Pressure Vessel Engineering Ltd.
120 Randall Drive Suite B, Waterloo, Ontario, Canada, N2V 1C6
Phone: 519-880-9808 • Fax: 519-880-9810 • Web: www.pveng.com

Pressure Vessel Engineering
120 Randall Drive, Suite B
Waterloo, Ontario
N2V 1C6

Nov 6, 2020

Caloris Engineering LLC
8649 Commerce Drive,
Easton, MD,
21601, USA

Drawing #: 20-3776
PVEng Reference #: 15892
Dear David G. Mullhausen

Please find enclosed the following documentation in regards to your CRN application.

1. CRN acceptance letter.
2. CRN stamped paperwork.

If you have any questions regarding this project, please contact me.

Best Regards,

Catherine Diplock

Catherine Diplock
519-880-9808 x226
cmd@pveng.com

Manitoba
Inspection and Technical Services Manitoba
Municipal Relations

Winnipeg Manitoba R3C 0P8
T (204) 945-3373
F (204) 948-2309
firecomm.gov.mb.ca/itsm_steam_pressure.html

September 29th, 2020

Pressure Vessel Engineering Ltd.
120 Randall Drive, Suite B
Waterloo, Ontario
N2V 1C6

Attention: Catherine Diplock

REGISTRATION OF DESIGN

Manufacturer: Seitz Stainless

The design(s) for the following Boiler/Pressure Vessel/Heat Exchanger has been received by us and has been examined and accepted for registration in the Province of Manitoba as follows.

MAIN DRAWING	REVISION	CRN	PRESSURE (PSIG)	TEMPERATURE (°F)	FILE
Weld Map	B	T5253.4	Shell Side: FV/25 Tube Side: FV/60	Shell Side: 300/40 Tube Side: 250/40	40490
M877-8325	A				

An invoice covering survey and registration fees is enclosed.

NOTE:

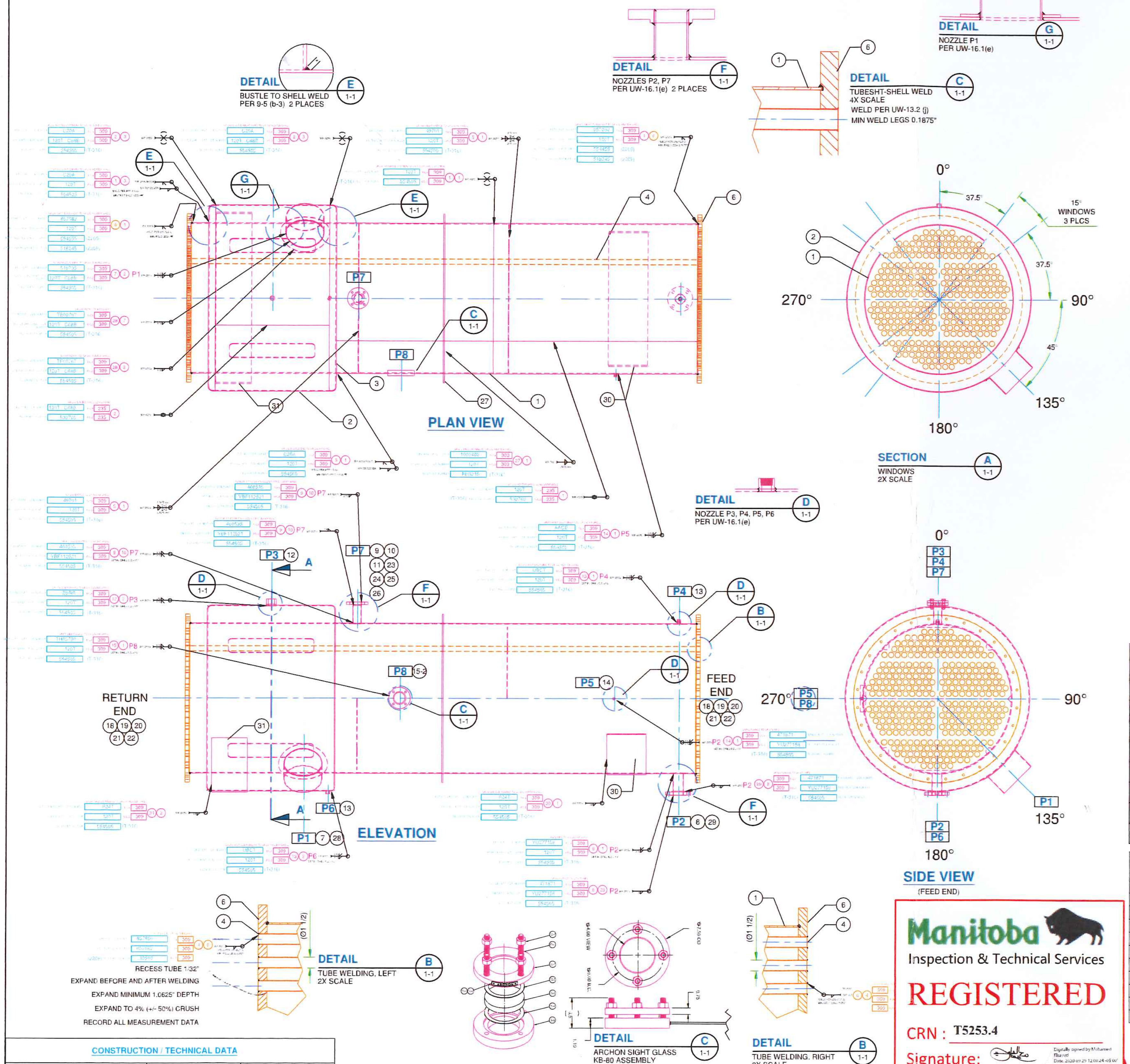
In addition to stamping every vessel with the registration number given above, and as required by CSA Code B51, **a Manufacturer's Data Report must be forwarded to this office** immediately at the time a unit is shipped to Manitoba.

