

REV.	CODE	REVISION DESCRIPTION	DATE	BY	CK
1		REV'D PER CUST MARK-UPS	6/10/10	AJR	JCS
2	MR	REMOVED NOTE 14C PER ECN NO. 205281-003-ECN	9/15/10	AJR	JCS

**DESIGN NOTES**

CONSTRUCTION: ASME CODE SECTION VIII, DIV. 1 (2007 EDITION, 09 ADDENDA)  
 COMPLETE WITH STAMP AND NATIONAL BOARD REGISTRATION  
 T.S. NO. EXEMPT FROM IMPACT TESTING PER UCS-66, UHA-51.  
 S.S. NO. EXEMPT FROM IMPACT TESTING PER UCS-66, UHA-51.

	SHELLSIDE	TUBESIDE
DESIGN PRESSURE	75 PSIG @ 365°F	60 PSIG
EXTERNAL PRESSURE	15 PSIG @ 365°F	15 PSIG @ 365°F
MDMT / DESIGN TEMP	-20°F/365°F	-20°F/365°F
CORROSION ALLOWANCE	1/8" (CS ONLY)	NONE
RADIOGRAPHIC EXAMINATION	SPOT PER CODE	SPOT PER CODE
POST WELD HEAT TREAT	NONE	NONE
J.E. LONGITUDINAL SEAM	100%	100%
J.E. CIRCUMFERENTIAL	85%	85%
HYDROSTATIC TEST PRESSURE	98 PSIG	78 PSIG
NUMBER OF PASSES	ONE (1)	ONE (1)

APPLICABLE CUSTOMER SPEC'S:

SPECIFICATION	SOURCE/GEN. DESCRIPTION
610815509	BAYER CROPSCIENCE P/O, 4/30/10, 2 PGS
COP-11	STANDARD PRACTICE PROCESS VESSELS, 1 PG
PCM-200	INORGANIC ZINC PAINT, 3/81, 1 PG
PCM-201	VINYL PAINT ON INORGANIC ZINC PRIMER, 3/81, 1 PG
PCM-234	MODIFIED SILICONE FOR STAINLESS STEEL, 10/99, 2 PGS

**CONSTRUCTION NOTES**

- FLANGE BOLT HOLES TO STRADDLE NORMAL VESSEL CENTERLINE UNLESS NOTED.
- EACH NOZZLE REINFORCING PAD OR SEGMENT THEREOF SHALL HAVE 1/4" NPT TEST HOLE & PLUGGED WITH GREASE. SEGMENTAL PADS REQUIRE FULL PENETRATION BUTTWELDS. FOR NOZZLES IN SHELL WITH PADS, THE PAD WELD SHALL BE ORIENTATED AT LEAST 45° FROM THE LONGITUDINAL AXIS OF THE SHELL. IF THE PAD SEAM IS NOT ORIENTATED AS NOTED, OR IF THE PAD IS LOCATED ON A NOZZLE IN A HEAD, THEN UT OR FULL RADIOGRAPHY OF THE WELD JOINT IS REQUIRED TO CONFIRM FULL PENETRATION.
- VESSEL SHALL BE CLEANED INSIDE AND OUTSIDE, FREE OF DIRT, GREASE, DEBRIS, LOOSE MILL SCALE, WELD SPATTER, ETC.
- INNER EDGES OF NOZZLES AND VESSEL PENETRATIONS SUCH AS AT BOSSES SHALL BE GROUND TO A RADIUS OF 1/8" OR HALF THE THK. OF THE NECK, WHICHEVER IS LESS.
- TOLERANCES: PER PMC-TOL-3
- UNLESS OTHERWISE SPECIFIED ALL EXTERNAL ATTACHMENTS SHALL BE SEAL WELDED.
- ALL OPENINGS SHALL BE CLOSED FOR SHIPMENT WITH WOOD, METAL, OR COMPOSITION PROTECTORS WHICH WILL PREVENT THE ENTRY OF DIRT OR FOREIGN MATTER.
- OUTSIDE INSPECTION REQUIRED: (YES) OR (NO) CUSTOMER TO ADVISE
- M.T.R. REQUIRED FOR ALL PRESSURE RETAINING PLATE, PIPE, & TUBES, MFG. SYMBOL OR COC'S SHALL BE SUPPLIED FOR THE BALANCE OF PRESSURE PARTS.
- SHIP LOOSE ITEMS: N/A
- EXCHANGERS WITH WELDED TUBESHEETS SHALL HAVE A WORKLINE CENTER PUNCHED ON THE O.D. OF THE SHELL, ON THE CENTERLINE OF THE FIRST SHELL NOZZLE. WORKLINE IS FOR REFERENCE ONLY.
- TUBE TO TUBESHEET JOINTS SHALL BE DOUBLE GROOVED AND ROLLER/HYDRO EXPANDED FOR THE FULL THICKNESS OF THE TUBESHEET PER NES-5/NES-80.
- HYDRO TEST REQUIREMENTS:
  - HYDRO TEST PRESSURE SHALL BE MAINTAINED FOR ONE HOUR.
  - WATER USED IN TESTING SHALL HAVE A CHLORIDE ION CONTENT NOT GREATER THAN 250 PPM.
  - METAL TEMPERATURE SHALL NOT BE LESS THAN 60°F DURING HYDROTEST.
- PAINTING REQUIREMENTS:
  - CARBON STEEL: SURFACE TO BE NEAR-WHITE BLASTED PER SSPC-SP-10. PRIME COAT: ONE (1) COAT OF CARBOLINE CARBOGUARD 893 SG, @ 3-5 MILS DFT. (COLOR: BRIGHT WHITE-T800)
  - TOP COAT: ONE (1) COAT OF CARBOLINE PLASITE 7156, @ 5-6 MILS DFT (COLOR: LIGHT GRAY)
  - STAINLESS STEEL: SUGAR BLAST
- ALL EXPOSED MACHINED OR THREADED SURFACES SHALL BE CLEANED AND COATED WITH HOUGHON RUST VETO HEAVY OR EQUAL
- ESTIMATED WEIGHTS: BONNET = 660 LBS

