# SAFETY DATA SHEET
## RASCOflex US409 B-Comp
### According to WHMIS 2015

## 1. Identification

### Product identifier

#### Product name

RASCOflex US409 B-Comp

### Recommended use of the chemical and restrictions on use

#### Application

Semi-flexible silicate polyurethane Injection Resin

### Details of the supplier of the safety data sheet

#### Supplier

Rascor Tunnel- und Spezialtiefbau GmbH, Ratsgasse 6, 97688 Bad Kissingen, Deutschland Phone: +49 (0) 971 130 2738, Fax: +49 (0) 971 133 6251

Distributer (Switzerland):
Rascor International AG, Gewerbestrasse 4, 8162 Steinmaur, Schweiz Phone: +41 (0) 44-857 11 11, Fax: +41 (0) 44-857 11 00

### Emergency telephone number

#### Emergency telephone

Phone: +41 (0) 44-857 11 11 (8.00h - 17.00h)

## 2. Hazard(s) identification

### Classification of the substance or mixture

#### Physical hazards

Not Classified

#### Health hazards


#### Environmental hazards

Not Classified

### Label elements

#### Pictogram

- ![Pictogram](image)

#### Signal word

Danger
RASCOflex US409 B-Comp

Hazard statements

H315 Causes skin irritation.
H317 May cause an allergic skin reaction.
H319 Causes serious eye irritation.
H332 Harmful if inhaled.
H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H335 May cause respiratory irritation.
H351 Suspected of causing cancer.
H373 May cause damage to organs through prolonged or repeated exposure.

Precautionary statements

P280 Wear protective gloves/protective clothing/eye protection/face protection.
P284 [In case of inadequate ventilation] wear respiratory protection.
P302+P352 If on skin: Wash with plenty of water.
P304+P340 If inhaled: Remove person to fresh air and keep comfortable for breathing. P305 +P351+P338 If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308+P313 If exposed or concerned: Get medical advice/attention.

Isocyanic acid, polymethylenepolyphenylene ester, Diphenylmethane 4,4’- diisocyanate EUH204: Contains isocyanates. May produce an allergic reaction.

Contains

3. Composition/information on ingredients

Mixtures

<table>
<thead>
<tr>
<th>Isocyanic acid, polymethylenepolyphenylene ester</th>
<th>60-100%</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAS number: 9016-87-9</td>
<td></td>
</tr>
<tr>
<td>Classification</td>
<td></td>
</tr>
<tr>
<td>Acute Tox. 4 - H332</td>
<td></td>
</tr>
<tr>
<td>Skin Irrit. 2 - H315</td>
<td></td>
</tr>
<tr>
<td>Eye Irrit. 2A - H319</td>
<td></td>
</tr>
<tr>
<td>Resp. Sens. 1 - H334</td>
<td></td>
</tr>
<tr>
<td>Skin Sens. 1 - H317</td>
<td></td>
</tr>
<tr>
<td>Carc. 2 - H351</td>
<td></td>
</tr>
<tr>
<td>STOT SE 3 - H335</td>
<td></td>
</tr>
<tr>
<td>STOT RE 2 - H373</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Diphenylmethane 4,4’- diisocyanate</th>
<th>30-60%</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAS number: 101-68-8</td>
<td></td>
</tr>
<tr>
<td>Classification</td>
<td></td>
</tr>
<tr>
<td>Acute Tox. 4 - H332</td>
<td></td>
</tr>
<tr>
<td>Skin Irrit. 2 - H315</td>
<td></td>
</tr>
<tr>
<td>Eye Irrit. 2A - H319</td>
<td></td>
</tr>
<tr>
<td>Resp. Sens. 1 - H334</td>
<td></td>
</tr>
<tr>
<td>Skin Sens. 1 - H317</td>
<td></td>
</tr>
<tr>
<td>Carc. 2 - H351</td>
<td></td>
</tr>
<tr>
<td>STOT SE 3 - H335</td>
<td></td>
</tr>
<tr>
<td>STOT RE 2 - H373</td>
<td></td>
</tr>
</tbody>
</table>

The full text for all hazard statements is displayed in Section 16.
4. First-aid measures

Description of first aid measures

**General information**
Move affected person to fresh air and keep warm and at rest in a position comfortable for breathing. Get medical attention. Treat symptomatically.