The registration of this design does not relieve the manufacturer, the owner or his agent of the responsibility for the design or construction of a boiler, pressure vessel, or fired heater coil in accordance with the applicable Acts, Codes and Standards. Inspection and Technical Services assumes no responsibility by registering designs, examining plans and/or inspecting equipment or facility.

Regards,

Mohamed Elsayed, P.Eng, PMP, LSSGB
Inspector & Design Surveyor
Inspection and Technical Services
Municipal Relations
508 - 401 York Avenue
Winnipeg, Manitoba, R3C 0P8
Email: Mohamed.Elsayed@gov.mb.ca
Cell: (204) 794-3534
Website: http://www.firecomm.gov.mb.ca/itsm_steam_pressure.html

ASME WELD MAP ONLY - SEE ADDITIONAL DRAWINGS FOR DIMENSIONING



BILL OF MATERIAL

ITEM	QTY	SIZE TYPE	DESCRIPTION DIMENSIONS	PART NO MATERIAL
1	1	3/16" PLT	HEATER SHELL Ø42" OD X 141 7/8" LG	SA240-304
2	1	3/16" PLT	BUSTLE Ø52" OD X 33 5/8" LG	SA240-304
3	2	3/16" PLT	BUSTLE ENDS, KNUCKLE CORNER IR 1", Ø42 1/8" ID X Ø51 1/2" OD	SA240-304
4	342	1 1/2" 18 GA	TUBES 12' LG	SA789-S32205
5	1	3/16" PLT	BAFFLE, 2 SECTIONS, SEE DWG Ø41 1/2" OD	M877-6287 SA240-304
6	2	1 1/4" PLT	TUBESHEET, SEE DWG Ø47" OD	M877-6287 SA240-S32205
7	1	10" SCH10	PIPE ~6 3/4" LG	SA312-304
8	1	2 1/2" SCH40	PIPE ~6 1/2" LG	SA312-304
9	1	2" SCH10	PIPE ~6 1/2" LG	SA312-304
10	1	2" IPS	150# SLIP ON FLANGE, ASME B16.5	SA182-304
11	1	2" IPS	BLIND FLANGE, ASME B16.5	SA182-304
12	1	2" NPT	3000# HALF COUPLING WITH PLUG	SA312-304
13	2	1/2" NPT	3000# HALF COUPLING WITH PLUG	SA312-304
14	1	1/4" NPT	3000# HALF COUPLING WITH PLUG	SA312-304
15	1	4" WINDOW	ARCHON SIGHT GLASS WELD PAD SEE BELOW	KB-80-ASM SA-182 304
16	0		DELETED	
17	0		DELETED	
18	40'	5/16" CORD	O-RING GASKET SUPPLIED BY CALORIS	EPDM
19	56	1/2" UNC	STD HEX BOLT, PTL THD 4" LG	18-8
20	56	1/2" UNC	HEX NUT	18-8
21	112	1/2" SAE	FLAT WASHER	18-8
22	56	1/2" SAE	LOCK WASHER	18-8
23	4	5/8" UNC	STD HEX BOLT, PTL THD 2 1/2" LG	18-8
24	4	5/8" UNC	HEX NUT	18-8
25	8	5/8" SAE	FLAT WASHER	18-8
26	4	5/8" SAE	LOCK WASHER	18-8
27	1	3/8"	VACCUM REINFORCING RING 2 1/2" WIDE X 42 1/8" ID	SA479-304
28	1	10 GA SHT	REINFORCING RING, FOR P1 10 3/4" ID X 1 1/2" WIDE	SA240-304
29	1	2 1/2" IPS	150# SLIP ON FLANGE	SA182-304
30	1	1/4" PLT	WELD BAND, FEED END IR 21" 11" W X 125°	SA240-304
31	1	1/4" PLT	WELD BAND, RETURN END IR 26" 10" WIDE X 130°	SA240-304

PORT SCHEDULE

TAG	QTY	SIZE CONN	DESCRIPTION DIMENSIONS	NOTES
P1	1	10" B/W	VAPOR INLET FROM BLOWER	IPS
P2	1	2 1/2" FLG	CONDENSATE DRAIN	
P3	1	3/4" NPT	PRESSURE RELIEF VALVE	
P4	1	1/2" NPT	CAPPED VENT PORT	
P5	1	1/4" NPT	TEST PORT, CAPPED	
P6	1	1/2" NPT	BUSTLE DRAIN	
P7	1	2" FLG	CLEAN OUT FLANGE, CAPPED	
P8	1	4" WELD PAD	SIGHTGLASS, ARCHON KB-080 BB-02A 4" 150 PSI, SA-182 F304,BOROSILICATE	DETAIL 'C'

ARCHON KB-080 BB-02A-000 SIGHT GLASS BILL OF MATERIAL

ITEM	DESCRIPTION	QTY
15-9	DRIVE SCREW	2
15-8	LABEL, ARCHON	1
15-7	HEX NUT, HEAVY, 5/8-11 UNC	4
15-6	STUD, 5/8-11 UNC X 3" LG	4
15-5	CUSHION GASKET	1
15-4	SEAL GASKET	1
15-3	LENS, TEMPERED BOROSILICATE	1
15-2	WELD PAD	1
15-1	COVER FLANGE	1

