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

1.1 Product identifier

DESMODUR RFE

1.2 Relevant identified uses of the substance or mixture and uses advised against

Use:
Hardener for coating materials or adhesives for industrial and trade applications

Uses advised against:
Not suitable for use in homeworker (DIY) applications.

1.3 Details of the supplier of the safety data sheet

Bayer MaterialScience AG
BMS-IO-S&T-PSRA-PSI Product Safety
51368 Leverkusen

Tel.: +49 214 30 25026
Email: productsafety@bayerbms.com

1.4 Emergency telephone number

+49 214 30 99300 (Sicherheitszentrale Bayer)

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Regulation (EC) No 1272/2008
Flammable liquids, Category 2 (H225)
Specific target organ toxicity (single exposure), Category 3 (H336)

Directive 67/548/EEC or 1999/45/EC
Highly flammable.
Repeated exposure may cause skin dryness or cracking. Vapours may cause drowsiness and dizziness.

2.2 Label elements

Regulation (EC) No 1272/2008

Danger

Hazardous components which must be listed on the label
ethyl acetate

Hazard statements:
H225 Highly flammable liquid and vapour.
H336 May cause drowsiness or dizziness.

Precautionary statements:
P210 Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
P233 Keep container tightly closed.
P240 Ground/bond container and receiving equipment.
P243 Take precautionary measures against static discharge.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.
P303 + P361 + P353 IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower.

Supplementary hazardous characteristics and labeling elements:
EUH066 Repeated exposure may cause skin dryness or cracking. EUH204 Contains isocyanates. May produce an allergic reaction.

Directive 67/548/EEC or 1999/45/EC
Labeling and classification in accordance with the EC Dangerous Preparations Directive (1999/45/EC) and subsequent amendments

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2.3 Other hazards

No information available.

SECTION 3: Composition/information on ingredients

**Type of product**: Mixture

**3.2 Mixtures**
Tris(p-isocyanatophenyl) thiophosphate
ca. 28 % in ethyl acetate

**Hazardous components**
ethyl acetate
Concentration [wt.-%]: ca. 71
EC-No.: 205-500-4
REACH Registration Number: 01-2119475103-46-0017
CAS-No.: 141-78-6
Classification (1272/2008/CE): Flam. Liq. 2 H225 Eye Irrit. 2 H319 STOT SE 3 H336

Tris(p-isocyanatophenyl) thiophosphate
Concentration [wt.-%]: ca. 28
EC-No.: 223-981-9
REACH Registration Number: 01-2119948848-16-0000
CAS-No.: 4151-51-3
Classification (1272/2008/CE): Acute Tox. 4 Oral H302
Classification (67/548/EEC): Xn R22

This contains:
chlorobenzene
Concentration [wt.-%]: < 1
Index-No.: 602-033-00-1
REACH Registration Number: 01-2119432722-45
CAS-No.: 108-90-7
Classification (1272/2008/CE): Flam. Liq. 3 H226  Acute Tox. 4 Inhalative H332  Skin Irrit. 2 H315  Aquatic Chronic 2 H411
Classification (67/548/EEC): R10  Xn R20  Xi R38  N R51/53
Specific threshold concentration
R52/53  2.5 - < 5 %
Xn, N R20, R52/53  5 - < 25 %
Xn, N R20, R51/53  >= 25 %

Exposure scenarios are not required for the impurities of the substance according to article 3(1) of Regulation (EC) No 1907/2006 mentioned above.

Candidate List of Substances of Very High Concern for Authorisation
This product does not contain substances of very high concern (Regulation (EC) No 1907/2006 (REACH), Article 57).

SECTION 4: First aid measures

4.1 Description of first aid measures

General advice: Take off all contaminated clothing immediately.

If inhaled: If aerosol or vapor is inhaled in high concentrations: Take the person into the fresh air and keep him warm, let him rest; if there is difficulty in breathing, medical advice is required.

In case of skin contact: In case of skin contact wash affected areas thoroughly with soap and plenty of water. Consult a doctor in the event of a skin reaction.

