

Turbo Poly Seal

GHS	PROTECTIVE CLOTHING	TRANSPORT OF DANGEROUS GOODS
		 <p>PAINT Class 3 UN 1263 P.G.: III</p>

SECTION I: IDENTIFICATION

Use: Mono component waterproofing bitumen/polyurethane resin.

Manufacturer:
Bergstrom Industries
8062 State Route 819
Greensburg PA 15601
Tel. 203 858 0080

In case of emergency:
203 858 0080

CHEMTREC (USA) (24h.): 1 800 424-9300

SECTION II: HAZARD(S) IDENTIFICATION

DANGER

Highly flammable liquid and vapour. May be fatal if swallowed and enters airways. Harmful if swallowed. Harmful if inhaled. May cause respiratory irritation or drowsiness or dizziness. Causes skin irritation. Causes serious eye irritation. May cause damage to the central nervous system through prolonged or repeated exposure if inhaled. May cause allergy or asthma symptoms or breathing difficulties if inhaled. May cause an allergic skin reaction.

Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Keep away from heat, sparks, open flames and hot surfaces. No smoking. Use explosion proof electrical equipment. Use only non-sparking tools. Take precautionary measures against static discharge. Do not eat or drink when using this product. Avoid breathing vapours. Use only outdoors or in a well-ventilated area. Wash hands thoroughly after handling.

Wear protective gloves, eye protection and an organic vapour respirator. Contaminated work clothing must not be allowed out of the workplace. Store in a well-ventilated place. Keep container tightly closed. Keep cool. Store locked up. Dispose of container in accordance with local, regional and national regulations.

SECTION III: COMPOSITION AND INFORMATION ON HAZARDOUS INGREDIENTS

NAME	CAS #	% WEIGHT	EXPOSURE LIMIT (ACGIH)	
			TLV-TWA	TLV-STEL
Asphalt	8052-42-4	15-40	0.5 mg/m ³	Not established
Toluene	108-88-3	7-13	20 ppm	Not established
Methyl ethyl ketone (MEK)	78-93-3	5-10	200 ppm	300 ppm
Propylene glycol monomethyl ether acetate (PGMMEA)	108-65-6	0.5-1.5	50 ppm	Not established
4,4'-Diphenylmethane diisocyanate 2,2'-Diphenylmethane diisocyanate (MDI)	101-68-8	0.1-1	0.005 ppm	Not established
<i>p</i> -Toluenesulfonyl Isocyanate (PTSI)	4083-64-1	0.1-1	Not established	Not established

Effects of Short-Term (Acute) Exposure

SKIN CONTACT

Asphalt: Contact may cause reddening, itching and inflammation. Skin contact may cause harmful effects in other parts of the body. (2)

Toluene: Toluene is a moderate skin irritant, based on animal information. Prolonged contact can cause dermatitis (dry, red skin). Absorption of toluene through the skin may contribute significantly to the overall exposure. Although no reports of harmful effects following skin absorption were located. (1)

MEK: MEK is expected to cause no or very mild irritation based on animal and limited human information. (1)

PGMMEA: PGMMEA is not a skin irritant, based on animal information. No human information was located. PGMMEA can be absorbed through the skin, but harmful effects are not expected by this route of exposure. (1)

MDI: MDI is a severe skin irritant based on animal information. In general, isocyanates can cause skin discoloration (staining) and hardening of the skin after repeated exposures. Skin contact is not expected to result in the absorption of harmful amounts. (1)

PTSI: PTSI is irritating to skin. May be harmful if absorbed through the skin. (2)

EYE CONTACT

Asphalt: Vapors may cause eye irritation and sensitivity to light. Effects may become more serious with repeated or prolonged contact. (2)

Toluene: Toluene is a very mild eye irritant, based on animal evidence. (1)

MEK: MEK is a moderate to severe irritant based on animal and limited human information. (1)

PGMMEA: PGMMEA may be a slight to moderate eye irritant, based on animal information. No human information was located. (1)

MDI: MDI may cause no irritation or slight eye irritation based on animal information. (1)

PTSI: PTSI is irritating to eyes. (2)

INHALATION

Asphalt: Effects of overexposure include irritation of the nose and throat, nausea, vomiting, diarrhea, abdominal pain and signs of nervous

system depression (e.g. headache, drowsiness, dizziness, loss of coordination and fatigue), irregular heartbeats, pulmonary edema, weakness and convulsions. (2)

Toluene: Inhalation of toluene vapour can affect the CNS. At approximately 50 ppm, slight drowsiness and headache have been reported. Irritation of the nose, throat and respiratory tract has occurred between 50 and 100 ppm. About 100 ppm has caused fatigue and dizziness; over 200 ppm has caused symptoms similar to drunkenness, numbness, and mild nausea; and over 500 ppm has caused mental confusion and incoordination. Higher concentrations (estimated at higher than 10 000 ppm) can result in unconsciousness and death. Most serious incidences of exposure have occurred when the vapour has accumulated in confined spaces. (1)

