

Safety Data Sheet

according to 1907/2006/EC, Article 31

Printing date 21.04.2009



Version 5

Revision: 21.04.2009

1 Identification of substance:

- **Product details:**
- **Trade name: R 20-TC Developer part 1**
- **Article number:** 10231
- **Application of the substance / the preparation**
 Photochemicals
 Photographic developer
 Reserved for industrial and professional use.
- **Manufacturer/Supplier:**
 ADEFO-CHEMIE GmbH
 Justus-von-Liebig-Str. 24-26
 D-63128 Dietzenbach
 Tel.: +49 6074 84239-0
 Fax: +49 6074 84239-63
 E-Mail: service@adefo-chemie.de
 www.adefo-chemie.de
- **Informing department:**
 Tel.: +49 6074 84239-0
 Fax: +49 6074 84239-63
 Competent person according to 1907/2006/EC, Annex II:
 E-Mail: kr@calbe-chemie.de
- **Emergency information:** Tel.: 0700-24112112 (CAL)

2 Hazards identification

- **Hazard designation:**
- | | | |
|---|---|---------------------------------|
|  |  | Xn Harmful |
| | | N Dangerous for the environment |

- **Information pertaining to particular dangers for man and environment**
 The product has to be labelled due to the calculation procedure of the "General Classification guideline for preparations of the EU" in the latest valid version.
 R 22 Harmful if swallowed.
 R 40 Limited evidence of a carcinogenic effect.
 R 41 Risk of serious damage to eyes.
 R 43 May cause sensitisation by skin contact.
 R 68 Possible risk of irreversible effects.
 R 50 Very toxic to aquatic organisms.
- **Classification system**
 The classification is in line with current EC lists. It is expanded, however, by information from technical literature and by information furnished by supplier companies.

3 Composition/information on ingredients

- **Chemical characterization**
- **Description:** Mixture of the substances listed below with harmless additions.

- **Dangerous components:**

CAS: 123-31-9	1,4-dihydroxybenzene (hydroquinone)	75-100%
EINECS: 204-617-8	Xn, Xi, N; R 22-40-41-43-68-50	

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CAS: 7681-57-4 EINECS: 231-673-0	disodium disulphite Xn, Xi; R 22-31-41	2.0-5.0%
CAS: 13047-13-7 EINECS: 235-920-3	4-(hydroxymethyl)-4-methyl-1-phenylpyrazolidin-3-one Xn, Xi, N; R 22-43-51/53	0.5-1.0%

- **Additional information** For the wording of the listed risk phrases refer to section 16.

4 First aid measures

- **General information** Instantly remove any clothing soiled by the product.
- **After inhalation** Supply fresh air; consult doctor in case of symptoms.
- **After skin contact** Instantly wash with water and soap and rinse thoroughly.
- **After eye contact**
Rinse opened eye for several minutes under running water (> 15 min). Then consult doctor.
- **After swallowing**
Rinse out mouth and then drink plenty of water.
Induce vomiting and call for medical help.
- **Information for doctor**
- **The following symptoms may occur:**
Sickness
Methaemoglobinaemia

5 Fire fighting measures

- **Suitable extinguishing agents**
CO₂, extinguishing powder or water jet. Fight larger fires with water jet.
- **For safety reasons unsuitable extinguishing agents** Water with a full water jet.
- **Special hazards caused by the material, its products of combustion or resulting gases:**
Can be released in case of fire
Carbon monoxide (CO)
- **Protective equipment:**
Do not inhale explosion gases or combustion gases.
Wear self-contained breathing apparatus.

6 Accidental release measures

- **Person-related safety precautions:**
Wear protective clothing.
Avoid causing dust.
- **Measures for environmental protection:**
Do not allow to enter drainage system, surface or ground water.
- **Measures for cleaning/collecting:**
Collect mechanically.
Dispose of contaminated material as waste according to item 13.
Ensure adequate ventilation.
- **Additional information:**
See Section 8 for information on personal protection equipment.

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See Section 13 for information on disposal.

