road services international

SAFETY DATA SHEET

Permamark® Extrude 2101

Yellow

33 Ryan Place Unit # 3
Brantford, ON N3S 7S1
Toll Free: 1-866-279-7365
Phone: 519-758-9500
Fax: 519-758-9576

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1. Product and Company Identification:

Permamark® Extrude 2101, Yellow

Synonyms: None

Product Information Phone Number:	519-758-9500 ***(M-F, 8:30 AM to 4:30 PM, Eastern)***
24 Hour Emergency Phone Number:	In Canada: 613-996-6666 (CANUTEC)
24 Hour Emergency Phone Number:	In USA: 800-424-9300 (CHEMTREC)
Product Intended Usage:	Field Reacted Polymeric Pavement Marking

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2. Hazard Identification:

Emergency Overview: The product is a thick yellow fluid with a coarse surface and a sweet solvent odour. Vapours are colourless, heavier than air and can travel to a source of ignition. This material is considered hazardous by the OSHA Hazard Communication Standard and by the Hazardous Products Act.

Potential Health Effects:

Inhalation: Inhalation of vapours irritates the respiratory tract. Symptoms from overexposure can include coughing, chest pain, headache, drowsiness, nausea, anorexia, irritability and narcosis. Very high levels may cause pulmonary edema and death. This material has been linked to cardiac arrest and other cardiovascular problems because of its ability to lower the blood pressure. High airborne levels of dust may cause irritation to eyes and respiratory tract. This material contains Crystalline Silica. Chronic inhalation of crystalline silica dust may cause silicosis, a fibrosis (scarring) of the lungs. Silicosis may be progressive; it may lead to disability or death. Crystalline silica inhaled from occupational exposure is classified as carcinogenic to humans.

Eye contact: Causes irritation, redness, and pain.

Skin contact: Causes irritation to skin. Symptoms include redness, itching, and pain. May cause allergic skin reactions. May be absorbed through the skin. Dental technicians using bare hands with methyl methacrylate moulding putty developed changes in the nerve impulse transmission in the fingers.

Ingestion: Harmful if swallowed. Ingestion may cause diarrhoea, nausea and vomiting and acute systemic effects paralleling ingestion. Ingestion of methyl methacrylate has been linked to liver and kidney damage.

Aggravated Medical Conditions: Persons with pre-existing skin disorders or eye problems, or impaired liver, kidney or respiratory function may be more susceptible to the effects of the substance.

Potential Environmental Effects: (See Section 12, Ecological Information)

3. Composition:

Ingredient	CAS Number	Weight % Range
Methyl Methacrylate	80-62-6	6.0 to 12.1
2-ethylhexyl acrylate	103-11-7	3.0 to 8.1
Acrylic polymer	Proprietary	3.0 to 8.1
Methacrylic Acid Ester	Proprietary	0.2 to 1.01
Paraffin	Proprietary	0.2 to 1.01
Crystalline Silica (Quartz)	1480-60-7	20 to 30
Titanium Dioxide	13463-67-7	5.0 to 7.0

New Jersey Trade Secret Registry Number NJTSR # 80100103-5118P

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4. First Aid Measures/Procedures:

Inhalation: Remove to fresh air. If irritation persists, call a Physician. Administer oxygen if breathing is difficult. If not breathing, give artificial respiration.

Eye Contact: Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

Skin Contact: Immediately flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention, immediately. Wash clothing before reuse. Thoroughly clean shoes before reuse.

Ingestion: Induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. Contact Poison Control or get medical attention immediately. Do NOT induce vomiting unless directed to do so by a poison control center or a physician.

Notes to Physician: After vomiting, have victim drink a mixture of 2 Tbsp of activated charcoal in 8 oz of water.

5. Firefighting Measures:

Flammable Liquid. Contact with strong oxidizers may cause a fire.

