



Material Safety Data Sheet

**Product Name - Semi Metallic Disc Pad - Titanium Dioxide -
Asbestos Free**

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: Semi - Metallic Disc Pad (Asbestos Free)

OTHER/GENERIC NAMES: AlliedSignal Braking Systems Friction Material; Titaniummetallic; Mixture of
proprietary ingredients; See Section 2.
Edge Code: J8, J10, J11

PRODUCT USE: Motor Vehicle Braking Systems

MANUFACTURER: AlliedSignal Friction Materials
900 W. Maple Road
Troy, MI 48064

FOR MORE INFORMATION CALL:
(Monday-Friday, 9:00am - 4:30pm)
AlliedSignal Friction Materials
Health, Safety & Environmental Quality
(810) 362 - 7109

IN CASE OF EMERGENCY CALL:
(24 Hours/Day, 7 Days/Week)
Medical Emergency:
(804) 530-6801 Dr. C. Hanna
Spill Response:
TESAC: (201) 455-2000

2. COMPOSITION/INFORMATION ON INGREDIENTS

INGREDIENT NAME

Cured Polymer Resin encapsulating the following:

Calcium Carbonate
Barium Sulfate
Aluminum Oxide
Magnesium Oxide
Carbon Black
Graphite
Iron Oxide
Silica/Quartz
Titanium dioxide

CAS NUMBER

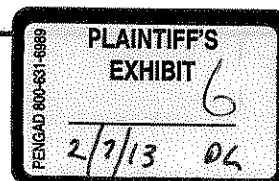
None
1317-65-3
7727-43-7
1344-28-1
1309-48-4
1333-86-4
7782-42-5
1309-37-1
14808-60-7
13463-67-7

WEIGHT %

Balance
5-10%
5-15%
2-10%
1-5%
2-10%
1-5%
2-5%
2-5%
1-2%

Trace impurities and additional material names not listed above may also appear in Section 15 towards the end of the MSDS.
These materials may be listed for local "Right-To-Know" compliance and for other reasons.

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Product Name - Semi Metallic Disc Pad - Asbestos Free

3. HAZARDS IDENTIFICATION

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

POTENTIAL HEALTH HAZARDS

SKIN: Some persons may be sensitive to partially cured phenolic or cashew resins and develop dermatitis-like reactions similar to poison ivy.

EYES: Exposure to dust may cause eye irritation.

INHALATION: Irritation or soreness in throat, nose and respiratory tract.

INGESTION: Not an anticipated route of entry.

DELAYED EFFECTS: The inhalation of airborne silica-quartz containing dusts may cause serious bodily harm such as pneumoconiosis or silicosis. These lung diseases may not be recognized until many years after exposure. The potential for such exposure from this product is low because the ingredients in friction materials are physically bonded together by a resin polymer matrix.

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

<u>INGREDIENT NAME</u>	<u>NTP STATUS</u>	<u>IARC STATUS</u>	<u>OSHA LIST</u>
Silica Quartz	Yes	Yes	No

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.

EYES: 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 an 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.



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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.

EXTINGUISHING MEDIA: Use extinguishing media appropriate for the surrounding area.

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

SPECIAL FIRE FIGHTING PRECAUTIONS/INSTRUCTIONS:

Self Contained Breathing Apparatus (SCBA) 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 up any residues. Use a wet method or vacuums equipped with High Efficiency Particulate (HEPA) filters to clean up any residues from this product. Wastes should be placed in dust tight containers or sealed plastic bags for disposal. Label Properly.

Spills and releases may have to be reported to Federal and/or local authorities. See 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 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.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS:

This friction material product, as shipped, is not considered hazardous, but machining (arcing, grinding, drilling or chamfering) may create dusts or airborne fibers in excess of the OSHA Permissible Exposure Limits (PEL's) for the respective ingredients and should be considered hazardous. If dusts exceed one or more of the OSHA PEL, NIOSH-approved respirators should be worn and proper engineering controls implemented. If the product is ground or machined, local exhaust to control dusts is recommended. The work should be monitored to determine whether employee exposures exceed OSHA PEL's for the respective ingredients. Packages containing this friction material product should be labeled as follows:

**CAUTION
AVOID CREATING OR BREATHING DUSTS**



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CONTAINS HAZARDOUS SUBSTANCES WHICH MAY CAUSE LUNG INJURY

Standard industrial hygiene practices, including housekeeping and vacuuming with High Efficiency Particulate (HEPA) filters or wet cleaning work surfaces to prevent dusts 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:

Respiratory protection may be required if the ingredient exposures exceed their respective Permissible Exposure Limits (PEL's) or the Time Weighted Average (TWA). 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" below and follow attached 29 CFR 1910.1001, Appendix F "Work Practices and Engineering Controls for Automotive Brake and Clutch Inspection, Disassembly, Repair and Assembly - Mandatory".

