1. Identification of the Substance/Mixture and of the Company/Undertaking

1.1. Product Identifier

Product Name: Red Lead, Minium

Article No.: 42500

1.2. Relevant identified Uses of the Substance or Mixture and Uses advised against

Identified uses:
- Use of lead metal in lead oxide production under industrial conditions.
- Use in lead oxides in lead acid battery production.
- Use of lead oxides in crystal glass production.
- Use of lead oxides in production of ceramic ware.
- Use of lead oxides in explosive manufacture.
- Professional use of paints and pigments.
- Professional use of batteries
- Professional use of rubber protection
- Consumer use of batteries

Uses advised against:

1.3. Details of the Supplier of the Safety Data Sheet (Producer/Importer)

Company: Kremer Pigmente GmbH & Co. KG

Address: Hauptstr. 41-47, 88317 Aichstetten, Germany

Tel./Fax.: Tel +49 7565 914480, Fax +49 7565 1606

Internet: www.kremer-pigmente.de

EMail: info@kremer-pigmente.de

Importer: --

1.4. Emergency No.

Emergency No.: +49 7565 914480 (Mon-Fri 8:00 - 17:00)

2. Hazards Identification

2.1. Classification of the Substance or Mixture

Classification according to Regulation (EC) No. 1272/2008 (CLP/GHS)

Acute toxicity (oral), hazard category 4
Acute toxicity (inhalation), hazard category 4
Carcinogenity, hazard category 2
Reproductive toxicity, hazard category 1A
Specific target organ toxicity (repeated exposure), hazard category 1
Hazardous to the aquatic environment, acute category 1
Hazardous to the aquatic environment, chronic category 1

H302 Harmful if swallowed.
H332 Harmful if inhaled.
H351 Suspected of causing cancer.

May damage fertility or the unborn child.
According to Regulation (EC) No. 1907/2006 (REACH)

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Printed: 12.01.2017
Version: 1

H360
Cat.: 1A
May cause harm to breast-fed children.

H362
Cat.: 
Causes damage to organs through prolonged or repeated exposure.

H372
Cat.: 1
Very toxic to aquatic life with long lasting effects.

Classification according to Directive No. 67/548/EC or No. 1999/45/EC

Harmful (Xn) R20 Harmful by inhalation.
Harmful (Xn) R22 Harmful if swallowed.
R33 Danger of cumulative effects.
Hazardous to the environment (N) R50 Very toxic to aquatic organisms.
R53 May cause long-term adverse effects in the aquatic environment.
R61 May cause harm to the unborn child.
T, Repr. Cat. 1, 3 R62 Possible risk of impaired fertility.

Safety Phrases:

Possible Environmental Effects:

2.2. Label Elements

Classification according to Regulation (EC) No. 1272/2008 (CLP/GHS)

Hazard designation:

GHS07

GHS08-2

GHS09

Signal word:

Danger

Hazard designation:

H302 Harmful if swallowed.
H332 Harmful if inhaled.
H351 Suspected of causing cancer.
H360 May damage fertility or the unborn child.
H362 May cause harm to breast-fed children.
H372 Causes damage to organs through prolonged or repeated exposure.
H410 Very toxic to aquatic life with long lasting effects.
Safety Data Sheet
According to regulation (EC) No. 1907/2006 (REACH)

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Safety designation:

P202  Do not handle until all safety precautions have been read and understood.
P260  Do not breathe dust/fume/gas/mist/vapours/spray.
P263  Avoid contact during pregnancy and while nursing.
P264  Wash thoroughly after handling.
P270  Do not eat, drink or smoke when using this product.
P271  Use only outdoors or in a well-ventilated area.
P273  Avoid release to the environment.
P280  Wear protective gloves/clothing/eye/face protection.
P301+P312  If swallowed: Call a poison center or physician if you feel unwell.
P304+P340  If inhaled: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P308+P313  If exposed or concerned: Get medical advice/attention.
P330  Rinse mouth.
P391  Collect spillage
P405  Store locked up.
P501  Dispose of contents/container according to regional, national and international regulations.

