

University of Notre Dame
2019-2020



NOTRE DAME ROCKETRY TEAM
MATERIALS SAFETY DOCUMENT

NASA STUDENT LAUNCH 2021
PLANETARY LANDING SYSTEM AND APOGEE CONTROL
SYSTEM

Updated November 1, 2020

365 Fitzpatrick Hall of Engineering

Notre Dame, IN 46556

Contents

Contents	i
1 Overview	1
2 OSHA Guidelines	1
3 Materials Handling Synopses	3
4 SDS Documents	11
4.1 Acrylic Enamel Paint	11
4.2 Aerotech Igniters	29
4.3 Aerotech Motors	31
4.4 Black Powder	33
4.5 Carbon Fiber	38
4.6 Electric Match Igniter	51
4.7 Elmer's Carpenter's Wood Glue	60
4.8 Elmer's School Glue	69
4.9 G10 Fiberglass	74
4.10 JB Weld Steel Reinforced Epoxy Twin Tubes Parts A and B	78
4.11 Lithium Polymer Battery	100
4.12 PLA 3D Printer Filament	110
4.13 Rocketpoxy Part A	119
4.14 Rocketpoxy Part B Curing Agent	123

1 Overview

The Materials Safety Document is a compilation of all Safety Data Sheets (SDS) for materials used in construction of the rocket. All SDS documents are attached for reference when a team member is to handle or encounter a material. An overview of the contents of an SDS, as required by the Occupational Safety and Health Administration (OSHA) is located in Section 2. A table of synopses for handling, personal protective equipment (PPE), and relevant first aid procedures can be found in Section 3. All SDS documents are attached for reference when a team member is to handle or encounter a material, and can be located in Section 4. All team members are expected to be aware of all hazards and requirements for each materials. The Materials Handling Synopses is not a substitute for the content in each SDS document, but a short overview of areas of concern. A copy of this document will be shared with each member of the Notre Dame Rocketry Team (NDRT), and a physical copy can be found in the NDRT workshop.

2 OSHA Guidelines

We will be using a Materials Safety Data Sheet (SDS) for each material that has a possibility of being used in construction, launch, or any other capacity. An SDS is a 16-section document outlining handling, first aid, and necessary PPE among other guidelines for using a materials.

Section 1 Identification of the chemical product and the company that distributes it.

Also contains a signal word and identified hazards.

Section 2 Information and composition on ingredients, which identifies specific species and route.

Section 3 Hazard Identification of potential health effects from skin contact, skin absorption, eye contact, inhalation, or ingestion, WHMIS symbols also given.

Section 4 First aid measures in case of skin contact, eye contact, inhalation, and ingestion.

Section 5 Fire fighting measures including conditions, flammability, means of extinction, fire characteristics, hazards of combustible products, and NFPA standards.

Section 6 Accidental release measures for environmental and other protection in case of spill, leak, or other accidental release.

Section 7 Handling and Storage productive and equipment, also specifications of storage requirements.

Section 8 Exposure control and personal protection equipment specifications of limits of ACGIH TLV, OSHA PEL, or other specific engineering controls such as ventilation or enclosure. Also specifications of personal protection such as gloves, respirators, eye protection, footwear, clothing, and other.

Section 9 Physical and chemical properties such as physical state, appearance, density, distribution, and other properties.

Section 10 Stability and reactivity of the chemical under certain conditions, and hazards of decomposition products.

Section 11 Toxicological information such as effects of acute or chronic exposure, irritancy, and other toxicological effects.

Section 12 Ecological information such as aquatic toxicity.

Section 13 Disposal considerations for waste.





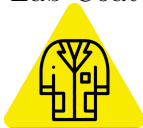
Section 14 Transportation information such as special shipping information, PIN, and regulations by TD, DOT, ICAO, IMO.



Section 15 Regulatory information from WHMIS classification, OSHA, SERA, TSCA and the products classification with CPR.






Section 16 Other Information




3 Materials Handling Synopses






Table 1: Material Safety Data Sheets Synopses




Material Name	Signal Word	Handling	Required PPE	Relevant First Aid
Acrylic Enamel Paint	Danger 	Keep away from flames and sources of heat. Residual vapors are very flammable. Only use outdoors or in a well-ventilated area. Wash hands thoroughly after handling. Wear long sleeves and impervious clothing when painting.	Respirator  Safety Goggles  Nitrile Rubber Gloves  Lab Coat 	Ingestion: Rinse mouth. Do NOT induce vomiting. Seek medical attention. Eyes: Flush with water for 15-30 minutes. Remove contacts. Keep eyes open while rinsing. Get medical attention. Inhalation: Remove to fresh air. Place victim in a position that makes breathing easy. Skin: Wash affected area with soap and water for 15-30 minutes. Remove contaminated clothing.
Aerotech Igniters	None	Keep away from flames and sources of heat. Keep in package until ready to use.	None	Ingestion: Induce vomiting. Seek medical attention. Mild burn: Apply first aid ointment. Severe burn: Immerse in cold water. Seek medical attention immediately.




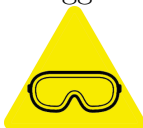
Aerotech Motors	None	Keep away from flames and sources of heat. Keep in package until ready to use.	Nitrile Rubber Gloves 	Ingestion: Induce vomiting. Seek medical attention. Mild burn: Apply first aid ointment. Severe burn: Immerse in cold water. Seek medical attention immediately.
Black Powder (Potassium Nitrate)	Warning 	No smoking near product. Keep away from sparks, flames, friction, impact, and other sources of heat.	None	Injury from Detonation: Call 911. Seek medical attention immediately.







Carbon Fiber	<p>Danger</p> 	<p>Do not get in eyes, on skin, or on clothing. Do not taste or swallow. Keep away from sources of heat or ignition.</p>	<p>Safety Goggles </p> <p>Lab Coat </p> <p>Nitrile Rubber Gloves </p> <p>Heat-Resistant Gloves (when heating) </p>	<p>Inhalation: Remove from exposure and move to fresh air.</p> <p>Skin: If there is a reaction, flush skin with lots of soap and water for at least 15 minutes. Remove contaminated clothing. Get medical attention if irritation develops or persists.</p> <p>Eyes: Flush eyes with lots of water for at least 15 minutes while lifting upper and lower eyelids. Get medical aid immediately.</p> <p>Ingestion: Do NOT induce vomiting. If able, rinse mouth and drink 2-4 cups of milk or water.</p>
--------------	-------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Electric Match Igniter	<p>Danger</p> 	<p>Keep away from sources of heat or ignition. Store in a cool, dry place. Avoid prolonged contact with skin. Store in original packaging until immediately before use. Store in accordance with local requirements for explosives.</p>	<p>Safety Goggles</p> 	<p>Inhalation: Remove from exposure and move to fresh air. If not breathing, administer CPR. Get medical aid.</p> <p>Eyes: Flush using an eye wash station for at least 15 minutes, occasionally lifting both eyelids. Get medical aid immediately.</p> <p>Ingestion: Do NOT induce vomiting. Rinse mouth with 2-4 cupfuls of milk or water. Get medical aid immediately.</p> <p>Skin: If irritation on skin, flush with soap and water for at least 15 minutes. Remove contaminated clothing and shoes.</p>
Elmer's Carpenter's Wood Glue	None	Use with adequate ventilation.	<p>Safety Goggles</p> 	<p>Eyes: Flush using an eye wash station. Contact a medical professional immediately.</p> <p>Ingestion: Do NOT induce vomiting. Rinse mouth thoroughly with water. Contact Poison Control immediately.</p> <p>Skin: Wash with plenty of soap and water.</p>

Elmer's School Glue	None	No guidelines.	None	<p>Eyes: Find an eye wash station. Contact a medical professional immediately.</p> <p>Ingestion: Do NOT induce vomiting. Contact Poison Control immediately.</p>
G10 Fiberglass	<p>Warning</p> 	<p>Use dust control equipment at the point of generation in machining or sanding operations.</p> <p>Wash hands and other exposed areas thoroughly after handling.</p> <p>Keep away from sources of heat or ignition.</p> <p>Do not wear contacts when working with this product.</p>	<p>Safety Goggles</p>  <p>Lab Coat</p>  <p>Nitrile Rubber Gloves</p>  <p>Heat-Resistant Gloves (when heating materials)</p> 	<p>Inhalation: Remove from exposure and move to fresh air. If not breathing, administer CPR.</p> <p>Skin: Wash contaminated area with soap and water. Get medical attention if irritation develops or persists.</p> <p>Eyes: Flush eyes with lots of water for at least 15 minutes while lifting upper and lower eyelids. Get medical aid immediately.</p> <p>Ingestion: Do NOT induce vomiting. Get medical attention immediately.</p>

JB Weld Steel Reinforced Epoxy	Warning 	Do not store below 35°C (95°F).	Respirator  Nitrile Rubber Gloves 	<p>Inhalation: Remove victim to fresh air. Place in a position that is comfortable for breathing. Administer CPR if the victim is not breathing. Seek medical attention immediately.</p> <p>Skin: Wash skin with soap and water, remove contaminated clothing, rinse skin for 10 minutes. Seek medical attention.</p> <p>Eyes: Rinse eyes using eye wash station. Seek medical attention.</p> <p>Ingestion: Wash out mouth with water. If swallowed, drink small sips of water. Do not induce vomiting unless medically advised. Seek medical attention.</p>
-----------------------------------------	----------------------------------------------------------------------------------------------	---------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Lithium Polymer Battery	<p>Warning</p> 	<p>Do not immerse in water. Do not disassemble or deform the battery. Do not expose to, or dispose of the battery in fire. Avoid excessive physical shock or vibration. Battery must be charged in an approved charger. Never use a modified or damaged charger. Store in a cool, dry and well-ventilated area.</p>	<p>Only required if cell has leak or vent:</p> <p>Respirator</p>  <p>Nitrile Rubber Gloves</p>  <p>Safety Goggles</p> 	<p>Ingestion: Wash out mouth with water. Do not induce vomiting unless medically advised. Seek immediate medical attention.</p> <p>Inhalation: Remove victim from chemical exposure to fresh air. Seek medical attention.</p> <p>Skin: Immediately flush with water. Seek medical attention.</p> <p>Eyes: Rinse eyes using eye wash station. Seek medical attention.</p>
Makerbot PLA	None	Store in a cool, dry place. Store below 50°C.	None	<p>Skin: Wash with soap and water.</p> <p>Ingestion: Rinse mouth with water. Seek medical attention.</p>

<p>Rocketpoxy Part A</p>	<p>Warning</p> 	<p>Store in a cool, dry place. Reseal partly used containers. Properly label all containers.</p>	<p>Nitrile Rubber Gloves</p>  <p>Safety Goggles</p> 	<p>Eyes: Flush eyes for 15 minutes. Seek medical attention. Skin: Wash with large amounts of soap and water. Remove contaminated clothing. Ingestion: Do not induce vomiting. Drink copious amounts of water. Seek medical attention immediately.</p>
<p>Rocketpoxy Part B Curing Agent</p>	<p>Danger</p> 	<p>Store in a cool, dry place. Reseal partly used containers. Properly label all containers.</p>	<p>Nitrile Rubber Gloves</p>  <p>Safety Goggles</p> 	<p>Eyes: Flush eyes for 15 minutes. Seek medical attention. Skin: Wash with large amounts of soap and water. Remove contaminated clothing. Ingestion: Do not induce vomiting. Drink copious amounts of water. Seek medical attention immediately.</p>

4 SDS Documents

4.1 Acrylic Enamel Paint

SAFETY DATA SHEET



DATE ISSUED :	5/14/2016
SDS REF. No :	A-4100 SERIES

A-4100 SERIES ACRYLIC ENAMEL AEROSOL

1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: A-4100 SERIES ACRYLIC ENAMEL AEROSOL

PRODUCT CODE: A-4100 SERIES

PRODUCT USE: Industrial Aerosol Touch Up Paint

MANUFACTURER

Cardinal Industrial Finishes
1329 Potrero Ave

S. El Monte, CA,
626 444-9274

24 HR. EMERGENCY TELEPHONE NUMBER

CHEMTREC (US Transportation): (800)424-9300

CHEMTREC (International Transportation) : 1(202)483-7616

WEB: WWW.CARDINALPAINT.COM

2. HAZARDS IDENTIFICATION

PICTOGRAMS



SIGNAL WORD : DANGER

HAZARD STATEMENTS :

H223 Flammable aerosol.

H319 Causes serious eye irritation.

H336 May cause drowsiness or dizziness.

PRECAUTIONARY STATEMENTS :

P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.

P264 Wash thoroughly after handling.

P280 Wear protective gloves/protective clothing/eye protection/face protection.

P304 + P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.

P312 Call a POISON CENTER or doctor/physician if you feel unwell.

P337 + P313 If eye irritation persists: Get medical advice/attention.

P403 Store in a well-ventilated place.

P501 Dispose of in accordance with Local, Regional, State, Federal and International Regulations.

R40 Limited evidence of a carcinogenic effect.

S36 Wear suitable protective clothing.

S37 Wear suitable gloves.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	Weight %	CAS Number	
Acetone	25% - 30%	67-64-1	
Propane Blend	25% - 30%	74-98-6	

Methyl Ethyl Ketone	15% - 20%	78-93-3	
Methyl Isobutyl Ketone	5% - 10%	108-10-1	
n-Methyl-2-pyrrolidone	1% - 5%	872-50-4	
Ethylene glycol mono butyl ether	1% - 5%	111-76-2	
Isobutyl Acetate	1% - 5%	110-19-0	

The follow substances may be present in varying quantities depending on color.

Titanium Dioxide	0% - 60%	13463-67-7	
Carbon Black	0% - 40%	1333-86-4	

4. FIRST AID MEASURES

Description of first aid measures.

EYES CONTACT : Flush with large quantities of water for 15 to 30 minutes. Remove contact lenses. Keep eyes wide open while rising. If eye irritation persists: Get medical attention.

SKIN CONTACT : Wash exposed area with mild soap and water for 15 to 30 minutes. Remove contaminated clothing. Repeated exposure may cause dryness or cracking.

INGESTION : Rinse mouth. Do NOT induce vomiting. Keep victim warm and seek immediate attention.

INHALATION : Remove to fresh air and keep in a position comfortable to breath. Call a doctor/physician if you feel unwell. Get medical attention.

Most important symptoms and effects, both acute and delayed. Symptoms/injuries: Eye irritation

Symptoms/injuries after inhalation: May cause drowsiness or dizziness.

Symptoms/injuries after eye contact: Cause serious eye irritation.

Symptoms/injuries after ingestion: Ingestion may cause nausea, vomiting and diarrhea.

Indication of any immediate medical attention and special treatment needed.

If medical advise is needed, have product container or label on hand.

5. FIRE FIGHTING MEASURES

SUITABLE EXTINGUISHING MEDIA : In the event of a fire, use specifically suitable extinguishing agents. Suitable extinguishing media: Foam, alcohol resistant foam, CO₂, water fog. Unsuitable extinguishing media: Do not use heavy water stream. A heavy water stream may spread burning liquid.

FIRE FIGHTING PROCEDURE : Firefighting instructions: Use water spray or fog for cooling exposed containers. Exercise caution when fighting any chemical fire. Prevent fire-fighting water from entering the environment. Protection during firefighting: Firefighters should wear full protective gear. Do not enter fire area without proper protective equipment, including self-contained breathing apparatus with full face piece operated in pressure demand or other positive pressure modes.

UNUSUAL FIRE AND EXPLOSION HAZARD : Fire hazard: Highly flammable/liquid or vapor.

Explosive hazard: May form flammable/explosive vapor-air mixture.

6. ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS, PROTECTIVE EQUIPMENT AND EMERGENCY PROCEDURES :

General measures: Remove ignition sources. Use special care to avoid static electric charges. No smoking.

FOR NON-EMERGENCY PERSONNEL :

For non-Emergency procedures: Evacuate unnecessary personnel.

FOR EMERGENCY RESPONDERS :

Equip cleanup crew with proper protection. Avoid breathing fume, vapors.

ENVIRONMENTAL PRECAUTIONS :

Prevent entry to sewers and public waters.

METHODS AND MATERIAL FOR CONTAINMENT AND CLEAN UP :

Collect damaged aerosols and use absorbent and/or inert material, then place in suitable container.

7. HANDLING AND STORAGE**PRECAUTIONS FOR SAFE HANDLING :** Additional hazards when processed: Handle empty containers with care because residual vapors are flammable.

Precautions for safe handling: Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when you are leaving work. Provide good ventilation in process area to prevent formation of vapor. No smoking. Use only non-sparking tools. Use outdoors or in a well ventilated area. Avoid breathing fume, vapors.

Hygiene measures: Wash Skin thoroughly after handling.

CONDITIONS FOR SAFE STORAGE, INCLUDING INCOMPATIBILITIES : Storage conditions: Store in a dry, cool and well-ventilated place away from: Heat sources. Direct sunlight.

Incompatible products: Strong bases. Strong acids.

Incompatible materials: Source of ignition. Direct sunlight. Heat Sources.

8. EXPOSURE CONTROLS\PERSONAL PROTECTION

Acetone(67-64-1)		
USA ACGIH	ACGIH STEL TLV	750 ppm
USA ACGIH	ACGIH TWA TLV	500 ppm
USA NIOSH	NIOSH STEL (Table Z-1)	1,000 ppm, 2,400 mg/m3
USA NIOSH	NIOSH TWA	250 ppm, 590 mg/m3
USA OSHA	OSHA TWA (Table Z-1)	1,000 ppm, 2,400 mg/m3
Aluminum Hydroxide(21645-51-2)		
USA ACGIH	ACGIH (TLV) TWA	10 mg/m3 (Total dust), 3 mg/m3 (Respirable fraction)
USA OSHA	OSHA (PEL) TWA	15 mg/m3 (Tptal dust), 5 mg/m3 (Respirable fraction)
Carbon Black(1333-86-4)		
USA ACGIH	ACGIH TLV (mg/m3)	3.0 mg/m3
USA OSHA	OSHA PEL (mg/m3)	3.5 mg/m3
Ethylene glycol mono butyl ether(111-76-2)		
USA ACGIH	ACGIH TWA (ppm)	20 ppm
USA NIOSH	NIOSH REL (ppm)	5 ppm
USA OSHA	OSHA PO TWA (ppm)	25 ppm
USA OSHA	OSHA TABLE Z-1 TWA (mg/m3)	50 ppm, 240 mg/m3
Isobutyl Acetate(110-19-0)		
USA ACGIH	ACGIH TWA TLV	150 ppm
USA OSHA	OSHA PEL (TABLE Z-1)	150ppm, 700 mg/m3
Isobutyl Alcohol(78-83-1)		
USA ACGIH	ACGIH TWA	50 ppm
USA OSHA	OSHA PEL	100 ppm, 300 mg/m3
Methyl Ethyl Ketone(78-93-3)		
USA ACGIH	ACGIH STEL (ppm)	300 ppm
USA ACGIH	ACGIH TWA (ppm)	200 ppm
USA OSHA	OSHA PEL (STEL) (ppm)	100 ppm
USA OSHA	OSHA PEL TWA (mg/m3)	410 mg/m3
Methyl Isobutyl Ketone(108-10-1)		
USA ACGIH	ACGIH TLV (ppm)	75 ppm
USA NIOSH REL	NIOSH STEL (ppm)	75 ppm
USA NIOSH REL	NIOSH TWA (ppm)	50 ppm
USA OSHA	OSHA TWA (ppm)	100 ppm
n-Methyl-2-pyrrolidone(872-50-4)		
USA ACGIH	ACGIH PEL	N/E
USA OSHA	OSHA TWA	N/E
Phenylethane(100-41-4)		
USA ACGIH	ACGIH STEL	125 ppm
USA ACGIH	ACGIH TWA	20 ppm
USA NIOSH	NIOSH REL	100 ppm, 435 mg/m3

USA NIOSH	NIOSH REL (ST)	125 ppm, 545 mg/m3
USA OSHA	OSHA STEL	125 ppm, 545 mg/m3
USA OSHA	OSHA TWA (Table Z-1)	100 ppm, 435 mg/m3
Propane Blend(74-98-6)		
ACGIH	ACGIH	N/E
USA OSHA	OSHA PEL (TWA) (ppm)	1000 ppm
USA OSHA	OSHA PEL (TWA) mg/m3	1800 mg/m3
Styrene(100-42-5)		
USA ACGIH	ACGIH STEL (ppm)	40 ppm
USA ACGIH	ACGIH TWA (ppm)	20 ppm
USA OSHA	OSHA TWA (ppm)	100 ppm
Titanium Dioxide(13463-67-7)		
PEL(Permissible Exposure Limit)	OSHA TWA	15 mg/m3
TLV	ACGIH TWA	10 mg/m3
Xylene(1330-20-7)		
USA ACGIH	ACGIH STEL	150 ppm
USA ACGIH	ACGIH TWA	100 ppm
USA OSHA	OSHA TWA (Table Z-1)	100 PPM, 435 mg/m3

PERSONAL PROTECTIVE EQUIPMENT

RESPIRATORY PROTECTION : If TLV of the product or any component is exceeded, a NIOSH approved dust respirator is advised in absence of environmental control. OSHA Regulations also permit other NIOSH dust respirators under specified conditions. (See your Safety Equipment Supplier) Engineering or administrative controls should be implemented to reduce exposure.

HAND PROTECTION REMARKS : The suitability for a specific workplace should be discussed with the producers of the protective gloves.

EYES PROTECTION : Eye wash bottle with pure water.
Tightly fitting safety goggles.
Where face-shield and protective suit for abnormal processing problems.

SKIN AND BODY PROTECTION : Wear impervious clothing. Choose body protection according to the amount and concentration of the dangerous substance at the work place.

WORK HYGIENIC PRACTICES: When using do not eat or drink. When using do not smoke. Wash hands before breaks and at the end of workday.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state	:	Liquid
Color	:	Various colors depending on the pigmentation.
Odor	:	Characteristic. Sweet. Mint like.
Odor threshold	:	No data available.
Ph	:	N/A – See Technical Data Sheet
Evaporation rate	:	Slower Than Ether
Melting point	:	-94.7 C (-138.46 F)
Freezing point	:	No data available.
Boiling point	:	-44.0 deg F TO 397.0 deg F
Flash point	:	-154.00 deg F
Lower explosion limit	:	1.1
Upper explosion limit	:	12.8
Vapor pressure	:	185 mm Hg
Vapor density	:	Heavier than air
Relative density	:	No data available.
Density	:	6.4452
Solubility	:	No data available.
Partion coefficient: n-octanol/water	:	No data available.
Autoignition temperature	:	No data available.
Decomposition temperature	:	No data available.

10. STABILITY AND REACTIVITY

REACTIVITY : No dangerous reaction known under conditions of normal use.

CHEMICAL STABILITY : Stable under normal conditions.

CONDITIONS TO AVOID : Heat, flames and sparks. Extremely high temperatures and direct sunlight.

INCOMPATIBLE MATERIALS : Avoid contact with strong oxidizing agents.

HAZARDOUS DECOMPOSITION PRODUCTS: Carbon dioxide (CO₂), carbon monoxide (CO), oxides of nitrogen (NO_x), dense black smoke.

11. TOXICOLOGICAL INFORMATION

Acetone(67-64-1)	
Aspiration toxicity	Remarks: Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting., Concentrations substantially above TLV value may cause narcotic effects., Solvents may degrease the skin.
Carcinogenicity	Species: mouse, (female), Application Route: Dermal; Exposure time: .365 d (90%) or 424 d (100%), Dose: 0.1ml 90(71mg) or 100% (79mg), Frequency of Treatment: 3 times a wk, NOAEL: 79; Result: did not display carcinogenic properties., Carcinogenicity-Assessment: Not classified as a human carcinogen.
Germ cell mutagenicity	Test Type: mammalian cell gene mutation assay. Test species: Mouse Lymphoma, Metabolic activation: Without metabolic activation; Method: OECD Guideline 476; Result: negative; Test Type: Ames test, Metabolic activation: Without metabolic activation; Method: OECD Guideline 471; Result: negative, Test Type: Chromosome aberration test in vitro, Test species: Chinese hamster ovary (CHO), Metabolic activation: Without metabolic activation; Method: OECD Guideline 473; Result: negative; Genotoxicity in vivo: Test Type: I vivo micronucleus test. Test species: Mouse, Application Route: Oral, Exposure: 13 wk, Dose: 5,000, 10,000, 20,000 ppm, Result: negative
Germ cell mutagenicity Assessment	Animal testing did not show any mutagenic effects.
LC50 (rat) Inhalation	76 mg/l (4 h exposure)
LD50 (rat) Oral	5,800 mg/kg; Symptoms: tremors
LD50 Dermal	>7,426 mg/kg
Repeated dose exposure	Species: mouse, male, NOAEL: 20,000, Application Route: Oral, Exposure time: 13 wk, Number of exposures: daily, Dose: 1250, 2500, 5000, 10000, 20000, Method OECD Test Guideline 408, GLP: No data available.; Species: mouse, female, NOAEL 20000, LAOEL: 50000; Application Route: Oral, Exposure time: 13 wk, Number of exposures: daily, Dose: 1250, 2500, 5000, 10000, 20000, Method OECD Test Guideline 408, GLP: No data available; Repeated dose toxicity Assessment: causes mild skin irritation., Causes serious eye irritation.
Reproductive toxicity	Effects on fertility: Species: rat, male; Application Route: oral; Dose: 0, 5,000, 10,000 mg/l; Frequency of Treatment: 7 days/week; General Toxicity - Parent: LOAEL: 10,000; Fertility: 10,000; Effects on fetal development: Species: rat; Application Route: Inhalation; Dose: 0, 440, 2200, 11,000 ppm; Frequency of Treatment: 7 days/week; General Toxicity Material: NOAEC: 2,200 ppm; Tetragenicity: NOAEC: 2,200 ppm; Embryo-fetal toxicity: NOAEC: 2,200 ppm; Result: No teratogenic potential. GLP: No data available.; Reproductive toxicity Assessment: Did not show teratogenic effects in animal experiments.
Respiratory or skin sensitisation	Test type: Maximization test, Species: guinea pig, Assessment: Does not cause skin sensitization. Result: Did not cause sensitization on laboratory animals.
Serious eye damage/eye irritation	Species: rabbit, Result : Slightly irritating to eyes, Exposure time: 24 h, Classification: Irritating to eyes, Remarks: Eye irritation.
Skin corrosion/irritation	Species: rabbit, Exposure time: 24 h, Classification: Not irritating to skin, Method: In vivo, Result: Mild irritation, Remarks: Repeated or prolonged contact with the mixture may cause removal natural fat from the skin resulting in desiccation of the skin.
STOT - single exposure	Exposure routes: Inhalation (vapor); Assessment: May cause drowsiness or dizziness.
STOT- repeated exposure	No data available.
Aluminum Hydroxide(21645-51-2)	
Additional Information	RTECS: BD0940000 Nausea, Vomiting, and Constipation.
Aspiration hazard	No data available.
Carcinogenicity	IARC: No components of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC. ACGIH: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH. NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP. OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.
Dermal	No data available.
Germ cell mutagenicity	Mouse lymphocyte Result- negative Mutagenicity (micronucleus test) Rat - male Result: negative
Inhalation	No data available.
LD50 Oral - Rat -	>5,000 mg/kg, Oral - Rat - female

female - Acute toxicity	
Reproductive toxicity	No data available.
Respiratory or skin sensitization	Maximization Test (GPMT) - Guinea pig Result- Does not cause skin sensitization.(OECD Test Guideline 406)
Serious eye damage/eye irritation	Eyes - Rabbit Result: No eye irritation (OECD Test Guideline 405)
Skin corrosion/irritation	Skin - Rabbit Result: No skin irritation - 4 h (OECD Test Guideline 404)
Specific target organ toxicity - repeated exposure	No data available.
Specific target organ toxicity - single exposure	No data available.
Amorphous Silica(7631-86-9)	
Additional toxicological information	The product is not subject to classification according to internally approved calculation methods for preparations: When used and handled according to specifications, the product does not have any harmful effects according to our experience and information provided to us.
Irritant of skin	Not irritating (rabbit) (OECD 404)
Irritant of eyes	Not irritating (rabbit) (OECD 405)
LC0 - Inhalative	>140->2000 mg/m ³ / 4 h (Rat) (OECD 403)
LD50 - Dermal - Rabbit	>5000 mg/kg (Rabbit)
LD50 - Oral - Rat	>5000 mg/kg (Rat) (OECD 401)
Other information - Oral	=> 1340 mg/kg/day
Sensitization	Not sensitizing (guinea pig) (OECD 406)
Carbon Black(1333-86-4)	
ACGIH	ACGIH The American Conference of Governmental Industrial Hygienists classifies carbon black as A4, Not Classifiable as a Human Carcinogen.
Carcinogenicity Classification	GHS- Not a hazardous substance or preparation according to the Global Harmonized System (GHS).
Human Epidemiology	Results of epidemiological studies of carbon black production workers suggest that cumulative exposure to carbon black may result in small decrements in lung function, as measured by FEV1. A recent U.S. respiratory morbidity study suggested a 27 mL decline in FEV1 from a 1 mg/m ³ (inhalable fraction) exposure over a 40-year period. An older European investigation suggested an exposure to 1 mg/m ³ (inhalable fraction) of carbon black over a 40-year working-lifetime will result in a 48 mL decline in FEV1. In contrast, normal age related decline over a similar period of time would be approximately 1200 ml. The relationship between symptoms and exposure to carbon black is less clear. In the U.S. study, 9% of the highest exposure group (in contrast to 5% of the unexposed group) reported symptoms consistent with chronic bronchitis. In the European study, methodological limitations in the administration of the questionnaire limit the drawing of definitive conclusions about symptoms.
Human Epidemiology - cont	Since this IARC evaluation of carbon black, Sorahan and Harrington 16) re-analyzed the UK study data using an alternative exposure hypothesis and found a positive association with carbon black exposure in two of the five plants. The same exposure hypothesis was applied by Morfeld and McCunney 17-18) to the German cohort; in contrast, they found no association between carbon black exposure and lung cancer risk and, thus, no support for the alternative exposure hypothesis used by Sorahan and Harrington 16).
Human Epidemiology - cont.	Morfeld and McCunney 19) applied a Bayesian approach to unravel the role of uncontrolled confounders and identified smoking and prior exposure to occupational carcinogens received before being hired in the carbon black industry as main causes of the observed lung cancer excess risk. Overall, as a result of these detailed investigations, no causative link between carbon black exposure and cancer risk in humans has been demonstrated. This view is consistent with the IARC evaluation in 2006. Several epidemiological and clinical studies of workers in the carbon black production industries show no evidence of clinically significant adverse health effects due to occupational exposure to carbon black. No dose response relationship was observed in workers exposed to carbon black.
Human Epidemiology - cont.	This study, however, indicated a link between carbon black and small opacities on chest films, with negligible effects on lung function. A study on carbon black production workers in the UK 10) found an increased risk of lung cancer in two of the five plants studied; however, the increase was not related to the dose of carbon black. Thus, the authors did not consider the increased risk in lung cancer to be due to carbon black exposure. A German study of carbon black workers at one plant 11-14) found a similar increase in lung cancer risk but, like the 2001 UK study 10), found no association with carbon black exposure. In contrast, a large US study 15) of 18 plants showed a reduction in lung cancer risk in carbon black production workers. Based upon these studies, the February 2006 Working Group at IARC concluded that the human evidence for carcinogenicity was inadequate 1) .!
IARC	IARC In 1995 IARC concluded, "There is inadequate evidence in humans for the carcinogenicity of carbon black." Based on rat inhalation studies IARC concluded that there is, "sufficient evidence in experimental animals for the carcinogenicity of carbon black," IARC's overall