Flash Point	10 C (50 F)	Tag Open Cup
Auto ignition Temperature	430 C (806 F)	
Lower Explosion limit	2.1 % (By Volume) (Methyl Methacrylate)	
Upper Explosion Limit	12.5 % (By Volume) (Methyl Methacrylate)	

Explosion: Above flash point, vapour-air mixtures are explosive within flammable limits noted above. Violent eruption of closed containers may occur when polymerization occurs. Polymerization may be caused by elevated temperature, oxidizers, peroxides, or sunlight. Vapours can flow along surfaces to distant ignition source and flash back. Sealed containers may rupture when heated. Vapours are sensitive to static discharge.

Flammable Properties: Vapours are heavier than air and can form an explosive mixture with air. Never use welding or cutting torches on or near containers or drums, even when empty. Product residue or vapour in the drums or container can ignite explosively.

Extinguishing Media: Use dry chemical, carbon dioxide or alcohol-resistant foam for fires involving this material.

Fire Fighting Procedures: Evacuate enclosed and surrounding areas. As in any fire, wear self-contained breathing apparatus with pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear. Use water spray to cool containers exposed to the fire and to disperse vapours. Keep spills away from sources of ignition.

6. Accidental Release Measures:

Procedures: Remove all sources of ignition and ventilate the area. All equipment used when handling the product must be grounded. Absorb any spilled product with an inert material and place in a duly identified chemical waste container. Obey all relevant local, state, provincial and federal laws and regulations. Do not flush to the sewer or land drainage works. Do not contaminate any lakes, streams, ponds, ground water or soil. Use personal protection. See Section 8, Exposure Controls/Personal Protection.

Other: US (CERCLA) and Canadian (TDGA/EPA) regulations require reporting of spills and releases to soil, water and air in excess of reportable quantities

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7. Handling and Storage:

Handling: Product is supplied in a stable form. Stir well before use. Open container carefully as it may be pressurized. Use with adequate ventilation. Use portable ventilation at the job site if required. Bond and ground containers when transferring material. Keep containers tightly closed. Use explosion proof equipment. Do not smoke, eat, drink or chew tobacco around material.

Storage: Store in the original container at temperatures not exceeding 30 ^{0}C (86 ^{0}F). Protect against physical damage. Outside or detached storage is preferred. Do not store in direct sunlight. Keep away from heat. Keep away from sparks, flames and other sources of ignition. Ensure the storage area is well ventilated. Keep containers tightly closed when not in use. Limit the storage of flammable liquids to approved areas with overhead sprinklers. Protect the material from contamination. (See section 10 for incompatible materials) Fill containers to 80% capacity as oxygen (air) is required for stabilization. For large containers, ensure that the oxygen (air) supply is sufficient to ensure stability. Do not store under pure nitrogen or purge with nitrogen or other oxygen-free gas. Residual vapours may explode on ignition. Do not pressurize, cut, weld, braze, solder, drill, grind or expose such containers to heat, sparks, flame, static electricity or other sources of ignition: they may explode and cause injury or death.

8. Exposure Controls/Personal Protection:

Exposure Limits Information

Methyl Methacrylate (CAS 80-62-6)			**Remarks**
ACGIH TLV-TWA	50 ppm	205 mg/m3	Sensitizer
OSH PEL-TWA	100 ppm	410 mg/m3	
ACGIH PEL-STEL	100 ppm	410 mg/m3	Sensitizer
OSHA PEL_STEL			Not established
OEL-TWA (Alberta)	100 ppm	410 mg/m3	
OEL-TWA (British Columbia)	50 ppm		Skin absorption can contribute to the overall exposure. May cause respiratory or skin sensitization. Keep exposure as low as reasonably achievable.
OEL-STEL (British Columbia)	125 ppm		Skin absorption can contribute to the overall exposure. May cause respiratory or skin sensitization. Keep exposure as low as reasonably achievable.
OEL-TWA (Ontario)	100 ppm	410 mg/m3	
OEL-STEL (Ontario)			Not established
OEL-TWA (Quebec)	100 ppm	410 mg/m3	
OEL-STEL (Quebec)			Not established
OEL-TWA (Mexico)	100 ppm	410 mg/m3	
OEL-STEL (Mexico)	125 ppm	510 mg/m3	

2-Ethylhexyl Acrylate (CAS 103-11-7): No Occupational Exposure Values are established by ACGIH or OSHA for Canada and Mexico. One citation was found from a manufacturer in France who reported the TLV as 10 ppm or 82 mg/m3. No PEL/STEL was reported.

