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INDUSTRIAL PRODUCTS FOR PLANT AND EQUIPMENT MAINTENANCE

Bob Holmberg
Salesman

GARLOCK INC.

PALMYRA, NEW YORK 14522

ST0214735

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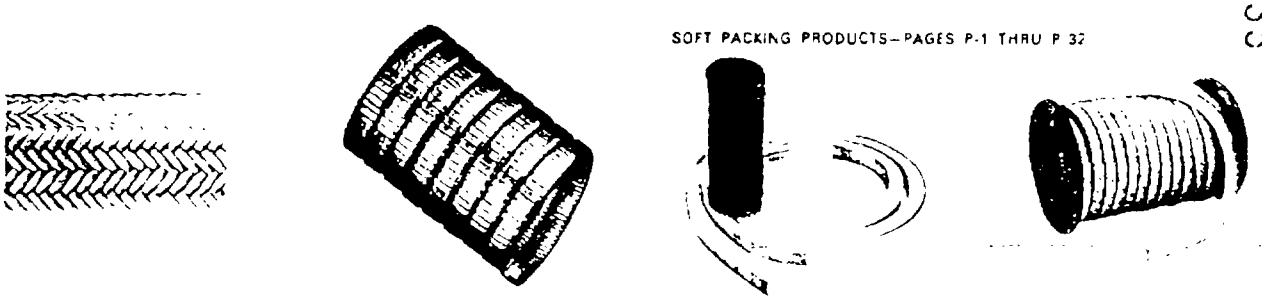

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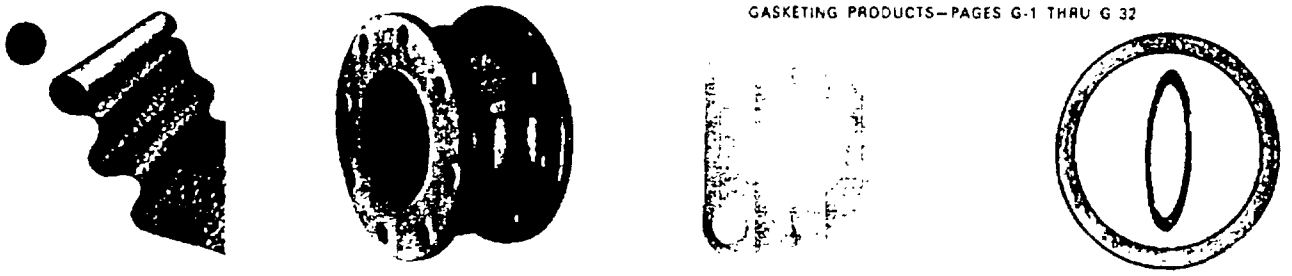

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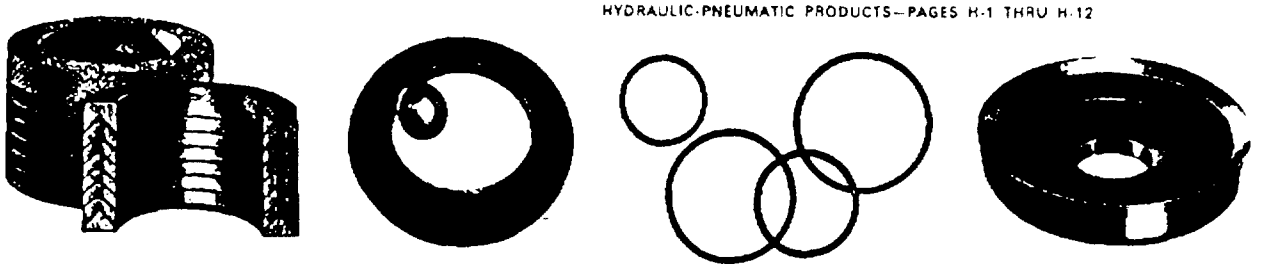

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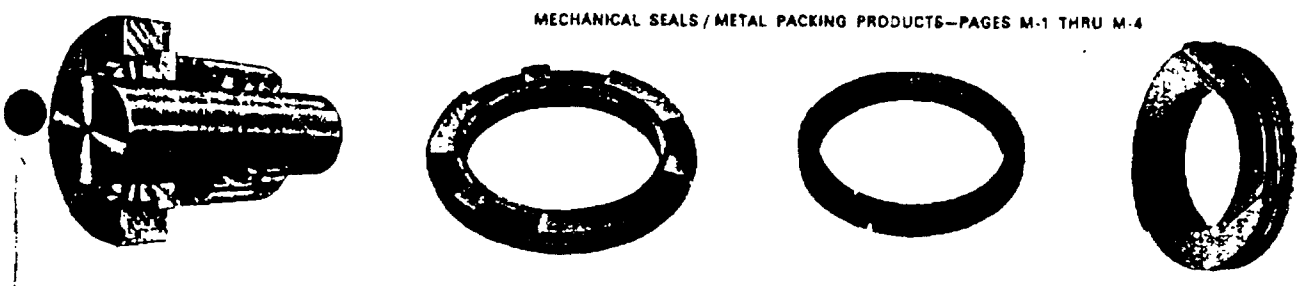

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GARLOCK CATALOG

INDUSTRIAL PRODUCTS FOR PLANT AND EQUIPMENT MAINTENANCE

About this catalog . . .

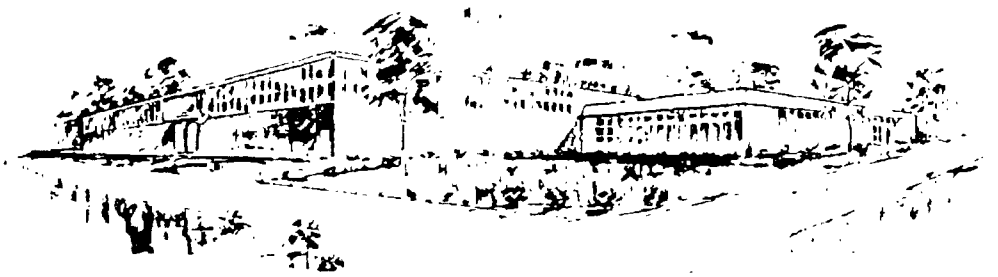
We are pleased to present our Garlock Plant and Equipment Maintenance Catalog. It has been organized to assist you in finding the maintenance products you require for your particular application. There are four sections: Hydraulic-Pneumatic; Gasketing; Soft Packing; and one section combining Mechanical Seals and Metal Packing. In these four sections you will find descriptive information on the complete line of products we offer for maintenance purposes. Each section has its own Product Index and Style Number Index. Page numbers have a distinguishing section prefix. On page T-1, you will find a Master Product Index for the entire catalog. Page T-4 presents a Master Style Number Index

About Garlock . . .

Since 1887 Garlock has supplied its products to, and served industry throughout the world. Our insistence on quality and our desire to keep pace with modern technology has made our slogan "The Standard Packing of the World"® an accepted truism. And our concentrated research and development program, intense quality assurance program, growing facilities, expansion of distribution points and our trained representatives all have but one aim . . . to serve you better. We stand ready to be of assistance at any time.

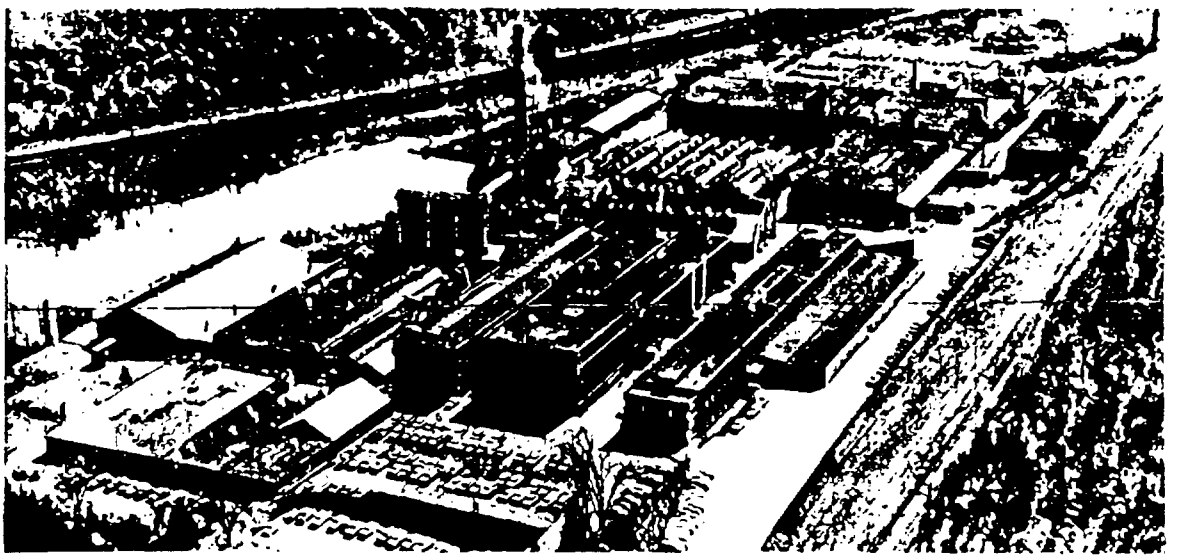
Please feel free to call upon your local representative or office, or if you prefer, contact us at Garlock Inc., Palmyra, New York 14522.

We hope you find this catalog truly helpful in selecting the quality Garlock products you need.



Canadian Office and Plant: Garlock of Canada Ltd., Toronto, Ontario

General Offices and Main Plant: Garlock Inc., Palmyra, N. Y.



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GARLOCK WARRANTY

Garlock Inc. guarantees that any product of its manufacture, which upon examination is found by a Garlock representative to be defective either in workmanship or material whereby it is not suitable under proper usage and service for the purpose for which designed, will be replaced free of charge including transportation charges but not cost of installation. This shall be Garlock's maximum liability. The sale of Garlock products under any other warranty or guarantee, expressed or implied, is not authorized by Garlock.

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GARLOCK MATERIALS
VS. VARIOUS MEDIA UNDER TYPICAL CONDITIONS

• This chart indicates the general suitability of basic materials commonly used in packings and gaskets against various media and is intended only for the general information of the packing user. Obviously the subject of the interaction of packing materials with the several liquids listed is too complex to be covered adequately in a few words. Although chemical considerations are important in the selec-

GARLOCK MATERIALS

medium	METALS	NATURAL RUBBER	SBR	NEOPRENE	NITRILE	SILICONE
Gases Air	Satisfactory except lead melts above 600°F.	Satisfactory but becomes tacky above 200°F	Satisfactory but hardens above 250°F	Satisfactory but hardens and decomposes above 250°F.	Satisfactory but hardens above 250°F.	Satisfactory but deterioration accelerated above 500°F
Oxygen	Satisfactory except lead melts above 600°F	Limited depending on conditions	Limited depending on conditions	Limited depending on conditions	Limited depending on conditions	Limited depending on conditions
Halogens (Chlorine (Bromine etc.)	Satisfactory if free from water. Otherwise attacked	Hardens on exposed surfaces	Hardens on exposed surfaces	Hardens on exposed surfaces	Hardens on exposed surfaces	Hardens on exposed surfaces
Other Hot Gases or Dry Steam.	Satisfactory below melting point Hot compressed H_2 embrittles steel	Satisfactory but becomes tacky above 200°F	Satisfactory but hardens above 250°F.	Satisfactory but hardens and decomposes above 250°F	Satisfactory but hardens above 250°F	Satisfactory but decomposes in steam above 300°F
LIQUIDS Water (including all neutral water-soluble salts sugar solutions, etc.)	Satisfactory except for iron fusting	Satisfactory but becomes tacky above 200°F.	Satisfactory but hardens above 250°F	Not recommended	Satisfactory but hardens above 250°F	Satisfactory but decomposes above 300°F
Alkaline Solutions	Satisfactory except lead tin, zinc, aluminum and alloys	Limited depending on conditions exposed surfaces become tacky	Satisfactory but exposed surfaces swell	Satisfactory but butyl rubber preferred	Satisfactory but exposed surfaces swell	Not recommended
Weak Acid Solutions (including Acetic and other organic acids sulphurous acid and low concentration of sulphuric acid and hydrochloric)	Copper, its alloys and stainless irons satisfactory, aluminum satisfactory in organic acids only and lead in all but acetic acid	Satisfactory if free from acid soluble fillers	Satisfactory if free from acid-soluble fillers	Satisfactory if free from acid soluble fillers	Satisfactory if free from acid soluble fillers	Not recommended
Strong Acids Hydrochloric Acid	Not recommended except Hastelloy, gold and platinum	Limited depending on conditions	Limited depending on conditions	Satisfactory up to 150°F if free from acid soluble fillers	Limited depending on conditions	Not recommended
Sulfuric Acid Dilute up to 50%	Not recommended except Durion, lead gold and platinum	Limited depending on conditions	Limited depending on conditions	Limited depending on conditions	Limited depending on conditions	Not recommended
Concentrated Sulfuric Acid	Limited depending on conditions	Not recommended	Not recommended	Not recommended	Not recommended	Not recommended
Concentrated Acetic Acid (Glacial)	Limited depending on conditions	Limited depending on conditions	Limited depending on conditions	Limited depending on conditions	Limited depending on conditions	Limited depending on conditions
Nitric Acid	Not recommended except Durion gold and platinum (Stainless Steel in concentrate but not dilute)	Not recommended	Not recommended	Not recommended	Not recommended	Not recommended
Aqua Ammonia	Satisfactory except copper and its alloys	Satisfactory but becomes tacky above 200°F.	Satisfactory but hardens above 250°F	Not recommended	Satisfactory but hardens above 250°F	Satisfactory but deteriorates above 300°F.
Liquid Ammonia (Anhydrous)	Satisfactory except copper and its alloys	Limited depending on conditions	Limited depending on conditions	Satisfactory	Satisfactory.	Limited depending on conditions
Liquid Chlorine Bromine, etc	Satisfactory if completely free from water. Otherwise attacks all metals	Not recommended	Not recommended	Not recommended	Not recommended	Not recommended
SOLVENTS Aliphatic (Gasoline etc.)	Satisfactory.	Not recommended	Not recommended	Limited depending on conditions	Satisfactory	Limited depending on conditions
Aromatic Types (Benzol, etc.) or chlorinated Types (Carbon tetra chloride etc.)	Satisfactory	Not recommended	Not recommended	Not recommended	Limited depending on conditions.	Not recommended
Acetone	Satisfactory	Limited depending on conditions. Butyl preferred	Limited depending on conditions	Limited depending on conditions	Not recommended	Limited depending on conditions
Alcohol	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Limited depending on conditions
OILS	Satisfactory, except high sulphur hot oils attack copper, iron and alloys	Not recommended	Not recommended	Limited depending on conditions and nature of oil	Satisfactory except for some additive type oils	Limited depending on conditions and nature of c

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** 3M TRADEMARK

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tion of packings, the mechanical properties of the packing itself usually are of greater importance. Packings rarely are fully exposed to the gas or liquid and therefore, do not necessarily react in the same degree as indicated for the base material. For these reasons packings or gaskets should not be accepted or rejected for any application solely on the basis of chemical consideration.

VITON* and FLUOREL**	PHENOLIC RESINS	TFE FLUOROCARBON	WHITE ASBESTOS	BLUE ASBESTOS	COTTON, FLAX VISCOSE RAYON	PAPER	LEATHER
Satisfactory but hardens above 500° F	Satisfactory. Reinforcing fiber usually establishes limits	Satisfactory but softens above 500° F	Satisfactory	Satisfactory	Satisfactory but weakens above 200° F	Satisfactory but weakens and embrittles above 200° F	Satisfactory from cryogenics to 200° F
Limited depending on conditions	Limited depending on conditions	Satisfactory but softens above 500° F	Satisfactory	Satisfactory	Not recommended	Not recommended	Not recommended
Satisfactory up to 225° F	Satisfactory except for effect on reinforcing fibers	Satisfactory	Satisfactory	Satisfactory	Not recommended	Not recommended	Not recommended
Satisfactory but hardens above 500° F Not recommended in steam above 300° F	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory but weakens above 200° F	Satisfactory but weakens above 200° F	Satisfactory but weakens above 200° F
Satisfactory but decomposes above 300° F	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory but weakens above 200° F	Satisfactory but weakens above 200° F	Satisfactory but weakens above 200° F
Limited depending on conditions	Satisfactory unless solutions are strong and above 200° F	Satisfactory	Satisfactory	Satisfactory	Not recommended	Not recommended	Not recommended
Satisfactory if free from acid soluble fillers	Satisfactory if used reinforcing fibers should be acid resistant	Satisfactory	Satisfactory	Satisfactory	Not recommended	Not recommended	Not recommended
Satisfactory if free from acid-soluble fillers	Satisfactory if used reinforcing fibers should be acid resistant	Satisfactory	Not recommended	Satisfactory	Not recommended	Not recommended	Limited depending on conditions
Satisfactory if free from acid soluble fillers	Satisfactory if used reinforcing fibers should be acid resistant	Satisfactory	Not recommended	Satisfactory	Not recommended	Not recommended	Limited depending on conditions
Satisfactory if free from acid soluble fillers	Not recommended	Satisfactory	Not recommended	Satisfactory	Not recommended	Not recommended	Not recommended
Limited depending on conditions	Limited depending on conditions	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory
Limited depending on conditions	Not recommended	Satisfactory	Not recommended	Satisfactory	Not recommended	Not recommended	Not recommended
Satisfactory but decomposes above 300° F	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory but weakens above 200° F	Satisfactory but weakens above 200° F	Satisfactory but weakens above 200° F
Not recommended	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Not recommended
Not recommended	Not recommended	Satisfactory	Satisfactory	Satisfactory	Not recommended	Not recommended	Not recommended
Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory but loses water, shrinks and hardens
Not recommended	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory but loses water, shrinks and hardens
Not recommended	Limited depending on conditions	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory but loses water, shrinks and hardens
Limited depending on conditions	Limited depending on conditions	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory but loses water, shrinks and hardens
Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory but weakens above 200° F	Satisfactory but weakens above 200° F	Satisfactory but becomes porous and hardens above 200° F

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*DuPont Trademark

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Soft Packing Products

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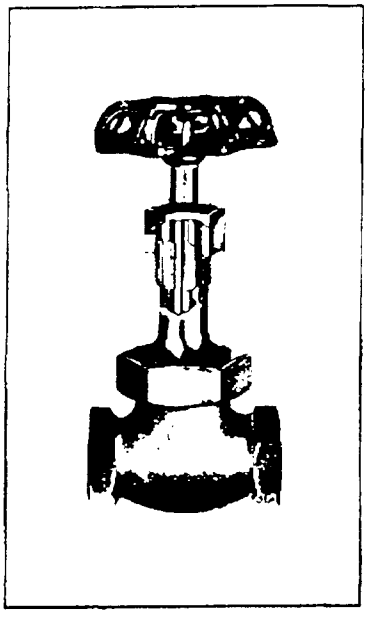

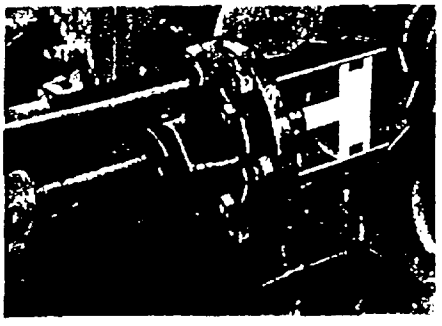

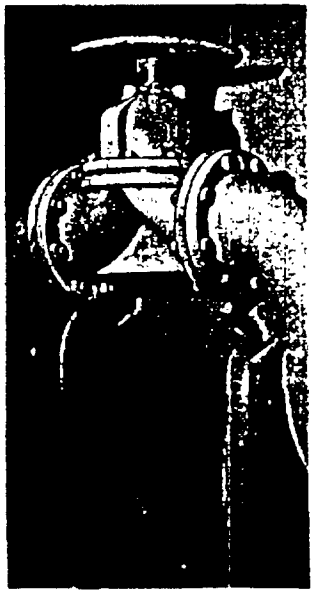

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GARLOCK WARRANTY

Garlock Inc. guarantees that any product of its manufacture, which upon examination is found by a Garlock representative to be defective either in workmanship or material whereby it is not suitable under proper usage and service for the purpose for which designed, will be replaced free of charge including transportation charges but not cost of installation. This shall be Garlock's maximum liability. The sale of Garlock products under any other warranty or guarantee, expressed or implied, is not authorized by Garlock.

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ST021712

GARLOCK LATTICE BRAID® PACKINGS

diagonally braided for greater strength and longer life



Through many years of use in thousands of varied applications, LATTICE BRAID packing has proved to be superior to all other forms of braided packing.

The secret of its superiority over ordinary braided packing lies in its lattice-linked construction illustrated above.

LATTICE BRAID packing is braided inside as well as outside. Each strand passes diagonally through the body of the packing at an angle of approximately 45°. This makes a completely unified structure. Every braided strand contributes to the strength of the entire packing.

ADVANTAGES OF LATTICE BRAID PACKINGS

1. LONGER LIFE, which means fewer repackings and less downtime. This is because LATTICE BRAID packing has no single braid or outer cover to wear through. Lattice-linked braiding holds together when worn far beyond the limits of ordinary packings.

2. UNUSUAL FLEXIBILITY. Lattice-linked braiding makes each strand much more flexible than ordinary braiding. Thus there is less stress when it is formed into rings.

3. QUICKER SEALING AND INFREQUENT GLAND ADJUSTMENT. The strands are each lubricated to evenly distribute lubricant throughout the packing, and control proper porosity. Because of this and its greater flexibility, LATTICE BRAID packing is ready to operate at once . . needs a minimum of further gland adjustment.

ST0214743

A LATTICE BRAID PACKING FOR EVERY SERVICE

The LATTICE BRAID packing line is complete for all services requiring braided packing. The variety of materials used is selected on the basis of continuing field research and over 75 years' experience in the packing business. The chart below tabulates the most common services. Contact your Garlock representative for recommendations covering any unusual applications.

GENERAL RECOMMENDATIONS

Service	Centrifugal Rotary Shafts	Valve Stems and Expansion Joints	Reciprocating Rods, Plungers and Rams
Water, including neutral, alkaline or weak acid solutions—low to medium pressures	730 733 740 751 5862 5875	731 5862 5875	730 733 740 751 5862 5875
—high pressure	731 735 5862 5875	731 732 735 5862 5875	735 745 5862 5875
Liquids, paper pulp and other products for which noncontamination is a requisite	733 ungraphited 737 5875	733 ungraphited 737 5875	733 ungraphited 737 5875
Mineral acids and caustics	736 5880 5881 5888 5889	736 5880 5881 5888 5889	736 5880 5881 5888 5889
Gasoline	734 5875	734 5875	734 5875
Oils —cold —hot (including tar, asphalt and creosote) up to 700°F.	5862 5875* 734 735	5862 5875* 734 735	5862 5875* 734 735
Steam, air and inert gases (up to 500°F.) (up to 700°F.)	5875* 731 735	5875* 731 732 735	5875* 731 732 735
Oxygen Gaseous	5780 5898	5780 5898	5780 5898
Liquid	5898	5898	5896

*Limited to 550° F.

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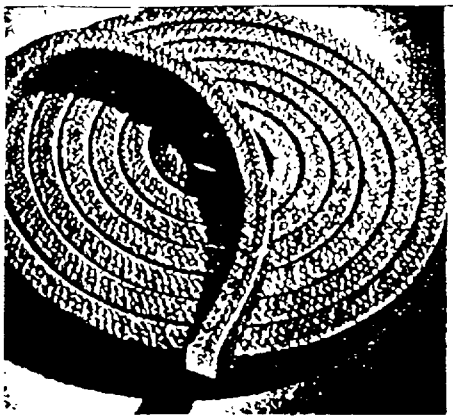
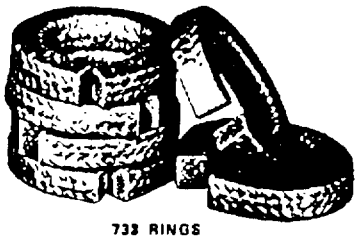


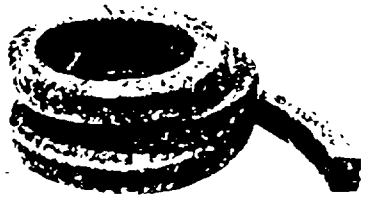
731 COIL



732 RING



733 RINGS



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GARLOCK ASBESTOS LATTICE BRAID PACKINGS

SERVICE	STYLE	APPLICATIONS
Water, neutral, alkaline or weak acid solutions ... low to medium pressures	730	Centrifugal or rotary shafts Reciprocating rods, plungers rams
Water, neutral, alkaline or weak acid solutions ... high pressure, steam air and inert gases to 500°F	731	Centrifugal or rotary shafts Reciprocating rods, plungers and rams Valve stems expansion joints
Water neutral alkaline or weak acid solutions ... high pressure, steam air and inert gases to 700°F	732	Reciprocating rods, plungers and rams Valve stems and expansion joints Ideal for end rings of packing sets
Water, neutral, alkaline or weak acid solutions ... low to medium pressures	733 737	Centrifugal or rotary shafts Reciprocating rods plungers, rams Same as 733 except no graphite finish Mica finish also available
Gasoline and cold or hot oils up to 700°F	734	Centrifugal or rotary shafts Reciprocating rods plungers and rams Valve stems and expansion joints
Water, neutral, alkaline or weak acid solutions ... high pressure steam air and inert gases oils, cold or hot (including tar, asphalt, creosote) to 700°F	735	Centrifugal or rotary shafts Reciprocating rods, plungers and rams Valve stems and expansion joints
Mineral acids and caustics	736	Centrifugal or rotary shafts Reciprocating rods, plungers and rams Valve stems and expansion joints

Note: Cut and die-formed rings of Braided Packing are available from warehouse stocks across the United States and in Canada. Number of styles available are limited at present but will be enlarged in the near future.

GARLOCK FLAX AND COTTON LATTICE BRAID PACKINGS

SERVICE	STYLE	APPLICATIONS
Water, neutral, alkaline or weak acid solutions ... low to medium pressures	740	Centrifugal or rotary shafts Reciprocating rods, plungers and rams
Water, neutral, alkaline or weak acid solutions ... high pressures	745	Reciprocating rods, plungers and rams
Water, neutral, alkaline or weak acid solutions ... low to medium pressures	761	Centrifugal or rotary shafts Reciprocating rods, plungers and rams

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for service on centrifugal or rotary shafts, reciprocating rods, plungers, rams, valve stems, expansion joints

MATERIALS	PACKING SIZES	1/4"	5/16"	3/8"	7/16"	1/2"	9/16"	5/8"	11/16"	3/4"	13/16"	7/8"	15/16"	1"
Long-fiber asbestos yarn lubricated and graphited throughout. Relatively firm packing	Coils per box	5	5	4	3	3	3	3	3	3	1	1	1	1
	Feet per box	120	100	116	72	66	60	51	45	42	26	24	22	20
	Pounds per box	4 3/4	6 1/4	10	9	11	12	12 3/4	13 1/4	15	10 3/4	11 1/2	12	12 1/2
Long-fiber asbestos yarn. Controlled lubrication and graphited throughout. Contains no excess lubrication	Coils per box	5	5	4	3	3	3	3	3	3	1	1	1	1
	Feet per box	120	100	116	72	66	60	51	45	42	26	24	22	20
	Pounds per box	4	5 1/2	8 1/2	8	9 1/2	10	11	11 1/2	13	9	9 1/2	10 1/4	10 1/2
Long-fiber asbestos yarn with copper wire insertion and copper wire corners. Lubricated and graphited throughout. Also available dry	Coils per box	2	1	1	1	1	1	1	1	1	1	1	1	1
	Feet per box	50	41	39	36	30	24	22	19	17	15	16	15	15
	Pounds per box	3 1/2	4 1/2	7 3/4	9	9	9 1/4	10	10	8 1/2	8	10 1/2	12 3/4	14
Long-fiber asbestos yarn, lubricated and graphited throughout. Available unlubricated and ungraphited, or with mica finish in place of graphite. Relatively soft packing	Coils per box	5	5	4	3	3	3	3	3	3	1	1	1	1
	Feet per box	120	100	116	72	66	60	51	45	42	26	24	22	20
	Pounds per box	4 1/2	6	9 1/4	8	10	11 1/4	12	12 1/2	14 1/2	10	11	11 1/4	11 3/4
Long fiber asbestos yarn lubricated with gasoline resistant compound and graphited throughout. Available dry, ungraphited or with mica finish	Coils per box	5	5	4	3	3	3	3	3	3	1	1	1	1
	Feet per box	120	100	116	72	66	60	51	45	42	26	24	22	20
	Pounds per box	4 1/2	6	9 3/4	8 3/4	10 1/4	11 1/2	13	13 3/4	15 1/2	10 1/2	12	11 3/4	13
Copper wire inserted long fiber asbestos yarn. Controlled lubrication and graphited throughout. Available dry, ungraphited or with mica finish	Coils per box	5	5	4	3	3	3	3	3	3	1	1	1	1
	Feet per box	120	100	116	72	66	60	51	45	42	26	24	22	20
	Pounds per box	5	6	10	9 1/4	11 1/2	12 1/4	12 1/2	13	14 1/2	10 1/2	11 1/2	12	12 1/2
African blue asbestos yarn, lubricated and graphited throughout. Also available with mica finish	Coils per box	5	5	4	3	3	3	3	3	3	1	1	1	1
	Feet per box	120	100	116	72	66	60	51	45	42	26	24	22	20
	Pounds per box	4 1/2	5 1/4	10 1/2	9 1/4	11 1/4	12 3/4	13	13	15 3/4	11 1/4	11 1/4	11 1/2	11 1/2

for service on centrifugal or rotary shafts; reciprocating rods, plungers, rams

MATERIALS	PACKING SIZES	1/4"	5/16"	3/8"	7/16"	1/2"	9/16"	5/8"	11/16"	3/4"	13/16"	7/8"	15/16"	1"
Highest grade long-fiber flax roving. Lubricated. Not graphited. Available unlubricated or with surface coating of graphite. Relatively soft packing	Coils per box	5	5	4	3	3	3	3	3	3	1	1	1	1
	Feet per box	120	100	116	72	66	60	51	45	42	26	24	22	20
	Pounds per box	4	5 1/2	9 1/2	7 1/4	9	9 1/2	10	11 1/2	12	8 1/4	9	10	10
Highest grade, long-fiber flax roving with waterproof hydraulic lubricant containing graphite. Also surface graphited	Coils per box	5	5	4	3	3	3	3	3	3	1	1	1	1
	Feet per box	120	100	116	72	66	60	51	45	42	26	24	22	20
	Pounds per box	4	5 1/2	9 1/2	7 3/4	8 1/2	10	11	12	12 1/2	8 1/2	9 3/4	10 3/4	10 1/2
High grade cotton yarn. Lubricated and graphited. Also available dry	Coils per box	5	5	4	3	3	3	3	3	3	1	1	1	1
	Feet per box	120	100	116	72	66	60	51	45	42	26	24	22	20
	Pounds per box	4	4 3/4	8	7	8	8 1/4	8 1/2	10 1/4	11	8 1/2	8 1/4	9	9 1/4

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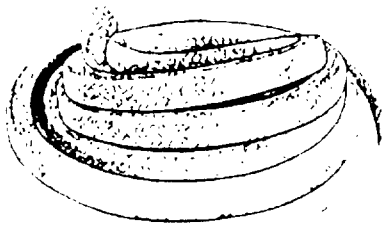
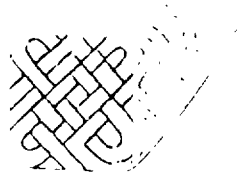
GARLOCK LATTICE BRAID PACKINGS WITH TFE