	evaluation was that, "Carbon black is possibly carcinogenic to humans (Group 2B)". This conclusion was based on IARC's guidelines, which require such a classification if one species exhibits carcinogenicity in two or more studies. IARC performed another review in 2006, and again classified carbon black as possibly carcinogenic to humans (Group 2B). In its 1987 review IARC concluded, "There is sufficient evidence in experimental animals for the carcinogenicity of carbon black extracts." Carbon black extracts are classified as, possibly carcinogenic to humans (Group 2B).
LD50 (Rat)	>8000 mg/kg
Mutagenic Effects and Germ Cell Mutagenicity	In an experimental investigation, mutational changes in the hprt gene were reported in alveolar epithelial cells in the rat following inhalation exposure to carbon black. This observation is believed to be rat specific and a consequence of "lung overload" which led to chronic inflammation and release of genotoxic oxygen species. This mechanism is considered to be a secondary genotoxic effect and thus, carbon black itself would not be considered to be mutagenic. Carbon black is not suitable to be tested in bacterial (Ames test) and other in vitro systems because of its insolubility in aqueous solutions. When tested, however, results for carbon black showed no mutagenic effects. Organic solvent extracts of carbon black can, however, contain traces of polycyclic aromatic hydrocarbons (PAHs). A study to examine the bioavailability of these PAHs showed that PAHs are very tightly bound to carbon black and not bioavailable.
NIOSH	NIOSH The U.S. National Institute of Occupational Safety and Health (NIOSH) 1978 criteria document on carbon black recommends that only carbon blacks with PAH contaminant levels greater than 0.1% require the measurement of PAHs in air. As some PAHs are possible human carcinogens, NIOSH recommends an exposure limit of 0.1 mg/m ³ for PAHs in air, measured as the cyclohexane-extractable fraction.
NTP	NTP Carbon black is not designated a carcinogen by the U.S. National Toxicology Program (NTP), the U.S. Occupational Safety and Health Administration (OSHA) or the European Union (EU).
Reproductive and Teratogenic Effects	No experimental studies on effects of carbon black on fertility and reproduction have been located. However, based on toxicokinetic data, carbon black is deposited in the lungs and based on its specific physicochemical properties (insolubility, low absorption potential), it is not likely to distribute in the body to reach reproductive organs, embryo and/or fetus under in vivo conditions. Therefore, no adverse effects of carbon black to fertility/reproduction or to fetal development are expected. No effects have been reported in long-term animal studies.
Sensitization	No animal data is available. No cases in humans have been reported.
STOT- repeated exposure	Therefore, no STOT, Repeated exposure classification is made.
STOT- single exposure	Inhalation studies with the rat showed lung effects (see Section 11.2 and 11.3), these effects are believed to be the effects of "lung overload" 1 and these effects are believed to be specific to the species. In addition, the European CLP Regulation states that no classification is necessary if the mechanism is not relevant to humans. 4) Also, the CLP Guidance on classification and labeling states that the "lung overload" mechanism is not relevant to humans. 4) Therefore, no STOT, Repeated Exposure classification is made
Ethylene glycol mono butyl ether(111-76-2)	
Aspiration toxicity	Remarks: No data available.
Carcinogenicity	Species mouse, Application Route: Inhalation, Exposure time 2 yr, Activity duration: 6 h, Frequency of Treatment: 5 days/week, NAOEL: 125 ppm Result: Limited evidence of carcinogenic effects with no relevance to humans., Carcinogenicity-Assessment: Not evidence of carcinogenicity in animal studies..
Further information	Product Remarks: Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting.,
Germ cell mutagenicity	Genotoxicity in vitro: Test Type: Mammalian cell gene mutation assay; Test species: Chinese hamster (CHO), Metabolic activation: with and without metabolic activation. Result: negative., Genotoxicity in vivo: Test Type: In vivo micronucleus test., Test species: mouse (male), application Route: Intraperitoneal, Result: negative., Germ cell mutagenicity Assessment: Tests on bacterial or mammalian did not show mutagenic effects.
LC50 (rat) inhalation	Acute inhalation toxicity: 500 ppm, Exposure time: 4 h; Assessment: the component/mixture is moderately toxic after short term inhalation.
LC50 (rat) Oral	Acute toxicity estimate: 500 mg/kg; Method: Expert judgment.; Assessment: the component/mixture is moderately toxic after single ingestion.
LD50 (rat) dermal	Acute toxicity estimate: 1,1000 mg/kg; Method: Expert judgment; Assessment: the component/mixture is moderately toxic after single contact with skin.
Repeated dose toxicity	Species: rat NOAEL: 30, Application Route: Inhalation Exposure time: 14 wk Number of exposures: 6 h/d, 5 d/wk.
Reproductive toxicity	Effects on fertility : Test Type: Two-generation study Species: mouse Application Route: oral Fertility: NOAEL: 720 mg/kg body weight Symptoms: Reduced fertility Result: Reduced fertility at maternally toxic doses Effects on fetal development : Test Type: Embryo-fetal development Species: rat Application Route: Inhalation Duration of Single Treatment: 10 d Frequency of Treatment: 6 hr/day Developmental Toxicity: Lowest observed adverse effect level: 100 ppm Result: Developmental toxicity occurred at maternal toxicity dose levels Reproductive toxicity - Assessment : No evidence of adverse effects on sexual function and fertility, and on development, based on animal experiments

Respiratory or skin sensitisation	Test Type: Maximization test, Species guinea pig, Result: Did not cause sensitization on laboratory animals.
Serious eye damage/ eye irritation	Species rabbit, Exposure time 24 h, Result: Irritating to eyes.
Skin corrosion/irritation	Remarks: Moderate skin irritation in susceptible persons., Species rabbit, Exposure time 24 h, Result: Mild skin irritation
STOT - repeated exposure	No data available.
STOT - single exposure	No data available.
Isobutyl Acetate(110-19-0)	
Aspiration hazard	No data available.
Carcinogenicity	No data available.
LC50 Inhalation	No data available
LD50 (Rabbit) Dermal	> 17,400 mg/kg
LD50 (Rat) Oral	3,200 - 6,400 mg/m3
Mutagenicity	In vitro Product: Salmonella typhimurium assay (Ames test), : negative +/- activation In vivo Product: Chromosomal aberration, oral: gavage (Mouse): Read-across from a similar material.
Other adverse effects	No data available.
Repeated dose toxicity	NOEL (Rat, Oral Study, 92 d): 316 mg/kg Read-across from a similar material.
Reproductive toxicity	No data available.
Respiratory or skin sensitization	Skin Sensitization:, (Guinea Pig) - non-sensitizing.
Serious eye damage/eye irritation	(Rabbit): none
Skin corrosion/irritation	(Rabbit, 4 h): none
Specific target organ toxicity - repeated exposure	No data available.
Specific target organ toxicity - single exposure	No data available.
Isobutyl Alcohol(78-83-1)	
Carcinogenicity Data:	The ingredient(s) of this product is (are) not classified as carcinogenic by ACGIH, IARC, OSHA or NTP.
LC50 Inhalation - Rat	8000 ppm; (4 h)
LD50 Dermal - Rabbit	3400 mg/kg
LD50 Oral - Rat (Acute Toxicity)	2460 mg/kg
Mutagenicity Data:	No adverse mutagenicity effects are anticipated.
Reproductive Data:	No adverse reproductive effects are anticipated.
Respiratory / Skin Sensitization Data:	None known.
Synergistic Materials:	Alcohols may interact synergistically with chlorinated solvents (example - carbon tetrachloride, chloroform, bromotrichloromethane), dithiocarbamates (example - disulfiram), dimethylnitrosamine and thioacetamide.
Tetragenicity Data:	No adverse Tetragenicity effects are anticipated.
Methyl Ethyl Ketone(78-93-3)	
Aspiration toxicity	Product: May be harmful if swallowed and enters airways.
Carcinogenicity	Remarks: This information is not available, Carcinogenicity-Assement: Not classified as a human carcinogen.
Further information	Product Remarks: Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting.,
Germ cell mutagenicity	Genotoxicity in vitro: Test Type: Ames test, Metabolic activation: with and without metabolic activation, Method OECD Test Guideline 471
LC50 (mouse) inhalation	320 mg/l (4 h exposure)
LC50 (rat) Oral	3737 mg/kg
LD50 (rabbit) dermal	6,480 mg/kg
Reproductive toxicity	Effects on fetal development, Species: rat female, Application Route: Inhalation, Dose: 400, 1000, 3000 ppm,
Respiratory or skin sensitisation	Test Type: Buehler Test, Species guinea pig, Method OECD Test Guideline 406, Result: Did not cause sensitization on laboratory animals.
Serious eye damage/ eye irritation	Remarks: Severe skin irritation, Species rabbit, Exposure time 24 h, Result: Irritation to eyes
Skin corrosion/irritation	Remarks: Moderate skin irritation, Species rabbit, Exposure time 24 h, Result: Mild skin irritation
STOT - repeated exposure	Product: No data available, Components: No data available.

STOT - single exposure	Product: Target Organs: Central Nervous system, Components: Exposure routes: Inhalation, Product: Target Organs: Central Nervous system
Methyl Isobutyl Ketone(108-10-1)	
Carcinogenicity Data	Methyl Isobutyl Ketone: Possibly carcinogenic to humans. (IARC-2B)
LC50 (Rat, 4) Inhalation	8.2 - 16.4 mg/l
LD50 (Rabbit) Dermal	>1 600 mg/kg
LD50 (Rat) Oral	2 080 - 4 600 mg/kg
Mutagenicity Data	Mutagenicity tests in animals have been negative or inconclusive. See "Other Studies Relevant to Material".
Other Studies Relevant Material	According to the International Agency for Research on Cancer (IARC), methyl isobutyl ketone is possibly carcinogenic to humans. (IARC-2B) MIBK was not teratogenic, embryotoxicity or fetotoxic following exposures that did not produce maternal toxicity. Rats and mice were exposed to 300, 1000 or 3000 ppm MIBK on days 6-15 of pregnancy. Exposures to 3000 ppm produced maternal and fetal toxicity, but no teratogenicity. There was no maternal toxicity, embryotoxicity or teratogenicity at 300 or 1000 ppm. Findings of fetotoxicity at 300 ppm were complicated by abnormal litter sizes and were determined not to be treatment related. (4) MIBK produced negative results in the micronucleus cryptogenic assay in mice in vivo. Most mutagenicity tests have produced negative results.
Reproductive Data	No adverse reproductive effects are anticipated.
Respiratory / Skin Sensitization Data	None known.
Synergistic Materials	In studies with mice, MIBK prolonged the loss of righting reflex induced by ethanol. In animal studies, MIBK has been shown to potentiate the hepatotoxicity of haloalkanes, such as chloroform, carbon tetrachloride and 1,2-dichlorobenzene. Combined exposure to methyl ethyl ketone and MIBK caused increased behavioral responses in baboons.
Teratogenicity Data	No adverse teratogenic effects are anticipated. See "Other Studies Relevant to Material".
n-Methyl-2-pyrrolidone(872-50-4)	
Aspiration Hazard	Not Applicable.
Assessment other acute effects	Assessment of STOT single: Causes temporary irritation of the respiratory tract. Irritation / corrosion Assessment of irritating effects: Eye contact causes irritation. Skin contact causes irritation. Causes temporary irritation of the respiratory tract. EU-classification Skin Species: rabbit Result: Slightly irritating. Method: Draize test Literature data. The European Union (EU) has classified this substance with 'Irritating to skin' (R38). Eye Species: rabbit Result: Irritant. Method: Draize test Literature data. Sensitization Assessment of sensitization: Skin sensitizing effects were not observed in animal studies. Mouse Local Lymph Node Assay (LLNA) Species: mouse Result: Non-sensitizing. Method: OECD Guideline 429 The product has not been tested. The statement has been derived from substances/products of a similar structure or composition.
Carcinogenicity	Assessment of carcinogenicity: In long-term animal studies in which the substance was given by inhalation, a carcinogenic effect was not observed. In long-term studies in rats in which the substance was given by feed, a carcinogenic effect was not observed. In long-term studies in rodents exposed to high doses, a tumorigenic effect was found; however, these results are thought to be due to a rodent-specific liver effect that is not relevant to humans. The whole of the information assessable provides no indication of a carcinogenic effect.
Genetic toxicity	Assessment of mutagenicity: The substance was not mutagenic in bacteria. No mutagenic effect was found in various tests with mammalian cell culture and mammals.
LC50 Inhalation - Rat	> 5.1 mg/l (OECD Guideline 403) Exposure time: 4 h An aerosol was tested. Limit concentration test only (LIMIT test). No mortality was observed.
LD50 Dermal - Rat	5,000 mg/m ³ ; Species: rat (male/female) Value: > 5,000 mg/kg (OECD Guideline 402) Literature data.
LD50 Oral - Rat	4,150 mg/kg (OECD Guideline 401) Literature data.
Repeated dose toxicity	Assessment of repeated dose toxicity: After repeated exposure the prominent effect is local irritation. The substance may cause damage to the testes after repeated inhalation of high doses. Experiment
Reproductive toxicity	Assessment of reproduction toxicity: As shown in animal studies, the product may cause damage to the testes after repeated high exposures that cause other toxic effects.
Symptoms of Exposure	Medical conditions aggravated by overexposure Data available do not indicate that there are medical conditions that are generally recognized as being aggravated by exposure to this substance/product.
Tetragenicity	Assessment of teratogenicity: The substance caused malformations/developmental toxicity in laboratory animals.
Phenylethane(100-41-4)	
Aspiration toxicity	May be fatal if swallowed and enters airways.
Carcinogenicity	Species: mouse, (male and female) Application Route: Inhalation Exposure time: 103 wk Activity duration: 6 h Dose: 0, 75, 250, 750 ppm Frequency of Treatment: 5 days/week NOAEL: 250 ppm Method: OECD Test Guideline 453 Result: evidence of carcinogenic activity Symptoms: increased incidences of alveolar/bronchiolar neoplasms, increase incidence of hepatocellular carcinomas GLP: yes Carcinogenicity - Assessment : Carcinogenicity classification not possible from current data.
Germ cell mutagenicity	Genotoxicity in vitro, Test Type: Chromosome aberration test in vitro Test species: Chinese

	hamster ovary (CHO) Metabolic activation: with and without metabolic activation Method: OECD Test Guideline 473 Result: negative GLP: no : Test Type: Mammalian cell gene mutation assay Test species: mouse lymphoma cells Metabolic activation: with and without metabolic activation Method : OECD Test Guideline 476 Result: negative GLP: yes Genotoxicity in vivo : Test Type: In vivo micronucleus test species: mouse (male) Application Route: Oral Method: OECD Test Guideline 474 Result: negative GLP: yes Test Type: DNA damage and/or repair Test species: mouse (male and female) Application Route: Inhalation Method: OECD Test Guideline 486 Result: negative GLP: yes Germ cell mutagenicity Assessment : In vivo tests did not show mutagenic effects
LC50 (Mouse, Male)	10 mg/l Assessment: The component/mixture is moderately toxic after short term inhalation.
LD50 (rabbit)	15,433 mg/kg
Repeated dose toxicity	Species: rat, male and female NOAEL: 75 mg/kg Application Route: Oral Exposure time: 28 d Dose: 75, 250 and 750 mg/kg bw/day Method: OECD Test Guideline 407 GLP: yes Symptoms: Increased kidney and liver weights
Reproductive toxicity	Effects on fertility : Test Type: One generation study Species: rat, male and female Application Route: Inhalation Dose: 0, 100, 500 and 1000 ppm Duration of Single Treatment: 6 h General Toxicity - Parent: NOAEC: 1,000 ppm General Toxicity F1: NOAEC: 100 ppm Symptoms: Reduced fetal weight. Reduced offspring weight gain. Method: OECD Test Guideline 415 Result: No reproductive effects. GLP: yes Effects on fetal development : Species: rat Application Route: Inhalation Dose: 0, 100, 500, 1000, 2000 ppm Duration of Single Treatment: 15 d General Toxicity Maternal: NOAEC: 500 ppm Teratogenicity: NOAEC: 2,000 ppm Developmental Toxicity: NOAEC: 500 ppm Symptoms: Reduced body weight Method: OECD Test Guideline 414 Result: Developmental toxicity occurred at maternal toxicity dose levels GLP: No data available Reproductive toxicity - Assessment : No toxicity to reproduction Did not show teratogenic effects in animal experiments.
Respiratory or skin sensitization	Remarks: No data available
Serious eye damage/eye irritation	Species: rabbit Result: Mild eye irritation Remarks: No data available
Skin corrosion/irritation	Species: rabbit Result: Mild skin irritation
STOT - repeated exposure	Target Organs: Auditory system Assessment: May cause damage to organs through prolonged or repeated exposure., The substance or mixture is classified as specific target organ toxicant, repeated exposure, category 2.
STOT - single exposure	No data available.
Propane Blend(74-98-6)	
Aspiration	No end point data for material. Not expected to be an aspiration hazard. Based on physico-chemical properties of the material.
Carcinogenicity	No end point data for material. Not expected to cause cancer.
Eye	Serious Eye Damage/Irritation: No end point data for material. , May cause mild, short-lasting discomfort to eyes.
Germ Cell Mutagenicity	Data available. Not expected to be a germ cell mutagen. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 471
Ingestion	N/A
Lactation	No end point data for material. Not expected to cause harm to breast-fed children.
LC50 (RAT) Inhalation	1443 mg/l (GAS) (15 minutes)
Other Information	May cause central nervous system disorder (e.g., narcosis involving a loss of coordination, weakness, fatigue, mental confusion and blurred vision) and/or damage. Exposure to rapidly expanding gas or vaporizing liquid may cause frostbite (cold burn). Very high exposure (confined spaces / abuse) to light hydrocarbons may result in abnormal heart rhythm (arrhythmias). Concurrent high stress levels and/or co-exposure to high levels of hydrocarbons (above occupational exposure limits), and to heart-stimulating substances like epinephrine, nasal decongestants, asthma drugs, or cardiovascular drugs may initiate arrhythmias. Simple asphyxiant: Acts by displacing oxygen in the lungs thereby diminishing the supply of oxygen available to the blood and tissues. Symptoms include shortness of breath, rapid heart rate, in coordination, lethargy, headaches, nausea, vomiting, and disorientation. Continued lack of oxygen may result in convulsions, loss of consciousness and death. Since exercise increase
Reproductive Toxicity	Data available. Not expected to be a reproductive toxicant. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 422
Sensitization	No end point data for material. Not expected to be a respiratory sensitizer.
Skin	N/A
Specific Target Organ Toxicity (STOT) Repeated Exposure	Not expected to cause organ damage from prolonged or repeated exposure. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 422
Specific Target Organ Toxicity (STOT) Single Exposure:	No end point data for material. Not expected to cause organ damage from a single exposure.
Styrene(100-42-5)	
Irritation / corrosion - Eye	Species: Rabbit; Result: non-irritant; Method: BASF - Test

Irritation / corrosion - Sensitization	Species: Guinea pig; Result: non-sensitization; Method: OECD Guideline 406.
Irritation / corrosion - Skin	Species: Rabbit; Result: non-irritant; Method: BASF - Test
LC50 Dermal - Rat	Not determined
LC50 Inhalation - Rat	Exposure time 4 h ; not determined
LD50 Oral - Rat	>5,000 mg/kg
Titanium Dioxide(13463-67-7)	
Carcinogenicity	In lifetime inhalation studies rats were exposed for 2 years to respectively 10, 50, 250 mg/m3 of respirable TiO2.
Dermal ALD (rabbit)	>10000 mg/m3
Eye irritation	slight irritation
Inhalation 4 h ALC	>6.82 mg/l
ORAL ALD (rat)	>2400 mg/kg
Sensitization	Did not cause sensitisation on laboratory animals.
Skin irritation	slight irritation
Xylene(1330-20-7)	
Acute dermal toxicity	Acute toxicity estimate : 1,100 mg/kg Method: Expert judgment.
Acute inhalation toxicity	Acute toxicity estimate, 4631 ppm Exposure time, 4 h Test atmosphere: gas Method; Calculation method.
Acute toxicity Product	Acute oral toxicity : Acute toxicity estimate : 3,523 mg/kg Method: Calculation method.
Aspiration Toxicity	May be fatal if swallowed and enters airways.
Carcinogenicity	Species: mouse, (male and female) Application Route: Oral Exposure time: 103 wk Dose: 0, 500 or 1000 mg/kg Frequency of Treatment: 5 days/week Method: Directive 67/548/EEC, Annex V, B.32. Result: did not display carcinogenic properties GLP: No data available, Carcinogenicity - Assessment : Animal testing did not show any carcinogenic effects.
Germ cell mutagenicity	Test Type: Chromosome aberration test in vitro. Test Species: Chinese hamster ovary (CHO) Metabolic Activation: With and without metabolic activation. Method Mutagenicity (in vitro mammalian cytogenetic test) Result: Negative. Test Type: Sister chromatid exchange assay in mammalian cells.
Germ cell mutagenicity Assessment	Animal testing did not show any mutagenic effects.
LC50 (rat, male) Inhalation	6700 ppm Exposure time: 4 h Method: Directive 67/548/EEC, Annex V, B.2. GLP: No data available Assessment: The substance or mixture is classified as specific target organ toxicant, single exposure, category 3 with respiratory tract irritation. Remarks: Acutely Toxic Category 4
LC50 (rat, male) Oral	3,523 mg/kg Method: EU Method B.1 (Acute Toxicity, Oral) Target Organs: Kidney, Bladder GLP: no
Repeated dose toxicity	Species: rat, male and female NOAEL: 250 mg/kg Application Route: Oral Exposure time: 103 wk Number of exposures: 5 d/wk Dose: 0, 250 or 500 mg/kg Assessment: The substance or mixture is classified as specific target organ toxicant, repeated exposure, category 2.
Reproductive toxicity	Effects on fertility : Test Type: Two-generation study Species: rat, male and female Application Route: Inhalation Dose: 0, 25, 100 and 500 ppm Duration of Single Treatment: 6 h Frequency of Treatment: 7 days/week General Toxicity - Parent: NOAEC: > 500 ppm General Toxicity F1: NOAEC: > 500 ppm Early Embryonic Development: NOAEC: > 500 ppm Result: No reproductive effects. Effects on fetal development : Species: rat Application Route: Inhalation Dose: 0, 100, 500, 1000 or 2000 ppm Duration of Single Treatment: 14 d Frequency of Treatment: 6 hr/day General Toxicity Maternal: NOAEC: 500 ppm Teratogenicity: NOAEC: > 2,000 Developmental Toxicity: NOAEC: 100 ppm Result: No teratogenic effects., Developmental toxicity occurred at maternal toxicity dose levels Reproductive toxicity - Assessment : Animal testing did not show any effects on fertility. Damage to fetus not classifiable
Respiratory or skin sensitization	Remarks: No data available
Serious eye damage/eye irritation	Species: rabbit Result: Mild eye irritation
Skin corrosion/irritation	Species: rabbit Exposure time: 24 h Result: Irritating to skin Remarks: Skin irritation, Category 2
STOT - repeated exposure	Target Organs: Liver, Kidney, Central nervous system Assessment: May cause damage to organs through prolonged or repeated exposure.
STOT - single exposure	No data available.

12. ECOLOGICAL INFORMATION

Acetone(67-64-1)	
Bioaccumulative potential	Partition coefficient: n-octanol/water: log Pow: -0.24
EC50 (Daphnia magna (Water flea))	7,630 mg/l (Exposure time 48 h); Test substance: Acetone
LC50 (Oncorhynchus mykiss (rainbow))	6,100 mg/l (Exposure time: 48 h)

trout))	
Mobility in soil	No data available.
Other adverse effects	No data Available. Regulation: 40 CFR Protection of Environment; Part 82 Protection of Stratospheric Ozone - CAA Section 602 Class I Substances., Additional ecological information: No data available.
Persistence and degradability	Biodegradability: Remarks: No data available
Toxicity to algae	Remarks: No data available
Aluminum Hydroxide(21645-51-2)	
Bioaccumulative potential	Inert material.
EC50 - Daphnia - Toxicity to daphnia and other aquatic invertebrates	>10,000 mg/l, Daphnia magna (Water flea) (OECD Test Guideline 202)
EC50 - Fish - Toxicity ro fish	>10,000 mg/l, Fish
Mobility in soil	Inert material.
NOEC - Toxicity to algae	>0.004 mg/l, 72 h, Pseudokirchneriella subcapitata (algae) - (OECD Test Guideline 201)
Other adverse effects	None known.
Persistence and degradability	Non-degradable
Amorphous Silica(7631-86-9)	
Additional ecological information	General notes: Do not allow product to reach ground water, water course or sewage system.
Bioaccumulative potential	No further revelent information available.
EC50 - Algae	>10000 mg/l (Scenedesmus subspicatus) (72 h) (OCED 201) comparable substance
EC50 - Daphnia magna	>1000 mg/l (Daphnia magna) (24 h) (OCED 202)
LC0 - Zebra fish	10000 mg/l (zebra fish) (96 h) (static) (OCED203)
Mobility in soil	No further revelent information available.
Persistence and degradability	The product is chemically and biologically inert. By the insolubility in water there is a separation at every filtration and sedimentation process.
Carbon Black(1333-86-4)	
Behavior in water treatment plants	Activated sludge, EC0 (3 h) > 800 mg/L. DEV L3 (TTC test)
Bioaccumulation Potential	Potential bioaccumulation is not expected because of the physicochemical properties of the substance
EC50 (Scenedesmus subspicatus)	> 10,000 mg/L, OECD (Guideline 201)
EC50 Daphnia magna (waterflea)	>5600 mg/l (24 h) OECD (Guideline 202)
Environmental fate	Carbon black is an inert solid, stable and insoluble in water or organic solvents. Its vapor pressure is negligible. Based on these properties it is expected that carbon black will not occur in air or water in relevant amounts. Also potential for distribution via water or air can be dismissed. The deposition in soil or sediments is therefore the most relevant compartment of fate in the environment.
LC50 Brachydanio reio (zebrafish)	>1000 mg/l (96 h) OECD (Guideline 203)
NOEC 50 (Scenedesmus subspicatus)	> 10,000 mg/L, OECD (Guideline 201)
Ethylene glycol mono butyl ether(111-76-2)	
Bioaccumulative potential	Partition coefficient: n-octanol/water: log Pow: 0.83
EC50 (Algae)	911 mg/l End point: Biomass Exposure time: 72 h Test Type: static test Analytical monitoring: yes Method: OECD Test Guideline 201 GLP: no
EC50 (Daphnia)	1,800 mg/l(48 h; Daphnia magna (Water flea)): Exposure time: 48 h Test Type: static test Method: OECD Test Guideline 202 GLP: no
LC50 (fish)	1,474 mg/l Pimephales promelas (Fathead minnow)Exposure time: 96 h Test Type: static test, Method: OECD Test Guideline 203 GLP: no
Mobility in soil	No data available
Other adverse effects	No data available
Persistence and degradability	aerobic Inoculum: Activated sludge, domestic, adaption not specified, Result: Readily biodegradable. Biodegradation: 90.4 % Exposure time: 28 d Method: OECD Test Guideline 301B GLP: no
Product	Regulation: 40CFR Protection of Environment, Part 82 Protection of Stratospheric Ozone - CAA Section 602 Class 1 Substances:

Isobutyl Acetate(110-19-0)	
Bioaccumulative potential Product	No data available.
Biological Oxygen Demand	BOD-5: 970 mg/g BOD-20: 1,300 mg/g
BOD/COD ratio	0.52 %
Chemical Oxygen Demand	1,870 mg/g
EC50 (Alga)	370 mg/l, (72 h, (Alga))
EC50 (Daphnia)	28.2 mg/l, (48 h, (Daphnia))
LC50 (Fish)	22.4 mg/l, (96 h, (Fathead minnow))
Mobility in soil	Known or predicted distribution to environmental compartments isobutyl acetate 1.193 - 1.844 (QSAR model)
NOEC (Alga)	95 mg/l, (72 h, (Alga))
Other adverse effects	No data available.
Persistence and degradability	81 % (20 d, Ready Biodegradability: Closed Bottle Test) Readily biodegradable
Results of PBT and vPvB assessment	Not fulfilling PBT (persistent/bioaccumulative/toxic) criteria Not fulfilling vPvB (very persistent, very bioaccumulative) criteria
Isobutyl Alcohol(78-83-1)	
Chronic	No data available.
Degradability / Persistence; Biological / A biological Degradation	Evaluation: Not readily biodegradable (by OECD criteria).
EC50 - Aquatic Plants	>100 mg/l (72 h) The product has not been tested. The statement has been derived from properties of the individual components.
EC50 - Daphnia - Acute	>100 mg/l (48 h) The product has not been tested. The statement has been derived from properties of the individual components.
LC50 - Fish - Acute	>100 mg/l (96 h) The product has not been tested. The statement has been derived from properties of the individual components.
Microorganisms	Toxicity to microorganisms: bacteria EC10 (17 h): >750 mg/l. The product has not been tested. The statement has been derived from properties of the individual components.
Methyl Ethyl Ketone(78-93-3)	
Bioaccumulative potential	Partition coefficient: n-octanol/water: log Pow: 2.49
EC50 (Algae)	2029 mg/l (48 h; Pseudokirchneriella subcapitata (Green Algae))
EC50 (Daphnia)	308 mg/l (48 h; Daphnia magna (Water flea))
LC50 (fish)	2993 mg/l (96 h; Pimephales promelas (Fathead minnow))
Mobility in soil	No data available
Other adverse effects	No data available
Persistence and degradability	Biodegradability: Concentration: 2mg/l; Result: Readily biodegradation: 98%; Exposure 28 d;
Product	Regulation: 40CFR Protection of Environment, Part 82 Protection of Stratospheric Ozone - CAA Section 602 Class 1 Substances:
Methyl Isobutyl Ketone(108-10-1)	
Deactivating Chemicals: None required.	None required.
Disposal of Packaging	Empty containers retain product residue (liquid and/or vapor) and can be dangerous. Empty drums should be completely drained, properly bunged and promptly returned to a drum reconditioner. Do not expose such containers to heat, flame, sparks, static electricity, or other sources of ignition; they may explode and cause injury or death. Do not dispose of package until thoroughly washed out.
EC50 (Daphnia Magna)	>200 mg/l (48 h)
Ecotoxicity	Low acute toxicity to aquatic organisms.
Environmental Fate	Can be dangerous if allowed to enter drinking water intakes. Do not contaminate domestic or irrigation water supplies, lakes, streams, ponds, or rivers. Methyl Isobutyl Ketone: This product is biodegradable. This product does not bioaccumulate in aquatic or terrestrial food chains.
LC50 (Fathead Minnow)	>179 mg/l (96 h)
Safe Handling of Residues	See "Waste Disposal Methods"
Waste Disposal Methods	. Reevaluation of the product may be required by the user at the time of disposal since the product uses, transformations, mixtures and processes may influence waste classification. Dispose of waste material at an approved (hazardous) waste treatment/disposal facility in accordance with applicable local, provincial and federal regulations. Do not dispose of waste with normal garbage, or to sewer systems.
n-Methyl-2-pyrrolidone(872-50-4)	

