SHEET GASKETS

ASBESTOS MATERIALS

GASKET CODE: SGA

SERVICE: ALL SERVICES, EXCEPT ACIDS.(NOTES 1, 2 & 3.)

SPECIFICATION: 1/16 INCH THICK COMPRESSED ASBESTOS SHEET GASKETING PER THE FOLLOWING SPECIFICATIONS:

CHRYSOTILE ASBESTOS CONTENT -	70% MIN.
LEACHABLE CHLORIDES -	200 PPM MAX.
DENSITY -	100 LB/FT³ MIN.
BINDER -	NITRILE OR NEOPRENE (NOT SBR)

GARLOCK	STYLE '7228' OR '8748'
CHESTERTON	STYLE '270'
DURABLA	STYLE 'BLACK WITH NITRILE BINDER AND LOW CHLORIDE'
TEADIT	ASBERIT STYLE 'S-1212'

SERVICE: ACID SERVICES

(USE GASKET CODE SGG OR SGT) (NOTE 11.)

GASKET CODE: SGE

SERVICE: AIR AND WATER SERVICES BELOW 300°F AND MAX. ANSI CLASS 150 RATING. (NOTE 9.)

SPECIFICATION: 1/16 INCH THICK ARAMID (KEVLAR) REINFORCED, NITRILE OR NEOPRENE BOUND SHEET GASKETING. 100 LB/FT³ MINIMUM DENSITY. (NOTES 8 & 10.)

GARLOCK	'BLUE GARD STYLE 3000'
CHESTERTON	'STYLE 199'
THERMOSEAL	'KLINGERSIL C 4401'
J.M.CLIPPER	'STYLE 976-WHITE KNIGHT' OR 'STYLE 978-C BLACK GOLD'
DURABLA	'DURLON 8500'
JOHN CRANE	'STYLE 2160' (THERMOSEAL 'KLINGERSIL C 4401')
LAMONS	'STYLE 3000' (GARLOCK 'BLUE GARD 3000')
FLEXITALLIC	'STYLE 3000' (GARLOCK 'BLUE GARD 3000')
SEPCO	'STYLE 6234' (THERMOSEAL 'KLINGERSIL C 4401')

NON-ASBESTOS MATERIALS

GASKET CODE: SGG

SERVICE: ALL SERVICES, EXCEPT OXIDIZING ACIDS (SULFURIC, NITRIC, ETC.) (NOTE 5.)

SPECIFICATION: 1/16 INCH THICK FLEXIBLE GRAPHITE SHEET GASKETING WITH .002 INCH THICK TYPE 316 SS FOIL CORE. FLEXIBLE GRAPHITE SPECIFICATIONS SHOULD BE AS FOLLOWS: (NOTE 8.)

DENSITY -	70 LB/FT³ ± 10 LB/FT³
CARBON CONTENT -	99 WT% MIN.
LEACHABLE CHLORIDES -	100 PPM MAX.
TOTAL SULFUR -	1000 PPM MAX.
FILLERS OR BINDERS -	NONE

FLEXITALLIC	'GRAFOIL GHR' (UNION CARBIDE 'GRAFOIL GHR')
LAMONS	'GRAFOIL GHR' (UNION CARBIDE 'GRAFOIL GHR')
FURON	'GRAFOIL GHR' (UNION CARBIDE 'GRAFOIL GHR')
CHESTERTON	'STYLE 199' (POLYCARBON 'CALGRAPH BSSC')
SEPCO	UNION CARBIDE 'GRAFOIL GHR' OR POLYCARBON 'CALGRAPH BSSC'
JOHN CRANE	'STYLE 264' (UNION CARBIDE 'GRAFOIL GHR' OR POLYCARBON CALGRAPH BSSC')
THERMOSEAL	'STYLE SLS' (UNION CARBIDE 'GRAFOIL GHR')
DURABLA	'GRAFOIL FGL 316' (UNION CARBIDE 'GRAFOIL GHR')
J.M.CLIPPER	'STYLE AF-14 GHR' (UNION CARBIDE 'GRAFOIL GHR')
GARLOCK	'STYLE 3125 SS'(POLYCARBON 'CALGRAPH BSSC')

