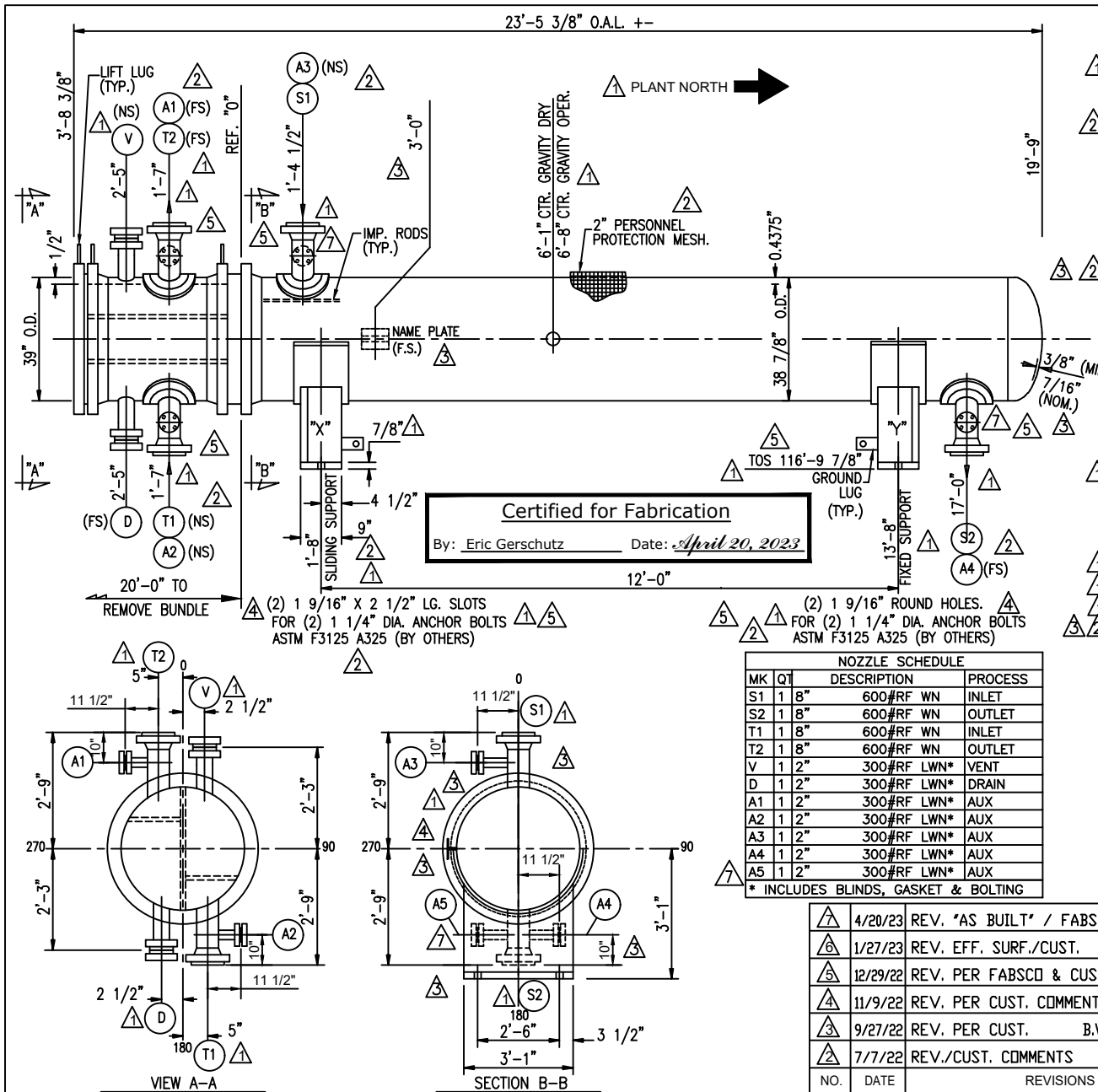
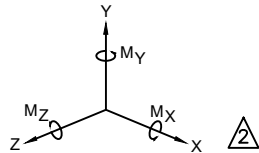


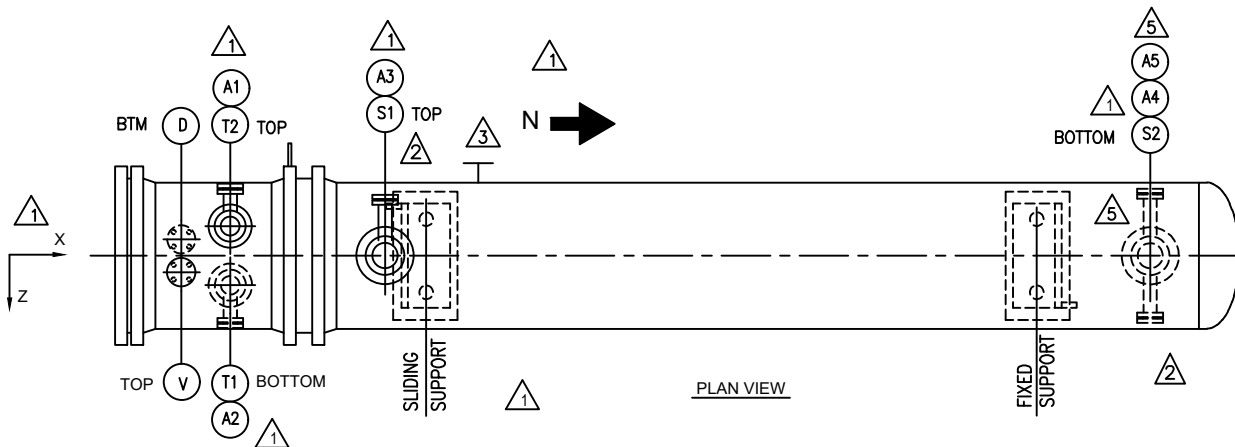


DESIGN DATA		SHELL	TUBE
DESIGN PRESSURE P.S.I.G.	295		230
M.A.W.P. P.S.I.G.	305		260
M.A.P. P.S.I.G.	315		267
LIMITED BY	TUBESHEET		CHAN. CVR.
VACUUM PRESSURE P.S.I.G.	15 @ 300° F.		N/A
TEST PRESSURE P.S.I.G.	SHOP-410/FIELD-398		SHOP-347/FIELD-338
DESIGN TEMP. Deg.F.	310		150
MDMT Deg. F.	32		32
CORROSION ALLOWANCE	1/32"		1/8"
NUMBER OF PASSES	1		6
RADIOGRAPHY	SPOT/UW-11(a)(5)(b)		SPOT/UW-11(a)(5)(b)
HEAT TREAT REQUIRED	NO		YES
ESTIMATED WEIGHTS, LBS.			
DRY: 20300 BUNDLE:10600 WET/HYDROTEST: 30500 CHAN.:4100 CH. CVR: 1575 SHELL: 5400			
SPECIFICATIONS			
ASME Code Section VIII, Division 1, 2021 Ed. (Stamp: Yes)			
TEMA Class R 10th Ed.; & Natl. Bd. Reg. is required. API-660 9th Ed.			
Design Reviewed For Compliance With The Requirements of UG-120(d)			
Impact Test Exempt per UCS-66(a),(c),(g), Fig. UCS-66 Gen. Note (c), UCS-67, and UHA-51(d).			
MATERIAL			
CHANNEL:	SA-516-70N	BAFFLES:	SA-240-316/316L
SHELL:	SA-240-316/316L	TUBES:	SA-789-S31803/S32205 (SMLS)
TUBESHEETS:	SA-240-S31803/S32205		
SEE B.O.M. FOR REMAINDER OF MATERIAL			
(460) U's 3/4" O.D.X 0.065" (AVG.) X 18'-0" LG.			
TUBE PITCH	1"	90°	SURFACE 3168.8 (EFF) SQ.FT.
GENERAL NOTES			
ALL BOLT HOLES TO STRADDLE NATURAL CENTER LINES.			
PERSONNEL PROTECTION SHELLSIDE (BY FABSCO)			
FIREPROOFING ON SUPPORTS : N/A			
TUBES SHALL BE SOLUTION ANNEALED			
SEAL WELD & EXPAND TUBES TO TUBESHEET			
STATIC HEAD: 1.36 PSI SHELL SIDE; 1.36 PSI TUBE SIDE			
SHELLSIDE : TOXIC ; TUBESIDE : WATER			
GASKETS: .1750" THK. 316 S.S. SPIRAL WOUND GPHT FILLED W/ 316 S.S.			
INNER & OUTER COMP. RINGS			
2 SETS OF SPARE GASKETS REQUIRED.			
10% SPARE BOLTING FOR BODY FLG'S.			
PAINT: SEE SHT. -1A			
PROJECT NAME: WORLD ENERGY RENEWABLES PROJECT			
EQUIPMENT OWNER: AIR PRODUCTS MANUFACTURING LLC			
SERVICE: PROPANE RECOVERY COMPRESSOR AFTERCOOLER			
LOCATION: WORLD ENERGY, PARAMOUNT, CA. USA			
PRODUCT: PROPANE RECOVERY COMPRESSOR AFTERCOOLER			
ITEM NO.: 18-X-371			
AIR PRODUCTS P.O. NO.:4505600058 / A8KM-4-402-PO-3			
AP PROJECT NO: EN-20-7120			
VDR CODE NO.: HCO9			
SERIAL NO.: S21-13258-8			
ENGINEER: EG			
CUSTOMER / CLIENT: WORLD ENERGY PARAMOUNT			
CD AS/DD	ASSEMBLY AND SPECIFICATIONS FOR ONE 38-216 A E U		
DD/DG			
T. DD/DG			
S DD/DG			
N./DD			
DD	DWN. BY	Fabsco SHELL & TUBE, LLC	REV. 7
	EMG		
	DATE		
	12-23-2021		
	CKD. BY	DWG.NO.	
	GS	S21-13258-8-1	



NOZZLE LOADS

MK.	M _X LBF-FT	M _Y LBF-FT	M _Z LBF-FT	F _X LBF	F _Y LBF	F _Z LBF	LOAD BASES
S1	9020	14600	11460	4560	3640	4560	8"-300#; 2 x API-660
S2	9020	14600	11460	4560	3640	4560	8"-300#; 2 x API-660
T1	9020	14600	11460	4560	3640	4560	8"-300#; 2 x API-660
T2	9020	14600	11460	4560	3640	4560	8"-300#; 2 x API-660



DESIGN DATA	SHELL	TUBE
OPERATING PRESSURE PSIG	250	50
OPERATING TEMP. °F.	IN: 180.3 OUT: 110	IN: 80 OUT: 112
HYDROTEST TEMP. °F.	60deg (min)	60deg (min)
JOINT EFF.	1	1
FLUID NAME	PROPANE	COOLING WATER
	TOXIC & FLAMMABLE	
FLUID DENSITY lb/ft ³	LIQ. IN: 32.38 OUT: 34.31	IN: 62.226 OUT: 61.842
	GAS IN: 1.83 OUT: 1.20	
LETHAL SERVICE	NO	NO
DESIGN DUTY Btu/hr	10164000	
WIND CODE	ASCE 7-16 WIND SPEED: 101 MPH IMP. FACTOR: 1	
SEISMIC CODE	ASCE 7-16 IMP. FACTOR: 1.5 Fa: 1 Fv: 1.721	
	Ss: 1.616 S ₁ : 0.579 Site Class: D Sd ₁ : 0.996	

PAINT: (PAINT SYSTEM #1)

CHANNEL ONLY !!!!!

SOLVENT CLEAN PER SSPC-SP1

SANDBLAST PER SSPC-SP10 (1.5-2.5 MILS ANCHOR PROFILE)

PRIMER: ONE COAT SHERWIN WILLIAMS ZINC CLAD II (2.5-4.0 MILS DFT)

INTERM: ONE COAT SHERWIN WILLIAMS MACROPOXY 646 (4.0-6.0 MILS DFT)
(COLOR: MILLWHITE)

FINISH COAT: ONE COAT SHERWIN WILLIAMS ACROLON 218HS
(2.0-3.0 MILS DFT)
(COLOR: LIGHT GRAY RAL #7035)

DO NOT SANDBLAST OR PAINT STN. STL. SHELL AND TUBESHEET.

APPLICABLE SPECIFICATIONS 3-12-10, 4-11-11, 4WEQ-1051, 4WGN-10001, 4WPI-670210, A8KM-PP-000-40002-A, A8KM-PP-000-50720-A, A8KM-PP-000-200001-A, A8KM-PP-000-500005-A, A8KM-PP-000-500510-A, A8KM-PP-000-500512-A, A8KM-PP-000-500520-A, A8KM-PP-000-500550-A, FORM 8232, SPEC-ENG-DOC001, SPEC-ENG-DOC002, SPEC-ENG-MQ042, SPEC-ENG-MQ057, SPEC-MED-DOC001

PROJECT NAME: WORLD ENERGY RENEWABLES PROJECT
EQUIPMENT OWNER: AIR PRODUCTS MANUFACTURING LLC
SERVICE: PROPANE RECOVERY COMPRESSOR AFTERCOOLER
LOCATION: WORLD ENERGY, PARAMOUNT, CA. USA
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ITEM NO.: 18-X-371
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AP PROJECT NO.: EN-20-7120
VDR CODE NO.: HCO9
SERIAL NO.: S21-13258-8
ENGINEER: EG
CUSTOMER / CLIENT: WORLD ENERGY PARAMOUNT

CHANNEL COVER TO CHANNEL FLANGE BOLTING INFO

STUD DIAMETER: 1 1/8" O.D.
NUMBER STUDS: (52)
STUD MATERIAL: SA-193-B7
BOLT TORQUE RANGE TO BE ACHIEVED: 842.1-873.2 Ft. LBS.

CHAN. FLG./T'SHT./SHELL FLG. BOLTING INFO

STUD DIAMETER: 1 1/8" O.D.
NUMBER STUDS: (52)
STUD MATERIAL: SA-193-B7
BOLT TORQUE RANGE TO BE ACHIEVED: 842.1-873.2 Ft. LBS.

SUPPLEMENTAL INFORMATION			
ONE 38 - 216 A E U			
NO.	DATE	REVISIONS	DWN. BY EMG DATE 5/4/2022 CKD. BY DiCarlo DWG.NO. S21-13258-8-1A REV. 5

-----API-660-----

- 1) STENCIL THE FOLLOWING ON THE EXCHANGER IN 3" HIGH (MIN.) WHITE BLOCK LETTERS::

P.O. NO.: 4505600058

ITEM NO.: 18-X-371

SHIPPING WT.: 20,300 LBS.

ON CHANNEL ONLY, STENCIL :

"DO NOT WELD ON CHANNEL-PWHT" 
IN TWO (2) PLACES, 180° APART.

- 2) STUDS, NUTS AND THREADED SURFACES SHALL BE COATED WITH MARKAL E-Z- BREAK COMPOUND BEFORE ASSEMBLY.
- 3) HYDRO TEST PRESSURE SHALL BE HELD FOR A MINIMUM OF ONE HOUR.
- 4) PLUG SHELL INSIDE DIAMETER WITH A METAL TEMPLATE CONSISTING OF TWO DISCS (EACH HAVING A DIAMETER EQUAL TO THE DIAMETER OF THE BAFFLES) RIGIDLY MOUNTED PERPENDICULAR TO A SHAFT, AND SPACED 12" APART.
- 5) THE FLATNESS TOLERANCE (MAXIMUM DEVIATION FROM A PLANE) ON PERIPHERAL GASKET CONTACT SURFACES SHALL BE $\pm 1/32"$.
- 6) FLATNESS OF GASKET SURFACES SHALL BE MEASURED WITH A DIAL INDICATOR. PASS PLATE GROOVES CAN BE MEASURED WITH A STRAIGHT EDGE.
- 7) WELD METAIL AND HAZ. HARDNESS EXAMINATION REQUIREMENTS ON CHANNEL ARE AS FOLLOWS (AFTER PWHT, IF REQUIRED):
-225 BHN, MAXIMUM.
-A 10mm BALL IS REQUIRED FOR TESTING.
-TEST ONE LONGITUDINAL AND ONE CIRCUMFERENTIAL WELD AND EACH CONNECTION TO COMPONENT WELD OF NOZZLES 2" NPT AND LARGER.
-IF MORE THAN ONE WELDING PROCEDURE IS USED TO PERFORM LONGITUDINAL OR CIRCUMFERENTIAL WELDS, HARDNESS READINGS SHALL BE MADE OF THE WELDS DEPOSITED BY EACH PROCEDURE.
-HARDNESS READINGS AND LOCATIONS SHALL BE RECORDED.
- 8) FINAL VISUAL WELD INSPECTION SHALL BE PERFORMED AFTER POST WELD HEAT TREATMENT, IF REQUIRED.

-----API-660 CONT.-----

- 9) COAT EXPOSED MACHINED SURFACES WITH AN EASILY REMOVABLE RUST PREVENTATIVE.
- 10) NOTIFY CUSTOMER FIVE (5) DAYS PRIOR TO START OF FABRICATION, WITNESS OR HOLD POINTS.
- 11) MATCH MARKS SHALL BE PROVIDED TO ENSURE PROPER ALIGNMENT OF BOLTED JOINTS.
- 12) STAMP THE SERIAL No. ON O.D. OF TUBESHEETS, FLANGES AND CHANNEL COVERS.
- 13) HYDRO TEST CHARTS REQUIRED.
- 14) NOZZLE WELD PADS & SUPT. PADS SHALL BE AIR & SOAP TESTED W/15 PSI (MIN), 25 PSI (MAX) AIR PRESSURE.
- 15) ALL FINISHED WELDS ON CHANNEL SHALL BE M.T. AFTER P.W.H.T.
- 16) SHELLSIDE HYDRO TEST SHALL BE PERFORMED WITH CHANNEL COVER REMOVED.
- 17) HEAT TREAT CHARTS REQUIRED.
- 18) AT LEAST ONE SPOT RADIOGRAPH SHALL BE MADE OF EACH CIRCUMFERENTIAL AND LONGITUDINAL JOINT. SPOT RADIOGRAPHS SHALL INCLUDE EACH START, STOP AND BURN-THROUGH OF WELDS MADE BY THE AUTOMATIC SUBMERGED ARC PROCESS.
- 19) SPOT RADIOGRAPHS SHALL BE AT LEAST 10" LONG, OR SHALL BE FULL LENGTH WHERE WELDS ARE LESS THAN 10 INCHES LONG.

____ STAINLESS STEEL REQUIREMENTS ____.

- 1) TEST WATER CHLORIDE CONTENT NOT TO EXCEED 50 PPM.
- 2) TOOLS, GRINDING WHEELS, BRUSHES, ETC USED ON STAINLESS STEEL SHALL NOT HAVE USED PREVIOUSLY ON CARBON STEEL.

