MATERIAL SAFETY DATA SHEET
Cured Organic Disc Pad - Asbestos

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: Cured Organic Disc Pad - Asbestos

OTHER/GENERIC NAMES: Cured Disc Pad, Organic. Formula: Mixture of proprietary ingredients; see Section 2. Shipping Edge Code :BX-"NN", WE-"NNN" Edge Code: XK, XO, XU, XY, XE, 15, 393

PRODUCT USE: Motor Vehicle Braking Systems.

MANUFACTURER: AlliedSignal Braking Systems
401 N. Bendix Dr. South Bend, IN 46634

FOR MORE INFORMATION CALL:
(Monday-Friday, 9:00am-4:30pm)EST
AlliedSignal Automotive Braking Systems
Health, Safety and Environmental Quality
Department (219) 237-5746

IN CASE OF EMERGENCY CALL:
(24 Hours/Day, 7 Days/Week)
Medical Emergency: (810)
626-9040 Dr. L. Paul
TESAC: (201) 455-2000

2. COMPOSITION/INFORMATION ON INGREDIENTS

INGREDIENT NAME	CAS #	WEIGHT %
Cured Polymer Resin encapsulating the following:	NONE	Balance
Asbestos - Processed Chrysotile	12001-29-5	20-50%
Calcium Carbonate	1317-65-3	5-10 %
Barium Sulfate	7727-43-7	5-20%
Aluminum Oxide	1344-28-1	2-5 %
Magnesium Oxide	1309-48-4	2-5 %
Carbon Black	1333-86-4	2-5 %
Graphite	7782-42-5	2-5 %
Iron oxide	1309-37-1	2-5 %

Trace impurities and additional material names not listed above may also appear in the Regulatory Information section (#15) towards the end of the MSDS. These materials may be listed for local "Right to Know" compliance and for other reasons.

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: Disc brakes are not normally cosnsidered hazardous, however, toxic and irritating materials may be released in a fire.

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POTENTIAL HEALTH HAZARDS:

SKIN: May cause minor irritation.

EYES: Exposure to dust may cause eye irritation.

INHALATION: Irritation or soreness in throat, nose and respiratory tract. See delayed effects below.

INGESTION: Not an anticipated route of entry.

DELAYED EFFECTS: Chronic restrictive lung disease is possible in the case of long term exposure to asbestos. There is a correlation between chronic lung effects and smoking.

Ingredients found on one of the OSHA designated carcinogen lists are listed below.

Ingredient Name	NTP Status	IARC Status	OSHA List
Asbestos - Processed Chrysotile	Carcinogen	Group 1: Carcinogen	Cancer Agent

4. FIRST AID MEASURES

** If any of the symptoms persist, seek medical attention immediately **

SKIN: Wash skin with soap and water after handling parts. Seek medical attention for persistent irritation.

EYE: Flush eyes with cool running water if dust becomes embedded. Seek medical attention if reddening persists.

INHALATION: Remove affected person to fresh air.

INGESTION: Not anticipated route of entry.

ADVICE TO PHYSICIAN: No specialized first aid or medical treatment procedures are required.

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES:
FLASH POINT: None
FLASH POINT METHOD: Not applicable
AUTOIGNITION TEMPERATURE: Not established
UPPER FLAME LIMIT (Volume % in air): Not applicable
LOWER FLAME LIMIT (Volume % in air): Not applicable
FLAME PROPAGATION RATE (Solids): Not established
OSHA FLAMMABILITY CLASS: Not classified as flammable material by OSHA

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EXTINGUISHING MEDIA:
No special media required

UNUSUAL FIRE AND EXPLOSION HAZARDS:
Toxic and irritating materials may be released in a fire.

SPECIAL FIREFIGHTING PRECAUTIONS/INSTRUCTIONS:
Self Contained Breathing Apparatus (SCBA) is recommended if articles are involved in a fire.

