



## Material Safety Data Sheet

**COMMERCIAL PRODUCT NAME**

**POLYKLEAR TOOLING GELCOAT**

### 1. IDENTIFICATION OF THE SUBSTANCE / PREPARATION

**Synonyms, Trade names:** Unsaturated polyester resin.

**Applications:** Gelcoat for composites.

### 2. COMPOSITION / INFORMATION ON INGREDIENTS

Ingredient name	CAS No.	Content	Symbol	R phrases
Styrene	100-42-5	40 %	Xn	R-10, 20, 36/38

See section 16 for explanations to R phrases.

### 3. HAZARDS IDENTIFICATION

Flammable.  
Harmful by inhalation.  
Irritating to eyes and skin.

The mixture of product vapor and air could be explosive.  
Strongly exothermic polymerization may be initiated by heat, peroxides or other free radical generators.

### 4. FIRST AID MEASURES

**General:** Move the exposed person to fresh air at once.  
Get medical attention if any discomfort continues.

**Inhalation:** Take person out of the contaminated area. Remove patient to fresh air.  
If the patient has difficulties breathing, call a doctor.

**Ingestion:** DO NOT INDUCE VOMITING!  
Do NOT make the victim drink milk or fatty fluids.  
If swallowed, seek immediate medical advice and show container or label to the doctor.



- Skin:** Remove contaminated clothing.  
Wash the skin immediately with soap and water.  
Get medical attention promptly if symptoms occur after washing.
- Eyes:** Promptly wash eyes with plenty of water while lifting the eyelids.  
Continue to rinse for at least 15 minutes and get medical attention.  
Never use solvent.  
Contact physician if irritation persists.

## 5. FIRE FIGHTING MEASURES

- Extinguishing Media:** RECOMMENDED:  
Water spray, fog or mist. Powder, foam or CO<sub>2</sub>.  
NOT SUITABLE:  
Water jet.

**Special fire fighting procedures:**

- Cool the container with sprayed water to avoid polymerization.
- Eliminate all sources of combustion.
- Treat as hydrocarbon fire.
- Limit spreading of extinguishing fluids.

**Hazardous combustion products:**

- Toxic gases / vapors / fumes.
- Carbon monoxide (CO), carbon dioxide (CO<sub>2</sub>), ...

**Protective measures in fire:**

- Wear individual breathing apparatus.

## 6. ACCIDENTAL RELEASE MEASURES

**Personal protection:** Avoid inhaling vapors.

- Wear protective equipment: gloves, goggles, and boots.
- Wear self-contained breathing apparatus.

**Environmental protection:**

- Discharge in sewers is prohibited.
- Do not allow this chemical to enter the environment.
- If the product contaminates lakes, rivers or sewers, inform appropriate authorities in accordance with local regulations.

**Spill cleanup methods:**

- RECOVERY:  
Spread sand.  
Collect the product in a container pending future destruction.
- DISPOSAL:  
Burn in an approved installation for liquids.  
Polymerized product: discharge authorized.
- INCOMPATIBLE MATERIALS:  
Wood sawdust

## 7. HANDLING AND STORAGE

**Usage precautions:**

- Collect vapors at source.
- Mechanical ventilation or local exhaust ventilation is required.
- During spraying wear suitable respiratory equipment.
- Do NOT smoke when using.
- Take precautionary measures against electrostatic charges.





**Storage precautions:**

Keep in cool, dry, ventilated storage and closed containers.  
Keep away from sunlight, heat, sparks and open flame.  
No smoking.  
Equipment earthing.

**Storage criteria:**

**INCOMPATIBLE MATERIALS:**  
Strong oxidizing agents.  
Catalysts and accelerators.

**PACKAGING MATERIALS RECOMMENDED:**  
Metal packaging.  
GRP tanks (Glass Reinforced Polyester).

**PACAKAGING MATERIALS NOT SUITABLE:**  
Aluminum.  
Copper or copper alloys.  
Plastics.

**8. EXPOSURE CONTROLS AND PERSONAL PROTECTION**

Ingredient name	CAS No.	Std	LT Exp. 8 hrs	ST Exp 15 min
Styrene	100-42-5	ACGIH (USA) 2003	20 ppm	40 ppm

**Process conditions:**

Use engineering controls to reduce air contamination to permissible exposure levels.  
Provide eyewash station.

**Ventilation:**

Provide adequate general and local exhaust ventilation.

**Respirators:**

Do NOT breathe vapors.  
If ventilation is insufficient, suitable respiratory protection must be provided.

**Protective gloves:**

Use solvent-proof protective gloves (Neoprene).

**Eye protection:**

Wear approved safety goggles.

**Other protection:**

Wear suitable protective clothing.

**Hygienic work practices:**

Change work clothing daily before leaving work place.  
Eating, smoking and water fountains prohibited in immediate work area.