VESSEL DATA SUMMARY

	SEITZ PROJECT NUMBER	20-3776
	DESCRIPTION	HORIZONTAL - 42" HEAT EXCHANGER
	SHELL CAPACITY	470 GALLONS
	TUBE CAPACITY	530 GALLONS
	CODE	SECTION VIII, DIV 1, 2019 EDITION
DESIGN	YEAR BUILT	2020
	DESIGN PRESSURE, TUBE SIDE	60 PSIG
	DESIGN PRESSURE, SHELL SIDE	25 PSIG
	DESIGN TEMPERATURE, TUBE SIDE	250 °F
	DESIGN TEMPERATURE, SHELL SIDE	300 °F
	MEAN METAL TEMP, TUBES	250 °F
	MEAN METAL TEMP, SHELL	250 °F
	MDMT	40 °F
	HEADS (COVERS)	SA240-S32205
	COVER DIVIDERS	SA240-S32205
	SHELL	SA240-304
	BUSTLE	SA240-304
MATERIALS	TUBES	SA789-S32205
	TUBESHEETS	SA240-S32205
	SHELL NOZZLES	SA312-304
	HEAD NOZZLES	SA790-S32205
	HEAD NOZZLE FLANGES	SA182-S32205
	VACUUM RINGS	SA479-304
	SADDLES	SA240-304
FINISH	FINISH, EXTERNAL	UNIFORM BEAD BLAST
	FINISH, PRODUCT CONTACT	SMOOTH, COLOR CLEANED
TEST	TEST, TUBE SIDE	HYDRO, 78 PSI
	TEST, SHELL SIDE	HYDRO, 33 PSI

ASME DATA PLATE 8X

DRY WEIGHT, WITHOUT COVERS 5,875 LBS
DRY WEIGHT, WITH COVERS 6,975 LBS

LICENSED PROFESSIONAL ENGINEER M.A.HISKETT 100168472 10-Aug-2020 PROVINCE OF ONTARIO

Manitoba Inspection & Technical Services
REGISTERED
CRN: T5253.4
Signature:
Date: Sep 29, 2020

...AM CHEST ONLY
...ADDITIONAL DRAWING
FOR COVER ASSEMBLIES

CONSTRUCTION / TECHNICAL DATA

	SHELL SIDE	TUBE SIDE
DESIGN PRESSURE	25 PSIG	60 PSIG
DESIGN VACUUM	FULL VACUUM	FULL VACUUM
HYDROTEST PRESSURE	33 PSIG	80 PSIG
DESIGN TEMPERATURE	300°F	250°F
MIN. OPERATING TEMPERATURE	40°F	40°F
TESTING	HYDROSTATIC	

TYP FINISH SPECIFICATIONS

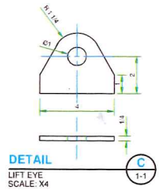
	EXTERIOR SURFACES & EXTERIOR WELDS	UNIFORM GLASS BEAD BLAST FREE OF WELD SPATTER & CREVICES
NON 3A	NON-SANITARY INTERIOR SURFACES & WELDS	MILL FINISH REMOVE DISCOLORATION WHERE INSPECTABLE
BREAK ALL EDGES		

APPROVED FOR CODE FABRICATION
ENG. SIGN DATE
Q.C. SIGN DATE
A.I. SIGN DATE
JOB NO.

