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### 1 IDENTIFICATION OF THE SUBSTANCE / MIXTURE AND OF THE COMPANY / UNDERTAKING

- 1.1 Product Identifier:** Nickel in form of semi-finished products according to trade names.
- Product name:** 95/5 Ni Al      NI4AL      95 Ni 4 Al      Nickel Aluminum  
Contains: nickel: Index-N°: 028-002-00-7; EC-N°: 231-111-4; CAS-N°: 7440-02-0
- 1.2 Relevant identified uses of the substance or mixture and uses advised against:**
- 1.2.1 Relevant identified uses:** Elemental nickel is applied as material alloys with special corrosion resistance according to the information in the material data sheet. The different applications can be obtained from the PROC-Codes (process categories) which are listed in the "Safety Data Assessment" and/or in the Dossier of nickel.
- 1.2.2 Uses advised against:** As component of articles which are in direct contact to skin of humans such as watches, jewelry and fasteners on clothing.
- 1.3 Details of the supplier of the safety data sheet:**
- Supplier:** DURA MAX  
King of Prussia, PA 19406
- Emergency telephone number:** 1-888-426-4851 POISON CONTROL HOTLINE
- Email:** [info@duramax.net](mailto:info@duramax.net)

### 2 HAZARDS IDENTIFICATION

- 2.1 Classification of the mixture:**  
The product is placed on the market in solid form
- 2.1.1 Classification in accordance with Directive 67/548/EEC (substances) or Directive 1999/45/EC (mixtures):**  
Mixture is classified as **R40 (Carc. Cat. 3); R48/23 (Toxic); R43 (May cause sensitization by skin contact)**
- 2.1.2 Classification in accordance with Regulation (EC) No 790/2009 (1.ATP of CLP) Regulation: (EC) No 1272/2008:**  
Skin Sensitization, Cat. 1; H317  
Carcinogenicity, Cat. 2; H351  
STOT rep. exp., Cat. 1; H372
- 2.2 Label elements:**
- Labeling in accordance with Regulation (EC) No 1272/2008 (CPL Regulation)**
- Annex I segment 1.3.4.: Metals in massive form and alloys do not require a label according to this Annex, if they do not present a hazard to human health by inhalation, ingestion or contact with skin or to the aquatic environment in the form in which they are placed on the market, although classified as hazardous in accordance with the criteria of the Annex I of the CLP Regulation. Nevertheless the supplier shall provide the information to downstream users or distributors by means of the SIS.
- Hazard Pictograms:**
-  
- GHS08 GHS07
- Signal word: DANGER**
- Hazard statements:**
- H317** May cause an allergic skin reaction  
**H351** Suspected of causing cancer.  
**H372** Causes damage to organs through prolonged or repeated exposure.

**Labeling elements in accordance with Directive 67/548/EEC**

Annex VI Segment 8 (Directive 92/32/EEC): Metals in massive form and alloys do not require a label according to this Annex, if they do not present a hazard to human health by inhalation, ingestion or contact with skin or to the aquatic environment in the form in which they are placed on the market, although classified as hazardous in accordance with the criteria of the Annex I of the CLP Regulation. Nevertheless the supplier shall provide the information to downstream users or distributors by means of the SIS.

**Hazard symbol:** T      **Hazard description:** Toxic

**R-phrases:**

**R40** Limited evidence of carcinogenic effect.

**R43** May Cause sensitisation by skin contact.

**R48/23** Toxic: danger of serious damage to health by prolonged exposure by inhalation.

**S-phrases:**

**S22** Do not breathe dust.

**S36** Wear suitable protective clothing.

**2.3 Other hazards:**

Nickel metal may cause health hazards by inhalation of dusts and fumes which can occur through mechanical and thermal treatment (e.g. grinding, polishing, welding, and cutting). Prolonged or repeated skin contact may cause dermatitis to nickel-sensitized persons. By handling the product there is a risk of causing lacerations.

