# SAFETY DATA SHEET

## 1. Identification

**Product identifier:** Nickelous Oxide, Green

**Other means of identification**
**Product No.:** 9005, 2795, 5309

**Recommended use and restriction on use**

**Recommended use:** Not available.
**Restrictions on use:** Not known.

**Manufacturer/Importer/Supplier/Distributor information**

**Manufacturer**

| | |
|---|---|
| Company Name: | Avantor Performance Materials, Inc. |
| Address: | 3477 Corporate Parkway, Suite 200<br>Center Valley, PA 18034 |
| Telephone: | Customer Service: 855-282-6867 |
| Fax: | |
| Contact Person: | Environmental Health & Safety |
| e-mail: | info@avantormaterials.com |

**Emergency telephone number:**
24 Hour Emergency: 908-859-2151

Chemtrec: 800-424-9300

## 2. Hazard(s) identification

**Hazard classification**

**Health hazards**

| | |
|---|---|
| Skin sensitizer | Category 1 |
| Carcinogenicity | Category 1A |
| Specific target organ toxicity - repeated exposure (Inhalation) | Category 1 |

**Environmental hazards**

| | |
|---|---|
| Chronic hazards to the aquatic environment | Category 4 |

**Label elements**

**Hazard symbol:**

**Signal word:** Danger

**Hazard statement:** May cause an allergic skin reaction.
May cause cancer.
Causes damage to organs through prolonged or repeated exposure.
May cause long lasting harmful effects to aquatic life.

**Precautionary statement**

**Prevention:** Wear protective gloves/protective clothing/eye protection/face protection. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not breathe dust/fume/gas/mist/vapors/spray. Wash thoroughly after handling. Do not eat, drink or smoke when using this product. Contaminated work clothing should not be allowed out of the workplace. Avoid release to the environment.

**Response:** IF ON SKIN: Wash with plenty of soap and water. If skin irritation or rash occurs: Get medical advice/attention. Take off contaminated clothing and wash it before reuse. IF exposed or concerned: Get medical advice/attention. Get medical advice/attention if you feel unwell.

**Storage:** Store locked up.

**Disposal:** Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal.

**Other hazards which do not result in GHS classification:** None.

## 3. Composition/information on ingredients

**Substances**

| Chemical identity | Common name and synonyms | CAS number | Content in percent (%)* |
|---|---|---|---|
| NICKEL OXIDE | | 1313-99-1 | 90 - 100% |

* All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

## 4. First-aid measures

**General information:** Get medical advice/attention if you feel unwell. Show this safety data sheet to the doctor in attendance.

**Ingestion:** Rinse mouth thoroughly. Call a POISON CENTER or doctor/physician if you feel unwell.

**Inhalation:** Move to fresh air. Get medical attention if symptoms persist.

**Skin contact:** Wash skin thoroughly with soap and water. Get medical attention if irritation persists after washing. Wash contaminated clothing before reuse.

**Eye contact:** Flush thoroughly with water. If irritation occurs, get medical assistance.

**Most important symptoms/effects, acute and delayed**

**Symptoms:** May cause irritation to skin, eyes, and respiratory tract.

**Indication of immediate medical attention and special treatment needed**

**Treatment:** Treat symptomatically. Symptoms may be delayed.

## 5. Fire-fighting measures

**General fire hazards:** In case of fire and/or explosion do not breathe fumes.

**Suitable (and unsuitable) extinguishing media**

| | |
|---|---|
| **Suitable extinguishing media:** | Use fire-extinguishing media appropriate for surrounding materials. |
| **Unsuitable extinguishing media:** | None known. |
| **Specific hazards arising from the chemical:** | During fire, gases hazardous to health may be formed. |

**Special protective equipment and precautions for firefighters**

| | |
|---|---|
| **Special fire fighting procedures:** | Move containers from fire area if you can do so without risk. Use water spray to keep fire-exposed containers cool. Cool containers exposed to flames with water until well after the fire is out. |
| **Special protective equipment for fire-fighters:** | Firefighters must use standard protective equipment including flame retardant coat, helmet with face shield, gloves, rubber boots, and in enclosed spaces, SCBA. |

## 6. Accidental release measures

| | |
|---|---|
| **Personal precautions, protective equipment and emergency procedures:** | Keep unauthorized personnel away. Keep upwind. Avoid inhalation of dust. Use personal protective equipment. Ventilate closed spaces before entering them. See Section 8 of the MSDS for Personal Protective Equipment. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. |
| **Methods and material for containment and cleaning up:** | Avoid dust formation. Sweep up and place in a clearly labeled container for chemical waste. Clean surface thoroughly to remove residual contamination. |
| **Notification Procedures:** | Prevent entry into waterways, sewer, basements or confined areas. Inform authorities if large amounts are involved. |
| **Environmental precautions:** | Prevent further leakage or spillage if safe to do so. Avoid discharge into drains, water courses or onto the ground. |