Engineering controls: Provide general and/or local exhaust ventilation to maintain airborne levels below the exposure limits in section 8. Refer to the current edition of "Industrial Ventilation: A Manual of Recommended Practice" published by the American conference of Governmental Hygienists for information on the design, installation, use and maintenance of exhaust systems.

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Respiratory Protection: A respiratory protection program that meets OSHA 1910.134 and ANSI Z88.2 or other applicable Federal/Provincial requirements must be followed whenever workplace conditions warrant the use of a respirator. NIOSH's "Respirator Decision Logic" may be useful in determining the suitability of the various types of respirators.

Eye Protection: The use of safety glasses with side shields is required when using this product.

Skin Protection: When working with larger quantities, a face mask, chemical resistant boots and an apron is recommended.

Hand Protection: Butyl and Nitrile Rubber gloves performed better than Latex or Natural Rubber in permeation testing. Gloves should be replaced regularly, especially after extended periods of contact with the product. Each work-place should select an appropriate glove that is the most suitable for their application.

Other Protective Equipment: A safety shower and eye wash fountain or similar equipment should be readily available in accordance with current regulations for the work-place. To identify additional personal protective equipment (PPE) requirements, it is recommended that a hazard assessment in accordance with OSHA PPE Standard (29CFR1910.132) be conducted before using this product.

9. Physical and Chemical Properties:

Appearance:	Opaque, yellow viscous fluid with a granulated surface
Odour:	Mild, slightly sweet, ester like solvent odour
Odour Threshold:	Less than 1 ppm
Physical State:	Liquid
pH value:	Not Applicable
Melting Point:	Not Available. Product is liquid at application temperatures
Initial Boiling Point:	Approximately 100 ^{0}C (212 ^{0}F) @ 1013 mbar
Flash Point:	10 ^{0}C (50 ^{0}F) Open Cup (Methyl Methacrylate)
Evaporation Rate:	Greater than 1 (Butyl Acetate = 1)
Flammability:	Flammable as a liquid and vapour. This material will ignite and support combustion.
Lower Explosion Limit:	2.1 % by Volume (Methyl Methacrylate)
Upper Explosion Limit:	12.5 % by Volume (Methyl Methacrylate)
Viscosity (dynamic):	15 to 16 (Daniel Gage)
Vapour Pressure:	Approximately 40 mbar at 20 ^{0}C
Vapour Density (air = 1):	Greater than 1 at 20 ^{0}C
Specific gravity:	1.93 Kg/Liter
Solubility In Water:	Approximately 20 grams/liter @ 20 ^{0}C
Partition Coefficient:	Not Available (n-Octanol/Water)
Auto-ignition Temp:	Not Available
Decomposition Temp:	Not Available

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10. Stability and Reactivity:

Reactivity: This product is highly reactive. It is specifically manufactured to be reacted in the field according to the manufacturers' instructions and/or guidelines.

Possibility of hazardous reactions: Reactivity may be initiated by heat, low dissolved oxygen and by the addition of a contaminant or chemical curative agent. Refer to section 7, Handling and Storage.

Chemical Stability: This product is stable under normal storage conditions.

Conditions to Avoid: Avoid heat and ignition sources, aging, contamination and an oxygen free atmosphere.

Incompatible Materials: Peroxides, Amines, sulphur compounds, heavy metal ions, Alkalis, reducing agents and oxidizing agents.

Hazardous Decomposition Products: None occur under proper use and storage. Uncontrolled polymerization can occur if the product is exposed to excessive heating or contamination with incompatible materials.

