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CS7H

Corporate Engineering

(4-6744)

Date: August 20, 1984

cc Charlie Petit - CS7H

Tom Pryor - CS7H

Re: Use of Asbestos in Piping Systems

To: Dave Allman - 1720
 Gene Anthony - CS7E
 Larry Baer - CS6M
 Dave Barrett - CS7H
 Paul Bernache - CS7V
 Jim Blankenship - CS6B
 A. D. Book - 1560
 Jim Borgmeyer - CS7V
 Len Bornemann - 1440
 Bruce Bradley - CS6M
 Paul Brewer - 1740
 George Butler - 1200
 M. R. Bynum - 1760
 Bob Carlton - CS7D
 Mike Combs - 1690
 Mac Feld - CS6G
 Gene Forneris - 1740
 Barry Hauf - CS6B
 Dave George - CS70
 Lee James - CS6M
 Joe Jeter - 1760
 Tom Jordan - 1870

Andy Larson - CS7E
 Walter Leong - 1760
 Tom Martin - CS6G
 Lynn Meenen - CS6M
 Charlie Pannett - CS6D
 Joe Purvis - CS7V
 Wendy Purvis - F4WB
 Rich Quinlisk - CS6B
 Rich Ramsey - CS6G
 Doug Rogel - 1900
 Glenn Ross - 1780
 Jack Roubidoux - CS6M
 Dennis Sagez - CS70
 B. J. Sanders - 1890
 Buddy Satterly - CS7E
 Mark Schoedel - CV
 Gene Stecher - CS70
 Gus Theodore - CS6B
 Ralph Tisher - CS70
 Al Tung - CS2B
 Don White - 1560
 Bill Womack - 1850

For those of you who haven't seen it, I have attached a copy of Monsanto's policy on the use of asbestos. As you probably know, most of the asbestos we use in new facilities is in piping systems. I developed a proposal for implementation of this policy on CED projects as shown below. The proposal was approved this morning.

PLAN FOR ELIMINATING ASBESTOS IN NEW PIPING SYSTEMS

Line Gaskets

1. Revise piping system masterspecs (PSM's). (I revised the electronic version this morning. Any PSS's developed using the automated system will not have asbestos containing gaskets.)
2. Revise piping system specifications (PSS's) for current projects before January.
3. Stop purchasing gasketing which contains asbestos on January 1, 1985, even if the requisition specifies asbestos.

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Coated and Wrapped Pipe

1. Revise piping system masterspecs (PSM's). (I revised the electronic version this morning. Any PSS's developed using the automated system will not have coated and wrapped pipe.)
2. Revise piping system specifications (PSS's) for current projects before January.
3. Stop purchasing coated and wrapped pipe on January 1, 1985.

Valves

1. Revise valve specifications before December, 1985.
2. Stop purchasing valves which contain asbestos on January 1, 1986, even if the requisition specifies otherwise.

RECOMMENDED ALTERNATES TO ASBESTOS

There is no universal substitute for asbestos. There are generally three materials which have been demonstrated to be suitable:

- * Asbestos substitutes
- * Reinforced PTFE
- * Flexible Graphite

For line gaskets, the primary alternates are compressed non-asbestos sheet, reinforced PTFE and reinforced flexible graphite (vendor information attached). For utilities such as air, water, inert gas and steam, I recommend using Garlock Blue-Gard style 3400. Unless this, or another asbestos substitute has been demonstrated to be suitable in a chemical service, I recommend using the reinforced PTFE for temperatures below 400 F. For temperatures from 400 F to 500 F, flexible graphite should be used in chemical service. Flexible graphite filled spiralwound gaskets should be substituted for asbestos filled spiralwound gaskets. I cannot recommend PTFE filled spiralwound gaskets because of reported leakage at moderate temperatures, presumably caused by creep. I understand the industry is gaining favor for reinforced PTFE filled spiralwound gaskets, but I know of no Monsanto experience with this gasket.

For coated and wrapped pipe, the primary alternates are extruded polyethylene coating and coal tar epoxy coating (K1.3 STD U2).

The primary alternates for valve gaskets are the same as for line gaskets. The primary alternates for valve packing are asbestos substitutes, PTFE and flexible graphite.

For specific applications, I recommend consulting with your friendly Materials Engineer.

