

## Material Safety Data Sheet

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 analogous to EC Regulation 1907/2006

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

#### 1.1 Identification of the substance or preparation:

Trade name: **Dräger-Tubes™ (which are classified as dangerous goods, PG III)**  
 Part nos. : various

#### 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  
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 Contact for information: Dräger Environmental Management  
 Telephone number +49 451/882-3125  
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#### 1.4 Emergency telephone: +49 451/882-2395

#### 1.5 Relevant products:

Part-No.	Trade Name	Part-No.	Trade Name
64 00 901	1000 DT Alco-Check 0.5 Bulk	67 28 121	Carbon Monoxide 50/a-L
64 00 441	1000 DT Alco-Check 0.8 Bulk	CH 19 701	Carbon Monoxide 8/a
64 00 701	Alco-Check 0,8	81 01 791	Carbon Tetrachloride 0,2/b
64 00 681	Alco-Check 0.4	67 28 861	Chloroform 2/a
64 00 721	Alco-Check 0.5 20 Test/ Display	81 03 421	Chlorpikrine 0,1/a
64 00 731	Alco-Check 0.5 Single Pack	67 18 301	CO 200/a + CO <sub>2</sub> 2 %/a
64 00 700	Alco-Check 0.8 Single Pack	81 03 541	Ethyl Formate 20/a
CH 00 199	Alcotest Box of 10 English	64 00 501	Gasoline Detektor
CH 00 201	Alcotest Box of 10 French	CH 26 101	Hydrocarbons 0.1 %/b
59 40 543	Alcotest Box of TEN/ USA	81 03 571	Hydrocarbons 0.1 %/c
CH 00 222	Alcotest Pack of 10	CH 25 401	Hydrocarbons 2
CH 00 225	Alcotest, Box of 3	81 03 581	Hydrocarbons 2/a
CH 00 237	Alcotest-Tubes (10 Pieces)	67 28 161	Methyl Acrylate 5/a
81 03 691	Benzene 0,25/a	67 24 601	Methylene Chloride 100/a
81 01 841	Benzene 0,5/c	67 28 881	Methylene Chloride 50/a-L
CH 24 801	Benzene 0.05	64 00 491	Motor Fuels Detector
81 03 641	Benzene 1/a	67 28 371	Oil 10/a-P
81 01 741	Benzene 15/a	67 33 031	Oil Mist 1/a
81 01 231	Benzene 2/a	81 03 111	Oil PN
67 28 071	Benzene 5/b	67 28 081	Oxygen 5 %/B
67 28 621	Carbon Disulphide 10/a-L	81 03 261	Oxygen 5 %/C
67 28 351	Carbon Disulphide 5/a	81 03 511	PID-Pre-filter Tube Benzene
67 28 751	Carbon Monoxide 0.001%/a	CH 28 401	Polytest
CH 29 901	Carbon Monoxide 0.3 %/b	CH 00 270	Respiratory CO-Test Unit
CH 20 601	Carbon Monoxide 10/b	67 33 141	Styrene 10/b
67 33 051	Carbon Monoxide 2/a	81 03 501	Tetra 0,1/a

67 28 511	Carbon Monoxide 5/a-P	67 33 161	Xylene 10/a
CH 25 601	Carbon Monoxide 5/c		

## 2. Hazards identification

### 2.0 Generell information:

**Dräger-Tubes™ are articles which are not subject to labelling. The requirements of EC regulation 1907/2006 do not apply to such products. Hence, the information in this Material Safety Data Sheet is purely voluntary!**

### 2.1 Classification:

Nature of hazard: C, corrosive

R 20/21/22 Harmful by inhalation, in contact with skin and if swallowed.  
 R 34 Causes burns.  
 R 41 Risk of serious damage to eyes.

### 2.2 Particular hazards for man and environment:

These products are non-flammable, granulate filled glass tubes. Improper handling, leaks, and/or damage to the tubes may release strong caustic/corrosive and/or irritant/harmful granulate material in solid form. The chemicals and preparations in the detector tubes may cause different irritation, injury or corrosive damage to the skin, eyes, gastrointestinal tract and may cause corrosive damage to the respiratory tract. If the glass tubes are broken, the sharp edges may cause cuts or scratches.

