# NICKEL OXIDE Safety Data Sheet accordingtoRegulation(EC)No.1907/2006(REACH) &1272/2008 (CLP)Dateofissue:22/12/2010Revisiondate:12/12/2012

## SECTION 1: Identification of the substance/mixture and of the company/undertaking.

 1.1. Product identifier Product name : Nickel Oxide EC No : 215-215-7/234-323-5 CAS No. : 1313-99-1/11099-02-8 REACH registration No. : 01-2119467172-41-XXXX Synonyms : nickel oxide sinter 75, NOS75, Nickel oxide (NiO), FMW, green nickel oxide, black nickel oxide, mononickel oxide, nickel monoxide, nickelous oxide, nickel (II) oxide, nickel (2+) oxide, Bunsenite.

 1.2. Relevant identified uses ofthesubstance or mixtureand uses advisedagainst

1.2.1.Relevantidentifieduses Industrial use of powdered and shaped nickel oxide containing catalysts (A) Industrial use of nickel oxide-containing catalysts for the production of catalysts containing other nickel compounds Production of nickel base powders from nickel oxide Production of nickel-containing electronics and thermally functioning ceramics Production of nickel-containing enamel frits Production of nickel-containing pigments Production of nickel-containing glass Stainless, special steels and special alloys manufacturing

1.2.2.Usesadvised against None Full text of use descriptors: see section 16. Exposure Scenarios: Annex 1

 1.3. Details of the supplier of the safety data sheet

Ve-Ka groothandel b.v.

Industrieweg 7a

6621 BD Deumel

Tel: 0487 571667

1.4. Emergency telephone number 0487 571667 SECTION

## 2: Hazards identification.

 2.1. Classification of the substance or mixture Classification according to Regulation (EC) No. 1272/2008 [CLP] Skin Sensitisation Category 1 Carcinogenicity Category 1A; Specific Target Organ Toxicity, Repeated exposure – Category 1 Aquatic Chronic Category 4 Full text of H-phrases: see section 16 Classification according to Directive 67/548/EEC or 1999/45/EC Carcinogenicity Category 1; R49 T; R48/23 R43 R53 Full text of R-phrases: see section 16 2.2. Label 

Hazardpictograms(CLP): Product identifier: Nickel Oxide Symbols: GHS07 – Exclamation mark GHS08

– Health Hazard Signal word (CLP): DANGER Hazard statements (CLP) : 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 (CLP): NOTE: number of P-statements has been reduced, as per CLP regulation, the full list can be found in Section 15)

Full text of R-Statements and Precautionary statements see section 15

## SECTION 3: Composition/information on ingredients.

 3.1. Substances Hazardous Ingredients Typical Composition (%) C.A.S. Number EINECS/EC Label No. Nickel Oxide NiO) 98 1313-99-1 215-215-7 Cobatous Oxide (CoO) 0-1.5 1307-96-6 215-154-6 Nickel Hydroxide 0-0.5 12054-48-7 235-008-05

## SECTION 4: First aid measures

. Ingestion: No specific first aid required. Inhalation: No specific first aid required. Skin: Remove contaminated clothing, and wash affected areas thoroughly with soap and water. If skin irritation or rash occurs: Get medical advice/attention. Show label if possible. Eyes: Irrigate eyeball thoroughly with water for at least 10 minutes. If discomfort persists seek medical attention.

 4.2. Most important symptoms and effects, both acute and delayed Skin contact: Rash Eye contact: Redness

4.3. Indication of any immediate medical attention and special treatment needed No special requirements

##  SECTION 5: Firefighting measures.

5.1. Extinguishing media Suitable extinguishing media: Any type to be selected according to materials stored in the immediate neighbourhood.

5.2. Special hazards arising from the substance or mixture Non-flammable. Extinguish surrounding fires with appropriate methods.

 5.3. Advice for firefighters Protection during firefighting: Use of approved supplied air or self-contained breathing apparatus operated in positive pressure mode are satisfactory. Totally impervious protective suits, gloves, and boots must be worn.

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##  SECTION 6: Accidental release measures.

6.1. Personal precautions, protective equipment and emergency procedures General measures: Keep public away from danger area. See section 8.2. Avoid dust production. Avoid all contact with this substance.

