/A FOR DIMENSIONAL / MAGNETIC PERMEABILITY VERIFICATION.

IDC Count : 0 Dwg Count: 0 Pgm Count: 0 QAP Count: 0 NDT Count: 0 WPS Count: 0

Piece #	Part ID	Qty	Drawing ID / Rev	Vendor	Dimensions
10	INCONEL 625_660-SHEET,NICKEL ALLOY .125" THK	760.0			20*38

(C) INCONEL 625 SHEET, .125" THICK PER
AMS 5599 / ASTM B443 (UNS N06625).
CERT AND MILL TEST REPORT REQ'D WITH SHIPMENT.

Material Certification:
Part Number: SE121-001P-3
Part Description: PORT EXTENSION TUBE

QAP Count: 3

Workorder	Part ID	Qty	Drawing ID / Rev	Engineer
64880/1.0		1	SE121-003P / --	BLUE/DOUG MCCORKLE

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 29 / Seq: 30	805-INPROCESS INSPECTION - PLA	1.00	1.00	1.00	SE121 / --

(C) INSPECT AND RECORD MAGNETIC PERMEABILITY (AFTER ROLLING)
Part Number: SE121-001P-3
Part Description: PVVS PORT EXTENSION TUBE
Specification: PP476 Rev: A

IDC Count : 1 Dwg Count: 0 Pgm Count: 0 QAP Count: 3 NDT Count: 0 WPS Count: 0

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 29 / Seq: 40	230-FABRICATION - WEIDNER	1.00	1.00	1.00	SE11 / --

(C) TRIM, FIT, (PURGE WELD JOINT WITH 100% ARGON. PURGE DAM MATERIAL MUST BE MADE FROM EITHER 625 INCONEL OR 300 SERIES STAINLESS STEEL) AND TACK WELD INTO 8" O.D. TUBE.
CLEAN AND PREPARE FOR PLASMA ARC WELDING
Specification: PP475 Rev: 2

IDC Count : 0 Dwg Count: 0 Pgm Count: 0 QAP Count: 1 NDT Count: 0 WPS Count: 1

WPS291.5 Rev:1 GTAW MAN
GTAW - Manual Fillers: INCONEL625_035_GMAW / INCONEL625_062_GTAW / INCONEL625_093_GTAW
Notes:

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 29 / Seq: 50	205-PLASMA WORKCENTER	1.00	1.00	1.00	SE121 / --

(F) SETUP, PURGE WELD JOINT WITH 100% ARGON. PURGE DAM MATERIAL MUST BE MADE FROM EITHER 625 INCONEL OR 300 SERIES STAINLESS STEEL.
PLASMA ARC WELD THE AXIAL JOINT PER DRAWING.
CWI VISUAL INSPECT THE PORT EXTENSION TUBE AXIAL WELD 100% UNDER 8X MAGNIFICATION PER ASME CODE ARTICLE 6, SECTION V. ACCEPTANCE PER AWS D1.6, 6.29.1.
Test Certification: CWI CERTIFICATE Rev:
Part Number: SE121-001P-3
Part Description: PORT EXTENSION TUBE

IDC Count : 5 Dwg Count: 0 Pgm Count: 0 QAP Count: 3 NDT Count: 0 WPS Count: 1

WPS380-PPPL Rev:2 PAW MAC
PAW - Machine Fillers: INCONEL625_035_GMAW / INCONEL625_062_GTAW / INCONEL625_093_GTAW
Notes: PLASMA WELDING

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 29 / Seq: 60	230-FABRICATION - WEIDNER	1.00	1.00	1.00	SE121 / --

(F) BLEND THE INTERIOR WELD SURFACE FLUSH TO THE BASE MATERIAL.
POLISH THE ENTIRE INTERIOR OF THE TUBE TO ACHIEVE A 32 MICRO-INCH RA SURFACE FINISH.
CLEAN PER PP475
Specification: PP475 Rev: 2

IDC Count : 0 Dwg Count: 0 Pgm Count: 0 QAP Count: 1 NDT Count: 0 WPS Count: 1

Workorder	Part ID	Qty	Drawing ID / Rev	Engineer
64880/1.0		1	SE121-003P / --	BLUE/DOUG MCCORKLE

WPS291.5 Rev:0 GTAW MAN
GTAW - Manual Fillers: INCONEL625_035_GMAW / INCONEL625_062_GTAW / INCONEL625_093_GTAW
Notes: TIG WELD ONLY

