

PLAINTIFF'S EXHIBIT

CHV-679

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SELECTING AND INSTALLING GASKETS

Purpose	1. This Instruction pertains to the proper selection and installation of the most common types of gaskets in general Refinery use.
Responsibility	2. The Foreman Mechanic in charge is responsible for the proper supervision of the work and the close adherence to this Instruction. 3. Satisfactory service from gaskets depends chiefly on three things - the condition of the gasketed surfaces, the type of gasket used, and the method of installation. These are considered in turn in the following sections. - <u>PREPARATION OF FLANGE FACES</u> -
Cleaning	4. Remove all foreign material from the flange faces, tongue, and grooves with a wire brush or metal scraper before bolting together. On tongue and groove and ring joint flanges, make certain that the groove is clean. In cases where flanges cannot be separated enough to permit the use of a wire brush, use a thin scraper (obtained from the Tool Room) to remove any accumulated foreign matter.
Inspection and Repair	5. Determine whether any condition exists which will prevent a tight joint being made without excessive bolt tension. Report all conditions of dished or warped flanges, cracks, excessive misalignment, and abnormal cold pull to the Foreman Mechanic or Job Foreman. He shall report unusual conditions to the Maintenance or Construction Foreman who shall report serious distortion of the flanges and shall procure the approval of this office whenever the corrective measures required are at variance with accepted practice. Minor defects (not affecting the strength of the flange) found on a flange face may be repaired. Pits and low spots may be built up with weld metal and high spots or distorted faces dressed off with an emery wheel or portable flange facing tool. It is preferable to leave flange faces rough machined to permit a "grip" on the gasket.

Rewritten 7/21/41

SELECTING AND INSTALLING GASKETS

- SELECTION OF GASKET -

- | | |
|---------------------------|---|
| General | 6. Select the correct type and size of gasket from the Gasket Table MF-3648, and the Gasket Dimension Chart, ME-4481 attached to this Instruction. Order machine cut gaskets of the correct size when practicable. For ring type joints, select the proper ring size from GC-32500. |
| Plain-Face Flanges | 7. On all <u>plain-face</u> flanges, use as thin a gasket as the conditions of the flanges will permit.

Use only one gasket between flanges except in those locations where frequent blinding will be facilitated by the use of two gaskets. |
| Raised-Face Flanges | 8. On <u>cast iron raised-face</u> flanges, use only flat ring gaskets. On <u>steel raised-face</u> flanges, use either asbestos composition or asbestos filled steel ring gaskets for services below 500°F. Above 500°F., use asbestos filled steel ring gaskets, except in special cases approved by this office Tauril gasket material may be used for temperatures up to 600°F. |
| Tongue and Groove Flanges | 9. On <u>tongue and groove</u> flanges, use an asbestos filled steel ring gasket, the width being that of the tongue. |
| Ring-Type Flanges | 10. On ring-type flanges, use a metal ring gasket: soft iron rings for ordinary services and annealed alloy rings for corrosive services. |
| Other Flanges | 11. On heat exchanger, cooler, or condenser heads, use the type of gasket required for the particular service. If the flange face is badly warped or is rough, use a hard twisted asbestos cord, coiling it on the flange face until the gasket surface is covered. Shellac or water proof grease may be used to hold the cord in place while the joint is being bolted up. |

- INSTALLING GASKETS -

- | | |
|------------------|--|
| Flange Paste | 12. Cover the flange faces with the type of flange paste specified for the service in the Appendix (page 6) of Engineering Instruction 800, "Bolting Up Practice". |
| Inserting Gasket | 13. On <u>raised-face</u> , <u>ring type</u> , and <u>plain-face</u> flanges, insert the gasket carefully to center it with the flanges and to prevent damage to the gasket. |

Rewritten 7/21/41

SELECTING AND INSTALLING GASKETS

Bolting Up	When <u>asbestos filled steel ring gaskets</u> are used with tongue and groove flanges, insert the gaskets with the seam at the bottom of the groove. 14. Determine that the bolts are in good condition and that the flanges are lined up correctly. Insert two or three bolts, slide the gasket into place, insert the remainder of the bolts and tighten them in accordance with directions outlined in "Bolting Up Practice," Engineering Instruction 800.
Making Up Joints	- <u>GASKETS FOR SPECIAL SERVICES</u> -
	15. Make up gasketed flanges for special services as follows: a. <u>Lines in Strong Acid Service</u> Cut the pipe thread well back on the pipe. Screw the flange on tight using red lead or litharge as a thread compound. Machine down the protruding end of the pipe flush with the flange face. Use a ring type red rubber or asbestos composition gasket with an I.D. the same as the pipe. Install as directed in Section 12 above. b. <u>Lead Lines in Acid Service</u> On thick lead pipe use cast iron flanges per Drawing No. E-25963. Back fill between the pipe and flange with molten lead. Use a red rubber gasket. On thin lead lines use a Van Stone joint. c. <u>Flanges on Lead Lined Treaters in Severe Service</u> Make up a gasket of 3/8" lead tubing with asbestos rope threaded through tubing to form a core. Burn the tubing together to form a complete ring gasket.