 6.1.1. For non-emergency personnel No additional information available 6.1.2. For emergency responders No additional information available

 6.2. Environmental precautions Prevent entry to sewers and soil. Notify authorities if product enters sewers or public waters.

 6.3. Methods and material for containment and cleaning up Methods for cleaning up: Collect mechanically and transfer into appropriate container for disposal. Avoid dust production.

 6.4. Reference to other sections See section 8 and 13 for more information.

##  SECTION 7: Handling and storage.

 7.1. Precautions for safe handling

7.2. Conditions for safe storage, including any incompatibilities Storage conditions: Store in dry, cool, well-ventilated area. Keep away from food, drink and animal feeding stuffs. Incompatible products: None known

 7.3. Specific end use(s) No additional information available SDS Ref:– 12-12-2014 NICKELOXIDE Safety Data Sheet according to Regulation (EC) No. 1907/2006 (REACH) & 1272/2008 (CLP) Date of issue: 22/12/2010 Revision date: 12/12/2012

## SECTION 8: Exposure controls/personal protection.

 8.1. Exposure Limits. Nickel Oxide (NiO) - CAS 1313-99-1 Exposure Limit (mg/m3 ) Year ACGIH TLV-TWA1 0.2\* ‡ as Ni 2008 OK WEL2 0.5 as Ni 2006 Japan 1 as Ni 2012 Korea 0.1 as Ni 2006 China 1 as Ni 2007 \* Inhalable fraction ‡ Insoluble inorganic fraction

 Freshwater µg Ni/L (bioavailable) 3.55 Marine µg Ni/L 8.6 Terrestrial Mg Ni/kg 29.9 DNEL's Compartment Unit PNEC Dermal Acute systemic mg/Ni/kg/day ─ Acute local mg/Ni/cm2 /day ─ Long-term systemic mg/Ni/kg/day ─ Long-term local mg/Ni/cm2 /day 0.024 Inhalation Acute systemic mg/Ni/m3 520 Acute local mg/Ni/m3 3.91 Long-term systemic mg/Ni/m3 0.052 3 Long-term local mg/Ni/m3 0.052 3

8.2. Environmental Limits. 1 Based on MMAD of 2.9µm, increases with increasing MMAD (estiamated as ≥6.4 mg Ni/m3 for Exposures to particles with a MMAD of ≥30µm. 2 When handling powders of particle aerodynamic equivalent diameter (AED) below 10µm, exposures (8h TWA) to these powders should be kept under 0.01 mg.Ni/m3 3 When exposure are solely to metallic and nickel oxides (without exposure to any other nickel compounds) and the mean particle size of the aerosol is greater than 10µm AED (≤ 10% of aerosol mass in respirable fraction), inhalable exposure levels uo to 0.2 mg Ni/m3could be reasonably assumed to be safe.

8.3. Occupational Exposure controls Appropriate engineering controls: Use as far as possible in a closed system. Provide a regular control of the atmosphere. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Local exhaust and general ventilation must be adequate to meet exposure standards. Please refer to the annex (exposure scenarios). Hand protection: Use gloves resistant to chemical products corresponding to EN 374:3. Take advice to gloves’ supplier. Eye protection: Wear safety glasses with side shields according EN 166. Skinandbody protection: Wear closed protective clothing. Respiratory protection: Use respiratory protection mask according to EN 140 or EN 405 with filter type P3 according to EN 143:2000 or FFP3 according to EN 149:2001. Environmental exposurecontrols: Prevent entry to sewers and soil.

## SECTION9: Physicalandchemical ;properties.

Pysical state at 200C and 101.3 kPa Solid

Colour White green

 Odour Black , odourless. Not

Odour Theshold Applicable

 pH No date available

Relative evaporation rate (butylacetate=1) No date available

 Melting point >1,900°C

Freezing point No date available

 Boiling point Nog applicatable

 Flash point No flammable

 Self ignition temperature >400C

 Decomposition No date available

 temperature Flammability Not flammable

 (solid, gas)

 Vapour pressure No data available

 Relative density 6.75 g/cm3 at 200C

Density Solubility in water 3.52X10-5 g/l at 200C (green nickel oxide) 2.26X10-3 g/l at

