

## 2-Propanol



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### IDENTIFICATION

#### 2-Propanol

Isopropyl alcohol

Isopropanol

Dimethylcarbinol

**ZVG No:** 11190  
**CAS No:** 67-63-0  
**EC No:** 200-661-7  
**INDEX No:** 603-117-00-0

### CHARACTERISATION

#### SUBSTANCE GROUP CODE

142200 Alcohols

#### STATE OF AGGREGATION

The substance is liquid.

#### PROPERTIES

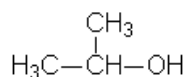
colourless  
alcohol-like odour

#### CHEMICAL CHARACTERISATION

Highly flammable liquid.  
Vapours form explosive mixtures with air.  
Mixable with water.  
Highly volatile.  
Acute or chronic health hazards result from the substance.  
(see: chapter REGULATIONS).

[Substance information in Wikipedia](#)

## FORMULA



**Molar mass:** 60,10 g/mol

**Conversion factor** (gaseous phase) at 1013 mbar and 20 °C:

1 ml/m<sup>3</sup> = 2,50 mg/m<sup>3</sup>

## PHYSICAL AND CHEMICAL PROPERTIES

[Melting point](#) | [Boiling point](#) | [Density](#) | [Vapour pressure](#) | [Flash point](#) | [Ignition temperature](#) | [Explosion data](#) | [Solubility](#) | [Partition coefficient](#) | [Hazardous reactions](#) | [Further Information](#)

## MELTING POINT

Melting point: -88 °C

Reference: [00440](#)

## BOILING POINT

Boiling Point: 82 °C

Reference: [00440](#)

## DENSITY

DENSITY

Value: 0,78 g/cm<sup>3</sup>

Temperature: 20 °C

Reference: [00440](#)

RELATIVE VAPOUR DENSITY

Ratio of the density to dry air at the same temperature and pressure

Value: 2,07

Reference: [00440](#)

RELATIVE DENSITY OF THE VAPOUR-AIR-MIXTURE

Ratio of the density to dry air at 20 °C and standard pressure

Value: 1,05

Reference: [99999](#)

## VAPOUR PRESSURE

Vapour pressure: 42,6 hPa

Temperature: 20 °C

Reference: [00446](#)

Vapour pressure: 77,7 hPa

Temperature: 30 °C

Reference: [00446](#)

Vapour pressure: 136 hPa

Temperature: 40 °C

Reference: [00446](#)

Vapour pressure: 229 hPa

Temperature: 50 °C

Reference: [00446](#)

### FLASH POINT

Flash point: 12 °C

Closed cup

Reference: [00440](#)

### IGNITION TEMPERATURE

Ignition temperature: 425 °C

Temperature class: T2

Reference: [00440](#)

### EXPLOSION DATA

Lower explosion limit:

2 vol.%

50 g/m<sup>3</sup>

Upper explosion limit:

13,4 vol.%

335 g/m<sup>3</sup>

Lower explosion point:

10 °C

Reference: [00440](#)

Max. exper. safe gap (MESG): 0,97 mm

at 40 °C

Reference: [00440](#)

Max. exper. safe gap (MESG): 0,91 mm

at 100 °C

Reference: [00440](#)

Max. exper. safe gap (MESG): 0,85 mm

at 150 °C

Reference: [00440](#)

### SOLUBILITY IN WATER

entirely mixable with water

Reference: [07796](#)

### PARTITION COEFFICIENT (octanol/water)

log Kow: 0,05

Recommended value of LOG KOW Databank.

Reference: [02070](#)

## HAZARDOUS REACTIONS

### Thermal decomposition

Decomposition when heated.

### Decomposition products

propanal  
propane  
propene  
ethane  
ethene  
acetylene  
formaldehyde  
water

### Hazardous chemical reactions

Risk of explosion in contact with:

strong oxidizing agents

nitric acid

oxygen

hydrogen peroxide

barium perchlorate

sodium dichromate

phosgene/iron salt

nitrogen dioxide

trinitro methan

The compound forms explosive peroxides.

The substance can react dangerously with:

alkali/alkaline earth metals

aluminium

amines

chlorine

strong acids

aldehydes

aluminium triisopropoxide

chlorine compounds

chromium trioxide

iron

potassium-tert.-butoxide

oleum

palladium + hydrogen

phosgene

phosphorus trichloride

## FURTHER INFORMATION

Conductivity:  $5,8 \cdot 10^{-6}$  S/m

Temperature: 25 °C

Reference: [08086](#)

## TOXICOLOGY / ECOTOXICOLOGY

### TOXICOLOGICAL DATA

#### LD50 oral rat

Value: 5050 mg/kg

Gigiena i Sanitariya. For English translation, see HYSAAV. Vol. 43(1), Pg. 8, 1978.

