

## Tantalum, Powder



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### IDENTIFICATION

#### Tantalum, Powder

**ZVG No:** 8440  
**CAS No:** 7440-25-7  
**EC No:** 231-135-5

### CHARACTERISATION

#### SUBSTANCE GROUP CODE

134000 Metals

#### STATE OF AGGREGATION

The substance is solid.

#### PROPERTIES

metal powder  
dark-grey  
odourless

#### CHEMICAL CHARACTERISATION

Flammable solid.

Can be ignited by the brief effects of exposure to sources of ignition and continues to burn when these are no longer present. The risk of ignition is greater the more finely the substance is spread.

The metal is non-flammable in compact form.

Practically insoluble in water.

[Substance information in Wikipedia](#)

#### DUST EXPLOSIVENESS

There is a risk of a dust explosion if the following conditions are met:

- The substance is given in very finely distributed form (powder, dust).
- The substance is whirled up in sufficient quantity in the air.
- An ignition source is present (flame, spark, electrostatic discharge, etc.)

Quelle: 99999

## FORMULA

Ta

**Molar mass:** 180,95 g/mol

## PHYSICAL AND CHEMICAL PROPERTIES

[Melting point](#) | [Boiling point](#) | [Density](#) | [Ignition temperature](#) | [Solubility](#)

### MELTING POINT

Melting point: 2996 °C

Reference: [01211](#)

### BOILING POINT

Boiling Point: 5429 °C

Reference: [00456](#)

### DENSITY

DENSITY

Value: 14,491 g/cm<sup>3</sup>

Reference: [00456](#)

### IGNITION TEMPERATURE

Ignition temperature: > 250 °C

Reference: [01211](#)

### SOLUBILITY IN WATER

Concentration: < 0,01 g/l

Temperature: 20 °C

Reference: [01211](#)

## 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 good ventilation in the working area.

Washing facility at the workplace required.

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

#### Equipment

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.

**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.

Sufficient ventilation must be guaranteed for refilling, transfer, or open use.

Avoid spillage.

Fill only into labelled container.

Avoid rising dust.

Use an appropriate exterior vessel when transporting in fragile containers.

**Cleaning and maintenance**

Avoid dust formation. Dust formation that cannot be avoided must be collected regularly.

Use tested industrial vacuum cleaners or suction systems for areas with a high risk of explosion.

Do not raise dust while cleaning.

Use of a blower for cleaning is not permitted.

Alternative: clean damp.

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.

Keep container tightly closed.

Storage temperature: Without any limitation.

Store in a dry place.

Store apart from sources of ignition and heat.

**Conditions of collocated storage**

Storage class 4.1 B (Flammable solid or desensitized 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.
- Aerosols (spray bottles).
- Flammable liquids of storage class 3.
- Strongly oxidizing substances of storage class 5.1A.
- Ammonium nitrate and preparations containing ammonium nitrate.
- 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](#)):

- Other explosive substances of storage class 4.1A.
- Pyrophoric substances.
- Substances liberating flammable gases in contact with water.
- Oxidizing substances of storage class 5.1B.
- Organic peroxides and self reactive substances.
- Combustible acutely toxic substances.
- Noncombustible toxic or chronically acting substances of storage class 6.1D.

The substance should not be stored with substances with which ha-zardous chemical reactions are possible.

## TECHNICAL MEASURES - FIRE AND EXPLOSION PROTECTION

### Technical, constructive measures

The substance is combustible in a finely distributed form (powder, dust).

Fire fighting equipment must be available.

If there is a risk of a dust explosion due to the dust-like distribution and the quantities used, measures according to [TRGS 722](#) (prevention of formation), 723 (prevention of ignition) and [TRGS 724](#) (constructive explosion protection) may become necessary.

### Precaution on handling

Area with fire risk.

Areas in which the substance can arise as a dust in such quantities that a dust explosion could occur are to be considered as at a risk of explosion.

Keep away from sources of ignition (e.g. open flames, heat sources and 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.

Do not use any tools that cause sparks.

## 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".

## 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: Particle filter P1, colour code white.

### Eye protection

Sufficient eye protection should 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.

Currently there is no information available regarding suitable glove materials.

Experience says that polychloroprene, nitrile rubber, butyl rubber, fluoro-caoutchouc, and polyvinyl chloride are suitable as glove materials for protection against un-dissolved solids.

### 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 inhalation of dust.

## 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:

Residues should be recycled.

Collect in container for recyclable metal residues. All metals should be collected separately.

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 a dust mask.

Pick up without creating dust.

Use non-sparking tools.

Afterwards ventilate area and wash spill site.

Endangerment of watert:

No hazards to sources of water are to be feared if released into water, drainage, sewer, or the ground.

## FIRE FIGHTING MEASURES

### Classes of fires

D combustible metals

### Suitable extinguishing media

Metal fire extinguisher

Dry sand

### Unsuitable extinguishing media

Water

Foam

### Instructions

Seek immediate cover in case of sudden release and raising of large quantities of dust.