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 29 / Seq: 70	805-INPROCESS INSPECTION - PLA	1.00	1.00	1.00	SE121 / --
(F)	INSPECT DIAMETER, ROUNDNESS, WELDING DISTORTION, MAGNETIC PERMEABILITY, AND INTERIOR SURFACE FINISH. RECORD IDC DATA Part Number: SE121-001P-3 Part Description: PVVS PORT EXTENSION TUBE Specification: PP475 Rev: 2 Specification: PP476 Rev: A Specification: PP477 Rev: A Specification: ASME B46.1 Rev: 95 Specification: A800 Rev: 97				

IDC Count : 2 Dwg Count: 0 Pgm Count: 0 QAP Count: 7 NDT Count: 0 WPS Count: 0

Sub ID	Part ID	Qty	Drawing ID / Rev
32	PLASMA PQR	1	/ Parent Sub:29 Op:50

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 32 / Seq: 10	705-WELD ENGINEERING/ CWI	1.00	1.00	1.00	
(C)	CWI to visually inspect PQR test plate per the requirements of ASME Sect. IX, AWS D1.1, and AWS B2.1. MTM NDT certification form required				

IDC Count : 0 Dwg Count: 0 Pgm Count: 0 QAP Count: 0 NDT Count: 1 WPS Count: 0

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 32 / Seq: 20	818-MQS CONTRACTOR X-RAY	1.00	1.00	1.00	
(C)	Radiographically inspect PQR test plate per the requirements of ASME Sect. IX, AWS D1.1, and AWS B2.1. Reference acceptance to all three specifications on the reader sheet.				

IDC Count : 0 Dwg Count: 0 Pgm Count: 0 QAP Count: 0 NDT Count: 0 WPS Count: 0

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev	Service ID
Sub: 32 / Seq: 30	450-SUBLET	1.00	1.00	1.00		TESTNG/MISC
(C)	* Perform destructive testing (ref: 2 tensile tests, 2 face bend tests, and 2 root bend tests) to the requirements of the following three specifications; ASME Sect. IX, AWS D1.1, and AWS B2. * All test samples and remaining plate to be returned to Major Tool and Machine when complete. * Separate test reports are required for each specification. Test reports are to reference the PQR number and must provide the tensile failure locations/characterss. * All NDT has been performed by Major Tool and Machine. A copy of the radiographic report is included with the test plate for reference. * A reference sheet with pertinent welding data is included with the test plate.					

Workorder	Part ID	Qty	Drawing ID / Rev	Engineer
64880/1.0		1	SE121-003P / --	BLUE/DOUG MCCORKLE

* Test plate info:
- One plate - 3/8" thick Inconel 625
- One plate - 3/8" thick Inconel 625
- Both plates butt welded using filler material ERNiCrMo-3 (Inconel 625)
- No post-weld heat treatment is required.
- Test plate is supplied in the as-welded condition.

IDC Count : 0 Dwg Count: 0 Pgm Count: 0 QAP Count: 0 NDT Count: 0 WPS Count: 0

Sub ID	Part ID	Qty	Drawing ID / Rev
33	ASTM B 705 MECHANICAL TEST PIE	1	/
			Parent Sub:19 Op:10

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 33 / Seq: 10	415-ROLLING/SHEAR/BRAKE PRESS	1.00	1.00	1.00	
(F)	1. SHEAR RECTANGLE PER MATERIAL CARD DIMENSIONS				
	2. ROLL TO 8" O.D. =/-0.03" X 6" LONG. LEAVE TRIM STOCK OVERLAPPED (FABRICATOR WILL TRIM). ENSURE OVERLAP IS ADEQUATE TO TRIM AND FIT THE DIAMETER REMOVING ANY ROLL FLATS RESULTANT FROM STARTING AND FINISHING THE ROLLING SEQUENCE.				

IDC Count : 0 Dwg Count: 0 Pgm Count: 0 QAP Count: 0 NDT Count: 0 WPS Count: 0

Piece #	Part ID	Qty	Drawing ID / Rev	Vendor	Dimensions
10	INCONEL 625_660-SHEET,NICKEL ALLOY .125" THK	180.0			6*30
(F)	INCONEL 625 SHEET, .125" THICK PER AMS 5599 / ASTM B443 (UNS N06625). CERT AND MILL TEST REPORT REQ'D WITH SHIPMENT.				