EXPOSURE GUIDELINES

<u>INGREDIENT NAME</u>	<u>ACGIH TLV</u>	<u>OSHA PEL</u>	<u>OTHER LIMIT</u>
Calcium Carbonate	10 mg/m3 total dust - TWA	15 mg/m3 total dust - TWA 5 mg/m3 respirable dust - TWA	None
Barium Sulfate	10 mg/m3 total dust - TWA	10 mg/m3 total dust - TWA	None
Aluminum Oxide	10 mg/m3 total dust - TWA	None	None
Magnesium Oxide	10 mg/m3 total dust - TWA	10 mg/m3 total dust - TWA	None
Carbon Black	3.5 mg/m3 TWA	3.5 mg/m3 TWA	None
Graphite	2.5 mg/m3	2.5 mg/m3	None
Silica/Quartz	10 mg/m3/& Silica + 2	10 mg/m3/& Silica + 2	See OSHA Table Z- 1000
Iron Oxide	10 mg/m3	10 mg/m3	None

* = Workplace Environmental Exposure Level (AIHA).

** = Biological Exposure Index (ACGIH).



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OTHER EXPOSURE LIMITS FOR POTENTIAL DECOMPOSITION PRODUCTS:

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): 3.2 - 3.7 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.)

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.



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DELAYED (SUBCHRONIC AND CHRONIC) EFFECTS:

The inhalation of airborne silica-quartz containing dusts may cause serious bodily harm such as pneumoconiosis or silicosis. These lung diseases may not be recognized until many years after exposure. The potential for such exposure from this product is low because the ingredients in friction materials are physically bonded together by a resin polymer matrix.

OTHER DATA: None

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:

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.

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 in Section 1.

15. REGULATORY INFORMATION

TOXIC SUBSTANCES CONTROL ACT (TSCA)

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

OTHER TSCA ISSUES: None



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SARA TITLE III/CERCLA

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

INGREDIENT NAME

Zinc Oxide

SARA/CERCLA RQ (LB)

1000

SARA EHS TPQ (LB)

Spills or releases resulting in the loss of any ingredient at or above its RQ requires immediate notification to the National Response Center [(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 numbers and weight percents are found in Section 2.

INGREDIENT NAME

Zinc Oxide

COMMENT

As Zinc Compounds

STATE RIGHT-TO-KNOW

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

INGREDIENT NAME

None Listed

WEIGHT % COMMENT

ADDITIONAL REGULATORY INFORMATION:

The finished units of friction material shipped to you contain polymer resin encapsulated ingredients. Subsequent processing (arcng, grinding, drilling or chamfering) may create a potential for the release of the ingredients 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):

This article is not a controlled product unless physically altered (i.e. drilling, grinding, chamfering, etc.).

FOREIGN INVENTORY STATUS:

Various.

16. OTHER INFORMATION

CURRENT ISSUE DATE: 1/08/97

PREVIOUS ISSUE DATE: 12/08/95

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 and the inclusion of the "Work Practices and Engineering Controls for Brake and Clutch Inspection, Disassembly, Repair and Assembly - Mandatory" (29 CFR 1910.1001, Appendix F) as an attachment.

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Other Information:

1. Always follow the "Work Practices and Engineering Controls for Brake and Clutch Inspection, Disassembly, Repair and Assembly - Mandatory" (29 CFR 1910.1001, Appendix F). Although some friction materials used for brake service still contain asbestos, most suppliers are replacing asbestos with steel, mineral, and/or synthetic fibers. Because long term medical effects of these 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) for one or more of the ingredients in the friction material may be exceeded. 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 ductwork or piping to a pollution control device.
3. In certain grinding operations where concentrations cannot be reduced below the PEL, a respirator program should be implemented. Respirators also may be required during certain maintenance, start-up or emergency situations where engineering controls cannot maintain concentrations below the PEL.
4. Good housekeeping is essential in a workplace where friction materials are handled. Vacuums equipped with High Efficiency Particulate (HEPA) filters should be used to remove accumulations of friction dusts and wastes. Never use compressed air or dry sweeping for cleaning.
5. Good personal hygiene practices are important in minimizing dust exposures. Do not smoke. Wash before eating. If the PEL is exceeded, protective equipment should be worn. Change into work clothes upon arrival at work and change from work clothes at conclusion of work.

**CAUTION
AVOID CREATING OR BREATHING DUSTS
CONTAINS HAZARDOUS SUBSTANCES
WHICH MAY CAUSE LUNG INJURY**

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.



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- (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 the standard and disposed of according to paragraph (k) of the standard.
- (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 standard.

