1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

Product information

<table>
<thead>
<tr>
<th>Trade name</th>
<th>Orthoresin Liquid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Company</td>
<td>DeguDent GmbH</td>
</tr>
<tr>
<td></td>
<td>Postfach 1364</td>
</tr>
<tr>
<td></td>
<td>D-63403 Hanau</td>
</tr>
<tr>
<td>Telephone</td>
<td>+49 (0)6181/59-5767</td>
</tr>
<tr>
<td>Telefax</td>
<td>+49 (0)6181/59-5879</td>
</tr>
<tr>
<td>Email address</td>
<td><a href="mailto:SDB@degudent.de">SDB@degudent.de</a></td>
</tr>
<tr>
<td>Emergency telephone</td>
<td>+49 (0)180 / 23 24-555</td>
</tr>
</tbody>
</table>

Use of the Substance / Preparation: For dental use only.

REACH Registration No.: if available listed in Chapter. 3

2. HAZARDS IDENTIFICATION

Classification as per Directive 67/548/EC or Directive 1999/45/EC

F: Highly flammable
R11: Highly flammable.

Xi: Irritant
R37/38: Irritating to respiratory system and skin.

R43: May cause sensitisation by skin contact.

Additional safety information for humans and the environment

When heated, formation of explosive vapour/air mixtures.
Danger of bursting of closed systems to vigorous exothermic polymerization. Avoid uncontrolled polymerization.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Information on ingredients / Hazardous components as per Directive 67/548/EC or Directive 1999/45/EC

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
<th>CAS-No.</th>
<th>EC-No.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>methyl methacrylate</strong></td>
<td>&gt; 90%</td>
<td>80-62-6</td>
<td>201-297-1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>F: R11</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Xi: R37/38</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>R43</td>
<td></td>
</tr>
<tr>
<td><strong>ethylene dimethacrylate</strong></td>
<td>&lt; 10%</td>
<td>97-90-5</td>
<td>202-617-2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Xi: R37</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>R43</td>
<td></td>
</tr>
</tbody>
</table>
4. FIRST AID MEASURES

General advice
Take off all contaminated clothing immediately.

Inhalation
Move victims into fresh air.
Consult a physician immediately.

Skin contact
Wash off immediately with soap and plenty of water.
Consult a physician immediately.

Eye contact
With eye held open, thoroughly rinse immediately with plenty of water for at least 5 minutes.
Consult an ophthalmologist.

Ingestion
Do not induce vomiting.
Have the mouth rinsed with water.
Have patient drink plenty of water in small sips.
Consult a physician immediately.

Notes to physician
Specific therapy/antidote treatment: none known
If required, therapy of irritative effect.
If substance has been swallowed:
Allergic reactions of the skin are possible.
Treatment of allergic reaction if necessary.
Early endoscopy in order to assess mucosa lesions in the oesophagus and stomach which may appear. If necessary, aspirate leftover substance.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media
mist, carbon dioxide (CO2), quenching foam - polar

Extinguishing media which must not be used for safety reasons
high volume water jet

Specific hazards during fire fighting
In case of combustion or decomposition of the product, the fumes produced lead to irritations or inflammations of the respiratory tract.
When heated, formation of explosive vapour/air mixtures.

Special protective equipment for fire-fighters
In the case of fire, wear respiratory protective equipment independent of surrounding air and chemical protective suit.

Further information
In case of fire cool containers or take them to a safe place.
Use water spray to cool unopened containers.
6. ACCIDENTAL RELEASE MEASURES

Personal precautions
- Keep unauthorized persons away.
- Wear personal protective equipment.
- Avoid coming into contact with the following substance/substance classes: Product.

Environmental precautions
- Prevent substance from entering soil, natural bodies of water and sewer systems.
- Avoid penetration into drainage system or in rooms situated at a lower level because of danger of explosion.

Methods for cleaning up
- Remove all sources of ignition.
- Absorb with liquid-binding material (e.g. inert absorbent sand universal binder).
- Pick up mechanically with a suitable device and collect in a suitable container.

Additional advice
- Ensure explosion proofness.
- Dispose of contaminated material as a waste in a correct manner.

7. HANDLING AND STORAGE

Handling
Safe handling advice
- Always close container tightly after removal of product.
- Avoid light effect heat sun rays.
- Vapours are heavier than air.
- Only fill up to 90 % of the container as air is required to stabilize.

Advice on protection against fire and explosion
- Product is flammable.
- Product is highly flammable.
- Keep away from sources of ignition - No smoking.
- Explosion-proof installations required.
- Take precautionary measures against static discharges.

Storage
Requirements for storage areas and containers
- Keep containers tightly closed in a dry, cool and well-ventilated place.
- Ensure there is good room ventilation.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No.</th>
<th>EC-No.</th>
<th>Control parameters</th>
<th>Control parameters</th>
</tr>
</thead>
<tbody>
<tr>
<td>methyl methacrylate</td>
<td>80-62-6</td>
<td>201-297-1</td>
<td>50 ppm</td>
<td>100 ppm</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>208 mg/m³</td>
<td>416 mg/m³</td>
</tr>
</tbody>
</table>

Engineering measures
- Ensure suitable suction/aeration at the work place and with operational machinery.
Personal protective equipment

Respiratory protection
If workplace exposure limit is exceeded apply Respirator with brown A-type filter.