### 3 COMPOSITION/INFORMATION ON INGREDIENTS


**3.1 Substances:** No data available

**Chemical composition**

Product identification / name of substance: Nickel (>97% Nickel)

Index-Nº: 028-002-00-7; EC-Nº: 231-111-4; CAS-Nº: 7440-02-0

Impurities and stabilizing additives are non-existent.

Substance name	EC No.	Registr. No	67/548/EEC	Classification		Pictogram / Signal word	Conc. (%) Volume	Note
				Hazard Class and Category	Hazard statement			
<sup>1,2</sup> Nickel	231-111-4	-	Toxic Carc. Cat 3: R40 T; R48/23, R43	Carcinogenicity Carc. 2 Specific target organ toxicity--- repeated exposure STOT RE 1 Respiratory / skin sensitization Skin Sens. 1	H351 H372 H317	 Danger	> 97%	S, 7

<sup>1</sup>Substance is classified in terms of Regulation (EC) No 1272/2008 Annex VI.

<sup>2</sup>Substance with workplace exposure limits.

Note S: This substance may not require a label according to Article 17 (see section 1.3 of Annex I) (Table 3.1).

This substance may not require a label according to Article 23 of Directive 67/548/EEC (see section 8 of Annex VI to that Directive) (Table 3.2).

Note 7: Alloys containing nickel are classified for skin sensitization when the release rate of 0.5µg Ni/cm<sup>2</sup>/week, as measured by the European Standard reference test method EN 1811, is exceeded.

### 4 FIRST AID MEASURES

**4.1 Description of first aid measures:**

**Inhalation:** Remove to fresh air and keep at rest. If breathing is difficult or has stopped, administer artificial respiration as necessary. Seek medical attention.

**Skin Contact:** Wash contaminated area thoroughly with soap and water. Remove and wash contaminated clothing. If a persistent rash or irritation occurs, seek medical attention.

**Eye Contact:** Immediately flush eyes with large amounts of running water for at least 15 minutes, lifting the upper and lower eyelids. Get medical attention.

**Ingestion:** Ingestion is considered unlikely due to product form. However, if swallowed do not induce vomiting. Seek medical attention. Advice to doctor: treat symptomatically.

**4.2 Most important symptoms and effects, both acute and delayed:**

Cough and breathlessness. Allergic reaction.

**4.3 Indication of any immediate medical attention and special treatment needed.** See 4.1.

### 5 FIREFIGHTING MEASURES

**5.1 Extinguishing media:**

**Suitable extinguishing media:** Adapt measures of extinguishing to the area, Dry sand.

**Unsuitable extinguishing media: In case of major fire and large quantities: Water**

**5.2 Special hazards arising from the substance or mixture:** Fire may produce irritating or poisonous gases (Toxic fumes)

**5.3 Advice for firefighters:** In the event of fire, wear self-contained breathing apparatus and protective clothing.

### 6 ACCIDENTAL RELEASE MEASURES

**6.1 Personal precautions, protective equipment and emergency procedures:** Avoid generation of dust. Provide adequate ventilation. Avoid contact with skin & eyes.

**For non-emergency personnel:** Wear appropriate personal protective equipment as specified in Section 8. Ensure adequate ventilation.

**For emergency responders:** No data available.

**6.2 Environmental precautions:** Avoid dispersal of spilled material and contact with soil, ground and surface water drains and sewers.

**Methods and material for containment and cleaning up:** Take up mechanically. Collect the material in labeled containers and dispose of according to local and regional authority requirements.

**6.3 Reference to other sections:** See Section 7 for information of safe handling. See Section 8 for information on personal protection equipment. See Section 13 for disposal information.

### 7 HANDLING AND STORAGE

**7.1 Precautions and safe handling:** Welding may produce fumes and gases hazardous to health. Avoid breathing these fumes and gases. Use adequate ventilation. Keep away from sources of ignition. Avoid contact with skin, eyes and clothing. Do not eat, drink and smoke in work areas.

**7.2 Conditions for safe storage, including and incompatibilities:** Store in cool, dry and well-ventilated place. Keep away from incompatible materials. Keep away from heat and open flame.