**Inhalation**
IF INHALED: Get medical attention immediately. Move affected person to fresh air and keep warm and at rest in a position comfortable for breathing. Do not induce vomiting.

**Ingestion**
IF SWALLOWED: Get medical attention immediately. If throat irritation or coughing persists, proceed as follows. Rinse mouth thoroughly with water. Promptly get affected person to drink large volumes of water to dilute the swallowed chemical. Stop if the affected person feels sick as vomiting may be dangerous. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs.

**Skin Contact**
IF ON SKIN: Rinse immediately with plenty of water. Continue to rinse for at least 10 minutes. Get medical attention if irritation persists after washing. Remove contaminated clothing.

**Eye contact**
IF IN EYES: Remove any contact lenses and open eyelids wide apart. Continue to rinse for at least 15 minutes and get medical attention. Get medical attention if irritation persists after washing.

**Protection of first aiders**
First aid personnel should wear appropriate protective equipment during any rescue.

**Most important symptoms and effects, both acute and delayed**

**General information**
Treat symptomatically. See Section 11 for additional information on health hazards.

**Inhalation**
May cause sensitisation by inhalation. The liquid may be irritating to eyes, respiratory system and skin. May cause allergy or asthma symptoms or breathing difficulties if inhaled. Development of symptoms may be delayed for 24 to 48 hours.

**Ingestion**
Gastrointestinal symptoms, including upset stomach.

**Skin contact**
May cause skin irritation. May cause sensitization or allergic reactions in sensitive individuals.

**Eye contact**
Causes skin and eye irritation.

**Indication of immediate medical attention and special treatment needed**

**Notes for the doctor**
Treat symptomatically.

**Specific treatments**
Treat symptomatically.

5. Fire-fighting measures

**Extinguishing media**

**Suitable extinguishing media**
Use fire-extinguishing media suitable for the surrounding fire. Extinguish with alcohol-resistant foam, carbon dioxide or dry powder.

**Unsuitable extinguishing media**
Do not use water, if avoidable.
RASCOflex US409 B-Comp

Special hazards arising from the substance or mixture

Specific hazards The product is not flammable. Irritating gases or vapors.

Hazardous combustion products Harmful gases or vapors.

Advice for firefighters

Protective actions during firefighting Stop leak if safe to do so. If leakage cannot be stopped, evacuate area. Move containers from fire area if it can be done without risk.

Special protective equipment for firefighters Use air-supplied respirator, gloves and protective goggles.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

Personal precautions No action shall be taken without appropriate training or involving any personal risk. Keep unnecessary and unprotected personnel away from the spillage. Avoid contact with skin, eyes and clothing. Avoid inhalation of vapors. Follow precautions for safe handling described in this safety data sheet.

Environmental precautions

Environmental precautions Spillages or uncontrolled discharges into watercourses must be reported immediately to the Environmental Agency or other appropriate regulatory body.

Methods and material for containment and cleaning up

Methods for cleaning up If leakage cannot be stopped, evacuate area. Move containers from spillage area. Large Spillages: Absorb spillage with sand or other inert absorbent. Collect and place in suitable waste disposal containers and seal securely. Small Spillages: Absorb small quantities with paper towels and evaporate in a safe place. Residues and empty containers should be taken care of as hazardous waste according to local and national provisions. Dispose of waste to licensed waste disposal site in accordance with the requirements of the local Waste Disposal Authority.

Reference to other sections For personal protection, see Section 8. For waste disposal, see Section 13. See Section 11 for additional information on health hazards. See Section 12 for additional information on ecological hazards.

