

Safety Data Sheet

acc. to OSHA HCS

Printing date 01/22/2014

Reviewed on 01/22/2014

1 Identification

Product identifier

- Trade name: **Akepox 2040 Component A**
- Article number: 10611, 10606, 10622
- Relevant identified uses of the substance or mixture and uses advised against: No further relevant information available.
- Application of the substance / the mixture: Epoxy resin adhesive

Details of the supplier of the safety data sheet

- Manufacturer/Supplier: AKEMI chemisch technische Spezialfabrik GmbH
Lechstrasse 28
D 90451 Nürnberg
Tel. +49(0)911-642960
Fax. +49(0)911-644456
e-mail info@akemi.de
- Information department: Laboratory
- Emergency telephone number: Product Safety Department AKEMI chemisch technische Spezialfabrik GmbH
Tel. +49(0)911-64296-59
Reachable during the following office hours:
Monday – Thursday from 07:30 a.m. to 16:30 p.m.
Friday from 07:30 a.m. to 13:30 p.m.

2 Hazard(s) identification

Classification of the substance or mixture



GHS07

- Skin Irrit. 2 H315 Causes skin irritation.
- Eye Irrit. 2A H319 Causes serious eye irritation.
- Skin Sens. 1 H317 May cause an allergic skin reaction.

Classification according to Directive 67/548/EEC or Directive 1999/45/EC



Irritant

Irritating to eyes and skin. May cause sensitization by skin contact.



Dangerous for the environment

Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Information concerning particular hazards for human and environment:

Contact with skin and inhalation of aerosols/ vapours of the preparation should be avoided.

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.

Classification system:

The classification was made according to the latest editions of international substances lists, and expanded upon from company and literature data.

Label elements

GHS label elements

The product is classified and labeled according to the Globally Harmonized System (GHS).

Hazard pictograms



GHS07

Signal word

Warning

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- Hazard-determining components of labeling: reaction product: bisphenol-A-(epichlorhydrin) epoxy resin (number average molecular weight = 700)
reaction product: bisphenol F-(epichlorhydrin); epoxy resin (number average molecular weight ≤ 700)
1.6-hexanediol diglycidyl ether
- Hazard statements H315 Causes skin irritation.
H319 Causes serious eye irritation.
H317 May cause an allergic skin reaction.
- Precautionary statements P101 If medical advice is needed, have product container or label at hand.
P102 Keep out of reach of children.
P103 Read label before use.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P261 Avoid breathing vapours.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P333+P313 If skin irritation or rash occurs: Get medical advice/attention.
P337+P313 If eye irritation persists: Get medical advice/attention.
P302+P352 IF ON SKIN: Wash with plenty of soap and water.
P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

- **Classification system:**
- **NFPA ratings (scale 0 - 4)**



- **HMIS-ratings (scale 0 - 4)**



- **Other hazards**
- Results of PBT and vPvB assessment
- PBT: Not applicable.
- vPvB: Not applicable.

3 Composition/information on ingredients

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

· Dangerous components:

CAS: 25068-38-6 NLP: 500-033-5 Index number: 603-074-00-8	reaction product: bisphenol-A-(epichlorhydrin) epoxy resin (number average molecular weight = 700) ☠ Xi R36/38-43; ☠ N R51/53 ⚠ Skin Irrit. 2, H315; Eye Irrit. 2, H319; Skin Sens. 1, H317	12.5-25%
CAS: 9003-36-5	reaction product: bisphenol F-(epichlorhydrin); epoxy resin (number average molecular weight ≤ 700) ☠ Xi R38-43; ☠ N R51/53 ⚠ Skin Irrit. 2, H315; Skin Sens. 1, H317	<12.5%
CAS: 16096-31-4 EINECS: 240-260-4	1.6-hexanediol diglycidyl ether ☠ Xi R36/38-43 R52/53 ⚠ Acute Tox. 4, H302; Skin Irrit. 2, H315; Eye Irrit. 2A, H319; Skin Sens. 1, H317	<12.5%

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· Additional information: For the wording of the listed risk phrases refer to section 16.

