

SDS -Safety Data Sheet

1. Chemical Product and Company Identification

Product name	SUMIPEX (PMMA moulding resin)
Supplier	Sumitomo Chemical Singapore Pte Ltd
Supplier's address	150 Beach Road #19-05 Gateway West Singapore 189720
Office No. (For enquiries during office hour)	+65 6499 4306
Manufacturer	Singapore Methyl Methacrylate Pte. Ltd.
Manufacturer's address	17 Sakra Road #01-02 Singapore 627886
24-hour Emergency No. (For advice on chemical emergencies, spillages, fires or First Aid)	NCEC + 44 (0) 1235 239 670 [Europe, Americas, Israel] + 44 (0) 1235 239 671 [Middle East/Africa] + 65 3158 1074 [Asia Pacific region (excluding China)] + 86 10 5100 3039 [China]
Office Fax No.	+65 6867 6749
Recommended use and restriction for use	Precautions are for general use only. For special handling, use only after implementing the safety measure appropriate for the application and usage.

2. Hazards Identification

Important Hazards and Effects

Human health hazards	This material contains ingredients corrosive to the skin and eyes. This material contains ingredients that cause respiratory tract sensitisation and skin sensitisation. This material contains ingredients that may cause irritation to the respiratory tract if inhaled as gas generated during heat forming/moulding of products. In addition, this material contains ingredients that may affect the nervous system if exposed to high concentrations of gas generated during heat forming/moulding of products or if exposed to the gas over a long period of time.
Environmental effects	This material contains hardly degradable ingredients. This material contains ingredients very harmful to aquatic organisms.
Physical and chemical hazards	Fire may produce flammable and/or harmful gases. Powders, dusts, shavings, borings, turnings or cuttings may explode or burn with explosive violence.
Specific Hazards	Contact with hot molten material may cause burns to the skin.

GHS Classification**Physical and chemical hazards**

FLAMMABLE SOLIDS Classification not possible

SELF-REACTIVE SUBSTANCES AND MIXTURES Classification not possible

PYROPHORIC SOLIDS Not classified

SELF-HEATING SUBSTANCES AND MIXTURES Classification not possible

CORROSIVE TO METAL Classification not possible

Health hazards

ACUTE TOXICITY (ORAL) Classification not possible

ACUTE TOXICITY (DERMAL) Classification not possible

ACUTE TOXICITY (INHALATION : VAPOUR) Classification not possible

ACUTE TOXICITY (INHALATION : MISTS) Classification not possible

SKIN CORROSION/IRRITATION Not classified

EYE DAMAGE/IRRITATION Not classified

SENSITISATION-RESPIRATORY Not classified

SENSITISATION-SKIN Not classified

GERM CELL MUTAGENICITY Classification not possible

CARCINOGENICITY Not classified

TOXIC TO REPRODUCTION Classification not possible

SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) Not classified

SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) Not classified

ASPIRATION HAZARD Classification not possible

Hazards to the environment

HAZARDOUS TO THE AQUATIC ENVIRONMENT-ACUTE HAZARD Classification not possible

HAZARDOUS TO THE AQUATIC ENVIRONMENT-LONG-TERM HAZARD Classification not possible

HAZARDOUS TO THE OZONE LAYER Classification not possible

Label Elements**Pictogram or symbol**

None

Signal word

None

Hazard statement

Precautionary statement None

3. Composition/Information on Ingredients

Substance/Mixture Mixture

Ingredient	Synonym	Chemical Formula	CAS No.	Content (%)
Alkyl methacrylate/Alkyl acrylate copolymer		$[(C_5H_8O_2)_x - (C_4H_6O_2)_y]_z$	9011-87-4	Not less than 99.1%
Methyl methacrylate	Methyl methacrylate, MMA, Methyl-2-methylpropenoate	$CH_2 = C(CH_3)COOC_2H_3$	80-62-6	Less than 0.8%
Methyl acrylate	Methyl-2-propenoate	$CH_2 = CHCOOC_2H_3$	96-33-3	Less than 0.1%

Impurities and Stabilizing Additives Related to GHS Classification No information

4. First-Aid Measures**Inhalation**

Blow nose and gargle. In case of inhalation of gases or fumes from hot molten resin, immediately move the exposed person to fresh air and keep warm and at rest in a position comfortable for breathing, covering his/her body with a blanket or similar.