[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

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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.



xc Ed Kosa ✓
Tai Misty
FYI
Ed
10/8

Memorandum
Automotive Aftermarket
105 Pawtucket Avenue
Rumford, RI 02916-2422

Date: October 10, 1994 *Received 10/17*
To: Gerard Dulac
From: Deborah Andreozzi
Subject: TitaniumMetallic Market Response

The first 6 models of the TitaniumMetallic product offering have been launched to the rebuilders. TitaniumMetallic is beginning to ship from ASAA rebuilders and enter the market place. Our sales force has been actively taking TitaniumMetallic sales kits to all levels of the market place - warehouse, jobber, installer and to retail accounts to talk about TitaniumMetallic and it's benefits. An article written in Brand News has generated phone calls from customers asking questions and wanting to know when they would be getting this new product. ASAA will be highlighting TitaniumMetallic at Industry Week in November. Trade ads are scheduled to begin in January in the major trade journals (Brake & Front End, Under Car Digest, etc.) highlighting TitaniumMetallic at the installer level. Attached find a detailed communication plan of all of the activities underway and planned to support this product.

Customers and Sales force are beginning to call and ask when additional part numbers will be available.

In summary, TitaniumMetallic is a success ! The market place is asking for more. The installers love the product and it's performance. Our sales force loves the product and are happy being able to take something promising to previously dissatisfied Bendix customers.

→ To support this success, we must continue to expand the TitaniumMetallic coverage across the balance of the semi-metallic disc pad line. Additional phases have been identified to achieve this:

	<u>Models</u>	<u>ASBS launch to ASAA Rebuilders</u>	<u>Ann. Pc. Volume</u>	<u>Status</u>
Phase I	6 models	August 1, 1994	4.489	Complete
Phase II	9 models	November 31, 1994	3.615	Pending
Phase III	50 models	February 1, 1995	2.735	Pending
Phase IV -	Semi Met I/M models, CTC, Midas - Plan to be determined			

See attached rollout plan as prepared by Austin Tague and Tom Chambers for details. This has been communicated to Cleveland in June.

We are requesting ASBS support and commitment in meeting these dates, and if possible, moving the dates forward to expedite the roll out. The continuous and timely progress of this rollout is critical to satisfying our customers and continuing this success for AlliedSignal.

We must also include in our discussions/plans any impact that increased growth/new business volume will have on the planned roll out.

Please advise the best forum for the discussion and coordination between ASAA and ASBS to accomplish this goal and satisfy our customers.

Thank you in advance for your assistance.

I also want to take this opportunity to thank you and everyone at ASBS for the successful launch of the first phase of the Titanium product offering. We appreciate all of the efforts and coordination required to support this new program. Please communicate our sincerest thanks to everyone involved.

cc: M. Breedlove- ASBS Troy
M. Chupa - ASBS Troy
C. Little - ASBS Cleveland
J. McGrath - ASAA
M. Monti - ASAA
J. Puishys - ASAA
D. Riel - ASBS South Bend
P. Ross - ASAA
E. Seilfer - ASBS Cleveland
B. Wilcock - ASBS South Bend



Memorandum

Automotive Aftermarket
105 Pawtucket Avenue
Rumford, RI 02916-2422

Date: October 11, 1994

To: Karen Borger Scott Cohoon Debbie Conley Ann DeAngelis
Ron Lamb Donna Larsen Jo-Ann Molinaro Lisa Sloat

From: Tom Chambers

Subject: Titanium Communications Schedule

cc: D. Andreozzi, G. Browne, D. Hausman, S. LaVallee, K. Mitter, G. Natella, P. Ross

We've all done lots of work now in releasing the TitaniumMetallic disc pad product line. Thanks for everyone's help so far. We'll need a big push to make a TitaniumMetallic splash at industry week. So far, the field is responding well to the product that has arrived. The following list details everything that we've done and are planning to communicate the TitaniumMetallic product line to the sales force and public.

<u>Date</u>	<u>Communication Piece</u>	<u>Target Audience</u>
May/June, 1994	Installer Test Market Sample Product Questionnaire	Regional installers
August 1, 1994	Sales Force Kit Sample Puck Brake Alert Question & Answer	ASAA sales force
September, 1994	Advance Auto Kit Mailing Sample Puck Brake Alert Question & Answer	Advance Automotive
September, 1994	Retail Account Mailing (exc. KMart/Advance) Brake Alert Question & Answer	Bendix friction retailers
October, 1994	Brand News Article	ASAA direct accounts
October, 1994	Dura Trans- (trade show booth) Photograph	Trade show attendees

<u>Date</u>	<u>Communication Piece</u>	<u>Target Audience</u>
mid October, 1994	TitaniumMetallic Media Alert	Trade editors
late October, 1994	TitaniumMetallic Sell Sheet	Sales/Installers/WD/Jobbers Retailers
late October, 1994	TitaniumMetallic Video	Trade Editors / Customers
late October, 1994	TitaniumMetallic Counter Display	Trade show attendees / Sales
late October, 1994	Saleable item for Trade Show	Trade show attendees/ editors
November, 1994	Media Kit - Trade Show Question & Answer Brake Alert Sell Sheet TitaniumMetallic saleable item TitaniumMetallic video	Trade Book Editors
November, 1994	Saleable items for Swingster supplement	Sales/Installers/WD/Jobbers Retailers
November, 1994	Follow Thru on Trade book PR placements/stories	Trade magazine audience
November, 1994	Counter Card	Installers/Jobbers/Retailers
December, 1994	Counter Mat	Installers/Jobbers/Retailers
January, 1995	Trade advertising placement begins	Trade magazine audience
March, 1995	Tech Talk Mailing Sell Sheet Article	Installers in Stop Shop
Feb & April, 1995	Shadetree Mechanic New Product Placement	Consumers
August, 1995	Reprint Titanium sell sheet w/ integrally molded disc additions	Sales/Installers/WD/Jobbers Retailers
August, 1995	Installer Re-Test Sample product Questionnaire	Regional installers