### LD50 dermal

Species: Rabbit

Value: 12800 mg/kg

Raw Material Data Handbook, Vol.1: Organic Solvents, 1974. Vol. 1, Pg. 100, 1974.

Reference: [02071](#)

## ECOTOXICOLOGICAL DATA

### LC50 Fish (96 hours)

Minimum: 4200 mg/l

Maximum: 11100 mg/l

Median: 9640 mg/l

Study number: 5

Reference for median:

Brooke, L.T., D.J. Call, D.L. Geiger, and C.E. Northcott 1984. Acute Toxicities of Organic Chemicals to Fathead Minnows (*Pimephales promelas*), Vol. 1. Center for Lake Superior Environmental Stud., Univ.of Wisconsin-Superior, Superior, WI :414

### LC50 Crustaceans (48 hours)

Minimum: 1400 mg/l

Maximum: 1400 mg/l

Median: 1400 mg/l

Study number: 1

Reference for median:

Blackman, R.A.A. 1974. Toxicity of Oil-Sinking Agents. Mar.Pollut.Bull. 5:116-118

Reference: [02072](#)

## OCCUPATIONAL HEALTH AND FIRST AID

[Routes of exposure](#) | [Toxic effects](#) |  
[First Aid](#)

## ROUTES OF EXPOSURE

### Main routes of exposure

The main route of exposure for isopropyl alcohol (IPA) under industrial conditions is via the respiratory tract.[07620]

### Respiratory tract

A mean retention rate of 58.2% in workers exposed to a maximum value of 260 ppm of IPA was calculated on the basis of the inhaled to the exhaled IPA vapour concentrations.

It must be considered that with regard to its high blood-air distribution coefficient and its effective metabolism, IPA belongs to those substances whose net resorption in the blood changes proportionally to the ventilation rate.

At a physical load of 150 W the resorbed pollutant amount should thus increase by the factor of 3 compared to resting conditions at the same external exposure degree.[99997]

### Skin

Kinetic data pertaining to humans are not available.[99983]

A comparative study on rabbits on the resorption via the most diverse practice-relevant exposure routes revealed that after equivalent (amounts of) application, the oral route provides the highest concentrations of IPA in the blood, followed by a combined route of inhalation and dermal exposure.[00083]

Model calculations on the basis of physicochemical parameters yielded different assessments of the share of skin contact with regard to the overall industrial exposure.[99997]

### Gastrointestinal tract

Orally ingested IPA is rapidly and effectively resorbed by humans.[07619]

## TOXIC EFFECTS

### Main toxic effects

Acute effects:

Irritative effects of the vapours (depending on the concentration) on the mucosae.

Irritative effects of the liquid on the eyes and the mucosae of the digestive tract;[07619]

systemic effects after massive toxicity: Disorders of the CNS and the cardiovascular system.[07620]

Chronic effects:

Skin damage (very seldom);[00083]

No reports on systemic effects after exposure under industrial conditions.[99983]

### Acute toxicity

Acute toxicity of IPA in general was found to be low.[07619]

The eye-irritating potential on humans is known from the application as a disinfectant. Short-term contact with splashes of the 70% solution caused immediate burning pain, but no significant damage.

After an exposure of several minutes, individual cases involved short-term turbidity, which was rapidly reversible.[07979]

Animal experiments do not entirely rule out corrosive effects of the undiluted substance on the eyes.[07619]

Skin-irritating effects on volunteers could only be recognised after prior superficial damage (abrasion) or after prior wetting over a period of 10 minutes.

A sensitisation was not achieved in several tests on guinea pigs (Buehler-Test).[07934]

Information on the resorptive effects after skin contact is available neither for humans nor from animal experiments.[99983]

The only published dermal range finding test revealed very low toxicity (LD<sub>50</sub>, rabbits: 12,870 mg per kg of bodyweight; no detailed information).

After exposure to the inhalation of the substance, a (pleasant) odour could be perceived between 3.2 and 200 ppm.

At the same time 200 ppm were indicated as the irritation threshold.[99997]

Systemic effects after the inhalation of IPA are known only from animal experiments.

On rats after a 6-hour exposure to 1,500 to 10,000 ppm of IPA, neurotoxic effects (reduction of the motoric activity up to the symptom complex of narcotic effects, i.e., exhaustion and severe paralysis, respiratory disorders, loss of reflexes) were observed in extents proportional to concentration/persistence.