**7.3 Specific end use(s):**

Nickel metal is applied as corrosion materials. The material complies with the requirements of Directive 2002/95/EC on the restriction of the use of certain hazardous in electrical and electronic equipment and of the Directive 200/53/EC on end-of-life vehicles: it is free from any additions of the hazardous substances mentioned in both Directives.

### 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

**8.1 Control parameters:**

For nickel there are no specific limit values for the workplace (AGW) in the IFA-Report 2013 (limit values list). Therefore the general dust limit value is valid for nickel.

General dust limit value	AGW (mg/m <sup>3</sup> )	
	mg/m <sup>3</sup>	Peak limit
Respirable/alveolar factor (A)	3	2(II)
Inhalable factor (E)	10	2(II)

\*The peak limit determines the level and duration of exposure. The definition of these short-term values is described in the IFA-Report 1/2013.

**8.2 Exposure controls:** Do not eat, drink and smoke. Immediately remove all contaminated clothing. Wash hands before breaks and at the end of work.

**8.2.1 Appropriate engineering controls:** Use local exhaust ventilation during all welding operations.

**8.2.2 Personal Protection:** The personal protection is depended on concentration and amount of the hazardous material.

**8.2.2.1 Eye/Face Protection:** Always wear eye protection during welding operations, helmet and /or face shield with filter lens. According to EN 166:2001 (personal eye-protection)

**Hand Protection:** Select the type of hand protection according to the kind of work to be done in order to make sure that any mechanical injury is avoided.

**Respiratory Protection:** In case the element concentration in the air at the workplace is not below the applicable OELs, use breathing filter apparatus class P3.

**Skin/Body Protection:** Wear protective clothes and boots to avoid direct contact with the material to be handled and to keep off any dust which may develop.

**8.2.3 Environmental exposure controls:** Avoid the formation of dust. Do not allow to enter sewers, surface and ground water.

## 9 PHYSICAL AND CHEMICAL PROPERTIES

### 9.1 Information on basic physical and chemical properties:

<b>Appearances:</b>	Solid (metal rod)
<b>Colour:</b>	Silver grey
<b>Odour:</b>	Not provided
<b>Odour threshold:</b>	Not applicable
<b>pH:</b>	Not applicable
<b>Melting point:</b>	1455°C
<b>Initial boiling point and boiling range:</b>	2730°C
<b>Flash point:</b>	Non-flammable
<b>Inflammability (solid, gas):</b>	Not applicable
<b>Upper/lower flammability or explosive limits:</b>	Not applicable
<b>Vapour pressure:</b>	1 mm Hg at 1810°C
<b>Vapour density:</b>	Not applicable
<b>Relative density:</b>	8.91 g/cm <sup>3</sup> (at 20°C)
<b>Solubility(ies)</b>	Nickel metal powder: insoluble in cold and hot water; massive metal: not applicable.
<b>Partition coefficient: n-octanol/water:</b>	Not applicable
<b>Self-ignition point:</b>	Not applicable
<b>Decomposition temperature:</b>	Not applicable
<b>Viscosity:</b>	Not applicable
<b>Explosive properties:</b>	Non-explosive
<b>Oxidizing properties:</b>	Non-oxidizing

**9.2 Other information:** Other physical and chemical properties can be obtained from product data sheet.

## 10 STABILITY AND REACTIVITY

**10.1 Reactivity / Chemical stability:** The product is stable under normal conditions. When using it may produce dangerous fumes and gases.

**10.2 Possibility of hazardous reactions:** Contact with certain acids may result in the release of gaseous acid decomposition products (e.g. hydrogen)

**10.3 Conditions to avoid:** not applicable

**10.4 Incompatible materials:** Oxidizing agents.

**10.5 Hazardous decomposition products:** No dangerous decomposition products are known. Welding fumes, gases and dust may occur through treatment of the metal.

### 11 TOXICOLOGICAL INFORMATION

#### 11.1 Information on toxicological effects:

The following values refer to metal ions of the pure metal (unless otherwise indicated).

**Acute toxicity:**

**Oral:** The acute oral toxicity of nickel metal has been determined in a well-performed animal study which concluded the acute oral LD50 was greater than >9000 mg/kg bw/day (LD50(oral)>9000 mg/kg bw/day), LOAEL=0.012 mg Ni/kg/day (FDRL 1983).