7. Handling and storage

Precautions for safe handling

Usage precautions For professional users only. Do not handle until all safety precautions have been read and understood. Use only in well-ventilated areas. Protect from moisture. Keep container dry. Container must be kept tightly closed when not in use. Do not eat, drink or smoke when using this product.

Advice on general occupational hygiene Do not eat, drink or smoke when using this product. Provide eyewash station. Wash promptly with soap and water if skin becomes contaminated. Promptly remove any clothing that becomes contaminated.
RASCOflex US409 B-Comp

Conditions for safe storage, including any incompatibilities

Storage precautions
Store at temperatures between 4°C and 30°C. Store in tightly-closed, original container in a dry, cool and well-ventilated place. Do not store near heat sources or expose to high temperatures. Store away from the following materials: Acids. Protect from moisture.

Storage class
Chemical storage.

Specific end use(s)
The identified uses for this product are detailed in Section 1.2.

8. Exposure Controls/personal protection

Diphenylmethane 4,4' - diisocyanate (CAS: 101-68-8)

DNEL
Workers - Dermal; Short term systemic effects: 50 mg/kg/day Workers - Inhalation; Short term systemic effects: 0.1 mg/m³ Workers - Dermal; Short term local effects: 28.7 mg/cm² Workers - Inhalation; Short term local effects: 0.1 mg/m³ Workers - Inhalation; Long term systemic effects: 0.05 mg/m³ Workers - Inhalation; Long term local effects: 0.05 mg/m³ Consumer - Dermal; Short term systemic effects: 25 mg/kg/day Consumer - Inhalation; Short term systemic effects: 0.05 mg/m³ Consumer - Oral; Short term systemic effects: 20 mg/kg/day Consumer - Dermal; Short term local effects: 17.2 mg/cm² Consumer - Inhalation; Short term local effects: 0.05 mg/m³ Consumer - Inhalation; Long term systemic effects: 0.025 mg/m³ Consumer - Inhalation; Long term local effects: 0.025 mg/m³

PNEC
- Fresh water; 1 mg/l - Marine water; 0.1 mg/l - Soil; 1 mg/kg - STP; 1 mg/l

Exposure controls

Protective equipment

Appropriate engineering controls
This product is not to be used under conditions of poor ventilation. In case of insufficient ventilation, wear suitable respiratory equipment.

Eye/face protection
Tight-fitting safety glasses. Personal protective equipment for eye and face protection should comply with OSHA 1910.133.

Hand protection
To protect hands from chemicals, gloves should comply with OSHA 1910.138 and be demonstrated to be impervious to the chemical and resist degradation. It is recommended that gloves are made of the following material: Nitrile rubber. Butyl rubber.

Other skin and body protection
Wear appropriate clothing to prevent skin contamination.

Hygiene measures
Wash hands thoroughly after handling. Promptly remove any clothing that becomes contaminated. Do not eat, drink or smoke when using this product.

Respiratory protection
Combination filter, type A2/P3.

Environmental exposure controls
Keep container tightly sealed when not in use. Residues and empty containers should be taken care of as hazardous waste according to local and national provisions.

9. Physical and Chemical Properties

Information on basic physical and chemical properties

Appearance
Colored liquid.
RASCOflex US409 B-Comp

Color  Brown.
Odor    Characteristic.
Odor threshold  Not determined.
pH      Not determined.
Melting point  Not applicable.
Initial boiling point and range  Not determined.
Flash point  >200°C
Evaporation rate  Not determined.
Evaporation factor  Not determined.
Flammability (solid, gas)  Not applicable.
Upper/lower flammability or explosive limits  Not applicable.
Other flammability  Not applicable.
Vapour pressure  Not determined.
Vapour density  Not determined.
Bulk density  Not applicable.
Solubility(ies)  Not determined.
Partition coefficient  Not determined.
Auto-ignition temperature  Not determined.
Decomposition Temperature  Not determined.
Viscosity  50-300 mPa s @ 25°C
Explosive properties  Not applicable.
Explosive under the influence of a flame  Not considered to be explosive.
Oxidising properties  Not applicable.
Density  1.15 - 1.35 g/cm3 @ 25°C

