

## Safety Data Sheet

According to Canadian Hazardous Products Regulations and WHMIS 2015

Initial preparation date: 12.16.2019

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Tough Resin

### SECTION 1: Identification

#### Product identifier

**Product name:** Tough Resin  
**Product code:** FLTOTL05

#### Recommended use of the product and restriction on use

**Relevant identified uses:** For use in Formlabs SLA Printers  
**Uses advised against:** Not determined or not applicable.  
**Reasons why uses advised against:** Not determined or not applicable.

#### Manufacturer or supplier details

**Manufacturer:**  
**United States**  
Formlabs, Inc  
35 Medford St  
Suite 201 Somerville, MA 02143  
6178550762  
sds@formlabs.com

#### Emergency telephone number:

**United States/Canada**  
CHEMTREC  
1-800-424-9300 (24 Hours)

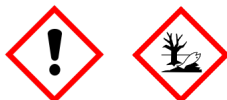
### SECTION 2: Hazard identification

#### GHS classification:

Skin irritation, category 2  
Eye irritation, category 2A  
Skin sensitization, category 1  
Chronic aquatic hazard, category 2

#### Label elements

##### Hazard pictograms:



**Signal word:** Warning

#### Hazard statements:

H315 Causes skin irritation  
H319 Causes serious eye irritation  
H317 May cause an allergic skin reaction  
H411 Toxic to aquatic life with long lasting effects

#### Precautionary statements:

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P264 Wash skin thoroughly after handling  
P280 Wear protective gloves/protective clothing/eye protection/face protection  
P261 Avoid breathing dust/fume/gas/mist/vapours/spray  
P272 Contaminated work clothing should not be allowed out of the workplace  
P302+P352 IF ON SKIN: Wash with plenty of soap and water  
P332+P313 If skin irritation occurs: Get medical advice/attention  
P362+P364 Take off contaminated clothing and wash it before reuse  
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing  
P337+P313 If eye irritation persists: Get medical advice/attention  
P333+P313 If skin irritation or rash occurs: Get medical advice/attention  
P363 Wash contaminated clothing before reuse  
P501 Dispose of contents/container in accordance with local/regional/national regulations

### Hazards not otherwise classified:

None

## SECTION 3: Composition/information on ingredients

Identification	Name	Weight %
CAS number: Trade Secret	Methacrylate Monomer(s)	25-45
CAS number: Trade Secret	Urethane dimethacrylate	55-75
CAS number: Trade Secret	Photoinitiator(s)	<0.9

**Additional Information:** None

## SECTION 4: First-aid measures

### Description of first-aid measures

#### General notes:

Show this Safety Data Sheet to the doctor in attendance.

#### After inhalation:

Remove source of exposure or move person to fresh air and keep comfortable for breathing. If experiencing respiratory symptoms: Call a POISON CENTER or doctor.

#### After skin contact:

Wash off immediately with soap and plenty of water while removing contaminated clothing and shoes. Continue rinsing for at least 15 minutes. See a physician if irritation persists.

#### After eye contact:

Immediately flush eyes, under eyelids with water for 15 minutes. Remove contact lenses, if present to do so. Protect unexposed eye. Continue rinsing on the way to hospital.

#### After ingestion:

If swallowed, DO NOT induce vomiting unless told to do so by physician or poison control center. Rinse

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mouth with water. Never give anything to drink to an unconscious person. Seek medical advice.

### Most important symptoms and effects, both acute and delayed

#### Acute symptoms and effects:

Symptoms may include blistering, irritation, burns and pain. Effects are dependent on exposure (dose, concentration, contact time).

#### Delayed symptoms and effects:

Symptoms of poisoning may appear several hours later.

### Immediate medical attention and special treatment

#### Specific treatment:

None known.

#### Notes for the doctor:

Treat symptomatically.

## SECTION 5: Fire-fighting measures

### Extinguishing media

#### Suitable extinguishing media:

Alcohol- resistant foam, Dry chemical or Carbon dioxide

#### Unsuitable extinguishing media:

None known

### Specific hazards during fire-fighting:

Evacuate all personnel to a predetermined safe location, no less than 2,500 feet in all directions. Can explode or detonate under fire conditions. Burning material may produce toxic vapors.

### Special protective equipment for firefighters:

Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA)

### Special precautions:

Avoid inhaling gases, fumes, mist, dust, vapor or aerosols. Avoid contact with eyes, skin, hair or clothing.

## SECTION 6: Accidental release measures

### Personal precautions, protective equipment and emergency procedures:

Wear respiratory protection. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. For personal protection see section 8.

### Environmental precautions:

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

### Methods and material for containment and cleaning up:

Contain and soak up spill with absorbent that does not react with spilled product. Place used absorbent into suitable, covered, labelled containers for disposal.

### Reference to other sections:

For disposal see section 13.