Hazardous components for labelling:

2. 3.  Other Hazards

Post-natal exposure of children to inorganic lead compounds is associated with adverse effects on neurobehavioural development.

3.  Composition/Information on Ingredients

3. 1.  Substance

3. 2.  Mixture

Chemical Characterization: Pb3O4, C.I. Pigment Red 105

Information on Components / Hazardous Ingredients:

<table>
<thead>
<tr>
<th>Substance / Component</th>
<th>Amount</th>
<th>CAS-Nr.</th>
<th>EINECS-Nr.</th>
<th>EC-Nr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead(II,IV) oxide (T,N; R61-62-50/53-20/22-33; H302-332-360-373-400-410); REACH Reg.-No. 01-2119517589-27-0001</td>
<td>100 %</td>
<td>1314-41-6</td>
<td>215-235-6</td>
<td>082-001-00-6</td>
</tr>
</tbody>
</table>

Additional information:

4.  First Aid Measures

4. 1.  Description of the First Aid Measures

General information: Seek medical attention in case of complaints.

After inhalation: Supply fresh air and seek medical advice in case of complaints.

After skin contact: Remove contaminated clothing. Wash off immediately with plenty of water and soap.

If irritation continues consult a physician.

After eye contact: Remove contact lens. Rinse open eyes with plenty of water.
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Revised edition: 13.05.2016   Version: 1   Printed: 12.01.2017

4.2.   Most important Symptoms and Effects, both Acute and Delayed

**Symptoms:**

- Inhalation: Headache, exhaustion, weakness.
- Swallowing: may cause stomach irritation, nausea, vomiting.
- Skin contact: prolonged contact may cause dryness of the skin.
- Eye contact: can cause slight irritations.
- Prolonged/repeated exposition is suspected of causing cancer.

**Effects:**

4.3.   Indication of any Immediate Medical Attention and special Treatment needed

**Treatment:**

Treat symptomatically.

Intoxication symptoms may occur after several hours, therefore a 48 hour medical observation is necessary.

In case of ingestion, induced vomiting or application of laxatives may be appropriate; treat as for lead poisoning.

There needs to be regular blood monitoring to confirm exposure controls are adequate.

5.   Fire-Fighting Measures

5.1.   Extinguishing Media

**Suitable extinguishing media:**

- Foam, carbon dioxide (CO2), extinguishing powder, water spray.
- Fight larger fire with alcohol resistant foam.
- Use extinguishing media for surrounding fire.

**Unsuitable extinguishing media:**

- Never apply a strong water jet.

5.2.   Special Hazards arising from the Substance or Mixture

**Special hazards:**

- Product is not flammable.
- In case of fire: formation of toxic gases/vapors.

5.3.   Advice for Firefighters

**Protective equipment:**

- Wear suitable protective clothing.
- Wear positive pressure self-contained breathing apparatus (SCBA).

Further information:

6.   Accidental Release Measures

6.1.   Personal Precautions, Protective Equipment and Emergency Procedures

**Personal precautions:**

- Do not inhale dust.
Wear appropriate protective equipment. Keep spectators away.
Avoid contact with skin.

6.2. Environmental Precautions

Environmental precautions:
Prevent contamination of soils, drains and surface water.

6.3. Methods and Material for Containment and Cleaning Up

Methods and material:
Take up mechanically and collect in suitable containers for disposal.
This product and its container must be disposed as hazardous waste.

6.4. Reference to other Sections

Protective clothing, see Section 8.
See Section 13 for information on disposal.

7. Handling and Storage

7.1. Precautions for Safe Handling

Instructions on safe handling:
Avoid breathing dust and use with adequate ventilation provided, required to keep exposure below permissible limit.
EEC-Directive Lead (82/605/EEC) and latest amendments as well as corresponding national regulations must be observed.

Hygienic measures:
Change contaminated clothing. Preventive skin protection recommended. Wash hands after work.

7.2. Conditions for Safe Storage, including any Incompatibilities

Storage conditions:
Store in roofed places at room temperature. Only for professional users.
Store in tightly sealed containers in a dry room.