5876 COIL

SERVICE	STYLE	APPLICATIONS
Oxygen gaseous, liquid	5780	Centrifugal or rotary shafts Reciprocating rods, plungers and rams Valve stems expansion joints
Water, Neutral alkaline or weak acid solutions For low, medium and high pressures, for cold and hot oils up to 700°F	5861	Centrifugal or rotary shafts Reciprocating rods, plungers and rams Valve stems, expansion joints
Water, Neutral alkaline or weak acid solutions For low, medium and high pressures for cold and hot oils up to 700°F	5862	Centrifugal or rotary shafts Reciprocating rods, plungers and rams Valve stems expansion joints
Water, Neutral alkaline or weak acid solutions For low, medium and high pressures For all products which require noncontamination Gasoline, cold and hot oils, up to 700°F, steam, air, and inert gases to 550°F	5875	Centrifugal or rotary shafts Reciprocating rods, plungers and rams Valve stems expansion joints
Mineral acids and caustics	5880	Centrifugal or rotary shafts Reciprocating rods, plungers and rams Valve stems expansion joints
Mineral acids and caustics	5881	Centrifugal or rotary shafts Reciprocating rods, plungers and rams Valve stems expansion joints
Mineral acids and caustics	5888	Centrifugal or rotary shafts Reciprocating rods, plungers and rams Valve stems, expansion joints
Mineral acids and caustics, high speed service	5889	Centrifugal or rotary shafts Reciprocating rods, plungers and rams Valve stems expansion joints
Oxygen gaseous, liquid	5898	Centrifugal or rotary shafts Reciprocating rods, plungers and rams Valve stems expansion joints

FOR ORDERING INFORMATION SEE PAGE P-30

ST0214716

ST0214716

for service on centrifugal or rotary shafts, reciprocating rods, plungers, rams, valve stems, expansion joints

MATERIALS	PACKING SIZES	1/4"	5/16"	3/8"	7/16"	1/2"	9/16"	5/8"	11/16"	3/4"	13/16"	7/8"	15/16"	1"
African blue asbestos yarn with TFE impregnation. Specially treated for oxygen service	Coils per box	Available in spools and reels. See size information below*							2	2	1	1	1	1
	Feet per box								30	28	26	24	22	20
	Pounds per box								7 1/4	9 1/8	10 1/8	12	12	12 1/4
Long-fiber asbestos yarn with TFE impregnation	Coils per box	Available in spools and reels See size information below*							2	2	1	1	1	1
	Feet per box								30	28	26	24	22	20
	Pounds per box								8 1/4	8 1/4	8 1/4	9 1/8	11	10 1/8
Long-fiber asbestos yarn with TFE impregnation and a white lubricant for easier run-in	Coils per box	Available in spools and reels See size information below*							2	2	1	1	1	1
	Feet per box								30	28	26	24	22	20
	Pounds per box								8 1/4	8 1/4	8 1/4	9 1/8	11	10 1/8
Long-fiber asbestos yarn with sintered TFE powder (U.S. Patent 3124032)	Coils per box	Available in spools and reels See size information below*							2	2	1	1	1	1
	Feet per box								30	28	26	24	22	20
	Pounds per box								8 1/4	8 1/4	8 1/4	9 1/8	11	10 1/8
African blue asbestos yarn with TFE impregnation	Coils per box	Available in spools and reels See size information below*							2	2	1	1	1	1
	Feet per box								30	28	26	24	22	20
	Pounds per box								7 1/4	9 1/8	10 1/8	12	12	12 1/4
African blue asbestos yarn with sintered TFE powder (U.S. Patent 3124032)	Coils per box	Available in spools and reels. See size information below*							2	2	1	1	1	1
	Feet per box								30	28	28	24	22	20
	Pounds per box								9 1/8	10 1/8	11 1/8	12 1/8	13	13 1/8
TFE fiber yarn with TFE impregnation—a very fine weave	Coils per box	Available in spools and reels See size information below*							2	2	1	1	1	1
	Feet per box								30	28	26	24	22	20
	Pounds per box								11 1/4	12	14 1/4	15 1/4	15	15
Specially treated and impregnated TFE fiber yarn for improved break-in and high speed service	Coils per box	Available in spools and reels. See size information below*							2	2	1	1	1	1
	Feet per box								30	28	26	24	22	20
	Pounds per box								11 1/4	12	14 1/4	15 1/4	15	15
TFE fiber yarn with TFE impregnation—a very fine weave. Specially treated for oxygen service	Coils per box	Available in spools and reels See size information below*							2	2	1	1	1	1
	Feet per box								30	28	26	24	22	20
	Pounds per box								11 1/4	12	14 1/4	15 1/4	15	15

*All Lattice Braid Styles in all sizes are available in 25 lb., 50 lb. and 100 lb. reels. Sizes 1/4", 5/16" and 3/8" are also available in 1 lb. and 5 lb. spools. Sizes 7/16" through 5/8" are also available in 5 lb. spools.

GARLOCK BRAIDED AND TWISTED PACKINGS



for service on reciprocating rods, rams and plungers; centrifugal and rotary shafts, valve stems and expansion joints

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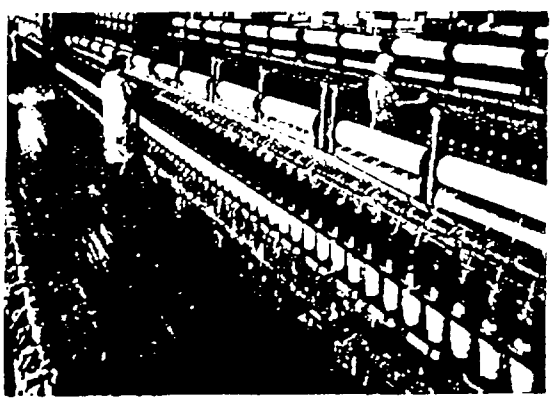
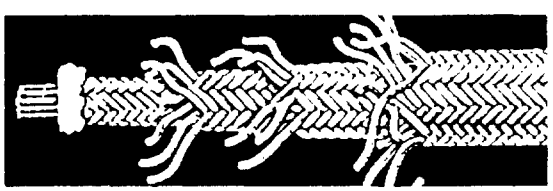


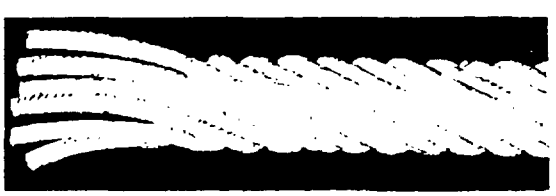
Spinning Asbestos Yarn



Regular Braid



Braid-Over-Braid



Twisted Packings

Garlock Braided and Twisted Packings have earned the reputation of being the finest in both performance and quality. Here are some of the reasons why: Garlock uses only the highest quality raw materials . . . long fiber, spinning grades of Canadian white asbestos . . . pure African blue asbestos . . . a variety of selected vegetable and synthetic fibers. And Garlock has the equipment and the experienced personnel to braid these high quality materials the best way for each type of service condition. In addition, each Garlock packing is carefully and properly lubricated with exactly the right type and amount of lubricant.

These Garlock packings are available in three styles

1. REGULAR BRAID (also called Square, Plaited or Flax Braid). Each strand passes over and under strands running in the opposite direction. Cross sections are square. These packings are especially suited for high speed rotary and reciprocating service.

2. BRAID-OVER-BRAID (also known as Multiple or Round Braid). This packing is built up to required size by braiding one or more covers around a center core of braided, twisted or homogeneous materials. Recommended for slow speed dynamic applications, valve stems and expansion joints. Especially good for valves where out-of-square cross sections are desired

3. TWISTED PACKINGS. Yarns are twisted around each other to obtain desired size. One packing size can be used for various size stuffing boxes! Because strands are easily undone, you can twist the desired size by using only the number of strands you need. An especially good general utility or emergency type of packing where packing space is small.

ST0211748

RECOMMENDATION CHART

Because of the wide selection of packings covered in this section, it would be impractical to include every Garlock style in a single chart. Therefore we have listed only the "number one" choice (or choices) for use against a particular medium under normal operating conditions. Personal preference or unusual service conditions may indicate the use of other styles than those listed in this chart.

MEDIUM	Reciprocating Rods, Plungers and Rams,** Centrifugal and Rotary Shafts	Valve Stems, Expansion Joints and Slow Speed Dynamic Applications
GASES*		
Oxygen	5603 B	5603 B
Air	234, 256	127
Halogens (Chlorine, Bromine, etc.)	5298	5561
Other Hot Gases or Dry Steam	256, 5555	127, 5555
LIQUIDS		
Water and Dilute Water Solutions	26, 31, 66, 90, 234	233
Alkaline Solutions	234	233
ACIDS		
Weak Acid Solutions (including Acetic and other Organic Acids, Sulphurous Acids and Low Concentrations of Sulphuric and Hydrochloric)	234, 5555	233
Hydrochloric Acid	230, 5298	5414, 5561
Concentrated Sulphuric Acid	230, 5298	5414, 5561
Concentrated Acetic Acid (Glacial)	230, 5298	5414, 5561
Nitric Acid	230, 5298	5561
Aqua Ammonia	234	233
Liquid Ammonia (Anhydrous)	234	233
Liquid Chlorine, Bromine, etc.	5298	5561
SOLVENTS		
Aliphatic (Gasoline, etc.)	237	257
Aromatic Types (Benzol, etc. or Chlorinated Types, Carbon Tetrachloride, etc.)	237	257
Ketones	234	233
Alcohols	234	233
OILS		
Cold	237	257
Hot***		
SPECIAL		
Processing Plants, and Paper Mills (where contamination or discoloration must be avoided)	5298, 5555	5555, 5561, 5865

*In sealing gases, Garlock Plastaflex Packings are often preferred.

**Garlock Asbestos - Rubber and Duck - Rubber Packings are also used on reciprocating rods.

***For hot oil service, Garlock Metal Foil Packings are often preferred. *Contact your Garlock representative.*

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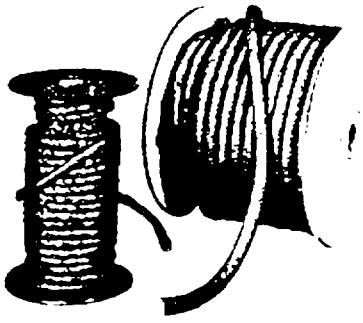
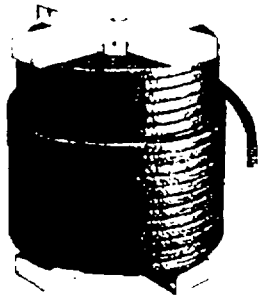
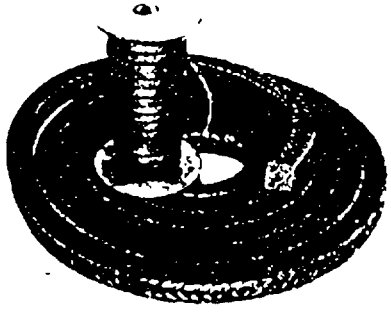
GARLOCK
BRAIDED WHITE ASBESTOS PACKINGS



117-B AND 117-T



234



256

SERVICE	STYLE	APPLICATIONS
Hot and cold water, low and medium pressure steam and aqueous solutions	17-B	Hot, slow speed general service on rotary and reciprocating shafts and valve stems
Hot and cold water, low and medium pressure steam and aqueous solutions	117-B	Similar to 17-B but at lower temperatures
Hot and cold water, low and medium pressure steam and aqueous solutions	117-T	An excellent valve stem and emergency slow-speed dynamic packing
Hot and cold water, low and medium pressure steam and aqueous solutions	233	For piston and valve rods of pumps and engines, valve stems and slow speed rotary shafts
General: Hot and cold water, alcohol, ketones, low and medium pressure steam and aqueous solutions	234	General applications on rotating or reciprocating shafts
Solvents: Cold oils, gasoline, benzol, chlorinated solvents, esters and carbon bisulphide. Not recommended against alcohol or ketones	237	Reciprocating rods and plungers, centrifugal pumps and rotary shafts, valve stems where solvents are involved
Hot and cold water, low and medium pressure steam and aqueous solutions	243	For piston and valve rods of pumps and engines, stems of globe and angle valves, shafts of centrifugal pumps
General: Hot and cold water, alcohol, ketones, low and medium pressure steam and aqueous solutions	244	Same as 234, but for use at higher pressures
Steam, air, water or inert gases	256	Ideal for compressor, expansion joint or valve stem service

ST0214750

ST0214750

ST0214751

for service on reciprocating rods, rams and plungers; centrifugal and rotary shafts . . .
also slow speed dynamic applications, valve stems, expansion joints

BRAID AND MATERIALS	PACKING SIZES	1/16"	1/8"	3/16"	1/4"	5/16"	3/8"	7/16"	1/2"	9/16"	5/8"	11/16"	3/4"	13/16"	7/8"	15/16"	1"
Braid over-braid. Round cross section. Long-fiber white asbestos yarn, treated with heat resisting compound for steam service to 600°F. Graphited throughout.	Feet per pound†	300	110	60	27	17	12	9	7	6	4 1/4	3 1/8	3	2 1/8	2 1/4	2	1 3/4
Braid over-braid. Round cross section. Long-fiber white asbestos yarn with mineral-fat lubricant. Graphited throughout.	Feet per pound†	300	110	60	27	17	12	9	7	6	4 1/4	3 1/8	3	2 1/8	2 1/4	2	1 3/4
Twisted. Round cross section. Long-fiber white asbestos yarn with mineral-fat lubricant. Graphited throughout.	Feet per pound†	300	110	60	27	17	12	9	7	6	4 1/4	3 1/8	3	2 1/8	2 1/4	2	1 3/4
Braid-over-braid. Square cross-section. Long fiber white asbestos yarn, impregnated with mineral fat lubricant. Graphited throughout. Available with wire, if specified.	Coils per box		x	x	6	6	4	3	3	3	3	3	3	1	1	1	1
	Feet per box		x	x	120	100	116	72	66	60	51	45	42	26	24	22	20
	Pounds per box		x	x	5	6 1/8	11	9 1/4	11	13 1/4	13 1/8	14 1/4	16	11 1/8	12 1/8	13	13 1/8
Regular braid. Square cross-section. White asbestos yarn, impregnated with mineral fat lubricant, graphited throughout. Available *unlubricated* but *surface* graphited, when specified.	Coils per box		x	x	6	6	4	3	3	3	3	3	3	1	1	1	1
	Feet per box		x	x	120	100	116	72	66	60	51	45	42	26	24	22	20
	Pounds per box		x	x	5	6 1/8	11	9 1/4	11	13 1/4	13 1/8	14 1/4	16	11 1/8	12 1/8	13	13 1/8
Regular braid. Square cross section. Long fiber white asbestos yarn lubricated with soap and glycerol compound and graphited throughout.	Coils per box		x	x	6	6	4	3	3	3	3	3	3	1	1	1	1
	Feet per box		x	x	120	100	116	72	66	60	51	45	42	26	24	22	20
	Pounds per box		x	x	5 1/8	7 1/4	12 1/4	10 1/4	12 1/8	14 1/4	15	16	17 3/4	12 1/8	14 1/4	14 1/8	15
Braid-over-braid. Round cross-section. Long fiber white asbestos yarn. Mineral-fat lubricant. Graphited throughout. Soft and pliable.	Coils per box		x	x	6	6	4	3	3	3	3	3	3	1	1	1	1
	Feet per box		x	x	120	100	116	72	66	60	51	45	42	26	24	22	20
	Pounds per box		x	x	4	5 1/4	8 3/4	7 1/4	8 1/4	10	10 1/8	11 1/4	12 1/8	9 1/4	9 3/4	10 1/8	10 3/4
Regular braid. Square cross section. Same materials as 234 except it has copper wire insertion.	Coils per box		x	x	6	6	4	3	3	3	3	3	1	1	1	1	1
	Feet per box		x	x	120	100	116	72	66	60	51	45	42	26	24	22	20
	Pounds per box		x	x	5 1/8	7 1/4	12 1/4	10 1/4	12 1/8	14 1/4	15	16	17 3/4	12 1/8	14 1/4	14 1/8	15
Regular braid. Square cross-section. Long fiber white asbestos yarn, copper wire inserted. Impregnated throughout with a petroleum lubricant by controlled process which eliminates excessive lubrication. Graphite coated surface. Available without wire, when specified.	Coils per box		x	x	6	6	4	3	3	3	3	3	3	1	1	1	1
	Feet per box		x	x	120	100	116	72	66	60	51	45	42	26	24	22	20
	Pounds per box		x	x	6 1/4	8	13 1/8	11 1/8	13 1/8	15 3/4	16 1/8	17 1/8	18 1/8	14 1/4	15 1/4	16	16 1/8

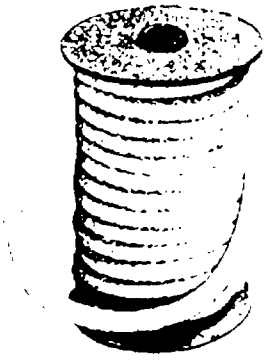
CONTINUED ON NEXT PAGE

ST0214751

BRAIDED WHITE ASBESTOS PACKINGS—Continued

SERVICE	STYLE	APPLICATIONS
Solvents. Cold oils, gasoline, benzol, chlorinated solvents, esters and carbon bisulphide. Not recommended against alcohol or ketones	257	Slow speed dynamic applications valve stems and expansion joints
General. Hot and cold water, alcohol, ketones, low and medium pressure steam and aqueous solutions	644	Particularly suited for compressor and turbine service. Capable of withstanding high gland loads without collapsing
Cold water	983	POLARPAK* braided packing. Ideal for maintenance, especially suited for high speed rotary and reciprocating service
Hot water and steam to 1250°F. (if stuffing box does not exceed 750°F.)	1700	Hot, dry installations- both dynamic valve stems and static gasketing furnace doors
Stock and liquor and white water in the paper industry	5482	PAPERPAK* braided packing. Made specifically for the paper industry. Especially suited for pumps and high-speed rotary and reciprocating applications where ever contamination cannot be tolerated
Oxygen	5603-B	Slow-speed dynamic applications on oxygen equipment, valve stems, expansion joints

*Garlock Trademark



6803-B

SOOT BLOWER PACKING

We offer two sizes of packing sets to fit Type IK soot blowers. Other sizes are available on special order. Sets consist of conical shaped packing rings of Style 127 braided white asbestos with plastallic cores, complete with top and bottom adapters.

Available in two standard sizes.

$2^{3}/_{4}$" x $3^{1}/_{8}$" x $3^{1}/_{4}$" deep.

$2^{3}/_{4}$" x $3^{1}/_{8}$" x $3^{3}/_{4}$" deep.



127

GARLOCK BRAIDED WHITE ASBESTOS PACKINGS WITH PLASTALLIC CORES

SERVICE	STYLE	APPLICATIONS
Hot water and steam valve stem service to 1200°F line* ; pressures to 4000 psi *Average temperature of packing will be several hundred degrees less than line temperature	127	Ideal for valve stems in high-pressure high-temperature power plant and oil refinery applications. Also unexcelled expansion joint packing for temperatures up to 750°F or 800°F
Similar to 127. Recommended where service conditions are not severe enough for 127 or where a Monel wire insertion is desired	5855 5865	Similar to 127 but made with Monel wire inserted asbestos yarn jacket. Also available without wire when specified Same as 5855 except made with mica instead of graphite to eliminate contamination and discoloration
Similar to 127	5901	Specially developed to meet Government Spec. MIL P 17303, Class II Type E, symbol 1111

ST0214752

for service on reciprocating rods, rams and plungers; centrifugal and rotary shafts . . . also slow speed dynamic applications, valve stems, expansion joints

BRAID AND MATERIALS	PACKING SIZES	1/16"	3/32"	1/8"	5/32"	3/16"	7/32"	1/4"	5/16"	3/8"	7/16"	1/2"	9/16"	5/8"	11/16"	3/4"	13/16"	7/8"	15/16"	1"
Braid over braid. Square cross section. Long-fiber white asbestos yarn with soap-fat lubricant. Graphited throughout	Feet per pound*		107	47	27	17½	12	8¾	6½	5	4½	3½	3	2½	2¼	2	1¾	1½	1⅜	1¼
Regular braid. Square cross-section. Long-fiber white asbestos yarn and strands of soft lead twisted together and braided. Thoroughly mineral fat lubricated. Graphite coated surface	Coils per box		x	x	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Feet per box		x	x	50	45	39	36	30	24	22	19	17	16	16	15	15	15	15	15
	Pounds per box		x	x	5½	7½	9½	12	13	13½	15	15¾	16½	17¼	20	23	26	28	30	33
Regular braid. Square cross section. All-white long fiber asbestos. Thoroughly compounded with stable all-white lubricant. Surface treated with all-white TFE fluorocarbon resin. Soft and pliable, with low friction characteristics	Coils per box		x	x	5	5	4	3	3	3	3	3	3	1	1	1	1	1	1	1
	Feet per box		x	x	120	100	116	72	66	60	51	45	42	26	24	22	20	19	18	17
	Pounds per box		x	x	6	6½	11	9¼	11	13½	13½	14½	16	11½	12½	13	13½	14½	15½	16½
Braid-over-braid. Round cross section (also available square or out-of-square). Long-fiber white asbestos yarn. No internal lubricant, but graphite coated on surface. Available with wire, when specified	Feet per pound‡	500	195	90	50	30	20	16	13	10	8	6½	5½	4½	4	3½	3	2¾	2½	2¼
Regular braid. Square cross-section. Same basic materials as 983, adapted to meet the special requirements of the paper industry	Coils per box		x	x	5	5	4	3	3	3	3	3	3	1	1	1	1	1	1	1
	Feet per box		x	x	120	100	116	72	66	60	51	45	42	26	24	22	20	19	18	17
	Pounds per box		x	x	6	6½	11	9¼	11	13½	13½	14½	16	11½	12½	13	13½	14½	15½	16½
Braid over braid. Square cross-section. 100% pure white asbestos yarn. Neither lubricated nor graphited. Use as is or treat to suit your needs. A relatively soft packing	Coils per box		x	x	5	5	4	3	3	3	3	3	3	1	1	1	1	1	1	1
	Feet per box		x	x	120	100	116	72	66	60	51	45	42	26	24	22	20	19	18	17
	Pounds per box		x	x	3½	4½	7½	6½	7½	9	9½	10	11½	8	8¾	9¼	9½	10	10½	11

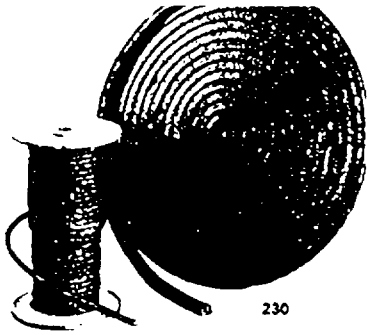
All Styles available on 25, 50 and 100 lb. reels x Available in 1 lb. and 5 lb. spools only *Sizes above 1" available in ⅛" increments
*Available on 1 lb. or 5 lb. spools or reels only ‡⅛"-⅜" – 1 lb. spools; ½"-¾" – 5 lb. spools; ⅞"-1" – 25, 50, 100 lb. reels

for service on valve stems, expansion joints and slow-speed dynamic applications

BRAID AND MATERIALS	PACKING SIZES	1/4"	5/16"	3/8"	7/16"	1/2"	9/16"	5/8"	11/16"	3/4"	13/16"	7/8"	15/16"	1"
Braided jacket. Square cross section. Homogeneous core of white asbestos. Braided jacket of 80% Grade AA asbestos. Inconel* wire inserted. Surface treated with elastomeric material and graphite. Corrosion inhibitor. Also available without wire	Coils per box	x	x	5	5	4	3	3	3	3	3	3	1	1	1	1
	Feet per box	x	x	120	100	116	72	66	60	51	45	42	26	24	22	20
	Pounds/box (wire)	x	x	6½	8	13½	11½	13½	15½	16½	17½	18½	14½	15½	16	16½
	Pounds/box (no wire)	x	x	5½	7½	12½	10½	12½	14½	15	16	17½	12½	14½	14½	15
Similar to 127 but made with Monel* wire inserted asbestos yarn jacket. Also available without wire when specified	Coils per box	x	x	5	5	4	3	3	3	3	3	3	1	1	1	1
	Feet per box	x	x	120	100	116	72	66	60	51	45	42	26	24	22	20
	Pounds/box (wire)	x	x	6½	8	13½	11½	13½	15¾	16½	17½	18½	14½	15½	16	16½
	Pounds/box (no wire)	x	x	5	6½	11	9¼	11	13½	13½	14½	16	11½	12½	13	13½
SBR bonded asbestos-graphite core with Grade AA, 80% asbestos Inconel* wire inserted yarn jacket. Corrosion inhibitor. If compliance with Government specification not necessary, use Garlock 127	Coils per box	x	x	5	5	4	3	3	3	3	3	3	1	1	1	1
	Feet per box	x	x	120	100	116	72	66	60	51	45	42	26	24	22	20
	Pounds/box (wire)	x	x	6½	8	13½	11½	13½	15¾	16½	17½	18½	14½	15½	16	16½
	Pounds/box (no wire)	x	x	5	6½	11	9¼	11	13½	13½	14½	16	11½	12½	13	13½

*International Nickel Company Trademark All styles available on 25, 50 and 100 lb. reels
x Available in 1 lb. and 5 lb. spools only ‡Sizes above 1" available in ½" increments

GARLOCK BRAIDED BLUE ASBESTOS PACKINGS



230

SERVICE	STYLE	APPLICATIONS
Acids and corrosive chemicals specifically recommended for nitric acid	230	Reciprocating rods, rams and plungers centrifugal and rotary shafts
Strong mineral acids, but NOT recommended for nitric acid service	5414	Slow speed dynamic applications valve stems and expansion joints

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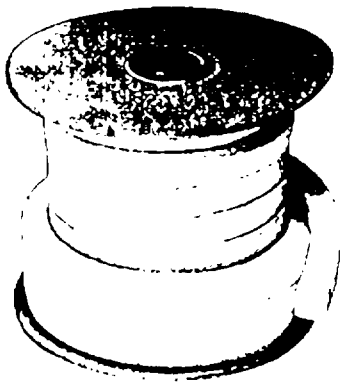
GARLOCK BRAIDED ASBESTOS PACKINGS WITH TFE TREATMENT



5555

SERVICE	STYLE	APPLICATIONS
Corrosive mineral acids and caustics including nitric acid. Not recommended against molten alkali metals, chlorine trifluoride or gaseous fluorine at elevated temperatures and pressures	5298	Suitable for general service on reciprocating rods rams, and plungers rotary and centrifugal shafts
Solvents, mild acids, mild alkalies	5555	Very effective valve stem packing where out-of-square sizes are required. Recommended for paper mills and process plants, where noncontamination is essential
Extremely corrosive acids and caustics including nitric acid. Not recommended against molten alkali metals or hot complex halogen compounds	5561	For service on slow speed dynamic applications, valve stems and expansion joints

GARLOCK BRAIDED FLAX PACKINGS



26

SERVICE	STYLE	APPLICATIONS
Cold water and dilute aqueous solutions	26	Low and medium pressure use on outside-packed plungers, reciprocating and centrifugal pumps, accumulators and other hydraulic equipment where cold water is encountered
Cold water and dilute aqueous solutions	31	Same as Style 26, except for somewhat less severe service

ST0211751

for service on reciprocating rods, rams and plungers; centrifugal and rotating shafts

BRAID AND MATERIALS	PACKING SIZES	1/8"	5/32"	3/16"	7/32"	1/4"	5/16"	3/8"	7/16"	1/2"	9/16"	5/8"	11/16"	3/4"	13/16"	7/8"	15/16"	1"*
Regular braid. Square cross section. Blue asbestos, thoroughly treated with mineral-fat lubricant. Externally graphited	Coils per box	x	x	5	5	4	3	3	3	3	3	3	1	1	1	1		
	Feet per box	x	x	120	100	116	72	66	60	51	45	42	26	24	22	20		
	Pounds per box	x	x	5 1/8	7 1/4	12 1/8	10 1/4	12 1/8	14 1/4	15	16	17 3/4	12 3/4	14 1/4	14 1/8	15		
Braid-over braid. Square cross-section. Blue asbestos thoroughly treated with blended mineral-animal fat lubricant. Externally graphited	Coils per box	x	x	5	5	4	3	3	3	3	3	3	1	1	1	1		
	Feet per box	x	x	120	100	116	72	66	60	51	45	42	26	24	22	20		
	Pounds per box	x	x	5 1/8	7 1/4	12 1/8	10 1/4	12 1/8	14 1/4	15	16	17 3/4	12 3/4	14 1/4	14 1/8	15		

All styles available on 25, 50 and 100 lb. reels. x Available in 1 lb. and 5 lb. spools only. *Sizes above 1" thru 1½" in ⅛" increments (Style 210 only)

for service on reciprocating rods, rams and plungers; centrifugal and rotary shafts; valve stems

BRAID AND MATERIALS	PACKING SIZES	1/8"	5/32"	3/16"	7/32"	1/4"	5/16"	3/8"	7/16"	1/2"	9/16"	5/8"	11/16"	3/4"	13/16"	7/8"	15/16"	1"†
Regular braid. Square cross-section. Blue African asbestos, thoroughly treated with TFE. No graphite. A relatively firm packing	Coils per box	x	x	x	x	x					2	2	1	1	1	1		
	Feet per box						xx	xx	xx	xx	30	28	26	24	22	20		
	Pounds per box										9 1/4	11 1/4	11 1/8	12 1/8	13	13 1/8		
Braided jacket. Square cross section. A plastic packing with powdered TFE-white asbestos core and single braided asbestos yarn jacket impregnated with TFE suspensoid. No graphite	Coils per box	x	x	x	x	x					2	2	1	1	1	1		
	Feet per box						xx	xx	xx	xx	30	28	26	24	22	20		
	Pounds per box										8 1/8	9 1/4	10 1/4	11	11 1/8	12		
Braid-over braid. Square cross section. Blue African asbestos, thoroughly treated with TFE. No graphite	Coils per box	x	x	x	x	x					2	2	1	1	1	1		
	Feet per box						xx	xx	xx	xx	30	28	26	24	22	20		
	Pounds per box										11	12 1/4	12 3/4	14 1/4	14 1/8	15		

All styles available on 25, 50 and 100 lb. reels. x Available in 1 lb. and 5 lb. spools only. xx Available in 5 lb. spools only. † Sizes above 1" in ½" increments.

for service on reciprocating rods, rams and plunges; centrifugal and rotary shafts

BRAID AND MATERIALS	PACKING SIZES	1/8"	5/32"	3/16"	7/32"	1/4"	5/16"	3/8"	7/16"	1/2"	9/16"	5/8"	11/16"	3/4"	13/16"	7/8"	15/16"	1"†
Regular braid. Square cross-section. High grade, No. 1 longest-fiber flax roving, free from tow and short fibers. Treated with blended marine wax and paraffin lubricant. No graphite. A medium hard packing	Coils per box	x	x	5	5	4	3	3	3	3	3	3	1	1	1	1		
	Feet per box	x	x	120	100	116	72	66	60	51	45	42	26	24	22	20		
	Pounds per box	x	x	3 1/8	4 1/8	7 1/4	8 1/4	7 1/4	9	9 1/8	10	11 1/4	8	8 1/8	9 1/4	9 1/8		
Same as Style 26, but with No. 2 long-fiber flax roving	Coils per box	x	x	5	5	4	3	3	3	3	3	3	1	1	1	1		
	Feet per box	x	x	120	100	116	72	66	60	51	45	42	26	24	22	20		
	Pounds per box	x	x	4	5 1/4	8 3/4	7 1/4	8 3/4	10	10 1/4	11 1/4	12 1/8	9 1/4	9 3/4	10 1/4	10 3/4		

All styles available on 25, 50 and 100 lb. reels. x Available in 1 lb. and 5 lb. spools only. † Sizes above 1" in ½" increments.

