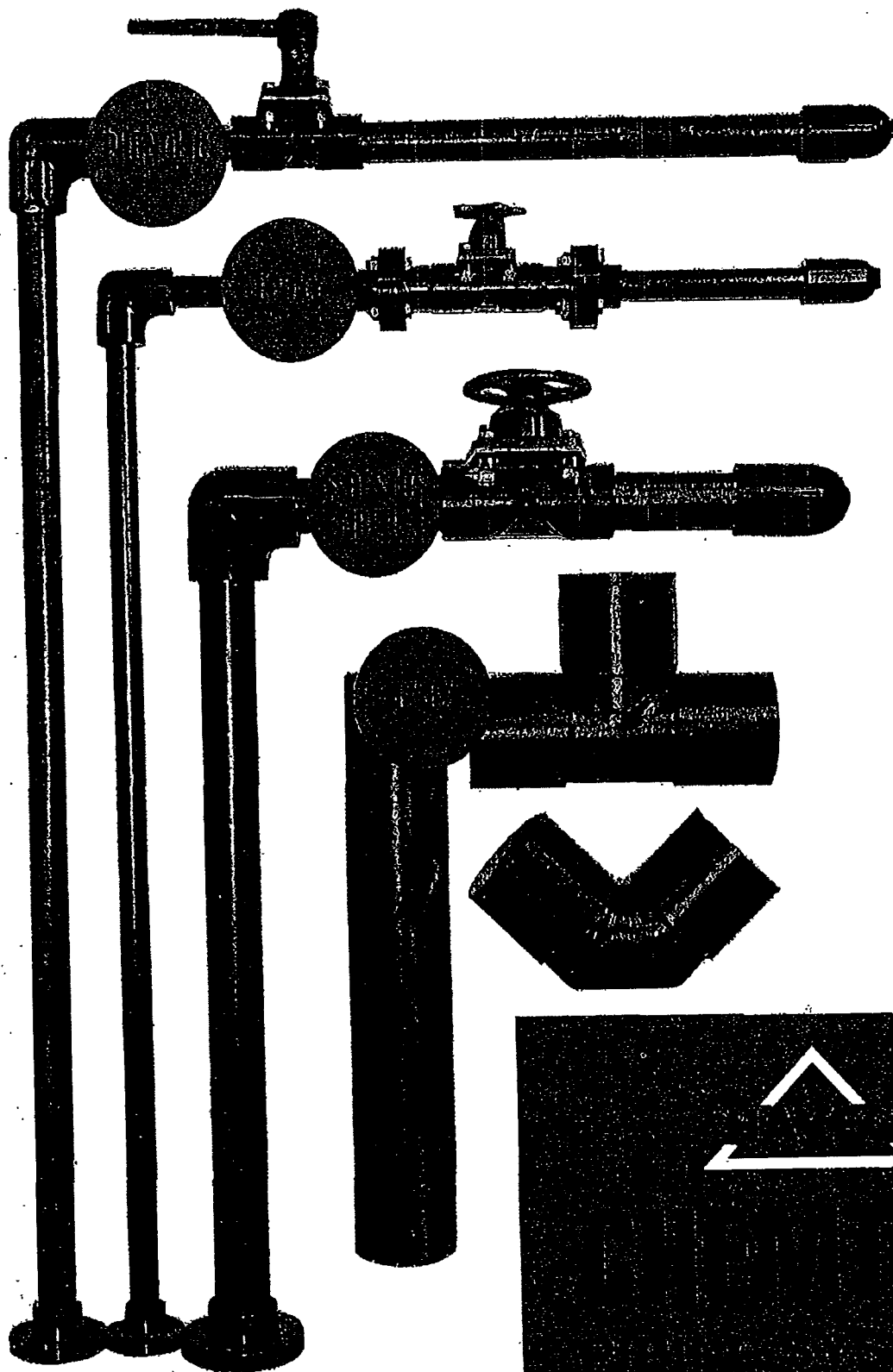


FILE NAME: Hercules Chemical (HERC)

DATE: 1971

DOC#: HERC033

DOCUMENT DESCRIPTION: Product Sales Literature



Higdon
EXHIBIT NO. 8
DATE 8-2-10

Asbestos-reinforced epoxy and phenolic systems for conveying many highly corrosive fluids at temperatures, minus 50 F to plus 300 F, and pressures to 150 psi.