**9. PHYSICAL AND CHEMICAL PROPERTIES**

**Appearance:**

Liquid.

**Color:**

Pigmented Gelcoat

**Odor:**

Styrene

**Physical data comments:**

Take precautionary measures against electrostatic discharges.

**Density (g/ml):**

1.15 – 1.20

Temperature: 20 °C

**Solubility description:**

Insoluble in water.

Soluble in most organic solvents.

**Flash point (°C):**

31

(value for styrene)



Auto ignition temperature (°C)	490	(value for styrene)
Vapor pressure (hPa)	6	(value for styrene)
Flammability Limit - Lower (%)	1.1 vol.%	(value for styrene)
Flammability Limit - Upper (%)	6.1 vol.%	(value for styrene)

## 10. STABILITY AND REACTIVITY

**Stability:** Stable under normal storage condition.

**Conditions to avoid:** Avoid heat, light and sources of ignition.

**Polymerization description:** Exothermic polymerization may occur by:  
Strong oxidizing agents, peroxides, radical formers.

**Hazardous Decomp. products:** By thermal decomposition, formation of:  
Toxic gases/vapors/fumes of:  
Carbon monoxide (CO), carbon dioxide (CO<sub>2</sub>), hydrocarbons.

## 11. TOXICOLOGICAL INFORMATION

**Inhalation:** Harmful by inhalation.  
Symptoms and signs include: headache, dizziness, tiring.

**Skin:** Irritating to skin.

**Eyes:** Irritating to eyes.

## 12. ECOLOGICAL INFORMATION

**Ecological information:** Do not discharge into drains or the environment; dispose to an authorized waste collection point.

**Degradability:** Styrene is readily biodegradable.

## 13. DISPOSAL CONSIDERATIONS

**Disposal methods:** Dispose of in accordance with local authority requirements.  
Dispose to an authorized waste collection point.  
This material and its container must be disposed of as hazardous waste.  
Cleaned packaging may be recycled.

## 14. TRANSPORT INFORMATION

**Road transport:**

UN No. Road: 1866  
ADR Class: Class 3: flammable liquids  
ADR packing group: III  
HAZARD NO. (ADR): 30 Flammable liquid (flash point between 23 °C and 61 °C, inclusive) or flammable liquid or solid in the molten state with a flash point above 61 °C, heated to a temperature equal or above its flash point, or self-heating liquid.  
ADR label No: 3





Proper shipping name:  
Road transport notes:

RESIN SOLUTION, flammable  
Emergency action code (UK) – 3Y

**Rail transport:**

RID class no:

3

**Sea transport:**

UN No. sea:  
IMDG class:  
IMDG packing group:  
EMS No:  
Marine pollutant:

1866  
3  
III  
F-E, S-E  
No

**Air transport:**

UN No. air:  
IATA/ICAO class:  
IATA/ICAO packing group:

1866  
3  
III

**15. REGULATORY INFORMATION:**

**Risk phrases:**

R-10 Flammable.  
R-20 Harmful by inhalation.  
R-36/38 Irritating to eyes and skin.

**Safety phrases:**

S-21 When using do not smoke.  
S-23 Do not breathe vapors.  
S-24/25 Avoid contact with skin and eyes.  
S-41 In case of fire and/or explosion, do not breathe fumes.  
S-51 Use only in well ventilated areas.

**Symbols:**

- Flammable  
Xn Harmful.

**Contains:**

Styrene.

**EU directives:**

Commission directive 2001/59/EC of August 6 2001 adapting to technical progress for the 28<sup>th</sup> time. Council directive 67/548/EEC on the approximation of the laws, regulations and administrative provisions relating to the classification, packaging and labeling of dangerous substances (Official journal L225 – 21/08/2001).

Dangerous preparations: directive 99/45 amended by directive 2001/60/EC – OJEC L226-22/08/2001.

Directive 91/155/EEC amended by directive 93/112/EEC and directive 2001/58/EC: Safety data sheets.

**Malaysia:**

Occupational safety and health (classification, packaging and labeling of hazardous chemicals) order 1997.

Guidelines for the classification of hazardous chemicals, department of occupational safety and health, ministry of human resources, 1997.

**16. OTHER INFORMATION:**

In accordance with the requirements of directive 2001/58/EC, the full text of risk phrases referred to in chapter 2 is stated here:

R-10 Flammable



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**Poly Klear**

Harmful by inhalation  
Irritating to eyes and skin

**Poly Klear**  
FIBERGLASS + RESIN  
User notes:

R-20  
R-36/38

**Poly Klear**  
FIBERGLASS + RESIN

In case of formulations or mixtures, the user must ensure that new hazards are not apparent in line with the above.

The information contained herein is based on our knowledge of the product, at the date of publishing and is given in good faith.

Please note the possible risks involved if this product is used for applications other than those for which it is intended.

This sheet shall only be used and reproduced for Health and Safety purposes.

