PLAINTIFF'S EXHIBIT
DUP-457

To: H. H. Nickolaus — Bldg. 3
From: R. J. Moczygemba - 581

For your info.

CC: W. T. Dodson
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J. W. Bolduc
J. E. Sthay
W. G. Todd
T. H. Barker
R. A. Bates
B. Thornbrugh
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M. R. Morfin
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S. W. Ellis
Alathon Maintenance Foremen

October 11, 1984

TO: W. A. SCZECH

FROM: R. J. MOCZYGEMBA RJM

ALATHON™ ASBESTOS GASKET AND PACKING PROGRAM

In response to A. H. Nicholaus' letter entitled "Use of Asbestos Gaskets" dated 6-18-84 (attached), I am proposing a program to phase out asbestos containing gaskets and packing where feasible from "F" and "J" Units. In all cases removal of asbestos packing and gaskets will be on an "as needed" basis. The non-asbestos gaskets and packing types I am proposing are recommended in the Engineering Standards. This program is straight forward in eliminating asbestos containing pipe flange gaskets, equipment gaskets, and valve packing, however phasing out packing used in equipment will require Technical involvement to determine the best replacement.

Pipe Flange Gaskets

Most low pressure process pipe flange gaskets in "F" and "J" Units are spiral wound gaskets using a metal winding with an asbestos paper filler. The Flexitallic™ Gasket Company has developed a replacement filler called Flexite™ Super which is superior to asbestos filled spiral wound gaskets (see attachment). Flexite™ Super can be used in any application where asbestos is used. It is accepted by the Engineering Department and is listed in the Engineering Standards.

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W. M. Bounds of the Design Division is working to add these gaskets to the pipe codes as an alternative to the abestos spiral wound gaskets presently listed. Flexite™ Super is comparable in price to asbestos spiral wound gaskets. The gaskets are color coded so they are not confused with 100% graphite (Grafoil) or asbestos filled gaskets. I am proposing setting up Flexite™ Super Pipe Flange Gaskets in Stores stock and issuing a COD to use these gaskets in all applications where asbestos spiral wound gaskets are used.

Asbestos precut sheet gaskets (DuPont Code G-1, Styrene Butadiene Rubber Bonded Compressed White Asbestos) are used in most service and some process applications in "F" and "J" Units. Many suppliers have developed non-asbestos sheet gaskets, however none have yet met the temperature rating, strength and chemical resistance of asbestos. ESD has conducted performance tests on various non-asbestos gaskets on the market. As a result the Engineering Standards have been revised to include acceptable gasket manufacturers. Testing showed only those gaskets manufactured from DuPont Kevlar™ aramid fiber pulp to be acceptable. The Engineering Standards list the non-asbestos with a temperature rating of 290°C compared to 400°C for asbestos. Unlike the Flexite™ Super for spiral wound applications, these gasket materials can not replace asbestos for all applications. After reviewing all pipe code applications in "F" and "J" Units, I am proposing using the DuPont Code G-80 (Garlock 3200) non-asbestos material for all present G-1 applications with the exception of high pH systems (pH>11) such as caustic service and highly basic water systems. In those applications I am proposing the use of Flexite™ Super spiral wound gaskets. The G-80 gasket has 50% higher cost compared to G-1. These gaskets are branded for identification. I am proposing setting up these gaskets in Stores stock and issuing a COD for its use as indicated above.

These gaskets I am proposing to put in Stores will eventually be used by all areas of the plant. The Acids and HMD Divisions are also developing asbestos gasket programs. The asbestos gaskets in Stores will not be deleted until all areas have successfully demonstrated the performance of non-asbestos gaskets. A committee chaired by J. L. Chambard has been given the task of working out the details of the transition to non-asbestos gaskets.

Equipment Gaskets

I am proposing revising all Stores descriptions for asbestos spiral wound equipment gaskets to specify Flexite™ Super. Also all Stores descriptions for asbestos precut sheet gaskets for equipment will be changed to S-80 material unless process conditions require other non-asbestos materials. Equipment involved in these changes will be process vessels, heat

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exchangers, process valves, automatic valves, Daniels check valves, relief valves, pumps, and miscellaneous instrumentation. No equipment gasket material change will be made until the proposed pipe flange non-asbestos gasket materials have been successfully demonstrated for at least six months.

Valve Stem Packing

Non-asbestos packing material is not new technology as is the case with gasket materials. Most of the valves in "F" and "J" Units are presently packed with non-asbestos material. Grafoil, Teflon yarn lattice braid and Teflon "V" ring packing are the most common. I have reviewed all pipe codes in "F" and "J" Units and am proposing a non-asbestos valve packing for all applications where asbestos is presently used. The proposed replacement for all services will be documented with a COD. In general I am proposing Grafoil™ packing for the high temperature and flammable services and 100% Teflon lattice braid for low temperature service and where severe chemical resistance is required. The pipe codes and valve codes will eventually be changed.