CONTINUED ON NEXT PAGE

TIPS ON BRAIDED PACKING INSTALLATION

After you have selected the braided packing that satisfies your particular need there is one important factor yet to be considered . . . proper installation.

Overtightening of glands, using undersized or oversized cross sections and seating rings improperly are just a few of the possible causes that can cripple a braided packing's performance.

In order to ensure maximum efficiency and length of service from your Garlock braided packings, the following installation tips should be followed carefully:

1. Always store packings in a clean, dry place. Dirt, and abrasive materials should never come in contact with packing before installation.
2. Cut packing on mandrel or shaft by winding packing needed for stuffing box around rod and cut through each turn while coiled. Packings should be cut to fit exactly.
3. Use *all* new packings—never install used rings.
4. Prior to installing new packing, clean stuffing box thoroughly.
5. Install one ring at a time . . . tamping each one firmly into place.
6. When installing rings, stagger joints at 90° or 120° intervals.
7. Nuts on gland should be tightened finger tight then released ½ turn before starting up.
8. Make sure gland is pulled up evenly. If pulled too tight, packing will overheat and score rod on shaft. If too loose, packing will fail. Wait 15 minutes between adjustments.
9. A slight drip (5-10 cc per minute) should be allowed. This acts as lubrication for packing.
10. Whenever possible, use a lantern ring for auxiliary lubrication . . . particularly for slurries, gases and mobile liquids. When installing lantern ring every precaution should be taken to line up lantern ring with opening in stuffing box wall. This registry should be maintained at all times.



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66

GARLOCK BRAIDED FLAX PACKINGS—Continued

SERVICE	STYLE	APPLICATIONS
For paper mills and process plants	50	Low and medium pressure cold water, high pressure cold oil on reciprocating and centrifugal pumps, rams and plungers where contamination or discoloration can not be tolerated.
Water-proof hydraulic flax packings for heavy-duty, high pressure service	90	Same as Style 26 except for heavy duty service where the presence of graphite will be beneficial.
Water-proof hydraulic flax packings for heavy-duty, high pressure service	131	Same as Style 90 but in milder service.

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GARLOCK BRAIDED JUTE PACKINGS

SERVICE	STYLE	APPLICATIONS
Cold water and dilute aqueous solutions	35	Low and medium pressure use on rods and outside packed plungers of reciprocating pumps, rotary shafts and valve stems.

GARLOCK BRAIDED COTTON PACKINGS

SERVICE	STYLE	APPLICATIONS
Hot or cold water, alcohol or dilute aqueous solutions	66	Low and medium pressure cold water on plungers, rams, reciprocating and centrifugal pump rods and shafts.

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for service on reciprocating rods, rams and plungers; centrifugal and rotary shafts

BRAID AND MATERIALS	PACKING SIZES	1/8"	5/32"	3/16"	7/32"	1/4"	9/32"	5/16"	11/32"	3/8"	13/32"	7/16"	1/2"	9/16"	5/8"
Regular braid. Square cross-section. Longest-fiber flax roving, free from tow and short fibers, impregnated with marine and petroleum wax lubricant. No graphite. Clean, non-toxic.	Coils per box	x	x	6	5	4	3	3	3	3	3	3	1	1	1	1
	Feet per box	x	x	120	100	116	72	66	60	51	45	42	26	24	22	20
	Pounds per box	x	x	4	5 1/4	8 3/4	7 1/4	8 3/4	10	10 1/4	11 1/4	12 1/2	9 1/4	9 3/4	10 1/4	10 3/4
Regular braid. Square cross-section. No. 1 longest-fiber flax roving, free from tow and short fibers, impregnated with modified marine and petroleum waxes and graphite lubricant. A relatively firm packing. For less severe service specify Style 90-S (soft) or Style 90-VS (very soft).	Coils per box	x	x	5	5	4	3	3	3	3	3	3	1	1	1	1
	Feet per box	x	x	120	100	116	72	66	60	51	45	42	26	24	22	20
	Pounds per box	x	x	4	5 1/4	8 3/4	7 1/4	8 3/4	10	10 1/4	11 1/4	12 1/2	9 1/4	9 3/4	10 1/4	10 3/4
Same as Style 90, but with No. 2 long-fiber flax roving.	Coils per box	x	x	5	5	4	3	3	3	3	3	3	1	1	1	1
	Feet per box	x	x	120	100	116	72	66	60	51	45	42	26	24	22	20
	Pounds per box	x	x	4	5 1/4	8 3/4	7 1/4	8 3/4	10	10 1/4	11 1/4	12 1/2	9 1/4	9 3/4	10 1/4	10 3/4

All styles available on 25, 50 and 100 lb. reels x Available in 1 lb. and 5 lb. spools only †Sizes above 1" in 1/8" increments

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for service on reciprocating rods and plungers; rotating shafts and valve stems

BRAID AND MATERIALS	PACKING SIZES	1/8"	5/32"	3/16"	7/32"	1/4"	9/32"	5/16"	11/32"	3/8"	13/32"	7/16"	1/2"	9/16"	5/8"
Regular braid. Square cross-section. High grade jute fiber, free from short fibers. Treated with mineral oil, paraffin and marine-fat lubricant. Ungraphited. Medium density. Also available dry.	Coils per box	x	x	5	5	4	3	3	3	3	3	3	1	1	1	1
	Feet per box	x	x	120	100	116	72	66	60	51	45	42	26	24	22	20
	Pounds per box	x	x	3 1/2	4 1/2	7 1/4	6 1/4	7 3/4	9	9 1/4	10	11 1/2	8	8 3/4	9 1/4	9 1/2

All styles available on 25, 50 and 100 lb. reels x Available in 1 lb. and 5 lb. spools only †Sizes from 1 1/16" thru 1 1/2" in 1/16" increments

for service on reciprocating rods, rams and plungers; centrifugal and rotary shafts

BRAID AND MATERIALS	PACKING SIZES	1/8"	5/32"	3/16"	7/32"	1/4"	9/32"	5/16"	11/32"	3/8"	13/32"	7/16"	1/2"	9/16"	5/8"
High-grade cotton yarn, braided regular in square cross section. Impregnated with mineral-fat lubricant and externally graphited. The softness of this style keeps shaft wear to a minimum.	Coils per box	x	x	5	5	4	3	3	3	3	3	3	1	1	1	1
	Feet per box	x	x	120	100	116	72	66	60	51	45	42	26	24	22	20
	Pounds per box	x	x	4	5 1/4	8 3/4	7 1/4	8 3/4	10	10 1/4	11 1/4	12 1/2	9 1/4	9 3/4	10 1/4	10 3/4

All styles available on 25, 50 and 100 lb. reels x Available in 1 lb. and 5 lb. spools only †Sizes from 1 1/16" thru 1 1/2" in 1/16" increments

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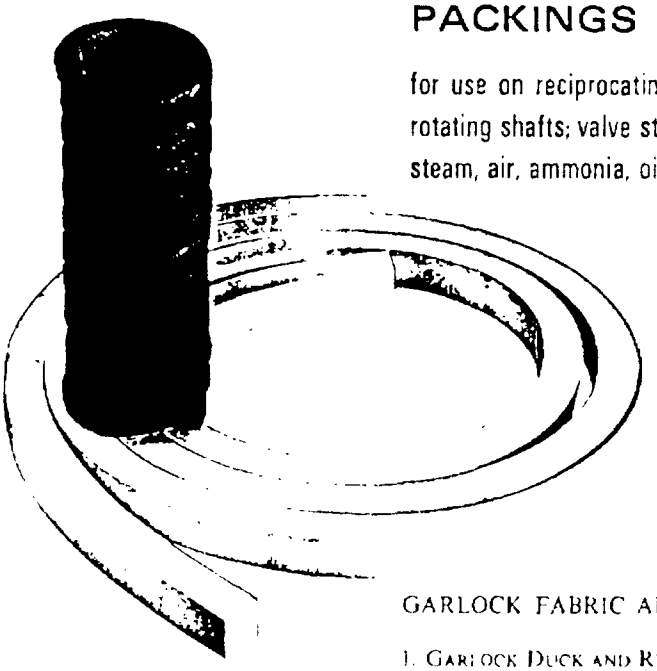
GARLOCK FABRIC AND RUBBER PACKINGS

for use on reciprocating rods, rams and plungers; centrifugal and rotating shafts; valve stems and expansion joints handling water, steam, air, ammonia, oils, chlorine and gases



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GARLOCK FABRIC AND RUBBER PACKINGS INCLUDE:

1. GARLOCK DUCK AND RUBBER PACKING made from highest quality, various weight cotton duck fabrics with natural, neoprene or SBR rubber binders. This packing does a superior job in hot water service, because its built-in resiliency compensates for the swelling tendency common with ordinary hot water packing. It withstands temperatures to 250°F. Garlock Duck and Rubber Packing is available in three types:

   LAMINATED CONSTRUCTION, where duck and rubber are press-laminated into slab form, then fabricated into coil or spiral form. All styles are laminated flat, except Garlock 711, which is laminated diagonally.

   ROLLED CONSTRUCTION, medium weight rubber-coated cotton duck with a hollow center. Cross section is square. Allows expansion and contraction of packing without binding.

   ROLLED CONSTRUCTION, medium weight rubber-coated cotton duck rolled around a round rubber core. Round cross section. High resiliency permits flexing without binding or seizing.

2. GARLOCK ASBESTOS AND RUBBER PACKING made from asbestos cloth woven in our own textile mill . . . impregnated and coated with Garlock compounded SBR rubber, insuring quality controlled products. Garlock Asbestos and Rubber Packing is available in two general types:

   LAMINATED CONSTRUCTION, where asbestos and rubber are laminated into slab form, then made into coils, spirals or rings. All styles laminated flat.

   ROLLED CONSTRUCTION, made of rolled asbestos cloth and rubber or metal in three styles: with rubber core, with lead wedge, or with accordion-folded asbestos cloth and rubber strip.

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GENERAL RECOMMENDATION CHART

This chart covers most common applications for Garlock Duck and Rubber Packings and Garlock Asbestos and Rubber Packings. The styles we consider best for various applications are listed. Some users may prefer other Garlock Fabric and Rubber styles, or braided packings, or plastallic packings, all covered in this catalog.

Fluid Being Handled	TYPE OF EQUIPMENT						
	Piston and Valve Rods	Steam Hammers	Slip-Type Expansion Joints	Compressor Rods	Valve Stems	Reciprocating Pump Rods	End Rings
Water (Hot or Cold)	333 711				333	333 711	282
Low-Pressure Steam (Up to 250°F.)	333 150	150 377	150	150 377	333 150	333 366	262
Medium-Pressure Steam (250°F. to 550°F.)	150 377	150 377	150	150 377	150	150 377	150
Air and Gases (Up to 600°F.)	150		150	150 366	150		150
Ammonia	711 377			334 377	334	711 377	
Chlorine					7130		
Aliphatic Oils (Up to 250°F.)	7279		7279	7279	7279	7279	7392

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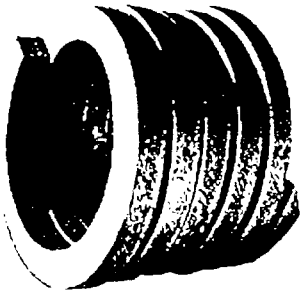
GARLOCK
DUCK AND RUBBER PACKINGS



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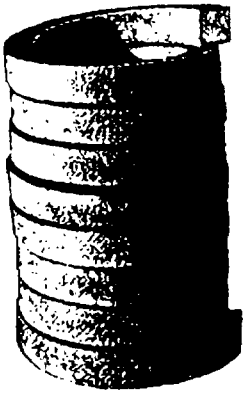

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SERVICE	STYLE	APPLICATIONS
Hot or cold water and low pressure steam	33*	Especially recommended for heavy duty hydraulic service or as end rings
Cold water	38*	Pistons or plungers of inside packed pumps or as end rings to prevent softer packing extrusion
Hot or cold water	262**	Same as Style 38 but also good for hot water service
Hot or cold water, low pressure steam	333***	Piston and valve rods of steam engines and reciprocating pumps valve stems rotating shafts at slow speeds (Also suitable for use against ammonia order style 334.)
Hot or cold water, low pressure steam	366	Steam hammer pistons plungers of outside packed pumps and elevators, piston rods of steam engines Hollow center allows for expansion compensates for rod weave or lateral motion
Hot or cold water, low pressure steam and hot mixtures of anhydrous ammonia	711	Piston and valve rods of steam engines and reciprocating pumps, ammonia rods, and rotating shafts at slow speeds Diagonal construction permits operation with light gland pressure Ideal where rod weave or lateral motion exists
Hot or cold water	7636†	Plungers of outside packed pumps, elevators, accumulators and other heavy hydraulic services As end rings in combination with braided packing rings
Ammonia	334‡	Suitable for ammonia service

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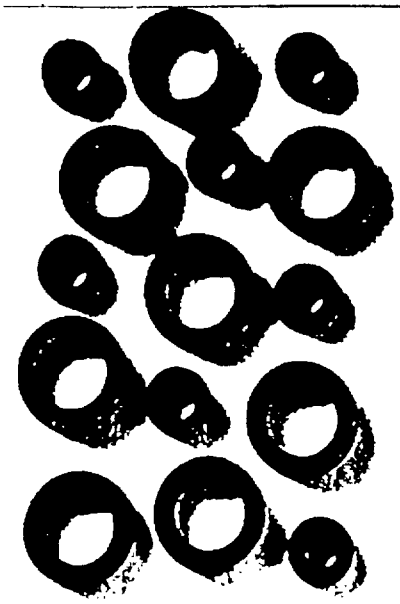
for service on pistons or plungers of inside-packed and outside-packed pumps; heavy hydraulic use; end rings

CONSTRUCTION AND MATERIALS	PACKING SIZES	1/4"	5/16"	3/8"	7/16"	1/2"	9/16"	5/8"	11/16"	3/4"	13/16"	7/8"	15/16"	1"
Laminate consisting of plies of strong medium-weight cotton duck treated with special Garlock SBR rubber compound. Either regular cure for most applications or rockhard cure for some hot water and high-pressure services	COILS per box			4	3	3	2	2	2	2		2		1		1
	Feet per box			60	45	45	30	30	30	30		30		15		15
	Pounds per box			1 9/16	2 1/8	3	2 3/4	3 1/8	4 1/4	5 1/8		8		5 1/8		7 1/4
Laminate of medium weight cotton duck plies treated with a Garlock SBR rubber compound. Dry top and bottom covers. No graphite or lubrication	COILS per box			4	3	3	2	2		2		2		1		1
	Feet per box			60	45	45	30	30		30		30		15		15
	Pounds per box			1 9/16	2	2 1/8	2 9/16	3 1/16		5 1/4		7 1/16		5 1/8		6 1/16
A laminated special white hydraulic packing of fine cotton fabric plies, treated with natural rubber compound. No graphite, no lubricant. Regular cure for most applications. Rockhard for some high-pressure hot water services	COILS per box			4	3	3	2	2	2	2	2	2	1	1	1	1
	Feet per box			60	45	45	30	30	30	30	30	30	15	15	15	15
	Pounds per box			2 1/8	3	4 1/16	4	5 1/16	6 1/16	8 1/16	9 1/4	11 9/16	6 1/16	8	8 1/16	10 1/16
A laminate consisting of plies of closely woven heavyweight cotton duck, treated with special Garlock SBR rubber compound. Graphited and mineral oil lubricated. Has rubber top and bottom covers	COILS per box			6	4	4	4	4	3	3		2		1		1
	Feet per box			75	50	50	50	50	37 1/2	37 1/2		25		12 1/2		12 1/2
	Pounds per box			3 1/16	3	4	5 1/16	7		8 1/4		8		5 1/16		7 1/16
	SPIRALS per box	4	3	2	1	1	1	1		1		1		1		*
	Feet per box	60	37 1/2	25	12 1/2	12 1/2	12 1/2	12 1/2		12 1/2		12 1/2		12 1/2		12 1/2
	Pounds per box	1/4	1	1 1/16	1/4	1	1 3/16	1 3/4		2 1/16		4		5 1/16		7 1/16
Rolled construction, with hollow center. Square cross-section. Special medium-weight cotton duck frictioned with Garlock SBR rubber compound (except outside surfaces). Modified glycerol lubricant. Externally graphited	COILS per box					4	4	4	3	3		2		1		1
	Feet per box					50	50	50	37 1/2	37 1/2		25		12 1/2		12 1/2
	Pounds per box					4	5 1/16	7	6 1/4	8 1/16		8		5 1/16		7 1/16
	SPIRALS per box			2	1	1	1	1		1		1		1		1
	Feet per box			25	12 1/2	12 1/2	12 1/2	12 1/2		12 1/2		12 1/2		12 1/2		12 1/2
	Pounds per box			1/4	1/4	1	1 3/16	1 3/4		2 1/16		4		5 1/16		7 1/16
Heavyweight cotton duck plies, treated with special Garlock SBR rubber compound. Laminated diagonally. Top and bottom covers of rubber and fabric. Graphited and mineral oil lubricated	COILS per box			6	4	4	4	4	3	3		2		1		1
	Feet per box			75	50	50	50	50	37 1/2	37 1/2		25		12 1/2		12 1/2
	Pounds per box			2 1/16	3	4	5 1/16	7		8 1/4		8		5 1/16		7 1/16
	SPIRALS per box			2	1	1	1	1	1	1	1	1	1	1		1
	Feet per box			25	12 1/2	12 1/2	12 1/2	12 1/2	12 1/2	12 1/2	12 1/2	12 1/2	12 1/2	12 1/2		12 1/2
	Pounds per box			1/4	1/4	1	1 3/16	1 3/4	2 1/16	2 1/16	3 1/8	4	4 1/16	5 1/16		7 1/16
Laminated heavyweight cotton duck plies, treated with Garlock black natural rubber compound. Untreated top and bottom fabric covers. No graphite. No lubrication	SPIRALS per box							2		2		2		1		1
	Feet per box							60		50		50		25		25
	Pounds per box							5 1/4		9		13 1/16		9		12
Same as 333 but in ring form																

*1¾" also available
**1⅛" and 1¼" also available
***1⅛" also available in spiral only
†1⅛", 1¼", 1⅜" and 1½" also available
‡Available in ring form



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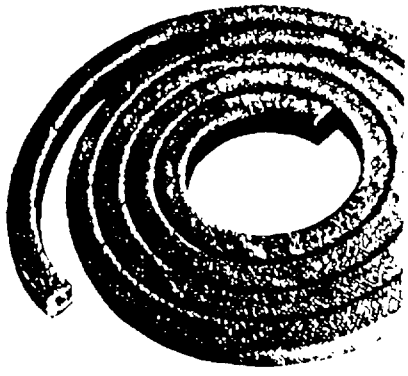

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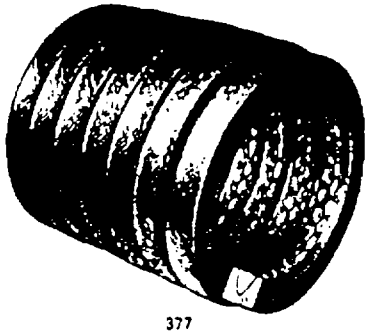

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FOR ORDERING INFORMATION,
SEE PAGE P-30

GARLOCK
ASBESTOS AND RUBBER PACKINGS

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SERVICE	STYLE	APPLICATIONS
Steam at pressures to 300 psi, temperatures to 600°F	144	Piston rods of steam engines, pumps, compressors, hammers, logging equipment, expansion joints. Particularly good against wet steam.
Steam at pressures to 300 psi, temperatures to 600°F	150*	Same as Style 144. Also ideal for use where vibration or lateral weave exists.
Steam, air, ammonia or gas at temperatures to 600°F	377	Especially good for vertical rods. Piston and valve rods on steam engines, pumps, compressors, hammers, logging machinery, ammonia compressors, reciprocating rods and shafts of enclosed crankcase types.
Hot and cold water, steam and gases to 600°F.	7130	Particularly recommended for use on valves on chlorine containers. *Approved by the Chlorine Institute.*

ST0214762

ST0214763

for service on piston and valve rods; compressor and pump rods; valve stems; expansion joints

CONSTRUCTION AND MATERIALS	PACKING SIZES	1/8"	5/32"	3/16"	7/32"	1/4"	5/16"	3/8"	7/16"	1/2"	9/16"	5/8"	11/16"	3/4"	13/16"	7/8"	15/16"	1"
Rolled construction with rubber core. Approximately square cross-section. Specially woven Garlock asbestos cloth, rubber impregnated (except outside surface). Wrapped around a resilient rubber core. Modified glycerol lubricant. Surface coated with graphite.	COILS per box	6	6	6	4	4	4	4	3	3	2	2	1	1	1	1		1
	Feet per box	75	75	75	50	50	50	50	37 1/2	37 1/2	25	25	12 1/2	12 1/2	12 1/2	12 1/2		12 1/2
	Pounds per box	1/4	1 1/4	3	3	4 1/2	6 1/2	8 1/2	7 1/2	9 1/2	8	9 1/2		6 3/4		8 1/2		8 1/2
	SPIRALS per box	4	3	2	1	1	1	1	1	1	1	1	1	1	1	1		1
	Feet per box	50	37 1/2	25	12 1/2	12 1/2	12 1/2	12 1/2	12 1/2	12 1/2	12 1/2	12 1/2	12 1/2	12 1/2	12 1/2	12 1/2		12 1/2
	Pounds per box	1/4	3/4	1	1 1/4	1 1/2	1 3/4	2 1/4	2 1/2	3 1/4	4	4 3/4		6 3/4		8 3/4		8 3/4
Fabric jacket around a core of accordion folded rubber-impregnated asbestos cloth, combined with resilient rubber strip. Square cross-section. Specially woven Garlock asbestos cloth, rubber impregnated (except outside surface). Externally treated with modified glycerol lubricant and graphite.	COILS per box	6	6	6	4	4	4	4	3	3	2	2	1	1	1	1		1
	Feet per box	75	75	75	50	50	50	50	37 1/2	37 1/2	25	25	12 1/2	12 1/2	12 1/2	12 1/2		12 1/2
	Pounds per box	1/4	1 1/4	3	3	4 1/2	6 1/2	8 1/2	7 1/2	9 1/2	8	9 1/2	5 1/2	6 3/4	7 3/4	8 3/4		8 3/4
	SPIRALS per box*	4	3	2	1	1	1	1	1	1	1	1	1	1	1	1		1
	Feet per box	50	37 1/2	25	12 1/2	12 1/2	12 1/2	12 1/2	12 1/2	12 1/2	12 1/2	12 1/2	12 1/2	12 1/2	12 1/2	12 1/2		12 1/2
	Pounds per box	1/2	3/4	1	1 1/4	1 1/2	1 3/4	2 1/4	2 3/4	3 1/4	4	4 3/4	5 1/2	6 3/4	7 3/4	8 3/4		8 3/4
Fabric construction, with lead wedge. Square cross section. The wedge-shaped soft bearing metal is set in a channel of woven, rubber-frictioned Garlock asbestos cloth. Wearing surfaces of wedge are staggered to assure pressure tight, yet continuous contact with rod. Modified glycerol lubricant. Externally graphited.	SPIRALS per box					1		1		1		1		1		1		1
	Feet per box					12 1/2		12 1/2		12 1/2		12 1/2		12 1/2		12 1/2		12 1/2
	Pounds per box					2 1/2		5 1/2		8		11 1/2		15 1/4		20 1/2		
Laminated fabric piled up and furnished in rectangular cross section. These rings are of Garlock asbestos cloth, frictioned with high grade SBR rubber binder. Rubber top and bottom covers. Treated with beeswax lubricant. Surface graphite coated. (Also available without graphite.)	Style 7130 available in rings with beveled joints, or "solid" if so specified. Available from stock in the standard sizes on the right																	

11/16" x 1 1/16" x 1/2"
13/16" x 1 1/16" x 1/2"
1 1/32" x 7/8" x 1/2"

*1 1/8" and 1 1/4" also available in spiral only

ST0214763

GARLOCK FLEXIBLE METALLIC PACKINGS

...low friction, long-lasting packings for service against high temperatures and high pressures

Garlock manufactures a wide selection of high quality flexible metallic packings capable of withstanding a variety of mediums on various types of equipment. Garlock Flexible Metallic Packings of lead, copper or aluminum are made into several different forms, including braided, twisted, pleated or spiral-wrapped. They provide the necessary high temperature and high pressure resistance, yet are sufficiently flexible and compressible to assure a tight, long-lasting seal.

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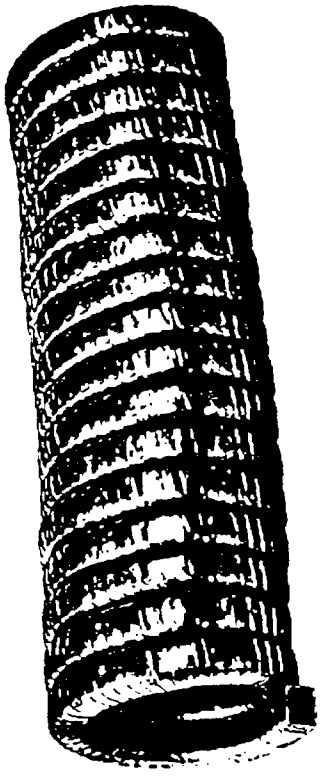

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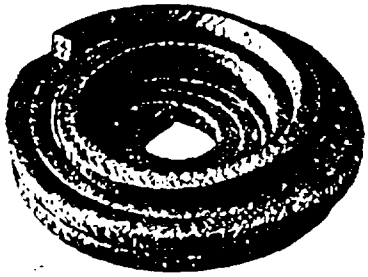
GARLOCK FLEXIBLE METALLIC LEAD PACKINGS

SERVICE	STYLE	APPLICATIONS
Steam, air, water, ammonia, gases and oils up to 550°F	**631**	Rods or shafts of centrifugal or reciprocating pumps, engines, valve stems, or expansion joints
Water or oil hydraulic service up to 550°F	**918**	Rotary and reciprocating shafts and rods of pumps or engines; valve stems
Steam, air, water, ammonia, gases and oils up to 550°F	**944**	Reciprocating rods or rotary shafts of engines, compressors, pumps. Especially recommended for rods not in perfect alignment
Steam, air, water, ammonia, gases and oils up to 550°F	**981**	Shafts of rotary or centrifugal pumps. Outside packed plungers of reciprocating pumps, reciprocating rods, valve stems



944

ST0214764

RECOMMENDED PACKING SERVICE APPLICATIONS

	Oil*	Water	Steam	Air	Gases (except Ammonia)	Liquid or Gaseous Ammonia	Dowtherm* A	Dowtherm* E
Valve Stems	631 633	631	631 635	631 635	631 635	631 633	633	937 635
Rotary Pumps	913					913	913	
Reciprocating Pumps and Compressors	631 633	631	631 635	631 635	631 635	631 633	633	631** 635
Expansion Joints	913						913	
End Rings	913	344	344	344	344	913	913	344

*Copper foil preferred by some instead of aluminum for low sulfur content oils
**Use up to 450° F only
*Dow Chemical Co. trademark

for service on rotary and reciprocating equipment and where packing must function somewhat as a bearing

CONSTRUCTION AND MATERIALS	PACKING SIZES	1/8"	5/32"	1/4"	5/16"	3/8"	7/16"	1/2"	9/16"	5/8"	11/16"	3/4"	13/16"	7/8"	15/16"	1"
Twisted Square cross section Lubricated and graphited lead foil twisted around an asbestos core A highly resilient packing	SPIRALS per box			1	1	1	1	1								
	Feet per box			12 1/2	12 1/2	12 1/2	12 1/2	12 1/2								
	Pounds per box			2 1/4	3 1/2	5	6 1/4	8 1/4								
Spiral-wrapped Square cross-section Lead foil around center core of braided and lubricated asbestos	SPIRALS per box			1	1	1		1		1		1		1		1
	Feet per box			12 1/2	12 1/2	12 1/2		12 1/2		12 1/2		12 1/2		12 1/2		12 1/2
	Pounds per box			1 1/2	1 1/2	2 1/2		4 1/4		6 1/2		9 1/2		14		17
Braided Approximately square cross-section Cotton yarn strands covered with lead foil and braided over a round core of resilient rubber Lubricated with oil Graphited throughout	COILS per box			1	1	1	1	1	1	1		1				
	Feet per box			50	45	39	36	30	24	22		17				
	Pounds per box			4 1/2	6 1/2	8 1/4	10 1/2	11 1/2	11 3/4	12 1/2		14 3/4				
Twisted with braided cover Square cross-section Strands of composition lead foil, bonded with special rubber cement, twisted to size and graphited Braided yarn cover, graphited	COILS per box	*	*	2	2	2	2	2		1		1				
	Feet per box	*	*	30	30	30	30	30		15		15				
	Pounds per box	*	*	5	8	11 1/2	15 1/2	20		16		23				

*Available in spool form; Styles 918, 981 and 631 also available in rings. 631 also available in coils

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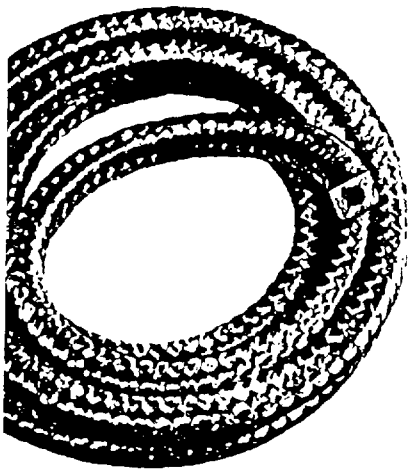
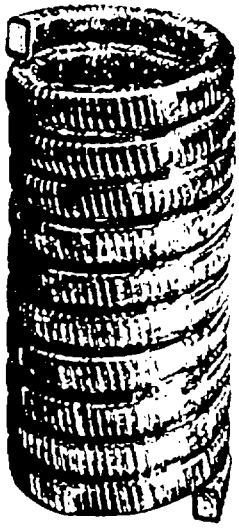
GARLOCK
FLEXIBLE METALLIC
COPPER PACKINGS



344

SERVICE	STYLE	APPLICATIONS
Temperatures up to 1500°F.	344	Heavy hydraulic service. As end or 'bull' rings, used in combination with other packings, to prevent extrusion where abnormal clearances between rod and stuffing box exist.
Steam, air, water, gases and low content sulfur oils up to 1000°F.	635	Centrifugal or reciprocating pumps, valves, expansion joints and other high pressure equipment.
Temperatures up to 1500°F.	937	Reciprocating rods of compressors, engines, pumps; shafts of rotary or centrifugal pumps; valve stems.



913

GARLOCK
FLEXIBLE METALLIC
ALUMINUM PACKINGS

SERVICE	STYLE	APPLICATIONS
Hot oils and hot petroleum derivatives at temperatures to 1000°F.	633	Centrifugal and rotary pumps, valves, stuffing boxes, expansion joints. Ideal for processing plants and paper mills.
Hot oils and hot petroleum derivatives at temperatures to 1000°F.	913	Centrifugal and reciprocating pumps, valves, still necks or other equipment handling hot crude oil, gas or distillates.