In case of eye contact: Hold the eyes open and rinse with preferably lukewarm water for a sufficiently long period of time (at least 10 minutes). Contact an ophthalmologist.

If swallowed: DO NOT induce the patient to vomit, medical advice is required.

4.2 Most important symptoms and effects, both acute and delayed

Notes to physician: Basic first aid, decontamination, symptomatic treatment.

4.3 Indication of any immediate medical attention and special treatment needed

Therapeutic measures: No information available.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media: Carbon dioxide (CO2), Foam, extinguishing powder, in cases of larger fires, water spray should be used.

Unsuitable extinguishing media: High volume water jet

5.2 Special hazards arising from the substance or mixture

Burning releases carbon monoxide, carbon dioxide, oxides of nitrogen, isocyanate vapors and traces of hydrogen cyanide. In the event of fire and/or explosion do not breathe fumes.
5.3 Advice for fire-fighters
During fire-fighting respirator with independent air-supply and airtight garment is required.

Do not allow contaminated extinguishing water to enter the soil, ground-water or surface waters.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures
Put on protective equipment (see section 8). Keep away from sources of ignition. Ensure adequate ventilation/exhaust extraction. Keep unauthorized persons away.

6.2 Environment related measures
Do not allow to escape into waterways, wastewater or soil.

6.3 Methods and material for containment and cleaning up
Remove mechanically; cover the remainder with wet, absorbent material (e.g. sawdust, chemical binder based on calcium silicate hydrate, sand). After approx. one hour transfer to waste container and do not seal (evolution of CO2!). Keep damp in a safe ventilated area for several days.

6.4 Reference to other sections
For further disposal measures see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling
Provide sufficient air exchange and/or exhaust in work rooms. Exhaust ventilation necessary if product is sprayed.

In all areas where isocyanate aerosols and/or vapor concentrations are produced in elevated concentrations, exhaust ventilation must be provided in such a way that the workplace exposure limits (WEL) is not exceeded. The air should be drawn away from the personnel handling the product. The threshold limit values noted in section 8 must be monitored.

Explosion protection required.

The personal protective measures described in section 8 must be observed. The precautions required in the handling of solvents and isocyanates must be taken. Avoid contact with skin and eyes and the inhalation of vapor.

Keep away from foodstuffs, drinks and tobacco. Wash hands before breaks and at end of work and use skin-protecting ointment. Keep working clothes separately. Take off all contaminated clothing immediately.

7.2 Conditions for safe storage, including any incompatibilities
Keep container dry and tightly closed in a cool and well ventilated place. Further information on the storage conditions which must be observed to preserve quality can be found in our product information sheet.

Storage class (TRGS 510) : 3: Flammable liquids

7.3 Specific end use(s)
No information available.
8.1 Control parameters

Components with workplace control parameters

<table>
<thead>
<tr>
<th>Substance</th>
<th>CAS-No.</th>
<th>Basis</th>
<th>Type</th>
<th>Value</th>
<th>Ceiling Limit Value</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>ethyl acetate</td>
<td>141-78-6</td>
<td>TRGS 900</td>
<td>TLV</td>
<td>400 ppm 1.500 mg/m³</td>
<td>2 Y</td>
<td>Listed.</td>
</tr>
<tr>
<td>ethyl acetate</td>
<td>141-78-6</td>
<td>TRGS 900</td>
<td>STEL</td>
<td>5 ppm 23 mg/m³</td>
<td></td>
<td>Category I: substances for which the localized effect has an assigned OEL or for substances with a sensitizing effect in respiratory passages.</td>
</tr>
<tr>
<td>chlorobenzene</td>
<td>108-90-7</td>
<td>EU ELV</td>
<td>TWA</td>
<td>15 ppm 70 mg/m³</td>
<td></td>
<td>Indicative</td>
</tr>
<tr>
<td>chlorobenzene</td>
<td>108-90-7</td>
<td>TRGS 900</td>
<td>STEL</td>
<td>10 ppm 47 mg/m³</td>
<td></td>
<td>Listed.</td>
</tr>
</tbody>
</table>

The product may contain traces of phenylisocyanate.

