AS475 ENCAPSULATION MATERIAL

1.1 INTRODUCTION

AS475 Sensor Encapsulation Material is a resin-based grout. It is specifically designed to embed permanent axle sensors and their cables into asphalt or concrete pavements.

The AS475 grout serves two purposes:

- An adhesive bond between the sensor and the road pavement material
- Isolation medium between the sensor and the road pavement.

This mixture consists of a resin material that has a fine mineral aggregate mixed in. The aggregate provides strength and consistency to the grout mixture. The aggregate also prevents the resin from cracking, by serving as a heat sink for the significant heat created during the curing of the resin.

The grout mixture will cure (harden) once a catalyst powder is added. The catalyst used with the AS475 grout is a Benzyl Peroxide Organic (BPO) powder.

IMPORTANT: If ambient temperature is below 10°C (50°F) refer to Section 2 for details regarding the use of epoxy in cold weather.

1.2 SHELF LIFE

AS475 Grout has a shelf life of 6 months from the manufacturing date.

1.3 SAFETY PRECAUTIONS

- Read and be familiar with the Material Safety Data Sheet for AS475 grout and for Benzyl Peroxide Organic (BPO). (See Sections 3 & 4 for MSDS information.)
- Avoid contact to skin and eyes. Wear appropriate protective clothing such as boots, overalls, gloves and safety glasses.
- Do not use these products in an enclosed area. Ensure there is good ventilation when using these materials. Avoid inhalation of vapors produced.
- Do not use the BPO powder near heat, sparks or open flame. BPO is a very powerful oxidizer that supplies its own oxygen when burning.
- Use a dust mask to prevent the inhalation of the BPO powder.

1.4 AMOUNT OF GROUT

The amount of AS475 grout to be used is dependent the size of the sensor being installed. The following table gives guidance on the amount of grout required for 6' and 12' BL sensors. These figures assume that the slot has been cut to the dimensions stated in the BL installation instruction. Slots cut deeper and/or wider may require more grout. Measurement Specialties (MSI) sells 18kg, 10kg and 7.5kg kits of grout. To get 5kg of grout, half of the 10kg kit or 1/3 of the 18kg kit must be poured into a separate container.

GROUT SIZE	6ft SENSORS COVERD	12ft SENSORS COVERED
18kg Kit	3	1.5
10kg Kit	2	1
7.5kg Kit*	1	1
5kg Kit*	1	0

* 5kg is enough grout to cover one 6' sensor, but MSI does not offer 5kg Kits

1.5 AMOUNT OF CATALYST

The table below gives the amount of catalyst to add to the mixture in order to produce a total curing time of 30-40 minutes. If the amounts below are used, the grout mixture will be totally cured in 30-40 minutes.

TEMPERATURE		AMOUNT OF BENZOYL PEROXIDE ORGANIC (BPO) POWDER	
ºC	ºF	Mix with 18 kg (18 U.S. qt) of grout	Mix with 10 kg (10 U.S. qt) of grout
<13	<55	6 x 33g VIALS	3 x 33g VIALS
13 - 24	55 - 75	4 x 33g VIALS	2 x 33g VIALS
>24	>75	2 x 33g VIALS	1 x 33g VIALS
TEMPERATURE		AMOUNT OF BENZOYL PEROXIDE ORGANIC (BPO) POWDER	
ºC	ºF	Mix with 7.5 kg (7.5 U.S. qt) of grout	Mix with 5 kg (5 U.S. qt) of grout
<13	<55	3 x 33g VIALS	2 x 33g VIALS
13 - 24	55 - 75	2 x 33g VIALS	1.5 x 33g VIALS
>24	>75	1 x 33g VIALS	0.75 x 33g VIALS

1.6 RECOMMENDED TOOLS AND MATERIALS

- AS-475 grout
- BPO powder
- electric drill with mixing paddle attachment
- protective clothing such as dust mask, boots, overalls, gloves and safety glasses
- paint thinner

1.7 MIXING INSTRUCTIONS

1. Ensure the roadway, slot and sensor are ready for installation. All preparation work should be complete prior to preparing the grout.