MEK: Brief (3-5 minutes) exposures to MEK vapours produced slight nose and throat irritation at 100 ppm and definite nose and throat irritation at 350 ppm in approximately 10 people. 143 volunteers exposed to 200 ppm for 4 hours reported throat irritation, unpleasant odour, nausea, and headache (in order of frequency reported). Higher exposures are expected to cause CNS depression with symptoms such as headache, nausea, dizziness, drowsiness, and confusion. Extremely high concentrations may cause loss of consciousness and possibly death. (1)

PGMMEA: PGMMEA does form a vapour at normal temperatures. High vapour or mist concentrations may irritate the eyes and nose, based on animal information and comparison to propylene glycol monomethyl ether. Very high concentrations may cause CNS depression, with symptoms such as headache, nausea and dizziness. (1)

MDI: MDI has a very low vapour pressure. Therefore, airborne exposures are unlikely to occur unless MDI is heated or forms an aerosol or mist during pouring, frothing or spraying operations. Short-term inhalation exposure to isocyanates can cause respiratory and mucous membrane irritation. Symptoms include eye and nose irritation, dry or sore throat, runny nose, shortness of breath, wheezing and laryngitis. Coughing with chest pain or tightness may also occur, frequently at night. These symptoms may occur during exposure or may be delayed several hours. (1)

PTSI: PTSI is irritating to respiratory system. May be harmful if inhaled. (2)

INGESTION

Asphalt: May cause irritation of the mouth, throat and gastrointestinal tract. Ingestion of large amounts may cause gastrointestinal blockage. (2)

Toluene: There are case reports of accidental ingestion of toluene causing severe CNS depression and death. Toluene is readily absorbed following ingestion producing symptoms similar to those described for inhalation above. Toluene may be aspirated, which is the inhalation of a chemical into the lungs, during ingestion or vomiting. Severe lung irritation, damage to the lung tissues and death may result. (1)

MEK: MEK is not considered toxic if ingested based on animal toxicity information. Ingestion of large doses is expected to cause CNS depression with symptoms such as headache, nausea, dizziness, drowsiness, and confusion. Extremely high concentrations may cause loss of consciousness and possibly death. Animal evidence suggests that MEK can be aspirated (inhaled) into the lungs during ingestion or vomiting. Aspiration of even a small amount of liquid could result in a life threatening accumulation of fluid in the lungs. Severe lung damage (edema), respiratory failure, cardiac arrest and death may result. (1)

PGMMEA: PGMMEA has a very low oral toxicity based on animal information. No human information was located. Ingestion is not a typical route of exposure. (1)

MDI: There have been no reports of human ingestion of MDI. Animal studies indicate that the toxic effects of the ingestion of MDI are slight. Ingestion could result in irritation and corrosion of the mouth, throat, and digestive tract. Ingestion is not a typical route of occupational exposure. (1)

PTSI: PTSI may cause irritation of the digestive tract. May be harmful if swallowed. (2)

Effects of Long-Term (Chronic) Exposure

RESPIRATORY EFFECTS

Asphalt: Some studies indicate that asphalt paving workers may experience lower respiratory tract symptoms (e.g., coughing, wheezing, and shortness of breath) and pulmonary function changes. Other studies of asphalt workers found no consistent relationship between exposure to asphalt fumes and pulmonary function. (2)

Toluene: Toluene is not a respiratory sensitizer. Despite widespread use, no reports of respiratory sensitization were located. (1)

MDI: Respiratory sensitization has developed in people working with MDI. The sensitization is usually caused by a very large exposure or by multiple exposures. Although varying periods of exposure (1 day to years) may elapse before sensitization occurs, it develops more often during the first few months of exposure. Sensitized individuals react to very low levels of isocyanates (for MDI, as low as 0.0014 ppm) that have no effect on unsensitized people. At first, the symptoms may appear to be a cold or mild hay fever. However, severe asthmatic symptoms can develop and include wheezing, chest tightness, shortness of breath, difficult breathing and/or coughing. Fever, chills, general feelings of discomfort, headache and fatigue can also occur. Symptoms may occur immediately upon exposure, within an hour or several hours after exposure or both and/or at night. Typically the asthma improves with removal from exposure (e.g. weekends and vacations) and returns, in some cases, in the form of an "acute attack", on renewed exposure. Sensitized people who continue to work with isocyanates may develop symptoms sooner after each exposure. The number and severity of symptoms may increase. Following removal from exposure, some workers may continue to have persistent respiratory problems such as asthmatic symptoms, bronchial problems and hypersensitivity to isocyanates. Others may recover fully and may gradually lose their sensitivity within several years. Isocyanates may also cause hypersensitivity pneumonitis, another allergic lung disease, which is characterized by symptoms such as shortness of breath, fever, tiredness, non-productive cough, and chills. Several studies have shown that continued exposure to low levels of MDI and other isocyanates may cause impaired lung function, such as diminished respiratory capacity. Other studies have shown that extremely low levels of MDI (e.g. less than 0.003 ppm) do not decrease lung function. Cross-sensitization between different isocyanates may occur. People sensitized to toluene diisocyanate (TDI) or hexamethylene diisocyanate (HDI) may show sensitization to MDI, without having previous exposure to this chemical. Exposure to isocyanates is likely to cause aggravation to individuals with existing respiratory disease, such as chronic bronchitis and emphysema. (1)