<table>
<thead>
<tr>
<th>Substance</th>
<th>CAS-No.</th>
<th>Basis</th>
<th>Type</th>
<th>Value</th>
<th>Ceiling Limit Value</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phenyl isocyanate</td>
<td>103-71-9</td>
<td>TRGS 900</td>
<td>TLV</td>
<td>0.01 ppm 0.05 mg/m³</td>
<td>1</td>
<td>Category I: substances for which the localized effect has an assigned OEL or for substances with a sensitizing effect in respiratory passages.</td>
</tr>
</tbody>
</table>

 Derived No Effect Level (DNEL) or Derived Minimal Effect Level (DMEL)

<table>
<thead>
<tr>
<th>ethyl acetate</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Value type</th>
<th>Route of exposure</th>
<th>Health Effects</th>
<th>Value</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Worker (short-term)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DNEL</td>
<td>Dermal</td>
<td>- systemic effects</td>
<td>Not relevant</td>
<td></td>
</tr>
<tr>
<td>DNEL</td>
<td>Inhalation</td>
<td>- systemic effects</td>
<td>1468 mg/m³ air</td>
<td></td>
</tr>
<tr>
<td>DNEL</td>
<td>Dermal</td>
<td>- local effects</td>
<td>Not relevant</td>
<td></td>
</tr>
<tr>
<td>DNEL</td>
<td>Inhalation</td>
<td>- local effects</td>
<td>1468 mg/m³ air</td>
<td>Most sensitive endpoint: irritation (respiratory tract)</td>
</tr>
<tr>
<td>Worker (long-term)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DNEL</td>
<td>Dermal</td>
<td>- systemic effects</td>
<td>63 mg/kg body weight/day</td>
<td></td>
</tr>
</tbody>
</table>
**Tris(p-isocyanatophenyl) thiophosphate**

<table>
<thead>
<tr>
<th>Value type</th>
<th>Route of exposure</th>
<th>Health Effects</th>
<th>Value</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>DNEL</td>
<td>Eye contact</td>
<td>- local effects</td>
<td></td>
<td>No hazard identified</td>
</tr>
<tr>
<td>Worker</td>
<td>(long-term)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DNEL</td>
<td>Inhalative</td>
<td>- systemic effects</td>
<td>0,047 mg/m³</td>
<td>Most sensitive endpoint: Repeated dose toxicity</td>
</tr>
<tr>
<td>DNEL</td>
<td>Dermal</td>
<td>- systemic effects</td>
<td></td>
<td>No hazard identified</td>
</tr>
<tr>
<td>DNEL</td>
<td>Inhalative</td>
<td>- local effects</td>
<td></td>
<td>No hazard identified</td>
</tr>
<tr>
<td>DNEL</td>
<td>Dermal</td>
<td>- local effects</td>
<td></td>
<td>No hazard identified</td>
</tr>
</tbody>
</table>

**Predicted No Effect Concentration (PNEC)**

<table>
<thead>
<tr>
<th>Compartment</th>
<th>Value</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freshwater</td>
<td>0,26 mg/l</td>
<td></td>
</tr>
</tbody>
</table>
Marine water | 0,026 mg/l
---|---
Water: Intermittent release | 1,65 mg/l
Fresh water sediment | 1,25 mg/kg dry weight
Marine sediment | 0,125 mg/kg dry weight
Soil | 0,24 mg/kg dry weight
STP (sewage-treatment plant) | 650 mg/l
Oral | 200 mg/kg food