Seek medical attention promptly. If breathing is shallow or has stopped, loosen tight clothing to maintain an open airway, and then provide oxygen or artificial respiration. If the person is breathing and vomiting, turn his/her head to the side. If unconscious, never give anything by mouth and never induce vomiting.

Skin Contact

Immediately remove contaminated clothing and shoes. Wash affected skin with running water or lukewarm water. If changes in the appearance of the affected area, for example, development of skin eruptions, are observed, or if skin irritation or pain persists, immediately seek medical attention.

In the case of contact with molten material, immediately pour large amounts of water over the affected area without removing the exposed person's clothing to thoroughly cool it. Then remove

the clothing, cover with clean gauze, etc. and promptly seek medical attention. Do not forcibly pull away materials or clothing attached to the skin.

Eye Contact

Flush with clean water for at least 15 minutes and immediately seek medical attention from an ophthalmologist. When washing the eye, hold the eyelids open using the thumb and index finger to ensure that effective rinsing has occurred behind the eyeball and the eyelid. Remove contact lenses if worn, unless they have adhered to eyes, and continue flushing. Do not allow the exposed person to rub his/her eyes or keep them tightly closed.

Ingestion

Wash mouth out thoroughly with water. Keep the exposed person warm and at rest, covering his/her body with a blanket, etc. Seek medical attention immediately. Provide artificial respiration or oxygen, if necessary. If the person is breathing and vomiting, turn his/her head to the side. If the exposed person is unconscious, never give anything by mouth and never induce vomiting.

Expected Acute and Delayed Symptoms

Inhalation: Irritation of nasal and pharyngeal mucosae, burning sensation in the respiratory tract, dizziness, drowsiness, headache, nausea, shortness of breath, sore throat, loss of consciousness, choking, asthmatic symptoms. Symptoms may be delayed.

Skin contact: Irritation, redness, pain.

Eye contact: Irritation, redness, pain.

Ingestion (If swallowed): Vomiting and other symptoms similar to those listed under 'Inhalation'.

Most Important Signs and Symptoms

No information available.

Protection of First-aiders

Use personal protective equipment, such as gloves, goggles and masks, to avoid contact with hazardous substances. Remove contaminated clothing and protective equipment. Pay attention to avoid any sources of ignition.

Notes to Physician

No information available.

5. Firefighting Measures**Extinguishing Media**

Carbon dioxide, dry chemical, foam, water

Extinguishing Agents Which Must Not Be Used

No information available.

Specific Hazards

Fire may produce flammable and/or harmful gases. (See "10. Stability and reactivity".) Powders, dusts, shavings, borings, turnings or cuttings may explode or burn with explosive violence. May be ignited by friction, heat, sparks and flames. When heated, decomposition gases may form explosive mixtures with air. Contact with molten substance may cause severe burns to skin and eyes.

Special Firefighting Procedures

Fight fire from protected position. Stay upwind. Keep unauthorized personnel away. Move containers from fire area if you can do it without risk. If cannot, cool containers with

flooding quantities of water until well after fire is out. Do not scatter spilled material with high pressure water streams. Dike fire-control water for later disposal; do not scatter the substances.

Protection of Firefighters

Wear positive pressure self-contained breathing apparatus, protective clothing, protective gloves, and protective footwear. Structural firefighters' protective clothing will only provide limited protection.

6. Accidental Release Measures

Personal Precautions, Protective Equipment and Emergency Procedures

Wear filter respirator for dust and protective clothing. Do not touch or walk through spilled material. For large spill, evacuate downwind for safe distance (at least 25 meters). Keep unauthorized personnel away from spilled area.