HYDROCHLORIC ACID: SPECIAL FOIL MATERIAL SHOULD BE HASTELLOY C (INSTEAD OF TYPE 316SS)

GASKET CODE: SGT

SERVICE: ACIDS (NOTES 6 & 7)

SPECIFICATION: 1/16 INCH THICK BARIUM SULFATE FILLED PTFE (TEFLON) SHEET GASKETING.(NOTE 8.)

ACCEPTABLE BRAND: GARLOCK 'GYLON 3510, OFF-WHITE'

PREFERRED BRAND FOR SULFURIC ACID: GARLOCK 'GYLON 3500, FAVN' 1/16 INCH THICK SILICA FILLED PTFE (TEFLON) SHEET GASKETING (NOTE 8).

SPIRAL WOUND GASKETS

ASBESTOS MATERIALS

GASKET CODE: SVA

SERVICE: ALL SERVICES, EXCEPT ACIDS. (NOTES 1,2 & 3)

SPECIFICATION: COMPRESSED ASBESTOS FILLED 0.175 INCH THICK SPIRAL WOUND GASKET PER ASME B16.20 WITH TYPE 304 SS WINDINGS AND CARBON STEEL OUTER COMPRESSION CENTERING RING. AN INNER RING IS REQUIRED PER ASME B16.20 FOR SOME SIZES OF CLASS 900 AND HIGHER GASKETS; MATERIAL SHOULD BE IDENTICAL TO WINDINGS. COMPRESSED ASBESTOS SPECIFICATIONS SHOULD BE AS FOLLOWS:

CHRYSOTILE ASBESTOS CONTENT -	70% MIN.
LEACHABLE CHLORIDES -	200 PPM MAX.
DENSITY -	100 LB/FT³ MIN.
BINDER -	NITRILE OR NEOPRENE (NOT SBR)

SERVICE: ACID SERVICES

(USE GASKET CODE SVG OR SVT) (NOTE 11.)

NON-ASBESTOS MATERIALS

GASKET CODE: SWG

SERVICE: ALL SERVICES, EXCEPT OXIDIZING ACIDS (SULFURIC, NITRIC, ETC.). (NOTE 5.)

SPECIFICATION: FLEXIBLE GRAPHITE FILLED 0.175 INCH THICK SPIRAL WOUND GASKET PER ASME B16.20 WITH TYPE 304 SS WINDINGS AND CARBON STEEL OUTER COMPRESSION CENTERING RING. NPS 12 AND LARGER SHOULD HAVE A TYPE 304 SS INNER RING. FLEXIBLE GRAPHITE SPECIFICATIONS SHOULD BE AS FOLLOWS:

DENSITY -	70 LB/FT³ ± 10 LB/FT³
CARBON CONTENT -	99 WT% MIN.
LEACHABLE CHLORIDES -	100 PPM MAX.
TOTAL SULFUR -	1000 PPM MAX.
FILLERS OR BINDERS -	NONE

SPECIAL WINDING MATERIALS: SPECIAL WINDING AND INNER RING MATERIALS (INSTEAD OF TYPE 304 SS) FOR HYDROFLUORIC AND HYDROCHLORIC ACID SERVICES SHOULD BE AS FOLLOWS:

HYDROFLUORIC ACID -	MONEL
HYDROCHLORIC ACID -	HASTELLOY C

GASKET CODE: SWT

SERVICE: ACIDS (NOTES 6 & 7)

SPECIFICATION: PTFE (TEFLON) FILLED 0.175 INCH THICK SPIRAL WOUND GASKET PER ASME B16.20 WITH WINDING MATERIAL AS DESIGNATED BELOW. AN INNER RING IS REQUIRED PER ASME B16.20. THE INNER RING MATERIAL SHOULD MATCH THE WINDING MATERIAL. THE OUTER COMPRESSION CENTERING RING SHOULD BE CARBON STEEL MATERIAL.