 20°C ( black nicel oxide)

 Bulk Density 800 – 1,300 kg/m3

Viscosity, kinematic Not aplicable

Viscosity, dynamic No date available

 Explosive properties No date available

 Oxidising properties No date available

Explosive limits Granulometry Not Apicable < 0,1% of particles aith a diameter <100µ

 9.2. Other information

None

## SECTION10: Stabilityandreactivity.

10.1. Reactivity Stable under normal conditions of handling and storage.

10.2. Chemical stability Stable under normal conditions of handling and storage.

10.3. Possibility of hazardous reactions

Stable under normal conditions of handling and storage.

10.4. Conditions to avoid Protect from moisture

10.5. Incompatible materials None

10.6. Hazardous decomposition products No information available

##  SECTION11:Toxicologicalinformation.

 11.1. Information on toxicological effects As a mixture the toxicological properties of the product are unknown. The toxicology of the reported ingredients are summarised below.

 NickelOxide

AcuteToxicity

a)Oral: Non toxic – LD50 ORAL RAT >11,000mg/kg (green); 9,990 (black

 b)Inhalation: Non toxic –LD50 INHAL RAT >5.08mg/kg (green); >5.15 (black

C) Dermal: No information available

Corrosivity/Irritation

 a)Respiratory Tract: No classification

 b)Skin: Not corrosive/irritating

 c) Eyes: Mildly irritating

Sensitization

 a)Respiratory

 Tract: Nickel metal induced asthma is very rare.3 case reports are available; the data is not sufficient to conclude that nickel metal is classified as a respiratory sensitizer.

b)Skin: Nickel oxide is currently classified as a dermal sensitizer (R43) according to the 1st ATP to the CLP Regulation. Recent studies evaluating the bioaccessibiliy of a series of Ni compounds in synthetic sweat indicated very low nickel ion release from Ni oxide, suggesting very low or no sensitization potency. Early Guinea pig maximization and Beuhler test results show low potential for nickel oxide to act as a dermal sensitizer.

c) Pre-existing conditions: Individuals known to be allergic to nickel should avoid contact with nickel whenever possible to reduce the likelihood of nickel allergic dermatitis reactions (skin rashes). Repeated contact may result in persistent chronic palmar/hand dermatitis in a smaller number of individuals, despite efforts to reduce or avoid nickel exposure

. Chronic toxicity

 a) Oral: No information available

 b) Inhalation: Exposure related toxicities were noted following 13 weeks and two years of exposure to NiO in both rats and mice in the US NTP chronic rat inhalation study. Adverse effects in rodents were primarily limited to the lung (e.g. increased tissue weight, inflammation, macrophage hyperplasia). The LOAEC from the chronic study in rats was 0.6 mg NiO/m3 or 0.5 mg Ni/m3

 c) Dermal: No information available

 Mutagenicity/Reproductive toxicity Not classified for reproductive/developmental toxicity

. Not classified for mutagenecity.

Carcinogenicity

a) Ingestion: No information available. Not classified

 b) Inhalation: Category 1A; Human epidemiological And animal data suggest that at least some forms of nickel oxide can be carcinogenic to the respiratory tract of humans after inhalation.

Cobaltous Oxide

LD50 ORAL RAT 202mg/kg Inhalation: Causes irritation to the respiratory tract, symptoms may include coughing, shortness of breath and nausea. Respiratory hypersensitivity, asthma may appear. Inhalation of cobalt dust and fumes is associated with an increased incidence of lung disease.

Ingestion: Causes abdominal pain, nausea, vomiting, flushing of the face and ears, mild hypotension, rash and ringing in the ears.

 Skin contact: May cause dermatitis, Causes irritation to skin. Symptoms include redness, itching and pain.

Eye contact: Causes irritation, redness and pain.

Pre-existing Conditions: Persons with pre-existing skin disorders or eye problems, or impaired liver, kidney or respiratory function may be more susceptible to the effects of the substance. Persons with allergies or sensitivity to cobalt may also be more susceptible to the effects of the substance.