Material Certification:
Part Number: SE121-001P-3
Part Description: PORT EXTENSION TUBE

QAP Count: 0

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 33 / Seq: 20	205-PLASMA WORKCENTER	1.00	1.00	1.00	SE121 / --
(F)	TRIM FIT AND TACK WELD CYLINDER. SETUP, PURGE WELD JOINT WITH 100% ARGON. PURGE DAM MATERIAL MUST BE MADE FROM EITHER 625 INCONEL OR 300 SERIES STAINLESS STEEL, AND PLASMA ARC WELD THE JOINT				

IDC Count : 0 Dwg Count: 0 Pgm Count: 0 QAP Count: 0 NDT Count: 0 WPS Count: 1

WPS380-PPPL Rev:2 PAW MAC
PAW - Machine Fillers: INCONEL625_035_GMAW / INCONEL625_062_GTAW / INCONEL625_093_GTAW
Notes: PLASMA WELDING

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev

Workorder	Part ID	Qty	Drawing ID / Rev	Engineer
64880/1.0		1	SE121-003P / --	BLUE/DOUG MCCORKLE

Sub: 33 / Seq: 30 — 230-FABRICATION - WEIDNER — 1.00 — 1.00 — 1.00

(F)
TRIM BOTH ENDS TO PRODUCE A TEST PIECE 4" MINIMUM LENGTH
PERFORM A FLATTENING TEST PER ASTM B 705, 7.2
(ENGINEERING WITNESS REQUIRED)
FILL OUT VISUAL TEST CERTIFICATE
Specification: ASTM B705 Rev: 94
Test Certification: VISUAL INSPECTION CERT
Part Number: ASTM B 705 MECH. TEST PIECE

IDC Count : 0 Dwg Count: 0 Pgm Count: 0 QAP Count: 3 NDT Count: 0 WPS Count: 0

Sub ID	Part ID	Qty	Drawing ID / Rev
35	SOURCE NOTIFICATION	1	/
			Parent Sub:1 Op:72

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 35 / Seq: 10	830-SOURCE WITNESS POINT -IN P	1.00	1.00	1.00	

(U)
SOURCE NOTIFICATION REQURIED ONE TO TWO WEEKS PRIOR TO VACUUM TESTING PORT SUB-ASSEMBLY. CUSTOMER DECISION WILL FOLLOW.
NOTIFICATION VIA CFT

Drw N/A IDC N/A IDC Count : 0 Dwg Count: 0 Pgm Count: 0 QAP Count: 0 NDT Count: 0 WPS Count: 0

Sub ID	Part ID	Qty	Drawing ID / Rev
25	PORT EXTENSION WELD BACKING RI	1	/
			Parent Sub:1 Op:90

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 25 / Seq: 10	415-ROLLING/SHEAR/BRAKE PRESS	1.00	1.00	1.00	SE121-003P / 0

(C)
1. SHEAR STRIP PER MATERIAL CARD AND DEBURR.
2. ROLL THE EASY WAY TO A 8.093" I.D. OBJ (0.031" WELD SHRINKAGE ALLOWANCE).
3. NOTIFY Q/A FOR DIMENSIONAL / MAGNETIC PERMEABILITY VERIFICATION.
Specification: PP475 Rev: 2

IDC Count : 0 Dwg Count: 0 Pgm Count: 0 QAP Count: 1 NDT Count: 0 WPS Count: 0

Piece #	Part ID	Qty	Drawing ID / Rev	Vendor	Dimensions
10	INCONEL 625_660-SHEET,NICKEL ALLOY .125" THK	162.0			4.5*36

(C)
INCONEL 625 SHEET, .125" THICK PER
AMS 5599 / ASTM B443 (UNS N06625).
CERT AND MILL TEST REPORT REQ'D WITH SHIPMENT.

Material Certification:
Part Number: SE121-003P-4
Part Description: WELD BACKING RING

QAP Count: 3

Workorder	Part ID	Qty	Drawing ID / Rev	Engineer
64880/1.0		1	SE121-003P / --	BLUE/DOUG MCCORKLE

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 25 / Seq: 15	805-INPROCESS INSPECTION - PLA	1.00	1.00	1.00	SE121 / --
(C)	INSPECT AND RECORD MAGNETIC PERMEABILITY (AFTER ROLLING)				
	Part Number: SE121-001P-4				
	Part Description: PVVS PORT EXTENSION WELD RING				
	Specification: PP475 Rev: 2				
	Specification: PP476 Rev: --				

