

UNION CARBIDE CORPORATION

SILICONES & URETHANE INTERMEDIATES
ENGINEERING
SOUTH CHARLESTON, WEST VIRGINIA

MEMORANDUM

May 22, 1985

TO: All Department Heads

COPY TO: W. E. Ballard
D. H. Harrah
F. M. Holmes
D. J. McNeil
D. J. Moody
B. G. Stump
W. S. Walker
P. G. West
J. N. Wickert
MOC

FROM: A. E. Wood

SUBJECT Use of Non-Asbestos Gaskets

To decrease exposure to asbestos materials, the GR shop has been using non-asbestos gasketing on pump heads since 1983. They originally used Garlock 3000 with nitrile binder. No gasketing failures were reported but severe gasket deterioration was noted. So they switched to the Garlock 3200 (with SBR binder) in early 1985. In May, they again switched to the Durabula and Garlock 3700 with EPR Binder.

Non-asbestos gaskets can not be a direct substitute for asbestos gasketing. Non-asbestos gaskets contain significant amounts of rubber binder and their proper selection has to consider the chemical resistancy of the rubbers to the process chemical.

Asbestos gaskets are 80% fiber, 10% rubber binder and 10% filler. If the rubber binder is attacked 90% of the gasket is left. The new non-asbestos gasketing materials on the market are 50% fiber, 30% rubber binder and 20% filler. An attack on the rubber binder can result in a catastrophic failure of the seal.

Last week, I inspected four non-asbestos gaskets that were installed in pump services. Three of the gaskets were in pumps that were in the shop for routine repair and these gaskets were only 50-95% attacked. These pumps were:

1. Polycls No.2 Reactor Circulating Pump (Garlock 3200-SBR binder, attacked by Ethylene Oxide).

2. Upper Island Residue Pumps (Garlock 3200-SBR binder attacked by ketenes).

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3. Silicones II Dowtherm Pump (Durabula-EPR binder, attacked by 700°F temperatures (Mfg. said it was good to 900°F) and attack of the EPR binder by Dowtherm).

The fourth gasket was a Durabula gasket with an EPR binder that was used on a piston pump. The gasket "blewout" due to either an overpressure or as a result of loss of the EPR binder due to attack by oils.

The above data, indicates that we have not yet had enough service life on the compressed non-asbestos gaskets, to have experienced the catastrophic failures that are possible once the binder has been attacked. But the probability of an occurrence is high if the situation is not addressed quickly.

A review of our hazardous and toxic chemicals lists with respect to the resistance of the SBR binder in the Garlock 3200 has been conducted. This review indicates that this gasket is not resistant to 90% of the hazardous and toxic chemicals in our plant (see attached listing). The Durabula gasket with the EPR binder is a newer, superior gasket but a preliminary review shows that EPR is not resistant to 50% of our process chemicals. There are no records of where these gasketing materials have been installed.

Please identify those pumps that are in services shown to attack these binders and work with the GR shop, Nelson Wickert and I to pull these pumps and verify that they have either Asbestos, Grafoil or Teflongaskets. Any other gasketing material should be replaced with one of these 3 materials.

The action plan is to:

1. Identify pumps handling high impact potential chemicals that attack non-asbestos gasketing binders (will need the following information: Pump Location, Service, Property Number by 6-14-85). Send lists to E. O. Harrah and A. E. Wood.

2. Determine gasket materials used in pump.

3. Re-gasket pumps that are gasketed with compressed non-asbestos gaskets.

4. Identify pumps handling medium impact potential chemicals and repeat above procedure by 6-21-85.

5. Identify pumps handling low impact potential chemicals and repeat procedure by 6-28-85.

The potential for an emission due to gasket failure is high - please work with us to correct this situation as soon as possible. Attached is D. J. McNeil's letter on use of Asbestos/Non-Asbestos Gasket Valve Packing Materials.

Feel free to call me on extension 3424 if you have any additional questions.

Andrew E. Wood
A. E. Wood

AEW/sml

UCC 011530

HAZARDOUS AND TOXIC MATERIAL QUESTIONNAIRE

MEDIUM IMPACT POTENTIAL

Chemical Resistance

	x gasket / Elastomer data →	Garlock 3200 SBR	Durabula Garlock 3700 EPR
Acetic Anhydride		Fair	R
Butyl Acrylate		NR	NR
~~Butyl Chloride~~		—	—
Butyraldehyde		NR	R
Chlorine		NR	NR
Diethylamine		Fair	R
Ethane, Stablized (Institute)		NR	NR
Ethyl Acrylate		NR	R
Isobutylene		—	—
Isobutyraldehyde		—	—
Natural Gas (Logan)		Fair	NR
Natural Gas (C-12 Gas)		Fair	NR
Propionic Acid		NR	—
Vinyl Acetate		Fair	—
Vinylidene Chloride		NR	—