The amount of 500 ppm did not show any impact.[07619]

Four hour LC<sub>50</sub> values were determined to amount to 29,800 ppm for rats and 11,200 ppm for mice.[07934]

From a series of cases involving oral toxicities in humans; the symptom complex is well known: Nausea, vomiting, abdominal pains, gastritis, decreased blood pressure, drop in temperature, unconsciousness, coma, death caused by respiratory paralysis.[07619]

The amount of 0.5 l of a 70% IPA solution can be lethal.[07980]

### Chronic toxicity

Inflammatory skin diseases from an allergic reaction were observed in rare cases of repeated skin contact.[00083]

Independent of this fact, in Switzerland application of IPA instead of ethanol for medical purposes and for the formulation of mouth care products, even in concentrated form, was recommended. However, when the substance is used as external disinfectant for larger areas, it must be ensured that the maximally resorbed amount does not exceed 500 mg/day.[07714]

In an epidemiological study of 60 women exposed to IPA over periods of up to 17 years (median exposure value: 106 ppm), distinctive clinical, biochemical or behavioural findings could not be verified when compared to 48 control persons.[99997]

In workers producing IPA by the strong-acid process, because of mixed exposures observed effects cannot be ascribed to IPA (see also 'carcinogenicity').

Further workplace studies are not available.[99983]

In a 13-week inhalation study on rats and mice (100, 500, 1,500, 5,000 ppm, 6 hours per day, 5 days per week), narcotic effects were observed in the highest dose groups during exposure.

Essential changes after the individual exposures could also only be objectified in the highest dosage group and only at certain times: Changes in body weight, impairment of motoric activities and blood counts, increased liver weights, kidney dysfunctions).[99997]

Chronic inhalation tests under largely analogous conditions yielded similar findings.

A 'no observed adverse effect concentration' (NOAEC) of 500 ppm was derived for IPA.[07619]

### **Reproductive toxicity, mutagenicity, carcinogenicity**

For classifying the reproductive toxicity and mutagenic and carcinogenic potential see list in Annex VI of the CLP regulation / TRGS 905 / List of MAK values (see section REGULATIONS).

Reproductive toxicity:

There is no reason to fear a risk of damage to the developing embryo or foetus when MAK and BAT values are observed.

[05341]

Mutagenicity:

IPA did not exhibit genotoxic effects in in-vitro and in-vivo tests.[07619]

Carcinogenicity:

The carcinogenic risk associated with the production of IPA by the strong acid procedure cannot be ascribed to a corresponding potential of IPA, but to technologically conditioned side products.

[07980]

Carcinogenicity studies on rats and mice did not reveal any carcinogenic potential of IPA.[07619]

### **Biotransformation and excretion**

Resorbed IPA possesses a considerable distribution volume (0.6–0.7 l/kg) in the organism.

An enrichment of the substance in certain compartments does not occur. Approx. 85% of the substance is oxidised to acetone in the liver by alcohol DHO.

In the case of a metabolic formation it is eliminated almost unchanged via the lungs, the kidneys and the skin, but most low concentrations are oxidised to CO<sub>2</sub> and water.

The elimination half-life for IPA was determined to amount to 2.5-3 hours, for acetone to approx. 22 hours. Blood-ethanol concentrations of > 0.1 per thousand inhibit the IPA degradation to a certain extent.[07620]

The quantification of acetone in the full blood or in the urine is suitable for a biological monitoring. [05309]

### **Annotation**

This occupational health information was compiled on 31.12.1999.

It will be updated if necessary.

This information was translated from German into English by Übersetzungsbüro Branco.

### **FIRST AID**

#### **Eyes**

Rinse the affected eye with widely spread lids for 10 minutes under running water whilst protecting the unimpaired eye.

Arrange medical treatment.

[05118]

#### **Skin**

Remove contaminated clothing while protecting yourself.  
Rinse the affected skin areas for at least 10 to 20 minutes under running water.  
Under no circumstances should alcohol, gasoline or other solvents be used.  
After massive or prolonged contact (e.g., with substantially contaminated working clothes):  
Arrange for medical treatment.  
[05118, 99999]

### **Respiratory tract**

Whilst protecting yourself remove the casualty from the hazardous area and take him to the fresh air.  
Lay the casualty down in a quiet place and protect him against hypothermia.  
In the case of breathing difficulties have the casualty inhale oxygen.  
If the casualty is unconscious but breathing lay him in a stable manner on his side.  
Arrange medical treatment.  
[00330]

### **Swallowing**

Rinse the mouth and spit the fluids out.  
If the casualty is conscious have him drink 1 glass of water (ca 200 ml).  
By no means administer alcohol.  
Do not make the casualty vomit.  
In case of spontaneous vomiting, position the casualty's head in deep position or at least place her in lateral position (aspiration hazard).  
Arrange medical treatment.  
[00330, 07978, 99999]

### **Information for physicians**



Toxicities involving IPA have been reported only in connection with oral routes of exposure. Possible consequences after massive exposure can be derived solely from animal experiments. [00083]

- Symptoms of acute toxicity:

Eyes: Irritations caused by concentrated vapours, immediate burning pain due to concentrated solutions, reversible cornea turbidity might occur; [07979] corrosive effects due to undiluted IPA cannot be completely ruled out;

Skin: In general, minor or no irritation; erythema or stronger perception of irritations after contact with pre-damaged skin; [07934]

