

**Safety Data Sheet**

according to Regulation (EU) No. 1907/2006

**Developer for hybrid polymers OrmoDev**

Print date: 16.08.2011

Product code: R41DEV0

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**1. Identification of the substance/preparation and of the company/undertaking**

Product group: Entwickler

**Identification of the substance or preparation**

Developer for hybrid polymers OrmoDev

**Use of the substance/preparation**

Chemical Speciality

**Company/undertaking identification**

Company name: micro resist technology GmbH  
Street: Koepenicker Str. 325, Haus 1  
Place: D-12555 Berlin  
Telephone: +49 30 641670-100  
e-mail: mrt@microresist.de  
Internet: www.microresist.de

Telefax: +49 30 641670-200

**Further Information**

This number is serviced during office hours.

**2. Hazards identification****Classification**

Indications of danger : Highly flammable, Harmful, Irritant

R-phrases:

Highly flammable.

Harmful by inhalation.

Irritating to eyes and respiratory system.

Repeated exposure may cause skin dryness or cracking.

GHS:

Hazard categories:

Flammable liquid: Flam. Liq. 2

Acute toxicity: Acute Tox. 4

Serious eye damage/eye irritation: Eye Irrit. 2

Specific target organ toxicity - single exposure: STOT SE 3

Hazard Statements:

Highly flammable liquid and vapour.

Harmful if inhaled.

May cause respiratory irritation.

Causes serious eye irritation.

May cause drowsiness or dizziness.

**3. Composition/information on ingredients****Chemical characterization ( Mixture )**



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### Hazardous components

EC-No.	Chemical name	Quantity
CAS-No.	Classification	
REACH-No.	GHS classification	
200-661-7	propan-2-ol; isopropyl alcohol; isopropanol	40-70 %
67-63-0	F, Xi R11-36-67	
	Flam. Liq. 2, Eye Irrit. 2, STOT SE 3; H225 H319 H336	
203-550-1	4-methylpentan-2-one, isobutyl methyl ketone	40-70 %
108-10-1	F, Xn, Xi R11-20-36/37-66	
	Flam. Liq. 2, Acute Tox. 4, Eye Irrit. 2, STOT SE 3; H225 H332 H319 H335	

Full text of R- and H-phrases: see section 16.

### 4. First aid measures

#### After inhalation

Provide fresh air. In case of breathing difficulties administer oxygen. If victim is at risk of losing consciousness, position and transport on their side. In case of irritation of the respiratory tract seek medical advice.

#### After contact with skin

After contact with skin, wash immediately with plenty of water and soap. Change contaminated clothing.

#### After contact with eyes

In case of contact with eyes, rinse immediately with plenty of flowing water for 10 to 15 minutes holding eyelids apart. Consult an ophthalmologist.

#### After ingestion

Rinse mouth immediately and drink large quantities of water. Immediately get medical attention.

### 5. Fire-fighting measures

#### Suitable extinguishing media

Carbon dioxide (CO<sub>2</sub>). Dry extinguishing powder. Foam.

#### Special exposure hazards arising from substance or preparation itself, combustion products, resulting gases

Concentrated vapours are heavier than air. Vapours may form explosive mixtures with air. In case of fire and/or explosion do not breathe fumes. Heating causes rise in pressure with risk of bursting. Beware of reignition.

#### Special protective equipment for fire-fighters

In case of fire: Wear self-contained breathing apparatus. Wear chemical resistant suit.

#### Additional information

Use water spray/stream to protect personnel and to cool endangered containers. Contaminated fire-fighting water must be collected separately.

### 6. Accidental release measures

#### Personal precautions

Remove all sources of ignition. The following must be prevented: inhalation. skin contact. Eye contact. Provide adequate ventilation.

#### Environmental precautions

Due to danger of explosion, prevent leakage of vapours into cellars, flues and ditches. In case of gas being released or leakage into waters, ground or the drainage system, the appropriate authorities must be informed.

#### Methods for cleaning up/taking up

Cover drains. Absorb with liquid-binding material (e.g. sand, diatomaceous earth, acid- or universal



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binding agents). Do not rinse down with water. Clean contaminated objects and areas thoroughly observing environmental regulations. Collect in closed containers for disposal.

## 7. Handling and storage

### Handling

#### Advice on safe handling

Use only in well-ventilated areas.