Exhibit 10

CRM-C-HRCL-001887

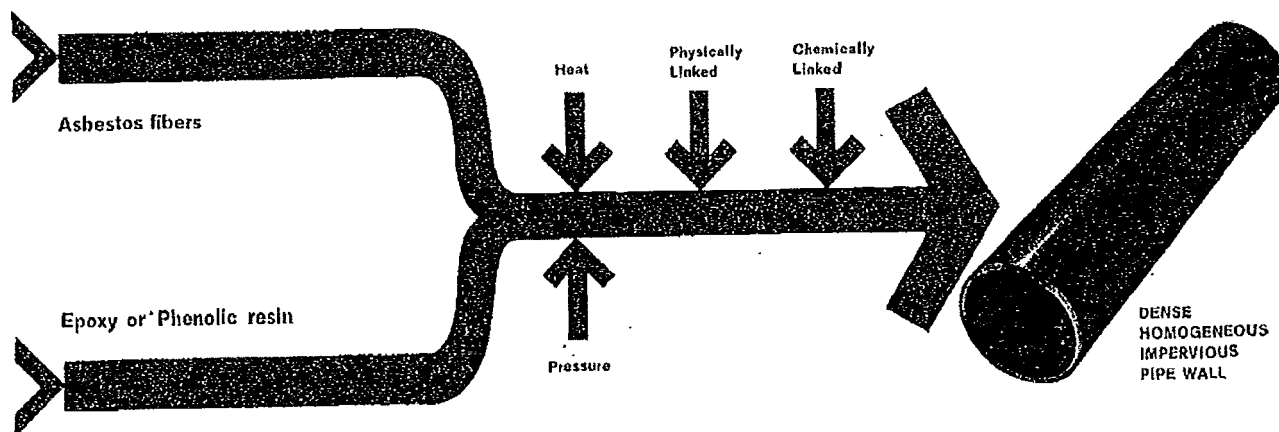


CHEMTITE®—A Major Improvement in Piping Systems

In Chemtite,* Haveg has combined asbestos fibers which possess great chemical resistance and tensile strengths up to 250,000 psi, with epoxy and phenolic resins in two separate pipe formulations... aromatic amine-cured epoxy with asbestos and phe-

nolic with asbestos. By means of a unique manufacturing process each combination of ingredients is linked together into a dense, homogeneous, impervious pipe material, as shown below:

A UNIQUE PROCESS

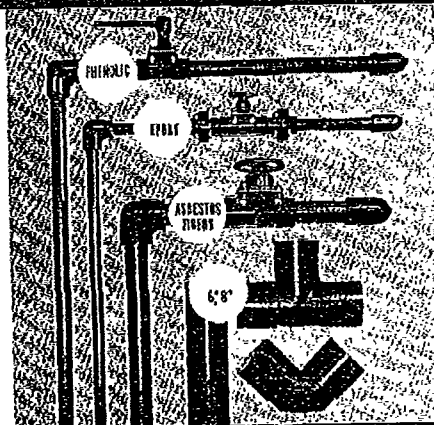


All products described herein are sold only in accordance with, and subject to, the limitations regarding our warranties and liabilities expressed in our Standard Terms and Conditions of Sales. No other warranties or liabilities whether expressed or implied, in fact or in law, shall pertain.

Pressure fittings, coupling and valve bodies are made from the same formulations as Chemtite pipe. Epoxy and phenolic materials are molded into the desired form in a transfer mold. Fittings, couplings and valve bodies have the same compositions and chemical properties as the corresponding pipe.

Pressure pipe and fittings are available in 1", 1½", 2", 3", and 4" sizes. "EB" identifies Epoxy materials, "PB" Phenolic materials. Hills-McCanna Diaphragm Valves with Chemtite bodies (epoxy or phenolic) are available in sizes 1", 1½", 2" and 3".

Information about 6" and 8" drain pipe and fittings is available.



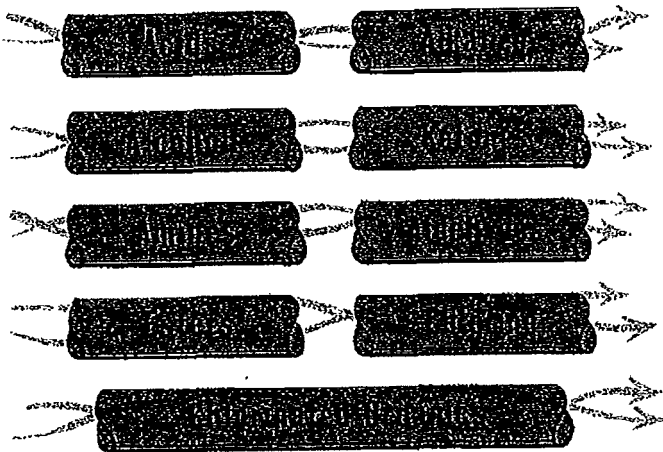
for Conveying Corrosive Chemicals

MOST COMPREHENSIVE RANGE OF CHEMICAL RESISTANCE

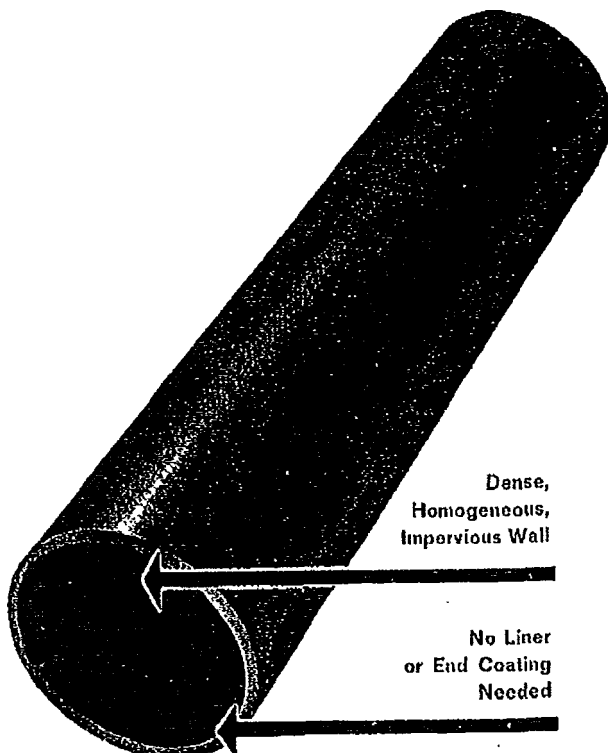
Chemtite epoxy and phenolic materials are among the most chemically inert materials in these resin systems. They are resistant to all the groups shown at the right.

