SAFETY DATA SHEET
according to Regulation (EC) No. 1907/2006 (REACH) and Regulation (EU) No 2015/830

Developer AR 600-51

Revision date: 23/2/2016  Date of print: 23/2/2016
Version: 6  Language: en-GB,IE
Page: 1 of 10

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier
Trade name: Developer AR 600-51

1.2 Relevant identified uses of the substance or mixture and uses advised against
General use: Intermediate for electronic industry

1.3 Details of the supplier of the safety data sheet
Company name: Allresist
Gesellschaft für chemische Produkte zur Mikrostrukturierung mbH
Street/POB-No.: Am Biotop 14
Postal Code, city: 15344 Strausberg
Germany
WWW: www.allresist.de
E-mail: info@allresist.de
Telephone: +49 (0)33 41-35 93-0
Telefax: +49 (0)33 41-35 93-29
Dept. responsible for information: Frau Feldt, Email: doerte.feldt@allresist.de

1.4 Emergency telephone number
Telephone: +49 (0)33 41-35 93-0
Only available during office hours.

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture
Classification according to EC regulation 1272/2008 (CLP)
Flam. Liq. 3; H226 Flammable liquid and vapour.
Acute Tox. 4; H302 Harmful if swallowed.
Acute Tox. 4; H312 Harmful in contact with skin.
Acute Tox. 4; H332 Harmful if inhaled.
Skin Corr. 1B; H314 Causes severe skin burns and eye damage.

2.2 Label elements
Labelling (CLP)

Signal word: Danger
Hazard statements:

- H226: Flammable liquid and vapour.
- H302: Harmful if swallowed.
- H312: Harmful in contact with skin.
- H314: Causes severe skin burns and eye damage.
- H332: Harmful if inhaled.

Precautionary statements:

- P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
- P243: Take precautionary measures against static discharge.
- P260: Do not breathe vapours.
- P280: Wear protective gloves/protective clothing/eye protection/face protection.
- P301+P330+P331: IF SWALLOWED: rinse mouth. Do NOT induce vomiting.
- P303+P361+P330: IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
- P304+P340: IF INHALED: Remove person to fresh air and keep 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.
- P310: Immediately call a POISON CENTER/doctor.
- P405: Store locked up.

Special labelling

Text for labelling: Contains Morpholine.

2.3 Other hazards

On contact with air, potentially explosive mixtures may develop.

SECTION 3: Composition / information on ingredients

3.1 Substances: not applicable

3.2 Mixtures

Chemical characterisation:

aqueous solution
**SAFETY DATA SHEET**

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Revision date: 23/2/2016  
Date of print: 23/2/2016  
Version: 6  
Language: en-GB,IE  
Page: 3 of 10

Hazardous ingredients:

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Designation</th>
<th>Content</th>
<th>Classification</th>
</tr>
</thead>
</table>
| EC No. 203-961-6  
CAS 112-34-5 | 2-(2-Butoxyethoxy)ethanol  
10 - 25 % | CLP: Eye Irrit. 2; H319.  
Xn; R20/21/22.  
Acute Tox. 4; H302.  
Acute Tox. 4; H312.  
Acute Tox. 4; H332.  
Skin Corr. 1B; H314. |
| EC No. 203-815-1  
CAS 110-91-8 | Morpholine  
10 - 25 % | CLP: Flam. Liq. 3; H226.  
Acute Tox. 4; H302.  
Acute Tox. 4; H312.  
Acute Tox. 4; H332.  
Skin Corr. 1B; H314. |
| EC No. 205-483-3  
CAS 141-43-5 | Ethanolamine  
1 - 10 % | CLP: Acute Tox. 4; H302.  
Acute Tox. 4; H312.  
Acute Tox. 4; H332.  
Skin Corr. 1B; H314. |

**SECTION 4: First aid measures**

4.1 Description of first aid measures

In case of inhalation: Move victim to fresh air. In case of irregular breathing or respiratory arrest provide artificial respiration. Immediately get medical attention.

Following skin contact: Clean with plenty of water. If possible, also wash with polyethylene glycol 400. Take off immediately all contaminated clothing. Immediately get medical attention.

After eye contact: Immediately flush eyes with plenty of flowing water for 10 to 15 minutes holding eyelids apart. Seek the attention of an ophthalmologist immediately.

After swallowing: Rinse mouth immediately and drink plenty of water. Do not induce vomiting. Risk of perforation! Immediately get medical attention. Do not try to neutralize.