* 4 First-aid measures

· Description of first aid measures

- General information: Take affected persons out into the fresh air.
Position and transport stably on side.
Immediately remove any clothing soiled by the product.
- After inhalation: Supply fresh air and to be sure call for a doctor.
In case of unconsciousness place patient stably in side position for transportation.
- After skin contact: If skin irritation continues, consult a doctor.
Immediately wash with water and soap and rinse thoroughly.
- After eye contact: Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.
- After swallowing: Rinse out mouth and then drink plenty of water.
- Information for doctor: Bisphenol-A based resins: Inhalation, swallowing or dermal incorporation may cause health damage. Irritates respiratory tract, digestion system, eyes and skin: e.g., cough, dyspnea, lacrimation, burning. May cause health interferences such as dermal changes, renal, hepatic damage, and blood count changes. May provoke skin allergies. Sensitized users can react towards very low concentrations of Bisphenol-A-Epichlorhydrine and should avoid any further contact with this chemical.
The sensitizing effect of epoxide based resins is mainly caused by the concentration of epoxy resin polymers with a specific molecular weight ≤ 300 . The observed allergic dermal and respiratory appearances should be treated symptomatically in dependence of the severity. An epoxy resin based allergic disease belongs to a cell mediated (interaction of lymphocytes) type IV allergy.
- Most important symptoms and effects, both acute and delayed Breathing difficulty
Headache
Dizziness
Nausea
Allergic reactions
- Danger Danger of impaired breathing.
Skin contact with polyester and epoxy resin solutions as ingredient of the product should be avoided due to risks of skin irritations or allergic skin appearances. If occasional hand contact can not be avoided, protection gloves, proper protection ointments and protective agents generating a protective layer on the skin were applied.
- Indication of any immediate medical attention and special treatment needed If swallowed, gastric irrigation with added, activated carbon.

* 5 Fire-fighting measures

- Extinguishing media
- Suitable extinguishing agents: CO₂, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
- Special hazards arising from the substance or mixture Formation of toxic gases is possible during heating or in case of fire.
In case of fire, the following can be released:
Carbon monoxide (CO)
In certain fire conditions, traces of other toxic gases cannot be excluded.
- Advice for firefighters
- Protective equipment: Wear fully protective suit.
Wear self-contained respiratory protective device.
Do not inhale explosion gases or combustion gases.

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- **Additional information** Collect contaminated fire fighting water separately. It must not enter the sewage system.
Dispose of fire debris and contaminated fire fighting water in accordance with official regulations.

6 Accidental release measures

- **Personal precautions, protective equipment and emergency procedures** Ensure adequate ventilation
Use respiratory protective device against the effects of fumes/dust/aerosol.
- **Environmental precautions:** Do not allow to penetrate the ground/soil.
Do not allow product to reach sewage system or any water course.
Inform respective authorities in case of seepage into water course or sewage system.
Do not allow to enter sewers/ surface or ground water.
- **Methods and material for containment and cleaning up:** Dispose of the collected material according to regulations.
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
Ensure adequate ventilation.
- **Reference to other sections** See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

7 Handling and storage

- **Handling:**
- **Precautions for safe handling** Keep receptacles tightly sealed.
Store in cool, dry place in tightly closed receptacles.
Use only in well ventilated areas.
Ensure good ventilation/exhaustion at the workplace.
- **Information about protection against explosions and fires:** No special measures required.
- **Conditions for safe storage, including any incompatibilities**
- **Storage:**
- **Requirements to be met by storerooms and receptacles:** Store only in the original receptacle.
Prevent any seepage into the ground.
- **Information about storage in one common storage facility:** Store away from reducing agents.
Store away from foodstuffs.
- **Further information about storage conditions:** Store receptacle in a well ventilated area.
Keep receptacle tightly sealed.
- **Specific end use(s)** No further relevant information available.

