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POTENTIAL OSHA REGULATION CHANGES - ASBESTOS BRAKE LININGS

This paper reviews current and projected future OSHA asbestos requirements relative to disc and drum brake linings, including the potential effects on capital investment and piece cost. Alternate supplier lining material program status is also reviewed.

Background

The current OSHA law allows two fibers/cc air sampled over an eight-hour period with no single reading to exceed ten fibers/cc air. Most affected lining suppliers have indicated that they expect OSHA to lower the maximum permissible fiber count from 2.0 to 1.0 sometime in 1978 with further reductions possibly down to 0.5 or lower longer term. Bendix expects the new law will be 0.5 not 1.0 fiber/cc. These changes may have a significant impact on the ability of the lining material suppliers and the suppliers involved in shoe and lining assembly (Bendix Hydraulics Division, Bendix Brake and Steering Division, and Kelsey Hayes) to continue to provide asbestos based linings on a cost effective basis if at all. NAAO Purchasing, Material Planning conducted a series of meetings with all affected suppliers to identify current fiber counts, notions to meet the proposed new standard, and costs for meeting new standards including capital expenditures and alternate materials and processes.

Supplier Responses

Supplier information provided at the NAAO Purchasing meetings and followup discussions since are summarized as follows.

- Generally the suppliers indicated that based on past experience with OSHA, whatever new lower fiber limit is adopted they could continue production as long as a plan and timetable to achieve the new limit was established and they could continue to demonstrate progress relative to the plan timetable. Several suppliers indicated, for example, that they continued producing linings out of compliance to the 2 fiber/cc limit for two years after it was made law.
- All suppliers are currently complying with the 2 fiber/cc law.
 - 1 fiber/cc limit - With the exception of Thiokol, major capital expenditures and lead times are expected: Bendix: \$1.5M, 1 year, Thermoid: \$0.5M, 6 months, Raybestos: \$13M, 3 years, Thiokol: conforms. Piece cost increase - Thiokol, none, Thermoid, 1 to 5%; all other suppliers "substantial" but undefined.
 - 0.5 fiber/cc limit - Thiokol is installing new preform equipment with which they expect to meet 0.5 limit. If not, a new tumbler and wash system will be required; \$1.1M, 9-12 months, Thermoid: same expenditures as quoted above for 1 fiber/cc limit. Bendix: \$5.5M, timing undetermined, may be impossible, Raybestos: expenditures undefined, may be impossible. Piece cost increase - undefined.
- Supplier non-asbestos lining program status is as follows:
 - Bendix: Development of non-asbestos lining materials is in progress for disc and drum brake applications. Test parts should be available to Ford with supporting test data by early 1978. Semi-metallic disc pads with asbestos in the backing layer only are available now and in use for heavy duty Police car applications. This lining, however, compared to the current released asbestos lining is noisier, has 30% to 40% less lining life, and is a \$1.20/vehicle cost penalty.

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Supplier Meeting Results (continued)

- **Thiokol:** A non-asbestos organic lining is being developed. Supplier conducted tests on initial phase parts were acceptable for lining noise and wear. Ford conducted FMVSS 105-75 tests, however, indicated that the material is too brittle; the lining fractured due to the extreme temperatures during this test. The lining compound is being revised; timing has not been established for revised parts and supporting test data.
- **Thermoid:** A non-asbestos lining is being developed on a second priority basis. Parts and supporting test data could be provided to Ford within six months if the program is accelerated.
- **Raybestos:** Programs have been initiated to develop non-asbestos drum and disc brake materials, both semi-metallic and non-metallic. Timing for test part availability to Ford with supporting test data is not established.

Competitive Position

In 1977 GM used semi-metallic linings with an asbestos backing on the Vega, Monza, Camaro, Nova and Chevelle station wagon in addition to Police applications. In 1978 semi-metallic usage is extended to include all "A" shell cars (Oldsmobile Cutlass, Pontiac LeMans, Buick Regal and Chevelle Malibu Classic). Delco presented Ford test data showing that their new semi-metallic lining having no asbestos backing released for 1978 on some of the "A" shell cars is much improved for noise and cold wear over existing semi-metallic linings. A letter was sent to Delco Moraine requesting that they initiate testing of their proposed new material on a Ford vehicle to selected Ford test procedures and to provide estimated piece costs for various assumed volumes. Delco Moraine is expected to respond shortly. However, Ford evaluation of this Delco Moraine semi-metallic lining on an Oldsmobile was unacceptable (rated 5) for noise.

In 1977 Chrysler, like Ford, used semi-metallic linings only for heavy duty Police applications. The 1978 semi-metallic usage is extended to include the new "L" car (similar to VW Rabbit).