4.2 Most important symptoms and effects, both acute and delayed

Systemic effects:
Possible danger of damage to liver and kidneys.
In case of inhalation:
Mucous membrane irritation, cough, shortage of breath, damage of respiratory tract.
Risk of resorption. Pulmonary edema is possible.
In case of ingestion: Risk of resorption.
Risk of perforation in the oesophagus and stomach.
After contact with skin: Risk of resorption.
After eye contact: Causes serious eye damage. Danger of loss of sight!

4.3 Indication of any immediate medical attention and special treatment needed

Treat symptomatically.

**SECTION 5: Firefighting measures**

5.1 Extinguishing media

Suitable extinguishing media:
Foam, dry extinguishing powder, water fog, carbon dioxide.
SAFETY DATA SHEET
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Developer AR 600-51

Extinguishing media which must not be used for safety reasons:
- High power water jet

5.2 Special hazards arising from the substance or mixture
In case of fire may be liberated: Nitrogen oxides (NOx), carbon monoxide and carbon dioxide.

5.3 Advice for firefighters
Special protective equipment for firefighters:
- Wear self-contained breathing apparatus. Wear full protective gear.

Additional information:
- Use fine water spray to cool endangered containers.
- Contaminated fire-fighting water must be collected separately. Do not allow water used to extinguish fire to enter drains, ground or waterways. Treat runoff as hazardous.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures
- Keep away from sources of ignition. - No smoking.
- Avoid contact with the substance. Wear suitable protective clothing.
- Do not breathe vapours. Provide adequate ventilation.

6.2 Environmental precautions
- Do not allow to penetrate into soil, waterbodies or drains.
- In case of release, notify competent authorities.

6.3 Methods and material for containment and cleaning up
- Absorb with liquid-binding material (e.g. sand, diatomaceous earth, acid- or universal binding agents). Place in appropriate containers for disposal.

6.4 Reference to other sections
- Refer additionally to section 8 and 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling
Advices on safe handling:
- Provide adequate ventilation. Execute works under fume hood.
- Provide room air exhaust at ground level. Vapours are heavier than air.
- Always close containers tightly after the removal of product.
- Avoid contact with skin, eyes, and clothing.

Precautions against fire and explosion:
- Keep away from sources of ignition. - No smoking.
- On contact with air, potentially explosive mixtures may develop.

7.2 Conditions for safe storage, including any incompatibilities
Requirements for storerooms and containers:
- Store container tightly closed in a dry and cool place.
- Do not allow the product to enter the ground.
- Storage temperature: 10 °C up to 22 °C.

Hints on joint storage:
- Keep away from food, drink and animal feedingstuffs.

Storage class:
- 3 = Flammable liquids
7.3 Specific end use(s)
No information available.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational exposure limit values:

<table>
<thead>
<tr>
<th>CAS No.</th>
<th>Designation</th>
<th>Type</th>
<th>Limit value</th>
</tr>
</thead>
<tbody>
<tr>
<td>112-34-5</td>
<td>2-(2-Butoxyethoxy) ethanol</td>
<td>Europe: IOELV: STEL</td>
<td>101.2 mg/m³; 15 ppm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Europe: IOELV: TWA</td>
<td>67.5 mg/m³; 10 ppm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Great Britain: WEL- STEL</td>
<td>101.2 mg/m³; 15 ppm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Great Britain: WEL-TWA</td>
<td>67.5 mg/m³; 10 ppm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ireland: 15 minutes</td>
<td>101.2 mg/m³; 15 ppm IOELV</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ireland: 8 hours</td>
<td>67.5 mg/m³; 10 ppm IOELV</td>
</tr>
<tr>
<td>110-91-8</td>
<td>Morpholine</td>
<td>Europe: IOELV: STEL</td>
<td>72 mg/m³; 20 ppm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Europe: IOELV: TWA</td>
<td>36 mg/m³; 10 ppm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Great Britain: WEL- STEL</td>
<td>72 mg/m³; 20 ppm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Great Britain: WEL-TWA</td>
<td>36 mg/m³; 10 ppm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ireland: 15 minutes</td>
<td>72 mg/m³; 20 ppm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ireland: 8 hours</td>
<td>36 mg/m³; 10 ppm</td>
</tr>
<tr>
<td>141-43-5</td>
<td>Ethanolamine</td>
<td>Europe: IOELV: STEL</td>
<td>7.6 mg/m³; 3 ppm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Europe: IOELV: TWA</td>
<td>2.5 mg/m³; 1 ppm (May be absorbed through the skin.)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Great Britain: WEL- STEL</td>
<td>7.6 mg/m³; 3 ppm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Great Britain: WEL-TWA</td>
<td>2.5 mg/m³; 1 ppm</td>
</tr>
<tr>
<td></td>
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<td>Ireland: 15 minutes</td>
<td>7.6 mg/m³; 3 ppm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ireland: 8 hours</td>
<td>2.5 mg/m³; 1 ppm</td>
</tr>
</tbody>
</table>

8.2 Exposure controls
Withdraw by suction.

Personal protection equipment

Occupational exposure controls

Respiratory protection: Respiratory protection must be worn whenever the WEL levels have been exceeded. Use filter type A (= against vapours of organic substances) according to EN 14387.