6. ACCIDENTAL RELEASE MEASURES

IN CASE OF SPILL OR OTHER RELEASE: (Always wear recommended personal protective equipment.)
No special precautions are required for intact packaging containing this product. If product is crushed, use respiratory protection equipment. Do not dry sweep product or use compressed air to clean any residues. High Efficiency Particulate Apparatus - HEPA vacuums should be used to clean up any residues from this product.

Spills and releases may have to be reported to Federal and/or local authorities. See the Regulatory Information section (#15) regarding reporting requirements.

7. HANDLING AND STORAGE

NORMAL HANDLING: (Always wear recommended personal protective equipment.)
Avoid breathing or creating dust. See Section 16 Other Information and follow the attached OSHA Appendix F to 1910.1001 Work Practices and Engineering Controls for Automotive Brake and Clutch Inspection, Disassembly, Repair and Assembly - Mandatory

STORAGE RECOMMENDATIONS:
No special requirements

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8. EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS:

The Friction Material product as shipped, is not considered hazardous, but machining (arcing, grinding, drilling or chamfering) and/or normal use may create asbestos dusts or airborne asbestos fibers in excess of the OSHA PEL and should be considered hazardous. If airborne asbestos fiber concentrations exceed the OSHA PEL, NIOSH approved respirators should be worn and proper engineering controls implemented. If product is ground or machined, local exhaust to control exposure to airborne asbestos fibers or dusts is recommended. The work environment should be monitored to determine whether employee exposures exceed the OSHA PEL in accordance with OSHA 29 CFR 1910.1001. Packages containing the Friction Material product should be labelled as follows:

DANGER
CONTAINS ASBESTOS FIBERS
AVOID CREATING DUST
CANCER AND LUNG DISEASE HAZARD

Standard industrial hygiene practices, including good housekeeping and vacuuming or wet cleaning work surfaces to prevent asbestos fibers or dust from becoming airborne should be implemented and maintained.

PERSONAL PROTECTIVE EQUIPMENT:

SKIN PROTECTION:

Gloves are recommended when handling or removing brake parts.

EYE PROTECTION:

Safety glasses are adequate for all uses.

RESPIRATORY PROTECTION:

If the OSHA PEL for asbestos is exceeded, respiratory protection shall comply with OSHA 29 CFR 1910.1001 (g) Respiratory Protection. Self Contained Breathing Apparatus (SCBA) should be used if dusts are created due to fire or explosion.

ADDITIONAL RECOMMENDATIONS:

See additional recommendations in Section 16 Other Information and follow the attached OSHA Appendix F to 1910.1001 - Work Practices and Engineering Controls for Automotive Brake and Clutch Inspection, Disassembly, Repair and Assembly - Mandatory.

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EXPOSURE GUIDELINES: (Guidelines exist for the following ingredients)

Ingredient Name	ACGIH TLV	OSHA PEL	Other Limit
Asbestos - Processed Chrysotile	2.0 f/cc	0.1 f/cc	1.0 f/cc 5TEL
Calcium Carbonate	10 mg/m3 total dust-TWA	15 mg/m3 total dust-TWA, 5 mg/m3 resp. dust-TWA	None
Barium Sulfate	10 mg/m3 (TWA) - Total dust	10 mg/m3 (TWA) - Total dust	None
Aluminum Oxide	10 mg/m3 (TWA) - Total dust	None	None
Magnesium Oxide	10 mg/m3 (TWA) - Total Dust	10 mg/m3 (TWA) - Total Dust	None
Carbon Black	3.5 mg/m3 (TWA)	3.5 mg/m3 (TWA)	None
Graphite	2.5 mg/m3	2.5 mg/m3	
Iron oxide	10 mg/m3	10 mg/m3	none

Other exposure limits for the decomposition products normally associated with product use are as follows:

Total Dust shall not exceed 5 mg/m3.

