Azinsa Óxidos	**CHEMICAL PRODUCT SAFETY DATA SHEET MINIUM (LEAD TETRAOXIDE) UN 2291**	Code:	HDS2291
		Review:	05
		Date review:	March, 2026
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SECTION I IDENTIFICATION OF THE HAZARDOUS CHEMICAL

1) Chemical name	2) Other means of identification	3) Recommended use of the substance
Lead(II,IV) oxide (Red Lead)	Minium, Red Lead, Lead Tetroxide	Pyrotechnics, anticorrosive pigments, battery manufacturing, industrial applications.

4) Supplier or manufacturer details	5) SETIQ Emergency Numbers
Azinsa Óxidos, S.A. de C.V. Fernando Montes de Oca #21, Bldg. B P2, San Nicolas Tlalnepantla, State of Mexico C.P. 54030.	55 59 15 88 (Mexico City) 01 (800) 00 214 (rest of the country) Available 24 hours a day, 365 days a year. Provides technical and specific information regarding emergencies and incidents.

SECTION II HAZARD IDENTIFICATION

1) Classification of the hazardous chemical substance.

Physical Hazards	Health Hazards	Environmental Hazards
Not classified as a physical hazard	GHS classification applicable to inorganic lead compounds	Hazardous to the aquatic environment – Acute, Category 1 Hazardous to the aquatic environment – Chronic, Category 1

2) Signage elements, including precautionary advice and pictograms.

Pictograms

Signal word: DANGER

Hazard Statements (H phrases):

- **H302:** Harmful if swallowed.
- **H332:** Harmful if inhaled.
- **H360:** May damage fertility. May damage the unborn child.
- **H373:** May cause damage to organs through prolonged or repeated exposure.
- **H410:** Very toxic to aquatic life with long-lasting effects.

Precautionary Statements (P phrases):

- **P201:** Do not handle until all safety precautions have been read and understood.
- **P202:** Do not handle until all safety precautions have been read and understood.
- **P260:** Do not breathe dust.
- **P264:** Wash thoroughly after handling.
- **P270:** Do not eat, drink or smoke when using this product.
- **P273:** Avoid release to the environment.
- **P280:** Wear protective gloves/protective clothing/eye protection/face protection.
- **P308 + P313:** IF exposed or concerned: Get medical advice/attention.

	• **P501:** Dispose of contents/container in accordance with applicable environmental regulations.

3) Other hazards not contributing to classification

- **Bioaccumulative:** Lead builds up in the body; repeated exposure can cause chronic effects.
- **Environmental persistence:** Stable in soil and sediments, causes long-term contamination.
- **Minor physical hazard:** Not flammable/explosive, but fine dust irritates eyes, skin, and respiratory tract.
- **Limited reactivity:** Reacts with strong acids, releasing toxic lead oxide vapors.

SECTION III COMPOSITION / INFORMATION ON INGREDIENTS

Substance Identification	CAS No.	UN No.	CE No.	Concentración (% peso)
Lead tetroxide (Pb_3O_4)	1314-41-6	2291	215-235-6	≥ 95 %

SECTION IV – FIRST AID MEASURES

1) Description of first aid measures

Inhalation	Move to fresh air. Seek immediate medical attention.
Ingestion	Do not induce vomiting. Urgent medical care required.
Skin	Wash with plenty of water and soap.
Eyes:	Rinse with water for 15 minutes.

2) Most important symptoms and effects, acute or delayed

Acute:	Nausea, vomiting, abdominal pain, dizziness, fatigue, irritation to skin/eyes/respiratory tract.
Chronic:	Kidney, liver, and nervous system damage; anemia; reproductive effects; lead accumulation.

3) Indication of immediate medical attention

- Seek immediate medical care after ingestion, inhalation, or severe contact.
- Treatment may include blood lead monitoring and, if necessary, chelation therapy.

SECTION V – FIRE-FIGHTING MEASURES

1) Suitable extinguishing media

- Water spray
- CO_2
- Chemical foam
- Dry powder

2) Specific hazards

- Releases toxic lead oxide vapors when heated.
- Not flammable or explosive.

3) Firefighter protection

- Use self-contained breathing apparatus
- Avoid inhaling smoke/dust
- Prevent contaminated water runoff from entering drains or waterways

SECTION VI – ACCIDENTAL RELEASE MEASURES

1) Personal precautions

- Avoid dust inhalation and skin/eye contact.
- Use gloves, goggles, protective clothing, and P100 respirator.

- Keep unauthorized personnel away.
- Avoid generating dust.

2) Environmental precautions

- Prevent material from reaching drains, soil, or wáter.
- Contain spills to avoid contamination.

3) Cleaning methods

- Collect material dry, avoid sweeping without protection.
- Use inert absorbent for residual dust.
- Store waste in labeled hazardous waste containers.
- Clean surfaces with water and detergen.

SECTION VII – HANDLING AND STORAGE

1) Safe handling

- Avoid dust inhalation and skin/eye contact.
- No eating, drinking, or smoking in work área.
- Ensure proper ventilation.
- Avoid generating dust.