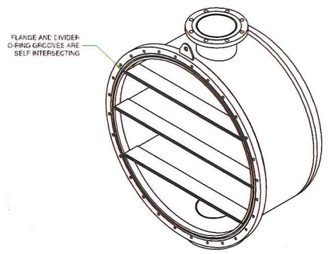
20-3776

PH EVPC1 01
FORCED RECIRCULATION
ASME HEAT EXCHANGER
42" OD X 12' LG
SHT 1 OF 1
WELD MAP B

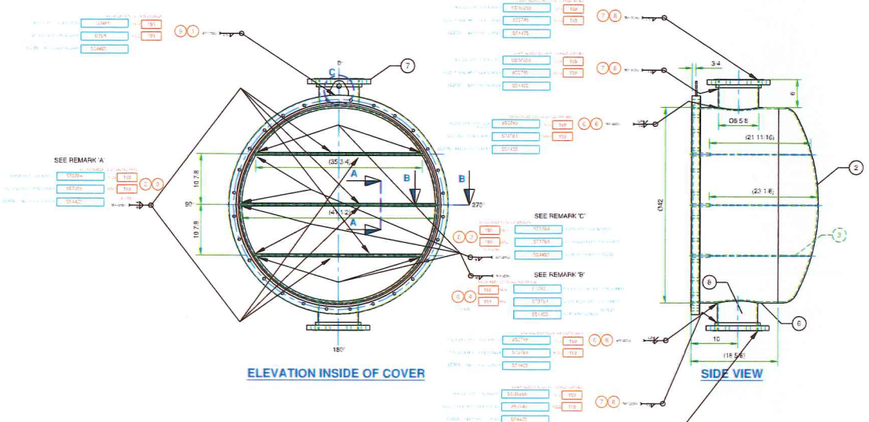
CALORIS A Better Process



DETAIL C
LIFT EYE
SCALE: X4

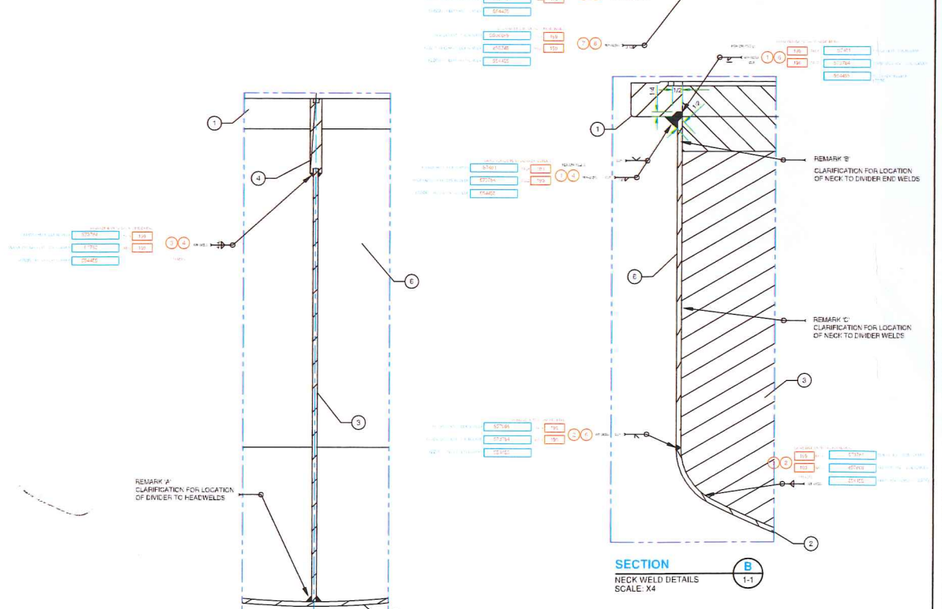


ITEM	QTY	SIZE TYPE	DESCRIPTION DIMENSIONS	PART NO MATERIAL
1	2	1.75" THK FLG	MACHINED FLANGE	MB77-8327 SA182-F65
2	2	1/4" PLT	ASME HEAD, Ø42", 42" DR, 2.52" KR, 0.5" SF, 0.218" MAF	SA240-S32205
3	17	1/4" PLT	DIVIDERS LENGTH CUT TO FIT	SA240-S32205
4	17	5/8" PLT	DIVIDER ENDS, 4" TALL LENGTH CUT TO FIT	SA240-S32205
5	1	1/4" PLT	NECK, RETURN END Ø42" X 5" TALL	SA240-S32205
6	1	1/4" PLT	NECK, FEED END Ø42" X 17" TALL	SA240-S32205
7	2	8" 150#	SLIP ON FLANGE ASME B16.5	SA182-S32205
8	2	8" SCH10	PIPE ~6 5/8" LG	SA790-S32205
9	2	LIGHT DUTY	LIFT EYE	SA240-304



ELEVATION INSIDE OF COVER

SIDE VIEW



SECTION A
GASKET AND WELD DETAILS
SCALE: X4

SECTION B
NECK WELD DETAILS
SCALE: X4

SEITZ SERIAL NUMBER
20-3776

CONSTRUCTION / TECHNICAL DATA	
	TUBE SIDE
DESIGN PRESSURE	60 PSIG
DESIGN VACUUM	FULL VACUUM
HYDROTEST PRESSURE	80 PSIG
DESIGN TEMPERATURE	250°F
MIN. TEMPERATURE	40°F
TESTING	HYDROSTATIC

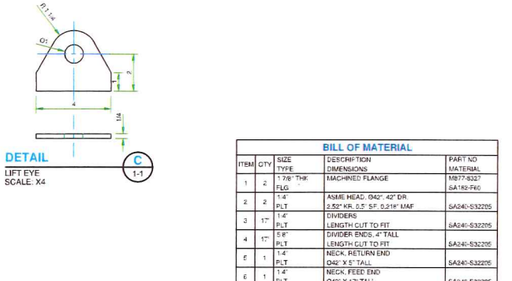
TYP	FINISH SPECIFICATIONS	
	EXTERIOR SURFACES & EXTERIOR WELDS	UNIFORM GRAIN BEAD BLAST FREE OF WELD SPATTER & CREVICES
	NON-SANITARY INTERIOR SURFACES & WELDS	MILL FINISH REMOVE DISCOLORATION WHERE INDETECTABLE
	BREAK ALL EDGES	

WELD MAP FOR FEED COVER ASSEMBLY FOR PH EVPO1 01

SHT 1 OF 2

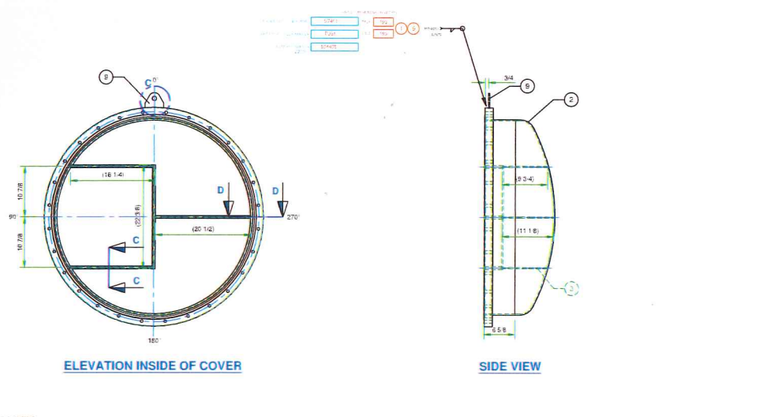
M677-8325 A

DRY WEIGHT-
FEED COVER: 715 LBS



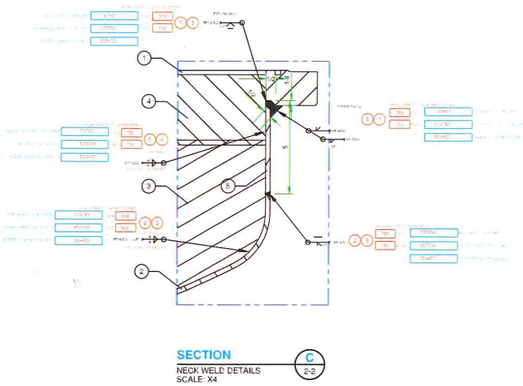
DETAIL C
LIFT EYE
SCALE: X4

ITEM	QTY	SIZE TYPE	DESCRIPTION DIMENSIONS	PART NO MATERIAL
1	2	1.75" THK FLG	MACHINED FLANGE	MB77-8327 SA182-F65
2	2	1/4" PLT	ASME HEAD, Ø42", 42" DR, 2.52" KR, 0.5" SF, 0.218" MAF	SA240-S32205
3	17	1/4" PLT	DIVIDERS LENGTH CUT TO FIT	SA240-S32205
4	17	5/8" PLT	DIVIDER ENDS, 4" TALL LENGTH CUT TO FIT	SA240-S32205
5	1	1/4" PLT	NECK, RETURN END Ø42" X 5" TALL	SA240-S32205
6	1	1/4" PLT	NECK, FEED END Ø42" X 17" TALL	SA240-S32205
7	2	8" 150#	SLIP ON FLANGE	SA182-S32205
8	2	8" SCH10	PIPE ~6 7/8" LG	SA790-S32205
9	2		LIGHT DUTY LIFT EYE	SA240-304

