

Product Safety Information Sheet

| | |
|---|------------------------------|
| Document: 9030165 | Date of revision: 30.10.2020 |
| Version: 10/2020 | Supersedes: Version 04/2020 |
| Format: Dräger-Tubes™ (which are not classified as dangerous goods!)_PSIS_st_165e.doc | Status: released |

1. Identification of the substance/preparation and of the company/undertaking

1.1 Identification of the substance or preparation:

Trade name: **Dräger-Tubes™ (Transport with LBA Exemption)**
 Part nos. : various (see section 1.5)

1.2 Use of the substance/preparation:

Detection of gases, measuring of gas concentrations.

1.3 Company/undertaking name:

Dräger Safety AG & Co. KGaA
 Revalstr. 1
 D-23560 Lübeck
 Telephone number +49 451/882-0
 Fax number +49 451/882-2080
 Contact for information: Global EHS Management
 Telephone number +49 451/882-6979
 Fax number +49 451/882-76979

1.4 Emergency telephone: +49 451/882-2395

1.5 Relevant products:

| Sach-Nr. | Trade name | Sach-Nr. | Trade name |
|----------|--|----------|----------------------------|
| 8101601 | Halogenated Hydrocarbons 100/a Detector Tube | 8103121 | Acetonitrile Detector Tube |
| 8103361 | Sulfurylfluoride Test | 8103471 | Sulfurylfluoride 1/a |

2. Hazards identification

2.0 General information:

Dräger-Tubes™ are articles which are not subject to labelling. The requirements of EC regulations 1907/2006 (Reach) and 1272/2008 (GHS/CLP) do not apply to such products. Hence, the information in this Product Safety Information Sheet is purely voluntary!

2.1 Classification:

Nature of hazard: "GHS07",
 "H332", H312", H302"
 "H318"

2.2 Particular hazards for man and environment:

The chemicals and preparations in the detector tubes may cause different irritation or injury to the skin, eyes and mucous membrane. If the glass tubes are broken, the sharp edges may cause cuts or scratches.
 Product is a pyrophoric iron powder enclosed in a glass tube. Powder ignites upon contact with air. Broken tubes may ignite combustible materials.
 During usw, tubes become hot and may produce thermal burns to the skin.

3. Composition/Information on ingredients

3.1 Chemical characterisation (constituent):

not applicable

3.2 Chemical characterisation (mixtures):

Dräger-Tubes™ are glass tubes usually containing small amounts of pyrophoric iron powder and inert carrier materials which have been impregnated with different chemicals. In the following table such chemicals are listed; for detailed information about the ingredients in the different tubes please see the Dräger-Tubes™-/CMS Handbook.

| EINECS / ELINCS-No. | CAS-No. | Designation acc. to the EC Regulations | Content | Unit | GHS-Pictogram | H-Phrases |
|---------------------|-----------|--|----------|--------------|---------------------|--|
| n/a | 7439-89-6 | Iron, pyrophoric | 0-2 | w/w per cent | GHS02 | H250 |
| n/a | n/a | Chromium (VI) salts | 0-2 | w/w per cent | GHS06, GHS09 | H301, H312, H315, H317, H318, H330, H335, H400, H410 |
| n/a | n/a | Amine compounds | 0-3 | w/w per cent | GHS06, GHS08, GHS09 | H302, H319, H331, H335, H373, H400, H410 |
| n/a | n/a | Zirconium compounds | 0-0.0005 | w/w per cent | GHS05 | H314 |

* based on the gross weight of the Draeger Tube™. The information contained in this Product Safety Information Sheet is applicable to the hazardous contents of the Draeger Tube™.

2.3 Other information:

Dräger-Tubes™ are closed glass tubes which are filled with several preparation layers. The preparation layers are usually fixed by holding and separating elements within the glass tube. Partially the Dräger-Tubes™ contain filled glass ampoules also with reactive liquids.

Important ingredients in preparations used for the Dräger-Tubes™:

- pyrophoric iron,
- inorganic chemicals, and
- organic chemicals/indicators in small quantities and in concentrations below the limit for labelling-requirements in acc. to CLP and the German GefStoffV.

Dräger-Tubes™ contain no ozone-depleting chemicals and no volatile organic chemicals (except special ampoules). During the manufacturing process for the Dräger-Tubes™ (except special calibration procedures) no ozone-depleting chemicals (group I-IV of the Montreal Protocol) were used.

