

March 22, 1966

UNION CARBIDE CORPORATION

(930-2966)
P.O. No. 1-35953

Purchase Specifications for Heat Exchanger - Item DK2-307
Date: March 22, 1966

PROJECT FILE COPY

Number required:
Equipment:

One
1,830 sq ft condenser, external packed
floating head with accumulator

Drawings,
Mechanical specifications:
Tube layout:

SK-99538 rev. 3-22-66
SK-33827-B1

Manufacturer:

Vulcan Manufacturing Company

Notes:

1. The construction of this equipment shall be in accordance with these specifications, all references herein, and the following attachments:

COP-1 - General Requirements for Design, Fabrication, Inspection,
and Testing of Welded Pressure Vessels dated 5-3-65
EQ-182 - Dimensional Tolerances for Heat Exchangers rev. 5-3-65
Stationary Tube Sheets (Form TS-2)
Welded Pressure Joint Schedule (Form 26 dated 6-2-65)
Specification Notes (Form 935-267 dated 4-65)

The manufacturer will be held responsible for complying with these Standard Specifications. Copies of the latest revision of the applicable standard have been assigned or are attached.

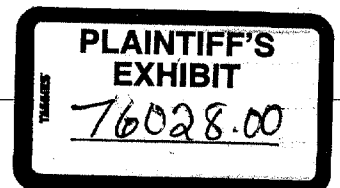
2. The equipment specified herein shall be manufactured from domestic (U.S.) materials.

Property No.: 6376-3507

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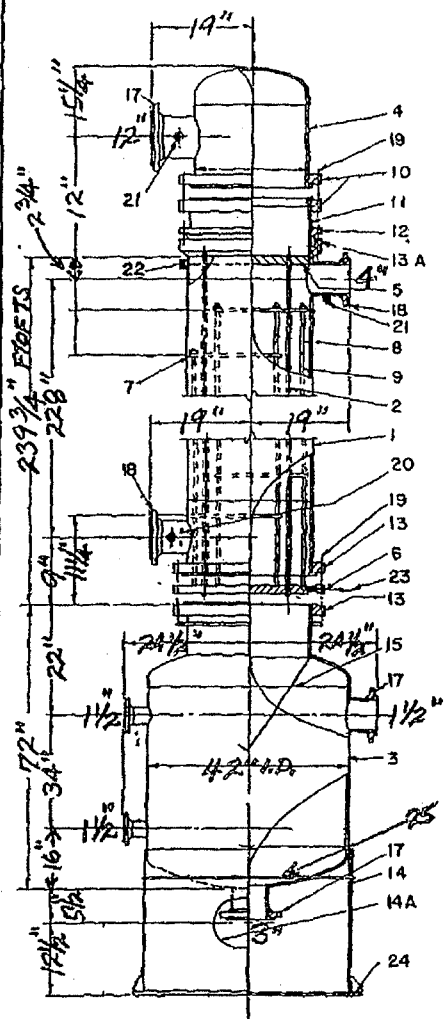
Attachments