7 Handling and storage

- **Handling**
- **Information for safe handling:**
No special precautions necessary if used correctly.
Prevent formation of dust.
- **Information about protection against explosions and fires:** No special measures required.
- **Storage**
- **Requirements to be met by storerooms and containers:** No special requirements.
- **Information about storage in one common storage facility:** Not required.
- **Further information about storage conditions:** Keep container tightly sealed.
- **Storage class** LGK 13 (VCI-Concept)

8 Exposure controls and personal protection

- **Additional information about design of technical systems:** No further data; see item 7.

- **Components with limit values that require monitoring at the workplace:**

123-31-9 1,4-dihydroxybenzene (hydroquinone)

WEL Long-term value: 0.5 mg/m³

7681-57-4 disodium disulphite

WEL Long-term value: 5 mg/m³

- **Additional information:** The lists that were valid during the compilation were used as basis.
 - **Personal protective equipment**
 - **General protective and hygienic measures**
The usual precautionary measures should be adhered to general rules for handling chemicals.
Keep away from foodstuffs, beverages and food.
Do not eat, drink or smoke while working.
Take off immediately all contaminated clothing
Be sure to clean skin thoroughly after work and before breaks.
Avoid contact with the eyes and skin.
 - **Breathing equipment:** Not necessary if room is well-ventilated.
 - **Protection of hands:**
Protective gloves.
The protective gloves to be used must comply with the specifications of the EC directive 89/686/EEC and the resultant standard EN 374.
This recommendation applies only to the product stated in the Safety Data Sheet and supplied by us as well as to the purpose specified by us.
Only use chemical-protective gloves with CE-labelling of category III.
Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation
 - **Material of gloves**
- | | Thickness (mm) | Breakthrough time (min) |
|---------------|----------------|-------------------------|
| Nitril rubber | 0,38 | > 480 |
| Neoprene | 0,65 | > 240 |
| Butyl rubber | 0,36 | > 480 |
- **For the permanent contact of a maximum of 15 minutes gloves made of the following materials are suitable:**
Synthetic gloves

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Value for permeation: Level:

≥3 (60 min)

- **As protection from splashes gloves made of the following materials are suitable:**

Synthetic gloves

Value for permeation: Level:

≥ 3 (60 min)

- **Not suitable are gloves made of the following materials:** Natural rubber, NR

- **Eye protection:** Safety glasses

- **Body protection:** Protective work clothing.

9 Physical and chemical properties:

· General Information

Form:	Crystalline powder
Colour:	Colourless
Odour:	Pungent

· Change in condition

Melting point/Melting range:	170°C
Boiling point/Boiling range:	Not determined

- **Flash point:** Not applicable

- **Ignition temperature:** 515°C

- **Self-inflammability:** Product is not selfigniting.

- **Danger of explosion:** Product is not explosive.

- **Density** Not determined

- **Settled apparent density at 20°C** 600 kg/m³

· Solubility in / Miscibility with

Water:	Soluble
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- **pH-value (50 g/l) at 20°C:** 6.5

· Solvent content:

Organic solvents:	0.0 %
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- **Solids content:** 100.0 %

10 Stability and reactivity

- **Thermal decomposition / conditions to be avoided:**

No decomposition if used according to specifications.

- **Dangerous reactions**

Reacts with strong acids

Reacts with acids releasing sulphur dioxide

- **Dangerous products of decomposition:** No dangerous decomposition products known

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11 Toxicological information

· **Acute toxicity:**

· **LD/LC50 values that are relevant for classification:**

123-31-9 1,4-dihydroxybenzene (hydroquinone)

Oral	LD50	320 mg/kg (rat)
Dermal	LD50	> 900 mg/kg (rat)

13047-13-7 4-(hydroxymethyl)-4-methyl-1-phenylpyrazolidin-3-one

Oral	LD50	565 mg/kg (rat)
Dermal	LD50	> 2000 mg/kg (rat)

· **Primary irritant effect:**

· **on the skin:** No irritant effect.