Requirements for storage areas and containers:
Store product in correctly labelled containers.

Information on fire and explosion protection:
Do not store together with: foodstuffs and animal feed.
Product is not combustible.
No special measures necessary.

Storage class (VCI):

Further Information:

7.3. Specific End Use(s)

Further information:

8. Exposure Controls/Personal Protection

8.1. Parameters to be Controlled
### Parameters to be controlled (DE):

**Lead and its compounds:** 0.1 mg/m³ (8h)

### Parameters to be controlled:

**Derived No-Effect Level (DNEL):**

10 µg/l (worker, inhalation/skin contact/swallowing, long-term exposition - systemic effects)

**Predicted No-Effect Concentration (PNEC):**

- **Fresh water:** 3.1 µg/l
- **Sea water:** 3.5 µg/l
- **Fresh water sediment:** 174 mg/kg
- **Sea water sediment:** 164 mg/kg
- **Soil:** 212 mg/kg
- **Sewage treatment system (STP):** 0.1 mg/l

### Additional Information:

**Biological limits:** EU: 70 µg/dl; DE: 40 µg/dl, 30 µg/dl (women below 45 years); GB: 60 µg/dl, 30 µg/dl (women of childbearing age); FR: 40 µg/dl, 30 µg/dl (women of childbearing age).

### Exposure Controls 8.2.

**Technical protective measures:**

No further measures, see Section 7. Use appropriate local exhaust ventilation to control airborne levels.

**Personal Protection**

**General protective measures:**

Do not inhale dust. Do not eat, drink or smoke while working. Wash hands before breaks and at the end of work. Remove contaminated clothing immediately.

**Respiratory protection:**

Wear protective mask, particle filter P2 or FFP2 or NIOSH N95 (for solid and liquid particles, EN 143, 149) if dust occurs.

**Hand protection:**

Protective gloves (EN 374)

**Protective glove material:**

Nitrile rubber (> 480 min, 0.11 mm).

**Eye protection:**

Safety glasses with protective shields (EN 166).

**Body protection:**

Protective clothing.

**Environmental precautions:**

One or more of the following measures may if necessary be taken to reduce emissions to water:

- Chemical precipitation: used primarily to remove the metal ions;
- Sedimentation;
- Filtration: used as final clarification step;
- Electrolysis: for low metal concentration;
- Reverse osmosis.
extensively used for the removal of dissolved metals; - Ion exchange: final cleaning step in the removal of heavy metal from process wastewater

One or more of the following measures may if necessary be taken to reduce emissions to air:

- Electrostatic precipitators using wide electrode spacing: Wet electrostatic precipitators;
- Cyclones, but as primary collector
- Fabric or bag filters: high efficiency in controlling fine particulate (melting): can achieve emission values similar to Membrane filtration techniques;
- Ceramic and metal mesh filters. PM10 particles are removed;
- Wet scrubbers

Lead compound removal from treatment works should be at least the minimum default 84% removal used in the CSR. Solid material collected from on-site treatment must be sent for metal recovery or treated as hazardous waste. Waste water treatment sludge must be recycled, incinerated or landfilled and not used as agricultural fertilizer.

9. Physical and Chemical Properties
9.1. Information on Basic Physical and Chemical Properties

Form: powder
Color: red
Odor: odorless
Odor threshold: not relevant
pH-Value: not determined
Melting temperature: > 550°C
Boiling temperature: > 550°C
Flash point: not flammable
Evaporation rate: not applicable
Flammability (solid, gas): non-combustible
Upper explosion limit: no information available
Lower explosion limit: no information available
Vapor pressure: not determined
Vapor density: No information available.
Density: 8.93 g/cm³ (20°C)
Solubility in water: 67.3 mg/l H₂O (20°C)
Coefficient of variation (n-Octanol/Water): not applicable

Auto-ignition temperature: not applicable

Decomposition temperature: > 550°C

Viscosity, dynamic: not applicable

Explosive properties: not explosive

Oxidizing properties: No oxidizing properties

Bulk density: 1200 - 3500 kg/m³

Further Information

Solubility in solvents: 0.07 mol/l HCl: 100 %

Viscosity, kinematic

Burning class:

Solvent content:

Solid content:

Particle size: 5 - 2000 µm

Stability and Reactivity

Reactivity

Stable if used according to specifications.

