



# SAFETY DATA SHEET

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

## Image Reversal Resist Series AR-U 4000 & Positive E-Beam Resist AR-P 7400

Material number AR-U 4000 & AR-P 7400

Revision date: 13/8/2019

Version: 12

Language: en-GB,IE

Date of print: 27/8/2020

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

### 1.1 Product identifier

Trade name: Image Reversal Resist Series AR-U 4000 & Positive E-Beam Resist AR-P 7400

### 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  
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  
Department responsible for information:  
Frau Dr. Zimmermann, Email: produktion@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.

### 2.2 Label elements

#### Labelling (CLP)



Signal word: **Warning**

Hazard statements: H226 Flammable liquid and vapour.

Precautionary Statements:

P210	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P261	Avoid breathing vapours/spray.
P303+P361+P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower.
P403+P235	Store in a well-ventilated place. Keep cool.



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### Special labelling

Text for labelling: Contains 2-Methoxy-1-methylethyl acetate.

### 2.3 Other hazards

Potentially explosive mixtures may form if adequate ventilation is not provided.  
Inhaling can lead to irritations of the respiratory tract and mucous membrane.  
Higher doses may have a narcotic effect.  
Special danger of slipping by leaking/spilling product.

Results of PBT and vPvB assessment:

No data available

## SECTION 3: Composition / information on ingredients

3.1 Substances: not applicable

### 3.2 Mixtures

Chemical characterisation: Mixture of the substances listed below with non-hazardous additions:

Hazardous ingredients:

Ingredient	Designation	Content	Classification
REACH 01-2119475791-29-xxxx EC No. 203-603-9 CAS 108-65-6	2-Methoxy-1-methylethyl acetate	50 - 75 %	Flam. Liq. 3; H226.
EC No. 270-931-7 CAS 68510-93-0	Naphthoquinone diazide	< 10 %	Flam. Sol. 2; H228. Self-react. CD; H242. Skin Irrit. 2; H315. Eye Irrit. 2; H319. Aquatic Chronic 3; H412.
EC No. 614-203-2 CAS 68002-20-0	Polymer Melamine- Formaldehyde-Methanol	< 5 %	Aquatic Chronic 3; H412.
EC No. 214-540-1 CAS 1143-72-2	2,3,4-trihydroxybenzophenone	< 2 %	Skin Irrit. 2; H315. Eye Irrit. 2; H319. STOT SE 3; H335.
EC No. 215-293-2 CAS 1319-77-3	Cresol-isomeric mixture	< 0.5 %	Acute Tox. 3; H301. Acute Tox. 3; H311. Skin Corr. 1B; H314.

Full text of H- and EUH-statements: see section 16.

## SECTION 4: First aid measures

### 4.1 Description of first aid measures

General information: IF exposed or concerned: Get medical advice/attention.  
If medical advice is needed, have product container or label at hand. First aider: Pay attention to self-protection!

In case of inhalation: Move victim to fresh air, put at rest and loosen restrictive clothing. Seek medical aid in case of troubles.

Following skin contact: Change contaminated clothing. Remove residues with soap and water.  
In case of skin irritation, consult a physician.



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After eye contact: Immediately flush eyes with plenty of flowing water for 10 to 15 minutes holding eyelids apart. Remove contact lenses, if present and easy to do. Continue rinsing. In case of eye irritation consult an ophthalmologist.

After swallowing: Never give anything by mouth to an unconscious person. Rinse mouth immediately and drink plenty of water. Do not induce vomiting. Seek medical attention.

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

Inhaling can lead to irritations of the respiratory tract and mucous membrane. Higher doses may lead to a narcotic effect.

### 4.3 Indication of any immediate medical attention and special treatment needed

Treat symptomatically. Decontamination. In the event of pulmonary irritation treat initially with dexamethasone - dosing aerosol. Subsequent observance for pneumonia and lung oedema.