Systemic effects occur due more to simultaneous vapour inhalation than to skin absorption (only after massive contact); [99999]

Inhalation: As of approx. 200 ppm slight, at higher [99997] concentrations more pronounced mucosa irritations; rapid occurrence of systemic effects after massive vapour inhalation; [07619]

Ingestion: Concentration-dependent irritations of the contacted mucosae; nausea, vomiting, possibly haematemesis, rapid occurrence of systemic effects;

Absorption: CNS disorders (lethargy, ataxia, nystagmus, dysarthria, somnolence to coma, convulsions, areflexia), cardiovascular disorders (hypotension, low-output syndrome, rhythm disorders -> shock -> circulatory arrest), dyspnoea to apnoea; kidney dysfunctions (due to shock, possibly also as substance-specific effects); [07978]

Decreased blood pressure was regarded as a particularly important clinical diagnosis parameter in cases of moderate toxicities. [00083]

- First medical assistance:

Eye contact with IPA requires in addition to thorough rinsing further treatment or a follow-up examination by an ophthalmologist. [05118]

After successful decontamination, follow-up control with regard to a possible combined dermal-inhalation absorption should be sufficient after skin contact. [99999]

To prevent the (improbable, but still possible) development of a lung oedema, topical administration of glucocorticoids is required after massive vapour inhalation. [00330]

The absolute key measures to be taken in the narcotic to asphyctic toxicity stadium are the stabilisation of the cardiovascular and respiratory functions -> more measures see below. [07718]

Gastric irrigation after oral intake of high doses appears inadvisable due to its rapid absorption. [07978]

The provocation of vomiting and the application of activated charcoal are questionable (see 'recommendations'). [99983]

Intubation should mainly be performed to avoid aspiration; the ventilation indication depends on the condition of the patient and a blood gas analysis.

Hypotension requires the adjustment of an existing volume deficit with electrolyte and glucose solutions and possibly through the administration of dopamine (2 - 5 µg per kg of body weight per minute).

Ventricular extrasystole with haemodynamic disorders requires the slow i.v. administration of 100-200 mg of lidocaine, followed by the application of 1-4 mg per minute as a permanent infusion.

The administration of 10-20 mg diazepam is recommended in cases that require the disruption of spasms; make sure to account for respiratory depressions. [07978]

## Recommendations

Some secondary literature sources recommend the induction of vomiting and subsequent administration of activated charcoal after ingestion. [99983]

Both measures would as a matter of timing (ingestion -> absorption) only be effective when they could be performed by the first aider.

However, this procedure must be advised against, because of the aspiration risk on the one hand and because of a possible damage of the mucous membranes caused by possibly undiluted absorbed IPA (-> haematemesis) on the other hand. [07978]

After admission to hospital the patient should undergo a haemodialysis in cases of a hefty ingestion. This procedure has turned out to be life-saving in several cases.

The following measures are recommended for specific paraclinical diagnostics:

Verification of IPA in the blood, possibly in the gastric contents, acetonemia, acetonuria, generally without acidosis; confirmation of ethanol as a possible combination pollutant. [00083]

Unlike in cases of methanol toxicities, ethanol must not be administered after toxicities involving IPA, since the metabolism to the less toxic acetone conducive to patient welfare would be substantially slowed down. [07978]

## Annotation

This first aid information was compiled on 31.12.1999.

It will be updated if necessary.

This information was translated from German into English by Übersetzungsbüro Branco.

## SAFE HANDLING

[Handling](#) | [Storage](#) | [Fire and explosion protection](#) | [Organisational measures](#) | [Personal protection](#) | [Disposal considerations](#) | [Accidental release measures](#) | [Fire fighting measures](#)

### TECHNICAL MEASURES - HANDLING

#### Workplace

Provision of very good ventilation in the working area.

Washing facility at the workplace required.

Eye bath required. These locations must be signposted clearly.

When handling excessive amounts of the substance an emergency shower is required.

#### Equipment

Use only closed apparatus.

If release of the substance cannot be prevented, then it should be suctioned off at the point of exit.

Consider emission limit values, a purification of waste gases if necessary.

Label containers and pipelines clearly.

Unsuitable materials:

Plastics have to be proven for their resistibility.

#### Advice on safer handling

Take care to maintain clean working place.

The substance must not be present at workplaces in quantities above that required for work to be progressed.

Do not leave container open.

Use leak-proof equipment with exhaust for refilling or transfer.

Do not transport with/using compressed air.

Avoid splashing.

Fill only into labelled container.

Use an appropriate exterior vessel when transporting in fragile containers.

#### Cleaning and maintenance

Use protective equipment while cleaning if necessary.

Only conduct maintenance and other work on or in the vessel or closed spaces after obtaining written permission.