4. First-aid measures

4.1 After inhalation:

If dusts of this product is inhaled, remove person immediately to fresh air. Seek medical attention if symptoms develop or persist.

4.2 After contact with skin:

Wash with plenty of water. Tube contents can be neutralized with lime and water, or rinsed with plenty of water, then treated with polyethylene glycol 400. If irritation persists, get medical advice. Discard any shoes or clothing items that cannot be decontaminated.

4.3 After contact with the eyes:

Immediately flush eyes with plenty of water (for at least 15 minutes), while holding eyelids open. Seek medical advice at once. Danger of corneal clouding.

4.4 After ingestion:

If the material is swallowed, get immediate medical attention or advice. Do not induce vomiting (Danger of perforation!).

4.5 Information for the doctor:

After ingestion there is a danger of the oesophagus and the stomach becoming perforated.

5. Fire-fighting measures

5.1 Suitable extinguishing media:

Dry chemical, carbon dioxide. Adapt extinguishing media to the environment. Materials in the glass tubes are non-flammable. Avoid direct contact of this product with water since this may cause an exothermic reaction.

5.2 Extinguishing media which must not be used for safety reasons:

Not checked

5.3 Special exposure hazards arising from substances or preparation itself, combustion products, resulting gases:

Non-Flammable, but danger of self ignition. Thermal decomposition of the tube contents may produce weak amount of harmful, irritant or toxic gases (carbon monoxide, ...). When using water as an extinguishing media, take care of the resulting slight acidic fire-fighting water.

Contents of the tubes may be corrosive to the eyes, skin, gastrointestinal tract and may cause irritation to the respiratory tract. Improper handling, leaks, and/or damage to the tube may release caustic granulate material in solid form. Pyrophoric iron ignites upon contact with air. This material may ignite combustible materials which it comes in contact with. In case of accidental release and uncontrolled contact with air the pyrophorous iron powder can cause an explosion or support a fire. Tubes become hot during use and should not be used in potentially combustible atmospheres.

5.4 Special protective equipment for fire-fighters:

Recommendation: Wear full protective clothing, including helmet, self-contained positive pressure or pressure demand breathing apparatus, protective clothing and face mask.

6. Accidental release measures

6.1 Personal precautions:

Do not inhale released vapour, fumes, or dusts from the spilled material. Do not allow spilled materials to contact eyes or skin, use protective gloves (e.g. PE/PP, Latex, rubber) resistant against acidic materials and safety goggles. Isolate area. Keep unnecessary personnel away. Use dust mask with P2/FFP2 filters. Never pour water on released material/pyrophoric iron. Wear appropriate protective equipment and clothing during clean-up. Avoid inhalation of dust from the spilled material. Avoid contact with skin and eyes.

6.2 Environmental precautions:

Block any potential routes to water systems. Do not discharge into the sewer system. Do not allow to enter drains/surface water/groundwater.

6.3 Methods for cleaning up:

Sweep up dry while avoiding formation of dusts. Do not pick up glass with bare hands. Dilute tube contents with water and baking soda. Shovel material into appropriate container for disposal. Thoroughly wash the area with water after a spill or leak clean-up. Sweep up or scrape broken tubes into container for disposal.

6.4 Additional information:

Allow hot tubes to cool before disposal. Follow all Local, State, Federal and Provincial regulations for disposal.

7. Handling and storage

7.1 Handling:

Precautions for safety handling:

Do not use in explosive atmospheres. A combustible gas monitor should be used to qualify any questionably flammable or combustible area before using one of these tubes. Use with caution around flammable or combustible materials. Avoid skin and eye contact with contents of the tubes. During use tubes become hot. Use caution to avoid burns. Avoid contact with sharp edges of glass. Wear appropriate personal protective equipment. Wash thoroughly after handling.

Information for protection against fire and explosion:

These products are non-flammable, but danger of self ignition in case of contact with the contents.

7.2 Storage:

Requirements for storage and containers:

Keep containers tightly closed and dry. Do not store at temperatures exceeding 77°F (25°C). Handling according to the Instructions for Use. Store the product in the original packaging. The expiry date on the packaging must be considered. Do not store this material in open or unlabelled containers. Do not store around flammable or combustible materials.

Information on storage together with other materials:

Observe VCI-concept for storing chemicals.