2. Ensure that all safety precautions, as outlined at the start of this section, have been observed.

3. Using the drill with the mixing paddle attached, mix the grout in the pail. All of the fine aggregate at the bottom of the pail must be thoroughly mixed into the grout until it takes on a smooth texture with no lumps (2 minutes at least).

4. Using the chart above, determine the amount of BPO powder to add to the grout mixture.

5. Add appropriate amount of BPO powder to the grout mixture.

6. Mix the grout and the BPO powder thoroughly for an additional 2 minutes. There is now 5-10 minutes of working time before it partially cures.

7. Use the grout mixture to install a sensor as indicated BL installation manual. Ensure there are no voids or air bubbles when applying the grout mixture. There is now 30-40 minutes before the grout mixture is completely cured.

8. Clean any uncured grout mixture from tools and equipment with paint thinner. Once the grout mixture has cured, it can only be removed by mechanical means.

2.0 GROUTS AND EPOXIES IN COLD WEATHER

Most installation products are designed for use around 20 to 25°C (68 to 77°F). Whenever possible, installations should be scheduled for seasons when outdoors temperatures are between 10 and 30°C (50 to 86°F). When temperatures are cooler than 10°C (50°F), then precautions should be taken to ensure the AS475 will cure correctly.

Three components must be considered when attempting to keep temperature above the minimum recommended application temperature.

2.1 PRODUCT

AS475 tends to thicken when cooled, making it difficult to mix and handle. We recommend that the product be maintained at a temperature of at least 20°C (68°F) for a minimum of 24 hours prior to use on a cool substrate. This heated storage should be maintained on the job site until mixing by storing in the cab of a heated vehicle or other means. This will allow easy mixing and pouring of the product.

2.2 SENSOR

The sensor should also be stored in a heated environment above 20°C (68°F) for 24 hours prior to and up until the sensor is to be installed.

2.3 SUBSTRATE

The substrate is much more difficult to warm. Placing an enclosure over the prepared sensor opening in the roadway and warming is the best way to ensure a warm and dry substrate for the grout to adhere to and the product will cure properly.

This can be accomplished by constructing a wooden box with conventional, incandescent bulbs on the inside as a heat source and powering by a generator if necessary. The box is placed over the clean, prepared slot and sensor with mounting apparatus to warm up the pavement and sensor. The grout is mixed, the cover removed and the sensor is installed normally. Immediately after pouring the grout and checking the sensor location, the cover is placed over the complete installation to aid in curing.

Another method is to force heated air through a duct placed over the sensor installation location before and after the grout is poured.

Care should be taken to avoid excessive heat. Excessive heat can damage the sensor or substrate. At no time should the installation materials be heated above 40°C (104°F).

NOTE: Open flames are EXTREMELY dangerous near most grout and epoxy products and should not be used due to explosion hazard.

3.0 MSDS – METHYL METHACRYLATE (AS475 SYSTEM 400)

3.1 SECTION 1 –PRODUCT IDENTIFICATION AND USE

Product Identifier	Lafrentz Formulas 400 Series
Product Identification Number (PIN):	UN 1247
Product Use:	Permanent plastic traffic lines and markings
Manufactured and Supplied by:	Lafrentz Road Services Ltd. 8225 Coronet Road Edmonton, AB T6E 4N7 Telephone: (780) 465 7586
24 Hour Emergency Telephone Number	(613) 996-6666

3.2 SECTION 2 - HAZARDOUS INGREDIENTS

HAZARDOUS INGREDIENTS	%	CAS NUMBER	LD50 OF INGREDIENT	LC50 OF INGREDIENT
METHYL METHACRYLATE	8-10	80-62-6	7872 mg/kg	Not applicable
2 ETHYLHEXYL ACRYLATE	4-6	103-11-7	None	none

3.3 SECTION 3 - PHYSICAL DATA

PHYSICAL STATE	Thick Liquid
ODOUR AND APPEARANCE	Strong Characteristic Odor Thick Liquid, Color as on Label
ODOUR THRESHOLD	Less than 1 PPM
VAPOUR PRESSURE	47 mbar
VAPOUR DENSITY	3.45 of MMA (Air =1)
EVAPORATION RATE	Not available
BOILING POINT	100 ° C
FREEZING POINT	-48 ° C
PH	Not applicable
SPECIFIC GRAVITY	2.0 g/ml
COEFF. WATER/OIL DIST	Not applicable