Frikken

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Don Frikken

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MONSANTO'S POLICY ON ASBESTOS

1. Action Policy Statement not made. This is a separate page.

2. Revise piping system specifications and standards to reflect Monsanto's social responsibility policy states that we will provide a safe and healthful workplace for our employees. To support this policy we will ensure that appropriate safety procedures and health considerations are incorporated into the design of all new Monsanto facilities and we will train employees in the safe operating practices and require the use of proper protective devices. To support this policy a program for the identification and elimination of asbestos materials within our workplaces will be developed.

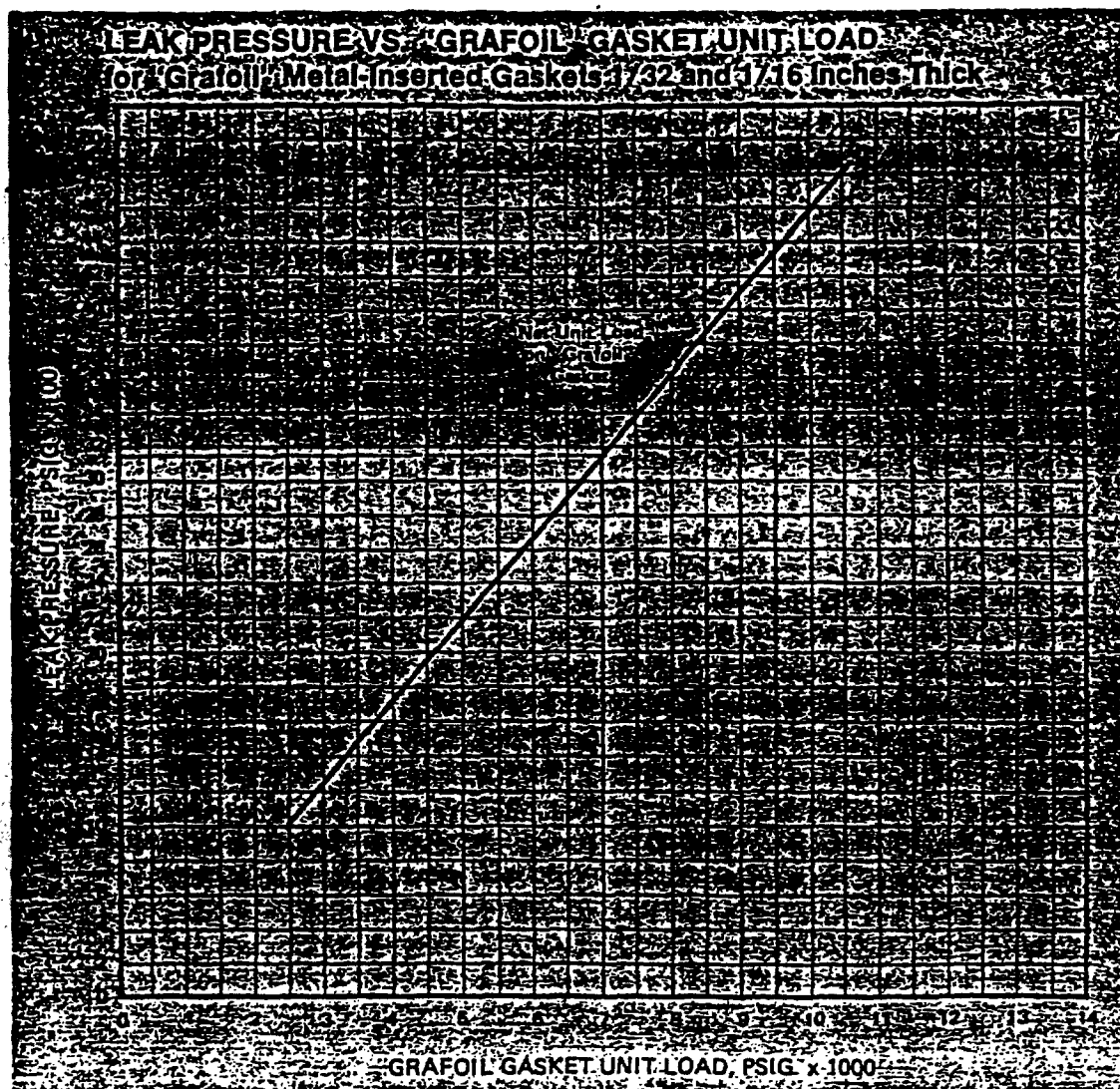
II. Scope

To implement the policy regarding the identification and elimination of asbestos materials we will:

1. Revise the specifications in the CED piping standards to eliminate asbestos gaskets. Situations in which non-asbestos gaskets will not meet the specific requirements will be handled by the operating company and CED on an exception basis.
2. Specify non-asbestos materials for valve packing and other speciality applications. This will require a transition period to inform all of our suppliers well ahead of time that we will no longer accept materials obtaining asbestos, to evaluate the cost and performance of alternatives for asbestos, and to change the Monsanto specifications. Situations in which non-asbestos materials will not meet the specific requirements will be handled by the operating company and CED on an exception basis. The target date for completion is December 31, 1985.
3. Replace asbestos in existing facilities with non-asbestos materials when repair, replacement, modification projects are executed. Situations in which non-asbestos materials will not meet the specific requirements will be handled by the operating company and CED on an exception basis.
4. Manage in a manner to assure proper protection of personnel those situations in which asbestos remains by:
 - a) providing workplace guidelines that reflect the state of technology today and that comply with all governmental regulations on handling, working with, and disposal of asbestos.

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Gasket loading vs. leakage pressures

The prime requirement for satisfactory sealing with "Grafoil" metal-inserted gaskets is sufficient unit load on the gasket at all times in one continuous path around the gasket.

If surfaces are maintained flat within 0.005 inches, and are held to a surface finish of 125 RMS or better, "Grafoil" gaskets will seal hydrostatic pressures as shown on the graph above, "Leak Pressure vs. Gasket Unit Load for 'Grafoil' Gaskets." A Net Load of 7,000 psi of dotted line example will seal up 3,150 psi

water pressure. The Net Unit Load is that force still exerted on the gasket surface after all the forces which tend to relieve the initial unit load are subtracted. One such opposing force is the "piston" action of the sealed pressure on the area within the gasket I.D. Others are: bolt stretch, piping stress, and differential thermal expansion. The initial load on "Grafoil" gaskets must be enough to end up, under operating conditions, at or above the Net Unit Load indicated on the graph.

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"GRAFOIL" METAL-INSERTED GASKETS PIPE-SIZE GASKET* DIMENSIONS

Gasket Dimension Inches	ID	O.D. for AMERICAN STANDARD STEEL FLANGES				
		50 lb.	100 lb.	150 lb.	300 lb.	1500 lb.
Pipe Size (In.)						
1/2	27/32	3/8	21/32			
3/4	1 1/16	21/8	23/8			
1	1 3/16	2 1/8	2 1/8			
1 1/2	1 29/32	3 1/8	3 3/8			
2	2 1/8	4 1/8	4 3/8			
2 1/2	3 1/8	5 1/8	5 3/8			
3	3 7/8	6 1/8	6 3/8			
4	4 7/8	7 1/8	7 3/8			
6	6 3/4	9 3/4	9 7/8			
8	8 1/2	11 1/2	12 1/2			
10	10 1/4	13 1/4	14 1/4			
12	12 3/4	16 3/4	18 3/4			
14	14 1/4	17 1/4	19 1/4			
16	16	20 1/4	21 1/4			
18	18	21 1/4	23 1/4			
20	20	23 1/4				

*Normally available from stock.

HOW TO INSTALL

1. Remove all projecting particles, scale, and burrs from the flange faces. Small subsurface defects will cause no trouble.
2. Part flanges enough to slide gasket in place, using a few bolts for positioning. Temporary spacers may be advisable.
3. Handle the "Grafoil" gasket with reasonable care to avoid tearing, scratching or bunging.
4. Insert rest of bolts. Draw flanges together evenly. Tighten all nuts hand tight. Increase bolt loading in usual manner until required bolt load is obtained.

HOW TO ORDER

See separate Catalog Section** for pricing and standard packaging. On order, specify size, quantity, catalog number and price.

CUSTOM SIZES

Gaskets with dimensions varying from those shown in the table, can be supplied upon request — please furnish sketch and dimensional data.

G-8819

GRAFOIL is a registered trade mark of Union Carbide Corporation.

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UNION CARBIDE CORPORATION

CARBON PRODUCTS DIVISION

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b) Maintaining a "state-of-the-art" awareness of the evolution of potential asbestos substitutes and of the evolution of technology, industry practices, and governmental regulations on handling, working with, and disposal of asbestos.

c) Periodically reviewing and evaluating those situations in which asbestos is still used.

July 19, 1984

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