

***** MATERIAL SAFETY DATA SHEET *******1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION**

PRODUCT NAME:	ECCOBOND™ 285 BLACK THERMALLY CONDUCTIVE ADHESIVE
COMPANY ADDRESS	Henkel Corporation 46 Manning Road Billerica, MA 01821
EMERGENCY CONTACT NUMBERS:	MEDICAL: 1.866-359-5657 (Health & Safety Call Center-24 hours) TRANSPORT: CHEMTREC: 1.800.424.9300 (24 hours) CHEMTREC International: 1.703.527.3887 (call collect) Customer Service: 1.781.828.3300

2. HAZARDS IDENTIFICATION**EMERGENCY OVERVIEW**

WARNING.
Possible cancer hazard.
Suspected of causing genetic defects.
EYE IRRITANT.
SEVERE SKIN IRRITANT.
SKIN SENSITIZER.
Black Paste Slight Odor

EYE	Will cause eye irritation. May cause permanent damage if eye is not immediately irrigated.
SKIN CONTACT	Repeated or prolonged skin contact may result in severe irritation. Repeated and/or prolonged contact may cause skin sensitization.
INHALATION	Unlikely to be hazardous by inhalation because of the low vapor pressure of the material at ambient temperature. Vapors and/or aerosols which may be formed at elevated temperatures may be irritating to eyes and respiratory tract. If the cured product is to be sanded or ground, wet sanding is recommended to eliminate airborne dust. Appropriate respiratory protection is suggested.
INGESTION	May cause nausea and vomiting.

3. COMPOSITION/INFORMATION ON INGREDIENTS

CHEMICAL FAMILY	Formulated Epoxy Resin	
COMPONENT	CAS NUMBER	CONCENTRATION (% by weight)
Aluminum oxide	1344-28-1	>50
Epoxy resin	PROPRIETARY	20 - 35
Silicon dioxide, crystalline free	112945-52-5	1 - 5
Butyl glycidyl ether	2426-08-6	1 - 5
Carbon black	1333-86-4	<0.5

Henkel Corporation

PRODUCT NUMBER: EC180655

ISSUE DATE: 28-February-2009

4. FIRST-AID MEASURES

EYE	Immediately irrigate with eyewash solution or clean water, holding the eyelids apart, for at least 15 minutes. Obtain immediate medical attention.
SKIN CONTACT	Wash skin with soap and water. If symptoms develop, obtain medical attention.
INHALATION	Remove to fresh air. Administer oxygen to aid breathing. Get medical attention.
INGESTION	If individual is conscious, give water to dilute stomach contents. Get prompt medical attention.

5. FIREFIGHTING MEASURES

AUTOIGNITION	Not available
FLASH POINT	> 200 °F
EXTINGUISHING MEDIA	Water spray or fog, CO2, dry chemical
SPECIAL FIREFIGHTING PROCEDURES	Fire fighters should be equipped with self-contained breathing apparatus to protect against potentially toxic and irritating fumes.; Cool exposed equipment with water spray.
FIRE & EXPLOSION HAZARDS	Combustible at high temperatures.
HAZARDOUS COMBUSTION PRODUCTS	Carbon monoxide, carbon dioxide, unknown hydrocarbons.
LOWER EXPLOSION LIMIT (%)	Not determined.
UPPER EXPLOSION LIMIT (%)	Not determined.

6. ACCIDENTAL RELEASE MEASURES

SPILL AND LEAK PROCEDURES	Evacuate immediate area and dike area to contain spill. Extinguish open flames and ignition sources in the immediate area. Wear proper protective clothing, gloves, and splash goggles. Absorb as much of spilled material as possible with rags, sand, vermiculite or other absorbent material. Scrape absorbed material into designated waste containers. Wash area thoroughly with detergent and rinse, taking care to prevent runoff into drains or other waterways. All spilled material, absorbed waste and wash water must be disposed of in accordance with all Federal state and local regulations.
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For safety and environmental precautions, please review entire Material Safety Data Sheet for necessary information.

7. HANDLING AND STORAGE

STORAGE TEMPERATURE	25 °C
SHELF LIFE, (Days)	365
HANDLING/STORAGE	Keep containers properly sealed and store indoors in a well ventilated area. Keep away from heat and sources of ignition.
SENSITIVITY TO STATIC ELECTRICITY	No
SPECIAL SENSITIVITY	No
SENSITIVITY TO MECHANICAL IMPACT	No

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

COMPONENT	EXPOSURE LIMITS		
	ACGIH	OSHA	Mfg Working Standard
Aluminum oxide	10 mg/m3 PEL (total dust); 5 mg/m3 PEL (respirable fraction, listed under Particulates not otherwise	15 mppcf TWA (respirable fraction); 5 mg/m3 TWA (respirable fraction);	Manufacturer: 6 mg/m3

