

NOVAMET

NOVAMET[®] GREEN NICKEL OXIDE

THIS DATA SHEET IS PREPARED IN COMPLIANCE WITH EU DIRECTIVE 2001/58/EC

1. Substance and Company Identification

This MSDS includes the following:

Green Nickel Oxide – Type A

Green Nickel Oxide – Type F

Green Nickel Oxide - Standard

NiO

C.A.S. Number 1313-99-1

EEC Label No 215-215-7

Company identification:

Novamet Specialty Products Corporation

681 Lawlins Road

Wyckoff, New Jersey 07481

In North America (Chemtrec): 24 hr: 1-800-424-9300

In Europe Inco Limited (Clydach Refinery) +44(0)1792-842501

2. Composition

Typical Analysis

NiO 99.9%

Information on Ingredients:

Hazardous Ingredient	Typical Composition	TRK mg/m ^{3*}	TLV mg/m ^{3*}	WEL mg/m ^{3*}
Nickel Oxide	99.9%	0.5	0.2	0.5

*as metal in inhalable size fraction

3. Hazards Identification

See section 15 for additional information

Nickel Oxide

Category 1 carcinogen.

R49 May cause cancer by inhalation.

R43 May cause sensitization by skin contact.

R53 May cause long-term adverse effects in the aquatic environment.

4. First Aid Measures

Ingestion No specific first aid required.

Inhalation No specific first aid required.

Skin Contact Wash thoroughly with water. For rashes seek medical advice. Show label if possible.

Eyes Irrigate eyeball thoroughly with water for at least 10 minutes. If discomfort persists seek medical attention.

Wounds Cleanse thoroughly to remove any nickel particles.

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5. Fire Fighting Measures

Non flammable. Extinguish surrounding fires with appropriate methods.

6. Accidental Release Measures

Collect spills by wet sweeping or vacuuming with the vacuum exhaust passing through a high efficiency particulate arresting (HEPA) filter if exhaust is discharged into the work place. Wear appropriate nationally approved respirators if collection and disposal of spills is likely to cause the concentration limits of airborne nickel to exceed the locally prescribed exposure limits.

7. Handling and Storage

Keep in the container supplied and keep container closed when not in use. Wear suitable protective clothing including gloves. As packed nickel oxide may constitute a manual handling risk.

Nickel oxide is subject to the Control of Major Accident Hazards Directives 82/501EEC, 96/82/EC & 98/433/EC (The Seveso Directive). Local consent needs to be obtained to store quantities in excess of 1 tonne.

8. Exposure Controls / Personal Protection

For exposure limits see Section 2. Maintain airborne nickel levels as low as possible.

Do not inhale dust. Ventilation is normally required when handling or using this product to keep airborne nickel oxide below the nationally authorized limits. If ventilation alone cannot control exposure, use respirators nationally approved for the purpose.

Avoid repeated skin and eye contact. Wear goggles or face shield. Wear suitable protective clothing and gloves. Wash skin thoroughly after handling and before eating, drinking or smoking. Launder clothing and gloves as needed.

9. Physical and Chemical Properties

Green, odourless powder less than 20 microns.

Ingredient	Mol. Wt.
NiO	74.71

Viscosity	N/A
Melting point	1984 ^o C
Boiling point	N/A
Flash Point	N/A
Autoflammability	N/A
Explosive properties	Not explosive
Vapour pressure	N/A
Bulk density	1.0 – 2.0 g/cm ³
Particle size	99% <20 microns
Solubility cold water	N/A
Solubility hot water	N/A
Partition coefficient	N/A
Magnetic properties	not magnetic

N/A = Not Applicable

10. Stability and Reactivity

Stable and non reactive.

11. Toxicological Information

Nickel Oxide

LD 50 ORAL RAT >9000 mg/kg

Inhalation: Evidence for the association of nickel compound exposures and cancer risk comes mainly from workers in now obsolete nickel refining operations. The studies of nickel workers suggest that respiratory cancer risks are primarily related to exposure to relatively insoluble forms of nickel notably sulphidic and oxidic nickel at concentrations greater than 10mg/m³. Toxic respiratory effects in animals may be caused by reduced particle clearance capacity.