Environmental Precautions

Prevent entry into waterways, sewers, basements or confined areas. Avoid release into the environment.

Methods and Materials for Containment and Cleaning Up

Small spill: Collect substance into clean container. Use clean non-sparking tools. Collect fine substance by dust explosion-proof cleaner to prevent scatter. Large spill: Wet down with water and dike for the later disposal. Wash contaminated area and collect waste water into container.

ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area). Prepare appropriate extinguishing agent. Prevent dust cloud.

7. Handling and Storage

Handling

Technical measures

Install appropriate equipment and wear appropriate protective clothing. See section 8. If dust generates, use dust explosion-proof electrical equipment and lighting. Take measures for static electricity by grounding and bonding. Use clean non-sparking tools. Install washing waterworks for emergency use.

Local and general ventilation

Ventilate by appropriate method. See section 8.

Precautions for safe handling

ELIMINATE all ignition sources. Handle in well ventilated place. Avoid contact with heated, molten substance. Prevent dust cloud and dust accumulation. Cool well molding or shaping residual before disposal. Do not eat or smoke when handling. Wash well after handling. Do not bring contaminated protective clothing and workwear out of limited area.

Storage

Technical measures

Dry, dark and cool. Well ventilated.

Proper storage

Avoid direct sun light. Keep away from ignition sources. Keep

conditions	away from strong oxidants. Sealed. Locked up. Avoid sudden temperature change.
Incompatible substances	See '10. Stability and Reactivity'.
Safe packaging materials	Use container ruled in UNRTGD (UN Recommendations on the Transport of Dangerous Goods).

8. Exposure Control/Personal Protection

Control Levels	Not established
Permissible Exposure Levels (Threshold Limit Value, Biological Exposure Indices)	
ACGIH (2012 ed.)	[Other dust (Class 3 Dust)] 3 mg/m ³ (Respirable dust) 10 mg/m ³ (Total dust) [Methyl methacrylate] 50 ppm (TWA), 100 ppm (STEL) [Methyl acrylate] 2 ppm (TWA)
Engineering Measures	Use local exhaust ventilation. When dust generate, use closed equipments and machines. Use dust explosion-proof electrical equipments and lighting. All equipment used when handling the product must be grounded. Install washing waterworks for emergency use.
Protective Equipment	
Respiratory system protection	Filter respirator for dust.
Hand protection	Protective gloves. Wear heat resistant protective gloves when handling molten substance.
Eye protection	Protective eyeglasses or goggles with side shields, full face-shields
Skin and body protection	Protective clothes (long-sleeved work clothes), cap, safety shoes, etc.
Hygiene measures	Minimize exposure. Avoid all contact. Do not eat, drink or smoke during work.

9. Physical and Chemical Properties

Appearance (Physical State, Form, Colour, etc.)	Colourless and transparent solid in pellet and bead form
Odour	Odourless
pH	No data available
Melting Point and Freezing Point	No clear melting point. Softening starts higher than around 80 deg C.

Boiling Point	No data available
Flash Point	No data available
Specific Gravity (Density)	1.1 – 1.2
Solubility in Solvents	Water: Insoluble Organic solvents (acetone, chloroform, etc.): Soluble
Auto ignition Point	Ignition point: Higher than 400 deg. C
Decomposition Temperature	No data available

10. Stability and Reactivity

Stability	Stable (at normal ambient temperature and pressure). When heated, decomposition gases may form explosive mixtures with air.
Possibility of Hazardous Reactions	No data available.
Conditions to Avoid	Ignition sources (open flame, spark, etc.), heat, hot surface, accumulation of static electricity.
Incompatible Materials	Strong oxidising agents
Hazardous Decomposition Products	Carbon monoxide and hydrocarbons may generate by heat.