TEMPERATURES, MINUS 50°F TO PLUS 300°F. PRESSURES, to 150 psi.

Both reinforcement and resins are resistant to high temperature. The asbestos fibers are aligned circumferentially in the pipe to provide maximum strength to contain high pressure. Epoxy system is recommended for maximum 250°F. Temperature recommendations are a function of service conditions.



A DENSE, HOMOGENEOUS IMPERVIOUS PIPE WALL THAT WILL NOT WEEP



- Low Thermal Conductivity
- Abrasion Resistant
- Low Creep
- Weather Resistant

The high density and homogeneity of the material provides a fluid seal as well as high chemical resistance. No need for resin-rich layer, liner or end coating to provide a seal or chemical resistance to the corrosive.

LONG LIFE

Many Chemtite installations have already surpassed the service life of the more expensive materials they replaced.

HIGH FLOW

Frictional flow factor (Hazen-Williams) of Chemtite is 145.

EASY TO TIE-IN TO OTHER MATERIALS

Chemtite pipe and fittings are made to nominal IPS schedule 40 O.D.

LOW THERMAL EXPANSION

Co-efficient of thermal expansion of Chemtite materials is 6.8×10^{-5} , about the same as that of steel.

COMPLIANCE WITH FDA REGULATIONS

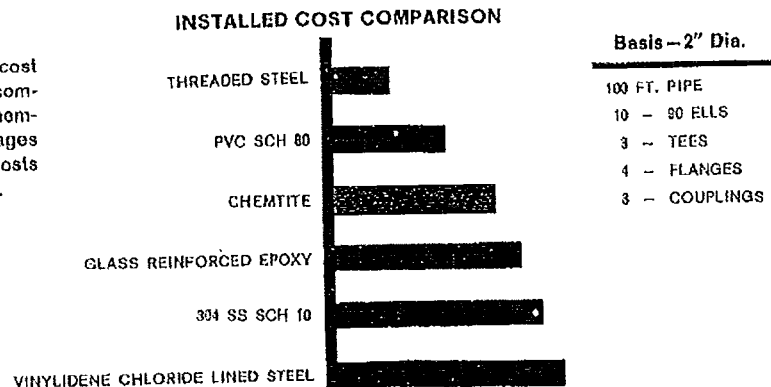
Epoxy Chemtite pipe system complies with the FDA regulations for use in conveying foods intended for human consumption.



CHEMTITE Systems Cost Less

The chart shows the relative installed cost of 2" phenolic Chemtite systems as compared to a range of other materials. Chemtite possesses performance advantages superior to lower cost materials and costs less than the other premium materials.

**Up to 33% SAVINGS
WITH CHEMTITE**



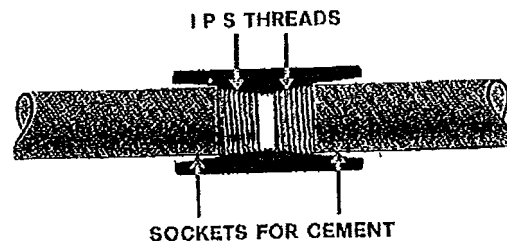
CHEMTITE Systems Cut Costs in Installation

NO WAITING FOR JOINT CEMENT TO HARDEN—Chemtite joints are combination thread-and-socket joints. The thread joint holds the parts rigidly in alignment and allows handling of the newly assembled parts without waiting for the joint cement to harden.

MAKE CUTS WITH A HACKSAW—No special cutting tools required.

THREAD PIPE ENDS ON-THE-JOB—No need to transport materials from the shop to the job.

HANDLE PIPE LENGTHS BY HAND—All lengths of all sizes may be easily handled by one man. Chain falls, pipe hoist or other rigging not required.



SUITABLE FOR INDOORS, OUTDOORS OR UNDERGROUND INSTALLATION—Chemtite systems are not affected by spillage or fumes within the plant. In the open air they are resistant to the effects of sun, rain and corrosives in the atmosphere. Not subject to ultra-violet degradation. Chemtite systems withstand aggressive soils and loads.

LESS DOWN-TIME—LITTLE MAINTENANCE—All of the above installation advantages save time and have made it possible for many Chemtite installations to be made between shifts without loss of production time.

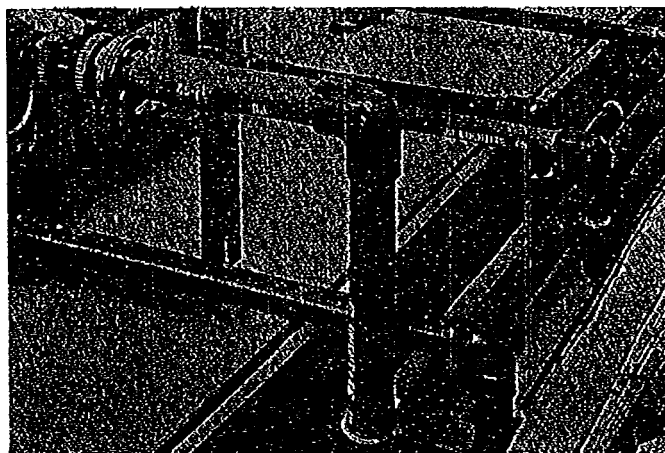
After installation, Chemtite systems require little maintenance. As previously indicated, they possess great resistance to environmental conditions. No painting necessary. Can be steam-cleaned.

