

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

#### 1.1. Product identifier

Product form	: Article
Trade name	: Nickel Based Alloys
Other means of identification	: 2.4813, 2.4879, 247EQ LOW HF, 247LC, 50Ni50Cr, 625, 713C Type, 718 PLUS, 718LN, A56, ABD-1050CC, ABI M247 LC, AEROLLOY 12Y, AIR319, ALLOY 1, ALLOY 145, ALLOY 186LC, ALLOY 2, ALLOY 21NA3, ALLOY 247DS, ALLOY 247EQLC, ALLOY 247LC, ALLOY 24LC DS, ALLOY 3, ALLOY 540, ALLOY 59, ALLOY 718, ALLOY A, ALLOY B, ALLOY C, ALLOY C-7, ALLOY M, ALLOY M18, ALLOY M200, ALLOY M300, ALLOY STM, ALLOY T, ALLOY1411, ALLOY142, ALLOY 143, ALLOY247LC, AM1, AM3, AMS 5383, AMS 5388, AMS 5390, AMS5596, ANC 18C, ANC 8, ANC 9, ANC 16, ANC18A, ANC19, ANC8, B1900, B1900+HF, B1914, BLENDALLOY, BLENDALLOY CSS340, BZL-12Y, C 1023, C 263, C101, C1023, C242, C263, C5-2, C7, C7-25, CA No.1, CAR 5, CGT 100, CHS 104, CHS70, CHS88U, CM-104, CM247LC, CM-648, CM-88Y, CMS 2200, CMS2100, CMS2400, CN1, CN2, CN3, CN4, CN5, CN6, CPW 1019, CW12MC, CW6MC, D-247, D-713C, DA-5141, DA-5161, DA-5170, DA-5320, DK 11, DK 12, DK001, DK002, DK003, DK004, DK005, DK006, DK-10, DK-13, DK-14, DK-15, DK-7, DK-8, DK-9, DMP-3, DMP-5, DS200, DS200+HF, DSGTD100, DT706, ECT-1, ECT-2, ECT-3, ECT-4, ECT-5, ECT-6, Edge 15ULS, Edge 14a,, EEQ111, EEQ222, EK9-V1, EMS 55371, EMS 55440, EMS 55445, EMS 73646, EP 539, EQ 111, ERB02, FeNi48, G39, GARRETT 100+, GMR235, G-NICR50NB, GTD111, GTD141, GTD141+, GTD157, GTD222, GTD241, GTD262, GTD444, GTD741, HAST C, HAST D, HAST X, HASTELLOY C, HASTELLOY C22, HASTELLOY C276, HASTELLOY C4, HASTELLOY X, HAYNES 230, HGTM-4, IC-247 LC, IM-247LC, IN713 LC, IN718, IN792, IN792 MOD 5A, IN100, IN6203DS, IN625, IN706, IN713C, IN713LC, IN718, IN738C, IN738LC, IN792, IN792+HF, IN792 MOD5A, IN792-5A, IN792SX, IN939, IN939 (SWPC), IN939 MOD, INC625, INC100, INCO 718, INCO 798, INCO 939, INCO713C, INCO738, INCO738LC, INCONEL 100, INCONEL 610, INCONEL 625, INCONEL 713, INCONEL 718, INCONEL 792, INCONEL 