

Material Safety Data Sheet

Product Name - Semi Metallic Disc Pad - Asbestos Free

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

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

OTHER/GENERIC NAMES: Honeywell Friction Material; Mixture of proprietary ingredients; See Section 2.
Edge Code: FM, FM2, FM3, FM4, H1, H2, H3, H3E, H3GZ, H4, H5, H6, H8, H10, HC, HE, HH, HI, HJ, HK, HM, HO, HQ, HT, HV, HX, HY, HYE, HZ, IQ3, IQ4, J1, J3, J4, J4E, J5, J8, J9, JA, JD, JF, JJ, JM, JP, JQ, JQD, JW, JV, JX, JXE, JZ, LHR1, LHR2, LHR3, NA, NB, NC, ND, NDE, NE, NF, NH, NJ, SUV, SUV2, SUV3, SUV4, SUV5, TMA, TMB, TME, TMQ, TMR, XO, XS, ZA, ZB, ZE, ZM, ZQ, ZQE, ZR, ZRE, Z8, Z9, Z10, 22, 24, 100, 300, 401, 402, 429, 510, 810, 812, 900, XD7614, XD7621.

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)
Chemtrec:
 1-800-424-9300
Spill Response:
 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	1-30%
Aluminum Oxide	1344-28-1	2-10%
Magnesium Oxide	1309-48-4	1-5%
Carbon Black	1333-86-4	0-10%
Graphite (Natural)	7782-42-5	1-5%
Iron Oxide	1309-37-1	2-15%
Silica/Quartz	14808-60-7	2-5%
Titanium Dioxide	13463-67-7	1-5%

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.

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3. HAZARDS IDENTIFICATION

Carbon Black has been evaluated by IARC as possibly carcinogenic to humans. Refer to Section II 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	No	Yes (Group 3 not classifiable)	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.

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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:

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CAUTION
AVOID CREATING OR BREATHING DUSTS
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/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	NIOSH 3.5 mg/m ³
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
Inert Dusts	5 mg/m ³ Respirable 10mg/ mg ³ Total TWA	5 mg/m ³ Respirable 15mg/ m ³ total dust TWA	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.

1. 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 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

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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.

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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

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	

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

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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.

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
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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

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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 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.

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- (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.

CURRENT ISSUE DATE: April 4, 2008

PREVIOUS ISSUE DATE: April 27, 2004

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

Added Edge Codes FM, FM3, FM4, H3, H3E, IQ3, IQ4, J5, LHR1, LHR2, LHR3, NDE, SUV, SUV4, SUV5, TMQ, TMR, ZQE, ZRE, Z8, Z9, Z10, 100, 300, 401, 402, 429, 510, 812, 900