Safety Data Sheet

1. Identification of the substance/mixture and of the company/undertaking
1.1. Product identifier
   imageCure, PRF35-ST

1.2. Relevant identified uses of the substance or mixture and uses advised against
   Stereolithography Resin

1.3. Details of the supplier of the safety data sheet
   Manufacture's name: Roland DG Corporation
   Address: 1-6-4 Shinmiyakoda, Kita-ku, Hamamatsu-shi, Shizuoka-ken, 431-2103
   JAPAN
   Phone: + 81-53-484-1224
   Fax: + 81-53-484-1226

1.4. Emergency telephone:

2. Hazard identification
2.1. Classification of the substance or mixture
   This product is classified as dangerous according to GHS.
   Skin corrosion/irritation: Category 2
   Eye damage/irritation: Category 2A
   Hazardous to the aquatic environment - long-term hazard: Category 3

2.2. GHS label elements, including precautionary statements
   Pictogram

   Signal word(s)          Warning
   Hazard statement(s)
   Causes skin irritation.
   Causes serious eye irritation.
   Harmful to aquatic life with long lasting effects.
Precautionary statement(s)

Prevention
Avoid release to the environment.
Wear protective gloves/protective clothing/eye protection/face protection.

Response
IF ON SKIN: Wash with plenty of soap and water.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
If skin irritation occurs / If eye irritation persists: Get medical advice/attention.

2.3. Other hazards
Potential Health Effects:

Eyes:
Causes severe eye injury which may persist for several days.

Skin:
Contact with skin may cause irritation, swelling or redness, allergic sensitization.

Inhalation:
Exposure to vapors (mist) will cause respiratory irritation and anesthesia.

Ingestion:
May cause injury of mouth, throat, and stomach.

Chronic Health Hazards:
Repeated skin contact may cause a persistent irritation or dermatitis.

Carcinogenicity:
None of the ingredients in this resin is listed by IARC as a carcinogen. (1,2A and 2B)

3. Composition/information on ingredients
Chemical nature: mixture

<table>
<thead>
<tr>
<th>Composition</th>
<th>CAS No.</th>
<th>EC No.</th>
<th>EU registration No.</th>
<th>% By Weight</th>
<th>Classification EC No. 1272/2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poly(oxy-1,2-ethanediyl), .alpha.-{(1-oxo-2-propen-1-yl).omega.-phenoxy-}</td>
<td>56641-05-5</td>
<td>500-133-9</td>
<td>N/A for the moment</td>
<td>50-60</td>
<td>Skin Irrit. 2: H315 Eye Irrit. 2: H319</td>
</tr>
<tr>
<td>Unsaturated aliphatic urethane triacrylate oligomer</td>
<td>-</td>
<td>-</td>
<td>N/A for the moment</td>
<td>35-45</td>
<td>Skin Irrit. 2: H315 Eye Irrit. 2: H319</td>
</tr>
<tr>
<td>1-Propanone, 2-methyl-1-[4-(methylthio)phenyl]-2-(4-morpholino)</td>
<td>71868-10-5</td>
<td>400-600-6</td>
<td>N/A for the moment</td>
<td>&lt;10</td>
<td>Acute Tox. 4: H302 Aquatic Chronic 2: H411</td>
</tr>
</tbody>
</table>

*For the full text of the H-Statements mentioned in this Section, see Section 16.*
4. First aid measures
4.1. Description of first aid measures
   Eyes: In case of contact, immediately flush eyes with plenty of water for several minutes. Hold eyelids open during flushing. Call a physician.
   Skin: In case of contact, immediately flush with plenty of water while removing contaminated clothing and shoes. Wash contaminated clothing before reuse. If swelling or redness occurs, call a physician.
   Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.
   Ingestion: If swallowed, DO NOT induce vomiting. Seek immediate medical advice.

4.2. Most important symptoms and effects, both acute and delayed
   Eyes: Causes severe eye injury which may persist for several days.
   Skin: Contact with skin may cause irritation, swelling or redness, allergic sensitization.
   Inhalation: Exposure to vapors (mist) will cause respiratory irritation and anesthesia.
   Ingestion: May cause injury of mouth, throat, and stomach.