### Tris(p-isocyanatophenyl) thiophosphate

<table>
<thead>
<tr>
<th>Compartment</th>
<th>Value</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freshwater</td>
<td>0,1 mg/l</td>
<td></td>
</tr>
<tr>
<td>Marine water</td>
<td>0,01 mg/l</td>
<td></td>
</tr>
<tr>
<td>Water: Intermittent release</td>
<td>1 mg/l</td>
<td></td>
</tr>
<tr>
<td>Freshwater sediment</td>
<td>2557 mg/kg dry weight</td>
<td></td>
</tr>
<tr>
<td>Marine sediment</td>
<td>155 mg/kg dry weight</td>
<td></td>
</tr>
<tr>
<td>STP (sewage-treatment plant)</td>
<td>100 mg/l</td>
<td></td>
</tr>
<tr>
<td>Soil</td>
<td>510 mg/kg dry weight</td>
<td></td>
</tr>
<tr>
<td>Air</td>
<td>No hazard identified</td>
<td></td>
</tr>
<tr>
<td>Secondary poisoning</td>
<td>Does not bioaccumulate.</td>
<td></td>
</tr>
</tbody>
</table>

### 8.2 Exposure controls

**Respiratory protection**
Respiratory protection required in insufficiently ventilated working areas and during spraying. An air-fed mask, or for short periods of work, a combination of charcoal filter and particulate filter is recommended.

**Hand protection**
Conditionally suitable materials for protective gloves; EN 374:
Butyl rubber - IIR (>= 0.5 mm); Break through time: >= 60 min
Recommendation: contaminated gloves should be disposed of.

**Eye protection**
Wear eye/face protection.

**Skin and body protection**
Wear suitable protective clothing.

### SECTION 9: Physical and chemical properties

**9.1 Information on basic physical and chemical properties**

- **Appearance:** liquid
- **Colour:** yellow to brownish
- **Odour:** ester-like
- **Odour Threshold:** not established
- **pH:** not applicable
- **Boiling point/boiling range:** ca. 77 °C at 1.013 hPa
- **Flash point:** ca. -4 °C
- **Evaporation rate:** not established
- **Flammability (solid, gas):** not established
- **Burning number:** not applicable
- **Upper/lower flammability or explosive limits:**
  - Ethyl acetate: upper: 11,5 % (V) / lower: 2,2 % (V)

---

**DIN 51755**

7/16 BMS_SDS_DE / DE
Vapour pressure: ca. 97 hPa at 20 °C
Vapour density: not established
Density: ca. 1,0 g/cm³ at 20 °C
Miscibility with water: immiscible at 15 °C
Water solubility of ingredients: 
ethyl acetate ca. 85 g/l at 20 °C
Surface tension: not established
Partition coefficient (n-octanol/water): not established
Auto-ignition temperature: not applicable
Ignition temperature: ca. 460 °C
Decomposition temperature: not established
Viscosity, dynamic: ca. 3 mPa.s at 20 °C
Explosive properties: not established
Dust explosion class: not applicable
Oxidising properties: not established

9.2 Other information
The indicated values do not necessarily correspond to the product specification. Please refer to the technical information sheet for specification data.

SECTION 10: Stability and reactivity

10.1 Reactivity
This information is not available.

10.2 Chemical stability
No decomposition below initial boiling point.

10.3 Possibility of hazardous reactions
Exothermic reaction with amines and alcohols; reacts with water forming CO2; in closed containers, risk of bursting owing to increase of pressure.

10.4 Conditions to avoid
This information is not available.

10.5 Incompatible materials
This information is not available.

10.6 Hazardous decomposition products
No hazardous decomposition products when stored and handled correctly.

SECTION 11: Toxicological information

11.1 Information on toxicological effects
Acute toxicity, oral
LD50 rat: > 2,000 mg/kg
Method: OECD Test Guideline 423
Toxicological studies at the product
Acute toxicity, dermal
edethyl acetate
LD50 rabbit, male: > 18,000 mg/kg
Tris(p-isocyanatophenyl) thiophosphate
Based on available data, the classification criteria are not met.