## SECTION 5: Firefighting measures

### 5.1 Extinguishing media

Suitable extinguishing media:

Extinguishing powder, water spray jet or carbon dioxide. In case of large fires alcohol resistant foam or water spray jet.

Extinguishing media which must not be used for safety reasons:

Full water jet.

### 5.2 Special hazards arising from the substance or mixture

Flammable liquid and vapour.

With air, vapours form potentially explosive mixtures, which are heavier than air. Vapours may proceed on the ground over great distances and cause fire and backflashes.

May form dangerous gases and vapours in case of fire.

Furthermore, there may develop: nitrogen oxides, sulphur oxides, carbon monoxide and carbon dioxide.

### 5.3 Advice for firefighters

Special protective equipment for firefighters:

Wear self-contained positive pressure breathing apparatus and full firefighting protective clothing.

Additional information: Hazchem-Code: •3Y

Heating will lead to pressure increase: Danger of bursting and explosion. Keep containers cool with water spray.

In case of major fire and large quantities: Evacuate area. Fight fire remotely due to the risk of explosion.

Do not allow fire water to penetrate into surface or ground water.

Fire residuals and contaminated extinguishing water must be disposed of in accordance with the regulations of the local authorities.



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## SECTION 6: Accidental release measures

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

Eliminate all ignition sources if safe to do so. Avoid contact with the substance. Do not breathe vapour/aerosol. Wear appropriate protective equipment. Provide adequate ventilation.

Cordon off downwind area at risk and warn inhabitants. Keep unprotected people away.

### 6.2 Environmental precautions

Do not allow to enter into ground-water, surface water or drains. Danger of explosion!

In case of release, notify competent authorities.

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

Isolate leaked material using non-flammable absorption agent (e.g. sand, earth, vermiculit, diatomaceous earth) and collect it for disposal in appropriate containers in accordance with the local regulations (see section 13).

Beware of reignition. Thoroughly clean surrounding area.

In case of greater quantities: Collect mechanically (use only explosion-proof equipment when pumping out).

Additional information: Use explosion-proof equipment and non-sparking tools/utensils.

Special danger of slipping by leaking/spilling product.

### 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, and local exhaust as needed. Do not breathe

vapour/aerosol. Avoid contact with skin, eyes, and clothing.

Wear appropriate protective equipment. Take off immediately all contaminated clothing and wash it before reuse.

When using do not eat, drink or smoke. Wash hands thoroughly after handling. Work place should be equipped with a shower and an eye rinsing apparatus.

Precautions against fire and explosion:

Keep away from sources of ignition - No smoking. Take precautionary measures against static discharges. Use grounding equipment. Use only explosion-protected equipment/instruments. Do not weld. Vapours can form explosive mixtures with air.

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

Requirements for storerooms and containers:

Keep container tightly closed in a cool, well-ventilated place.

Keep away from sources of ignition and heat. Protect from direct sunlight.

Store containers in upright position. Explosion protection required.

Qualified materials: steel, polypropylene.

Unsuitable materials: Copper, zinc.

Storage temperature: 10 - 18 °C.

Hints on joint storage:

Do not store together with: strong oxidizing agents, acids, alkalis.

Keep away from food, drink and animal feedingstuffs.



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### 7.3 Specific end use(s)

No information available.

## SECTION 8: Exposure controls/personal protection

### 8.1 Control parameters

Occupational exposure limit values:

CAS No.	Designation	Type	Limit value
108-65-6	2-Methoxy-1-methylethyl acetate	Europe: IOELV: STEL	550 mg/m <sup>3</sup> ; 100 ppm (may be absorbed through the skin)
		Europe: IOELV: TWA	275 mg/m <sup>3</sup> ; 50 ppm (may be absorbed through the skin)
		Great Britain: WEL-STEL	548 mg/m <sup>3</sup> ; 100 ppm (may be absorbed through the skin)
		Great Britain: WEL-TWA	274 mg/m <sup>3</sup> ; 50 ppm (may be absorbed through the skin)
		Ireland: 15 minutes	550 mg/m <sup>3</sup> ; 100 ppm (may be absorbed through the skin)
		Ireland: 8 hours	275 mg/m <sup>3</sup> ; 50 ppm (may be absorbed through the skin)
1319-77-3	Cresol-isomeric mixture	Europe: IOELV: TWA	22 mg/m <sup>3</sup> ; 5 ppm
		Ireland: 8 hours	22 mg/m <sup>3</sup> ; 5 ppm (may be absorbed through the skin)

### 8.2 Exposure controls

Provide for good ventilation or exhaust system or work with completely self-contained equipment. Explosion protection required.