-----STANDARD SHOP PRACTICES-----

- 1) ALL BOLT HOLES SHALL STRADDLE NATURAL CENTERLINES.
- 2) GRIND INSIDE WELDS FLUSH WITH SHELL.
- 3) GRIND INSIDE WELDS SMOOTH WITH CHANNELS.
- 4) RADIUS ALL NOZZLES 1/8" INSIDE AT CYLINDER I.D.
- 5) SEAL WELD SUPPORT SADDLES WITH 1/4"(MIN) FILLET WELD.
- 6) EXCHANGER SHALL BE CLEANED INSIDE AND OUTSIDE OF WELD SPATTER, DIRT, WELD ROD AND OTHER DEBRIS.
- 7) FOR MDMT OF +30° F. (MINIMUM), HYDRO TEST WATER TEMPERATURE SHALL NOT TO BE LESS THAN 40°F.
- 8) ALL EXTERNAL ATTACHMENTS TO BE SEAL WELDED.
- 9) HYDROSTATIC TEST, USE CLEAN WATER WITH A CORROSION INHIBITOR ADDED.
VOLUME OF WATER TUBESIDE = 481 GALLONS (APPROXIMATELY)
- 10) ALL LIFTING DEVICE ATTACHMENT WELDS SHALL BE EXAMINED BY THE PT METHOD.
- 11) INSTALL SHIPPING COVERS ON ALL NOZZLES.
- 12) ALL SEAL WELDED EXTERNAL NON PRESSURE ATTACHMENTS REQUIRE A 1/4" NPT VENT HOLE.
- 13) AFTER THE HYDRO TEST, THE HEAT EXCHANGER SHALL BE COMPLETELY DRAINED AND THOROUGHLY DRIED.

-----NDT REQUIREMENTS-----

- 1) SHELL: SPOT PER UW-11(a)(5)(b) RADIOGRAPH.
- 2) CHANNEL: SPOT PER UW-11(a)(5)(b) RADIOGRAPH.

PROJECT NAME: WORLD ENERGY RENEWABLES PROJECT
EQUIPMENT OWNER: AIR PRODUCTS MANUFACTURING LLC
SERVICE: PROPANE RECOVERY COMPRESSOR AFTERCOOLER
LOCATION: WORLD ENERGY, PARAMOUNT, CA USA
PRODUCT: PROPANE RECOVERY COMPRESSOR AFTERCOOLER
ITEM NO.: 18-X-371
AIR PRODUCTS P.O. NO.: 4505600058 / ABKM-4-402-P0-3
AP PROJECT NO: EN-20-7120
VDR CODE NO.: BE04
SERIAL NO.: S21-13258-8
ENGINEER: EG
CUSTOMER / CLIENT: WORLD ENERGY PARAMOUNT

JOB NOTES

DWN. BY
DD

DATE
6/21/22

CKD. BY
DiCarlo

Fabsco
SHELL & TUBE, LLC

DWG. NO.
S21-13258-8-1B

REV.
2

	9/28/22	REV. PER FABSCO BW/DD
	7/7/22	ADDED DWG./ FABSCO DD
NO.	DATE	REVISIONS

- 1) ALL SHARP EDGES SHALL BE GROUND TO A .078" RAD. (MIN.)
- 2) THE INITIAL ROOT PASS OF DBL WELDED GROOVE JOINTS, INCLUDING ROOT TACK WELDS, SHALL BE CHIPPED, GROUND &/OR GOUGED TO SOUND METAL, AREA TO BE EITHER MPE OR DPE PRIOR TO WELDING FROM OTHER SIDE.
- 3) ON CHANNEL, ALL CAT. A,B,C,D WELDS, THE WELDS AND ADJACENT METAL TO BE HEATED TO 600°F., WRAPPED WITH INSULATION & ALLOWED TO COOL UNTIL PWHT CAN BE PERFORMED LATER.
- 4) PRESSURE CONTAINING WELDS, INTERNAL ATTACHMENT WELDS, & SUPPORT WELDS SHALL BE CONTOURED TO PERMIT PROPER INTERPRETATION OF ANY REQ'D. UT EXAMINATION.
- 5) ALL WELDING CONSUMABLES SHALL BE OF LOW HYDROGEN TYPE. E60XX ELECTRODES SHALL NOT BE USED!
- 6) ON CHANNEL, ONE BRINELL READING SHALL BE TAKEN ON THE INSIDE & OUTSIDE OF EACH SECTION, HEAD, NOZZLE, LONG SEAM, CIRC SEAM & EACH NOZZLE WELD. READING SHALL NOT EXCEED 200 BH (MAX.) READ TO BE DONE AFTER ANY REQ'D. PWHT. HARDNESS TEST & LOCATIONS SHALL BE RECORDED FOR REVIEW. CUST. INSP. TO WITNESS TESTING.
- 7) THE FERRITE NUMBER FOR 316/316L S.S. WELD PROCEDURES AND PRODUCTION WELDS SHALL BE BETWEEN 3.0-8.0 FN AS DETERMINED BY FERRITSCOPE OR CHEMICAL ANALYSIS. FERRITSCOPE SHALL BE CALIBRATED USING AWS 4.2M FERRITE READING SHALL BE MEASURED BEFORE PWHT.
- 8) A MIN. OF SIX FERRITE READINGS SHALL BE TAKEN ON THE SURFACE AT EACH OF THE FOLLOWING LOCATIONS:
 - A) 10 LOCATIONS MIN. OF CONTINUOUS OVERLAY ON EACH COVER, CYL, TEMA RING & HEAD.
 - B) EACH NOZZLE INSTALLATION (1 AT EACH END).
 - C) EACH AREA OF OVERLAY STRIPBACK (IF PRESENT).
 - D) EACH NEW SPOOL OF CONTINUOUS OVERLAY STRIP OR WIRE ELECTRODE.
 - E) FERRITE CHECKS SHALL BE ON A MIN. OF 5% OF PRODUCTION WELDS.
- 9) TEMPORARY ATTACHMENTS TO BE REMOVED, AREA TO BE GROUND FLUSH W/ SURROUNDING AREAS, FOLLOWED BY MPE OR DPE. DO NOT "KNOCK OFF."
- 10) HYDRO TEST WATER TEMP. AT ALL LOCATIONS SHALL BE AT LEAST 50°F. AT ALL TIMES DURING HYDROTEST.
- 11) THE TEMPERATURE OF THE HYDROTEST WATER AND THE EXCHANGER SHALL BE EQUALIZED PRIOR TO HYDROTEST.
- 12) PMI OF WELD CONSUMABLES PRIOR TO WELDING SHALL BE PERFORMED. CHEMICAL ANALYSIS OF WELD OVERLAY DEPOSITS SHALL BE TAKEN AT A MINIMUM DEPTH OF 1/16" BELOW THE FINAL SURFACE OF THE WELD. THE RESULT OF CHEM. ANALYSIS SHALL MEET THE DEPOSIT ANALYSIS OF UNDILUTED WELD METAL.

- 13) PMI AS FOLLOWS:
 - A) ON TUBES, 5% OF EACH HEAT LOT.
 - B) 100% OF ALL PRESSURE CONTAINING WELDS.
 - C) 100% ALL OTHER PRESSURE RETAINING PARTS.
 - D) 100% EACH CYLINDER OR HEAD.
 - E) VERIFIED MATERIALS SHALL BE MARKED WITH "PMI" OR "PMI-B"
 - F) CHEMICAL COMPOSITION FOR 316/316L MATERIAL :
C= .035% (MAX.) Ni= 10.0-15.0% (MIN.)
Cr= 16-18% (MIN.) Mo= 2.00-3.00% (MIN)
 - G) CHEMICAL COMPOSITION FOR 2205 DUPLEX SS MATERIAL:
Ni= 4.50-6.50% (MIN.) N=0.14-0.20 (MIN)
Cr= 22.0-23.0% (MIN.) Mo= 3.00-3.50% (MIN)
 - H) RESULTS OF PMI SHALL BE RECORDED ON REPORT FORMS & NOTED ON DWG'S.
- 14) STAMPING TO BE DONE W/ "LOW STRESS" STAMPS.
- 15) WELDS SHALL BE CONTOURED TO PERMIT PROPER INTERPRETATION OF WELDS.
- 16) NOZ. TO CYL. WELDS, BRANCH NOZ. WELDS WHICH CAN'T BE X-RAYED SHALL BE UT.
- 17) ALL ARC STRIKES, START, STOPS SHALL BE CONFINED TO THE WELDING GROOVE OR SHALL BE REMOVED BY LIGHT GRINDING FOLLOWED BY MPT OR DPE.
- 18) THE USE OF HIGH NICKEL CONTENT C'STL. WELDING CONSUMABLES OR C-1/2Mo CONSUMABLES IS PROHIBITED.
- 19) ALL WELD SURFACES TO BE VISUALLY INSPECTED TO ENSURE THAT LAMINATIONS &/OR OTHER DEFECTS ARE NOT PRESENT.
IF PWHT IS REQ'D. ALL PLATE EDGES SHALL BE MPT OR DPE BEFORE WELDING.
- 20) ACCEPTANCE NDE SHALL BE PERFORMED AFTER ANY REQ'D. PWHT.
- 21) PEENING IS NOT PERMITTED FOR PURPOSE OF CLEANING WELDS.
- 22) RADIOGRAPH OF WELDS IN PIPE EQ/OR SMALLER THAN 3" NPS, MAY BE DONE BY THE ELLIPTICAL PROJECTION TECHNIQUE. AT LEAST TWO SEPARATE EXPOSURES ARE REQ'D. AT 90° APART.
- 23) EXCH'S. TO BE STENCILED W/ THE FOLLOWING"

"HEIGHT" : 6'-6"
"WIDTH" : 4'-0"
"LENGTH" : 23'-6"
"WEIGHT" : 20,300#
⚠ (SEE API-660 NOTE #1
FOR REMAINING INFO)

- 24) FINISHED EXCHANGER IS TO BE WEIGHED.
TO BE WITHIN +/- 2% OR BETTER ACCURACY.
A CALIBRATED WEIGHT CERTIFICATE SHALL BE PROVIDED.
- 25) LIFTING POINTS & CENTER OF GRAVITY SHALL BE MARKED ON EXCHANGER.
- 26) THE ENTIRE SURFACE OF FORGINGS INCLUDING WELD BEVEL SHALL BE EXAMINED BY MT AFTER FINISH MACHINING & PRIOR TO WELDING.
- 27) EXCHANGER SHALL BE IN A MANNER WHICH KEEPS NOZZLES FROM TOUCHING THE TRUCK BEDS AND/OR SURFACES AT OFF-LOADING AREA AT JOBSITE.
- 28) PRIOR TO WELDING, JOINTS SHALL BE VISUALLY INSPECTED FOR CLEANLINESS, CONDITION OF TACK WELDS IF PRESENT, PREHEAT IF SPECIFIED, AND FILLER METAL TO BE USED.
- 29) REQUIRED PREHEAT TEMPERATURE SHALL ALSO APPLY TO THERMAL CUTTING AND TACK WELDING.
- 30) PREHEAT ALL JOINT TO A MINIMUM OF 125° F. WHEN MOISTURE REMOVAL IS REQUIRED.
- 31) ALL WELDING SHALL BE IN ACCORDANCE WITH ASME SECT. IX & PROJECT SPECIFICATIONS
A8KM-PP-000-500550-A, A8KM-PP-000-500532-A,
4WEQ-1051, 3-11-10, 4-11-11.
- 32) ALL SHELL & HEAD JOINTS SHALL BE BACK WELDED JOINTS, WHERE POSSIBLE.
- 33) WELDS FROM EACH WELD PROCEDURE, WELDER/WELDING OPERATOR SHALL BE FULL RADIOGRAPHED IF ACCESSIBLE.
- 34) NON PRESSURE PARTS TO PRESSURE CONTAINING COMPONENT WELDS SHALL BE 100% M.P.E. OR D.P.E.
- 35) ALL LONG & CIRC SEAMS, NOZZLE ATTACHMENT WELDS SHALL BE FULL PENETRATION WELDED AS SHOWN ON DWG. -13.
- 36) FOR OFFSET NOZZLES, THE MIN. THROAT DIMENSIONS SHALL BE MAINTAINED.

PROJECT NAME: WORLD ENERGY RENEWABLES PROJECT
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PRODUCT: PROPANE RECOVERY COMPRESSOR AFTERCOOLER
ITEM NO.: 18-X-371
AIR PRODUCTS P.O. NO.: 4505600058 / ABKM-4-402-PO-3
AP PROJECT NO.: EN-20-7120
VDR CODE NO.: BE04
SERIAL NO.: S21-13258-8
ENGINEER: EG
CUSTOMER / CLIENT: WORLD ENERGY PARAMOUNT

			JOB NOTES (CONT.)		
			DWN. BY DD	Fabsco	
			DATE 7/7/22	SHELL & TUBE, LLC	
A	9/27/22	REV. PER CUST. B.W./DD	CKD. BY <i>DiCarlo</i>	DWG. NO. S21-13258-8-1C	REV. 2
A	7/7/22	ADDED DWG./FABSCD DD			
NO.	DATE	REVISIONS			

- 1) MACHINE ALL COVER SURFACES TO 250 RMS EXCEPT GASKET FACES TO BE 125 RMS.
- 2) ALL COVER PASS PLATE GROOVE WIDTHS TO BE 1/2" WIDE.
- 3) ALL COVER PASS PLATE GROOVE JUNCTIONS TO BE NOTCHED 3/8" AT 45 Deg.



- 1) ALL WELDING TO BE IN ACCORDANCE W/ PROCEDURES ON DWG. -18.
 - 2) ALL BOLT HOLES TO STRADDLE CENTER LINES.
 - 3) FOR WELD AND BEVEL DETAILS SEE DWG. -13.
 - 4) GRIND ALL INSIDE WELDS SMOOTH.
 - 5) SPOT X-RAY PER UW-11(a)(5)(b)
 - 6) POST-WELD HEAT TREAT CHANNEL:
 - A) HEAT FROM 800°F TO 1175°F +0° - 25° AT 400°F PER HOUR.
 - B) HOLD AT 1175°F +0°-25° F FOR 1-HOUR (MIN).
 - C) COOL FROM 1175°F +0° - 25° TO 800°F AT 500°F PER HOUR.
 - D) FURTHER COOLING MAY BE IN STILL AIR.
- PROJECT NAME: W
EQUIPMENT OWNER:
SERVICE: PROPANE
LOCATION: WORLD E
PRODUCT: PROPANE
ITEM NO.: 18-
AIR PRODUCTS P.O.
AP PROJECT NO: 1
VDR CODE NO: 1
SERIAL NO.: S21-1

PROJECT NAME: WORLD ENERGY RENEWABLES PROJECT
EQUIPMENT OWNER: AIR PRODUCTS MANUFACTURING LLC
SERVICE: PROPANE RECOVERY COMPRESSOR AFTERCOOLER
LOCATION: WORLD ENERGY, PARAMOUNT, CA. USA
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ITEM NO.: 18-X-371
AIR PRODUCTS P.O. NO.: 4505600058 / ABKM-4-402-PO-3
AP PROJECT NO.: EN-20-7120
VDR CODE NO.: BE04
SERIAL NO.: S21-13258-8
ENGINEER: EG
CUSTOMER / CLIENT: WORLD ENERGY PARAMOUNT



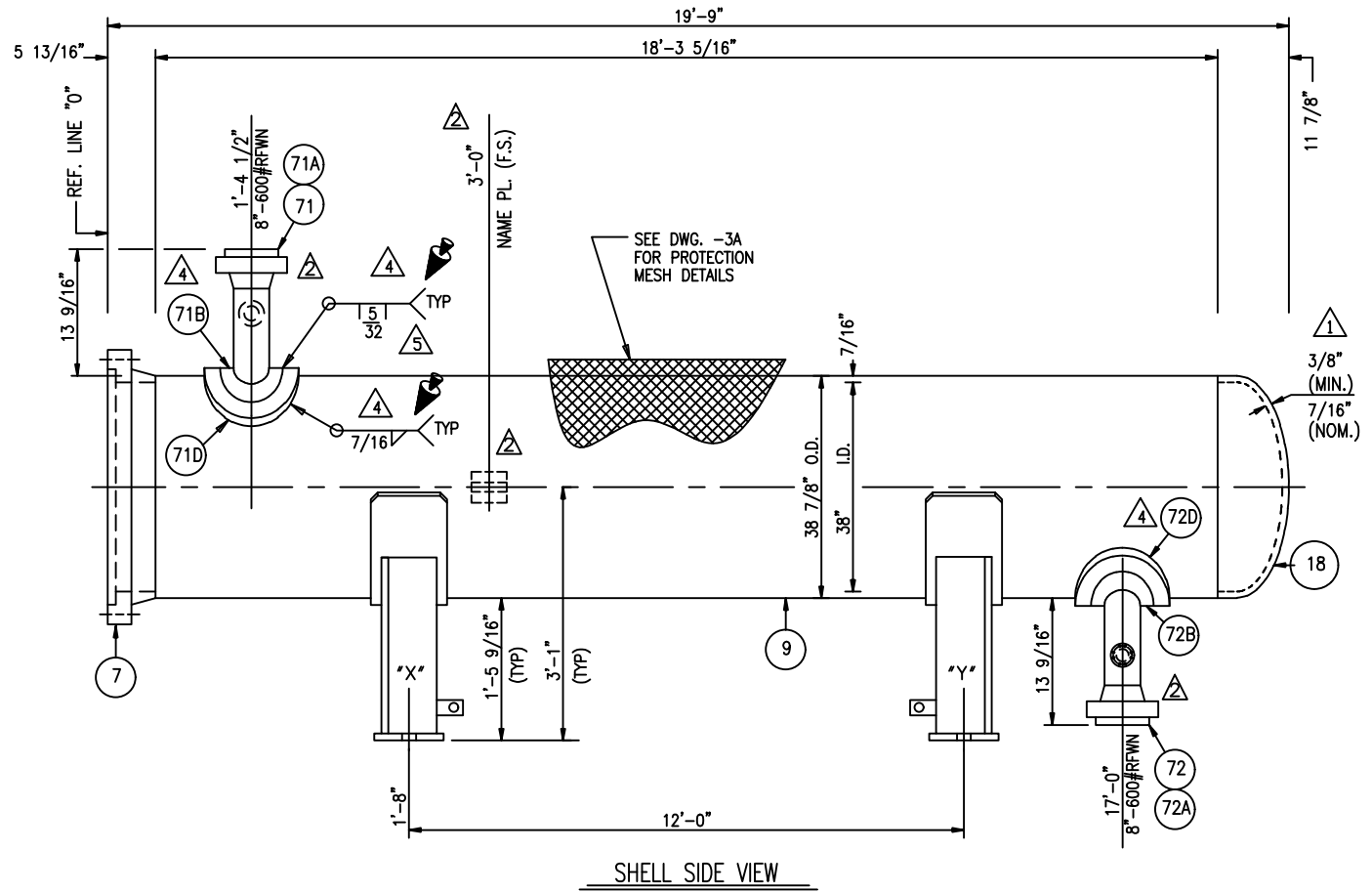
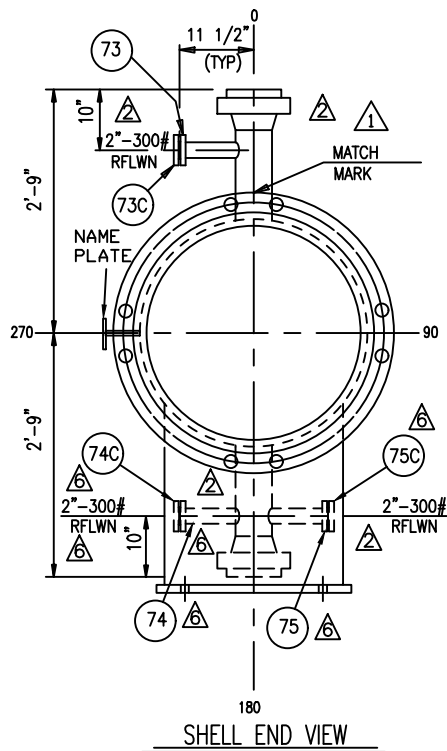
* { MACHINE GASKET FACING TO 125 RMS AFTER ALL
WELDING & HEAT TREAT.
FOR FLANGE DETAILS SEE DWG. 12

NOTE:
TRIM WELD PAD RINGS
IN ORDER TO MAINTAIN 2"
GAP WELD TOE TO WELD TOE
FROM RING TO CIRC. SEAM.



