

## Safety data sheet according to Regulation (EC) No 1907/2006, Annex II

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

#### 1.1 Product identifier

#### FUEL CELL

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

##### Relevant identified uses of the substance or mixture:

Cartridge

##### Uses advised against:

No information available at present.

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

GB

OK Befestigung GmbH & Co. KG, Liesentorweg 19 A, 47802 Krefeld, Germany  
Phone: +49 (0)2151 953639, Fax: +49 (0)2151 953649  
www.okbefestigung.de

Qualified person's e-mail address: info@chemical-check.de, k.schnurbusch@chemical-check.de Please DO NOT use for requesting Safety Data Sheets.

#### 1.4 Emergency telephone number

##### Emergency information services / official advisory body:

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##### Telephone number of the company in case of emergencies:

+49 (0)2151 953639 ( Mo. - Fr. 08.00 h - 17.00 h )

### SECTION 2: Hazards identification

#### 2.1 Classification of the substance or mixture

##### Classification according to Regulation (EC) 1272/2008 (CLP)

| Hazard class    | Hazard category                              | Hazard statement                                         |
|-----------------|----------------------------------------------|----------------------------------------------------------|
| Flam. Gas       | 1                                            | H220-Extremely flammable gas.                            |
| Aquatic Chronic | 3                                            | H412-Harmful to aquatic life with long lasting effects.  |
| Press. Gas      | Compressed gas, Liquefied gas, Dissolved gas | H280-Contains gas under pressure, may explode if heated. |

#### 2.2 Label elements

##### Labeling according to Regulation (EC) 1272/2008 (CLP)



Danger

H220-Extremely flammable gas. H412-Harmful to aquatic life with long lasting effects. H280-Contains gas under pressure, may explode if heated.

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P210-Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.  
 P377-Leaking gas fire: Do not extinguish, unless leak can be stopped safely. P381-Eliminate all ignition sources if safe to do so.  
 P403-Store in a well-ventilated place.

## 2.3 Other hazards

The mixture does not contain any vPvB substance (vPvB = very persistent, very bioaccumulative) or is not included under XIII of the regulation (EC) 1907/2006 (< 0,1 %).

The mixture does not contain any PBT substance (PBT = persistent, bioaccumulative, toxic) or is not included under XIII of the regulation (EC) 1907/2006 (< 0,1 %).

## SECTION 3: Composition/information on ingredients

### 3.1 Substance

n.a.

### 3.2 Mixture

| Pentane                                                     | Substance for which an EU exposure limit value applies.                               |
|-------------------------------------------------------------|---------------------------------------------------------------------------------------|
| Registration number (REACH)                                 | --                                                                                    |
| Index                                                       | 601-006-00-1                                                                          |
| EINECS, ELINCS, NLP                                         | 203-692-4                                                                             |
| CAS                                                         | 109-66-0                                                                              |
| content %                                                   | 1-5                                                                                   |
| Classification according to Regulation (EC) 1272/2008 (CLP) | Aquatic Chronic 2, H411<br>Asp. Tox. 1, H304<br>STOT SE 3, H336<br>Flam. Liq. 2, H225 |

| Hydrocarbons, C6, isoalkanes, < 5% n-hexane                 |                                                                                                              |
|-------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|
| Registration number (REACH)                                 | 01-2119484651-34-XXXX                                                                                        |
| Index                                                       | ---                                                                                                          |
| EINECS, ELINCS, NLP                                         | 931-254-9 (REACH-IT List-No.)                                                                                |
| CAS                                                         | (64742-49-0)                                                                                                 |
| content %                                                   | 1-2,5                                                                                                        |
| Classification according to Regulation (EC) 1272/2008 (CLP) | Flam. Liq. 2, H225<br>Asp. Tox. 1, H304<br>Skin Irrit. 2, H315<br>STOT SE 3, H336<br>Aquatic Chronic 2, H411 |

| Hydrocarbons, C6-C7, isoalkanes, cyclics, < 5% n-hexane     |                                                                                       |
|-------------------------------------------------------------|---------------------------------------------------------------------------------------|
| Registration number (REACH)                                 | 01-2119486291-36-XXXX                                                                 |
| Index                                                       | ---                                                                                   |
| EINECS, ELINCS, NLP                                         | 926-605-8 (REACH-IT List-No.)                                                         |
| CAS                                                         | ---                                                                                   |
| content %                                                   | 1-2,5                                                                                 |
| Classification according to Regulation (EC) 1272/2008 (CLP) | Aquatic Chronic 2, H411<br>Asp. Tox. 1, H304<br>Flam. Liq. 2, H225<br>STOT SE 3, H336 |

For the text of the H-phrases and classification codes (GHS/CLP), see Section 16.

The substances named in this section are given with their actual, appropriate classification!

For substances that are listed in appendix VI, table 3.1/3.2 of the regulation (EC) no. 1272/2008 (CLP regulation) this means that all notes that may be given here for the named classification have been taken into account.

## SECTION 4: First aid measures

### 4.1 Description of first aid measures

#### Inhalation

Remove person from danger area.