If possible, take container out of dangerous zone.

Shut off sources of ignition.

### Special protective equipment

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

Metal oxide fume

Wear self-contained breathing apparatus.

## REGULATIONS

## EUROPEAN GHS CLASSIFICATION AND LABELLING

### Classification

Flammable solids, Category 1; H228



**Signal Word** "Danger"

### Hazard Statement - H-phrases

H228: Flammable solid.

### 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.

P241: Use explosion-proof electrical/ventilating/lighting/... equipment.

P280: Wear protective gloves/protective clothing/eye protection/face protection.

P370+P378: In case of fire: Use metal fire powder for extinction.

Registration entry of the manufacturer on the ECHA website

Reference: [07520](#)

State: 2020

Checked: 2021

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

### Prohibition label



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



Do not extinguish with water



No admittance for unauthorized persons

### Warning label



Caution - inflammable material

**Precept label**

Use safety goggles

**GERMAN WATER HAZARD CLASS**

Substance No: 1443

non-hazardous to waters

Metals, provided they are solid with a particle size  $\geq 1$  mm, that don't react with water or atmospheric oxygen, unless an hazardous substance legal classification is necessary or a WGK-classification (German water hazard class) was released by the Federal Environment Agency (Umweltbundesamt).

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 5.2.1 Overall Dust, including fine dust

The emissions of dust in the exhaust gas are not allowed to exceed the following values:

Mass flow: 0,20 kg/hr

or

Mass conc.: 20 mg/m<sup>3</sup>

The mass per unit volume of 0,15 g/m<sup>3</sup> in exhaust gas is not allowed to be exceeded also on observance or lower deviation of a mass flow of 0,20 kg/h.

**TRANSPORT REGULATIONS**

UN Number: 3089

Shipping name: Metal powder, flammable,  
n.o.s.

Hazard Identification Number: 40

Class: 4.1 (Flammable solids)

Packing Group: II (medium danger)

Danger Label: 4.1

Classification code: F3

Tunnel restrictions:

Passage forbidden through tunnels of category E.

Reference: 07520

**TRGS 900 - GERMAN OCCUPATIONAL EXPOSURE LIMIT VALUES**1,25 mg/m<sup>3</sup>

with reference to the respirable fraction

Source: AGS, DFG

Scope:

General threshold limit value for dust - respirable fraction

10 mg/m<sup>3</sup>

with reference to the inhalable fraction

Peak limitation: Excursion factor 2

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

Category II - Substances with systemic effects

Source: AGS, DFG

Scope:

General threshold limit value for dust - inhalable fraction

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

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

0,3 mg/m<sup>3</sup>

with reference to the respirable fraction

Peak limitation: Excursion factor 8

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

Category II - Substances with systemic effects

Carcinogenic: Category 4

Substances which are carcinogenic with no or minor genetically toxic effects. If there is a MAK-value for these substances no considerable contribution to the hazard of cancer will be expected.

Pregnancy: Group C

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

Respirable fraction

4 mg/m<sup>3</sup>

with reference to the inhalable fraction

Pregnancy: Group C

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

Limit value for inhalable fraction.

### **RESTRICTIONS OF USE / BANS OF USE**

**REACH Regulation (EC) No 1907/2006 Annex XVII**



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,
- “whoopee” 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 to Regulation (EC) No 1907/2006, [consolidated version](#) (BAUA) (only in German)

## 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

## REGULATIONS OF GERMAN ACCIDENT INSURERS

[DGUV Regel 112-190](#)

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

## LINKS

[International Limit Values](#)

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

## REFERENCES

Quelle: 00001

IFA: Erfassungs- und Pflegehandbuch der GESTIS-Stoffdatenbank (nicht öffentlich)

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

Quelle: 00456

Hazardous Substances Data Bank (HSDB) in PubChem

Quelle: 01211

GHS-Sicherheitsdatenblatt, Merck

GHS Material Safety Data Sheet, Merck

Quelle: 01231

GHS-Sicherheitsdatenblatt, Thermo Fisher Scientific

GHS Material Safety Data Sheet, Thermo Fisher Scientific

Quelle: 05300

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

Quelle: 05350

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

Quelle: 07520

Europäische Chemikalienagentur ECHA: Informationen über registrierte Substanzen

European Chemicals Agency ECHA: Information on registered substances

Quelle: 07580

Bekanntmachung der Liste der wassergefährdenden Stoffe im Bundesanzeiger vom 10.08.2017, zuletzt geändert 24.11.2023

Quelle: 08112

DFG Deutsche Forschungsgemeinschaft: MAK- und BAT-Werte-Liste 2023, Senatskommission zur Prüfung gesundheitsschädlicher Arbeitsstoffe, Mitteilung 59; GMS PUBLISSO

Quelle: 99999

Angabe des Bearbeiters

Indication of the editor

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