Hand protection: Protective gloves according to EN 374. Glove material: butyl caoutchouc (butyl rubber) (0.7 mm). Breakthrough time: > 480 min. Observe glove manufacturer's instructions concerning penetrability and breakthrough time.

Eye protection: Tightly sealed goggles according to EN 166.

Body protection: Wear suitable protective clothing. In case of handling larger quantities: flame-retardant protective clothing, antistatic.

General protection and hygiene measures: Take off immediately all contaminated clothing. Wash hands before breaks and after work. When using do not eat, drink or smoke. Have eye wash bottle or eye rinse ready at work place.
SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance: Form: liquid

Colour: colourless

Odour: characteristic

Odour threshold: no data available

pH value: alkaline

Melting point/freezing point: no data available

Initial boiling point and boiling range: approx. 130 °C (Morpholine)

Flash point/flash point range: 32 °C (Morpholine)

Evaporation rate: no data available

Flammability: no data available

Explosion limits:

LEL (Lower Explosion Limit): 0.70 Vol-% (2-(2-Butoxyethoxy)ethanol)

UEL (Upper Explosive Limit): 24.60 Vol-% (2-(2-Butoxyethoxy)ethanol)

Vapour pressure:

at 20 °C: 10 hPa (Morpholine)

at 60 °C: 62 hPa (Morpholine)

Vapour density: no data available

Density: at 20 °C: approx. 1 g/mL

Water solubility: completely miscible

Partition coefficient: n-octanol/water: no data available

Auto-ignition temperature: no data available

Thermal decomposition: no data available

Viscosity, dynamic: no data available

Explosive properties: no data available

Oxidizing characteristics: no data available

9.2 Other information

Ignition temperature: > 200 °C

SECTION 10: Stability and reactivity

10.1 Reactivity

On contact with air, potentially explosive mixtures may develop.

10.2 Chemical stability

Product is stable under normal storage conditions.

10.3 Possibility of hazardous reactions

With nitrosic agents (such as nitric salts or nitric oxides) under special conditions may form nitrosamines.

10.4 Conditions to avoid

Keep away from heat.

10.5 Incompatible materials

strong oxidizing agents, strong acids, alkalis (bases, alkalis), metals
10.6 Hazardous decomposition products

In case of fire may be liberated: Nitrogen oxides (NOx), carbon monoxide and carbon dioxide.

Thermal decomposition: no data available

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Toxicological effects:
- Acute toxicity (oral): Acute Tox. 4; H302 = Harmful if swallowed.
- Acute toxicity (dermal): Acute Tox. 4; H312 = Harmful in contact with skin.
- Acute toxicity (inhalative): Acute Tox. 4; H332 = Harmful if inhaled.
- Skin corrosion/irritation, eye damage/irritation: Skin Corr. 1B; H314 = Causes severe skin burns and eye damage.
- Sensitisation to the respiratory tract: Lack of data.
- Skin sensitisation: Lack of data.
- Germ cell mutagenicity/Genotoxicity: Lack of data.
- Carcinogenicity: Lack of data.
- Reproductive toxicity: Lack of data.
- Effects on or via lactation: Lack of data.
- Specific target organ toxicity (single exposure): Lack of data.
- Specific target organ toxicity (repeated exposure): Lack of data.
- Aspiration hazard: Lack of data.

In case of inhalation:
- Risk of resorption. Pulmonary edema is possible.

Other information:
- Information about Morpholine:
  - LD50 Rat, oral: 1050 mg/kg.
  - LD50 Rabbit, dermal: 500 mg/kg.
  - LC50 Rat, inhalative: 7.8 - 8.2 mg/L.

With nitrosic agents (such as nitric salts or nitric oxides) under special conditions may form nitrosamines. In animal experiments nitrosamines were carcinogenic.

Symptoms

Systemic effects:
- Possible danger of damage to liver and kidneys.

In case of inhalation:
- Mucous membrane irritation, cough, shortage of breath, damage of respiratory tract.
- Risk of resorption. Pulmonary edema is possible.

In case of ingestion:
- Risk of resorption.

In case of perforation in the oesophagus and stomach.
- After contact with skin: Risk of resorption.
- After eye contact: Causes serious eye damage. Danger of loss of sight!