IDC Count : 1 Dwg Count: 0 Pgm Count: 0 QAP Count: 4 NDT Count: 0 WPS Count: 0

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 25 / Seq: 20	230-FABRICATION - WEIDNER	1.00	1.00	1.00	SE121-003P / 0
(F)	1. TRIM AND FIT TO VESSEL CONTOUR, CUT WIDTH, PREP				
	2. WELD PER DRAWING (SIZE TO EXISTING PORT TUBE)				
	3. BLEND WELD FLUSH TO BASE METAL				
	4. CWI VISUAL INSPECT WELD 100% UNDER 8X MAGNIFICATION PER ASME CODE ARTICLE 6, SECTION V. ACCEPTANCE PER AWS D1.6, 6.29.1.				
	Specification: PP475 Rev: 5				
	Part Number: SE121-003P-4				
	Part Description: WELD BACKING RING				
	Certification: CWI CERTIFICATE				

IDC Count : 5 Dwg Count: 0 Pgm Count: 0 QAP Count: 4 NDT Count: 0 WPS Count: 1

WPS291.5 Rev:0 GTAW MAN
GTAW - Manual Fillers: INCONEL625_035_GMAW / INCONEL625_062_GTAW / INCONEL625_093_GTAW
Notes: TIG WELD ONLY

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 25 / Seq: 30	415-ROLLING/SHEAR/BRAKE PRESS	1.00	1.00	1.00	SE121 / A
(F)	RE-ROLL / ROUND UP BAND (IF NECESSARY)				
	Specification: PP475 Rev: 2				

IDC Count : 0 Dwg Count: 5 Pgm Count: 0 QAP Count: 1 NDT Count: 0 WPS Count: 0

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 25 / Seq: 40	805-INPROCESS INSPECTION - PLA	1.00	1.00	1.00	SE121 / A
(F)	VERIFY DIMENSIONAL CONDITION				
	VERIFY MAGNETIC PERMEABILITY				
	VERIFY CLEANLINESS				
	RECORD I.D.C. DATA				
	Part Number: PVVS PORT EXTENSION TUBE				
	Specification: ASTM A800 Rev: 2001				
	Specification: PP476 Rev: 2				
	Specification: PP475 Rev: 5				

Workorder	Part ID	Qty	Drawing ID / Rev	Engineer
64880/1.0		1	SE121-003P / --	BLUE/DOUG MCCORKLE

IDC Count : 2 Dwg Count: 5 Pgm Count: 0 QAP Count: 4 NDT Count: 0 WPS Count: 0

Sub ID	Part ID	Qty	Drawing ID / Rev
28	STORAGE / SHIPPING CRATE	1	/
			Parent Sub:1 Op:115

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 28 / Seq: 10	425-SHIPPING - PLANTS 1 & 2	1.00	1.00	1.00	SE121 / A

(F)
BUILD A CUSTOM STORAGE / SHIPPING CRATE PER ENGINEERING DIRECTION TO SUIT THE FOLLOWING REQUIREMENTS:
1. THE CONTAINER MUST PROTECT THE PART FROM DAMAGE AND CONTAMINATION DURING STORAGE / HANDLING DURING THE MANUFACTURING PROCESS AT MTM.
2. THE PART RESTS / SUPPORTS MUST BE HARDWOOD AND CONFIGURED SO NO NAILS OR SCREWS COME INTO CONTACT WITH THE PART.
3. THE CONTAINER MUST HAVE PROVISIONS TO BE LIFTED AND HANDLED BY EITHER A FORKLIFT, OR CRANE / LIFTING STRAPS.

IDC Count : 0 Dwg Count: 5 Pgm Count: 0 QAP Count: 0 NDT Count: 0 WPS Count: 0

Sub ID	Part ID	Qty	Drawing ID / Rev
31	NAMEPLATE	1	/
			Parent Sub:1 Op:115

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 31 / Seq: 10	415-ROLLING/SHEAR/BRAKE PRESS	1.00	1.00	1.00	

(C)
SHEAR RECTANGLE PER MATERIAL CARD
DEBURR EDGES AND CLEANUP
NOTIFY Q/A AND HAVE THE MAGNETIC PERMEABILITY CHECKED (AND RECORDED) PRIOR TO SUBCONTRACTING.

IDC Count : 1 Dwg Count: 0 Pgm Count: 0 QAP Count: 0 NDT Count: 0 WPS Count: 0

Piece #	Part ID	Qty	Drawing ID / Rev	Vendor	Dimensions
10	INCONEL 625_660-SHEET,NICKEL ALLOY .125" THK	24.0			4*6

(C)
INCONEL 625 SHEET, .125" THICK PER
AMS 5599 / ASTM B443 (UNS N06625).
CERT AND MILL TEST REPORT REQ'D WITH SHIPMENT.