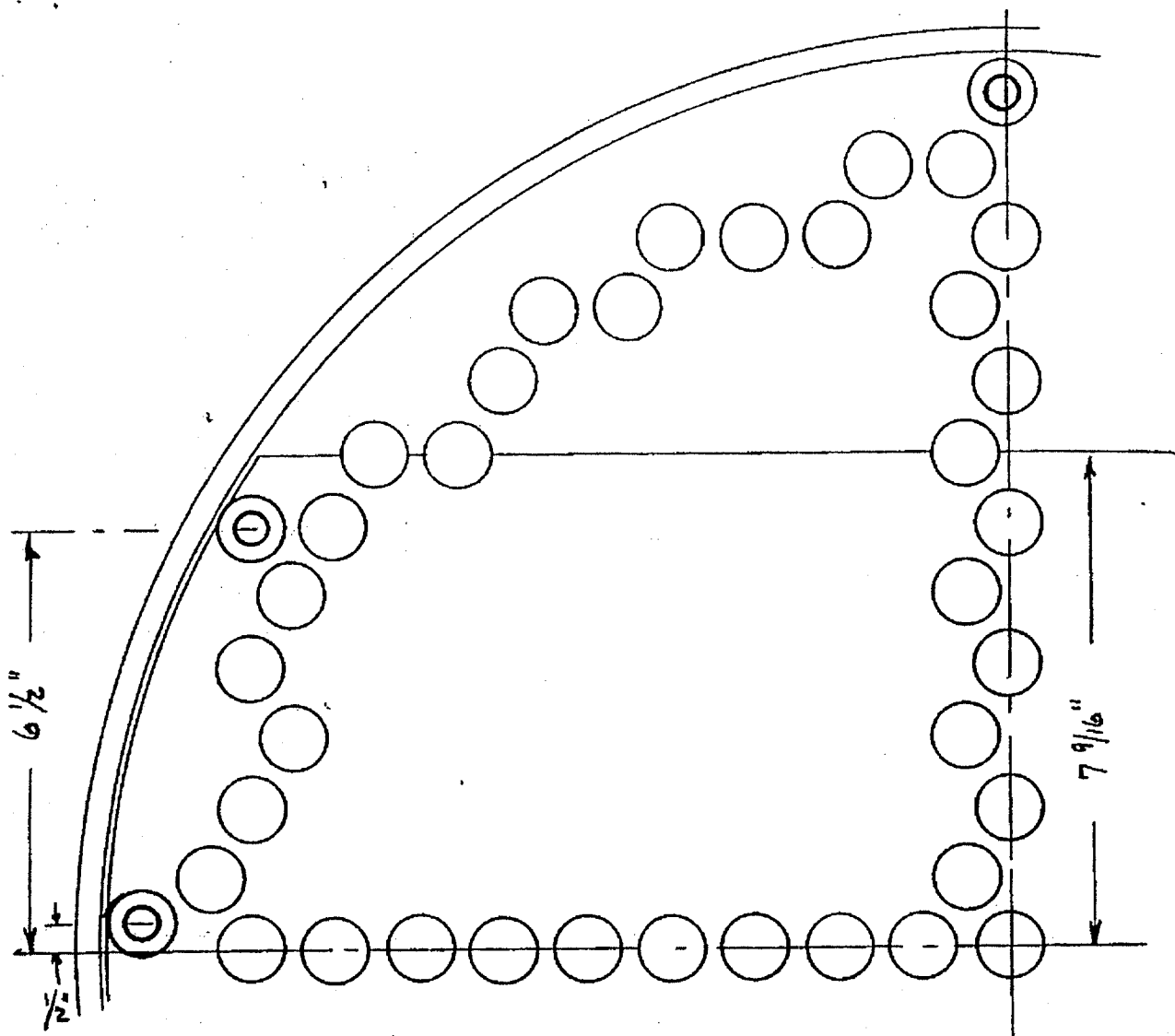
Form 935-267 dated 4-65
SK-99538 rev. 3-22-65
SK-33827-B1
Form 26 dated 6-2-65
Form TS-2



THE REQUIREMENTS STATED IN THIS SECTION TAKE PRECEDENCE
OVER ANY CONFLICTING REQUIREMENTS IN SUBSEQUENT SECTIONS

UCASB00228057





I.D. OF SHELL - 27"
 TUBES - 349 - 1" O.D. - 1 1/4" Δ PITCH
 SPACERS - EIGHT - 1" O.D.
 TIE RODS - EIGHT - 3/4" O.D.

27" TUBE LAYOUT
 1" O.D. TUBES
 1 1/4" Δ PITCH

SK 33077 .01

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WELDED PRESSURE JOINT SCHEDULE

Blank Space Indicates Code Minimum Requirements Acceptable
Lettered Notes Mandatory Where Indicated

Joint Location Par. UW-3		Type: See Table UW-12 or Code Figure Designated; See Note (a)	Inspection See Notes	Joint Eff. to be Used Where Applicable
Category A	Shell	Type No. 1 or 2; remove backing strip if used.	<i>SPOT RADIO- GRAPHY PAR DN-52</i>	<i>85%</i>
	Tube			
Category B	Shell	Type No. 1, 2, or 3; see note (b)		
	Tube	Type No. 1 or 2; remove backing strip if used		
Category C	Shell	See Note (b)		
	Tube	Flanges: Fig. UA-48 (1), (1a), (f), (6), (6a), (6b); remove backing strip if used. Tubesheet-to-shell: Fig. UW- ¹³² 52 (a), (b), (c)		
Category D	Shell	Full penetration welds extending through the entire thickness of the vessel wall or nozzle wall <u>are not</u> required.		
	Tube	Any full penetration type shown in Fig. UW-16.1		

Notes: The table indicates the minimum acceptable requirements. More stringent Code requirements dictated by design supplied shall apply.