### TECHNICAL MEASURES - STORAGE

#### Storage

Do not use any food containers - risk of mistake.

Containers have to be labelled clearly and permanently.

Store in the original container as much as possible.

Use breakable containers only up to 2 litres content.

Keep container tightly closed.

Recommended storage temperature:

+5 to +30 degree C.

Store in a dry place.

Keep container in a well-ventilated place.

Store smaller vessels in cabinets with collecting tubs.

Store apart from sources of ignition and heat.

Protect from overheating/heating up.

Substance is hygroscopic, protect from moisture.

The maximum permissible stored quantities are to be found in the Technische Regel für Gefahrstoffe "Lagerung von Gefahrstoffen in ortsbeweglichen Behältern" ([TRGS 510](#)).

Storage is not permissible in hallways, thoroughfare, stairways, public hallways and corridors, on the roof, in attics, and in workrooms.

### Conditions of collocated storage

Storage class 3 (Flammable liquid substances)

Only substances of the same storage class should be stored together.

Collocated storage with the following substances is prohibited:

- Pharmaceuticals, foods, and animal feeds including additives.
- Infectious, radioactive und explosive substances.
- Gases.
- Other explosive substances of storage class 4.1A.
- Flammable solid substances or desensitized substances of storage class 4.1B.
- Pyrophoric substances.
- Substances liberating flammable gases in contact with water.
- Strongly oxidizing substances of storage class 5.1A.
- Ammonium nitrate and preparations containing ammonium nitrate.
- Organic peroxides and self reactive substances.
- Non combustible acutely toxic substances of storage class 6.1B.

Under certain conditions the collocated storage with the following sub-stances is permitted (For more details see [TRGS 510](#)):

- Oxidizing substances of storage class 5.1B.
- Noncombustible toxic or chronically acting substances of storage class 6.1D.
- Combustible solids of storage class 11.

The substance should not be stored with substances with which hazardous chemical reactions are possible.

## TECHNICAL MEASURES - FIRE AND EXPLOSION PROTECTION

### Technical, constructive measures

Substance is combustible.

Fire fighting equipment must be available.

The possibility of the formation of a hazardous explosive atmosphere must be evaluated in the risk assessment. Depending on the result of the risk assessment, measures in accordance with [TRGS 722](#) (prevention of formation), [TRGS 723](#) (prevention of ignition) and [TRGS 724](#) (constructive explosion protection) may be required.

Take precautionary measures against static discharges.

Earth all parts which can be electrically charged.

### Precaution on handling

The vapour-air-mixture is explosive.

Area with explosion risk.

Keep at a distance from sources of ignition (e.g. electrical devices, open flames, heat sources, sparks).

Observe the smoking prohibition!

Absolutely no welding in the working area.

Only work with vessels and lines after these have been thoroughly rinsed and inerting.

Work done with fire or open flame should only be carried out with written permission if the risk of fire or explosion cannot be completely eliminated.

Use caution with empty vessels; explosion is possible in case of ignition.

Do not use any tools that cause sparks.

It must be avoided that gases or vapours can escape into other rooms where sources of ignition are present.

## ORGANISATIONAL MEASURES

Instruction on the hazards and the protective measures using instruction manual ([TRGS 555](#)) are required with signature if just more than one minor hazard was detected.

Instruction must be provided before employment and then at a minimum of once per annum thereafter.

An escape and rescue plan must be prepared when the location, scale, and use of the work-site so demand.

It must be assured that the workplace limit values are being maintained. If the limit values are exceeded, additional protection measures are necessary.

The measurements must be recorded and kept on file.

Observe the restrictions on juvenile employment as defined in the "Jugendarbeitsschutzgesetz".

Only employees are permitted to enter the work areas. Signposting to this effect must be displayed.

## PERSONAL PROTECTION

### Body protection

Wear an apron or a lab coat.

Wear flameproof, antistatic protective clothing.

### Respiratory protection

In an emergency (e.g.: unintentional release of the substance, exceeding the occupational exposure limit value) respiratory protection must be worn. Consider the maximum period for wear.

Respiratory protection: Gas filter A, Colour code brown.

Use insulating device for concentrations above the usage limits for filter devices, for oxygen concentrations below 17% volume, or in circumstances which are unclear.

### Eye protection

Sufficient eye protection must be worn.

Wear glasses with side protection.

### Hand protection

The use of resistant protective gloves is recommended.

Skin protection cremes do not protect as effectively against the substance as protective gloves. Therefore suitable protective gloves should be preferred as far as possible.