## SECTION 7: Handling and storage

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### Precautions for safe handling:

Avoid contact with skin, eyes, and clothing. Follow good hygiene procedures when handling chemical materials. Refer to Section 8. Follow proper disposal methods. Refer to Section 13. Do not eat, drink, smoke, or use personal products when handling chemical substances.

### Conditions for safe storage, including any incompatibilities:

Store in a cool, dry, well ventilated place. Store away from sources of heat or ignition. Store away from incompatible materials described in Section 10. Keep containers closed when not in use

## SECTION 8: Exposure controls/personal protection

Only those substances with limit values have been included below.

### Occupational Exposure limit values:

No occupational exposure limits noted for the ingredient(s).

### Biological limit values:

No biological exposure limits noted for the ingredient(s).

### Information on monitoring procedures:

Not determined or not applicable.

### Appropriate engineering controls:

Effective ventilation in all processing areas.

### Personal protection equipment

#### Eye and face protection:

Safety goggles

#### Skin and body protection:

Impervious clothing and chemical resistant gloves

#### Respiratory protection:

In case of insufficient ventilation, wear suitable respiratory protection

### General hygienic measures:

Handle in accordance with good industrial hygiene and safety measures. Wash hands and face after handling chemical products. Wash hands before eating, drinking and smoking. Wash hands at the end of the workday.

## SECTION 9: Physical and chemical properties

### Information on basic physical and chemical properties

Appearance (physical state, color):	Blue/Green Liquid
Odor:	Characteristic acrylate
Odor threshold:	Not determined or not available.
pH-value:	Not determined or not available.
Melting/Freezing point:	Not determined or not available.
Boiling point/range:	> 100°C
Flash point:	> 93.5°C
Evaporation rate:	Not determined or not available.
Flammability (solid, gaseous):	Not Flammable

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Explosion limit upper:	Not determined or not available.
Explosion limit lower:	Not determined or not available.
Vapor pressure:	Not determined or not available.
Vapor density:	Not determined or not available.
Density:	1.11 g/cm <sup>3</sup>
Relative density:	Not determined or not available.
Solubilities:	Not determined or not available.
Partition coefficient (n-octanol/water):	Not determined or not available.
Auto/Self-ignition temperature:	Not determined or not available.
Decomposition temperature:	Not determined or not available.
Dynamic viscosity:	890 cps @ 35°C
Kinematic viscosity:	Not determined or not available.
Explosive properties	Not determined or not available.
Oxidizing properties	Not determined or not available.

### Other information

## SECTION 10: Stability and reactivity

### Reactivity:

Does not react under normal conditions of use and storage.

### Chemical stability:

Stable under normal storage and handling conditions.

### Possibility of hazardous reactions:

Under normal conditions of storage and use, hazardous reactions will not occur.

### Conditions to avoid:

Incompatible materials.

Avoid storage >38°C (100°F) and exposure to light/direct sunlight and heat.

### Incompatible materials:

Strong oxidizing agents.

Polymerization initiators, including peroxides, strong oxidizing agents, alcohols, copper, copper alloys, carbon steel, iron, rust, and strong bases.

### Hazardous decomposition products:

Under normal conditions of storage and use, hazardous decomposition products should not be produced.

## SECTION 11: Toxicological information

### Acute toxicity

**Assessment:** Based on available data, the classification criteria are not met.

**Product data:** No data available.

### Substance data:

Name	Route	Result
Methacrylate Monomer(s)	oral	LD50 Rat: >2000 mg/kg
	dermal	LD50 Rabbit : >5000 mg/kg
Photoinitiator(s)	oral	LD50 Rat : >5000 mg/kg

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### Skin corrosion/irritation

**Assessment:**

Causes skin irritation.

**Product data:**

No data available.

**Substance data:** No data available.

### Serious eye damage/irritation

**Assessment:**

Causes serious eye irritation.

**Product data:**

No data available.

**Substance data:**

Name	Result
Methacrylate Monomer(s)	Causes serious eye irritation.

### Respiratory or skin sensitization

**Assessment:**

May cause an allergic skin reaction.

**Product data:**

No data available.

**Substance data:**

Name	Result
Methacrylate Monomer(s)	May cause an allergic skin reaction.
Urethane dimethacrylate	May cause an allergic skin reaction.
Photoinitiator(s)	May cause an allergic skin reaction.

### Carcinogenicity

**Assessment:** Based on available data, the classification criteria are not met.

**Product data:** No data available.

**Substance data:** No data available.

**International Agency for Research on Cancer (IARC):** None of the ingredients are listed.

**National Toxicology Program (NTP):** None of the ingredients are listed.

### Germ cell mutagenicity

**Assessment:** Based on available data, the classification criteria are not met.

**Product data:**

No data available.

**Substance data:** No data available.

### Reproductive toxicity

**Assessment:** Based on available data, the classification criteria are not met.

**Product data:**

No data available.

**Substance data:** No data available.

### Specific target organ toxicity (single exposure)

**Assessment:** Based on available data, the classification criteria are not met.

**Product data:**

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No data available.