 Nickel Hydroxide

 No information currently available

## SECTION 12: Ecocological information.

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

 12.2. Persistence and degradability The PBT and vPBT criteria of Annex XIII to the Regulation do not apply to inorganic substances, such as nickel metal. The methods for determining the biological degradability are not applicable to inorganic substances.

 12.3. Bioaccumulative potential Nickel does not tend to bioaccumulate or biomagnify in aquatic or terrestrial systems.

12.4. Mobility in soil The substance is essentially insoluble in water.

 12.5. Results of PBT and vPvB assessment Not classified as PBT or vPBT.

 12.6. Other adverse effects None anticipated

##  SECTION 13: Disposal considerations.

 13.1. Waste treatment methods Recover or recycle if possible. Dispose of contents in accordance with local, national or international legislation

13.2. Additional Information No information available

## SECTION 14: Transport information.

 In accordance with ADR / RID / ADNR / IMDG / ICAO / IATA

 14.1. UN number Not applicable

14.2. UN proper shipping name Not classified as dangerous according to Transport Regulations

14.3. Transport hazard class(es) Not applicable

14.4. Packing group Not applicable

14.5. Environmental hazards Other information: No supplementary information available.

 14.6. Special precautions for user

 14.6.1. Overland transport Not applicable

14.6.2. Transport by sea No additional information available

14.6.3. Air transport No additional information available

 14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code Not applicable

## SECTION 15: Regulatory information.

 15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

 15.1.1. Classification according to Dangerous Substance Directive 67/548EEC T – Toxic: Category 1 carcinogen. R48/23: Toxic: danger of serious damage to health by prolonged exposure through inhalation R49: May cause cancer by inhalation R43: May cause sensitisation 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 advice immediately (show the label where possible) S61: Avoid release to the environment. Refer to special instructions/safety data sheet –

 NICKEL OXIDE Safety Data Sheet

 All components are listed on EINECS. (European Inventory of Existing Chemical Substances)

15.1.2. Classification according to Part 3 of Annex VI of EU Regulations No. 1272/2008

Skin Sensitization: Category 1 Carcinogenicity: Category 1A Specific Target Organ Toxicity, Repeated exposure: Category 1 Aquatic Chronic: Category 4



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

 Prevention:

P201: Obtain special instructions before use.

 P202: Do not handle until all safety precautions have been read and understood.

P260: Do not breathe dust/fume/gas/mist/vapours/spray.

 P261: Avoid breathing dust/fume/ gas/mist/vapours/spray.

 P264: Wash hands and face thoroughly after handling.

 P270: Do not eat, drink or smoke when using this product.

 P272: Contaminated work clothing should not be allowed out of the workplace

P273: Avoid release to the environment.

P280: Wear protective gloves/protective clothing/eye protection/face protection.

 P281: Use personal protective equipment as required Response:

 P302+P352: IF ON SKIN: Wash with plenty of water

 P308+P311: IF exposed or concerned Get medical advice/attaention

 P333+P313: If skin irritation or a rash occurs: Get medical advice/attention.

P314: Get Medical advice/attention if you feel unwell.

 P321: See Safety Data Sheet for specific treatment

 P363: Wash contaminated clothing before reuse.

Storage:

P405: Store locked up

 Disposal:

P501: Dispose of contents/container in accordance with local/regional/national/international regulations

##  SECTION16: Otherinformation.

 16.1. Indications of change

 a) Original Document

 b) Formatting Changes

The following Acronyms may be found in this document

ACGIH: American Conference of Governmental Industrial Hygienists

 DNEL: Derived No Effect Level

 LTEL: Long Term Exposure Limit

 LR: Lead Registrant

 MMAD: Mass Median Aerodynamic Diameter

 NIOSH: National Institute of Occupational Safety and Health

 OEL: Occupatioal Exposure Limits

 OR: Only Representative

 OSHA: Occupational Safety and Health Administration

 PBT: PBT: Persistent, Bioaccumulative and Toxic

 PNEC: Predicted No Effect Concentration

STEL: Short Term Exposure Limit

STOT: Specific Target Organ Toxicity

 TLV - TWA: Threshold Limit Value – Time Weighted Average

vPvB: Very persistent and very Bioaccumulative

WEL: Workplave Exposure Limit (UK HSE EH40)

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