WINDING MATERIAL:		
	SULFURIC ACID -	ALLOY 20
	NITRIC ACID -	TYPE 304 SS
	PHOSPHORIC ACID -	TYPE 316L SS
	HYDROFLUORIC ACID -	MONEL
	HYDROCHLORIC ACID -	HASTELLOY C

PERTAINS TO BOTH MATERIALS

ACCEPTABLE BRANDS: (NOTE 3.)

FLEXITALLIC	'STYLE CGI' (WITH INNER RING)	'STYLE CG' (WITHOUT INNER RING)
LAMONS	'STYLE VRI' (WITH INNER RING)	'STYLE VR' (WITHOUT INNER RING)
FURON	'STYLE RVI' (WITH INNER RING)	'STYLE RV' (WITHOUT INNER RING)

METAL JACKETED GASKETS

ASBESTOS MATERIALS

GASKET CODE: MJA

SERVICE: ALL SERVICES, EXCEPT ACIDS. (NOTES 2,3 & 13)

SPECIFICATION: 3/32 INCH THICK 26 GA. DOUBLE METAL JACKETED GASKET WITH COMPRESSED ASBESTOS FILLER MATERIAL. METAL JACKETING SHOULD BE AS SPECIFIED BELOW. COMPRESSED ASBESTOS FILLER SPECIFICATIONS SHOULD BE AS FOLLOWS:

CHRYSOTILE ASBESTOS CONTENT-	70% MIN.
DENSITY-	100 LB/FT³ MIN.
BINDER-	NITRILE, NEOPRENE, OR SBR

NON-ASBESTOS MATERIALS

GASKET CODE: MJE

SERVICE: AIR AND WATER SERVICES BELOW 300°F. (NOTE 9.)

SPECIFICATION: 3/32 INCH THICK 26 GA. DOUBLE METAL JACKETED GASKET WITH ELASTOMERIC-BOUND FILLER MATERIAL. ACCEPTABLE FILLER MATERIALS ARE QUIN T. CORP. 'MV-4800', GARLOCK 'BLUE GARD 3000', OR EQUIVALENT APPROVED BY CHEVRON. METAL JACKETING MATERIAL SHOULD BE AS SPECIFIED BELOW.

GASKET CODE: MJG

SERVICE: ALL SERVICES, EXCEPT OXIDIZING ACIDS (SULFURIC, NITRIC, PHOSPHORIC, ETC.). (NOTES 5 & 14)

SPECIFICATION: 3/32 INCH THICK 26 GA. DOUBLE METAL JACKETED GASKET WITH FLEXIBLE GRAPHITE FILLER MATERIAL. METAL JACKETING SHOULD BE AS SPECIFIED BELOW. FLEXIBLE GRAPHITE FILLER SPECIFICATIONS SHOULD BE AS FOLLOWS:

DENSITY -	70 LB/FT³ ± 10 LB/FT³
CARBON CONTENT -	99 WT% MIN.
LEACHABLE CHLORIDES-	100 PPM MAX.
TOTAL SULFUR-	1000 PPM MAX.
FILLERS OR BINDERS-	NONE

GASKET CODE: MJT

SERVICE: CORROSIVE (NOTES 7, 13, & 14)

SPECIFICATION: 3/32 INCH THICK 26 GA. DOUBLE METAL JACKETED GASKET WITH PTFE (TEFLON) FILLER MATERIAL. METAL JACKETING SHOULD BE AS SPECIFIED BELOW.