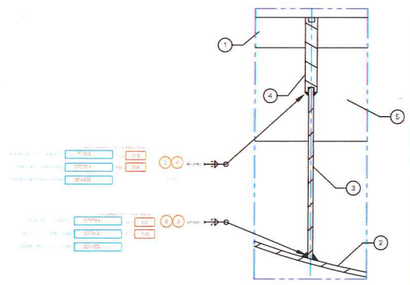


ELEVATION INSIDE OF COVER

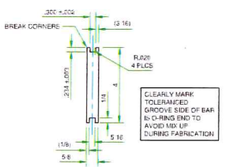
SIDE VIEW



SECTION C
NECK WELD DETAILS
SCALE: X4



SECTION D
GASKET AND WELD DETAILS
SCALE: X4



ITEM 4 DETAIL
SCALE: X4

SEITZ SERIAL NUMBER
20-3776

CONSTRUCTION / TECHNICAL DATA	
	TUBE SIDE
DESIGN PRESSURE	60 PSIG
DESIGN VACUUM	FULL VACUUM
HYDROTEST PRESSURE	80 PSIG
DESIGN TEMPERATURE	250°F
MIN. TEMPERATURE	40°F
TESTING	HYDROSTATIC

TYP	FINISH SPECIFICATIONS	
	EXTERIOR SURFACES & EXTERIOR WELDS	UNIFORM GRAIN BEAD BLAST FREE OF WELD SPATTER & CREVICES
	NON-SANITARY INTERIOR SURFACES & WELDS	MILL FINISH REMOVE DISCOLORATION WHERE INDETECTABLE
	BREAK ALL EDGES	

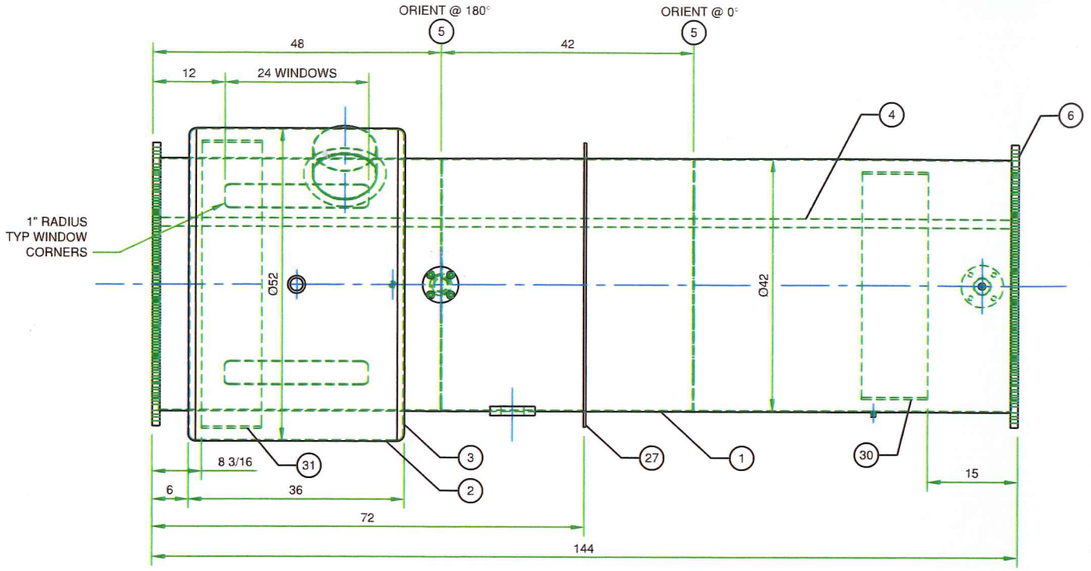
WELD MAP FOR RETURN COVER ASSEMBLY FOR PH EVPO1 01