FOR ORDERING INFORMATION, SEE PAGE P-30

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ST0211767

for service on rotary and reciprocating equipment, particularly where temperatures are high

CONSTRUCTION AND MATERIALS	PACKING SIZES	1/8"	3/16"	1/4"	5/16"	3/8"	7/16"	1/2"	9/16"	5/8"	11/16"	3/4"	13/16"	7/8"	15/16"	1"
Regular braid. Square cross-section. Fine copper wire. Not lubricated or otherwise treated.	Coils per box			1	1	1	1	1	1	1	1	1	1	1	1	1
	Feet per box			50	45	39	36	30	24	22	19	17	15	15	15	15
	Pounds per box			7	8 1/4	12 1/8	15 1/8	16 1/8	17	19 1/4	20 1/4	21 1/8	22 1/8	26	29 1/4	34
Twisted. Square cross section. Lubricated, graphited copper foil, twisted around an asbestos core. Twisting forms crevices in foil to hold high-temperature oil and provide auxiliary lubricant.	Spirals per box	1	1	1	1	1	1	1		1						
	Feet per box	12 1/8	12 1/8	12 1/8	12 1/8	12 1/8	12 1/8	12 1/8		12 1/8						
	Pounds per box	1/8	1/8	1/4	1 1/4	1 1/8	2 1/8	3 1/4		E						
Regular braid. Square cross section. Special copper tinsel, bonded with rubber cement. Surface-coated with graphite.	Coils per box			1	1	1	1	1	1	1		1				1
	Feet per box			50	45	39	36	30	24	22		17				15
	Pounds per box			4 1/4	6 1/4	8 1/4	10 1/8	11 1/4	11 3/4	12 1/8		14 1/4				22 1/8

All styles also available as rings

for service on rotary and reciprocating equipment, valve stems, still necks, expansion joints

CONSTRUCTION AND MATERIALS	PACKING SIZES	1/8"	3/16"	1/4"	5/16"	3/8"	7/16"	1/2"	9/16"	5/8"	11/16"	3/4"	13/16"	7/8"	15/16"	1"
Twisted. Rectangular cross section. Lubricated and graphited aluminum foil, twisted around an asbestos core.	Spirals per box			1	1	1		1								
	Feet per box			12 1/8	12 1/8	12 1/8		12 1/8								
	Pounds per box			1/8	3/8	1		1 1/4								
Pleated. Square cross-section. Pleated aluminum foil wrapped around core of braided dry asbestos. Two spirally-wound covers of aluminum foil. Pockets in foil pleats carry lubricant and graphite . . . provide auxiliary lubrication supply. A flexible packing . . . can be formed into rings without distortion.	Spirals per box			1	1	1		1		1		1				1
	Feet per box			12 1/8	12 1/8	12 1/8		12 1/8		12 1/8		12 1/8				12 1/8
	Pounds per box			1/8	3/8	1 1/8		1 1/8		2 1/8		4 1/4				7 1/8

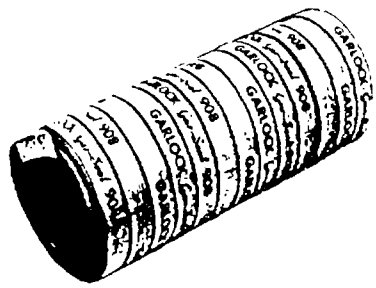
Both styles also available as rings

ST0211767

Garlock Plastallic Packings are soft and readily formable. Every style is scientifically compounded with pure asbestos, special lubricants and binders, and graphite or mica. Some styles contain soft bearing metals. All are particularly suited to sealing gases and highly mobile liquids.

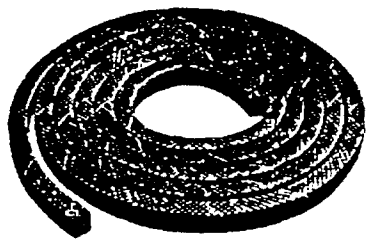
Garlock Plastallic Packings are available in coil, spiral and formed rings. Coil and spiral forms have rectangular cross sections. Rings are approximately square in cross section. These forms are installed the same way as any other type of coil, spiral or ring packings.

GARLOCK PLASTALLIC PACKINGS



908

SERVICE	STYLE	APPLICATIONS
Steam, air, water, weak acids and inert gases to 600°F.	**908**	Shafts of centrifugal or rotary pumps, reciprocating rods and valve stems.
Steam, air, water, weak acids and inert gases to 500°F. Meets Specification MIL-P-17303-C, Class 1, Type B, Symbol 1433.	**909**	Shafts of centrifugal or rotary pumps, reciprocating rods and valve stems.



927

SERVICE	STYLE	APPLICATIONS
Strong mineral acids (including nitric acid) and strong alkaline solutions.	**924**	Shafts of centrifugal or rotary pumps, valve stems, reciprocating rods and plungers.
Oils, solvents up to 600°F, steam, gases and dilute aqueous solutions (except mineral acid solutions).	**927**	Shafts of centrifugal or rotary pumps, reciprocating rods, plungers and valve stems.
Oils, solvents up to 600°F, steam, gases and dilute aqueous solutions (except mineral acid solutions).	**928**	Shafts of centrifugal or rotary pumps, reciprocating rods, plungers and valve stems.
Oils, solvents up to 600°F, steam, gases and dilute aqueous solutions (except mineral acid solutions).	**930**	Shafts of centrifugal or rotary pumps, reciprocating rods, plungers and valve stems.
Strong mineral acids (including nitric acid), organic solvents and strong alkaline solutions at low or high pressures. Temperature from −90°F. to +500°F.	**9166**	Shafts of centrifugal or rotary pumps, reciprocating rods, plungers and valve stems particularly where highly corrosive fluids are involved.
Strong mineral acids, alkaline solutions and all types of solvents and gases.	**9165**	Reciprocating rods; rotary shafts and valve stems.
Strong mineral acids (including nitric acid), alkaline solutions, all types of solvents and gases from −90°F. to +500°F.	**9167**	Reciprocating rods, rotary shafts and valve stems made of metal, glass or porcelain.



9166

ST0214768

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Garlock Plastallic Packings are also available in bulk form, packaged in cans. This loose packing is easily installed by tamping evenly and tightly into stuffing box, and drawing open the gland until leakage is properly controlled. In service, this bulk packing becomes a homogeneous mass or bushing. When additional packing is required, just add more plastallic. Old plastallic bulk packing need not be removed.

All styles shown available in Ring form. Molded to specified size within following limitations:

	Min	Max
I.D.	⅜"	10"
O.D.	⅝"	11½"
Packing Space	⅛"	1"

for use on reciprocating rods, rams and plungers; centrifugal and rotary shafts; valve stems; expansion joints

CONSTRUCTION AND MATERIALS	PACKING SIZES	3/32"	1/4"	5/16"	3/8"	7/16"	1/2"	5/8"	**
A non metallic, dry graphited packing. Asbestos fibers and graphite, bonded together with a water-resistant, oil-resistant binder. Special corrosive inhibiting agent	Spirals per box	1	1	1	1	1	1	1	1
	Feet per box	19	17	15	17	16	16	15	15
	Pounds per box	1/8	1 1/4	1 5/8	2 1/4	3 1/8	5 1/4	6 1/4	11
A dry, graphited plastic packing of asbestos fibers, lead particles and graphite bonded with a water and oil resistant binder. Has corrosion inhibiting agent	Spirals per box	1	1	1	1	1	1	1	*
	Feet per box	19	17	15	17	16	16	15	15
	Pounds per box	1/4	2	2 1/8	3 3/4	5 1/8	8	10	17 1/4

CONSTRUCTION AND MATERIALS	PACKING SIZES Specify Size	3/32" Round (OX)	1/4" x 5/16" (X)	5/16" x 3/8" (3 8X)	3/8" x 1/2" (2X)	7/16" x 3/8" (3X)	** Square (4X)	Available in bulk
A non metallic plastic packing of African blue asbestos fiber and special bonding material containing acid resistant lubricant and graphite. Coils and rings have a skeleton-braided cover of glass yarn	Coils per box	**	**	**	3	2	1	1 1/2 lb cans
	Feet per box	435	73	43	51	26	20	
	Pounds per box	5	6	5	10 3/4	11	11 1/2	
Asbestos fiber, shredded composition lead foil. Special bonding compound containing lubricant and graphite. Coils and rings have skeleton-braided covers of black cotton yarn with a single red strand	Coils per box	**	**	**	3	2	1	2 1/2 lb cans†
	Feet per box	228	43	26	51	26	20	
	Pounds per box	5	5	5	20 1/2	21 1/2	23 1/2	
Asbestos fiber, shredded copper foil. Special bonding agent containing lubricant and graphite. Coils and rings have skeleton-braided covers of black cotton yarn with a single yellow strand	Coils per box	**	**	**	3	2	1	2 lb cans†
	Feet per box	266	51	30	51	26	20	
	Pounds per box	5	5	5	15	16	18	
A non-metallic packing of asbestos fiber and a special bonding compound containing lubricant and graphite. Coils and rings have skeleton-braided covers of black cotton yarn with two red strands	Coils per box	**	**	**	3	2	*	2 lb cans
	Feet per box	420	70	41	61	26	20	
	Pounds per box	5	5	5	11	11 1/4	12	
A plastic packing of TFE powder, graphite and synthetic hydrocarbon binder. Coils and rings have skeleton-braided covers of TFE yarn	Coils per box	**	**	**	3	2	1	As ordered in even pound cans
	Feet per box				61	26	20	
	Pounds per box	5	5	5	13 1/4	11 3/4	12 3/4	
A dry rod or shaft packing of pure TFE powder. Has no binder	Available in ring or bulk form							As ordered in even pound cans
A plastic packing of shredded TFE thoroughly impregnated with TFE suspensoid	Available in ring or bulk form							As ordered in even pound cans

**Size OX on 1, 2 or 5 pound spools; Size X on 2 or 5 pound spools; Size 3-8X on 5 pound spools. Read "Feet per Box" as "Feet per Spool"

†Loose forms of 927 and 928 furnished with twisted lead ribbon end ring material

ST0211769

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HOW TO ORDER GARLOCK SOFT PACKING

When ordering, it is essential we have certain information about service conditions, equipment, etc. Please use the following outline as a guide:

1. If possible, send a blueprint or sketch of stuffing box and surrounding equipment.
2. Submit information about condition of equipment. (Surface finishes, runout, etc.)
3. Normal operating hours, whether intermittent or continuous; rpm or cycles per minute, and length of stroke.
4. Medium handled, or that which will come in contact with packing (be as specific as possible . . . concentrated hydrochloric acid, propane gas, etc.)
5. Temperature of medium.
6. Pressure encountered.
7. Dimensions: (a) Rod or shaft diameter(s), (b) Bore of stuffing box(es); (c) Inside depth of stuffing box(es); (d) Bevels (if any).
8. Lantern ring location, when applicable.
9. Number of stuffing boxes per machine or unit.

ST0214770

POSSIBLE CAUSES OF PACKING FAILURES

Many times causes of packing failure are not readily apparent. However, careful examination of the used packing will often indicate the factors causing this failure.

Listed below are some examples of how certain clues can pinpoint these underlying causes.

If one or more rings are missing from the set—

Look for a badly worn stuffing box bottom with packing being extruded into the system. (As a result of this condition, packing may get into the valve traps or contaminate the fluid being handled.)

If packing thickness, directly over or on either side of shaft, has changed—

Look for badly worn bearings, causing shaft whip or rod or plunger that's out of alignment

If packing cross section directly beneath the rod, shaft or plunger is excessively reduced or early leakage occurs at top of rod or shaft—

Look for low bearings with shaft or rod riding on packing.

If outside diameter of packing is worn—

Look for loose rings or ring rotating with shaft.

If one or more rings have "bulges" in the faces—

Look for adjacent rings cut too short, causing packing under pressure to be forced into joints.

If bottom rings are in fair condition yet rings next to gland followers are prematurely deformed—

Look for improperly installed packings and use of excessive gland pressure

If packings tend to sheet-out or extrude between rod or shaft and gland follower—

Look for too great a clearance between rod or shaft and gland follower. Use of an anti-extrusion ring may be necessary if pressure is high or if clearances cannot be reduced.

Temperature Limitations of Various Packing Materials

1500° F	Copper	500° F	TFE and lead
1000° F	Aluminum	250° F	Duck and Rubber
750° F	Pure Asbestos (white or blue)	200° F	Cotton
		175° F	Flax and Jute

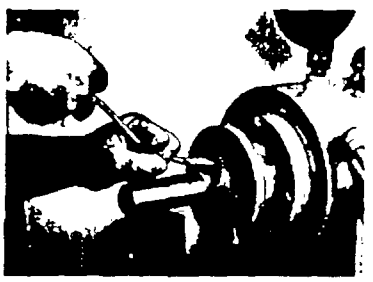
Recommended Use of Asbestos According to Acidity or Alkalinity of Solutions

pH 14 and stronger OH−	Blue Asbestos
pH 4 to pH 14	White Asbestos
pH 4 and stronger H+	Blue Asbestos

ST0214770

MISCELLANEOUS GARLOCK MAINTENANCE PRODUCTS

ST0214771



GARLOCK FLEXIBLE PACKING HOOKS
for quick, easy removal of old packing from stuffing boxes

The flexible shafts of these sturdy, high-grade packing hooks make it much easier to remove old packing from cramped or hard-to-reach areas. The sharp point of the screw tip is easily inserted and anchored in the packing. And, should the tip become damaged, it can be easily unscrewed and replaced on the spot. Also, the threaded end of the flexible shaft (with screw tip removed) may be used to remove tapped fairlerns, bushings or other removable metal rings.

The complete set, packaged in a strong metal box, includes: *Two No. 1 Flexible Hooks* 7¾" long, with screw tip for packing spaces as small as 5/16". Screw thread size 8-32. *One Extra Screw Tip* for No. 1 hook. *Two No. 2 Flexible Hooks* 10⅝" long, with screw tip for packing spaces from 7/16" up. Screw thread size: ¼-20. *One Extra Screw Tip* for No. 2 hook. *One No. 4 Solid Curved-End Hook* with T-shaped handle. *One No. 5 Solid Curved-End Hook* with looped handle, ⅜" shank. *One No. 6 Solid Curved-End Hook* with looped handle, 3/16" shank. *One Open-End Wrench*.

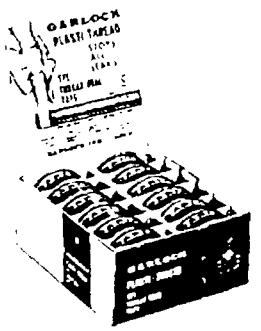
To order complete sets, specify Set "D." All hooks, and extra screw tips for Nos. 1 and 2 may be individually purchased.



GARLOCK PLASTI-THREAD®
...the TFE Thread Seal Tape

The quickest, neatest, cleanest way to seal a threaded joint. Longest-lasting and most effective, too. PLASTI-THREAD, the TFE thread seal tape, is 100% pure fluorocarbon in ribbon form, will seal thread joints in any pipe including stainless steel, copper, plastic, brass, galvanized metal and aluminum. It is chemically inert, corrosion resistant. Withstands temperature extremes from −400° F. to +600° F. PLASTI-THREAD, the TFE thread seal tape, is non-hardening, permanently self-lubricating for fast assembly or disassembly. And, being non-toxic, it will not affect food, fuels, petro-chemicals, etc.

Easy-to-use: Just clean threads of oil and grime... wrap threads with PLASTI-THREAD TFE thread seal tape ...join pipe in normal manner.



PACKAGING: Garlock PLASTI-THREAD TFE thread seal tape is packaged in convenient spools in two sizes: ½" x 520" and ½" x 1296". Either size available in 12-spool cartons at substantial savings.



NEW GARLOCK FORMULA 116
PENETRATING OIL

A multi-purpose penetrating oil for general maintenance use, Garlock Formula 116 effectively penetrates corroded surfaces, scale, grease and dirt. Also acts as a moisture displacing agent and residual lubricant. Use it for *Freeing* rusty threaded connections.... *Loosening* red and white lead, tar, grease, dirt and graphite without injury to basic metals, paint or wood... *Removing* rust, scale and carbon deposits without harming basic metals ... *Starting* wet engines by spraying on ignition wires and around spark plugs ...*Lubricating* rusted surfaces to prevent further seizing... *Cleaning* tar or grease from surfaces.

PACKAGING: Garlock Formula 116 Penetrating Oil is packaged in handy aerosol cans containing 6 ounces, avoir., each. 12-Can Economy Pack also available.



NEW GARLOCK 510 ENAMEL

A revolutionary new heavy-duty industrial coating that virtually eliminates costly, time-consuming surface preparation.

NO DE GREASING NECESSARY. Just remove excess oil, water, loose dirt, and scale ... then apply Garlock 510 Enamel. It actually penetrates oil, moisture and rust to form a perfect bond to any type of metal.

NO PRIMER REQUIRED. Garlock 510 Enamel covers all raw and sound previously painted surfaces. Even new galvanized surfaces need no pre-treatment or "aging."

DRIES IN 20 MINUTES to a hard, long-lasting gloss finish. Downtime becomes a matter of minutes instead of hours. And, there is no lingering paint odor.

APPLY WITH REGULAR EQUIPMENT. Garlock 510 Enamel goes on smoothly, evenly with brush, roller or spray equipment. Never dries in the can... doesn't even skin over. Easy cleanup, too, with Garlock 520 Reducer or any high quality lacquer thinner.

USE INDOORS OR OUTDOORS. In addition to being ideal for protecting and dressing-up indoor equipment, Garlock 510 Enamel works equally well on equipment constantly exposed to the outdoor elements.

AVAILABLE IN EIGHT COLORS: Green, Gray, Blue, White, Yellow, Orange, Red, Black.



GARLOCK 520 REDUCER. Used to thin Garlock 510 Enamel for use in spray equipment. Also used in cleaning painting equipment, and when a first quality lacquer thinner is required.

SPECIFICATIONS

GARLOCK PART NUMBER: Garlock 510

PACKAGING: 510 Enamel- gallon cans
520 Reducer- gallon cans

COVERAGE: Approximately 450 feet per gallon

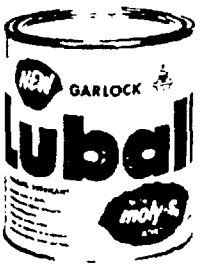
APPLICATION: Brush, roller or spray

DRYING TIME: 20 minutes or less

ST0214771

GARLOCK LUBRICATING PASTES

Packings in operation must receive regular and proper lubrication to insure most efficient operation. Too little or the wrong kind of lubrication results in excessive friction, scored rods, leaks and ultimate destruction of packing. The two Garlock Lubricating Pastes, described below, have been developed to provide proper packing lubrication against water, steam and common chemical service up to 500°F.



GARLOCK LUBALL® packing lubricant with Moly-S_2* for water, steam and common chemical service up to 500°F

This improved packing lubricant has been proved in the field to give highly dependable, long-life service and smooth operation. LUBALL packing lubricant will make your packing last longer, and you won't have to tighten glands as often. This will save both time and money.

This completely waterproof lubricating paste contains no graphite, no soap or fillers to clog orifices. It withstands temperatures to 500°F . . . maintains viscosity throughout its usable temperature range . . . never melts. It is insoluble in water . . . retaining all its properties. Will not separate or break down.

Moly-S, gives LUBALL packing lubricant its superior lubricating properties because: it fills metal pores on contact . . . deposits a thin film that becomes an integral part of the metal, has very low shear strength . . . does not build up as a deposit if additional quantity is added, has very low coefficient of friction . . . reduces operating friction drastically.

Application is easy by one of three methods: 1. Externally at time of packing installation. 2. Injecting into stuffing box through a pressure fitting. 3. Using a screw compression cup with lantern ring in stuffing box.

LUBALL packing lubricant is supplied in 1 lb., 4 lb. and 7 lb. cans . . . and 20 lb., 35 lb. and 70 lb. pails. CAUTION: NOT TO BE USED AS A BEARING LUBRICANT.

*Garlock trademark for molybdenum disulfide



GARLOCK COMPOUND NO. 2 WITH GRAPHITE

for steam and water service

This high-quality lubricating paste prolongs the life of any rod packing working against steam, hot water, cold water, or aqueous solutions. Its outstanding advantages include: high lubricating value, reducing friction to a minimum, long lubricating life, because of its heat resistance and wearing qualities; maintenance of proper viscosity at all times . . . even under heat; complete resistance to water and steam; ability to inhibit rust and corrosion . . . particularly recommended for use on new equipment.

Garlock Compound No. 2 should be heavily applied to packing before it is installed. Subsequent applications may be made through pressure fitting or grease cup . . . or by swabbing the rod or plunger.

Compound No. 2 Lubricating Paste is supplied in 12 oz., 20 oz., 5 lb. and 10 lb. cans; and in 25 lb., 50 lb. and 100 lb. pails.

GARLOCK TAPPING COMPOUND . . .

an all-purpose compound for use in metal operations

Garlock Tapping Compound is recommended for many jobs including: tapping, reaming, broaching, thread cutting, drilling, boring, milling, lathe turning, lubricating, lubricating lathe centers, press-fitting die bushings, punches, etc.

Garlock Tapping Compound helps improve production and lower costs because it reduces amount of torque required, permits higher speeds in metal machine operations, reduces tool breakage and work spoilage.

READY TO USE. Just stir and apply to work with a brush or oil can. Compound may be thinned with mineral oil if desired. Not intended for regular coolant systems.



Garlock Tapping Compound is supplied in 1 lb. cans with 24 cans per case, in 2 lb. cans with 12 cans per case, in 8 lb. and 40 lb. cans, and 400 lb. drums.



GARLOCK PIPE THREAD COMPOUND

for permanently tight joints

Garlock Pipe Thread Compound for those who prefer the daub-on type. A tried and proved material you can depend upon for permanently tight threaded joints in pipelines and other equipment.

AVAILABLE IN TWO TYPES. TYPE A for use against steam, dry gas, water, alcohol, hot or cold heavy oils. TYPE B for use against gasoline, light oils, kerosene, carbon tetrachloride, benzol and solvents (except alcohol).

Ready to apply as it comes from the can. No thinning needed. Just stir and apply to pipe threads with dauber or short-bristled, stiff brush.

Garlock Pipe Thread Compound of both types is supplied in 1 lb., 2 lb. and 4 lb. cans; and in 40 lb. and 80 lb. pails.

GARLOCK INC. General Offices and Main Factories: PALMYRA, N. Y. 14522

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

BULLETIN AD 3714 PRINTED IN U.S.A. 5-64(12.5)

ST0214772

GARLOCK

BULLETIN
AD-231-3

Gasketing Products

ST0214773



ST0214773

GARLOCK WARRANTY

Garlock Inc. guarantees that any product of its manufacture, which upon examination is found by a Garlock representative to be defective either in workmanship or material whereby it is not suitable under proper usage and service for the purpose for which designed, will be replaced free of charge including transportation charges but not cost of installation. This shall be Garlock's maximum liability. The sale of Garlock products under any other warranty or guarantee, expressed or implied, is not authorized by Garlock.

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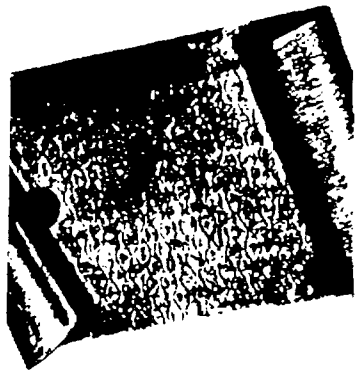

GARLOCK COMPRESSED ASBESTOS SHEET GASKETING

Garlock Compressed Asbestos Sheet combines white or blue asbestos with a variety of binders . . . bonded under pressure and vulcanized into a homogeneous sheet. All styles are tough and durable with sufficient compressibility to seal properly, yet resist plastic flow under heavy bolt loads. Ideal for high pressure/high temperature applications employing rigid flanges with adequate bolting capacity. For basic information covering four popular styles, see chart below. Contact your Garlock representative on other styles.

900

MATERIAL	Compressed Chrysotile asbestos with SBR binder					
TENSILE STRENGTH	With grain 6000 psi. Across grain 2500 psi. Average 4250 psi					
APPLICATION	*Steam, gas, air and other services at temperatures to 700°F. Not recommended against extremely hot oil, organic solvents or strong mineral acids*					
EQUIPMENT	On pipe flanges, boiler manholes, gasketed joints on steam engines, compressors, internal combustion engines, pumps or other equipment					
THICKNESSES (inches)	1/64, 1/32, 1/16, 3/32, 1/8, 3/16, 1/4					
SHEET SIZES (inches)	40 x 40	50 x 50	60 x 60	75 x 75	120 x 120	150 x 150
NOMINAL WEIGHTS* (pounds per sheet)	6.0	9.4	13.5	21.1	54.0	84.4

*Nominal weights for 1/16 in. thickness. Other thicknesses in proportion.

7021

MATERIAL	Compressed Chrysotile asbestos with SBR binder					
TENSILE STRENGTH	With grain 6800 psi. Across grain 2500 psi. Average 6000 psi					
APPLICATION	Hot oil service at high temperature – steam or hot gases up to 700°F					
EQUIPMENT	On flanges of cracking stills and other refinery equipment, pipe lines, compressors, internal combustion engines, other high temperature applications					
THICKNESSES (inches)	1/64, 1/32, 1/16, 3/32, 1/8, 3/16, 1/4					
SHEET SIZES (inches)	40 x 40	50 x 50	60 x 60	75 x 75	120 x 120	150 x 150
NOMINAL WEIGHTS* (pounds per sheet)	6.0	9.4	13.5	21.1	54.0	84.4

*Nominal weights for 1/16 in. thickness. Other thicknesses in proportion.

7228

MATERIAL	Compressed Chrysotile asbestos with neoprene binder					
TENSILE STRENGTH	With grain 5200 psi. Across grain 2800 psi. Average 4000 psi					
APPLICATION	Oil, refrigerants and solvents at temperatures to 300°F					
EQUIPMENT	On pipe flanges and gasketed joints of internal combustion engines, compressors, pumps and similar equipment					
THICKNESSES (inches)	1/64, 1/32, 1/16, 3/32, 1/8					
SHEET SIZES (inches)	40 x 40	50 x 50	60 x 60	75 x 75	120 x 120	150 x 150
NOMINAL WEIGHTS* (pounds per sheet)	6.0	9.4	13.5	21.1	54.0	84.4

*Nominal weights for 1/16 in. thickness. Other thicknesses in proportion.

CONTINUED ON NEXT PAGE

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7705

MATERIAL	*African blue asbestos fibers with acid-resisting SBR rubber binder*					
TENSILE STRENGTH	With grain 5000 psi Across grain 2000 psi Average 3500 psi					
APPLICATION	Hot or cold mineral acids either alone or with oils and organic solvents					
EQUIPMENT	*Chemical and process plant pumps, piping, stills, heat exchangers and equipment handling corrosive fluids*					
THICKNESSES (inches)	1/32, 1/16 3/32 1/8					
SHEET SIZES (inches)	40 x 40	50 x 50	60 x 60	75 x 75	120 x 120	150 x 150
NOMINAL WEIGHTS* (pounds per sheet)	5.0	7.8	11.2	17.5	44.8	70.0

*Nominal weights for 1/16 in. thickness. Other thicknesses in proportion.

ST0214776



GARLOCK
WOVEN ASBESTOS CLOTH GASKETING

Woven of long-fiber asbestos yarn. Garlock 605 Asbestos Cloth is reinforced with fine brass wire. The cloth is then impregnated with one of several binders, including SBR, neoprene, silicone or TFE. The style most used in maintenance for hot, medium pressure work, particularly where flange faces are pitted or rough. Typical style applications are covered in the chart below. For information on other styles, contact your Garlock representative.

STYLE
605

MATERIAL	*Asbestos cloth with brass wire insertion, impregnated with high-temperature-resistant natural rubber cement*
APPLICATION	Steam, gases and aqueous solutions (other than strong mineral acids) at temperatures to 600°F
EQUIPMENT	On cylinder heads or flanged joints requiring ports or bolt holes in gaskets of relatively narrow flange width
THICKNESSES (inches)	3/64, 1/16, 1/8, 3/16, 1/4
SIZE (inches)	48 wide
WEIGHTS	3/64 in – 100 lb rolls 1/16 in. and greater – 200 lb rolls

604

	Same as above material, folded into endless gaskets particularly for boiler manholes, handholes, flanged joints, autoclaves and stills. For dimensions, see current price sheets.

ST0214776



GARLOCK
FOLDED ASBESTOS GASKETS
GASKETING TAPE AND COIL

601

Folded Asbestos	Folded and die formed into endless gaskets particularly for boiler manholes, handholes, flanged joints, autoclaves and stills For dimensions, see current price sheets
MATERIAL	Natural rubber bonded, wire-inserted white asbestos cloth
APPLICATION	For tube plates of Heine water tube boilers
SIZES (inches)	Round—3-1/2 I.D. x 4-1/4 O.D. x 1/8 thick. Oval—3-1/2 x 4-5/8 I.D. x 3/8 flange x 1/8 thick

602

Folded Asbestos	Folded and die formed into endless gaskets particularly for boiler manholes, handholes, flanged joints, autoclaves and stills For dimensions, see current price sheets
MATERIAL	Natural rubber, bonded, wire-inserted white asbestos cloth
APPLICATION	For use on tube plates of Babcock & Wilcox water tube boilers
SIZES (inches)	Oval—4 3/8 x 5-3/8 I.D. x 5/16 flange x 1/8 thick. Square—4-3/4 x 4-7/8 I.D. x 1/4 flange x 1/8 thick

608

Folded Asbestos	Folded and die formed into endless gaskets particularly for boiler manholes, handholes, flanged joints, autoclaves and stills For dimensions, see current price sheets
MATERIAL	Natural rubber, bonded, wire-inserted asbestos cloth
APPLICATION	For use on Edgemoor boiler tube plates
SIZE (inches)	Oval—4-1/16 x 5-1/8 I.D. x 1/2 flange x 1/8 thick

612

Folded Tape	
MATERIAL	Wire-inserted asbestos cloth treated with heat resistant rubber cement folded, formed and pressed
APPLICATION	Steam, gases, water or aqueous solutions (except strong mineral acids) at temperatures to 600°F
EQUIPMENT	For flanged joints, especially large diameter such as autoclaves, cylinder heads, or other equipment requiring a soft asbestos gasketing
SIZES (inches)	Widths—From 1/2 up Thickness—From 3/32 up. Continuous lengths

7051

Coil	
MATERIAL	Wire-inserted asbestos cloth, treated with heat resistant rubber cement. Square or rectangular cross section available without wire or with graphiting when specified
APPLICATION	Steam, gases, water or aqueous solutions (except strong mineral acids) at temperatures to 600°F
EQUIPMENT	On heater doors or other equipment usually installed in grooved flanges
SIZES (inches)	Standard—1/4, 5/16, 3/8, 1/2, 5/8, 11/16, 3/4, 7/8 and 1 in. square cross section Square and rectangular forms available in other sizes

ST0214777

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GARLOCK HOMOGENEOUS RUBBER SHEET GASKETING

Rubber is an excellent material for a wide range of gasketing needs. Deforms easily to fit uneven flange surfaces, yet can never be reduced in volume. It is so extensible it can be assembled over a projection or shoulder and "snap tight" within a groove. It is highly impermeable. Forms a tight barrier against passage of gases or fluids. Neoprene is especially good in this respect. Its elasticity makes possible a leakproof seal with minimum flange pressure. It also allows gasket to move with flange surfaces without disrupting seal.