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE: Gray or Dark solid brake part
PHYSICAL STATE: Solid
MOLECULAR WEIGHT: May vary based on concentration of components.
CHEMICAL FORMULA: May vary based on concentration of components.
ODOR: Mild odor
SPECIFIC GRAVITY: (Water = 1.0) 1.6 -2.3 gm/cc
SOLUBILITY IN WATER: (Weight %) None
pH: Not established
BOILING POINT: Not applicable
MELTING POINT: Not applicable
VAPOR PRESSURE: Not applicable
VAPOR DENSITY: (Air = 1.0) No volatiles in product
EVAPORATION RATE: Not applicable Compared to: None
% VOLATILES: None
FLASH POINT: None
(Flash point method and additional flammability data are found in section 5.)

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10. STABILITY AND REACTIVITY

NORMALLY STABLE? (Conditions to Avoid)
Product is stable

INCOMPATIBILITIES:
None

HAZARDOUS DECOMPOSITION PRODUCTS:
Toxic and irritating materials may be released in a fire.

HAZARDOUS POLYMERIZATION?
None

11. TOXICOLOGICAL INFORMATION

IMMEDIATE (ACUTE) EFFECTS:
Skin and eye irritation may occur on repeated contact to dusts.

DELAYED (SUBCHRONIC & CHRONIC) EFFECTS:
Chronic restrictive lung disease is possible in the case of long term exposures to asbestos. Exposure to asbestos has also been associated with cancer and mesothelioma. There is a correlation between chronic lung effects and smoking. No sub-chronic effects are likely.

OTHER DATA:

12. ECOLOGICAL INFORMATION

Normal decomposition is not expected to result in ecological damage.

13. DISPOSAL CONSIDERATIONS

RCRA:
Is the unused product a RCRA hazardous waste if discarded? No
If yes, the RCRA ID number is: None

OTHER DISPOSAL CONSIDERATIONS: Dispose in accordance to all applicable federal, state and local regulations.

The information offered here is for the product as shipped. Use and/or alterations to the product such as mixing with other materials may significantly change the characteristics of the material and alter the RCRA classification and the proper disposal method.

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14. TRANSPORT INFORMATION

US DOT HAZARD CLASS: None

US DOT ID NUMBER: None

For additional information on shipping regulations affecting this material, contact the information number found on the first page.

15. REGULATORY INFORMATION

TOXIC SUBSTANCES CONTROL ACT (TSCA):

TSCA INVENTORY STATUS: Articles are manufactured from materials found on the TSCA Inventory.

OTHER TSCA ISSUES: Section 12b export rules apply to asbestos articles.

SARA TITLE III/CERCLA:

RQs & TPQs:

"Reportable Quantities" (RQs) and/or "Threshold Planning Quantities" (TPQs) exist for the following ingredients.

Ingredient	SARA/CERCLA RQ(lbs)	SARA EHS TPQ(lbs)
Asbestos - Processed Chrysotile	1 lb.	None

Spills/releases resulting in the loss of any ingredient at or above its RQ requires immediate notification to the National Response Center (1-800-424-8802) and to your Local Emergency Planning Committee.

SECTION 311 HAZARD CLASS: Product as shipped - none.

SARA 313 TOXIC CHEMICALS:

The following ingredients are SARA 313 "Toxic Chemicals". CAS #'s and wt.% are found in section #2.

Ingredient	Comment
Asbestos - Processed Chrysotile	Reportable
Aluminum Oxide	None
Graphite	None

STATE RIGHT TO KNOW:

In addition to the ingredients found in section 2, the following are listed for state right-to-know purposes:

Ingredient	Wt.%	Comment

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ADDITIONAL REGULATORY INFORMATION:

The finished units of friction materials shipped to you contain encapsulated asbestos fiber which is not friable. Subsequent processing (arcing, grinding, drilling or chamfering) may create a potential for the release of asbestos containing dust or airborne fiber to the atmosphere (e.g. from your dust collection system, if you grind our product) or to a landfill (e.g. if you dispose of wetted or pelletized grinding dust or drill chips). If they are of sufficient quantities, you may be required to report such "Releases" on EPA Form "R".