· **on the eye:** Strong irritant with the danger of severe eye injury.

· **Additional toxicological information:**

The product shows the following dangers according to the calculation method of the General EC Classification Guidelines for Preparations as issued in the latest version:

Harmful

Irritant

Hydroquinone has been included in the German "TRGS 905" (Technical Rules for Dangerous Substances/Index of carcinogen and mutagen substances or substances dangerous to reproductive systems), and has been classified as "Category 3" of carcinogen and mutagen substances

(3 = category of lowest dangerousness). The according EU committees have not yet evaluated this classification.

This statement was deduced from the properties of the single components.

· **Sensitisation** May cause sensitisation by skin contact.

· **CMR effects (carcinogenicity, mutagenicity and toxicity for reproduction)**

Limited evidence of a carcinogenic effect.

Possible risk of irreversible effects.

12 Ecological information:

· **Information about elimination (persistence and degradability):** Not determined

· **Behaviour in environmental systems:** Not determined

· **Mobility and bioaccumulation potential:** Not determined

· **Ecotoxicological effects:** Not determined

· **Remark:** Very toxic for fish

· **Behaviour in sewage processing plants:** Not determined

· **General notes:**

Water danger class 3 (German Regulation) (Self-assessment): extremely hazardous for water.

Do not allow product to reach ground water, water bodies or sewage system.

Also poisonous for fish and plankton in water bodies.

Very toxic for aquatic organisms

At present there are no ecotoxicological assessments.

The product does not contain organically bounded halogens (AOX-free).

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13 Disposal considerations

- **Product:**
- **Recommendation**
 Must not be disposed of together with household garbage. Do not allow product to reach sewage system.
 Must be specially treated under adherence to official regulations.

- **European waste catalogue**

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- **Uncleaned packagings:**
- **Recommendation:**
 Non contaminated packagings can be used for recycling.
 Empty contaminated packagings thoroughly. They can be recycled after thorough and proper cleaning.
 Packagings that cannot be cleaned are to be disposed of in the same manner as the product.
 EAK-No. 15 01 10
- **Recommended cleaning agent:** Water, if necessary with cleaning agent.

14 Transport information

- **Land transport ADR/RID (cross-border)**



- **ADR/RID-GGVS/E Class:** 9 Miscellaneous dangerous substances and articles.
- **UN-Number:** UN 3077
- **Packaging group:** III
- **Label:** 9
- **Designation of goods:** 3077 ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (1,4-dihydroxybenzene (hydroquinone))
- **Remarks:** "Limited quantity" according to chapter 3.4 ADR

- **Maritime transport IMDG:**



- **IMDG Class:** 9
- **UN Number:** UN 3077
- **Label:** 9
- **Packaging group:** III
- **EMS Number:** F-A,S-F
- **Marine pollutant:** No
- **Correct technical name:** ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (hydroquinone)
- **Remarks:** "Limited quantity" according to chapter 3.4 IMDG

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Air transport ICAO-TI and IATA-DGR:


- **ICAO/IATA Class:** 9
- **UN/ID Number:** UN 3077
- **Label** 9
- **Packaging group:** III
- **Correct technical name:** ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (hydroquinone)
- **Remarks:** Packing Instruction PAX/CAO 911

15 Regulatory information

Designation according to EC guidelines:

The product has been classified and labelled in accordance with EC Directives / Ordinance on Hazardous Materials (GefStoffV)

Code letter and hazard designation of product:


Xn Harmful
N Dangerous for the environment

Hazard-determining components of labelling:

1,4-dihydroxybenzene (hydroquinone)

Risk phrases:

22 Harmful if swallowed.
40 Limited evidence of a carcinogenic effect.
41 Risk of serious damage to eyes.
43 May cause sensitisation by skin contact.
68 Possible risk of irreversible effects.
50 Very toxic to aquatic organisms.

Safety phrases:

26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
36/37/39 Wear suitable protective clothing, gloves and eye/face protection.
61 Avoid release to the environment. Refer to special instructions/safety data sheets.