939, ITPDS-1, K2-A, K2-A2, K2-A3, KS-A4, K435, KH/8, KM-15, KM-16, KM-17, KM-18, LDSX1, LDSX 2, LDSX 3, LDSX 4, LDSX 5, LDSX 6, LDSX 7, L;DSX 8, M1, M247, M247LC, M35-1, MAR M 002, MAR M 247, MARM M 247LC, MAR M 421, MAR M002, MAR M246, MAR M247, MARM 002, MARM 247, MARM002, MARM002 DS, MARM200, MARM200+HF, MARM246, MARM247, MARM247LC, MD2, MGA1400, ML-103, MM002, MM247, MM247LC, MSRR 7138, MSRR 7169, MSRR 7184, MSRR 7242, MSRR7040, MSRR7044, MSRR7045, MSRR7046, MSRR7048, MSRR7080, MSRR7101, MSRR7125, MSRR7132, MSRR7133, MSRR7150, MSRR7169, MSRR7173, MSRR7198, MSRR7201, MSRR7210, MSRR7217, MSRR7225, MSRR7228, MSRR7239, MSRR7257, MSRR7268, MSRR7277, MSRR7286, MTS1733A, N115, N18, N4, N500, N-7M, N90, NC22FeD, NCK20D, NI 46, NICKEL ALLOY 625, NICKEL ALLOY 718, NiCo15Cr10AlTi, NiCr21Mo14W, NICROTUNG, NILO 475, NIM 80, NIMOCAST 75, NIMOCAST 80, NIMOCAST 90, NIMONIC105, NIMONIC 115, NIMONIC 80, NIMONIC90, NIMONIC C242, NITA, NITI, NK10CWATATD, NK15 CATD, NK15CADT, NTA8CKWA, NW12KCA, NW12KCA+Hf, PD16, PD21, PE10, PERMALLOY B, PN 052V, PN052-1, PN189, PN193, PN194, PSM 116, PSM100, PSM-109, PSM-116, PWA1480, PWA655, R80LZR, RCV09, RCV11, RENE 108, RENE 125, RENE 142, RENE 41, RENE 77, RENE 80, RENE ML103, RENE N2, RENE N4, RENE N5, RENE N500, RENE N515, RENE N636, RENE100, RENE108, RENE125, RENE142, RENE220, RENE41, RENE77, RENE80, RM-3, RR1000, RR1005, RR2000, RRMS33017, RRMS33023, SC2000, SC-4, SC-5, SC-6, SCA425, SCA425+, SEL 1, SM111, SM222, SRR99, STAL 125, STAL 135, STAL 15, STAL 18, STAL 185, STAL 125, STAL 125CC1, STAL 125SX, STAL 13, STAL 13D, STAL 15AM, STAL 15CC, STAL 15SX, STAL 16L, STAL 18, SUPERALLOY, SX 4, SX-16, SX-3, SX4, SX-4, SX6, SX-6, T2, T3, T4, T5, T6, TM321, TMD K37, TMD 103, TMS 244, TMS 82+, TMS1001, TMS1002, TMS1003, TMS1004, TMS238, TMS244, TMS-6, TMS-6-K1, TMS-75, U500, U520, U720, UDIMET 500, USC800, VIM BZL-12Y, VIM IN718, VIM M247LC, VZHL 14-VI, W12MW, WASPALLOY, XH56, XH62, ZS6K, ZS6KW, ZS6U