PTSI: PTSI may cause sensitization by inhalation. Repeated exposures may cause asthma and allergic reactions to isocyanates. (2)

MEK, PGMMEA: No human or animal information is available.

SKIN SENSITIZATION

Toluene: Toluene is not a skin sensitizer. Despite widespread use, no reports of skin sensitization in humans were located. (1)

MEK: MEK is not an occupational skin sensitizer. Despite extensive industrial use, there is only one case report of sensitization in a painter, which was confirmed by positive response to standard patch testing with MEK. (1)

PGMMEA: PGMMEA is not a skin sensitizer, based on unconfirmed animal information. No human information was located. (1)

MDI: Allergic contact dermatitis has developed from occupational contact with MDI. (1)

Asphalt, PTSI: No human or animal information is available.

NERVOUS SYSTEM

Toluene: Numerous studies of rotogravure printers, painters and rubberized-matting workers with chronic exposure to toluene are inconclusive about chronic CNS damage. Some studies report changes such as memory loss, sleep disturbances, loss of ability to concentrate, or incoordination, while others report no effects. (1)

MEK: Limited evidence suggests that MEK may cause harmful effects on the nervous system. Nervous system effects have been seen in some human population (epidemiological) studies and case reports where the exposure is primarily to MEK. However, these studies have limitations such as lack of information on exposure levels, small numbers, and lack of information on alcohol consumption. (1)

Asphalt, PGMMEA, MDI, PTSI: No human or animal information is available.

TARGET ORGANS

Toluene: Kidney and liver effects are not expected to occur unless exposures are very high. A review of several studies on toluene and its effects on colour vision concluded that the evidence is inconclusive as to whether long-term exposure to toluene results in a persistent impairment of colour vision. Firm conclusions of hearing effects cannot be drawn based on the limited information available. Hearing loss has been observed in workers in some studies following long-term exposure to toluene and noise and in animals exposed to very high concentrations of toluene. (1)

Asphalt, MEK, PGMMEA, MDI, PTSI: No human or animal information is available.

CARCINOGENICITY

Toluene: The International Agency for Research on Cancer (IARC) has concluded that this chemical is not classifiable as to its carcinogenicity to humans (Group 3). The American Conference of Governmental Industrial Hygienists (ACGIH) has designated this chemical as not classifiable as a human carcinogen (A4). The US National Toxicology Program (NTP) has not listed this chemical in its report on carcinogens. (1)

MEK: IARC has not evaluated the carcinogenicity of this chemical. ACGIH has not assigned a carcinogenicity designation to this chemical. NTP has not listed this chemical in its report on carcinogens. (1)

MDI: IARC has concluded that this chemical is not classifiable as to its carcinogenicity to humans (Group 3). ACGIH has not assigned a carcinogenicity designation to this chemical. NTP has not listed this chemical in its report on carcinogens. (1)

Asphalt, PGMMEA: No human or animal information is available. IARC has not evaluated the carcinogenicity of these chemicals. ACGIH has not listed any of these chemicals. NTP has not listed any of these chemicals in its report on carcinogens. (1)

PTSI: No human or animal information is available.

TERATOGENICITY, EMBRYOTOXICITY, FETOTOXICITY

Toluene: Toluene is a developmental toxicity hazard, based on information obtained from animal studies. Fetotoxicity (reduced foetal weight), behavioural effects (effects on learning and memory) and hearing loss (in males) have been observed in the offspring of rats exposed by inhalation to 1 200 or 1 800 ppm toluene. These effects were observed in the absence of maternal toxicity. A detailed review of toluene and its potential to cause teratogenicity/embryotoxicity in occupational situations has been published. This review concludes that although many occupational studies have evaluated general solvent exposure and pregnancy outcomes, few studies have specifically investigated toluene exposure. (1)

MEK: The information located is not sufficient to conclude that MEK causes developmental toxicity. Little human information was located. In general, animal studies have shown slight fetotoxicity (e.g. skeletal anomalies, reduced fetal weight) at concentrations that produced mild maternal toxicity. (1)

PGMMEA: Commercial PGMMEA is largely the alpha isomer, with small amounts of the beta isomer. The commercial product has not caused developmental toxicity in animal studies, even in the presence of maternal toxicity, and, therefore, is not considered a developmental toxin. (1)

Asphalt, MDI, PTSI: No human or animal information is available.