Garlock Homogeneous Rubber Sheet is available in SBR, natural, neoprene, nitrile, silicone and other rubbers. Furnished in black unless otherwise indicated. The most popular styles are covered in the chart below and on the following pages. Most meet several specifications, including Military, S.A.E., A.M.S., and Federal requirements. For information on other styles, contact your Garlock representative.

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STYLE

152

MATERIAL	SBR
HARDNESS	60 duro (Soft)
TENSILE STRENGTH	1500 psi
APPLICATION	Hot or cold water, aqueous solutions (except strong acids), low pressure steam or gas
EQUIPMENT	On pipe flanges or other flanged joints requiring soft high grade rubber gaskets
THICKNESSES (inches)	1/16, 1/8, 3/16, 1/4 and greater
SIZE	36 in. wide
WEIGHT	200 lb. rolls

91

MATERIAL	SBR
HARDNESS	60 duro (Medium soft)
TENSILE STRENGTH	1200 psi
APPLICATION	Hot or cold water, aqueous solutions (except strong acids), low pressure steam or gas
EQUIPMENT	On pipe flanges or other flanged joints requiring medium soft, high grade rubber gaskets
THICKNESSES (inches)	1/32, 1/16, 1/8, 3/16, 1/4 and greater
SIZE	36 in. wide
WEIGHTS	1/32 in – 100 lb. rolls 1/16 in. and greater – 200 lb. rolls

ST0214778

22

MATERIAL	SBR (red)
HARDNESS	80 duro (Very firm)
TENSILE STRENGTH	1200 psi
APPLICATION	Hot or cold water, aqueous solutions (except strong acids), low pressure steam or gas
EQUIPMENT	On pipe flanges or other flanged joints requiring very firm high grade rubber gaskets
THICKNESSES (inches)	1/32, 1/16, 1/8, 3/16, 1/4 and greater
SIZE	36 in. wide
WEIGHTS	1/32 in. – 100 lb. rolls 1/16 in. and greater – 200 lb. rolls

353

MATERIAL	SBR
HARDNESS	80 duro (Very firm)
TENSILE STRENGTH	1200 psi
APPLICATION	Hot or cold water, aqueous solutions (except strong acids), low pressure steam or gas
EQUIPMENT	On pipe flanges or other flanged joints requiring very firm high grade black rubber gaskets
THICKNESSES (inches)	1/16, 1/8, 3/16, 1/4 and greater
SIZE	36 in. wide
WEIGHT	200 lb. rolls

6023

MATERIAL	Natural (tan)
HARDNESS	35 duro (Extra soft)
TENSILE STRENGTH	3000 psi
APPLICATION	Hot or cold water
EQUIPMENT	On flanged joints requiring very light bolt load or where flange surfaces are extremely irregular
THICKNESSES (inches)	1/16, 1/8, 3/16, 1/4 and greater
SIZE	36 in. wide
WEIGHT	200 lb. rolls

7491

MATERIAL	Neoprene
HARDNESS	40 duro (Very soft)
TENSILE STRENGTH	1500 psi
APPLICATION	Non-aromatic petroleum, fatty oils, solvents (except aromatic, chlorinated or ketone types) up to 300°F
EQUIPMENT	On flanged joints where oil-resistant qualities of very soft neoprene are required
THICKNESSES (inches)	1/16, 1/8, 3/16, 1/4 and greater
SIZE	36 in. wide
WEIGHT	200 lb. rolls

CONTINUED ON NEXT PAGE

ST0214779

ST0214779

8312

MATERIAL	Neoprene
HARDNESS	50 duro (Soft)
TENSILE STRENGTH	1500 psi
APPLICATION	Non-aromatic petroleum, fatty oils, solvents (except aromatic, chlorinated or ketone types) up to 300°F
EQUIPMENT	On flanged joints where oil resistant qualities of soft neoprene are required
THICKNESSES (Inches)	1/16, 1/8, 3/16, 1/4 and greater
SIZE	36 in. wide
WEIGHT	200 lb. rolls

7986

MATERIAL	Neoprene
HARDNESS	60 duro (Medium soft)
TENSILE STRENGTH	2000 psi
APPLICATION	Non-aromatic petroleum, fatty oils, solvents (except aromatic, chlorinated or ketone types) up to 300°F
EQUIPMENT	On flanged joints where oil-resistant qualities of medium soft neoprene are required
THICKNESSES (inches)	1/16, 1/8, 3/16, 1/4 and greater
SIZE	36 in. wide
WEIGHT	200 lb. rolls

8639

MATERIAL	Neoprene
HARDNESS	70 duro
TENSILE STRENGTH	1800 psi
APPLICATION	Non-aromatic petroleum, fatty oils, solvents (except aromatic, chlorinated or ketone types) up to 300°F
EQUIPMENT	On flanged joints where oil-resistant qualities of firm neoprene are required
THICKNESSES (inches)	1/32, 1/16, 1/8, 3/16, 1/4 and greater
SIZE	36 in. wide
WEIGHTS	1/32 in.—100 lb. rolls 1/16 in. and greater—200 lb. rolls

7797

MATERIAL	Neoprene
HARDNESS	80 duro (Very firm)
TENSILE STRENGTH	1500 psi
APPLICATION	Non-aromatic petroleum, fatty oils, solvents (except aromatic, chlorinated or ketone types) up to 300°F
EQUIPMENT	On flanged joints where oil-resistant qualities of very firm neoprene are required
THICKNESSES (inches)	1/32, 1/16, 1/8, 3/16, 1/4 and greater
SIZE	36 in. wide
WEIGHTS	1/32 in.—100 lb. rolls 1/16 in. and greater—200 lb. rolls

ST0214780

ST0214780

8495

MATERIAL	Nitrile
HARDNESS	70 duro (Firm)
TENSILE STRENGTH	2000 psi
APPLICATION	Oils, solvents (including aromatic types and to very limited extent, chlorinated and ketone types) up to 300°F
EQUIPMENT	On flanged joints where high temperature, oil-resistant qualities of firm nitrile are required
THICKNESSES (inches)	1/16, 1/8, 3/16, 1/4 and greater
SIZE	36 in. wide
WEIGHT	200 lb. rolls

8452

MATERIAL	Nitrile
HARDNESS	90 duro (Extra firm)
TENSILE STRENGTH	1800 psi
APPLICATION	Oils, solvents (including aromatic types and to very limited extent, chlorinated and ketone types) up to 300°F
EQUIPMENT	On flanged joints where high temperature, oil-resistant qualities of extra firm nitrile are required
THICKNESSES (inches)	1/32, 1/16, 3/32, 1/8, 3/16, 1/4 and greater
SIZE	36 in. wide
WEIGHT	1/16 in. and greater—200 lb. rolls

9536

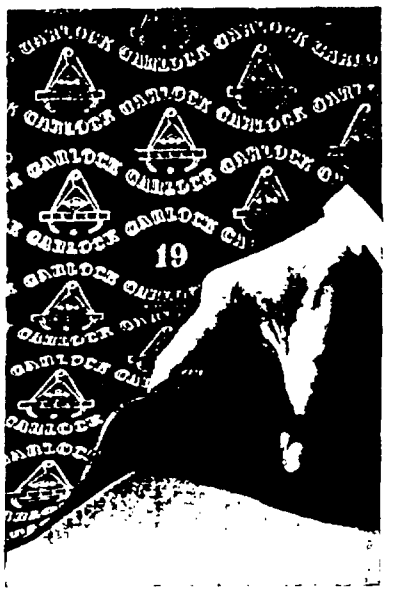
MATERIAL	Silicone (White)
HARDNESS	50 Duro (Soft)
TENSILE STRENGTH	700 psi
APPLICATION	On flanged or exposed joints where a soft silicone gasket is desired. Withstands extreme temperatures (−150°F to 500°F), aging and weathering, sunlight and corona, many oils and chemicals
EQUIPMENT	Heat exchangers, ovens, outdoor lighting units, transformers, etc.
THICKNESSES (inches)	1/32, 1/16, 1/8, 3/16, 1/4 and greater
SIZE (inches)	24 x 24 trimmed
NOMINAL WEIGHT	0.38 lbs. per square foot for 1/16 in. thickness. Other thicknesses in proportion

9297

MATERIAL	Silicone (Grey)
HARDNESS	70 Duro (Firm)
TENSILE STRENGTH	800 psi
APPLICATION	On flanged or exposed joints where a firm silicone gasket is desired. Withstands extreme temperatures, −150°F to 500°F, aging and weathering, sunlight and corona, and many oils and chemicals
EQUIPMENT	Heat exchangers, ovens, outdoor lighting units, transformers, etc.
THICKNESSES (inches)	1/32, 1/16, 1/8, 3/16, 1/4 and greater
SIZE (inches)	24 x 24 trimmed
NOMINAL WEIGHT	0.38 lbs. per square foot for 1/16 in. thickness. Other thicknesses in proportion

ST0211781

ST0211781



GARLOCK CLOTH-INSERTED RUBBER SHEET GASKETING

Specially designed to withstand greater pressures, heavy bolt loads and sudden vibrations, heavy-duty Garlock Cloth-Inserted Rubber Sheet combines all the outstanding features of rubber with the added strength of a reinforcing fabric or wire insert. It is ideal for severe hydraulic service that would cause unreinforced rubber to creep or blow out. Available in a variety of styles, including the two popular numbers covered in the chart below. For information on the complete line of Garlock Cloth-Inserted Rubber Sheet, contact your Garlock representative.

ST0211782

19

MATERIAL	SBR rubber with 5 oz. cotton sheeting insert for $^{1}/_{32}$ in. thickness 12 oz. cotton chafer insert for all other thicknesses
HARDNESS	80 duro (Very firm)
APPLICATION	Hot or cold water aqueous solutions (except strong acids) and low pressure steam or gas
EQUIPMENT	On flanged joints of pipe lines or equipment in heavy hydraulic service where very firm gaskets are required
THICKNESSES (inches)	1/32, 1/16, 3/32, 1/8, 3/16, 1/4
SIZE	44 in. wide
WEIGHTS—Approximate (per sq. yard)	1/32 in.—2.07 lb. 1/16 in.—4.13 lb. 3/32 in.—5.75 lb. 1/8 in.—7.63 lb. 3/16 in.—11.38 lb. 1/4 in.—15.19 lb. (1/32 in.—100 lb. rolls) (1/16 in. and greater—200 lb. rolls)

24

MATERIAL	SBR rubber with brass wire insert (Red)
HARDNESS	80 duro (Very firm)
APPLICATION	Hot or cold water, aqueous solutions (except strong acids), low pressure steam
EQUIPMENT	On flanged joints of all kinds, particularly on narrow flanges, where equipment is subject to vibration or for heavy bolt loading
THICKNESSES (inches)	1/32, 1/16, 1/8, 3/16, 1/4
SIZE (inches)	44 in. wide
WEIGHTS—Approximate (per sq. yard)	1/32 in.—3.25 lb. 1/16 in.—5.83 lb. 1/8 in.—12.68 lb. 3/16 in.—15.13 lb. 1/4 in.—19.0 lb. (1/32 in.—100 lb. rolls) (1/16 in. and greater—200 lb. rolls)

ST0211782



GARLOCK CLOTH-INSERTED DIAPHRAGM SHEET GASKETING

Garlock diaphragm sheet takes advantage of the elasticity and extensibility of rubber combined with the ruggedness of fabric insert construction. This gives the sheet extremely high burst strength as well as the flexibility so essential in diaphragm service. Each Garlock style is specially compounded, using various combinations of rubbers and fabric inserts, to meet specific service conditions. Available in a variety of styles, including the three popular numbers covered below. For information on other styles, see your Garlock representative.

619

MATERIAL	SBR rubber with 17 oz. tire duck fabric insert. Burst test across 2 in. dia. opening 300 psi (1/8 in. – 1 in. ply)
HARDNESS	60 duro (Soft)
APPLICATION	Dry natural gas, air or water at medium or high pressures
EQUIPMENT	On diaphragm motors for valves, switches or similar devices
THICKNESSES (inches)	1 ply—1/16, 3/32, 1/8 2 ply—3/16 3 ply—1/4
SIZE	44 in. wide
WEIGHTS—Approximate (per sq. yard)	1/16 in.—3.38 lb 3/32 in.—5.07 lb 1/8 in.—6.75 lb 3/16 in.—10.13 lb 1/4 in.—13.50 lb (1/16 in. and greater—200 lb. rolls)

7992

MATERIAL	Neoprene with 17 oz. tire duck fabric insert. Burst test across 2 in. dia. opening 300 psi (1/8 in. ply)
HARDNESS	50 duro (Soft)
APPLICATION	Wet natural gas, gasoline, oils or refrigerant gases at medium high pressures
EQUIPMENT	On diaphragm motors for valves, switches or similar devices
THICKNESSES (inches)	1 ply—1/16, 1/8 2 ply—3/16 3 ply—1/4
SIZE	44 in. wide
WEIGHTS—Approximate (per sq. yard)	1/16 in.—3.63 lb 1/8 in.—7.50 lb 3/16 in.—11.13 lb 1/4 in.—14.76 lb (1/16 in. and greater—200 lb. rolls)

8798

MATERIAL	Neoprene with 13 oz. nylon fabric insert. Burst test across 2 in. dia. opening 1000 psi (1/8 in. – 1 ply)
HARDNESS	60 duro (Soft)
APPLICATION	Wet natural gas, gasoline, oils or refrigerant gases at low, medium and high pressures
EQUIPMENT	On diaphragm motors for valves, switches and similar devices. Strength of nylon insert permits use of thinner diaphragm
THICKNESSES (inches)	1 ply—1/16, 1/8 2 ply—3/16 3 ply—1/4
SIZE	44 in. wide
WEIGHTS—Approximate (per sq. yard)	1/16 in.—3.69 lb 1/8 in.—7.63 lb. 3/16 in.—16.38 lb 1/4 in.—14.94 lb (1/16 in. and greater—200 lb. rolls)

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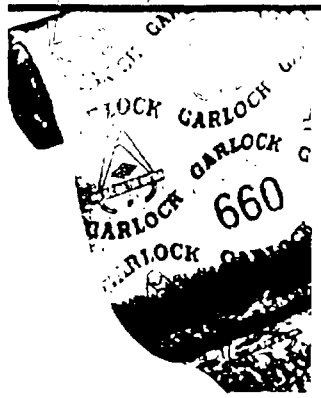
ST0214783



GARLOCK VEGETABLE FIBER SHEET GASKETING

This gasketing is made by a process which combines a paper-making vegetable fiber and a variety of binders. Compressed into a homogeneous structure, it forms a strong, compressible sheet packing. The favorite styles are covered in the chart below.

STYLE
660

MATERIAL	Vegetable fiber and cork granules with glue glycerine binder
TENSILE STRENGTH	1000 psi
APPLICATION	Oils, solvents, aromatic and non-aromatic fuels up to 250°F
EQUIPMENT	On pipe flanges or flanged joints at moderate pressures. Especially for lightweight sheet metal flanges
THICKNESSES (inches)	010, 1/64, 021, 1/32, 1/16, 3/32, 3/64, 1/8, 3/16, 1/4
SIZES	For roll lengths and standard sheet sizes see table, Style 670

681

MATERIAL	Vegetable fiber with glue-glycerine binder
TENSILE STRENGTH	2000 psi
APPLICATION	Oils, solvents, aromatic and non-aromatic fuels up to 250°F
EQUIPMENT	On pipe flanges or joints at moderate pressure where a strong, tough fiber sheet is needed. Rigid flanges will yield the best performance
THICKNESSES (inches)	006, 010, 1/64, 021, 1/32, 3/64, 1/16, 3/32, 1/8
SIZES	36 in. wide For roll lengths and standard sheet sizes see table, Style 670

670

MATERIAL	Vegetable fiber and cork granules with nitrile rubber binder
TENSILE STRENGTH	1000 psi
APPLICATION	Hot or cold water, gas, oils, solvents, aromatic and non-aromatic fuels and other petroleum products up to 300°F
EQUIPMENT	On pipe flanges and flanged joints, especially those that are rough or wavy
THICKNESSES (inches)	1/64, 1/32, 3/64, 1/16, 3/32, 1/8, 3/16, 1/4, 5/16, 3/8, 1/2
SIZES	45 in. wide in 1/64 in. and 1/32 in. 44 in. wide in all other thicknesses

STYLE	STANDARD ROLL LENGTHS (yards)			STANDARD SHEETS	
	100	50	25		
	Thicknesses (inches)	Thicknesses (inches)	Thicknesses (inches)	Thicknesses (inches)	Sizes (inches)
660	010, 1/64, 021	1/32, 3/64	1/16, 3/32, 1/8	3/16 & 1/4	36 x 36 and 40 x 60
681	006, .010, 1/64, 021	1/32, 3/64	1/16, 3/32, 1/8	3/16 & 1/4	36 x 36
670		1/64, 1/32, 3/64	1/16, 3/32, 1/8	3/16 thru 1/2	44 x 60

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HOW TO ORDER
GARLOCK GASKETING MATERIAL

FAST DELIVERY

A chain of Garlock combination warehouse—gasket-cutting facilities is maintained throughout the United States and Canada. This assures prompt delivery. Sheet orders are filled without delay from large stocks of Garlock gasket materials maintained at each warehouse.

Or if you need gaskets cut precisely to your specifications, any one of these strategically-located Garlock gasket-cutting centers will produce them quickly and economically . . . regardless of quantity. These centers are located in:

Houston, Texas
Palmyra, New York
Philadelphia, Pennsylvania
Toronto, Ontario, Canada

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ORDERING INFORMATION

SHEET MATERIAL

Please furnish the following information:

A. Fluid or gas to be sealed. If chemical or corrosive, concentration must be known.

B. Pressure to be sealed, both operating and test.

C. Operating temperature range and cycle time.

D. Type of joint.

E. Flange surface finish.

CUT GASKETS

Please furnish the above information *plus* the following:

A. Actual gasket dimensions, shape and thickness.

B. Number and size of bolts and bolt circle diameter.

C. Bolt material.

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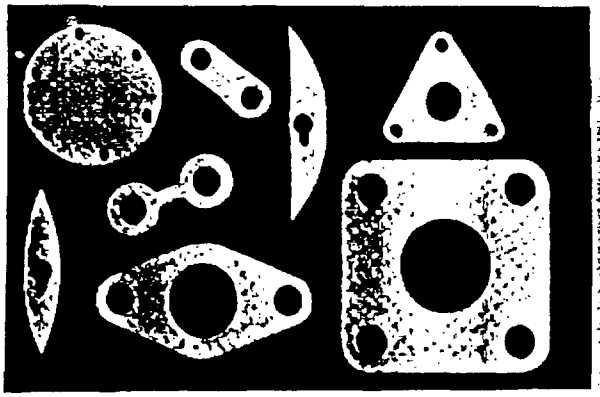

GARLOCK SOLID TFE CHEMISEAL® PIPE FLANGE GASKETS

corrosion-resistant non-contaminating wide temperature range (–450° F. to 500° F.)

Garlock 8764 gaskets of solid TFE fluorocarbon resin are used throughout industry wherever resistance to chemical attack or product non-contamination are important considerations. Generally, solid TFE fluorocarbon gaskets: (1) are serviceable against any material except molten alkali metals and fluorine under pressure—eliminating change of gaskets to suit medium; (2) have outstanding non-adhesive properties eliminating gasket sticking where joints are opened frequently; and (3) are completely reusable and therefore economical.

Solid TFE CHEMISEAL gaskets are available in either ring, full face, or special-shaped forms.

STANDARD SIZES GARLOCK 8764 PIPE FLANGE RING GASKETS—CLASS 150 POUND FLANGE

PIPE SIZE (inches)	OLD STANDARD I.D	OLD STANDARD O.D	ASA* STANDARD I.D	ASA* STANDARD O.D.	PIPE SIZE (inches)	OLD STANDARD I.D.	OLD STANDARD O.D.	ASA* STANDARD I.D.	ASA* STANDARD O.D.
1	1	2 1/8	1 1/16	2 1/8	4	4	6 1/8	4 1/8	6 1/8
1 1/4	1 1/4	3	1 5/16	3	5	5	7 3/8	5 9/16	7 3/8
1 1/2	1 1/2	3 1/8	1 5/8	3 1/8	6	6	8 1/8	6 5/8	8 1/8
2	2	4 1/8	2 1/16	4 1/8	8	8	11	8 1/8	11
2 1/2	2 1/2	4 1/8	2 1/2	4 1/8	10	10	13 3/8	10 3/4	13 3/8
3	3	5 1/8	3 1/2	5 1/8	12	12	16 1/8	12 1/4	16 1/8
3 1/2	3 1/2	6 1/8	4	6 1/8					

*Non-Metallic Gaskets for Pipe Flanges ASA B16.21 – 1951.

NOTE: ASA standard sizes will be shipped unless "old standard" is specified on the order

GARLOCK 8764 TFE SHEET FOR EMERGENCY GASKET CUTTING

Garlock 8764 TFE Sheet, per United States Department of Commerce Standard CS-239-63 Grade B, is available for cutting gaskets in your plant to fill emergency needs for either standard or non-standard flanged joints. TFE Sheet is available in three standard sheet sizes: 24 in. x 24 in., 36 in. x 36 in. and 48 in. x 48 in. and twelve standard thicknesses shown in chart below. Standard sheet size tolerances are +.250 in. −.000 in.

THICKNESS (inches)	THICKNESS TOLERANCES (inches)	APPROX. WEIGHT (lb./sq. ft.)	THICKNESS (inches)	THICKNESS TOLERANCES (inches)	APPROX. WEIGHT (lb./sq. ft.)
1/32	+.015 −.005	0.40	3/16	+.038 −.019	4.32
1/16	+.015 −.005	0.75	1/8	+.046 −.022	5.73
3/32	+.020 −.005	1.12	5/32	+.054 −.027	7.16
1/8	+.016 −.008	1.45	3/16	+.070 −.035	8.60
5/32	+.022 −.011	2.17	1/4	+.078 −.039	10.00
1/4	+.030 −.015	2.89	*1	+.087 −.043	11.45

*48 in. x 48 in. sheets available in these thicknesses per United States Department of Commerce Standard CS-239-63 Grade C.

†Thicknesses greater than 1 in., per United States Department of Commerce Standard CS-239-63 Grade B, available in standard sheet sizes on special order.

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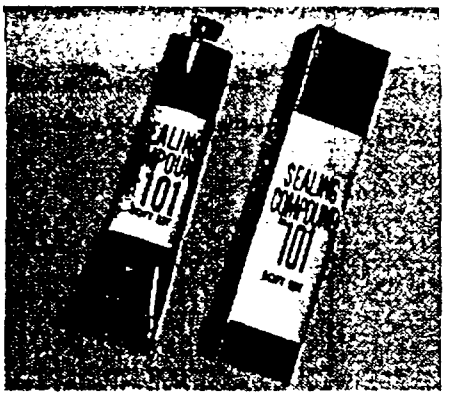

GARLOCK SEALING COMPOUND NO. 101

non-hardening plastic compound for flanged joints

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Garlock Sealing Compound No. 101 is a superior plastic material developed in the Garlock laboratories for use:

with gaskets on flanged joints where the flanges are rough or pitted.

when making temporary repairs to gasketed joints, where pressures are low.

when sealing the seams or joints between light metal surfaces where gaskets cannot be applied.

when making temporary joints between bolted flanges without using gaskets, where pressures are low.

as a substitute for Garlock Pipe Thread Compound on threaded joints when regular pipe thread compound is not immediately available.

This compound is non hardening . . . joints on which it is used do not "freeze," thus permitting easy disassembly of the joint. Garlock Sealing Compound No. 101 is unaffected by water, kerosene, gasoline, or grease.

WIDE SERVICE RANGE

Garlock Sealing Compound No. 101 is recommended for use at temperatures ranging from below 0° to 500°F. on pipe lines or other equipment handling: water, steam, air, oil, gasoline, gas, weak acids, or alkalies.

EASY TO APPLY

Garlock Sealing Compound No. 101 is ready to use as squeezed from the tube. Apply only a thin, even coat to surfaces to be sealed . . . compound's bright red color makes it easy to determine when surfaces are completely covered. Allow a few minutes for compound to dry. Close joint.

AVAILABLE FORMS

Garlock Sealing Compound No. 101 is packaged in a convenient 11-ounce collapsible metal tube.

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GARLOCK STYLE 555
TYPE CR GUARDIAN® GASKETS

Semi-metallic gaskets combining all the advantages of spiral-wound design and an integral gauge ring for sealing high pressures, high temperatures, in raised face, plain face and lapped joints.

GARLOCK Type CR GUARDIAN Spiral-Wound Gaskets are manufactured under the most rigid engineering specifications and quality control standards in the industry. Gaskets are packaged at the factory in heavy duty corrugated boxes for protection and easy identification. Each box contains 25, 10 or 5 identical assemblies, depending on size, and is clearly labeled as to nominal pipe size, pressure series and material specifications. Factory packaging of spiral-wound gaskets keeps gaskets looking new and free from contamination, eliminates separation of gasket and ring components, facilitates storing until used and assures selection of the right gasket for the right joint to make a safe seal.

GARLOCK Type CR GUARDIAN Spiral-Wound Gaskets are made of alternating plies of preformed, "V" shaped, spring-like metals and asbestos or other fillers. Gasket density, i.e. the relationship of the engineered "V" design of the preformed metal to the selected filler, is varied according to the bolting of the joint assembly to maintain gasket resiliency and to control gasket compressibility. Type 304 stainless steel and Canadian asbestos are the standard materials used in the sealing component. The gauge ring, stamped with identifying information, is cold rolled steel, plated to resist atmospheric corrosion. The ring O.D. equals the bolt circle less the diameter of one bolt, making it easy to center the gasket assembly in the joint.

The sealing component is .175 in. nominal thickness and the gauge ring is ⅛ in. nominal thickness. The unusual resiliency and rebound characteristics of the gasket permit it to adjust to varying conditions of loading, internal pressure and temperature changes. Optimum compression, without overstressing the bolts, is achieved when flange faces are brought down to the gauge ring, compressing the gasket to a .125 in.-.135 in. thickness.

GARLOCK Type CR GUARDIAN Spiral-Wound Gaskets are available for immediate delivery, in standard materials, from Garlock warehouses for ASA standard flanged fittings (A.S.A. B16.5) to and including 2500 lb. series. Standard dimensions are in accordance with A.P.I. Standard 601 Specification. Type CR gaskets are also available in accordance with current Military Specifications.

Other Metals and Fillers

GARLOCK Type CR GUARDIAN Spiral-Wound Gaskets for all pipe sizes and pressure series are available in combinations of metals and fillers other than Type 304 stainless steel and Canadian asbestos. Other available metals and alloys are: plated low carbon steel, Monel*, nickel, Inconel*, Hastelloy B†, phosphor bronze and stainless steel Types 309S, 316L and 347. Compressed asbestos sheet with various types of binders as fillers are also available. Blue African asbestos, TFE and TFE-suspensoid-treated asbestos are recommended as fillers for chemical and process applications requiring a high degree of resistance to corrosion. Garlock's exclusive "Pyro-Fil" ceramic filler is recommended for elevated temperature applications to 1900°F.

HOW TO ORDER

To order standard gaskets, give part number from chart on next page, nominal pipe size, pressure series and material specifications.

Cast Iron Flanges

To order for cast iron plain flanges American Standard Class 125, give part number listed in 150 psi column and for American Standard Class 250, give part number listed in 300 psi column.

Note: Bolting-up procedures prescribed by maintenance engineering should be followed in all cases to avoid damage to cast iron flanges.

Specials

GARLOCK Type CR GUARDIAN Spiral-Wound Gaskets can be designed and manufactured for special applications using other than standard fittings. When ordering, give complete details of joint design. Use the GUARDIAN Spiral-Wound Gasket Inquiry Data Sheet for this purpose. Copies of the form are available from your Garlock sales representative.

Other Types

GARLOCK GUARDIAN Spiral-Wound Gaskets are available for all ASA recessed joints in nominal pipe sizes ¼ in.—24 in. and all pressure series to 2500 psi. Ask your Gar-

*International Nickel Co. trademark. †Union Carbide Co. trademark

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lock sales representative for information describing Type RM for large male and female joints, Type RL for large tongue and groove joints, and Type RS for small tongue and groove joints.

GARLOCK GUARDIAN Spiral-Wound Gaskets for manholes and handholes are available for practically all standard makes of high pressure boilers and equipment. Dimensions and material specifications are outlined in current literature under Types BM and BR for boiler manholes and BH for handholes and tubecaps.

Type CT is a new addition to the GUARDIAN line of spiral-wound gaskets. Type CT is a self-centering gasket assembly similar to Type CR. It is designed for use only in ASA standard raised face, plain face and lapped joints, ¼ in.—24 in. nominal pipe sizes and for 150, 300, 400 and 600 psi flanges. Not recommended for pressures exceeding 600 psi. The sealing component has the identical design characteristics and dimensions of Type CR. The centering guide consists of a light gauge, plated steel ring, secured firmly to the head of the engineered "V." Use of Type CT should be limited to applications where there is no opportunity for over-compressing the gasket. Type CT is not recommended for any special applications or flanged joints deviating from ASA standards.

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GUARDIAN GASKET DIMENSIONS AND PART NUMBERS

Nominal Pipe Size (inches)	O.D. (inches)	150 PSI			300 PSI			400 PSI			600 PSI		
		I.D. (inches)	Nominal Ring O.D. (inches)	Part No.	I.D. (inches)	Nominal Ring O.D. (inches)	Part No.	I.D. (inches)	Nominal Ring O.D. (inches)	Part No.	I.D. (inches)	Nominal Ring O.D. (inches)	Part No.
*½	⅞	½	1⅜	CR01002	½	1⅜	CR03002	⅝	1¾	CR04002	½	1¾	CR06002
*¾	1⅛	¾	1⅝	CR01006	¾	2⅛	CR03006	¾	2⅛	CR04006	¾	2⅛	CR06006
*1	1⅜	1	2⅛	CR01C07	1	2⅛	CR03007	1	2⅛	CR04007	1	2⅛	CR06007
1	1⅞	1¼	2⅝	CR01C10	1¼	2⅞	CR03010	1¼	2⅞	CR04010	1¼	2⅞	CR06010
1¼	2⅛	1 13/32	3	CR01012	1 43/64	3¼	CR03012	1 43/64	3¼	CR04012	1 43/64	3¼	CR06012
1½	2½	1 57/64	3⅜	CR01015	1 51/64	3½	CR03015	1 51/64	3½	CR04015	1 51/64	3½	CR06015
2	3⅛	2⅛	4⅛	CR01020	2⅛	4⅜	CR03020	2⅛	4⅛	CR04020	2⅛	4⅛	CR06020
2½	3⅝	3⅛	4⅝	CR01025	3⅛	5⅛	CR03025	3⅛	5⅛	CR04025	3⅛	5⅛	CR06025
3	4½	4	5⅝	CR01C30	4	6⅛	CR03C30	4	6⅛	CR04030	4	6⅛	CR06030
*3½	5⅛	4⅛	6⅛	CR01035	4⅛	6⅝	CR03035	4⅛	6⅝	CR04C35	4⅛	6⅝	CR06035
4	5⅝	5	6⅞	CR01040	5	7⅛	CR03040	4⅞	7	CR04040	4⅛	7⅛	CR06040
*4½	6⅛	5 9/16	7	CR01045	5 9/16	7⅝	CR03045	—	—	—	—	—	—
5	7	5 13/16	7⅝	CR01050	5 13/16	8⅛	CR03050	5 13/16	8⅛	CR04050	5 13/16	9⅛	CR06050
6	8⅛	7⅛	8⅛	CR01060	7⅛	9⅛	CR03060	6⅛	9⅛	CR04060	6⅛	10⅛	CR06060
8	10⅜	9⅛	11	CR01080	9⅛	12⅛	CR03080	8⅛	12	CR04080	8⅛	12⅛	CR06080
10	12⅛	11 9/16	13⅜	CR01100	11 9/16	14⅛	CR03100	10 13/16	14⅛	CR04100	10 13/16	15⅜	CR06100
12	14⅜	13⅜	16⅛	CR01120	13⅜	16⅝	CR03120	12⅛	16⅛	CR04120	12⅛	18	CR06120
14	16	14⅛	17⅞	CR01140	14⅛	19⅛	CR03140	14⅛	19	CR04140	14⅛	19⅜	CR06140
16	18⅛	16⅛	20⅛	CR01160	16⅛	21⅛	CR03160	16⅛	21⅛	CR04160	16⅛	22⅛	CR06160
18	20⅛	18 1/16	21⅞	CR01180	18 1/16	23⅛	CR03180	18⅛	23⅛	CR04180	18⅛	24⅛	CR06180
20	22⅜	20 1/16	23⅞	CR01200	20 1/16	25⅜	CR03200	20⅛	25⅛	CR04200	20⅛	26⅛	CR06200
24	27	24⅛	28⅛	CR01240	24⅛	30⅛	CR03240	24⅛	30⅛	CR04240	24⅛	31⅛	CR06240

*Not covered in API Standard 601 Specifications. Gasket dimensions are for ASA B16.5 flanges.