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## Safety Data Sheet

According to REACH Regulation (EC) No 1907/2006, as retained and amended in UK law.

### 1.2. Relevant identified uses of the substance or mixture and uses advised against

#### 1.2.1. Relevant identified uses

Use of the substance/mixture : Cast ingots and billets at varying weights and dimensions. Ingots and billets are sold and distributed to downstream processors who remelt the superalloys into products used within aerospace and power generation turbine components.

#### 1.2.2. Uses advised against

Restrictions on use : None known

### 1.3. Details of the supplier of the safety data sheet

Ross & Catherall  
Forge Lane  
S21 1BA Killamarsh – Sheffield  
United Kingdom  
T +44 0114 248 6404  
[rossandcatherall.com/contact](http://rossandcatherall.com/contact)

### 1.4. Emergency telephone number

Emergency number : +44 0114 248 6404 ext 345

Country/Area	Organisation	Emergency number
United Kingdom	National Poisons Information Service (Birmingham Centre). City Hospital. Dudley Road B18 7QH.	0344 892 0111 Only for healthcare professionals

## SECTION 2: Hazards identification

### 2.1. Classification of the substance or mixture

#### Classification according to GB CLP (SI 2019:720 as amended)

Respiratory sensitisation, Category 1 H334  
Skin sensitisation, Category 1 H317  
Germ cell mutagenicity, Category 2 H341  
Carcinogenicity, Category 1B H350  
Reproductive toxicity, Category 1B H360F  
Specific target organ toxicity – Repeated exposure, Category 1 H372  
Full text of H- and EUH-statements: see section 16

#### Adverse physicochemical, human health and environmental effects

May cause cancer. Suspected of causing genetic defects. May damage fertility or the unborn child. Causes damage to organs through prolonged or repeated exposure. May cause an allergic skin reaction. Causes serious eye irritation. May cause allergy or asthma symptoms or breathing difficulties if inhaled.

### 2.2. Label elements

#### Labelling according to GB CLP (SI 2019:720 as amended)

Hazard pictograms (GB CLP) :



GHS08

Signal word (GB CLP) :

Danger

Contains :

Nickel; Cobalt

Hazard statements (GB CLP) :

H317 - May cause an allergic skin reaction.

H334 - May cause allergy or asthma symptoms or breathing difficulties if inhaled.

H341 - Suspected of causing genetic defects.

H350 - May cause cancer (inhalation).

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Precautionary statements (GB CLP)	H360F - May damage fertility. H372 - Causes damage to organs through prolonged or repeated exposure. : P201 - Obtain special instructions before use. P202 - Do not handle until all safety precautions have been read and understood. P260 - Do not breathe dust. P264 - Wash hands, forearms 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.
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### 2.3. Other hazards

Other hazards which do not result in classification : This product is not hazardous in the form in which it is shipped by the manufacturer. The hazards listed above are only present during processes which generate dust (cutting, grinding, polishing, demolishing, etc). Preventative exposure and necessary precautions to airborne particulates of dust must be taken.

### Results of PBT and vPvB assessment

This substance does not meet the PBT criteria of UK REACH regulation, annex XIII

This substance does not meet the vPvB criteria of UK REACH regulation, annex XIII

Component	
Substance(s) not meeting the PBT criteria of UK REACH regulation, in accordance with Annex XIII	Nickel (7440-02-0), Chromium (7440-47-3), Molybdenum (7439-98-7), Titanium (7440-32-6), Cobalt (7440-48-4), Tungsten (7440-33-7), Rhenium (7440-15-5), Aluminium (7429-90-5), Tantalum (7440-25-7), Iron (7439-89-6)
Substance(s) not meeting the vPvB criteria of UK REACH regulation, in accordance with Annex XIII	Nickel (7440-02-0), Chromium (7440-47-3), Molybdenum (7439-98-7), Titanium (7440-32-6), Cobalt (7440-48-4), Tungsten (7440-33-7), Rhenium (7440-15-5), Aluminium (7429-90-5), Tantalum (7440-25-7), Iron (7439-89-6)

### Results of Endocrine Disruptor assessment

The substance is not included in the list established in accordance with Article 59(1) of UK REACH for having endocrine disrupting properties, or is not identified as having endocrine disrupting properties in accordance with the criteria set out in GB BPR and GB PPP

Component	
Substance(s) not considered as endocrine disrupting. They are not included in the list established in accordance with Article 59(1) of UK REACH for having endocrine disrupting properties, nor identified as having endocrine disrupting properties in accordance with the criteria set out in GB BPR and GB PPP	Nickel(7440-02-0), Chromium(7440-47-3), Iron(7439-89-6), Molybdenum(7439-98-7), Aluminium(7429-90-5), Tungsten(7440-33-7), Tantalum(7440-25-7), Rhenium(7440-15-5), Titanium(7440-32-6), Cobalt(7440-48-4)