Henkel Corporation

PRODUCT NUMBER: EC180655

ISSUE DATE: 28-February-2009

	regulated).	50 mppcf TWA (total dust); 15 mg/m3 TWA (total dust)
Silicon dioxide, crystalline free	10 mg/m3 PEL (total dust); 5 mg/m3 PEL (respirable fraction, listed under Particulates not otherwise regulated).	15 mppcf TWA (respirable fraction); 5 mg/m3 TWA (respirable fraction); 50 mppcf TWA (total dust); 15 mg/m3 TWA (total dust)
Butyl glycidyl ether	Skin - potential significant contribution to overall exposure by the cutaneous route 3 ppm TWA.	50 ppm TWA; 270 mg/m3 TWA
Carbon black	3.5 mg/m3 TWA.	3.5 mg/m3 TWA
VENTILATION REQUIREMENTS	Local mechanical ventilation. Sufficient to keep vapors below TLV exposure limits.	
EYE PROTECTION REQUIREMENTS	Wear close fitting goggles or full face shield.	
GLOVE REQUIREMENTS	Neoprene or natural rubber is recommended.	
CLOTHING REQUIREMENTS	Wear protective equipment to comply with good occupational hygiene practice.	
CHANGE/REMOVAL OF CLOTHING	Remove contaminated clothing and launder before reuse.	
WASH REQUIREMENTS	Showers and eye washing equipment must be provided at handling points.	
RESPIRATOR REQUIREMENTS	Respiratory protection required if the exposure level is unknown or has been measured and found to exceed the published exposure limits.	

9. PHYSICAL AND CHEMICAL PROPERTIES

PURE SUBSTANCE OR MIXTURE	Mixture
PHYSICAL FORM	Paste
COLOR	Black
ODOR	Slight
ODOR THRESHOLD	None Established
OXIDIZING PROPERTIES	Not applicable
BOILING POINT	Not determined.
SOLUBILITY IN WATER	Insoluble
PARTITION COEFFICIENT (n-octanol/water)	Not determined.
SPECIFIC GRAVITY (WATER=1)	2.4
EVAPORATION RATE	Not determined.
VAPOR PRESSURE (mmHg)	< 0.1 @ 25°C
VAPOR DENSITY (air = 1)	> 1.0
VOLATILES	< 0.8 %/wt
VOLATILE ORGANIC COMPOUNDS	< 18.8 g/liter
AUTOIGNITION	Not available
FLASH POINT	> 200 °F

10. STABILITY AND REACTIVITY

STABILITY	Stable
STABILITY DETAIL	Material is stable under normal temperatures and pressures.

Henkel Corporation

PRODUCT NUMBER: EC180655

ISSUE DATE: 28-February-2009

MATERIALS TO AVOID	Amines, Acids, Strong oxidizers, Mercaptans, Imidazoles
CONDITIONS TO AVOID	Elevated temperatures
HAZARDOUS DECOMPOSITION PRODUCTS	Carbon monoxide, carbon dioxide, unknown hydrocarbons.
HAZARDOUS POLYMERIZATION CONDITIONS	Hazardous polymerization has not been reported to occur under normal temperatures and pressures.

11. TOXICOLOGICAL INFORMATION

ROUTE OF ENTRY		Eye Contact; Skin Contact; Inhalation; Ingestion	
CARCINOGEN	<u>IARC</u> <u>(group)</u>	<u>NTP</u>	<u>OSHA Substance</u> <u>Specific Regulation</u>
COMPONENT			
Carbon black	Yes (2B)	No	Not Listed
CHRONIC (LONG TERM) EFFECTS OF EXPOSURE			
EFFECTS OF CHRONIC EXPOSURE		A component(s) of this product was found to be positive in one or more mutagenetic assays.	
TARGET ORGANS		Eyes; Skin; Respiratory system	
SKIN SENSITIZATION		Sensitizer. May cause allergic reaction.	
PRODUCT TOXICOLOGY			
PRODUCT INFORMATION		This data sheet is based on a consideration of the properties of the constituents.	
COMPONENT	ORAL TOXICITY	NOTES ON ORAL TOXICITY	
Aluminum oxide		No hazard in normal industrial use. Ingestion may cause irritation of the gastrointestinal tract. Non-toxic.	
Epoxy resin	Oral LD50: Rat > 5000 mg/kg	Unlikely to be hazardous if swallowed.	
Butyl glycidyl ether	Oral LD50: Rat 1000 mg/kg	May cause nausea, vomiting and diarrhea.	
Carbon black	Oral LD50: Rat > 8000 mg/kg	Unlikely to be hazardous if swallowed. Ingestion may cause irritation of the gastrointestinal tract.	
COMPONENT	DERMAL TOXICITY	NOTES ON DERMAL TOXICITY	
Aluminum oxide		Slight/mild irritant.	
Epoxy resin	Dermal LD50: Rabbit > 6000 mg/kg	Repeated or prolonged skin contact may result in moderate irritation. Repeated and/or prolonged contact may cause skin sensitization.	
Butyl glycidyl ether	Dermal LD50: Rabbit 788 mg/kg	Severely irritating; may cause permanent skin damage. Repeated and/or prolonged contact may cause irritation and skin sensitization.	
Carbon black		Non-irritant.	
COMPONENT	INHALATION TOXICITY	NOTES ON INHALATION TOXICITY	
Aluminum oxide		Dust may cause irritation.	