Nominal Pipe Size (inches)	O.D. (inches)	900 PSI			1500 PSI			2500 PSI		
		I.D. (inches)	Nominal Ring O.D. (inches)	Part No.	I.D. (inches)	Nominal Ring O.D. (inches)	Part No	I.D. (inches)	Nominal Ring O.D. (inches)	Part No.
*½	1⅛	⅝	2⅛	CR09005	⅝	2⅛	CR15005	⅝	2¾	CR25005
*¾	1 9/16	1	2⅝	CR09007	1	2⅝	CR15007	1	3	CR25007
1	1⅜	1⅛	3⅛	CR09010	1⅛	3⅛	CR15010	1⅛	3½	CR25010
1¼	2 1/16	1 5/16	3⅛	CR09012	1 5/16	3⅛	CR15012	1 5/16	4⅛	CR25012
1½	2⅛	1⅞	3⅞	CR09015	1⅞	3⅞	CR15015	1⅞	4½	CR25015
2	3⅛	2 1/16	5⅛	CR09020	2 1/16	5⅛	CR15020	2 1/16	5⅛	CR25020
2½	3⅞	2⅛	6⅛	CR09025	2⅛	6⅛	CR15025	2⅛	6⅛	CR25025
3	4⅝	3⅛	6⅝	CR09030	3⅛	6⅞	CR15030	3⅛	7⅛	CR25030
4	5⅛	4⅛	8⅛	CR09040	4⅛	8⅛	CR15040	4⅛	8⅛	CR25040
*5	7	5 1/16	9⅛	CR09050	5 1/16	10	CR15050	5⅛	11	CR25050
6	8⅛	6⅛	11⅛	CR09060	6⅛	11⅛	CR15060	6⅛	12⅛	CR25060
8	10⅜	8⅛	14⅛	CR09080	8⅛	13⅞	CR15080	8⅛	15⅛	CR25080
10	12⅛	10 1/16	17⅛	CR09100	10⅛	17⅛	CR15100	10⅛	18⅛	CR25100
12	14⅜	12⅛	19⅜	CR09120	12⅛	20⅛	CR15120	12⅛	21⅛	CR25120
14	16	14⅛	20⅛	CR09140	14⅛	22⅛	CR15140	—	—	—
16	18⅛	16⅛	22⅝	CR09160	16⅛	26⅛	CR15160	—	—	—
18	20⅛	18⅛	25⅛	CR09180	18⅛	27½	CR15180	—	—	—
20	22⅜	20⅛	27⅛	CR09200	20⅛	29½	CR15200	—	—	—
24	27	24⅛	33	CR09240	24⅛	36⅛	CR15240	—	—	—

*Not covered in API Standard 601 Specifications. Gasket dimensions are for ASA B16.5 flanges.

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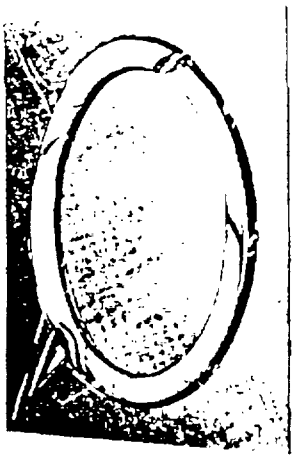


GARLOCK CHEMISEAL® JACKETED GASKETS

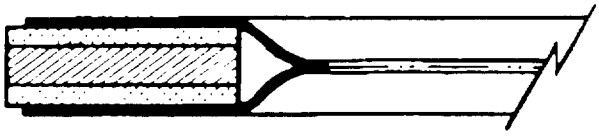
for chemical-resistant piping and equipment

CHEMISEAL Jacketed Gaskets are now skin-packed to keep them clean, sanitary and perfectly flat for perfect sealing ability whenever you are ready to use them.

GARLOCK 8764 gaskets with TFE jackets (often called envelopes) are ideal for applications where corrosion, contamination or other undesirable effects must be combated . . . also where gasketing must be resilient and highly deformable. Good examples are glass-lined piping and such processing equipment as reactors, kettles, condensers, heat exchangers and columns.

In glass-lined steel piping, bolting pressures must not be too heavy. Thus, the gasket filler material must be carefully selected. From the several Garlock filler materials you can choose the one with exactly the right deformability to assure a tight lasting seal on any specific application.

On processing equipment, where corrosion and contamination cannot be tolerated, the TFE jacket gives complete resistance to both conditions . . . reduces chemical permeability to the base minimum—virtually eliminating mechanical failure.



SLIT ENVELOPE JACKETS

SLIT ENVELOPE JACKETS are basically ring gaskets .040 in. thick, split from outside diameter to about $^{1}/_{16}$ in. from inside diameter. Bearing surface is determined by filler dimensions as jacket requires clearance between filler I.D. and jacket I.D. Gasket outside diameter nests within bolt circle. Inside diameter is approximate nominal I.D. of pipe. Available for standard A.S.A. flanges in pipe sizes from 1 in. through 12 in. Maximum O.D. 24 in.



MILLED ENVELOPE JACKETS

MILLED ENVELOPE JACKETS are made from TFE cylinder stock. Jacket is machined from its O.D. to within $^{1}/_{32}$ in. of I.D., leaving shields of approximately .020 in. top and bottom. Flat I.D. of jacket fits flush with pipe I.D. Gasket O.D. nests within bolt circle. Standard sizes from 1 in. through 12 in. Maximum O.D. 24 in.

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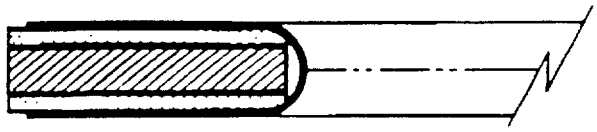
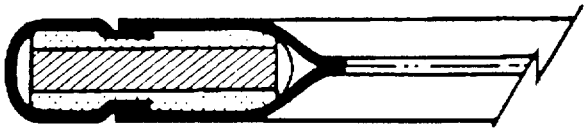


FORMED SHIELD JACKETS

FORMED SHIELD JACKETS are necessary for diameters over 12 in. and such irregular openings as tank heads and manholes. Over-all thicknesses range from $^{3}/_{16}$ in. to $^{3}/_{8}$ in. Exclusive Garlock Butt Welded Construction* eliminates any "lump" at the seam and allows (1) uniform bolting around entire flange surface for tight, leakproof seal; (2) much less bolt loading for a good seal, as compared with lap joint construction.

*Patent applied for.



DOUBLE JACKET DESIGN

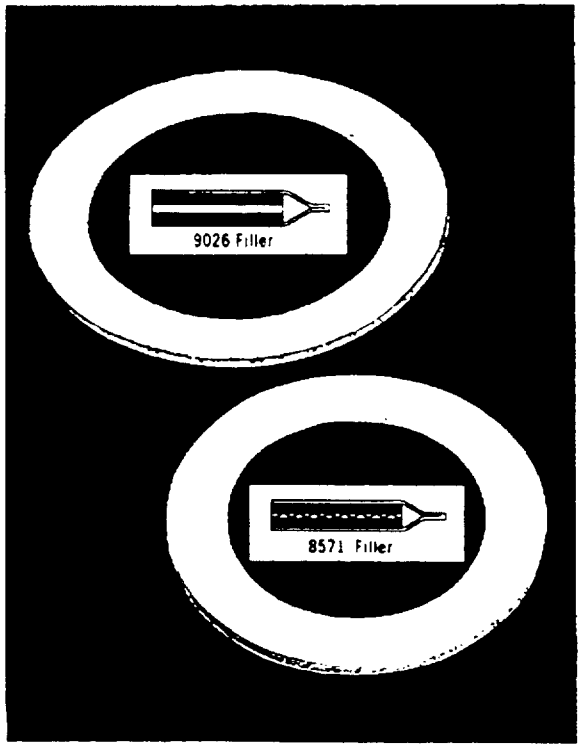
DOUBLE JACKET DESIGN. Two jackets are overlapped to protect O.D. as well as I.D. They can be either slit envelope, milled envelope or formed shield types. Especially recommended for vacuum service where outside atmosphere is corrosive enough to attack filler material. Minimum standard I.D. is 12 in. Under special conditions smaller sizes can be made.

FOR GLASS LINED STEEL FLANGED PIPING AND EQUIPMENT

GARLOCK 9026 FILLER. Made of compressed asbestos between two layers of felted blue asbestos. *Service:* For pressures under 300 psi on larger diameter openings.

GARLOCK 8571 FILLER. Made of corrugated steel between two layers of felted blue asbestos. *Service:* For high pressures (300 psi and over). Its use in nominal sizes up to 12 in. for low or high pressure service is recommended due to its ability to seal at lower bolt loads than 9026 Filler.

Interchangeable for any glass-lined flanged openings, these fillers are recommended because their resiliency and deformability make possible minimum bolt loading. This, in turn, accommodates the fragile characteristics of the glass lining. Other than glass-lined steel, these fillers should be used *only* where excessive flange surface irregularity is present. For vacuum service double jacketed gaskets are recommended, with either of the above fillers completely shielded.



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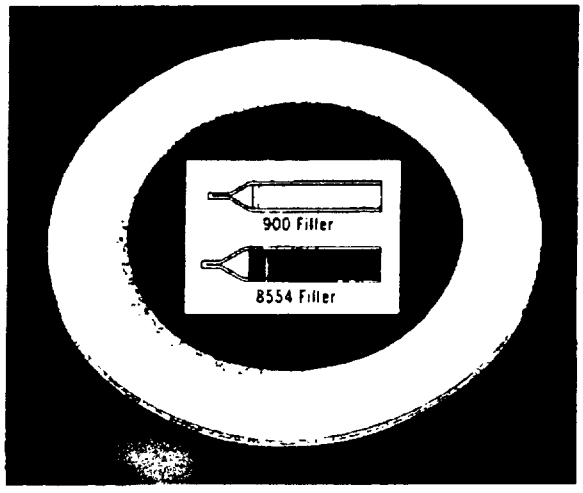
FOR OTHER CHEMICAL PIPING AND EQUIPMENT

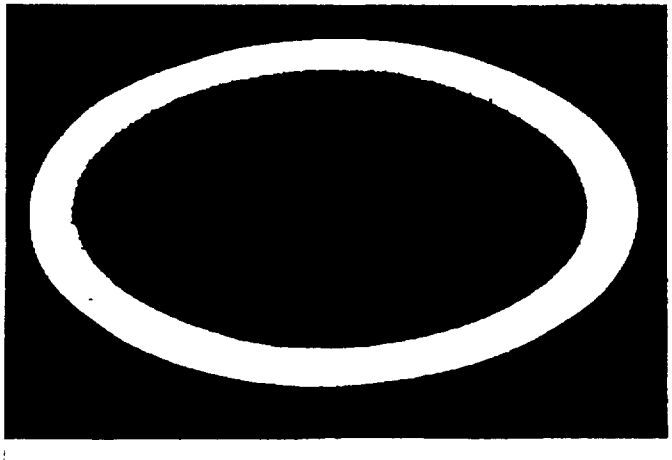
GARLOCK 900 FILLER. Made of compressed asbestos sheet, available from $^{1}/_{16}$ in. through $^{3}/_{16}$ in. thick. Selected because of low sulphur content, it resists hardening and retains resiliency at elevated temperatures and over long periods of exposure. *Service:* For use on standard flanges and materials such as plastic, porcelain, carbon, etc., where pipe ends or flange faces are smooth and flat . . . and therefore do not require a high degree of deformation.

GARLOCK 8554 FILLER. Made of a layer of felted blue asbestos, available from $^{1}/_{16}$ in. through $^{1}/_{4}$ in. thick. *Service:* For flanges where maximum deformation is required, and service pressure and bolt load are low. Material has excellent recovery characteristics.



Standard Sizes Elliptical Manhole Gaskets for Glass-lined Steel Equipment (with 9026 style Filler)

NOMINAL PIPE SIZE (inches)	I.D. (inches)	O.D (inches)
9 x 12	8 $^{7}/_{8}$ x 12 $^{7}/_{8}$	12 x 15
12 x 16	12 $^{7}/_{8}$ x 16 $^{7}/_{8}$	16 $^{7}/_{8}$ x 19 $^{7}/_{8}$
14 x 18	14 $^{7}/_{8}$ x 18 $^{7}/_{8}$	17 x 21



Sizes of CHEMISEAL Jacketed Gaskets for Glass-lined Steel Equipment

NOMINAL FLANGE SIZE (inches)	JACKET SIZE I.D. (inches)	FILLER DIMENSIONS (inches)		
		I.D	O.D.	Thickness
1	1	1 $^{5}/_{8}$	2 $^{1}/_{2}$	$^{3}/_{16}$
1 $^{1}/_{2}$	1 $^{1}/_{2}$	2	3 $^{1}/_{8}$	$^{3}/_{16}$
2	2	2 $^{1}/_{8}$	4	$^{3}/_{16}$
3 & 3 $^{1}/_{4}$	3	3 $^{1}/_{8}$	5 $^{3}/_{8}$	$^{3}/_{16}$
4	4	4 $^{1}/_{8}$	6 $^{1}/_{8}$	$^{3}/_{16}$
5	5	6 $^{1}/_{8}$	7 $^{1}/_{8}$	$^{3}/_{16}$
6	6	6 $^{1}/_{8}$	8 $^{1}/_{8}$	$^{3}/_{16}$
8	8	8 $^{1}/_{8}$	10 $^{1}/_{8}$	$^{3}/_{16}$
10	10	10 $^{3}/_{4}$	13	$^{3}/_{16}$
12	12	12 $^{3}/_{4}$	16	$^{3}/_{16}$
14	14 $^{1}/_{8}$	14 $^{3}/_{4}$	17 $^{1}/_{8}$	$^{3}/_{16}$
16	16 $^{1}/_{8}$	16 $^{1}/_{8}$	19	$^{3}/_{16}$
18	18 $^{1}/_{8}$	18 $^{1}/_{8}$	21	$^{3}/_{16}$
20	20 $^{1}/_{8}$	20 $^{1}/_{8}$	23	$^{3}/_{16}$
24	24 $^{1}/_{8}$	24 $^{1}/_{8}$	27	$^{3}/_{16}$
28	28 $^{1}/_{8}$	28 $^{1}/_{8}$	33 $^{1}/_{8}$	$^{1}/_{4}$
30	30 $^{1}/_{8}$	30 $^{1}/_{8}$	33 $^{1}/_{8}$	$^{1}/_{4}$

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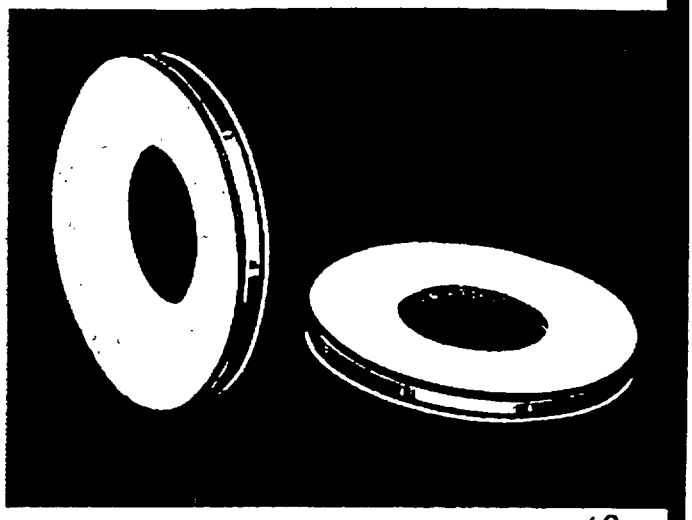
GARLOCK CHEMISEAL JACKETED ADAPTERS

for connecting unlike nozzles of same nominal size



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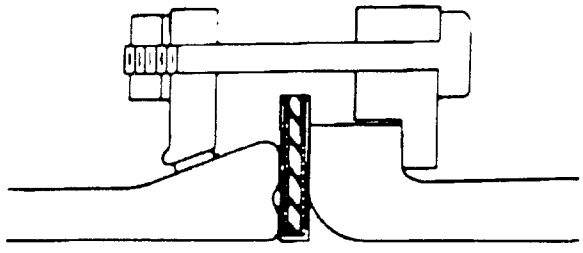
These TFE jacketed adapters, with steel bearing cores, are easy-to-install single units. They end the fuss and bother of using two separate gaskets and a bearing ring. The self-contained bearing core in these adapters provides rigidity and transfers bearing load from such dissimilar flanged ends as large I.D. glass- or rubber-lined steel to conical end glass or equivalent pipe (see drawing).

Garlock CHEMISEAL Jacketed Adapters are available in standard sizes from 1 in. to 6 in. For special sizes specify: (1) nominal diameters of nozzles to be joined. (2) types of materials to be joined.



HOW TO ORDER CHEMISEAL JACKETED GASKETS

Please specify the following:

1. Nominal pipe size *2. Filler type* *3. Flange material* *4. Any special conditions*

INFORMATION REQUIRED FOR GASKET RECOMMENDATION

1. Standard nominal flange or pipe size
2. Equipment manufacturer's name
3. Pipe or equipment material
4. Type and condition of flange
5. Dimensions inside of bolt holes
6. Material being handled
7. Temperatures
8. Pressures
9. Type of jacket preferred
10. Filler material preferred

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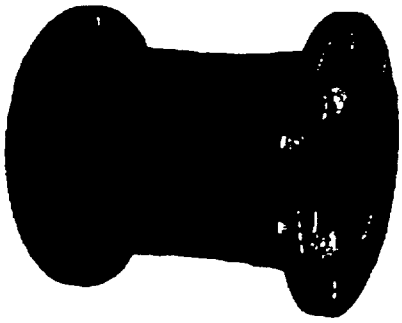
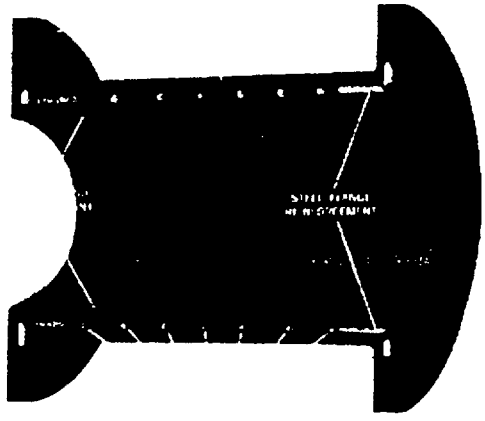


GARLOCK FLEXO-MATIC® PIPE

for hot and cold water service in heating, ventilating, and air conditioning systems.

Garlock FLEXO-MATIC pipe is designed to eliminate undesirable piping conditions within a wide range of temperatures and pressures. It is ideal for connecting pumps, centrifugal compressors, cooling towers and similar applications. Here are some of the advantages of FLEXO-MATIC pipe:

- Reduces noise and vibration
- Eliminates stress caused by expansion and contraction
- Compensates for misalignment
- Cuts maintenance costs by reducing piping failures and shutdowns
- Handles constant temperatures to 180°F
- Withstands pressures from full vacuum to 150 psi



CONSTRUCTION FEATURES:

- Special heat resisting, heavy duty tube
- Multiple plies of specially woven high tensile fabric
- Rugged cover withstands aging, weathering and mechanical damage
- Helical-wound steel wire is firmly embedded in carcass to prevent collapse, crushing and provide reinforcement to prolong service life

NOTE: Other materials also available for various service conditions. These include neoprene, natural and Hypalon® rubbers and asbestos.

®DuPont registered trademark

FLEXO-MATIC PIPE
with male pipe ends



Style 7200

GARLOCK Style 7200 for smaller pipe sizes is equipped with forged I.P.T. male fittings. It withstands temperatures to 200°F, pressures to 150 psi.

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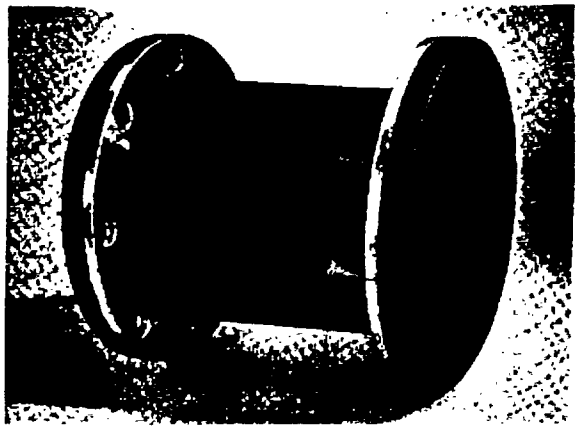
GARLOCK STYLE 7250—Withstands temperatures to 180°F, pressures to 150 psi

GARLOCK STYLE 7350—Special construction for temperatures higher than 180°F and for pressures higher than 150 psi

Both styles available with choice of flange constructions shown below:



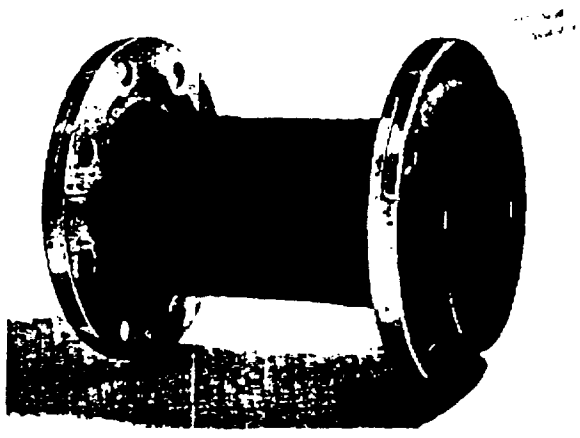
7350

FLEXO-MATIC pipe with regular full-faced flanges with 125 lbs. American Standard Drilling for cast iron, or 150 lbs. for steel. Special flanges may be ordered to 300 lbs. drilling, or to your specific needs. The galvanized steel retaining rings are of split construction and fit flush against flange to prevent damage to flange when tightened.

FLEXO-MATIC PIPE SIZES*

PIPE I.D (inches)	Standard Face-to-Face Garlock Style 7250 and 7350—■ Standard Overall Length Garlock Style 7200—●					
	12"	18"	24"	30"	36"	48"
¾		●				
1		●				
1¼		●				
1½		●				
2	■	■	● ■			
2½	■	■	● ■			
3	■	■	● ■	■	● ■	
4	■	■	■	■	■	
5	■	■	■	■	■	
6		■	■	■	■	
8			■	■	■	■
10			■		■	■
12			■		■	■

*NOTE Above lengths recommended for best installation results. Reducing units available for connecting pipe of unequal diameters. Please make inquiry for pipe sizes not indicated in above table.



7250

FLEXO-MATIC pipe with beaded flange. This type is designed for use with adjustable interlocking malleable iron retaining rings (as illustrated), and requires no drilling.

HOW TO ORDER FLEXO-MATIC PIPE

Please include the following information when ordering:

1. Garlock style number
2. Number of units required with or without metal retaining rings
3. Pipe size
4. Face-to-face dimension
5. Full-faced flanged ends or beaded flanged ends
6. Bolt hole drilling: Specify standard ASA or Special
7. Medium handled
8. Operating conditions (pressure, temperature, etc.)
9. Type, frequency and amount of movement
10. Special conditions which might affect selection

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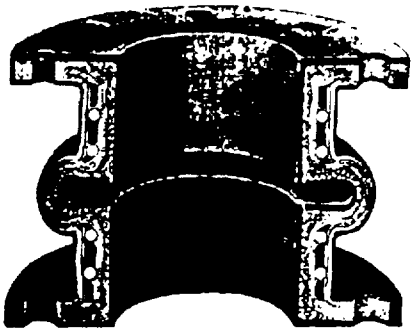
GARLOCK EXPANSION JOINTS

for reducing vibration, noise and flange breakage, preventing stresses and compensating for misalignment in piping systems



GARLOCK RUBBER EXPANSION JOINTS

These rugged, yet flexible joints are made of a high-grade rubber compound combined with plies of sturdy cotton duck. Their bodies are internally reinforced with steel rings. Typical applications include air conditioning systems, air ducts, air injection lines, blower lines, brine tanks, chilled water lines, circulating water lines to condensers, turbine and condenser connections, dry vacuum lines, hot water lines to 180°F, jet condensers, paper stock lines, pump lines (discharge and suction), ventilating systems.

Arches in Garlock Expansion Joints flex with expansion and contraction of piping . . . thus relieving stresses and strain in the line. Soft rubber arch fillers are furnished when excessive sediment exists in pipe line. These prevent arches from filling and becoming inoperative . . . also prevent turbulent flow. For special applications where space is limited joints can be furnished without arches. Flanges of Garlock Rubber Expansion Joints are integral with body of joint . . . drilled for bolts to coincide with bolt holes of pipe flanges on which they will be installed. No gaskets required. Also available are spool-type joints with sleeve ends designed to slip over ends of open pipe.

Garlock Spool-Type Expansion Joints

These rubber expansion joints are available in three forms:

STANDARD—for connecting concentric pipe flanges of same diameter and alignment.

TAPERED—for connecting concentric flanges of different diameters. Also available with eccentric taper to connect off-center piping. In general, maximum taper is 6 in. For example, from 30 in. to 24 in. diameter. Furnished with arches or without . . . for use where expansion is slight.

OFFSET—for applications where there is an unusual amount of misalignment in piping. Can also be produced to compensate for non-parallel flanges.

Service

Garlock Spool-Type Expansion Joints are recommended for use against hot or cold water, mild acids, mild caustic solutions, brine, air and exhaust steam up to 180°F. Available in three styles:

Garlock 204 for pressures up to 125 psi, depending upon size of joint. See table at right.

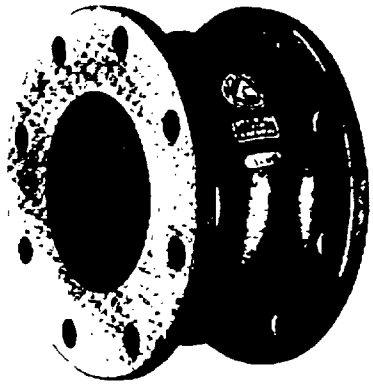
Garlock 205 for vacuum to 30 in. of mercury.

Garlock 206 for pressure and vacuum. See table.

Special Applications:

1. Where oil is present in liquid or gas, specify neoprene lining.
2. Where, in addition, oily vapor or an oil drip contacts outside of joint, specify neoprene cover and neoprene lining.
3. Where line carries petroleum derivatives, specify neoprene throughout.

Garlock also offers other rubber compounds for particular applications, depending upon service conditions.





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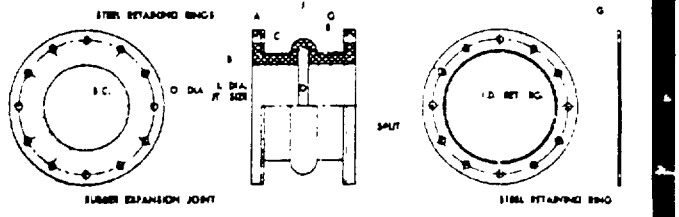
DIMENSIONS OF SPOOL-TYPE JOINTS

The table below shows the range of pipe sizes in which Garlock Spool-Type Rubber Expansion Joints are made, with the necessary dimensions and essential physical limitations applicable to each size. With present production equipment the maximum face-to-face dimension (F) for joints of any size is 17½ in. Larger face-to-face dimensions can be made on special order.



THE MAXIMUM FACE-TO-FACE DIMENSION (F) FOR JOINTS OF ANY SIZE IS 17½"

Joint Size (I. Dia.)	†¼	†1	†1¼	†1½	2	2½	3	3½	4	5	6	8	10	12	14	16	18	20	*22	24	*26	*28	30	*34	36	*40	42	*44	48	*50	54	*56	60	*62	*66	72
Outside Dia. Flange	3⅜	4¼	4⅝	5	6	7	7½	8½	9	10	11	13½	16	19	21	23½	25	27½	29½	32	34¼	38½	38¼	43¾	48	50¾	53	55¼	59¼	61½	66¼	68¼	73	75¼	80	86½
Bolt Circle	2⅛	3⅛	3⅛	3⅛	4¾	5½	6	7	7½	8½	9½	11¾	14¼	17	18½	21¼	22¾	25	27¼	29½	32	34¼	36	40½	42¾	47¼	49½	51¾	58	58¼	62¾	65	69¼	71¾	76	82½
No. Bolt Holes	4	4	4	4	4	4	4	8	8	8	8	8	12	12	12	16	16	20	20	20	24	28	28	32	32	36	36	40	44	44	44	48	52	52	52	60
Dia. Bolt Holes	⅝	⅝	⅝	⅝	⅝	⅝	⅝	⅝	⅝	⅝	⅝	⅞	1	1	1⅛	1⅛	1¼	1¼	1⅛	1⅛	1⅛	1⅛	1⅛	1⅛	1¼	1¼	1⅛	1⅛	1¼	1⅛	2	2	2	2	2	2
I. D. Ring	1⅜	2⅛	2⅝	2 11/16	3⅜	4⅛	4⅝	5⅛	5⅝	6⅞	7⅛	9⅜	12⅛	14¼	16½	18⅛	20½	22⅛	24⅛	26⅛	28⅛	30½	32⅞	37	39	43	45⅛	47¼	51¼	53⅛	57¼	59¼	63¼	65⅛	69¼	75¼
A	9/32	5/16	5/16	5/16	9/32	11/32	5/16	5/16	11/32	11/32	3/8	7/16	1/2	9/16	5/8	11/16	3/4	7/8	1	1	1	1	1	1	1	1	1 1/16	1 1/16	1 1/16	1 1/16	1 1/16	1 1/16	1 1/16	1 1/16	1 1/16	1 1/16
B	1/16	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1	1 1/16	1 3/16	1 5/16	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8
C	1	1	1	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	2	2	2	2	2	2	2 1/4	2 1/4	2 1/4	2 1/4	2 1/4	2 1/4	2 1/4	2 1/4	2 1/4	2 1/4	2 1/4	2 1/4	2 1/4	2 1/4	2 1/4	2 1/4	2 1/4
D	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1	1	1	1	1	1	1	1	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8
E	3/8	3/8	7/16	7/16	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	11/16	11/16	3/4	3/4	3/4	15/16	15/16	15/16	15/16	15/16	15/16	1 5/16	1 5/16	1 5/16	1 5/16	1 5/16	1 5/16	1 5/16	1 5/16	1 5/16	1 5/16	1 5/16	1 5/16	1 5/16
Recommended Minimum Dimension F	5	5	6	6	6	6	6	6	6	6	8	8	8	8	8	8	8	8	10	10	10	10	10	10	18	10	12	12	12	12	12	12	12	12	12	12
G	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2
Recommended W. P. lbs. per sq. in. Gauge Pressure 180° F. Max. Temp. — Style 204	150	150	150	150	150	150	150	150	150	175	125	125	125	125	75	60	60	60	60	60	50	50	50	50	58	50	50	50	50	50	60	50	50	50	50	40
Recommended W. P. lbs. per sq. in. Gauge Pressure 180° F. Max. Temp. — Style 206	90	90	90	90	90	90	90	90	90	90	90	85	85	85	60	45	45	45	40	60	40	40	40	40	40	40	35	35	35	35	35	35	35	35	35	35
Max. Axial Compress. in.	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8
Max. Transverse Deflection in.	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8
Max. Axial Elong. in.	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8	3/16	3/16	3/16	3/16	3/16	3/16	7/32	7/32	7/32	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4

* 1914 125 lb American Standard Drilling Only All others shown 1928 125 lb American Standard Drilling. 1939 American Standard Same as 1928 American Standard
†Ordinarily supplied with filled arch

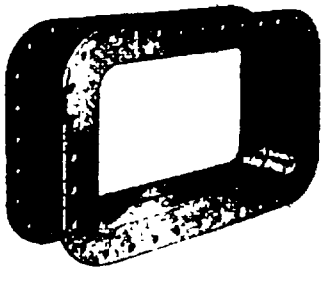
NOTE: FOR HIGH PRESSURE WORK – for pressures higher than indicated in the above table, and where less axial compression and transverse deflection can be tolerated, Garlock Fully Armored Rubber Expansion Joints are available. Consult your Garlock Sales Office or representative for details.