Chemical Stability

Stable if used according to specifications.

Possibility of Hazardous Reactions

Unknown.

Conditions to Avoid

Conditions to avoid:

Protect from heat.

Imcompatible Materials

Strong oxidizing agents.

Hazardous Decomposition Products

None if stored and handled according to specifications.

Further Information

Toxicological Information
11.1. Information on Toxicological Effects

The toxicity of this substance has been assessed using read-across froms studies with similar inorganic lead compounds.

Acute Toxicity

LD50, oral: > 10000 mg/kg (rat)
ATE oral: 500 mg/kg

LD50, dermal: > 2000 mg/kg (rat)

LC50, inhalation: > 5.05 mg/l (rat)

Sparingly soluble inorganic lead compounds have generally been found to be of relatively low acute toxicity by ingestion, in contact with skin and by inhalation. Nevertheless current EC regulations require this substance to be classified as harmful by ingestion and inhalation.

ATE Inhalation (dusts/mists): 1.5 mg/l

Primary effects

Irritant effect on skin: Non irritating

Irritant effect on eyes: May irritate eyes.

Inhalation: No information available.

Ingestion: No information available

Sensitization:

No sensitizing effects known.

Guinea pig maximization test (GPMT) - Guinea pig: not sensitizing

Mutagenicity:

Genotoxicity - in vitro: inconclusive data. The evidence for genotoxic effects of highly soluble inorganic lead compounds in contradictory, numerous studies reporting both positive and negative effects. Responses appear to be induced by indirect mechanisms, mostly at very high concentrations that lack physiological relevance.

Reproductive toxicity:

Suspected of damaging the unborn child. Post-natal exposure of children to inorganic lead compounds is associated with adverse effects on neurobehavioural development.

Cancerogenity:

An inhalation study of lead monoxide in rats showed that it did not induce, initiate or promote tumors of the lung. However, there is evidence that soluble lead compounds may have a carcinogenic effect, particularly on the kidneys of rats. However, the mechanisms by which this effect occurs are still unclear.

Epidemiology studies of workers exposed to inorganic lead compounds have found a limited association with stomach cancer. This has led to the classification by IARC than inorganic lead
compounds are probably carcinogenic to humans (Group 2A).
IARC: Group 2A: Probably carcinogenic to humans.

Teratogenicity:
Suspected of damaging fertility.

Specific target organ toxicity (STOT):
Single exposure: no organospecific toxicity expected.
Repeated exposure: lead is absorbed into the body through inhalation of spray / mist or by ingestion. Lead is accumulated in the body and may cause damage to the brain and nervous system after prolonged exposure.
Target organs: blood system, kidneys, reproductive organs, central nervous system.

Additional toxicological information:
Aspiration hazard: not applicable
Toxicokinetics:
Inorganic lead compounds are slowly absorbed by ingestion and inhalation and poorly absorbed through the skin. If absorbed, lead will accumulate in the body with low rates of excretion, leading to long-term build up. Part of risk management is to take blood samples from workers for analysis to ensure that exposure levels are acceptable.
Route of entry: ingestion, inhalation, skin and/or eye contact.

12. Ecological Information
12.1. Aquatic Toxicity

The following acute Ecotoxicity Reference Values (ERV) were used to determine the classification of lead tetraoxide: pH 6: 243.6 µg/l; pH 7: 125.1 µg/l; pH 8: 68.33 µg/l
The following chronic Ecotoxicity Reference Values (ERV) were used to determine the classification of lead tetraoxide: pH 6: 58.3 µg/l; pH 7: 29.8 µg/l; pH 8: 20.33 µg/l