11. Toxicological Information

Acute Toxicity	[Alkyl methacrylate/Alkyl acrylate copolymer] - insufficient data
Oral	[Methyl methacrylate] Rat LD ₅₀ 8400–9400 mg/kg [Methyl acrylate] Rat LD ₅₀ 277 mg/kg
Dermal	[Methyl methacrylate] Rabbit LD ₅₀ > 9,400 mg/kg [Methyl acrylate] Rabbit LD ₅₀ 1,250 mg/kg
Inhalation	[Methyl methacrylate] Vapour: Rat LC ₅₀ (4H) 3570–7093 ppm Since the value is not more than 90% of the saturated vapour concentration (36,525 ppm), it can be considered as an

experimental value with 'vapour that hardly contains mists'.

[Methyl acrylate]

Vapour: Rat

LC₅₀ (4H) 3.58, 5.7, 6.5, 4.83 mg/L. From these values, LC₅₀ (4hr. converted value) was calculated in accordance with technical guidelines and then it was converted into ppm. The converted value is 1,200 ppm. Since the saturated vapour pressure concentration at vapour pressure of 11,500 Pa (25 deg. C) (HSDB (2005)) is 114,000 ppm, LC₅₀ (4 hr. converted value) is a concentration lower than 90% of the saturated vapour pressure concentration. The vapour is therefore considered to be a 'vapour in which mists are barely mixed'.

Skin Corrosivity/ Irritation

[Alkyl methacrylate/Alkyl acrylate copolymer]

Data is insufficient

[Methyl methacrylate]

Moderate skin irritation was observed in rabbits. On humans, contact dermatitis associated with papules and vesicles through occupational exposure develops.

[Methyl acrylate]

Necrosis was observed in the primary skin irritation in rabbits.

Serious Eye Damage and Eye Irritation

[Alkyl methacrylate/Alkyl acrylate copolymer]

Data is insufficient.

[Methyl methacrylate]

Moderate irritation was caused in rabbit eyes by 5% solution of this material. No effects on iris and cornea. In a conjunctival oedema, redness of grade 2 was observed after 24 hours.

[Methyl acrylate]

As a result of eye irritation tests in rabbits, 'intense irritation' and 'no recovery from conjunctival disorder is observed (in 7 days)' have been reported.

Respiratory Sensitization or Skin Sensitization

Respiratory sensitization:

[Alkyl methacrylate/Alkyl acrylate copolymer]

Data is insufficient

[Methyl methacrylate]

Classified as "sensitizing chemical substances" in the Guidelines for Prevention of Occupational Allergic Diseases (draft) edited by the Japan Society for Occupational Health and the special committee of the Japanese Society of Occupational and Environmental Allergy.

Substance in Group 2 of respiratory tract sensitization defined by the Japan Society for Occupational Health.

[Methyl acrylate]

Since no data is available, classification is impossible.

Skin sensitization:

[Alkyl methacrylate/Alkyl acrylate copolymer]

Data is insufficient

[Methyl methacrylate]

Substance in Group 2 of skin sensitization defined by the Japan Society for Occupational Health

Maximization test in guinea pigs: Positive (5% aqueous solution)

[Methyl acrylate]

Classified as “sensitizing chemical substances (which sensitizing properties have been just reported)” in the Guidelines for Prevention of Occupational Allergic Diseases (draft) edited by the Japan Society for Occupational Health and the special committee of the Japanese Society of Occupational and Environmental Allergy.

Substance in Group 2 of skin sensitization defined by the Japan Society for Occupational Health.

Germ Cell Mutagenicity

[Alkyl methacrylate/Alkyl acrylate copolymer]

Data is insufficient

[Methyl methacrylate]

Ames test: Negative, In vivo heritable germ cell mutagenicity test (dominant lethal test): Negative, In vivo germ cell mutagenicity test: Negative.

[Methyl acrylate]

Heritable germ cell mutagenicity test: Negative, In vivo germ cell mutagenicity test: Negative, In vivo somatic cell mutagenicity test (micronucleus test): Positive (Intraperitoneal injection), In vivo germ cell genotoxicity: Negative

Carcinogenicity

[Alkyl methacrylate/Alkyl acrylate copolymer]

IARC: Not listed

[Methyl methacrylate]

IARC: Group 3, ACGIH: A4, EPA: E,

[Methyl acrylate]

IARC: 3 ACGIH: A4, EPA: D,

Reproductive Developmental Toxicity

[Alkyl methacrylate/Alkyl acrylate copolymer]

Data is insufficient.