CHEMTITE Systems—

Proved in More Than
1000 Services

TYPICAL INSTALLATIONS IN SERVICE MORE THAN FOUR YEARS

	Temp.	% Conc.	Chemtite Resin
Contaminated HCl	120°F	32%	PB
Lime Slurry Transfer	200°F		EB
Hydrobromic Acid Vapors	120°F		EB
Hydrochloric Acid	Ambient	37%	PB
Hydrochloric Acid	220°F	10%	PB
Hydrochloric Acid & Benzene	140°F	20%	PB
Hydrochloric Acid	220°F	10%	PB
Steam Condensate	200-230°F		PB
Steam—DIPhenyl & Other Organics	245°F		EB
Sulfuric Acid H ₂ SO ₄ (Drain)	Ambient	60%	PB
Sulfuric Acid & Copper Sulfate	190°F	25%	PB
Sulfuric Acid	150°F	60%	PB
Sulfuric Acid	175°F	78%	PB
Tri-poly Phosphate	150°F		EB
Wet Process Phosphoric Acid, P ₂ O ₅	160°F	54%	PB & EB



Phenolic CHEMTITE lines conveying 81% HCl at temperatures to 200°F and pressures to 100 psi.



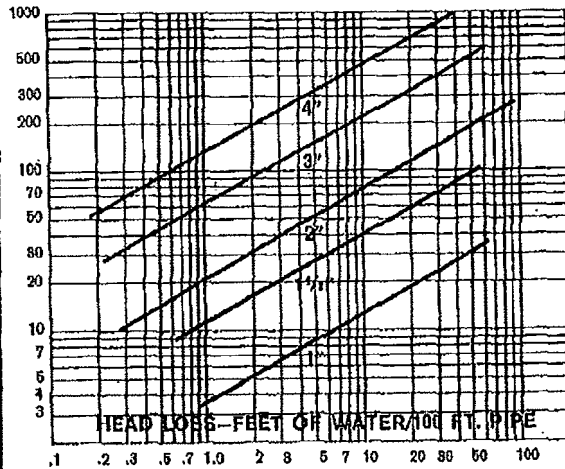
Epoxy CHEMTITE vent lines to scrubber conveying POCl₃, alkaline and acid vapors.



Phenolic CHEMTITE pipe—Hydrochloric Acid—Benzene & traces of Phenol.

CHEMTITE—The Right Piping System for Many Corros

Chemtite Pipe Flow Chart



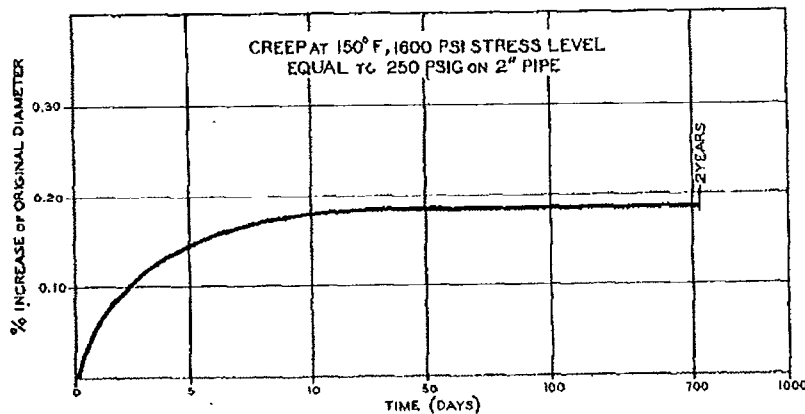
*The technical data and information set forth herein is a compilation of laboratory data and field experience with respect to similar environments that has been accumulated. To the best of our technical capability it indicates the probable serviceability of our CHEMTITE pipe products in the environments discussed. However, it is not meant and should not be understood as a warranty of suitability of the products for any particular purpose. The information is merely set forth your guidance but determinations as to which products are to be used and in what environments are left to the purchaser. We invite your inquiries for further information regarding your contemplated applications.

HOW TO DETERMINE THE SUITABILITY OF CHEMTITE FOR YOUR APPLICATION

To be sure that all circumstances of your application are taken into account, complete information regarding the corrosives to be conveyed, should be supplied to your Haver representative.

Factor for Loss Through Fittings in Equivalent Feet of Pipe

Fitting Size	1 in.	1 1/2 in.	2 in.	3 in.	4 in.
Coupling	0.7	1.0	1.5	2.7	3.7
Flange	0.6	0.9	1.3	2.5	3.5
90° ELL	4.2	6.3	8.5	18.2	17.7
45° ELL	1.7	2.5	3.4	5.5	7.4
TEE (thru leg)	5.0	7.5	10.0	15.8	21.0