Garlock Rectangular-Type Expansion Joints

Designed for pressure applications, Garlock 204 Expansion Joints are made to conform to the size, contour, drilling and face-to-face dimensions required. Can also be furnished in oval and other shapes. Recommended for flexible connections between turbines and condensers, and for low-pressure blower ducts or forced draft lines where standard construction would be unnecessarily strong or too heavy for service involved. Available with or without arch, depending upon service requirements. Garlock Rectangular-Type Expansion Joints are also available for vacuum service, with either external or internal flanges.

Metal Retaining Rings

Garlock rubber expansion joints are regularly installed with split and beveled retaining rings made of steel with a coat of "zinc shield" paint. These are placed behind and directly against inner faces of the joint flanges. This provides metal surfaces in contact with bolt heads . . . prevents damage to rubber flanges when bolts are tightened. Nominally ⅜ in. thick, the rings are supplied with bolt holes conforming to joints with which they are to be used. Hot-dipped galvanized retaining rings are available on order.





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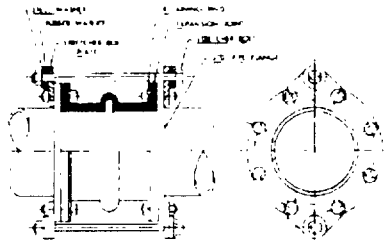
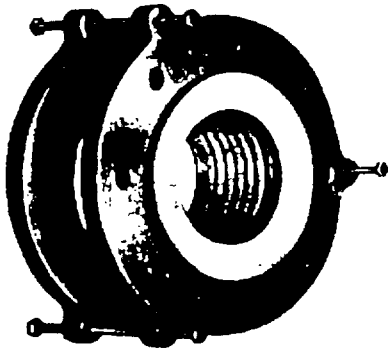
Control Units

Occasionally expansion joints may be located in a pipe line where pipe cannot be properly anchored, and where pipe would have a tendency to separate at either end following installation. For such cases the use of a control unit in conjunction with the expansion joint is recommended. This will limit excessive elongation of the joint and thus prevent injury to it. Control units can be ordered with joints, if specified.



GARLOCK TFE EXPANSION JOINTS AND FLEXIBLE COUPLINGS

for fluid process piping handling strong acids, strong caustics, foods, halogenated solvents



CHEMISEAL®—All-TFE Expansion Joints

Garlock 8764 all-TFE expansion joints consist of TFE bellows with several convolutions. They are designed to completely shield flanges from medium carried. Built-in compressible gaskets contact metal retaining flanges. No adapters or additional gaskets required

Retaining flanges, of high-grade ductile iron finished in grey enamel, should be ordered with the all-TFE expansion joint. Other materials can be furnished on special order. Flanges are drilled and tapped to either ASME or Corning specifications. All flanges have three control rods to prevent stretching beyond maximum face-to-face working limit.

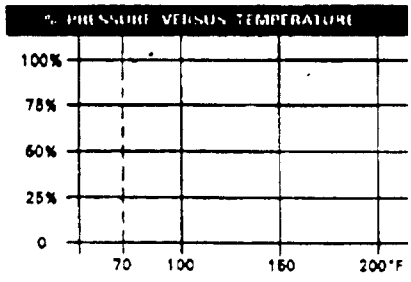
CHEMISEAL all-TFE expansion joints are excellent for axial contraction and expansion in long runs of pipe and other connections. Recommended for pressures up to 75 psi at varying temperatures as indicated in tables A and B below.

Table A shows pressure limits at 70°F, recommended for various sizes of Garlock 8764 all-TFE expansion joints. Table B shows percent of maximum temperature (as shown in Table A) for these joints at elevated temperatures. To compute pressure rating at elevated temperatures, take the maximum pressure from Table A applicable to I.P.S. of joint, and correct in accordance with percentage rating shown in Table B. *Example:* a 2 in. joint rated in Table A at 75 psi at 70°F, is reduced to about 68% of that rating or 50 psi at 150°F. For higher pressures see TFE Lined Rubber Expansion Joints on page 28.

TABLE A—pressure limits at 70°F

PRESSURE (inches)	25 lbs	50 lbs	75 lbs
½ and ¾			
1 to 3 inc.			
4 and 6			
8 and 10			
12			

TABLE B



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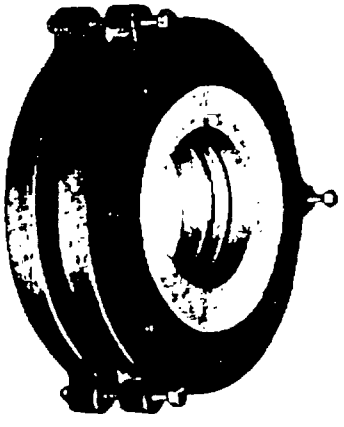
Standard Sizes and face-to-face working limits of CHEMISEAL all-TFE expansion joints are shown in chart below. By adding extra convolutions, greater face-to-face working limits can be accommodated. Also joints for larger pipe sizes are available on special order.

STANDARD DIMENSIONS
Garlock 8764 All-TFE Expansion Joints

I.P.S.	I.D.	O.D.	Face-to-Face Working Limits	
In.	In.	In.	Min.	Max.
*1/8	1/8	1 3/32	1 1/16	1 7/16
*3/4	3/4	1 3/32	1 1/16	2
*1	1	2	1 3/16	2 1/4
*1 1/8	1 1/8	2 1/4	1 3/16	2 3/4
*2	2	3 1/8	2 1/16	3 1/8
2 1/2	2 1/2	4 1/8	2 1/16	3 1/8
*3	3	5	2 1/16	4 1/8
*4	4	6	2 1/16	4 1/8
5	5	7	2 1/16	4 1/8
*6	6	8	2 1/16	4 1/8
8	8	10	2 1/16	5 1/4
10	10	12	2 1/16	5 1/4
*12	12	14	2 1/16	5 1/4

*Supplied with either ASME or Glass Pipe Flanges.
Larger sizes available on special order.



CHEMISEAL All-TFE Flexible Couplings

Same as Garlock 8764 all-TFE expansion joints, with the following differences:

1. Garlock 8764 Flexible Couplings consist of all-TFE bellows with only a few convolutions.
2. Recommended for pressures to 50 psi, at all temperatures to 200°F.
3. Used as vibration damper; for correcting slight misalignment; for compensating for limited axial contraction and expansion in chemical resistant piping.
4. Standard sizes and face-to-face working limits are shown in chart below. To accommodate greater face-to-face working limits use Garlock 8764 all-TFE expansion joints.

STANDARD DIMENSIONS
Garlock 8764 All-TFE Flexible Couplings

I.P.S.	I.D.	O.D.	Face-to-Face Working Limits	
In.	In.	In.	Min.	Max.
*1/8	1/8	1 3/32	1/16	1 7/16
*3/4	3/4	1 3/32	1/16	1 7/16
*1	1	2	1 3/16	1 3/16
*1 1/8	1 1/8	2 1/4	1 3/16	1 3/16
*2	2	3 1/8	1 3/16	1 3/16
2 1/2	2 1/2	4 1/8	1 3/16	1 3/16
*3	3	5	1 3/16	2 1/16
*4	4	6	1 3/16	2 3/16
5	5	7	1 3/16	2 3/16
*6	6	8	1 3/16	2 3/16
8	8	10	1 7/16	2 1/4
10	10	12	2 1/16	2 3/16
12	12	14	2 1/16	2 3/16

*Supplied with either ASME or Glass Pipe Flanges.
Larger sizes available on special order.

FLANGE BOLTING
All flanges supplied with tapped bolt holes for Garlock 8764 Expansion Joints and Flexible Coupilngs

Nom. I.P.S.	125# ASME FLANGES			STANDARD GLASS PIPE FLANGES		
	Bolt Circle	Bolting		Bolt Circle	Bolting	
In.	In.	No.	Size	In.	No.	Size
1/8	2 3/8	4	1/2-13	2 3/16	3	1/4-20
3/4	2 3/4	4	1/2-13	2 1/2	3	1/4-20
1	3 1/2	4	5/8-13	2 3/4	3	5/16-18
1 1/8	3 1/8	4	5/8-13	3 1/8	3	5/16-18
2	4 3/4	4	3/4-11	3 1/8	3	5/16-18
2 1/2	5 1/2	4	3/4-11	X		X
3	6	4	3/4-11	5 1/4	6	5/16-18
4	7 1/2	8	5/8-11	6 1/4	6	1/4-20
5	8 1/2	8	3/4-10	X		X
6	9 1/2	8	3/4-10	9 1/2	8	5/16-18
8	11 3/4	8	7/8-10	X		X
10	14 1/4	12	7/8-9	X		X
12	17	12	7/8-9	X		X

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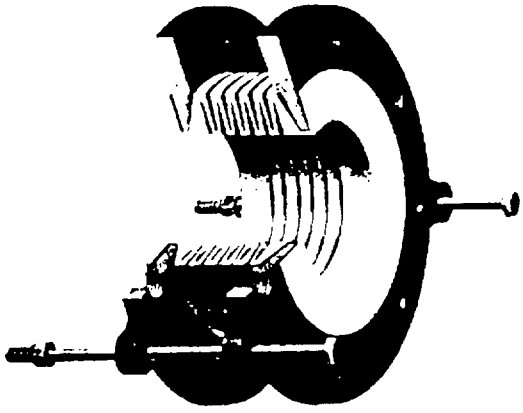
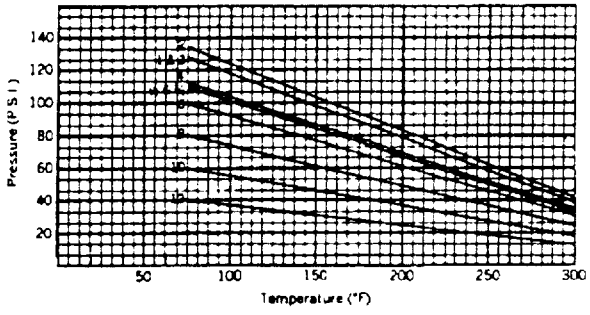


CHEMISEAL All-TFE Expansion Joints with Polyester Reinforcing Rings

Garlock 8764 Reinforced All-TFE CHEMISEAL Expansion Joints have polyester rings to provide greater resistance to pressures and temperatures than regular TFE expansion joints. The patented combination of polyester reinforcing rings and TFE convolutions minimizes distortion and blowout of the joint under pressure, greatly extending the range of application.

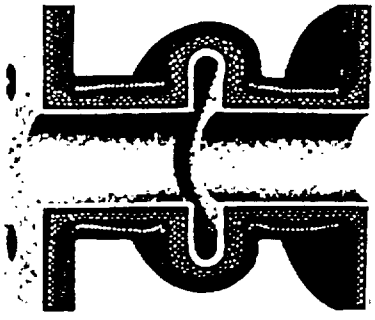
Available in sizes from 1 to 12 inches, temperatures to +300°F., pressures to 135 psi—see charts below. Joints for larger pipe sizes available on special order. Greater face-to-face working limits can be provided with extra convolutions in the joint.

PRESSURE-TEMPERATURE RATINGS



STANDARD DIMENSIONS

Pipe Size (inches)	Standard No. of Convolutions	Face to Face Working Limits (inches) Min.	Max
1	5	1 11/16	2 3/8
1 1/2	5	1 3/4	2 17/32
2	5	2 1/16	3 3/16
2 1/2	5	2 1/16	3 3/16
3	6	2 29/32	4 1/8
4	6	2 29/32	4 1/8
6	6	2 29/32	4 1/8
8	6	3 1/32	4 29/32
10	6	3 1/32	4 29/32
12	6	3 1/32	4 29/32



Garlock TFE-Lined CHEMISEAL Expansion Joints

Garlock 204 and 206 TFE-Lined and Full-Face FEP-Lined CHEMISEAL expansion joints are designed to withstand higher pressures than the all-TFE CHEMISEAL joints. They consist of a spool-shaped liner within a rugged spool-type, rubber and cotton duck expansion joint.

CHEMISEAL TFE liner shields the inside of the rubber joint and covers the flange faces to the inside of the bolt holes. The diameter of the liner at the faces is equal to the nominal pipe diameter. Available in multiple arches and tapered construction.

CHEMISEAL FEP liner shields the inside of the rubber joint and completely covers the flange faces to the outside diameter. The diameter of the liner at the faces is equal to the nominal pipe diameter. Not available in multiple arches or tapered construction.

Standard Sizes, minimum face-to-face working limits and maximum working pressures for Garlock TFE/FEP-Lined Expansion Joints are shown in chart on next page. Maximum recommended temperature for standard sizes is 180°F. Lined joints for higher temperatures available on special order. These joints are also suitable for use on vacuum to 30 inches of mercury and corresponding pressure and vacuum applications.

Metal retaining rings are required with lined joints, same as used with Garlock 204 and 206 rubber and duck expansion joints.

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Pipe Size (Inches)	O.D. of Joint at Flange (Inches)	Min. Face-to-Face Dim (Inches)	Max Pressure (Lbs. per Sq. In.)	Max Axial Compression (Inches)	Max Transverse Deflection (Inches)	Max. Axial Elongation (inches)
*¾	3⅞	6	150	⅛	⅛	⅛
*1	4⅛	6	150	⅛	⅛	⅛
*1¼	4⅝	6	150	⅛	⅛	⅛
*1½	5	6	150	⅛	⅛	⅛
*2	6	6	150	⅛	⅛	⅛
*2½	7	6	150	⅛	⅛	⅛
*3	7⅞	6	150	⅛	⅛	⅛
*3½	8½	6	150	⅛	⅛	⅛
4	9	6	150	⅛	⅛	⅛
*5	10	6	125	⅛	⅛	⅛
6	11	6	125	⅛	⅛	⅛
8	13½	6	125	¼	⅛	¼
10	16	8½	125	¼	⅛	⅜
12	19	6½	125	¼	⅛	⅜
14	21	7½	75	¼	⅛	⅜
16	23½	7½	60	¼	⅛	⅜
18	25	8	60	¼	⅛	⅜
*20	27½	8	60	⅜	⅛	7/16
24	32	10	60	⅜	⅛	7/16

*Available only with TFE Liners.

HOW TO ORDER

Garlock Expansion Joints and Flexible Couplings

Please supply the following information:

1. Garlock style number
2. Pipe size
3. Face-to-face working limits:
   Minimum
   Maximum
4. Operating conditions:
   Fluid handled
   Temperature in degrees F
   Pressure
   Vacuum
5. Type and make of flange and piping
6. Specify if American Standard drilling. If not, specify number and size of bolt holes and diameter of bolt circle
7. Number of joints required

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CHOOSING THE RIGHT GASKET MATERIAL . . .

Every gasket material available to industry has certain inherent limitations that tend to restrict each material's range of applications. However, many of these limitations may be partially or wholly eliminated by several methods, including use of reinforcing inserts, combining with other materials, varying construction, or by the type of joint the material must seal.

Although mechanical factors are important to the design of the complete joint, primary selection of a gasket material is greatly influenced by two factors:

TEMPERATURE OF FLUID OR GAS CONTAINED

NATURE OF FLUID OR GAS CONTAINED

TEMPERATURE

With very few exceptions, a material should never be used at temperatures higher than those recommended for its group.

Temperature ranges for rubber are: Natural—up to 200 F; SBR, Nitrile and Neoprene—up to 250°F; Viton* —up to 450°F; Silicone—up to 500°F.

Vegetable fiber sheet with glue-glycerine bond has a temperature range up to 250°F; with synthetic rubber bond up to 300°F.

Woven asbestos cloth is effective up to 600°F; compressed asbestos up to 700°F.

Rubber used in most cloth-inserted sheets usually determines the material's temperature range.

However, you should never select or reject a gasket material solely on the preceding information as this is merely a general guide. To be sure, consult your nearest Garlock representative for more specific recommendations.

FLUID CONTAINED

By using the resistance chart on pages T-2, 3, you can easily ascertain a material's reaction to a specific medium, and thereby determine its suitability in service. Should there be any doubt regarding the reaction of any material, please contact your Garlock representative. He'll gladly help you determine the material's suitability

Although the above values are of extreme importance, various other factors should also be given due consideration as they directly influence the fluid contained and its effect on the gasket material.

CONCENTRATION of the corrosive agent can have a decided effect upon the gasket material selection. Full strength solutions are not necessarily more corrosive than those of dilute proportions The reverse is often true.

PURITY of corrosive agent or the absence of contaminating compounds is another factor involved. Example: dissolved oxygen in otherwise chemically pure water may cause rapid oxidation of high temperature steam generating equipment.

TEMPERATURE of corrosive agent, in addition to temperature effect on mechanical properties, will also influence the rate of corrosive attack.

LOCATION of gasket can often influence its chemical resistance. For example, a gasket either in a partially filled line or one at or above the solution level may be more subject to attack than those below the surface.

CONSTRUCTION of gasket material decidedly affects its chemical resistance. It is generally poor economy to use an inferior material that can cause frequent gasket replacements. This ultimately results in extremely high maintenance costs. However, if it is necessary that a joint be opened frequently, a less expensive, less resistant material may be quite satisfactory. Where a joint is seldom opened, the most resistant material, regardless of cost, is usually the most economical in the long run.

Also, if a slight swelling of the gasket occurs due to reaction to fluid, the overall effect may be a more positive seal. Conversely, materials that shrink and dry out usually cause early gasket failure.

OTHER FACTORS that may influence material selection are internal pressures, operating cycle and vibration. A highly resilient material and proper design is essential where sudden variations in operating conditions occur frequently.

Bolt relaxation, caused by thermal expansion and creep, is sometimes an important consideration. Expansion and contraction of line or gasket and excessive bending movements on the flange may also limit selection of gasket material and construction.

To sum it all up—if these considerations are all taken into account and properly evaluated and a suitable gasket material is selected from the resistance chart, the choice, in most cases, can be narrowed to a small number Final choice, then, can usually be made on the basis of relative cost, availability or personal experience.

DESIGNING YOUR GASKET CORRECTLY

Ideally, the designer should adapt flange construction to the existing gasket design. However, this is usually impossible as joint features are, in most cases, already fixed and cannot be changed as easily as the gasket.

But, regardless of whether you are designing flange to gasket or gasket to flange, the design principles are identical . . . only the approach is different. In order to achieve satisfactory gasket design and, consequently, prolonged

*Du Pont Trademark

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trouble-free service from your gaskets, the following design information should be followed carefully.

GASKET YIELD STRESS—"Y" FACTOR

If a tight seal is to be effected, gasket material must be compressed sufficiently and flow into imperfections of the contact faces . . . filling all voids between mating flanges. If this flow doesn't take place a seal can't be effected without using gasket pastes or compounds.

"Y" factor is the amount of force, expressed in psi, that must be applied to the gasket contact area causing this essential flow. "Y" factor is wholly independent of internal pressure. It is the minimum amount of stress needed if a gasket is to seal at all . . . even at very low pressures.

For example, soft rubber requires so little stress that it is considered self-yielding. Therefore, rubber of less than 75 durometer has a "Y" value of 0 psi. Most gasket materials and designs require relatively high initial stress if gasket is to seal properly. Once high initial stress is effected, however, gasket load may be sharply reduced without loss of efficiency. If such loss does occur, it is normally caused by bolt expansion, creep and relaxation.

GASKET FACTOR—"M" FACTOR

There are three forces that largely determine the "M" factor (see fig. 1). They are:

1. Bolt load—the force that squeezes the gasket into the face voids to form seal.
2. Hydrostatic end force—force that tends to separate flanges when internal pressure is applied.
3. Internal pressure—pressure that acts on the portion of the gasket exposed to the pressure side of the joint. Tends to blow gasket out of joint.

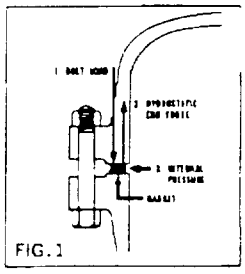


FIG. 1

"M" or gasket factor is the ratio of residual unit stress (bolt load minus hydrostatic end force) on gasket (psi) to internal pressure of the system. "M" factor usually remains constant throughout a wide range of pressure for a given gasket material and construction.

A gasket factor of 3.0, for example, would indicate that the residual stress of the gasket must be a minimum of three times the system's internal pressure if a proper seal is to be maintained.

TWO BASIC STEPS

STEP 1. First, designer must determine total force available: (a) to yield the gasket, and (b) to maintain a tight seal under service conditions. This force, usually supplied by bolts, will depend on the size and number of bolts in the flange and on the maximum allowable bolt stress. In turn, the maximum bolt stress will depend on the bolt material and operating temperature. Once this is obtained, total available bolt force can easily be determined by multiplying total bolt area by allowable stress.

STEP 2. Next, an approximation of gasket dimensions should be ascertained. For some confined-joint facings, recess face dimensions limit gasket dimensions. On a full-face joint, a full-face gasket may be provided, reducing flange distortion. On other facings, considerable leeway is available. It is possible, then, to find "Y" and "M" factors at the service pressure by determining the bolt force available and by having worked out a rough approximation of the gasket dimensions. By pairing these findings with a previous selection of materials, based on the recommendation chart (page T-2, 3) and operating conditions, the proper gasket may be selected from a table of gasket factors and yield stresses (Tables 1 and 2 next page).

BOLT LOAD FORMULAS

The initial bolt load required to seat a gasket sufficiently should be:

$Wm_2 = 3.14\ b\ GY.$

The required operating bolt load should be at least sufficient, under maximum operating conditions, to resist the hydrostatic end force and, in addition, to maintain a compression load on the gasket that experience has shown is sufficient, under maximum operating conditions, to resist the hydrostatic end force and, in addition, to maintain a compression load on the gasket that experience has shown is sufficient to assure a tight joint:

$Wm_1 = 0.785\ G^2P + (2b \times 3.14\ GMP)$

When determining number of bolts needed, use the greater of the two values Wm_1 or Wm_2.

Nomenclature for the two formulas are:

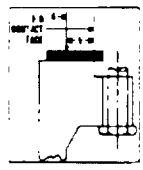
Wm_1 = required bolt load for maximum operating conditions in lbs.

Wm_2 = required initial bolt load without internal pressure in lbs.

G = outside diameter of gasket contact face less 2b.

P = maximum allowable working pressure in psi.

b = effective gasket seating width in inches (see Table 1 next page).



NOTE: $b = b_0$ when b_0 is equal to or less than 1/4"

$b = \sqrt{\frac{b_0}{2}}$ when b_0 is greater than 1/4"

2b = effective gasket pressure width in inches

M = gasket factor (see Table 2 next page)

Y = gasket seating load in psi (see Table 2)

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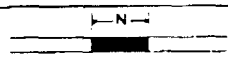
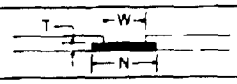
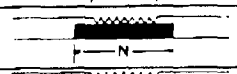
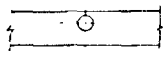
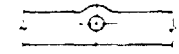
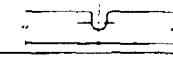
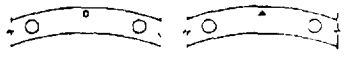
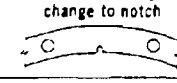
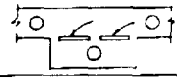
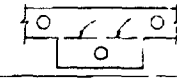
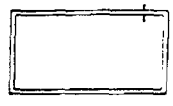
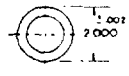
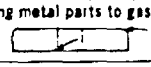
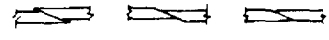
EFFECTIVE GASKET WIDTH—b (Table 1)	
FACING LIMITS	GASKET SEATING WIDTH b
	$b_0 = \frac{N}{2}$
	$b_0 = \frac{W+T}{2}$, $\left(\frac{W+N}{4}\text{ maximum}\right)$
	$b_0 = \frac{7N}{16}$
	$b_0 = \frac{3N}{8}$

GASKET FACTORS (Table 2)		
MATERIAL	"M"	"Y"
Rubber		
Below 75 durometer	0.50	0
75 or higher durometer	1.00	200
Rubber with cotton fabric insert	1.25	400
Asbestos with a suitable binder for operating conditions:		
1/8" thickness	2.00	1600
1/16" thickness	2.75	3700
1/32" thickness	3.50	6500
Vegetable fiber	1.75	1100

Note: This data applies only when the gasket is contained entirely within the inner edges of the bolt holes.

COMMON FAULTS IN GASKET DESIGN AND SUGGESTED REMEDIES

DETAIL	WHY FAULTY	SUGGESTED REMEDY
Bolt holes close to edge 	Causes breakage in stripping and assembling	Projection or "ear"  Notch instead of hole 
Very small bolt holes or noncircular openings 	Require hand picking . . . easy to miss	Avoid hole sizes under 3/32-inch diameter. If small hole is for locating or indexing, change to notch 
Tear-away parts with open slots at attached edges 	Slots require hand picking, costly dies and die maintenance	Simple perforation 
Thin walls, delicate cross section in relation to over-all size 	High scrap loss, stretching or distortion in shipment or use. Restricts choice to high tensile strength materials	Have the gasket in mind during early design stages
Metalworking tolerances applied to gasket thickness, diameters, length, width, etc 	Results in perfectly usable parts being rejected at incoming inspection. Requires time and correspondence to reach agreement on practical limits. Increases cost of parts and tooling. Delays deliveries	Most gasket materials are compressible. Many are affected by humidity changes. Try standard or commercial tolerances before concluding that special accuracy is required
Transference of fillets, radii, etc., from mating metal parts to gasket 	Unless part is molded, such features mean extra operations and higher cost	Most gasket stocks will conform to mating parts without preshaping. Be sure radii, chamfers, etc., are functional, not merely copied from metal members
Large gaskets made in sections with beveled joints 	Extra operations to skive. Extra operations to glue. Difficult to obtain smooth, even joints without steps or transverse grooves 	Die-cut dovetail joint 

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ST0214804

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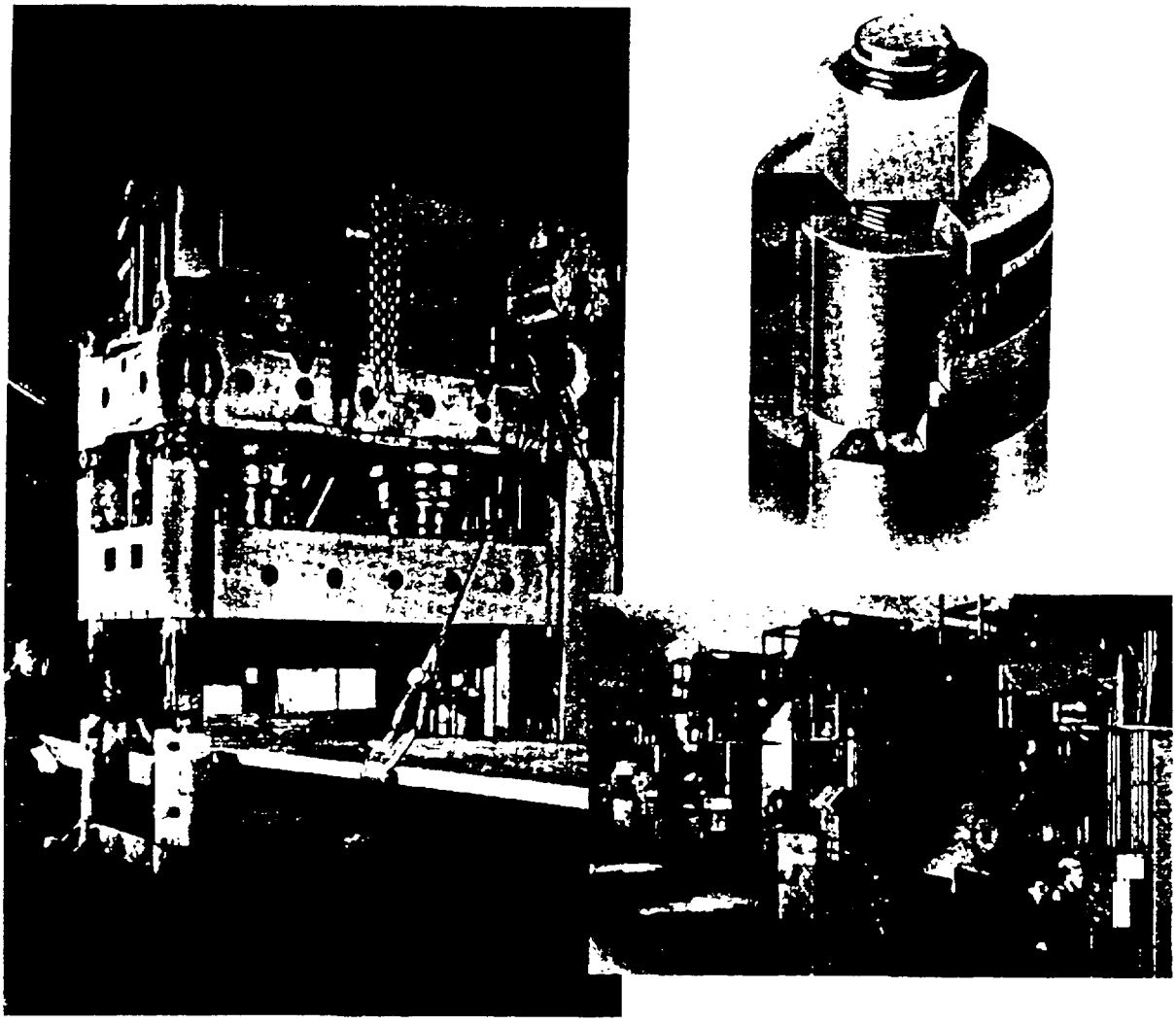
BULLETIN AD 231-3 PRINTED IN U.S.A. 9-64 (12-65)

ST0214804

BULLETIN
AD-231 1

Hydraulic-Pneumatic Products



SUBMITTED

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GARLOCK WARRANTY

Garlock Inc. guarantees that any product of its manufacture, which upon examination is found by a Garlock representative to be defective either in workmanship or material whereby it is not suitable under proper usage and service for the purpose for which designed, will be replaced free of charge including transportation charges but not cost of installation. This shall be Garlock's maximum liability. The sale of Garlock products under any other warranty or guarantee, expressed or implied, is not authorized by Garlock.