10. Stability and reactivity

Reactivity  Water-reactive materials.
Stability  Stable at normal ambient temperatures and when used as recommended.
Possibility of hazardous reactions  The following materials may react with the product: Water, moisture.
Conditions to avoid  Avoid exposure to high temperatures or direct sunlight.
Materials to avoid  Avoid contact with the following materials: Strong alkalis. Amines. Alcohols.
Hazardous decomposition products  Heating may generate the following products: Hydrogen cyanide (HCN). Carbon dioxide (CO2). Carbon monoxide (CO). Nitrous gases (NOx).
11. Toxicological information

### Information on toxicological effects

#### Acute toxicity - oral

<table>
<thead>
<tr>
<th>Notes (oral LD₅₀)</th>
<th>LD₅₀</th>
<th>Oral, Rat</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&gt;10000 mg/kg</td>
<td></td>
</tr>
</tbody>
</table>

#### Acute toxicity - dermal

<table>
<thead>
<tr>
<th>Notes (dermal LD₅₀)</th>
<th>LD₅₀</th>
<th>Dermal, Rabbit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&gt;9400 mg/kg</td>
<td></td>
</tr>
</tbody>
</table>

#### Acute toxicity - inhalation

<table>
<thead>
<tr>
<th>Notes (inhalation LC₅₀)</th>
<th>LD₅₀</th>
<th>Inhalation, Rat</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.49 mg/m³</td>
<td></td>
</tr>
</tbody>
</table>

#### ATE Inhilation (Vapours mg/l)

<table>
<thead>
<tr>
<th>ATE Inhilation (Vapours mg/l)</th>
<th>11.0</th>
</tr>
</thead>
</table>

#### Skin corrosion/Irritation

**Animal data**

- Isocyanic acid, polymethylenepolyphenylene ester
- Test: OECD 404 Acute Dermal Irritation/Corrosion
- Species: Rabbit
- Route of Exposure: Skin
- Result: Mild irritant

#### Serious eye damage/irritation

**Serious eye damage/irritation**

- Product/ingredient name: 4,4'-Methylene diphenyl diisocyanate
- Test: OECD 405 Acute Eye Irritation/Corrosion
- Species: Rabbit
- Route of exposure: Eyes
- Result: Non-irritant

#### Respiratory sensitization

**Respiratory sensitisation**

- Isocyanic acid, polymethylenepolyphenylene ester:
  - Test: No official guidelines
  - Route of exposure: Respiratory
  - Species: Guinea pig
  - Result: Sensitising

**Respiratory sensitisation**

- 4,4'-Methylene diphenyl diisocyanate:
  - Test: No official guidelines
  - Route of exposure: Respiratory
  - Species: Guinea pig
  - Result: Sensitising

#### Skin sensitization

**Skin sensitisation**

- Isocyanic acid, polymethylenepolyphenylene ester:
  - Route of exposure: Skin
  - Species: Mouse
  - Result: Sensitising

**Skin sensitisation**

- 4,4'-Methylene diphenyl diisocyanate:
  - Route of exposure: Skin
  - Species: Mouse
  - Result: Sensitising

#### Carcinogenicity

- 7/11
RASCOflex US409 B-Comp

Carcinogenicity
Isocyanic acid, polymethylenepolyphenylene ester Carcinogenicity Studies EU 2 years; 5 days per week, Inhalation, Rat Result - Negative 4,4'-Methylenediphenyl diisocyanate OECD 453 Combined Chronic Toxicity, Carcinogenicity Studies EU 2 years; 5 days per week, Inhalation, Rat Result - Positive Target organs - lungs Rats have been exposed for two years to a respirable aerosol of polymeric MDI which resulted in chronic pulmonary irritation at high concentrations. Only at the top level (6 mg/m3), there was a significant incidence of a benign tumour of the lung (adenoma) and one malignant tumour (adencarcinoma). There were no lung tumours at 1 mg/m3 and no effects at 0.2 mg/m3. Overall, the tumour incidence, both benign and malignant, and the number of animals with the tumours were not different from controls. The increased incidence of lung tumours is associated with prolonged respiratory irritation and the concurrent accumulation of yellow material in the lung, which occurred throughout the study. In the absence of prolonged exposure to high concentrations leading to chronic irritation and lung damage, it is highly unlikely that tumour formation will occur.