8 Exposure controls/personal protection

- **Additional information about design of technical systems:** No further data; see item 7.
- **Control parameters**
- **Components with limit values that require monitoring at the workplace:** The product does not contain any relevant quantities of materials with critical values that have to be monitored at the workplace.

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

Do not eat, drink, smoke or sniff while working.
 Use skin protection cream for skin protection.
 Clean skin thoroughly immediately after handling the product.
 Keep away from foodstuffs, beverages and feed.
 Immediately remove all soiled and contaminated clothing.
 Wash hands before breaks and at the end of work.
 Do not inhale gases / fumes / aerosols.
 Avoid contact with the eyes and skin.
 - Breathing equipment:

Not necessary if room is well-ventilated.
 Short term filter device:
 Filter A/P2
 In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use respiratory protective device that is independent of circulating air.
 - Protection of hands:

Preventive skin protection by use of skin-protecting agents is recommended.
 After use of gloves apply skin-cleaning agents and skin cosmetics.
 Akemi skin protection agent recommendation for preventive skin shelter in application and combination of protective gloves:
 STOKO EMULSION (<http://www.stoko.com>)
 Akemi skin protection recommendation for skin cleaning after product handling:
 SLIG SPEZIAL (<http://www.stoko.com>)
 Akemi skin protection agent recommendation for skin aftercare:
 STOKO VITAN (<http://www.stoko.com>)
 The protection gloves to be used have to comply with the specifications of the directive 89/686/EC and the directive derived decree EN374, respectively, e.g. the above listed protection glove type. The mentioned permeation times' data were generated and verified with material samples of the recommended protection glove type in the scope of laboratory analyses of the company KCL GmbH in compliance with EN374.
 This recommendation refers exclusively to the material safety data sheet referenced product delivered by Akemi and the indicated field of application. In case of product dilution or in case of mixture with different substances or chemicals, and in condition of EN374 deviation the producer of CE-approved protection gloves must be contacted for detailed information (e.g., KCL GmbH, Germany, 36124 Eichenzell, internet: <http://www.kcl.de>).
- 

Protective gloves

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
 Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture.
 Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation
- Material of gloves

Butyl rubber, BR
 Chloroprene rubber, CR
 Nitrile rubber, NBR
 The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.

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- Penetration time of glove material Value for the permeation: Level \leq 6, 480 min
The exact break trough time has to be found out by the manufacturer of the protective gloves and has to be observed.
- For the permanent contact gloves made of the following materials are suitable: Butyl rubber, BR
Butoject (KCL, Art No. 897, 898)
Nitrile rubber, NBR
Camatril (KCL, Art No. 730, 731, 732, 733)
Dermatril (Art No. 740, 741, 742)
Chloroprene rubber, CR
Camapren (KCL, Art No. 720, 722, 726)
- As protection from splashes gloves made of the following materials are suitable: Nitrile rubber, NBR
Dermatril (KCL, Art No. 740, 741, 742)
Camatril (KCL, 730, 731, 732, 733)
Chloroprene rubber, CR
Camapren (KCL, Art No. 720, 722, 726)
- Not suitable are gloves made of the following materials: Leather gloves
Strong gloves
- Eye protection:  Tightly sealed goggles
- Body protection: Protective work clothing

9 Physical and chemical properties**· Information on basic physical and chemical properties****· General Information****· Appearance:**

Form: Pasty
Color: Light grey
Odor: Characteristic

· pH-value: Not applicable

· Change in condition

Melting point/Melting range: Undetermined.
Boiling point/Boiling range: > 200 °C (> 392 °F)

· Flash point: Not applicable.

· Ignition temperature: > 300 °C °C (> 572 °C °F)

· Decomposition temperature: > 200 °C °C (> 392 °C °F)

· Auto igniting: Product is not selfigniting.

· Danger of explosion: Product does not present an explosion hazard.