Chemical Application Table*

Corrosive Chemicals

EB Chemtite Epoxy System

PB Chemtite Phenolic System

T Test Before Using

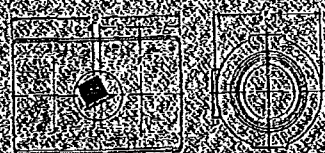
NR Not Recommended

Chemical	EB	PB	T	Temp	Chemical	EB	PB	T	Temp
Acetic Anhydride	PB, EB	T	T	T	Hydrochloric Acid	0-10%	PB, EB	PB, EB	PB, EB
Acetic Acid-Glacial	10%	PB, EB	PB	PB	10-25%	PB, EB	PB, EB	PB, EB	PB, EB
Acetone	T	T	T	T	25-37%	PB, EB	PB, EB	PB, EB	PB, EB
Acetone	EB	EB	EB	EB	Hydrofluoric Acid	5%	EB	T	T
Alkyl Benzene	PB, EB	PB	PB	T	Isothion	EB	EB	EB	EB
					Isopropyl Alcohol	PB, EB	EB	EB	EB
Aluminum Sulfate	PB, EB	PB, EB	PB, EB	PB 300°F	Kerosene	PB, EB	PB, EB	PB, EB	PB 300°F
Ammonia Gas	EB	EB	T	EB 250°F	Maleic Acid	PB, EB	PB, EB	T	EB 250°F
Ammonium Nitrate	PB, EB	PB, EB	PB, EB	PB 300°F	Methyl Alcohol	PB, EB	EB	PB	PB 300°F
Ammonium Sulfate	PB, EB	PB, EB	PB, EB	PB 300°F	Methyl Chloride	PB	PB	T	T
					Methyl Ethyl Ketone	PB, EB	PB	T	T
					Methyl Isobutyl Ketone	PB, EB	PB	T	T
Antine	10%	PB, EB	T	T	Naphthalene	PB, EB	PB	PB	T
Aqua Ammonia	20%	EB	EB	EB	Nitric Acid	3%	PB, EB	PB	NR
Benzaldehyde	PB, EB	T	EB	EB	Ortho Dichlorobenzene	PB	PB	PB	T
Benzene	PB, EB	PB	PB	T	Oxalic Acid	PB, EB	PB, EB	PB, EB	T
					Potassium Nitrate	PB, EB	T	T	T
					Potassium Nitrate 24	EB	T	T	T
Butyl Acetate	EB	PB	T	T	Phosphoric Acid	0-10%	PB, EB	PB, EB	PB 300°F
Butyl Alcohol	PB, EB	PB, EB	PB, EB	PB 300°F	10-25%	PB, EB	PB, EB	PB, EB	EB 250°F
Calcium Chloride	PB, EB	PB, EB	PB, EB	PB 300°F	25-50%	PB	PB, EB	PB, EB	PB 300°F
Carbon Dioxide Gas	PB, EB	PB, EB	PB, EB	PB 300°F	50-80%	PB, EB	PB, EB	PB, EB	PB 300°F
Carbonic Acid	PB, EB	PB, EB	T	T	Picric Acid	PB, EB	EB	EB	NR
					Potassium Hydroxide	10%	EB	T	T
					Potassium Dichromate	50%	PB, EB	T	T
					Potassium Permanganate	50%	PB, EB	T	T
Calcium Hydroxide	EB	EB	EB	PB 300°F	Soda Ash, Saturated	EB	EB	EB	T
Carbon Tetrachloride	PB, EB	T	NR	EB 250°F	Sodium Bicarbonate	-PB, EB	PB, EB	PB, EB	EB 250°F
Chlorine Water	PB	PB	PB	PB 300°F	Sodium Chloride	PB, EB	PB, EB	PB, EB	EB 250°F
Chlorobenzene	PB	PB	PB	PB 300°F	Sodium Dichromate	PB, EB	T	T	T
Chloroform	PB	PB	PB	T	Sodium Hydroxide	10%	EB	EB	NR
Chloroform	PB, EB	PB, EB	PB, EB	PB 300°F	50%	EB	PB, EB	PB, EB	PB 300°F
Citric Acid	PB, EB	PB, EB	PB, EB	PB 300°F	Sodium Sulfate	PB, EB	PB, EB	PB, EB	EB 250°F
Copper Sulfate	PB, EB	PB, EB	PB, EB	EB 250°F	Sodium Sulfate	PB, EB	PB, EB	PB, EB	EB 250°F
Ethyl Acetate	EB	EB	T	T	Sulfur Dioxide Gas	Dry	PB, EB	PB, EB	PB 300°F
Ethyl Acetate	PB, EB	PB, EB	PB, EB	PB 300°F	Wet	PB, EB	PB, EB	PB, EB	PB 300°F
Ethyl Alcohol	PB	PB	PB	EB 250°F	Sulfuric Acid	0-10%	PB, EB	PB, EB	PB 300°F
Ethylene Chloride	PB, EB	EB	T	PB 300°F	10-25%	PB, EB	PB, EB	PB, EB	PB 300°F
Ethylene Chlorohydrin	PB	PB	PB	PB 300°F	25-50%	PB	PB	PB	PB 300°F
Ethylene Chlorohydrin	PB	PB	PB	EB 250°F	50-75%	PB	PB	PB	PB 300°F
Ethylene Dichloride	PB, EB	PB, EB	PB, EB	EB 250°F	75-95%	PB	PB (to 130°F)	NR	NR
Ethylene Glycol	PB, EB	PB, EB	PB, EB	PB 300°F	Toluene	PB, EB	PB	PB	T
Ferric Chloride	PB, EB	PB, EB	PB, EB	EB 250°F	Trichloroethylene	PB	PB	PB	PB 300°F
Formaldehyde	PB, EB	PB, EB	T	T	Triisobutyl Phosphate	PB, EB	PB, EB	PB, EB	EB 250°F
Formic Acid	PB, EB	PB, EB	T	T	Turpentine	PB, EB	PB, EB	PB, EB	EB 250°F
Fumaric Acid	PB, EB	PB, EB	T	T	Xylene	PB, EB	PB, EB	PB, EB	T
Gasoline	PB, EB	PB, EB	PB, EB	PB 300°F	Zinc Chloride	PB, EB	PB, EB	PB, EB	T
Heptane	PB, EB	PB, EB	PB, EB	PB 300°F	Zinc Sulfate	PB, EB	PB, EB	PB, EB	PB 300°F
Hexane	PB, EB	PB, EB	PB, EB	EB 250°F					EB 250°F