Further information on storage conditions:

Contents are corrosive. Avoid contact with water. Open tubes should be stored in the container in a well ventilated area until they are disposed of.

Storage class:

LGK 4.2 (recommendation, VCI-concept)

7.3 Certain application:

n/a

8. Exposure controls/Personal protection

8.1 Components with exposure limit values:

Several, in relation to the chemicals in the tubes (see Section 2). But with normal handling of the Dräger-Tubes™ there should be no exposure to contents. However, if exposure does occur, follow the national exposure limits for the relevant chemicals. For detailed information about the ingredients in the different tubes, please see the Dräger-Tubes™ -/CMS Handbook.

| EC, Land | CAS-No. | Description of material | Type | Content | Unit |
|----------|---------|-------------------------|------|---------|-------------------|
| D | n/a | Chromium(VI) compounds | TRK | 0,05 E* | mg/m ³ |

*) E = inhalable fraction

8.2 Exposure controls:

8.2.1 Occupational exposure controls:

General protection and hygiene measures:

With normal handling of the Dräger-Tubes™ there should be no exposure to contents. However, if exposure does occur, follow the exposure limits. Use good industrial hygiene practices.

Personal protection:

8.2.1.1 Respiratory protection:

Not necessary when handled according to the Instructions for Use.

8.2.1.2 Hand protection:

With normal handling of the Dräger-Tubes™ there should be no exposure to contents. In case of accidents use suitable protective gloves made from PE/ PP, Latex, butyl or nitrile rubber. Please observe the glove manufacturers instructions on permeability and rupture times as well as the specific workplace conditions. Heat resistant gloves are recommended when handling hot tubes. Opened or broken tubes may have sharp edges capable of cutting skin, avoid contact with splinters of glass.

8.2.1.3 Eye protection:

Not necessary when handled according to the Instructions for Use.
 Recommendation: Wear safety glasses with side shields.

8.2.1.4 Skin protection:

Prophylactic skin protection is recommended. Wash thoroughly after handling. Skin care.

8.2.2 Additional information on plant design:

Handling according to the Instructions for Use.

9. Physical and chemical properties

9.1 General information:

Form: Glass tubes containing colourless and/or coloured solids.

Colour: various

Odour: slightly pungent/odourless

9.2 Important information about the protection of health, safety and the environment:

Method (67/548/EEC):

Solubility: n/a

pH-value: n/a (acidic reaction)

Boiling point: n/a

Melting point: n/a

Flame point: n/a

| | | |
|-----------------------|--------|--|
| Inflameability: | | n/a |
| Explosion limits: | | |
| | lower: | n/a |
| | upper: | n/a |
| Ignition temperature: | | danger of self ignition of the content (pyrophoric iron) |
| Vapour pressure: | | n/a |
| Mass density: | | n/a |
| Further information: | | n/a |

9.3 Other information
 n/a

10. Stability and reactivity

General information:
 Stable under normal conditions and appropriate commerce.

10.1 Conditions to avoid:
 Do not use in explosive atmospheres. Powder/granulate ignites upon contact with air. Do not mix other substances with content of tubes. Avoid contact with oxidizers, humid gases/materials, water and oxygen/air. In case of accidental release and uncontrolled contact with air the pyrophoric iron powder can cause an explosion or support a fire. Hazardous polymerisation will not occur. Do not store above 25°C (77°F).

10.2 Materials to avoid:
 Tubes contents react with bases. Possibility of a slight exothermic reaction.
 Tube contents (powder/granulate) are incompatible with air, water, oxidizers. In case of accidental release and uncontrolled contact with air the pyrophorous iron powder can cause an explosion or support a fire. Strict handling according to the Instruction for Use.

10.3 Hazardous decomposition products:
 Decomposition of granulate in the tubes may produce hazardous substances.
 Possibility of a dangerous exothermic reaction: Tube contents (powder/granulate) are incompatible with air, water, oxidizers; dangerous exothermic reaction will occur at once.
 Dangerous products of decomposition at contact with water: In case of exothermic reaction, decomposition of organic and inorganic substances may produce dangerous/toxic gases.