National regulations
Information about limitation of use:

Employment restrictions concerning pregnant and lactating women must be observed.

Technical instructions (air):

Class	Share in %
I	79.5

- **Water hazard class:** Water danger class 3 (Self-assessment): extremely hazardous for water.

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16 Other information:

These data are based on our present knowledge. However, they shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

· **Relevant R-phrases**

- 22 Harmful if swallowed.
- 31 Contact with acids liberates toxic gas.
- 40 Limited evidence of a carcinogenic effect.
- 41 Risk of serious damage to eyes.
- 43 May cause sensitisation by skin contact.
- 50 Very toxic to aquatic organisms.
- 51/53 Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
- 68 Possible risk of irreversible effects.

· **Recommended restriction of use** No public product, only for commercial use

· **Sources**

applicable EEC directives:

- 1999/45/EC last change 2006/8/EC
 - 67/548/EC last change 2004/73/EC (29. ATP)
- Internal physical tests, MSDS of the ingredients

· * **Data compared to the previous version altered.**

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1 Identification of substance:

- **Product details:**
- **Trade name: R 20-TC Developer part 2**
- **Article number:** 10231
- **Application of the substance / the preparation** Photographic developer
- **Manufacturer/Supplier:**
 ADEFO-CHEMIE GmbH
 Justus-von-Liebig-Str. 24-26
 D-63128 Dietzenbach
 Tel.: +49 6074 84239-0
 Fax: +49 6074 84239-63
 E-Mail: service@adefo-chemie.de
www.adefo-chemie.de
- **Informing department:**
 Tel.: +49 6074 84239-0
 Fax: +49 6074 84239-63
 Competent person according to 1907/2006/EC, Annex II:
 E-Mail: kr@calbe-chemie.de
- **Emergency information:** Tel.: 0700-24112112 (CAL)

2 Hazards identification

- **Hazard designation:**



C Corrosive

- **Information pertaining to particular dangers for man and environment**
 The product has to be labelled due to the calculation procedure of the "General Classification guideline for preparations of the EU" in the latest valid version.
 R 35 Causes severe burns.
- **Classification system**
 The classification is in line with current EC lists. It is expanded, however, by information from technical literature and by information furnished by supplier companies.

3 Composition/information on ingredients

- **Chemical characterization**
- **Description:** Mixture of the substances listed below with harmless additions.

- **Dangerous components:**

CAS: 1310-58-3 EINECS: 215-181-3	potassium hydroxide C, Xn; R 22-35	10-15%
CAS: 497-19-8 EINECS: 207-838-8	sodium carbonate Xi; R 36	10-25%
CAS: 139-89-9 EINECS: 205-381-9	trisodium 2-(carboxylatomethyl(2-hydroxyethyl)amino)ethyliminodi(acetate) Xi; R 36/38	2.0-5.0%

- **Additional information** For the wording of the listed risk phrases refer to section 16.



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4 First aid measures

- **General information** Instantly remove any clothing soiled by the product.
- **After inhalation** Supply fresh air; consult doctor in case of symptoms.
- **After skin contact** Instantly wash with water and soap and rinse thoroughly.
- **After eye contact**
Rinse opened eye for several minutes under running water (> 15 min). Then consult doctor.
- **After swallowing**
Rinse out mouth and then drink plenty of water.
Do not induce vomiting; instantly call for medical help.
- **Information for doctor**
- **Danger** Danger of gastric perforation.

5 Fire fighting measures

- **Suitable extinguishing agents**
CO₂, extinguishing powder or water jet. Fight larger fires with water jet or alcohol-resistant foam.
Use fire fighting measures that suit the environment.
- **For safety reasons unsuitable extinguishing agents** Water with a full water jet.
- **Special hazards caused by the material, its products of combustion or resulting gases:**
Can be released in case of fire
sulphur dioxide (SO₂)
- **Protective equipment:** Do not inhale explosion gases or combustion gases.