#### Advice on protection against fire and explosion

Take precautionary measures against static discharges. Keep away from sources of ignition - No smoking.

### Storage

#### Requirements for storage rooms and vessels

Keep container tightly closed and in a well-ventilated place. storage temperature: of °C: 18 up to °C: 25  
Keep away from sources of ignition - No smoking. Take precautionary measures against static discharges.

#### Further information on storage conditions

Protect against: UV-radiation/sunlight. heat.

Storageclass (VCI):

3

## 8. Exposure controls/personal protection

### Exposure limit values

#### Exposure limits (EH40)

CAS-No.	Chemical name	ml/m³	mg/m³	F/ml	Category	Origin
108-10-1	4-Methylpentan-2-one	50	208		TWA (8 h)	WEL
		100	416		STEL (15 min)	WEL
67-63-0	Propan-2-ol	400	999		TWA (8 h)	WEL
		500	1250		STEL (15 min)	WEL

#### Biological Monitoring Guidance Values (EH40)

CAS-No.	Chemical name	Parameter	Value	Test material	Sampling time
108-10-1	4-methylpentan-2-one	4-methylpentan-2-one	20 µmol/L	urine	Post shift

### Exposure controls

#### Protective and hygiene measures

When using do not eat or drink. Protect skin by using skin protective cream. After work, wash hands and face. Immediately remove any wetted clothing, shoes or stockings.

#### Respiratory protection

If technical suction or ventilation measures are not possible or are insufficient, protective breathing apparatus must be worn. Respiratory protection required in case of: aerosol or mist generation. Filter respirator (full mask or mouth-piece) with filter: A

#### Hand protection

Tested protective gloves are to be worn: Single-use gloves.  
Type of chemical protective gloves to choose depends on the concentration and quantity of dangerous substances as well as on work place specifications.  
In the cases of special applications, it is recommended to check the chemical resistance with the manufacturer of the gloves.  
Breakthrough times and swelling characteristics of the material must be taken into consideration.



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Before using check leak tightness / impermeability.

**Eye protection**

Suitable eye protection: Tightly sealed safety glasses.

**Skin protection**

For the protection against direct skin contact, body protective clothing is essential (in addition to the usual working clothes). Wear antistatic work clothing.

**Environmental exposure controls**

Due to danger of explosion, prevent leakage of vapours into cellars, flues and ditches.

**9. Physical and chemical properties****General information**

Physical state:	liquid
Colour:	colourless
Odour:	characteristic

**Important health, safety and environmental information**

Test method

**Changes in the physical state**

Boiling point:	82,4 °C
Flash point:	~14 °C
Lower explosion limits:	1,2 vol. %
Upper explosion limits:	12,7 vol. %
Ignition temperature:	425 °C
Vapour pressure:	43 hPa
(at 20 °C)	
Density (at 25 °C):	0,79 g/cm³
Water solubility:	miscible.
Viscosity / dynamic:	<7 mPa·s
(at 25 °C)	

**Other information****10. Stability and reactivity****Conditions to avoid**

UV-radiation/sunlight. heat. Only use material in places where open light, fire and other sources of ignition can be kept away. Take precautionary measures against static discharges.

**Materials to avoid**

Oxidizing agents, strong. Reducing agents. Alkalis (alkalis).

Alkali metals. Alkaline earth metals. Aluminium. (Ignition hazard.)

Exothermic reactions with: Oxidizing agents. Nitric acid. Aldehyde. Amines. iron.

Formation of potentially explosive mixtures with: Phosgene. Hydrogenium peroxide. Nitrogen oxides (NOx).

**Hazardous decomposition products**

Carbon monoxide. Carbon dioxide.

**Additional information**

Materials to avoid: copper. Oil.

**11. Toxicological information**



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**Acute toxicity**

Acute toxicity, oral LD50: 5045 mg/kg species: Rat. (propan-2-ol; isopropyl alcohol; isopropanol) (RTECS)

Acute toxicity, oral LD50: 2080 mg/kg species: Rat. (4-methylpentan-2-one, isobutyl methyl ketone) (RTECS)

Acute toxicity, inhalant LC50: 46,5 mg/l /4h species: Rat. (propan-2-ol; isopropyl alcohol; isopropanol)

Acute toxicity, inhalant LC50: 8,3-16,6 mg/l /4h species: Rat. (4-methylpentan-2-one, isobutyl methyl ketone)

Acute toxicity, dermal LD50: 12800 mg/kg species: Rabbit. (propan-2-ol; isopropyl alcohol; isopropanol) (RTECS)

Acute toxicity, dermal LD50: >16000 mg/kg species: Rabbit. (4-methylpentan-2-one, isobutyl methyl ketone) (IUCLID)

**Corrosive and irritant effects**

propan-2-ol; isopropyl alcohol; isopropanol:  
Irritant effect on the eye: Causes serious eye irritation.