3.4 SECTION 4 – FIRE AND EXPLOSION DATA

FLAMMABILITY	Yes, somewhat flammable
UNDER FOLLOWING CONDITIONS	When an open flame is introduced the product will burn slowly. Fire goes out when flame is taken away.
MEANS OF EXTINCTION	Water spray, Foam, and Carbon Dioxide Dry Chemical
FLASHPOINT	17 Degrees C
UPPER FLAMMABILITY LIMIT	12.5 (% by volume)
LOWER FLAMMABILITY LIMIT	2.1 (% by volume)
AUTOIGNITION TEMPERATURE	280 Degree C
HAZARDOUS COMBUSTION PRODUCTS	CO2; CO
SENSITIVITY TO IMPACT	None
SENSITIVITY TO STATIC DISCHARGE	None

3.5 SECTION 5 - REACTIVITY DATA

CHEMICAL STABILITY	Avoid heat, light and direct sunlight. Methyl Methacrylate monomer (MMA) tends to self-polymerization with heat build-up (exothermic reaction).
INCOMPATIBLE MATERIALS	Radical sources such as peroxides, AZ0 compounds, heavy metal ions, redox systems, amines, sulphur compounds. MMA acts as a strong solvent and can soften some plastic, paint and rubber.
CONDITIONS OF REACTIVITY	MMA has an inhibitor against self-polymerization. Oxygen of air improves the efficiency of the inhibitor. Avoid storage under oxygen free atmosphere
POSSIBLE HAZARDOUS DECOMPOSITION PRODCUTS	Not available

3.6 SECTION 6 - TOXICOLOGICAL PROPERTIES

ROUTES OF ENTRY:	
SKIN CONTACT	Yes
SKIN ABSORPTION	Yes
EYE CONTACT	Yes
INHALATION	Yes
INGESTION	Yes
ACUTE OVER EXPOSURE EFFECTS	May be irritating after swallowing , Skin contact or inhalation
CHRONIC OVER EXPOSURE EFFECTS	Dermatitis
EXPOSURE LIMITS	Not available
IRRITANCY OF PRODUCT	Eyes, Skin, Respiratory tract, and Gastrointestinal tract
SENSITIZATION TO PRODUCT	By skin contact
CARCINOGENICITY	None reported
TERATOGENICITY	None reported
REPRODUCTIVE TOXICITY	None reported
MUTAGENCITY	None reported
SYNERGISTIC PRODUCTS	None reported

3.7 SECTION 7 - PREVENTATIVE MEASURES

PERSONAL PROTECTIVE EQUIP	
GLOVES	Rubber or PVA
RESPIRATORY	Organic Vapor/Acid
EYES	Goggles
FOOTWEAR	Not applicable
CLOTHING	No special clothing
OTHER	Safety showers and eye wash systems
ENGINEERING CONTROLS	Use outdoors. Exhaust ventilation recommended when used indoors.
LEAK AND SPILL PROCEDURE	Add B.P.O. 3% by weight and mix in thoroughly. Peel off when like putty, then landfill.
WASTE DISPOSAL	Add 1% B.P.O. powder spread out not more then 3cm thick. Landfill when hard.
HANDLING PROCEDURES	Do not eat, drink or smoke while working with materials
STORAGE REQUIREMENTS	Store in cool, ventilated area. Keep away from incompatible materials
SPECIAL SHIPPING INFORMATION	Controlled under “Transport of Dangerous Goods” Legislation as a flammable.

3.8 SECTION 8 - FIRST AID MEASURES

SKIN	Rinse with soap and water. Remove clothing and shoes after flushing has begun.
EYE	Flush eyes with large amounts of water for at least 15 minutes. Seek medical attention
INHALATION	Inhalation of vapors may cause nausea, move individual to fresh air
INGESTION	If swallowed, keep at rest, seek medical attention.