[Methyl methacrylate]

Inhalation (Rat) Teratogenicity test: No teratogenicity

Oral (Rabbit) Teratogenicity test: No teratogenicity.

Diet (Rabbit) Reproductive toxicity study: No effect on reproduction

Specific Target Organ Toxicity (single exposure)

[Alkyl methacrylate/Alkyl acrylate copolymer]

Data is insufficient

[Methyl methacrylate]

In an inhalation exposure test with human volunteers, a short-term inhalation exposure experiment (197–1970 mg/m³, 20–90 minutes) was conducted and results such as “Irritation of eyes and nasal mucosae, dizziness, drowsiness were observed” and “Irritation of respiratory tract, weakness, fever, dizziness, nausea, headache, drowsiness were observed” were reported. It is presumed that methyl methacrylate produces methanol through its metabolic process, and methanol as its metabolite exerts an inhibitory reaction on the central nervous system, and consequently transient

anaesthetic effects are shown.

[Methyl acrylate]

In humans, this substance causes coma, convulsion, lacrimation and its vapour irritates eyes, respiratory tract, and the skin. Target organ toxicity is irritation of central nervous system, respiratory tract, etc.

**Specific Target
Organ Toxicity
(repeated
exposure)**

[Alkyl methacrylate/Alkyl acrylate copolymer]

Data is insufficient

[Methyl methacrylate]

In an epidemiological investigation on people with long-term exposure to this substance, headaches, pain in hands and feet, extreme fatigue, sleep disorder, memory impairment, and irritation were reported. It is reported that effects such as atrophic rhinitis, sore throat, autonomic dysfunction, neurasthenia, headaches, dizziness, nervousness, attention disturbance, and decreased memory are present. Based on the above-mentioned results, target organs are the respiratory tract and the central nervous system, Category 1 (respiratory tract, central nervous system)

(Rat) Inhalation exposure test: exposure concentration 0, 25, 100, 400 ppm. 6 hrs/day, 5 days/week, 105 weeks

Effects: In animals given not less than 25 ppm of the substance, rhinitis in the epithelial mucosa of the nasal concha was observed. In observation of pathologic specimens, denaturation and atrophy in olfactory epithelia were observed in animals administered 100 ppm or 400 ppm of substance. The target organ is the respiratory organs, observed within the range of the guidance value.

[Methyl acrylate]

In experimental animals, "atrophy of olfactory epithelia, columnar cell layer deletion associated with piled basal cell hyperplasia," and "increase in relative weight of kidney, increase of renal diseases" were observed. Target organs are respiratory organs and kidneys, based on the guidance values classified in Category 1 (respiratory organs),

Aspiration Hazard [Alkyl methacrylate/Alkyl acrylate copolymer]

Data is insufficient

[Methyl methacrylate, Methyl acrylate]

Since no data is available, classification is impossible.

12. Ecological Information

Ecotoxicity [Alkyl methacrylate/Alkyl acrylate copolymer]

Data is insufficient

**Hazards to the
aquatic
environment
(acute)**

Fish [Methyl methacrylate]

