

MATERIAL SAFETY DATA SHEET

PRODUCT NAME: DURAGRAPH® GRAPHITES

SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

Product identifier

Duragraph®

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

Use of the substance/mixture

Processing of graphite (substance) --> Milling and sieving of graphite powder

Distribution and handling of graphite (substance) --> Bulk loading and unloading, repacking, sampling and storage of synthetic graphite powder

Formulation of mixtures --> Mixing of graphite powder with additional components

Calendering/molding operations --> Compression of graphite as a substance or in Preparations (production of articles)

Thermal treatment --> Thermal treatment at temperatures above 500 °C, incl. charging and discharging

Use as an article (mechanical applications) --> Sealing and bearing application industrial incl. automotive

Use as an article (high temperature applications) --> Heater, Shielding and thermal management

Use as an article (electrical applications) --> Conductivity (e.g. electrical contacts, brushes)

Use as an article (metallurgical applications) --> e.g. graphite electrodes, dies for continuous casting

Use as substance or in preparations --> e.g. use in lubricants and conductive materials

Use as substance or in preparations --> e.g. recarburiser, casting powder, ramming mass

Uses advised against

none

SECTION 2: HAZARDS IDENTIFICATION

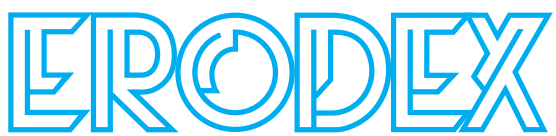
Classification of the substance or mixture

This mixture is not classified as dangerous according to Directive 1999/45/EC.

Label elements

Other hazards

High slip hazard because of leaking or spilled product. Graphite dusts could cause an electrical short.



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SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

Mixtures

Chemical characterization

Mixture based on Graphite

EC-no. (EINECS/ELINCS): 231-955-3;

CAS-No.: 7782-42-5;

concentration: > 94 % by weight;

dangerous contamination: none

REACH Article 33 (SVHC): This Product contains no chemical substance, that is listed in Article 59 (1, 10) of Regulation (EC) No. 1907/2006.

SECTION 4: FIRST AID MEASURES

Description of first aid measures

General information

None / none

After inhalation

Provide fresh air.

After contact with skin

Gently wash with plenty of soap and water.

After contact with eyes

Rinse cautiously with water for several minutes.

After ingestion

Rinse mouth immediately and drink large quantities of water.

Most important symptoms and effects, both acute and delayed

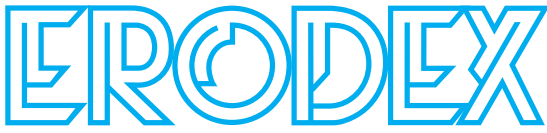
None

Indication of any immediate medical attention and special treatment needed

None

SECTION 5: FIREFIGHTING MEASURES

Extinguishing media



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Suitable extinguishing media

Foam. Carbon dioxide (CO₂). Extinguishing powder. Water spray. (use only up to 1500°C)
Use inert gases or covering with cold coke or graphite powder (> 1500 °C).

Extinguishing media which must not be used for safety reasons

High power water jet.

Special hazards arising from the substance or mixture

Can be released in case of fire: Carbon dioxide (CO₂). Carbon monoxide. Sulphur dioxide (SO₂).

Fire class A: Solid material fires, mainly of organic nature, that normally burn with formation of embers.

Advice for fire-fighters

In case of insufficient ventilation, wear suitable respiratory equipment.

Additional information

At temperature > 1500 °C graphite reacts with substances containing oxygen.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Avoid generation of dust.

Wear personal protection equipment.

Environmental precautions

At temperature > 1500 °C graphite reacts with substances containing oxygen.

Methods and material for containment and cleaning up

Collect mechanically

Reference to other sections

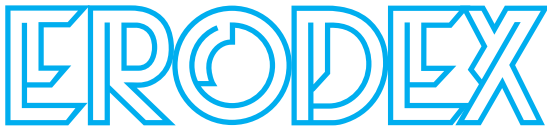
Additional information: Section 8 and 13

SECTION 7: HANDLING AND STORAGE

Precautions for safe handling

Advice on safe handling

High slip hazard because of leaking or spilled product.



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Advice on protection against fire and explosion

Dust should be vacuumed up immediately at the place it occurs.