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Supply person with fresh air and consult doctor according to symptoms.  
If the person is unconscious, place in a stable side position and consult a doctor.  
Respiratory arrest - Artificial respiration apparatus necessary.

#### **Skin contact**

Normally not irritating to skin.  
Wash in water.  
Cover frostbite aseptically.

#### **Eye contact**

Remove contact lenses.  
Wash thoroughly for several minutes using copious water - call doctor immediately, have Data Sheet available.

#### **Ingestion**

Typically no exposure pathway.  
Rinse the mouth thoroughly with water.  
Call doctor immediately - have Data Sheet available.

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

If applicable delayed symptoms and effects can be found in section 11 and the absorption route in section 4.1.  
In certain cases, the symptoms of poisoning may only appear after an extended period / after several hours.

The following may occur:

At high levels of concentration the propellant dispels the oxygen in air needed to breathe.

Respiratory distress

Nausea

Headaches

Effect on the central nervous system

Coordination disorders

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

n.c.

### **SECTION 5: Firefighting measures**

#### **5.1 Extinguishing media**

##### **Suitable extinguishing media**

Water jet spray/foam/CO2/dry extinguisher

##### **Unsuitable extinguishing media**

High volume water jet

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

In case of fire the following can develop:

Oxides of carbon

Toxic gases

Danger of bursting (explosion) when heated

Explosive gas/air mixtures

#### **5.3 Advice for firefighters**

In case of fire and/or explosion do not breathe fumes.

Protective respirator with independent air supply.

According to size of fire

Full protection, if necessary.

Cool container at risk with water.

Dispose of contaminated extinction water according to official regulations.

### **SECTION 6: Accidental release measures**

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

Remove possible causes of ignition - do not smoke.

Ensure sufficient supply of air.

Avoid inhalation, and contact with eyes or skin.

#### **6.2 Environmental precautions**

Prevent penetration into drains, cellars, working pits or other places in which accumulation could be hazardous.

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

If spray or gas escapes, ensure ample fresh air is available.

Without adequate ventilation, formation of explosive mixtures may be possible.

#### **6.4 Reference to other sections**

For personal protective equipment see Section 8 and for disposal instructions see Section 13.

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## SECTION 7: Handling and storage

In addition to information given in this section, relevant information can also be found in section 8 and 6.1.

### 7.1 Precautions for safe handling

#### 7.1.1 General recommendations

Ensure good ventilation.

Keep away from sources of ignition - Do not smoke.

Take precautions against electrostatic charges.

Only use equipment that is suitable for this product and the intended pressure and temperature.

Eating, drinking, smoking, as well as food-storage, is prohibited in work-room.

Observe directions on label and instructions for use.

Use working methods according to operating instructions.

#### 7.1.2 Notes on general hygiene measures at the workplace

General hygiene measures for the handling of chemicals are applicable.

Wash hands before breaks and at end of work.

Keep away from food, drink and animal feedingstuffs.

Remove contaminated clothing and protective equipment before entering areas in which food is consumed.

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

Keep out of access to unauthorised individuals.

Do not store with flammable or self-igniting materials.

Not to be stored in gangways or stair wells.

Observe special regulations for gases.

Keep protected from direct sunlight and temperatures over 50°C.

Store in a well ventilated place.

Store upright.

Store cool.

### 7.3 Specific end use(s)

No information available at present.

## SECTION 8: Exposure controls/personal protection

### 8.1 Control parameters

Workplace exposure limit (WEL) of the total hydrocarbon solvent content of the mixture (RCP method according to EH40):  
 500 mg/m<sup>3</sup>

| Chemical Name                                                                                | Pentane                                                                                                                                                                   | Content %:1-5   |
|----------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| WEL-TWA: 600 ppm (1800 mg/m <sup>3</sup> ) (WEL),<br>1000 ppm (3000 mg/m <sup>3</sup> ) (EU) | WEL-STEL: ---                                                                                                                                                             | ---             |
| Monitoring procedures:                                                                       | - Compur - KITA-113 SB(C) (549 368)<br>- Draeger - Pentane 100/a (67 24 701)<br>DFG (D) (Lösungsmittelgemische Meth. Nr. 1), DFG (E) (Solvent mixtures 1) -<br>1998, 2002 |                 |
| BMGV: ---                                                                                    | Other information: ---                                                                                                                                                    |                 |
| Chemical Name                                                                                | Hydrocarbons, C6, isoalkanes, < 5% n-hexane                                                                                                                               | Content %:1-2,5 |
| WEL-TWA: 800 mg/m <sup>3</sup>                                                               | WEL-STEL: ---                                                                                                                                                             | ---             |
| Monitoring procedures:                                                                       | - Draeger - Hydrocarbons 2/a (81 03 581)<br>- Draeger - Hydrocarbons 0,1%/c (81 03 571)<br>- Compur - KITA-187 S (551 174)                                                |                 |
| BMGV: ---                                                                                    | Other information: (WEL acc. to RCP-method, EH40)                                                                                                                         |                 |
| Chemical Name                                                                                | Hydrocarbons, C6-C7, isoalkanes, cyclics, < 5% n-hexane                                                                                                                   | Content %:1-2,5 |
| WEL-TWA: 350 mg/m <sup>3</sup> (cyclohexane)                                                 | WEL-STEL: ---                                                                                                                                                             | ---             |
| Monitoring procedures:                                                                       | - Draeger - Hydrocarbons 2/a (81 03 581)<br>- Draeger - Hydrocarbons 0,1%/c (81 03 571)<br>- Compur - KITA-187 S (551 174)                                                |                 |
| BMGV: ---                                                                                    | Other information: ---                                                                                                                                                    |                 |
| Chemical Name                                                                                | Propane                                                                                                                                                                   | Content %:      |
| WEL-TWA: 1000 ppm (ACGIH)                                                                    | WEL-STEL: ---                                                                                                                                                             | ---             |
| Monitoring procedures:                                                                       | - Compur - KITA-125 SA (549 954)                                                                                                                                          |                 |
| BMGV: ---                                                                                    | Other information: ---                                                                                                                                                    |                 |

