MATERIAL SAFETY DATA SHEET
Effective Date: March 26, 2002 Code: Cured Organic Segment/Drum Brake

Section 1 - PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: Cured Organic Segment/Drum Brake

Identity Edge Code: AE2455FF, AE2400EE, AE2477EE

MANUFACTURER'S NAME:
Honeywell Friction Materials
900 West Maple Road
Troy, MI 48084

EMERGENCY TELEPHONE NO.
(800) 424-9300
(800) 707-4555

MISCELLANEOUS INFORMATION:
(248) 362-7274

SUPPLIER'S NAME:
Rayloc
Division of Genuine Parts Company
3100 Windy Hill Road
Atlanta, Georgia 30339

REVISION DATE:
Nov. 1, 2012

Section 2 - HAZARDOUS INGREDIENTS

INGREDIENT	CAS NUMBER	WEIGHT %
Cured Polymer Resin encapsulating the following:	None	Balance
Calcium Carbonate	1317-65-3	5-10
Barium Sulfate	7727-43-7	5-20
Aluminum Oxide	1344-28-1	2-50
Magnesium Oxide	1309-48-4	<5
Carbon Black	1333-86-4	2-15
Graphite	7782-42-5	<5
Iron Oxide	1309-37-1	<5
Zinc Oxide	1314-13-2	<5
Steel Fiber	None	10-35
Calcium Oxide	1305-62-0	<5
Silica/Quartz	14808-60-7	2-5

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.

Section 3 - HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW
Drum 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, respiratory tract and dermatitis-like reactions.

POTENTIAL HEALTH HAZARDS

Eyes: Exposure to dust may cause eye irritation.

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

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.

INGREDIENT NAME	NTP STATUS	IARC STATUS	OSHA LIST
Silica Quartz	No	Yes (group 3 not classifiable)	No
Carbon Black	No	Yes (Group 2B- possible carcinogen)	No

Section 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.

Section 5 - FIREFIGHTING MEASURES

FLAMMABLE PROPERTIES

Flash Point: None

Flash Point Method: N/A

Autoignition Temperature: Not established

Upper Flame Limit (volume % in air): N/A

Lower Flame Limit (volume % in air): N/A

Flame Propagation Rate (solids): N/A

OSHA Flammability Class: Not classified as flammable material by OSHA.

Extinguishing Media: No special media required

Unusual Fire and Explosion Hazards:
Toxic and irritating materials may be released in a fire. See section 10, Conditions to Avoid.

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.

Section 6 - ENVIRONMENTAL 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.

Section 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

Section 8 - EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls:
This friction material product, as shipped, is not considered hazardous, but machining (arching, grinding, drilling, or chamfering) may create dusts or airborne fibers in excess of the OSHA Permissible Exposure Limits (PELS's) for the respective ingredients and should be considered hazardous. If dusts exceed one or more of the OSHA, PEL or 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 as these hazardous substances 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 and 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 Limits (PEL's) or the Time Weight Average (TWA). Self Contained Breathing Apparatus (SCBA) should be used if dusts are created due to fire or explosion.

Additional Recommendation:
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

INGREDIENT NAME	ACGIH TLV	OSHA PEL	OTHER LIMIT
Calcium Carbonate	10 mg/m3 TD	15 mg/m3 TD 5 mg/m3 RD	None
Barium Sulfate	0.5 mg/m3 TD	0.5 mg/m3 TD	NIOSH 5 mg/m3 RD 10 mg/m3 TD
Aluminum Oxide	5 mg/m3 RD 10 mg/m3	15 mg/m3 TD	NIOSH 5 mg/m3 RD 10 mg/m3 TD
Magnesium Oxide	10 mg/m3 (fume) TD	10 mg/m3 (fume) TD	None
Carbon Black	3.5 mg/m3	3.5 mg/m3	NIOSH 3.5 mg/m3
Graphite	2.0 mg/m3 RD 15 mg/m3 TD	5 mg/m3 RD 15 mg/m3 TD	NIOSH 2.5 mg/m3 (Natural Graphite)
Silica/Quartz	0.1 mg/m3	See OSHA table Z - 1000	6 mg/m3 Total
Iron Oxide	10 mg/m3	10 mg/m3	None
Inert Dusts	5 mg/m3 RD 10 mg/m3 TD	5 mg/m3 RD 15 mg/m3 TD	None

Zinc Oxide	10 mg/m3	10 mg/m3	None
Calcium Oxide	2 mg/m3	2 mg/m3	None

*TD=Total Dust *RD=Respirable Dust

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

Vapor Pressure: N/A Vapor Density: (air=1.0)
Boiling Point: N/A Melting Point: N/A
Solubility in Water: None Volatile: None
Evaporation rate: N/A Flash Point: None
ph: N/A Physical State: Solid
Appearance and odor: Gray or dark solid part - mild odor
Specific Gravity (H20 - 1): 1.7 - 2.5 GM/CC
Molecular Weight: May vary based on concentration of components
Chemical Formula: May vary based on concentration of components

Section 10 - STABILITY AND REACTIVITY

STABILITY: Stable

HAZARDOUS POLYMERIZATION: None

CONDITIONS TO AVOID: None

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

Section 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.

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 methodology, lack of appropriate controls for cigarette smoking, and other confounding factors such as concurrent exposures to carbon minoxide, 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 it's 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) of 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.

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

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 with or without metabolic activation, S9

Section 12 - ECOLOGICAL INFORMATION

Normal decomposition is not expected to result in ecological damage.

Section 13 - DISPOSAL CONSIDERATIONS

RCRA:
Is the unused product an RCRA hazardous waste if discarded? NO

OTHER DISPOSAL CONSIDERATIONS:
Dispose in accordance to all applicable federal, state, and local regulations.
The information offered here if 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

Section 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.

Section 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.

INGREDIENT NAME	SARA/CERCLA RQ (lb)
Barium Sulfate	1000

Spills or releases resulting in the loss of any ingredient at or above it's 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 numbers and weight percents are found in Section 2.

INGREDIENT NAME	COMMENT
Aluminum Oxide	De Minimus concentration for section 313 is 1.0% (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.

INGREDIENT NAME	WEIGHT%	COMMENT

Aluminum Oxide	1 - 10%	CA,CT,FL,IL,IN,KY,MA,MN,NJ,PA,RI
Barium Sulfate	15 - 20%	CA,CT,FL,IL,IN,KY,MA,MN,NC,NJ,PA,RI
Carbon Black	0 - 5%	CA,IL,IN,KY,MA,MN,NC,NJ,PA,RI
Graphite	2 - 8%	CA,FL,IL,IN,KY,MA,MN,NC,PA,RI
Silica	1 - 5%	CA,FL,MA,MN,NJ

ADDITIONAL REGULATORY INFORMATION:
The finished units of friction material shipped to you contain polymer resin encapsulated ingredients. Subsequent processing (arcing, 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

Section 16 - 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.

APPENDIX F TO 29 CFR 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 in 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 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 splashed 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.