## 7. Handling and storage

| | |
|---|---|
| **Precautions for safe handling:** | Use personal protective equipment as required. Avoid contact with eyes, skin, and clothing. Avoid inhalation of dust. Wash thoroughly after handling. Use only with adequate ventilation. |
| **Conditions for safe storage, including any incompatibilities:** | Keep containers tightly closed. Store in cool, dry place. Store in a well-ventilated place. |

## 8. Exposure controls/personal protection

**Control parameters**

**Occupational exposure limits**

| Chemical identity | Type | Exposure Limit values | Source |
|---|---|---|---|
| NICKEL OXIDE - Inhalable fraction. - as Ni | TWA | 0.1 mg/m3 | US. ACGIH Threshold Limit Values (2011) |
| | TWA | 0.2 mg/m3 | US. ACGIH Threshold Limit Values (2011) |
| NICKEL OXIDE - as Ni | REL | 0.015 mg/m3 | US. NIOSH: Pocket Guide to Chemical Hazards (2010) |
| | PEL | 1 mg/m3 | US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006) |
| | PEL | 1 mg/m3 | US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006) |
| | TWA | 0.1 mg/m3 | US. OSHA Table Z-1-A (29 CFR 1910.1000) (1989) |
| | TWA | 1 mg/m3 | US. OSHA Table Z-1-A (29 CFR 1910.1000) (1989) |

**Appropriate engineering controls** No data available.

**Individual protection measures, such as personal protective equipment**

**General information:** Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.

**Eye/face protection:** Use tight fitting goggles if dust is generated.

**Skin protection**

**Hand protection:** Wear protective gloves.

**Other:** Wear suitable protective clothing.

**Respiratory protection:** In case of inadequate ventilation use suitable respirator.

**Hygiene measures:** Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Provide eyewash station and safety shower.

## 9. Physical and chemical properties

**Appearance**

**Physical state:** Solid
**Form:** Crystals or powder.
**Color:** Green
**Odor:** Odorless
**Odor threshold:** No data available.
**pH:** No data available.
**Melting point/freezing point:** 1,955 °C
**Initial boiling point and boiling range:** 2,730 °C
**Flash Point:** No data available.
**Evaporation rate:** No data available.
**Flammability (solid, gas):** No data available.

**Upper/lower limit on flammability or explosive limits**

| | |
|---|---|
| **Flammability limit - upper (%):** | No data available. |
| **Flammability limit - lower (%):** | No data available. |
| **Explosive limit - upper (%):** | No data available. |
| **Explosive limit - lower (%):** | No data available. |
| **Vapor pressure:** | No data available. |
| **Vapor density:** | No data available. |
| **Relative density:** | 6.67 (20 °C) |
| **Solubility(ies)** | |
| **Solubility in water:** | Insoluble in water |
| **Solubility (other):** | No data available. |
| **Partition coefficient (n-octanol/water):** | No data available. |
| **Auto-ignition temperature:** | No data available. |
| **Decomposition temperature:** | No data available. |
| **Viscosity:** | No data available. |

**Other information**

| | |
|---|---|
| **Molecular weight:** | 74.69 g/mol (NiO) |

## 10. Stability and reactivity

| | |
|---|---|
| **Reactivity:** | No dangerous reaction known under conditions of normal use. |
| **Chemical stability:** | Material is stable under normal conditions. |
| **Possibility of hazardous reactions:** | Hazardous polymerization does not occur. |
| **Conditions to avoid:** | Excessive heat. |
| **Incompatible materials:** | Strong oxidizing agents. Hydrogen peroxide (H2O2) Aluminum. Hydrogen. |
| **Hazardous decomposition products:** | In a fire, nickel may form nickel carbonyl, a highly toxic substance and known carcinogen. |

## 11. Toxicological information

**Information on likely routes of exposure**

| | |
|---|---|
| **Ingestion:** | May cause irritation of the gastrointestinal tract. |
| **Inhalation:** | May cause irritation to the respiratory system. |
| **Skin contact:** | May cause allergic skin reaction based on human experience. |
| **Eye contact:** | May cause temporary eye irritation. |

**Information on toxicological effects**

**Acute toxicity (list all possible routes of exposure)**

**Oral**
**Product:** No data available.

**Dermal**
**Product:** No data available.

**Inhalation**
**Product:** No data available.

**Repeated dose toxicity**
**Product:** No data available.

**Skin corrosion/irritation**
**Product:** May cause skin irritation.

**Serious eye damage/eye irritation**
**Product:** May irritate eyes.

**Respiratory or skin sensitization**
**Product:** Not a skin sensitizer. May cause an allergic skin reaction.

**Carcinogenicity**
**Product:** May cause cancer.

**IARC Monographs on the Evaluation of Carcinogenic Risks to Humans:**

| | |
|---|---|
| NICKEL OXIDE | Overall evaluation: 1. Carcinogenic to humans. |

**US. National Toxicology Program (NTP) Report on Carcinogens:**

| | |
|---|---|
| NICKEL OXIDE | Known To Be Human Carcinogen. |

**US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050):**
No carcinogenic components identified

**Germ cell mutagenicity**

**In vitro**
**Product:** No mutagenic components identified

**In vivo**
**Product:** No mutagenic components identified

**Reproductive toxicity**
**Product:** No components toxic to reproduction

**Specific target organ toxicity - single exposure**
**Product:** No data available.

**Specific target organ toxicity - repeated exposure**
**Product:** May cause damage to organs through prolonged or repeated exposure.