· Vapor pressure at 20 °C (68 °F): 2 hPa (2 mm Hg)

· Density at 20 °C (68 °F): 1.71 g/cm³ (14.27 lbs/gal)

· Specific gravity at 20 °C (68 °F): 1.71 g/cm³ (14.27 lbs/gal)

· Solubility in / Miscibility with Water: Not miscible or difficult to mix.

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· <u>Viscosity:</u>	
<u>Dynamic:</u>	Not determined. Not applicable
<u>Kinematic:</u>	Not determined. Not applicable
· <u>Solvent content:</u>	
<u>Organic solvents:</u>	0.0 %
<u>Solids content:</u>	56.6 %
· <u>Other information</u>	No further relevant information available.

10 Stability and reactivity

· <u>Reactivity</u>	
· <u>Chemical stability</u>	
· <u>Thermal decomposition / conditions to be avoided:</u>	
· <u>Possibility of hazardous reactions</u>	No decomposition if used and stored according to specifications. May produce violent reactions with bases and numerous organic substances including alcohols and amines. Reacts with reducing agents. Reacts with strong acids.
· <u>Conditions to avoid</u>	No further relevant information available.
· <u>Incompatible materials:</u>	No further relevant information available.
· <u>Hazardous decomposition products:</u>	Irritant gases/vapors

11 Toxicological information

- **Information on toxicological effects**
- Acute toxicity:

· LD/LC50 values that are relevant for classification:

25068-38-6 reaction product: bisphenol-A-(epichlorhydrin) epoxy resin (number average molecular weight = 700)

Oral	LD50	20000 mg/kg (mouse)
		19800 mg/kg (rabbit)
		11400 mg/kg (rat)
Dermal	NOEL	540 mg/kg (rat) (OECD 416)
	LD50	1270 mg/kg (mouse)
		> 2000 mg/kg (rabbit) > 1200 mg/kg (rat)

9003-36-5 reaction product: bisphenol F-(epichlorhydrin); epoxy resin (number average molecular weight ≤ 700)

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

- Primary irritant effect:
- on the skin: Irritant to skin and mucous membranes.
- on the eye: Irritating effect.
- Sensitization: Sensitization possible through skin contact.

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· Additional toxicological information:

The product shows the following dangers according to internally approved calculation methods for preparations:
Irritant

· Carcinogenic categories

· IARC (International Agency for Research on Cancer)

14807-96-6	Talc (Mg ₃ H ₂ (SiO ₃) ₄)	2B
13463-67-7	titanium dioxide	2B

· NTP (National Toxicology Program)

None of the ingredients is listed.

12 Ecological information

· Toxicity

· Aquatic toxicity:

25068-38-6 reaction product: bisphenol-A-(epichlorhydrin) epoxy resin (number average molecular weight = 700)

EC50/24h	1.1-3.6 mg/l (daphnia magna)
EC50/48h	2.8 mg/l (daphnia magna)
EC50/72h	9.4 mg/l (selenastrum capricornutum)
EC50/96h	220 mg/l (green alge)
	3.6 mg/l (Leuciscus idus)
IC50	>100 mg/l (bacteria)
LC50/96h	1.3 mg/l (piscis)
	1.5 mg/l (Oncorhynchus mykiss) (OECD 203)
	1.5-7.7 mg/l (rainbow trout)
NOEC	0.3 mg/kg (daphnia magna) (OECD 211)

9003-36-5 reaction product: bisphenol F-(epichlorhydrin); epoxy resin (number average molecular weight ≤ 700)

EC50/48h	1.6 mg/l (daphnia magna) (OECD 202: Part I)
EC50/72h	1.8 mg/l (green alge) (OECD 201)
IC50	>100 mg/l (bacteria)
LC50/96h	0.55 mg/l (piscis) (OECD 203)
NOEC	0.3 mg/kg (daphnia magna) (OECD 211)

· Persistence and degradability No further relevant information available.

· Behavior in environmental systems:

· Bioaccumulative potential No further relevant information available.

· Mobility in soil No further relevant information available.

