SAFETY DATA SHEET
Nickel Oxide (powder and pieces)

1. Identification

Product identifier

Product name Nickel Oxide (powder and pieces)

Internal identification Replaces M-2200-030

Synonyms; trade names nickel monoxide

CAS number 1313-99-1

Recommended use of the chemical and restrictions on use

Application Exterior surface coating.

Uses advised against No specific uses advised against are identified.

Details of the supplier of the safety data sheet

Supplier Kurt J Lesker Company

Manufacturer Kurt J Lesker Company
1925 Route 51
Jefferson Hills, PA 15025
+1 412-387-9200

Kurt J Lesker Company LTD
United Kingdom
15-16 Burgess Road
Hastings, East Sussex, TN35 4NR
England
Customer Service: +44 (0) 1424 458100
msds@lesker.com

Emergency telephone number

Emergency telephone North America [USA, Canada, Mexico]: 1-866-519-4752
Mainland China: (+86) 4001 2001 74
Europe: (int'l call prefix)-1-760-476-3961
Asia Pacific: (int'l call prefix)-1-760-476-3960
Middle East & Africa: (int'l call prefix)-1-760-476-3959
South Korea: (+82) 070 4732 5813

Access Code - 333594

2. Hazard(s) identification

Classification of the substance or mixture

Physical hazards Not Classified

Health hazards Skin Sens. 1 - H317 Carc. 1A - H350 STOT RE 1 - H372

Environmental hazards Aquatic Chronic 4 - H413
Nickel Oxide (powder and pieces)

Label elements

Pictogram

![Pictogram]

Signal word
Danger

Hazard statements
H317 May cause an allergic skin reaction.
H350 May cause cancer.
H372 Causes damage to organs through prolonged or repeated exposure.
H413 May cause long lasting harmful effects to aquatic life.

Precautionary statements
P260 Do not breathe vapor/ spray.
P273 Avoid release to the environment.
P302+P352 If on skin: Wash with plenty of water.
P308+P313 If exposed or concerned: Get medical advice/ attention.
P333+P313 If skin irritation or rash occurs: Get medical advice/ attention.
P362+P364 Take off contaminated clothing and wash it before reuse.

Contains
Nickel Oxide

Other hazards
This substance is not classified as PBT or vPvB according to current EU criteria.

3. Composition/information on ingredients

Mixtures

<table>
<thead>
<tr>
<th>Nickel Oxide</th>
<th>0 - 100%</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAS number:</td>
<td>1313-99-1</td>
</tr>
</tbody>
</table>

Classification
Skin Sens. 1 - H317
Carc. 1A - H350
STOT RE 1 - H372
Aquatic Chronic 4 - H413

The full text for all hazard statements is displayed in Section 16.

4. First-aid measures

Description of first aid measures

General information
Get medical attention if any discomfort continues. Show this Safety Data Sheet to the medical personnel.

Inhalation
Move affected person to fresh air and keep warm and at rest in a position comfortable for breathing. Loosen tight clothing such as collar, tie or belt. Get medical attention if symptoms are severe or persist.

Ingestion
Rinse mouth thoroughly with water. Get medical advice/attention if you feel unwell. Do not induce vomiting unless under the direction of medical personnel.

Skin Contact
It is important to remove the substance from the skin immediately. In the event of any sensitization symptoms developing, ensure further exposure is avoided. Remove contamination with soap and water or recognized skin cleansing agent. Get medical attention if symptoms are severe or persist after washing.

Eye contact
Rinse with water. Get medical attention if any discomfort continues.
Nickel Oxide (powder and pieces)

Protection of first aiders

First aid personnel should wear appropriate protective equipment during any rescue.

Most important symptoms and effects, both acute and delayed

General information

The severity of the symptoms described will vary dependent on the concentration and the length of exposure.

Inhalation

Prolonged or repeated exposure may cause the following adverse effects: May cause cancer.

Ingestion

May cause sensitization or allergic reactions in sensitive individuals. Prolonged or repeated exposure may cause the following adverse effects: May cause cancer.

Skin contact

May cause skin sensitization or allergic reactions in sensitive individuals. Prolonged contact may cause dryness of the skin. Prolonged or repeated exposure may cause the following adverse effects: May cause cancer.

Eye contact

No specific symptoms known. May be slightly irritating to eyes.

Indication of immediate medical attention and special treatment needed

Notes for the doctor

Treat symptomatically. May cause sensitization or allergic reactions in sensitive individuals.

5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media

The product is not flammable. Extinguish with alcohol-resistant foam, carbon dioxide, dry powder or water fog. Use fire-extinguishing media suitable for the surrounding fire.