**Dermal:** No studies have been found on acute toxicity by the dermal route.

**Inhalation:** Acute inhalation toxicity information is inconclusive due to methodological deficiencies in available studies. However, due to the expected poor absorption of nickel via inhalation of nickel metal, further testing is not considered relevant. NOAEC=10.2 mg Ni/L air; Rat, single dose, 1h, (FDRL 1985).

**Irritation/Corrosivity skin/eye:** No relevant or reliable human studies were identified for skin irritation. Not irritating and no concern for corrosive effects.

**Sensitization respiratory tract:** The available data is not considered sufficient for classification as a respiratory sensitizer.

**Skin sensitization:** May cause sensitization by skin contact. Nickel is a causer of allergic reactions (dermatitis).

**Mutagenicity in vitro/in vivo:** no reliable in vivo or human studies were identified.

**Carcinogenicity:** Nickel metal carries a classification as a suspect carcinogen. It is classified as a Category 3, R40 carcinogen under EU Classification & Labelling; Category 2, H351 carcinogen under GHS and CLP; and Group 2B carcinogen (possible human carcinogen) by IARC (1990). These classifications were based on the lack of human evidences of carcinogenicity, but the presence of positive results for tumor induction in animals after injection or intratracheal instillation. Nickel metal has been consistently negative for respiratory carcinogenicity in human studies and was also negative in a recent animal inhalation study (Oller et al. 2008). At the manufacture of nickel from his ores occur nickel sulphides and -oxides which are demonstrable carcinogen in combination. However it was not possible to identify the cancer-causing agents.

**Reproductive toxicity:** Data from a reproductive toxicity study with nickel sulphate hexahydrate (SLI, 2000) combined with toxicokinetic data (Ichimatsu et. Al 1995) provides sufficient justification that metal should not be considered a reproductive toxicant.

**Specific target organ toxicity (STOT) – single exposure:** No relevant or reliable human studies.

**Specific target organ toxicity (STOT) – repeated exposure:**

Oral: NOAEL: 2.2mg Ni/kg bw/day (Read across from nickel sulphate hexahydrate, Rat, 2-year study, SLI 2000). Inhalation: LOAEC: 0.1 mg Ni/m<sup>3</sup> air (Rat, 2-year study, Oller et al. 2008).

**Danger of aspiration:** No relevant or reliable human studies.

### 12 ECOLOGICAL INFORMATION

**12.1 Toxicity:** Non-hazardous. Nickel metal is solid, compact and not soluble in water.

**12.2 Persistence and degradability:** For an inorganic substance, biotic degradation in the environment is not a relevant process.

**12.3 Bioaccumulative potential:** No data available.

**12.4 Mobility in soil:** Though nickel does bioaccumulate in aquatic biota, the bioaccumulation factors are generally low and apparently nickel does not become magnified along food chains (McGeer et al. 2003).

**12.5 Results of PBT and vPvB assessment:** The PBT and vPvB criteria of Annex XIII to the Regulation do not apply to inorganic substances.

**12.6 Other adverse effects:** In Germany nickel metal is classified as water hazard class 2 (except alloys).

### 13 DISPOSAL CONSIDERATIONS

**13.1 Valorization methods:** Nickel should be recycled.

**Used packaging cleaning, treatment, destruction procedures:** Destruction of packaging in accordance with applicable legislation.

**Disposal code:** Not applicable.

**Special precautions:** Not applicable.

**Relevant EU- or other regulations:** Not applicable

### 14 TRANSPORT INFORMATION

**14.1 ADR/RID/ADN:** The mixture is not subject to international regulations on transport of dangerous goods.

<b>UN number:</b>	Not applicable
<b>UN proper shipping name:</b>	Not applicable

<b>Transport hazard class(es)</b>	Not applicable
<b>Packing group:</b>	Not applicable
<b>Environmental hazards:</b>	Not applicable
<b>Special precautions for user:</b>	Not applicable
<b>Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code:</b>	Not applicable

### 15 REGULATORY INFORMATION

#### 15.1 Safety, health and environmental regulations/legislation for the substance or mixture:

There are restrictions for nickel under Title VIII of REACH Regulation.