Hand protection
Wear protective gloves made of the following materials: solvent-resistant material.

Glove material: butyl-rubber
Material thickness: 0.5 mm
Break through time: 60 min

Method: Source: GESTIS substance database (hazardous substance information system of commercial professional associations)

The suitability for a specific workplace should be discussed with the producers of the protective gloves.
The exact break through time can be obtained from the protective glove producer and this has to be observed.

Preventive skin protection
Use barrier cream regularly.

Eye protection
goggles

Skin and body protection
Immediately change moistened and saturated work clothes.
Use suitable skin protective agents before handling product. Cleanse and apply cream to skin after work.
Preventive skin protection recommended.

Hygiene measures
No eating, drinking, smoking, or snuffing tobacco at work. Wash face and/or hands before break and end of work.
If workplace exposure limits are exceeded and/or larger amounts are released (leakage, spilling, dust) the indicated respiratory protection should be used.
Avoid contact with skin and eyes.
After contact with skin, wash immediately with plenty of water.
If there is the possibility of skin/eye contact, the indicated hand/eye/body protection should be used.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Form: liquid
Colour: according to the coloration
Odour: ester-like

Safety data

Melting point/range: -48.2 °C related to substance: methyl methacrylate

Boiling point/range: 100.3 °C (1013 hPa) related to substance: methyl methacrylate

Method: DIN 51 751

Flash point: 10 °C related to substance: methyl methacrylate

Method: DIN 51 755

Ignition temperature: 430 °C related to substance: methyl methacrylate

Method: DIN 51 794

Lower explosion limit: 2.1 % (V) related to substance: methyl methacrylate
Upper explosion limit 12.5 % (V) related to substance: methyl methacrylate
Vapour pressure 38.7 hPa (20 °C) related to substance: methyl methacrylate
Density 0.94 g/cm³ (20 °C) Method: DIN 51757 related to substance: methyl methacrylate
Water solubility 15.9 g/l (20 °C) related to substance: methyl methacrylate
Partition coefficient (n-octanol/water) POW: 1.38 (measured) (literature value) related to substance: methyl methacrylate
Viscosity, dynamic 0.63 mPa.s (20 °C) Method: Brookfield method related to substance: methyl methacrylate

10. STABILITY AND REACTIVITY

Conditions to avoid
Avoid light effect / sun rays.
Protect from heat sources of ignition.

Materials to avoid
Product polymerizes on contact with radical generating substances such as peroxides, azo compounds, heavy metal compounds, solutions.

Hazardous reactions
Danger of bursting of closed systems to vigorous exothermic polymerization. Avoid uncontrolled polymerization.

11. TOXICOLOGICAL INFORMATION

Acute oral toxicity LD50 Rat: > 5000 mg/kg Method: OECD Test Guideline 401 literature related to substance: methyl methacrylate
Acute inhalation toxicity LC50 Rat: 29.8 mg/l / 4 h (literature value) related to substance: methyl methacrylate
Acute dermal toxicity LD50 Rabbit: > 5000 mg/kg literature related to substance: methyl methacrylate
Skin irritation Rabbit / 24 h not irritating Method: Draize Test related to substance: methyl methacrylate
Eye irritation Rabbit not irritating
Method: Draize Test
related to substance: methyl methacrylate

Sensitization
guinea pig: positive and negative
literature
related to substance: methyl methacrylate

Repeated dose toxicity
inhalative Rat
Testing period: 2 years
NOAEL 25 mg/kg
target organ/effect: irritative effects, skin linings
literature
related to substance: methyl methacrylate

Oral Rat
Testing period: 2 years
NOAEL 2000 mg/kg
drinking water analysis
no therapy-related results
literature
related to substance: methyl methacrylate

Gentoxicity in vitro
positive and negative
literature
related to substance: methyl methacrylate

Gentoxicity in vivo
no evidence of mutagenic effects
literature
related to substance: methyl methacrylate

Mutagenicity assessment
in vivo: no evidence of mutagenic effects

Carcinogenicity
inhalative Rat
related to substance: methyl methacrylate

Oral Rat
related to substance: methyl methacrylate

inhalative mouse
related to substance: methyl methacrylate

Oral mouse
related to substance: methyl methacrylate

inhalative dog
related to substance: methyl methacrylate

Oral dog
related to substance: methyl methacrylate

carcinogenicity assessment
no evidence that cancer may be caused, literature.
related to substance: methyl methacrylate

teratogenicity assessment
no evidence of teratogenic properties
related to substance: methyl methacrylate
12. ECOLOGICAL INFORMATION

Elimination information (persistence and degradability)

Biodegradability

Exposure time: 14 day
Result: 94 % Readily biodegradable.
Method: OECD 301 C
related to substance: methyl methacrylate

Ecotoxicity effects

Toxicity to fish
LC50 Lepomis macrochirus: 191 mg/l / 96 h
literature
related to substance: methyl methacrylate