WEL-TWA = Workplace Exposure Limit - Long-term exposure limit (8-hour TWA (= time weighted average) reference period) EH40. AGW = "Arbeitsplatzgrenzwert" (workplace limit value, Germany). | WEL-STEL = Workplace Exposure Limit - Short-term exposure limit (15-minute reference period). | BMGV = Biological monitoring guidance value EH40. BGW = "Biologischer Grenzwert" (biological limit value, Germany) | Other information: Sen = Capable of causing occupational asthma. Sk = Can be absorbed through skin. Carc = Capable of causing cancer and/or heritable genetic damage.

\*\* = The exposure limit for this substance is repealed through the TRGS 900 (Germany) of January 2006 with the goal of revision.

| Hydrocarbons, C6, isoalkanes, < 5% n-hexane |                                            |                             |            |       |              |      |
|---------------------------------------------|--------------------------------------------|-----------------------------|------------|-------|--------------|------|
| Area of application                         | Exposure route / Environmental compartment | Effect on health            | Descriptor | Value | Unit         | Note |
| Consumer                                    | Human - oral                               | Long term, systemic effects | DNEL       | 1301  | mg/kg bw/day |      |
| Consumer                                    | Human - dermal                             | Long term, systemic effects | DNEL       | 1377  | mg/kg bw/day |      |
| Consumer                                    | Human - inhalation                         | Long term, systemic effects | DNEL       | 1137  | mg/m3        |      |
| Workers / employees                         | Human - dermal                             | Long term, systemic effects | DNEL       | 13964 | mg/kg bw/day |      |
| Workers / employees                         | Human - inhalation                         | Long term, systemic effects | DNEL       | 5306  | mg/m3        |      |

| Hydrocarbons, C6-C7, isoalkanes, cyclics, < 5% n-hexane |                                            |                             |            |       |              |      |
|---------------------------------------------------------|--------------------------------------------|-----------------------------|------------|-------|--------------|------|
| Area of application                                     | Exposure route / Environmental compartment | Effect on health            | Descriptor | Value | Unit         | Note |
| Consumer                                                | Human - dermal                             | Long term, systemic effects | DNEL       | 1377  | mg/kg bw/day |      |
| Consumer                                                | Human - inhalation                         | Long term, systemic effects | DNEL       | 1131  | mg/kg        |      |
| Consumer                                                | Human - oral                               | Long term, systemic effects | DNEL       | 1301  | mg/kg bw/day |      |
| Workers / employees                                     | Human - dermal                             | Long term, systemic effects | DNEL       | 13964 | mg/kg bw/day |      |
| Workers / employees                                     | Human - inhalation                         | Long term, systemic effects | DNEL       | 5306  | mg/kg        |      |

## 8.2 Exposure controls

### 8.2.1 Appropriate engineering controls

Ensure good ventilation. This can be achieved by local suction or general air extraction.

If this is insufficient to maintain the concentration under the WEL or AGW values, suitable breathing protection should be worn.

Applies only if maximum permissible exposure values are listed here.

### 8.2.2 Individual protection measures, such as personal protective equipment

General hygiene measures for the handling of chemicals are applicable.

Wash hands before breaks and at end of work.

Keep away from food, drink and animal feedingstuffs.

Remove contaminated clothing and protective equipment before entering areas in which food is consumed.

Eye/face protection:

Normally not necessary.

Skin protection - Hand protection:

Normally not necessary.

If applicable

Leather gloves

Skin protection - Other:

Protective working garments (e.g. safety shoes EN ISO 20345, long-sleeved protective working garments).

Respiratory protection:

Normally not necessary.

If OES or MEL is exceeded.

Gas mask filter AX (EN 14387), code colour brown.

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At high concentrations:  
 Respiratory protection appliance (insulation device) (e.g. EN 137 or EN 138)  
 Observe wearing time limitations for respiratory protection equipment.