REPRODUCTIVE TOXICITY

Toluene: Toluene is not considered a reproductive hazard. No conclusions can be drawn based on the available human information. Reproductive effects have not been observed in animal studies. (1)

MEK: The information located is not sufficient to conclude that MEK causes reproductive toxicity. Little human and no animal information was located. (1)

PGMMEA: The available information does not suggest that PGMMEA causes reproductive toxicity. No human or animal information was located for PGMMEA. (1)

Asphalt, MDI, PTSI: No human or animal information is available.

MUTAGENICITY

Toluene: There is insufficient information available to conclude that toluene is mutagenic. Results from the available human studies are inconclusive. Both positive and negative results have been obtained in human studies, but no studies were carried out with toluene exposure only, or with adequate control of other factors. (1)

MEK: MEK is not known to be a mutagen. No human information was located. (1)

MDI: In one case report, MDI caused DNA damage in human white blood cells after inhalation exposure to 5 to 20 ppb. This report provides insufficient information for determining the mutagenicity of MDI. No other human or animal in vivo studies have been reported. (1)

Asphalt, PGMMEA, PTSI: No human or animal information is available.

TOXICOLOGICALLY SYNERGISTIC MATERIALS

Toluene: Combined exposure to toluene and noise, toluene and n-hexane, toluene and aspirin or toluene, ethylbenzene and noise has caused a synergistic loss of hearing in animal studies. Increased hearing loss has also been observed in workers in some studies following long-term exposure to toluene and noise. (1)

MEK: There are several human case reports of neurological effects resulting from high exposure to MEK in combination with other solvents. (1)

Asphalt, PGMMEA, MDI, PTSI: No human or animal information is available.

POTENTIAL FOR ACCUMULATION

Toluene: Toluene is readily absorbed by inhalation, ingestion and through the skin. Inhaled toluene appears quickly in the brain fat (lipid) where it is rapidly eliminated. The half-life in human adipose tissue is 0.5-2.7 days. Toluene is removed rapidly from the blood. It is metabolized in the liver where it is converted via several steps primarily to hippuric acid, which is excreted in the urine. A small amount of toluene is also exhaled unchanged. Toluene has been identified in human milk. (1)

MEK: MEK does not accumulate in the body. It is rapidly absorbed by inhalation, skin contact and ingestion and transferred into the blood and other tissues. MEK is metabolized in the liver, mainly to 3-hydroxy-2-butanone and 2,3-butanediol, which are eliminated in urine. Most MEK probably enters the general metabolism in the body and is converted to acetate, which is eventually broken down to carbon dioxide and water, which are then eliminated in exhaled air and urine. Small amounts of MEK itself are also eliminated in exhaled air and urine. MEK and its metabolites are mostly cleared from the body within 24 hours. (1)

PGMMEA: Does not accumulate. (1)

MDI: MDI can enter the body by inhalation or ingestion. It is probably metabolized to 4,4'-methylene dianiline, which is metabolized further and excreted. (1)

Asphalt, PTSI: No human or animal information is available.

SECTION IV: FIRST-AID MEASURES

SKIN CONTACT

Wash with plenty of water. If skin irritation or rash occurs: Get medical advice. Take off immediately all contaminated clothing and wash it before reuse.

EYE CONTACT

Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice.

INHALATION

If breathing is difficult, remove person to fresh air and keep comfortable for breathing. If experiencing respiratory symptoms: Call a poison center.

SWALLOWING

Immediately call a poison center. Do NOT induce vomiting. Rinse mouth.

SECTION V: FIRE-FIGHTING MEASURES

FLAMMABILITY: Flammable liquid, Class IB (NFPA)

EXPLOSION DATA: Sensitivity to mechanical impact: No
Sensitivity to static charge: Can accumulate static charge by flow.

FLASH POINT: 10.5 C

AUTO-IGNITION TEMPERATURE: Not available

FLAMMABILITY LIMITS IN AIR: (% in volume) Not available

FIRE AND EXPLOSION HAZARDS

This product may be ignited by heat, sparks of flames. Vapours are heavier than air and may travel a considerable distance to a source of ignition and flash back to a leak or open container. The product may ignite on contact with strong oxidizing agents. Do not cut, puncture or weld empty containers.

COMBUSTION PRODUCTS

Irritating and/or toxic gases or fumes may be generated by thermal decomposition or combustion: carbon oxides, nitrogen oxides, sulfur oxides, trace of cyanhydric acid, acetic acid, hydrogen peroxide, aldehydes, alcohols, ketones, vinyl acetate, vinyl ether, methane, ethane and ethylene, may be formed depending on fire conditions.