If anyone has questions concerning this list, please let me know.

**TITANIUM COATING PROJECT
INITIAL FORECAST
PHASE I
AUGUST 1, 1994
LAUNCH TO REBUILDER PARTNERS**

<u>RANK</u>	<u>DISC PAD</u>	<u>1994 FORECAST</u>	<u>J8 PART NUMBER</u>	<u>QTY PER SET</u>	<u>1994 FORECAST</u>	<u>WKLY FCST</u>
1	MKD154	314,095	SNP7070AMET	4	1,256,380	26,731
2	MKD289	306,774	SNP7070BMET	2	613,548	13,054
			SNP71300MET	2	613,548	13,054
4	MKD215	263,726	SNP7136IMET	2	527,452	11,222
			SNP7136OMET	2	527,452	11,222
6	MKD324	116,681	SNP7308AMET	4	466,724	9,930
10	MKD259	73,508	SNP7164AIMET	2	147,016	3,128
			SNP7164AOMET	2	147,016	3,128
20	MKD170	<u>47,341</u>	SNP7097AMET	4	<u>189,364</u>	<u>4,029</u>
	TOTAL	<u>1,122,125</u>			<u>4,488,500</u>	<u>95,500</u>

REVISION 2
07/01/94

**TITANIUM COATING PROJECT
INITIAL FORECAST
PHASE II
NOVEMBER 30, 1994
LAUNCH TO REBUILDER PARTNERS**

*Arnie,
any stock tolerance
issues?*

*10/18/94
asked Betty to request
Arnie push answer to
above, in particular for
7070B/C & 725A's. 265
1994 WKLY*

<u>RANK</u>	<u>DISC PAD</u>	<u>1994 FORECAST</u>	<u>J8 PART NUMBER</u>	<u>QTY PER SET</u>	<u>FORECAST</u>	<u>FCST</u>
3	MKD52S	270,412	SNP728AMET <i>on Cell 5</i>	4	1,081,648	23,014
5	MKD205	135,838	SNP7125AIMET	2	271,676	5,780
			SNP7125AOMET	2	271,676	5,780
8	MKD506	82,100	SNP7385MET	4	328,400	6,987
9	MKD159	78,611	SNP7070BMET <i>already set up</i>	2	157,222	3,345
			SNP7070CMET <i>start fine in batch ASAP</i>	2	157,222	3,345
10	MKD52	71,211	SNP728AMET <i>on Cell 5 starting 10/24</i>	4	284,844	6,061
12	MKD310	69,201	SNP7072AOMET	2	138,402	2,945
			SNP7072BIMET	2	138,402	2,945
13	MKD219	68,583	SNP7133AOMET	4	274,332	5,837
14	MKD86	67,785	SNP7019AOMET <i>3</i>	2	135,570	2,884
			SNP7019IMET	2	135,570	2,884
15	MKD257	<u>60,033</u>	SNP7106AMET	4	<u>240,132</u>	<u>5,109</u>
	TOTAL	<u>903,774</u>			<u>3,615,096</u>	<u>76,917</u>

REVISION 2
07/01/94

TITANIUM COATING PROJECT
INITIAL FORECAST
PHASE III
FEBRUARY 1, 1995
LAUNCH TO REBUILDER PARTNERS

<u>RANK</u>	<u>DISC PAD</u>	<u>1994 FORECAST</u>	<u>J8 PART NUMBER</u>	<u>QTY PER SET</u>	<u>1994 FORECAST</u>	<u>WKLY FCST</u>
16	MKD521	59,244	SNP7403AIMET	2	118,488	2,521
			SNP7403AOMET	2	118,488	2,521
17	MKD360	54,616	SNP7013AIMET	2	109,232	2,324
			SNP7013AOMET	2	109,232	2,324
18	MKD199	52,996	SNP7082CIMET	2	105,992	2,255
			SNP7082COMET	2	105,992	2,255
19	MKD50	52,061	SNP7013AIMET	2	104,122	2,215
			SNP7013AOMET	2	104,122	2,215
21	MKD149	47,306	SNP7024AOMET	2	94,612	2,013
			SNP7081AIMET	2	94,612	2,013
22	MKD203	36,915	SNP7122AIMET	2	73,830	1,571
			SNP7122AOMET	2	73,830	1,571
23	MKD153	36,686	SNP7084AMET	4	146,744	3,122
24	MKD221	32,541	SNP7139AMET	4	130,164	2,769
25	MKD220	32,377	SNP7134AMET	4	129,508	2,755
26	MKD417	29,688	SNP7304AMET	4	118,752	2,527
27	MKD466	28,980	SNP7219MET	4	115,920	2,466
31	MKD505	22,421	SNP7384IMET	2	44,842	954
			SNP7384OMET	2	44,842	954
32	MKD522	22,151	SNP7404AMET	4	88,604	1,885
33	MKD477	19,686	SNP7358AMET	4	78,744	1,675
34	MKD200	14,563	SNP7082BIMET	2	29,126	620
			SNP7082COMET	2	29,126	620
35	MKD150	14,063	SNP7082AIMET	2	28,126	596