Additional information	Sum parameter Chemical oxygen demand (COD): (DIN 38409 Part 41) approx. 1,600 mg/g Biochemical oxygen demand (BOD) Incubation period 5 d: < 2 mg/g Absorbable organically-bound halogen (AOX): This product contains no organically-bound halogen.
Bioaccumulative potential	Assessment bioaccumulation potential Because of the n-octanol/water distribution coefficient (log Pow) accumulation in organisms is not to be expected.
EC50 (Algae)	> 500 mg/l, (72 h), Scenedesmus subspicatus (DIN 38412 Part 9) The details of the toxic effect relate to the nominal concentration.
EC50 (Daphnia)	> 1,000 mg/l, (24 h), Daphnia magna (DIN 38412 Part 11, static) The details of the toxic effect relate to the nominal concentration.
LD50 (fish)	> 500 mg/l, Salmo gairdneri, syn. O. mykiss (static) The details of the toxic effect relate to the nominal concentration.
Microorganisms/Effect on activated sludge	Toxicity to microorganisms DIN EN ISO 8192 aquatic activated sludge, industrial/EC50 (0.5 h): > 600 mg/l The details of the toxic effect relate to the nominal concentration.
Mobility in soil	Assessment transport between environmental compartments The substance will rapidly evaporate into the atmosphere from the water surface. Adsorption to solid soil phase is not expected.
Persistence and degradability	Assessment biodegradation and elimination (H2O) Readily biodegradable (according to OECD criteria). Elimination information 73 % BOD of the ThOD (28 d) (OECD 301C; ISO 9408; 92/69/EEC, C.4-F) (aerobic, Inoculum conforming to MITI requirements (OECD 301C)) Readily biodegradable (according to OECD criteria). Assessment of stability in water In contact with water the substance will hydrolyze slowly.
Phenylethane(100-41-4)	
Bioaccumulative potential	Partition coefficient: noctanol/water : log Pow: 2.92
EC50 (Daphnia magna (Water flea))	1.8 mg/l Exposure time: 48 h Test Type: static test
EC50 (Pseudokirchneriella subcapitata)	5.4 mg/l Exposure time: 72 h Test Type: static test Analytical monitoring: yes Method: Static GLP: yes
LC50 (Oncorhynchus mykiss (rainbow trout))	4.2 mg/l Exposure time: 96 h Test Type: semi-static test
Mobility in soil	No data available.
Other adverse effects	Results of PBT and vPvB assessment: This substance is not considered to be persistent, bioaccumulating nor toxic (PBT). This substance is not considered to be very persistent nor very bioaccumulating (vPvB).
Persistence and degradability	Biodegradability: Inoculum: activated sludge Concentration: 22 mg/l Result: Readily biodegradable. Biodegradation: 70 % Exposure time: 28 d GLP: yes
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	(Daphnia): 3.6 mg/l Toxicity to bacteria: GLP: Remarks: No data available Ecotoxicology Assessment Chronic aquatic toxicity : Harmful to aquatic life with long lasting effects.
Propane Blend(74-98-6)	
Atmospheric Oxidation	Material -- Expected to degrade at a moderate rate in air.
Bioaccumulative potential	Material -- Potential to bioaccumulate is low
Ecotoxicity	Not expected to demonstrate chronic toxicity to aquatic organisms.
Mobility in soil	Material -- Highly volatile, will partition rapidly to air. Not expected to partition to sediment and wastewater solids.
Persistence and Degradability	Biodegradation: Material -- Expected to be inherently biodegradable
Styrene(100-42-5)	
Bioaccumulation	At present state of knowledge, no negative ecological effects are expected.
Chronic	No data available regarding toxicity to Daphnis.
Chronic	No data available regarding toxicity to fish.
EC50 (Algae)	(72 h); No data available concerning toxicity for algae.
EC50 (Daphnia) Acute	(48 h) No data available regarding toxicity to daphnia.
LC50 Fish (Leuciscus idus) Acute	>100 mg/l (96 h)
Microorganisms	Toxicity to microorganisms: The inhibition of the degradation activity sludge is not anticipated when introduced to biological treatment plants in appropriate low concentrations.
Titanium Dioxide(13463-67-7)	
LC50 fish	Fathead minnow 96 h >1000 mg/l
Xylene(1330-20-7)	
Bioaccumulative potential	Partition coefficient: noctanol/water : log Pow: 2.77 - 3.15
EC50 (Pseudokirchneriella subcapitata)	4.36 mg/l End point: Growth rate Exposure time: 73 h Test Type: static test Analytical monitoring: yes

IC50 (Daphnia magna (Water flea))	1 mg/l Exposure time: 24 h Test Type: static test substance: Information given is based on data obtained from similar substances. Method: OECD Test Guideline 202 GLP
LC50 (Oncorhynchus mykiss (rainbow trout))	2.6 mg/l Exposure time: 96 h Test substance: Information given is based on data obtained from similar substances. Method: OECD Test Guideline 203 GLP: No data available
Mobility in soil	No data available.
Persistence and degradability	Biodegradability: Inoculum: activated sludge Result: Readily biodegradable. Biodegradation: 72 % Exposure time: 20 d

13. DISPOSAL CONSIDERATIONS

WASTE TREATMENT METHODS

GENERAL INFORMATION : No data available.

DISPOSAL METHOD: Dispose of waste and residues in accordance with Local, State, and Federal Regulations. Mix with compatible chemical which is less flammable and incenerate. Since emptied containers retain product residue, follow label warnings even after container is emptied. Residual vapors may explode on ignition; do not cut, drill, grind or weld or near this container.

14. TRANSPORT INFORMATION

***CHECK WITH YOUR CARRIER FOR ADDITIONAL RESTRICTIONS THAT MAY APPLY.**

USDOT GROUND

DOT (DEPARTMENT OF TRANSPORTATION)

PROPER SHIPPING NAME (DOT) : Limited Quantity

HAZARDS CLASS : 2.1

UN/NA NUMBER : UN1950

PACKING GROUP : Not Applicable

EMERGENCY RESPONSE GUIDE (ERG) : 126

IATA (AIR)

DOT (INTERNATIONAL AIR TRANSPORTATION ASSOCIATION)

PROPER SHIPPING NAME : Aerosols

HAZARDS CLASS : 2.1

UN/NA NUMBER : UN1950

PACKING GROUP : N/A

EMERGENCY RESPONSE GUIDE (ERG) : 126

IMDG (OCEAN)

PROPER SHIPPING NAME : Aerosols

HAZARDS CLASS : 2.1

UN/NA NUMBER : UN1950

PACKING GROUP : N/A

EMERGENCY RESPONSE GUIDE (ERG) : 126

MARINE POLLUTANT : No

SPECIAL PRECAUTIONS : P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking. P235 Keep cool.

15. REGULATORY INFORMATION

US FEDERAL REGULATIONS

All ingredients in Section #3 are TSCA (Toxic Substance Control Act) listed.

OSHA HAZARDS : Flammable liquid, Moderate skin irritant, Moderate eye irritant, Carcinogen.

EPCRA - Emergency

CERCLA REPORTABLE QUANTITY

This product contains:	Chemical CAS#
Methyl Ethyl Ketone	78-93-3
Ethylene glycol mono butyl ether	111-76-2
Carbon Black	1333-86-4
Isobutyl Alcohol	78-83-1
Xylene	1330-20-7

Phenylethane	100-41-4
--------------	----------

SARA 304 Extremely Hazardous Substances Reportable Quantity : This material does not contain any components with a section 304 EHS RQ.

SARA TITLE III (SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT)

SARA 311/312 Hazards : Fire Hazard, Acute Health Hazard, Chronic Health Hazard

SARA 313 :

This product contains:	Chemical CAS#
Acetone	67-64-1
Propane Blend	74-98-6
Methyl Ethyl Ketone	78-93-3
*Methyl Isobutyl Ketone	108-10-1
Titanium Dioxide	13463-67-7
n-Methyl-2-pyrrolidone	872-50-4
Ethylene glycol mono butyl ether	111-76-2
Isobutyl Acetate	110-19-0
Carbon Black	1333-86-4

CLEAN AIR ACT :

This product contains:	Chemical CAS#
Methyl Isobutyl Ketone	108-10-1
Styrene	100-42-5
Phenylethane	100-41-4

INTERNATIONAL REGULATIONS

CLASSIFICATION ACCORDING TO REGULATION (EC) No. 1272/2008 (CLP) :

Flam. Liq. Cat. 2; H223
 Eye Irrit. Cat. 2; H319
 STOT SE Cat. 3; H336

NATIONAL REGULATIONS

This product contains:	Chemical CAS#
#Methyl Isobutyl Ketone	108-10-1
#Titanium Dioxide	13463-67-7
#Carbon Black	1333-86-4

Indicates a chemical listed by IARC as a possible carcinogen.

STATE REGULATIONS

CALIFORNIA PROPOSITION 65

This product contains:	Chemical CAS#
#Methyl Isobutyl Ketone	108-10-1
+n-Methyl-2-pyrrolidone	872-50-4
*Phenylethane	100-41-4

*This product contains (a) chemical (s) known to the State of California to cause cancer.

#This product contains (a) chemical (s) known to the State of California to be carcinogenic.

+This product contains (a) chemical (s) known to the State of California to cause birth defects or other reproductive harm.

Massachusetts Right to Know

This product contains	Chemical CAS#
Acetone	67-64-1
Methyl Ethyl Ketone	78-93-3
n-Methyl-2-pyrrolidone	872-50-4
Ethylene glycol mono butyl ether	111-76-2
Carbon Black	1333-86-4
Isobutyl Alcohol	78-83-1
Xylene	1330-20-7
Phenylethane	100-41-4

Pennsylvania Right to Know

This product contains	Chemical CAS#
Acetone	67-64-1
Methyl Ethyl Ketone	78-93-3
Titanium Dioxide	13463-67-7
n-Methyl-2-pyrrolidone	872-50-4
Ethylene glycol mono butyl ether	111-76-2
Amorphous Silica	7631-86-9
Aluminum Hydroxide	21645-51-2
Carbon Black	1333-86-4
Isobutyl Alcohol	78-83-1
Water	7732-18-5
Xylene	1330-20-7
Phenylethane	100-41-4

New Jersey Right to Know

This product contains	Chemical CAS#
Acetone	67-64-1
Methyl Ethyl Ketone	78-93-3
Titanium Dioxide	13463-67-7
n-Methyl-2-pyrrolidone	872-50-4
Ethylene glycol mono butyl ether	111-76-2
Amorphous Silica	7631-86-9
Aluminum Hydroxide	21645-51-2
Carbon Black	1333-86-4
Isobutyl Alcohol	78-83-1
Water	7732-18-5
Xylene	1330-20-7
Phenylethane	100-41-4

16. OTHER INFORMATION

Other Product Information

% Volatile by Volume: 93.23

% Volatile by Weight: 84.94

% Solids by volume: 6.77
% Exempt by Volume: 27.11

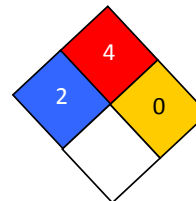
% Solids by Weight: 15.06
% Exempt by Weight: 27.76

VOC CONTENT:

Excluding Exempt VOC: 606
Including Exempt VOC: 442

HMIS RATING

Health :	2*
Flammability :	4
Reactivity :	0
Personal Protection :	H

NFPA CODES

MANUFACTURER DISCLAIMER : The information contained in this Safety Data Sheet is considered to be true and accurate. Cardinal Industrial Finishes makes no warranties, expressed or implied, as to the accuracy and adequacy of this information. This data is offered solely for the user's consideration, investigation and verification.

4.2 Aerotech Igniters

AeroTech Division, RCS Rocket Motor Components, Inc.

Material Safety Data Sheet & Emergency Response Information

Prepared in accordance with 29 CFR § 1910.1200 (g)

Section 1. Product Identification

Copperhead™ igniter, FirstFire™ igniter, FirstFire Jr.™ igniter. These products contain varying percentages of Ammonium or Potassium Perchlorate, carbon black and carbon fibers dispersed in a flammable binder with lesser amounts of proprietary ingredients such as burn rate modifiers and a metal fuel.

Section 2. Physical Characteristics

Narrow copper foil strips or yellow wires coated with a small amount of black igniter composition on one end, little or no odor

Section 3. Physical Hazards

Igniters are flammable and may give off varying amounts of Hydrogen Chloride and Carbon Monoxide gas, soot and carbon fibers when burned.

Section 4. Health Hazards

Igniter coating may be hazardous in the case of ingestion, and may be toxic to kidneys, lungs and the nervous system. Symptoms may include respiratory irritation, skin irritation, muscle tightness, vomiting, diarrhea, abdominal pain, muscular tremors, weakness, labored breathing, irregular heartbeat, and convulsions. Inhalation of large amounts of combustion products may produce similar but lesser symptoms as ingestion.

Section 5. Primary Routes of Entry

Ingestion, inhalation.

Section 6. Permitted Exposure Limits

None established for manufactured product.

Section 7. Carcinogenic Potential

None known.

Section 8. Precautions for Safe Handling

Keep away from flames and other sources of heat. Do not smoke within 25 feet of product. Do not ingest. Do not breathe combustion products. Keep in original packaging until ready for use.

Section 9. Control Measures

See section 8.

Section 10. Emergency & First Aid Procedures

If ingested, induce vomiting and call a physician. If combustion products are inhaled, move to fresh air and call a physician if ill effects are noted. For mild burns use a first aid burn ointment. For severe burns immerse the burned area in cold water at once and see a physician immediately.

Section 11. Date of Preparation or Revision

July 20, 2010

Section 12. Contact Information

AeroTech Division, RCS Rocket Motor Components, Inc.
2113 W. 850 N. St.
Cedar City, UT 84721
(435) 865-7100 (Ph)
(435) 865-7120 (Fax)
Email: customerservice@aerotech-rocketry.com
Web: <http://www.aerotech-rocketry.com>
Emergency Response: Infotrac (352) 323-3500

4.3 Aerotech Motors

AeroTech Division, RCS Rocket Motor Components, Inc.

Material Safety Data Sheet & Emergency Response Information

Prepared in accordance with 29 CFR § 1910.1200 (g)

Section 1. Product Identification

Model rocket motor, high power rocket motor, hobby rocket motor, composite rocket motor, rocket motor kit, rocket motor reloading kit, containing varying amounts of solid propellant with the trade names White Lightning™, Blue Thunder™, Black Jack™, Black Max™, Redline™, Warp-9™ or Mojave Green™. These products contain varying percentages of Ammonium Perchlorate, Strontium and/or Barium Nitrate dispersed in synthetic rubber with lesser amounts of proprietary ingredients such as burn rate modifiers and metal fuels. Rocket motor ejection charges contain black powder.

Section 2. Physical Characteristics

Black plastic cylinders or bags with various colored parts, little or no odor

Section 3. Physical Hazards

Rocket motors and reload kits are flammable; rocket motors may become propulsive in a fire. All propellants give off varying amounts of Hydrogen Chloride and Carbon Monoxide gas when burned, Mojave Green propellant also produces Barium Chloride.

Section 4. Health Hazards

Propellant is an irritant in the case of skin and eye contact, may be extremely hazardous in the case of ingestion, and may be toxic to kidneys, lungs and the nervous system. Symptoms include respiratory irritation, skin irritation, muscle tightness, vomiting, diarrhea, abdominal pain, muscular tremors, weakness, labored breathing, irregular heartbeat, and convulsions. Inhalation of large amounts of combustion products may produce similar but lesser symptoms as ingestion.

Section 5. Primary Routes of Entry

Skin contact, ingestion, and inhalation.

Section 6. Permitted Exposure Limits

None established for manufactured product.

Section 7. Carcinogenic Potential

None known.

Section 8. Precautions for Safe Handling

Disposable rubber gloves are recommended for handling Mojave Green propellant. Keep away from flames and other sources of heat. Do not smoke within 25 feet of product. Do not ingest. Do not breathe exhaust fumes. Keep in original packaging until ready for use.

Section 9. Control Measures

See section 8.

Section 10. Emergency & First Aid Procedures

If ingested, induce vomiting and call a physician. If combustion products are inhaled, move to fresh air and call a physician if ill effects are noted. In the case of skin contact, wash area immediately and contact a physician if severe skin rash or irritation develops. For mild burns use a first aid burn ointment. For severe burns immerse the burned area in cold water at once and see a physician immediately.

Section 11. Date of Preparation or Revision

July 20, 2010

Section 12. Contact Information

AeroTech Division, RCS Rocket Motor Components, Inc.
2113 W. 850 N. St.
Cedar City, UT 84721
(435) 865-7100 (Ph)
(435) 865-7120 (Fax)
Email: customerservice@aerotech-rocketry.com
Web: <http://www.aerotech-rocketry.com>
Emergency Response: Infotrac (352) 323-3500

4.4 Black Powder



Goex Powder, Inc.

Material Safety Data Sheet

MSDS-BP (Potassium Nitrate)

Revised 3/17/09

PRODUCT INFORMATION	
Product Name	Black Powder
Trade Names and Synonyms	N/A
Manufacturer/Distributor	GOEX Powder, Inc.(DOYLINE, LA) & various international sources
Transportation Emergency	800-255-3924 (24 hrs – CHEM TEL)

PREVENTION OF ACCIDENTS IN THE USE OF EXPLOSIVES

The prevention of accidents in the use of explosives is a result of careful planning and observance of the best known practices. The explosives user must remember that he is dealing with a powerful force and that various devices and methods have been developed to assist him in directing this force. He should realize that this force, if misdirected, may either kill or injure both him and his fellow workers.

WARNING

All explosives are dangerous and must be carefully transported, handled, stored, and used following proper safety procedures either by or under the direction of competent, experienced persons in accordance with all applicable federal, state and local laws, regulations, or ordinances. ALWAYS lock up explosive materials and keep away from children and unauthorized persons. If you have any questions or doubts as to how to use any explosive product, DO NOT USE IT before consulting with your supervisor, or the manufacturer, if you do not have a supervisor. If your supervisor has any questions or doubts, he should consult the manufacturer before use.

HAZARDOUS COMPONENTS				
Material or Components	%	CAS NO.	TLV	PEL
Potassium nitrate	70-76	007757-79-1	NE	NE
Charcoal	8-18	N/A	NE	NE
Sulfur	9-20	007704-34-9	NE	NE
Graphite ¹	Trace	007782-42-5	15 mppct (TWA)	2.5 mg/m ³

N/A = Not assigned NE = Not established

¹ Not contained in all grades of black powder.

P.O. Box 659, Doyline, LA 71023-0659, (318) 382-9300
www.goexpowder.com

PHYSICAL DATA	
Boiling Point	N/A
Vapor Pressure	N/A
Vapor Density	N/A
Solubility in Water	Good
Specific Gravity	1.70 – 1.82 (mercury method) 1.92 – 2.08 (pycnometer)
PH	6.0 – 8.0
Evaporation Rate	N/A
Appearance and Odor	Black granular powder. No odor detectable.

HAZARDOUS REACTIVITY	
Instability	Keep away from heat, sparks, and open flames. Avoid impact, friction and static electricity.
Incompatibility	When dry, black powder is compatible with most metals; however, it is hygroscopic and when wet, attacks all common metals except stainless steel. Black powder must be tested for compatibility with any material not specified in the production/procurement package with which they may come in contact. Materials include other explosives, solvents, adhesives, metals, plastics, paints, cleaning compounds, floor and table coverings, packing materials, and other similar materials, situations, and equipment.
Hazardous decomposition	Detonation produces hazardous overpressures and fragments (if confined). Gases produced may be toxic if exposed in areas with inadequate ventilation.
Polymerization	Polymerization will not occur.

FIRE AND EXPLOSION DATA	
Flashpoint	Not applicable
Auto Ignition Temperature	Approx. Range: 392°F-867°F / 200°C-464°C
Explosive temperature (5 sec)	Ignites @ approx. 427°C (801°F)
Extinguishing media	Water
Special fire fighting procedures	ALL EXPLOSIVES: DO NOT FIGHT EXPLOSIVES FIRES. Try to keep fire from reaching explosives. Isolate area. Guard against intruders. Division 1.1 Explosives (heavily encased): Evacuate the area for 5,000 feet (approximately 1 mile) if explosives are heavily encased. Division 1.1 Explosives (not heavily encased): Evacuate the area for 2,500 feet (approximately ½ mile) if explosives are not heavily encased. Division 1.1 Explosives (all): Consult U.S. DOT Emergency Response Guide 112 for further details.

Unusual fire and explosion hazards	Black powder is a deflagrating explosive. It is very sensitive to flame and spark and can also be ignited by friction and impact. When ignited unconfined, it burns with explosive violence and will explode if ignited under even slight confinement.
------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

HEALTH HAZARDS	
General	Black powder is a Division 1.1 Explosive, and detonation may cause severe physical injury, including death. All explosives are dangerous and must be handled carefully and used following approved safety procedures under the direction of competent, experienced persons in accordance with all applicable federal, state and local laws, regulation and ordinances.
Carcinogenicity	None of the components of Black Powder are listed as a carcinogen by NTP, IARC, or OSHA.

FIRST AID	
Inhalation	Not a likely route of exposure. If inhaled, remove to fresh air. If not breathing give artificial respiration, preferably by mouth-to-mouth. If breathing is difficult, give oxygen. Seek prompt medical attention. Avoid when possible.
Eye and skin contact	Not a likely route of exposure. Flush eyes with water. Wash skin with soap and water.
Ingestion	Not a likely route of exposure. If ingested, dilute by giving two glasses of water and induce vomiting. Avoid when possible.
Injury from detonation	Seek prompt medical attention.

SPILL OR LEAK PROCEDURES	
Spill/leak response	Use appropriate personal protective equipment. Isolate area and remove sources of friction, impact, heat, low level electrical current, electrostatic or RF energy. Only competent, experienced persons should be involved in clean up procedures. Carefully pick up spills with non-sparking and non-static producing tools.
Waste disposal	Desensitize by diluting in water. Open train burning, by qualified personnel, may be used for disposal of small unconfined quantities. Dispose of in compliance with Federal Regulations under the authority of the Resource Conservation and Recovery Act (40 CFR Parts 260-271).

SPECIAL PROTECTION INFORMATION	
Ventilation	Use only with adequate ventilation. (If required)
Respiratory	None
Eye	None
Gloves	Impervious rubber gloves. (If required)
Other	Metal-free and/non-static producing clothes

SPECIAL PRECAUTIONS

- Keep away from friction, impact, and heat and open flame. Do not consume food, drink, or tobacco in areas where they may become contaminated with these materials.
- Contaminated equipment must be thoroughly water cleaned before attempting repairs.
- Use only non-spark producing tools.
- No smoking.

STORAGE CONDITIONS

Store in a cool, dry place in accordance with the requirements of Subpart K, ATF: Explosives Law and Regulations (27 CFR 55.201-55.219).

SHIPPING INFORMATION

Proper shipping name	Black Powder	
Hazard class	1.1D	
UN Number	UN0027	
DOT Label & Placard	DOT Label	EXPLOSIVES 1.1D
	DOT Placard	EXPLOSIVES 1.1
Alternate shipping	Limited quantities of GOEX black powder (1# cans only) may be transported as "Black powder for small arms – flammable solid" pursuant to U.S. Department of Transportation 49 CFR.	

The information contained in this Material Safety Data Sheet is based upon available data and believed to be correct; however, as such has been obtained from various sources, including the manufacturer, military and independent laboratories, it is given without warranty or representation that it is complete, accurate, and can be relied upon. GOEX, Incorporated, has not attempted to conceal in any manner the deleterious aspects of the product listed herein, but makes no warranty as to such. Further, GOEX, Incorporated, cannot anticipate nor control the many situations in which the product or this information may be used; there is no guarantee that the health and safety precautions suggested will be proper under all conditions. It is the sole responsibility of each user of the product to determine and comply with the requirements of all applicable laws and regulations regarding its use. This information is given solely for the purposes of safety to persons and property. Any other use of this information is expressly prohibited.

For further information contact: GOEX Powder, Incorporated
P. O. Box 659
Doyline, LA 71023-0659
Telephone Number: (318) 382-9300
Fax Number: (318) 382-9303

BLACK POWDER**FRICITION TEST**

PA

Steel – Snaps
Fiber – Unaffected

IMPACT TEST

PA

16 Inches (10% Point)

ELECTROSTATIC DISCHARGE TEST**Bureau of Mines**

0.8 Joules (Confined)
12.5 Joules Unconfined)

STABILITY

75° C International Heat Test – 0.31% Loss
Vacuum Stability – 0.5cc @ 100° C

BRISANCE – Sand Test 8 gm.**VELOCITY**

In the open, trains of black powder burn very slowly, measurable in seconds per foot. Confined, as in steel pipe, speeds of explosions have been timed at values from 560 feet per second for very coarse granulations to 2,070 feet per second for the finer granulations. Confinement and granulation will affect the values.

CHEMICAL DECOMPOSITION

Use water to dissolve the potassium nitrate. By leeching out the potassium nitrate, the residue of sulfur and charcoal is non-explosive but combustible when dry – dispose separately.

SPECIAL REQUIREMENTS:

Black Powder is very sensitive to flame and spark and can also be ignited by friction and impact. When ignited unconfined, it burns with explosive violence and will explode if ignited under even slight confinement.

When dry, it is compatible with most metals. However, it is hygroscopic and when wet, attacks all common metals except stainless steel.

CAUTION: Explosives must be tested for compatibility with any material not specified in the production/procurement package with which they may come in contact. Materials include other explosives, solvents, adhesives, metals, plastics, paints, cleaning compounds, floor and table coverings, packing materials and other similar materials, situations and equipment. Explosives include propellants and pyrotechnics.

5

4.5 Carbon Fiber



SAFETY DATA SHEET

PRODUCT IDENTIFICATION

Product Name:	TC-09-U (Carbon unidirectional) 9.4 oz/yd ² - 320 g/m ²	
Product Composition:	97.0% Toho[®] Carbon, 3.0% HM Glass (by product weight)	
Weaver:	Texonic inc 445 St-Jacques Québec, Canada J3B 2M1 Tel.: (450) 346-6853	
Raw materials:	Toho Tenax America 121 Cardiff Valley Road Rockwood, TN 37854 USA Tel.: (800) 424-9300 (Chemtrec)	EY Technologies 939 Currant Road Fall River, MA 02720 USA Tel.: (508) 673-3307
The production of TC-09-U fabric has not in any way altered the physical state of the raw materials used to make this product, please see the enclosed SDS from the supplier of the raw material.		



SAFETY DATA SHEET

SDS NO. 0503 Rev L

EFFECTIVE DATE: 5 November 2014

1. IDENTIFICATION OF THE SUBSTANCE AND OF THE COMPANY

Product Identifier: Tenax®-A, E, or J - continuous or chopped carbon fiber, with sizing (surface finish)

Company: Toho Tenax America, Inc.
121 Cardiff Valley Road
Rockwood, TN 37854

Phone: (865) 354-4120

Fax: (865) 354-8409

Homepage: <http://www.tohotenax-us.com>

Contacts: Jason Carling – Global R&D Manager jcarling@tohotenaxus.com
Mark Klemmer – ES&H Manager mklemm@tohotenaxus.com

Emergency Phone #: **CHEMTREC (800) 424-9300**

Recommended Use: Continuous or Chopped Carbon Fiber may be used in thermoplastic, thermoset, paper, adhesives, etc.

Uses advised against: None known

Method of operation: See product information.

2. HAZARD(S) IDENTIFICATION

Overview: In supplied form the product is not hazardous. When handled and processed can cause skin, eye and respiratory tract irritation

Primary Routes of Exposure: Eye – Yes, Skin – Yes, Inhalation – Yes, Ingestion – No

HMIS Rating: Health – 1, Flammability – 0, Reactivity – 0, Special – NONE

Hazard Classification:	May cause eye or skin irritation, otherwise Non Hazardous
Hazard Statement:	H315, H319
Hazard Symbols:	None
Signal Word:	None
Health Hazards:	See Section 11
Precautionary statement:	Possible irritant to the skin, eyes and respiratory tract when processed due to nuisance dust generation. Fiber is electrically conductive.
Physical / Chemical Hazards:	See Section 10 for additional information: In the supplied form the product is not explosive however the processing and buildup of fine dust can lead to a risk of dust explosions. Warning: processing may create combustible dust concentrations in the air.
Environmental hazards:	No specific hazards known.
Other hazards:	None



3. COMPOSITION/INFORMATION on INGREDIENTS

<u>Name</u>	<u>CAS</u>	<u>% WT</u>	<u>OSHA PEL TWA</u>	<u>ACGIH TLV TWA</u>	<u>SARA</u>
Carbon Fiber (derived from polyacrylonitrile)	7440-44-0	>=95%	N/A	N/A	No
Trade Secret Sizing Chemistry	N/A	<=5%	N/A	N/A	No

Comment on component parts: No dangerous components.

4. FIRST AID MEASURES

General information:	N/A
Inhalation:	Ensure supply of fresh air. Seek medical attention if breathing becomes difficult.
Skin contact:	Supply with medical care. Consult a doctor if skin irritation persists.
Eye contact:	In case of contact with eyes rinse thoroughly with plenty of water and seek medical advice.
Ingestion:	Supply with medical care. Rinse out mouth and give plenty of water to drink. Induce the patient to vomit of his own accord only if fully conscious.
Advice to doctor:	Treat symptomatically

5. FIRE FIGHTING MEASURES

Flash Point:	N/A
LEL:	N/A
UEL:	N/A
Suitable extinguishing media:	Dry powder
Extinguishing media that must not be used:	Full water jet
Special exposure hazards arising from the substance or preparation itself or combustion products:	Carbon monoxide (CO); Nitrogen oxides (NOx).
Special protective equipment for firefighters:	Do not inhale combustion gases. Use self-contained breathing apparatus.
Additional information:	Fire residues and contaminated firefighting water must be disposed of in accordance with local regulations.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions:	N/A
Environmental precautions:	N/A
Methods for cleaning up:	Take up mechanically. Dispose of material in accordance within the regulations.