Equipment Packing

In those few cases where asbestos packing is used in equipment (i.e., extruder screws, heat exchanger tube sheets, pumps, etc.) careful attention should be given to packing selection. Consideration to such items as shaft speed, shaft surface finish, temperature, pressure, lubrication/cooling, packing abrasiveness, etc. makes packing selection unique to each application. For this reason I am proposing technical involvement and COD's for each individual case as needed.

Miscellaneous

This program does not at this time propose any replacement for asbestos filled corrugated metal, single or double jacketed metal or french-type metal gaskets. These style gaskets should be available with other fillers in the near future. Gaskets of this type pose no real industrial hygiene concern since they are in most cases totally enveloped with metal.

Summary of Program

1. Issue RPO-COD for using non-asbestos spiral wound and precut sheet pipe flange gaskets and valve stem packing. Set these items up in Stores. Train mechanics on identification and proper use (Responsibility-Maintenance, Timing 12/84).

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2. After evaluating non-asbestos pipe flange gaskets for at least six months then select suitable non-asbestos equipment gaskets and issue RPO-COD for their use. Change Stores description to show these changes. (Responsibility-Maintenance, Timing 9/85).

3. Evaluate and issue COD for equipment packing applications as required. (Responsibility-Maintenance/Technical).

4. Specify non-asbestos gaskets and packing for all new equipment ordered. (Responsibility-Maintenance/Technical)

5. When available begin using non-asbestos filled semi-metallic gaskets. (Responsibility-Maintenance, Timing 12/85).

RJM:bw

DUP 0814518

"SAFETY IS MY RESPONSIBILITY"

RONALD J. MOCZYGEMBA
581

June 18, 1984

TO: ALL SUPERVISION - LIST "C"

FROM: A. H. NICKOLAUS AHN
BLDG. 3

USE OF ASBESTOS GASKETS

Attached for your information is an article from the February 1984 issue of "Du Pont Environmental Quality Today". It describes the Engineering Department's program to phase out, insofar as possible, the use of asbestos in gaskets and packings.

The Victoria Plant's policy (I/H Procedure No. 10) is that non-asbestos bearing materials must be substituted wherever feasible for asbestos. Therefore:

1. New installations should specify non-asbestos containing gaskets and packings wherever possible.

2. Non-asbestos gaskets and packings specified as alternatives in the Engineering Standards should be tested in existing installations. If found suitable, they should replace asbestos gaskets after existing stocks are used up.

3. Priority should be given to replacing those asbestos containing gaskets that are changed most often.

AHN/rtg
Attachment

DV

"SAFETY IS MY RESPONSIBILITY"

DUP 0814519

FROM: "Du Pont Environmental Quality Today", Feb. 84

ASBESTOS GASKETS ARE GETTING FEWER

By now, everyone is aware of the health hazard of breathing asbestos fibers. On November 4, 1983, OSHA further tightened the regulations on airborne asbestos fibers to reduce the statistical probability of asbestosis and lung cancer. The allowable level was cut from 2 to 1/2 fiber over 0.0002 in. long per cubic centimeter of air. This level approaches the practical limit for detection and will undoubtedly cause companies which supply and process asbestos to get out of the business. Garlock, the largest U.S. manufacturer of packings and gaskets, discontinued its entire asbestos line at the end of 1982.

Since asbestos fibers in compressed sheet gasketing material are locked in by the rubber binder which makes up about 20% of most sheets, they cause no health hazard to the gasket user with normal handling and use. However, cleanup of flanges from which asbestos gaskets have been removed and handling of used, dried out gaskets will release asbestos fibers. Therefore, from a safety as well as a legal standpoint, many Du Pont Locations ban any asbestos-containing materials at the site. Aimed primarily at pipe insulation, woven tapes and loose column packings, the ban also includes packing, brake linings, and compressed asbestos gasekts.

Design Division's Technical Services Section and the Gasket and Packings Standards Subcommittee have begun a transition program to phase out asbestos gaskets over the next few years. They plan to:

- Advise plant personnel of the transition with articles such as this one, and letters where needed.
- Highlight asbestos-containing gaskets and packings by bold print of their Du Pont codes in Engineering Standards U2A and U1C, and in Specifications SU2A and SU1C.
- Begin listing alternative gaskets along with the G-1, G-2 and G-40 gaskets in all new P-codes, and revising existing P-codes and specifications.
- Remove references to all gaskets containing asbestos from the Du Pont codes after a period of time.

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Generally, the stocks of asbestos gaskets on the plants should be used up and not discarded at this time, subject to plant and department policy. Wherever possible, non-asbestos gaskets should be used by plant maintenance personnel.

The Standards now list four sheet gasket codes for "non-asbestos" gaskets which have been specified as substitutes for G-1, G-2, and G-40 (compressed asbestos sheet) gaskets. The new non-asbestos codes are S-80, S-81, S-82 and S-83. The differences are in the rubber used to bond the sheets:

- S-80 SBR (Styrene butadiene rubber)
- S-81 NBR (Nitrile butadiene rubber)
- S-82 CR (Neoprene)
- S-83 EPDM (Ethylene-propylene terpolymer elastomer - Nordel).