The following materials are suitable for protective gloves (Permeation time  $\geq$  8 hours):

Nitrile rubber/Nitrile latex - NBR (0,35 mm)

Butyl rubber - Butyl (0,5 mm)

Fluoro carbon rubber - FKM (0,4 mm)

Protective gloves of the following materials should not be worn longer than 4 hours continually (Permeation time  $\geq$  4 hours):

Polychloroprene - CR (0,5 mm)

Following materials are unsuitable for protective gloves because of degradation, severe swelling or low permeation time:

Natural rubber/Natural latex - NR

Polyvinyl chloride - PVC

The times listed are suggested by measurements taken at 22 °C and constant contact. Temperatures raised by warmed substances, body heat, etc. and a weakening of the effective layer thickness caused by expansion can lead to a significantly shorter breakthrough time. In case of doubt contact the gloves' manufacturer. A 1.5-times increase / decrease in the layer thickness doubles / halves the breakthrough time. This data only applies to the pure substance. Transferred to mixtures of substances, these figures should only be taken as an aid to orientation.

### Occupational hygiene

Take heed of usual occupational hygiene measures when handling chemical substances, especially wash the skin with soap and water before breaks and at the end of work and apply fatty skin-care products after washing.

Avoid contact with eyes. In case of contact rinse the affected eye(s).

Avoid inhalation of vapour or mist.

Change clothing that has become wet and do not reuse until completely dry.

Increased risk of combustion from wicking.

## DISPOSAL CONSIDERATIONS

Hazardous waste according to Waste Catalogue Ordinance (AVV).

If there is no way of recycling it must be disposed of in compliance with the respective national and local regulations.

Collection of small amounts of substance:

Place in a collection container for halogen-free organic solvents and solutions of halogen-free organic substances.

Collection vessels must be clearly labelled with a systematic description of their contents. Store the vessels in a well-ventilated location. Entrust them to the appropriate authorities for disposal.

## ACCIDENTAL RELEASE MEASURES

Shut off all sources of ignition.

Evacuate area. Warn affected surroundings.

Wear personal protective equipment (see chapter Personal Protection).

Absorb any spilt liquid with an absorbent (e.g. diatomite, vermiculite, sand) and dispose of according to regulations.

Use non-sparking tools.

Afterwards ventilate area and wash spill site.

Endangerment of watert:

Low hazard to waters. Inform the responsible authorities when very large quantities get into water, drainage, sewer, or the ground.

## FIRE FIGHTING MEASURES

### Classes of fires

B liquid or melting  
substances

### Suitable extinguishing media

Water (spray - not splash)

Dry extinguishing powder

Carbon dioxide

Fight large fire with alcohol resistant foam or water spray.

### Instructions

Cool surrounding containers with water spray.

If possible, take container out of dangerous zone.

Heating causes a rise in pressure, risk of bursting and explosion.

Shut off sources of ignition.

Beware of backfire.

Use only explosion proved equipment.

Do not allow runoff to get into the sewage system.

### Special protective equipment

In the case of a fire hazardous substances can be released.

Carbon monoxide and carbon dioxide

Wear self-contained breathing apparatus.

## REGULATIONS

[GHS Classification/Labelling](#) | [Workplace labelling](#) | [Water hazard class](#) | [Air quality control](#) | [Transport Regulations](#) | [Threshold limit values](#) | [MAK recommendations](#) | [Biological exposure indeces](#) | [SevesoIII](#) | [Restriction of use](#) | [Technical rules](#) | [Regulations of accident insurers](#)

### EUROPEAN GHS CLASSIFICATION AND LABELLING

#### Classification

Flammable liquids, Category 2; H225

Eye irritation, Category 2; H319

Specific Target Organ Toxicity (single exposure), Category 3; H336



**Signal Word** "Danger"

#### Hazard Statement - H-phrases

H225: Highly flammable liquid and vapour.

H319: Causes serious eye irritation.

H336: May cause drowsiness or dizziness.

#### Precautionary Statement - P-phrases

P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

P240: Ground and bond container and receiving equipment.

P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P403+P233: Store in a well-ventilated place. Keep container tightly closed.

Manufacturer's specification by Merck

Reference: [01211](#)

State: 2018

Checked: 2020

The substance is listed in appendix VI, table 3 of CLP regulation.

The given classification can deviate from the listed classification, since this classification is to be complemented concerning missing or divergent danger classes and categories for the respective substance.

Reference: [99999](#)

### GHS-CLASSIFICATION OF MIXTURES

The classification of mixtures containing this substance results from Annex 1 of Regulation (EC) 1272/2008.

Reference: [99999](#)

### WORKPLACE LABELLING ACCORDING TO GERMAN [ASR A1.3](#)

**Prohibition label**



No open flame; fire, open ignition sources and smoking prohibited



No admittance for unauthorized persons

#### Warning label



Caution - inflammable material

#### Precept label



Use safety goggles

#### GERMAN WATER HAZARD CLASS

Substance No: 135

WGK 1 - low hazard to waters

Classification according to the announcement of the list of substances hazardous to water in the Federal Register of 10.08.2017, last update 24.11.2023

#### TECHNICAL INSTRUCTIONS ON AIR QUALITY CONTROL (TA LUFT)

Chapter 5.2.5 Organic Substances.