- (a) Welded joints which will actually be supplied shall be either detailed or adequately described by ASA Standard Welding Symbols on the Fabricator's drawings.
- (b) Weld reinforcement and/or backing strip shall be removed from inside shell welds.
- 1) When interference with specified spacer location results
 - 2) When interference with specified baffle to shell clearance results.

Stationary Tube Sheets - (Gasketed, Both Sides)

The tube sheet design shall permit the pressure testing on the high pressure side to be conducted while the opposite face of the tube sheet is exposed for inspection. The tube sheet thickness shall be adequate to sustain the uniform edge moment resulting from the test bolting loads concurrent with the test pressure. The total stress due to pressure, under design conditions shall not exceed the Code allowable stress value at the coincident design temperature.

Tube sheet thickness shall be calculated using the following formula except that in no case shall the tube sheet thickness be less than 1".

$$T^2 = \frac{1.5625 PR^2 + 6 M_B}{S \text{ at } 100^\circ\text{F.}}$$

Where:.

T = Net tube sheet thickness at center.

$M_B = \frac{.159 W_{(atm)} h_g}{R}$ Uniform edge moment from test bolt load, inch pounds per inch of mean gasket circumference

P = Design pressure, psig at 100°F.

R = G/2, inches

S = Maximum allowable stress value under design conditions, psi at 100°F.

$W_{(atm)}$ = Flange design bolt load, pounds.

h_g = Radial distance from gasket load reaction to the bolt circle, inches.

UNION CARBIDE CORPORATION
OLEFINS DIVISION
SPECIFICATIONS NOTES

DK2-307

ITEM NO(S): Condenser, with Accumulator

GENERAL SPECIFICATIONS

1. BUYER'S STANDARD SPECIFICATIONS: Vendor will be held responsible for complying with Buyer's Standard Specifications to which reference is made in the accompanying sections. Only those Standard Specifications to which specific reference is made apply to the equipment specified herein.
2. MATERIALS AND PARTS: All materials and parts used in the fabrication of this equipment shall be of domestic (U.S.) manufacture, unless specifically identified in Vendor's written quotation and accepted in writing by Buyer.
3. ELECTRICAL EQUIPMENT: All electrical equipment shall conform to the requirements of the National Electric Code.
4. FLANGES: The bolt circle, number and size of bolts, and outside diameter of all flanges to which piping may be attached shall conform to ASA dimensions and drilling, unless otherwise specified in the accompanying specifications. Screwed flanges are not acceptable.
5. MASTER SPECIFICATIONS: All standard pumps shall be in strict accordance with Buyer's MASTER SPECIFICATIONS FOR STANDARD CENTRIFUGAL PROCESS PUMPS, latest revisions, and applicable Price Agreement.
6. CORRESPONDENCE: All correspondence pertaining to this equipment, including drawings, test reports, and all notification of when tests are to be made, shall be addressed to the person indicated on the "Purchase Order" Union Carbide Corporation, Olefins Division, P.O. Box 8361, South Charleston, West Virginia, 25303.
7. DRAWINGS (Both Approval and Certified): All drawings shall show Buyer's Item number, purchase order number, property number, and equipment weights (wet and dry). As applicable, drawings shall also show wiring diagrams, terminal block connections, horsepower, voltage, amperage, wattage, etc., for electrical components.

The following section of the Purchase-Specification Notes designates specific requirements for the design, fabrication, inspection, and testing of the equipment specified in more detail in the accompanying sections. Only those notes indicated by an ☒ will apply to the equipment specified herein.

1. ASME CODE:

- ☒ 1A. All parts of any vessel subjected to pressure or to vacuum shall conform in all respects with all applicable requirements of the latest edition of Section VIII (Unfired Pressure Vessels) of ASME Boiler and Pressure Vessel Code including Interpretations and Addenda.
- ☒ 1B. ASME Code inspection and Code stamp required.

2. APPROVAL DRAWINGS:

- ☐ 2A. Four copies of Vendor's outline dimension drawings, showing outline dimensions of equipment and location and size of all connections, are required for approval and shall be approved before fabrication is started. After approval, certified drawings shall be submitted.
- ☒ 2B. Four copies of Vendor's detail working drawings are required and shall be approved by Buyer before fabrication is started.
- ☐ 2C. Vendor shall not submit drawings for approval except where it is proposed to use different details than shown. In such cases, four copies of Vendor's drawings showing the proposed changes are required for approval and shall be approved before fabrication is started.