**Annex XVII to Regulation (EC) No 1907/2006 - Restriction on manufacture, placing on the market and use of certain dangerous substances, mixtures and articles:**

**Nickel CAS No 7440-02-0 EC No 231-111-4 and its compounds:**

**1. Shall not be used: (a) in any post assemblies which are inserted into pierced ears and other pierced parts of the human body unless the rate of nickel release from such post assemblies is less than 0,2 µg/cm<sup>2</sup> /week (migration limit); (b) in articles intended to come into direct and prolonged contact with the skin such as: — earrings, — necklaces, bracelets and chains, anklets, finger rings, — wristwatch cases, watch straps and tighteners, — rivet buttons, tighteners, rivets, zippers and metal marks, when these are used in garments, if the rate of nickel release from the parts of these articles coming into direct and prolonged contact with the skin is greater than 0,5 µg/cm<sup>2</sup> / week. (c) in articles referred to in point (b) where these have a non-nickel coating unless such coating is sufficient to ensure that the rate of nickel release from those parts of such articles coming into direct and prolonged contact with the skin will not exceed 0,5 µg/cm<sup>2</sup> / week for a period of at least two years of normal use of the article.**

**2. Articles which are the subject of paragraph 1 shall not be placed on the market unless they conform to the requirements set out in that paragraph.**

**3. The standards adopted by the European Committee for Standardization (CEN) shall be used as the test methods for demonstrating the conformity of articles to paragraphs 1 and 2.**

Corrigendum to Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC (OJ L 396, 30.12.2006);

Corrigendum to Directive No 2006/121/EC of the European Parliament and of the Council of 18 December 2006 amending Council Directive 67/548/EEC on the approximation of laws, regulations and administrative provisions relating to the classification, packaging and labeling of dangerous substances in order to adapt it to Regulation (EC) No 1907/2006 concerning the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH) and establishing a European Chemicals Agency (OJ L 396, 30.12.2006);

Regulation (EC) No 1272/2008 of the European parliament and the Council of 16 December 2008 on classification, labeling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006 (OJ L 353, 31.12.2008).

COMMISSION REGULATION (EC) No 790/2009 of 10 August 2009 amending, for the purposes of its adaptation to technical and scientific progress, Regulation (EC) No 1272/2008 of the European Parliament and the Council on classification, labeling and packaging of substances and mixtures.

COMMISSION REGULATION (EC) No 453/2010 of 20 May 2010 amending Regulation (EC) No 1907/2006 of the European Parliament and of the Council on Registration, Evaluation, Authorization and Restriction of Chemicals (REACH).

**15.2 Chemical safety assessment:** Chemical safety assessment is not available.



### 16 OTHER INFORMATION

#### 16.1 List of relevant risk phrases and hazard statements:

**R40 Limited evidence of a carcinogenic effect.**

**R43 May cause sensitization by skin contact.**

**R48/23 Toxic: danger of serious damage to health by prolonged exposure through inhalation.**

**H317 May cause an allergic skin reaction.**

**H351 Suspected of causing cancer.**

**H372 Causes damage to organs through prolonged or repeated exposure.**

**16.2 Instructions for the training:** Product handling instruction shall be included into the educational system about the safety work (initial training, training at the workplace, repeated training) according to specific conditions at the workplace.

**16.3 Recommended restrictions on use (i.e. non-statutory recommendations by supplier):** Mixture should not be used for any other purpose than for which is appointed (point 1.2). Because of the fact that specific conditions of use of mixture are out of supplier's control, it is responsibility of the user to adjust the prescribed warnings to local laws and regulations. Safety information describes the product in terms of safety and it cannot be considered as technical information about product.

**16.4 Sources of key data used to compile the Safety Data Sheet:** SDS was prepared using data from producer.

**16.5 Purpose of SDS:** Purpose of this SDS is to provide relevant information for users of product to ensure proper handling and control of risks/hazards.