### Personal protection equipment

#### Occupational exposure controls

- Respiratory protection: When aerosols and vapours form: Use appropriate 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)-Layer thickness: 0.70 mm.  
Breakthrough time: >480 min.  
Unsuitable materials: natural rubber, nitrile rubber  
Observe glove manufacturer's instructions concerning penetrability and breakthrough time.
- Eye protection: Tightly sealed goggles according to EN 166.
- Body protection: Flame retardant, antistatic and chemical resistant protective clothing.



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### General protection and hygiene measures:

Use only non-sparking tools. Keep away from sources of heat (e.g. hot surfaces), sparks and open flames.

Avoid contact with skin, eyes, and clothing. Take off immediately all contaminated clothing and wash it before reuse.

Do not breathe vapour/aerosol. Work place should be equipped with a shower and an eye rinsing apparatus.

Wash hands before breaks and after work. When using do not eat, drink or smoke.

## SECTION 9: Physical and chemical properties

### 9.1 Information on basic physical and chemical properties

Appearance:	Physical state at 20 °C and 101.3 kPa: liquid Colour: brown-red
Odour:	ester-like
Odour threshold:	No data available
pH value:	No data available
Melting point/freezing point:	-66 °C (2-Methoxy-1-methylethyl acetate)
Initial boiling point and boiling range:	146 °C (2-Methoxy-1-methylethyl acetate)
Flash point/flash point range:	42 °C (c.c.)
Evaporation rate:	No data available
Flammability:	Flammable liquid and vapour.
Explosion limits:	No data available
Vapour pressure:	at 20 °C: 3.6 hPa (2-Methoxy-1-methylethyl acetate) at 50 °C: 21 hPa (2-Methoxy-1-methylethyl acetate)
Vapour density:	4.56 (2-Methoxy-1-methylethyl acetate)
Density:	at 20 °C: approx. 1.1 g/mL
Water solubility:	at 20 °C: partially soluble
Partition coefficient: n-octanol/water:	No data available
Auto-ignition temperature:	No data available
Decomposition temperature:	No data available
Viscosity, kinematic:	No data available
Explosive properties:	Vapours can form explosive mixtures with air.
Oxidizing characteristics:	No data available

### 9.2 Other information

Ignition temperature:	315 °C (2-Methoxy-1-methylethyl acetate)
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## SECTION 10: Stability and reactivity

### 10.1 Reactivity

Flammable liquid and vapour. Vapours can form explosive mixtures with air.

### 10.2 Chemical stability

Stable under recommended storage conditions.



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### 10.3 Possibility of hazardous reactions

Heating will lead to pressure increase: Danger of bursting and explosion.

### 10.4 Conditions to avoid

Keep away from heat sources, sparks and open flames.  
Protect from direct sunlight.

### 10.5 Incompatible materials

Strong oxidizing agents, acids, alkalis. Attacks many plastics and rubbers.

### 10.6 Hazardous decomposition products

No hazardous decomposition products when regulations for storage and handling are observed.

Thermal decomposition: No data available

## SECTION 11: Toxicological information

### 11.1 Information on toxicological effects

Toxicological effects: The statements are derived from the properties of the single components. No toxicological data is available for the product as such.

Acute toxicity (oral): Based on available data, the classification criteria are not met.

ATEmix (calculated):  $2000 \text{ mg/kg} < \text{ATE} \leq 5000 \text{ mg/kg}$

Acute toxicity (dermal): Based on available data, the classification criteria are not met.