JACKETING MATERIAL:	FRESH AND SALT WATER -	COPPER OR BRASS
	SOUR WATER -	TYPE 316 SS (TYPE 316L SS FOR WELDED CONSTRUCTION) (NOTE 14.)
	GENERAL SERVICES AND HYDROCARBON SERVICES WITH H_2S BELOW 550°F (IF EQUIPMENT IS CS) -	CARBON STEEL
	SERVICES WITH H_2S FROM 550°F TO 700°F -	TYPE 410 SS (TYPE 430 SS FOR WELDED CONSTRUCTION) (NOTE 14.)
	SERVICES WITH H_2S AND H_2 FROM 550°F TO 750°F -	TYPE 304 SS (TYPE 304L SS FOR WELDED CONSTRUCTION) (NOTE 14.)
	SERVICES WITH H_2S AND H_2 ABOVE 750°F -	TYPE 321 OR 347 SS

PERTAINS TO BOTH MATERIALS

ACCEPTABLE BRANDS: (NOTE 3.)

LAMONS	'STYLE 300'
FLEXITALLIC	'STYLE 123'
FURON	'STYLE 623'

GASKET CODE LEGEND

FIRST TWO LETTERS
- SG.....SHEET GASKET
- SV.....SPIRAL WOUND
- MJ.....METAL JACKETED

THIRD LETTER
- A.....ASBESTOS
- E.....ELASTOMER
- G.....GRAPHITE
- T.....PTFE (TEFLON)

NOTES

1. THIS DRAWING WAS DEVELOPED AS A GUIDE FOR THE USE OF NON-ASBESTOS GASKETING MATERIALS THAT MEET THE REQUIREMENTS OF ASME AND ANSI STANDARDS. REFER TO ASME/ANSI B16.21 'NON-METALLIC FLAT GASKETS' AND ASME B16.20 'METALLIC GASKETS FOR PIPE FLANGES-RING-JOINT, SPIRAL WOUND, AND JACKETED'. INFORMATION REGARDING RING JOINT GROOVE DIMENSIONS CAN BE FOUND IN ASME/ANSI B16.5.

   GASKET STYLE SELECTION FOR FLANGED CLOSURES ON VALVE BONNETS OR HEAT EXCHANGER HEADS ARE A PROPRIETARY DESIGN DEVELOPED BY THE ORIGINAL EQUIPMENT MANUFACTURER.

2. REFER TO CHEVRON'S STANDARD ENGINEERING FORM PIH-EF-743 FOR LIMITING PARAMETERS FOR SHEET, SPIRAL WOUND AND RING JOINT GASKET STYLES AND MATERIALS. TO DETERMINE THE ASME/ANSI CLASS RATING AND THE GASKET STYLE SELECTION FOR AN EXISTING PIPING SYSTEM, REFER TO THE FACILITY PIPING SPECIFICATION CLASS SHEETS.

3. HISTORICALLY, ASBESTOS GASKETS WERE ACCEPTABLE FOR USE IN ALL SERVICES EXCEPT ACID. PRESENTLY, SPIRAL WOUND GASKET MANUFACTURERS HAVE CHANGED TO NON-ASBESTOS FILLER MATERIALS AND HAVE DISCONTINUED THE FABRICATION OF SPIRAL WOUND GASKETS WITH ASBESTOS IN THE UNITED STATES. SOME AUTHORIZED IMPORT SOURCES MAY BE AVAILABLE THROUGH THE MAJOR GASKET MANUFACTURERS. GRAPHITE MATERIAL HAS EVOLVED AS THE PRINCIPLE NON-ASBESTOS SUBSTITUTE THAT IS CONSIDERED BOTH FIRE-SAFE AND COMPATIBLE FOR MOST HYDROCARBON SERVICES. PURE GRAPHITE DOES NOT HAVE THE RESILIENCY OF ASBESTOS AND REQUIRES CAREFUL HANDLING AND STORAGE.

   THE 'ACCEPTABLE' BRANDS LISTED ON THIS DRAWING HAVE THE MANUFACTURER'S REFERENCED ALPHA-NUMERIC IDENTIFICATION. THE COMPLETE ORDERING DESCRIPTION SHOULD INCLUDE THE INFORMATION NOTED UNDER 'SPECIFICATION' FOR THE APPROPRIATE GASKET.