			FRONT CHANNEL DETAILS			
④	1/19/23	REV. PER CUST. COMMENTS DD/DG	DWN. BY B.W.	Fabsco SHELL & TUBE, LLC		
③	12/29/22	REV. WELD PADS/CUST. DD/DG				
②	11/9/22	ADD V&D NOTCH/CUST. DD/DG	DATE 5/16/22			
①	7/7/22	REV. PER CUST. COMMENTS DD	CKD. BY <i>DiCarlo</i>	DWG.NO. S21-13258-8-2	REV 4	
NO.	DATE	REVISIONS				

FOR FLANGE DETAILS SEE DWG. 12



NOTES:

- 1) ALL WELDING TO BE IN ACCORDANCE W/ PROCEDURES ON DWG. -16.
- 2) ALL BOLT HOLES TO STRADDLE CENTER LINES.
- 3) FOR WELD AND BEVEL DETAILS SEE DWG. -13.
- 4) FOR SUPPORT DETAILS SEE DWG. -9.
- 5) GRIND ALL INSIDE WELDS FLUSH.
- 6) SPOT X-RAY PER UW-11(a)(5)(b)

PROJECT NAME: WORLD ENERGY RENEWABLES PROJECT
EQUIPMENT OWNER: AIR PRODUCTS MANUFACTURING LLC
SERVICE: PROPANE RECOVERY COMPRESSOR AFTERCOOLER
LOCATION: WORLD ENERGY, PARAMOUNT, CA. USA
PRODUCT: PROPANE RECOVERY COMPRESSOR AFTERCOOLER
ITEM NO.: 18-X-371
AIR PRODUCTS P.O. NO.: 4505600058 / A8KM-4-402-PO-3
AP PROJECT NO.: EN-20-7120
VDR CODE NO.: BE04
SERIAL NO.: S21-13258-8
ENGINEER: EC
CUSTOMER / CLIENT: WORLD ENERGY PARAMOUNT

NO.	DATE	REVISIONS
1	4/20/23	REV. "AS BUILT" / FABSCO AS/DG
2	1/19/23	REV. GAP DIM/CUST. DD/DG
3	12/29/22	REV. WELD PADS/CUST. DD/DG
4	11/9/22	NO REV./RESUBMIT FOR AP'L DD/DG
5	9/27/22	REV. PER CUST. B.W./DD
6	7/7/22	REV. PER CUST. COMMENTS DD

SHELL DETAILS			
DWN. BY B.W.		Fabscos SHELL & TUBE, LLC	
DATE 5/16/22			
CKD. BY <i>DiCarlo</i>		DWG.NO. S21-13258-8-3	
		REV. 6	

FORM U-1 MANUFACTURER'S DATA REPORT FOR PRESSURE VESSELS

As Required by the Provisions of the ASME Boiler and Pressure Vessel Code Rules, Section VIII, Division 1 **Corrected Copy** Page 1 of 3

1. Manufactured and certified by **Fabsco Shell & Tube, LLC, Plant Two, 2410 Industrial Road, Sapulpa, Oklahoma, 74066, USA**
(Name and address of Manufacturer)

2. Manufactured for **AIR PRODUCTS MFG, LLC., 1940 AIR PRODUCTS BLVD, ALLENTOWN, Pennsylvania, 18195, USA**
(Name and address of Purchaser)

3. Location of installation **WORLD ENERGY, PARAMOUNT, California, USA**
(Name and address)

4. Type **HORIZ.** **HEAT EXH.** **S21-13258-8**
(Horizontal, vertical, or sphere) (Tank, separator, jkt. vessel, heat exch., etc.) (Manufacturer's serial number)

N/A **S21-13258-8-1 REV 7** **11166** **2023**
(CRN) (Drawing number) (National Board number) (Year built)

5. ASME Code, Section VIII, Div. 1 **2021/ N/A** **N/A** **N/A**
[Edition and Addenda, if applicable (date)] (Code Case Number) [Special Service per UG-120(d)]

Items 6-11 incl. to be completed for single wall vessels, jackets of jacketed vessels, shell of heat exchangers, or chamber of multichamber vessels.

6. Shell: (a) Number of course(s) **3** (b) Overall length **18' 3.3125"**

Course(s)			Material	Thickness		Long. Joint (Cat. A)			Circum. Joint (Cat. A, B, & C)			Heat Treatment	
No.	Diameter	Length	Spec./Grade or Type	Nom.	Corr.	Type	Full, Spot, None	Eff.	Type	Full, Spot, None	Eff.	Temp.	Time
2	38" ID	6' 1.1250"	SA-240-316/316L	7/16"	1/32"	1	SPOT	1.00	1	SPOT	1.00	N/A	N/A
1	38" ID	6' 1.0625"	SA-240-316/316L	7/16"	1/32"	1	SPOT	1.00	1	SPOT	1.00	N/A	N/A

Body Flanges on Shells												
No.	Type	ID	OD	Flange Thk	Min Hub Thk	Material	How Attached	Location	Bolting			
									Num & Size	Bolting Material	Washer (OD, ID, thk)	Washer Material
1	N/A	38"	44.7500"	5 13/16"	N/A	SA-182F316/316L	WELDED	END	52 - 1 1/8" O.D.	SA-193-B7	1 1/8" O.D.	F-436-1

7. Heads: (a) **SA-240-316/316L** (b) **N/A**
(Material spec. number, grade or type) (H.T. - time and temp.) (Material spec. number, grade or type) (H.T. - time and temp.)

	Location (Top, Bottom, Ends)	Thickness		Radius		Elliptical Ratio	Conical Apex Angle	Hemispherical Radius	Flat Diameter	Side to Pressure		Category A		
		Min.	Corr.	Crown	Knuckle					Convex	Concave	Type	Full, Spot, None	Eff.
(a)	END	3/8"	1/32"	N/A	N/A	2:1	N/A	N/A	N/A		X	S	None	1.00
(b)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A			N/A	N/A	N/A

Body Flanges on Heads												
No.	Location	Type	ID	OD	Flange Thk	Min Hub Thk	Material	How Attached	Bolting			
									Num & Size	Bolting Material	Washer (OD, ID, thk)	Washer Material
(a)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		N/A	N/A	N/A

8. Type of jacket **N/A** Jacket closure **N/A**
(Describe as ogee & weld, bar, etc.)

If bar, give dimensions; if bolted, describe or sketch **N/A**

9. MAWP **305 psi** **15 psi** at max. temp. **310 °F** **300 °F** Min. design metal temp. **32 °F** at **305 psi**
(Internal) (External) (Internal) (External)

10. Impact test **NO, EXEMPT PER UG-20(f), UCS-66(a,c, g), FIG. UCS-66 GENERAL NOTE(c), UCS-67, UHA-51(d)** at test temperature of **N/A**
[Indicate yes or no and the component(s) impact tested]

11. Hydro., pneu., or comb. test pressure **HYDRO at 410/398** Proof test **N/A**

Items 12 and 13 to be completed for tube sections.

12. Tubesheet **SA-240S31803/32205** **40.7500"** **3 1/8"** **1/32"** **BOLTED**
[Stationary (material spec. no.)] [Diameter (subject to press.)] (Nominal thickness) (Corr. allow.) Attachment (welded or bolted)

N/A **N/A** **N/A** **N/A** **N/A**
[Floating (material spec. no.)] (Diameter) (Nominal thickness) (Corr. allow.) (Attachment)

13. Tubes **SA-789S31803/S32205** **3/4"** **0.065"** **460** **U**
(Material spec. no., grade or type) (O. D.) (Nominal thickness) (Number) [Type (Straight or U)]

Manufactured by **Fabsco Shell & Tube, LLC, Plant Two, 2410 Industrial Road, Sapulpa, Oklahoma, 74066, USA**Manufacturer's Serial No. **S21-13258-8**CRN **N/A**National Board No. **11166**

Items 14-18 incl. to be completed for inner chambers of jacketed vessels or channels of heat exchangers.

14. Shell: (a) No. of course(s) **1** (b) Overall length **2' 2.5000"**

Course(s)			Material	Thickness		Long. Joint (Cat. A)			Circum. Joint (Cat. A, B, & C)			Heat Treatment	
No.	Diameter	Length	Spec./Grade or Type	Nom.	Corr.	Type	Full, Spot, None	Eff.	Type	Full, Spot, None	Eff.	Temp.	Time
1	38" ID	2' 2.5000"	SA-516-70N	1/2"	1/8"	1	SPOT	1.00	1	SPOT	1.00	1175°	1

Body Flanges on Shells

No.	Type	ID	OD	Flange Thk	Min Hub Thk	Material	How Attached	Location	Bolting			
									Num & Size	Bolting Material	Washer (OD, ID, thk)	Washer Material
2	N/A	38"	44.7500"	5 7/8"	N/A	SA-350LF2CL1	WELDED	ENDS	52 - 1 1/8"	SA-193-B7	1 1/8" O.D.	F-436-1

15. Heads: (a) **SA-350LF2CL1, HT @1175°F FOR 1 HR**

(Material spec. number, grade or type) (H.T. - time and temp.)

(b) **N/A**

(Material spec. number, grade or type) (H.T. - time and temp.)

	Location (Top, Bottom, Ends)	Thickness		Radius		Elliptical Ratio	Conical Apex Angle	Hemispherical Radius	Flat Diameter	Side to Pressure		Category A		
		Min.	Corr.	Crown	Knuckle					Convex	Concave	Type	Full, Spot, None	Eff.
(a)	END	3 3/4"	1/8"	N/A	N/A	N/A	N/A	N/A	44 3/4"			S	None	1.00

Body Flanges on Heads

No.	Location	Type	ID	OD	Flange Thk	Min Hub Thk	Material	How Attached	Bolting			
									Num & Size	Bolting Material	Washer (OD, ID, thk)	Washer Material
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

16. MAWP **260 psi** **N/A** at max. temp. **150 °F** **N/A** Min. design metal temp. **32 °F** at **260 psi**.
(Internal) (External) (Internal) (External)17. Impact test **NO, EXEMPT PER UG-20(f), UCS-66(a,c, d), FIG. UCS-66 GENERAL NOTE(c), UCS-67, UHA-51** at test temperature of **N/A**.
[Indicate yes or no and the component(s) impact tested]18. Hydro., pneu., or comb. test pressure **Hydro. at 347/338** Proof test **N/A**

19. Nozzles, inspection, and safety valve openings:

Purpose (Inlet, Outlet, Drain, etc.)	No.	Diameter or Size	Type	Material		Nozzle Thickness		Reinforcement Material	Attachment Details		Location (Insp. Open.)
				Nozzle	Flange	Nom.	Corr.		Nozzle	Flange	
INLET/OUTLET	1/1	8"-600#	RF WN	SA-312-TP316/316L	SA-182-F316/316L	XH	1/32"	SA-240-316/316L	UW16.1	WELDED	SHELL
INLET/OUTLET	1/1	8"-600#	RF WN	SA-312-TP316/316L	SA-182-F316/316L	XH	1/8"	SA-516-70N	UW16.1	WELDED	CHANNEL
VENT/DRAIN	1/1	2"-300#	RF LWN		SA-350LF2CL1	0.66"	1/8"		UW16.1	WELDED	CHANNEL
AUX	2	2"-300#	RF LWN		SA-350LF2CL1	0.66"	1/8"		UW16.1	WELDED	CHANNEL
AUX	3	2"-300#	RF LWN		SA-182-F316/316L	0.66"	1/32"		UW16.1	WELDED	SHELL

20. Supports: Skirt **NO** Lugs **NONE** Legs **NONE** Others **2 SADDLES** Attached **WELDED TO SHELL**
(Yes or no) (Number) (Number) (Describe) (Where and how)

21. Manufacturer's Partial Data Reports properly identified and signed by Commissioned Inspectors have been furnished for the following items of the report (list the name of part, item number, Manufacturer's name, and identifying number):

N/A

22. Remarks

SERVICE: PROPANE RECOVERY COMPRESSOR AFTERCOOLER ITEM: 18-X-371

Manufactured by **Fabsco Shell & Tube, LLC, Plant Two, 2410 Industrial Road, Sapulpa, Oklahoma, 74066, USA**Manufacturer's Serial No. **S21-13258-8**CRN **N/A**National Board No. **11166****CERTIFICATE OF SHOP COMPLIANCE**

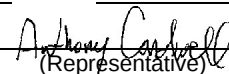
We certify that the statements in this report are correct and that all details of design, material, construction, and workmanship of this vessel conform to the ASME BOILER AND PRESSURE VESSEL CODE, Section VIII, Division 1. U Certificate of Authorization Number **30112** Expires **December 30, 2024**

Date **06/10/2024**

Name

Fabsco Shell & Tube, LLC, Plant Two

Signed


(Representative)

(Manufacturer)

CERTIFICATE OF SHOP INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and employed by

Bureau Veritas Inspection and Insurance Company, of Lynn, MA

have inspected the pressure vessel described in this Manufacturer's Data Report on **September 13, 2023**, and state that,

to the best of my knowledge and belief, the Manufacturer has constructed this pressure vessel in accordance with ASME BOILER AND PRESSURE VESSEL CODE, Section VIII, Division 1. By signing this certificate neither the Inspector nor his/her employer makes any warranty, expressed or implied, concerning the pressure vessel described in this Manufacturer's Data Report. Furthermore, neither the Inspector nor his/her employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Date **06/11/2024**

Signed


(Authorized Inspector)

Commissions:

16613

(National Board Authorized Inspector Commission number)

CERTIFICATE OF FIELD ASSEMBLY COMPLIANCE

We certify that the statements made in this report are correct and that the field assembly construction of all parts of this vessel conforms with the requirements of ASME BOILER AND PRESSURE VESSEL CODE, Section VIII, Division 1. U Certificate of Authorization Number _____ Expires _____

Date _____ Name _____

(Assembler)

Signed _____

(Representative)

CERTIFICATE OF FIELD ASSEMBLY INSPECTION

I, the undersigned, holding a valid commission issued by The National Board of Boiler and Pressure Vessel Inspectors and employed by _____,

have compared the statements in this Manufacturer's Data Report with the described pressure vessel and state that parts referred to as data items _____, not included in the certificate of shop inspection, have been inspected by me and to the best of my knowledge and belief, the Manufacturer has constructed and assembled this pressure vessel in accordance with the ASME BOILER AND PRESSURE VESSEL CODE, Section VIII, Division 1. The described vessel was inspected and subjected to a pressure test of _____. By signing this certificate neither the Inspector nor his/her employer makes any warranty, expressed or implied, concerning the pressure vessel described in this Manufacturer's Data Report. Furthermore, neither the Inspector nor his/her employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

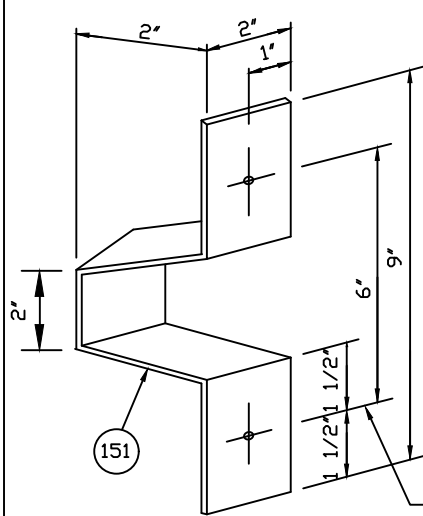
Date _____

Signed _____

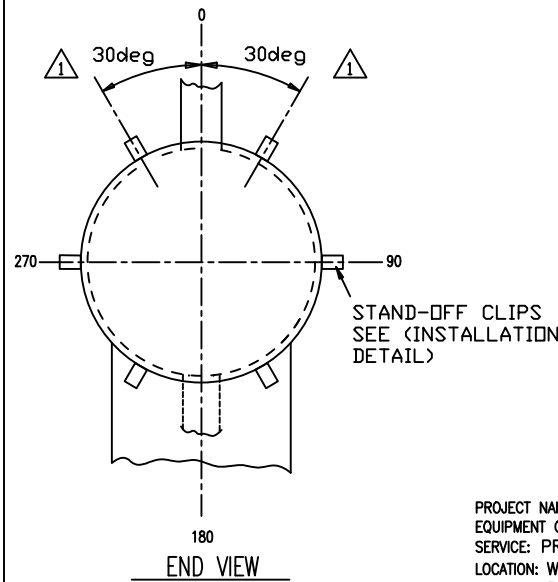
(Authorized Inspector)

Commission _____

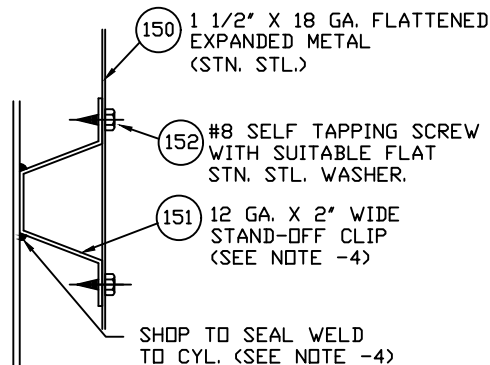
(National Board Authorized Inspector Commission number)



STAND-OFF CLIP DETAIL

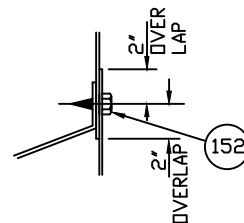


END VIEW

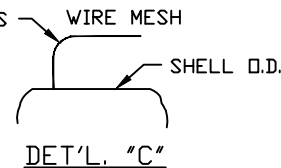


INSTALLATION DETAIL
(SEE NOTE -2)

BEND MESH ENDS
TOWARDS SHELL



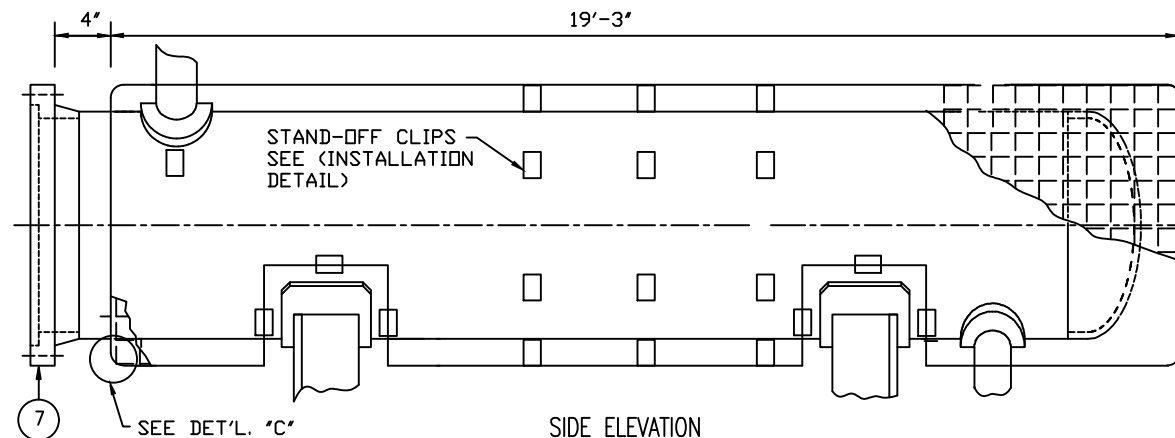
OVERLAP DETAIL



DET'L. "C"

GENERAL NOTES

1. APPLICABLE SPECIFICATIONS, ABKM-PP-000-500540-A GALVANIZING SPECIFICATION.
2. STAND-OFF CLIPS SHALL BE INSTALLED IN ROWS AT 24" SPACING IN TWO (2) DIRECTIONS, MAX. DISTANCE FROM EDGE OF EXPANDED METAL TO CENTERLINE OF STAND-OFFS SHALL BE 6".
3. EXPANDED METAL SHALL BE PRE-ROLLED OR FORMED WITH ALL EXPOSED EDGES CUT SUCH THAT FULL DIAMONDS FORM A CLEAN EDGE AND ALL SHARP EDGES ARE SMOOTH AND FREE OF BURRS.
4. STAND OFF CLIPS SHALL BE SHOP WELDED TO THE CYL/HD & BE THE SAME MATERIAL. BOLTING HARDWARE & EXPANDED METAL SHALL BE STN. STL.
5. ALL PARTS INCLUDING HARDWARE SHALL BE SUPPLIED BY FABSCO.
6. ALL PARTS SHALL BE IDENTIFIED WITH A METAL TAG INDICATING ITEM NO., PO NO. & PIECE MARK NO. INSTALLATION HARDWARE SHALL BE BOXED & TAGGED AS ABOVE WITH TEN PERCENT (10%) EXTRA TO ACCOUNT FOR LOSS OR DAMAGE.
7. STANDOFF DISTANCE SHALL BE 2" MIN.