Onchorhynchus mykiss: > 79 mg/l / 96 h
Method: OECD 203
literature
related to substance: methyl methacrylate

Toxicity to daphnia
EC50 Daphnia magna: 68 mg/l / 48 h
Method: OECD 202
(literature value)
related to substance: methyl methacrylate

EC50 Daphnia magna: 49 mg/l / 21 d
Method: OECD 202 part 2
(literature value)
related to substance: methyl methacrylate

Toxicity to algae
EC50 selenastrum capricornutum: 170 mg/l / 96 h
Method: OECD 201
literature
related to substance: methyl methacrylate

Toxicity to bacteria
EC0 Pseudomonas putida: 100 mg/l
literature
related to substance: methyl methacrylate

Further information on ecology

Further Information
Prevent penetration into soil, stretches of water and drainage systems.

13. DISPOSAL CONSIDERATIONS

Product
Disposal according to local authority regulations.

Uncleaned packaging
Disposal according to local authority regulations.

14. TRANSPORT INFORMATION

Land transport ADR/RID/GGVSEB (Germany)

Class 3
ADR/RID-Labels 3
# SAFETY DATA SHEET (EC 1907/2006)

## Orthoresin Liquid

<table>
<thead>
<tr>
<th>Material no.</th>
<th>Specification</th>
<th>Version</th>
<th>Revision date</th>
<th>Print Date</th>
<th>Page</th>
</tr>
</thead>
</table>

**UN-No** 1247

**Packaging group** II

**orange warning plate** 339 / 1247

**Tunnel Restriction Code (ADR)** (D/E)

**Description of the goods (Technical name)**

METHYL METHACRYLATE MONOMER, STABILIZED

### Sea transport IMDG-Code/GGVSee (Germany)

<table>
<thead>
<tr>
<th>Class</th>
<th>UN-No</th>
<th>Packaging group</th>
<th>EmS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sea</td>
<td>3</td>
<td>2</td>
<td>EmS</td>
</tr>
</tbody>
</table>

**Proper technical name (Proper shipping name)**

METHYL METHACRYLATE MONOMER, STABILIZED

### Air transport ICAO-TI/IATA-DGR

<table>
<thead>
<tr>
<th>Class</th>
<th>UN-No</th>
<th>Packaging group</th>
<th>EmS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air</td>
<td>3</td>
<td>2</td>
<td>EmS</td>
</tr>
</tbody>
</table>

**Proper technical name (Proper shipping name)**

Methyl methacrylate monomer, stabilized

### Inland waterway transport ADN/ADNR/GGVSEB (Germany)

<table>
<thead>
<tr>
<th>Class</th>
<th>ADR/RID-Labels</th>
<th>UN-No / Substance number</th>
<th>Packaging group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inland</td>
<td>3</td>
<td>1247</td>
<td>2</td>
</tr>
</tbody>
</table>

**Description of the goods (Technical name)**

METHYL METHACRYLATE MONOMER, STABILIZED

### Loading instructions/Remarks

- **IATA_C** ERG-Code 3L
- **IATA_P** ERG-Code 3L

**IMDG**

Clear of living quarters.

**ADR**

Measures as 2.2.3.2.2 ADR/RID/ADNR have been applied.

**ADR**

Observe listed materials regulation §35, paragraph 1 GGVSEB

**ADNR**

Measures as 2.2.3.2.2 ADR/RID/ADNR have been applied.

### 15. REGULATORY INFORMATION

#### Labelling according to EC Directives

**hazard-defining component(s)**

- methyl methacrylate

**Symbol(s)**

<table>
<thead>
<tr>
<th>F</th>
<th>Highly flammable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Xi</td>
<td>Irritant</td>
</tr>
</tbody>
</table>

**R-phrase(s)**

<table>
<thead>
<tr>
<th>R11</th>
<th>Highly flammable.</th>
</tr>
</thead>
<tbody>
<tr>
<td>R37/38</td>
<td>Irritating to respiratory system and skin.</td>
</tr>
<tr>
<td>R43</td>
<td>May cause sensitisation by skin contact.</td>
</tr>
</tbody>
</table>

**S-phrase(s)**

<table>
<thead>
<tr>
<th>S 2</th>
<th>Keep out of the reach of children.</th>
</tr>
</thead>
<tbody>
<tr>
<td>S24</td>
<td>Avoid contact with skin.</td>
</tr>
<tr>
<td>S37</td>
<td>Wear suitable gloves.</td>
</tr>
<tr>
<td>S46</td>
<td>If swallowed, seek medical advice immediately and show this container or label.</td>
</tr>
</tbody>
</table>
National legislation

employment restriction

The employment limitations under the protection of young persons act, the laws on pregnant women and young mothers and work at home is/are to be observed.

16. OTHER INFORMATION

Risk phrase (R phrase) texts

- methyl methacrylate
  - R11  Highly flammable.
  - R37/38 Irritating to respiratory system and skin.
  - R43  May cause sensitisation by skin contact.

- ethylene dimethacrylate
  - R37  Irritating to respiratory system.
  - R43  May cause sensitisation by skin contact.

Further information

Changes since the last version are highlighted in the margin. This version replaces all previous versions.

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