6 Accidental release measures

- **Person-related safety precautions:**
Avoid causing dust.
Wear protective clothing.
- **Measures for environmental protection:**
Do not allow to enter drainage system, surface or ground water.
- **Measures for cleaning/collecting:**
Collect mechanically.
Dispose of contaminated material as waste according to item 13.
Ensure adequate ventilation.
- **Additional information:**
See Section 8 for information on personal protection equipment.
See Section 13 for information on disposal.

7 Handling and storage

- **Handling**
- **Information for safe handling:** Prevent formation of dust.
- **Information about protection against explosions and fires:** No special measures required.
- **Storage**
- **Requirements to be met by storerooms and containers:** No special requirements.

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- **Information about storage in one common storage facility:** Do not store together with acids.
- **Further information about storage conditions:** Keep container tightly sealed.
- **Storage class** LGK 8B (VCI-Concept)

8 Exposure controls and personal protection

- **Additional information about design of technical systems:** No further data; see item 7.

- **Components with limit values that require monitoring at the workplace:**

1310-58-3 potassium hydroxide

WEL Short-term value: 2 mg/m³

- **Additional information:** The lists that were valid during the compilation were used as basis.
- **Personal protective equipment**
- **General protective and hygienic measures**

The usual precautionary measures should be adhered to general rules for handling chemicals.
Keep away from foodstuffs, beverages and food.
Take off immediately all contaminated clothing
Do not eat, drink or smoke while working.
Wash hands during breaks and at the end of the work.
Avoid contact with the eyes and skin.
- **Breathing equipment:** Not required.
- **Protection of hands:**

Protective gloves.
The protective gloves to be used must comply with the specifications of the EC directive 89/686/EEC and the resultant standard EN 374.
This recommendation applies only to the product stated in the Safety Data Sheet and supplied by us as well as to the purpose specified by us.
Only use chemical-protective gloves with CE-labelling of category III.
- **Material of gloves**

Butyl rubber, BR
Recommended thickness of the material: ≥ 0.5 mm
Nitrile rubber, NBR
(0,35 mm)
- **Penetration time of glove material**

Value for permeation: Level ≥ 6 (480 min)
The determined penetration times according to EN 374 part III are not performed under practical conditions. Therefore a maximum wearing time, which corresponds to 50% of the penetration time, is recommended.
- **For the permanent contact of a maximum of 15 minutes gloves made of the following materials are suitable:**

Synthetic gloves
Value for permeation: Level:
6 (480 min)
- **Eye protection:** Tightly sealed safety glasses.
- **Body protection:** Protective work clothing.

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9 Physical and chemical properties:

· General Information

Form:	Solid. Crystalline powder
Colour:	Colourless
Odour:	Not characteristic

· Change in condition

Melting point/Melting range:	Not determined
Boiling point/Boiling range:	Not determined

· Flash point:	Not applicable
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· Ignition temperature:

· Decomposition temperature:	> 250°C
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· Self-inflammability:	Product is not selfigniting.
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· Danger of explosion:	Product is not explosive.
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· Critical values for explosion:

Oxidizing properties	None
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· Density	Not determined
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· Settled apparent density at 20°C	1200 kg/m ³
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· Solubility in / Miscibility with

Water:	Soluble
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· pH-value (100 g/l) at 25°C:	13.5
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· Solvent content:

Organic solvents:	0.0 %
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· Solids content:	100.0 %
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10 Stability and reactivity

· Thermal decomposition / conditions to be avoided:

No decomposition if used according to specifications.

· Dangerous reactions

Strong exothermic reaction with acids

Reacts with acids releasing sulphur dioxide

· **Dangerous products of decomposition:** No dangerous decomposition products known

11 Toxicological information

· Acute toxicity:

· LD/LC50 values that are relevant for classification:

1310-58-3 potassium hydroxide

Oral	LD50	365 mg/kg
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· Primary irritant effect:

· **on the skin:** Strong caustic effect on skin and mucous membranes.

· **on the eye:** Strong caustic effect.