TITANIUM COATING PROJECT
INITIAL FORECAST
PHASE III
FEBRUARY 1, 1995
LAUNCH TO REBUILDER PARTNERS

<u>RANK</u>	<u>DISC</u> <u>PAD</u>	<u>1994</u> <u>FORECAST</u>	<u>J8</u> <u>PART</u> <u>NUMBER</u>	<u>QTY</u> <u>PER</u> <u>SET</u>	<u>1994</u> <u>FORECAST</u>	<u>WKLY</u> <u>FCST</u>
			SNP7082AOMET	2	28,126	598
36	MKD421	13,856	SNP7308AMET	4	55,424	1,179
37	MKD385	12,617	SNP7274AIMET	2	25,234	537
			SNP7274AOMET	2	25,234	537
38	MKD557	10,915	SNP7436AMET	4	43,660	929
39	MKD84	10,810	SNP7017AIMET	2	21,620	460
			SNP7017AOMET	2	21,620	460
40	MKD478	8,742	SNP7274AIMET	2	17,484	372
			SNP7274AOMET	2	17,484	372
41	MKD473	6,021	SNP7353AMET	4	24,084	512
42	MKD344	6,000	SNP7237AMET	4	24,000	511
43	MKD529	5,828	SNP7237AMET	4	23,312	496
44	MKD344C	5,543	SNP7237AMET	4	22,172	472
45	MKD507	5,102	SNP7386MET	4	20,408	434
46	MKD591	5,100	SNP7403AIMET	2	10,200	217
			SNP7470AOMET	2	10,200	217
47	MKD152	4,220	SNP7072AIMET	2	8,440	180
			SNP7072AOMET	2	8,440	180
48	MKD218	3,199	SNP7131AMET	4	12,796	272
49	MKD499	2,708	SNP7082BIMET	2	5,416	115
			SNP7082COMET	2	5,416	115
50	MKD142	2,666	SNP7074AMET	4	10,664	227

**TITANIUM COATING PROJECT
INITIAL FORECAST
PHASE III
FEBRUARY 1, 1995
LAUNCH TO REBUILDER PARTNERS**

<u>RANK</u>	<u>DISC PAD</u>	<u>1994 FORECAST</u>	<u>J8 PART NUMBER</u>	<u>QTY PER SET</u>	<u>1994 FORECAST</u>	<u>WKLY FCST</u>
51	MKD367	2,569	SNP7258AMET	4	10,276	219
52	MKD529C	2,355	SNP7237AMET	4	9,420	200
53	MKD87	2,203	SNP7020AIMET	2	4,406	94
			SNP7020AOMET	2	4,406	94
54	MKD119	2,082	SNP7053MET	4	8,328	177
55	MKD151	2,023	SNP7083BIMET	2	4,046	86
			SNP7083BLOMET	1	2,023	43
			SNP7083BROMET	1	2,023	43
56	MKD623	1,808	SNP7384IMET	2	3,616	77
			SNP7384OMET	2	3,616	77
57	MKD91	1,752	SNP7027AIMET	2	3,504	75
			SNP7027AOMET	2	3,504	75
58	MKD523	1,604	SNP7405AIMET	2	3,208	68
			SNP7405AOMET	2	3,208	68
59	MKD386	1,582	SNP7275AMET	4	6,328	135
60	MKD219S	1,276	SNP7133AOMET	2	2,552	54
			SNP7133BIMET	2	2,552	54
61	MKD381	1,253	SNP7270AMET	4	5,012	107
62	MKD385S	1,147	SNP7274AIMET	2	2,294	49
			SNP7274AOMET	2	2,294	49
63	MKD576	683	SNP7304AMET	4	2,732	58
64	MKD39	588	SNP7018AMET	4	2,352	50
66	MKD8	369	SNP7028AMET	4	1,476	31

**TITANIUM COATING PROJECT
INITIAL FORECAST
PHASE III
FEBRUARY 1, 1995
LAUNCH TO REBUILDER PARTNERS**

<u>RANK</u>	<u>DISC PAD</u>	<u>1994 FORECAST</u>	<u>J8 PART NUMBER</u>	<u>QTY PER SET</u>	<u>1994 FORECAST</u>	<u>WKLY FCST</u>
67	MKD20	358	SNP771MET	4	1,432	30
69	MKD90	240	SNP7026AMET	4	960	20
70	MKD179	218	SNP7106AMET	4	872	19
71	MKD38	<u>48</u>	SNP778MET	4	<u>192</u>	<u>4</u>
	TOTAL	<u>683.779</u>			<u>2,735.116</u>	<u>58.194</u>

NOTE: MKD87, MKD149, AND MKD557 CURRENTLY USE HD FRICTION.