11. Toxicology Information:

Acute Oral Toxicity:

LD50 rat, OECD 401 (methyl methacrylate)	> 5,000 mg/kg
LD50 rat (2-ethylhexyl acrylate)	> 2,000 mg/kg

Acute Inhalational Toxicity:

LC50 rat, 4 h The data mentioned above refer to the component methyl methacrylate.	29.8 mg/l
LC50 mouse The data mentioned above refer to the component 2-ethylhexyl acrylate.	0.6 mg/l

Acute Dermal Toxicity:

LD50 rabbit (methyl methacrylate)	> 5,000 mg/kg
LD50 rabbit (2-ethylhexyl acrylate)	> 5,000 mg/kg

Irritant Effect on the Skin: Irritating

Irritant Effect on the Eyes: Contact with the eyes will cause irritation, redness and pain.

Sensitization: Methyl Methacrylate (MMA) in sensitization tests on guinea pigs with and without adjuvant, both positive and negative results were found. In humans, various types of allergic reactions have been observed (symptoms: headache, eye irritations, and/or skin affections). 2-ethylhexyl acrylate may cause sensitization by skin contact.

Toxicity on Repeated Administration:

rat, inhalation, 2 a, 0 - 400 ppm (methyl methacrylate) Findings: Damage to mucous membranes in the nose at 400 ppm	*NOAEL 25 ppm
rat, in drinking water, 2 a, 0 - 2000 ppm (methyl methacrylate) Findings: no toxic effects	*NOAEL 2000 ppm

***NOAEL** (No observed adverse effect level) denotes the level of exposure of an organism, found by experiment or observation, at which there is no biologically or statistically significant (e.g. alteration of morphology, functional capacity, growth, development or life span) increase in the frequency or severity of any adverse effects in the exposed population when compared to its appropriate control.

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Mutagenicity: Methyl Methacrylate (MMA) provided both positive and negative results in in vitro mutagenicity/ geno-toxicity tests. No experimental indication of genotoxicity in vivo available. In summary, MMA is not considered mutagenic according to internationally accepted criteria. No information is available concerning the mutagenicity of 2-ethylhexyl acrylate. Due to the form of the product and the application, no mutagenic effect is expected as a result of the Crystalline Silica (Quartz) component.

Carcinogenicity: Methyl Methacrylate was found non-carcinogenic in inhalation of vapors and feeding studies carried out on rats, mice and dogs. 2-ethylhexyl acrylate is not listed by ACGIH, IARC, NTP, or CA Prop 65. Crystalline Silica (Quartz) is considered to be an IARC group 1 carcinogen. Chronic inhalation exposure to Crystalline Quartz dust may cause silicosis, a fibrosis (scarring) of the lungs. Silicosis can be progressive leading to disability and death. Due to the liquid form and rapid polymerization of the material when used as directed, no chronic effects are expected from the crystalline silica quartz.

Reproduction toxicity:

Methyl Methacrylate	No indications of toxic effects in reproduction studies on animals.
2-ethylhexyl acrylate	No information is available
Crystalline Silica (Quartz)	No information is available

Teratogenicity:

2-ethylhexyl acrylate	TDLo=187 g/kg (Mouse, skin) Tumours reported on skin and appendages.
	TD=240 g/kg (Mouse, skin) Tumours reported at site of application.

Further Information: There is no toxicological data available for the product as made. Avoid contact with the skin and eyes. Protect against inhalation of the product vapors, mists and dusts.

12. Ecological Information (Ecotoxicity):

Fish Toxicity: Methyl methacrylate	
LC50 Oncorhynchus mykiss, rainbow trout, OECD 203, flow through, GLP, 96 h	> 79 mg/l
Fish Toxicity: 2-ethylhexyl acrylate	
LC50 Leuciscus idus melanotus, fish test according to Mann, DEV L15, 48 h	23 mg/l
Daphnia Toxicity: Methyl methacrylate	
EC50 Daphnia magna, OECD 202, flow through, 48 h	69 mg/l
NOEC Daphnia magna, OECD 202 part 2, flow through, 21 d	37 mg/l
Daphnia Toxicity: 2-ethylhexyl acrylate	
EC50 Daphnia magna, OECD 202 / ISO 6341 / 84/449/EEC V,C2, 48 h	17.45 mg/l
Algae Toxicity: Methyl methacrylate	
EC3 Scenedesmus quadricauda, cell proliferation inhibition test, 8 d	37 mg/l
Bacteria Toxicity: Methyl methacrylate	
EC0 Pseudomonas putida	100 mg/l