FIRE FIGHTING INSTRUCTIONS

Evacuate area. Wear self-contained breathing apparatus and appropriate protective clothing in accordance with standards. Approach fire from upwind and fight fire from maximum distance or use unmanned hose holders or monitor nozzles. Always stay away from containers because of the high risk of explosion. Stop leak before attempting to put out the fire. If leak cannot be stopped, and if there is no risk to the surrounding area, let the fire burn itself out. Move containers from fire area if this can be done without risk. Cool containers with flooding quantities of water until well after fire is out.

EXTINGUISHING MEDIA

Foam anti-alcohol or universal, dry chemical powder, CO₂, foam. Use of water spray when fighting fire may be inefficient because of the low flash point of the product.

SECTION VI: ACCIDENTAL RELEASE MEASURES

RELEASE OR SPILL

Ventilate area. Wear appropriate protective equipment during cleanup. Eliminate all sources of ignition. Shut off source of leak if you can do it without risk. Contain the spill. Absorb or cover with absorbent material, dry earth, sand or other non-combustible material and transfer

to containers. Sweep or shovel into containers with lids, use clean non-sparking tools to collect absorbed material. Cover and remove to appropriate well ventilated area until disposal. Do not touch or walk through spilled material. Wash spill area with soap and water. Prevent entry into waterways, sewers, basements or confined areas.

SECTION VII: HANDLING AND STORAGE

HANDLING

This product is flammable and toxic. Avoid contact with eyes, skin and clothing. Do not ingest. Avoid breathing mist, vapour or dust. Wash thoroughly after handling. Persons with antecedents of asthma, chronic or periodic respiratory disorders should never manipulate this product. Before handling, it is very important that ventilation controls are operating and protective equipment requirements are being followed. People working with this product should be properly trained regarding its hazards and its safe use. Eliminate all ignition sources (e.g. sparks, open flames, hot surfaces). Keep away from heat. Ground transfer containers to avoid static accumulation. Tightly reseal all partially used containers. Do not cut, puncture or weld empty containers.

STORAGE

Store containers in a cool well-ventilated area out of direct sunlight and away from humidity, heat and ignition sources. Keep storage areas clear of combustible materials. No smoking near storage area. Store away from incompatible materials. Store the product according to occupational health and safety regulations and fire and building codes. Storage area should be clearly identified, clear of obstruction and accessible only to trained and authorized personnel. Inspect periodically for damage or leaks. Have appropriate fire extinguishers and spill clean-up equipment near storage area. Inspect all containers to make sure they are properly labelled.

SECTION VIII: EXPOSURE CONTROLS / PERSONAL PROTECTION

HANDS: Wear gloves made from butyl rubber, polyvinyl alcohol or Viton.

RESPIRATORY: If the TLV is exceeded, if use is performed in a poorly ventilated confined area, use an approved respirator in accordance with standards.

EYES: Wear chemical safety goggles in accordance with standards.

OTHERS: Eye bath and safety shower.

CONTROL OF VAPOURS: Local exhaust is needed to control vapour and dust level to below recommended limits.

SECTION IX: PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE:	Liquid
ODOUR AND APPEARANCE:	Brown liquid with solvent odour
ODOUR THRESHOLD:	Not available
VAPOUR DENSITY (air = 1):	Heavier than air
EVAPORATION RATE (Butyl acetate = 1):	Not available
BOILING POINT (760 mm Hg):	Not available
FREEZING POINT:	Not available
SPECIFIC GRAVITY (H₂O = 1):	1.07 kg/L
SOLUBILITY IN WATER (20°C):	Not soluble
VOLATILE ORGANIC COMPOUND (V.O.C.) CONTENT:	225 g/L
VISCOSITY:	30 000 cP

SECTION X: STABILITY AND REACTIVITY

STABILITY: This material is stable at handling and storage conditions recommended under the section VII.

CONDITIONS OF REACTIVITY: Avoid excessive heat. Exposed to high temperatures this product can emit dangerous decomposition products, such as fumes, carbon oxide, nitrogen oxide, trace of hydrocyanic acid, trace of formaldehyde, trace of hydrochloric acid.

INCOMPATIBILITY: Keep away from oxidizing and reducing agents and from highly acidic and basic materials to avoid exothermic reactions.

HAZARDOUS DECOMPOSITION PRODUCTS: This product slowly reacts with water and causes an emanation of carbonic gas which would lead to pressure increasing in closed container.