Thermal hazards:  
 Not applicable

Additional information on hand protection - No tests have been performed.  
 In the case of mixtures, the selection has been made according to the knowledge available and the information about the contents.  
 Selection of materials derived from glove manufacturer's indications.  
 Final selection of glove material must be made taking the breakthrough times, permeation rates and degradation into account.  
 Selection of a suitable glove depends not only on the material but also on other quality characteristics and varies from manufacturer to manufacturer.  
 In the case of mixtures, the resistance of glove materials cannot be predicted and must therefore be tested before use.  
 The exact breakthrough time of the glove material can be requested from the protective glove manufacturer and must be observed.

### 8.2.3 Environmental exposure controls

No information available at present.

## SECTION 9: Physical and chemical properties

### 9.1 Information on basic physical and chemical properties

|                                          |                                                                                               |
|------------------------------------------|-----------------------------------------------------------------------------------------------|
| Physical state:                          | Gas forming, Liquid                                                                           |
| Colour:                                  | Colourless                                                                                    |
| Odour:                                   | Characteristic                                                                                |
| Odour threshold:                         | Not determined                                                                                |
| pH-value:                                | n.a.                                                                                          |
| Melting point/freezing point:            | Not determined                                                                                |
| Initial boiling point and boiling range: | Not determined                                                                                |
| Flash point:                             | n.a.                                                                                          |
| Evaporation rate:                        | Not determined                                                                                |
| Flammability (solid, gas):               | Not determined                                                                                |
| Lower explosive limit:                   | Not determined                                                                                |
| Upper explosive limit:                   | Not determined                                                                                |
| Vapour pressure:                         | 18 bar                                                                                        |
| Vapour density (air = 1):                | Gasses, heavier than air.                                                                     |
| Density:                                 | Not determined                                                                                |
| Bulk density:                            | n.a.                                                                                          |
| Solubility(ies):                         | Not determined                                                                                |
| Water solubility:                        | Not miscible                                                                                  |
| Partition coefficient (n-octanol/water): | Not determined                                                                                |
| Auto-ignition temperature:               | Not determined                                                                                |
| Decomposition temperature:               | Not determined                                                                                |
| Viscosity:                               | n.a.                                                                                          |
| Explosive properties:                    | Product is not explosive. Possible build up of explosive/highly flammable vapour/air mixture. |
| Oxidising properties:                    | No                                                                                            |

### 9.2 Other information

|                           |                |
|---------------------------|----------------|
| Miscibility:              | Not determined |
| Fat solubility / solvent: | Not determined |
| Conductivity:             | Not determined |
| Surface tension:          | Not determined |
| Solvents content:         | Not determined |

## SECTION 10: Stability and reactivity

### 10.1 Reactivity

The product has not been tested.

### 10.2 Chemical stability

Stable with proper storage and handling.

### 10.3 Possibility of hazardous reactions

No dangerous reactions are known.

### 10.4 Conditions to avoid

See also section 7.

Heating, open flame, ignition sources

Pressure increase will result in danger of bursting.

### 10.5 Incompatible materials

See also section 7.

Avoid contact with strong oxidizing agents.

### 10.6 Hazardous decomposition products

See also section 5.2

No decomposition when used as directed.

## SECTION 11: Toxicological information

### 11.1 Information on toxicological effects

Possibly more information on health effects, see Section 2.1 (classification).

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| Toxicity / effect                                             | Endpoint | Value | Unit | Organism | Test method | Notes  |
|---------------------------------------------------------------|----------|-------|------|----------|-------------|--------|
| Acute toxicity, by oral route:                                |          |       |      |          |             | n.d.a. |
| Acute toxicity, by dermal route:                              |          |       |      |          |             | n.d.a. |
| Acute toxicity, by inhalation:                                |          |       |      |          |             | n.d.a. |
| Skin corrosion/irritation:                                    |          |       |      |          |             | n.d.a. |
| Serious eye damage/irritation:                                |          |       |      |          |             | n.d.a. |
| Respiratory or skin sensitisation:                            |          |       |      |          |             | n.d.a. |
| Germ cell mutagenicity:                                       |          |       |      |          |             | n.d.a. |
| Carcinogenicity:                                              |          |       |      |          |             | n.d.a. |
| Reproductive toxicity:                                        |          |       |      |          |             | n.d.a. |
| Specific target organ toxicity - single exposure (STOT-SE):   |          |       |      |          |             | n.d.a. |
| Specific target organ toxicity - repeated exposure (STOT-RE): |          |       |      |          |             | n.d.a. |
| Aspiration hazard:                                            |          |       |      |          |             | n.d.a. |
| Symptoms:                                                     |          |       |      |          |             | n.d.a. |

#### Pentane

| Toxicity / effect                  | Endpoint | Value  | Unit    | Organism | Test method                                | Notes                                                                |
|------------------------------------|----------|--------|---------|----------|--------------------------------------------|----------------------------------------------------------------------|
| Acute toxicity, by oral route:     | LD50     | >16000 | mg/kg   | Rat      |                                            |                                                                      |
| Acute toxicity, by dermal route:   | LD50     | >2000  | mg/kg   | Rabbit   |                                            |                                                                      |
| Acute toxicity, by inhalation:     | LC50     | >100   | mg/l/4h | Rat      |                                            |                                                                      |
| Skin corrosion/irritation:         |          |        |         |          |                                            | Mild irritant, Repeated exposure may cause skin dryness or cracking. |
| Serious eye damage/irritation:     |          |        |         |          |                                            | Mild irritant                                                        |
| Respiratory or skin sensitisation: |          |        |         |          |                                            | Not sensitizing                                                      |
| Germ cell mutagenicity:            |          |        |         |          | OECD 471 (Bacterial Reverse Mutation Test) | Negative                                                             |
| Aspiration hazard:                 |          |        |         |          |                                            | Yes                                                                  |
| Symptoms:                          |          |        |         |          |                                            | drowsiness, vomiting, cramps, drowsiness, mucous membrane irritation |