Fish toxicity:
Acute aquatic toxicity:
LC50: 0.01 - 0.1; M-Factor (acute): 10
pH 5.5 - 6.5: LC50: 0.04 - 0.81 mg/l (96h, Pimephales promelas; Onchorhynchus mykiss)
pH > 6.5 - 7.5: LC50: 0.052 - 3.598 mg/l (96h, Pimephales promelas; Onchorhynchus mykiss)
pH > 7.5 - 8.5: LC50: 0.113 - 3.249 mg/l (96h, Pimephales promelas; Onchorhynchus mykiss)
Chronic aquatic toxicity (NOEC):
NOEC: 0.01 - 0.1; M-Factor (chronic): 1
Freshwater-Fish: EC10, NOEC: 0.0178 - 1.558 mg/l (Onchorhynchus mykiss, Salmo salar, Pimephales promelas, Salvelinus fontinalis, Ictalurus punctatus, Lepomis macrochirus, Salvelinus namaycush, Cyprinus carpio, Acipenser sturio)
Saltwater-Fish: EC10, NOEC: 0.229 - 0.437 mg/l (Cyprinodon variegatus)

Daphnia toxicity:
Acute toxicity:
pH 5.5 - 6.5: LC50: 0.073 - 0.655 mg/l (48h, Daphnia magna,
According to regulation (EC) No. 1907/2006 (REACH)

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Ceriodaphnia dubia)

pH > 6.5 - 7.5: LC50: 0.028 - 1.179 mg/l (48h, Daphnia magna, Ceriodaphnia dubia)

Chronic aquatic toxicity (NOEC):
Freshwater invertebrates: NOEC (EC10): 0.0017 - 0.963 mg/l (Daphnia magna, Hyalella azteca, Lymnaea palustris, Ceriodaphnia dubia, Lymnaea stagnalis, Philodina rapida, Alona rectangular, Diaphanosoma birgei, Chironomus tentans, Branchionus calyciflorus, Chironomus riparius, Baetis tricaudatus)
Marine water invertebrates: NOEC (EC10): 0.0092 - 1.409 mg/l (Mytilus trossulus, Americamysis bahia, Mytilus galloprovincialis, Nannochloris oculata, Stronglyocentrotus purpuratus, Paracentrotus lividus, Dendraster excentricus, Tisbe battagliai, Crassostrea gigas)
Freshwater sediment: NOEC (EC10): 573 - 3.390 mg/kg (Tubifex tubifex, Epheror virgo, Hyalella azteca, Gammarus pulex, Lumbriculus variegatus, Hexagenia limbata, Chironomus tentans)
Marine water sediment: NOEC (EC10): 680 - 1.291 mg/kg (Nannochloris oculata, Leptocheirus plumulosus)

Bacteria toxicity:

EC10 (NOEC): 1.06 - 2.92 mg/l (Respiration); 2.79 - 9.59 mg/l (Ammonia uptake rate); 1.0 - 7.0 mg/l (Mortality)

Chronic toxicity (NOEC):
Microorganisms, EC10: 97 - 7880 mg/l (Denitrification, N-mineralization, nitrification, basal respiration, substrate-induced respiration)
Toxicity to terrestrial invertebrates, EC10: 34 - 2445 mg/kg (Folsomia candida, Proisotoma minuta, Sinella curviseta, Eisenia fetida, Eisenia andrei, Dendrobaena rubida, Lumbriculus rubellus, Aporrectodea caliginosa)
Toxicity to terrestrial plants, EC10: 57 - 6774 mg/kg (Hordeum vulgare, Zeo mays, Echinochloa crus-galli, Lolium perenne, Sorgum bicolor, Triticum aestivum, Oryza sativa, Rephanus sativus, Lycopersicon esculentum, Lactuca sativa, Cucumus sativus, Picea rubens, Pinus taeda)

Algae toxicity:

Acute toxicity:
pH 5.5 - 6.5: ErC50: 0.072 - 0.388 mg/l (72h, Pseudokirchneriella subcapitata, Chlorella kessleri)
pH > 6.5 - 7.5: ErC50: 0.026 - 0.079 mg/l (72h, Pseudokirchneriella subcapitata, Chlorella kessleri)
pH > 7.5 - 8.5: ErC50: 0.020 - 0.049 mg/l (72h, Pseudokirchneriella subcapitata, Chlorella kessleri)