SIDE ELEVATION

MESH ENDS
TO BE BENT
90° TO
PREVENT
SHARP POINTS
(TYP. BOTH
ENDS)

PROJECT NAME: WORLD ENERGY RENEWABLES PROJECT
EQUIPMENT OWNER: AIR PRODUCTS MANUFACTURING LLC
SERVICE: PROPANE RECOVERY COMPRESSOR AFTERCOOLER
LOCATION: WORLD ENERGY, PARAMOUNT, CA. USA
PRODUCT: PROPANE RECOVERY COMPRESSOR AFTERCOOLER
ITEM NO.: 18-X-371
AIR PRODUCTS P.O. NO.: 4505600058 / ABKM-4-402-PO-3
AP PROJECT NO: EN-20-7120
VDR CODE NO.: BE04
SERIAL NO.: S21-13258-8
ENGINEER: EG
CUSTOMER / CLIENT: WORLD ENERGY PARAMOUNT

			SHELL MESH DETAILS			
			DWN. BY B.W.	Fabsco SHELL & TUBE, LLC		
			DATE 5/16/22			
△	10/3/22	REV. PER FABSCD B.W./DD	CKD. BY DiCarlo	DWG.NO.	S21-13258-8-3A	REV. 2
△	7/7/22	REV. PER CUST. & FABSCD DD				
NO.	DATE	REVISIONS				

Fabscos
SHELL & TUBE, LLC

0

90

270

180

SHELL SIDE

DRILL (13) 25/32"Ø HOLES
X 1/8" DEEP FOR IMP. RODS
IN SHELLSIDE ONLY.
SEE DWG. -5 FOR LOCATION.
DO NOT DRILL THRU!!

NOTES:

- 1) MACHINE ALL SURFACES TO 250 RMS
EXCEPT GASKET FACES TO BE 125 RMS.
- 2) ALL PASS PLATE GROOVE WIDTHS TO
BE 1/2" WIDE.
- 3) ALL PASS PLATE GROOVE JUNCTIONS
TO BE NOTCHED 3/8" AT 45 Deg.

NOTES:

- 1) MACHINE ALL SURFACES TO 250 RMS
EXCEPT GASKET FACES TO BE 125 RMS.
- 2) ALL PASS PLATE GROOVE WIDTHS TO
BE 1/2" WIDE.
- 3) ALL PASS PLATE GROOVE JUNCTIONS
TO BE NOTCHED 3/8" AT 45 Deg.

⊗ THK. INCLUDES 1/8" FUTURE
MACHINING ALLOWANCE BOTH SIDES

SEE DWG. -4A FOR SEAL WELD
& TUBE HOLE GROOVING DETAIL

PROJECT NAME: WORLD ENERGY RENEWABLES PROJECT
EQUIPMENT OWNER: AIR PRODUCTS MANUFACTURING LLC
SERVICE: PROPANE RECOVERY COMPRESSOR AFTERCOOLER
LOCATION: WORLD ENERGY, PARAMOUNT, CA. USA
PRODUCT: PROPANE RECOVERY COMPRESSOR AFTERCOOLER
ITEM NO.: 18-X-371
AIR PRODUCTS P.O. NO.: 4505600058 / ABKM-4-402-PO-3
AP PROJECT NO: EN-20-7120
VDR CODE NO.: BE04
SERIAL NO.: S21-13258-8
ENGINEER: EG
CUSTOMER / CLIENT: WORLD ENERGY PARAMOUNT

SQUARE HEAD EYEBOLT PLUG DETAIL

② (65) EYEBOLT (TO SHIP LOOSE W/ EXCHANGER)

TUBESHEET DETAILS

DWN. BY	
B.W.	

DATE	5/16/22
------	---------

CKD. BY
DiC

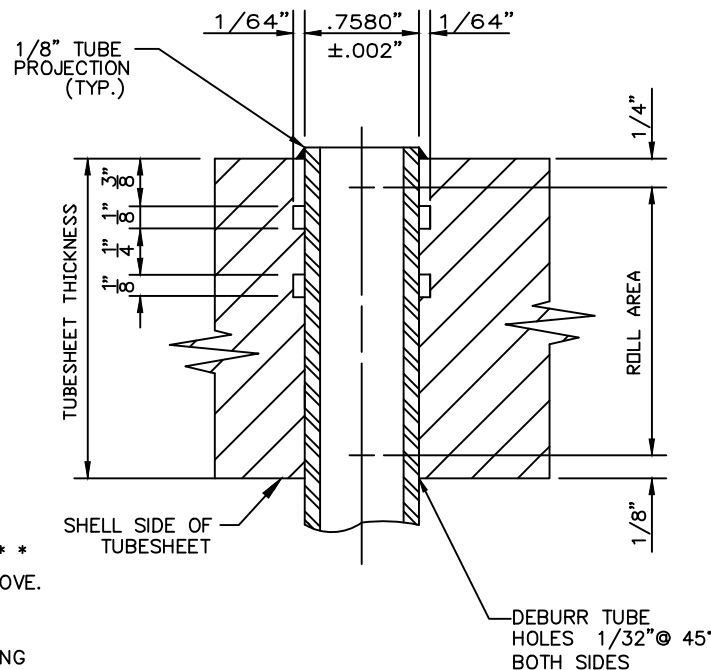
Fabsco
SHELL & TUBE, LLC

	DWG.NO.

S21-13258-8-4

REV.	2
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				TUBESHEET DETAILS		
				DWN. BY B.W.		
				DATE 5/16/22		
	9/28/22	REV. PER FABSCO/CUST	B.W./DD	CKD. BY <i>DiCarlo</i>	DWG.NO.	REV 2
	7/7/22	ADDED DETAIL/CUST.	DD		S21-13258-8-4	
NO.	DATE	REVISIONS				

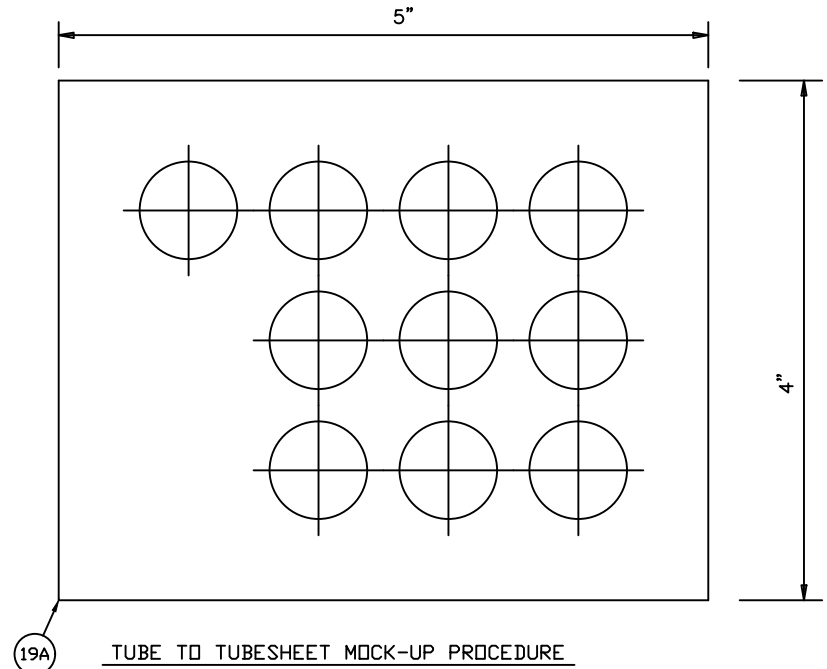
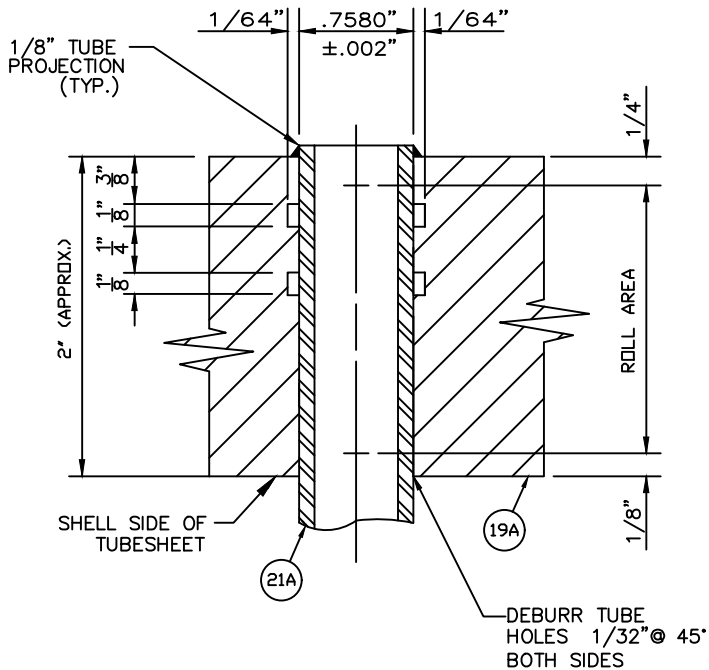


TUBE TO TUBESHEET SEAL WELD AND FABRICATION SEQUENCE

1. DRILL, REAM AND RING GROOVE TUBE HOLES PER DETAIL ABOVE.
2. CLEAN AREAS TO BE WELDED AND ROLLED WITH DEGREASER.
3. INSTALL TUBES IN BUNDLE AND SET PROJECTIONS.
TUBESHEET HOLES & TUBES WILL BE CHECKED FOR OVERSIZING & TOLERANCES PRIOR TO INSTALLATION INTO POSITION.
ALL TUBES SHALL HAVE CORRECT PROTRUSION FROM TUBESHEET AS REQUIRED ON THE DWG.
4. FUSION WELD USING GTAW PROCESS USING WPS: "T-219".
5. LIQUID PENETRANT EXAMINE ALL WELDS AND THEN CLEAN THEM WITH DEGREASER. REPAIR ANY DEFECTIVE WELDS AND RECHECK.
6. TUBE-TO-T'SHT. WELDS SHALL BE AIR & SOAP TESTED PRIOR TO FINAL ROLLING W/ 15 PSI (MAX.) AIR PRESSURE.
7. FINAL ROLL TUBES INTO TUBESHEET PER DETAIL ABOVE. TUBES TO BE ROLLED FOR TUBESHEET THICKNESS SHOWN ABOVE. STOP SHALL BE USED ON TUBE ROLLER TO THAT ASSURES EXPANSION IS WITHIN LIMITS OF ROLL AREA. TUBE WALL REDUCTION TO BE 2% MAX. TUBE ROLLING CHART TO BE DONE.
8. REPEAT STEP 5.
9. THE FERRITE CONTENT OF TUBE WELDS SHALL BE CHECKED USING EITHER A MAGNE-GAGE OR FISCHER FERRITE SLOPE CALIBRATED IN ACCORDANCE WITH AWS A4.2. A MIN. OF THREE (3) TESTS SHALL BE MADE OF EACH 1.7m (5 FT.) OF WELD.
THE AVERAGE VALUE OF THE TESTS ON EACH WELD SHALL BE 30-70% FERRITE. A REPORT SHALL BE FILLED OUT.

PROJECT NAME: WORLD ENERGY RENEWABLES PROJECT
EQUIPMENT OWNER: AIR PRODUCTS MANUFACTURING LLC
SERVICE: PROPANE RECOVERY COMPRESSOR AFTERCOOLER
LOCATION: WORLD ENERGY, PARAMOUNT, CA. USA
PRODUCT: PROPANE RECOVERY COMPRESSOR AFTERCOOLER
ITEM NO.: 18-X-371
AIR PRODUCTS P.O. NO: 4505600058 / A8KM-4-402-PD-3
AP PROJECT NO: EN-20-7120
VDR CODE NO.: BE04
SERIAL NO.: S21-13258-8
ENGINEER: EG
CUSTOMER / CLIENT: WORLD ENERGY PARAMOUNT

TUBE SEAL WELD & TUBE HOLE GROOVING DETAIL			Fabsco SHELL & TUBE, LLC	
			DWN. BY B.W.	
			DATE 5/16/22	
			CKD. BY DiCarlo	DWG. NO. S21-13258-8-4A
				REV. 2
NO.	DATE	REVISIONS		



TUBE TO TUBESHEET MOCK-UP PROCEDURE

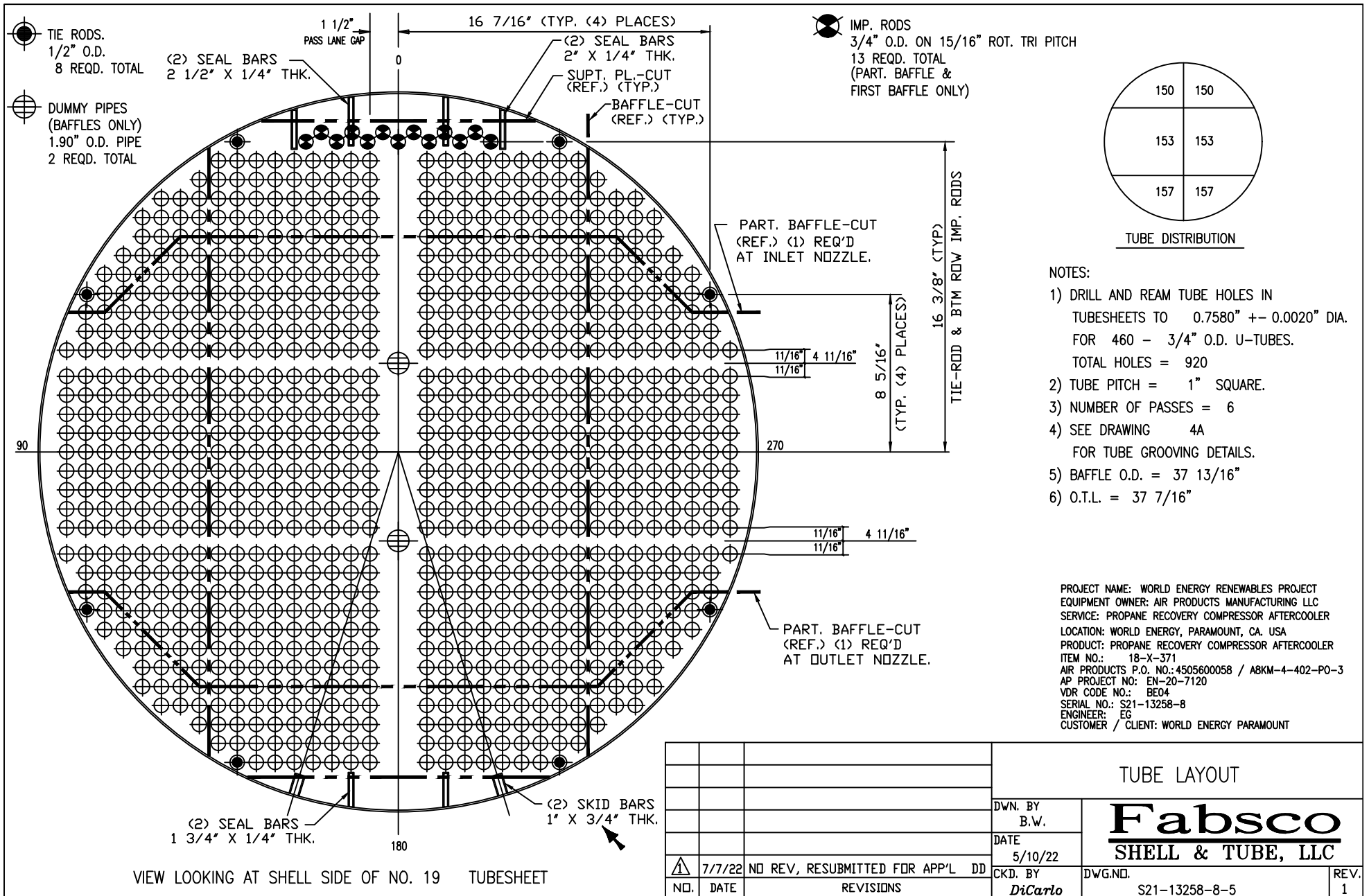
1. DRILL (10) HOLES ON 1" SQ. PITCH.
2. MOCK-UP TO BE SECTIONED, POLISHED & ETCHED.
3. EXAMINE FOR CRACKS AT 10X MAGNIFICATION.
4. RESULTS AND SECTIONED PIECE TO BE MADE AVAILABLE TO CUSTOMER FOR REVIEW.