10.4 Further information:
 n/a

11. Toxicological information

11.1 Toxicity tests:
 Classification-relevant LD/LC₅₀-values: Toxicity data are available for the component pyrophoric iron; no toxicity data are available for the other contents of the tubes (carrier materials impregnated with different chemicals!).

| Component | Type | Values/Range of Values | Species | Method |
|------------------|------|------------------------|---------|--------|
| Iron, pyrophoric | oral | 30 mg/kg | rat | --- |

- 11.1.1 Specific symptoms in animal studies:** No data are available.
- 11.1.2 Irritant/corrosive effects:** Irritant and weak corrosive effects of the contents of the tubes cannot be excluded.
- 11.1.3 Sensitization:** Sensitization effects of the contents of the tubes cannot be excluded.
- 11.1.4 Subacute and chronic toxicity:**
 - Experiments: No data are available.
 - Species: No data are available.

11.1.5 Carcinogenic, mutagenic and reproductive toxic effects:

No data are available. See Section 11.3

11.1.6 Further information:

For detailed information about the ingredients in the different tubes and their hazards, please see the Dräger-Tubes™-/CMS Handbook and section 2.

11.2 Effects on human body/Experiments made in practice:

after inhalation:

Inhalation of dusts from the tube contents may cause irritation or injury to the respiratory system.

after ingestion:

Product contents may be harmful or fatal if swallowed. This product may produce damage to the gastrointestinal tract if swallowed.

after eye contact:

Eye contact with contents of the tubes may cause corrosive damage with irritation, and possible eye injury.

after skin contact:

Skin contact with the contents of the tubes may cause slight corrosive damage with irritation.

11.3 Additional toxicological information:

The toxicity of the impregnated carrier material contained in the tubes has not been tested in detail. With respect to the chemicals used for the impregnation these materials should be handled in the same way as the pure chemicals. They may cause sensitization, irritation or injury to the skin, eyes and mucous membrane. Carcinogenic, mutagenic and reproductive toxic effects can not be excluded, because some of the impregnation chemicals in pure form are classified accordingly. During the use of the tube, hydrochloric/hydrofluoric acid is formed which makes the contents of the tube corrosive to skin and eyes. Contact may cause severe irritation including burns. Hydrogen chloride/fluoride or hydrochloric/-fluoric acid is a corrosive acid. Chronic exposure may be associated with changes in pulmonary function, chronic bronchitis, dermatitis, erosion of dental enamel, conjunctivitis and upper respiratory tract abnormalities. Chronic inhalation of iron has resulted in mottling of the lungs, a condition referred to a siderosis.

Further information:

If the glass tube is broken, the sharp edges may cause cuts or scratches. Contents from broken tubes may be corrosive to skin and cause severe irritation.

12. Ecological information

12.1 Ecotoxicity:

No ecotoxicity data are available for the preparations/components in the Dräger-Tubes™.

12.2 Mobility:

No data are available

12.3 Persistence and degradability:

Biological decompositionability:

No data are available

Behaviour in purification plants:

No data are available

12.4 Bioaccumulative potential:

No data are available

12.5 Other adverse effects:

No data are available

12.6 Additional information:

Dräger-Tubes™ themselves and also the chemical preparations/components in the tubes shouldn't be released into water because the chemicals on the carrier material could be dissolved and then contaminate the water. Normally water extracts from the impregnated carrier materials have a low pH-value and contain small amounts of the chemicals used for impregnation. So, it would be expected to produce ecotoxicity upon exposure to aquatic organisms and aquatic systems. Dräger-Tubes™ themselves and the chemical preparations/components in the tubes are not expected to accumulate in the food chain.

Adverse ecological effects cannot be excluded in the event of improper handling or disposal.

13. Disposal considerations

13.1 Product (recommendations):

If discarded, wastes may be classified as corrosive waste or reactive waste. Prior to disposal, carefully dilute tube contents with water. Add baking soda to neutralise acidity. Do not allow this material to drain into sewers/water supplies. Waste must be handled in accordance with all federal, state, provincial, and local regulations.

Dräger-Tubes™ must be disposed of in accordance with local waste disposal regulations. If discarded, wastes may be classified as hazardous waste. Applicable "waste numbers" (federal, state, provincial, and local) for this products or their components have not been checked in detail.

| | | |
|---------------------------------------|---|---------|
| Waste category: | EWL (European waste list): | 170204* |
| Waste designation: | Glass, plastic and wood containing or contaminated with dangerous substances. | |
| Obligation to prove correct disposal: | yes | |

13.2 Not cleaned packaging material (recommendations):

The disposal of plastic containers and flexible packages is possible by EWL 150102, and fibre board boxes by EWL 150101.