## 3. Composition/Information on ingredients

### 3.1 Chemical characterisation (constituent):

not applicable

### 3.2 Chemical characterisation (preparation):

Dräger-Tubes™ are glass tubes usually containing small amount of 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 Directive	Content*	Unit	Symbol	R-Phrases
n/a	n/a	Chromium(VI) salts	0-2	w/w per cent	T <sup>+</sup> , N	49-46-E21-E25-E26-37/38-41-43-50/53
202-088-8	91-66-7	N,N-Diethylaniline	0-0.2	w/w per cent	T, N	23/24/25-33-51/53
n/a	n/a	Formaldehyde	0-0.5	w/w per cent	Xn	20/22-36/37/38-40-43
n/a	n/a	Hydrochloric acid	0-10	w/w per cent	C	34-37
206-114-9	78036-57-8	Hydrazine-Hydrate	0-1	w/w per cent	T, N	45-E23/24/25-34-43-50/53
234-740-2	12029-98-0	Iodinepentoxide	0-0,5	w/w per cent	Xi	8-36/38
n/a	n/a	Palladium compounds	0-0,5	w/w per cent	C	34
202-429-0	95-53-4	o-Tolidine	0-0,0005	w/w per cent	T, N	22-45-51/53
n/a	n/a	Selenium salts	0-1	w/w per cent	T, N	23/25-33-50/53
n/a	n/a	Sulphuric acid/fuming sulphuric acid	0-10	w/w per cent	C	14-35-37
n/a	n/a	Titanium salts	0-5	w/w per cent	C	34-36/37
---	100-10-7	4-Dimethylaminobenzaldehyd	0-2	%	./.	---

\* based on the gross weight of the Draeger Tube™. -

The information contained in this MSDS is applicable to the hazardous contents of the Draeger Tubes™.

### 3.3 Other information:

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

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

- inorganic acid,
- inorganic salts, and
- organic chemicals/indicators in small quantities and in concentrations below the limit for marking-requiring in acc. to the German GefStoffV.

Substantial ingredients of the ampoules used in the Dräger-Tubes™:

- inorganic acids,
- organic solvents.

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

Contents of the tubes are 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. From the contents of the tubes small quantities of corrosive or toxic gases could be released by thermal decomposition or burning.

### 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.

### 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:

Follow all Local, State, Federal and Provincial regulations for disposal.

## 7. Handling and storage

### 7.1 Handling:

Precautions for safety handling:

Observe the Instructions for Use.

Information for protection against fire and explosion:

These products are non-flammable.

### 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.

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 8 (recommendation) (VCI-Concept)

### 7.3 Certain application:

n/a

## 8. Exposure controls/Personal protection

### 8.1 Components with exposure limit values:

Some, 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	7664-93-9	Sulphuric acid	MAK	0,1 E**	mg/m <sup>3</sup>
UK	7664-93-9	Sulphuric acid	TLV	[1]	mg/m <sup>3</sup>
EU	7664-93-9	Sulphuric acid	TLV	0,05	mg/m <sup>3</sup>
D	n/a	Chromium(VI) compounds	TRK	./.	./.
D/EU/UK	1333-82-0	Chromium trioxide	EU	Carc. Cat 1 / S	./.
D/EU/UK	7778-50-9	Potassium dichromate	EU	Carc. Cat 1 / Muta. Cat. 2 / S	
		E = inhalable fraction	MAK = German TLV		
		Carc. Cat 1 = Carcinogen to human body			

		Carc. Cat 2 = Carcinogen to human body is possible.			
		Muta. Cat 2 = Reproductive toxic to human body is possible.			
		S = Hazard of sensitization			

## 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 practice.

#### 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.

##### 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  
 Inflammability: n/a  
 Explosion limits:  
     lower: n/a  
     upper: n/a  
 Ignition temperature: n/a  
 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 mix other substances with contents of tubes. Avoid contact with water. Stable under normal conditions. 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 an exothermic reaction.

**10.3 Hazardous decomposition products:**

Decomposition of the granulate in the tubes may produce toxic substances (e.g. sulphur oxides).