SECTION 12: Ecological information

12.1 Toxicity

Aquatic toxicity:
- Forms corrosive mixtures with water even if diluted.
12.2. Persistence and degradability
Further details:

Information about 2-(2-Butoxyethoxy)ethanol:
Biodegradation: 58 %/28 d (OECD 301 C).

Information about Morpholine:
Biodegradation: 97 %/21 d (OECD 302 B).

12.3 Bioaccumulative potential
Bioconcentration factor (BCF):
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
General information: Do not allow to enter into ground-water, surface water or drains.

SECTION 13: Disposal considerations

13.1 Waste treatment methods
Product
Waste key number: 16 03 05* = organic wastes containing dangerous substances
* = Evidence for disposal must be provided.

Recommendation: Incinerate as hazardous waste according to applicable local, state, and federal regulations. Discharge into the environment must be avoided. Obtain the consent of pollution control authorities before discharging to wastewater treatment plants.

Contaminated packaging
Recommendation: Dispose of waste according to applicable legislation. Handle contaminated packages in the same way as the substance itself.

SECTION 14: Transport information

14.1 UN number
ADR/RID, IMDG, IATA: UN 2920

14.2 UN proper shipping name
ADR/RID, IMDG, IATA: UN 2920, CORROSIVE LIQUID, FLAMMABLE, N.O.S. (Morpholine solution)

14.3 Transport hazard class(es)
ADR/RID: Class 8, Code: CF1
IMDG, IATA: Class 8, Subrisk 3

14.4 Packing group
ADR/RID, IMDG, IATA: II
14.5 Environmental hazards
Marine pollutant: No

14.6 Special precautions for user

Land transport (ADR/RID)
Warning board: ADR/RID: Kemmler-number 83, UN number 2920
Hazard label: 8+3
Special provisions: 274
Limited quantities: 1 L
EQ: E2
Contaminated packaging - Instructions: P001 IBC02
Special provisions for packing together: MP15
Portable tanks - Instructions: T11
Portable tanks - Special provisions: TP2 TP27
Tank coding: L4BN
Tunnel restriction code: D/E

Sea transport (IMDG)
EmS: F-E, S-C
Special provisions: 274
Limited quantities: 1 L
EQ: E2
Contaminated packaging - Instructions: P001
Contaminated packaging - Provisions: -
IBC - Instructions: IBC02
IBC - Provisions: -
Tank instructions - IMO: -
Tank instructions - UN: T11
Tank instructions - Provisions: TP2, TP27
Stowage and handling: Category C. SW1 SW2
Properties and observations: Causes burns to skin, eyes and mucous membranes.

Air transport (IATA)
Hazard: Corrosive & Flammable liquid
EQ: E2
Passenger Ltd.Qty.: Pack.Instr. Y840 - Max. Net Qty/Pkg. 0.5 L
Passenger: Pack.Instr. 851 - Max. Net Qty/Pkg. 1 L
Cargo: Pack.Instr. 855 - Max. Net Qty/Pkg. 30 L
ERG: 8F

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
no data available

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture
National regulations - Great Britain
Hazchem-Code: 3W
National regulations - EC member states

Labelling of packaging with <= 125mL content

Signal word: Danger

Hazard statements:
- H314: Causes severe skin burns and eye damage.

Precautionary statements:
- P260: Do not breathe vapours.
- P280: Wear protective gloves/protective clothing/eye protection/face protection.
- P301+P330+P331: IF SWALLOWED: rinse mouth. Do NOT induce vomiting.
- P303+P361+P353: IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
- P304+P340: IF INHALED: Remove person to fresh air and keep 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.
- P310: Immediately call a POISON CENTER/doctor.
- P405: Store locked up.

15.2 Chemical Safety Assessment
For this mixture a chemical safety assessment is not required.

SECTION 16: Other information

Further information

Wording of the H-phrases under paragraph 2 and 3:
- H226 = Flammable liquid and vapour.
- H302 = Harmful if swallowed.
- H312 = Harmful in contact with skin.
- H314 = Causes severe skin burns and eye damage.
- H319 = Causes serious eye irritation.
- H332 = Harmful if inhaled.

Reason of change: General revision (Regulation (EU) Nr. 2015/830)

Date of first version: 23/11/2010

Department issuing data sheet

Contact person: see section 1: Dept. responsible for information

For abbreviations and acronyms, see: ECHA Guidance on information requirements and chemical safety assessment, chapter R.20 (Table of terms and abbreviations).

The information in this data sheet has been established to our best knowledge and was up-to-date at time of revision. It does not represent a guarantee for the properties of the product described in terms of the legal warranty regulations.