REVISION 2
07/01/94

**Product Name - Semi Metallic Disc Pad – Titanium Dioxide -
Asbestos Free**

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: Semi - Metallic Disc Pad (Asbestos Free)

OTHER/GENERIC NAMES: Honeywell Friction Materials; Titaniummetallic;
Mixture of proprietary ingredients: See Section 2.
Edge Code: J8, J10, J11

PRODUCT USE: Motor Vehicle Braking Systems

MANUFACTURER: Honeywell Friction Materials
900 W. Maple Road
Troy, MI 48084

FOR MORE INFORMATION CALL:
(Monday-Friday, 8:00am - 5:00pm
Eastern Standard Time)
Honeywell Friction Materials
Health, Safety & Environmental Quality
(248) 362 - 7274

IN CASE OF EMERGENCY CALL:
(24 Hours/Day, 7 Days/Week)
Spill Response - Chemtrec: 1-800-424-9300
Honeywell Information: 1-800-707-4555

2. COMPOSITION/INFORMATION ON INGREDIENTS

<u>INGREDIENT NAME</u>	<u>CAS NUMBER</u>	<u>WEIGHT %</u>
Cured Polymer Resin encapsulating the following:	None	Balance
Calcium Carbonate	1317-65-3	5-10%
Barium Sulfate	7727-43-7	5-15%
Aluminum Oxide	1344-28-1	2-10%
Magnesium Oxide	1309-48-4	1-5%
Carbon Black	1333-86-4	2-10%
Graphite	7782-42-5	1-5%
Iron Oxide	1309-37-1	2-5%
Silica/Quartz	14808-60-7	2-5%
Titanium dioxide	13463-67-7	1-2%

Trace impurities and additional material names not listed above may also appear in Section 15 towards the end of the MSDS. These materials may be listed for local "Right-To-Know" compliance and for other reasons.

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Note: The user must verify that they have the most current issue.

Product Name - Semi Metallic Disc Pad - Titanium Dioxide - Asbestos Free

3. HAZARDS IDENTIFICATION

Carbon Black has been evaluated by IARC as possibly carcinogenic to humans. Refer to Section 11 for further information.

EMERGENCY OVERVIEW: Disc brakes are not normally considered hazardous, however, toxic and irritating materials may be released in a fire, machining, grinding, arching, etc. Exposure to dusts may cause eye irritation, soreness in the throat, nose and respiratory tract, and dermatitis-like reactions.

POTENTIAL HEALTH HAZARDS

SKIN: Some persons may be sensitive to partially cured phenolic or cashew resins and develop dermatitis-like reactions similar to poison ivy.

EYES: Exposure to dust may cause eye irritation.

INHALATION: Irritation or soreness in throat, nose and respiratory tract.

INGESTION: Not an anticipated route of entry.

DELAYED EFFECTS: The inhalation of airborne silica-quartz containing dusts may cause serious bodily harm such as pneumoconiosis or silicosis. These lung diseases may not be recognized until many years after exposure. The potential for such exposure from this product is low because the ingredients in friction materials are physically bonded together by a resin polymer matrix.

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

<u>INGREDIENT NAME</u>	<u>NTP STATUS</u>	<u>IARC STATUS</u>	<u>OSHA LIST</u>
Silica Quartz	Yes	Yes	No
Carbon Black	No	Yes (Group 2B - Possible Carcinogen)	No

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.

EYES: 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 an anticipated route of entry.

ADVICE TO PHYSICIAN: No specialized first aid or medical treatment procedures are required. Treat according to symptoms present.

Product Name - Semi Metallic Disc Pad – Titanium Dioxide - Asbestos Free

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.

EXTINGUISHING MEDIA: Use extinguishing media appropriate for the surrounding area.

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

SPECIAL FIRE FIGHTING PRECAUTIONS/INSTRUCTIONS: Self Contained Breathing Apparatus (SCBA) and full fire fighting turn-out gear (Bunk Gear) are 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 up any residues. Use a wet method or vacuums equipped with High Efficiency Particulate (HEPA) filters to clean up any residues from this product. Wastes should be placed in dust tight containers or sealed plastic bags for disposal. Label Properly.