4-methylpentan-2-one, isobutyl methyl ketone:  
Irritant effect on the eye: Causes serious eye irritation.  
Irritant effect on the skin: irritant.  
Has de-greasing effect on the skin. Repeated exposure may cause skin dryness or cracking.

**Sensitising effects**

propan-2-ol; isopropyl alcohol; isopropanol: no danger of sensitization. (Guinea-pig. ) (IUCLID)  
4-methylpentan-2-one, isobutyl methyl ketone: no danger of sensitization. (OECD 406.)

**Severe effects after repeated or prolonged exposure**

4-methylpentan-2-one, isobutyl methyl ketone: Specific target organ toxicity (single exposure): Process vapours can irritate airways, skin and eyes.

**Carcinogenic/mutagenic/toxic effects for reproduction**

propan-2-ol; isopropyl alcohol; isopropanol, 4-methylpentan-2-one, isobutyl methyl ketone:  
No experimental indications of genotoxicity in-vitro exist. Ames test negative. (IUCLID)

**Further information**

Data apply to the principal component.

**12. Ecological information****Ecotoxicity**

propan-2-ol; isopropyl alcohol; isopropanol:

Acute fish toxicity LC50: 1400 mg/l /96 h species: Lepomis macrochirus (EXOTOX Database)

Acute Daphnia toxicity EC50: 13299 mg/l /48 h species: Daphnia magna (IUCLID)

Algae toxicity IC50: >1000 mg/l /72 h species: Scenedesmus subspicatus (IUCLID)

Bacterial toxicity: EC50: 1050 mg/l /16 h species: Pseudomonas putida

4-methylpentan-2-one, isobutyl methyl ketone:

Acute fish toxicity LC50: 505-540 mg/l /96 h species: Pimephales promelas

Acute Daphnia toxicity EC50: 170 mg/l /48 h species: Daphnia magna

Algae toxicity IC50: 400 mg/l /96 h species: Selenastrum capricornutum

Bacterial toxicity: EC50: 80 mg/l /5 min species: Photobacterium phosphoreum

**Persistence and degradability**

propan-2-ol; isopropyl alcohol; isopropanol:

Biological degradation: Results: Easily biodegradable (concerning to the criteria of the OECD). Degree of elimination: 95 %, Time (d): 21, Method: OECD 301E/ EWG 92/69, annex V, C.4-B



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4-methylpentan-2-one, isobutyl methyl ketone:

Biological degradation: Results: Easily biodegradable (concerning to the criteria of the OECD). Degree of elimination: 99 %, Time (d): 7, Method: OECD 301E/ EWG 92/69, annex V, C.4-B

**Bioaccumulative potential**

propan-2-ol; isopropyl alcohol; isopropanol:

Distribution coefficient (n-octanol / water) (log P O/W): 0,05 (OECD 107)

4-methylpentan-2-one, isobutyl methyl ketone:

Distribution coefficient (n-octanol / water) (log P O/W): 1,31

Due to the n-octanol-water partition coefficient, a bio-accumulation in organisms is not to be expected.

**Further information**

product has not been tested. Do not allow uncontrolled leakage of product into the environment.

**13. Disposal considerations****Advice on disposal**

Appropriate disposal / Product: Remove according to the regulations.

Contaminated packaging: Cleaned containers may be recycled.

**14. Transport information****Land transport (ADR/RID)**

UN number: 1993

ADR/RID class: 3

Classification code: F1

Warning plate

Hazard-no.: 33

Hazard label: 3



ADR/RID packing group: II

Limited quantity: LQ4

Tunnel restriction code: D/E

**Description of the goods**

FLAMMABLE LIQUID, N.O.S. (Isopropanol, Methyl isobutyl ketone)

**Other applicable information (land transport)**

Special provisions: 274 601 640D

Excepted Quantity: E2

Transport category: 2

**Inland waterways transport****Other applicable information (inland waterways transport)**

Not classified for this carrier.