Chronic toxicity:
Freshwater plants, NOEC (EC10): 0.0061 - 1.190 mg/l (Pseudokirchneriella subcapitata), 0.085 - 1.025 mg/l (Lemna minor)
Marine water plants, NOEC (EC10): 0.0529 - 1.234 mg/l (Skeletonema costatum), 0.0119 mg/l (Champia parvula)

12. 2. Persistence and Degradability

Lead is naturally occurring and ubiquitous in the environment. Lead is obviously persistent in the sense that they do not depend to CO2, water, and other elements of less environmental concern.
In the water compartment, lead is rapidly and strongly bound to the suspended solids of the water column. This binding and subsequent settling to the sediment allows for rapid metal removal of lead from the water column. Insignificant remobilization of lead from sediment is expected.

12.3. Bioaccumulation

Bioaccumulation potential (BAF): 1.552 l/kg; Fish: 0.10 kg/kg; Soil: not likely

12.4. Mobility

Slightly soluble in water.
Adsorption/Soil: log Kd 5.2 (fresh water sediment); log Kd 5.7 (marine sediment); log Kd 3.8 (soil)

12.5. Results of PBT- und vPvP Assessment

Inorganic substance: does not comply with the criteria for the classification as PBT or vPvB.

12.6. Other Adverse Effects

Water hazard class:

3, hazardous
Do not let product contaminate ground water, waterways or sewage system.

Behaviour in sewage systems:

Further ecological effects:

AOX Value:

13. Disposal Considerations

13.1. Waste Treatment Methods

Product:

In accordance with current regulations, product has to be taken to a special waste disposal site, after consultation with site operator and/or with the responsible authority. Product may not be burned. If possible reuse product.

European Waste Code (EWC):

060405 - Wastes containing other heavy metals.

Uncleaned packaging:

Packaging may be disposed of in the same manner as the product.

14. Transport Information

14.1. UN Number

ADR, IMDG, IATA 2291

14.2. UN Proper Shipping Name

ADR/RID: BLEIVERBINDUNG, LÖSLICH, N.A.G. (Bleitetraoxid)

IMDG/IATA: LEAD COMPOUND, SOLUBLE, N.O.S. (Trilead Tetraoxide)
42500 Red Lead, Minium

14.4 Packaging Group

ADR/RID: III
IMDG: III
IATA: III

14.5 Environmental Hazards

Labelling according 5.2.1.8 ADR/RID: fish and tree
Labelling according 5.2.1.6.3 IMDG: fish and tree
Labelled with "P" according 2.10 IMDG: yes

14.6 Special Precautions for User


14.7 Transportation in Bulk according to Annex II of MARPOL 73/78 and IBC-Code
not applicable

14.8 Further Information

15. Regulatory Information

15.1 Safety, Health and Environmental Regulations/Legislation specific for the Substance or Mixture

Water hazard class: 3, very hazardous for water (German Regulation)

Local regulations on chemical accidents: 9a (Directive 2003/105/EC)

Employment restrictions:
The employment restrictions for young workers in accordance with the Youth Employment Protection Law (94/33/EC) are to be observed.
The employment restrictions for expectant and nursing mothers in accordance with the Maternity Protection Guideline (94/85/EEC) are to be observed.
Concerning pregnancy: group B (TRGS 505, TRGS 900, Germany)

Restriction and prohibition of application: Restricted to professional users (TRSG 200, No. 6.9).

Technical instructions on air quality: 5.2.2 (II)
15. 2. Chemical Safety Assessment

A Chemical Safety Assessment has been carried out for this product.

15. 3. Further Information

Contains lead, do not use for paint of objects which could be licked or chewed by children.

Danger of cumulative effect (when the content of lead is > 1%).


16. Other Information

This product should be stored, handled and used in accordance with good hygiene practices and in conformity with any legal regulations. This information contained herein is based on the present state of knowledge and is intended to describe our product from the point of view of safety requirements. It should be therefore not be construed as guaranteeing specific properties.