HAZARDOUS POLYMERISATION: None

SECTION XI: TOXICOLOGICAL INFORMATION

TOXICOLOGICAL DATA

Toluene: (1)

LC₅₀ (inhalation, rat): 7 350 ppm (4-hour exposure)

LD₅₀ (oral, rat): 5 580 mg/kg

LD₅₀ (dermal, rabbit): 12 125 mg/kg

MEK: (1)

LC₅₀ (inhalation, rat): 11 700 ppm (4-hour exposure)

LD₅₀ (oral, rat): 2 740 mg/kg cited as 3.4 ml/kg

LD₅₀ (dermal, rabbit): > 8 050 mg/kg

PGMMEA: (1)

LC₅₀ (inhalation, rat): > 5 320 ppm (4-hour exposure)

LD₅₀ (oral, rat): > 10 000 mg/kg

LD₅₀ (dermal, rabbit): > 19 200 mg/kg

MDI: (1)

LC₅₀ (inhalation, rat): 369-490 mg/m³ (4-hour exposure, aerosol)

LD₅₀ (oral, rat): > 10 000 mg/kg

LD₅₀ (dermal, rabbit): > 10 000 mg/kg

PTSI: (2)

LC₅₀ (inhalation, rat): 640 ppm (1-hour exposure)

LD₅₀ (oral, rat): 2 234 mg/kg

LD₅₀ (dermal, rabbit): > 10 000 mg/kg

Asphalt: No information available.

Effects of Short-Term (Acute) Exposure

INHALATION

Toluene: The major effect of toluene is on the CNS. Studies with rats have shown that up to approximately 1 000 ppm causes excitation and increased activity. At approximately 2 000 ppm, there is CNS depression with drowsiness, incoordination and unconsciousness. Death at higher concentrations is from respiratory failure. (1)

MEK: Very high concentrations have produced irritation of the nose and eyes, followed by CNS depression with incoordination, unconsciousness, gasping respiration and death. Guinea pigs were exposed to 3 300 to 100 000 ppm for 13.5 hours. No abnormal signs were observed during or following exposure to 3 300 ppm for 810 minutes. Exposure to 10 000 ppm produced irritation (2-4 minutes), lacrimation (40 minutes), incoordination (90 minutes) and unconsciousness (240-280 minutes). Gasping respiration was produced during 20 and 180-minute exposures to 33 000 and 100 000 ppm. Death resulted from 45 and 200-minute exposures to 33 000 and 100 000 ppm. Slight congestion of the brain and marked congestion and emphysema of the lungs, liver and kidneys were observed in animals that died during exposure. Animals that survived subsequently recovered. (1)

PGMMEA: No adverse effects were noted in rats following a single 6-hour exposure to a saturated vapour concentration of PGMMEA (greater than 4 345 ppm). Single acute exposures to the saturated vapours of PGMMEA for 7 hours caused only eye and nose irritation. (1)

MDI: MDI has a very low vapour pressure and it is difficult to achieve vapour concentrations necessary for inhalation toxicity testing. Therefore, inhalation toxicity studies have focused on the effects of the aerosol. The overall effect was a decline in respiratory rate which was determined to be due mainly to MDI's action as a pulmonary irritant. (1)

Asphalt, PTSI: No information available.

EYE IRRITATION

Toluene: Toluene is a very mild eye irritant. (1)

MEK: MEK is a moderate to severe irritant. (1)

PGMMEA: PGMMEA may be slight to moderate eye irritant. (1)

MDI: MDI has caused no irritation or slight irritation to the eyes. (1)

PTSI: PTSI caused severe eye irritation in rabbits. (2)

Asphalt: No information available.

SKIN IRRITATION

Toluene: Toluene is a moderate skin irritant. (1)

MEK: MEK is probably a very mild irritant. (1)

PGMMEA: PGMMEA is not irritating to the skin. (1)

MDI: MDI is a severe skin irritant. (1)

PTSI: PTSI caused slight skin irritation in rabbits. (2)

Asphalt: No information available.

INGESTION

Toluene: Rats were given a single dose of 0, 2 580, 3 870 or 5 100 mg/kg (cited as 0, 3.0, 4.5 and 6.0 mL/kg) undiluted toluene and monitored for neurotoxic effects using a battery of functional tests on days 1, 7 and 14. Within 1 hour of dosing, the animals became hyperactive for more than 8 hours. Significantly increased horizontal activity occurred in males at 3 870 and 5 100 mg/kg, and in females at 5 100 mg/kg. Significantly decreased vertical activity occurred in both sexes at all doses. By day 14 vertical activity scores were still depressed in the 2 580 and 3 870 mg/kg groups. (1)

MEK: Exposure of mice in acute lethality studies has resulted in incoordination, unconsciousness, respiratory depression and death. MEK is easily aspirated into the lungs. (1)

PGMMEA: Rats receiving 5 000 mg/kg PGMMEA (beta isomer) showed signs of CNS depression. (1)

MDI: Rats were given daily doses of 4.3 to 5 g/kg for 5 days. The only effect was a slight enlargement of the spleen in 2 of 5 rats. (1)

Asphalt, PTSI: No information available.

Effects of Long-Term (Chronic) Exposure

SKIN CONTACT

Asphalt: An increase of skin tumors was observed in lifetime studies of laboratory rodents exposed to extracts of asphalt. The relevance of these studies to humans is not clear. No increase in skin tumors was observed in a lifetime bioassay where laboratory mice were treated with paving fume condensates. (2)

MEK: Application of 1-2 ml to the backs of guinea pigs for up to 31 weeks (5 days/week) caused no signs of neurotoxicity and no effects on structure of the nerves. (1)

Toluene, PGMMEA, MDI, PTSI: No information available.