#### Hydrocarbons, C6, isoalkanes, < 5% n-hexane

| Toxicity / effect              | Endpoint | Value  | Unit  | Organism | Test method                    | Notes |
|--------------------------------|----------|--------|-------|----------|--------------------------------|-------|
| Acute toxicity, by oral route: | LD50     | >16750 | mg/kg | Rat      | OECD 401 (Acute Oral Toxicity) |       |

|                                  |      |        |       |        |                                      |                                                                                                                                                      |
|----------------------------------|------|--------|-------|--------|--------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| Acute toxicity, by dermal route: | LD50 | >3350  | mg/kg | Rabbit | OECD 402 (Acute Dermal Toxicity)     |                                                                                                                                                      |
| Acute toxicity, by inhalation:   | LC50 | 259354 | mg/m3 | Rat    | OECD 403 (Acute Inhalation Toxicity) |                                                                                                                                                      |
| Skin corrosion/irritation:       |      |        |       |        |                                      | Irritant                                                                                                                                             |
| Aspiration hazard:               |      |        |       |        |                                      | Yes                                                                                                                                                  |
| Symptoms:                        |      |        |       |        |                                      | drowsiness, unconsciousness, heart/circulatory disorders, headaches, cramps, drowsiness, mucous membrane irritation, dizziness, nausea and vomiting. |

| Hydrocarbons, C6-C7, isoalkanes, cyclics, < 5% n-hexane       |          |       |         |          |                                                          |                                                                                                                                                                                                     |
|---------------------------------------------------------------|----------|-------|---------|----------|----------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Toxicity / effect                                             | Endpoint | Value | Unit    | Organism | Test method                                              | Notes                                                                                                                                                                                               |
| Acute toxicity, by oral route:                                | LD50     | >5000 | mg/kg   | Rat      | OECD 401 (Acute Oral Toxicity)                           | Analogous conclusion                                                                                                                                                                                |
| Acute toxicity, by dermal route:                              | LD50     | >2000 | mg/kg   | Rat      | OECD 402 (Acute Dermal Toxicity)                         | Analogous conclusion                                                                                                                                                                                |
| Acute toxicity, by inhalation:                                | LC50     | >20   | mg/l/4h | Rat      | OECD 403 (Acute Inhalation Toxicity)                     | Vapours, Analogous conclusion                                                                                                                                                                       |
| Skin corrosion/irritation:                                    |          |       |         |          | OECD 404 (Acute Dermal Irritation/Corrosion)             | Drying of the skin.                                                                                                                                                                                 |
| Serious eye damage/irritation:                                |          |       |         |          | OECD 405 (Acute Eye Irritation/Corrosion)                | Mild irritant                                                                                                                                                                                       |
| Respiratory or skin sensitisation:                            |          |       |         |          | OECD 429 (Skin Sensitisation - Local Lymph Node Assay)   | Not sensitising                                                                                                                                                                                     |
| Germ cell mutagenicity:                                       |          |       |         |          | OECD 471 (Bacterial Reverse Mutation Test)               | Negative                                                                                                                                                                                            |
| Carcinogenicity:                                              |          |       |         |          | OECD 451 (Carcinogenicity Studies)                       | Negative                                                                                                                                                                                            |
| Reproductive toxicity:                                        |          |       |         |          | OECD 414 (Prenatal Developmental Toxicity Study)         | Negative                                                                                                                                                                                            |
| Specific target organ toxicity - single exposure (STOT-SE):   |          |       |         |          |                                                          | May cause drowsiness or dizziness.                                                                                                                                                                  |
| Specific target organ toxicity - repeated exposure (STOT-RE): |          |       |         |          | OECD 413 (Subchronic Inhalation Toxicity - 90-Day Study) | Yes                                                                                                                                                                                                 |
| Aspiration hazard:                                            |          |       |         |          |                                                          | Yes                                                                                                                                                                                                 |
| Symptoms:                                                     |          |       |         |          |                                                          | respiratory distress, drying of the skin., drowsiness, annoyance, heart/circulatory disorders, coughing, headaches, cramps, drowsiness, mucous membrane irritation, dizziness, nausea and vomiting. |

| Propane                 |          |       |      |          |                                            |          |
|-------------------------|----------|-------|------|----------|--------------------------------------------|----------|
| Toxicity / effect       | Endpoint | Value | Unit | Organism | Test method                                | Notes    |
| Germ cell mutagenicity: |          |       |      |          | OECD 471 (Bacterial Reverse Mutation Test) | Negative |



