

**Zinc Nanoparticles (Zn)**  
**US Research Nanomaterials, Inc.**  
**Material Safety Data Sheet**  
acc. to OSHA and ANSI

**1 Identification of substance:**

- Product details:**
- Trade name:** Zinc powder
- Stock number:** US1166
- Manufacturer/Supplier:**  
US Research Nanomaterials, Inc.  
3302 Twig Leaf Lane  
Houston, Texas 77084, USA  
[www.us-nano.com](http://www.us-nano.com)

**2 Composition/Data on components:**

- Chemical characterization:**  
**Description:**  
(CAS#)  
zinc (CAS# 7440-66-6): 100%
- Identification number(s):**
- EINECS Number:** 231-175-3
- EU Number:** 030-001-00-1

**3 Hazards identification**

- Hazard description:** F Highly flammable
- Information pertaining to particular dangers for man and environment**  
R 15 Contact with water liberates extremely flammable gases.  
R 17 Spontaneously flammable in air.

**4 First aid measures**

- After inhalation**

Supply fresh air. If required, provide artificial respiration. Keep patient warm.  
Seek immediate medical advice.

**After skin contact**

Immediately wash with water and soap and rinse thoroughly.  
Seek immediate medical advice.

**After eye contact**

Rinse opened eye for several minutes under running water. Then consult a doctor.

**After swallowing** Seek immediate medical advice.

**5 Fire fighting measures**

**Suitable extinguishing agents**

Special powder for metal fires. Do not use water.  
Limestone powder  
Dry sand

**For safety reasons unsuitable extinguishing agents**  
Water

**Protective equipment:**

Wear self-contained respirator.  
Wear fully protective impervious suit.

**6 Accidental release measures**

**Person-related safety precautions:**

Wear protective equipment. Keep unprotected persons away. Ensure adequate ventilation  
Keep away from ignition sources

**Measures for environmental protection:**

Do not allow material to be released to the environment without proper governmental permits.

**Measures for cleaning/collecting:**

Ensure adequate ventilation.  
Do not flush with water or aqueous cleansing agents  
Keep away from ignition sources.

**Additional information:**

See Section 7 for information on safe handling  
See Section 8 for information on personal protection equipment.  
See Section 13 for disposal information.

## 7 Handling and storage

### Handling

#### Information for safe handling:

Keep container tightly sealed.  
Store in cool, dry place in tightly closed containers.  
Ensure good ventilation at the workplace.

#### Information about protection against explosions and fires:

Keep ignition sources away.  
Substance/product is self ignitable.

### Storage

#### Requirements to be met by storerooms and receptacles:

No special requirements.

#### Information about storage in one common storage facility:

Do not store together with oxidizing and acidic materials.  
Store away from water/moisture.

#### Further information about storage conditions:

Protect from humidity and water.  
Keep container tightly sealed.  
Store in cool, dry conditions in well sealed containers.

## 8 Exposure controls and personal protection

### **Additional information about design of technical systems:**

Properly operating chemical fume hood designed for hazardous chemicals and having an average face velocity of at least 100 feet per minute.

### **Components with limit values that require monitoring at the workplace:**

Not required.

**Additional information:** No data

**Personal protective equipment**

**General protective and hygienic measures**

The usual precautionary measures for handling chemicals should be followed.

Keep away from foodstuffs, beverages and feed.  
Remove all soiled and contaminated clothing immediately.  
Wash hands before breaks and at the end of work.

**Breathing equipment:**

Use suitable respirator when high concentrations are present.

**Protection of hands:** Impervious gloves

**Eye protection:**

Safety glasses  
Full face protection

**Body protection:** Protective work clothing.

**9 Physical and chemical properties:**

**General Information**

**Form:** Powder

**Color:** Black gray

**Odor:** Odorless

	<u>Value/Range</u>	<u>Unit</u>	<u>Method</u>
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**Change in condition**

**Melting point/Melting range:** 419.5 ° C

**Boiling point/Boiling range:** 907 ° C

**Sublimation temperature / start:** Not determined

**Flash point:** Not applicable

**Flammability (solid, gaseous)**

Contact with water liberates extremely flammable gases.