Further remarks: Section 9 (Explosive properties:)

Further information on handling

Section 8.2 "General protection and hygiene measures:"

Conditions for safe storage, including any incompatibilities

Requirements for storage rooms and vessels

None

Advice on storage compatibility

None

Further information on storage conditions

None

Specific end use(s)

None

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Additional advice on limit values

If technical suction or ventilation measures are not possible or are insufficient, protective breathing apparatus must be worn. [EN 14387]

Worker, industry. and Worker, professional:

DNEL/DMEL (inhalation.) : 1,2 mg/m³

Consumer use :

DNEL/DMEL (inhalation.) : 0,3 mg/m³

DNEL/DMEL (oral.) : 813 mg/kg bw/day

Remark:

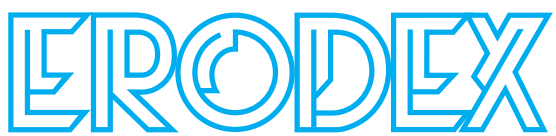
DNEL (inhalation) is applicable for respirable fractions of Graphite dust that can reach the alveolar regions of the lung.

Exposure controls

Occupational exposure controls

"Dust: 10 mg/m³ (inhalable); 3 mg/m³ (alveolar) [TRGS 900]"

Procedures to check the limit monitoring: [DIN EN 481].



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Protective and hygiene measures

Do not eat, drink, smoke or sneeze at the workplace. Wash hands before breaks and at the end of work.

Respiratory protection

If technical suction or ventilation measures are not possible or are insufficient, protective breathing apparatus must be worn. [EN 14387]

Hand protection

Suitable gloves type: Chromate-free leather. [EN 388] Wear cotton undermitten if possible.

Eye protection

Dust protection goggles. [EN 166]

Skin protection

None

Environmental exposure controls

None

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Physical state:	Solid
Colour:	Grey / black
Odour:	None/none

Changes in the physical state

Melting point:	> 600 °C OECD 102
Boiling point:	Not applicable
Sublimation point:	3652-3697 °C
Softening point:	Not applicable
Flash point:	Not applicable

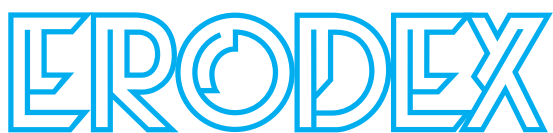
Flammability

Solid: Non-flammable.

Explosive properties

Not explosive.

Lower explosion limits:	Not applicable
Upper explosion limits:	Not applicable



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Auto-ignition temperature

Solid: None/none

Oxidizing properties

None/none

Vapour pressure: Not applicable

Density (at 20 °C): 2,2 g/cm³

Water solubility: < 0,00045 g/L OECD 105 / EU A.6

(at 20 °C)

Partition coefficient: Not applicable

Viscosity / dynamic: Not applicable

Evaporation rate: Not applicable (inorganic substance)

Other information

Graphite dust with particles sizes from 4 to 40 µm is able to explode in a wide range of concentrations. The minimum ignition energy is > 1000 J for the finest dust. The dusts tested were classified as St1. (Denkevits A., 2003)

SECTION 10: STABILITY AND REACTIVITY

Reactivity

None

Chemical stability

No adverse effects known.

Possibility of hazardous reactions

None

Conditions to avoid

Graphite dust with particles sizes from 4 to 40 µm is able to explode in a wide range of concentrations. The minimum ignition energy is > 1000 J for the finest dust. The dusts tested were classified as St1. (Denkevits A., 2003)

Incompatible materials

None

Hazardous decomposition products

None

Further information

None

SECTION 11: TOXICOLOGICAL INFORMATION

Information on toxicological effects

Toxicokinetics, metabolism and distribution

Based on existing data the substance does not fulfill the criteria of CMR-substances Cat. 1 and 2 according to 67/548/EEC.

Acute toxicity

Based on available data the classification criteria are not met.

Acute toxicity, oral: LD50: > 2000 mg/kg bw/day [Rat.] (OECD 423)

Acute toxicity, inhalant: LD50: (4h) > 2000 mg/m³ Air. [Rat.] (OECD 403)

Dose limit according to CLP.

Specific effects in experiment on an animal

STOT-SE

Based on available data the classification criteria are not met.

Acute toxicity, oral: Specific effects: none ; Affected organs: not applicable. [Rat.] (OECD 423)

Acute toxicity, inhalant: Specific effects: Only usual signs of discomfort after the end of exposure were observed.

Irritation and corrosivity

Skin corrosion/irritation: Not an irritant. [Rabbit.] (OECD 404)

Irritant effect on the eye: Not an irritant. [Rabbit.] (OECD 405)

Respiratory or skin sensitisation: no danger of sensitization. [Mouse.] (OECD 429)

Severe effects after repeated or prolonged exposure

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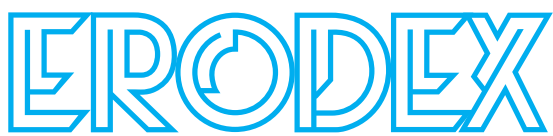
Based on available data the classification criteria are not met.

Subacute oral toxicity:

Specific effects: none, Affected organs: not applicable. [Rat.] (OECD 422.)