CRMC-HRCL-001893

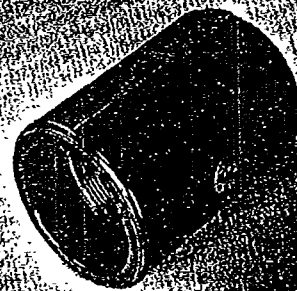
FITTINGS AND DIMENSIONS

COUPLING



Sizes	G	D	C	O	F	Wt.
1"	4.13	1.00	1.00	0.13	2.19	3/4 lb.
1 1/2"	4.83	1.00	1.25	0.13	2.81	1 1/8 lbs.
2"	4.50	1.00	1.25	0	2.90	1/2 lb.
3"	5.00	1.25	1.50	0	4.00	3/4 lb.
4"	6.25	1.13	2.00	0	5.04	1 1/2 lbs.

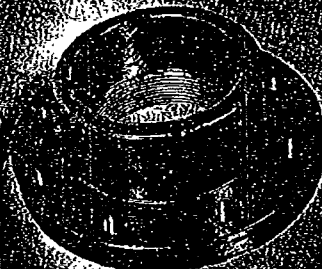
*Threads are straight...not tapered.



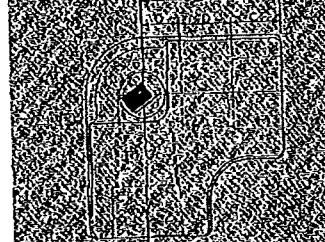
FLANGE



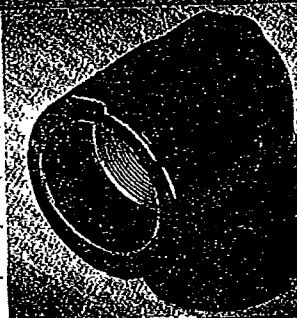
Sizes	G	D	C	L	H	J	Wt.
1"	2.06	1.00	1.00	.70	3.13	4.25	3/4 lb.
1 1/2"	2.31	1.00	1.25	.75	3.88	5.00	1 1/8 lbs.
2"	2.50	1.06	1.38	.81	4.75	6.00	1 1/2 lbs.
3"	2.75	1.19	1.50	1.00	6.00	7.50	2 7/8 lbs.
4"	3.38	1.31	2.00	1.06	7.50	9.00	4 1/2 lbs.



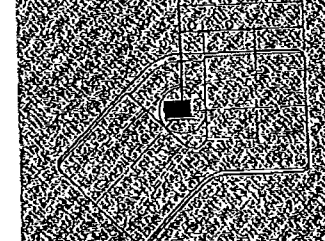
90° ELL



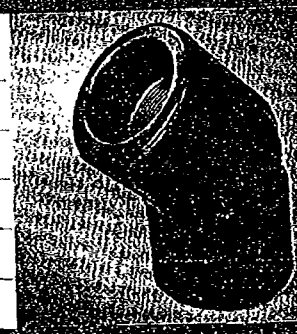
Sizes	G	D	C	O	Wt.
1"	2.75	1.00	1.00	0.75	1 1/2 lbs.
1 1/2"	3.31	1.00	1.25	1.06	1 3/4 lbs.
2"	3.81	1.13	1.38	1.31	2 3/8 lbs.
3"	4.56	1.25	1.50	1.81	6 lbs.
4"	5.69	1.38	2.00	2.31	9 3/4 lbs.



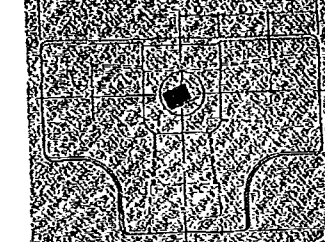
45° ELL



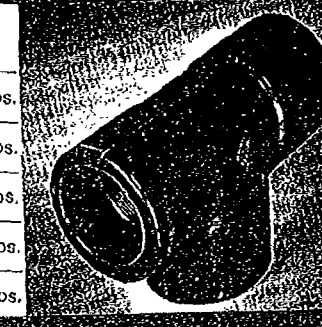
Sizes	G	D	C	O	Wt.
1"	2.44	1.00	1.00	0.44	1 1/8 lbs.
1 1/2"	2.75	1.00	1.25	0.50	1 5/8 lbs.
2"	3.13	1.13	1.30	0.63	1 7/8 lbs.
3"	3.75	1.25	1.50	1.00	5 1/8 lbs.
4"	4.63	1.38	2.00	1.25	6 1/8 lbs.



TEE



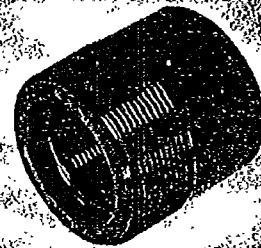
Sizes	J	D	C	O	J/2	Wt.
1"	5.50	1.00	1.00	0.75	2.75	1 3/8 lbs.
1 1/2"	6.63	1.00	1.25	1.06	3.31	2 3/8 lbs.
2"	7.63	1.13	1.38	1.31	3.81	3 3/8 lbs.
3"	9.13	1.25	1.50	1.81	4.56	6 3/8 lbs.
4"	11.38	1.38	2.00	2.31	5.68	10 1/2 lbs.