4. VARIOUS GASKET STYLES MADE WITH ASBESTOS OR ASBESTOS COMPOSITION ARE IN PLACE AT MANY FACILITIES AND WILL NORMALLY ONLY BE REPLACED WHEN THERE IS A NEED TO DISMANTLE THE FLANGE CONNECTION. CHEVRON TESTS SHOW THAT EXPOSURE LEVELS TO ASBESTOS WHEN REMOVING, HANDLING, CUTTING, OR INSTALLING GASKETS ARE WELL BELOW THE OSHA PERMISSIBLE OF 0.2 FIBERS/CC (8 HOUR TIME WEIGHTED AVERAGE) OR 1.0 FIBERS/CC (SHORT TERM EXPOSURE).

   MANY DISTRIBUTORS WILL NO LONGER STOCK ASBESTOS PRODUCTS BECAUSE OF POSSIBLE LITIGATION OVER HAZARDOUS MATERIAL. IT IS ANTICIPATED THAT NON-ASBESTOS MATERIAL SUBSTITUTES, COMPATIBLE WITH HYDROCARBON SERVICES AND FIRE-SAFE, WILL EVENTUALLY REPLACE ALL FORMS OF ASBESTOS GASKETING.

5. GRAPHITE MATERIAL IN OXIDIZING ENVIRONMENTS (SUCH AS HIGH TEMPERATURE AIR) IS LIMITED TO 850 DEGREES FAHRENHEIT, AND IN NON-OXIDIZING ENVIRONMENTS (SUCH AS STEAM OR HYDROCARBONS) TO 1200 DEGREES FAHRENHEIT. THE PARAMETERS INDICATED ON PIH-EF-743 OVERRIDE THE GRAPHITE ALLOWABLE TEMPERATURES.

6. FLEXIBLE GRAPHITE GASKET MATERIAL IS PREFERRED FOR NON-OXIDIZING ACID SERVICES (SUCH AS HYDROFLUORIC AND HYDROCHLORIC) BECAUSE OF ITS EXCEPTIONAL RESISTANCE TO FIRE.

7. PTFE (TEFLON) MATERIAL HAS VERY LITTLE RESISTANCE TO FIRE BUT MAY BE THE ONLY ACCEPTABLE CHOICE FOR AN OXIDIZING ACID SERVICE. PTFE IS LIMITED TO OPERATING TEMPERATURES BELOW 500 DEGREES FAHRENHEIT WHEN USED AS A VALVE SEAT MATERIAL THAT IS FULLY CONFINED ON THREE SIDES. PTFE GASKETING OR SEALS THAT ARE NOT CONFINED SHOULD BE LIMITED TO OPERATING TEMPERATURES BETWEEN 250-350 DEGREES FAHRENHEIT DEPENDING ON THE DESIGN. A SPIRAL WOUND PTFE (TEFLON) FILLED GASKET IS PREFERRED TO A PTFE SHEET GASKET.

8. SHEET GASKETS FOR PIPING FLANGES SHOULD BE THE SELF-CENTERING FLAT RING TYPE PER ASME/ANSI B16.21. EACH SHEET GASKET SHOULD HAVE THE MANUFACTURER'S NAME PRINTED ON ONE SIDE.

9. ELASTOMERIC-BOUND SHEET GASKET MATERIAL ARE LIMITED TO NON-FLAMMABLE SERVICES AND ASME/ANSI CLASS 150 FLANGES.

10. SHEET GASKETS WITH A MAXIMUM THICKNESS OF 1/16 INCH ARE PREFERRED TO MINIMIZE THE POSSIBILITY OF A BLOW-OUT. ELASTOMER SHEET GASKETS 1/8 INCH THICK HAVE BEEN USED ON OCCASION IN LOW PRESSURE WATER SERVICE.