WHMIS CLASSIFICATION (CANADA):

Special Regulations exist in each Province.

FOREIGN INVENTORY STATUS:

Various

16. OTHER INFORMATION

CURRENT ISSUE DATE: 02/06/94
PREVIOUS ISSUE DATE: 09/14/92

CHANGES TO MSDS FROM PREVIOUS ISSUE DATE ARE DUE TO THE FOLLOWING:

These changes are the result of the adoption of the ANSI 16 Section MSDS format, the revised OSHA asbestos standard and inclusion of OSHA Appendix F to 1910.1001 Work Practices and Engineering Controls for Automotive Brake and Clutch Inspection, Disassembly, Repair and Assembly - Mandatory as an attachment.

OTHER INFORMATION:

1) Always follow the attached OSHA Appendix F to 1910.1001 - Work Practices and Engineering Controls for Automotive Brake and Clutch Inspection, Disassembly, Repair and Assembly - Mandatory. Although many friction materials used for brake service still contain asbestos, most suppliers are now replacing asbestos with steel, mineral, and/or synthetic fibers. The OSHA regulations refer directly to the use of asbestos in friction materials. However, because the long term medical effects of non-asbestos fibers are unknown, it is suggested that exposure levels be controlled for all replacement friction materials.

2) Whenever possible, purchase friction materials that are preground and ready for installation. If machining is necessary, there is a possibility that the permissible exposure limit (PEL) may be exceeded, in which case respiratory protection is required. Local exhaust ventilation must be provided so that worker exposures are maintained below the PEL. Local exhaust ventilation consists of dust collection hoods or enclosures connected by duct or piping to a pollution control device.

3) In certain grinding operations, where concentrations cannot be reduced to below the PEL, a respirator program shall be used in accordance to OSHA 29 CFR 1910.1001. Respirators also may be required during certain maintenance, start-up or emergency situations where engineering controls cannot maintain concentrations below the PEL. Where a regulated area is designated for

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concentrations exceeding the PEL, approved personal protective equipment along with approved respirators must be worn.

4) Good housekeeping is essential in a workplace where asbestos-containing materials are handled. Vacuums equipped with High Efficiency Particulate Air (HEPA) Filters should be used to remove accumulations of asbestos dust and waste. Never use compressed air or dry sweeping for cleaning.

5) Good personal hygiene practices are important in minimizing asbestos dust exposure. Do not smoke. Wash before eating. PEL is exceeded, protective clothing must be worn. Change to work clothes upon arrival at work and change from work clothes at conclusion of work. Do not take work clothing home. Laundering of asbestos contaminated clothing shall be done so as to prevent release of airborne asbestos fibers in excess of the PEL.

CAUTION: DO NOT BREATHE DUST FROM THIS OR ANY OTHER FRICTION MATERIAL

DANGER
CONTAINS ASBESTOS FIBERS
AVOID CREATING DUST
CANCER AND LUNG DISEASE HAZARD

Appendix F to § 1910.1001 -- Work Practices and Engineering Controls for Automotive Brake and Clutch Inspection, Disassembly, Repair and Assembly -- Mandatory

This mandatory appendix specifies engineering controls and work practices that must be implemented by the employer during automotive brake and clutch inspection, disassembly, repair, and assembly operations. Proper use of these engineering controls and work practices will reduce employees' asbestos exposure below the permissible exposure level during clutch and brake inspection, disassembly, repair, and assembly operations. The employer shall institute engineering controls and work practices using either the method set forth in paragraph [A] or paragraph [B] of this appendix, or any other method which the employer can demonstrate to be equivalent in terms of reducing employee exposure to asbestos as defined and which meets the requirements described in paragraph [C] of this appendix, for those facilities in which no more than 5 pairs of brakes or 5 clutches are inspected, disassembled, reassembled and/or repaired per week, the method set forth in paragraph [D] of this appendix may be used:

[A] Negative Pressure Enclosure/HEPA Vacuum System Method

(1) The brake and clutch inspection, disassembly, repair, and assembly operations shall be enclosed to cover and contain the clutch or brake assembly and to prevent the release of asbestos fibers into the worker's breathing zone.