**Marine transport**

UN number: 1993

IMDG code: 3

Marine pollutant: NO

Hazard label: 3



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IMDG packing group: II  
 EmS: F-E, S-E  
 Limited quantity: 1 L

**Description of the goods**

FLAMMABLE LIQUID, N.O.S. (Isopropanol, Methyl isobutyl ketone)

**Other applicable information (marine transport)**

Special provisions: 274, 330, 944  
 Excepted Quantity: E2

**Air transport**

UN/ID number: 1993  
 ICAO/IATA-DGR: 3  
 Hazard label: 3



ICAO packing group: II  
 Limited quantity Passenger: 1 L  
 IATA-packing instructions - Passenger: 353  
 IATA-max. quantity - Passenger: 5 L  
 IATA-packing instructions - Cargo: 364  
 IATA-max. quantity - Cargo: 60 L

**Description of the goods**

FLAMMABLE LIQUID, N.O.S. (Isopropanol, Methyl isobutyl ketone)

**Other applicable information (air transport)**

Excepted Quantity: E2  
 Passenger-LQ: Y341  
 Special provisions: A3

**15. Regulatory information****Chemical Safety Assessment**

Chemical safety assessments for substances in this mixture were not carried out.

**Labelling**

Danger symbols:

F - Highly flammable; Xn - Harmful



F - Highly flammable

Xn - Harmful

**Hazardous components which must be listed on the label**

4-methylpentan-2-one, isobutyl methyl ketone

**R phrases**

11 Highly flammable.  
 20 Harmful by inhalation.



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- 36/37 Irritating to eyes and respiratory system.  
66 Repeated exposure may cause skin dryness or cracking.

### S phrases

- 16 Keep away from sources of ignition - No smoking.  
26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.  
29 Do not empty into drains.  
07/09 Keep container tightly closed and in a well-ventilated place.  
24/25 Avoid contact with skin and eyes.

### GHS labelling

Signal word:

Danger

Pictograms:

flame; exclamation mark



### Hazard statements

- H225 Highly flammable liquid and vapour.  
H332 Harmful if inhaled.  
H335 May cause respiratory irritation.  
H319 Causes serious eye irritation.  
H336 May cause drowsiness or dizziness.

### Precautionary statements

- P210 Keep away from heat/sparks/open flames/hot surfaces. - No smoking.  
P280 Wear protective gloves/protective clothing/eye protection/face protection.  
P304+P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.  
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.  
P403+P233 Store in a well-ventilated place. Keep container tightly closed.

### Special labelling for certain preparations

Repeated exposure may cause skin dryness or cracking.

### EU regulatory information

1999/13/EC (VOC):

Data concerning the Directive 1999/13/EC on the limitation of emissions of volatile organic compounds (VOC-RL): This chemical is a VOC according to 99/13/EC. VOC-value (in g/l): 100 % (790 g/l)

### National regulatory information

Employment restrictions:

Observe employment restrictions for young people. Observe employment restrictions for child bearing mothers and nursing.

Water contaminating class (D):

1 - slightly water contaminating

## 16. Other information

### Full text of R-phrases referred to under sections 2 and 3

- 11 Highly flammable.  
20 Harmful by inhalation.  
36 Irritating to eyes.  
36/37 Irritating to eyes and respiratory system.  
66 Repeated exposure may cause skin dryness or cracking.  
67 Vapours may cause drowsiness and dizziness.



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**Full text of H-Statements referred to under sections 2 and 3**

H225	Highly flammable liquid and vapour.
H319	Causes serious eye irritation.
H332	Harmful if inhaled.
H335	May cause respiratory irritation.
H336	May cause drowsiness or dizziness.

**Further Information**

The information is based on present level of our knowledge. It does not, however, give assurances of product properties and establishes no contract legal rights.

The above information describes exclusively the safety requirements of the product and is based on our present-day knowledge. The information is intended to give you advice about the safe handling of the product named in this safety data sheet, for storage, processing, transport and disposal. The information cannot be transferred to other products. In the case of mixing the product with other products or in the case of processing, the information on this safety data sheet is not necessarily valid for the new made-up material.

**Changes**

Chapter: 14

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*(The data for the hazardous ingredients were taken respectively from the last version of the sub-contractor's safety data sheet.)*