The following values, specified as overall carbon, are in all not allowed to be exceeded in exhaust gas:

Mass flow: 0,50 kg/hr

or

Mass conc.: 50 mg/m<sup>3</sup>

At old units with an annual mass flow till 1,5 Mg/a, specified as total carbon, the emissions in exhaust gas are not allowed to exceed 1,5 kg/h.

#### TRANSPORT REGULATIONS

UN Number: 1219

Shipping name: Isopropanol

Hazard Identification Number: 33

Class: 3 (Flammable Liquids)

Packing Group: II (medium danger)

Danger Label: 3



Classification code: F1

Tunnel restrictions:

Transports in bulk or in tanks: passage forbidden through tunnels of category D and E.

Other transports: passage forbidden through tunnels of category E.

Reference: [07902](#)

### **TRGS 900 - GERMAN OCCUPATIONAL EXPOSURE LIMIT VALUES**

200 ml/m<sup>3</sup>

500 mg/m<sup>3</sup>

Peak limitation: Excursion factor 2

Duration 15 min, mean; 4 times per shift; interval 1 hour

Category II - Substances with systemic effects

There is no reason to fear a risk of damage to the developing embryo or foetus when AGW and BGW are adhered to.

Source: DFG

### **RECOMMENDATIONS OF MAK-COMMISSION**

This data is recommended by scientific experience and is not established law.

200 ml/m<sup>3</sup>

500 mg/m<sup>3</sup>

Peak limitation: Excursion factor 2

Duration 15 min, mean; 4 times per shift; interval 1 hour

Category II - Substances with systemic effects

Pregnancy: Group C

There is no reason to fear damage to the embryo or foetus when MAK and BAT values are observed.

### **GERMAN BIOLOGICAL EXPOSURE INDICES**

Parameter: Acetone

Value: 25 mg/l

Assay material: Whole blood

Sampling time: end of exposure/end of shift

Reference: [05347](#)

Parameter: Acetone

Value: 25 mg/l

Assay material: Urine

Sampling time: end of exposure/end of shift

Reference: [05347](#)

### **DIRECTIVE 2012/18/EU (Seveso III)**



**The substance is subject to the hazard categories of the Hazardous Incident Ordinance:**

P5(a,b,c) Flammable liquids Category 2 or 3

**Quantity thresholds for determination of operation scopes:**

Annex I Part 1 Section: P5a

Flammable liquids Category 2 or 3 (or other liquids with a flash point  $\leq 60$  °C), maintained at a temperature above their boiling point

Qualifying quantity for the application of

Lower-tier requirements: 10 t

Upper-tier requirements: 50 t

Annex I Part 1 Section: P5b

Flammable liquids Category 2 or 3 (or other liquids with a flash point  $\leq 60$  °C), where particular processing conditions, such as high pressure or high temperature, may create major-accident hazards or accident hazards

Qualifying quantity for the application of

Lower-tier requirements: 50 t

Upper-tier requirements: 200 t

Annex I Part 1 Section: P5c

Flammable liquids, Category 2 or 3 not covered by P5a and P5b

Qualifying quantity for the application of

Lower-tier requirements: 5000 t

Upper-tier requirements: 50000 t

**RESTRICTIONS OF USE / BANS OF USE****REACH Regulation (EC) No 1907/2006 Annex XVII**

Annex XVII, Point 3

1. The putting into circulation and the utilisation of the substance is not allowed in decorative objects, games and joke articles.

2. Substances labelled with H304 which can be utilised as fuels in decorative lamps and are put in circulation in amounts of 15 l or less must not contain a dye and/or a perfume.

Further information on prohibitions can be taken from the regulation.

Annex XVII, Point 40

Shall not be used, as substance or as mixtures in aerosol dispensers where these aerosol dispensers are intended for supply to the general public for entertainment and decorative purposes such as the following:

- metallic glitter intended mainly for decoration,
- artificial snow and frost,
- “whoopie” cushions,
- silly string aerosols,
- imitation excrement,
- horns for parties,
- decorative flakes and foams,
- artificial cobwebs,
- stink bombs.

Further information on prohibitions and exceptions can be taken from the regulation.

#### Annex XVII, Point 75

Mixtures containing certain hazardous substances shall no longer be placed on the market for tattooing purposes. Mixtures containing such substances in specified concentrations shall no longer be used for tattooing purposes after 04.01.2022. Substances falling within one or more of the following points:

- carcinogenic or reproductive toxic substances according to Part 3 of Annex VI to CLP Regulation (excluding the classification due to effects only following exposure by inhalation),
- skin-sensitising, skin-corrosive, skin-irritant, serious eye-damaging or eye-irritant substances according to Annex VI Part 3 of the CLP Regulation,
- substances listed with specified conditions in Annex II or IV to Regulation (EC) No 1223/2009 [Cosmetics Regulation], and
- substances listed in Appendix 13 to Annex XVII (point 75) of the REACH Regulation.