(2) The enclosure shall be sealed tightly and thoroughly inspected for leaks before work begins on brake and clutch inspection, disassembly, repair, and assembly.

(3) The enclosure shall be such that the worker can clearly see the operation and shall provide impermeable sleeves through which the worker can handle the brake and clutch inspection, disassembly, repair and assembly. The integrity of the sleeves and ports shall be examined before work begins.

(4) A HEPA-filtered vacuum shall be employed to maintain the enclosure under negative pressure throughout the operation. Compressed air may be used to remove asbestos fibers or particles from the enclosure.

(5) The HEPA vacuum shall be used first to loosen the asbestos-containing residue from the brake and clutch parts and then to evacuate the loosened asbestos-containing material from the enclosure and capture the material in the vacuum filter.

(6) The vacuum's filter, when full, shall be first wetted with a fine mist of water, then removed and placed immediately in an impermeable container, labeled according to paragraph (j) (2) (ii) of this section and disposed of according to paragraph (k) of this section.

(7) Any spills or releases of asbestos-containing waste material from inside of the enclosure or vacuum hose or vacuum filter shall be immediately cleaned up and disposed of according to paragraph (k) of the section.

[B] Low Pressure/Wet Cleaning Method

(1) A catch basin shall be placed under the brake assembly, positioned to avoid splashes and spills.

(2) The reservoir shall contain water containing an organic solvent or wetting agent. The flow of liquid shall be controlled such that the brake assembly is gently flooded to prevent the asbestos-containing brake dust from becoming airborne.

(3) The aqueous solution shall be allowed to flow between the brake drum and brake support before the drum is removed.

(4) After removing the brake drum, the wheel hub and back of the brake assembly shall be thoroughly wetted to suppress dust.

(5) The brake support plate, brake shoes and brake components used to attach the brake shoes shall be thoroughly washed before removing the old shoes.

(6) In systems using filters, the filters, when full, shall be first wetted with a fine mist of water, then removed and placed immediately in an impermeable container, labeled according to paragraph (j) (2) (ii) of this section and disposed of according to paragraph (k) of this section.

(7) Any spills of asbestos-containing aqueous solution or any asbestos-containing waste material shall be cleaned up immediately and disposed of according to paragraph (k) of this section.

(8) The use of dry brushing during low pressure/wet cleaning operations is prohibited.

[C] Equivalent Methods

An equivalent method is one which has sufficient written detail so that it can be reproduced and has been demonstrated that the exposures resulting from the equivalent method are equal to or less than the exposures which would result from the use of the method described in paragraph [A] of this appendix. For purposes of making this comparison, the employer shall assume that exposures resulting from the use of the method described in paragraph [A] of this appendix shall not exceed 0.004 f/cc, as measured by the OSHA reference method and as averaged over at least 18 personal samples.

[D] Wet Method

(1) A spray bottle, hose nozzle, or other implement capable of delivering a fine mist of water or amended water or other delivery system capable of delivering water at low pressure, shall be used to first thoroughly wet the brake and clutch parts. Brake and clutch components shall then be wiped clean with a cloth.

(2) The cloth shall be placed in an impermeable container, labeled according to paragraph (j) (2) (ii) of the standard and then disposed of according to paragraph (k) of the standard, or the cloth shall be laundered in a way to prevent the release of asbestos fibers in excess of 0.1 fiber per cubic centimeter of air.

(3) Any spills of solvent or any asbestos-containing waste material shall be cleaned up immediately according to paragraph (k) of the standard.

(4) The use of dry brushing during the wet method operations is prohibited.