SKIN SENSITIZATION

MDI: The sensitizing potency of MDI was investigated using the mouse ear-swelling test (MEST). The dose required to sensitize 50% of the animals was 0.73 mg/kg. In this test, MDI was less potent than hexamethylene diisocyanate (HDI) and dicyclohexylmethane diisocyanate (HMDI), but more sensitizing than toluene diisocyanate (TDI). Cross reactivity was observed between MDI and HDI, HMDI and TDI. (1)

Asphalt, Toluene, MEK, PGMMEA, PTSI: No information available.

INHALATION

Asphalt: No increase in lung or other tumors were observed in a lifetime inhalation study in laboratory rats exposed to fumes from paving asphalt. (2)

Toluene: Numerous studies using rats and mice have shown reduced performance on some neurobehavioural tests but not others, both during and after inhalation exposures mainly of 500 ppm and higher. In general, these effects were reversible. (1)

MEK: Exposure to 5 000 ppm for 13 weeks produced an exposure-related effect on body and liver weights in male and female rats, as well as a depression in brain weight in females. Guinea pigs and rats were exposed to 235 ppm for 12 weeks (5 days/week, 7 hours/day). There were no deaths or signs of intoxication for rats. There were deaths in both control and experimental guinea pigs (2 in each group). Extensive neurological studies with high exposures have shown no effects. (1)

PGMMEA (rat, mouse): Repeated exposures at 300 and 1 000 ppm for two weeks (6 hours/day, 5 days first week, 4 days second week) produced no adverse effects. There were minor changes found at very high exposures (3 000 ppm) - slight increase in liver weight for females, slight effect on kidney function and slight to moderate injury to the lining of the nose. The latter effect was more severe with mice. It was suggested that this effect was related to acetic acid resulting from hydrolysis of PGMA in the nose. There were no effects on thymus and spleen weights, on bone marrow or blood. (1)

MDI, PTSI: No information available.

INGESTION

Toluene: Rats and mice were given 0, 312, 625, 1 250, 2 500 or 5 000 mg/kg/day in corn oil for 13 weeks (5 days/week). All mice and rats given 5 000 mg/kg/day died within the first week. At 2 500 mg/kg, 8/10 male rats, 1/10 female rats, 4/10 male mice and 4/10 female mice died before the end of the study. At 2 500 and 5 000 mg/kg/day, there were clinical signs of CNS depression, tearing (lachrymation) and excessive salivation. Male rats had a significantly decreased body weight at 2 500 mg/kg/day and liver and kidney weights were significantly increased at 625 mg/kg/day and higher. In female rats, liver, kidney and heart weights were significantly increased at 1 250 mg/kg/day. An increase in cell size (hypertrophy) was seen in the central lobe of the liver in rats exposed to 2 500 mg/kg/day. Tissue death (necrosis) was seen in the brain at 1 250 mg/kg/day in male rats and at 2 500 mg/kg/day in female rats. Liver weights were significantly increased in female mice exposed to 312 mg/kg/day and higher and in male mice exposed to 1 250 mg/kg/day and higher. (1)

MDI: Rats were given daily doses of 4.3 to 5 g/kg for 5 days. The only effect was a slight enlargement of the spleen in 2 of 5 rats. (1)

PGMMEA: Rats were orally exposed to 100, 300 or 1 000 mg/kg/day for 44 days. At 1 000 mg/kg/day, body weight was depressed and food consumption reduced, with decreases in blood glucose and inorganic phosphorus and a slight increase in relative adrenal weight. No effects were noted at the lower doses. (1)

Asphalt, MEK, PTSI: No information available.

CARCINOGENICITY

Toluene: IARC has concluded there is inadequate evidence for the carcinogenicity of toluene in experimental animals. (1)

MDI: There is no animal information on the carcinogenicity of MDI itself. In one study, polymeric MDI containing 44.8-50.2% monomeric MDI was tested for carcinogenicity by inhalation in rats. An increased incidence of lung tumours was observed. IARC has determined there is limited evidence for the carcinogenicity of a mixture containing monomeric and polymeric MDI to experimental animals. (1)

Asphalt, MEK, PGMMEA, PTSI: No information available.