14. Transport information

14.1 Road transport ADR/RID and GGVSE (cross-border/domestic):

| | | | | | |
|----------|---|--------|-----|----------------------|-----|
| UN-No.: | 1383 | Class: | 4.2 | Packing group: | ./. |
| Name: | Pyrophoric metal, n.o.s. (iron) | | | Classification code: | S4 |
| Remarks: | Transport of Dräger-Tubes™ cited in section 1 are dangerous goods. Under special conditions exemptions from the ADR/GGVSE regulations are possible. | | | | |

14.2 Marine transport IMDG-Code/GGVSee:

| | | | |
|-------------------|--|-------------------------|---------------------------------|
| UN-No. | 1383 | Correct technical name: | Pyrophoric metal, n.o.s. (iron) |
| Class: | 4.2 | Sub risk: | Packing group: I |
| EmS-No.: | not checked | MFAG: | ./. |
| Marine pollutant: | no | | |
| Remarks: | Transport of Dräger-Tubes™ cited in section 1 are dangerous goods. Under special conditions exemptions from the IMDG regulations are possible. | | |

14.3 Air transport ICAO-TI und IATA-DGR:

| | | | |
|----------|--|-----------------------|---------------------------------|
| UN-No. | 1383 | Proper shipping Name: | Pyrophoric metal, n.o.s. (iron) |
| Class | 4.2 | Sub risk: | ./. |
| Remarks: | The Dräger-Tubes™ cited in section 1 are forbidden for shipment by passenger or cargo aircraft. Under special conditions exemptions from the ICAO/IATA regulations are possible. | | |

14.4 Transport/further information:

Transport of Dräger-Tubes™ cited in section 1 are dangerous goods. Under special conditions exemptions from the Dangerous Goods regulations are possible.

15. Regulatory information

15.1 Labelling according to EC Regulations:

Hazardous symbols and indicators of danger for dangerous substances and preparations: No labelling necessary.

Hazardous components to be indicated on label: contains: n/a

H-Phrases:

n/a

P-Phrases (recommendation):

P102 Keep out of reach of children.

P302+P352 IF ON SKIN: Wash with plenty of water.

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.

15.2 National regulations:

Additional classification acc. to GefStoffV Annex II No. (only if differing from EC classification): n/a

Restrictions of occupation: n/a
Statutory order on hazardous incidents: n/a
Water pollution class: 3 (self-classification)
Information according 1999/13/EC about limitation of emissions of volatile organic compounds (VOC-guideline):
Further regulations, restrictions, and prohibition regulation:
(such as principles of industrial medicine and health and safety regulations)
Instruction Sheet BG-Chemie (Chemical Professional Association):
Other state regulations may apply. Check individual state requirements.

16. Other information

Use of the substance / preparation:

See section 1.2; additional information in the Instructions for Use.

Relevant H-Phrases:

H250 Catches fire spontaneously if exposed to air.

H301 Toxic if swallowed.
H302 Harmful if swallowed.
H312 Harmful in contact with skin.
H314 Causes severe skin burns and eye damage.
H315 Causes skin irritation.
H317 May cause an allergic skin reaction.
H318 Causes serious eye damage.
H319 Causes serious eye irritation.
H330 Fatal if inhaled.
H331 Toxic if inhaled.
H335 May cause respiratory irritation.
H373 May cause damage to organs through prolonged or repeated exposure.

H400 Very toxic to aquatic life.
H410 Very toxic to aquatic life with long lasting effects.

Comments:

n. a.; n/a; ./.: not applicable
MAC: Maximum allowable concentration
COD: Chemical oxygen demand
BOD: Biochemical oxygen demand
EWL: European waste list
VOC: Volatile organic compounds
VCI: Verband der Chemischen Industrie e.V. (Association of the German chemical industry)
WGK: German water hazard class

Further information:

The above information represents our current state of experience and describes the product only with respect to safety requirements. The manufacturer makes no representations and assumes no liability for any direct, incidental or consequential damages resulting from its use. It is the responsibility of the customer to test whether the product is suitable for the purpose intended by the customer.

Any questions of warranty and liability for this product are subject to our General Terms and Conditions unless legislation imperatively provides otherwise.

Data sheet issued by: Global EHS Management
Contact: Dr. Michaela Schatz, Michaela.schatz@draeger.com

Changes to preceding version: In section 1.