**Ignition temperature:** Not determined

**Decomposition temperature:** Not determined

**Auto igniting:** Spontaneously flammable  
in air.

**Explosion limits:**

**Lower:** Not determined

**Upper:** Not determined

**Vapor pressure:** at 487 °C 1.33 hPa

**Density:** at 20 °C 7.133 g/cm<sup>3</sup>

**Solubility in / Miscibility with**

**Water:** Insoluble

#### 10 Stability and reactivity

**Thermal decomposition / conditions to be avoided:**  
Decomposition will not occur if used and stored according to specifications.

**Materials to be avoided:**

Amines

Water/moisture

Acids

Oxidizing

agents Bases

Acid chlorides

**Dangerous reactions** Contact with water releases flammable gases

**Dangerous products of decomposition:**

No dangerous decomposition products known

#### 11 Toxicological information

**Acute toxicity:**

**Primary irritant effect:**

**on the skin:** Irritant to skin and mucous membranes.

**on the eye:** Irritating effect.

**Sensitization:** No sensitizing effects known.

**Subacute to chronic toxicity:**

Zinc containing fumes may cause metal fume fever. Effects include dry throat, metallic taste, chest pain, dyspnea, rales and dry cough. Several hours later, chills may occur with lassitude, malaise, fatigue, headache, back pain, muscle cramps, blurred vision, nausea, fever, perspiration, vomiting and leukocytosis.

**Additional toxicological information:**

To the best of our knowledge the acute and chronic toxicity of this substance is not fully known.

No classification data on carcinogenic properties of this material is available from the EPA, IARC, NTP, OSHA or ACGIH.

**12 Ecological information:**

**General notes:**

Do not allow material to be released to the environment without proper governmental permits.

**13 Disposal considerations**

**Product:**

**Recommendation**

Consult state, local or national regulations to ensure proper disposal.

**Uncleaned packagings:**

**Recommendation:**

Disposal must be made according to official regulations.

**14 Transport information**

**DOT regulations:**

**Hazard class:** 4.3

**Identification number:** UN1436

**Packing group:** II

**Hazardous substance:** 1000 lbs, 454 kg

**Proper shipping name (technical name):**  
Zinc powder

- Land transport ADR/RID (cross-border)**
- ADR/RID class:** 4.3 Substances which, in contact with water, emit flammable gases
- Item:** 14b
- Danger code (Kemler):** 423
- UN-Number:** 1436
- Description of goods:** Zinc powder
- Maritime transport IMDG:**
- IMDG Class:** 4.3
- UN Number:** 1436
- Packaging group:** II
- Proper shipping name:** Zinc powder
- Air transport ICAO-TI and IATA-DGR:**
- ICAO/IATA Class:** 4.3
- UN/ID Number:** 1436
- Packaging group:** II
- Proper shipping name:** Zinc powder

## **15 Regulations**

- Product related hazard informations:**
- Hazard symbols:** F Highly flammable
- Risk phrases:**
  - 15 Contact with water liberates extremely flammable gases.
  - 17 Spontaneously flammable in air.
- Safety phrases:**
  - 2 Keep out of the reach of children.
  - 7/8 Keep container tightly closed and dry.

43 In case of fire, use metallic extinguishing powder.  
Never use water.

**National regulations**

All components of this product are listed in the U.S. Environmental Protection Agency Toxic Substances Control Act Chemical Substance Inventory.

**Information about limitation of use:**

For use only by technically qualified individuals. This product contains zinc and is subject to the reporting requirements of section 313 of the Emergency Planning and Community Right to Know Act of 1986 and 40CFR372.

**16 Other information:**

- Employers should use this information only as a supplement to other information gathered by them, and should make independent judgement of suitability of this information to ensure proper use and protect the health and safety of employees. This information is furnished without warranty, and any use of the product not in conformance with this Material Safety Data Sheet, or in combination with any other product or process, is the responsibility of the user.