TERATOGENICITY, EMBRYOTOXICITY, FETOTOXICITY

Toluene: Toluene does cause developmental effects in animals, based on fetotoxicity (reduced foetal weight), behavioural effects (effects on learning and memory) and hearing loss (in males) observed in the offspring of rats exposed by inhalation to 1 200 or 1 800 ppm toluene. These effects were observed in the absence of maternal toxicity. (1)

MEK: The information located is not sufficient to conclude that MEK causes developmental toxicity. It has caused fetotoxic effects (minor

skeletal variations, delayed bone formation, reduced fetal weight) in rats and mice in the presence of mild maternal toxicity. One rat study showed non-dose-related fetotoxicity in the absence of maternal toxicity, and a low, but statistically significant, increase in malformations in the presence of mild maternal toxicity. These observations were not confirmed in later studies by the same researchers. A more recent study reports statistically significant reduced fetal weight at 2 000 ppm, in the absence of maternal toxicity. However, the overall weight reduction at this concentration was only 4%. (1)

PGMMEA: Inhalation of PGMMEA (alpha isomer) did not cause developmental effects in rats. (1)

Asphalt, MDI, PTSI: No information available.

REPRODUCTIVE TOXICITY

Toluene: The available information does not indicate that toluene is a reproductive toxin. A significant decrease in sperm was noted in rats exposed by inhalation to 2 000 ppm for 90 days, an exposure that also caused mild generalized toxicity. There was no accompanying decrease in fertility. No adverse effects on reproduction were observed in other studies. (1)

Asphalt, MEK, PGMMEA, MDI, PTSI: No information available.

MUTAGENICITY

Toluene: The available information is not sufficient to conclude that toluene is mutagenic. Positive results in live animals have only been observed in a limited, unconfirmed study and in studies using routes of exposure that are not relevant to occupational situations. Negative results have been observed in studies using rats and mice exposed orally or by inhalation. Negative results have been obtained at non-toxic doses in cultured mammalian cells, in several tests using bacteria and in a test using yeast. Negative and positive results have been obtained in fruit flies (*Drosophila*). (1)

MEK: MEK is not known to be a mutagen. Negative results were obtained in two studies in live animals that used a route of exposure that is not relevant to occupational situations. Negative results were also obtained in most tests using cultured mammalian cells, bacteria and yeast. (1)

PGMMEA: No studies using live animals were located. Negative results have been obtained in tests using cultured mammalian cells and bacteria. (1)

MDI: It is not possible to conclude that MDI is mutagenic. (1)

Asphalt, PTSI: No information available.

SECTION XII: ECOLOGICAL INFORMATION

ENVIRONMENTAL EFFECTS

Do not allow product or runoff from fire control to enter storm or sanitary sewers, lakes, rivers, streams, or public waterways. Block off drains and ditches. Provincial and federal regulations may require that environmental and/or other agencies be notified of a spill incident. Spill area must be cleaned and restored to original condition or to the satisfaction of authorities. May be harmful to aquatic life.

SECTION XIII: DISPOSAL CONSIDERATIONS

WASTE DISPOSAL

This product is listed as hazardous waste. Consult local, state, provincial or territory authorities to know disposal methods. Also listed as hazardous waste by the RCRA (USA); waste disposal as to follow EPA regulations. Do not dispose of waste with normal garbage or sewers systems.

SECTION XIV: TRANSPORT INFORMATION

CLASSIFICATION (TDG - DOT): Class 3

IDENTIFICATION NUMBER: UN 1263

SHIPPING NAME: Paints

PACKING GROUP: III (according to TDG Regulations 2.19 (3); 49CFR 173.121; IATA 3.3.3.1.1.; IMDG 2.3.2.3.)

CONTAINERS FOLLOW THE STANDARDS.

Classification based on Section V of this document

SECTION XV: REGULATORY INFORMATION

DSL: All constituents of this product are included on the Domestic Substances List (DSL – Canada)

TSCA: All constituents of this product are included on the Toxic Substances Control Act Inventory (TSCA – United States).

Prop. 65: This product contains chemicals known to the State of California to cause cancer or reproductive toxicity.

SECTION XVI: OTHER INFORMATION

GLOSSARY

ASTM: American Society for Testing and Materials (United States)

CAS: Chemical Abstract Services

CSA: Canadian Standardization Association

DOT: Department of Transportation (United States)

EPA: Environmental Protection Agency (United States)

GHS Globally Harmonized System

LD₅₀/LC₅₀: Less high lethal dose and lethal concentration published

NIOSH: National Institute for Occupational Safety and Health (United States)

RCRA: Resource Conservation and Recovery Act (United States)

TDG: Transportation of Dangerous Goods (Canada)

TLV-TWA: Threshold Limit Value – Time-Weighted Average

Reference:

- (1) CHEMINFO (2015) Canadian Centre of Occupational Health and Safety, Hamilton (Ontario) Canada.
- (2) Supplier's safety data sheet.

Code of SDS:

CA U DRU SS FS 011

For information:

1 800 567-1492

The Safety Data Sheets of Bergstrom Industries are available on Internet at the following site:

<https://bergstrom.com/product/turbo-poly-seal-roof-repair-kit-5-ft/>

Justification of the update:

- GHS format.

To the best of our knowledge, the information contained herein is accurate. However, neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