Possibility of a dangerous exothermic reaction:

Avoid contact with bases/water, tube contents may react with bases and water in an exothermic reaction.

Dangerous products of decomposition at contact with water:

Acids and solutions of (heavy) metal salts

**10.4 Further information:**

n/a

**11. Toxicological information**

**11.1 Toxicity tests:**

Classification-relevant LD/LC<sub>50</sub>-values: No toxicity data are available for the contents of the tubes (carrier materials impregnated with different chemicals!).

**11.1.1 Specific symptoms in animal studies:**

No data are available.

**11.1.2 Irritant/corrosive effects:**

Irritant and corrosive effects of the contents of the tubes cannot be excluded.

**11.1.3 Sensitization:**

Sensitisation 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 would cause irritation or injury to the respiratory system.

**after ingestion:**

Product contents would be harmful or fatal if swallowed. This product produces corrosive damage to the gastrointestinal tract if swallowed.

**after eye contact:**

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

**after skin contact:**

Skin contact with the contents of the tubes may cause 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 material should be handled in the same way as the pure chemicals. They may cause sensitisation, 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.

**Further information:**

If the glass tube is broken, the sharp edges may cause cuts or scratches.

## 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.

## 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.: 3260 Class: 8 Packing group: III  
 Name: Corrosive solid, acidic, inorganic, n.o.s. (Sulphuric acid, mixt.) Classification code: C2  
 Remarks: Dräger-Tubes™ could be shipped in "Excepted Quantities" according to Code E1

### 14.2 Marine transport IMDG-Code/GGVSee:

UN-No. 3260 Correct technical name: Corrosive solid, acidic, inorganic, n.o.s. (Sulphuric acid, mixt.)  
 Class: 8 Sub risk: ./ Packing group: III  
 EmS-No.: F-A, S-B MFAG: ./  
 Marine pollutant: ./  
 Remarks: Dräger-Tubes™ could be shipped in "Excepted Quantities" according to Code E1

### 14.3 Air transport ICAO-TI und IATA-DGR:

UN-No. 3260 Proper shipping Name: Corrosive solid, acidic, inorganic, n.o.s. (Sulphuric acid, mixt.)  
Class 8 Sub risk: ./ PG: III  
Remarks: Dräger-Tubes™ could be shipped in "Excepted Quantities" according to Code E1.

#### 14.4 Transport/further information:

May be sent by post.

### 15. Regulatory information

#### 15.1 Labelling according to EC Directive:

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

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

R-Phrases:

n/a

S-Phrases:

S 2 Keep out of the reach of children.

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

#### 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: 2 (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 R-Phrases:

R 8 Contact with combustible material may cause fire.

R 14 Reacts violently with water.

R 20/22 Harmful by inhalation and if swallowed.

R 21 Harmful in contact with skin.

R 22 Harmful if swallowed.

R 23/24/25 Toxic by inhalation, in contact with skin and if swallowed.

R 23/25 Toxic by inhalation and if swallowed.

R 25 Toxic if swallowed.

R 26 Very toxic by inhalation.

R 33 Danger of cumulative effects.

R 34 Causes burns.

R 35 Causes severe burns.

R 36/37 Irritating to eyes and respiratory system.

R 36/37/38 Irritating to eyes, respiratory system and skin.

R 36/38 Irritating to eyes and skin.

R 37 Irritating to respiratory system.

R 37/38 Irritating to respiratory system and skin.

R 40 Limited evidence of a carcinogenic effect.

R 41 Risk of serious damage to eyes.

R 43 May cause sensitisation by skin contact.

R 45 May cause cancer.

R 46 May cause heritable genetic damage.

R 49 May cause cancer by inhalation.

R 50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

R 51 Toxic to aquatic organisms.



R 53      May cause long-term adverse effects in the aquatic environment.

**Comments:**

n. a.; n/a; ./.:      not applicable  
MAC:                  Maximum allowable concentration  
COD:                  Chemical oxygen demand  
BOD:                  Biochemical oxygen demand  
EWL:                  European waste list  
EU                      European Union  
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:      d-em  
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Changes to preceding version:      In Section 1.5