· Ecotoxicological effects:

· Remark: Toxic for fish

· Additional ecological information:

· General notes: Do not allow product to reach ground water, water course or sewage system.
Also poisonous for fish and plankton in water bodies.
Toxic for aquatic organisms
Water hazard class 2 (Self-assessment): hazardous for water

· Results of PBT and vPvB assessment

· PBT: Not applicable.

· vPvB: Not applicable.

· Other adverse effects No further relevant information available.

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*** 13 Disposal considerations**

· Waste treatment methods

· Recommendation: Must not be disposed of together with household garbage. Do not allow product to reach sewage system.

· Uncleaned packagings:

· Recommendation: Empty contaminated packagings thoroughly. They can be recycled after thorough and proper cleaning.

· Recommended cleansing agent: Alcohol
acetone

*** 14 Transport information**

· UN-Number
· DOT, ADR, IMDG, IATA UN3082

· UN proper shipping name
· DOT Environmentally hazardous substances, liquid, n.o.s. (reaction product: bisphenol-A-(epichlorhydrin) epoxy resin (number average molecular weight = 700), reaction product: bisphenol F-(epichlorhydrin); epoxy resin (number average molecular weight ≤ 700))

· ADR 3082 Environmentally hazardous substances, liquid, n.o.s. (reaction product: bisphenol-A-(epichlorhydrin) epoxy resin (number average molecular weight = 700), reaction product: bisphenol F-(epichlorhydrin); epoxy resin (number average molecular weight ≤ 700))

· IMDG ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (reaction product: bisphenol-A-(epichlorhydrin) epoxy resin (number average molecular weight = 700), reaction product: bisphenol F-(epichlorhydrin); epoxy resin (number average molecular weight ≤ 700)), MARINE POLLUTANT

· IATA ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (reaction product: bisphenol-A-(epichlorhydrin) epoxy resin (number average molecular weight = 700), reaction product: bisphenol F-(epichlorhydrin); epoxy resin (number average molecular weight ≤ 700))

· Transport hazard class(es)

· DOT, IMDG, IATA



· Class 9 Miscellaneous dangerous substances and articles.
· Label 9

· ADR



· Class 9 (M6) Miscellaneous dangerous substances and articles
· Label 9

· Packing group
· DOT, ADR, IMDG, IATA III

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<ul style="list-style-type: none"> · Environmental hazards: · <u>Marine pollutant:</u> · <u>Special marking (ADR):</u> · <u>Special marking (IATA):</u> 	Product contains environmentally hazardous substances: Yes Symbol (fish and tree) Symbol (fish and tree) Symbol (fish and tree)
<ul style="list-style-type: none"> · Special precautions for user · <u>Danger code (Kemler):</u> 	Warning: Miscellaneous dangerous substances and articles 90
<ul style="list-style-type: none"> · Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code 	Not applicable.
<ul style="list-style-type: none"> · Transport/Additional information: · <u>DOT</u> · <u>Remarks:</u> 	Special marking with the symbol (fish and tree).
<ul style="list-style-type: none"> · UN "Model Regulation": 	UN3082, Environmentally hazardous substances, liquid, n.o.s. (reaction product: bisphenol-A-(epichlorhydrin) epoxy resin (number average molecular weight = 700), reaction product: bisphenol F-(epichlorhydrin); epoxy resin (number average molecular weight ≤ 700)), 9, III

* 15 Regulatory information

- **Safety, health and environmental regulations/legislation specific for the substance or mixture**

- Sara

- Section 355 (extremely hazardous substances):

None of the ingredient is listed.

- Section 313 (Specific toxic chemical listings):

None of the ingredients is listed.

- TSCA (Toxic Substances Control Act):

All ingredients are listed.

- Proposition 65

- Chemicals known to cause cancer:

None of the ingredients is listed.

- Chemicals known to cause reproductive toxicity for females:

None of the ingredients is listed.

- Chemicals known to cause reproductive toxicity for males:

None of the ingredients is listed.