TUBE TO TUBESHEET SEAL WELD MOCK UP

1. DRILL, REAM AND RING GROOVE TUBE HOLES PER DETAIL ABOVE.
2. CLEAN AREAS TO BE WELDED AND ROLLED WITH DEGREASER.
3. INSTALL TUBES IN BUNDLE AND SET PROJECTIONS.
4. FUSION WELD USING GTAW PROCESS USING WPS: "T-219".
SEE WELD PROCEDURE FOR TESTING REQUIREMENTS.
5. LIQUID PENETRANT EXAMINE ALL WELDS AND THEN CLEAN THEM WITH DEGREASER. REPAIR ANY DEFECTIVE WELDS AND RECHECK.
6. ROLL TUBES INTO TEST BLOCK PER DETAIL ABOVE.
7. REPEAT STEP 5.
8. THE FERRITE CONTENT OF TUBE WELDS SHALL BE CHECKED USING EITHER A MAGNE-GAGE OR FISCHER FERRITE SLOPE CALIBRATED IN ACCORDANCE WITH AWS A4.2. A MIN. OF THREE (3) TESTS SHALL BE MADE OF EACH 1.7m (5 FT.) OF WELD.
THE AVERAGE VALUE OF THE TESTS ON EACH WELD SHALL BE 30-70% FERRITE. A REPORT SHALL BE FILLED OUT.

PROJECT NAME: WORLD ENERGY RENEWABLES PROJECT
EQUIPMENT OWNER: AIR PRODUCTS MANUFACTURING LLC
SERVICE: PROPANE RECOVERY COMPRESSOR AFTERCOOLER
LOCATION: WORLD ENERGY, PARAMOUNT, CA. USA
PRODUCT: PROPANE RECOVERY COMPRESSOR AFTERCOOLER
ITEM NO.: 18-X-371
AIR PRODUCTS P.O. NO: 4505600058 / A8KM-4-402-PD-3
AP PROJECT NO: EN-20-7120
VDR CODE NO: BE04
SERIAL NO: S21-13258-8
ENGINEER: EG
CUSTOMER / CLIENT: WORLD ENERGY PARAMOUNT

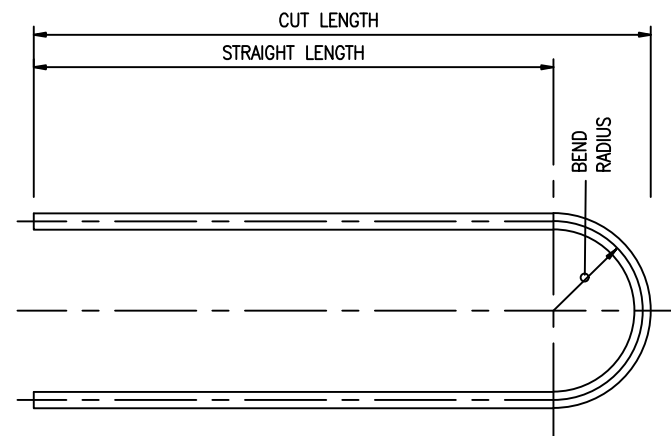
TUBE WELDING MOCK UP			
		DWN. BY DD	Fabsco SHELL & TUBE, LLC
		DATE 7/7/22	
		CKD. BY DiCarlo	
		DWG. NO. S21-13258-8-4B	
NO.	DATE	REVISIONS	REV. 2
△	9/28/22	REV. PER CUST. B.W/DD	
△	7/7/22	ADDED DWG. PER CUST. DD	



ROW	NO.OF TUBES	BEND RADIUS	BEND DIAMETER	BEND LENGTH	STRAIGHT LENGTH	CUT LENGTH	DEVELOPED LENGTH
A	32	1 1/2"	3"	0'-4 3/4"	18'-0"	18'-1 7/8"	36'-4 3/4"
B	32	2 1/2"	5"	0'-7 7/8"	18'-0"	18'-2 7/8"	36'-7 7/8"
C	32	3 1/2"	7"	0'-11"	18'-0"	18'-3 7/8"	36'-11"
D	32	4 1/2"	9"	1'-2 3/16"	18'-0"	18'-4 7/8"	37'-2 3/16"
E	32	5 1/2"	11"	1'-5 5/16"	18'-0"	18'-5 7/8"	37'-5 5/16"
F	32	6 1/2"	13"	1'-8 7/16"	18'-0"	18'-6 7/8"	37'-8 7/16"
G	32	7 1/2"	15"	1'-11 9/16"	18'-0"	18'-7 7/8"	37'-11 9/16"
H	31	8 1/2"	17"	2'-2 3/4"	18'-0"	18'-8 7/8"	38'-2 3/4"
J	31	9 1/2"	19"	2'-5 7/8"	18'-0"	18'-9 7/8"	38'-5 7/8"
K	29	10 1/2"	21"	2'-9"	18'-0"	18'-10 7/8"	38'-9"
L	27	11 1/2"	23"	3'-0 3/16"	18'-0"	18'-11 7/8"	39'-0 3/16"
M	27	12 1/2"	25"	3'-3 5/16"	18'-0"	19'-0 7/8"	39'-3 5/16"
N	25	13 1/2"	27"	3'-6 7/16"	18'-0"	19'-1 7/8"	39'-6 7/16"
O	21	14 1/2"	29"	3'-9 9/16"	18'-0"	19'-2 7/8"	39'-9 9/16"
P	19	15 1/2"	31"	4'-0 3/4"	18'-0"	19'-3 7/8"	40'-0 3/4"
Q	15	16 1/2"	33"	4'-3 7/8"	18'-0"	19'-4 7/8"	40'-3 7/8"
R	11	17 1/2"	35"	4'-7"	18'-0"	19'-5 7/8"	40'-7"

NOTES:

- 1) THE NITROGEN CONTENT SHALL BE 0.14%-0.20%.
- 2) EACH HEAT LOT OF DUPLEX TUBE MATERIAL SHALL BE CORROSION TEST PER ASTM A923 TEST METHOD "C". AND SHALL MEET THE GIVEN CRITERIA.
IN ADDITION, ONE SPECIMEN REPRESENTING EACH HEAT LOT OF DUPLEX STN. STL. SHALL RECEIVE A MICROSTRUCTURAL EXAMINATION PER THE REQUIREMENTS OF ASTM A923 TEX METHOD "A".
THE PRESENCE OF POSSIBLY AFFECTED, AFFECTED OR CENTERLINE STRUCTURES SHALL BE GROUNDS FOR REJECTION OF THE SOLUTION ANNEALED BATCH REPRESENTED BY THE SPECIMEN, AND THE BATCH SHALL REQUIRE REHEAT TREATMENT AND RETESTING.
THE SAMPLE SIZE SHALL BE A 25mm (1") LONG TUBE SPECIMEN FOR EACH HEAT LOT.
- 3) TUBING SHALL BE SOLUTION ANNEALED WITHIN THE TEMPERATURE RANGE LISTED FOR THE PARTICULAR GRADE IN ASME SA-789 FOR SUFFICIENT TIME TO ELIMINATE INTERMETALLIC PRECIPITATES AND THEN RAPIDLY COOLED BY WATER QUENCHING, OR AIR, OR INERT GAS COOLING TO BELOW 315deg C. (600deg F.).
OTHER HEAT TREATMENTS AND QUENCHING MEDIA OTHER THAN WATER MUST BE APPROVE BY THE CUSTOMER.
- 4) NO WELD REPAIRS OF BASE MATERIALS AND NO REPAIR OF TUBE DENTS ARE PERMITTED. THESE TUBE SECTIONS SHALL BE REJECTED.
- 5) HARDNESS TESTING OF TUBING SHALL BE DONE IN ACC. W/ SA-789, EXCEPT THAT THE MAXIMUM HARDNESS SHALL BE ROCKWELL C 28.
FAILURE TO MEET THIS HARDNESS REQUIREMENT SHALL CONSTITUTE FAILURE OF THE SPECIMEN AND SHALL RESULT IN HARDNESS TESTING BEING REQUIRED ON EACH LENGTH IN THE HEAT LOT REPRESENTED BY THE SPECIMEN.
- 6) ELECTRIC RESISTANCE SOLUTION ANNEAL U-BENDS PLUS 1'-0" OF STRAIGHT LENGTH AT 1900-1950deg F. FOLLOWED BY RAPID COOL.
- 7) AFTER HEAT TREATING, OTHER THAN BRIGHT ANNEAL PROCEDURES, ALL TUBING SHALL RECEIVE A DESCALING TREATMENT OF PICKLING FOLLOWED BY NEUTRALIZING AND APPROPRIATED RINSING TREATMENT.
ALL MILL SCALE SHALL BE REMOVED.



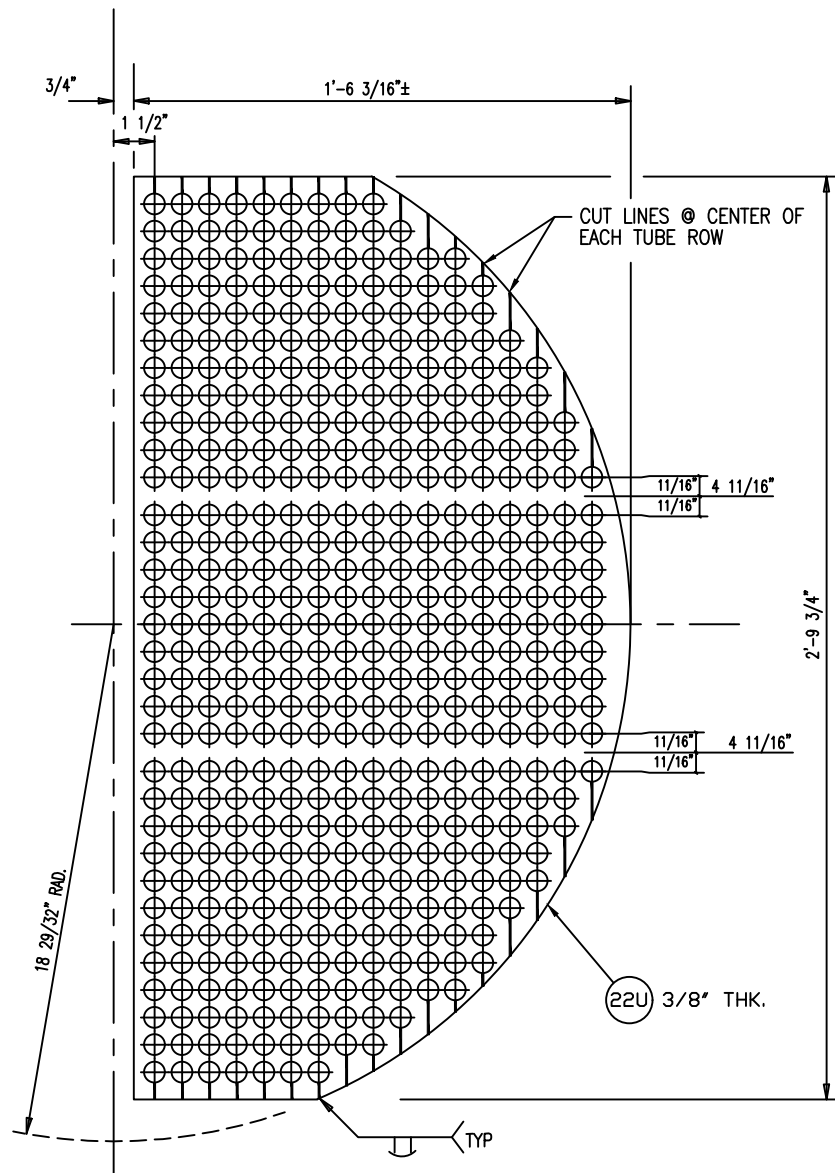
TOTAL NO. REQUIRED: 460
 SIZE: 3/4" (.065" AVG.)
 MATERIAL: SA-789S31803/S32205 (SMLS)

MAXIMUM OUT-OF-ROUNDNESS OF TUBES AT
 U-BENDS NOT TO EXCEED 10%.

QUANTITIES SHOWN ARE FOR
 ONE SET OF U-TUBES,
 1 -SET REQ'D. TOTAL.

PROJECT NAME: WORLD ENERGY RENEWABLES PROJECT
 EQUIPMENT OWNER: AIR PRODUCTS MANUFACTURING LLC
 SERVICE: PROPANE RECOVERY COMPRESSOR AFTERCOOLER
 LOCATION: WORLD ENERGY, PARAMOUNT, CA. USA
 PRODUCT: PROPANE RECOVERY COMPRESSOR AFTERCOOLER
 ITEM NO.: 18-X-371
 AIR PRODUCTS P.O. NO.: 4505600058 / A8KM-4-402-PO-3
 AP PROJECT NO: EN-20-7120
 VDR CODE NO.: BE04
 SERIAL NO.: S21-13258-8
 ENGINEER: EG
 CUSTOMER / CLIENT: WORLD ENERGY PARAMOUNT

TUBE BENDING SCHEDULE			
		DWN. BY	Fabsco SHELL & TUBE, LLC
		B.W.	
		DATE	
		5/11/22	
		CKD. BY	DiCarlo
		DWG.NO.	
NO.	DATE	REVISIONS	S21-13258-8-6 REV. 0

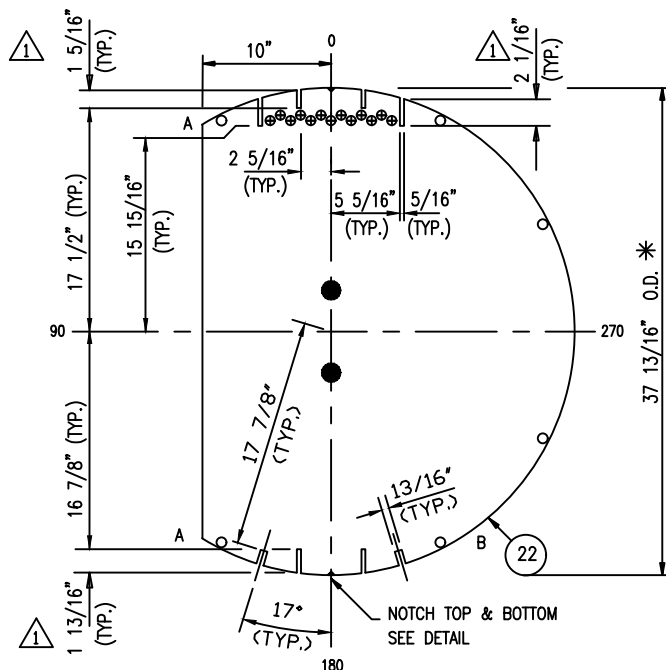


NOTES:

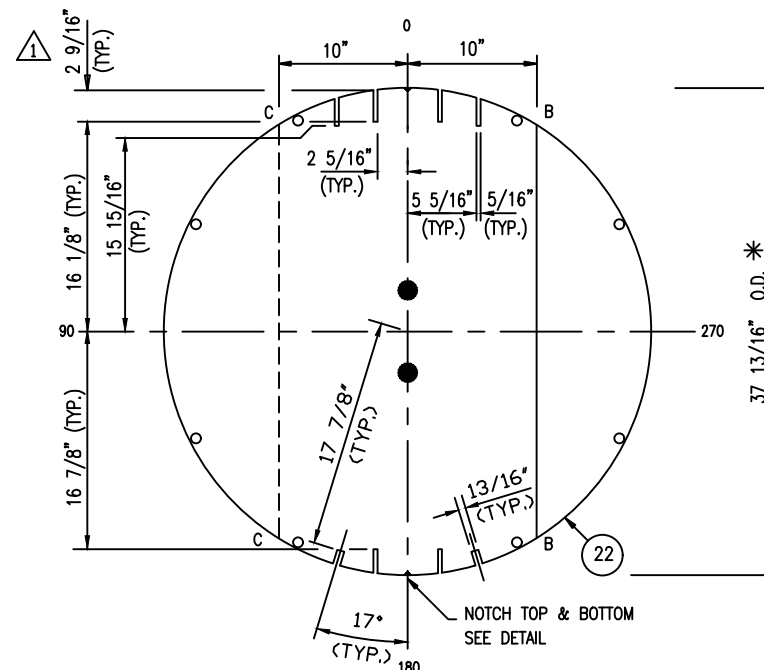
- 1) DRILL TUBE HOLES 25/32" DIA.
(NO SMALLER DUE TO POSSIBLE FLATTENING
@ BENDS) & DEBURR.
- 2) TUBE PITCH = 1" 90° SQUARE.
- 3) CUT PART #22U ON CENTERLINE
OF EACH ROW SHOWN.
- 4) STARTING AFTER INSERTING ROW "A", INSERT STRIPS
BETWEEN EACH ROW AT BENDS AS SHOWN.
- 5) WELD PIECES TOGETHER AS SHOWN.

PROJECT NAME: WORLD ENERGY RENEWABLES PROJECT
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ITEM NO.: 18-X-371
AIR PRODUCTS P.O. NO.: 4505600058 / ABKM-4-402-PO-3
AP PROJECT NO: EN-20-7120
VDR CODE NO.: BE04
SERIAL NO.: S21-13258-8
ENGINEER: EG
CUSTOMER / CLIENT: WORLD ENERGY PARAMOUNT

			U-BEND SUPPORT BAFFLE		
			DWN. BY	Fabsco SHELL & TUBE, LLC	
			DD		
			DATE	DiCarlo	
			7/7/22		
			CKD. BY	DWG.NO.	REV.
			7/7/22	S21-13258-8-7A	2
NO.	DATE	REVISIONS			
△	9/28/22	REV. PER FABSCO BW/DD			
△	7/7/22	ADDED DWG./CUST DD			



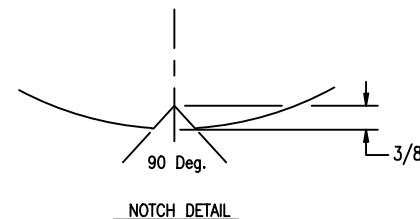
VIEW ZZ OF BAFFLES
5/16\" THK.
1 -REQD. CUT AA



VIEW ZZ OF BAFFLES
5/16\" THK.
6 -REQD. CUT CC
7 -REQD. CUT BB

⊕ DENOTES (13) 13/16\" HOLES
FOR 3/4\" O.D. IMP. RODS.
"DRILL IN PART. "D" BAFFLE,
& "A" BAFFLE ONLY"
(SEE TUBE LAYOUT FOR LOCATION)

● DRILL (2) 1 15/16\" HOLES
FOR 1.90\" Ø DUMMY PIPES
(SEE TUBE LAYOUT FOR LOCATION)



NOTCH DETAIL

NOTES:

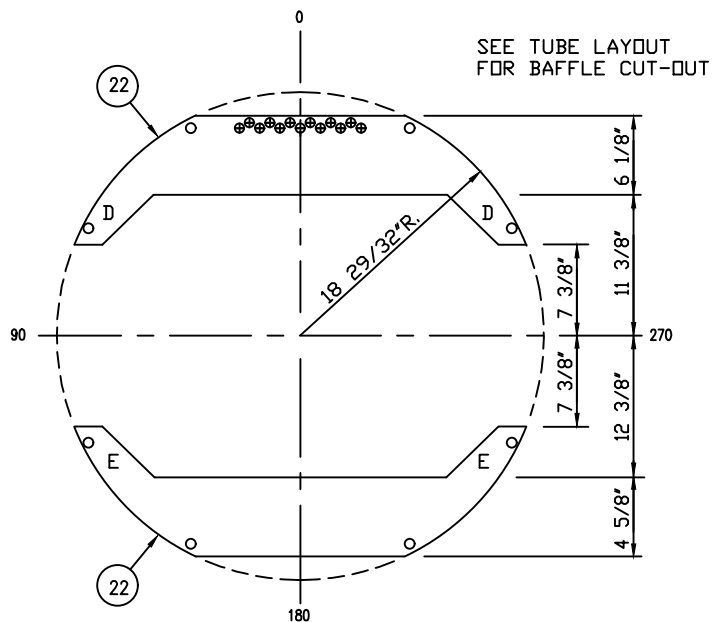
- 1) DRILL TUBE HOLES IN BAFFLES 49/64\" DIA. & DEBURR.
- 2) DRILL TIE ROD HOLES 9/16\" DIA.
SEE TUBE LAYOUT FOR LOCATION.
- 3) RADIUS ALL CORNERS ON BAFFLE CUTS.
- * 4) CHECK SHELL I.D. BEFORE MACHINING BAFFLE O.D.
- 5) MACHINE O.D. OF BAFFLES TO 250 RMS.