**Substance data:** No data available.

### Specific target organ toxicity (repeated exposure)

**Assessment:** Based on available data, the classification criteria are not met.

**Product data:**

No data available.

**Substance data:** No data available.

### Aspiration toxicity

**Assessment:** Based on available data, the classification criteria are not met.

**Product data:**

No data available.

**Substance data:** No data available.

### Information on likely routes of exposure:

No data available.

### Symptoms related to the physical, chemical and toxicological characteristics:

No data available.

### Other information:

No data available.

## SECTION 12: Ecological information

### Acute (short-term) toxicity

**Assessment:** Based on available data, the classification criteria are not met.

**Product data:** No data available.

**Substance data:** No data available.

### Chronic (long-term) toxicity

**Assessment:** Toxic to aquatic life with long lasting effects.

**Product data:** No data available.

**Substance data:** No data available.

### Persistence and degradability

**Product data:** No data available.

**Substance data:**

Name	Result
Methacrylate Monomer(s)	This substance is readily biodegradable.
Urethane dimethacrylate	This substance is not readily biodegradable.
Photoinitiator(s)	The substance is not readily biodegradable.

### Bioaccumulative potential

**Product data:** No data available.

**Substance data:**

Name	Result
Methacrylate Monomer(s)	The substance has low potential to bioaccumulate because of log Kow value (0.97 at 20 deg C).
Photoinitiator(s)	This substance is not expected to bioaccumulate because of log Kow (2.91).

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### Mobility in soil

**Product data:** No data available.

**Substance data:**

Name	Result
Methacrylate Monomer(s)	The substance has a low potential for adsorption to soil
Urethane dimethacrylate	This substance is expected to distribute between the water column and organic soil and sediment particles.
Photoinitiator(s)	This substance is expected to be adsorbed by the soil.

**Other adverse effects:** No data available.

## SECTION 13: Disposal considerations

### Disposal methods:

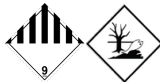
It is the responsibility of the waste generator to properly characterize all waste materials according to applicable regulatory entities

### Contaminated packages:

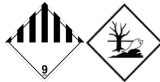
Not determined or not applicable.

## SECTION 14: Transport information

### Canadian Transportation of Dangerous Goods (TDG)

UN number	UN 3082
UN proper shipping name	Environmentally hazardous liquid, N.O.S. Methacrylate Polymer
UN transport hazard class(es)	9 
Packing group	III
Environmental hazards	Marine Pollutant
Special precautions for user	None
Additional Information	This product is not regulated as a dangerous good when transported in sizes of ≤5L or ≤5 kg provided the packaging meets the general provisions of TDG schedule 1 provision 99

### International Maritime Dangerous Goods (IMDG)

UN number	Not regulated
UN proper shipping name	Environmentally hazardous liquid, N.O.S. Methacrylate Polymer
UN transport hazard class(es)	9 
Packing group	III
Environmental hazards	Marine Pollutant
Special precautions for user	None



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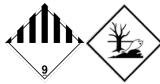
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<b>Additional Information</b>	This product is not regulated as a dangerous good when transported in sizes of ≤5L or ≤5 kg provided the packaging meets the general provisions of 4.1.1.1, 4.1.1.2 and 4.1.1.4 to 4.1.1.8.
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### International Air Transport Association Dangerous Goods Regulations (IATA-DGR)

<b>UN number</b>	Not regulated
<b>UN proper shipping name</b>	Environmentally hazardous liquid, N.O.S. Methacrylate Polymer
<b>UN transport hazard class(es)</b>	9 
<b>Packing group</b>	III
<b>Environmental hazards</b>	Marine Pollutant
<b>Special precautions for user</b>	None
<b>Additional Information</b>	This product is not regulated as a dangerous good when transported in sizes of ≤5L or ≤5 kg provided the packaging meets the general provisions of 5.0.2.4.1, 5.0.2.6.1 and 5.0.2.8.

<b>Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code</b>	
<b>Bulk Name</b>	None
<b>Ship type</b>	None
<b>Pollution category</b>	None

## SECTION 15: Regulatory information

### Canada regulations

#### Domestic substances list (DSL):

Trade Secret	Methacrylate Monomer(s)	Listed
Trade Secret	Urethane dimethacrylate	Not Listed
Trade Secret	Photoinitiator(s)	Listed

#### Non-domestic substances list (NDSL):

Trade Secret	Urethane dimethacrylate	Listed
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## SECTION 16: Other information

**Abbreviations and Acronyms:** None

### Disclaimer:

This product has been classified in accordance with the Canadian Hazardous Products Regulations and WHMIS 2015. The information provided in this SDS is correct, to the best of our knowledge, based on information available. The information given is designed only as a guidance for safe handling, use, storage, transportation and disposal and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination

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with any other materials, unless specified in the text. The responsibility to provide a safe workplace remains with the user.

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**End of Safety Data Sheet**