	(Fathead Minnow) LC ₅₀ (96 hrs) 130–460 ppm (Intermediate value: 285 ppm)
	(Bluegill (<i>Lepomis macrochirus</i>)) LC ₅₀ (96 hrs) 232–283 ppm (Intermediate value: 257.5 ppm)
	(Guppy (<i>Poecilia reticulata</i>)) LC ₅₀ (96 hrs) 368 ppm
	[Methyl acrylate]
	(Sheepshead Minnow) LC ₅₀ (96 hrs) 1.1 mg/L (Category 2)
	(Medaka (<i>Oryzias latipes</i>)) LC ₅₀ (96 hrs) 1.36 mg/L
Crustacea	[Methyl methacrylate]
	Daphnia magna EC ₅₀ (48 hrs) = 69 mg/L
	[Methyl acrylate]
	Daphnia magna EC ₅₀ (48 hrs) = 2.64 mg/L
Algae	[Methyl methacrylate]
	Green algae LC ₅₀ (98 hrs) = 170 mg/L
	[Methyl acrylate]
	(Green algae) LC ₅₀ (72 hrs) = 6.9 mg/L
Hazards to the aquatic environment (chronic)	
Persistency/Degradability	[Methyl methacrylate] Readily biodegradable
	[Methyl acrylate] Rapidly biodegradable
Bioaccumulative Potential	[Methyl methacrylate]
	log Kow = 1.38
	BCF = 2.3
	[Methyl acrylate]
	log Kow = 0.8
Chronic Hazards to the Aquatic Environment	[Methyl methacrylate, Methyl acrylate]
	Both ingredients are readily biodegradable and have also low bioaccumulative potential.
Mobility in Soil	No information available
Other adverse effects	No information available
Environmental standards	No information available

13. Disposal Considerations

Comply with the applicable laws and regulations regarding this product in each country.

14. Transport Information

International

Does not fall under the dangerous substances defined in the UN

Regulations recommendation on the transport of dangerous goods.

**Information on
sea transport
regulation**

UN No. None

**Proper
Shipping Name**

**UN Hazard
Class**

**UN Subsidiary
Risk**

**UN Packing
Group**

**Marine
Pollutant**

**Information on air
transport
regulation (IATA)**

UN No. None

**Proper
Shipping Name**

**UN Hazard
Class**

**UN Subsidiary
Risk**

**UN Packing
Group**

**Domestic
Regulations**

**Information on
land transport
regulation**

Transportation should be performed using containers, packaging, methods of labelling, loading and transportation in accordance with local regulations.. Do not transport together with dangerous substances as listed in the Categories 1, 3 and 6 under the Fire Service Law (Japan).

**Information on
sea transport
regulation**

UN No. None

**Proper
Shipping Name** None

**UN Hazard
Class**

UN Packing

Group**Marine
Pollutant****Information on air
transport
regulation****UN No.** None**Proper
Shipping Name****UN Hazard
Class****UN Packing
Group****Specific Safety
Measures and
Conditions on
Transport**

Make sure containers have no cracks, corrosions or leaks etc. before transportation. Load containers to ensure that they are protected from falling, dropping or being damaged, and securely prevent collapse of cargo piles.

Transport carefully, taking any necessary measures to prevent containers from producing significant friction or trembling/shaking.

Vehicles and ships should be equipped with protective equipment (gloves, eyeglasses, masks, etc.) as well as fire extinguishers and any tools necessary for emergencies.

15. Regulatory Information

Comply with the applicable laws and regulations regarding this product in each country.

16. Other Information**Disclaimer:**

This data sheet is based on currently available documents, information, and data, and does not provide definitive information on any of the contents, physicochemical properties, hazards, toxicity, or other details of the product. In addition, the precautions given in this document are based on ordinary handling. In special handling situations, implement safety measures suitable to the purpose and usage.

This SDS applies to the following products:

SUMIPEX EP Clear 011

SUMIPEX EX Clear 011

SUMIPEX EXN

SUMIPEX LG Clear 011

SUMIPEX LG2 Clear 011

SUMIPEX MG5 Clear 011

SUMIPEX MGSS Clear 011

SUMIPEX MGSV Clear 011
SUMIPEX MH Clear 011
SUMIPEX MHF Clear 011
SUMIPEX MM Clear 011
SUMIPEX MH5 Clear 011
SUMIPEX MHF-ADF Clear 011
SUMIPEX MHN Clear 011
SUMIPEX ME Clear 011
SUMIPEX LG2S Clear 011
SUMIPEX LW Clear 011
SUMIPEX LW2 Clear 011