3.9 SECTION 9 - PREPARATION DATE OF MSDS

PREPARED BY: LAFRENTZ ROAD SERVIES LTD. – Production Department DATE: May 3, 2000 PHONE NUMBER: (780) 465-7586
NOTICE: The data contained herein is based on information that Lafrentz Road Services Ltd. Believes to be reliable, but no expressed or implied warranty is made with regard to the accuracy of such data or its suitability for a given situation. Such data relates only to the specific product described and not to such product in combination with any other product and no agent of Lafrentz Road Services Ltd. Is authorized to vary any of such data. Lafrentz Road Services Ltd. And its agents disclaim all liability for any actions taken or forgone on reliance upon such data.

4.0 MSDS – B.P.O. POWDER

4.1 SECTION 1 – CHEMICAL PRODUCT AND COMPANY INFO

PRODUCT NAME	Cadox BFF-50
SYNONYM	Benzyl peroxide with dicyclohexyl phthalate
CAS #	Mixture
MANUFACTURERS NAME	Akzo Nobel Polymer chemicals LLC
ADDRESS	300 south Riverside Plaza Chicago, IL 60606
COUNTRY	USA
PRODUCT USE	Polymer initiator
ISSUE DATE	3/31/1994
CHEMICAL NAME	Dibenzoyl peroxide with dicyclohexyl phthalate
CHEMICAL FORMULA	Mixture
CHEMICAL FAMILY	Organic peroxides/Diacyl peroxides
PRODUCT/TECHNICAL INFORMATION	1-800-828-7929
MEDICAL/HANDLING EMERGENCY	1-914-693-6946
TRANSPORTATION EMERGENCY	Chemtrec 1-800-424-9300
REVISION DATE	12/08/1999
REVISION NO.	006

4.2 SECTION 2 - COMPOSITION INFORMATION

SUBSTNACE DESCRIPTION	PERCENT	CAS#
Dibenzoyl peroxide **	50.000	94-36-0
Dicyclohexyl phthalate	50.000	84061-7
**** SUBSTANCE IS A COMPOUND AND/OR MIXTURE**		

4.3 SECTION 3 HAZARDS IDENTIFICATION

APPEARANCE & ODOR	White granules with a slight odor
STATEMENT OF HAZARDS	Danger! Organic peroxide. Heat or contamination may cause hazardous decomposition. May cause eye, skin and respiratory tract irritation. May cause allergic skin reaction.
FIRE & EXPLOSION HAZARDS	Toxic and flammable vapors may be produced under combustion. Isolate from sources of ignition.
PRIMARY ROUTE OF EXPOSURE	Skin and eye contact are the primary routes of exposure to this product.
INHALATION ACUTE EXPOSURE	No toxic effects are expected to be caused by inhalation of fumes or vapors. Inhalation of powder, dust or fumes may be irritating to the upper respiratory system.
SKIN CONTACT – ACUTE	Skin contact may cause mild irritation
EYE CONTACT – ACUTE	Eye contact may cause mild to moderate irritation
INGESTION - ACUTE	This product has low order of toxicity. No significant toxic effects are expected.
CARCINOGENICITY	
IARC	No
NTP	No
OSHA	No
ACGIH	No

4.4 SECTION 4 - FIRST AID MEASURES

INHALATION	Remove to fresh air. If breathing becomes difficult, oxygen may be given, preferably with a physician's advice. If not breathing, give artificial respiration. Get medical attention.
SKIN CONTACT	Remove contaminated clothing and equipment. Wash all affected areas with plenty of soap and water for at least 15 minutes. DO NOT attempt to neutralize with chemical agents. Wash any contaminated clothing before reuse. Obtain medical advice if irritation occurs.
EYE CONTACT	Flush eyes with large quantities of running water for a minimum of 15 minutes. If the victim is wearing contact lenses, remove them. Hold the eyelids apart during the flushing to ensure rinsing of the entire surface of the eye and lids with water. DO NOT let victim rub eye(s). Do not attempt to neutralize with chemical agents. Oils or ointments should not be used at this time. Get medical attention if eye irritation occurs.
INGESTION	Immediately give several glasses of water. DO NOT induce vomiting. If vomiting occurs,