The references to legislative & regulatory information and codes of practice are not exhaustive.

Other applicable regulations may be considered.

It is the responsibility of the user to refer to existing legislation concerning the use, storage and the safe handling of the product.

It is also the responsibility of the user to communicate ALL information related to the protection of Health, Safety & Environment contained within this Material Safety Data Sheet to those persons involved in the handling of this product.

**Poly Klear**  
FIBERGLASS + RESIN  
Information sources:

See also technical data sheet.

**Poly Klear**  
FIBERGLASS + RESIN

Revision date:

Revision number:

0

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## TECHNICAL DATA SHEET POLYKLEAR TOOLING GELCOAT

Tooling gelcoat is a low viscosity and medium reactivity of iso-phthalic-NPG unsaturated polyester resin gelcoat, can be classified to blade coating and spray coating according to operating methods.

Typical properties of liquid resin:

Property	Unit	Specification	Test Method
Appearance		Yellow, White, Red, Orange, Blue, Green	
Viscosity @25	CPS	1800 - 2000	CNS-9716
Gel Time	Min	15+/-5	K6731
Solid Content	%	60± 1.5	
Shelf Life @25	month	6	
Gravity		1.09~1.2	

1. Concentration: MEKPO – 1.50%; Cobalt(6%) – 1%.
2. Tests are based on CNS-9716, K6731
3. Thixotropic resin is also modified available
4. Viscosity and gel time are adjustable upon request.

Typical clear casting properties of cured resin

Property	US Standard	Test Method
Tensile Strength	6.8 kgf/mm <sup>2</sup>	ASTM D638
Flexural Strength	12 kg/mm <sup>2</sup>	ASTM D90
Flexural Modulus	350 kg/mm <sup>2</sup>	ASTM D790
Heat Distortion Temperature	80 C	ASTM D648
Elongation	2.1-3.1 %	ASTM D638
Barcol Hardness	40 -50	

Notes:

Shelf life of Tooling gelcoat is 6 month at 25 oC storage. Storage time will be

**shortened with elevating temperature. To avoid heat like sun shine and hot steam and to avoid moisture, water and stain from dropping into resin are required.**

**Drum must be sealed up to guarantee the quality.**

### Anti-corrosion Test

Item	Appearance	Weight Change (%)	Test
10%NaOH	No Change	6.12	ASTM C581-87
10%H <sub>2</sub> SO <sub>4</sub>	No Change	1.46	
10%HNO <sub>3</sub>	No Change	1.48	
10%HCl	No Change	1.07	
H <sub>2</sub> O	No Change	1.65	

Immersing testing went through 720 hours at 70 oC.

#### LUZON:

REGIONAL OFFICE  
TAGUIG  
1st Avenue, Sta. Maria Industrial Subd,  
Bagumbayan, Taguig City  
Tel.#: (02) 506-8519 ; 837-0710  
837-0708

#### VISAYAS:

HEADQUARTERS  
CEBU  
2F SEA Olympus Building, AC Cortes Ave.  
Trunkline #: (032) 421-7777  
Tel.#: (032) 346-7137 ; 421-7800 to 06  
421-7817 to 18 ; 421-7823  
Fax #: (032) 421-7789 ; 346-1817

#### MINDANAO:

REGIONAL OFFICE  
DAVAO  
Unit A16 J.King Warehouse Complex  
Km.3 Maa Road, Davao City 8000  
Telefax #: (082) 244-1206 ; 302-2711

✉ inquiry@olympus.com.ph



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## Technical Target of Gelcoat sheet Raw Materials

1.0 mm	430 G	
1.2 mm	300g +300g	
1.5 mm	300g +450g	
Width		
Fiatten width	Width of chopped strand mat	
1000 mm	1040 mm	
1000 mm	1270 mm	
Biaxial tension polyester film		
Items	Target	Unit
Transmission of light	85	%
Density	1.09 – 1.2	gm/cc
MEKPO ( M-50 )		
Items	Target	Unit
Reactive Oxygen Content	8.8 - 9	%
Appearance	Transparent liquid	
Visc.	24	mPas
Density	1.18	g/cm2
SADT	60	C

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TAGUIG1st Avenue, Sta. Maria Industrial Subd,  
Bagumbayan, Taguig City  
Tel.#: (02) 506-8519 ; 837-0710  
837-0708**VISAYAS:**HEADQUARTERS  
CEBU2F SEA Olympus Building, AC Cortes Ave.  
Trunkline #: (032) 421-7777  
Tel.#: (032) 346-7137 ; 421-7800 to 06  
421-7817 to 18 ; 421-7823  
Fax #: (032) 421-7789 ; 346-1817**MINDANAO:**REGIONAL OFFICE  
DAVAOUnit A16 J.King Warehouse Complex  
Km.3 Maa Road, Davao City 8000  
Telefax #: (082) 244-1206 ; 302-2711

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