Spills and releases may have to be reported to Federal and/or local authorities. See 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 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.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS: This friction material product, as shipped, is not considered hazardous, but machining (arcing, grinding, drilling or chamfering) may create dusts or airborne fibers in excess of the OSHA Permissible Exposure Limits (PEL's) for the respective ingredients and should be considered hazardous. If dusts exceed one or more of the OSHA PEL, NIOSH-approved respirators should be worn and proper engineering controls implemented. If the product is ground or machined, local exhaust to control dusts is recommended. The work should be monitored to determine whether employee exposures exceed OSHA PEL's for the respective ingredients. Packages containing this friction material product should be labeled as follows:

**CAUTION
AVOID CREATING OR BREATHING DUSTS
CONTAINS HAZARDOUS SUBSTANCES
WHICH MAY CAUSE LUNG INJURY**

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Honeywell

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Standard industrial hygiene practices, including housekeeping and vacuuming with High Efficiency Particulate (HEPA) filters or wet cleaning work surfaces to prevent dusts 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: Respiratory protection may be required if the ingredient exposures exceed their respective Permissible Exposure Limits (PEL's) or the Time Weighted Average (TWA). 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" below and follow attached 29 CFR 1910.1001, Appendix F "Work Practices and Engineering Controls for Automotive Brake and Clutch Inspection, Disassembly, Repair and Assembly - Mandatory".

EXPOSURE GUIDELINES

<u>INGREDIENT NAME</u>	<u>ACGIH TLV</u>	<u>OSHA PEL</u>	<u>OTHER LIMIT</u>
Calcium Carbonate	10 mg/m ³ total dust - TWA	15 mg/m ³ total dust - TWA 5 mg/m ³ respirable dust - TWA	None
Barium Sulfate	0.5 mg/m ³ total dust - TWA	0.5 mg/m ³ total dust - TWA	NIOSH 5 mg/m ³ Respirable 10 mg/m ³ Total TWA
Aluminum Oxide	5 mg/m ³ Respirable 10 mg/m ³	15mg/m ³ Total	NIOSH 5 mg/m ³ Respirable 10 mg/ m ³ Total TWA
Magnesium Oxide	10 mg/m ³ (fume) total dust - TWA	10 mg/m ³ (fume) total dust - TWA	None
Carbon Black	3.5 mg/m ³ TWA	3.5 mg/m ³ TWA	None
Graphite	2.0 mg/m ³ Respirable 15 mg/m ³ Total TWA	5mg/m ³ Respirable 15mg/m ³ total dust TWA	NIOSH 2.5 mg/m ³ (Natural Graphite)
Silica/Quartz	0.1mg/m ³	See OSHA Table Z- 1000	6mg/m ³ Total
Iron Oxide	10 mg/m ³	10 mg/m ³	None
Titanium Dioxide	10 mg/m ³	15 mg/m ³	None
Inert Dust	5 mg/m ³ Respirable 10 mg/m ³ Total TWA	5 mg/m ³ Respirable 15mg/m ³ Total Dust TWA	None

OTHER EXPOSURE LIMITS FOR POTENTIAL DECOMPOSITION PRODUCTS: None

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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):	3.2 - 3.7 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.)

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

Silica:

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

DELAYED (SUBCHRONIC AND CHRONIC) EFFECTS: The inhalation of airborne silica containing dusts may cause serious bodily harm such as pneumoconiosis or silicosis. These lung diseases may not be recognized until many years after exposure. The potential for such exposure from this product is low because the ingredients in friction materials are physically bonded together by a resin polymer matrix.

OTHER DATA: None

Carbon Black:

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

DELAYED (SUBCHRONIC AND CHRONIC) EFFECTS:

HUMAN STUDIES: Epidemiological studies of workers in the carbon black producing industries of North America and Western Europe show no evidence of clinically significant, adverse health effects due to occupational exposure to carbon black. Early studies in the former USSR and Eastern Europe report respiratory diseases among workers exposed to carbon black, including: bronchitis, pneumoconiosis, emphysema, and rhinitis. These studies are of questionable validity, due to inadequate study design and

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methodology, lack of appropriate controls for cigarette smoking, and other confounding factors such as concurrent exposures to carbon monoxide, coal oil, and petroleum vapors. Moreover, review of these studies indicates that work environment concentrations of carbon black were considerably greater than current occupational exposure standards. In its Monograph Volume 65, issued in April 1996, the International Agency for Research on Cancer (IARC) reevaluated carbon black and concluded "there is inadequate evidence in humans for the carcinogenicity of carbon black".

CARCINOGENICITY: The IARC evaluation in Monograph 65 concluded "there is sufficient evidence in experimental animals for the carcinogenicity of carbon black". Based on this evaluation, along with their evaluation of inadequate evidence of carcinogenicity in humans, IARC's overall evaluation is that "carbon black is possibly carcinogenic to humans (Group 2B)".