7. HANDLING AND STORAGE

Advice on safe handling:	No special measures necessary if used correctly.
Advice on protection against fire and explosion:	Dust may form an explosive mixture with air when processed. Keep away from sources of ignition and refrain from smoking in the vicinity.
Requirements for storage rooms and vessels:	No special measures necessary.
Advice on storage compatibility:	Do not store together with oxidizing agents.
Further information on storage conditions:	Store in a dry place. Recommended storage temperature: < 50°C, relative humidity: < 85% Electrical equipment, enclosures and circuits in or near areas where carbon fibers are used should be protected against infiltration or contact with airborne particles or filaments. Carbon fiber is electrically conductive and may cause an electrical short.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Additional advice on system design:	Ensure adequate ventilation on workstations. The effectiveness and design of ventilation systems and their implementation to control dust should be considered. Proper routine housekeeping should be instituted to ensure dust does not accumulate on surfaces.
Respiratory protection:	Breathing apparatus in the event of high concentrations, filter N95. Short-term: filter apparatus, filter N95
Hand protection:	Butyl rubber, > 120 min (EN 374)
Eye protection:	Safety glasses
Skin protection:	Mechanical irritation accompanied by itching or dermal effects may occur from exposure to material. Clean room type clothing that consists of a light weight, well ventilated, fabric may prevent the transfer of dust. Consider taping at the wrist and ankle areas to control contact with exposed areas. A PPE hazard analysis should be conducted based on the user processes.
General protective measures:	Avoid contact with eyes. Do not inhale dust.
Hygiene measures:	Wash hands before breaks and after work. Use barrier skin cream.
Delimitation and monitoring of the environmental exposition:	Not determined

9. PHYSICAL AND CHEMICAL PROPERTIES

Form:	Fine Fiber
Color:	Black
Odor:	Odorless
pH Value [1%]:	N/A
pH value:	N/A
Boiling point [°C]:	N/A
Flash point [°C]:	N/A
Flammability [°C]:	N/A
Lower explosion limit:	N/A
Upper explosion limit:	N/A
Oxidizing properties:	None
Vapor pressure [kPa]:	N/A
Density at 20°C [g/ml]:	1.76 – 1.86 (carbon density)
Bulk density [kg/m³]:	N/A
Solubility in water:	Insoluble
Partition coefficient [noctanol/water]:	N/A
Viscosity:	N/A
Relative vapor density in air:	N/A
Evaporation speed:	N/A
Melting point:	ca. 3500 °C
Autoignition temperature:	N/A
Decomposition temperature:	>650 °C in air, preparation > 290°C
Electrically Conductive:	Yes

10. STABILITY AND REACTIVITY

Hazardous reactions: Avoid reactions with strong oxidizing agents. Accumulation of fine dust may entail the risk of a dust explosion in the presence of air. The fine dust from a carbon fiber compound or composite that is cut or formed can create additional dust explosion risk depending on the resin or compounding agent. A process hazard analysis is recommended to determine what, if any, risks are present.

Hazardous decomposition products: No hazardous decomposition products will be formed during normal usage of carbon fiber. Complete or partial combustion of the surface coating on "sized" carbon fiber may generate CO_x, NO_x, and / or other trace chemicals.

11. TOXICOLOGICAL INFORMATION

Acute oral toxicity:	Not determined
Acute dermal toxicity:	Irritant
Acute inhalational toxicity:	Irritant
Irritant effect on eye:	Not determined
Irritant effect on skin:	Mechanical skin irritation.
Sensitization:	Not determined
Sub-acute toxicity:	Not determined
Chronic toxicity:	Not determined
Mutagenicity:	Not determined
Reproduction toxicity:	Not determined
Carcinogenicity:	Not determined
Experiences made in practice:	Fiber abrasion can cause mechanical skin irritation.

12. ECOLOGICAL INFORMATION

Fish toxicity:	N/A
Daphnia toxicity:	N/A
Behavior in environment compartments:	Not determined
Behavior in sewage plant:	N/A
Bacteria toxicity:	N/A
Biological degradability:	N/A
COD:	Not determined
BOD 5:	Not determined
AOXadvice:	No dangerous components
General information:	Ecological data are not available.

13. DISPOSAL CONSIDERATIONS

Product:	For recycling, consult manufacturer and / or waste disposal centers.
EU Waste Number:	160306, 061399
Contaminated packaging:	Packaging that cannot be cleaned should be disposed of as for product. Uncontaminated packaging may be taken for recycling.
EU Waste Number:	150101, 150102

14. TRANSPORT INFORMATION

Classification according to DOT:	Non Hazardous
Classification according to IMDG:	Not classified as "Dangerous Goods"
Classification according to IATA:	Not classified as "Dangerous Goods"

15. REGULATORY INFORMATION

SARA Title III:	Section 302/304 Extremely Hazardous Substance: None Section 311 Hazardous Categorization: None Section 313 Toxic Chemicals: None
CERCLA Section 102(a) Hazardous Substance:	None
RCRA Information:	Currently, the product is not listed in federal hazardous waste regulations 40 CFR, Part 261.33, paragraphs (e) or (f), i.e. chemical products that are considered hazardous if they become wastes. State or local hazardous waste regulations may also apply if they are different from the federal regulation. It is the responsibility of the user of the product to determine at the time of disposal, whether the product meets relevant waste classification and to assure proper disposal.
U.S., EPA, TSCA Information:	This product is an article as defined by TSCA and is not required to be listed in the TSCA inventory.
Ozone Depletion Information:	This product does not contain or is not manufactured with ozone depleting substances as identified in Title VI, Clean Air Act "Stratospheric Ozone Protection" and the regulations set forth in 40 CFR, Part 82.
Exposure Risk:	Not determined
Chemical safety report:	Not determined

Labeling:	All chemicals in this product are included on the TSCA Inventory
Hazard symbols:	None
R-phrases:	R36/37/38 – Irritation to eyes, respiratory system and skin
S-phrases:	S36/37/39 – Wear suitable protective clothing such as gloves, eye and face protection for nuisance dust and skin abrasion protection.
Special labeling:	
Authorization, TITLE VII:	N/A
Restrictions:	
TITLE VIII:	N/A
TRANSPORT REGULATIONS:	IATADGR (2008).

16. OTHER INFORMATION

VOC (1999/13/CE):	N/A
Customs Tariff:	Not determined
European Union (2002/95/EC) RoHS / RoHS2:	

These products do not contain any of the chemicals listed in the RoHS / RoHS2 regulations

REVISION HISTORY – SDS 503 –Carbon Fiber - Continuous Filament or Chopped, with Sizing		
Revision	Effective	Summary of Changes
REV: I	8/19/13	Changed Title from MSDS (Material Safety Data Sheet) to SDS (Safety Data Sheet).
REV: I	8/19/13	Changed Format of MSDS to SDS Format-Required under the modification of the OSHA Hazardous Communication Standard (29CFR1910.1200).
REV: J	9/16/13	The order of sections 2 and 3 has been reversed. GHS Hazard Statements and GHS Precautionary Statements have been listed in Section 2 Hazard Identification, (R and S Codes). Emergency phone # moved to Section 1. Product Relevant Uses and Uses Advised Against have been added to Section 1.
REV: K	11/13/13	Updated Section 2 for GHS compliance.
REV: L	11/5/14	Section 2 hazard statement was clarified.

SAFETY DATA SHEET

HM2819

DATE: 3/11/2016

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: HM2819
SYNONYMS: EVA Hot Melt coated yarn

MANUFACTURER: E.Y. Technologies
ADDRESS: 939 Currant Road Fall River MA. 02720

EMERGENCY PHONE: (508) 673-3307
FAX PHONE: (508)672-6717

PREPARED BY: Peter Stetkiewicz

SECTION 2: HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW:

PHYSICAL APPEARANCE: Clear hot melt coated yarn.
IMMEDIATE CONCERNS: Contact with molten coating will cause thermal burns.

POTENTIAL HEALTH EFFECTS

EYES: Molten coating will cause severe eye damage if contact occurs.

SKIN: When heated hot melt coating can cause thermal burns.

INGESTION: Ingestion causes irritation of upper respiratory system and gastrointestinal disturbance. Molten coating will produce burns to the gastrointestinal tract.

INHALATION: Heated fumes can cause irritation of respiratory system.

CHRONIC: No data available.

CARCINOGENICITY: Not considered a carcinogen in its current form.

MUTAGENICITY: No data available.

PRECAUTIONARY STATEMENTS: Read and follow Safety Data Sheet before use. Seek medical advice/attention if symptoms contained herein persist or worsen.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

INGREDIENT: Proprietary Non/Hazardous

<u>CAS NO.</u>	<u>CHEMICAL NAME</u>	<u>% WT</u>
----------------	----------------------	-------------

SECTION 3 NOTES:

CARCINOGENICITY			
OSHA: NO	ACGIH: NO	NTP: NO	IARC: NO
OTHER:			

SAFETY DATA SHEET

HM2819

DATE: 3/11/2016

SECTION 4: FIRST AID MEASURES

EYES: If hot product contacts eye, flush with water for at least 15 minutes and seek medical attention.

SKIN: If hot product contacts skin, cool under running water and get medical attention. Cool melted product on skin with plenty of water. Do not remove solidified product.

INGESTION: If ingested, get immediate medical attention. Do not induce vomiting unless instructed to do so by medical personnel.

INHALATION: Move to fresh air in case of accidental inhalation of vapors or decomposition of products. If symptoms persist, get medical attention.

NOTES TO PHYSICIANS OR FIRST AID PROVIDERS: No data available.

SECTION 4 NOTES:

SECTION 5: FIRE-FIGHTING MEASURES

SUITABLE EXTINGUISHING MEDIA: Dry chemical, foam or carbon dioxide.

FIRE FIGHTING PROCEDURES: This material is in solid form at room temperature, but in fire conditions fumes and decomposition will produce acetic acid and carbon monoxide. Full protective clothing and breathing apparatus should be worn.

UNUSUAL FIRE AND EXPLOSION HAZARD: Cooling with water will solidify the material very rapidly. No unusual fire and explosion hazards are known.

COMBUSTION PRODUCTS: Incomplete combustion will produce acetic acid and carbon monoxide.

SECTION 5 NOTES:

SECTION 6: ACCIDENTAL RELEASE MEASURES

SMALL SPILL: Collect spillage. Dispose of contents in accordance with local and federal requirements.

LARGE SPILL: Avoid release to the environment. Collect spillage in accordance with local and federal requirements.

ENVIRONMENTAL PRECAUTION

WATER SPILL: Avoid release to waterways.

LAND SPILL: Do not allow material to enter drains.

PERSONAL PRECAUTIONS: Wear appropriate personal protective equipment during cleanup.

METHOD OF CLEANING UP: Clean spills in a manner to avoid releases to waterways. Place material in a properly labeled container.

SECTION 6 NOTES:

SECTION 7: HANDLING AND STORAGE

HANDLING AND STORAGE: Store in a cool location (60-80F) away from sunlight and any source of heat. Cover when not in use.

CONDITIONS FOR SAFE STORAGE, INCLUDING INCOMPATIBILITIES: Keep in a cool place. Keep container covered and dry.

SAFETY DATA SHEET

HM2819

DATE: 3/11/2016

SECTION 7 NOTES:

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

OSHA TABLE COMMENTS: NL = Not Listed.

EXPOSURE LIMITS: None established.

PERSONAL PROTECTIVE EQUIPMENT

RESPIRATORY PROTECTION: When thermal processing fumes are generated and ventilation is not sufficient to effectively remove them, appropriate NIOSH/MSHA approved respiratory protection must be provided.

EYE AND FACE PROTECTION: Where safety glasses, chemical goggles for fumes which may arise from thermal processing.

SKIN PROTECTION: Wear suitable protective clothing. Use any type of rubber thermal insulating gloves and other clothing as necessary to protect from thermal burns.

WORK HYGIENIC PRACTICES: Wear suitable protective clothing. Wash thoroughly after handling. Do not eat, drink or smoke when using this product.

SECTION 8 NOTES:

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE: Clear hot coated yarn.

ODOR: Mild odor.

PHYSICAL STATE: Solid.

pH AS SUPPLIED: No data available.

BOILING POINT: No data available.

MELTING POINT: Hot Melt: 185°F

FREEZING POINT: No data available.

VAPOR PRESSURE (mmHg): No data available.

VAPOR DENSITY (AIR = 1): Heavier than air.

SPECIFIC GRAVITY (H₂O = 1): 1.2 @ 75°F.

EVAPORATION RATE: No data available.

SOLUBILITY IN WATER: Insoluble.

PERCENT SOLIDS BY WEIGHT: Solid material.

VISCOSITY: No data available.

SECTION 9 NOTES:

SAFETY DATA SHEET

HM2819

DATE: 3/11/2016

SECTION 10: STABILITY AND REACTIVITY

STABLEUNSTABLE

STABILITY: X

CONDITIONS TO AVOID (STABILITY): Avoid excessive overheating.

HAZARDOUS DECOMPOSITION PRODUCTS: Upon decomposition this product emits acetic acid and carbon monoxide.

HAZARDOUS POLYMERIZATION: Will not occur.

SECTION 10 NOTES:

SECTION 11: TOXICOLOGICAL INFORMATION

SIGNS AND SYMPTOMS OF OVEREXPOSURE: Possible nausea, headaches or respiratory distress.

ACUTE EFFECTS:

EYE: Molten material can damage eyes. Fumes can cause eye irritation.

SKIN: Molten material can cause severe burns.

INGESTION: Molten polymer will burn the internal organs severely.

CHRONIC EFFECTS: Prolonged and repeated inhalation of fumes may cause headaches.

TOXICOLOGICAL INFORMATION: Non-Toxic

SECTION 11 NOTES:

SECTION 12: ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION: All hot melt coated yarns are manufactures without the intentional use of volatile organic compounds and/or hazardous air pollutants regulated by the EPA in the Clean Air Act Amendment of 1990.

SECTION 12 NOTES:

SECTION 13: DISPOSAL CONSIDERATIONS

DISPOSAL METHOD: Dispose of contents in accordance with local, regional, national and/or international regulations.

EMPTY CONTAINER: Dispose of container in accordance with local, regional, national and/or international regulations.

RCRA/EPA WASTE INFORMATION: No data available.

SECTION 13 NOTES: It is the obligation of each user of the product mentioned herein to determine and comply with the requirements of all applicable local, regional, national and/or international regulations.

SAFETY DATA SHEET

HM2819

DATE: 3/11/2016

SECTION 14: TRANSPORT INFORMATION**U.S. DEPARTMENT OF TRANSPORTATION**

PROPER SHIPPING NAME: Not regulated as hazardous goods.

TECHNICAL NAME: No data available.

HAZARD CLASS: Not regulated as hazardous goods.

ID NUMBER: Not regulated as hazardous goods.

SECTION 14 NOTES:**SECTION 15: REGULATORY INFORMATION****UNITED STATES****SARA TITLE III (SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT)****311/312 HAZARD CATEGORIES:**

FIRE: No.

REACTIVITY: No.

CHRONIC: No.

PRESSURE GENERATING: No.

ACUTE: No.

313 REPORTABLE INGREDIENTS: Refer to Section 2.

302/304 EMERGENCY PLANNING

EMERGENCY PLAN: No data available.

CALIFORNIA PROPOSITION 65: None.

SECTION 15 NOTES:**SECTION 16: OTHER INFORMATION**

HMIS RATING	
Health:	0
Flammability:	1
Physical Hazards:	0
Personal Protection:	X*

* The customer is responsible for determining the PPE code for this material.

DISCLAIMER: The information and data herein are believed to be accurate and have been compiled from sources believed to be reliable. It is offered for your consideration, investigation and verification. Buyer assumes all risks from use, storage, and handling of the product in compliance with the applicable federal, state and local laws and regulations. EY TECHNOLOGIES MAKES NO WARRANTY OF ANY KIND, EXPRESSED OR IMPLIED, CONCERNING THE ACCURACY OR COMPLETENESS OF THE INFORMATION AND DATA HEREIN. EY Technologies will not be liable for claims relating to any party's use or reliance on information and data contained herein regardless of whether it is claimed that the information and data are inaccurate, incomplete or otherwise misleading. This information relates to the material designated and may not be valid for such material used in combination with any other materials.



Disclaimer:

The information given by this document is based on the best knowledge at the date shown. It is given in good faith.

Furthermore, user's attention is drawn to the possible risks run when the product is used for any purpose other than the one for which it was designed.

These SDSs do not exempt users from knowing and applying the rules regulating their activities. Users assume full responsibility for applying the appropriate safety measures when the product is used.

The specifications mentioned in these SDSs are only those of the manufacturers of the raw materials and no further testing was performed by Texonic.

The technical department

4.6 Electric Match Igniter



Pro150 Igniter SAFETY DATA SHEET

Page: 1 of 9
Version: 2.00 / EN
Rev. Date: 2016-07-26

1.0 PRODUCT / COMPANY IDENTIFICATION

1.1 Product Identifier

Product Name: Pro150 Igniter
Synonyms: Igniter, Hobby Rocket Motor Igniter, Electric Match
Part Number: INI-150

1.2 Relevant Identified Uses

Product Use: Igniter, used to ignite Pro150 hobby rocket motors

1.3 Details of the Supplier of the SDS

Manufacturer / Supplier: Cesaroni Technology Inc.
P.O. Box 246
2561 Stouffville Rd.
Gormley, Ont.
Canada L0H 1G0
E-mail: regulatory@cesaroni.net

1.4 Emergency Telephone Numbers

Telephone Numbers:
Product Information: Tel: +1-905-887-2370 Fax: +1-905-887-2375
24 Hour Emergency Telephone Number: Tel: +1-613-996-6666 (CANUTEC)

2.0 HAZARDS IDENTIFICATION

2.1 Classification

Classification: Explosive Article – Division 1.4 (UN GHS – ST-SG-AC10-30-Rev5e)
(WHMIS 2015 – Canada, HazCom 2012 – USA, Regulation (EC) No. 1272/2008 [CLP] – EU, 67/548/EEC or 1999/45/EC – EU)

2.2 Label Elements

Signal Word: Danger

GHS Pictograms:



Hazard Statements: H204 Fire or Projection Hazard
H302 Harmful if swallowed

Precautionary Statements

P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking
P250 Do not subject to grinding/shock/friction.
P370+P380 In case of fire: Evacuate Area.
P372 Explosion risk in case of fire.
P373 DO NOT fight fire when fire reaches explosives.
P401 Store in accordance with local/regional/national regulations.
P501 Dispose of in accordance with local/regional/national regulations.

2.3 Other Hazards

Emergency Overview:

These articles contain potassium perchlorate. All explosives are dangerous and must be handled carefully and used following approved safety procedures under the direction of competent, experienced personnel in accordance with all applicable federal, state and local laws and regulations. Avoid inhaling exhaust products.



Pro150 Igniter SAFETY DATA SHEET

Page: 2 of 9
Version: 2.00 / EN
Rev. Date: 2016-07-26

Potential Health Effects:

Eye:

Not a likely route of exposure. May cause eye irritation.

Skin:

Not a likely route of exposure. Low hazard for usual industrial/hobby handling.

Ingestion:

Not a likely route of exposure.

Inhalation:

Not a likely route of exposure. May cause respiratory tract irritation. Do not inhale exhaust products.

3.0 COMPOSITION / INFORMATION ON INGREDIENTS

3.1 Substances n/a

3.2 Mixtures

3.2.1 Description of the Mixtures

ProFire Igniters consist of two insulated wires that are capped at one end by a small circuit board. The circuit board is covered in a pyrotechnic composition.

3.2.2 Hazardous Ingredients

Pellets

Name	CAS No.	EC No.	REACH Registration No.	% [weight]	Classification according to Reg. (EC) No. 1278/2008 (CLP)
Charcoal	16291-96-6	240-383-3	01-2119560590-41-0000	8%	
Sulfur	7704-34-9	231-722-6	01-2119487295-27-0000	8%	Skin Irrit. 2
Potassium Nitrate	7757-79-1	231-818-8	01-2119488224-35-0000	30%	
Potassium Perchlorate	7778-74-7	231-912-9	01-2120021000-89-0000	30%	Ox. Sol. 1 Acute Tox. 4
Graphite	7782-42-5	231-955-3	01-2119486977-12-0000	< 1%	Not classified

4.0 FIRST AID MEASURES

4.1 Description of First Aid Measures

4.1.1 General Information

Burns received from igniters may be treated as regular burns, following normal first aid procedures.

4.1.2 Following Inhalation

Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

4.1.3 Following Skin Contact

Most people will not react to skin contact. If there is any sign of skin reaction or irritation, flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists.

4.1.4 Following Eye Contact

Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

4.1.5 Following Ingestion

Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.



Pro150 Igniter SAFETY DATA SHEET

Page: 3 of 9
Version: 2.00 / EN
Rev. Date: 2016-07-26

- 4.1.6 Self-Protection of the First Aider**
Avoid inhaling exhaust products.
- 4.2 Most Important Symptoms and Effects, both acute and delayed**
- 4.2.1 Symptoms:**
Skin rash
- 4.2.2 Effects:**
Continued rash may indicate sensitivity to ammonium perchlorate composite propellant
- 4.3 Indication of any immediate medical attention and special treatment needed**
- 4.3.1 Notes for the doctor:**
Treat with regular procedures
- 4.3.2 Special Treatment:**
No special treatments required

5.0 FIRE FIGHTING MEASURES

- 5.1 Extinguishing Media:**
- 5.1.1 Suitable Extinguishing Media**
In case of fire, use water, dry chemical, chemical foam, or alcohol-resistant foam to contain surrounding fire.
- 5.1.2 Unsuitable Extinguishing Media**
None
- 5.2 Special Hazards Arising from the Substance or Mixture**
- 5.2.1 Hazardous Combustion Products**
During a fire, irritating and highly toxic gases, including boron and titanium, may be generated by thermal decomposition or combustion.
- 5.3 Advice for Fire Fighters**
Keep all persons and hazardous materials away. Igniters may project sparks that could cause secondary fires. Avoid breathing exhaust products. As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.
- 5.4 Additional Information**
These articles burn rapidly and generate a significant flame for a short period of time. Black powder is a deflagrating explosive. It is very sensitive to flame and spark and can also be ignited by friction and impact. When ignited unconfined, it burns with explosive violence and will explode if ignited under even slight confinement. Do not inhale exhaust products.

6.0 ACCIDENTAL RELEASE MEASURES

- 6.1 Personal precautions, protective equipment and emergency procedures**
- 6.1.1 For non-emergency personnel**
- Protective equipment:** If no source of ignition present, no special PPE is required.
- Emergency procedures:** Replace articles in packaging and boxes and seal securely. Sweep or scoop up using non-sparking tools.
- 6.1.2 For emergency responders**
- Personal protective equipment:** If no source of ignition present, no special PPE is required.
- 6.2 Environmental precautions:** Be sure to sweep or scoop up complete spill.



Pro150 Igniter SAFETY DATA SHEET

Page: 4 of 9
Version: 2.00 / EN
Rev. Date: 2016-07-26

6.3 Methods and material for containment and cleaning up

- 6.3.1 For containment:** Prevent igniters from contaminating surface and ground water. If overdip cracks off, prevent wind from carrying particles away.
- 6.3.2 For cleaning up:** Clean up spills immediately. Replace articles in packaging and boxes and seal securely. Sweep or scoop up using non-sparking tools.
- 6.3.3 Other information:** None
- 6.4 Reference to other sections** See section 13 for disposal procedures.
- 6.5 Additional information:** None

7.0 HANDLING AND STORAGE

7.1 Precautions for safe handling

- 7.1.1 Protective measures:**
- Advice on safe handling: Do not get in eyes, on skin or on clothing. Do not taste or swallow. Avoid prolonged or repeated contact with skin. Follow manufacturer's instructions for use.
- Fire preventions: Keep away from sources of heat or ignition.
- Aerosol and dust generation preventions: n/a
- Environmental precautions: Store in a cool, dry place.

7.1.2 Advice on general occupational hygiene

7.2 Conditions for safe storage, including any incompatibilities

- Technical measures & storage conditions: Store in a cool, dry place, away from sources of heat or ignition.
- Packaging materials: Store in original packaging until immediately before use.
- Requirements for storage rooms and vessels: Store in accordance with local requirements for explosives.
- Hints on storage assembly: n/a
- Storage class: n/a
- Materials to avoid: Do not store with combustibles.
- Further information on storage conditions: n/a

7.3 Specific end uses:

- Recommendations: Use as per supplied instructions.
- Specific end uses: Use in accordance with national regulations for High Power Rocketry. (eg. Canadian Association of Rocketry, Tripoli Rocketry Association, etc.)

8.0 EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Control Parameters

- 8.1.1 Occupational Exposure Limits**
No occupational exposure limits listed
- 8.1.2 Biological Limit Values**
No biological limits listed



Pro150 Igniter SAFETY DATA SHEET

Page: 5 of 9
Version: 2.00 / EN
Rev. Date: 2016-07-26

8.1.3 Exposure Limits at Intended Use

8.1.4 DNEL/PNEC Values
No DNEL values listed.
No PNEC values listed.

8.1.5 Risk management measures according to used control banding approach
Employ good industrial hygiene practices.

8.2 Exposure Controls

8.2.1 Appropriate Engineering Controls
Use adequate explosion proof ventilation to keep airborne concentrations low. All equipment and working surfaces must be grounded.

8.2.2 Personal Protective Equipment

8.2.2.1 Eye/Face Protection
Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

8.2.2.2 Skin Protection
Clothing should be appropriate for handling pyrotechnic substances.

8.2.2.3 Respiratory protection
A respirator is not typically necessary.

8.2.2.4 Thermal Hazards
An igniter can cause severe burns when it goes off. Follow supplied instructions.

8.2.3 Environmental Exposure Controls

8.2.4 Consumer Exposure Controls
Follow supplied instructions.

9.0 PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on Basic Physical and Chemical Properties

9.1.1 Appearance

Physical State:	solid
Appearance:	igniter with black pellets inside.
Odour:	none
Odour Threshold:	Not available.
pH:	Not available.
Vapour Pressure:	Not available.
Vapour Density:	Not available.
Viscosity:	Not available.
Evaporation Rate:	Not available.
Boiling Point:	Not available.
Freezing/Melting Point:	Not available.
Coefficient of water/oil distribution:	Not available.
Autoignition Temperature:	280°C
Flash Point:	Not available.
Explosion Limits, lower (LEL):	Not available.
Explosion Limits, upper (UEL):	Not available.
Sensitivity to Mechanical Impact:	Not available
Sensitivity to Static Discharge:	can be ignited by static discharge
Decomposition Temperature:	> 400°C
Solubility in water:	Not available
Specific Gravity/Density:	Not available
Molecular Formula:	Not applicable
Molecular Weight:	Not applicable.

9.2 Other Information
none



Pro150 Igniter SAFETY DATA SHEET

Page: 6 of 9
Version: 2.00 / EN
Rev. Date: 2016-07-26

10.0 STABILITY AND REACTIVITY

- 10.1 Reactivity**
- 10.2 Chemical Stability**
Under storage at normal ambient temperatures (minus 40° C to + 40° C), the product is stable.
- 10.3 Possibility of Hazardous Reactions**
Hazardous polymerization will not occur.
- 10.4 Conditions to Avoid**
Heat, static electricity, friction, impact
- 10.5 Incompatible Materials**
Combustible or flammable materials, explosive materials
- 10.6 Hazardous Decomposition Products**
Oxides of Nitrogen, hydrochloric acid

11.0 TOXICOLOGICAL INFORMATION

- 11.1 Information on Toxicological Effects**
- 11.1.1 Substances** **not applicable**
- 11.1.2 Mixtures**
- | | | |
|-----|---------------------------|-------------------|
| (a) | Acute toxicity | no data available |
| (b) | Irritation | no data available |
| (c) | Corrosivity | no data available |
| (d) | Sensitisation | no data available |
| (e) | Repeated dose toxicity | no data available |
| (f) | Carcinogenicity | no data available |
| (g) | Mutagenicity | no data available |
| (h) | Toxicity for reproduction | no data available |
- 11.2 Other Information**

Exposure Limits:

Ingredient Name	CAS Number	OSHA PEL	ACGIH TLV
Charcoal	16291-96-6	not established	not established
Sulfur	7704-34-9	not established	not established
Potassium Nitrate	7757-79-1	not established	not established
Potassium Perchlorate	7778-74-7	not established	not established
Graphite	7782-42-5	not established	not established

12.0 ECOLOGICAL INFORMATION

- | | |
|------------------------------------------------|--------------------------------------------------------|
| 12.1 Toxicity | No Data Available |
| 12.2 Persistence and Degradability | No Data Available |
| 12.3 Bioaccumulative Potential | No Data Available |
| 12.4 Mobility in Soil | No Data Available |
| 12.5 Results of PBT and vPvB Assessment | No Data Available |
| 12.6 Other Adverse Effects | The substance has a very low global warming potential. |



Pro150 Igniter SAFETY DATA SHEET

Page: 7 of 9
Version: 2.00 / EN
Rev. Date: 2016-07-26

13.0 DISPOSAL CONSIDERATIONS

13.1 Waste Treatment Methods

13.1.1 Product/Packaging Disposal

Pack firmly in hole in ground. Ignite electrically from a safe distance and wait 5 minutes before approaching. Dispose of spent components in inert trash.
Dispose of used packaging materials in inert trash.

13.1.2 Waste Treatment Options

Igniters should be burned before disposal.

13.1.3 Other Disposal Recommendations

Consult local regulations about disposal of explosive materials.

13.2 Additional Information

None

14.0 TRANSPORT INFORMATION

	Land Transport (ADR/RID)	Inland Waterway Transport (AND)	Sea Transport (IMDG)	Air Transport (ICAO-TI/IATA- DGR)
14.1 UN No.	UN 00454			
14.2 UN Proper Shipping Name	Igniters			
14.3 Transport Hazard Class	1.4 S			
14.4 Packing Group	n/a			
14.5 Environmental Hazards	None listed			

14.6 Special Precautions for the User

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not designed for bulk transport.

14.8 Additional Information

14.8.1 All Transport Carriers

See below

14.8.2 Land Transport (ADR/RID)

Limited Quantity: 0
Special Provisions: none
Tunnel Restriction Code: E
Classification Code: 1.4S
Transport Category: 4 (E)
Hazard Identification Number (Kemler No.): none
Remark:

14.8.3 Inland Waterway Transport (ADN)

Limited Quantity: 0
Special Provisions: none
Category: not applicable
Remark: Handling provisions- LO01, HA01, HA03

14.8.4 Sea Transport (IMDG)

Limited Quantity: None
Special Provisions: none
Marine Pollutant: not applicable
Segregation Group: not applicable
Remark: Packing Instruction 101

14.8.5 Air Transport (ICAO-TI / IATA-DGR)

Limited Quantity: None
Special Provisions: None
Remark: Packing Instruction 142, Max. 25 kg per package (passenger aircraft, Max 100 kg / per package (cargo aircraft)



Pro150 Igniter SAFETY DATA SHEET

Page: 8 of 9
Version: 2.00 / EN
Rev. Date: 2016-07-26

15.0 REGULATORY INFORMATION

15.1 Safety, Health and Environmental Regulations/Legislation

15.1.1 EU Regulations

Authorizations

Restrictions on Use

Follow local regulations for use and storage of class 1.4S explosives

Other EU Regulations

15.1.2 National Regulations

Canada

This product has been classified according to the hazard criteria of the Canadian Controlled Products Regulations (CPR) and the SDS contains all of the information required by the CPR.

WHMIS Classification: Not Controlled (explosive)
 Canadian Explosives Classification: Rocket Motors – **R.3, PE4**
 These products are authorized explosives in Canada.
 These products are not considered "Controlled Goods" in Canada under the Controlled Goods Regulations.

United States of America

EPA Hazard Categories (SARA 311,312)

Hazardous Chemical Lists

CERCLA Hazardous Substance (40 CFR 302.4)	No
SARA Extremely Hazardous Substance (40CFR 355)	No
SARA Toxic Chemical (40CFR 372.65)	No
Massachusetts Right-To-Know Substance List (MSL)	No
Pennsylvania Right-To-Know Substance List	No
New Jersey Worker & Community Right-To-Know Act	No
California Proposition 65	No

Chemical Inventories

Canada	All ingredients are listed on the DSL.
United States	All ingredients are listed on the TSCA Inventory.
Europe	All ingredients are listed on the EINECS inventory.
Australia	All ingredients are listed on the AICS Inventory.
China	All ingredients are listed on the IECSC Inventory.
Japan	All ingredients are listed on the ENCS Inventory.
Korea	All ingredients are listed on the Existing Chemicals List (ECL).
Philippines	All ingredients are listed on the PICCS.