	keep head below hips to reduce the risk of aspiration. Give fluids again. Have a physician determine if condition of patient will permit induction of vomiting or evacuation of stomach. Never give anything by mouth to a person who is unconscious or convulsing.
MEDICAL CONDITIONS AGGRAVATED	Persons with pre-existing skin disease may be at an increased risk if exposed dermally to this material.
NOTE TO PHYSICIAN	No specific antidote is known. Based on the individual reactions of the patient, the physician's judgment should be used to control symptoms and clinical conditions.

4.5 SECTION 5 - FIRE FIGHTING MEASURES

FLASH POINT	N/D F N/D C
FLASH METHOD	ND
AUTOIGNITION TEMPERATURE	N/D F N/D C
UPPER EXPLOSION LIMIT	N/D
LOWER EXPLOSION LIMIT	N/D
EXTINGUISHING MEDIA	Use water fog, dry chemical, carbon dioxide, or foam extinguishing agents. Extinguish large fires with large amount of water spray, fog or foam from a safe/protected position.
FIREFIGHTING PROCEDURES	As in any fire, prevent human exposure to fire, smoke, fumes or products of combustion. Evacuate non-essential personnel from the fire area. Firefighters should wear full-face, self-contained breathing apparatus and impervious protective clothing. If possible, move container from the fire area. If not leaking, keep fire exposed containers cool with a water fog or spray to prevent rupture due to excessive heat. High pressure water may spread product from broken containers increasing contamination or fire hazard. Dike fire control water for later disposal. Do not allow contaminated water to enter waterways.
FIRE & EXPLOSION HAZARDS	Toxic and flammable vapors may be produced under combustion. Isolate from sources of ignition
OTHER FIRE & EXPLOSION HAZARDS	This product can produce flammable vapors which may travel to a source of ignition and flash back
HAZARDOUS PRODUCTS/COMBUSTION	Oxides of carbon and biphenyl (OSHA PEL=1 mg/m2; ACGIH TLV=1.3mg/m3) are produced during the decomposition of this product. Flammable gases and vapors may also be produced during thermal decomposition.
NFPA HEALTH RATING	2
NFPA FLAMMABILITY RATING	2
NFPA REACTIVITY RATING	2

4.6 SECTION 6 - ACCIDENTAL RELEASE MEASURES

CLEANUP	Remove all sources of ignition from the spill area. Stop source of spill. If tools are needed, they should be non-sparking. Dike area to prevent spill from spreading. Evacuate all non-essential personnel unwind. Any person entering an area of a significant spill or of an unknown concentration of a gas or a vapor should use a NOISH-approved, positive-pressure/pressure-demand, self-contained breathing apparatus. Protective equipment to prevent skin and eye contact should be worn. Soak up spilled material with a suitable absorbent such as clay, sand or earth. Sweep up absorbed material and place in a chemical waste container for disposal.

4.7 SECTION 7 - HANDLING AND STORAGE

HANDLING	Wear protective clothing when handling this product to avoid eye and skin contact. Wash thoroughly after handling. Electrically grounded tanks and containers should always be used as should non-sparking, electrically grounded hand tools and appliances. Ground or bond to ground all vessels when transferring to prevent the accumulation of static electricity. See National Electric Code. Emptied container may retain product residues. Follow all warnings and precautions even after container is emptied.
STORAGE	To insure product quality, storage temperatures should not exceed 77 F (25 C). To insure against possible exothermic self-accelerating decomposition, storage temperature is derived from the SADT (see Section 10). Keep containers tightly closed. Store away from reducing agents, strong oxidizers, acids, alkalis and

	accelerators.
MAX STORAGE TEMPERATURE	77.0 F (25.00 C)
GENERAL COMMENTS	Containers should not be opened until ready for use. Use clean non-sparking equipment and tools when handling