Material Certification: TRACE ID: 92220
Part Number: NAMEPLATE

QAP Count: 2

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 31 / Seq: 11	260-SANDBLAST	1.00	1.00	1.00	

(C)
BLAST 100% WITH 180-220 VIRGIN ALUMINUM OXIDE MEDIA
CLEANUP AND WIPE DOWN WITH ISOPROPANOL USING LINT FREE WIPES (AVAILABLE IN Q/A)
CONTACT ENGINEERING (DOUG McCORKLE) FOR VISUAL INSPECTION.
AFTER ACCEPTED, WRAP AND TAPE WITH FOAM PROTECTION.

Workorder	Part ID	Qty	Drawing ID / Rev	Engineer
64880/1.0		1	SE121-003P / --	BLUE/DOUG MCCORKLE

IDC Count : 0 Dwg Count: 0 Pgm Count: 0 QAP Count: 0 NDT Count: 0 WPS Count: 0

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev	Service ID
Sub: 31 / Seq: 15	450-SUBLET	1.00	1.00	1.00		ENGRVNG/ETCHNG

(F) ETCH THE FOLLOWING INFORMATION PER PROVIDED DRAWING:
MAJOR TOOL & MACHINE, INC. LOGO (USE FURNISHED ARTWORK)
PPPL LOGO (USE FURNISHED ARTWORK)

SE121-01
NATIONAL COMPACT STELLARATOR EXPERIMENT
PROTOTYPE VACUUM VESSEL SEGMENT
PRIME-CONTRACT: DE-AC02-76-CH03073
SUB-CONTRACT: S-04344-F
SCOPE: NCSX-SOW-121-01-02
SPECIFICATION: NCSX-CSPEC-121-01-01
MANUFACTURER: MAJOR TOOL AND MACHINE, INC.
MTM #: 64880

NOTES:
THE SUPPLIED DRAWING IS ONLY A CONCEPT AND IS PROVIDED TO DEFINE THE NECESSARY IDENTIFICATION INFORMATION. THE FINAL COMPOSITION IS TO BE DETERMINED BY THE MANUFACTURER.
VENDOR IS TO PROVIDE PROTOTYPE SAMPLES (EITHER A PHYSICAL SAMPLE OR RENDERING) OF I.D. TAG DESIGN / COMPOSITION FOR MTM APPROVAL PRIOR TO PRODUCING THE FINAL ARTICLE.
THE MATERIAL OF THE TAG (625 INCONEL, OR 316L STAINLESS) HAS BEEN SELECTED BASED ON IT'S LOW MAGNETIC PERMEABILITY PROPERTIES. EXTREME CARE MUST BE MAINTAINED DURING THE PROCESSING AND HANDLING OF THE TAG. ALL EFFORTS MUST BE MADE TO AVOID THE INDUCTION OF MAGNETIC PROPERTIES BY MEANS OF CONTAMINATION FROM CONTACT WITH IRON BASED MATERIALS (EG PLATTENS, WORK TABLES, HAND TOOLS, ETC....) THE METHOD OF PART MARKING ALSO MUST NOT AFFECT MAGNETIC PERMEABILITY. REFERENCE MTM CLEANLINESS CONTROL PROCEDURE PP475

Specification: PP475 Rev: 2
Part Number: PVVS NAMEPLATE

IDC Count : 0 Dwg Count: 0 Pgm Count: 0 QAP Count: 2 NDT Count: 0 WPS Count: 0

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 31 / Seq: 20	820-RECEIVING INSPECTION	1.00	1.00	1.00	

(F) RECEIVE AND INSPECT NAMEPLATE PER MTM PURCHASE ORDER
INSPECT MAGNETIC PERMEABLITY AND RECORD IDC DATA
Specification: PP476 Rev: --

IDC Count : 1 Dwg Count: 0 Pgm Count: 0 QAP Count: 1 NDT Count: 0 WPS Count: 0

Sub ID	Part ID	Qty	Drawing ID / Rev
36	SOURCE NOTIFICATION	1	/

Workorder	Part ID	Qty	Drawing ID / Rev	Engineer
64880/1.0		1	SE121-003P / --	BLUE/DOUG MCCORKLE

Parent Sub:1 Op:120

Operation	Resource	QtyPer	StartQty	EndQt	Drawing ID / Rev
Sub: 36 / Seq: 10	831-SOURCE INSPECTION - FINAL	1.00	1.00	1.00	
(U)	FINAL SOURCE INSPECTION NOTIFICATION REQUIRED ONE TO TWO WEEKS PRIOR TO FINAL INSPECTION. CUSTOMER DECISION WILL FOLLOW. NOTIFICATION VIA CFT.				

IDC Count : 0 Dwg Count: 0 Pgm Count: 0 QAP Count: 0 NDT Count: 0 WPS Count: 0