SHT 2 OF 2

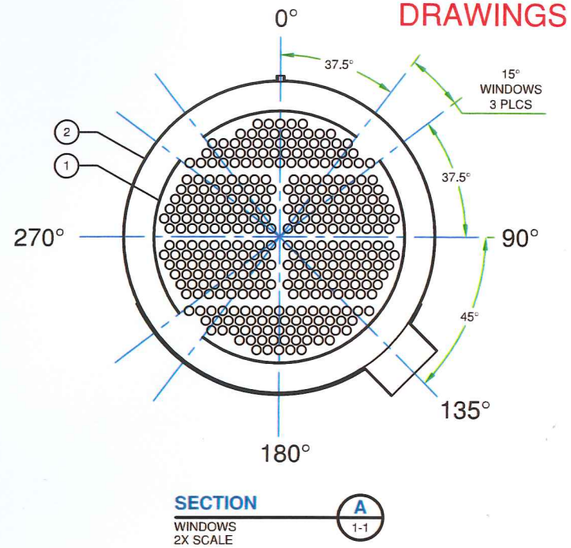
M677-8326 A

DRY WEIGHT-
RETURN COVER: 385 LBS

DIMENSIONAL DWG ONLY - SEE ADDITIONAL DRAWINGS FOR ASME WELD INFORMATION

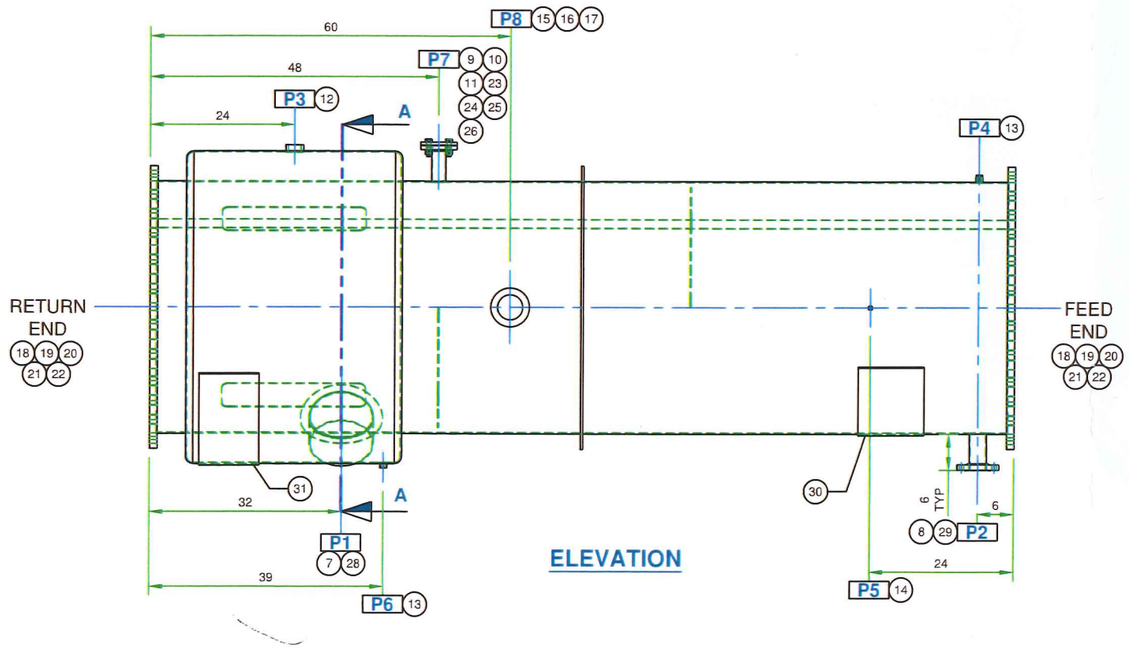


PLAN VIEW

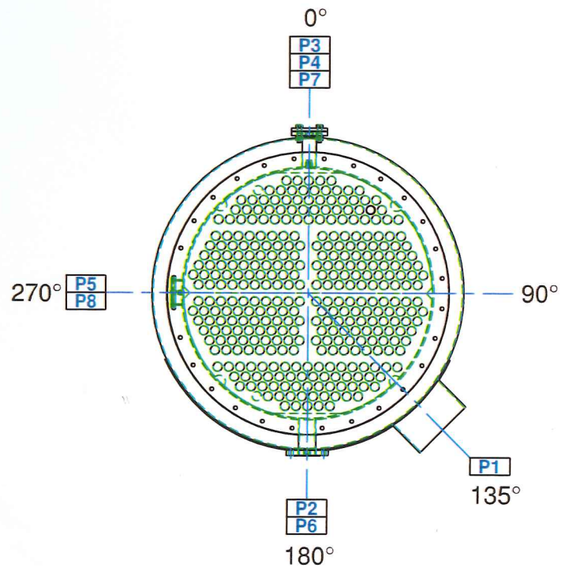


SECTION A 1-1
WINDOWS
2X SCALE

STEAM CHEST ONLY
SEE ADDITIONAL DRAWING FOR COVER ASSEMBLIES



ELEVATION



SIDE VIEW
(FEED END)