4.8 SECTION 8 - EXPOSURE CONTROL/PERSONAL PROTECTION

RESPIRATORY	Use a NOISH-approved organic vapor respirator with dust, mist and fume filter to reduce potential for inhalation exposure if use conditions generate vapor, mist or aerosol and adequate ventilation (e.g., outdoor or well-ventilated area) is not available. Where exposure potential necessitates a higher level of protection, use a NOISH-approved, positive-pressure/pressure-demand, air supplied respirator. When using respirator cartridges or canisters, they must be changed frequently (following each use or at the end of the work shift) to assure breakthrough exposure does not occur.
SKIN	Skin contact with liquid or its aerosol should be minimized through the use of suitable protective clothing, gloves and footwear selected with regard for use condition exposure potential.
EYE	Because eye contact with this product may cause irritation, chemical goggles and /or a face shield should be worn when handling this product.
VENTILATION	Local exhaust ventilation, enclosed system design, continuous monitoring devices, process isolation and remote control are traditional exposure control techniques which may be used to effectively minimize exposure
OTHER	Safety showers, with quick opening valves which stay open, should be readily available in all areas where this material is handled or stored. Water should be supplied through insulated and heat-traced lines to prevent freeze-ups in cold weather.
EXPOSURE LIMITS	Available exposure limits applicable to this product are shown below.

EXPOSURE LIMITS/REGULATORY INFORMATION (IN MG/M3)

SUBSTANCE DESRIPTION	REG. AGCY	PEL	TLV	TWA	STEL	CEIL
Dibenzoyl peroxide						
	OSHA	5.0000	N/D	N/D	N/D	N/D
	ACGIH	N/D	5.000	N/D	N/D	N/D
	NIOSH	N/D	N/D	5.000	N/D	N/D
	SUPPLIER	N/D	N/D	N/D	N/D	N/D
Dicyclohexyl phthalate						
	OSHA	N/D	N/D	N/D	N/D	N/D
	ACGIH	N/D	N/D	N/D	N/D	N/D
	NIOSH	N/D	N/D	N/D	N/D	N/D
	SUPPLIER	N/D	N/D	N/D	N/D	N/D

LEGEND:	EXPSOURE LIMIT DESCRIPTION
CEIL	Ceiling Exposure Limit
PEL	Permissible Exposure Limit
STEL	Short Term Exposure Limit
TLV	Threshold limit value
TWA	Time weighted average
N/D	Not determined

4.9 SECTION 9 – PHYSICAL AND CHEMICAL PROPERTIES

VAPOR PRESSURE (MM Hg)	N/D
VAPOR DENSITY (AIR =1.0)	N/D
EVAPORATION RATE	N/D
VOLATILE %	N/D
BOILING POINT	N/D F N/D C
ODOUR THRESHOLD (PPM)	N/D
SPECIFIC GRAVITY	N/D
BULK DENSITY	N/D
SOLUBILITY IN WATER	N/D Insoluble
SOLUBILITY IN OTHER SOLVENTS	N/D
COEFFICIENT OF OIL/WATER	N/D
POUR POINT	N/D F N/D C
MELTING POINT	N/D F N/D C
PH FACTOR	N/D
CLOUD POINT	N/D F N/D C

FLASH POINT	N/D F N/D C
FLASH METHOD	N/D
UPPER EXPLOSION LIMIT	N/D
LOWER EXPLOSION LIMIT	N/D
AUTO IGNITION TEMPERATURE	N/D F N/D C
OTHER	SADT = 140 F (60 c) (See Section 10)

4.10 SECTION 10 – STABILITY AND REACTIVITY

STABILITY	This product is stable at ambient temperatures but may decompose is exposed to temperatures above 131 F (55 C)
INCOMPATIBILITIES	This product is incompatible with strong acids, strong oxidizers, strong bases, metal salts, reducing agents and accelerators.
POLVMERIZATION	Hazardous polymerization is not expected to occur under normal temperatures and pressures.
DECOMPOSITION	Decomposition products are carbon dioxide, carbon monoxide and biphenyl.
CONDITIONS TO AVOID	The SADT for this product is 140 F (60 C). The SADT (self accelerating decomposition temperature) is an experimentally derived temperature at which a typical package of the product will undergo self accelerating decomposition. Decomposition can be expected to be hazardous and uncontrollable. Under no circumstances should this product be exposed to temperatures near or above the emergency temperature of 131 F (55 C). Such an exposure could initiate hazardous decomposition. Contact with incompatible materials such as acids, alkalis, heavy metals and reducing agents will also result in hazardous decomposition.

