

SAFETY INFORMATION SHEET FOR NICKEL ALLOY

1. INTRODUCTORY INFORMATION

Outokumpu nickel alloy products are considered as articles under the European Regulation (EC) 1907/2006, concerning the Registration, Evaluation, Authorisation, and Restriction of Chemicals (REACH), a position adopted by Outokumpu.

In accordance with REACH and the European Regulation (EC) 1272/2008 on Classification, Labelling, and Packaging of substances and mixtures (CLP), only substances and preparations require a Safety Data Sheet (SDS). While articles under REACH do not require a classic SDS, REACH Article 32 requires articles to be accompanied by sufficient information to permit safe use and disposal. In order to comply with this requirement, Outokumpu provides this Safety Information Sheet (SIS) with information on the safe use of the nickel alloys and their potential impact on both human health and environment (1,2).

2. ARTICLE DATA

2.1. Article name and description

Nickel alloys are utilized in applications requiring corrosion, heat, and creep resistance. Outokumpu nickel alloy products include hot and cold rolled alloy products like plate, sheet, strip, bar, rod, wire rod, and cold drawn wire.

2.2. Article supplier

Outokumpu

For regional contacts see our web page: www.outokumpu.com

E-mail: stainless.info@outokumpu.com

2.3. Article composition:

Table 1. Outokumpu nickel alloys. Composition is approximate and given in weight percentages.

Grade	EN	UNS	Fe	C	Cr	Ni	Mo	Mn	Ti	Al	Si	Cu
Ultra Alloy 825	2.4858	N08825	30	0.02	23	42	3	0.8	1		0.4	2
Therma Alloy 800	1.4876	N08800	45	0.04	21	31		0.5	0.4	0.3	0.5	
Therma Alloy 800H/HT	1.4958/ 1.4959	N08810/ N08811	45	0.08	21	31		0.5	0.5	0.4	0.5	

Other elements such as Nitrogen (N), Phosphorus (P), Boron (B) and Sulphur (S) may be present in controlled amounts. Due to the natural origin of the material also some elements that have not been

intentionally added may be present as impurities. The concentration of cobalt typically ranges from 0.01 % to 0.5 %.

2.4. Article physical and chemical properties:

- Physical state: solid
- Colour: silver-grey
- Odour: odourless
- Density: 7.9 – 8.8 g/cm³
- Melting point: 1,300 to 1,520°C
- Water solubility: Insoluble

Nickel alloys are stable and non-reactive under normal ambient atmospheric conditions, because in solid form all alloying elements are firmly bonded in the metallic matrix. Solid nickel alloys do not contain Cr (VI) compounds. When heated to very high temperatures (melting or during welding operations), fumes may be produced.

3. GENERAL INFORMATION ON THE SAFE USE OF NICKEL ALLOY PRODUCTS

Nickel alloy is a term used to describe a versatile family of engineering materials, which are selected primarily for their corrosion and heat resistant properties. Nickel alloys typically contain a minimum of 30% nickel and other chemical elements such as chromium, molybdenum, copper, aluminium, titanium, carbon and nitrogen may be added to further increase corrosion and heat resistance.

The alloying elements in nickel alloys are firmly bonded in its chemical matrix. Due to this bonding the release of any of the constituents is very low and negligible when the alloy is used appropriately.

Nickel alloys are generally applied where safety is of utmost importance in high temperature and highly corrosive environments (e.g. piping in chemical and petrochemical industry, nuclear power systems and furnaces).

4. SAFETY INFORMATION

4.1. Description of Hazards

In accordance with (EC) Regulations 1272/2008 (CLP) and 790/2009 (ATP 1), nickel is classified as a Carcinogen Category 2 by inhalation, Specific Target Organ Toxicity Repeated Exposure 1 (STOT RE1) and Skin Sensitizer 1. Cobalt is classified as a Skin Sensitizer 1, Respiratory Sensitizers 1 (if inhaled) and Aquatic Chronic 4.

Normally there are no hazards to man or environment from alloys in the massive form in which they are supplied. However, people who are already sensitised to nickel may get an allergic dermatological reaction (3). Prolonged and direct skin contact is not recommended for nickel sensitised persons. Dust and fumes may be generated during some processing, for example welding, cutting and grinding. Excessive concentrations of dust and fume may affect worker's health, primarily of the lungs.

Due to the non-hazardous nature of the alloy in massive form labelling is not required.

4.2. Specific process and exposure controls

Specific occupational exposure limits have been established for some constituent elements and compounds. Users of this Safety Information Sheet are strongly advised to refer to the occupational exposure limits set by their EU Member State for the substances in nickel alloys and, where relevant, welding fumes.

In processing the material, it is necessary to assess the need for personal protection equipment and respiratory protection should be provided for workers at risk of inhalation (e.g. welding, cutting and grinding processes). Suitable hand and eye protection should be worn where there is a risk of laceration and flying particles.

The process of welding should only be performed by trained workers with the personal protective equipment in accordance with the laws of each Member State relating to safety. Guidance on the welding of metals and alloys is provided on the European Welding Association website (4). The guidance document will provide background information on health hazards posed by welding processes and appropriate risk management measures.

4.3 First Aid Measures

There are no specific First Aid Measures developed for the nickel alloy. Medical attention should be provided in case of an excessive inhalation of dust or a physical injury to the skin or to the eyes. Nickel alloy particles are non-magnetic and may not respond to a magnet placed over the eye.

4.4 Handling and Storage

There are no special measures for handling nickel alloys. Normal precautions should be taken to avoid physical injuries produced mainly by sharp edges. Personal protective equipment must be used e.g. special gloves and eye protection.

Care should be taken to avoid exposing fine process dust (e.g. from grinding and blasting operations) to high temperatures as it may present a potential fire hazard.

4.5 Uses

Nickel alloys are present in a wide variety of activities. Main use areas include industrial processes, aviation, petrochemical processes and high temperature piping or furnace applications.

5. ENVIRONMENTAL INFORMATION

There are no hazards to the environment from nickel alloys in the forms supplied. Nickel alloys are part of an integrated life cycle and it is a material that is 100% recyclable. Thus, surplus and scrap (waste) nickel alloy is valuable and in demand for the production of prime new nickel alloy.

Recycling routes are well-established, and recycling is therefore the preferred disposal route. While disposal to landfill is not harmful to the environment, it is a waste of resources and therefore to be avoided for the benefit of recycling.

REFERENCES

1. Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)
2. Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures
3. EN 1811:2011+A1:2015 Standard: Reference test method for release of nickel from all post assemblies which are inserted into pierced parts of the human body and articles intended to come into direct and prolonged contact with the skin (test for measuring Ni release in artificial sweat)
4. http://www.european-welding.org/wp-content/uploads/2016/10/Communication-statements_july_2010.pdf

Information given in this data sheet may be subject to alterations without notice. Care has been taken to ensure that the contents of this publication are accurate but Outokumpu and its affiliated companies do not accept responsibility for errors or for information which is found to be misleading.

Suggestions for or descriptions of the end use or application of products or methods of working are for information only and Outokumpu and its affiliated companies accept no liability in respect thereof. Before using products supplied or manufactured by the company the customer should satisfy himself of their suitability.