4.3. Indication of any immediate medical attention and special treatment needed
   No information

5. Firefighting measures
5.1. Extinguishing media
   Suitable extinguishing media:
   - Dry chemical, Foam, Carbon dioxide, Dry sand, Loaded stream in spray.
   Unsuitable extinguishing media:
   - Water, High-pressure water jet

5.2. Special hazards arising from the substance or mixture
   Hazardous decomposition products: Carbon monoxide, carbon dioxide, oxides of nitrogen, toxic gases/vapors.
   Flash Point: >93deg.C

5.3. Advice for firefighters
   Wear special chemical protective clothing and positive pressure self-contained breathing apparatus (SCBA). Approach fire from upwind to avoid hazardous vapors and toxic decomposition products. Decontaminate or discard any clothing that may contain chemical residues. Applying direct water may be dangerous because fire may expand to surroundings.
6. Accidental release measures
6.1. Personal precautions, protective equipment and emergency procedures
    Evacuate personnel, thoroughly ventilate area, use self-contained breathing apparatus and wear appropriate personal
    protective equipment.
6.2. Environmental precautions
    Wipe off spillage. Prevent liquid from entering sewers, waterways or low areas.
6.3. Methods and material for containment and cleaning up
    Sweep up material and dispose as waste following local regulations.

6.4. Reference to other sections
    Refer to “Section 8 Exposure controls/ personal protection” and “Section 13 Disposal consideration” as appropriate.

7. Handling and storage
7.1. Precautions for safe handling
    Avoid contact with eyes, skin and clothing. Use proper ventilation and no fire in work place. Keep out of reach of children
    and do not drink. Do not dismantle container.
7.2. Conditions for safe storage, including any incompatibilities
    Keep containers tightly closed. Do not store the product in high or freezing temperatures. Keep the product out of direct
    sunlight. Do not store the product with metals, amines, free radical initiators, oxidising agents.
7.3. Specific end use(s): Stereolithography Resin

8. Exposure controls/ personal protection
8.1. Control parameters
    Occupational Exposure Limits:
    DNEL(Derived No Effect Level)

<table>
<thead>
<tr>
<th>components</th>
<th>Long term exposure</th>
<th>Short term exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-Propanone, 2-methyl-1-[4-(methylthio)phenyl]-2-(4-morpholinyl)-</td>
<td>0.32mg/m³</td>
<td>5.38mg/m³</td>
</tr>
</tbody>
</table>

*Refere to Toxicological Information of REACH registered substance.  
(Assessment information of exposure via inhalation route for workers)
8.2 Exposure controls:

Appropriate engineering controls: Provide general and/or local exhaust ventilation.

Respiratory protection:
In case ventilation is insufficient, employee must use NIOSH approved air purifying respiratory protection equipment. Use a half facepiece respirator (with goggles) or full face-piece respirator (without goggles) filtered with organic vapor cartridge. For emergency and other conditions where the exposure guideline may be exceeded, use an approved positive-pressure self-contained breathing apparatus or positive-pressure airline with auxiliary self contained air supply. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.

Hand protection:
When handling the resin or washing the multiple job, use protective gloves. Recommended Chemical Protective Gloves are ethylene vinyl alcohol (EVA) Gloves and Laminate gloves. Laminate gloves are made by cutting and then heat-sealing patterns of various hand sizes from laminated sheets of EVA sealed between layers of polyethylene.

Eye protection:
When handling the resin, wear safety glasses or chemical splash goggles.

Skin protection:
When handling the resin, wear protective clothing.

Hygiene measures:
Wash hands after handling. In case contact with clothing, wash before reuse. Do not eat, drink or smoke in handling or storage area.

Environmental exposure control: Avoid release to the environment.

9. Physical and chemical properties

9.1. Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Clear Liquid</td>
</tr>
<tr>
<td>Odour</td>
<td>Characteristic odor</td>
</tr>
<tr>
<td>Odour threshold</td>
<td>No data available</td>
</tr>
<tr>
<td>pH</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Melting point/freezing point</td>
<td>No data available</td>
</tr>
<tr>
<td>Initial boiling point and boiling range</td>
<td>No data available</td>
</tr>
<tr>
<td>Flash point</td>
<td>&gt; 93deg.C</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>No data available</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Upper/lower flammability or explosive limits</td>
<td>No data available</td>
</tr>
<tr>
<td>Vapor pressure</td>
<td>No data available</td>
</tr>
<tr>
<td>Vapor density</td>
<td>No data available</td>
</tr>
<tr>
<td>Relative density</td>
<td>No data available</td>
</tr>
<tr>
<td>Solubility</td>
<td>No data available</td>
</tr>
<tr>
<td>Solubility (ies)</td>
<td>Water solubility: Slightly soluble</td>
</tr>
<tr>
<td>Partition coefficient: n-octanol/water</td>
<td>No data available</td>
</tr>
<tr>
<td>Auto-ignition temperature</td>
<td>No data available</td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>No data available</td>
</tr>
<tr>
<td>Viscosity</td>
<td>No data available</td>
</tr>
<tr>
<td>Explosive properties</td>
<td>No data available</td>
</tr>
<tr>
<td>Oxidizing properties</td>
<td>No data available</td>
</tr>
<tr>
<td>Volatile organic compounds (VOC)</td>
<td>No data available</td>
</tr>
<tr>
<td>content</td>
<td></td>
</tr>
</tbody>
</table>