Acute toxicity, inhalation
edethyl acetate
LC50 rat: > 22.5 mg/l, 6 h
Test atmosphere: vapour
Tris(p-isocyanatophenyl) thiophosphate
LC50 rat, male: 5,721 mg/l, 4 h
Test atmosphere: dust/mist
Method: OECD Test Guideline 403

Primary skin irritation
Species: rabbit
Result: slight irritant
Classification: No skin irritation
Method: OECD Test Guideline 404
Toxicological studies at the product

Primary mucosae irritation
Species: rabbit
Result: slight irritant
Classification: No eye irritation
Method: OECD Test Guideline 405
Toxicological studies at the product

Sensitisation
edethyl acetate
Skin sensitisation according to Magnusson/Kligmann (maximizing test):
Species: guinea pig
Result: negative
Classification: Does not cause skin sensitization.
Method: OECD Test Guideline 406
Tris(p-isocyanatophenyl) thiophosphate
Skin sensitisation according to Buehler (epicutaneous test):
Species: guinea pig
Result: negative
Classification: Does not cause skin sensitization.
Method: OECD Test Guideline 406
Toxicological studies at the product containing solvent.

Respiratory sensitization
Classification: No classification according to EC Directives 2006/121/EC or 1999/45/EC as respiratory sensitizer.

Subacute, subchronic and prolonged toxicity
edethyl acetate
LOAEL (Lowest observable adverse effect level): 350 ppm
Application Route: Inhalative
Species: rat, male/female
Dose Levels: 0 - 350 - 750 - 1500 ppm
Exposure duration: 13 w
Frequency of treatment: 6 hours a day, 5 days a week
Target Organs: Nasal inner lining
Test substance: vapour
Method: OECD Test Guideline 413
NOAEL: 900 mg/kg
Application Route: Oral
Species: rat, male/female
Dose Levels: 0 - 300 - 900 - 3600 mg/kg
Exposure duration: 13 w
Frequency of treatment: daily

Tris(p-isocyanatophenyl) thiophosphate
NOAEL: 2.8 mg/m³
Application Route: Inhalative
Species: rat, male/female
Dose Levels: 0 - 2.8 - 15.4 - 74 mg/m³
Exposure duration: 28 d
Frequency of treatment: (6 hours a day, 5 days a week)
Test substance: as aerosol
Method: OECD Test Guideline 412

Carcinogenicity
ethyl acetate
No data available.

Reproductive toxicity/Fertility
ethyl acetate
Available data show no indications for reproductive toxicity.

Tris(p-isocyanatophenyl) thiophosphate
Available data show no indications for reproductive toxicity.

Reproductive toxicity/Teratogenicity
ethyl acetate
NOAEL (teratogenicity): 20000 ppm
NOAEL (maternal): 16000 ppm
NOAEL (developmental toxicity): 20000 ppm
Species: rat, female
Application Route: Inhalative
Dose Levels: 0 - 10000 - 16000 - 20000 ppm
Method: OECD Test Guideline 414
Studies of a comparable product.

Tris(p-isocyanatophenyl) thiophosphate
Available data show no indications for reproductive toxicity.

Genotoxicity in vitro
Test type: Salmonella/microsome test (Ames test)
Result: No indication of mutagenic effects.
Method: OECD Test Guideline 471
Studies at the product.

Test type: Point mutation in mammalian cells (HPRT test)
Test system: Chinese hamster V79 cell line
Metabolic activation: with/without
Result: negative
Method: OECD Test Guideline 476
Studies at the product.

Test type: Micronucleus test
Test system: Chinese hamster V79 cell line
Metabolic activation: with/without
Result: negative
Method: OECD Test Guideline 487
Studies at the product.

Genotoxicity in vivo
ethyl acetate

Test type: In vivo micronucleus test
Species: mouse, male
Application Route: intraperitoneal
Dose: 0 -100 - 200 - 400 - 800 mg/kg
Result: negative
Method: OECD Test Guideline 474

STOT evaluation – one-time exposure
ethyl acetate
May cause drowsiness or dizziness.

Tris(p-isocyanatophenyl) thiophosphate
Based on available data, the classification criteria are not met.