RECOMMENDED SPARE PARTS (PER VESSEL)

QTY.	DESCRIPTION	PART NO.
1	BONNET FLANGE GASKET	GSK-BLU-000063-031

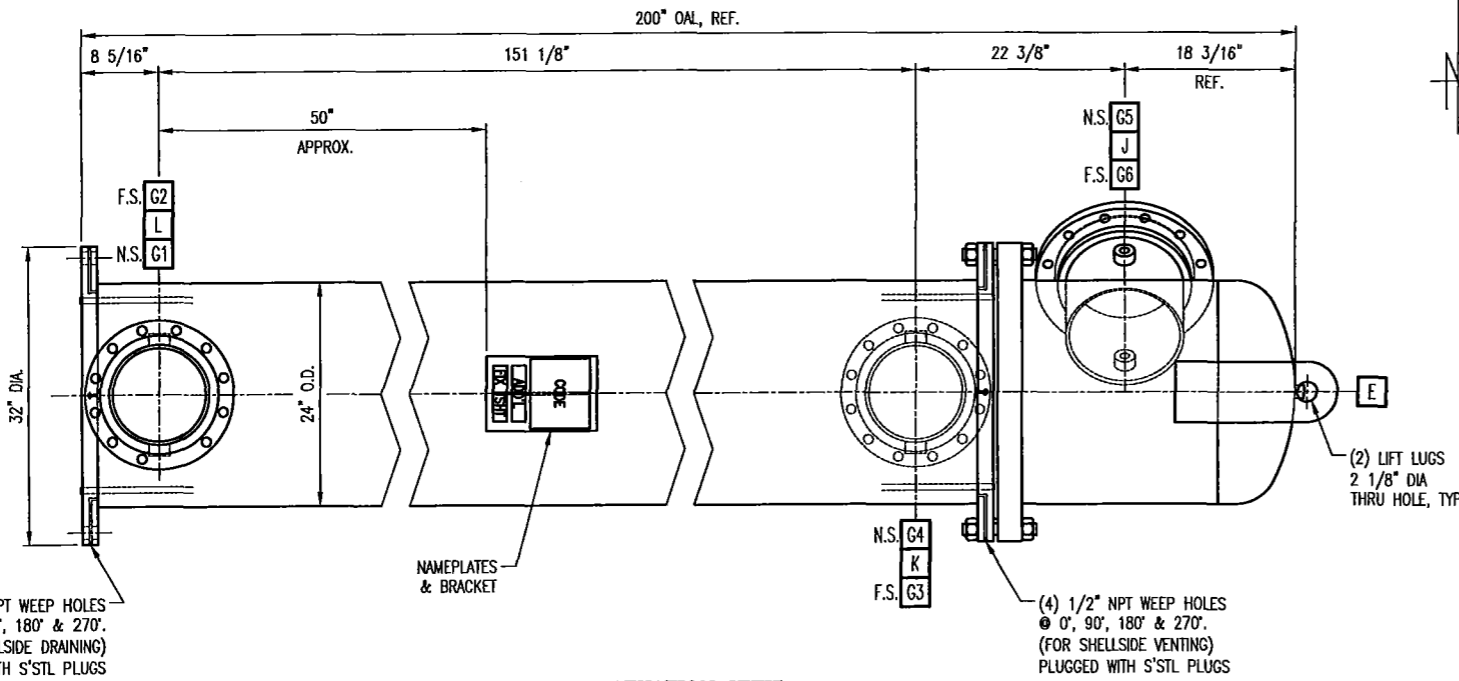
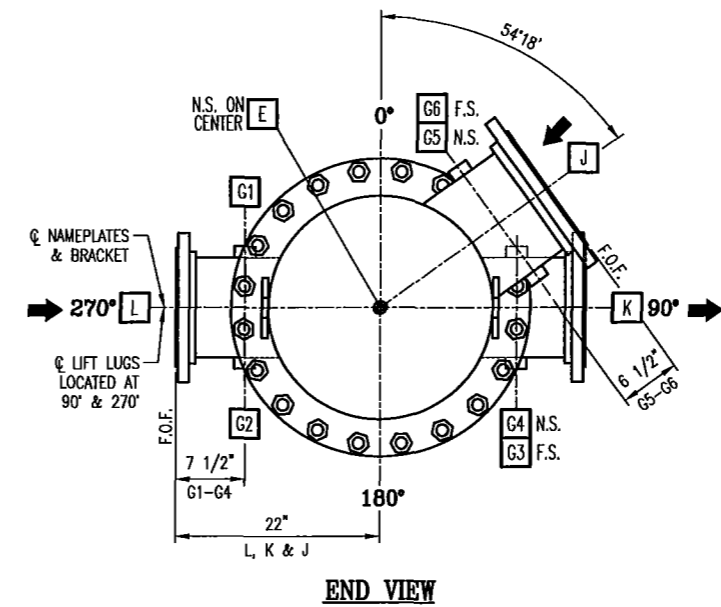
NO. OF UNITS REQD.	TEMA CLASS	ESTIMATED WEIGHT EMPTY	ESTIMATED WEIGHT FULL OF WATER
ONE (1)	"B"	5340 LBS.	8605 LBS.

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**ALCO PRODUCTS**  
 Subsidiary of Peerless Manufacturing Company.  
 50 COBHAM DRIVE, ORCHARD PARK, NY 14127  
 (716) 662-6540 WWW.PEERLESSMFG.COM

CUSTOMER: BAYER CROPSCIENCE  
 LOCATION: PITTSBURGH, PA  
 PO#: 610815509

TITLE: #23-168 "B" SHELL & TUBE EXCHANGER  
 TAG #: 00010 PROP. #: 6376N (LATER)  
 SCALE: 1" = 10" UNITS: IN. DATE: 5/27/10 JOB NO.: 205281-1-1  
 DRN BY: AJR [CHK'D: JCS] APPVD: DEM ENG. CONTACT: J. SONGSTER  
 DOC NO: BE-1000-02 SIZE: D SHEET 1 OF 1 REV. 2



**ELEVATION VIEW**

**END VIEW**

**FIXED TUBESHEET NAMEPLATE**

CAUTION: THE CODE REQUIRED PRESSURES AND TEMPERATURES MARKED ON THE HEAT EXCHANGER RELATE TO THE BASIC DESIGN CONDITIONS. THE HEAT EXCHANGER DESIGN HAS BEEN EVALUATED FOR SPECIFIC OPERATING CONDITIONS AND SHALL BE RE-EVALUATED BEFORE IT IS OPERATED AT DIFFERENT OPERATING CONDITIONS.