IARC carcinogenicity
Isocyanic acid, polymethylenepolyphenylene ester - 3
4,4'-Methylenediphenyl diisocyanate - 3

Reproductive toxicity
Teratogenicity: - OECD 414 Prenatal Developmental Toxicity Study: 4 mg/m³, NOAEL, Rat - Male, Female 4,4'-Methylenediphenyl diisocyanate Does not contain any substances known to be toxic to reproduction. No evidence of reproductive toxicity in animal studies.

Specific target organ toxicity - single exposure
STOT - single exposure Isocyanic acid, polymethylenepolyphenylene ester Category 3 - Inhalation - Respiratory tract irritation 4,4'-Methylenediphenyl diisocyanate Category 3 - Inhalation - Respiratory tract irritation

Specific target organ toxicity - repeated exposure
STOT - repeated exposure Isocyanic acid, polymethylenepolyphenylene ester Category 2 - Inhalation - Respiratory tract 4,4'-Methylenediphenyl diisocyanate Category 2 - Inhalation - Respiratory tract

Aspiration hazard
Not anticipated to present an aspiration hazard, based on chemical structure.

General information
Mutagenicity:
Isocyanic acid, polymethylenepolyphenylene ester
Test - OECD 474
Result - Negative
Equivocal Product/ingredient name - 4,4'-Methylenediphenyl diisocyanate
Test - EU EC B. 13/14 Mutagenicity -Reverse Mutation Testing using Bacteria
Result - Negative
Test - OECD 474 Mammalian Erythrocyte Micronucleus Test
Result - Negative No specific health hazards known.

Skin Contact
The liquid may be irritating to skin.

Eye contact
The product is irritating to eyes and skin.

Acute and chronic health hazards
Potential chronic health effects:
Isocyanic acid, polymethylenepolyphenylene ester
Test - OECD 453 Combined Chronic Toxicity/Carcinogenicity Studies
Result type - NOEC Dusts and mists
Result - 0.2 mg/m³ Inhalation - LC50 (rat): ca. 490 mg/m³ (4 hours) : using experimentally produced respirable aerosol having aerosol having aerodynamic <5microns. Repeated exposure may cause chronic upper respiratory irritation. This product may cause skin and eye irritation. May cause damage to mucous membranes in nose, throat, lungs and bronchial system.
**RASCOflex US409 B-Comp**

### Route of entry
- Inhalation
- Ingestion
- Skin and/or eye contact

### Medical Symptoms
Symptoms following overexposure may include the following:
- Allergic rash
- Asthma
- Pulmonary sensitization
- Breathlessness
- Coughing
- Chest tightness
- Feeling of chest pressure

### 12. Ecological Information

#### Toxicity

- **Acute toxicity - fish**
  - 4,4'-Methylenediphenyl diisocyanate
  - LC₅₀, 96 hours: >1000 mg/l, Fish

- **Acute toxicity - aquatic invertebrates**
  - Isocyanic acid, polymethylenepolyphenylene ester
  - OECD 202 Daphnia sp. Acute Immobilisation Test* Acute EC₅₀, 24 hours: >1000 mg/l, Daphnia magna
  - NOEC, 112 days: >10000 mg/l, Daphnia magna
  - OECD 211 Daphnia Magna Reproduction Test, 21 days: >10 mg/l, Daphnia magna
  - OECD 202 Daphnia sp. Acute Immobilisation Test* Acute EC₅₀, 24 hours static: >1000 mg/l, Daphnia magna
  - OECD 211 Daphnia Magna Reproduction Test, 21 days Semi-static: >10 mg/l, Daphnia magna

- **Acute toxicity - aquatic plants**
  - Isocyanic acid, polymethylenepolyphenylene ester
  - OECD 201 Alga, Growth Inhibition Test, 72 days: >1640 mg/l, Algae

- **Acute toxicity - microorganisms**
  - Isocyanic acid, polymethylenepolyphenylene ester
  - OECD 209 Activated Sludge, Respiration Inhibition Test, 3 hours: >100 mg/l, Bacteria

#### Persistence and degradability

- **Persistence and degradability**
  - No data available.