APPROVED: 8/28/39

REWRITTEN: 7/21/41

Signed _____

GASKET CHART
for
GENERAL REFINERY SERVICE

Note: This chart is for general use only. For special cases consult the Engr. Dept.
This chart is to be appended to Engineering Instruction No. 506.

Service	Equipment	L O G A T I O N		Type of Gasket
		Type of Surface	Operating Limitations Press. Temp.	
Air, Gas Water, Steam Oil, Tar, Distillate, Vapor Acid Oil, Sludge SO ₂ , SO ₂ Extract, Caustic, Ammonia, Phenol	Pump Cases Line Flanges Valve Bonnets	Plain face-All	Under 150# Under 350°F.	Asbestos Composition
		Raised Face Steel	Over 150# 350°F.-500°F.	Asbestos Composition or Asbestos Metallic (2)
		G.I.	All	Thin High Pressure Asbestos Comp. Ring or Asbestos Filled Steel Ring
		Tongue & Groove	Over 500°F. All	Asbestos Composition Asbestos Filled Steel Ring
		Ring Joint	All	Soft Iron Ring for Normal Services; Annealed Alloy for Corrosive Service
	Pressure Vessel, Cooler Exchangers and Condenser Heads	Plain Face	Under 150# Under 500°F.	Asbestos Composition, Asbestos Filled Steel Ring or Asbestos Cord
		Tongue & Groove Ring Joint	Over 150# Over 500°F.	Asbestos Composition (4) or Asbestos Filled Steel Ring
	Acid Oil Treaters Still Head Manholes	Plain Face	All	Asbestos Filled Steel Ring
	Tank Manways	Plain Face	All	Soft Iron Ring for Normal Services; Annealed Alloy for Corrosive Service
	Meter Cases	Plain Face	All	Asbestos Composition, Asbestos Cord or Asbestos Filled Lead Tube Ring Asbestos Millboard
Sulfuric Acid	Boiler Manholes & Boiler Handholes	Wet Steam		Asbestos Composition
		Dry or Superheated Steam		Asbestos Composition Wire Inserted Folded Asbestos Asbestos Filled Copper Ring
	Centrifugal Pump Case All Other Equipment			Asbestos Composition or Asbestos Millboard (1) Red Rubber or Asbestos Composition
	Vapor Proof Equipment			Rubber (3) Cork, Vellumoid or equivalent

- Notes:**
1. If flanges are rough, use Asbestos Millboard in this service.
 2. If flanges are rough, use Asbestos Metallic in this service.
 3. Change gaskets once a year.
 4. Tauril or equivalent for temperatures not exceeding 600°F.

General Revision 5-1-39
General Revision 8-3-39
General Revision 11-8-39
General Revision 7-2-41
MF - 3648-4

DATE	12/15/83						
BY	PSA						
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OPR'S DEPT.							
ENG. DEPT.							
APPROVALS							
REVISIONS	<table border="1"> <tr> <td>1</td> <td>REDUCE COL. TO 32nds, ADD "S PIPE.</td> </tr> <tr> <td>2</td> <td>RETOINED</td> </tr> <tr> <td>3</td> <td>GENERAL REVISION</td> </tr> </table>	1	REDUCE COL. TO 32nds, ADD "S PIPE.	2	RETOINED	3	GENERAL REVISION
1	REDUCE COL. TO 32nds, ADD "S PIPE.						
2	RETOINED						
3	GENERAL REVISION						

DIMENSION SHEET FOR GASKETS TO ACCOMPANY ENGINEERING INSTRUCTION #506

STEEL CLAD GASKETS ARE $\frac{3}{32}$ " THICK FOR PIPE SIZES $\frac{1}{2}$ " TO 12" - $\frac{1}{8}$ " THICK FOR SIZES OVER 12"