Carbon black has not been listed as a carcinogen by the National Toxicology Program (NTP) or the Occupational Safety and Health Administration (OSHA). The National Institute of Occupational Safety and Health (NIOSH) criteria document on carbon black recommends that only carbon blacks with PAH levels greater than 0.1% be considered suspect carcinogens.

MUTAGENICITY: Carbon black is negative in mutagenicity tests and bioassays for food use testing.

REPRODUCTIVITY: None known.

CHRONIC INGESTION: No significant changes were seen in rats or mice during feeding studies with carbon black for up to two years.

CHRONIC EYE: No adverse effects expected.

CHRONIC SKIN: After application of a carbon black suspension to the skin of mice, rabbits, and rats, no skin tumors were reported. Powder may cause drying of the skin with repeated or prolonged contact.

SENSITIZATION: No animal data is available. Based on experience, no adverse effects are expected.

ANIMAL TOXICITY:

PRIMARY EYE IRRITATION (Rabbit): Produced slight conjunctiva redness which cleared within 7 days.

PRIMARY SKIN IRRITATION (Rabbit): Very slight erythema.

ORAL LD50 (Rat): >8,000 mg/kg.

"MUTAGENICITY" TEST: Not mutagenic without or with metabolic activation, S9.

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:

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 in Section 1.

15. REGULATORY INFORMATION**TOXIC SUBSTANCES CONTROL ACT (TSCA)**

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

OTHER TSCA ISSUES: None

SARA TITLE III/CERCLA

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

<u>INGREDIENT NAME</u>	<u>SARA/CERCLA RQ (LB)</u>	<u>SARA EHS TPQ (LB)</u>
Barium Sulfate	1000	N/A

Spills or releases resulting in the loss of any ingredient at or above its RQ requires immediate notification to the National Response Center [(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 numbers and weight percents are found in Section 2.

<u>INGREDIENT NAME</u>	<u>COMMENT</u>
Aluminum Oxide	De Minimus concentration for section 313 is 1.0% (Aluminum Oxide fibrous forms and Aluminum fumes and dusts).
Barium Sulfate	De Minimus concentration for section 313 is 1.0% (Barium and Barium Compounds).

STATE RIGHT-TO-KNOW

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

<u>INGREDIENT NAME</u>	<u>WEIGHT %</u>	<u>COMMENT</u>
Aluminum Oxide	2-10%	CA, CT, FL, IL, IN, KY, MA, MN, NJ, PA AND RI
Barium Sulfate	5-15%	CA, CT, FL, IL, IN, KY, MA, MN, NC, NJ, PA AND RI
Carbon Black	2-10%	CA, IL, IN, KY, MA, MN, NC, NJ, PA AND RI
Graphite	1-5%	CA, FL, IL, IN, KY, MA, MN, NC, PA AND RI
Silica/Quartz	2-5%	CA, FL, MA, MN AND NJ
Titanium Dioxide	1-2%	MA, NJ, PA AND RI

ADDITIONAL REGULATORY INFORMATION: The finished units of friction material shipped to you contain polymer resin encapsulated ingredients. Subsequent processing (arc-ing, grinding, drilling or chamfering) may create a potential for the release of the ingredients 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

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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): This article is not a controlled product unless physically altered (i.e. drilling, grinding, chamfering, etc.).

FOREIGN INVENTORY STATUS: Various.

16. OTHER INFORMATION

Other Information:

1. Always follow the "Work Practices and Engineering Controls for Brake and Clutch Inspection, Disassembly, Repair and Assembly - Mandatory" (29 CFR 1910.1001, Appendix F). Although some friction materials used for brake service still contain asbestos, most suppliers are replacing asbestos with steel, mineral, and/or synthetic fibers. Because long term medical effects of these 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) for one or more of the ingredients in the friction material may be exceeded. 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 ductwork or piping to a pollution control device.
3. In certain grinding operations where concentrations cannot be reduced below the PEL, a respirator program should be implemented. Respirators also may be required during certain maintenance, start-up or emergency situations where engineering controls cannot maintain concentrations below the PEL.
4. Good housekeeping is essential in a workplace where friction materials are handled. Vacuums equipped with High Efficiency Particulate (HEPA) filters should be used to remove accumulations of friction dusts and wastes. Never use compressed air or dry sweeping for cleaning.
5. Good personal hygiene practices are important in minimizing dust exposures. Do not smoke. Wash before eating. If the PEL is exceeded, protective equipment should be worn. Change into work clothes upon arrival at work and change from work clothes at conclusion of work.

**CAUTION
AVOID CREATING OR BREATHING DUSTS
CONTAINS HAZARDOUS SUBSTANCES
WHICH MAY CAUSE LUNG INJURY**

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

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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 the standard and disposed of according to paragraph (k) of the standard.
- (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 standard.

[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.

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Note: The user must verify that they have the most current issue.

[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.

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CHANGES TO MSDS FROM PREVIOUS ISSUE DATE ARE DUE TO THE FOLLOWING: Revising the MSDS to ensure compliance with the ANSI standards and any OSHA regulations.