2) Safe storage

- Store in closed containers, in a dry and ventilated place.
- Keep away from strong acids.
- Avoid heat and moisture.

SECTION VIII – EXPOSURE CONTROLS / PERSONAL PROTECTION

1) Exposure limits (NOM-010-STPS-2014)

Inorganic lead (Pb): **0.05 mg/m³** (TWA)

2) Engineering controls

- Local exhaust or dust extraction
- Closed handling areas
- Risk area signage

3) Personal protective equipment (PPE)

Respiratory:	Respirator with P100 filter or equivalent for lead dust.
Hands:	Nitrile, neoprene, or chemical-resistant latex gloves.
Eyes:	Sealed safety goggles or face shield
Skin:	Long-sleeve protective clothing, non-absorbent

SECTION IX – PHYSICAL AND CHEMICAL PROPERTIES

1) Appearance (physical condition and color):	2) Odor	3) Odor threshold	4) pH
Bright red powder	Odorless	Not applicable	Not applicable
5) Melting/freezing point:	**6) Initial boiling point and boiling range:**	**7) Flash point:**	**8) Evaporation rate:**

~500°C (decomposes before melting completely)	Not applicable (does not boil; decomposes when heated)	Not applicable (non-flammable)	Not aplicable
9) Flammability (solid or gas):	**10) Upper/lower flammability or explosive limits**	**11) Presión de vapor:**	**12) Vapor pressure:**
Non-flammable	Not applicable	Not applicable	No aplicable
13) Apparent relative density	**14) Solubility(s):**	**15) Partition coefficient: N-octanol/water:**	**16) Spontaneous ignition temperature:**
~8.3 g/cm³	Insoluble in water; soluble in concentrated acids	Not available / not significant	non-flammable
17) Decomposition temperature:	**18) Viscosity:**	**19) Molecular weight:**	**20) Other relevant data:**
>500°C, releases lead oxides	Not applicable (solid)	685.6 g/mol	Non-magnetic. Stable at room temperature. Persistent and bioaccumulative in the environment.

SECTION X. STABILITY AND REACTIVITY

1) Reactivity:	• Stable under normal temperature and pressure conditions. • Does not exhibit violent reactivity under normal storage and handling conditions.
2) Chemical stability:	• Chemically stable at room temperature. • Does not decompose under proper storage.
3) Possibility of dangerous reactions:	• It can react with strong acids, releasing toxic lead oxide fumes. • Exposure to intense heat can cause the compound to decompose.
4) Incompatible materials	• Strong acids (e.g., nitric acid, concentrated hydrochloric acid) • Combustible materials in the presence of fine dust
5) Conditions to avoid:	• Extreme heat or ignition sources (although not flammable, it may decompose). • Excessive humidity. • Contact with strong acids.
6) Hazardous decomposition products:	• Lead oxides (PbO, PbO_2). • Toxic lead fumes in case of extreme heating.

SECTION XI. TOXICOLOGICAL INFORMATION

1) Likely routes of exposure

- Inhalation of fine dust.
- Accidental ingestión.
- Prolonged dermal contact (less relevant, but absorption is possible).

2) Symptoms related to the physical, chemical, and toxicological characteristica

- Irritation of skin, eyes, and respiratory tract
- Nausea, vomiting, and abdominal pain
- Fatigue, dizziness, and headache

3) Immediate and delayed effects, as well as chronic effects from short-term or long-term exposure

Immediate effects:
- Irritation of eyes, skin, and respiratory tract
- Gastrointestinal discomfort after ingestion
- **Delayed and chronic effects:**
- Damage to the central and peripheral nervous system.
- Kidney and liver damage.
- Anemia.
- Reproductive toxicity and risk to the fetus.
- Accumulation of lead in bones and tissues, causing long-term effects.

4) Numerical measures of toxicity (such as acute toxicity estimates)

- Oral LD50 (mouse/rat): ~1,500 mg/kg
- Inhalation LC50 (rat): ~5 mg/L/4 h (dust)
- Approximate data; dependent on particle form and size

5) Interactive effects

Lead toxicity may increase when combined with other substances that affect the kidneys, liver, or nervous system, such mercury or certain solvents.

6) When specific chemical data are not available

Use toxicological criteria for inorganic lead as reference for exposure and risk assessment.

7) Mixtures

- Not applicable when handled as a pure substance.
- For commercial pigments, check the manufacturer's datasheet for additional components.

8) Information on the mixture or its components

- Minium consists mainly of $Pb_3O_4 \geq 95\%$
- It does not contain other significant components that alter the primary toxicity of lead.

9) Other information.

- Lead is cumulative; even low, repeated exposures may cause severe long-term effects.
- Environmental exposure may affect aquatic organisms and their food chain.

SECTION XII. ECOTOXICOLOGICAL INFORMATION

1) Toxicity

- Very toxic to aquatic organisms (fish, invertebrates, and algae).
- Causes severe effects even at low concentrations.