References:

**GERMANY:** Unfallverhütungsvorschrift BGV D1 , "Schweißen, Schneiden und verwandte Verfahren".

**U.S.A.** American National Standard Z49.1 "Safety in Welding and cutting" , American Welding Society, 550 North Le Jeune Road P.O. Box 351040 MIAMI, FL 33135 U.S.A. ACGIH: Threshold Limits Values and Biological Exposure Indices 6500 Glenway Ave., Cincinnati Ohio 45211 U.S.A.

**U.K.** WMA Publication 236 and 237, "Hazards from Welding fume" , "The welder at work, some general aspects of health and safety" , available from the manufacturer

**CANADA** CSA Standard CAN/CSA-W117.2-01 "Safety in welding and cutting"

#### 16.6 Other References:

- 1) Nickel RRS Draft Final Report, March 2008.
- 2) European Union Risk Assessment Report Nickel, 30.May 2008, Denmark.
- 3) Chemical Safety Report Nickel, March 2010.
- 4) IFA Report 1/2013, List of limit values 2013, Institute for Occupational Safety and Health of the German Social Accident Insurance (IFA), March 2013.
- 5) IFA Report 1/2012, List of hazardous substances 2012, Institute for Occupational Safety and Health of the German Social Accident Insurance (IFA), July 2012.
- 6) BGI/GUV-I 504-38 March 2009.
- 7) Bundesgesundheitsblatt Gesundheitsforschung und Gesundheitsschutz 44 (2001) 12, 1243-1248.
- 8) GESTIS-database on hazardous substances, Information system on hazardous substances of the German Social Accident Insurance.
- 9) European Chemical Substances Information System, European Commission Joint Research Centre.

#### 16.7 Regulations:

Directive 2000/53/EC Directive 2002/95/EC

Directive 2008/58/EC Directive 67/548/EEC

Regulation (EC) N° 1272/2008 (CLP Regulation)

Regulation (EC) N° 1907/2006 (REACH Regulation)

Regulation (EG) N° 790/2009 (1.ATP of the CLP Regulation)

Regulation (EU) N° 453/2010

VwVwS 2005 (Administrative Regulation on the Classification of Substances hazardous to waters into Water Hazard Classes)

### 16.8 List of Acronyms:

- ADR** – European Agreement concerning the International Carriage of Dangerous Goods by Road
- BAT** – Biological tolerance values
- BGIA** – Institute of Occupational Safety and Health
- Bw** – Bodyweight
- Carc.** –Carcinogenicity
- Cat.** – Category
- CLP** – Regulation on Classification, Labelling and Packaging of Substances and Mixtures (EU)
- FDRL** – Food and Drug Research Laboratory
- GHS** – Globally Harmonized System of Classification, Labelling and Packaging of Chemicals
- GUV** – Statutory accident insurance
- LD50** – Median lethal dose (Dose at which 50% of subjects will die)
- LOAEL** – Lowest Observable Adverse Effect Level (lowest dose which causes an harmful effects)
- MAK** – Maximum concentration of a chemical substance in the workplace
- NOAEC** – No Observable Adverse Effect Concentration (maximum concentration which causes no harmful effects)
- OEL** – Occupational exposure limits
- SLI** – Springborn Laboratories, Inc., Spencerville, Ohio
- STOT rep. exp.** – Specific target organ toxicity - repeated exposure
- TRGS** – Technical Rules of Hazardous Substances
- TRK** -Technical guidance concentrations
- UBA** – Federal Environmental Agency

The data supplied in this form are based on the information in our possession at the date of updating. We will assume no liability regarding the accuracy and completeness of the information. All chemical products can in fact present unknown risks to health, safety and / or the environment, even in relation to the different operating conditions, and they must therefore be used with care. For this reason we cannot guarantee that the risk described in this form are the only foreseeable risks. The user must therefore satisfy himself as to the particular conditions under which it is intended to be use in. Moreover, it must be noted that the user is obliged to comply with all the legislative, administrative and regulatory provisions regarding the product and its use in terms of occupational hygiene and safety, and environmental protection, apart from the information given in the form, given purely as guidance. **Technical Department**