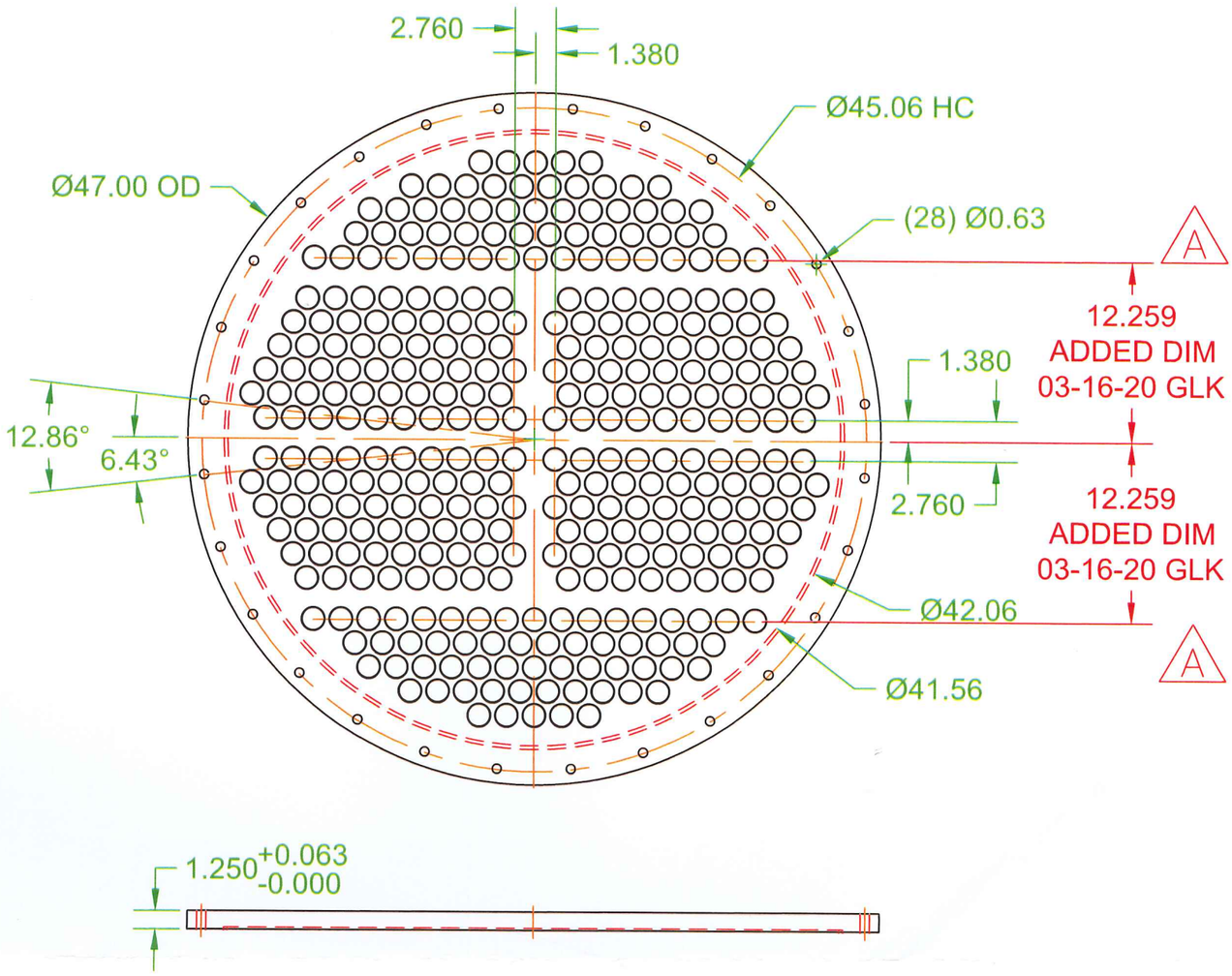
SEITZ SERIAL NUMBER
20-3776

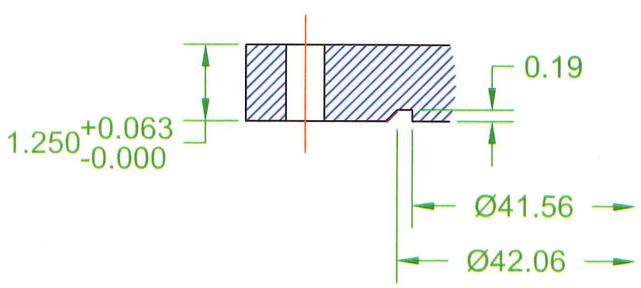
DRY WEIGHT, WITHOUT COVERS 5,975 LBS
DRY WEIGHT, WITH COVERS 7,075 LBS

D	WELD BAND THICKNESS & PCRT P3 SIZE CHANGE	BY: DGM 03-20-20	SCALE	1:10		FOR MERIT FOODS	PH EVP01 01 FORCED RECIRCULATION ASME HEAT EXCHANGER 42" OD X 12' LG DIMENSIONS ONLY
C	BUSTLE DESIGN CHANGES WELD BANDS ADDED	BY: DGM 03-19-20	DRAWN	01-17-20	EGM		
B	RELEASE FOR FABRICATION	BY: DGM 02-21-20	CHECK	00-00-00	-		
A	RELEASE FOR QUOTATION	BY: DGM 01-17-20	APPR	00-00-00	-	CALORIS® A Better Process www.caloris.com (410) 822-6900	DWG # M877-8303 REV D