ATEmix (calculated):  $2000 \text{ mg/kg} < \text{ATE} \leq 5000 \text{ mg/kg}$

Acute toxicity (inhalative): Based on available data, the classification criteria are not met.

ATEmix (calculated):  $\text{ATE} > 20 \text{ mg/L}$

Skin corrosion/irritation: Lack of data.

Serious eye damage/irritation: Lack of data.

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.

Other information: Information about 2-Methoxy-1-methylethyl acetate:

LD50 Rat, oral:  $> 5000 \text{ mg/kg}$ .

LD50 Rabbit, dermal:  $> 2000 \text{ mg/kg}$ .

Information about Cresol-isomeric mixture:

LD50 Rat, oral:  $1454 \text{ mg/kg}$ .

LD50 Rabbit, dermal:  $242 \text{ mg/kg}$ .



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### Symptoms

Nausea, vomiting, headache, dizziness, unconsciousness.

In case of inhalation: Vapours > 100 ppm: irritant.

If higher concentrations occur: strongly irritant.

Other symptoms: depression of central nervous system, Cough and shortage of breath.

Pulmonary edema is possible. Symptoms may occur with delay.

In case of ingestion: May be harmful if swallowed.

Other symptoms: Nausea, vomiting, depression of central nervous system.

After contact with skin:

Danger of cutaneous absorption. Prolonged/repetitive skin contact may cause skin defatting or dermatitis.

After eye contact: May cause irritations.

## SECTION 12: Ecological information

### 12.1 Toxicity

Aquatic toxicity:

Information about 2-Methoxy-1-methylethyl acetate:

Daphnia toxicity:

EC50 Daphnia magna (Big water flea): > 500 mg/L/48h.

Fish toxicity:

LC50 Oncorhynchus mykiss: 134 mg/L/96h (OECD 203)

Algae toxicity:

EC50 Pseudokirchneriella subcapitata (green algae): > 1000 mg/L/96h

Information about Naphthoquinone diazide:

Fish toxicity:

LC50 zebrafish 22 - 50 mg/L/96h.

### 12.2 Persistence and degradability

Further details:

Biodegradability:

Information about 2-Methoxy-1-methylethyl acetate: 83 % /10 d (OECD 301 F). Easily bio-degradable.

Effects in sewage plants:

Information about 2-Methoxy-1-methylethyl acetate:

EC10 activated sludge: >1000 mg/L/30min (OECD 209)

### 12.3 Bioaccumulative potential

Partition coefficient: n-octanol/water:

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.





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## SECTION 13: Disposal considerations

### 13.1 Waste treatment methods

#### Product

Waste key number: 16 03 05\* = Organic wastes containing hazardous substances  
\* = Evidence for disposal must be provided.

Recommendation: Incinerate as hazardous waste according to applicable local, state, and federal regulations.

#### Contaminated packaging

Recommendation: Disposal of waste according to applicable legislation. Handle empty containers with care. Incineration may cause explosion. Handle contaminated packages in the same way as the substance itself. Non-contaminated packages may be recycled.

## SECTION 14: Transport information

### 14.1 UN number

ADR/RID, IMDG, IATA-DGR:  
UN 1993

### 14.2 UN proper shipping name

ADR/RID, IMDG, IATA-DGR:  
UN 1993, FLAMMABLE LIQUID, N.O.S. (2-Methoxy-1-methylethyl acetate)

### 14.3 Transport hazard class(es)

ADR/RID: Class 3, Code: F1  
IMDG: Class 3, Subrisk -  
IATA-DGR: Class 3



### 14.4 Packing group

ADR/RID, IMDG, IATA-DGR:  
III

### 14.5 Environmental hazards

Marine pollutant: no

### 14.6 Special precautions for user

#### Land transport (ADR/RID)

Warning board: ADR/RID: Kemmler-number 30, UN number UN 1993  
Hazard label: 3  
Special provisions: 274 601  
Limited quantities: 5 L  
EQ: E1  
Contaminated packaging - Instructions: P001 IBC03 LP01 R001  
Special provisions for packing together: MP19  
Portable tanks - Instructions: T4  
Portable tanks - Special provisions: TP1 TP29  
Tank coding: LGBF  
Tunnel restriction code: D/E