**ADDITIONAL NAMEPLATE**

CUSTOMER: BAYER CROPSCIENCE  
 PO#: 610815509  
 TAG NO.: 00010

CERTIFIED BY: **NAT'L. BD. LATER**

**PEERLESS MFG. CO.**

W SHELL  
 MAX. ALLOW. WORK PRESS. 75 PSIG @ 365°F  
 MIN. DESIGN METAL TEMP. -20°F AT 75 PSIG  
 MAX. ALLOW. EXT. PRESS. 15 PSIG @ 365°F

RT-2(S)  
 RT-2(I)

TUBE  
 MAX. ALLOW. WORK PRESS. 60 PSIG @ 365°F  
 MIN. DESIGN METAL TEMP. -20°F AT 60 PSIG  
 MAX. ALLOW. EXT. PRESS. 15 PSIG @ 365°F

MFG. SERIAL NO. 205281-1-1 YR. BUILT 2010  
 SHOP ORDER NO.: 205281-1-1  
 PART NO.: BE-1000  
 MFG. BY: IPMFG CO. FOR ALCO PRODUCTS

GENERAL MATERIALS OF CONSTRUCTION:

TUBES	SA249 TP316 (5/8" x .065" (16 BWG) A.W.)
TUBESHEET	SA240 316
BAFFLES	316SS
SHELL	SA312 TP316
BONNET SHELL	SA312 TP316
BONNET HEAD	SA240 316
BONNET FLANGE	SA516-70N
LAP JOINT FACE RINGS	SA240 316
PRESSURE BOLTING	SA193 B7 / SA194 24 (CAD PLATED)
GASKET	BLUEGARD 3000

BONNET FLANGE	BE-1000-13C
BAFFLE DETAIL	BE-1000-13B
TUBESHEET DETAIL	BE-1000-13A
FABRICATION DRAWING	BE-1000-10
BILL OF MATERIAL	BE-1000-45

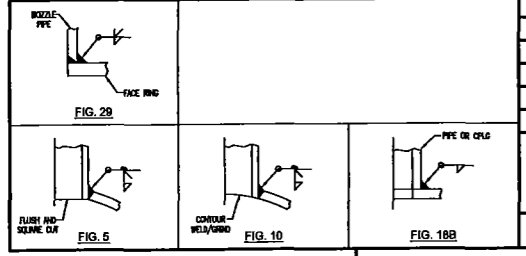
CODE CALCULATIONS: 205281-1-1-26

Title	Number	Title	Number
REFERENCE DOCUMENTS (GENERAL)		REFERENCE DOCUMENTS (PROPRIETARY)	

WELD PROCEDURES: BW-6, -69, -200, -20, -100, -32, -2103

**SCHEDULE OF OPENINGS**

MARK NO.	QTY	SIZE	SERIES	FACING	TYPE	I.D.	SERVICE	WALL THK	O.D.	THK	WIDTH	BILL OF MATL ITEM NUMBER	INSIDE NECK	OUTSIDE NECK	O S PAD	WELD FIGURE NO.	INSIDE PROJECTION	REMARKS
E	1	3/4"	6000#	NPT	HALF	CPLG	VENT		1.375"			15,31		3/16"	18B	SET ON	W/ S'STL PLUGS	
G1-G6	6	1"	6000#	NPT	HALF	CPLG	CUST. CONNECTION		2.250"			14,30		3/16"	18B	SET ON	W/ S'STL PLUGS	
J	1	12"	150#	RF	LJ		TUBESIDE INLET	.375"	12.750"			11,12,13		3/8"	5,29	SET FLUSH		
K	1	10"	150#	RF	LJ		SHELLSIDE OUTLET	.365"	10.750"			8,9,10		3/8"	10,29	CONTOUR GRIND		
L	1	10"	150#	RF	LJ		SHELLSIDE INLET	.365"	10.750"			8,9,10		3/8"	10,29	CONTOUR GRIND		



**SCHEDULE OF OPENINGS**

CAD User: BE