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For further information, contact C. P. Shaw or W. M. Bounds, ENGG, L-8233 (366-3661).

DVI

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KNUCKLE DOWN, INC.
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Flexitallic®

Asbestos Spiral Wound Gaskets vs. Flexite™ Super

Comparison Chart

	Asbestos	Flexite™ Super
• Composition	(Chrysotile) hydrated magnesium Silicate with Latex binder	Chlorite mineral paper with 30% graphite and acrylic binder
• Service/Application	As with any Spiral-Wound asbestos gasket	Better than asbestos
• Recommended Surface Finish	125-250 AARH/RMS	Tested at 63-500 AARH/RMS
• Temperature	Recommended to 1000° F	Tested to 1500° F
• Sealability	As with any Spiral-Wound gasket	Virtually equal to graphite (see graph on back)
• Bolting Requirements	As with any Spiral-Wound gasket	Less demanding
• Residue left on Flanges	Yes	No
• Price	Similar	Similar

Conclusion: *Flexite Super is superior to all asbestos spiral-wound gaskets.*

D√1 2008311

FLEXITALLIC® GASKET COMPANY, INC.

BELLMAWR PLANT: POST OFFICE BOX 848 • BELLMAWR, NEW JERSEY 08031 • 609/931-2500
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DUP 0814522

Flexitallic

Proven Better Sealing Performance Than Asbestos Fillers

When tested as a filler material in spiral-wound gaskets, Flexite Super gave better sealing performance than asbestos.

Performance figures were ascertained under conditions laid down in a thermal cycling test used in the refining industry.

Tests were carried out with 2" NPS Class 300 flanges, using nitrogen gas over a period of 24 hours. Rig was pressurized to 750 psig and left for a minimum of 16 hours. Pressure was released and temperature increased to 860° F over a period of 2 hours and the rig pressurized to 310 psig. Pressure and temperature were held for 1 hour. Rig was then allowed to cool to ambient, and pressure and temperature recorded. Temperature was again increased to 860° F and held for 1 hour. Pressure must return to 310 psig for the gasket assembly to successfully meet conditions of the test.

Temperature

The Flexite Super filled gasket assembled between stainless steel flanges was placed in a furnace at a temperature of 1500° F for 4 hours.

The gasket was then taken out of the flanges and pressure tested at ambient. The gasket was a NW50 ND10-40.
Available load = 13.03 tons
Sealing pressure at available load = 1000 PSI

To meet the pressure/temperature requirement, the gasket must seal a minimum of 40 bar (590 PSI) at the available load. The tested gasket therefore met the requirement easily.

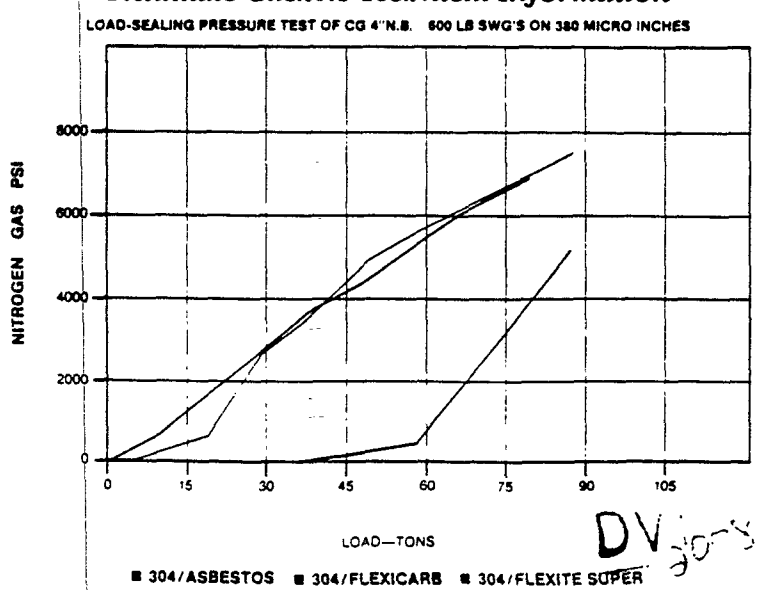
Immersion Tests to ASTM F104

Test Conditions	%, Increase	Standard Asbestos	'Flexite' Super
Oil No. 1 5 hrs. at 150°C	%, Thickness %, Weight	3.5 52.4	1.7 43.9
Oil No. 3 5 hrs. at 150°C	%, Thickness %, Weight	3.0 51.3	0.6 44.5
Fuel A 5 hrs. at 23°C	%, Thickness %, Weight	-1.6 43.0	-1.0 37.2
Fuel B 5 hrs. at 23°C	%, Thickness %, Weight	0.4 54.7	0.9 41.0

Typical Physical Properties

	Standard Asbestos	'Flexite' Super
Density	64 lbs./ft.³	68 lbs./ft.³
Tensile Strength MD	520 psi	460 psi
Tensile Strength CD	270 psi	400 psi
Compression at 1000 psi	27%	24%
Recovery	19%	24%
Total Chloride	150 ppm	49 ppm

Flexitallic Gaskets Technical Information



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