- **Biodegradation**
  - Not readily biodegradable.

- **Bioaccumulative potential**
  - Bio-Accumulative Potential
    - log Pow: BCF - 200, 4,4'-Methylenediphenyl diisocyanate log Pow: 4,51 BCF - 200

- **Partition coefficient**
  - Not determined.

- **Mobility in soil**
  - Mobility
    - By considering the production and use of the substance, it is unlikely that significant environmental exposure in the air or water will arise. Immiscible with water, but will react with water to produce inert and non-biodegradable solids. Conversion to soluble products, including diamino-diphenylmethane (MDA), is very low under the optimal laboratory conditions of good dispersion and low concentration. In air, the predominant degradation process is predicted to be a relatively rapid OH radical attack, by calculation and by analogy with related diisocyanates.

- **Adsorption/desorption coefficient**
  - Not available.

#### Results of PBT and vPvB assessment

- **This product does not contain any substances classified as PBT or vPvB.**

#### Other adverse effects

- **None known.**
### RASCOflex US409 B-Comp

#### Waste treatment methods

**General information**
Dispose of waste to licensed waste disposal site in accordance with the requirements of the local Waste Disposal Authority. Waste is classified as hazardous waste.

**Disposal methods**
Dispose of contents/container in accordance with national regulations. Waste is classified as hazardous waste.

**Waste class**
European Waste Catalogue (EWC):
- Waste Code - 08 05 01* Waste Designation - waste isocyanates
- Waste Code - 16 03 05* Waste Designation - organic wastes containing dangerous substances

### 14. Transport information

**General**
The product is not covered by international regulations on the transport of dangerous goods (IMDG, IATA, DoT).

**UN Number**
Not applicable.

**UN proper shipping name**
Not applicable.

**Transport hazard class(es)**
No transport warning sign required.

**Packing group**
Not applicable.

**Environmental hazards**

**Environmentally Hazardous Substance**
No.

**Special precautions for user**
Not applicable.

**Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code**
Not applicable.

### 15. Regulatory information

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

**National regulations**
- Control of Substances Hazardous to Health Regulations 2002 (as amended).
- EH40/2005 Workplace exposure limits.
- Health and Safety at Work etc. Act 1974 (as amended).
RASCOflex US409 B-Comp

**EU legislation**


Verwaltungsvorschrift wassergefährdende Stoffe (Germany): WGK 1 (slightly water pollutant)

**Guidance**

Isocyanates: Health hazards and precautionary measures EH16.

Workplace Exposure Limits EH40.

**Restrictions (Title VIII Regulation 1907/2006)**

No specific restrictions on use are known for this product.

15.2. Chemical safety assessment

No chemical safety assessment has been carried out.

**Inventories**

**EU - EINECS/ELINCS**

All the ingredients are listed or exempt.

16. Other information

<table>
<thead>
<tr>
<th>General information</th>
<th>Only trained personnel should use this material.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revision date</td>
<td>7/21/2015</td>
</tr>
<tr>
<td>Revision</td>
<td>1</td>
</tr>
<tr>
<td>SDS No.</td>
<td>5301</td>
</tr>
</tbody>
</table>
| Hazard statements in full | H315 Causes skin irritation.  
H317 May cause an allergic skin reaction.  
H319 Causes serious eye irritation.  
H332 Harmful if inhaled.  
H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.  
H335 May cause respiratory irritation.  
H351 Suspected of causing cancer.  
H373 May cause damage to organs through prolonged or repeated exposure. |