2) Persistence and degradability

- Highly persistent inorganic compound.

- Not biodegradable under normal environmental conditions.

3) Bioaccumulation potential

- High potential for bioaccumulation in aquatic and terrestrial organisms.
- Can accumulate in tissues and sediments.

4) Mobility in soil

- Moderately mobile; may remain in sediments and soil for long periods.
- Poorly soluble in water, which favors its retention in soil and sediments.

5) Other adverse effects

- Causes chronic contamination of water bodies and soil.
- Poses a risk to the food chain due to lead accumulation.

6) Additional information.

- No relevant photodegradation or biodegradation effects are known.
- Spills and releases should be avoided; treat as hazardous waste in accordance with Mexican environmental legislation (LGPGIR).

SECTION XIII. INFORMATION RELATING TO DISPOSAL

1) Methods for waste treatment.

- Dispose of waste in closed containers labeled as hazardous waste.
- Transfer waste to authorized facilities for the treatment and disposal of heavy-metal residues.
- Avoid discharges to soil, water, or drainage systems.

2) Disposal of contaminated containers and packaging.

- Empty containers must be considered hazardous waste.
- Rinse with water and detergent only if the wash water can be collected as hazardous waste.
- Destroy or recycle only through methods authorized by environmental regulations.

3) Special precautions for disposal

- Use personal protective equipment (gloves, goggles, respirator).
- Avoid dust generation during handling.
- Keep waste away from water sources and soil.

4) Recommendations related to safe disposal.

- Comply with LGPGIR and local hazardous-waste regulations.
- Document disposal activities to ensure traceability and legal compliance.

5) Additional information

- Do not mix with organic or combustible waste.
- Avoid any release into the environment due to its high bioaccumulation potential and toxicity.
- Consider safe transport of waste to authorized facilities following hazardous-materials transport regulations.

SECTION XIV TRANSPORT INFORMATION

1) UN Number

UN 2291

2) United Nations proper shipping name

LEAD, SOLID, N.O.S. (Red Lead, Minium)

3) Transport hazard class(es)

Clase 6 – Toxic substance.
(Substance presenting relatively low danger within its class).

Toxic substance
(Lead Tetroxide)

4) Packing group (if applicable)

Regulation depends on the mode of transport.

Land transport (ADR / RID):
- UN Number: UN 2291
- Class: 6
- Packing Group: III
- Hazard Label: 6 (toxic)
- Special provisions: According to current regulations

Maritime transport (IMDG):
- UN Number: UN 2291
- Class: 6
- Packing Group: III
- Marine pollutant: Yes
- EmS: According to current IMDG Code

Air transport (IATA):
- UN Number: UN 2291
- Class: 6
- Packing Group: III
- Packing instructions: According to current IATA DGR
- Limited quantities: Applicable per regulations

5) Environmental hazards

- Very toxic to aquatic organisms
- May cause long-term adverse effects in the aquatic environment
- Considered a marine pollutant
- Persistent and bioaccumulative
- Avoid release to the environment

Hazardous to the aquatic environment)

6) Special precautions for users

- Avoid generation and accumulation of dust
- Handle in well-ventilated areas
- Use personal protective equipment
- Respirator for toxic particles
- Chemical-resistant gloves
- Eye protection and protective clothing
- Keep containers tightly closed
- Keep away from food, beverages, and animal feed
- Comply with national and international hazardous

7) Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable.

- Lead tetroxide is an inorganic solid substance and is therefore not subject to the provisions of MARPOL Annex II nor the IBC Code, which apply to bulk liquid substances.

SECTION XV. REGULATORY INFORMATION

1) Specific safety, health, and environmental regulations for the hazardous chemical substance or mixture

Lead tetroxide is regulated in Mexico under **NOM-018-STPS-2015**, and its hazards must be classified and communicated in accordance with the Globally Harmonized System (GHS).
It is also subject to **NOM-010-STPS-2014**, as it is a lead compound with an established occupational exposure limit, requiring exposure assessment, control measures, and health surveillance of personnel.
The use of personal protective equipment must comply with **NOM-017-STPS-2008**.

From an environmental standpoint, waste containing this substance may be classified as hazardous according to **NOM-052-SEMARNAT-2005**, and must be managed and disposed of in accordance with the **LGPGIR** (General Law for the Prevention and Integral Management of Waste).
Its transport must comply with applicable hazardous materials regulations (**UN 2291, Class 6, Packing Group III**).

SECTION XVI. OTHER INFORMATION INCLUDING DETAILS REGARDING THE PREPARATION AND UPDATING OF SA DATA SHEETS

The information contained in this Safety Data Sheet (SDS) was prepared based on **NOM-018-STPS-2015**, the **Globally Harmonized System (GHS)**, and recognized technical sources available at the date of issuance.

The data provided here describe the product's safety requirements and should not be considered as a guarantee of specific properties. The user is responsible for evaluating the information and ensuring compliance with applicable legislation according to the particular use of the product.