PROJECT NAME: WORLD ENERGY RENEWABLES PROJECT
EQUIPMENT OWNER: AIR PRODUCTS MANUFACTURING LLC
SERVICE: PROPANE RECOVERY COMPRESSOR AFTERCOOLER
LOCATION: WORLD ENERGY, PARAMOUNT, CA. USA
PRODUCT: PROPANE RECOVERY COMPRESSOR AFTERCOOLER
ITEM NO.: 18-X-371
AIR PRODUCTS P.O. NO.: 4505600058 / A8KM-4-402-PO-3
AP PROJECT NO.: EN-20-7120
VDR CODE NO.: BE04
SERIAL NO.: S21-13258-8
ENGINEER: EG
CUSTOMER / CLIENT: WORLD ENERGY PARAMOUNT

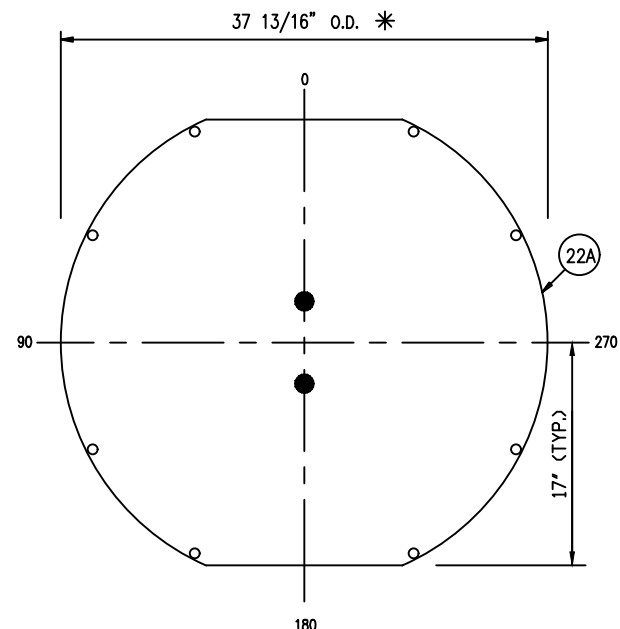
BAFFLE DETAILS

Fabsco
SHELL & TUBE, LLC

NO.	DATE	REV.	PER CUST. COMMENTS	DD	CKD. BY	DWG.NO.	REV.
1	7/7/22		REV. PER CUST. COMMENTS	DD	DiCarlo	S21-13258-8-8	1



VIEW ZZ OF BAFFLES
 1 -REQD. CUT DD 5/16" THK.
 1 -REQD. CUT EE 5/16" THK.



VIEW XX OF SUPT.PL.
 5/16" THK.
 1-REQ'D.

⊕ DENOTES (13) 13/16" HOLES
 FOR 3/4" O.D. IMP. RODS.
 *DRILL IN PART. "D" BAFFLE,
 & "A" BAFFLE ONLY"
 (SEE TUBE LAYOUT FOR LOCATION)

● DRILL (2) 1 15/16" Ø HOLES
 FOR 1.90" Ø DUMMY PIPES
 (SEE TUBE LAYOUT FOR LOCATION)

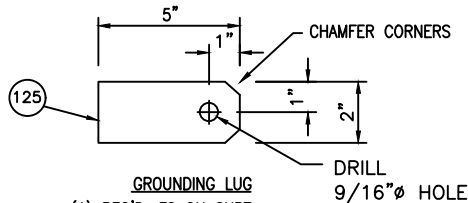
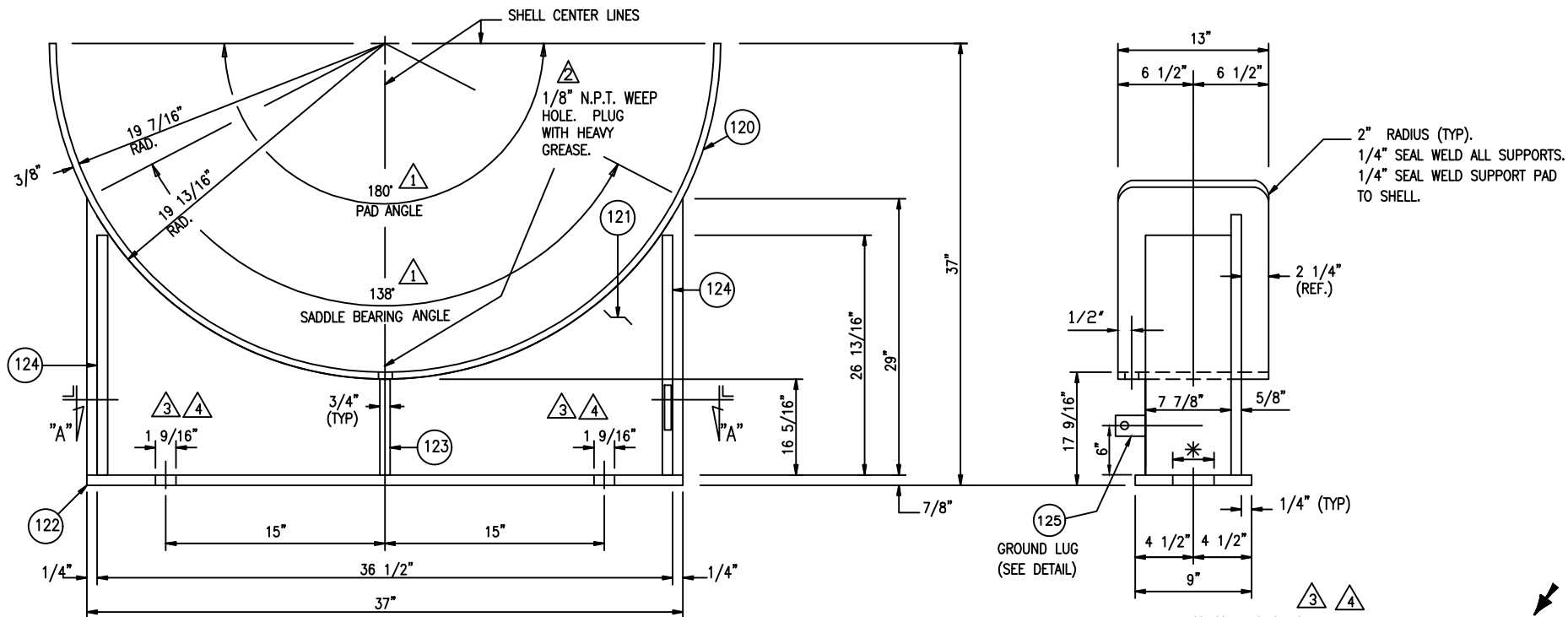
PROJECT NAME: WORLD ENERGY RENEWABLES PROJECT
 EQUIPMENT OWNER: AIR PRODUCTS MANUFACTURING LLC
 SERVICE: PROPANE RECOVERY COMPRESSOR AFTERCOOLER
 LOCATION: WORLD ENERGY, PARAMOUNT, CA. USA
 PRODUCT: PROPANE RECOVERY COMPRESSOR AFTERCOOLER
 ITEM NO.: 18-X-371
 AIR PRODUCTS P.O. NO.: 4505600058 / A8KM-4-402-PO-3
 AP PROJECT NO: EN-20-7120
 VDR CODE NO.: BE04
 SERIAL NO.: S21-13258-8
 ENGINEER: EG
 CUSTOMER / CLIENT: WORLD ENERGY PARAMOUNT

NOTES:

- 1) DRILL TUBE HOLES IN BAFFLES 49/64" DIA. & DEBURR.
- 2) DRILL TIE ROD HOLES 9/16" DIA.
SEE TUBE LAYOUT FOR LOCATION.
- 3) RADIUS ALL CORNERS ON BAFFLE CUTS.
- * 4) CHECK SHELL I.D. BEFORE MACHINING BAFFLE O.D.
- 5) MACHINE O.D. OF BAFFLES TO 250 RMS.

BAFFLE DETAILS			
			DWN. BY B.W.
			DATE 5/11/22
△	7/7/22	REV. PER CUST. COMMENTS DD	CKD. BY DiCarlo
			DWG.NO. S21-13258-8-8A
NO.	DATE	REVISIONS	REV. 1

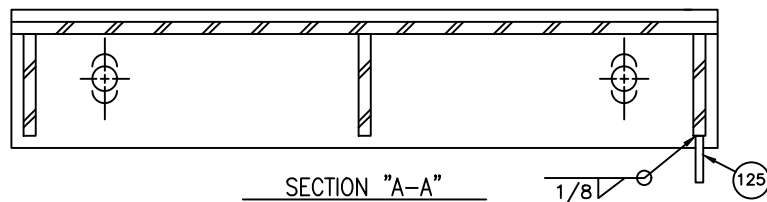
Fabsco
 SHELL & TUBE, LLC



GROUNDING LUG
 (1) REQ'D. FS ON SUPT.
 MK "X", (1) REQ'D. NS
 ON SUPT. MK "Y".
 1/4" THK.
MATERIAL: SA-240-304

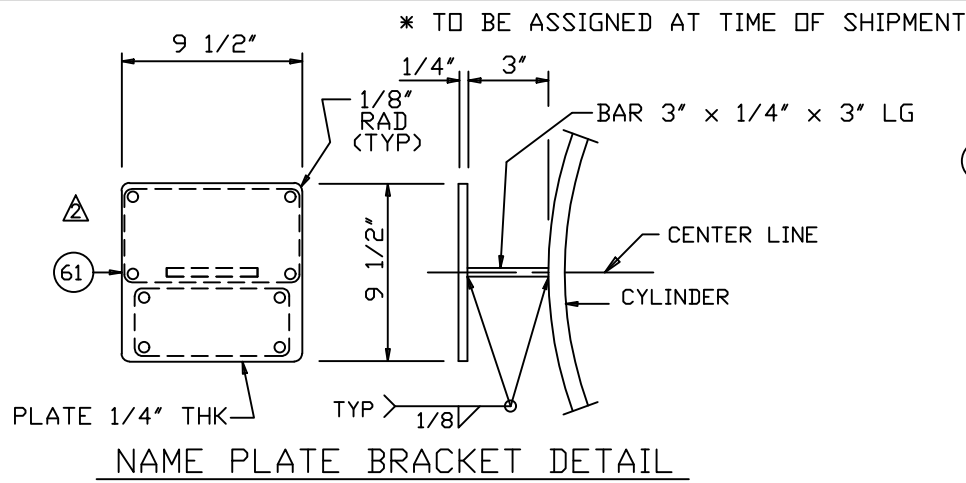
* ONE REQUIRED MARKED "X" W/ (2) 1 9/16" X 2 1/2" LG. SLOTS.
 ONE REQUIRED MARKED "Y" W/ (2) 1 9/16" ROUND HOLES.

PROJECT NAME: WORLD ENERGY RENEWABLES PROJECT
 EQUIPMENT OWNER: AIR PRODUCTS MANUFACTURING LLC
 SERVICE: PROPANE RECOVERY COMPRESSOR AFTERCOOLER
 LOCATION: WORLD ENERGY, PARAMOUNT, CA. USA
 PRODUCT: PROPANE RECOVERY COMPRESSOR AFTERCOOLER
 ITEM NO.: 18-X-371
 AIR PRODUCTS P.O. NO.: 4505600058 / A8KM-4-402-PO-3
 AP PROJECT NO.: EN-20-7120
 VDR CODE NO.: BE04
 SERIAL NO.: S21-13258-8
 ENGINEER: EG
 CUSTOMER / CLIENT: WORLD ENERGY PARAMOUNT

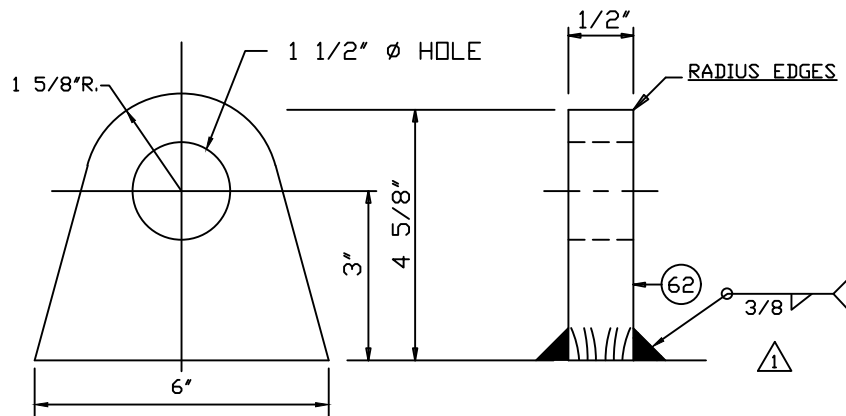


SUPPORT DETAILS			
NO.	DATE	REVISIONS	REV.
	12/28/22	REV. PER CUST. COMMENTS DD/DG	4
	11/9/22	REV. PER CUST. COMMENTS DD/DG	
	9/28/22	REV. PER CUST. B.W/DD	
DWN. BY		DATE	
B.W.		5/16/22	
CKD. BY		DWG. NO.	
DiCarlo		S21-13258-8-9	

Fabsco
 SHELL & TUBE, LLC



(ONE) REQUIRED



LIFTING LUG DETAIL

3-REQUIRED

PROJECT NAME: WORLD ENERGY RENEWABLES PROJECT
EQUIPMENT OWNER: AIR PRODUCTS MANUFACTURING LLC
SERVICE: PROPANE RECOVERY COMPRESSOR AFTERCOOLER
LOCATION: WORLD ENERGY, PARAMOUNT, CA. USA
PRODUCT: PROPANE RECOVERY COMPRESSOR AFTERCOOLER
ITEM NO.: 18-X-371
AIR PRODUCTS P.O. NO.: 4505600058 / A8KM-4-402-PO-3
AP PROJECT NO.: EN-20-7120
VDR CODE NO.: HC09
SERIAL NO.: S21-13258-8
ENGINEER: EG
CUSTOMER / CLIENT: WORLD ENERGY PARAMOUNT

MATERIAL: 18-8 STN. STL.(16 GA)

ASME

U

RT-4
HT-T

60

NAT'L BD. *

CERTIFIED BY

FABSCO SHELL & TUBE, LLC
SAPULPA, OKLAHOMA

MAWP	MAWT
SHELL 305	PSI AT 310 ° F.
MAEWP	MAWT
SHELL 15	PSI AT 300 ° F.
MDMT	MAWP
SHELL 32 ° F.	AT 305 PSI
MAWP	MAWT
TUBES 260	PSI AT 150 ° F.
MAEWP	MAWT
TUBES N/A	PSI AT N/A ° F.
MDMT	MAWP
TUBES 32 ° F.	AT 260 PSI

SERIAL NUMBER	YEAR BUILT	ITEM/TAG NUMBER
S21-13258-8	2023	18-X-371

P.O. NO.: 4505600058

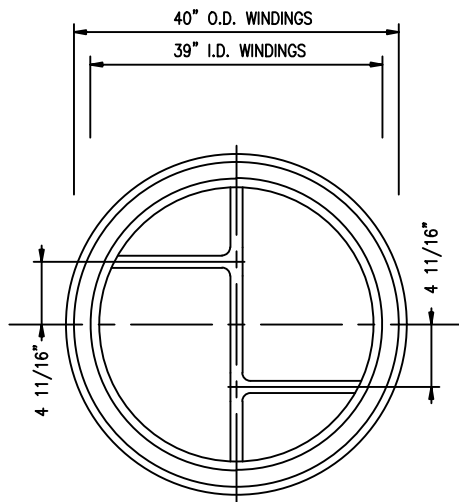
SERVICE: PROPANE RECOVERY COMPRESSOR AFTERCOOLER

INFORMATION NAME PLATE

HYDRO TEST PRESS PSIG..TUBESIDE: SHOP-347/FIELD-338
HYDRO TEST PRESS PSIG..SHELLSIDE: SHOP-410/FIELD-398
DESIGN PRESS.: SHELLSIDE=125 PSI; TUBESIDE=120 PSI
SECT. VIII, DIV 1, 2021 ED; API-660; TEMA "R"

LIFT LUG DETAIL w/ NAME PLATE & BRACKET	
DWN. BY B.W.	Fabscos SHELL & TUBE, LLC
DATE 5/16/22	
CKD. BY DiCarlo	DWG. NO. S21-13258-8-10
REV. 2	

NO.	DATE	REVISIONS
9/28/22	REV. PER CUST.	B.W./DD
7/7/22	REV. PER CUST. COMMENTS	DD



(1)-REQUIRED.
CHANNEL COVER GASKET.

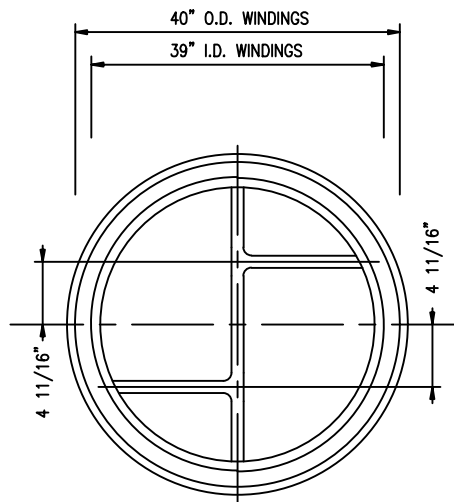
0.175" THK. 316 S.S. SPIRAL WOUND

W/ GRAPHITE FILLER & INNER / OUTER COMP. RINGS (A)

RIB TO BE 3/16" THK X 7/16" WIDE 316 S.S. DBL. JCKTD.

W/ GRAPHITE FILLER AND 1/64" THK. GRAPHITE
FACE ON BOTH SIDES

TEST PRESSURE:
SHOP: 347/ FIELD: 338



(1)-REQUIRED.
CHANNEL GASKET.