NOMINAL PIPE SIZE	$\frac{1}{16}$ " ASBESTOS COMPOSITION RING GASKETS				STEEL CLAD ASBESTOS RING GASKETS		STEEL CLAD ASBESTOS SMALL T & G GASKETS	
	125# C.I.	150# STEEL	175# 250# C.I. 300# STEEL	400# STEEL	600# STEEL	150# STEEL	300# STEEL	ALL STEEL FLANGES
$\frac{1}{2}$	$1\frac{1}{2} \times 3\frac{3}{8}$			$1\frac{1}{2} \times 3\frac{3}{4}$		$2\frac{1}{8} \times 3\frac{3}{8}$	$2\frac{1}{8} \times 3\frac{3}{4}$	$2\frac{3}{32} \times 2\frac{17}{32}$
2	$2 \times 4\frac{1}{8}$			$2 \times 4\frac{3}{8}$		$2\frac{1}{8} \times 4\frac{1}{8}$	$2\frac{1}{8} \times 4\frac{3}{8}$	$2\frac{2}{32} \times 3\frac{9}{32}$
$2\frac{1}{2}$	$2\frac{1}{2} \times 4\frac{7}{8}$			$2\frac{1}{2} \times 5\frac{1}{8}$		$3\frac{3}{8} \times 4\frac{7}{8}$	$3\frac{3}{8} \times 5\frac{1}{8}$	$3\frac{11}{32} \times 3\frac{25}{32}$
3	$3 \times 5\frac{3}{8}$			$3 \times 5\frac{7}{8}$		$4\frac{1}{4} \times 5\frac{3}{8}$	$4\frac{1}{4} \times 5\frac{7}{8}$	$4\frac{7}{32} \times 4\frac{21}{32}$
4	$4 \times 6\frac{7}{8}$		$4 \times 7\frac{1}{8}$	4×7	$4 \times 7\frac{5}{8}$	$5\frac{3}{16} \times 6\frac{7}{8}$	$5\frac{3}{16} \times 7\frac{1}{8}$	$5\frac{5}{32} \times 5\frac{23}{32}$
6	$6 \times 8\frac{3}{4}$		$6 \times 9\frac{7}{8}$	$6 \times 9\frac{3}{4}$	$6 \times 10\frac{1}{2}$	$7\frac{1}{2} \times 8\frac{3}{4}$	$7\frac{1}{2} \times 9\frac{1}{8}$	$7\frac{15}{32} \times 8\frac{1}{32}$
8	8×11		$8 \times 12\frac{1}{8}$	8×12	$7\frac{1}{8} \times 12\frac{5}{8}$	$9\frac{3}{8} \times 11$	$9\frac{3}{8} \times 12\frac{1}{8}$	$9\frac{11}{32} \times 10\frac{1}{32}$
10	$10 \times 13\frac{3}{8}$		$10 \times 14\frac{1}{4}$	$10 \times 14\frac{1}{8}$	$9\frac{3}{4} \times 15\frac{3}{4}$	$11\frac{1}{4} \times 13\frac{3}{8}$	$11\frac{1}{4} \times 14\frac{1}{4}$	$11\frac{1}{32} \times 12\frac{1}{32}$
12	$12 \times 16\frac{1}{8}$		$12 \times 16\frac{5}{8}$	$12 \times 16\frac{1}{2}$	$11\frac{3}{4} \times 18$	$13\frac{1}{2} \times 16\frac{1}{8}$	$13\frac{1}{2} \times 16\frac{5}{8}$	$13\frac{5}{32} \times 14\frac{1}{32}$
14	$14 \times 17\frac{3}{4}$	$13\frac{1}{4} \times 17\frac{3}{4}$	$13\frac{1}{4} \times 19\frac{1}{8}$	$13\frac{1}{8} \times 19$	$12\frac{1}{8} \times 19\frac{3}{8}$	$14\frac{3}{4} \times 17\frac{3}{4}$	$14\frac{3}{4} \times 19\frac{1}{8}$	$14\frac{23}{32} \times 15\frac{1}{32}$
16	$16 \times 20\frac{1}{4}$	$15\frac{1}{4} \times 20\frac{1}{4}$	$15\frac{1}{4} \times 21\frac{1}{4}$	$15 \times 21\frac{1}{8}$	$14\frac{3}{4} \times 22\frac{1}{4}$	$16\frac{3}{4} \times 20\frac{1}{4}$	$16\frac{3}{4} \times 21\frac{1}{4}$	$16\frac{23}{32} \times 17\frac{2}{32}$
18	$18 \times 21\frac{5}{8}$	$17\frac{1}{4} \times 21\frac{5}{8}$	$17 \times 23\frac{1}{2}$	$17 \times 23\frac{3}{8}$	$16\frac{1}{2} \times 24\frac{1}{8}$	$19\frac{1}{4} \times 21\frac{5}{8}$	$19\frac{1}{4} \times 23\frac{1}{2}$	$19\frac{1}{32} \times 20\frac{5}{32}$
20	$20 \times 23\frac{7}{8}$	$19\frac{1}{4} \times 23\frac{7}{8}$	$19 \times 25\frac{3}{4}$	$18\frac{7}{8} \times 25\frac{1}{2}$	$18\frac{1}{4} \times 26\frac{1}{8}$	$21 \times 23\frac{7}{8}$	$21 \times 25\frac{3}{4}$	$20\frac{3}{32} \times 22\frac{1}{32}$
24	$24 \times 28\frac{1}{4}$	$23\frac{1}{4} \times 28\frac{1}{4}$	$23 \times 30\frac{1}{2}$	$22\frac{3}{8} \times 30\frac{1}{4}$	$22 \times 31\frac{1}{8}$	$25\frac{1}{4} \times 28\frac{1}{4}$	$25\frac{1}{4} \times 30\frac{1}{2}$	$25\frac{1}{32} \times 26\frac{1}{32}$
* 5	$5 \times 7\frac{3}{4}$		$5 \times 8\frac{1}{2}$	$5 \times 8\frac{3}{8}$	$5 \times 9\frac{1}{2}$	$6\frac{3}{4} \times 7\frac{5}{8}$	$6\frac{3}{4} \times 8\frac{3}{8}$	$6\frac{9}{32} \times 6\frac{27}{32}$

DIMENSION SHEET FOR GASKETS

ME-4481-2