Subacute inhalative toxicity:

Specific effects: Wet lung weight was increased. Minor histopathological findings in the lung and nasal cavity. Affected organs: Irritating to respiratory system. [Rat.] (OECD 412.)



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Carcinogenic/mutagenic/toxic effects for reproduction

Based on available data the classification criteria are not met.

genotoxicity:

Bacterial reverse mutation assay (OECD 471): negative.

Mammalian chromosome aberration test (OECD 473): negative.

Mammalian cell gene mutation test (gene mutation) (OECD 476): negative.

Carcinogenicity:

No indications of human carcinogenicity exist. (literature value MAK, 2001)

Reproductive toxicity:

NOAEL: > 1000 mg/kg bw/day [Rat.] (OECD 422.) Dose as nominal food intake, corresponding to limit dose acc. to OECD 422.

Additional information on tests

Aspiration hazard: Solid substance. Based on available data the classification criteria are not met.

No human data on effects after ingestion, skin or eye contact. See section 4 for first aid measures.

Empirical data on effects on humans

none

none

Further information

Result: No signs of systemic toxicity were observed, no signs of any effects on development, reproduction, or fertility.

SECTION 12: ECOLOGICAL INFORMATION

Toxicity

Acute fish toxicity: LC50: > 100 mg/l Exposure time: (96 h) Method: OECD 203

Acute Daphnia toxicity: EC50: > 100 mg/l Exposure time: (48 h) Method: OECD 202

Algae toxicity: EC50: > 100 mg/l Exposure time: (72 h) Method: OECD 201

Longterm fish toxicity: not determined

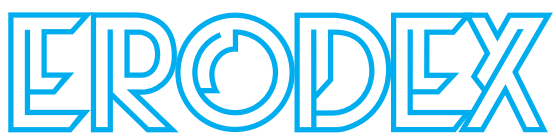
Chronic daphnia toxicity: not determined

Persistence and degradability

not determined; Product is inorganic.

Bioaccumulative potential

not determined; Product is inorganic.



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Mobility in soil

Not determined;

Results of PBT and vPvB assessment

This substance does not meet the criteria for classification as PBT or vPvB.

Other adverse effects

No adverse effects known.

SECTION 13: DISPOSAL CONSIDERATIONS

Waste treatment methods

Advice on disposal

According to EAKV, allocation of waste identity numbers/waste descriptions must be carried out in a specific way for every industry and process.

Contaminated packaging

According to EAKV, allocation of waste identity numbers/waste descriptions must be carried out in a specific way for every industry and process.

SECTION 14: TRANSPORT INFORMATION

Land transport (ADR/RID)

UN proper shipping name:

Not a hazardous material with respect to these transportation regulations.

Inland waterways transport

UN proper shipping name:

Not a hazardous material with respect to these transportation regulations.

Marine transport

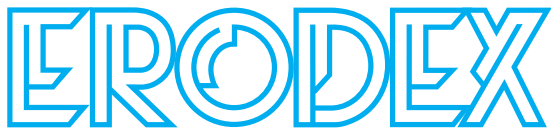
UN proper shipping name:

Not a hazardous material with respect to these transportation regulations.

Air transport

UN proper shipping name:

Not a hazardous material with respect to these transportation regulations.



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SECTION 15: REGULATORY INFORMATION

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

National regulatory information

Water contaminating class (D): - - not water contaminating

Chemical Safety Assessment

For this substance a chemical safety assessment has been carried out.

SECTION 16: OTHER INFORMATION

Abbreviations and acronyms

“A - Alveolengängig; ADR - Accord européen relatif au transport international des marchandises Dangereuses par Route; bw - Body Weight; CAS - Chemical Abstract Service; CSR - Chemical Safety Report; DFG Deutsche Forschungsgemeinschaft; DIN - Deutsche Industrie Norm; DNEL - Derived No Effect Level; E - Einatembar; EAKV - Europäischer Abfallkatalog Verordnung; EC – Effective Concentration; EC - Effect Concentration European Commission; EINECS - European Inventory of Existing Commercial Chemical Substances; ELINCS - European List of Notified Chemical Substances; EN - Europäische Norm; LC - Lethal Concentration; LD - Lethal Dosis; NOAEL - No Observed Adverse Effect Level; OECD - Organization for Economic Cooperation and Development; PBT - Persistent, Bioaccumulative and Toxic; RE - Repeated Exposure; REACH - Registration, Evaluation, Authorisation and Restriction of Chemicals;”

Further Information

The above information describes exclusively the safety requirements of the product and is based on our present-day knowledge. The information is intended to give you advice about the safe handling of the product named in this safety data sheet, for storage, processing, transport and disposal. The information cannot be transferred to other products. In the case of mixing the product with other products or in the case of processing, the information on this safety data sheet is not necessarily valid for the new made-up material.

(The data for the hazardous ingredients were taken respectively from the last version of the sub-contractor's safety data sheet.)