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|           |  |  |  |  |  |                                                                                                                                    |
|-----------|--|--|--|--|--|------------------------------------------------------------------------------------------------------------------------------------|
| Symptoms: |  |  |  |  |  | breathing difficulties, unconsciousness, frostbite, headaches, cramps, mucous membrane irritation, dizziness, nausea and vomiting. |
|-----------|--|--|--|--|--|------------------------------------------------------------------------------------------------------------------------------------|

## SECTION 12: Ecological information

Possibly more information on environmental effects, see Section 2.1 (classification).

| FUEL CELL (HOCHDRUCK)                    |          |      |       |      |          |             |        |
|------------------------------------------|----------|------|-------|------|----------|-------------|--------|
| Toxicity / effect                        | Endpoint | Time | Value | Unit | Organism | Test method | Notes  |
| 12.1. Toxicity to fish:                  |          |      |       |      |          |             | n.d.a. |
| 12.1. Toxicity to daphnia:               |          |      |       |      |          |             | n.d.a. |
| 12.1. Toxicity to algae:                 |          |      |       |      |          |             | n.d.a. |
| 12.2. Persistence and degradability:     |          |      |       |      |          |             | n.d.a. |
| 12.3. Bioaccumulative potential:         |          |      |       |      |          |             | n.d.a. |
| 12.4. Mobility in soil:                  |          |      |       |      |          |             | n.d.a. |
| 12.5. Results of PBT and vPvB assessment |          |      |       |      |          |             | n.d.a. |
| 12.6. Other adverse effects:             |          |      |       |      |          |             | n.d.a. |

| Pentane                              |          |      |       |      |                     |             |                  |
|--------------------------------------|----------|------|-------|------|---------------------|-------------|------------------|
| Toxicity / effect                    | Endpoint | Time | Value | Unit | Organism            | Test method | Notes            |
| 12.1. Toxicity to fish:              | LC50     | 96h  | 9,87  | mg/l | Oncorhynchus mykiss |             |                  |
| 12.1. Toxicity to fish:              | LC50     | 96h  | 9,87  | mg/l | Salmo gairdneri     |             |                  |
| 12.1. Toxicity to fish:              | LC50     | 96h  | 9,99  | mg/l | Lepomis macrochirus |             |                  |
| 12.1. Toxicity to daphnia:           | EC50     | 48h  | 9,74  | mg/l | Daphnia magna       |             |                  |
| 12.2. Persistence and degradability: |          | 8d   | 70    | %    |                     |             |                  |
| 12.3. Bioaccumulative potential:     | Log Pow  |      | 3,39  |      |                     |             | calculated value |

| Hydrocarbons, C6, isoalkanes, < 5% n-hexane |          |      |       |      |                                  |             |                                              |
|---------------------------------------------|----------|------|-------|------|----------------------------------|-------------|----------------------------------------------|
| Toxicity / effect                           | Endpoint | Time | Value | Unit | Organism                         | Test method | Notes                                        |
| 12.1. Toxicity to fish:                     | LC50     | 48h  | >1    | mg/l | Oryzias latipes                  |             | Analogous conclusion                         |
| 12.1. Toxicity to daphnia:                  | LC50     | 48h  | 3,87  | mg/l | Daphnia magna                    |             | Analogous conclusion                         |
| 12.1. Toxicity to algae:                    | ErC50    | 72h  | 55    | mg/l | Pseudokirchnerie lla subcapitata |             | Analogous conclusion                         |
| 12.1. Toxicity to algae:                    | NOELR    | 72h  | 30    | mg/l | Raphidocelis subcapitata         |             |                                              |
| 12.2. Persistence and degradability:        |          | 28d  | 98    | %    |                                  |             | Readily biodegradable (Analogous conclusion) |
| 12.3. Bioaccumulative potential:            | Log Kow  |      | 4     |      |                                  |             |                                              |
| 12.5. Results of PBT and vPvB assessment    |          |      |       |      |                                  |             | No PBT substance, No vPvB substance          |

| Hydrocarbons, C6-C7, isoalkanes, cyclics, < 5% n-hexane |          |      |       |      |                                  |             |       |
|---------------------------------------------------------|----------|------|-------|------|----------------------------------|-------------|-------|
| Toxicity / effect                                       | Endpoint | Time | Value | Unit | Organism                         | Test method | Notes |
| 12.1. Toxicity to fish:                                 | LL50     | 96h  | 12    | mg/l | Oncorhynchus mykiss              |             |       |
| 12.1. Toxicity to daphnia:                              | EL50     | 48h  | 3     | mg/l | Daphnia magna                    |             |       |
| 12.1. Toxicity to algae:                                | NOELR    | 72h  | 30    | mg/l | Pseudokirchnerie lla subcapitata |             |       |