The International Agency for Research on Cancer (IARC) (ref. 4) in 1990 and the U.S. Tenth Report on Carcinogens (ref. 5) in 2002 concluded there was sufficient evidence that nickel compounds are carcinogenic to humans. The Report of the International Committee on Nickel Carcinogenesis in Man reported that workers who have been primarily exposed to nickel oxide showed some evidence of increased lung cancer.

The European Union Commission in 1991 classified nickel oxide and work involving exposure to dusts, fumes and sprays produced during the roasting and electrorefining of nickel-copper mattes as carcinogenic processes.

ACGIH has re-evaluated the data regarding the carcinogenicity of nickel and nickel compounds and has classified nickel oxide as a confirmed human carcinogen, Class A1.

There is some evidence that the inhalation of nickel oxide has resulted in an increased incidence of malignant lung tumors in rats. Inhalation of nickel oxide at concentrations 50 times the TLV, produced pneumoconiosis in hamsters. Repeated intratracheal instillation of nickel oxide produced an increased incidence of malignant lung tumors in rats.

Wounds: Nickel oxide has caused tumors at the site of injection in rodents.

Ingestion: The U.S. National Institute for Occupational Safety and Health (NIOSH) concluded there is no evidence that nickel and its inorganic compounds are carcinogenic when ingested. The U.S. Food and Drug Administration has affirmed that nickel is generally recognized as safe (GRAS) as a direct human food ingredient.

Preexisting Conditions: Prolonged and intimate skin contact can cause an allergic skin rash in previously sensitized individuals.

Reproductive Toxicity: There is no evidence of mutagenesis. Animal experiments indicate that soluble nickel ingestion causes adverse effects on fetal development at a threshold oral exposure of 2.2 mg Ni/kg/day by pregnant rats. Data are insufficient to determine if this effect occurs in humans and no regulatory agency has classified soluble forms of nickel as reproductive risks for humans.

12. Ecological Information

The environmental classification for NiO is R53, may cause long-term adverse effects in the aquatic environment.

13. Disposal Considerations

Nickel-containing material is normally collected to recover nickel values. Should disposal be deemed necessary follow local regulations.

14. Transport Information

International Marine Dangerous Goods Code	Not regulated
International Civil Aviation Organization Technical Instructions for the Dangerous Goods by Air	Not regulated
U.S. Dept. of Transportation Regulations	Not regulated
Canadian Transportation of Dangerous Goods Act	Not regulated
European Agreement Concerning the International Carriage of Dangerous Goods by Road	Not regulated

15. Regulatory Information

Nickel oxide is classified as a Category 1 carcinogen "substances or processes known to be carcinogenic to man" by the EU in Directive 67/548/EEC (Classification, Packaging and Labelling Directive) and in the UK in the Chemicals Hazard Information and Packaging for Supply Regulations and as such it requires to be labeled with the following risk and safety phrases.

Nickel Oxide

T; Toxic; Category 1 carcinogen.

R49	May cause cancer by inhalation.
R43	May cause sensitization by skin contact.
R53	May cause long-term adverse effects in the aquatic environment.
S53	Avoid exposure, obtain special instructions before use.
S45	In case of accident or if you feel unwell seek medical attention immediately. (Show label where possible). Avoid release to the environment.
S61	Refer to special instructions/safety data sheet.

16. Other Information

Medical staff should note that this data sheet has been lodged with the following Poisons Information Center:

National Poison Center Phone line: 44-0870 6006266

E- Mail : wnpu@compuserve.com

Fax : 44-02920 704357

17. Notes and Bibliography

Disclaimer: The information in this Data Sheet is provided in good faith and is accurate to Novamet's best knowledge and belief but except as implied by law, no representation or warranty is given in relation to the information and Novamet accepts no liability.

References are available upon request.