Henkel Corporation

PRODUCT NUMBER: EC180655

ISSUE DATE: 28-February-2009

Epoxy resin		Unlikely to be hazardous by inhalation because of the low vapor pressure of the material at ambient temperature.
Butyl glycidyl ether	Inhalation LC50 (8hr): Rat 1030 ppm	Vapor or aerosol, if generated, can cause irritation of the eyes, nose and respiratory tract.
Carbon black	Inhalation LC50 (1hr): Rat 6750 mg/m3	Inhalation of high concentrations of dust may cause mechanical irritation and discomfort. Repeated exposure to dusts may aggravate pre-existing respiratory conditions. Prolonged or frequent breathing of excess dust may cause an adverse respiratory effect.
COMPONENT		NOTES ON EYE IRRITATION
Aluminum oxide		Slight/mild irritant. Particulates may scratch eye surfaces and cause mechanical irritation.
Epoxy resin		May cause eye irritation.
Butyl glycidyl ether		Severe/very severe irritant.
Carbon black		Particulates may scratch eye surfaces and cause mechanical irritation.

12. ECOLOGICAL INFORMATION

POTENTIAL EFFECT ON ENVIRONMENT	Unknown.
POTENTIAL TO BIOACCUMULATE	Unknown.
ECOTOXICITY	Unknown.
AQUATIC TOXICITY	None Established

13. DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHODS	Disposal should be in accordance with local, state or national legislation.
EMPTY CONTAINER WARNINGS	Empty containers may contain product residue; follow MSDS and label warnings even after they have been emptied.

14. TRANSPORTATION INFORMATION

This section provided for general information only. The shipping description below may not represent requirements for all modes of transportation, packaging, shipping methods or locations outside of the United States.

FOR MORE COMPLETE TRANSPORTATION REGULATORY INFORMATION PLEASE REFER TO THE SHIPPING DOCUMENTS ACCOMPANYING THE SHIPMENT OF THIS PRODUCT.

DOT CLASSIFICATION	Not Regulated
ICAO/IATA CLASSIFICATION	Not classified as dangerous.

Henkel Corporation

PRODUCT NUMBER: EC180655

ISSUE DATE: 28-February-2009

The information provided herein may not include the impact of additional regulatory requirements (eg, for materials meeting the definition of a hazardous waste under RCRA, hazardous substances under CERCLA, and/of marine pollutants under CWA or other similar federal, state or local laws) or any associated exceptions or exemptions under regulations applicable to the transport of this material.

15. REGULATORY INFORMATION

TSCA	All components are on the TSCA inventory.
Canadian Domestic Substance List (DSL)	Is on DSL
China (IECSC)	On the IECSC Inventory.
Australia (AICS)	On the AICS Inventory.
Korea (KECI)	On the KECI Inventory.
Philippines (PICCS)	On the PICCS Inventory.

SARA - Section 313 (Superfund Amendments and Reauthorization Act of 1986 - 40CFR 372)	CAS NUMBER
Aluminum oxide	1344-28-1

CALIFORNIA PROPOSITION 65

WARNING: This product contains the following chemicals that are known to the State of California to cause cancer, birth defects or other reproductive harm.

Unless a concentration is specified in Section 2 of the MSDS, the below chemical/s are present in trace amounts.

COMPONENT	CAS NUMBER
Carbon black	1333-86-4
Phenyl glycidyl ether	122-60-1
Epichlorohydrin	106-89-8

16. OTHER INFORMATION

HMIS® Hazard Ratings

HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings are not required on MSDSs by OSHA's 29 CFR 1910.1200, we choose to provide them as a service to our customers using HMIS®. These ratings are to be used only with a fully implemented HMIS® program. To deal adequately with the safe handling of this material, all the information contained in this MSDS must be considered.

NPCA recommends that employers must determine appropriate PPE for the actual conditions under which this product is used in their workplace. For information on PPE codes, consult the HMIS® Implementation Manual.

When two ratings are provided for Health, the first represents the material 'as supplied', and the second represents the material 'in use'.

* = chronic health hazard

HMIS® is a registered trademark of the National Paint and Coatings Association (NPCA).

<u>Health</u>	<u>Flammability</u>	<u>Physical Hazard</u>
*2	1	0

PREPARED BY:

Regulatory Affairs
Henkel Corporation

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PRODUCT NUMBER: EC180655

ISSUE DATE: 28-February-2009

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