Unsuitable extinguishing media

Do not use water jet as an extinguisher, as this will spread the fire.

Special hazards arising from the substance or mixture

Specific hazards

None known.

Hazardous combustion products

Thermal decomposition or combustion products may include the following substances: Harmful gases or vapors.

Advice for firefighters

Protective actions during firefighting

Avoid breathing fire gases or vapors. Evacuate area. Keep upwind to avoid inhalation of gases, vapors, fumes and smoke. Ventilate closed spaces before entering them. Cool containers exposed to heat with water spray and remove them from the fire area if it can be done without risk. Cool containers exposed to flames with water until well after the fire is out. Avoid discharge to the aquatic environment. Control run-off water by containing and keeping it out of sewers and watercourses. If risk of water pollution occurs, notify appropriate authorities.

Special protective equipment for firefighters

Wear positive-pressure self-contained breathing apparatus (SCBA) and appropriate protective clothing. Standard Firefighter's clothing including helmets, protective boots and gloves will provide a basic level of protection for chemical incidents.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

Personal precautions

Wear protective clothing as described in Section 8 of this safety data sheet. No action shall be taken without appropriate training or involving any personal risk. Avoid contact with skin and eyes.

Environmental precautions

Environmental precautions

Avoid discharge into drains or watercourses or onto the ground. Avoid discharge to the aquatic environment.

Methods and material for containment and cleaning up
Nickel Oxide (powder and pieces)

Methods for cleaning up
Wear protective clothing as described in Section 8 of this safety data sheet. Clear up spills immediately and dispose of waste safely. Collect spillage with a shovel and broom, or similar and reuse, if possible. Collect and place in suitable waste disposal containers and seal securely. Flush contaminated area with plenty of water. Wash thoroughly after dealing with a spillage. Dangerous for the environment. Do not empty into drains. For waste disposal, see Section 13.

Reference to other sections
For personal protection, see Section 8. See Section 11 for additional information on health hazards. See Section 12 for additional information on ecological hazards. For waste disposal, see Section 13.

7. Handling and storage

Precautions for safe handling
Read and follow manufacturer’s recommendations. Wear protective clothing as described in Section 8 of this safety data sheet. Keep away from food, drink and animal feeding stuffs. Keep container tightly sealed when not in use. May cause cancer. Avoid discharge to the aquatic environment. Do not handle until all safety precautions have been read and understood. Do not handle broken packages without protective equipment. Do not reuse empty containers.

Advice on general occupational hygiene
Wash promptly if skin becomes contaminated. Take off contaminated clothing and wash before reuse. Wash contaminated clothing before reuse.

Conditions for safe storage, including any incompatibilities
Storage precautions
Store locked up. Keep only in the original container. Keep container tightly closed, in a cool, well ventilated place. Keep containers upright. Protect containers from damage.

Storage class
Miscellaneous hazardous material storage.

Specific end uses(s)
The identified uses for this product are detailed in Section 1.

8. Exposure controls/Personal protection

Control parameters
Occupational exposure limits
Long-term exposure limit (8-hour TWA): ACGIH 0.2 mg/m³ as Ni
A1

Nickel Oxide
Long-term exposure limit (8-hour TWA): ACGIH 0.2 mg/m³ as Ni
A1
ACGIH = American Conference of Governmental Industrial Hygienists.
A1 = Confirmed Human Carcinogen.

Exposure controls
Protective equipment
Nickel Oxide (powder and pieces)

**Appropriate engineering controls**

Provide adequate general and local exhaust ventilation. Ensure the ventilation system is regularly maintained and tested. Good general ventilation should be adequate to control worker exposure to airborne contaminants. Observe any occupational exposure limits for the product or ingredients.

**Eye/face protection**

Unless the assessment indicates a higher degree of protection is required, the following protection should be worn: Tight-fitting safety glasses.

**Hand protection**

Wear protective gloves. The most suitable glove should be chosen in consultation with the glove supplier/manufacturer, who can provide information about the breakthrough time of the glove material. To protect hands from chemicals, gloves should comply with OSHA 1910.138 and be demonstrated to be impervious to the chemical and resist degradation. Considering the data specified by the glove manufacturer, check during use that the gloves are retaining their protective properties and change them as soon as any deterioration is detected. Frequent changes are recommended.

**Other skin and body protection**

Wear appropriate clothing to prevent any possibility of skin contact.

**Hygiene measures**

Wash hands thoroughly after handling. Wash at the end of each work shift and before eating, smoking and using the toilet. Do not eat, drink or smoke when using this product.