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- **Sensitization:** No sensitizing effect known.
- **Subacute to chronic toxicity:** No known symptoms to date.
- **Additional toxicological information:**
The product shows the following dangers according to the calculation method of the General EC Classification Guidelines for Preparations as issued in the latest version:
Corrosive
This statement was deduced from the properties of the single components.
Swallowing will lead to a strong caustic effect on mouth and throat and to the danger of perforation of esophagus and stomach.

12 Ecological information:

- **Information about elimination (persistence and degradability):** Not determined
- **Behaviour in environmental systems:** Not determined
- **Mobility and bioaccumulation potential:** Not determined
- **Ecotoxic effects:** Not determined
- **Remark:** Not determined
- **Behaviour in sewage processing plants:** Not determined
- **General notes:**
Water hazard class 1 (German Regulation) (Self-assessment): slightly hazardous for water.
At present there are no ecotoxicological assessments.
The product does not contain organically bounded halogens (AOX-free).

13 Disposal considerations

- **Product:**
- **Recommendation**
Must not be disposed of together with household garbage. Do not allow product to reach sewage system.
Must be specially treated under adherence to official regulations.

- **European waste catalogue**

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- **Uncleaned packagings:**
- **Recommendation:**
Non contaminated packagings can be used for recycling.
Empty contaminated packagings thoroughly. They can be recycled after thorough and proper cleaning.
Packagings that cannot be cleaned are to be disposed of in the same manner as the product.
EAK-No. 15 01 10
- **Recommended cleaning agent:** Water, if necessary with cleaning agent.

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14 Transport information

· **Land transport ADR/RID (cross-border)**



- **ADR/RID-GGVS/E Class:** 8 Corrosive substances.
- **Kemler Number:** 80
- **UN-Number:** UN 3262
- **Packaging group:** III
- **Label** 8
- **Designation of goods:** 3262 CORROSIVE SOLID, BASIC, INORGANIC, N.O.S. (POTASSIUM HYDROXIDE)
- **Remarks:** "Limited quantity" according to chapter 3.4 ADR

· **Maritime transport IMDG:**



- **IMDG Class:** 8
- **UN Number:** UN 3262
- **Label** 8
- **Packaging group:** III
- **EMS Number:** F-A,S-B
- **Marine pollutant:** No
- **Correct technical name:** CORROSIVE SOLID, BASIC, INORGANIC, N.O.S. (POTASSIUM HYDROXIDE)
- **Remarks:** "Limited quantity" according to chapter 3.4 IMDG

· **Air transport ICAO-TI and IATA-DGR:**



- **ICAO/IATA Class:** 8
- **UN/ID Number:** UN 3262
- **Label** 8
- **Packaging group:** III
- **Correct technical name:** CORROSIVE SOLID, BASIC, INORGANIC, N.O.S. (POTASSIUM HYDROXIDE)
- **Remarks:** PAX 822, CAO 823

15 Regulatory information

- **Designation according to EC guidelines:**
The product has been classified and labelled in accordance with EC Directives / Ordinance on Hazardous Materials (GefStoffV)
- **Code letter and hazard designation of product:**



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- **Hazard-determining components of labelling:**
potassium hydroxide
- **Risk phrases:**
35 Causes severe burns.
- **Safety phrases:**
26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
36/37/39 Wear suitable protective clothing, gloves and eye/face protection.
45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
- **National regulations**
- **Water hazard class:** Water hazard class 1 (Self-assessment): slightly hazardous for water.

16 Other information:

These data are based on our present knowledge. However, they shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

- **Relevant R-phrases**
22 Harmful if swallowed.
35 Causes severe burns.
36 Irritating to eyes.
36/38 Irritating to eyes and skin.
- **Recommended restriction of use** No public product, only for commercial use
- **Sources**
applicable EEC directives:
 - 1999/45/EC last change 2006/8/EC
 - 67/548/EC last change 2004/73/EC (29. ATP)Internal physical tests, MSDS of the ingredients
- *** Data compared to the previous version altered.**

GB