STOT evaluation – repeated exposure
ethyl acetate
Based on available data, the classification criteria are not met.

Tris(p-isocyanatophenyl) thiophosphate
Based on available data, the classification criteria are not met.

Aspiration toxicity
ethyl acetate
Based on available data, the classification criteria are not met.

Tris(p-isocyanatophenyl) thiophosphate
Based on available data, the classification criteria are not met.

CMR Assessment
ethyl acetate
Carcinogenicity: Based on available data, the classification criteria are not met.
Mutagenicity: In vitro an in vivo tests did not show mutagenic effects. On the basis of this data, the substance is not classified as mutagenic.
Teratogenicity: Based on available data, the classification criteria are not met.
Reproductive toxicity/Fertility: Based on available data, the classification criteria are not met.

Tris(p-isocyanatophenyl) thiophosphate
Carcinogenicity: Based on available data, the classification criteria are not met.
Mutagenicity: In vitro tests did not show mutagenic effects
Teratogenicity: Based on available data, the classification criteria are not met.
Reproductive toxicity/Fertility: Based on available data, the classification criteria are not met.

Toxicology Assessment
ethyl acetate
Acute effects: Based on available data, the classification criteria are not met.
Sensitization: Based on available data, the classification criteria are not met.
Repeated dose toxicity: Repeated exposure may cause skin dryness or cracking.

Tris(p-isocyanatophenyl) thiophosphate
Acute effects: Harmful if swallowed.
Sensitization: Based on available data, the classification criteria are not met.
Repeated dose toxicity: Based on available data, the classification criteria are not met.

Additional information
Tris(p-isocyanatophenyl) thiophosphate
Special properties/effects: Over-exposure entails the risk of concentration-dependent irritating effects on eyes, nose throat, and respiratory tract. Delayed appearance of the complaints and development of hypersensitivity (difficult breathing, coughing, asthma) are possible. Hypersensitive persons may suffer from these effects even at low isocyanate concentrations. Prolonged or repeated exposure may cause irritation of skin and eyes.

SECTION 12: Ecological information
Do not allow to escape into waterways, wastewater or soil.

12.1 Toxicity

**Acute Fish toxicity**
Species: Danio rerio (zebra fish)
Exposure duration: 96 h
Method: OECD Test Guideline 203
No toxic effects with saturated solution.
Ecotoxicological studies of the product

**Chronic Fish toxicity**
ethyl acetate
NOEC < 9.65 mg/l
Species: Pimephales promelas (fathead minnow)
Exposure duration: 32 d
Method: Early life stage test

**Acute toxicity for daphnia**
Species: Daphnia magna (Water flea)
Exposure duration: 48 h
Method: OECD Test Guideline 202
No toxic effects with saturated solution.
Ecotoxicological studies of the product

**Chronic toxicity to daphnia**
ethyl acetate
NOEC (Reproduction) 2.4 mg/l
Species: Daphnia magna (Water flea)
Exposure duration: 21 d
Method: no data available

**Acute toxicity for algae**
Species: scenedesmus subspicatus
Exposure duration: 72 h
Method: OECD Test Guideline 201
No toxic effects with saturated solution.
Ecotoxicological studies of the product

**Acute bacterial toxicity**
EC50 > 10,000 mg/l
Species: activated sludge
Method: OECD Test Guideline 209
Ecotoxicological studies of the product

**Sediment Toxicity**
ethyl acetate
Due to the low n-octanol-water partition coefficient, an adsorption on the sediment is not to be expected.

**Ecotoxicology Assessment**
ethyl acetate
Acute aquatic toxicity: The substance is graded as non-critical to water organisms.
Chronic aquatic toxicity: Due to easy biodegradability, the chronic aquatic toxicity can be regarded as uncritical.
Toxicity Data on Soil: Not expected to adsorb on soil.
Impact on Sewage Treatment: Because of the low bacterial toxicity, there is no risk of an adverse effect on the performance of biological waste water treatment plants.