**Aspiration hazard**
**Product:** Not classified

**Other effects:** None known.

## 12. Ecological information

**Ecotoxicity:**

**Acute hazards to the aquatic environment:**

**Fish**
**Product:** No data available.

**Aquatic invertebrates**
**Product:** No data available.

**Chronic hazards to the aquatic environment:**

**Fish**
**Product:** No data available.

**Aquatic invertebrates**
**Product:** No data available.

**Toxicity to Aquatic Plants**
**Product:** No data available.

**Persistence and degradability**

**Biodegradation**
**Product:** There are no data on the degradability of this product.

**BOD/COD ratio**
**Product:** No data available.

**Bioaccumulative potential**
**Bioconcentration factor (BCF)**
**Product:** No data available on bioaccumulation.

**Partition coefficient n-octanol / water (log Kow)**
**Product:** No data available.

**Mobility in soil:** No data available.

**Known or predicted distribution to environmental compartments**
NICKEL OXIDE No data available.

**Other adverse effects:** May cause long lasting harmful effects to aquatic life.

## 13. Disposal considerations

**Disposal instructions:** Discharge, treatment, or disposal may be subject to national, state, or local laws.

**Contaminated packaging:** Since emptied containers retain product residue, follow label warnings even after container is emptied.

## 14. Transport information

**DOT**
Not regulated.

**IMDG**
Not regulated.

**IATA**

Not regulated.

## 15. Regulatory information

**US federal regulations**

**TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)**
**US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)**
None present or none present in regulated quantities.

**CERCLA Hazardous Substance List (40 CFR 302.4):**
None present or none present in regulated quantities.

**Superfund amendments and reauthorization act of 1986 (SARA)**

**Hazard categories**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| X | Acute (Immediate) | X | Chronic (Delayed) | | Fire | | Reactive | | Pressure Generating |

**SARA 302 Extremely hazardous substance**
None present or none present in regulated quantities.

**SARA 304 Emergency release notification**
None present or none present in regulated quantities.

**SARA 311/312 Hazardous chemical**

| Chemical identity | Threshold Planning Quantity |
|---|---|
| NICKEL OXIDE | 500 lbs |

**SARA 313 (TRI reporting)**

| Chemical identity | Reporting threshold for other users | Reporting threshold for manufacturing and processing |
|---|---|---|
| NICKEL OXIDE | 10000 lbs | 25000 lbs. |

**Clean Water Act Section 311 Hazardous Substances (40 CFR 117.3)**
None present or none present in regulated quantities.

**Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130):**
None present or none present in regulated quantities.

**US state regulations**

**US. California Proposition 65**
NICKEL OXIDE Carcinogenic.

**US. New Jersey Worker and Community Right-to-Know Act**
NICKEL OXIDE Listed

**US. Massachusetts RTK - Substance List**
NICKEL OXIDE Listed

**US. Pennsylvania RTK - Hazardous Substances**
NICKEL OXIDE Listed

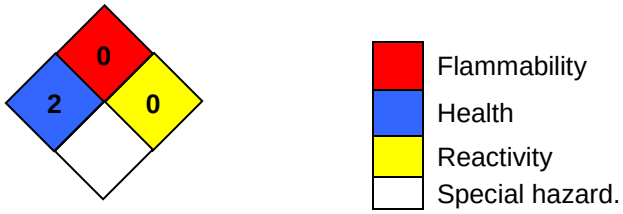
**US. Rhode Island RTK**
NICKEL OXIDE Listed

**Inventory Status:**

| | |
|---|---|
| Australia AICS: | On or in compliance with the inventory |
| Canada DSL Inventory List: | On or in compliance with the inventory |
| EINECS, ELINCS or NLP: | On or in compliance with the inventory |
| Japan (ENCS) List: | On or in compliance with the inventory |
| China Inv. Existing Chemical Substances: | On or in compliance with the inventory |
| Korea Existing Chemicals Inv. (KECI): | On or in compliance with the inventory |
| Canada NDSL Inventory: | Not in compliance with the inventory. |
| Philippines PICCS: | On or in compliance with the inventory |
| US TSCA Inventory: | On or in compliance with the inventory |
| New Zealand Inventory of Chemicals: | On or in compliance with the inventory |
| Japan ISHL Listing: | On or in compliance with the inventory |
| Japan Pharmacopoeia Listing: | Not in compliance with the inventory. |

## 16.Other information, including date of preparation or last revision

**NFPA Hazard ID**




Hazard rating: 0 - Minimal; 1 - Slight; 2 - Moderate; 3 - Serious; 4 - Severe

| | |
|---|---|
| **Issue date:** | 08-05-2014 |
| **Revision date:** | No data available. |
| **Version #:** | 1.0 |
| **Further information:** | No data available. |

**Disclaimer:**

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