**Respiratory protection**

Ensure all respiratory protective equipment is suitable for its intended use and is NIOSH approved. Check that the respirator fits tightly and the filter is changed regularly. Gas and combination filter cartridges should comply with OSHA 1910.134. Full face mask respirators with replaceable filter cartridges should comply with OSHA 1910.134. Half mask and quarter mask respirators with replaceable filter cartridges should comply with OSHA 1910.134.

**Environmental exposure controls**

Keep container tightly sealed when not in use. Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

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### 9. Physical and chemical properties

**Information on basic physical and chemical properties**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Solid.</td>
</tr>
<tr>
<td>Color</td>
<td>Dark. Grey.</td>
</tr>
<tr>
<td>Odor</td>
<td>No characteristic odor.</td>
</tr>
<tr>
<td>Odor threshold</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>pH</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Melting point</td>
<td>Not available.</td>
</tr>
<tr>
<td>Initial boiling point and range</td>
<td>Not available.</td>
</tr>
<tr>
<td>Flash point</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Upper/lower flammability or explosive limits</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Vapor pressure</td>
<td>Not available.</td>
</tr>
<tr>
<td>Vapor density</td>
<td>Not available.</td>
</tr>
<tr>
<td>Relative density</td>
<td>6.67 @ 20°C</td>
</tr>
</tbody>
</table>
Nickel Oxide (powder and pieces)

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bulk density</td>
<td>Not available.</td>
</tr>
<tr>
<td>Solubility(ies)</td>
<td>Insoluble in water.</td>
</tr>
<tr>
<td>Partition coefficient</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Auto-ignition temperature</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Decomposition Temperature</td>
<td>Not available.</td>
</tr>
<tr>
<td>Viscosity</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Molecular weight</td>
<td>Not available.</td>
</tr>
</tbody>
</table>

10. Stability and reactivity

- **Reactivity**: There are no known reactivity hazards associated with this product.
- **Stability**: Stable at normal ambient temperatures and when used as recommended. Stable under the prescribed storage conditions.
- **Possibility of hazardous reactions**: No potentially hazardous reactions known.
- **Conditions to avoid**: There are no known conditions that are likely to result in a hazardous situation.
- **Materials to avoid**: No specific material or group of materials is likely to react with the product to produce a hazardous situation.
- **Hazardous decomposition products**: Does not decompose when used and stored as recommended. Thermal decomposition or combustion products may include the following substances: Harmful gases or vapors.

11. Toxicological information

- **Information on toxicological effects**
  - **Acute toxicity - oral**
    - **Notes (oral LD₅₀)**: Based on available data the classification criteria are not met.
  - **Acute toxicity - dermal**
    - **Notes (dermal LD₅₀)**: Based on available data the classification criteria are not met.
  - **Acute toxicity - inhalation**
    - **Notes (inhalation LC₅₀)**: Based on available data the classification criteria are not met.
  - **Skin corrosion/irritation**
    - **Animal data**: Based on available data the classification criteria are not met.
  - **Serious eye damage/irritation**
    - **Serious eye damage/irritation**: Based on available data the classification criteria are not met.
  - **Respiratory sensitization**
    - **Respiratory sensitization**: Based on available data the classification criteria are not met.
  - **Skin sensitization**
    - **Skin sensitization**: May cause skin sensitization or allergic reactions in sensitive individuals.
  - **Germ cell mutagenicity**
  - **Genotoxicity - in vitro**
    - **Genotoxicity - in vitro**: Based on available data the classification criteria are not met.
  - **Carcinogenicity**
Nickel Oxide (powder and pieces)

Carcinogenicity
May cause cancer.

IARC carcinogenicity
None of the ingredients are listed or exempt.

NTP carcinogenicity
Reasonably anticipated to be a human carcinogen.

Reproductive toxicity
Reproductive toxicity - fertility
Based on available data the classification criteria are not met.

Reproductive toxicity - development
Based on available data the classification criteria are not met.

Specific target organ toxicity - single exposure
STOT - single exposure
Not classified as a specific target organ toxicant after a single exposure.

Specific target organ toxicity - repeated exposure
STOT - repeated exposure
STOT RE 1 - H372

Aspiration hazard
Aspiration hazard
Not relevant. Solid.

General information
May cause cancer after repeated exposure. Risk of cancer depends on duration and level of exposure. The severity of the symptoms described will vary dependent on the concentration and the length of exposure.

Inhalation
No specific symptoms known.

Ingestion
May cause sensitization or allergic reactions in sensitive individuals.

Skin Contact
May cause skin sensitization or allergic reactions in sensitive individuals. Prolonged contact may cause dryness of the skin.