3. CERTIFIED DRAWINGS:

- ☐ 3A. One - septa or Nine Eleven copies of certified outline dimension drawings are required. (An additional copy shall be furnished if Vendor desires a copy stamped and returned.)
- ☒ 3B. One septa or Nine Eleven copies of certified detailed working drawings are required. (An additional copy shall be furnished if Vendor desires a copy stamped and returned.)
- ☐ 3C. Vendor shall furnish four certified copies of his detail drawings from which this equipment will be fabricated. These drawings are for information only and they will not be checked by Buyer for design details or conformance with Buyer's drawings. Buyer's acceptance of these drawings does not release Vendor from his design and conformance obligations.

4. BLIND FLANGES AND GASKETS FOR TESTING

- ☒ 4A. Vendor shall supply all blind flanges and gaskets for testing in his plant. Test gaskets shall be the same as the gaskets specified in the Vessel Specifications. If gaskets are not specified, ring joints shall be tested with Armo soft iron rings and all other types of joints shall be tested with 1/16 in. U. S. Rubber Company's No. 4999 or approved equal gaskets. All such flanges and gaskets shall be retained by Vendor upon completion of tests. For main vessel joints broken following tests, Vendor shall furnish new gaskets for these joints and ship the new gaskets with the equipment.

5. NAMEPLATE:

- ☒ 5A. Buyer's nameplate shall be attached as per Standard EQ-15A and filled out by Vendor from information to be furnished by an authorized representative of Buyer. Copies of Standard EQ-15A will be supplied on request.
- ☐ 5B. Vendor is not required to attach Buyer's nameplate.

6. INSPECTION AND TESTS:

Inspection Privilege

- ☒ 6A. Buyer or his agent shall have the privilege of inspection and/or expediting at all times during the manufacture and testing of the equipment.

Degree of Inspection (Check One)

- ☐ 6B. No inspection or witnessing of tests will be required by the Buyer or his agent at the Vendor's plant. Expedite only.
- ☐ 6B. The equipment specified herein shall be given a complete inspection by Buyer or his agent for quality of workmanship at Vendor's plant.
- ☐ 6B. Buyer's inspection shall be limited to performing a dimensional check after completion of the item to insure that dimensions and tolerances are in accordance with specifications. For heat exchangers, Inspector shall check baffle to shell clearance and the rod and spacer location prior to installation of the baffles in the shell.
- ☒ 6B. The equipment specified herein shall be given a complete inspection by Buyer or his agent at Vendor's plant.

Who Will Inspect (Check One)

- ☐ 6C. Inspection and witnessing of tests, when either or both are specified, shall be made under the supervision of an authorized agent or representative of Buyer.
- ☐ 6C. Inspection and witnessing of tests, when either or both are specified, shall be made under the supervision of an ASME Code Inspector only.
- ☒ 6C. Inspection and witnessing of tests, when either or both are specified, shall be made under the supervision of an ASME Code Inspector and by Buyer or his agent at Vendor's plant.

Witnessing of Tests (Check One)

- ☒ 6D. Pressure tests of the equipment or of its parts shall be witnessed by Buyer or his agent.
- ☒ 6D. Pressure tests of the equipment or of its parts shall be witnessed by an ASME Code Inspector.
- ☐ 6D. Six copies of certified pressure tests reports are required. (An additional copy of the certified test report shall be shipped with the equipment.)

7. INSTALLATION INSTRUCTIONS AND PARTS LISTS:

- ☐ 7A. Six copies of certified installation instructions are required.
- ☐ 7B. Six copies of repair parts lists are required.

8. OPERATING INSTRUCTIONS:

- ☐ 8A. Three copies of operating instructions are required for approval.
- ☐ 8B. Six copies of certified operating instructions are required.

9. PERFORMANCE DATA:

- ☐ 9A. Six copies of certified performance data or curves for this class of equipment are required.
- ☐ 9B. Six copies of Performance Data Form No. _____ shall be completed by Vendor and returned to Buyer.

10. PERFORMANCE TESTS:

- ☐ 10A. Buyer or his agent will witness performance tests for the equipment specified herein.
- ☐ 10B. Six copies of certified performance tests are required.

11. MAINTENANCE DATA:

- ☐ 11A. Six copies of Maintenance Data Form No. _____ shall be completed by Vendor and returned to Buyer.

:bmj

Date: 13-22-66
By: EOF

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