15.2 Chemical safety Assessment

A Chemical Safety Assessment is not required for this product.

16.0 OTHER INFORMATION

16.1 Changes From Last Version

Overhaul to comply with WHMIS 2015, HazCom 2012 and REACH.

16.2 Abbreviations and Acronyms

DNEL	Derived No-Effect Exposure Limit
HS	Globally Harmonized System
PNEL	Predicted No Effect level

16.3 Key Literature References and Sources of Data



Pro150 Igniter SAFETY DATA SHEET

Page: 9 of 9
Version: 2.00 / EN
Rev. Date: 2016-07-26

GESTIS

16.4 Classification for mixtures and used evaluation method according to regulation (EC) 1207/2008 [CLP]
No tests conducted.

16.5 Relevant R-, H-, and EUH- Phrases

Risk Phrases:

R 2 Risk of explosion by shock, friction, fire or other sources of ignition.
R 11 Highly flammable
R 44 Risk of explosion if heated under confinement.

Safety Phrases:

S 1/2 Keep locked up and out of the reach of children.
S 8 Keep container dry.
S 15 Keep away from heat.
S 16 Keep away from sources of ignition -- No smoking.
S 17 Keep away from combustible material.
S 18 Handle and open container with care.
S 33 Take precautionary measures against static discharges.
S 41 In case of fire and/or explosion do not breathe fumes.

16.6 Training Advice
Follow supplied instructions carefully.

16.7 Further Information

SDS Prepared by: Regulatory Affairs Department
Cesaroni Technology Inc.
P.O. Box 246
2561 Stouffville Rd.
Gormley, ON
Canada L0H 1G0

Telephone: 905-887-2370 x239
Fax: 905-887-2375
Web Sites: www.cesaronitech.com
www.Pro38.com

The data in this Material Safety Data Sheet relates only to the specific material or product designated herein and does not relate to use in combination with any other material or in any process.

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no way shall the company be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if the company has been advised of the possibility of such damages.

4.7 Elmer's Carpenter's Wood Glue

Page 1 of 9



Safety Data Sheet:
**Material Name: Elmer's
Carpenter's Wood Glue-MAX**
SDS ID: SDS-30
Issue Date: 2015-04-08
Revision: 1.1

Other Sections

[01](#) [02](#) [03](#) [04](#) [05](#) [06](#) [07](#) [08](#) [09](#) [10](#) [11](#) [12](#) [13](#) [14](#) [15](#) [16](#)

Section 1 - PRODUCT AND COMPANY IDENTIFICATION

Material Name

Elmer's Carpenter's Wood Glue-MAX

Synonyms

69220, 69221, 69222, 69224 E7290 E7300 E7310 E7330

Product Use

adhesives

Restrictions on Use

None known.

Manufacturer Information

Elmer's Products, Inc
460 Polaris Parkway, Suite 500
Westerville, OH 43082
USA
Phone: 1-888-435-6377
Fax: 1-800-741-6046
Email: comments@elmers.com

Emergency Phone Number:
Poison Control Center
1-888-516-2502

For additional product information, access our website at www.elmers.com. To place an order, call 1-800-848-9400.

Section 2 - HAZARDS IDENTIFICATION

Classification in accordance with paragraph (d) of 29 CFR 1910.1200.

None needed according to classification criteria

GHS Label Elements**Symbol(s)**

None needed according to classification criteria

Signal Word

None needed according to classification criteria

Hazard Statement(s)

None needed according to classification criteria

Precautionary Statement(s)**Prevention**

None needed according to classification criteria

Response

None needed according to classification criteria

Storage

None needed according to classification criteria

Disposal

Dispose of contents/container in accordance with local/regional/national/international regulations

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

CAS	Component Name	Percent
NA	Non-hazardous substance	100

Section 4 - FIRST AID MEASURES

Inhalation

If adverse effects occur, remove to uncontaminated area. If discomfort persists, contact a physician.

Skin

If on skin, wash immediately with plenty of soap and water. Get medical attention if irritation develops.

Eyes

Remove contact lenses, if present and easy to do. IMMEDIATELY wash with large amounts of warm water, occasionally lifting upper and lower lids, until no evidence of chemical remains (at least 15-20 minutes). Get medical attention immediately.

Ingestion

Rinse mouth thoroughly with water. Never give anything by mouth to an unconscious or convulsive person. Do NOT induce vomiting. Immediately call a POISON CENTER or doctor/physician.

Most Important Symptoms/Effects**Acute**

No information on significant adverse effects.

Delayed

No information on significant adverse effects.

Section 5 - FIRE FIGHTING MEASURES

Extinguishing Media**Suitable Extinguishing Media**

carbon dioxide, regular dry chemical, regular foam, water

Unsuitable Extinguishing Media

None known.

Hazardous Combustion Products

oxides of carbon

Special Protective Equipment and Precautions for Firefighters

Slight fire hazard.

Fire Fighting Measures

Move container from fire area if it can be done without risk. Avoid inhalation of material or combustion by-products. Stay upwind and keep out of low areas.

Section 6 - ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment and Emergency Procedures

Wear personal protective clothing and equipment. See Section 8 for personal protection information.

Methods and Materials for Containment and Cleaning Up

Stop leak if possible without personal risk. Absorb with earth, sand or other non-combustible material and transfer to container. Collect spilled material in appropriate container for disposal.

Section 7 - HANDLING AND STORAGE

Precautions for Safe Handling

Use only with adequate ventilation. Wash thoroughly after handling.

Conditions for Safe Storage, Including any Incompatibilities

None needed according to classification criteria

Store in accordance with all current regulations and standards. Keep separated from incompatible substances.

Incompatible Materials

oxides of carbon.

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

Component Exposure Limits

ACGIH, NIOSH, EU, OSHA (US) and Mexico have not developed exposure limits for any of this product's components

Biological limit value

There are no biological limit values for any of this product's components.

Engineering Controls

Based on available information, additional ventilation is not required. Ensure compliance with applicable exposure limits.

Individual Protection Measures, such as Personal Protective Equipment

Eye/face protection

Wear splash resistant safety goggles. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

Skin Protection

Protective clothing is not required under normal conditions.

Respiratory Protection

No respirator is required under normal conditions of use. Under conditions of frequent use or heavy exposure, respiratory protection may be needed.

Glove Recommendations

Protective gloves are not required under normal conditions.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

Appearance	beigeliquid	Physical State	Liquid
Odor	Not available	Color	beige
Odor Threshold	Not available	pH	2.4 - 2.8
Melting Point	Not available	Boiling Point	100 °C
Freezing point	0 °C	Evaporation Rate	Not available
Boiling Point Range	Not available	Flammability (solid, gas)	Not flammable
Autoignition	Not available	Flash Point	Not available
Lower Explosive Limit	Not available	Decomposition	Not available
Upper Explosive Limit	Not available	Vapor Pressure	Not available
Vapor Density (air=1)	Not available	Specific Gravity (water=1)	1.1 - 1.13
Water Solubility	dispersible	Partition coefficient: n-octanol/water	Not available
Viscosity	Not available	Solubility (Other)	Not available
Density	9.2 - 9.4	Physical Form	liquid

Section 10 - STABILITY AND REACTIVITY

Reactivity

No hazard expected.

Chemical Stability

Stable at normal temperatures and pressure.

Possibility of Hazardous Reactions

Will not polymerize.

Conditions to Avoid

Avoid heat, flames, sparks and other sources of ignition. Avoid contact with incompatible materials.

Incompatible Materials

strong oxidizing materials.

Hazardous decomposition products**Combustion**

oxides of carbon

Section 11 - TOXICOLOGICAL INFORMATION

Information on Likely Routes of Exposure**Inhalation**

No information on significant adverse effects.

Skin Contact

No information on significant adverse effects.

Eye Contact

No information on significant adverse effects.

Ingestion

No information on significant adverse effects.

Acute and Chronic Toxicity**Component Analysis - LD50/LC50**

The components of this material have been reviewed in various sources and no selected endpoints have been identified

Immediate Effects

No information on significant adverse effects.

Delayed Effects

No information on significant adverse effects.

Irritation/Corrosivity Data

No information on significant adverse effects.

Respiratory Sensitization

No information available for the product.

Dermal Sensitization

No information available for the product.

Component Carcinogenicity

None of this product's components are listed by ACGIH, IARC, NTP, DFG or OSHA

Germ Cell Mutagenicity

No information available for the product.

Reproductive Toxicity

No information available for the product.

Specific Target Organ Toxicity - Single Exposure

No target organs identified.

Specific Target Organ Toxicity - Repeated Exposure

No target organs identified.

Aspiration hazard

No data available.

Medical Conditions Aggravated by Exposure

No data available.

Section 12 - ECOLOGICAL INFORMATION

Component Analysis - Aquatic Toxicity

No LOLI ecotoxicity data are available for this product's components

Persistence and Degradability

No information available for the product.

Bioaccumulative Potential

No information available for the product.

Biodegradation

No information available for the product.

Section 13 - DISPOSAL CONSIDERATIONS

Disposal Methods

Dispose in accordance with all applicable regulations.

Component Waste Numbers

The U.S. EPA has not published waste numbers for this product's components

Section 14 - TRANSPORT INFORMATION

US DOT Information:

UN/NA #: Not regulated.

TDG Information:

UN#: Not regulated.

IATA Information:

No Classification assigned.

Section 15 - REGULATORY INFORMATION

U.S. Federal Regulations

None of this products components are listed under SARA Sections 302/304 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65), CERCLA (40 CFR 302.4), TSCA 12(b), or require an OSHA process safety plan.

SARA Section 311/312 (40 CFR 370 Subparts B and C)

Acute Health: No **Chronic Health:** No **Fire:** No **Pressure:** No **Reactivity:** No

U.S. State Regulations

None of this product's components are listed on the state lists from CA, MA, MN, NJ or PA

Not listed under California Proposition 65**Canada Regulations**

This product has been classified in accordance with the criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

Canadian WHMIS Ingredient Disclosure List (IDL)

The components of this product are either not listed on the IDL or are present below the threshold limit listed on the IDL.

WHMIS Classification

Not a Controlled Product under Canada's Workplace Hazardous Material Information System.

Component Analysis - Inventory**U.S. Inventory (TSCA)**

All the components of this substance are listed on or are exempt from the inventory.

Section 16 - OTHER INFORMATION

NFPA Ratings

Health: 1 Fire: 1 Reactivity: 0

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

Summary of Changes

New SDS: 11/06/2014

Key / Legend

ACGIH - American Conference of Governmental Industrial Hygienists; ADR - European Road Transport; AU - Australia; BOD - Biochemical Oxygen Demand; C - Celsius; CA - Canada; CAS - Chemical Abstracts Service; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CLP - Classification, Labelling, and Packaging; CN - China; CPR - Controlled Products Regulations; DFG - Deutsche Forschungsgemeinschaft; DOT - Department of Transportation; DSD - Dangerous Substance Directive; DSL - Domestic Substances List; EEC - European Economic Community; EINECS - European Inventory of Existing Commercial Chemical Substances; EPA - Environmental Protection Agency; EU - European Union; F - Fahrenheit; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; ICAO - International Civil Aviation Organization; IDL - Ingredient Disclosure List; IDLH - Immediately Dangerous to Life and Health; IMDG - International Maritime Dangerous Goods; JP - Japan; Kow - Octanol/water partition coefficient; KR - Korea; LEL - Lower Explosive Limit; LLV - Level Limit Value; LOLI - List Of Lists™ - ChemADVISOR's Regulatory Database; MAK - Maximum Concentration Value in the Workplace; MEL - Maximum Exposure Limits; NFPA - National Fire Protection Agency; NIOSH - National Institute for Occupational Safety and Health; NJTSR - New Jersey Trade Secret Registry; NTP - National Toxicology Program; NZ - New Zealand; OSHA - Occupational Safety and Health Administration; PH - Philippines; RCRA - Resource Conservation and Recovery Act; REACH- Registration, Evaluation, Authorisation, and restriction of Chemicals; RID - European Rail Transport; SARA - Superfund Amendments and Reauthorization Act; STEL - Short-term Exposure Limit; TDG - Transportation of Dangerous Goods; TSCA - Toxic Substances Control Act; TWA - Time Weighted Average; UEL - Upper Explosive Limit; US - United States.

Other Information

Disclaimer:

Supplier gives no warranty whatsoever, including the warranties of merchantability or of fitness for a particular purpose. Any product purchased is sold on the assumption the purchaser shall determine the quality and suitability of the product. Supplier expressly disclaims any and all liability for incidental, consequential or any other damages arising out of the use or misuse of this product. No information provided shall be deemed to be a recommendation to use any product in conflict with any existing patent rights.

4.8 Elmer's School Glue

Page 1 of 5



Safety Data Sheet:
Material Name: Elmer's School Glue
SDS ID: SDS-12
Issue Date: 2015-06-30
Revision: 1.3

Other Sections

[01](#) [02](#) [03](#) [04](#) [05](#) [06](#) [07](#) [08](#) [09](#) [10](#) [11](#) [12](#) [13](#) [14](#) [15](#) [16](#)

Section 1 - PRODUCT AND COMPANY IDENTIFICATION

Material Name

Elmer's School Glue

Trade Names

Elmer's School Glue

Synonyms

US: E134; E208; E301; E304; E308; E330; E340; E1304; E1500; E4047; E513; E6134; EC1202; Canada: 30331; 60300; 60307; 60308; 60310; 60331; 60341; 50260; 50261

Product Use

adhesives

Restrictions on Use

None known.

Details of the supplier of the safety data sheet

Elmer's Products, Inc
460 Polaris Parkway, Suite 500
Westerville, OH 43082
USA
Phone: 1-888-435-6377
Fax: 1-800-741-6046
Email: comments@elmers.com

Emergency Phone Number:
Poison Control Center
1-888-516-2502

For additional product information, access our website at www.elmers.com. To place an order, call 1-800-848-9400.

Section 2 - HAZARDS IDENTIFICATION

Classification in accordance with paragraph (d) of 29 CFR 1910.1200.

None needed according to classification criteria

GHS Label Elements**Symbol(s)**

None needed according to classification criteria

Signal Word

None needed according to classification criteria

Hazard Statement(s)

None needed according to classification criteria

Precautionary Statement(s)**Prevention**

None needed according to classification criteria

Response

None needed according to classification criteria

Storage

None needed according to classification criteria

Disposal

Dispose of contents/container in accordance with local/regional/national/international regulations

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

CAS	Component Name	Percent
NA	Non-hazardous substance	100

Section 4 - FIRST AID MEASURES

Inhalation

If adverse effects occur, remove to uncontaminated area. If discomfort persists, contact a physician.

Skin

If on skin, wash immediately with plenty of soap and water. Get medical attention if irritation develops.

Eyes

Remove contact lenses, if present and easy to do. IMMEDIATELY wash with large amounts of warm water, occasionally lifting upper and lower lids, until no evidence of chemical remains (at least 15-20 minutes). Get medical attention immediately.

Ingestion

Rinse mouth thoroughly with water. Never give anything by mouth to an unconscious or convulsive person. Do NOT induce vomiting. Immediately call a POISON CENTER or doctor/physician.

Most Important Symptoms/Effects**Acute**

No information on significant adverse effects.

Delayed

No information on significant adverse effects.

Section 5 - FIRE FIGHTING MEASURES

Extinguishing Media**Suitable Extinguishing Media**

carbon dioxide, regular dry chemical, regular foam, water

Unsuitable Extinguishing Media

None known.

Hazardous Combustion Products

oxides of carbon

Advice for firefighters

Slight fire hazard.

Fire Fighting Measures

Move container from fire area if it can be done without risk. Avoid inhalation of material or combustion by-products. Stay upwind and keep out of low areas.

Section 6 - ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment and Emergency Procedures

Wear personal protective clothing and equipment. See Section 8 for personal protection information.

Methods and Materials for Containment and Cleaning Up

Stop leak if possible without personal risk. Absorb with earth, sand or other non-combustible material and transfer to container. Collect spilled material in appropriate container for disposal.

Section 7 - HANDLING AND STORAGE

Precautions for Safe Handling

Use only with adequate ventilation. Wash thoroughly after handling.

Conditions for Safe Storage, Including any Incompatibilities

None needed according to classification criteria

Store in accordance with all current regulations and standards. See original container for storage recommendations. Keep separated from incompatible substances.

Incompatible Materials

oxidizing materials.

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

Component Exposure Limits

ACGIH, NIOSH, EU, OSHA (US) and Mexico have not developed exposure limits for any of this product's components

Biological limit value

There are no biological limit values for any of this product's components.

Engineering Controls

Based on available information, additional ventilation is not required.

Individual Protection Measures, such as Personal Protective Equipment**Eye/face protection**

Eye protection not required under normal conditions.

Skin Protection

Protective clothing is not required under normal conditions.

Respiratory Protection

No respirator is required under normal conditions of use.

Glove Recommendations

Protective gloves are not required under normal conditions.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

Appearance	white liquid	Physical State	Liquid
Odor	mild odor	Color	white
Odor Threshold	Not available	pH	4.5 - 5.5
Melting Point	Not available	Boiling Point	100 °C
Freezing point	0 °C	Evaporation Rate	Not available
Boiling Point Range	Not available	Flammability (solid, gas)	Not flammable
Autoignition	Not available	Flash Point	Not available
Lower Explosive Limit	Not available	Decomposition	Not available
Upper Explosive Limit	Not available	Vapor Pressure	Not available
Vapor Density (air=1)	Not available	Specific Gravity (water=1)	1.03 +/- 0.01
Water Solubility	miscible	Partition coefficient: n-octanol/water	Not available
Viscosity	Not available	Solubility (Other)	Not available
Density	8.6 +/- 0.1	Physical Form	liquid

Section 10 - STABILITY AND REACTIVITY

Reactivity

No hazard expected.

Chemical Stability

Stable at normal temperatures and pressure.

Possibility of Hazardous Reactions

Will not polymerize.

Conditions to Avoid

Avoid heat, flames, sparks and other sources of ignition. Avoid contact with incompatible materials.

Incompatible Materials

strong oxidizing materials.

Hazardous decomposition products**Combustion**

oxides of carbon

Section 11 - TOXICOLOGICAL INFORMATION

Information on Likely Routes of Exposure**Inhalation**

No information on significant adverse effects.

Skin Contact

No information on significant adverse effects.

Eye Contact

No information on significant adverse effects.

Ingestion

No information on significant adverse effects.

Acute and Chronic Toxicity**Component Analysis - LD50/LC50**

The components of this material have been reviewed in various sources and no selected endpoints have been identified

Immediate Effects

No information on significant adverse effects.

Delayed Effects

No information on significant adverse effects.

Irritation/Corrosivity Data

No information on significant adverse effects.

Respiratory Sensitization

No information available for the product.

Dermal Sensitization

No information available for the product.

Component Carcinogenicity

None of this product's components are listed by ACGIH, IARC, NTP, DFG or OSHA

Germ Cell Mutagenicity

No information available for the product.

Tumorigenic Data

No data available

Reproductive Toxicity

No information available for the product.

Specific Target Organ Toxicity - Single Exposure

No target organs identified.

Specific Target Organ Toxicity - Repeated Exposure

No target organs identified.

Aspiration hazard

No data available.

Medical Conditions Aggravated by Exposure

No data available.

Section 12 - ECOLOGICAL INFORMATION

Component Analysis - Aquatic Toxicity

No LOLI ecotoxicity data are available for this product's components

Persistence and Degradability

No information available for the product.

Bioaccumulative Potential

No information available for the product.

Biodegradation

No information available for the product.

Section 13 - DISPOSAL CONSIDERATIONS

Disposal Methods

Dispose in accordance with all applicable regulations.

Component Waste Numbers

The U.S. EPA has not published waste numbers for this product's components

Section 14 - TRANSPORT INFORMATION

US DOT Information:

UN/NA #: Not regulated.

TDG Information:

UN#: Not regulated.

Section 15 - REGULATORY INFORMATION

U.S. Federal Regulations

None of this product's components are listed under SARA Sections 302/304 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65), CERCLA (40 CFR 302.4), TSCA 12(b), or require an OSHA process safety plan.

SARA Section 311/312 (40 CFR 370 Subparts B and C)

Acute Health: No **Chronic Health:** No **Fire:** No **Pressure:** No **Reactivity:** No

U.S. State Regulations

None of this product's components are listed on the state lists from CA, MA, MN, NJ or PA

Not listed under California Proposition 65**Canada Regulations**

This product has been classified in accordance with the criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

Canadian WHMIS Ingredient Disclosure List (IDL)

The components of this product are either not listed on the IDL or are present below the threshold limit listed on the IDL.

WHMIS Classification

Not a Controlled Product under Canada's Workplace Hazardous Material Information System.

Component Analysis - Inventory**U.S. Inventory (TSCA)**

All the components of this substance are listed on or are exempt from the inventory.

Section 16 - OTHER INFORMATION

NFPA Ratings

Health: 1 Fire: 1 Reactivity: 0

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

Summary of Changes

New SDS: 09/09/2014

Key / Legend

ACGIH - American Conference of Governmental Industrial Hygienists; ADR - European Road Transport; AU - Australia; BOD - Biochemical Oxygen Demand; C - Celsius; CA - Canada; CAS - Chemical Abstracts Service; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CLP - Classification, Labelling, and Packaging; CN - China; CPR - Controlled Products Regulations; DFG - Deutsche Forschungsgemeinschaft; DOT - Department of Transportation; DSD - Dangerous Substance Directive; DSL - Domestic Substances List; EEC - European Economic Community; EINECS - European Inventory of Existing Commercial Chemical Substances; EPA - Environmental Protection Agency; EU - European Union; F - Fahrenheit; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; ICAO - International Civil Aviation Organization; IDL - Ingredient Disclosure List; IDLH - Immediately Dangerous to Life and Health; IMDG - International Maritime Dangerous Goods; JP - Japan; Kow - Octanol/water partition coefficient; KR - Korea; LEL - Lower Explosive Limit; LLV - Level Limit Value; LOLI - List Of Lists™ - ChemADVISOR's Regulatory Database; MAK - Maximum Concentration Value in the Workplace; MEL - Maximum Exposure Limits; NFPA - National Fire Protection Agency; NIOSH - National Institute for Occupational Safety and Health; NJTSR - New Jersey Trade Secret Registry; NTP - National Toxicology Program; NZ - New Zealand; OSHA - Occupational Safety and Health Administration; PH - Philippines; RCRA - Resource Conservation and Recovery Act; REACH - Registration, Evaluation, Authorisation, and restriction of Chemicals; RID - European Rail Transport; SARA - Superfund Amendments and Reauthorization Act; STEL - Short-term Exposure Limit; TDG - Transportation of Dangerous Goods; TSCA - Toxic Substances Control Act; TWA - Time Weighted Average; UEL - Upper Explosive Limit; US - United States.

Other Information**Disclaimer:**

Supplier gives no warranty whatsoever, including the warranties of merchantability or of fitness for a particular purpose. Any product purchased is sold on the assumption the purchaser shall determine the quality and suitability of the product. Supplier expressly disclaims any and all liability for incidental, consequential or any other damages arising out of the use or misuse of this product. No information provided shall be deemed to be a recommendation to use any product in conflict with any existing patent rights.

4.9 G10 Fiberglass

MATERIAL SAFETY DATA SHEET

Acculam® Epoxyglas




Accurate Plastics, Inc.
 18 Morris Place, Yonkers, NY 10705
 33 Tech Park Dr., Falmouth, MA 02536
 914.476.0700 phone
 914.476.0533 fax
 acculam.com web

Section 1. Chemical Product and Company Identification

<i>Product name</i> Acculam® Epoxyglas	<i>Trade Name</i> NEMA Grades G10, G11, FR4, FR 5
<i>Product Description</i> Rigid composites having a glass fabric reinforcement with an epoxy resin binder	
<i>Manufacturer</i> Accurate Plastics, Inc. 18 Morris Place Yonkers, NY 10705-1929	<i>IN CASE OF EMERGENCY:</i> Tel: 914-476-0700 Chemtrec:
<i>Date of Preparation:</i> 4/22/2015	Replaces: 12/14/13
<i>Preparers Name</i> KJ Soltys	

Section 2. Hazards Identification

As received this product is not classified as hazardous by OSHA. Dust and fumes generated during machining and processing of this product are classified as hazardous according to OSHA standards.

GHS Classification of Epoxyglas at Ambient Conditions	
Inhalation	Not Classified
Skin	Not Classified
Eyes	Not Classified
Ingestion	Not Classified
Cancer	Not Classified
Chronic	Not Classified
GHS Classification of Epoxy Fiberglass Laminate Dust and Fumes	
 WARNING!	
Hazard Statements	
Dust generated during machining and grinding operations may cause eye irritation	H 315; H332
Fumes from thermal decomposition or burning may irritate eyes, nose & respiratory system	H 315; H 320; H332; H 335
Dust generated by machining operations can be explosive. Dust may accumulate to explosive concentrations in uncontrolled environments.	H 201 Mass explosion hazard. .

MATERIAL SAFETY DATA SHEET

Acculam® Epoxyglas

Precautionary Statements	
Avoid eye exposure to dust and fumes	P262
Avoid skin contact with dust and fumes	P 261
In case of inadequate ventilation wear respiratory protection	P 285

Section 3. Composition, Information on Ingredients

<i>Component Information</i>	
<i>Chemical Name</i>	<i>CAS #</i>
Fiberglass	65997-17-3
Epoxy Resin	25036-25-3

Section 4. First Aid Measures

Eyes	Immediately wash the eyes with large amounts of water for at least 15 minutes, occasionally lifting the lower and upper lids. Get medical attention immediately. Contact lenses should not be worn when working with this material.
Skin	Immediately wash the contaminated skin with soap and water. If redness, itching or a burning sensation develops, get medical attention.
Inhalation	Immediately move the exposed person to fresh air. If not breathing give artificial respiration and get immediate medical attention.
Ingestion	If large quantities of dust or particles have been swallowed, DO NOT INDUCE VOMITING. Treat symptoms. Get medical attention immediately.

Section 5. Fire Fighting Measures

Flash Point	N/D
Flammability Classification OSHA/NFPA	Flash Pt. <00°F Class: Solid
Extinguishing Media	Carbon dioxide, water, foam.
Unusual Fire and Explosions Hazards	Isolate fire area and deny unnecessary entry. Fire fighters should wear positive-pressure self-contained breathing apparatus (SCBA) and protective clothing. Dust from machining and fabrication operations may be explosive if mixed with air in critical proportions in the presence of an ignition source. Heat from fire can generate decomposition products that may cause a health hazard.

Section 6. Accidental Release Measures

Small Spills	Contain and manage dust during manufacturing. If collected dust is spilled from collection container sweep up spilled material using water spray to suppress the dust. Shovel into suitable disposal container. Eliminate all ignition sources.
Large Spills	Eliminate all ignition sources. Sweep up spilled material using water spray to suppress dust. Transfer to proper containers for disposal. Persons not wearing protective equipment should be excluded from the area of spill until cleanup has been completed.

Section 7. Handling & Storage

Store material in a clean, cool, ventilated area away from all sources of ignition. Dust generated during normal manufacturing operations can represent both a health hazard and a fire hazard. Use dust control equipment at the point of generation in machining and grinding operations. Wash hands and other exposed areas thoroughly after handling and wash soiled clothing before reuse.

MATERIAL SAFETY DATA SHEET

Acculam® Epoxyglas

Section 8. Exposure Controls/Personal Exposure

Component Information		Exposure Limits	
Chemical Name	CAS #	TLV, TWA ACGIH	OSHA PEL, TWA
Fiberglass	65997-17-3	10 mg/m ³ (dust)	15 mg/m ³ (total dust) 5 mg/m ³ (respirable)
Epoxy Resin	25036-25-3	10 mg/m ³ (dust)	10 mg/m ³ (dust)
Grinding, cutting, or drilling epoxy fiber glass plastic produces nonrespirable fiber shaped plastic (organic) dust and respirable fibrous glass dust regulated by OSHA as noted above. Respirable fiberglass dust may cause cancer.			
Eye Protection	Minimize dust generating activities. Wear safety goggles with side shield or face shield. Contact lenses must not be worn.		
Skin Protection	Wear gloves to protect against sharp edges and thermal effects when handling heated material. To prevent repeated or prolonged skin contact, wear impervious clothing and boots.		
Respiratory Protection	If personal exposure cannot be controlled below applicable limits (See Section 2) by area ventilation, wear a properly fitted particulate respirator approved by NIOSH/MSHA for protection against dust.		
Ventilation	General area ventilation is acceptable if the exposure is maintained below applicable exposure limits. (See Section 8) Use local exhaust for sawing and machining operations.		
Other Precautions	Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure.		

Section 9. Physical and Chemical Properties

% Volatile Content by Weight	<0.05%	Specific Gravity (gm/cc)	1.6
Melting Point	N/A	Freezing Point (°C)	N/A
Vapor Pressure (mm Hg)	N/A	Solubility in Water	Insoluble
Vapor Density (Air=1)	N/A	Appearance and Odor	Gray, Odorless Solid

Section 10. Stability and Reactivity

Stability	Stable
Conditions to Avoid	Protect from heat, sparks, flame and possible sources of ignition.
Incompatibility	Avoid contact with strong acids and bases.
Hazardous Decomposition Products	Carbon dioxide, carbon monoxide, bromine and other hazardous gases. These gases and other volatiles may be generated under normal processing conditions.
Hazardous Polymerization	Will Not Occur!

Section 11. Toxicological Information (see Section 3. for Exposure Symptoms)

Acute Toxicity			
Component Tested	Oral LD ₅₀ (rat)	Dermal LD ₅₀ (rabbit)	Inhalation LC ₅₀ 4hr (rat)
Glass Fiber (continuous filament)	N/D	N/D	N/D

N/D = Not Determined

Section 12. Ecological Information

If manufacturing by products, scraps and dust are disposed of according federal guidelines for nonregulated waste, then these materials will pose no threat to the environment. Not biodegradable.

Section 13 Disposal Considerations

RCRA: This product, if disposed as shipped, is not considered a hazardous waste as specified in 40 CFR 261. Dispose of in

MATERIAL SAFETY DATA SHEET

Acculam® Epoxyglas

accordance with all applicable federal, state and local regulations. Generation of particulates during machining and fabricating operations may be subject to Federal and State Air Pollution Control Laws.

Section 14 Transportation Information

This product, if offered for shipment, is not regulated by USDOT 49 CFR Parts 171 - 180: Regulation of Hazardous Materials Transportation in Commerce.