Eye contact
No specific symptoms known.

Route of exposure
Ingestion Inhalation Skin and/or eye contact

Target Organs
No specific target organs known.

Medical considerations
Skin disorders and allergies.

12. Ecological information

Toxicity
Aquatic Chronic 4 - H413 May cause long lasting harmful effects to aquatic life.

Persistence and degradability
The degradability of the product is not known.

Bioaccumulative potential
No data available on bioaccumulation.

Partition coefficient
Not applicable.

Mobility in soil
Mobility
No data available.

Other adverse effects
None known.

13. Disposal considerations

Waste treatment methods
### Nickel Oxide (powder and pieces)

**General information**
The generation of waste should be minimized or avoided wherever possible. Reuse or recycle products wherever possible. This material and its container must be disposed of in a safe way. When handling waste, the safety precautions applying to handling of the product should be considered. Care should be taken when handling emptied containers that have not been thoroughly cleaned or rinsed out. Empty containers or liners may retain some product residues and hence be potentially hazardous.

**Disposal methods**
Dispose of surplus products and those that cannot be recycled via a licensed waste disposal contractor. Waste, residues, empty containers, discarded work clothes and contaminated cleaning materials should be collected in designated containers, labeled with their contents. Incineration or landfill should only be considered when recycling is not feasible.

### 14. Transport information

| General | The product is not covered by international regulations on the transport of dangerous goods (IMDG, IATA, DOT). |
| UN Number |  |
| UN No. (International) | Not applicable. |
| UN proper shipping name |  |
| Proper shipping name (International) | Not applicable. |
| Transport hazard class(es) |  |
| Transport Labels (International) | No transport warning sign required. |
| Packing group |  |
| Packing group (International) | Not applicable. |
| Environmental hazards |  |
| Environmentally Hazardous Substance No. |  |
| Special precautions for user | Not applicable. |
| Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code | Not applicable. |

### 15. Regulatory information

| US Federal Regulations |  |
| SARA Section 302 Extremely Hazardous Substances Tier II Threshold Planning Quantities | None of the ingredients are listed or exempt. |
| CERCLA/Superfund, Hazardous Substances/Reportable Quantities (EPA) | None of the ingredients are listed or exempt. |
| SARA Extremely Hazardous Substances EPCRA Reportable Quantities | None of the ingredients are listed or exempt. |
| SARA 313 Emission Reporting | None of the ingredients are listed or exempt. |
Nickel Oxide (powder and pieces)

CAA Accidental Release Prevention
None of the ingredients are listed or exempt.

FDA - Essential Chemical
None of the ingredients are listed or exempt.

FDA - Precursor Chemical
None of the ingredients are listed or exempt.

SARA (311/312) Hazard Categories
None of the ingredients are listed or exempt.

OSHA Highly Hazardous Chemicals
None of the ingredients are listed or exempt.

US State Regulations

California Proposition 65 Carcinogens and Reproductive Toxins
None of the ingredients are listed or exempt.

California Air Toxics "Hot Spots" (A-I)
None of the ingredients are listed or exempt.

California Air Toxics "Hot Spots" (A-II)
None of the ingredients are listed or exempt.

California Directors List of Hazardous Substances
None of the ingredients are listed or exempt.

Massachusetts "Right To Know" List
None of the ingredients are listed or exempt.

Rhode Island "Right To Know" List
None of the ingredients are listed or exempt.

Minnesota "Right To Know" List
None of the ingredients are listed or exempt.

New Jersey "Right To Know" List
None of the ingredients are listed or exempt.

Pennsylvania "Right To Know" List
None of the ingredients are listed or exempt.

Inventories

US - TSCA
None of the ingredients are listed or exempt.

US - TSCA 12(b) Export Notification
None of the ingredients are listed or exempt.

16. Other information

Training advice
Only trained personnel should use this material.

Revision date
4/11/2019

Revision
2
Nickel Oxide (powder and pieces)

Supersedes date: 3/29/2017
SDS No.: 4867

Hazard statements in full:
H317 May cause an allergic skin reaction.
H350 May cause cancer.
H372 Causes damage to organs (Lungs) through prolonged or repeated exposure.
H372 Causes damage to organs through prolonged or repeated exposure.
H413 May cause long lasting harmful effects to aquatic life.

End of SDS

This information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process. Such information is, to the best of the company's knowledge and belief, accurate and reliable as of the date indicated. However, no warranty, guarantee or representation is made to its accuracy, reliability or completeness. It is the user's responsibility to satisfy himself as to the suitability of such information for his own particular use.