Conclusions and Recommendations

- Based on past experience with OSHA, if the OSHA requirement is changed, as expected, sufficient time will be given to make an orderly transition to either an asbestos lining complying with the new requirement if determined feasible, or an alternate non-asbestos lining.
- Funding to support 8 man years labor and \$1.5M material and test should be provided to develop a non-asbestos lining for release by 1980 on selected car lines to gain production experience and on all car lines by 1981 if determined advantageous or required. The work plan to accomplish this is as follows:

<u>Item</u>	<u>Estimated Timing</u>
• Review supplier preliminary test data	3-1-78
• Monitor additional Ford requested supplier tests	6-1-78
• Review supplier test data, select best proposals for Ford testing	7-1-78
• Conduct Ford brake tests including Fleet Evaluations, FMVSS 105-75, Durability, City Traffic, Mountain.	6-1-79
• Retest new submissions if required	2-1-80
• Release on selected car lines to gain production experience	Job #1, 1980
• Release all car lines if advantageous or required	Job #1, 1981

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June 29, 1977

SUPPLIER SUMMARY

Supplier	Current Fiber Level Count	Actions Required to Meet New Fiber Limits	Place Cost Penalty	Alternate Programs
Beddex Friction Material	0.1 - 2.0	1.0 fiber limit - New emission controls and process modifications; investment \$1.5M, timing 1 year 0.5 fiber limit - New emission controls and process modifications; investment \$5.5M, timing undetermined, may be possible.	Substantial but unknown	Non-metallic disc with asbestos backing available. Discs made by 12/20/77 vehicle penalty, noise, poor cold start. Non asbestos organic - development in progress for disc and drum applications - parts to Ford for evaluation with supporting test data by early 1978.
Bandis Hydraulics	0.5 all areas except receiving & inspection	Equipment on order to comply with 0.5 by August, 1977; investment \$0.012M		
Thiokol	0.4 - 1.4	New preform equipment being installed and is expected to reduce fiber count to 0.5. If 0.5 is not achieved, new tumbler and wash systems will be required; investment \$1.1M, lead time 9-12 months, requalification of lining necessary	None Undefined	Non asbestos organic lining developed - Initial phase parts unacceptable. Lining changes are being made. Timing for new parts with supporting supplier test data not available.
Thermoid	Less than 2.0	1.0 or 0.5 fiber limit - New and more elaborate dust collection and encapsulation equipment; investment \$0.5M, timing 6 months.	1 to 5%	Non-asbestos organic lining is being developed on a second priority basis - supplier test results could be provided to Ford within six months if the program is accelerated.
Raybestos	2.0	1.0 fiber limit - New spending \$4.5M/year for next three years to achieve 0.5 fiber limit may not be achievable	Undefined Undefined	Programs have been initiated to develop non asbestos drum and disc brake materials, both non-metallic and non asbestos. Timing for test part availability to Ford with supporting test data is not established.
Kelsey Hayes	Less than 2.0	1.0 or 0.5 fiber limit - Refacilitate all operations related to disc brake processing; investment \$-3M, timing 1 year minimum	Undefined	

Brake Department
June 28, 1977

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1978 LINING USAGE CHART

Car Line	Front		Rear	
	Lining Number	Supplier	Lining Number	Supplier
Pinto/Bobcat/Mustang	FMD7157A	Bendix	4641A/H3133	Bendix
Fairmont/Zephyr Sedan	TP-1353	Thiokol	R-4797-5/ R-4924-1	Raybestos
S/W and Police	TP-1353	Thiokol	4641A/H3133	Bendix
Granada/Monarch Rear Drum	FMD7157A	Bendix	4641A/H3133	Bendix
Rear Disc	FMD7157A	Bendix	FMD7157A	Bendix
T-Bird/XR7 LTD II/Cougar/Ford/Mercury except HD Police	TP1353	Thiokol	4641A/H3133	Bendix
LTD II/Cougar/Ford/Mercury HD Police	FMD7131N/O	Bendix	4641A/H3133	Bendix
Ford/Mercury Rear Disc except Hi-Perf Police	TP1353	Thiokol	TP1353	Thiokol
Ford/Mercury Rear Disc Hi-Perf Police	FMD7131N/O	Bendix	FMD7131N/O	Bendix
Lincoln Rear Drum	FMD7157A	Bendix	4641A/H3133	Bendix
Rear Disc	FMD7157A	Bendix	FMD7157A	Bendix
Mark V Rear Disc	FMD7157A	Bendix	FMD7157A	Bendix

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