Shipping Information	N/A
Classification	N/A
Identification	N/A
Packing Group	N/A
Label	N/A
NOT REGULATED AS HAZMAT	

Section 15. Regulatory Information

<i>Regulations Governing Product:</i>			
Inventory Status: United States (TSCA) - All ingredients are on the inventory or exempt from listing.			
SARA TITLE III			
EPCRA 302 EHS Extremely Hazardous Substance Reporting:		N/A	
EPCRA 311/312 Tier II Chemical Inventory Reporting:		N/A	
<i>Regulations Governing Ingredients</i>			
<i>Chemical Name</i>	<i>CAS #/Chemical Category</i>	<i>CERCLA RQ</i>	<i>SARA TITLE III EPCRA 313 RQ</i>

Section 16 Other InformationREFERENCES

CRC Press: Handbook of Chemical and Physical Constants by David R. Lide
 Merck & Company: The Merck Index
 Sigma-Aldrich Company: Aldrich Handbook of Fine Chemicals
 Dictionary of Toxicology by Robert Lewis
 US Department of Commerce, Center for Disease Control, National Library of Medicine TOXNET
 US Department of Transportation, Research and Special Programs Administration: Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements

The information contained herein are given in good faith but no guarantee or warranty of any kind, expressed or implied, is made with respect to the information above.

Accurate Plastics, Inc. expressly disclaims any liability which may be incurred in using the information contained herein.

4.10 JB Weld Steel Reinforced Epoxy Twin Tubes Parts A and B



SAFETY DATA SHEET

Issuing Date 11-Nov- 2014

Revision Date 11-Nov-2014

Revision Number 1

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

Product identifier

Product SDS Name Steel Reinforced Epoxy Resin – Twin Tubes - Part A

J-B Weld FG SKU Part Numbers Covered

8265, 8265F, 8276, 8276F, 8265S, 8265A, 8265H, 8272, 8272F, 8280, 8280F, 8281, 80165, 7265S, 7280, 8276A, 8273H, 8270, 8270F, 8271, 80176, 7276, 7270

J-B Weld Product Names Covered

J-B Weld™ (all Twin Tubes), KwikWeld™ (all Twin Tubes), MarineWeld™ (Twin Tubes Only)

J-B Weld Product Type

Steel Reinforced Epoxy

Recommended use of the chemical and restrictions on use

Recommended Use General Purpose Adhesive

Uses advised against No information available

Details of the supplier of the safety data sheet

Supplier Name J-B WELD COMPANY,LLC
Supplier Address 1130 COMO ST
 SULPHUR SPRINGS, TX 75482
 USA

Emergency Telephone Numbers Transportation Emergencies: Chemtrec (24 hour transportation emergency response info):
800-424-9300 or 703-527-3887

Poison/Medical Emergencies: Poison Control Centers (24 hour emergency poison / medical response info): 800-222-1222

Supplier Email info@jbweld.com

Supplier Phone Number 903-885-7696

2. HAZARDS IDENTIFICATION

OSHA/HCS status This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Classification of the substance or mixture
GHS label elements SKIN CORROSION/IRRITATION - Category 2
SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 2B
SKIN SENSITIZATION - Category 1



Hazard pictograms

Signal word

Hazard statements

Warning!
Causes skin and eye irritation.
May cause an allergic skin reaction.

Precautionary statements**Prevention**

Wear protective gloves. Wear eye or face protection. Avoid breathing dust. Wash hands thoroughly after handling. Contaminated work clothing should not be allowed out of the workplace.

Response

IF ON SKIN: Wash with plenty of soap and water. Take off contaminated clothing. Wash contaminated clothing before reuse. If skin irritation or rash occurs: Get medical attention. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical attention.

Storage

Not applicable.

Disposal

Dispose of contents and container in accordance with all local, regional, national and international regulations.

Hazards not otherwise classified

None known.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance/mixture

Mixture

Ingredient name	% by weight	CAS number
reaction product: bisphenol-A-(epichlorhydrin); epoxy resin	10 - 30	25068-38-6
crystalline silica non-respirable	0.1 - 1	14808-60-7
carbon black respirable	0.1 - 1	1333-86-4

Occupational exposure limits, if available, are listed in Section 8.

4. FIRST AID MEASURES

Description of necessary first aid measures**Inhalation**

Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention if adverse health effects persist or are severe. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Skin contact

Wash with plenty of soap and water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. Get medical attention. In the event of any complaints or symptoms, avoid further exposure. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Eye contact

Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention.

Ingestion

Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention if adverse health effects persist or are severe. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Most important symptoms/effects, acute and delayed**Potential acute health effects****Inhalation**

No known significant effects or critical hazards.

Skin contact

Causes skin irritation. May cause an allergic skin reaction.

Eye contact

Causes serious eye irritation.

Ingestion

Irritating to mouth, throat and stomach.



Over-exposure signs/symptoms

Inhalation	No specific data.
Skin contact	Adverse symptoms may include the following: irritation redness
Eye contact	Adverse symptoms may include the following: pain or irritation watering redness
Ingestion	No specific data.

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

Specific treatments No specific treatment.

See toxicological information (Section 11)

5. FIRE-FIGHTING MEASURES

Extinguishing media

Suitable extinguishing media Use an extinguishing agent suitable for the surrounding fire.

Unsuitable extinguishing media None known.

Specific hazards arising from the chemical No specific fire or explosion hazard.

National Fire Protection Association (U.S.A.)**Hazardous thermal decomposition products**

Decomposition products may include the following materials:
carbon dioxide
carbon monoxide
halogenated compounds
metal oxide/oxides

Special protective actions for fire-fighters

Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

Special protective equipment for fire-fighters

Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.



6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel	No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.
For emergency responders	If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".
Environmental precautions	Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods and materials for containment and cleaning up

Small spill	Move containers from spill area. Avoid dust generation. Using a vacuum with HEPA filter will reduce dust dispersal. Place spilled material in a designated, labeled waste container. Dispose of via a licensed waste disposal contractor.
Large spill	Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Avoid dust generation. Do not dry sweep. Vacuum dust with equipment fitted with a HEPA filter and place in a closed, labeled waste container. Dispose of via a licensed waste disposal contractor. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

7. HANDLING AND STORAGE

Conditions for safe storage, including any incompatibilities	Do not store below the following temperature: 35°C (95°F). Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.
Precautions for safe handling	
Protective measures	Put on appropriate personal protective equipment (see Section 8). Persons with a history of skin sensitization problems should not be employed in any process in which this product is used. Do not get in eyes or on skin or clothing. Do not ingest. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.
Advice on general occupational hygiene	Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.



8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Occupational exposure limits

Ingredient name	CAS #	Exposure limits
crystalline silica non-respirable	14808-60-7	<p>OSHA PEL Z3 (United States, 9/2005). Notes: 250/(%SiO₂+5) TWA: 250 MPPCF / (%SiO₂+5) 8 hours. Form: Respirable</p> <p>OSHA PEL Z3 (United States, 9/2005). Notes: 10/(SiO₂+2) TWA: 10 MG/M³ / (%SiO₂+2) 8 hours. Form: Respirable</p> <p>ACGIH TLV (United States, 3/2012). TWA: 0.025 mg/m³ 8 hours. Form: Respirable fraction</p> <p>NIOSH REL (United States, 1/2013). TWA: 0.05 mg/m³ 10 hours. Form: respirable dust</p> <p>OSHA PEL Z3 (United States, 9/2005). Notes: 30/(%SiO₂+2) TWA: 30 MG/M³ / (%SiO₂+2) 8 hours. Form: Total dust.</p>
carbon black respirable	1333-86-4	<p>OSHA PEL 1989 (United States, 3/1989). TWA: 3.5 mg/m³ 8 hours.</p> <p>ACGIH TLV (United States, 6/2013). TWA: 3 mg/m³ 8 hours. Form: Inhalable fraction</p> <p>NIOSH REL (United States, 10/2013). TWA: 3.5 mg/m³ 10 hours.</p> <p>TWA: 0.1 mg of PAHs/cm³ 10 hours.</p> <p>OSHA PEL (United States, 2/2013). TWA: 3.5 mg/m³ 8 hours.</p>

Appropriate engineering controls

No special ventilation requirements. Good general ventilation should be sufficient to control worker exposure to airborne contaminants. If this product contains ingredients with exposure limits, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure below any recommended or statutory limits.

Environmental exposure controls

Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Individual protection measures

Hygiene measures

Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Contaminated work clothing should not be allowed out of the workplace. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Respiratory protection

Use a properly fitted, particulate filter respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Skin protection

Hand protection

Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

Body protection

Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.



Other skin protection	Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
Eye/face protection	Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases, or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state	Solid.
Color	Black. [Dark]
Odor	Ethereal. [Slight]
Odor threshold	Not available.
pH	Not available.
Melting point	Not available.
Boiling point	Not available.
Flash point	Closed cup: >93.3°C (>199.9°F) [Setaflash.] [Product does not sustain combustion.]
Evaporation rate	Not available.
Flammability (solid, gas)	Extremely flammable in the presence of the following materials or conditions: open flames, sparks and static discharge. Non-flammable in the presence of the following materials or conditions: heat, shocks and mechanical impacts, oxidizing materials, reducing materials, combustible materials, organic materials, metals, acids, alkalis and moisture.
Lower and upper explosive (flammable) limits	Not available.
Vapor pressure	Not available.
Vapor density	Not available.
Relative density	1.927
Solubility	Insoluble in the following materials: cold water and hot water.
Solubility in water	Not available.
Auto-ignition temperature	Not available.
Decomposition temperature	>220°C (>428°F)
Viscosity	Not available.
VOC (% content)	<1%

10. STABILITY AND REACTIVITY

Reactivity	No specific test data related to reactivity available for this product or its ingredients.
Chemical stability	The product is stable.
Possibility of hazardous reactions	Under normal conditions of storage and use, hazardous reactions will not occur.
Conditions to avoid	No specific data
Incompatible materials	No specific data
Hazardous decomposition products	Under normal conditions of storage and use, hazardous decomposition products should not be produced.



11. TOXICOLOGICAL INFORMATION

Information on toxicological effects

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
carbon black respirable	LD50 Oral	Rat	>15400 mg/kg	-

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
reaction product: bisphenol-A(epichlorhydrin); epoxy resin	Eyes - Mild irritant	Rabbit	-	100 milligrams	-
	Skin - Moderate irritant	Rabbit	-	24 hours 500 microliters	-
	Skin - Severe irritant	Rabbit	-	24 hours 2 milligrams	-

Sensitization

No specific data.

Mutagenicity

No specific data.

Carcinogenicity

No specific data.

Classification

Product/ingredient name	OSHA	IARC	NTP
crystalline silica nonrespirable	-	1	Known to be a human carcinogen.
carbon black respirable	-	2B	-

Reproductive toxicity

No specific data.

Teratogenicity

No specific data.

Specific target organ toxicity (single exposure)

No specific data.

Specific target organ toxicity (repeated exposure)

No specific data.

Aspiration hazard

No specific data.

Information on the likely routes of exposure Not available.

Potential acute health effects

Eye contact Causes serious eye irritation.
Inhalation No known significant effects or critical hazards.
Skin contact Causes skin irritation. May cause an allergic skin reaction.
Ingestion Irritating to mouth, throat and stomach.

Symptoms related to the physical, chemical and toxicological characteristics



Eye contact	Adverse symptoms may include the following: pain or irritation watering redness
Inhalation	No specific data.
Skin contact	Adverse symptoms may include the following: irritation redness
Ingestion	No specific data.
Delayed and immediate effects and also chronic effects from short and long term exposure	
Short term exposure	
Potential immediate effects	Not available.
Potential delayed effects	Not available.
Long term exposure	
Potential immediate effects	Not available.
Potential delayed effects	Not available.
Potential chronic health effects	No specific data.
General	Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.
Carcinogenicity	No known significant effects or critical hazards.
Mutagenicity	No known significant effects or critical hazards.
Teratogenicity	No known significant effects or critical hazards.
Developmental effects	No known significant effects or critical hazards.
Fertility effects	No known significant effects or critical hazards.
Numerical measures of toxicity	
Acute toxicity estimates	No specific data.

12. ECOLOGICAL INFORMATION

Toxicity

No specific data.

Persistence and degradability

No specific data.

Bioaccumulative potential

Product/ingredient name	LogP _{ow}	BCF	Potential
reaction product: bisphenol-A(epichlorhydrin); epoxy resin	2.64 to 3.78	31	low

Mobility in soil

Soil/water partition coefficient (K_{oc}) Not available.

Other adverse effects No known significant effects or critical hazards.

13. DISPOSAL CONSIDERATIONS



Disposal methods

The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

RCRA classification

Not available.

14. TRANSPORT INFORMATION

	DOT Classification	TDG Classification	Mexico Classification	IMDG	IATA
UN Number	Not regulated.	Not regulated.	Not regulated.	Not regulated.	Not regulated.
UN proper shipping name	-	-	-	-	-
Transport hazard class(es)	-	-	-	-	-
Packing group	-	-	-	-	-
Environmental hazards	No.	No.	No.	No.	No.
Additional information	-	-	-	-	-

Special precautions for user

Transport within user's premises: always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

15. REGULATORY INFORMATION

U.S. Federal regulations

TSCA 8(a) PAIR: Siloxanes and Silicones, di-Me, reaction products with silica

TSCA 9(a) CDR Exempt/partial exemption: Not determined

United States Inventory (TSCA 8b): All components are listed or exempted.

Clean Air Act Section 112(b) Hazardous Air Pollutants (HAPs) Not listed

Clean Air Act Section 602 Class I Substances Not listed

Clean Air Act Section 602 Class II Substances Not listed

SARA 302/304**Composition/information on ingredients**

No products were found.

SARA 304 RQ

Not applicable



SARA 311/312**Classification** Immediate (acute) health hazard**Composition / information on ingredients**

Name	%	Fire hazard	Sudden release of pressure	Reactive	Immediate (acute) health hazard	Delayed (chronic) health hazard
reaction product: bisphenol-A-(epichlorhydrin); epoxy resin	10-30	No.	No.	No.	Yes.	No.
crystalline silica non-respirable	0.1-1	No.	No.	No.	No.	Yes
carbon black respirable	0.1-1	No.	No.	No.	No.	Yes.

State regulations**Massachusetts** The following components are listed: CALCIUM CARBONATE**New York** None of the components are listed.**New Jersey** The following components are listed: CALCIUM CARBONATE; LIMESTONE, SILICA, QUARTZ; QUARTZ (SiO₂); CARBON BLACK**Pennsylvania** The following components are listed: LIMESTONE; QUARTS (SiO₂); CARBON BLACK**Minnesota Hazardous Substances** None of the components are listed.**California Prop. 65****WARNING: This product contains a chemical known to the State of California to cause cancer.**

Ingredient Name	Cancer	Reproductive	No significant risk level	Maximum acceptable dosage level
crystalline silica non-respirable	Yes.	No.	No.	No.
carbon black respirable	Yes.	No.	No.	No.

Canada inventory All components are listed or exempted.**International regulations**
International lists**Australia inventory (AICS):** All components are listed or exempted.**China inventory (IECSC):** All components are listed or exempted.**Japan inventory:** Not determined.**Korea inventory:** All components are listed or exempted.**Malaysia Inventory (EHS Register):** Not determined.**New Zealand Inventory of Chemicals (NZIoC):** Not determined.**Phillipines inventory (PICCS):** All components are listed or exempted.**Taiwan inventory (CSNN):** Not determined.**Substances of very high concern** None of the components are listed.**16. OTHER INFORMATION****Key to abbreviations**

ATE = Acute Toxicity Estimate



BCF = Bioconcentration Factor
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
IATA = International Air Transport Association
IBC = Intermediate Bulk Container
IMDG = International Maritime Dangerous Goods
LogPow = logarithm of the octanol/water partition coefficient
MARPOL 73/78 = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
UN = United Nations

NON-WARRANTY: The information presented in this publication is based upon the research and experience of J-B Weld Company. No representation or warranty is made, however, concerning the accuracy or completeness of the information presented in this publication. J-B Weld Company makes no warranty or representation of any kind, express or implied, including without limitation any warranty of merchantability or fitness for any particular purpose, and no warranty or representation shall be implied by law or otherwise. Any products sold by J-B Weld Company are not warranted as suitable for any particular purpose to the buyer. The suitability of any products for any purpose particular to the buyer is for the buyer to determine. J-B Weld Company assumes no responsibility for the selection of products suitable to the particular purposes of any particular buyer. J-B Weld Company shall in no event be liable for any special, incidental, or consequential damages.





SAFETY DATA SHEET

Issuing Date 11-Nov- 2014

Revision Date 11-Nov-2014

Revision Number 1

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

Product identifier

Product SDS Name Steel Reinforced Epoxy Hardener – Slow Cure – Twin Tubes - Part B

J-B Weld FG SKU Part Numbers Covered

8265, 8265F, 8265S, 8265A, 8265H, 8272, 8272F, 8280, 8280F, 8281, 80165, 7265S, 7280

J-B Weld Product Names Covered

J-B Weld™ (Twin Tubes), MarineWeld™ (Twin Tubes Only)

J-B Weld Product Type

Steel Reinforced Epoxy

Recommended use of the chemical and restrictions on use

Recommended Use General Purpose Adhesive

Uses advised against No information available

Details of the supplier of the safety data sheet

Supplier Name J-B WELD COMPANY,LLC

Supplier Address 1130 COMO ST
SULPHUR SPRINGS, TX 75482
USA

Emergency Telephone Numbers Transportation Emergencies: Chemtrec (24 hour transportation emergency response info):
800-424-9300 or 703-527-3887

Poison/Medical Emergencies: Poison Control Centers (24 hour emergency poison / medical response info): 800-222-1222

Supplier Email info@jbweld.com

Supplier Phone Number 903-885-7696

2. HAZARDS IDENTIFICATION

OSHA/HCS status This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Classification of the substance or mixture ACUTE TOXICITY: ORAL - Category 4
GHS label elements ACUTE TOXICITY: INHALATION – Category 4



Hazard pictograms
Signal word
Hazard statements

Warning!
Harmful if swallowed or if inhaled.

Precautionary statements**Prevention**

Use only outdoors or in a well-ventilated area. Avoid breathing vapor. Do not eat, drink or smoke when using this product. Wash hands thoroughly after handling.

Response

IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or physician if you feel unwell. IF SWALLOWED: Call a POISON CENTER or physician if you feel unwell. Rinse mouth.

Storage

Not applicable.

Disposal

Dispose of contents and container in accordance with all local, regional, national and international regulations.

Hazards not otherwise classified

None known.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance/mixture

Mixture

Ingredient name	% by weight	CAS number
benzyl alcohol	1-5	100-51-6
titanium dioxide	1-5	13463-67-7
2,4,6-tris(dimethylaminomethyl)phenol	1-5	90-72-2

Occupational exposure limits, if available, are listed in Section 8.

4. FIRST AID MEASURES

Description of necessary first aid measures**Inhalation**

Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention if adverse health effects persist or are severe. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

Skin contact

Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Eye contact

Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention if irritation occurs.

Ingestion

Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention. If necessary, call a poison center or physician. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Most important symptoms/effects, acute and delayed**Potential acute health effects****Inhalation**

Harmful if inhaled. Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure.

Skin contact

No known significant effects or critical hazards.

Eye contact

No known significant effects or critical hazards.

Ingestion

Harmful if swallowed.



Over-exposure signs/symptoms**Inhalation** No specific data.**Skin contact** No specific data.**Eye contact** No specific data.**Ingestion** No specific data.**Indication of immediate medical attention and special treatment needed, if necessary****Notes to physician** In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.**Specific treatments** No specific treatment.

See toxicological information (Section 11)

5. FIRE-FIGHTING MEASURES**Extinguishing media****Suitable extinguishing media** Use an extinguishing agent suitable for the surrounding fire.**Unsuitable extinguishing media** None known.**Specific hazards arising from the chemical** In a fire or if heated, a pressure increase will occur and the container may burst**National Fire Protection Association (U.S.A.)****Hazardous thermal decomposition products**

Decomposition products may include the following materials:

- carbon dioxide
- carbon monoxide
- nitrogen oxides
- sulfur oxides
- metal oxide/oxides

Special protective actions for fire-fighters

Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

Special protective equipment for fire-fighters

Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.



6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel

No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders

If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Environmental precautions

Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods and materials for containment and cleaning up

Small spill

Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Large spill

Stop leak if without risk. Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose some hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.



7. HANDLING AND STORAGE

Conditions for safe storage, including any incompatibilities

Do not store below the following temperature: 35°C (95°F). Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

Precautions for safe handling

Protective measures

Put on appropriate personal protective equipment (see Section 8). Persons with a history of skin sensitization problems should not be employed in any process in which this product is used. Do not get in eyes or on skin or clothing. Do not ingest. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

Advice on general occupational hygiene

Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Occupational exposure limits

Ingredient name	CAS #	Exposure limits
benzyl alcohol	100-51-6	AIHA WEEL (United States, 10/2011). TWA: 10 ppm 8 hours.
titanium dioxide	13463-67-7	ACGIH TLV (United States, 3/2012). TWA: 10 mg/ m ³ 8 hours. OSHA PEL 1989 (United States, 3/1989). TWA: 10 mg/ m ³ 8 hours. Form: Total dust. OSHA PEL (United States, 6/2010). TWA: 15 mg/ m ³ 8 hours. Form: Total dust.

Appropriate engineering controls

Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

Environmental exposure controls

Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Individual protection measures

Hygiene measures

Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Contaminated work clothing should not be allowed out of the workplace. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Respiratory protection

Use a properly fitted, particulate filter respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.



Skin protection
Hand protection

Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

Body protection

Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Other skin protection

Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Eye/face protection

Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases, or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: safety glasses with side-shields.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state	Liquid.
Color	White.
Odor	Amine-like.
Odor threshold	Not available.
pH	Not available.
Melting point	Not available.
Boiling point	Not available.
Flash point	Closed cup: >93.3°C (>199.9°F) [Setaflash.] [Product does not sustain combustion.]
Evaporation rate	Not available.
Flammability (solid, gas)	Flammable in the presence of the following materials or conditions: open flames, sparks and static discharge.
Lower and upper explosive (flammable) limits	Not available.
Vapor pressure	Not available.
Vapor density	Not available.
Relative density	1.955
Solubility	Not available.
Solubility in water	Not available.
Auto-ignition temperature	Not available.
Decomposition temperature	>220°C (>392°F)
Viscosity	Not available.
VOC (% content)	<1%

10. STABILITY AND REACTIVITY

Reactivity	No specific test data related to reactivity available for this product or its ingredients.
Chemical stability	The product is stable.



Possibility of hazardous reactions	Under normal conditions of storage and use, hazardous reactions will not occur.
Conditions to avoid	No specific data
Incompatible materials	No specific data
Hazardous decomposition products	Under normal conditions of storage and use, hazardous decomposition products should not be produced.

11. TOXICOLOGICAL INFORMATION

Information on toxicological effects

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Benzyl alcohol	LD50 Oral	Rat	1230 mg/kg	-
2,4,6-tris (dimethylaminomethyl)phenol	LD50 Dermal LD50 Oral	Rat Rat	1280 mg/kg 1200 mg/kg	- -

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
benzyl alcohol	Skin – mild irritant	Man	-	48 hours 16 milligrams	-
	Skin – Moderate irritant	Pig	-	100 Percent	-
	Skin – Moderate irritant	Rabbit	-	24 hours 100 milligrams	-
titanium dioxide	Skin – Mild Irritant	Human	-	72 hours 300 Micrograms Intermittent	-
2,4,6-tris (dimethylaminomethyl)phenol	Eyes – Severe irritant	Rabbit	-	24 hours 50 Micrograms	-
	Skin – mild irritant	Rat	-	0.025 Milliliters	-
	Skin – Severe irritant	Rat	-	0.25 Milliliters	-
	Skin – Severe irritant	Rabbit	-	24 hours 2 milligrams	-

Sensitization

No specific data.

Mutagenicity

No specific data.

Carcinogenicity

No specific data.

Classification

Product/ingredient name	OSHA	IARC	NTP
titanium dioxide	-	2B	-

Reproductive toxicity

No specific data.

Teratogenicity

No specific data.

Specific target organ toxicity (single exposure)

No specific data.



Specific target organ toxicity (repeated exposure)

No specific data.

Aspiration hazard

No specific data.

Information on the likely routes of exposure

Not available.

Potential acute health effects**Eye contact**

No known significant effects or critical hazards.

Inhalation

Harmful if inhaled. Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure.

Skin contact

No known significant effects or critical hazards.

Ingestion

Harmful if swallowed.

Symptoms related to the physical, chemical and toxicological characteristics**Eye contact**

No specific data.

Inhalation

No specific data.

Skin contact

No specific data.

Ingestion

No specific data.

Delayed and immediate effects and also chronic effects from short and long term exposure**Short term exposure****Potential immediate effects**

Not available.

Potential delayed effects

Not available.

Long term exposure**Potential immediate effects**

Not available.

Potential delayed effects

Not available.

Potential chronic health effects

No specific data.

General

No known significant effects or critical hazards.

Carcinogenicity

No known significant effects or critical hazards.

Mutagenicity

No known significant effects or critical hazards.

Teratogenicity

No known significant effects or critical hazards.

Developmental effects

No known significant effects or critical hazards.

Fertility effects

No known significant effects or critical hazards.

Numerical measures of toxicity**Acute toxicity estimates**

Route	ATE value
Oral	1969.5 mg/kg
Dermal	8745 mg/kg
Inhalation (dusts and mists)	3.551 mg/l



12. ECOLOGICAL INFORMATION

Toxicity

Product/ingredient name	Result	Species	Exposure
benzyl alcohol	Acute LC50 460000µg/l Fresh water	Fish – Pimephales, promelas – Juvenile (Fledgling, Hatchling, Weanling)	96 hours
titanium dioxide	Acute LC50 1000000µg/l Marine water	Fish – Fundulus heteroclitus	96 hours

Persistence and degradability

No specific data.

Bioaccumulative potential

Product/ingredient name	LogP _{ow}	BCF	Potential
benzyl alcohol	0.87	-	low
titanium dioxide	-	352	low
2,4,6-tris (9dimethylaminomethyl) phenol	0.219	-	low

Mobility in soil

Soil/water partition coefficient (K_{oc}) Not available.

Other adverse effects

No known significant effects or critical hazards.

13. DISPOSAL CONSIDERATIONS

Disposal methods

The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

RCRA classification

Not available.



14. TRANSPORT INFORMATION

	DOT Classification	TDG Classification	Mexico Classification	IMDG	IATA
UN Number	Not regulated.	Not regulated.	Not regulated.	Not regulated.	Not regulated.
UN proper shipping name	-	-	-	-	-
Transport hazard class(es)	-	-	-	-	-
Packing group	-	-	-	-	-
Environmental hazards	No.	No.	No.	No.	No.
Additional information	-	-	-	-	-

Special precautions for user **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

15. REGULATORY INFORMATION

U.S. Federal regulations **TSCA 8(a) PAIR:** Siloxanes and Silicones, di-Me, reaction products with silica
TSCA 9(a) CDR Exempt/partial exemption: Not determined
United States Inventory (TSCA 8b): All components are listed or exempted.

Clean Air Act Section 112(b) Hazardous Air Pollutants (HAPs) Not listed

Clean Air Act Section 602 Class I Substances Not listed

Clean Air Act Section 602 Class II Substances Not listed

SARA 302/304

Composition/information on ingredients No products were found.

SARA 304 RQ Not applicable

SARA 311/312

Classification Immediate (acute) health hazard

Composition / information on ingredients

Name	%	Fire hazard	Sudden release of pressure	Reactive	Immediate (acute) health hazard	Delayed (chronic) health hazard
benzyl alcohol	1-5	No.	No.	No.	Yes.	No.
titanium dioxide	1-5	No.	No.	No.	No.	Yes
2,4,6-tris (dimethylaminomethyl)phenol	1-5	No.	No.	No.	Yes.	No.



State regulations**Massachusetts**

The following components are listed: BARIUM SULFATE; BENZYL ALCOHOL; TETRAETHYLENE PENTAMINE; CALCIUM CARBONATE; TITANIUM DIOXIDE

New York

None of the components are listed.

New Jersey

The following components are listed: BARIUM SULFATE; SULFURIC ACID; BARIUM SALT (1:1); PROPYLENE GLYCOL; 1,2-PROPANEDIOL; TETRAETHYLENEPENTAMINE; 1,2-ETHANEDIAMINE, N-(2-AMINOETHYL)N'-[2-[(2-AMINOETHYL)AMINO]ETHYL]-; CALCIUM CARBONATE; LIMESTONE; TITANIUM DIOXIDE; TITANIUM OXIDE (TiO₂)

Pennsylvania

The following components are listed: BARIUM SULFATE; 1,2-PROPANEDIOL; BENZENEMETHANOL; 1,2-ETHANEDIAMINE, N-(2-AMINOETHYL)-N'[[2-(2-AMINOETHYL)AMINO]ETHYL]-; LIMESTONE; TITANIUM OXIDE (TiO₂)

Minnesota Hazardous Substances

None of the components are listed.

California Prop. 65

WARNING: This product contains a chemical known to the State of California to cause cancer.

Ingredient Name	Cancer	Reproductive	No significant risk level	Maximum acceptable dosage level
titanium dioxide	Yes.	No.	No.	No.
crystalline silica non-respirable	Yes.	No.	No.	No.

Canada inventory

All components are listed or exempted.

International regulations**International lists**

Australia inventory (AICS): All components are listed or exempted.

China inventory (IECSC): All components are listed or exempted.

Japan inventory: Not determined.

Korea inventory: All components are listed or exempted.

Malaysia Inventory (EHS Register): Not determined.

New Zealand Inventory of Chemicals (NZIoC): All components are listed or exempted.

Phillipines inventory (PICCS): All components are listed or exempted.

Taiwan inventory (CSNN): Not determined.

Substances of very high concern

None of the components are listed.

16. OTHER INFORMATION

Key to abbreviations

ATE = Acute Toxicity Estimate
 BCF = Bioconcentration Factor
 GHS = Globally Harmonized System of Classification and Labelling of Chemicals
 IATA = International Air Transport Association
 IBC = Intermediate Bulk Container
 IMDG = International Maritime Dangerous Goods
 LogPow = logarithm of the octanol/water partition coefficient
 MARPOL 73/78 = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
 UN = United Nations

NON-WARRANTY: The information presented in this publication is based upon the research and experience of J-B Weld Company. No representation or warranty is made, however, concerning the accuracy or completeness of the information presented in this publication. J-B Weld Company makes no warranty or representation of any kind, express or implied, including without limitation any warranty of merchantability or fitness for any particular purpose, and no warranty or representation shall be implied by law or otherwise. Any products sold by J-B Weld Company are not warranted as suitable for any particular purpose to the buyer. The suitability of any products for any purpose particular to the buyer is for the buyer to determine. J-B Weld Company assumes no responsibility for the selection of products suitable to the particular purposes of any particular buyer. J-B Weld Company shall in no event be liable for any special, incidental, or consequential damages.



4.11 Lithium Polymer Battery



SAFETY DATA SHEET

This Safety Data Sheet Complies with directives from the United States Occupational Safety and Health Administration (OSHA), Canadian Controlled Product Regulations (WHMIS), the European Union Commission Regulation (EC) 1907/2006 & (EC) 2015/830, the Australian National Occupational Health and Safety Commission (NOHSC), the Taiwan Bureau of Standards, the Japan Ministry of Economy, the Inspection and Quarantine of the People's Republic of China (GB/T 16483-2008), and the Brazil Standard (ABNT NRB 14725-3).