**Tris(p-isocyanatophenyl) thiophosphate**
Acute aquatic toxicity: Based on available data, the classification criteria are not met.
Chronic aquatic toxicity: Based on available data, the classification criteria are not met.
Impact on Sewage Treatment: Because of the low bacterial toxicity, there is no risk of an adverse effect on the performance of biological waste water treatment plants.

12.2 Persistence and degradability
Biodegradability
ethyl acetate
Test type: aerobic
Inoculum: activated sludge
Biodegradation: ca. 69 %, 20 d, i.e. readily biodegradable

Inoculum: activated sludge
Biodegradation: 93 %, 6 d, i.e. readily biodegradable
Method: Simulation study

Tris(p-isocyanatophenyl) thiophosphate
Test type: aerobic
Inoculum: activated sludge
Biodegradation: 58,2 %, 28 d, i.e. not readily degradable
Method: OECD Test Guideline 301 F

Stability in water
ethyl acetate
Test type: Hydrolysis
Half life: 16 Years (pH: 5)
Hydrolytic temperature: 25 °C

Test type: Hydrolysis
Half life: 2 Years (pH: 7)
Hydrolytic temperature: 25 °C

Test type: Hydrolysis
Half life: 7,5 d (pH: 9)
Hydrolytic temperature: 25 °C
Hydrolyses slowly on contact with water.

Tris(p-isocyanatophenyl) thiophosphate
Test type: Hydrolysis
Half life: < 24 h at 20 °C (pH: 7)
Method: OECD Test Guideline 111
The substance hydrolyzes rapidly in water.
Studies of a comparable product.

Photodegradation
ethyl acetate
Test type: Phototransformation in air
Temperature: 25 °C
sensitizer: OH-radicals
Half-life indirect photolysis: 75 h
After evaporation or exposure to the air, the product will be slowly degraded by photochemical processes.

Volutility (Henry's Law constant)
Tris(p-isocyanatophenyl) thiophosphate
Calculated value = 0.621 Pa*m3/mol at 20 °C
The substance has to be scored as being slightly volatile from water.

12.3 Bioaccumulative potential

Bioaccumulation
ethyl acetate
Bioconcentration factor (BCF): 30
Species: Leuciscus idus (Golden orfe)
Exposure duration: 3 d
Does not significantly accumulate in organisms.

12.4 Mobility in soil
**Distribution among environmental compartments**

**ethyl acetate**
- Adsorption/Soil
  - Due to the low n-octanol-water partition coefficient, an adsorption on the soil is not to be expected.
- Highly mobile in soils

**Tris(p-isocyanatophenyl) thiophosphate**
- Adsorption/Soil
  - Koc value: 256000
  - Method: calculated

**Environmental distribution**

**ethyl acetate**
- Method: (calculated)
  - The product will be dispersed amongst the various environmental compartments (soil/ water/ air).

**12.5 Results of PBT and vPvB assessment**

**ethyl acetate**
- This substance does not meet the criteria for classification as PBT or vPvB.

**Tris(p-isocyanatophenyl) thiophosphate**
- This substance does not meet the criteria for classification as PBT or vPvB.

**12.6 Other adverse effects**

Isocyanate reacts with water at the interface forming CO2 and a solid insoluble product with high melting point (polyurea). This reaction is accelerated by surfactants (e.g. detergents) or by watersoluble solvents. Previous experience shows that polyurea is inert and non-degradable.

**SECTION 13: Disposal considerations**

Dispose in accordance with applicable international, national and local laws, ordinances and statutes. For disposal within the EC, the appropriate code according to the European Waste Catalogue (EWC) should be used.

**13.1 Waste treatment methods**

After final product withdrawal, all residues must be removed from containers (drip-free, powder-free or paste-free). Once the product residues adhering to the walls of the containers have been rendered harmless, the product and hazard labels must be invalidated. These containers can be returned for recycling to the appropriate centres set up within the framework of the existing take-back scheme of the chemical industry. Containers must be recycled in compliance with national legislation and environmental regulations.