Persistence/Degradability: This product is blended to be a durable, field reacted polymer pavement marking. Used as directed, the cured product will persist in the environment and slowly degrade to polymeric dust. The blend is made with naturally occurring minerals held in a biodegradable organic matrix. In its uncured state, the fluid coating will not persist in the environment but quickly react to form a solid. The organic portion of the uncured product is biodegradable; the naturally occurring minerals in the blend will not degrade. Once cured, there is no evidence to suggest that the product is biodegradable in either soil or water.

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Bioaccumulation/Accumulation: The cured product is a solid with low volatility. The cured product is essentially insoluble in water. The cured product has low potential for bioaccumulation. The cured product has low mobility in soil. The cured product is predicted to have low toxicity to aquatic organisms.

Further Information on Ecology: Do not allow the uncured product to enter the soil, waterways or waste water.

13. **Disposal Considerations:** Waste must be disposed of in accordance with federal, state, provincial and local regulations. Incineration is the preferred method. Empty containers must be handled with care due to residual flammable product. DO NOT HEAT OR CUT THE CONTAINERS WITH ELECTRIC OR GAS TORCH. DO NOT REFILL EMPTY CONTAINERS.

14. Transportation Information:

US DOT Hazard Classification
Proper Shipping Name: Coating Solution
Technical Name: (containing methyl methacrylate)
Hazard Class: 3
UN Number: UN 1139
Packing Group: II
ERG: 127

Canadian TDG Classification
Proper Shipping Name: Coating Solution
Technical Name: (containing methyl methacrylate)
Hazard Class: 3
UN Number: UN 1139
Packing Group: II
ERG: 127

15. Regulatory Information:

Inventory Information:

USA TSCA	listed
Canada DSL	listed

US Federal Regulatory Information:

Component / CASRN	TPQ [lbs]	CERCLA RQ [lbs] (40CFR302.4)	SARA 302 List of EHS	SARA 313 (40CFR372)	TSCA 12b
Methyl methacrylate /80-62-6	NONE	1000	NO	YES	NO

Component Classification Under Clean Air Act Section 112:

Component / CASRN	Weight %	HAP	EHAP
Methyl methacrylate /80-62-6	6.0 to 12.1	YES	NO

Product Classification under Section 311/312 of SARA (40CFR370):
ACUTE, FIRE, REACTIVE

US State Regulatory Information:

Component / CASRN	New Jersey RTK	Pennsylvania RTK	Massachusetts RTK	California Prop 65 Cancer	California Prop 65 Repro
Methyl methacrylate / 80-62-6	YES	YES	YES	NO	NO
Methacrylic acid ester / Proprietary	NO	NO	NO	NO	NO
2-ethylhexyl acrylate / 103-11-7	NO	YES	YES	NO	NO
Acrylic polymer / Proprietary	NO	NO	NO	NO	NO
Paraffin / Proprietary	NO	YES	YES	NO	NO

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Canadian Regulations: This product has been classified in accordance with the hazard criteria of the Hazardous Products Act. The SDS contains all information required by the Hazardous Products Act. This is a controlled product.

WHMIS:

Hazard Class:	**Hazard Category:**
Flammable Liquid	2
Skin Irritation	2
Eye Irritation	2A
Specific Target Organ Toxicity- Single Exposure	3
Aspiration Hazard	1

NPRI Information:

Component / CASRN	NPRI
Methyl methacrylate /80-62-6	YES

Other Information:

	Health	Flammability	Physical Hazard
HMIS-Ratings	2	3	1
NFPA-Ratings	2	3	1

HMIS Hazard Ratings
4 = severe
3 = serious
2 = moderate
1 = slight
0 = minimal
N = no rating for powders
* = chronic health hazard

NFPA Hazard Ratings
4 = extreme
3 = high
2 = moderate
1 = slight
0 = insignificant
N = no rating for powders

Prepared by: M Small, B.Sc. (Honours Chemistry), B. Ed.
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