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0111S

R = Recommend
NR = Not Recommended
Fair, —, = Questionable, insufficient data

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HAZARDOUS AND TOXIC MATERIAL QUESTIONNAIRE

LOW IMPACT POTENTIAL	Chemical Resistance		
	Zgasket	Garlock 3200	Durabla Garlock 370
	Elastomer data	SBR	EPR
Acetone		Static only	R
Acetylene		Fair	R
Amyl Acetate		NR	R
Brucine Sulfate		—	—
Butanol		R	NR
Butyl Acetate		NR	R
CELLOSOLVE Acetate		NR	R
Cyclohexanone		NR	R
Di-t-Butyl Peroxide		—	—
Dioxane		NR	R
Dodecanoyl Peroxide		—	—
Ethanol		R	R
Ethyl Acetate		NR	R
Ethylenediamine		Fair	R
2-Ethylhexyl Acrylate		NR	—
Ethyl Silicate, Condensed		Fair	R
Ethyl Silicate 40		Fair	R
Gasoline, Drips		NR	NR
Gasoline, Fuel		NR	NR
Hydrogen		R	R
Isobutanol		Fair	R
Isobutyl Acetate		NR	—
Isopropanol		Fair	R
Isopropyl Acetate		NR	—
Mesityl Oxide		Fair	R
Methanol		R	R
Methyl Acetate		Static only	R
Methyl n-Amyl Ketone		NR	R
Methyl CELLOSOLVE		NR	R
Methyl Ethyl Ketone		NR	R
Methyl Isobutyl Ketone		NR	R
Nicotine Alkaloid		—	—
Nicotine Solution		—	—
2,4 - Pentanedione		—	—
Propane		NR	NR
n - Propanol		R	R
n - Propyl Acetate		NR	R
Pyridine		NR	R
Triethylamine		—	—
Trimethylamine, 25%		—	—
Toluene		NR	NR

R = Recommend
NR = Not Recommended

January 30, 1985
0111S

Fair, Static only, —, = Questionable, insufficient data.

UCC 011532

HAZARDOUS AND TOXIC MATERIAL QUESTIONNAIRE

HIGH IMPACT POTENTIAL ≈ gasket	Chemical Resistance: Garlock 3200	Durabla Garlock 370
Elastomer data →	SBR	EPR
Acetaldehyde	static only	R
Acrylonitrile	NR	NR
Allyl Alcohol	—	—
Ammonia	R-Cold = NR-Hot	—
Carbon Monoxide, 512 to du Pont	Fair	R
Dimethylamine	NR	—
Dimethyldichlorosilane	NR	NR
Ethane, Liquid (Hastings)	NR	NR
Ethylene Oxide	NR	NR
Hydrogen, 512 to du Pont	R	R
Hydrogen Chloride	—	—
Liquid Concentrates	—	—
Methyl Chloride	NR	NR
Methyldichlorosilane	NR	NR
Methyltrichlorosilane	NR	NR
Monomethylamine	—	—
Propylene Oxide	NR	R
Silicon Tetrachloride	NR	—
Sulfur Trioxide	Fair	R
Trichlorosilane	NR	—
Trimethylchlorosilane	NR	—
Vinyl Methyl Ether	NR	—

January 30, 1985
0111S

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UNION CARBIDE CORPORATION

SILICONES & URETHANE INTERMEDIATES
ENGINEERING
SOUTH CHARLESTON, WEST VIRGINIA

MEMORANDUM

May 15, 1985

TO: W. E. Ballard
J. C. Cogar*
J. R. Dean
E. O. Harrah*
F. M. Holmes*
D. W. Moody*
B. G. Stump*
[redacted]
W. C. Young*

*Attended Meeting

FROM: D. J. McNeil*

SUBJECT: Use of Asbestos/Non-Asbestos Gasket/Valve Packing Materials

On 5/10/85 the above group met to discuss the use of non-asbestos gasket and valve packing materials.

When the asbestos health concern was first disclosed the South Charleston location made a concentrated effort to remove and discontinue the use of asbestos materials (gloves, insulation, etc.). This policy was also applied to asbestos gasketing and valve packing materials. Therefore, the 514 location began to buy and use other gasketing materials, such as "Blue-Gard" and Garlock 3200. No records were kept on where these materials were used.

It is the E&TS organization's position that there are significant risks involved in the use of these materials. Non-asbestos compressed non-metallic gaskets have been shown to be inferior in chemical resistance and have a lower maximum temperature limit than teflon (Ashbaugh/Moody/Neeley letter of 6/22/82-attached).

Asbestos gaskets are 80% fiber, 10% binder and 10% filler. If the binder is attacked 90% of the gasket is left. The new gasketing materials are 50% fiber, 30% binder and 20% filler. An attack on the binder can result in a catastrophic failure of the seal.

It is also the E&TS and Safety Department's position that asbestos materials can be stored, cut and handled in a safe manner since the fibers are encapsulated in binder.

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The action plan developed by the group was to:

1. Limit gasket and valve packing materials at 514 to

BGS/WEB
-Asbestos
-Grafoil
-Teflon (Gylon-Fawn)
-Elastomers such as Viton, Neoprene, EPR, etc. in low temperature and special services only

Any exception must be clearly identified and monitored with copies going to D. J. McNeil and A. E. Wood. Any exceptions need technically supportable reasons.

WCY 2. Run tests on exposure during handling/cutting of asbestos materials in the 514 shops.

BGS Review operating procedures

JCC 3. Get rid of "other" unacceptable materials

AEW 4. Try to determine where "other" gasketing materials were put in service and the risks involved in leaving them in that service.

AEW/EOH Document service life of "other" materials when equipment with this material is pulled to gather data base for when asbestos becomes unavailable. Replace "other" material with one of the acceptable materials when found.

BGS/
WCY 5. Review and train personnel on accepted "wet down" procedures for handling "failed" asbestos gaskets (failed means that the binder was lost)

Run tests on exposure in handling old/failed asbestos materials.

6. Run organized/well documented tests on "other" materials by contacting the MOC group (AEW) for monitoring.

A. E. Wood will monitor and document these activities. Any additional concerns or questions can be addressed to him.

Thanks for your support,

D. J. McNeil

DJM/sml

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