## SECTION 3: Composition/information on ingredients

### 3.1. Substances

Not applicable

### 3.2. Mixtures

Name	Product identifier	%	Classification according to GB CLP (SI 2019:720 as amended)
Nickel substance with workplace exposure limit(s)	CAS-No.: 7440-02-0 EC-No.: 231-111-4	45 – 100	Skin Sens. 1, H317 Carc. 2, H351 STOT RE 1, H372
Chromium substance with workplace exposure limit(s)	CAS-No.: 7440-47-3 EC-No.: 231-157-5	15 – 40	Not classified
Iron	CAS-No.: 7439-89-6 EC-No.: 231-096-4	0.1 – 40	Not classified

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Name	Product identifier	%	Classification according to GB CLP (SI 2019:720 as amended)
Molybdenum	CAS-No.: 7439-98-7 EC-No.: 231-107-2	0.1 – 30	Not classified
Aluminium	CAS-No.: 7429-90-5 EC-No.: 231-072-3	0.1 – 18	Aquatic Acute 1, H400 (M=1)
Tungsten substance with workplace exposure limit(s)	CAS-No.: 7440-33-7 EC-No.: 231-143-9	0.1 – 15	Not classified
Tantalum substance with workplace exposure limit(s)	CAS-No.: 7440-25-7 EC-No.: 231-135-5	0.1 – 15	Not classified
Rhenium	CAS-No.: 7440-15-5 EC-No.: 231-124-5	0.1 – 8	Aquatic Chronic 3, H412
Titanium	CAS-No.: 7440-32-6 EC-No.: 231-142-3	0.1 – 7	Not classified
Cobalt substance with workplace exposure limit(s)	CAS-No.: 7440-48-4 EC-No.: 231-158-0	0.1 – 5	Acute Tox. 4 (Oral), H302 (ATE=550 mg/kg bodyweight) Eye Irrit. 2, H319 Resp. Sens. 1, H334 Skin Sens. 1, H317 Muta. 2, H341 Carc. 1B, H350 Repr. 1B, H360F STOT RE 1, H372 Aquatic Chronic 4, H413

Comments : The concentration ranges are provided due to batch-to-batch variability.  
Full text of H- and EUH-statements: see section 16

## SECTION 4: First aid measures

### 4.1. Description of first aid measures

First-aid measures general	: In the finished material form, no special first aid measures are required. The following first aid measures must be followed during any process generating dust. First aider: Pay attention to self-protection. Never give anything by mouth to an unconscious person. If exposed or concerned: Get medical advice/attention.
First-aid measures after inhalation	: If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing. If the victim is unconscious: Lay in a stable manner on victim's side. If experiencing respiratory symptoms: Call a poison center or a doctor.
First-aid measures after skin contact	: Take off contaminated clothing. Wash skin with plenty of water. If skin irritation or rash occurs: Get medical advice/attention. Wash contaminated clothing before reuse.
First-aid measures after eye contact	: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.
First-aid measures after ingestion	: Rinse mouth. Do NOT induce vomiting. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Call a poison center or a doctor if you feel unwell.

### 4.2. Most important symptoms and effects, both acute and delayed

Symptoms/effects after inhalation	: If dust are formed : May cause allergy or asthma symptoms or breathing difficulties if inhaled.
Symptoms/effects after skin contact	: If dust are formed : May cause an allergic skin reaction. Risk of thermal burns on contact with molten product.
Symptoms/effects after eye contact	: Not expected to present a significant eye contact hazard under anticipated conditions of normal use. If dust are formed : Stinging, redness, itching, tears, blurred vision, swelling.

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Symptoms/effects after ingestion	: Not expected to present a significant ingestion hazard under anticipated conditions of normal use. If dust are formed : Ingestion may cause nausea and vomiting, Gastrointestinal disturbances.
Chronic symptoms	: Suspected of causing genetic defects. May cause cancer. May damage fertility or the unborn child. Causes damage to organs through prolonged or repeated exposure.