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 FUEL CELL (HOCHDRUCK)

|                                      |       |     |    |      |                                     |  |  |
|--------------------------------------|-------|-----|----|------|-------------------------------------|--|--|
| 12.1. Toxicity to algae:             | ErL50 | 72h | 55 | mg/l | Pseudokirchnerie<br>lla subcapitata |  |  |
| 12.2. Persistence and degradability: |       | 28d | 98 | %    |                                     |  |  |

| Propane                                  |          |      |       |      |          |             |                                                                                 |
|------------------------------------------|----------|------|-------|------|----------|-------------|---------------------------------------------------------------------------------|
| Toxicity / effect                        | Endpoint | Time | Value | Unit | Organism | Test method | Notes                                                                           |
| 12.3. Bioaccumulative potential:         | Log Pow  |      | 2,28  |      |          |             | A notable biological accumulation potential is not to be expected (LogPow 1-3). |
| 12.5. Results of PBT and vPvB assessment |          |      |       |      |          |             | No PBT substance, No vPvB substance                                             |

## SECTION 13: Disposal considerations

### 13.1 Waste treatment methods

#### For the substance / mixture / residual amounts

EC disposal code no.:

The waste codes are recommendations based on the scheduled use of this product.

Owing to the user's specific conditions for use and disposal, other waste codes may be allocated under certain circumstances. (2014/955/EU)

16 05 04 gases in pressure containers (including halons) containing hazardous substances

Recommendation:

Sewage disposal shall be discouraged.

Pay attention to local and national official regulations.

Implement substance recycling.

#### For contaminated packing material

Pay attention to local and national official regulations.

Do not perforate, cut up or weld uncleaned container.

Residues may present a risk of explosion.

15 01 04 metallic packaging

## SECTION 14: Transport information

### General statements

14.1. UN number: 2037

#### Transport by road/by rail (ADR/RID)

14.2. UN proper shipping name:

UN 2037 RECEPTACLES, SMALL, CONTAINING GAS (GAS CARTRIDGES)

14.3. Transport hazard class(es): 2.1

14.4. Packing group: -

Classification code: 5F

LQ (ADR 2015): 1 L

14.5. Environmental hazards: Not applicable

Tunnel restriction code: D

Receptacles, small, containing gas

#### 14.6. Special precautions for user

Persons employed in transporting dangerous goods must be trained.

All persons involved in transporting must observe safety regulations.

Precautions must be taken to prevent damage.

#### 14.7. Transport in bulk according to Annex II of MARPOL and the IBC Code

Freighted as packaged goods rather than in bulk, therefore not applicable.

Minimum amount regulations have not been taken into account.

Danger code and packing code on request.

Comply with special provisions.

## SECTION 15: Regulatory information

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

For classification and labelling see Section 2.

Observe restrictions:

Comply with trade association/occupational health regulations.

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Observe youth employment law (German regulation).  
 Directive 2010/75/EU (VOC): 100 %

## 15.2 Chemical safety assessment

A chemical safety assessment is not provided for mixtures.

## SECTION 16: Other information

Revised sections: 1-16  
 These details refer to the product as it is delivered.  
 Employee instruction/training in handling hazardous materials is required.  
 Employee training in handling dangerous goods is required.

### Classification and processes used to derive the classification of the mixture in accordance with the ordinance (EG) 1272/2008 (CLP):

| Classification in accordance with regulation (EC) No. 1272/2008 (CLP) | Evaluation method used                             |
|-----------------------------------------------------------------------|----------------------------------------------------|
| Flam. Gas 1, H220                                                     | Classification based on test data.                 |
| Aquatic Chronic 3, H412                                               | Classification according to calculation procedure. |
| Press. Gas Compressed gas, Liquefied gas, Dissolved gas, H280         | Classification based on test data.                 |

The following phrases represent the posted Hazard Class and Risk Category Code (GHS/CLP) of the product and the constituents (specified in Section 2 and 3).

H225 Highly flammable liquid and vapour.

H304 May be fatal if swallowed and enters airways.

H315 Causes skin irritation.

H336 May cause drowsiness or dizziness.

H411 Toxic to aquatic life with long lasting effects.

Flam. Gas — Flammable gases (including chemically unstable gases)

Aquatic Chronic — Hazardous to the aquatic environment - chronic

Press. Gas — Gases under pressure

Asp. Tox. — Aspiration hazard

STOT SE — Specific target organ toxicity - single exposure - narcotic effects

Flam. Liq. — Flammable liquid

Skin Irrit. — Skin irritation

### Any abbreviations and acronyms used in this document:

AC Article Categories

acc., acc. to according, according to

ACGIH American Conference of Governmental Industrial Hygienists

ADR Accord européen relatif au transport international des marchandises Dangereuses par Route (= European Agreement concerning the International Carriage of Dangerous Goods by Road)

AOEL Acceptable Operator Exposure Level

AOX Adsorbable organic halogen compounds

approx. approximately

Art., Art. no. Article number

ATE Acute Toxicity Estimate according to Regulation (EC) 1272/2008 (CLP)

BAM Bundesanstalt für Materialforschung und -prüfung (Federal Institute for Materials Research and Testing, Germany)

BAuA Bundesanstalt für Arbeitsschutz und Arbeitsmedizin (= Federal Institute for Occupational Health and Safety, Germany)

BCF Bioconcentration factor

BGV Berufsgenossenschaftliche Vorschrift (= Accident Prevention Regulation)