- Chemicals known to cause developmental toxicity:

None of the ingredients is listed.

- Carcinogenicity categories

- EPA (Environmental Protection Agency)

None of the ingredients is listed.

- TLV (Threshold Limit Value established by ACGIH)

14807-96-6	Talc (Mg ₃ H ₂ (SiO ₃) ₄)	A4
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13463-67-7	titanium dioxide	A4
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- MAK (German Maximum Workplace Concentration)

14807-96-6	Talc (Mg ₃ H ₂ (SiO ₃) ₄)	3B
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13463-67-7	titanium dioxide	3A
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<ul style="list-style-type: none"> · NIOSH-Ca (National Institute for Occupational Safety and Health) 	<p>13463-67-7 titanium dioxide</p>
<ul style="list-style-type: none"> · OSHA-Ca (Occupational Safety & Health Administration) 	<p>None of the ingredients is listed.</p>
<ul style="list-style-type: none"> · <u>GHS label elements</u> 	<p>The product is classified and labeled according to the Globally Harmonized System (GHS).</p>
<ul style="list-style-type: none"> · <u>Hazard pictograms</u> 	<div style="text-align: center;">  <p>GHS07</p> </div>
<ul style="list-style-type: none"> · <u>Signal word</u> 	<p>Warning</p>
<ul style="list-style-type: none"> · <u>Hazard-determining components of labeling:</u> 	<p>reaction product: bisphenol-A-(epichlorhydrin) epoxy resin (number average molecular weight = 700) reaction product: bisphenol F-(epichlorhydrin); epoxy resin (number average molecular weight ≤ 700) 1.6-hexanediol diglycidyl ether</p>
<ul style="list-style-type: none"> · <u>Hazard statements</u> 	<p>H315 Causes skin irritation. H319 Causes serious eye irritation. H317 May cause an allergic skin reaction.</p>
<ul style="list-style-type: none"> · <u>Precautionary statements</u> 	<p>P101 If medical advice is needed, have product container or label at hand. P102 Keep out of reach of children. P103 Read label before use. P280 Wear protective gloves/protective clothing/eye protection/face protection. P261 Avoid breathing vapours. P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P333+P313 If skin irritation or rash occurs: Get medical advice/attention. P337+P313 If eye irritation persists: Get medical advice/attention. P302+P352 IF ON SKIN: Wash with plenty of soap and water. P501 Dispose of contents/container in accordance with local/regional/national/international regulations.</p>
<ul style="list-style-type: none"> · <u>National regulations:</u> 	
<ul style="list-style-type: none"> · <u>Information about limitation of use:</u> 	<p>Employment restrictions concerning young persons must be observed. Employment restrictions concerning pregnant and lactating women must be observed.</p>
<ul style="list-style-type: none"> · <u>Water hazard class:</u> 	<p>Water hazard class 2 (Self-assessment): hazardous for water.</p>
<ul style="list-style-type: none"> · <u>VOC USA</u> 	<p>The VOC of the materials was determined in accordance with procedures outlined in EPA Method 24, "Determination of Volatile Matter, Water Content, Volume Solid of Surface Coatings". The VOC was calculated using the equations referenced in ASTM D 3960, "Determination of Volatile Organic Compound (VOC) Content of Paints and Related Coatings". 0.0 g/l</p>
<ul style="list-style-type: none"> · <u>Chemical safety assessment:</u> 	<p>A Chemical Safety Assessment has not been carried out.</p>

* **16 Other information**

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

· Department issuing MSDS: Laboratory

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· Contact:

Dieter Zimmermann
Elke Hake
Fon ++49 (0)911 64296-59
@mail E.Hake@akemi.de

· Date of preparation / last revision

01/22/2014 / -

· Abbreviations and acronyms:

RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)
ICAO: International Civil Aviation Organization
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association
ACGIH: American Conference of Governmental Industrial Hygienists
EINECS: European Inventory of Existing Commercial Chemical Substances
ELINCS: European List of Notified Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent

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