11. BLUE-AFRICAN ASBESTOS (CROCIDOLITE) IS NO LONGER AVAILABLE, AND CANADIAN WHITE ASBESTOS (CHRYSOTILE) IS NOT SUITABLE FOR ACID SERVICES. HOWEVER, CHEVRON TESTS INDICATE THAT ONE BRAND OF LONG-FIBER CHRYSOTILE ASBESTOS GASKET MATERIAL (DURABLA BLACK) MAY BE ACCEPTABLE IN CONCENTRATED SULFURIC ACID SERVICE. THE MATERIAL IS ATTACKED, BUT NOT SEVERELY ENOUGH TO PRECLUDE ITS USE.

12. SPIRAL WOUND GASKETS NPS 12 AND LARGER WITH A GRAPHITE FILLER AND ALL NPS SIZES WITH A PTFE (TEFLON) FILLER SHOULD HAVE BOTH AN OUTER CARBON STEEL COMPRESSION CENTERING RING AND AN INNER RING MADE OF THE SAME MATERIAL AS THE WINDING. THE INNER RING IS NECESSARY WITH THESE PARTICULAR FILLER MATERIALS BECAUSE OF THEIR BEHAVIOR UNDER PRESSURE; THEY TEND TO COLLAPSE THE WINDING INWARDLY ON NPS 12 AND LARGER. ADDITIONALLY, INNER RINGS ARE REQUIRED FOR CERTAIN SIZES IN ASME/ANSI PRESSURE CLASSES AS DEFINED IN ASME B16.20.

13. METAL JACKETED GASKETS HAVE BEEN USED PRIMARILY FOR HEAT EXCHANGER GASKETS AND VESSEL MANWAY GASKETS. THEY ARE NOT RECOMMENDED FOR ACID SERVICES BECAUSE ANY SEEPAGE INTO THE JACKET IS DIFFICULT TO NEUTRALIZE AND COULD BE A HEALTH HAZARD WHEN HANDLED.

14. METAL JACKETED GASKETS WITH COMPLICATED RIB DESIGNS AND THOSE GREATER THAN NPS 60 TYPICALLY USE A FABRICATED JACKETING EMPLOYING SOME FORM OF WELDED CONSTRUCTION.

REFERENCE DRAWINGS			
CORPORATE PIPING SPECIFICATION	GB-135169	NON-METALLIC GASKETS	ASME B16.21
FLANGE & GASKET LIMITATIONS	PIH-EF-743	METALLIC GASKETS	ASME B16.20
		PIPE FLANGE	ANSI B16.5
VALVE PACKING RECOMMENDATIONS	GC-L99771		

REVISIONS

3	ADDED 'AND MATERIALS' TO NOTE 2, REARRANGED SGG GASKET NOTES FOR CLARITY	7-1-97	LIL	GJH
2	ASSOC. TO SGA-MFG. TEADIT, DELETED: KLINGER STYLE KLINGERIT-UNIVERSAL. REVISED: SGG-THERMOSEAL WAS KLINGER, C 4401 WAS 4401. J.M. CLIPPER 978-C WAS 978. JOHN CRANE (REF.) C 4401 WAS 4401. REVISED: SGG-FLEXITALLIC WAS 'FLEXI-CARB' WITH SS FOIL		JEF	GJH
2	GENL. CHESTERTON WAS STYLE 193, THERMOSEAL WAS KLINGER, DURABLA WAS 'GRAFOIL FGT 316', SVA, SVG, AND SVT-ASME B16.20 REFERENCE WAS API STANDARD 601. SVT-REVISED INNER RING REQUIREMENTS. REVISED NOTICE 1, 3, 8 & 12.	8-4-94	ZR	

Chevron Research and Technology

SCALE NONE | DATE 3-9-89 | APPROVED

DR. FTS CH. ____ DR. APP. ____ ENGR. TVS

OPR'G DEPT. ____ ENG. DEPT. ____

GASKET SPECIFICATIONS AND ACCEPTABLE BRANDS

A | C.C. ____ | S.O. ____ | GD-L1264 | 3

STANDARD DRAWING

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