BHT Butylhydroxytoluol (= 2,6-Di-*t*-butyl-4-methyl-phenol)

BMGV Biological monitoring guidance value (EH40, UK)

BOD Biochemical oxygen demand

BSEF Bromine Science and Environmental Forum

bw body weight

CAS Chemical Abstracts Service

CEC Coordinating European Council for the Development of Performance Tests for Fuels, Lubricants and Other Fluids

CESIO Comité Européen des Agents de Surface et de leurs Intermédiaire Organiques

CIPAC Collaborative International Pesticides Analytical Council

CLP Classification, Labelling and Packaging (REGULATION (EC) No 1272/2008 on classification, labelling and packaging of substances and mixtures)

CMR carcinogenic, mutagenic, reproductive toxic

COD Chemical oxygen demand

CTFA Cosmetic, Toiletry, and Fragrance Association

DMEL Derived Minimum Effect Level

DNEL Derived No Effect Level

DOC Dissolved organic carbon

DT50 Dwell Time - 50% reduction of start concentration

DVS Deutscher Verband für Schweißen und verwandte Verfahren e.V. (= German Association for Welding and Allied Processes)

dw dry weight

e.g. for example (abbreviation of Latin 'exempli gratia'), for instance

EC European Community

ECHA European Chemicals Agency

EEA European Economic Area

EEC European Economic Community

EINECS European Inventory of Existing Commercial Chemical Substances

ELINCS European List of Notified Chemical Substances

EN European Norms

EPA United States Environmental Protection Agency (United States of America)

ERC Environmental Release Categories

ES Exposure scenario

etc. et cetera

EU European Union

EWC European Waste Catalogue

Fax. Fax number

gen. general

GHS Globally Harmonized System of Classification and Labelling of Chemicals

GWP Global warming potential

HET-CAM Hen's Egg Test - Chorionallantoic Membrane

HGWP Halocarbon Global Warming Potential

IARC International Agency for Research on Cancer

IATA International Air Transport Association

IBC Intermediate Bulk Container

IBC (Code) International Bulk Chemical (Code)

IC Inhibitory concentration

IMDG-code International Maritime Code for Dangerous Goods

incl. including, inclusive

IUCLID International Uniform Chemical Information Database

LC lethal concentration

LC50 lethal concentration 50 percent kill

LCLo lowest published lethal concentration

LD Lethal Dose of a chemical

LD50 Lethal Dose, 50% kill

LDLo Lethal Dose Low

LOAEL Lowest Observed Adverse Effect Level

LOEC Lowest Observed Effect Concentration

LOEL Lowest Observed Effect Level

LQ Limited Quantities

MARPOL International Convention for the Prevention of Marine Pollution from Ships

n.a. not applicable

n.av. not available

n.c. not checked

n.d.a. no data available

NIOSH National Institute of Occupational Safety and Health (United States of America)

NOAEC No Observed Adverse Effective Concentration

NOAEL No Observed Adverse Effect Level

NOEC No Observed Effect Concentration

NOEL No Observed Effect Level

ODP Ozone Depletion Potential

OECD Organisation for Economic Co-operation and Development

org. organic

PAH polycyclic aromatic hydrocarbon

PBT persistent, bioaccumulative and toxic

PC Chemical product category

PE Polyethylene

PNEC Predicted No Effect Concentration

POCP Photochemical ozone creation potential

ppm parts per million

PROC Process category

PTFE Polytetrafluorethylene

REACH Registration, Evaluation, Authorisation and Restriction of Chemicals (REGULATION (EC) No 1907/2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals)

REACH-IT List-No. 9xx-xxx-x No. is automatically assigned, e.g. to pre-registrations without a CAS No. or other numerical identifier. List Numbers do not have any legal significance, rather they are purely technical identifiers for processing a submission via REACH-IT.

RID Règlement concernant le transport International ferroviaire de marchandises Dangereuses (= Regulation concerning the International Carriage of Dangerous Goods by Rail)

SADT Self-Accelerating Decomposition Temperature

SAR Structure Activity Relationship

SU Sector of use

SVHC Substances of Very High Concern

Tel. Telephone

ThOD Theoretical oxygen demand

TOC Total organic carbon

TRGS Technische Regeln für Gefahrstoffe (=Technical Regulations for Hazardous Substances)

UN RTDG United Nations Recommendations on the Transport of Dangerous Goods

VbF Verordnung über brennbare Flüssigkeiten (= Regulation for flammable liquids (Austria))

VOC Volatile organic compounds

vPvB very persistent and very bioaccumulative

WEL-TWA, WEL-STEL WEL-TWA = Workplace Exposure Limit - Long-term exposure limit (8-hour TWA (= time weighted average) reference period), WEL-STEL = Workplace Exposure Limit - Short-term exposure limit (15-minute reference period) (EH40, UK).

WHO World Health Organization

wwt wet weight

The statements made here should describe the product with regard to the necessary safety precautions - they are not meant to guarantee definite characteristics - but they are based on our present up-to-date knowledge.  
No responsibility.

These statements were made by:

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