None disposal into waste water.

**SECTION 14: Transport information**

**ADR/RID**

<table>
<thead>
<tr>
<th>14.1 UN number</th>
<th>1173</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.2 UN proper shipping name</td>
<td>ETHYL ACETATE, SOLUTION</td>
</tr>
<tr>
<td>14.3 Transport hazard class(es)</td>
<td>3</td>
</tr>
<tr>
<td>Hazard Identification Number</td>
<td>33</td>
</tr>
<tr>
<td>14.4 Packing group</td>
<td>II</td>
</tr>
<tr>
<td>14.5 Environmental hazards</td>
<td>no</td>
</tr>
</tbody>
</table>

Limited quantity regulations applicable in accordance with chapter 3.4 ADR/RID in compliance with threshold value

**ADN**

<table>
<thead>
<tr>
<th>14.1 UN number</th>
<th>1173</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.2 UN proper shipping name</td>
<td>ETHYL ACETATE, SOLUTION</td>
</tr>
<tr>
<td>14.3 Transport hazard class(es)</td>
<td>3</td>
</tr>
</tbody>
</table>
Hazard Identification Number : 33
14.4 Packing group : II
14.5 Environmental hazards : no

This classification data does not apply to transportation by tanker. If required, additional information can be requested from the manufacturer.

IATA
14.1 UN number : 1173
14.2 UN proper shipping name : ETHYL ACETATE, SOLUTION
14.3 Transport hazard class(es) : 3
14.4 Packing group : II
14.5 Environmental hazards : no

IMDG
14.1 UN number : 1173
14.2 UN proper shipping name : ETHYL ACETATE, SOLUTION
14.3 Transport hazard class(es) : 3
14.4 Packing group : II
14.5 Environmental hazards : no

14.6 Special precautions for user
See section 6 - 8.
Additional information : Highly flammable.
Keep dry. Avoid heat above +40 °C.
Keep away from foodstuffs, acids and alkalis.

14.7 Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code
Not applicable.

SECTION 15: Regulatory information

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

EU Directive 96/82 EC (Seveso II Directive)
Revision: 2003
Listed in regulation: Highly flammable
Number in regulation: 7b
Quantity1: 5,000 t
Quantity2: 50,000 t

TA Luft List (Germany)
Type: Organic Substances
portion Class 1: 28 %
Fraction of other substances: 72 %

Water contaminating class (Germany)
1 slightly water endangering
(in accordance with Annex 4 to the Directive on Water-Hazardous Substances)
Any existing national regulations on the handling of isocyanates and solvents must be observed.

15.2 Chemical Safety Assessment
A Chemical Safety Assessment has been carried out for:
ethyl acetate
Tris(p-isocyanatophenyl) thiophosphate

SECTION 16: Other information
Full text of hazardous (H) warnings referred to under sections 2, 3 and 10 of the CLP classification (1272/2008/CE).

H225 Highly flammable liquid and vapour.
H226 Flammable liquid and vapour.
H302 Harmful if swallowed.
H315 Causes skin irritation.
H319 Causes serious eye irritation.
H332 Harmful if inhaled.
H336 May cause drowsiness or dizziness.
H332 Harmful if inhaled.
H411 Toxic to aquatic life with long lasting effects.

Full text of R-phrases referred to under sections 2, 3 and 10 of the EU classification (67/548/EEC,1999/45/EC).

R10 Flammable.
R11 Highly flammable.
R20 Harmful by inhalation.
R22 Harmful if swallowed.
R36 Irritating to eyes.
R38 Irritating to skin.
R51/53 Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
R66 Repeated exposure may cause skin dryness or cracking.
R67 Vapours may cause drowsiness and dizziness.

No exposure scenarios are provided for this mixture, because the necessary information about operational conditions and Risk Management Measures (RMM) of the identified uses can be found in chapter 8 of this SDS.

Changes since the last version are highlighted in the margin. This version replaces all previous versions.

Further information

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.