SECTION I - PRODUCT AND COMPANY IDENTIFICATION

1.1 Product Identification:

Secondary Smart Lithium-Ion Battery Packs:

Model	Ratings	Model	Ratings	Model	Ratings
L02Dxxxx	7.2V, <24Wh, <10A	ND2017xxxx	7.2V, <41Wh, <3A	NL2020xxxx	10.8V, <97Wh, <10A
L03Dxxxx	10.8V, <37Wh, <10A	ND2037xxxx	7.2V, <49Wh, <10A	NL2024xxxx	14.4V, <97Wh, <10A
L04Dxxxx	7.2V, <49Wh, <10A	ND2057xxxx	7.2V, <49Wh, <10A	NL2044xxxx	14.4V, <97Wh, <10A
L04Dxxxx	14.4V, <49Wh, <10A	ND2034xxxx	14.4V, <49Wh, <10A	NL2050xxxx	10.8V, <97Wh, <10A
L06Dxxxx	10.8V, <73Wh, <10A	ND2054xxxx	14.4V, <49Wh, <10A	NL2054xxxx	14.4V, <97Wh, <10A
L08Cxxxx	14.4V, <98Wh, <10A	NF2047xxxx	7.2V, <73Wh, <10A	PG3665xxxx	25.2V, <73Wh, <20A
L08Dxxxx	14.4V, <98Wh, <10A	NF2030xxxx	10.8V, <73Wh, <10A	PH2059xxxx	28.8V, <98Wh, <10A
L12Dxxxx	14.4V, <97Wh, <10A	NF2040xxxx	10.8V, <73Wh, <10A	PH2054xxxx	14.4V, <98Wh, <20A
L16Dxxxx	14.4V, <98Wh, <10A	NH2054xxxx	14.4V, <98Wh, <10A	PH3054xxxx	14.4V, <58Wh, <20A
NB2037xxxx	7.2V <24Wh <10A	NH2057xxxx	7.2V, <98Wh, <12A	PH3059xxxx	28.8V, <43Wh, <20A
NC2040xxxx	10.8V, <37Wh, <10A	NH2034xxxx	14.4V, <98Wh, <10A	RH2024xxxx	14.4V, <98Wh, <20A
NC2560xxxx	10.8V, <22Wh, <2A	Ni2020xxxx	10.8V, <94Wh, <10A		
ND2053xxxx	3.6V, <49Wh, <10A	Ni2040xxxx	10.8V, <94Wh, <10A		

(Where "XXXX" is used to specific custom part number and capacity value.)

1.2 Company Identification:

Company Name: Inspired Energy, LLC
 Address: 25440 NW 8th Place; Newberry, FL 32669
 Telephone Number: +1-352-472-4855
 Fax Number: +1-352-472-4859
 Emergency Contact Number: +1-703-527-3887

SECTION II - HAZARD IDENTIFICATION

2.1 Classification of Products:

Secondary battery packs are enclosed in UL-94, V-0 enclosures designed to withstand temperatures and pressures encountered during normal use. The hazardous component in battery packs is the lithium-ion cell. Under normal use the battery cells present no physical danger of ignition or explosion and chemical danger of hazardous materials leakage.

Battery cells are designed to vent gas to prevent explosion, if exposed to a fire, added mechanical shocks, electrically abused or physically damaged. This leaked gas could contain material classified as hazardous.

2.2 Label and Markings:

2.2.1 Example of Battery Pack Markings:



2.2.2 Example of Packaging Labels:



(Used Only on Air Cargo Shipments)

2.3 Effect(s) of Hazard Exposure:

Human Health Effects if Exposed to Cell Venting:

Skin Contact: The steam or liquid of the cell electrolyte can have adverse reactions to the skin. If cell electrolyte contacts skin it can cause severe irritation or chemical burns.

Eye Contact: The steam or liquid of the cell electrolyte can have adverse reactions to the eyes. If cell electrolyte contacts the eyes it can cause severe irritation or chemical burns.

Inhalation: The steam or liquid of the cell electrolyte can have adverse reactions if inhaled. If cell electrolyte is inhaled it may cause severe respiratory irritation.

Ingested: Swallowing or ingesting the contents of an open cell can cause serious chemical burns to the mouth, esophagus and gastrointestinal tract.

Medical Conditions Aggravated by Exposure: Not Available

Interactions with Other Chemicals: Immersion in high conductivity liquids may cause corrosion and breaching of the cell or battery enclosure. If vented cell electrolyte contacts water it will generate detrimental hydrogen fluoride.

Environmental Effects: Not Available

SECTION III - COMPOSITION / INFORMATION OF INGREDIENTS

3.1 Classification of Hazardous Ingredients by Geographic Markets:

USA: This battery pack is an article pursuant to 29 CFR 1910.1200. The information contained in this Safety Data Sheet contains valuable information critical to the safe handling and proper use of the product. This SDS should be retained and available for employees and other users of this product.

Canada: This is not a controlled product under WHMIS. The products listed in this Safety Data Sheet are defined as "Manufactured Articles" and is not subject to the regulations of the Hazardous Products Act.

EU: This product is an article according to the REACH Regulation (1907/2006).

Australia: The products listed in this SDS are constructed using Lithium-Ion cell or battery and is classified as an article and is not hazardous when used according to the recommendations of the manufacturer. The hazard is associated with the contents of the cell. If the cell or battery is compromised and starts to leak, based upon the battery ingredients the contents are classified as hazardous according to the criteria of the National Occupational Health and Safety Commission stated by SafeWork Australia.

Taiwan: This product is not classified as a dangerous good.

Japan: This product is not classified as a dangerous good.

China: This product is not classified as a dangerous good.

Brazil: This product is not classified as a dangerous good.

Cell Component	Chemical Name	Mass Range (Weight %)*
Electrolyte Salt	Lithium Hexafluorophosphate	1~5
Electrolyte Solvents	Ethylene Carbonate, Propylene Carbonate, Diethyl Carbonate, Dimethyl Carbonate, Ethyl Methyl Carbonate	5~20
PVDF	Polyvinylidene fluoride	<1
Base	Copper	1~15
Cathode	Lithium Cobaltite, Manganese, Nickel, Aluminum	20~50
Anode	Graphite, Carbon Black	13~18

(* Quantities may vary depending on battery model)

SECTION IV - FIRST-AID MEASURES

4.1 Description of First Aid Measures:

The hazardous component in secondary battery packs are in the internally sealed cells. **The following measures are only applicable if the cells have been abused/damaged causing exposure of hazardous materials noted under section three.**

Ingestion: Have the victim rinse mouth thoroughly. Do not induce vomiting. Contact your local poison control center. Immediately seek medical attention.

Inhalation: Remove victim from exposure to chemicals and into the fresh air. Immediately seek medical attention.

Skin Contact: Immediately flush with water. Immediately seek medical attention.

Eye Contact: If eye contact with the contents of a vented cell immediately flush eyes with water. Immediately seek medical attention.

Protection for First Aiders: Do not expose yourself to corrosive vapor-contaminated areas without a respirator.

First Aid Facilities: Eye wash bottle, fountain and safety showers (running water).

4.2 Most Important Symptoms & Effects Caused by Exposure:

Ingestion of cell contents may cause gastrointestinal tract irritation or even vomiting. Inhalation of vented cell vapors may lead to severe irritation of the mouth and upper respiratory tract causing a burning/pain sensation or inflammation in the nose and throat. Inhalation could also cause coughing or difficulty breathing. Eye contact may cause severe eye irritation, eye burning/pain and even possible irreversible damage. Skin contact may lead to irritation and possible chemical burns.

SECTION V - FIRE FIGHTING MEASURES

5.1 Extinguishing Media:

Suitable Extinguishing Media: Water, Fire Extinguishing Powder, Nitrogen Gas, Carbon Dioxide, or Foam.

Unsuitable Extinguishing Media: Oxidizing agents, reducing agents, acids or alkalis.

Explosion Data: Closed containers may explode when exposed to temperatures above 120°C (248°F).

Hazchem Code: 4W (Australia, New Zealand and Malaysia)

Sensitivity to Mechanical Impact: Extreme mechanical abuse could cause venting of the cells.

Sensitivity to Static Discharge: If electrolyte is exposed to electrostatic discharge it could ignite.

5.2 Special Hazards Arising from the Chemical:

If a cell vents and exposes lithium hexafluorophosphate mixed with water vapor, this could create a poisonous gas of hydrogen-fluoride gas. Degradation of the cell by heat may produce hazardous fumes of lithium, cobalt-manganese, hydrofluoric acid, hydrogen and oxides of carbon, aluminum, lithium, copper and cobalt.

5.3 Specific Method for Fire Fighting:

When battery cells combust they tend to ignite other cells in the adjacent area. Prevent this by flooding the area with Carbon Dioxide, Foam, Nitrogen Gas or Fire Extinguishing Powder. Although use of water will extinguish flame it may create hydrogen-fluoride gas.

5.4 Special Protective Equipment for Fire Fighters:

Respiratory Protection: Self-contained Breathing Apparatus
Hand Protection: Protective Gloves
Eye Protection: Full Face Breathing Apparatus or Goggles
Body Protection: Protective Uniform

SECTION VI - ACCIDENTAL RELEASE MEASURES

If battery packs internal cells become damaged, they could possibly leak minuscule amounts of contaminants. The following procedures list precautions and steps to cleaning these contaminants.

6.1 Personal Precautions:

Quarantine contaminated area at a 33 feet (10 meters) radius from the center of contamination. Don protective equipment and clothing listed in Section 8.2.

6.2 Environmental Precautions:

Cover spilled materials with absorbent non-reactive material (ie. vermiculite). Keep contaminated non-reactive material away from soil, sewers or waterways. Inform appropriate authorities if contamination occurs.

6.3 Methods for Clean Up:

Quarantine contaminated area at a 33 feet (10 meters) radius from the center of contamination. Don protective equipment and clothing listed in Section 8. Do not touch Spilled material. Use only non-sparking tools and equipment. Do not expose spilled material to moisture. Seal all possible locations where contaminants might migrate into the environment. Clean up solids and place them into a waste container safe for disposing of contaminated trash. Clean up spilled liquids with vermiculite and place them into the same container. Appropriately transport contaminated material to a waste facility capable of handling contaminated materials.

6.4 Precautions to Prevent Secondary Hazard:

Avoid the release of collected materials. Do not bring the collected materials near open flame. Seal contaminants into a waste container safe for disposing of contaminated trash. Transport contaminants to an appropriate waste facility.

SECTION VII - HANDLING AND STORAGE**7.1 Precautions for Safe Handling:**

Avoid shorting the battery. Do not immerse in water. Do not disassemble or deform the battery. Do not expose to, or dispose of the battery in fire. Avoid excessive physical shock or vibration. Keep out of the reach of children. Battery must be charged in an approved charger. Never use a modified or damaged charger. Use for specified product applications only. Store in a cool, dry and well-ventilated area. Never use a battery that has suffered abuse. Refer to data sheet for safe operating instructions.

7.2 Conditions for Safe Storage:

Store battery packs in a cool (25°C+/-5°C), Dry (<85% Humidity) well ventilated area. Keep battery packs in packaging material to prevent exposure to elements and conductive material.

Do not store battery packs near heat, high humidity, open flame, sunlight, water, seawater, strong acids, strong oxidizers, strong reducing agents, strong alkalis or metal wire.

7.3 Specific End Uses:

Rechargeable Smart Battery Packs are used across a wide market scope as a DC power supply for portable electronic devices.

SECTION VIII - EXPOSURE CONTROLS, PERSONAL PROTECTION

Under routine operation none of these safety procedures or equipment are required. Take the following safety measures only if the internal cells are comprised and leak or vent.

8.1 Exposure Control Measures:

Exposure Limit Values- ACGIH does not mention electrolyte as a controlled method. Not applicable.

Biological Monitoring- Not Applicable.

Control Banding- Not Applicable.

Recommended Monitoring Procedures- Follow standard monitoring procedures.

Derived no-effect level- Not Applicable.

Derived minimal effect level- Not Applicable.

Predicted no-effect concentrations- Not Applicable.

8.2 Personal Protective Equipment:

Engineering Controls- Special ventilation is only required if cell venting occurs.

Eye and Face Protection- Wear chemical resistant safety goggles or face shield.

Hand Protection- Wear chemical resistant gloves.

Skin Protection- Wear long sleeved clothing. Solid clothing should be washed with detergent.

Respiratory Protection- Wear an approved half face inorganic vapor, gas, acid and particulate respirator.

Thermal Protection- Not Applicable.

Hygiene Measures- Do not eat, drink or smoke in work areas.

Environmental Exposure Controls- Do not release into the environment.

SECTION IX - PHYSICAL AND CHEMICAL PROPERTIES

Physical State- Sealed Solid

Appearance- Small Battery Pack

pH- Not Applicable

Relative Density- Not Applicable

Boiling Point- Not Applicable

Melting Point- Not Applicable

Viscosity- Not Applicable

Oxidizing Properties- Not Applicable

Flash Point- Not Applicable

Water Partition- Not Applicable

Vapor Pressure- Not Applicable

Vapor Density- Not Applicable

Solubility in Water- Insoluble
Water Distribution Coefficient- Not Applicable
Odor Type- Odorless
Odor Threshold- Not Applicable
Evaporation Rate- Not Applicable
Auto Ignition Temperature- Not Applicable
Flammability Limits- Not Applicable
Decomposition Temperature- 90°C

SECTION X - STABILITY AND REACTIVITY

10.1 Stability and Reactivity:

Stability- The battery packs manufactured by Inspired Energy are completely stable under normal use and in normal storage conditions.

Reactivity- The internal cells within the battery packs may become unstable due to abusive conditions. Conditions to Avoid- Avoid shorting the battery. Do not immerse in water. Do not disassemble or deform the battery. Do not expose to, or dispose of the battery in fire. Avoid excessive physical shock or vibration. Keep out of the reach of children. Battery must be charged in approved charger. Never use a modified or damaged charger. For specified product use only. Store in a cool, dry and well-ventilated area. Never use a battery that has suffered abuse. Refer to data sheet for safe operating instructions.

Incompatible Materials- Do not immerse in water or any other high corrosive conductive liquid.

Hazardous, Decomposition Products- Internal cells may decompose to hydrogen fluoride, phosphorous oxides, sulfur oxides, sulfuric acid, lithium hydroxide, carbon monoxide and carbon dioxide.

SECTION XI - TOXICOLOGICAL INFORMATION

11.1 Information on Toxicological Effects:

The battery packs manufactured by Inspired Energy present no toxicological effects under normal use. The hazardous components of the battery packs are within the internal cell. Within recommended conditions the electrode materials and liquid electrolytes do not react when the cell remains sealed. Exposure to these hazardous components is only possible if the battery leaks or vents. The following toxicology data is in respect to a person coming into contact with exposed electrolyte of the cell.

11.2 Acute Toxicity:

Swallowed- The electrolyte contained within the cells of the battery pack is a corrosive material. Ingestion of this electrolyte would be harmful. Swallowing may result in nausea, vomiting, diarrhea, abdominal pain and chemical burns in the gastrointestinal tract. During normal usage ingestion of a sealed battery pack is physically impossible.

11.3 Skin Corrosion or Irritation:

The electrolyte contained within the cells of the battery pack is a corrosive liquid. If this corrosive liquid make contact to your skin they could cause irritation or even severe chemical burns. A sealed battery presents no danger to a person's hand or skin.

11.4 Serious Eye Damage or Irritation:

The electrolyte contained within the cells of the battery pack is a corrosive liquid. If this electrolytes makes contact with the eye it could cause irritation or even irreversible damage to the eye. A sealed battery presents no danger to eyes.

11.5 Respiratory or Skin Sensitization:

OECD Test 406 as performed by the cell manufacture, presented no evidence that the electrolyte contained within the cell of battery pack cause no respiratory or skin sensitizers.

11.6 Germ Cell Mutagenicity:

OECD Test 471, 475, 476, 478 and 479 Test 406 as performed by the cell manufacture, presented no evidence that the electrolyte contained within the cell of a battery pack cause no mutagenic effect.

11.7 Carcinogenicity:

The electrolyte contained within the cell of a battery pack is not considered by the cell manufacture to be a carcinogen.

11.8 Reproductive Toxicity:

OECD Test 414 and 421 Test 406 as performed by the cell manufacture, presented no evidence that the Electrolyte contained within the cell of a battery pack cause an hazard to the human reproductive system.

11.9 Specific Target Organ Toxicity (STOT) - Single Exposure:

Inhalation of vapors from a leaking cell within a battery pack will cause irritation or even severe pain to the mouth and respiratory tract. Sealed battery packs present no organ toxicity.

11.10 Specific Target Organ Toxicity (STOT) - Repeated Exposure:

OECD Tests 410 and 412 presented that prolonged exposure to a battery pack cells causes no organ damage.

11.11 Aspiration Hazards:

The electrolyte contained within the cell of the battery pack presents no aspiration concern. Although if the electrolyte is swallowed vomiting could occur and cause aspiration into the lungs.

SECTION XII - ECOLOGICAL INFORMATION

12.1 Ecotoxicity: A sealed battery pack does not pose any ecotoxicity hazard. The internal cells under normal use and conditions pose no ecotoxicity hazard. In the rare case the cells seal is broken or damaged the cell could leak electrolyte. If this electrolyte reacts with water it could potentially cause damage to flora and fauna. Follow the steps under Section 13 to insure cells are disposed of properly.

12.2 Persistence and Degradability: No data available.

12.3 Bio Accumulative Potential: Not applicable.

12.4 Mobility in Soil: No data available.

12.5 Results of PBT and vPvB Assessment: Not applicable.

SECTION XIII - DISPOSAL CONSIDERATIONS

13.1 Waste Treatment Methods: Recycling of Inspired Energy's Smart Battery Packs is strongly encouraged. Every battery has instructions for contacting the Rechargeable Battery Recycling Corp (RBRC) to ensure the appropriate recycling method within the USA. Every battery has the appropriate symbols to direct appropriate disposal in Europe. The battery packs internal cell's contents should not be released into the environment, do not dump into any sewers, on the ground or into any body of water. Do not dispose of battery packs in fire. Used battery packs should be stored in their original packaging. Ensure packs are stored in a manner to prevent short circuit of the cells. Battery pack should be fully discharged before recycling. Do not break battery pack open before disposal.

13.2 Classification of Waste to comply with Waste Regulations:

USA: Expended batteries are not considered hazardous waste. Cells and batteries involved in a fire may be considered to be hazardous waste. Dispose of in accordance with local, state and federal laws and regulations. Consult universal/hazardous waste regulations for further information regarding disposal of spent batteries. If the internal cells are leaking/broken open, consult hazardous waste regulations under US Environmental Protection Agency's Resource Conservation and Recovery Act (RCRA). Also, consult state and local regulations for further disposal requirements.



Inspired Energy is a committed partner in Call2recycle's Rechargeable Battery Recycling Corporation (RBRC) program. Promoting the recycling of Li-Ion battery packs by providing a toll-free telephone number to call and receive information to the nearest local recycling facility.

Canada: Expended battery packs are not considered hazardous waste. Cells and batteries involved in a fire may be considered to be hazardous waste. Dispose of in accordance with local, provincial and federal laws and regulations. Consult the Canadian Environmental Protection Act for additional details.

EU: Expended battery pack waste must be disposed of in accordance with relevant EC Directives and national, regional and local environmental control regulations. For disposal within the EC, the appropriate code according to the European Waste Catalogue (EWC) should be used. EU Waste Code: 16 06 05 – other batteries and accumulators.

Australia: Expended battery packs must be taken for recycling or disposal at an appropriate collection depot by suitably licensed contractors in accordance with government regulations.

Taiwan: Expended battery packs are not considered hazardous waste. Cells and batteries should be recycled at an appropriate collection site in accordance with government regulations.

Japan: Recycling of expended lithium-ion battery packs is regulated by the Wastes Disposal and Public Cleaning Law and the Law for Promotion of Effective Utilization.

13.3 Classification of Waste to comply with Transport Regulations: Expended Lithium-Ion Battery packs are not considered hazardous waste. Lithium-ion battery packs that have been involved in a fire maybe considered hazardous waste and should be marked and classified as such.

13.4 Classification of Waste Packaging Material: Under normal use packaging is not consider hazardous and should be disposed of in accordance with local recycling regulations. Packaging that has been exposed to a damaged leaking cells should be considered hazardous waste and disposed of in accordance to local rules and regulations.

SECTION XIV - TRANSPORT INFORMATION

14.1 UN Number: 3480 or 3481

14.2 UN Proper Shipping Name: 3480-Lithium Ion Batteries. 3481-Lithium Ion Batteries Contained in Equipment or Lithium Ion Batteries Packed with Equipment

14.3 Transport Hazard Classes:

Class: 9

Susidiary Risk: None

Labels: 9

Hazard No. (ADR): Not Applicable

14.4 Packing Group: II

14.5 Environmental Hazards: None

14.6 Special Precautions for User: Read Safety Data Sheet and Specification Data sheet before use. Australia, New Zealand and Singapore follow Hazchem Code: 4W.

14.7 Transport in bulk IBC Code: No applicable code.

14.8 Modal Information:

Land (ADR):	3480 – 188, 230, 310, 348 (Special packaging instruction P903 applies). 3481 – 188, 230, 248, 360 (Special packaging instruction P903 applies).
Land (RID):	3480 – 188, 230, 310, 348 (Special packaging instruction P903 applies). 3481 – 188, 230, 248, 360 (Special packaging instruction P903 applies).
Land (ADN)	3480 – 188, 230, 310, 348 (Special packaging instruction P903 applies). 3481 – 188, 230, 248, 360 (Special packaging instruction P903 applies).
Sea (IMDG):	188, 230, 310 (Special packaging instruction P903 applies). EmS: F-A, S-I; Stowage Category A IMDG Code: 9033
Air (IATA)	A88, A99, A154, A164, A183 (Packing Instruction 965, 966, 967). ERG Code: - Lithium ion cell or batteries - Lithium ion batteries in compliance with Packing Instruction 965. Lithium ion cell or batteries packed with equipment - Lithium ion batteries in compliance with Packing Instruction 966. Lithium ion cell or batteries contained in equipment - Lithium ion batteries in compliance with Packing Instruction 967.

Inspired Energy products listed under this SDS will conform to various sections of PI 965 or PI 966 or PI 967 based on the contents and packaging of the shipment. Please see the shipping documents for complete details for individual shipments. This document is not intended to replace or authorize shipments of lithium-ion cells; it is intended as a guide for use by trained individuals.

SECTION XV - REGULATORY INFORMATION

15.1 Safety, Health and Environmental Regulations/ Legislation:

United States Federal and State Regulations: TSCA Status: All ingredients in these products are listed on the TSCA inventory. **OSHA:** These products do not meet criteria as per Part 1910.1200, manufactured article. **SARA EPA Title III:** None. **Sec. 302/304:** None. **Sec. 311/312:** None. **Sec. 313:** None. **CERCLA RQ:** None.

Canadian Federal Regulations: These products have been classified in accordance with the hazard criteria of the Controlled Products Regulations and the SDS contains all the information required by the Controlled Products Regulations. **WHMIS Classification:** Not Controlled, manufactured article. **New Substance Notification Regulations:** Lithium hexafluorophosphate is listed on the Non-Domestic Substance List (NDSL). All other ingredients in the product are listed, as required, on Canada's Domestic Substances List (DSL). **National Pollutant Release Inventory (NPRI) Substances:** These products do not contain any NPRI chemicals.

EU Regulations: Regulation (EC) No. 1005/2009 on substances that deplete the ozone layer, Annex I: Not listed. Regulation (EC) No. 1005/2009 on substances that deplete the ozone layer, Annex II: Not listed. Regulation (EC) No. 850/2004 on persistent organic pollutants, Annex I as amended: Not listed. Regulation (EC) No. 689/2008 concerning the export and import of dangerous chemicals, Annex I, part 1 as amended: Not listed. Regulation (EC) No. 689/2008 concerning the export and import of dangerous chemicals, Annex I, part 2 as amended: Not listed. Regulation (EC) No. 689/2008 concerning the export and import of dangerous chemicals, Annex I, part 3 as amended: Not listed. Regulation (EC) No. 689/2008 concerning the export and import of dangerous chemicals, Annex V as amended: Not listed. Regulation (EC) No. 166/2006, REACH Article 59(10) candidate List as currently published by ECHA: Not listed. **EU Authorizations:** Regulation (EC) No. 1907/2006, REACH Annex XIV Substances subject to authorization, as amended: Not listed. **EU Restrictions on use:** Regulation (EC) No. 1907/2006, REACH Annex XVII Substances subject to restriction on marketing and use as amended: Aluminum (CAS 7429-90-5) Directive 2004/37/EC: on the safety and health of pregnant workers and workers who have recently given birth or are

breastfeeding: Not listed. **Other EU Regulations** Directive 96/82/EC (Seveso II) on the control of major accident hazards involving dangerous substances: Not listed. Directive 94/33/EC on the protection of young people at work: Not listed. FSSF00058AG Inspired Energy's Page 13 of 15 August 2015 This Safety Data Sheet complies with the requirements of Regulation (EC) No. 1907/2006 and amended on 28 May 2015 by (EU) 2015/830.

Australia and New Zealand SUSMP: Not applicable **AICS:** All ingredients are on the AICS list. **HSNO Approval number:** Not applicable **HSNO Group Title:** Not applicable **NOHSC:10008 Risk Phrases:** R34 - Causes Burns. **NOHSC:1008 Safety Phrases:** S1 – Keep locked up. S2 – Keep out of reach of children. S23 – Do not breathe vapor. S24/25 – Avoid contact with skin and eyes. S26 – In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S27/28 – After contact with skin, take off immediately all contaminated clothing and wash immediately with plenty of water. S36/37/39 – Wear suitable protective clothing, gloves and eye/face protection. S56 – Dispose of this material and its container at hazardous waste or special waste collection point. S62 – If swallowed, DO NOT induce vomiting: seek medical advice immediately and show this container or label. S64 – If swallowed, rinse mouth with water (Only if the person is conscious).

EC Classification for the Substance/Preparation: These products are not classified as hazardous according to Regulation (EC) No. 1272/2008. Keep out of the reach of children.

Japanese Regulations Japanese Industrial Standards (JIS) JIS Z 7253:2012 Waste disposal and public cleaning law Law for Promotion of Effective Utilization of Resources

Taiwanese Regulations Regulation of Labelling and Hazard Communication of Dangerous and Harmful Materials: Labeling requirements and other relevant provision of chemicals, this product is not classified as dangerous goods. Toxic Chemicals Substance Control Law: Not Listed. CNS 1030016 Safety of primary and secondary lithium cells and batteries during transport.

Chinese Regulations General Rule for Classification and Hazard Communication of Chemicals (GB 13690-2009): Specifies the classification, labeling and hazard communication of chemicals in compliance with the GHS standard for chemical production sites and labeling of consumer goods. General Rule for Preparation of Precautionary Labels for Chemicals (GB 15258-2009): Specifies the relevant application methods of precautionary labels for chemicals. Safety Data Sheet for Chemical Products Content and Order of Sections (GB/T 16483-2008)

15.2 Chemical Safety Assessment: Not applicable.

SECTION XVI - OTHER INFORMATION

Preparation Date: March 24, 2016

Prepared by: Inspired Energy's Compliance Department

Revision: V1- Initial Release

Disclaimer: The information contained within is provided for your information only. The information and recommendations set forth herein are made in good faith and are believed to be accurate as of the date of preparation. However, INSPIRED ENERGY, INC. MAKES NO WARRANTY, EITHER EXPRESSED OR IMPLIED, WITH RESPECT TO THIS INFORMATION AND DISCLAIMS ALL LIABILITY FROM RELIANCE ON IT.

4.12 PLA 3D Printer Filament

Safety Data Sheet

Material Name: PLA 3D Printer Filament/ MakerBot PLA

SDS ID: MB-002_US

Section 1 - PRODUCT AND COMPANY IDENTIFICATION

Material Name

PLA 3D Printer Filament/ MakerBot PLA

Synonyms

Polyactide resin

Chemical Family

polymer, copolymer

Product Use

3D Printing

Restrictions on Use

Do not use in printers where temperatures exceed 250°C.

Details of the supplier of the safety data sheet

MakerBot Industries LLC

One MetroTech Center

Brooklyn, NY 11201

USA

Phone #: MakerBot (347) 334-6800

Emergency Phone #: +1 978 495 5580 –USA multi-linguist response

E-mail: RegulatoryCompliance@makerbot.com

Emergency Poison Control Hot Line : 1 (800) 222-1222

Section 2 - HAZARDS IDENTIFICATION

Classification in accordance with paragraph (d) of 29 CFR 1910.1200.

None needed according to classification criteria

GHS Label Elements**Symbol(s)**

None needed according to classification criteria

Signal Word

None needed according to classification criteria

Hazard Statement(s)

None needed according to classification criteria.

Precautionary Statement(s)**Prevention**

None needed according to classification criteria.

Response

None needed according to classification criteria.

Storage

None needed according to classification criteria.

Safety Data Sheet

Material Name: PLA 3D Printer Filament/ MakerBot PLA

SDS ID: MB-002_US

Disposal

Dispose of contents/container in accordance with local/regional/national/international regulations.

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

CAS	Component Name	Percent
9051-89-2	1,4-Dioxane-2,5-dione, 3,6-dimethyl-, (3R-cis)-, polymer with (3S-cis)-3,6-dimethyl-1,4-dioxane-2,5-dione and trans-3,6-dimethyl-1,4-dioxane-2,5-dione	>98

Section 4 - FIRST AID MEASURES

Inhalation

Heating may release vapors which may be irritating. In case of inhalation of decomposition products, affected person should be moved into fresh air and kept still. Get medical advice/attention.

Skin

It is unlikely that first aid will be required. IF ON SKIN: Wash with plenty of soap and water. If skin irritation occurs: Get medical advice/attention.

Eyes

It is unlikely that first aid will be required. Dust may be irritating to the eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention, if needed.

Ingestion

IF SWALLOWED: Rinse mouth. Get immediate medical advice/attention.

Indication of any immediate medical attention and special treatment needed

First aid is not expected to be necessary if material is used under ordinary conditions and as recommended. Treat symptomatically and supportively.

Most Important Symptoms/Effects**Acute**

Molten material may cause thermal burns.

Delayed

No information on significant adverse effects.

Note to Physicians

Treat symptomatically. Give artificial respiration if not breathing.

Antidote

None known. Treat symptomatically and supportively.

Safety Data Sheet

Material Name: PLA 3D Printer Filament/ MakerBot PLA

SDS ID: MB-002_US

Section 5 - FIRE FIGHTING MEASURES

Extinguishing Media**Suitable Extinguishing Media**

Water, alcohol resistant foam, regular dry chemical

Unsuitable Extinguishing Media

None known

Special Hazards Arising from the Chemical

Avoid generating dust; fine dust dispersed in air in sufficient concentrations, and in the presence of an ignition source is a potential dust explosion hazard.

Hazardous Combustion Products

Oxides of carbon, aldehydes. May decompose upon heating to produce corrosive and/or toxic fumes.

Fire Fighting Measures

Wear full protective fire fighting gear including self contained breathing apparatus (SCBA) for protection against possible exposure. Keep unnecessary people away, isolate hazard area and deny entry. Stay upwind and keep out of low areas.