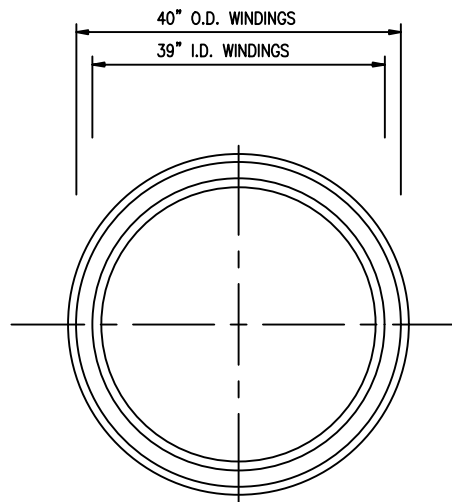
0.175" THK. 316 S.S. SPIRAL WOUND

W/ GRAPHITE FILLER & INNER / OUTER COMP. RINGS (B)

RIB TO BE 3/16" THK X 7/16" WIDE 316 S.S. DBL. JCKTD.

W/ GRAPHITE FILLER AND 1/64" THK. GRAPHITE
FACE ON BOTH SIDES

TEST PRESSURE:
SHOP: 347/ FIELD: 338



(1)-REQUIRED.
SHELL GASKET.

0.175" THK. 316 S.S. SPIRAL WOUND

W/ GRAPHITE FILLER & INNER / OUTER COMP. RINGS (C)

TEST PRESSURE:

SHOP: 410 / FIELD: 398

===== COMPRESSION RINGS =====

- (A) 40.7500 O.D. X .1250 THICK: MATERIAL=SA-240-316
38.2500 I.D. X .1250 THICK: MATERIAL=SA-240-316
- (B) 40.7500 O.D. X .1250 THICK: MATERIAL=SA-240-316
38.2500 I.D. X .1250 THICK: MATERIAL=SA-240-316
- (C) 40.7500 O.D. X .1250 THICK: MATERIAL=SA-240-316
38.2500 I.D. X .1250 THICK: MATERIAL=SA-240-316

NOTES:

- 1) QUANTITIES SHOWN FOR ONE SET
(3)-SET REQUIRED TOTAL.
ONE SET OF GASKETS TO BE USED IN EXCH. AND
(2) SETS TO BE BOXED, MARKED WITH
P.O. & ITEM NO. & SHIPPED WITH EXCHANGER.
- 2) ALL RADII TO BE 1/4"

CHANNEL COVER TO CHANNEL FLANGE BOLTING INFO

STUD DIAMETER: 1 1/8" O.D.

NUMBER STUDS: (52)

STUD MATERIAL: SA-193-B7

BOLT TORQUE RANGE TO BE ACHIEVED: 842.1-873.2 Ft. LBS.

CHAN. FLG./T'SHT./SHELL FLG. BOLTING INFO

STUD DIAMETER: 1 1/8" O.D.

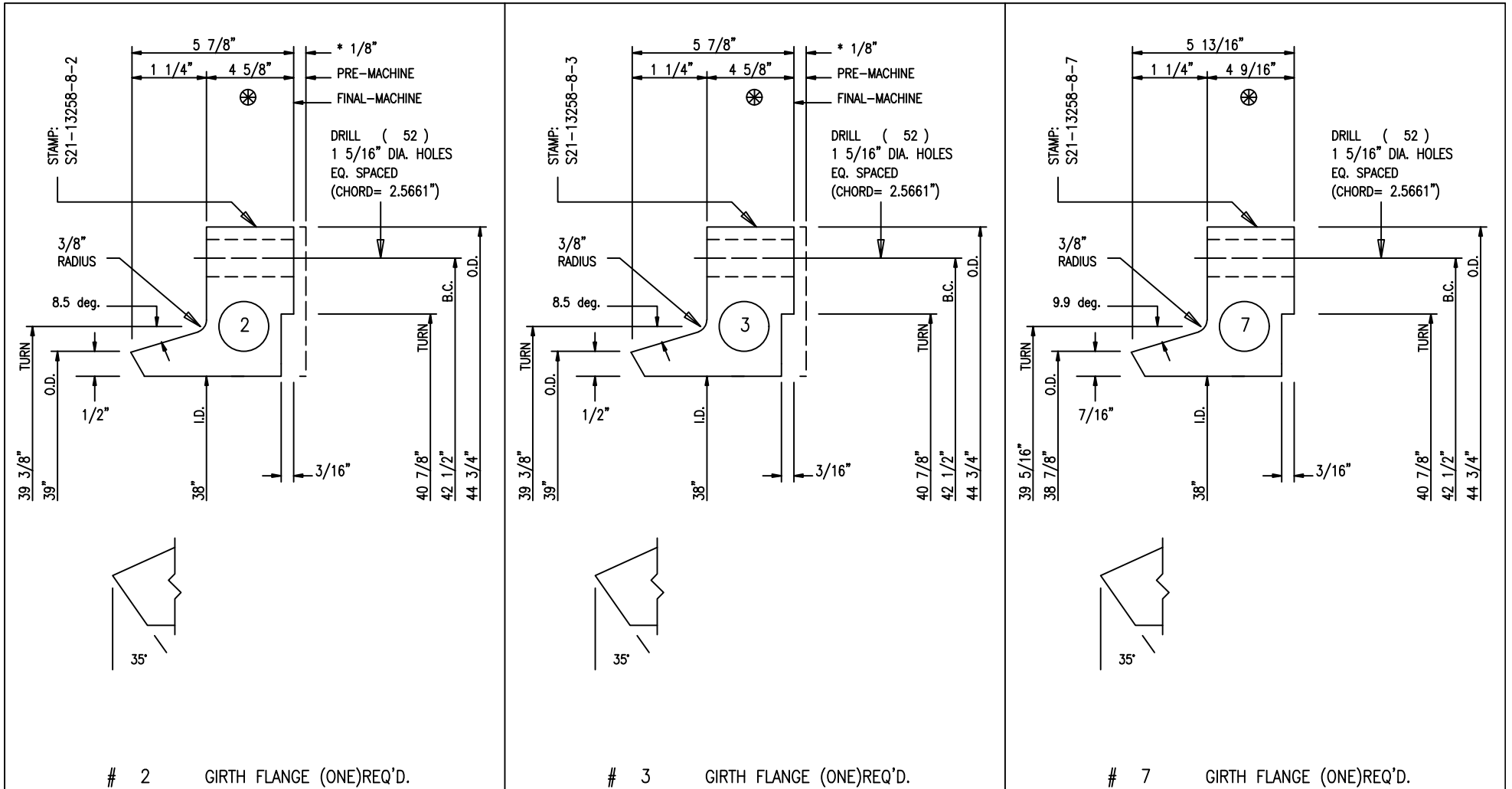
NUMBER STUDS: (52)

STUD MATERIAL: SA-193-B7

BOLT TORQUE RANGE TO BE ACHIEVED: 842.1-873.2 Ft. LBS.

PROJECT NAME: WORLD ENERGY RENEWABLES PROJECT
EQUIPMENT OWNER: AIR PRODUCTS MANUFACTURING LLC
SERVICE: PROPANE RECOVERY COMPRESSOR AFTERCOOLER
LOCATION: WORLD ENERGY, PARAMOUNT, CA. USA
PRODUCT: PROPANE RECOVERY COMPRESSOR AFTERCOOLER
ITEM NO.: 18-X-371
AIR PRODUCTS P.O. NO.: 4505600058 / A8KM-4-402-P0-3
AP PROJECT NO: EN-20-7120
VDR CODE NO.: BE04
SERIAL NO.: S21-13258-8
ENGINEER: EG
CUSTOMER / CLIENT: WORLD ENERGY PARAMOUNT

			GASKET DETAILS			
			DWN. BY B.W.	Fabsco SHELL & TUBE, LLC		
			DATE 5/16/22			
△	7/7/22	REV. PER CUST. COMMENTS	DD	CKD. BY <i>DiCarlo</i>	DWG.NO.	REV. 1
NO.	DATE	REVISIONS				



NOTES:

- MACHINE ALL SURFACES TO 250 RMS EXCEPT GASKET SURFACES MACHINE TO 125 RMS.
- ALL BOLT HOLES TO STRADDLE NATURAL CENTER LINES.
- * FINAL MACHINE FACING AFTER FINAL WELDING.
- THE FLATNESS TOLERANCE (MAXIMUM DEVIATION FROM A PLANE) ON PERIPHERAL GASKET CONTACT SURFACES SHALL BE $\pm 1/32"$.



THK. INCLUDES 1/8" FUTURE MACHINING ALLOWANCE

PROJECT NAME: WORLD ENERGY RENEWABLES PROJECT
EQUIPMENT OWNER: AIR PRODUCTS MANUFACTURING LLC
SERVICE: PROPANE RECOVERY COMPRESSOR AFTERCOOLER
LOCATION: WORLD ENERGY, PARAMOUNT, CA. USA
PRODUCT: PROPANE RECOVERY COMPRESSOR AFTERCOOLER
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AP PROJECT NO: EN-20-7120
VDR CODE NO.: BE04
SERIAL NO.: S21-13258-8
ENGINEER: EG
CUSTOMER / CLIENT: WORLD ENERGY PARAMOUNT

GIRTH FLANGES			
		DWN. BY	Fabsco SHELL & TUBE, LLC
		B.W.	
		DATE	5/16/22
		CKD. BY	DiCarlo
		DWG.NO.	S21-13258-8-12
		REV.	2
NO.	DATE	REVISIONS	
9/28/22		REV. PER CUST. B.W./DD	
7/7/22		NO REV, RESUBMIT FOR APP'L DD	

MK.NO.	QUAN.	DESCRIPTION			MATERIAL	NOZ MK.	SUPPLIER	P.O. NO.	DUE
21	△	460	TUBES 3/4" OD X 0.0650" (AVG) THK PER BEND SCHEDULE 13)		SA-789S31803/S32205(SMLS)				
△									
△			FORGED RING MATERIAL						
2	△	1	FLG 44 3/4" O.D.X 38" I.D.X 5 7/8" THK (f) 6)7)8)12)		SA-350LF2CL1				
3	△	1	FLG 44 3/4" O.D.X 38" I.D.X 5 7/8" THK (f) 6)7)8)12)		SA-350LF2CL1				
7	△	1	FLG 44 3/4" O.D.X 38" I.D.X 5 13/16" THK (f) 6)7)		SA-182F316/316L				
△									
△			TUBESHEETS & COVERS						
19	△	1	TUBESHEET 40 3/4" O.D.X 3 1/8" THK (f) 7)13)14)		SA-240S31803/32205				
1	△	1	COVER 44 3/4" O.D.X 3 3/4" THK (f) 6)7)12)		SA-350LF2CL1				
△									
△			BAFFLES						
22	△	15	BAFFLES PER DWG. -8		SA-240-316/316L				
22A	△	1	SUPT PL. PER DWG. -8		SA-240-316/316L				
22A	△	1	U-BEND SUPT. PL. PER DWG. -7A		SA-240-316/316L				
△									
△			HEADS						
18	△	1	ELLIP HD. 38" I.D.X 3/8" THK(min) W/2" SF		SA-240-316/316L				
△									
△			CYLINDERS						
9	△	1	R&W CYL 38" I.D.X 7/16" THK X 18'-3 5/16" LG.						
△			2-CYL'S 6'-1 1/8" 1-CYL 6'-1 1/16"		SA-240-316/316L				
4	△	1	R&W CYL 38" I.D.X 1/2" THK X 2'-2 1/2" LG. 8)12)		SA-516-70N				
△									
△			TUBE MOCK UP MATERIAL						
19A	△	1	TEST PLATE 4" X 5" X 2" THK. 7)13)14)		SA-240S31803				
△			(TO BE FROM HEAT AS #19)		/S32205				
21A	△	10	TUBES 3/4" OD X 0.0650" (AVG) X 6" LG. 13)		SA-789S31803				
△			(TO BE FROM HEAT AS #21)		/S32205(SMLS)				
△									
△			METAL SHIPPING COVER MATERIAL(REMOVE BEFORE SERVICE)						
160	△	4	PL. 16 1/2" O.D. X 3/8" THK. W/(12) 9/16" DIA. HOLES		C.-STL.				
△			EQUALLY SPACED ON 13 3/4" B.C. (8"-600#)						
161	△	4	GASKETS: 0.175" THK. 304 S.S. SPIRAL WOUND GRAPHITE						
△			FILLED, STYLE "CG", C-STL. COMP RING FOR (8"-600# RF)						
162	△	48	1/2" HEX HD. ALL THD. BOLTS X 4 1/4" LG. W/(1) HEX NUT		C.-STL.				
△			AND (2) FLAT WASHERS EACH (8"-600#)						
108	△	2	1/4" NPT GAGE W/ -30 TO 30 PSI (MINIMUM) DIAL		C.-STL.				
109	△	2	1/4" X 1" NPT BUSHING		C.-STL.				
110	△	2	1" - 3000 # SCREWED TEE		SA-234-WPB				
111	△	4	1" NPT PIPE NIPPLE 0.179" (SCH. 80) X 2" LG. (TOE)		SA-106-B				
112	△	4	1" NPT PIPE NIPPLE 0.179" (SCH. 80) X 1 1/2" LG. (TBE)		SA-106-B				
113	△	4	1" - 50 # (MAX.) THD. BALL VALVE		C-STL.				
114	△	4	1" - 3000 # HEX HEAD PLUG		C-STL.				
115	△	2	1" 3M FS THRD 90 ELL		SA-105				
△									
△									
△									
△			SEE DWG. -17 FOR BILL OF MATERIAL NOTES						

PROJECT NAME: WORLD ENERGY RENEWABLES PROJECT
 EQUIPMENT OWNER: AIR PRODUCTS MANUFACTURING LLC
 SERVICE: PROPANE RECOVERY COMPRESSOR AFTERCOOLER
 LOCATION: WORLD ENERGY, PARAMOUNT, CA. USA
 PRODUCT: PROPANE RECOVERY COMPRESSOR AFTERCOOLER
 ITEM NO.: 18-X-371
 AIR PRODUCTS P.O. NO.: 4505600058/
 48KM-4-402-PO-3
 AP PROJECT NO: EN-20-7120
 VDR CODE NO.: FA01
 SERIAL NO.: S21-13258-8
 ENGINEER: EC
 CUSTOMER / CLIENT: WORLD ENERGY PARAMOUNT

		BILL OF MATERIAL			
		DVN. BY			
		B.W.			
		DATE	5/16/22		
		CKD. BY	DiCarlo		
		DWG.NO.	S21-13258-8-14		
		REV.	4		

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MK.NO.	QUAN.	DESCRIPTION				MATERIAL	NOZ MK.	SUPPLIER	P.O. NO.	DUE
		ANSI FLANGES								
71	1	ASME 8"	- 600 #	RF	WN W/ (SchXH BORE)	5)9)	S1	SA-182F316/316L		
72	1	ASME 8"	- 600 #	RF	WN W/ (SchXH BORE)	5)9)	S2	SA-182F316/316L		
81	1	ASME 8"	- 600 #	RF	WN W/ (SchXH BORE)	5)8)9)12)	T1	SA-350LF2CL1		
82	1	ASME 8"	- 600 #	RF	WN W/ (SchXH BORE)	5)8)9)12)	T2	SA-350LF2CL1		
73	1	ASME 2"	- 300 #	RF	LWN X 8 3/4" LG(2.000"BORE)	5)9)	A3	SA-182F316/316L		
74	1	ASME 2"	- 300 #	RF	LWN X 8 3/4" LG(2.000"BORE)	5)9)	A5	SA-182F316/316L		
75	1	ASME 2"	- 300 #	RF	LWN X 8 3/4" LG(2.000"BORE)	5)9)	A4	SA-182F316/316L		
83	1	ASME 2"	- 300 #	RF	LWN X 9" LG(2.000"BORE)	5)8)9)12)	V	SA-350LF2CL1		
84	1	ASME 2"	- 300 #	RF	LWN X 9" LG(2.000"BORE)	5)8)9)12)	D	SA-350LF2CL1		
85	1	ASME 2"	- 300 #	RF	LWN X 8 3/4" LG(2.000"BORE)	5)8)9)12)	A1	SA-350LF2CL1		
86	1	ASME 2"	- 300 #	RF	LWN X 8 3/4" LG(2.000"BORE)	5)8)9)12)	A2	SA-350LF2CL1		
73C	1	ASME 2"	- 300 #	RF	BLIND FLG.	5)9)	A3	SA-182F316/316L		
74C	1	ASME 2"	- 300 #	RF	BLIND FLG.	5)9)	A5	SA-182F316/316L		
75C	1	ASME 2"	- 300 #	RF	BLIND FLG.	5)9)	A4	SA-182F316/316L		
83C	1	ASME 2"	- 300 #	RF	BLIND FLG.	5)8)9)12)	V	SA-350LF2CL1		
84C	1	ASME 2"	- 300 #	RF	BLIND FLG.	5)8)9)12)	D	SA-350LF2CL1		
85C	1	ASME 2"	- 300 #	RF	BLIND FLG.	5)8)9)12)	A1	SA-350LF2CL1		
86C	1	ASME 2"	- 300 #	RF	BLIND FLG.	5)8)9)12)	A2	SA-350LF2CL1		
71A	1	WL/SM,PIPE 8"	X(0.5000"	SchXH	X 9 3/4" LG.		S1	SA-312TP316/316L		
72A	1	WL/SM,PIPE 8"	X(0.5000"	SchXH	X 9 3/4" LG.		S2	SA-312TP316/316L		
81A	1	SMLS,PIPE 8"	X(0.5000"	SchXH	X 11 3/4" LG.	8)12)	T1	SA-106-B		
82A	1	SMLS,PIPE 8"	X(0.5000"	SchXH	X 11 3/4" LG.	8)12)	T2	SA-106-B		
71B	1	WELD PAD 12 3/4"	O.D. X 9 1/8"	I.D. X 7/16"	THK		S1			
					(ROLL TO 19 7/16" I.R.)			SA-240-316/316L		
71D	1	PAD RING 16"	O.D. X 13 1/2"	I.D. X 7/16"	THK		S1			
					(ROLL TO 19 7/16" I.R.)			SA-240-316/316L		
72B	1	WELD PAD 12 3/4"	O.D. X 9 1/8"	I.D. X 7/16"	THK		S2			
					(ROLL TO 19 7/16" I.R.)			SA-240-316/316L		
72D	1	PAD RING 16"	O.D. X 13 1/2"	I.D. X 7/16"	THK		S2			
					(ROLL TO 19 7/16" I.R.)			SA-240-316/316L		
81B	1	WELD PAD 13 1/4"	O.D. X 12 3/4"	O.D. X 9 5/8"	I.D. X		T1			
					(ROLL TO 19 1/2" I.R.)			SA-516-70N		
81D	1	PAD RING 18"	O.D. X 17 1/2"	O.D. X 13 7/8"	I.D. X		T1			
					(ROLL TO 19 1/2" I.R.)			SA-516-70N		
82B	1	WELD PAD 13 1/4"	O.D. X 12 3/4"	O.D. X 9 5/8"	I.D. X		T2			
					(ROLL TO 19 1/2" I.R.)			SA-516-70N		
82D	1	PAD RING 18"	O.D. X 17 1/2"	O.D. X 13 7/8"	I.D. X		T2			
					(ROLL TO 19 1/2" I.R.)			SA-516-70N		
150	1	1 1/2" X 18 GA. EXP'D. METAL								
		PERSONAL PROTECTION MESH PER DWG. -3A						304/304L		
151	60	PERSONAL PROTECTION STAND-OFF CLIPS PER DWG. -3A						SA-240-316		
152	120	#8 SELF TAPPING SCREW W/ FLAT S.S. WASHER PER DWG. -3A						304/304L		
		NOZZLE HYDROTEST GASKETS								
180	4	GASKETS: 0.175" THK 304 SS SPIRAL WOUND GRAPHITE								
		FILLED, STYLE "CG" W/C-STL COMP. RING (8"-600# RF)								
		SEE DWG. -17 FOR BILL OF MATERIAL NOTES								