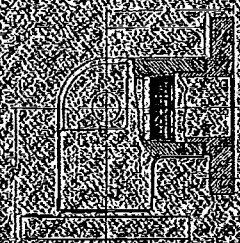
REDUCING BUSHING



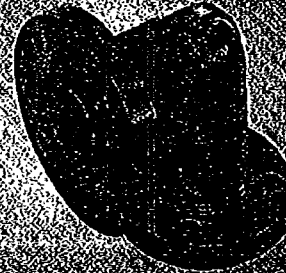
Sizes	D	C	E	A
1½" x 1"	1.00	1.00	1.31	1.39
2" x 1½"	1.00	1.25	1.89	1.92
3" x 2"	1.13	1.38	2.37	2.39
4" x 3"	1.25	1.50	3.49	3.52



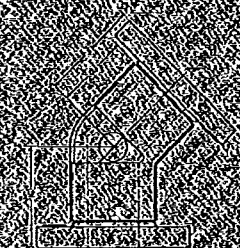
FLANGED 90° ELL



Sizes	X ₁	G ₂
1	3.64	2.75
1½	4.25	3.31
2	4.81	3.81
3	5.75	4.56
4	7.07	5.69



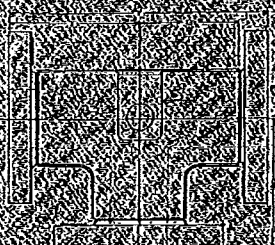
FLANGED 45° ELL



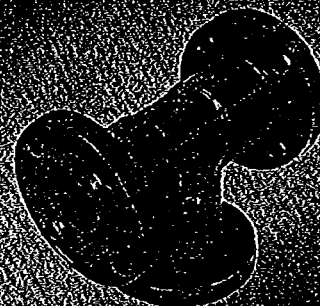
Sizes	X ₁	G ₂
1	3.33	2.44
1½	3.69	2.75
2	4.12	3.13
3	4.94	3.75
4	6.01	4.63



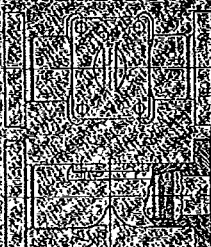
FLANGED TEE



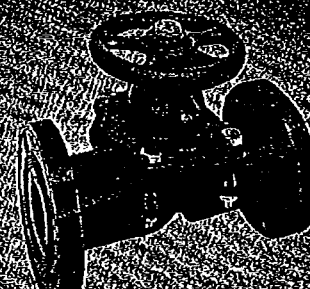
Sizes	Y	X ₁	G ₂
1	7.28	3.64	2.75
1½	8.50	4.25	3.31
2	9.62	4.81	3.81
3	11.50	5.75	4.56
4	13.80	6.95	5.69



VALVE BODY



Sizes	AU
1	7⅞
1½	8⅞
2	10⅞
3	12⅞



HAVEG® CHEMTITE Systems-Easy to Work With and Install

A Chemtite Pipe Installation Guide is provided with each Chemtite order to insure that the installer gains all of the advantages of Chemtite. Also, your Haveg sales engineer will advise regarding specific installation conditions. No special techniques are needed in installing Chemtite. The following outlines the basic procedure.



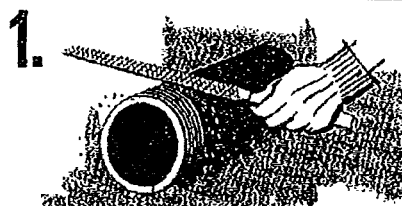
CUT with a Standard Hacksaw

A power saw or a mason saw may also be used. Use care to obtain square cuts. Do not use standard tubing cutters.

THREAD Pipe Ends On-The-Job

Use one of the Ridgid tools shown . . . equipped with Tungsten Carbide Tipped Dies. (Ridgid #65R-TC for sizes 1", 1½", 2"; Ridgid #141 for sizes 3" and 4"). They are available with the proper dies through local Ridgid distributors. For hand threading with the #65R-TC use a chain type vise and grip the pipe at a point not more than 12" from the end to be threaded. Take care not to apply too much pressure with the vise.

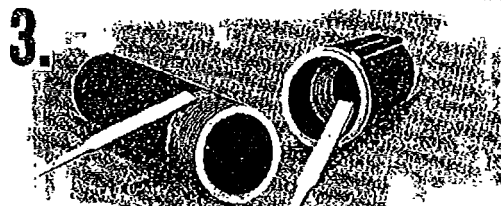
MAKE Joints in 10 Minutes or Less



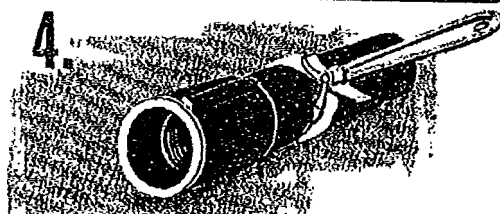
1. Prepare the pipe by removing the glaze from the area next to the threads where cement is to be applied. Use sand paper or a rasp. Fittings are sanded at the factory.