4.11 SECTION 11 – TOXICOLOGICAL INFORMATION

INHALATION	Inhalation toxicity data is not available for this product. However, a 78% wet dibenzoyl peroxide product when tested in rats had an LC50 > 24.3mg/L after a 4 hour exposure
INHALATION CHRONIC	Prolonged and/or repeated inhalation may cause respiratory tract irritation
DERMAL	Dermal toxicity data is not available for this product. However, it is not considered a primary skin irritant or corrosive to skin based upon tests in rabbits with a 78% granular dibenzoyl peroxide product
DERMAL CHRONIC	Chronic dermal exposure effects for this product are not known. However prolonged and/or repeated contact is expected to cause mild irritation, dermatitis and may cause sensitization
EYE	The acute eye effects of this product have not been determined. However, a 78% granular dibenzoyl peroxide product was a slight irritant to rabbit eyes (5 minutes) and moderate irritant to rabbit eyes (24 hours)
INGESTION	Ingestion toxicity data is not available for this product. However, the oral LD50 for a 78% granular dibenzoyl peroxide product is >5000 mg/kg in rats
INGESTION CHRONIC	Chronic ingestion effects of this product are not known
CARCINOGENICITY/MUTAGENICITY	While this product has not been evaluated for genetic activity, a 78% granular dibenzoyl peroxide product gave negative results in the Ames Test, Chromosome Aberration Assay, and the Mouse Dominant Lethal Test.
REPRODUCTION EFFECTS	The reproductive toxicity of this product is not known
NEUROTOXICITY	The neurotoxin effects for this product are not known
OTHER EFFECTS	No other toxic effects for this product are known
TARGET ORGANS	Overexposure to this product may affect the skin, eyes and respiratory system

4.12 SECTION 12 – ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFO	The ecological toxicity of this product is not known
DISTRIBUTON	Other ecological information on this product is not known
CHEMICAL FATE	Chemical fate information on this product is not known

4.13 SECTION 13 – DISPOSAL CONSIDERATIONS

WASTE DISPOSAL	The characteristic of reactivity per RCRA would be exhibited by the

	unused product if it becomes a waste material. The EPA Hazardous Waste Number of D003 would be applicable
CONTAINER DISPOSAL	Containers should be drained of residual product before disposal. Empty containers should be disposed of in accordance with all applicable laws and regulations

4.14 SECTION 14 – TRANSPORT INFORMATION

SHIPPING DESCRIPTION	Organic Peroxide Type D, Solid (Dibenzoyl Peroxide, 50%) 5.2, UN3106, PG II North American Emergency Response Guide No. L145
REQUIRED LABELS	Organic Peroxide
ENVIRON HAZARDOUS SUBSTNACE	This product does not contain an environmentally hazardous substance per 49 CFR 172.101, Appendix A

4.15 SECTION 15 – REGULATORY INFORMATION

DIBENZOYL PEROXIDE IS SUBJECT TO THE FOLLOWING	ENVIRONTMENTAL LIST DSL Domestic Substance List – Canada MA. LIST Massachusetts Substance List NJ R-T-K New Jersey R-T-K Hazard. Sub. PA. LIST Penn. Hazardous Substance List SARA 313 SARA Title III, Section 313 TSCA Toxic Subst. Cont. Act – listed
DICYCLOHEXYL PHTHALATE IS SUBJECT TO THE FOLLOWING	ENVIRONTMENTAL LIST DSL Domestic Substance List – Canada TSCA Toxic Subst. Cont. Act – listed
OTHER REGULATORY INFORMATION	No other regulatory information is available on this product.
WHMIS HAZARD CLASS	C,D-2B,F
HAZARD RATING SOURCE	HMIS
HEALTH	2
REACTIVITY	2
FLAMMABILITY	2