PROJECT NAME: WORLD ENERGY RENEWABLES PROJECT
EQUIPMENT OWNER: AIR PRODUCTS MANUFACTURING LLC
SERVICE: PROPANE RECOVERY COMPRESSOR AFTERCOOLER
LOCATION: WORLD ENERGY, PARAMOUNT, CA. USA
ITEM NO.: 18-X-371
AIR PRODUCTS P.O. NO.: 4505600058/
AP PROJECT NO: EN-20-7120
VDR CODE NO.: FA01
SERIAL NO.: S21-13258-8
ENGINEER: EG
CUSTOMER / CLIENT: WORLD ENERGY PARAMOUNT

BILL OF MATERIAL				DWN. BY	
				B.W.	
				DATE	
				CKD. BY	
				<i>DiCarlo</i>	

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REV.
6

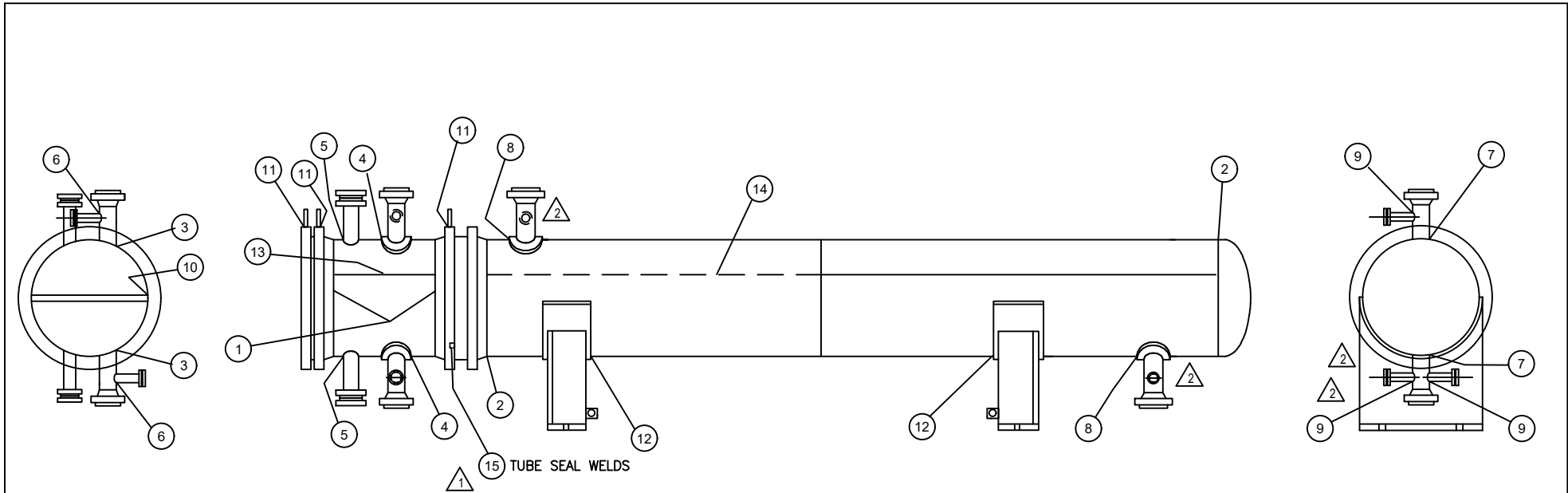
DWG.NO. S21-13258-8-15

MK.NO.	QUAN.	DESCRIPTION	MATERIAL	NOZ MK.	SUPPLIER	P.O. NO.	DUE
		BOLTING & GASKETS					
40	1	LOT OF GASKETS PER DWG. -11					
41	52	1 1/8" ROUND X 8-THREAD STUDS X 14" LG. 1&2 12)	SA-193-B7				
42	52	1 1/8" ROUND X 8-THREAD STUDS X 17 3/4" LG. 3&7 12)	SA-193-B7				
43	416	1 1/8" HEAVY HEX NUTS 8-THREAD 12)	SA-194-2H				
43	208	1 1/8" NARROW SERIES WASHERS	F-436-1				
		SPARE STUDS & NUTS (TO SHIP LOOSE W/EXCH.)					
141	5	1 1/8" DIA. (10-THD.) STUDS X 14" LG. 1&2 12)	SA-193-B7				
142	5	1 1/8" ROUND X 8-THREAD STUDS X 17 3/4" LG. 3&7 12)	SA-193-B7				
143	40	1 1/8" HVY HEX NUTS (8-THD.) 12)	SA-194-2H				
144	10	1 1/8" NARROW SERIES WASHERS	F-436-1				
		BLIND FLANGE MATERIAL					
171	56	STUDS: 5/8" DIA. (11-THD.) X 5 3/4" LG.(2"-300# RF) 12)	SA-193-B7				
172	224	NUTS: 5/8" (11-THD.) HVY. HEX (2"-300# RF) 12)	SA-194-2H				
173	7	GASKETS: 0.175" THK 316 SS SPIRAL WOUND GRAPHITE					
		FILLED, STYLE "CGI" W/316 SS INNER RING & (2"-300# RF)					
		C-STL. OUTER RING FOR					
174	112	5/8" NARROW SERIES WASHERS	F-436				
		MISC. MATERIAL					
60	1	STD. NAME PLATE	STN.STL.				
61	1	NAME PL BRKT (PER DWG. -10)	SA-240-316/316L				
62	3	LIFTING LUGS (PER DWG. -10)	SA-516-70N				
23	143	FT. 1/2" O.D. TIE RODS	SA-479-316/316L				
23B	16	1/2" TIE ROD HEX NUTS	SA-194-8M				
23A	143	FT. 3/4" O.D. SPACER TUBING	SA-249-316/316L				
220	2	1.900" O.D. DUMMY PIPES X 15'-10 13/16" LG.	SA-312TP316/316L				
221	13	3/4" DIA. IMP RODS X 1'-10 1/4" LG.	SA-479-316/316L				
22R	2	SEAL BARS 2 1/2" X 1/4" THK X 14'-9 13/16" LG.	SA-240-316/316L				
22S	2	SEAL BARS 1 3/4" X 1/4" THK X 14'-9 13/16" LG.	SA-240-316/316L				
22T	2	SKID BARS 1" X 3/4" THK X 14'-9 13/16" LG.	SA-240-316/316L				
22U	2	SEAL BARS 2" X 1/4" THK X 14'-9 13/16" LG.	SA-240-316/316L				
50	2	PASS PLATES 17 7/8" X 3/4" THK X 38 3/4" LG. 8)12)	SA-516-70N				
51	1	PASS PLATES 37 7/8" X 3/4" THK X 38 3/4" LG. 8)12)	SA-516-70N				
63	4	SQ. HD. PULLBOLT PLUGS: 3/4" DIA. (10-THD.) X 3 1/2" LG.	S31803/S32205				
22P	2	END CAPS: 1.900" O.D. X 1/4" THK.	316/316L				
65	2	SHOULDER EYEBOLT: 3/4" OD (10-THD.) W/ 2" SHANK	ASTM A489				
		SUPPORT MATERIAL					
120	2	PLATE 13" X 3/8" THK X 61" LG.	SA-240-316/316L				
121	2	PLATE 37" X 5/8" THK X 29" LG.	SA-516-70				
122	2	PLATE 9" X 7/8" THK X 37" LG.	SA-516-70				
123	2	PLATE 7 7/8" X 3/4" THK X 16 5/16" LG.	SA-516-70				
124	4	PLATE 7 7/8" X 3/4" THK X 26 13/16"LG.	SA-516-70				
125	2	GROUNDING LUGS: 2" X 1/4" THK. X 5" LG.	SA-240-304				
		FOR BILL OF MATERIAL NOTES, SEE DWG. -17					
		PAINT PER DWG. -1A					
		DELETED					
		DELETED					

PROJECT NAME: WORLD ENERGY RENEWABLES PROJECT
EQUIPMENT OWNER: AIR PRODUCTS MANUFACTURING LLC
SERVICE: PROPANE RECOVERY COMPRESSOR AFTERCOOLER
LOCATION: WORLD ENERGY, PARAMOUNT, CA, USA
PRODUCT: PROPANE RECOVERY COMPRESSOR AFTERCOOLER
ITEM NO.: 18-X-371
AIR PRODUCTS P.O. NO.:4505600058/
ABW-4-402-PO-3
AP PROJECT NO: EN-20-7120
VPR CODE NO: F401
SERIAL NO.: S21-13258-8
ENGINEER: EC
CUSTOMER / CLIENT: WORLD ENERGY PARAMOUNT

BILL OF MATERIAL			
		DWN. BY	
		B.W.	
		DATE	
		5/17/22	
		CKD. BY	
		DiCarlo	
		DWG.NO.	S21-13258-8-16
		REV.	3

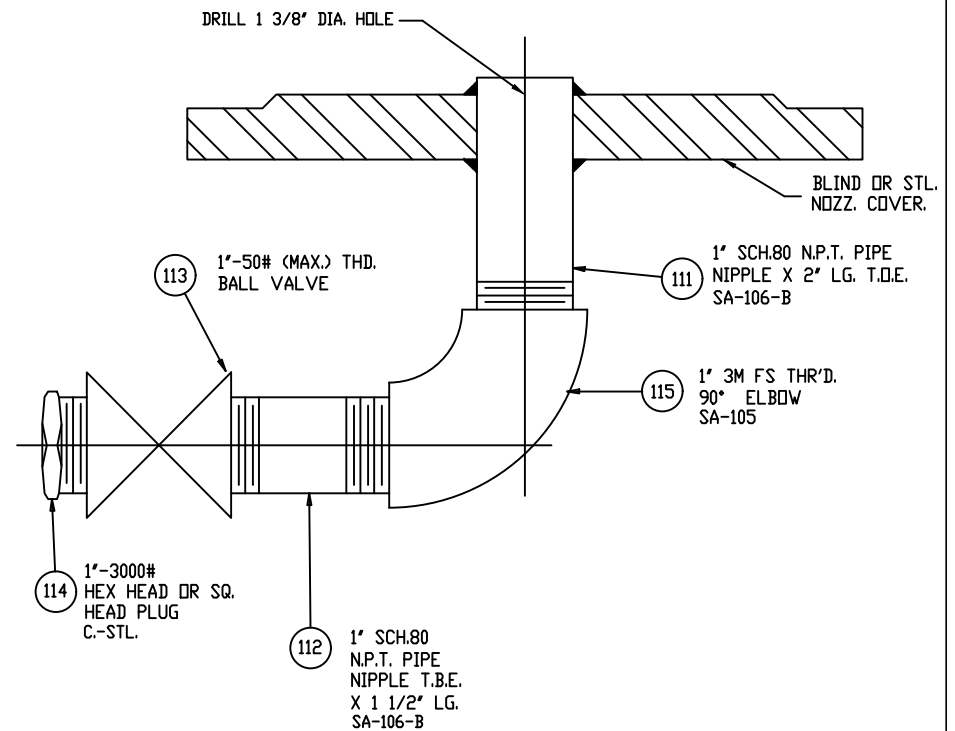
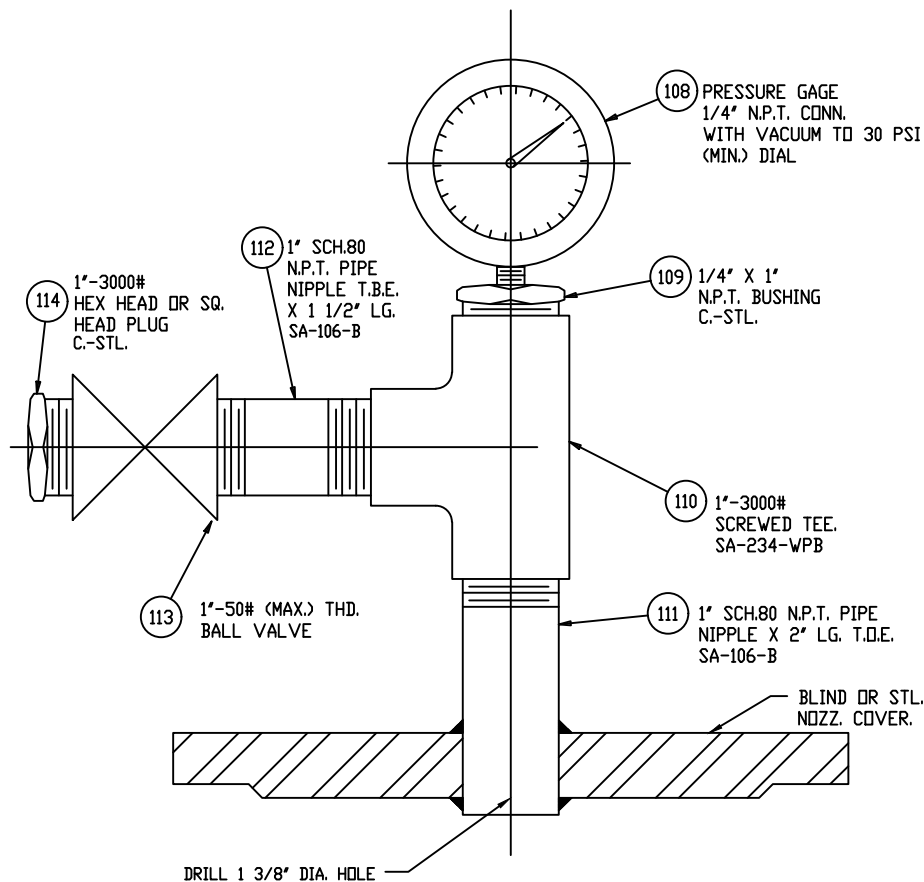
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	X-RAY	U.T.	M.T.	P.T.	W.F.M.T.	BRINELL	MK.
CHANNEL CIRCULAR SEAM	X		X	X	X	X	(1)
SHELL CIRCULAR SEAM	X		X	X	X	X	(2)
CHANNEL NOZZLE TO PIPE	X	X	X	X	X	X	(3)
CHANNEL WELD PAD TO PIPE	X	X	X	X	X	X	(4)
CHANNEL V & D TO PIPE		X	X	X	X	X	(5)
CHANNEL AUX. TO PIPE		X	X	X	X	X	(6)
SHELL NOZZLE TO PIPE	X	X	X	X	X	X	(7)
SHELL WELD PAD TO PIPE		X	X	X	X	X	(8)
SHELL AUX. TO PIPE			X	X	X	X	(9)
PASS PLATE TO CYLINDER		X	X	X	X	X	(10)
LIFT LUG WELDS			X	X			(11)
SUPPORT PAD TO CYLINDER			X	X	X	X	(12)
CHANNEL LONG SEAM	X		X	X	X	X	(13)
SHELL LONG SEAM	X		X	X	X	X	(14)
TEMPORARY ATTACHMENT LOCATIONS			X	X			
TUBE SEAL WELDS				X			(15) ⚠

PROJECT NAME: WORLD ENERGY RENEWABLES PROJECT
 EQUIPMENT OWNER: AIR PRODUCTS MANUFACTURING LLC
 SERVICE: PROPANE RECOVERY COMPRESSOR AFTERCOOLER
 LOCATION: WORLD ENERGY, PARAMOUNT, CA. USA
 PRODUCT: PROPANE RECOVERY COMPRESSOR AFTERCOOLER
 ITEM NO.: 18-X-371
 AIR PRODUCTS P.O. NO.: 4505600058 / ABKM-4-402-PO-3
 AP PROJECT NO.: EN-20-7120
 VDR CODE NO.: QD07
 SERIAL NO.: S21-13258-8
 ENGINEER: EG
 CUSTOMER / CLIENT: WORLD ENERGY PARAMOUNT

			NDE MAP		
			DWN. BY	Fabsco SHELL & TUBE, LLC	
			B.W.		
⚠	4/20/23	REV. "AS BUILT" / FABSCO AS/DD	DATE	5/10/22	
⚠	7/7/22	REV. PER CUST. COMMENTS DD	CKD. BY		
NO.	DATE	REVISIONS	DiCarlo	DWG. No.	REV.
				S21-13258-8-19	2



NOTES:

- 1) A VACUUM MUST BE CREATED INSIDE EXCHANGER WHICH IS TO BE BROKEN BY INTRODUCING 10 PSI DRY NITROGEN THROUGH VALVE.
- 2) POSITIVE PRESS. TO READ 10 PSI CONTINUOUS.
- 3) GAGE & VALVE TO REMAIN ON EXCHANGER AND BE PROTECTED AGAINST BREAKAGE DURING SHIPMENT.
- 4) STENCIL ON CAUTION TAG & WIRE TO NOZZ. CVR., *WARNING, THIS EXCHANGER IS UNDER POSITIVE PRESSURE, RELIEVE PRESSURE BEFORE OPENING ANY CLOSURE.*
- 5) ALL OPENINGS TO BE PLUGGED OR CAPPED BEFORE SHIPMENT.
- 6.) 2-GAGE REQUIRED. (1-SHELLSIDE & 1-TUBESIDE).

PROJECT NAME: WORLD ENERGY RENEWABLES PROJECT
EQUIPMENT OWNER: AIR PRODUCTS MANUFACTURING LLC
SERVICE: PROPANE RECOVERY COMPRESSOR AFTERCOOLER
LOCATION: WORLD ENERGY, PARAMOUNT, CA. USA
PRODUCT: PROPANE RECOVERY COMPRESSOR AFTERCOOLER
ITEM NO.: 18-X-371
AIR PRODUCTS P.O. NO.: 4505600058 / A8KM-4-402-PO-3
AP PROJECT NO: EN-20-7120
VDR CODE NO.: BE04
SERIAL NO.: S21-13258-8
ENGINEER: EG
CUSTOMER / CLIENT: WORLD ENERGY PARAMOUNT

PRESSURE GAGE & VALVE DETAIL FOR NITROGEN PURGE

DWN. BY

DD

DATE

12/29/22

CKD. BY

DG

DWG.NO.

S21-13258-8-20

REV.

1

NO.	DATE	REVISIONS
1	12/29/22	ADDED DETAIL/CUST. DD/DG