9.2. Other information: No information
10. Stability and reactivity
10.1. Reactivity: High temperatures and UV light may cause rapid polymerization.
10.2. Chemical stability: Polymerize under heat and/or light.
10.3. Possibility of hazardous reactions: Not expected
10.4. Conditions to avoid: Elevated temperatures/heat, UV light, when not in use.
10.5. Incompatible materials: Avoid contact with acids, amines, free radical initiators, oxidizing agents.

11. Toxicological information
11.1. Information on toxicological effects
   Acute toxicity:
   1-Propanone, 2-methyl-1-[4-(methylthio)phenyl]-2-(4-morpholinyl)-
   LD50 (Oral-rat) 1984 mg/kg
   Serious eye damage/eye irritation: No data available
   Causes serious eye irritation. (Poly(oxy-1,2-ethanediyl), .alpha.-(1-oxo-2-propen-1-yl)-.omega.-phenoxy-, Unsaturated aliphatic urethane triacrylate oligomer)
   Skin corrosion/irritation: No data available
   Causes skin irritation. (Poly(oxy-1,2-ethanediyl), .alpha.-(1-oxo-2-propen-1-yl)-.omega.-phenoxy-, Unsaturated aliphatic urethane triacrylate oligomer)
   Respiratory or skin sensitisisation: No data available
   Germ cell mutagenicity: No data available
   Reproductive toxicity: No data available
   Carcinogenicity: None of the ingredients in this product is listed by IARC as a carcinogen. (1,2A and 2B)
   STOT-single exposure: No data available
   STOT-repeated exposure: No data available
   Aspiration hazard: No data available

12. Ecological information
12.1. Toxicity:
   The followings are according to the data on Bisphenol A, ethoxylated, dimethacrylate.
   May cause long lasting harmful effects to aquatic life.
12.2. Persistence and degradability: No data available
12.3. Bioaccumulative potential: No data available
12.4. Mobility in soil: No data available
12.5. Results of PBT and vPvB assessment: No data available
12.6. Other adverse effects: No data available

13. Disposal considerations
13.1. Waste treatment methods:
   This product is considered as a hazardous waste according to Directive 2008/98/EC.
   Treatment, storage, transportation, and disposal must be in accordance with applicable Federal, State/Provincial and Local regulations. Do not flush to surface water or sanitary sewer system.
14. Transport information
14.1. UN Class/UN Number:
ADR/ADG/DOT, IMDG, or IATA : Not regulated
14.2. UN proper shipping name:
ADR/ADG/DOT, IMDG, or IATA : Not regulated
14.3. Transport hazard class(es):
ADR/ADG/DOT, IMDG, or IATA : Not regulated
14.4. Packing group:
ADR/ADG/DOT, IMDG, or IATA : Not regulated
14.5. Environmental hazards:
ADR/ADG/DOT, IMDG, or IATA : Not regulated
14.6. Special precautions for user:
Transport and storage of the product in accordance with general precautions and instructions mentioned in this SDS.

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and IBC code:
Not regulated

15. Regulatory information
EU information:
Chemical Safety Assessment according to (EC)1907/2006:
This product has not carried out any Chemical Safety Assessment yet.

Australia Information:
Hazardous statement: Classified as hazardous according to NOHSC criteria.

International Information:
None of the ingredients in this resin is listed by IARC as a carcinogen. (1,2A and 2B)

16. Other information
List of relevant H-Statements:
H302 Harmful if swallowed.
H315 Causes skin irritation.
H319 Causes serious eye irritation.
H411 Toxic to aquatic life with long lasting effects.

The information in this Safety Data Sheet (SDS) is believed to be correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release 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 with any other materials or in any process, unless specified in the text. It is subject to revision as additional knowledge and experience is gained. Roland DG does not warrant the completeness or accuracy of the information contained herein.