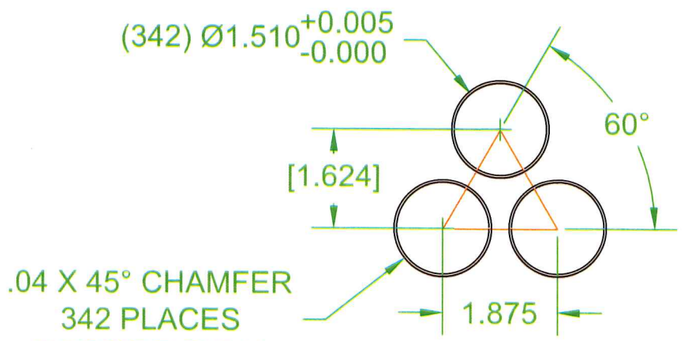
D SIZE

MATERIAL: PLATE 1-1/2", SA240-S32205,
MILL/MILL
QTY. 2
BLANK: (2) 47" OD
CALORIS DWG#: M883-8287 Rev. B
ITEM#: 1





GROOVE DETAIL
SCALE: 4X



PITCH DETAIL
SCALE: 4X

TOLERANCES UNLESS OTHERWISE SPECIFIED					
DECIMALS	.0 +/-.06	.00 +/-.03	.000 +/-.005		
FRACTIONS	+/- 1/16	ANGLES	+/-3°		

WARNING! DO NOT SCALE DWG

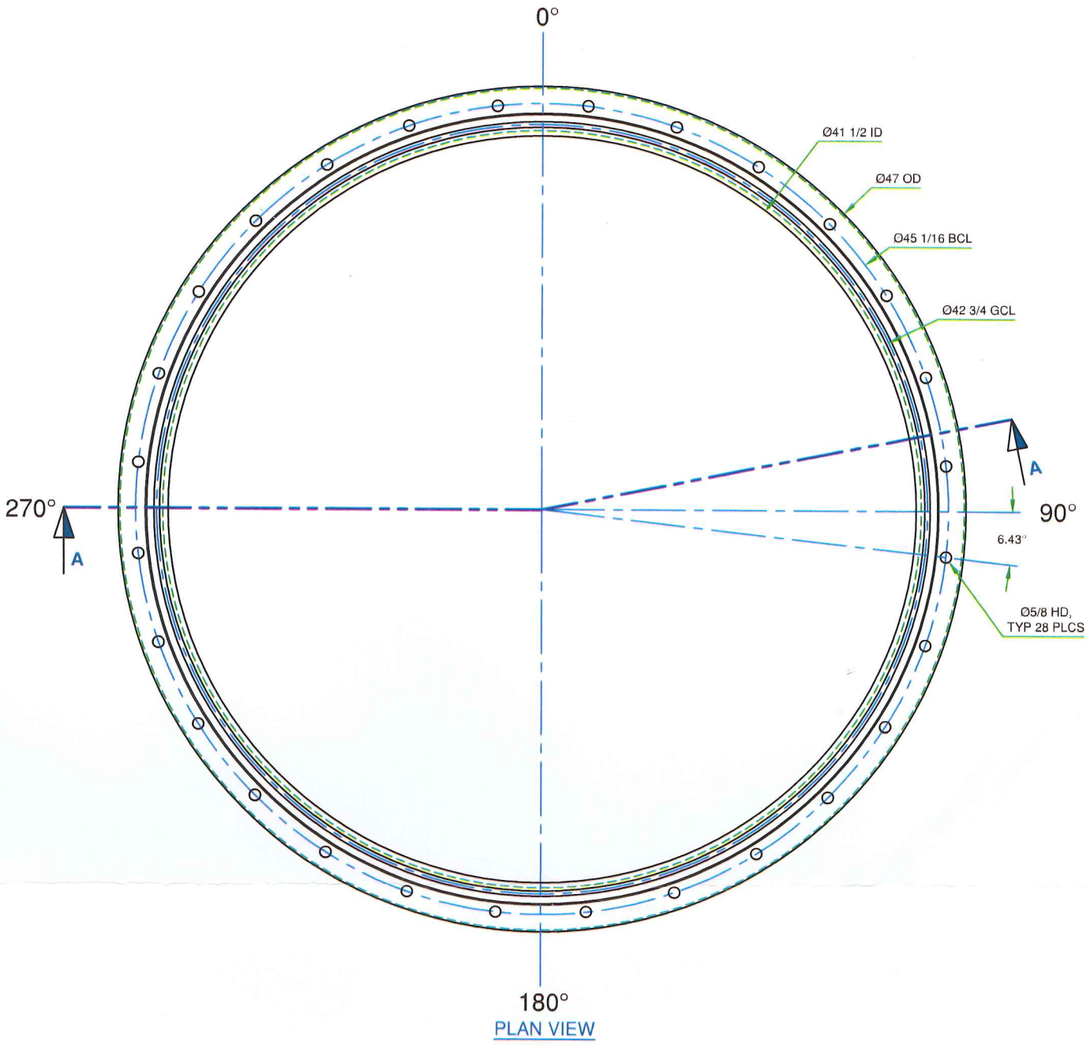
REV	REVISION DESCRIPTION	DATE	NAME
A	ADDED DIM. 12.259"	3/16/20	GLK
B	ADDED OUTSIDE BEVEL TO GROOVE	4/17//20	JSH

Seitz Stainless
17578 400 Street, Avon, MN 56310

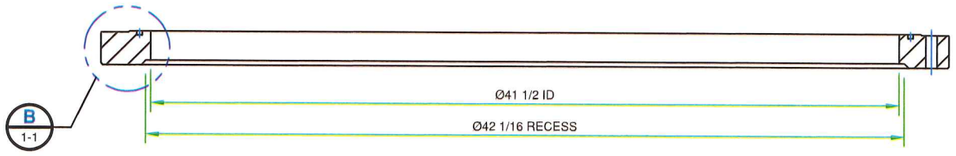
TITLE			
TUBESHEET			
DRAWN BY	CHECKED BY	DWG NO/FILE NAME	
DDT		3776 – TUBESHEET	
SIZE	SCALE	DATE COMPLETED	CUSTOMER/REF	SHEET OF SHEET
B	1:1	2/18/20	20-3776	1 of 1

BILL OF MATERIAL

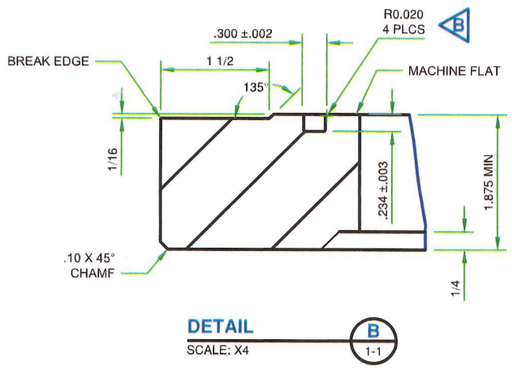
ITEM	QTY	SIZE TYPE	DESCRIPTION DIMENSIONS	PART NO MATERIAL
1	2	1 7/8" PLT	MACHINED FLANGE Ø47" OD	 SA-182 F60



PLAN VIEW



SECTION A 1-1
HORIZONTAL VIEW



DETAIL B 1-1
SCALE: X4

20-3776

TYP	FINISH SPECIFICATIONS	
	EXTERIOR SURFACES & EXTERIOR WELDS	UNIFORM GLASS BEAD BLAST FREE OF WELD SPATTER & CREVICES
NON 3A	NON-SANITARY INTERIOR SURFACES & WELDS	MILL FINISH REMOVE DISCOLORATION WHERE INSPECTABLE
	BREAK ALL EDGES	

		BY:	SCALE	1:4	FOR MERIT FOODS	MACHINED FLANGE FOR PH EVP01 01 SHT 1 OF 1	
			DRAWN	01-29-20 AFB			
C	ADDED BEVEL TO OUTSIDE OF WELD GROOVE	BY: JSH	CHECK	01-29-20 DGM			
		04-15-20	APPR	02-03-20			
B	RADIUS ADDED TO CORNERS OF GASKET GROOVE	BY: DGM		02-21-20		DWG # M877-8327	REV B
A	RELEASE FOR FABRICATION	BY: DGM		02-13-20			

CALORIS® A Better Process www.caloris.com (410) 822-6900

D-SIZE