In general, mixtures placed on the market for use for tattooing purposes must be labelled "Mixture for use in tattoos or permanent make-up." from 04.01.2022 on and may not be used for tattooing purposes without this labelling. Further safety information shall be provided on the packaging or in the instructions for use. Before using a mixture for tattooing purposes, the person using the mixture shall provide this information to the person undergoing the procedure.

Further information on the restrictions, concentration limits and exemptions can be taken from the Regulation.

Annex XVII to Regulation (EC) No 1907/2006, [consolidated version](#) (BAUA) (only in German)

#### Consumer Goods Ordinance

Attachment 1 to § 3, Point 5

The substance must not be utilised for the production or treatment of joke articles.

#### TECHNICAL RULES FOR HAZARDOUS SUBSTANCES

##### [TRGS 201](#)

Einstufung und Kennzeichnung bei Tätigkeiten mit Gefahrstoffen; Ausgabe Februar 2017, zuletzt geändert und ergänzt April 2018

##### [TRGS 400](#)

Gefährdungsbeurteilung für Tätigkeiten mit Gefahrstoffen; Ausgabe Juli 2017

##### [TRGS 555](#)

Betriebsanweisung und Information der Beschäftigten; Ausgabe Februar 2017

##### [TRGS 600](#)

Substitution; Ausgabe Juli 2020

##### [TRGS 402](#)

Ermitteln und Beurteilen der Gefährdungen bei Tätigkeiten mit Gefahrstoffen: Inhalative Exposition; Ausgabe September 2023

##### [TRGS 500](#)

Schutzmaßnahmen; Ausgabe September 2019

##### [TRGS 509](#)

Lagern von flüssigen und festen Gefahrstoffen in ortsfesten Behältern sowie Füll- und Entleerstellen für ortsbewegliche Behälter; Ausgabe Juni 2022

##### [TRGS 510](#)

Lagerung von Gefahrstoffen in ortsbeweglichen Behältern; Ausgabe Januar Dezember 2020

##### [TRGS 800](#)

Brandschutzmaßnahmen; Ausgabe Dezember 2010

### [TRGS 720](#)

Gefährliche explosionsfähige Gemische - Allgemeines; Ausgabe Juli 2020, zuletzt berichtigt März 2021

### [TRGS 721](#)

Gefährliche explosionsfähige Gemische - Beurteilung der Explosionsgefährdung; Ausgabe Oktober 2020, zuletzt berichtigt Dezember 2020

### [TRGS 722](#)

Vermeidung oder Einschränkung gefährlicher explosionsfähiger Atmosphäre, Ausgabe Februar 2021

### [TRGS 723](#)

Gefährliche explosionsfähige Gemische - Vermeidung der Entzündung gefährlicher explosionsfähiger Gemische; Ausgabe Juli 2019, zuletzt geändert Oktober 2020

### [TRGS 724](#)

Gefährliche explosionsfähige Gemische - Maßnahmen des konstruktiven Explosionsschutzes, welche die Auswirkung einer Explosion auf ein unbedenkliches Maß beschränken, Ausgabe Juli 2019

### [TRGS 906](#)

Verzeichnis krebserzeugender Tätigkeiten oder Verfahren nach § 2 Abs. 3 Nr. 4 GefStoffV; Ausgabe April 2023

Starke-Säure-Verfahren bei der Herstellung von Isopropylalkohol

## REGULATIONS OF GERMAN ACCIDENT INSURERS

### [DGUV Regel 112-190](#)

Benutzung von Atemschutzgeräten, Ausgabe November 2021  
(in German only)

## LINKS

[International Limit Values](#)

[OECD Screening Information DataSet \(SIDS\)](#)

[The MAK Collection for Occupational Health and Safety](#)

[DGUV Information 213-098: List of substances - lesson in schools \(in German only\)](#)

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Data acquisition and maintenance manual of the GESTIS substance database (non-public)

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[TRGS 510](#) "Lagerung von Gefahrstoffen in ortsbeweglichen Behältern" Ausgabe Dezember 2020

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[TRGS 903](#) "Biologische Grenzwerte" in der jeweils gültigen Fassung

Quelle: 05341

[TRGS 900](#) "Arbeitsplatzgrenzwerte" in der zum Bearbeitungszeitpunkt gültigen Fassung

Quelle: 05347

[TRGS 903](#) "Biologische Grenzwerte (BGW)" Ausgabe Februar 2013; zuletzt geändert Juni 2023

Quelle: 05350

[TRGS 900](#) "Arbeitsplatzgrenzwerte" Ausgabe Januar 2006, zuletzt geändert und ergänzt Juni 2023

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Angabe des Bearbeiters

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