2. Chemtite joint cement is supplied. It is applicable to both phenolic and epoxy systems.



3. Spread cement evenly, approx. ⅛" thickness over the sanded area of the pipe and on the threads. Apply a thin film in the socket area to assure complete coverage.



4. Thread pipe into the socket using a strap wrench and then remove excess cement from the fillet. Assembly of the line can continue without waiting for the cement to harden.

CHEMTITE Full Face Teflon Envelope Gaskets

Full face gaskets are recommended. J-M Service Sheet #60 or #76 is adequate for most services. Unusual service requirements may dictate the need for other gasketing materials. J-M Teflon envelope gasket with full face expanded filler, as shown, is recommended for severe chemical exposure. Chemtite flanges conform to ASA 150 lb. flange dimensions.

Drilling and Tapping

Split a Chemtite sliding repair sleeve of the proper size, cement it over the clean, rasped area to be drilled or tapped. Drill through both sleeve and pipe.

Alterations and Repairs

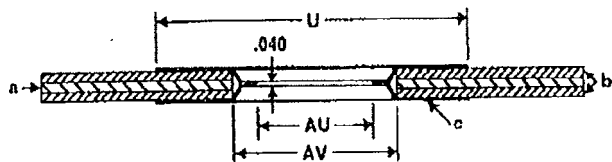
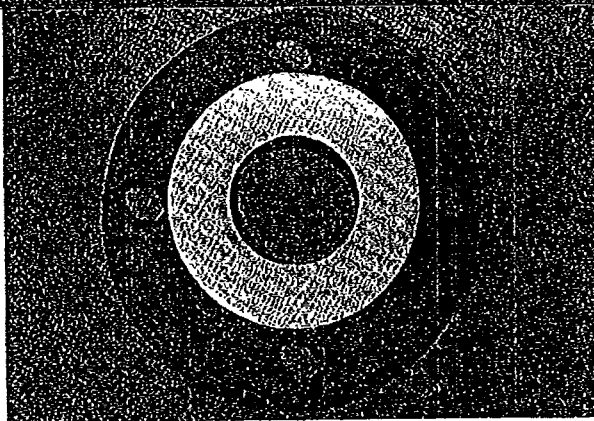
Other lines may be tied into a Chemtite line or repairs made easily. A Chemtite sliding repair sleeve is available for joining fittings or a new length of Chemtite into the line.

Expansion Allowances

The coefficient of thermal expansion of Chemtite is about the same as that of steel. Chemtite has lower thermal conductivity and thus expands and contracts more slowly than steel.

A Pipe Installation Instructor Can Help

This pocket-sized folder provides full recommendations for techniques and procedures to use in installing Chemtite pipe. A copy is shipped with each Chemtite order. Have installation foreman and mechanics read it before beginning an installation.



a. One layer of J-M style #60 sheet, $\frac{1}{8}$ thick (compressed white chrysotile asbestos)

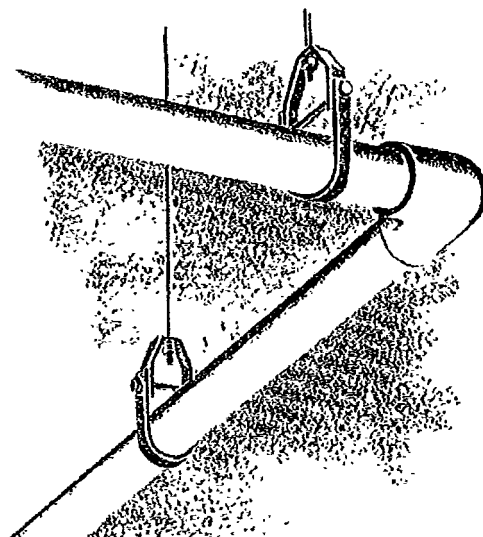
b. Two layers of J-M style #83 sheet, $\frac{1}{8}$ thick (blue acid resisting asbestos)

c. Teflon envelope 0.020 thick

Pipe Size	*No. of holes	Filler		Envelope	
		AV	AU	U	
1	4	1 $\frac{1}{8}$	1	2 $\frac{1}{2}$	
1 $\frac{1}{2}$	4	1 $\frac{1}{2}$	1 $\frac{1}{2}$	3 $\frac{1}{4}$	
2	4	2 $\frac{3}{4}$	2	4	
3	4	3 $\frac{1}{2}$	3	5 $\frac{1}{4}$	
4	8	4 $\frac{1}{2}$	4	6 $\frac{3}{4}$	

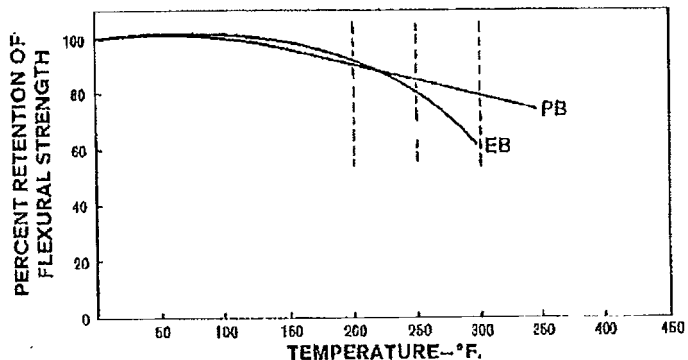
*bolt holes equally spaced

Use Standard Procedures for Hanging and Support



HANGER SPACING, FT.
No external load

Size	1	1 $\frac{1}{2}$	2	3	4
72°	7	10	12	15	20





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