Special Protective Equipment and Precautions for Firefighters

Avoid inhalation of material or combustion by-products. Stay upwind and keep out of low areas.

Section 6 - ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment and Emergency Procedures

No measures required.

Methods and Materials for Containment and Cleaning Up

Collect spilled material in appropriate container for reuse or disposal. Dispose in accordance with all applicable regulations.

Environmental Precautions

Avoid release to the environment. Comply with all applicable regulations on spill and release reporting. Prevent entry into waterways, sewers, basements, or confined areas.

Section 7 - HANDLING AND STORAGE

Precautions for Safe Handling

Minimize dust generation and accumulation. Routine housekeeping should be instituted to ensure that dusts do not accumulate on surfaces. Dry powders can build static electricity charges when subjected to the friction of transfer and mixing operations.

Conditions for Safe Storage, Including any Incompatibilities

None needed according to classification criteria.

Store in a cool dry place. Store below 50 C. Avoid heat, flames, sparks and other sources of ignition. Keep away from incompatible materials.

Incompatible Materials

Safety Data Sheet

Material Name: PLA 3D Printer Filament/ MakerBot PLA**SDS ID: MB-002_US**

Oxidizing agents, strong bases

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

Component Exposure Limits

1,4-Dioxane-2,5-dione, 3,6-dimethyl-, (3R-cis)-, polymer with (3S-cis)-3,6-dimethyl-1,4-dioxane-2,5-dione and trans-3,6-dimethyl-1,4-dioxane-2,5-dione	9051-89-2
ACGIH:	10 mg/m ³ TWA inhalable particles, recommended; 3 mg/m ³ TWA respirable particles, recommended (related to Particulates not otherwise classified (PNOC))
OSHA (US):	15 mg/m ³ TWA total dust; 5 mg/m ³ TWA respirable fraction (related to Particulates not otherwise classified (PNOC))
	15 mppcf TWA respirable fraction; 5 mg/m ³ TWA respirable fraction; 50 mppcf TWA total dust; 15 mg/m ³ TWA total dust (related to Particulates not otherwise classified (PNOC))

EU - Occupational Exposure (98/24/EC) - Binding Biological Limit Values and Health Surveillance Measures

There are no biological limit values for any of this product's components.

ACGIH - Threshold Limit Values - Biological Exposure Indices (BEI)

There are no biological limit values for any of this product's components.

Engineering Controls

Provide local exhaust ventilation system. Ventilation should be sufficient to effectively remove and prevent buildup of any dusts or fumes that may be generated during handling or thermal processing.

Individual Protection Measures, such as Personal Protective Equipment**Eye/face protection**

None during normal use. Protect against molten solid.

Skin Protection

None during normal use. Protect against molten solid.

Respiratory Protection

No respirator is required under normal conditions of use. If respirable dusts are generated, respiratory protection may be needed.

Glove Recommendations

Protect against molten solid. In the molten form: Wear protective gloves.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

Safety Data Sheet

Material Name: PLA 3D Printer Filament/ MakerBot PLA

SDS ID: MB-002_US

Appearance	Spool,string,strand	Physical State	solid
Odor	odorless,sweet,plastic	Color	clear,translucent,opaque
Odor Threshold	varies	pH	Not available
Melting Point	150 - 180 °C	Boiling Point	Not available
Freezing point	Not available	Evaporation Rate	Not available
Boiling Point Range	Not available	Flammability (solid, gas)	Not available
Autoignition	388 °C	Flash Point	Not available
Lower Explosive Limit	Not applicable	Decomposition	>250 °C
Upper Explosive Limit	Not applicable	Vapor Pressure	Not available
Vapor Density (air=1)	Not available	Specific Gravity (water=1)	Not available
Water Solubility	Insoluble	Partition coefficient: n-octanol/water	Not available
Viscosity	Not available	Solubility (Other)	Not available
Density	1.25 g/cc	Molecular Weight	Not available

Section 10 - STABILITY AND REACTIVITY

Reactivity

The product is chemically stable under recommended conditions of storage, use and temperature.

Chemical Stability

Stable under normal conditions of use.

Possibility of Hazardous Reactions

Will not polymerize.

Conditions to Avoid

Avoid contact with temperatures above 250 C.

Incompatible Materials

Oxidizing agents, strong bases

Hazardous decomposition products

Oxides of carbon, aldehydes

Thermal decomposition products

May decompose upon heating to produce corrosive and/or toxic fumes.

Safety Data Sheet

Material Name: PLA 3D Printer Filament/ MakerBot PLA

SDS ID: MB-002_US

Section 11 - TOXICOLOGICAL INFORMATION

Information on Likely Routes of Exposure**Inhalation**

No hazard is expected from the normal use of this product. Dust may cause irritation of the nose, throat and upper respiratory tract.

Skin Contact

Molten material may cause burns.

Eye Contact

Molten material may cause burns.

Ingestion

No information on significant adverse effects.

Acute and Chronic Toxicity**Component Analysis - LD50/LC50**

The components of this material have been reviewed in various sources and the following selected endpoints are published:

1,4-Dioxane-2,5-dione, 3,6-dimethyl-, (3R-cis)-, polymer with (3S-cis)-3,6-dimethyl-1,4-dioxane-2,5-dione and trans-3,6-dimethyl-1,4-dioxane-2,5-dione (9051-89-2)

Oral LD50 Rat >5000 mg/kg

Dermal LD50 Rabbit >2000 mg/kg

Immediate Effects

Molten material may cause thermal burns.

Delayed Effects

No information on significant adverse effects.

Irritation/Corrosivity Data

No data available.

Respiratory Sensitization

No data available.

Dermal Sensitization

Found to be non-sensitizing when tested on guinea pigs.

Component Carcinogenicity

None of this product's components are listed by ACGIH, IARC, NTP, DFG or OSHA

Germ Cell Mutagenicity

Negative in the Ames test for mutagenicity.

Tumorigenic Data

No data available

Reproductive Toxicity

No data available.

Specific Target Organ Toxicity - Single Exposure

No target organs identified.

Specific Target Organ Toxicity - Repeated Exposure

Safety Data Sheet

Material Name: PLA 3D Printer Filament/ MakerBot PLA**SDS ID: MB-002_US**

No target organs identified.

Aspiration hazard

No data available.

Medical Conditions Aggravated by Exposure

No data available.

Section 12 - ECOLOGICAL INFORMATION

Component Analysis - Aquatic Toxicity

1,4-Dioxane-2,5-dione, 3,6-dimethyl-, (3R-cis)-, polymer with (3S-cis)-3,6-dimethyl-1,4-dioxane-2,5-dione and trans-3,6-dimethyl-1,4-dioxane-2,5-dione	9051-89-2
Algae:	EC50 72 hr Algae >1100 mg/L

Persistence and Degradability

No information available for the product.

Bioaccumulative Potential

No information available for the product.

Mobility

No information available for the product.

Section 13 - DISPOSAL CONSIDERATIONS

Disposal Methods

Dispose of contents/container in accordance with local/regional/national/international regulations. Avoid release to the environment. Incineration should be done in accordance with prevailing municipal, state, and federal laws and standards from local environmental agencies.

Component Waste Numbers

The U.S. EPA has not published waste numbers for this product's components

Section 14 - TRANSPORT INFORMATION

US DOT Information:

UN#: Not regulated

Section 15 - REGULATORY INFORMATION

U.S. Federal Regulations

Safety Data Sheet

Material Name: PLA 3D Printer Filament/ MakerBot PLA

SDS ID: MB-002_US

None of this products components are listed under SARA Sections 302/304 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65), CERCLA (40 CFR 302.4), TSCA 12(b), or require an OSHA process safety plan.

SARA Section 311/312 (40 CFR 370 Subparts B and C)

Acute Health: No Chronic Health: No Fire: No Pressure: No Reactivity: No

U.S. State Regulations

None of this product's components are listed on the state lists from CA, MA, MN, NJ or PA

Not listed under California Proposition 65

Canadian WHMIS Ingredient Disclosure List (IDL)

The components of this product are either not listed on the IDL or are present below the threshold limit listed on the IDL.

Component Analysis - Inventory

1,4-Dioxane-2,5-dione, 3,6-dimethyl-, (3R-cis)-, polymer with (3S-cis)-3,6-dimethyl-1,4-dioxane-2,5-dione and trans-3,6-dimethyl-1,4-dioxane-2,5-dione (9051-89-2)

US	CA	EU	AU	PH	JP - ENCS	JP - ISHL	KR - KECI/KECL	KR - TCCA	CN	NZ	MX	TW
Yes	DSL	No	Yes	No	Yes	No	No	No	Yes	Yes	No	Yes

Section 16 - OTHER INFORMATION

NFPA Ratings

Health: 0 Fire: 1 Reactivity: 0

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

Summary of Changes

New SDS : 08/26/2015

New SDS : 09/26/2016 Updated phone numbers, email

Key / Legend

ACGIH - American Conference of Governmental Industrial Hygienists; ADR - European Road Transport; AU - Australia; BOD - Biochemical Oxygen Demand; C - Celsius; CA - Canada; CAS - Chemical Abstracts Service; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CLP - Classification, Labelling, and Packaging; CN - China; CPR - Controlled Products Regulations; DFG - Deutsche Forschungsgemeinschaft; DOT - Department of Transportation; DSD - Dangerous Substance Directive; DSL - Domestic Substances List; EEC - European Economic Community; EINECS - European Inventory of Existing Commercial Chemical Substances; EPA - Environmental Protection Agency; EU - European Union; F - Fahrenheit; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; ICAO - International Civil Aviation Organization; IDL - Ingredient Disclosure List; IDLH - Immediately Dangerous to Life and Health; IMDG - International Maritime Dangerous Goods; JP - Japan; Kow - Octanol/water partition coefficient; KR - Korea; LEL - Lower Explosive Limit; LLV - Level Limit Value; LOLI - List Of LIsts™ - ChemADVISOR's Regulatory Database; MAK - Maximum Concentration Value in the Workplace; MEL - Maximum Exposure Limits; NFPA - National Fire Protection Agency; NIOSH - National Institute for Occupational Safety and Health; NJTSR - New Jersey Trade Secret Registry; NTP - National Toxicology Program; NZ - New Zealand; OSHA - Occupational Safety and Health Administration; PH -

Safety Data Sheet

Material Name: PLA 3D Printer Filament/ MakerBot PLA

SDS ID: MB-002_US

Philippines; RCRA - Resource Conservation and Recovery Act; REACH- Registration, Evaluation, Authorisation, and restriction of Chemicals; RID - European Rail Transport; SARA - Superfund Amendments and Reauthorization Act; STEL - Short-term Exposure Limit; TDG - Transportation of Dangerous Goods; TSCA - Toxic Substances Control Act; TWA - Time Weighted Average; UEL - Upper Explosive Limit; US - United States.

Other Information

Disclaimer:

Supplier gives no warranty whatsoever, including the warranties of merchantability or of fitness for a particular purpose. Any product purchased is sold on the assumption the purchaser shall determine the quality and suitability of the product. Supplier expressly disclaims any and all liability for incidental, consequential or any other damages arising out of the use or misuse of this product. No information provided shall be deemed to be a recommendation to use any product in conflict with any existing patent rights.

4.13 Rocketpoxy Part A



Section 1- Product and Company Identification

Product: ROCKETPOXY PART A
Manufacturer/Supplier:
 Glenmarc Industries Inc
 2001 S Blue Island Ave
 Chicago IL 60608
 Phone: 312-243-0800
 web: www.glenmarc.com
Information Phone Number: 312-243-0800
Emergency Phone Number: Chemtel: 800-255-3924 (US & Canada)
Product Use: Adhesive
Restriction on Use: None known
SDS Date of Preparation: May 2017

Product Type: Epoxy resin
 Product Use: Industrial resin supplied exclusively for workplace use.
 Signal word: Warning
 Hazard label(s):



Hazard statement(s):
 H320: Causes eye irritation
 H303: May be harmful if swallowed
 H315: Causes skin irritation
 H317: May cause allergic skin reaction
 H335: May cause respiratory irritation

Precautionary statement(s):
 P202: Do not handle until all safety precautions have been read and understood
 P261: Avoid breathing dust/fume/gas/mist/vapours/spray.
 P270: Do not eat, drink or smoke when using this product.
 P281: Use personal protective equipment as required.
 P285: In case of inadequate ventilation wear respiratory protection.
 P273: Avoid release to the environment.

Section 2: Hazard(s) Identification

No.	CANCER	REPRO-TOX	TARGET ORGANS	ACGIH/TLV	OSHA/PEL
P	NO	NO	UNKNOWN	N.A.mg/M3	N.A.mg/M3
2	NO	NO	Eyes, Skin	N.A.mg/M3	N.A.mg/M3

Note: CONTAINS MATERIAL(S) REGULATED AS DUST HAZARDS, DISPERSED IN A NON-HAZARDOUS FORM. IF DUST IS RECREATED, APPROPRIATE RESPIRATORY AND/OR EXPLOSION PRECAUTIONS MUST STILL BE USED.

Section 3: Composition / Information On Ingredients

UNDER GHS-OSHA §4.11 THE PRECISE COMPOSITION OF THIS PRODUCT IS WITHHELD AS CONFIDENTIAL BUSINESS INFORMATION (CBI). A MORE COMPLETE DISCLOSURE CAN BE PROVIDED TO A HEALTH, OR SAFETY PROFESSIONAL WHEN NECESSARY.

Substance/Mixture: Mixture

NO. COMPONENT	CAS. NO.	PERCENT
P epoxy resin mixture	N.A.	< 100%
2 triphenyl phosphate	101-02-0	< 15%

Section 4: First-Aid Measures

Emergency and first aid procedures:

Eyes: Immediately flush eyes with large amounts of water for 15 minutes. Get medical attention

SKIN: Wash affected area immediately with large amounts of soap and water. Remove and wash contaminated clothing before reuse. Contact a physician if irritation occurs.

INHALATION: Remove victim to fresh air and provide oxygen if breathing is difficult. Get medical attention.

Ingestion: Do not induce vomiting. Give large quantities of water. Call a physician immediately. Never give anything mouth to an unconscious person.

Section 5: Fire-Fighting Measures

Flash Point: $\geq 275^{\circ}\text{F}$ (For product or lowest flash point ingredient)

Flammability classification: Combustible class (IIIB) Extinguishing Media: Water fog, dry chemical, carbon dioxide, or foam.

Note: Either atmosphere-supply or air-purifying respirators should be available for fire fighters (20 DFR 1910.134).

Section 6: Accidental Release Measures

If Material is spilled: Avoid contact with material. Persons not wearing proper protective equipment (see below) should be excluded from the area until clean up is complete. Dike area to prevent spill spreading and scoop up excess to recovery containers. Absorb remnant on noncombustible material such as clay and shovel into containers for disposal.

Waste disposal Method: Dispose of any waste(s) generated above in accordance with federal, state, and local regulations.

Section 7: Handling and Storage

Avoid skin and eye contact.

Avoid breathing vapor, mist or fumes.

Ensure that all containers are properly labeled to prevent accidental ingestion or improper disposal

Reseal partly used containers.

Wash with soap and water before eating, drinking or using toilet facilities.

Store under cool, dry conditions and away from open flames and high temperatures.

Observe conditions of good industrial hygiene and safe working practice.

Section 8: Exposure Controls/Personal Protection

Respiratory Protection: Not normally necessary unless the material is being used in such a way as to produce dust, mist, vapor, fumes, or smoke, in which case niosh approved respiratory protection should be used.

Ventilation: Should be sufficient to control any dust, mist, vapor or fumes produced by processing or handling method. Breathing or vapor must be avoided.

Hand Protection: Impervious gloves, neoprene or nitrile rubber gloves.

Eye Protection: Splash proof goggles or safety glasses with side shields.

Other Protective Equipment: Clean, body covering clothing and footwear.

Section 9: Physical And Chemical Properties

Physical State: Paste

Odor: bland

Color: white

pH: neutral

SP. GR: 1.57

Density: 12.9 lbs./gal.

Vapor Pressure: Negligible

Note: Other properties are either not available, or do not apply.

Section 10: Stability and Reactivity

Stability: stable under normal storage conditions. Unstable at elevated temperatures. Slowly corrodes copper, Aluminum, Zinc and Galvanized surfaces.

Incompatibility: Strong oxidizing agents, strong lewis or mineral acids, Nitrous Acid, Sodium Hypochlorite, and Peroxides.

Hazardous Decomposition products: Oxides of Carbon and Nitrogen, Nitric Acid, Nitrosoamine, and other unknown organic compounds.

Section 11: Toxicological Information

Effects of Overexposure:

Acute:

Eyes: moderately irritating to eyes.

Skin: moderately irritating to skin.

Inhalation: not likely to be inhalation hazard

Ingestion: low oral toxicity

Chronic:

No specific hazards.

Section 12: Ecological Information

Ecotoxicity effects:

Aquatic Toxicity: No data is available on the product itself.

Toxicity to other organisms: No data available.

Persistence and degradability:

Mobility: No data is available on the product itself.

Bioaccumulation: No data is available on the product itself.

Section 13: Disposal Considerations

Waste Disposal Method: Dispose of waste in Accordance with all federal, state, and local regulations.

Container Disposal: Since emptied containers retain product residue, all labeled hazard precautions must be observed consult with federal, state and local authorities for definitions of "Empty" and proper disposal practices.

Section 14: Transport Information

US IDOT (49 CFR)

Un Number: NONE

Proper Shipping Name: plastic material liquid

Contains: not regulated

Hazards class: n/a

Packaging Group: n/a

International Air Transportation (ICAO.TATA)

Un Number: NONE

Proper Shipping Name: plastic material liquid

Contains: not regulated

Hazards class: n/a

Packaging Group: n/a

Water Transportation (IMO/IMDG)

Un Number: NONE

Proper Shipping Name: plastic material liquid

Contains: not regulated

Hazards class: n/a

Packaging Group: n/a

Section 15: Regulatory Information

A. CAL SAFE DRINKING WATER & TOXIC ENFORCEMENT ACT OF 1986

No Chemical Name Cas. No. Cancer/Repro. Tox quantity

n/a

This product may contain traces of prop. 65 listed chemicals as impurities. However, any used as ingredients are listed above.

B. CERCLA- §40 CFR 302.4

Releases exceeding the reportable quantity (RQ) Must be reported to the national response center (800)424-8802

RQ = 100 lbs. (Unlisted hazardous waste – characteristic of corrosivity)

C.. RCRA - §40 CFR 261.33

RQ = 1000 lbs. (unlisted corrosive content > 10%)

D SARA Title III --§52 CFR 13378, - §52 CFR 21152

No.	RQ(lbs.)	TPQ(lbs.)	SEC.313	313 CAT.	
311/312					
	(•1)	(•2)	(•3)	(•4)	(•5)
1	None	Not listed	Not listed	None	H1, H2
2	None	Not Listed	Not listed	None	H1, H2

•1 = Reportable quantity of extremely hazardous substance, SEC 302

•2 = Threshold planning quantity, extremely hazardous substance, SEC 302

•3 = Toxic chemical SEC 313 (individual chemical listed)

•4 = Toxic release inventory form category SEC, 313 (40 CFR 372.65 C)

•5 = Hazard category for sara SEC 311/312 reporting

H1 = Immed, (Acute) health hazard H2 = Delayed (Chronic) health hazard

P3 = Fire hazard P4= Sudden pressure release hazard P5= Reactive Haz.

E. Voc – SCAQMD Rules

No	Chemical	Quantity	VP mm Hg	gms./l. @ 20oC
----	----------	----------	----------	----------------

NIL

Note: This product does not contain solvents, but may contain ingredients with vp's low enough to be emitted if heated alone. When 2 part resins and hardeners are properly mixed together These ingredients react together and are consumed without significant atmospheric emissions.

F. International Chemical Inventory Status:

EINECS-EU	Listed, exempted, Polymer substance, or as no longer polymer.
AICS-AUSTRALIA	All components are listed or exempted.
ENCS-JAPAN	Not determined.
ISHL-japan	Not determined.
KECI/ECL-KOREA	All components are listed or exempted.
IECSC/SEPA-CHINA	All components are listed or exempted.
PICCS-PHILIPPINES	All components are listed or exempted.
DSL-CANADA	All components are listed or exempted.
TSCA-USA	All components are listed or exempted.

G WHMIS (CANADA);

WHMIS: D28 Materials causing other toxic effects – toxic material

Section 16: Other Information

HMIS

Health 2, Flammability 1, Reactivity, 1

Revision Summary: New format to comply with OSHA Hazcom 2012

The information contained herein is based on data considered accurate. However, no warranty is expressed or implied regarding the accuracy of these data or the results to be obtained from the use thereof.

Vendor assumes no responsibility for injury to vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Additionally, vendor assumes no responsibility for injury to vendee or third persons proximately caused by abnormal use of the material even if reasonable safety procedures are followed. Furthermore, vendee assumes the risk to his use of the material.

4.14 Rocketpoxy Part B Curing Agent



GHS Safety Data Sheet (SDS)

Section 1- Product and Company Identification

Product: ROCKETPOXY PART B CURING AGENT

Manufacturer/Supplier:

Glenmarc Industries Inc

2001 S Blue Island Ave

Chicago IL 60608

Phone: 312-243-0800

web: www.glenmarc.com

Information Phone Number: 312-243-0800

Emergency Phone Number: Chemtel: 800-255-3924 (US & Canada)

Product Use: Adhesive

Restriction on Use: None known

SDS Date of Preparation: May 2016

Product Type: Modified Amine Mixture

Product Use: Industrial curing agent supplied exclusively for workplace use.

Signal word: Danger

Hazard label(s):

Corrosive



Irritant



Environment



Hazard statement(s):

H318: Causes serious eye damage. (Eye Dam. 1)

H302+H332: Harmful if swallowed or inhaled. (Acute Tox. 4 Oral + Inhalation)

H317: May cause an allergic skin reaction. (Skin Sens. 1)

H361: Suspected of damaging fertility or the unborn child. (Bisphenol ! –Repr. 2)

H401: Toxic to aquatic life. (Bisphenol A – Aquatic Acute 2)

Precautionary statement(s):

P202: Do not handle until all safety precautions have been read and understood

P261: Avoid breathing dust/fume/gas/mist/vapours/spray.

P270: Do not eat, drink or smoke when using this product.

P281: Use personal protective equipment as required.

P285: In case of inadequate ventilation wear respiratory protection.

P271: Avoid release to the environment.

Section 2: Hazard(s) Identification

No.	CANCER	REPRO-TOX	TARGET ORGANS	ACGIH/TLV	OSHA/PEL
P	NO	NO	UNKNOWN	N.A.mg/M3	N.A.mg/M3
2	NO	NO	Eyes, Skin	5mg/M3	5 mg/M3

Note: CONTAINS MATERIAL(S) REGULATED AS DUST HAZARDS, DISPERSED IN A NON-HAZARDOUS FORM. IF DUST IS RECREATED, APPROPRIATE RESPIRATORY AND/OR EXPLOSION PRECAUTIONS MUST STILL BE USED.

Section 3: Composition / Information On Ingredients

UNDER GHS-OSHA §4.11 THE PRECISE COMPOSITION OF THIS PRODUCT IS WITHHELD AS CONFIDENTIAL BUSINESS INFORMATION (CBI). A MORE COMPLETE DISCLOSURE CAN BE PROVIDED TO A HEALTH, OR SAFETY PROFESSIONAL WHEN NECESSARY.

Substance/Mixture: Mixture

NO. COMPONENT	CAS. NO.	PERCENT
P Modified Amine MIXTURE	N.A.	< 100%
2 Bisphenol A	80-05-7	< 2%

Section 4: First-Aid Measures

Emergency and first aid procedures:

Eyes: Immediately flush eyes with large amounts of water for 15 minutes. Get medical attention

SKIN: Wash affected area immediately with large amounts of soap and water. Remove and wash contaminated clothing before reuse. Contact a physician if irritation occurs.

INHALATION: Remove victim to fresh air and provide oxygen if breathing is difficult. Get medical attention.

Ingestion: Do not induce vomiting. Give large quantities of water. Call a physician immediately. Never give anything mouth to an unconscious person.

Section 5: Fire-Fighting Measures

Flash Point: $\geq 275^{\circ}\text{F}$ (For product or lowest flash point ingredient)

Flammability classification: Combustible class (IIIB) Extinguishing Media: Water fog, dry chemical, carbon dioxide, or foam.

Note: Either atmosphere-supply or air-purifying respirators should be available for fire fighters (20 DFR 1910.134).

Section 6: Accidental Release Measures

If Material is spilled: Avoid contact with material. Persons not wearing proper protective equipment (see below) should be excluded from the area until clean up is complete. Dike area to prevent spill spreading and scoop up excess to recovery containers. Absorb remnant on noncombustible material such as clay and shovel into containers for disposal.

Waste disposal Method: Dispose of any waste(s) generated above in accordance with federal, state, and local regulations.

Section 7: Handling and Storage

Avoid skin and eye contact.

Avoid breathing vapor, mist or fumes.

Ensure that all containers are properly labeled to prevent accidental ingestion or improper disposal

Reseal partly used containers.

Wash with soap and water before eating, drinking or using toilet facilities.

Store under cool, dry conditions and away from open flames and high temperatures.

Observe conditions of good industrial hygiene and safe working practice.

Section 8: Exposure Controls/Personal Protection

Respiratory Protection: Not normally necessary unless the material is being used in such a way as to produce dust, mist, vapor, fumes, or smoke, in which case niosh approved respiratory protection should be used.

Ventilation: Should be sufficient to control any dust, mist, vapor or fumes produced by processing or handling method. Breathing or vapor must be avoided.

Hand Protection: Impervious gloves, neoprene or nitrile rubber gloves.

Eye Protection: Splash proof goggles or safety glasses with side shields.

Other Protective Equipment: Clean, body covering clothing and footwear.

Section 9: Physical And Chemical Properties

Physical State: Paste

Odor: Ammonia Like

Color: Tan

pH: Alkaline

SP. GR: 1.55

Density: 12.9 lbs./gal.

Vapor Pressure: Negligible

Note: Other properties are either no available, or do not apply.

Section 10: Stability and Reactivity

Stability: stable under normal storage conditions. Unstable at elevated temperatures. Slowly corrodes copper, Aluminum, Zinc and Galvanized surfaces.

Incompatibility: Strong oxidizing agents, strong lewis or mineral acids, Nitrous Acid, Sodium Hypochlorite, and Peroxides.

Hazardous Decomposition products: Oxides of Carbon and Nitrogen, Nitric Acid, Nitrosoamine, and other unknown organic compounds.

Section 11: Toxicological Information

Effects of Overexposure:

Acute:

Eyes: Causes severe conjunctival irritation, corneal injury and iritis.

Skin: May Cause irritation, burns, ulceration, or skin sensitization.

Inhalation: Vapors are irritating and may cause tears, burning of nose and throat, coughing, wheezing, Nausea, and vomiting.

Ingestion: moderately toxic, may cause mouth and throat burns, abdominal pain, nausea, vomiting, Weakness, thirst, and coma.

Chronic:

Amine vapors may cause liver and kidney injury, eye, skin or lung disorders may develop or be aggravated by amines.

Section 12: Ecological Information

Ecotoxicity effects:

Aquatic Toxicity: No data is available on the product itself.

Toxicity to other organisms: No data available.

Persistence and degradability:

Mobility: No data is available on the product itself.

Bioaccumulation: No data is available on the product itself.

Section 13: Disposal Considerations

Waste Disposal Method: Dispose of waste in Accordance with all federal, state, and local regulations.

Container Disposal: Since emptied containers retain product residue, all labeled hazard precautions must be observed consult with federal, state and local authorities for definitions of "Empty" and proper disposal practices.

Section 14: Transport Information

U.S. Department of Transportation Ground (49 CFR)

Un Number: Un1760

Proper Shipping Name: Corrosive liquid, N.O.S.

Contains: Modified amine mixture

Hazards class: 8

Packaging Group: III

International Air Transportation (ICAO.TATA)

UN NUMBER: Un 1760.

Proper shipping name: corrosive liquid, N.O.S.

Contains: Modified amine mixture

Hazard class: 8

Packaging group: III

Water Transportation (IMO/IMDG)

Un number: Un 1760

Proper shipping name: Corrosive liquid, N.O.S.

Contains: Modified amine mixture

Hazard class: 8

Packaging group: III

Marine pollutant: No

Section 15: Regulatory Information

A. CAL SAFE DRINKING WATER & TOXIC ENFORCEMENT ACT OF 1986

No	Chemical Name	Cas. No.	Cancer/Repro. Tox	quantity
2	Bisphenol A	80-05-7	No Pending	< 2%

This product may contain traces of prop. 65 listed chemicals as impurities. However, any used as ingredients are listed above.

B. CERCLA- §40 CFR 302.4

Releases exceeding the reportable quantity (RQ) Must be reported to the national response center (800)424-8802

RQ = 100 lbs. (Unlisted hazardous waste – characteristic of corrosivity)

C.. RCRA - §40 CFR 261.33

RQ = 1000 lbs. (unlisted corrosive content > 10%)

D SARA Title III –§52 CFR 13378, - §52 CFR 21152

No.	RQ(lbs.)	TPQ(lbs.)	SEC.313	313 CAT.	
	(•1)	(•2)	(•3)	(•4)	(•5)
311/312					
1	None	Not listed	Not listed	None	H1, H2
2	None	Not Listed	Yes	None	H1, H2

•1 = Reportable quantity of extremely hazardous substance, SEC 302

•2 = Threshold planning quantity, extremely hazardous substance, SEC 302

•3 = Toxic chemical SEC 313 (individual chemical listed)

•4 = Toxic release inventory form category SEC, 313 (40 CFR 372.65 C)

•5 = Hazard category for sara SEC 311/312 reporting

H1 = Immed, (Acute) health hazard H2 = Delayed (Chronic) health hazard

P3 = Fire hazard P4= Sudden pressure release hazard P5= Reactive Haz.

E. Voc – SCAQMD Rules

No	Chemical	Quantity	VP mm Hg	gms./l. @ 20oC

NIL

Note: This product does not contain solvents, but may contain ingredients with vp's low enough to be emitted if heated alone. When 2 part resins and hardeners are properly mixed together These ingredients react together and are consumed without significant atmospheric emissions.

F. International Chemical Inventory Status:

EINECS-EU	Listed, exempted, Polymer substance, or as no longer polymer.
AICS-AUSTRALIA	All components are listed or exempted.
ENCS-JAPAN	Not determined.
ISHL-japan	Not determined.
KECI/ECL-KOREA	All components are listed or exempted.
IECSC/SEPA-CHINA	All components are listed or exempted.
PICCS-PHILIPPINES	All components are listed or exempted.
DSL-CANADA	All components are listed or exempted.
TSCA-USA	All components are listed or exempted.

G WHMIS (CANADA);

WHMIS: D28 Materials causing other toxic effects – toxic material

WHMIS: E – Corrosive Material

Section 16: Other Information

Revision Summary: New format to comply with OSHA Hazcom 2012

The information contained herein is based on data considered accurate. However, no warranty is expressed or implied regarding the accuracy of these data or the results to be obtained from the use thereof.

Vendor assumes no responsibility for injury to vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Additionally, vendor assumes no responsibility for injury to vendee or third persons proximately caused by abnormal use of the material even if reasonable safety procedures are followed. Furthermore, vendee assumes the risk to his use of the material.