ST0214806

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433	Chevron – Cotton Duck and Butyl Rubber	4
532	Chevron – Nitrile and Asbestos	4
813	Molded Cups – Asbestos Cloth and SBR	8
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7271	Molded Cups – Medium Cotton Duck and Neoprene	8
7857	Chevron – Cotton Duck and Rubber – Rockhard	4
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*DuPont Trademark

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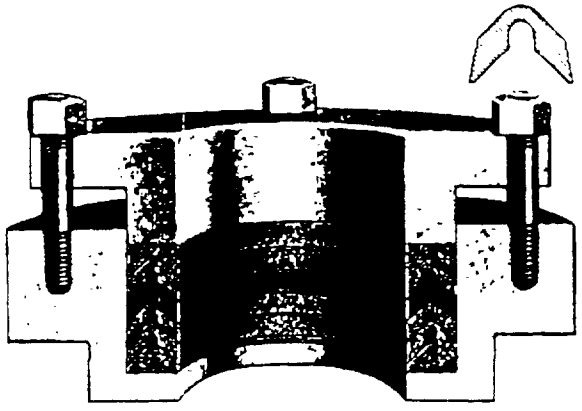
ST0214806

GARLOCK

NEW CHEVRON® PACKING

for rams, plungers and reciprocating rods



THE PACKING that adjusts itself to automatically compensate for pressure changes. Instead of the usual inverted "V" construction, Chevron packing incorporates a flexible arch at the apex of the "V." See diagram. This allows the packing lips to fluctuate with changing pressures . . . tighten with increasing pressures . . . yield with diminishing pressures.

This friction relieving, pressure compensating action, plus a wide choice of materials put Chevron packings way ahead of ordinary V-types in trouble-free service life. Once you properly adjust the gland, no more adjustments are needed.

WORKS EFFICIENTLY IN A SHALLOW STUFFING BOX. The design of Chevron packing permits nesting the rings. Thus you can use more rings in a stuffing box of given depth. A distinct advantage for shallow stuffing boxes . . . especially if pressures are high.

FURNISHED IN RINGS AND ADAPTER RINGS. Garlock Chevron packing is available in ring form . . . usually in complete sets . . . a sufficient number of rings to fill required depth . . . top and bottom adapters are required to fit the set to the configuration of the box and gland. See depth tables Pages 4 and 5.

General Recommendations for All Chevron Packings Against Various Pressures

This table is for general guidance. Many satisfactory Chevron packings installations can be made with packings smaller or larger than sizes indicated . . . and with more or less rings than shown.

SIZES
From
3/16" I.D. to 56" I.D.
9/16" O.D. to 57" O.D.

Diameter of Rod	1/4" to 1 1/8"	1 1/4" to 2 1/4"	2 1/2" to 5"	5" to 16"	16" Up
Packing Space	1/4	5/16	3/8	1/2	3/4"
Pressures up to 1000 psi, use 3 rings, nominal depth of set	41/64	51/64	1	1 13/64	1 39/64
1000 to 2000 psi, use 4 rings, nominal depth of set	3/4	1 1/16	1 5/16	1 17/32	2 1/32
2000 to 4000 psi, use 5 rings, nominal depth of set	55/64	1 13/64	1 3/4	1 49/64	2 31/64
4000 to 6000 psi, use 6 rings, nominal depth of set	31/32	1 13/32	1 9/16	2	2 1/16

* 1/4" — Other cross sections are available

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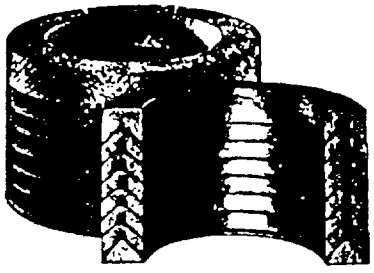
GARLOCK
CHEVRON® PACKING
OF FABRIC AND RUBBER AND HOMOGENEOUS RUBBER



Style No	Materials of construction	Generally recommended for use against
432 (New Chevron Packing)	Cotton duck and nitrile rubber	Oils from low to medium temperatures, 225° F. or 275° F. intermittently. Water-in-oil and water-glycol fire resistant hydraulic fluids. Water and mild or dilute, aqueous solutions
433	Cotton duck and butyl rubber	Fire resistant fluids of the phosphate ester base and chlorinated hydrocarbon type *NOT* suitable for petroleum base fluids. Satisfactory for ketones at room temperature
532	Nitrile and asbestos	For service up to 300° F. against same fluids as New Chevron packing
7857	Cotton duck and rubber molded rockhard	All fluids; oil, water or synthetic *EXCEPT* reactive chemicals and fluids of the ketone, aldehyde, ester and amine type, also chlorinated solvents
8051	Cotton duck and white rubber	Fluids in the process industries where a non-discoloring white packing is required.
8452	Homogeneous rubber	Cold and warm oils up to 226° F. max
9150	Homogeneous rubber	Same fluids as New Chevron packing *EXCEPT* water and aqueous solutions (due to lack of lubricity) up to 225° F. or intermittently to 275° F.

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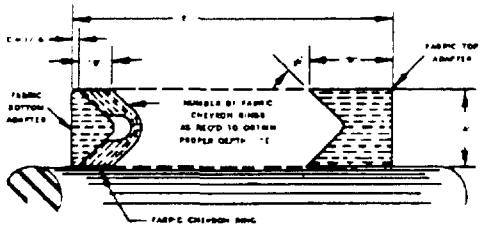
NOMINAL DEPTHS

SPECIAL NOTES

For ease in determining the nominal depth of Chevron packings containing fabric, refer to chart below.

1. Depths are nominal.
2. Schedule does not apply to sets with metal adapters.



Nominal Packing Space "A"	Stack Ht. of One CHEVRON Ring "B"	Height of Adapter Rings "C" and "D"	Total Depth "E" (Which Includes "C" Plus "D" Plus Number of CHEVRON Rings as Indicated)									
			1 Ring	2 Rings	3 Rings	4 Rings	5 Rings	6 Rings	7 Rings	8 Rings	9 Rings	10 Rings
3/16"	3/16"	5/16"	17/32"	11/16"	1 1/32"	1 3/8"	1 23/32"	2 1/16"	2 13/32"	2 3/4"	3 1/8"	3 15/32"
7/32"	7/32"	5/16"	9/16"	23/32"	1 5/32"	1 15/32"	1 31/32"	2 11/32"	2 25/32"	3 1/4"	3 21/32"	4 1/32"
1/4"	1/4"	5/16"	19/32"	25/32"	1 9/32"	1 17/32"	1 15/16"	2 5/16"	2 23/32"	3 5/16"	3 25/32"	4 1/4"
9/32"	9/32"	11/32"	5/8"	13/16"	1 5/16"	1 13/16"	2 5/16"	2 13/16"	3 5/16"	3 13/16"	4 5/16"	4 13/16"
5/16"	11/32"	3/8"	21/32"	27/32"	1 3/8"	1 29/32"	2 3/8"	2 27/32"	3 3/8"	3 27/32"	4 3/8"	4 29/32"
11/32"	3/8"	3/8"	11/16"	1"	1 5/16"	1 5/8"	1 15/16"	2 5/16"	2 11/16"	3 1/16"	3 7/16"	3 13/16"
3/8"	3/8"	7/16"	23/32"	1 1/32"	1 7/16"	1 13/16"	2 3/16"	2 9/16"	2 15/16"	3 5/16"	3 11/16"	4 1/16"
13/32"	13/32"	1/2"	25/32"	1 3/32"	1 15/32"	1 7/8"	2 9/32"	2 21/32"	3 1/32"	3 7/16"	3 13/16"	4 3/16"
7/16"	13/32"	15/32"	13/16"	1 5/32"	1 17/32"	1 31/32"	2 11/32"	2 25/32"	3 3/16"	3 19/32"	3 15/16"	4 5/16"
15/32"	7/16"	1/2"	27/32"	1 7/32"	1 19/32"	2"	2 13/32"	2 13/16"	3 5/16"	3 13/16"	4 5/16"	4 13/16"
1/2"	15/32"	17/32"	29/32"	1 9/32"	1 21/32"	2 1/32"	2 15/32"	2 29/32"	3 7/16"	3 15/16"	4 7/16"	4 29/32"
17/32"	15/32"	9/16"	15/16"	1 11/32"	1 23/32"	2 1/16"	2 17/32"	2 31/32"	3 1/2"	4"	4 1/2"	5"
9/16"	1/2"	9/16"	31/32"	1 13/32"	1 25/32"	2 3/32"	2 19/32"	3 1/32"	3 17/32"	4 1/32"	4 17/32"	5 1/32"
19/32"	17/32"	5/8"	1"	1 15/32"	1 27/32"	2 5/32"	2 21/32"	3 1/16"	3 19/32"	4 1/16"	4 19/32"	5 1/16"
5/8"	9/16"	5/8"	1 1/32"	1 17/32"	1 29/32"	2 7/32"	2 23/32"	3 5/32"	3 21/32"	4 5/32"	4 21/32"	5 5/32"
21/32"	19/32"	11/16"	1 1/16"	1 19/32"	1 31/32"	2 9/32"	2 25/32"	3 9/32"	3 23/32"	4 9/32"	4 23/32"	5 9/32"
11/16"	5/8"	11/16"	1 3/32"	1 21/32"	2 1/32"	2 11/32"	2 27/32"	3 13/32"	3 25/32"	4 13/32"	4 25/32"	5 13/32"
23/32"	21/32"	3/4"	1 5/32"	1 23/32"	2 3/32"	2 13/32"	2 29/32"	3 17/32"	3 27/32"	4 17/32"	4 27/32"	5 17/32"
3/4"	11/16"	3/4"	1 7/32"	1 25/32"	2 5/32"	2 15/32"	3 1/32"	3 21/32"	4 1/32"	4 21/32"	5 1/32"	5 21/32"
25/32"	23/32"	13/16"	1 9/32"	1 27/32"	2 7/32"	2 17/32"	3 3/32"	3 25/32"	4 5/32"	4 25/32"	5 5/32"	5 25/32"
13/16"	3/4"	13/16"	1 11/32"	1 29/32"	2 9/32"	2 19/32"	3 5/32"	3 29/32"	4 9/32"	4 29/32"	5 9/32"	5 29/32"
27/32"	25/32"	7/8"	1 13/32"	1 31/32"	2 11/32"	2 21/32"	3 7/32"	3 31/32"	4 13/32"	4 31/32"	5 13/32"	6 1/32"
7/8"	13/16"	7/8"	1 15/32"	2 1/32"	2 13/32"	2 23/32"	3 9/32"	4 1/32"	4 17/32"	5 1/32"	5 17/32"	6 1/32"
29/32"	27/32"	15/16"	1 17/32"	2 3/32"	2 15/32"	2 25/32"	3 11/32"	4 3/32"	4 19/32"	5 3/32"	5 19/32"	6 3/32"
15/16"	7/8"	15/16"	1 19/32"	2 5/32"	2 17/32"	2 27/32"	3 13/32"	4 5/32"	4 21/32"	5 5/32"	5 21/32"	6 5/32"
31/32"	29/32"	1"	1 21/32"	2 7/32"	2 19/32"	2 29/32"	3 15/32"	4 7/32"	4 23/32"	5 7/32"	5 23/32"	6 7/32"
1"	15/16"	1"	1 23/32"	2 9/32"	2 21/32"	3 1/32"	3 17/32"	4 9/32"	4 25/32"	5 9/32"	5 25/32"	6 9/32"
1 1/32"	31/32"	1 1/32"	1 25/32"	2 11/32"	2 23/32"	3 3/32"	3 19/32"	4 11/32"	4 27/32"	5 11/32"	5 27/32"	6 11/32"
1 1/16"	1"	1 1/32"	1 27/32"	2 13/32"	2 25/32"	3 5/32"	3 21/32"	4 13/32"	4 29/32"	5 13/32"	5 29/32"	6 13/32"
1 3/32"	1 1/32"	1 1/16"	1 29/32"	2 15/32"	2 27/32"	3 7/32"	3 23/32"	4 15/32"	4 31/32"	5 15/32"	5 31/32"	6 15/32"
1 1/8"	1 1/16"	1 1/16"	1 31/32"	2 17/32"	2 29/32"	3 9/32"	3 25/32"	4 17/32"	5 1/32"	5 17/32"	6 1/32"	6 17/32"
1 5/32"	1 3/32"	1 1/8"	2 1/32"	2 19/32"	2 31/32"	3 11/32"	3 27/32"	4 19/32"	5 3/32"	5 19/32"	6 3/32"	6 19/32"
1 3/16"	1 1/8"	1 1/8"	2 3/32"	2 21/32"	3 1/32"	3 13/32"	3 29/32"	4 21/32"	5 5/32"	5 21/32"	6 5/32"	6 21/32"
1 7/32"	1 5/32"	1 3/16"	2 5/32"	2 23/32"	3 3/32"	3 15/32"	3 31/32"	4 23/32"	5 7/32"	5 23/32"	6 7/32"	6 23/32"
1 1/4"	1 3/16"	1 3/16"	2 7/32"	2 25/32"	3 5/32"	3 17/32"	4 1/32"	4 25/32"	5 9/32"	5 25/32"	6 9/32"	6 25/32"
1 9/32"	1 7/32"	1 1/4"	2 9/32"	2 27/32"	3 7/32"	3 19/32"	4 3/32"	4 27/32"	5 11/32"	5 27/32"	6 11/32"	6 27/32"
1 5/16"	1 1/4"	1 5/16"	2 11/32"	2 29/32"	3 9/32"	3 21/32"	4 5/32"	4 29/32"	5 13/32"	5 29/32"	6 13/32"	6 29/32"
1 11/32"	1 9/32"	1 5/16"	2 13/32"	2 31/32"	3 11/32"	3 23/32"	4 7/32"	4 31/32"	5 15/32"	5 31/32"	6 15/32"	6 31/32"
1 3/8"	1 5/16"	1 3/8"	2 15/32"	3 1/32"	3 13/32"	3 25/32"	4 9/32"	5 1/32"	5 17/32"	6 1/32"	6 17/32"	7 1/32"
1 13/32"	1 3/8"	1 3/8"	2 17/32"	3 3/32"	3 15/32"	3 27/32"	4 11/32"	5 3/32"	5 19/32"	6 3/32"	6 19/32"	7 3/32"
1 7/16"	1 13/32"	1 7/16"	2 19/32"	3 5/32"	3 17/32"	3 29/32"	4 13/32"	5 5/32"	5 21/32"	6 5/32"	6 21/32"	7 5/32"
1 15/32"	1 7/16"	1 7/16"	2 21/32"	3 7/32"	3 19/32"	3 31/32"	4 15/32"	5 7/32"	5 23/32"	6 7/32"	6 23/32"	7 7/32"
1 1/2"	1 15/32"	1 1/2"	2 23/32"	3 9/32"	3 21/32"	4 1/32"	4 17/32"	5 9/32"	5 25/32"	6 9/32"	6 25/32"	7 9/32"

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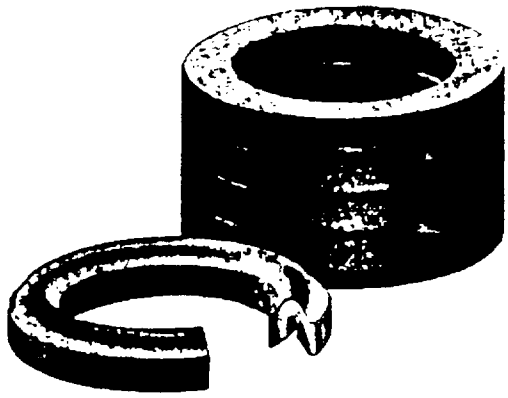
GARLOCK XV
CHEVRON* PACKING
OF TFE FLUOROCARBON RESIN
for extremely corrosive liquids and gases



Garlock 8764 Chevron packing of TFE fluorocarbon resin has a low coefficient of friction, and is non-adhesive. It is chemically inert to all materials except molten alkali metals. This packing is suitable for use at temperatures ranging from −350° F. to +500° F.

NOMINAL DEPTHS

Nominal Packing Space	Stack Height of one CHEVRON Ring	Stack Height of T & B Adapters	Approx. Total Stack Height Which Includes T & B Adapters Plus Number of CHEVRON Rings Indicated					
			1 Ring	2 Rings	3 Rings	4 Rings	5 Rings	6 Rings
5/32"	.150"	262"	.412"	.562"	.722"	872"	1.022"	1.172"
3/16"	.175"	307"	.482"	.657"	.832"	1.007"	1.182"	1.357"
1/4"	.200"	350"	.550"	.750"	950"	1.150"	1.350"	1.550"
5/16"	.260"	.438"	.688"	.938"	1.188"	1.438"	1.688"	1.938"
3/8"	.300"	525"	825"	1.125"	1.425"	1.725"	2.025"	2.325"
7/16"	.350"	613"	.963"	1.313"	1.663"	2.013"	2.363"	2.713"
1/2"	.400"	700"	1.100"	1.500"	1.900"	2.300"	2.700"	3.100"
9/16"	.450"	788"	1.238"	1.688"	2.138"	2.588"	3.038"	3.488"
5/8"	.500"	875"	1.375"	1.875"	2.375"	2.875"	3.375"	3.875"
3/4"	.600"	1 050"	1.650"	2.250"	2.850"	3.450"	4.050"	4.650"
J.I.C. sizes also available								

NOTE: Garlock XV 8764 Chevron packing of TFE can be furnished in nominal packing space sizes from 5/32" to 3/4" in 1/16" increments

ST0214809

TO ORDER GARLOCK CHEVRON PACKING, SPECIFY:

1. Diameter of rod, plunger or piston groove
2. Diameter of stuffing box or cylinder
3. Depth of stuffing box
4. Extreme gland entrance into stuffing box
5. Bevel of gland
6. Bevel of bottom of stuffing box
7. Type of fluid
8. Pressure
9. Temperature
10. Number of sets required

ST0214800

GARLOCK
BITAN* LEATHER* VEE PACKING

for reciprocating, and slow speed rotating, or oscillating motions



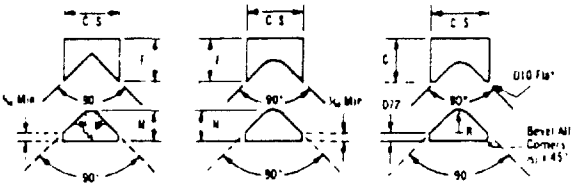
Sets of three to six leather Vee packing rings will give you effective service in many high and low pressure applications, for example, in cylinder assemblies of hydraulic jacks, presses, valves or actuating devices. Garlock Leather Vee Packings, being low in height, save space . . . are particularly adapted for non-adjustable glands, where close control of overall height is essential. The naturally low break-away and running friction of leather give these Vee packings long service life. And, they can't suddenly fail. A gradual increase in leakage after extended use will warn you well ahead of replacement time.

Adapters for Garlock Bitan Leather Vee Packings

Adapters are used to give proper support to the sealing lips. See design recommendations for adapters of three different materials below:

ADAPTER DIMENSIONS			
C/S = F	R	C	N
1/8	5/64	.240	5/32
5/16	1/8	302	3/16
3/8	9/64	.365	7/32
7/16	3/16	.427	1/4
1/2	3/16	.490	9/32
3/4	13/64	740	13/32

DESIGN RECOMMENDATIONS FOR ADAPTERS



Number of Bitan Vee Packing Rings for Various Pressures

The number of rings used in a set depends upon the normal operating pressure. For maximum service life, use the number of Vees shown in chart below. For extra depths, use washers or longer adapters . . . *never use more than six Vees in one set.*

Pressure PSI	Number of Vees per Set
0 to 500	3
500 to 5,000	4
5,000 to 10,000	5
10,000 and over	6

*Other tonnages available

HOW TO ORDER

When ordering Garlock Leather Vee Packings, please include the following information with your order:

1. DIMENSIONS
   - (a) *Diameter of rod or plunger*
   - (b) *Diameter of stuffing box or cylinder*
   - (c) *Stack height of set or individual Vee*
2. OPERATING CONDITIONS
   - (a) *Maximum temperature – °F.*
   - (b) *Normal pressure – psi*
   - (c) *Type of fluid – water, oil, air, or other*

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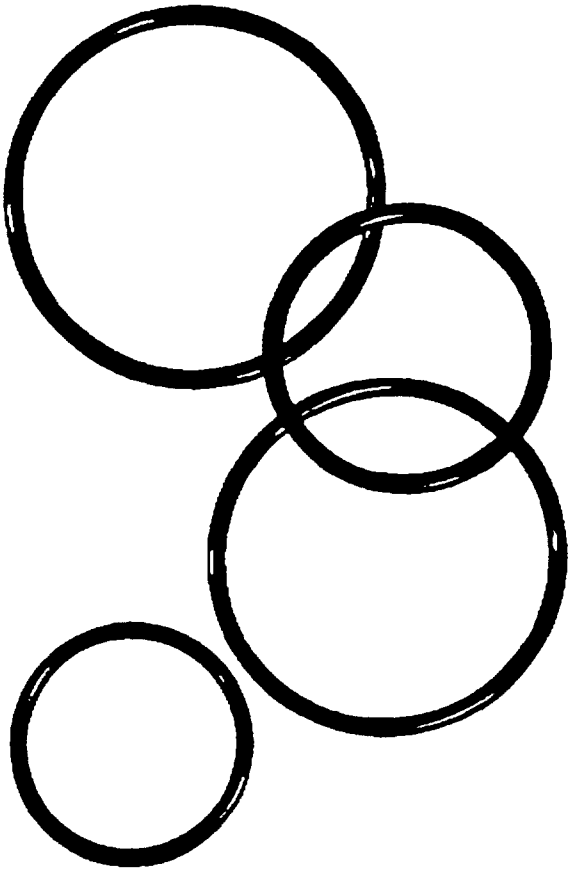
ST0214810

GARLOCK
O-RINGS

for dynamic sealing of pistons and piston rods and for static gasketing



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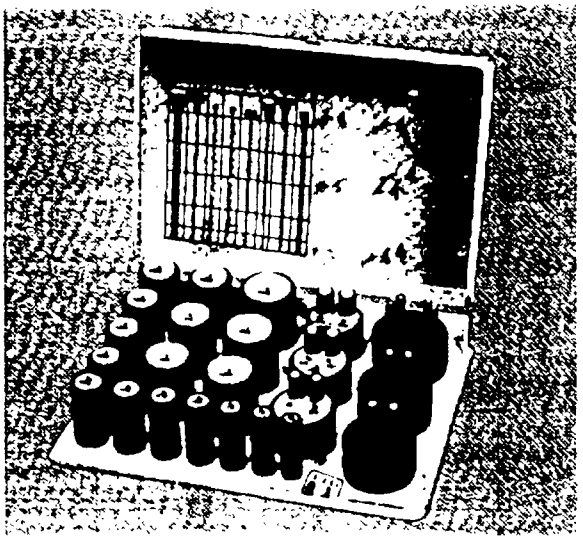
Round in cross section, Garlock O-Rings are precision molded to extremely accurate dimensions. They are very effective for both dynamic and static applications. In *dynamic service* O-Rings prevent leakage of fluid between surfaces with reciprocating motion, as in pistons and piston rods. In *static service* O-Rings act as gaskets for use between two stationary parts that require round-bodied gasketing. *Leather Back-Up Rings* are also available in all sizes.

SIZES OF GARLOCK O-RINGS conform to industry standards. For *dynamic use* sizes range from ⅛" I.D. x ¼" O.D. to 15½" I.D. x 16" O.D. For *static use* from 1⅜" I.D. x 1⅞" O.D. to 10" I.D. x 10¼" O.D. For smaller or larger sizes than these, dynamic rings may be used by increasing the squeeze required for dynamic service by approximately 60% in the smaller sizes and 20% in the larger.

Garlock 8990 Buna-N Rubber O-Rings have a nominal 70 durometer hardness. They are suitable for most O-ring applications. Recommended for use against air, water, oil, non-aromatic gasoline, kerosene and petroleum-base and water-base hydraulic fluids. Underwriters Laboratory Approved. *All popular sizes stocked at Garlock warehouses.*



Garlock 8990 General Purpose O-Ring Kit—380 rings in a compact package

- Contains 30 most popular sizes—75% of most-used O-rings.
- More rings than most other kits.
- Cover has chart for easy identification. Ready to use. Just pick off the needed ring.
- Instant size reference from color-coded storage posts.
- Integral cross-section diameter gauge indicates replacement ring cross section.

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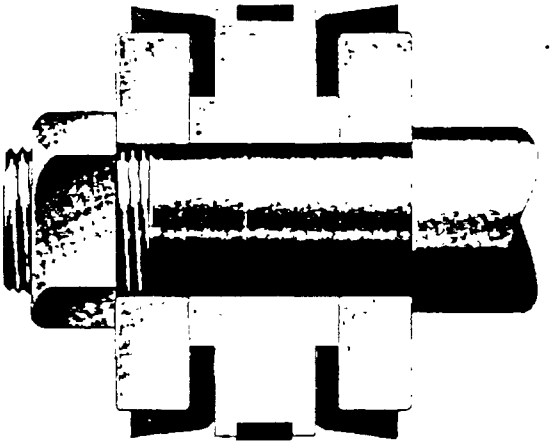
GARLOCK

MOLDED CUPS

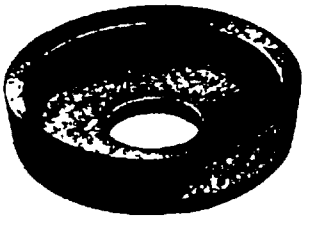
for hydraulic and pneumatic pistons



Garlock Molded Cups are available in a variety of types and materials. Each is designed to do its particular job best . . . against air, water, oils, greases, solvents or gases . . . at sub-zero cold or +450° F. heat . . . at high pressures or low . . . for light or heavy hydraulic or pneumatic service.

GARLOCK MOLDED FABRIC AND RUBBER CUPS

for normal hydraulic service



Garlock Molded Fabric and Rubber Cups are recommended for most regular hydraulic cylinder applications . . . at pressures up to 2000 psi. Sizes include cylinder diameters up to 24". See chart below for material and service specifications of six popular Garlock styles.

SPECIFICATIONS—GARLOCK FABRIC-INSERTED MOLDED CUPS

Service	Garlock No.	Relative Hardness	Type of Rubber	Type of Fabric Insert
Mineral oils, greases or air at atmospheric temperatures Heavy-duty hydraulic cylinders	8136	Flexible	Neoprene	Heavy weight cotton duck
Mineral oils, greases or air at atmospheric temperature. Medium to high pressures	7271	Flexible	Neoprene	Medium weight cotton duck
Mineral oils, greases or air at atmospheric temperatures on hydraulic cylinder applications such as hydraulic jacks, grease guns, barber chairs, etc.	7131	Firm	Neoprene	Fine cotton duck
Water or air at atmospheric temperature Medium to high pressures	8619	Rockhard	SBR	Medium weight cotton duck
Suitable for phosphate ester base and chlorinated hydrocarbon type, fire-resistant hydraulic fluids	8656	Firm	Butyl	Medium weight cotton duck
Air at elevated temperatures, medium pressures, low pressure steam or superheated water at temperatures to 250° F. to 500° F.	813	Firm	SBR	Asbestos cloth

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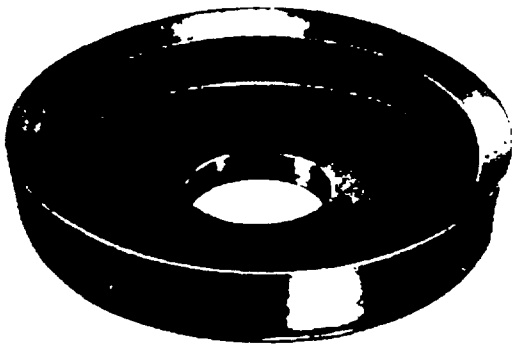
GARLOCK HOMOGENEOUS

MOLDED CUPS

for pneumatic and light hydraulic service



HOMOGENEOUS RUBBER MOLDED. In this type of service, where close tolerances and fine finishes are present, Homogeneous Cups are recommended. In most cases, 90 durometer material gives you the best ratio of low friction and wearing quality.

TFE FLUOROCARBON MOLDED. When sealing against air or gas, adequate lubrication is essential for long-life, positive sealing. Where lubrication is impractical or impossible, consider TFE cups for lasting friction-free service. Both regular TFE or filled TFE cups are available to meet your specific needs.

SPECIFICATIONS—GARLOCK HOMOGENEOUS MOLDED CUPS

Service	Garlock No.	Material	Durometer
Air, water and low-pressure oil. Meets following specifications: ASTM-D-735-59T, Grade SB916E; MIL-D-17650; MIL-R-3065, Grade SB-910ABE.	8452	Nitrile	90
For phosphate ester base and chlorinated hydrocarbon type fire-resistant fluids *NOT* suitable for petro eum base fluids.	9188	Butyl	90
Special lubricants, fuels, fluids, i.e. OS45, JP-4 fuel, high octane gasoline, MIL-O-8200, 8515, Pydraul;, Shell Iris 902.	9659	Viton*	90
Air, gases without lubrication, high temperature (450° to 600° F.), all solvents and acids EXCEPT molten alkali metals and certain fluorine compounds at high temperatures and pressures.	8764	TFE	Hard
Same as 8764 except for more severe operating conditions.	8500	TFE and glass	Hard
Cold and hot water, oil temperatures—sub zero to +160° F.; high pressures.	14	BITAN Leather	Hard

‡Monsanto Trademark *DuPont Trademark

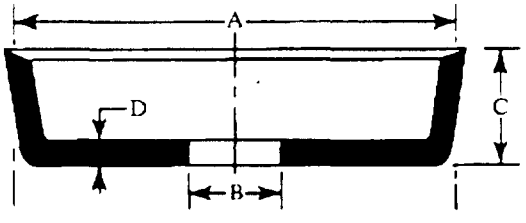
HOW TO ORDER GARLOCK MOLDED CUPS

For general applications the cup dimensions shown in table at right are recommended.

When ordering Garlock Molded Cups, specify:

1. Cylinder diameter (A)
2. Hole diameter (B)
3. Cup height (C)
4. Cup thickness (D)
5. Type of fluid: water, oil, air or other
6. Pressure (psi)
   - (a) Normal operating
   - (b) Maximum
   - (c) Minimum
7. Temperature
   - (a) Normal operating
   - (b) Maximum
   - (c) Minimum

For Cylinder Diameters	Height of Cup		Thickness of Cup	
	Minimum	Maximum	Minimum	Maximum
Below 1"	3/16"	7/16"	1/16"	3/32"
1" to 2"	3/8"	1/2"	3/32"	1/8"
2" to 3"	3/8"	5/8"	3/32"	3/16"
3" to 5"	1/2"	3/4"	1/16"	3/16"
5" to 8"	3/4"	1"	1/8"	1/4"
8" and up	1"	1 1/4"	3/16"	1/4"



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