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### Sea transport (IMDG)

EmS: F-E, S-E  
Special provisions: 223, 274, 955  
Limited quantities: 5 L  
Excepted quantities: E1  
Contaminated packaging - Instructions: P001, LP01  
Contaminated packaging - Provisions: -  
IBC - Instructions: IBC03  
IBC - Provisions: -  
Tank instructions - IMO: -  
Tank instructions - UN: T4  
Tank instructions - Provisions: TP1, TP29  
Stowage and handling: Category A.  
Properties and observations: -  
Segregation group: none

### Air transport (IATA)

Hazard label: Flamm. liquid  
Excepted Quantity Code: E1  
Passenger and Cargo Aircraft: Ltd.Qty.: Pack.Instr. Y344 - Max. Net Qty/Pkg. 10 L  
Passenger and Cargo Aircraft: Pack.Instr. 355 - Max. Net Qty/Pkg. 60 L  
Cargo Aircraft only: Pack.Instr. 366 - Max. Net Qty/Pkg. 220 L  
Special provisions: A3  
Emergency Response Guide-Code (ERG): 3L

### 14.7 Transport in bulk according to Annex II of Marpol 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: •3Y  
No data available

#### National regulations - EC member states

Volatile organic compounds (VOC):  
approx. 65 % by weight = 715 g/L

#### Labelling of packaging with <= 125mL content



Signal word: **Warning**  
Hazard statements: not applicable  
Precautionary Statements:  
P261 Avoid breathing vapours/spray.

### 15.2 Chemical Safety Assessment

For this mixture a chemical safety assessment is not required.



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## SECTION 16: Other information

### Further information

Wording of the H-phrases under paragraph 2 and 3:

- H226 = Flammable liquid and vapour.
- H228 = Flammable solid.
- H242 = Heating may cause a fire.
- H301 = Toxic if swallowed.
- H311 = Toxic in contact with skin.
- H314 = Causes severe skin burns and eye damage.
- H315 = Causes skin irritation.
- H319 = Causes serious eye irritation.
- H335 = May cause respiratory irritation.
- H412 = Harmful to aquatic life with long lasting effects.

Abbreviations and acronyms:

- ADN: European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways
- ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road
- OEL: Occupational Exposure Limit Value
- AS/NZS: Australian Standards/New Zealand Standards
- CAS: Chemical Abstracts Service
- CFR: Code of Federal Regulations
- CLP: Classification, Labelling and Packaging
- DMEL: Derived minimal effect level
- DNEL: Derived no-effect level
- EC50: Effective Concentration 50%
- EC: European Community
- EN: European Standard
- EU: European Union
- IATA: International Air Transport Association
- IBC Code: International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk
- IMDG Code: International Maritime Dangerous Goods Code
- LC50: Median lethal concentration
- LD50: Lethal dose 50%
- MARPOL: Maritime Pollution: The International Convention for the Prevention of Pollution from Ships
- OSHA: Occupational Safety and Health Administration
- PBT: Persistent, bioaccumulative and toxic
- PNEC: Predicted no-effect concentration
- REACH: Registration, Evaluation, Authorisation and Restriction of Chemicals
- RID: Regulations Concerning the International Carriage of Dangerous Goods by Rail
- STOT SE: Specific target organ toxicity - single exposure
- TLV: Threshold Limit Value
- UN: United Nations
- vPvB: Very persistent and very bioaccumulative
- WEL: Workplace Exposure Limit

Reason of change: Changes in section 8: occupational exposure limit values (Germany)

Date of first version: 13/1/2011

### Department issuing data sheet

Contact person: see section 1: Department responsible for information



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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.