### 4.3. Indication of any immediate medical attention and special treatment needed

Treat symptomatically.

## SECTION 5: Firefighting measures

### 5.1. Extinguishing media

Suitable extinguishing media	: Metal fire powder. Sand.
Unsuitable extinguishing media	: Do not use a heavy water stream.

### 5.2. Special hazards arising from the substance or mixture

Fire hazard	: No fire hazard.
Explosion hazard	: Warning. May form explosive dust-air mixture if small particles are generated during further processing, handling, or by other means.
Hazardous decomposition products in case of fire	: Toxic fumes may be released. Metallic oxides.

### 5.3. Advice for firefighters

Firefighting instructions	: Fight fire from safe distance and protected location. Do not enter fire area without proper protective equipment, including respiratory protection. Move containers from fire area if it can be done without personal risk. Use extinguishing media appropriate for surrounding fire. Prevent fire fighting water from entering the environment.
Protection during firefighting	: Do not attempt to take action without suitable protective equipment. Self-contained breathing apparatus. Complete protective clothing.

## SECTION 6: Accidental release measures

### 6.1. Personal precautions, protective equipment and emergency procedures

General measures	: Avoid all personal contact including breathing in the dust. Do not take actions involving personal risks. Absorb spillage to prevent material damage. Notify authorities if product enters sewers or public waters.
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#### 6.1.1. For non-emergency personnel

Protective equipment	: Wear recommended personal protective equipment.
Emergency procedures	: Evacuate the danger area. If outdoors, move to an area upwind of the danger area. Do not breathe fume, dust. If possible without taking personal risks, remove ignition sources, ventilate area. Prevent other non-emergency personnel from entering the danger area.

#### 6.1.2. For emergency responders

Protective equipment	: Wear the recommended personal protective equipment. For further information refer to section 8: "Exposure controls/personal protection".
Emergency procedures	: Evacuate personnel to a safe area. Ventilate spillage area.

### 6.2. Environmental precautions

Avoid release to the environment. Notify authorities if product enters sewers or public waters.

### 6.3. Methods and material for containment and cleaning up

For containment	: Using a clean shovel, put the material in a dry container and cover without compressing it.
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According to REACH Regulation (EC) No 1907/2006, as retained and amended in UK law.

Methods for cleaning up : Take up mechanically (sweeping, shovelling) and collect in suitable container for disposal. Avoid creating or spreading dust. Contaminated absorbent material may pose the same hazard as the spilled product. Decontaminate surfaces and equipment with water and detergent. Until a sufficient level of dilution is achieved, the decontamination water may pose the same hazards as the product. Dispose of collected material as soon as possible in accordance with applicable local/regional/national/international regulations. Notify authorities if product enters sewers or public waters.

### 6.4. Reference to other sections

For further information refer to section 8: "Exposure controls/personal protection". For further information refer to section 13.

## SECTION 7: Handling and storage

### 7.1. Precautions for safe handling

Precautions for safe handling : Ensure good ventilation of the work station. Wear personal protective equipment. Do not breathe dust. Avoid contact with skin, eyes and clothing. Avoid handling which leads to dust formation. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Take precautionary measures against static discharge.

Hygiene measures : Do not eat, drink or smoke when using this product. Always wash hands after handling the product. Wash contaminated clothing before reuse.

### 7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Store in a cool, dry and well-ventilated area away from incompatible substances. Keep container tightly closed.

Incompatible materials : Strong acids. Strong bases. Strong oxidizing agents.

Packaging materials : Always store product in container of same material as original container.

### 7.3. Specific end use(s)

No additional information available

## SECTION 8: Exposure controls/personal protection

### 8.1. Control parameters

#### 8.1.1 National occupational exposure and biological limit values

<b>Nickel (7440-02-0)</b>	
<b>United Kingdom - Occupational Exposure Limits</b>	
Local name	Nickel
WEL TWA (OEL TWA)	0.1 mg/m <sup>3</sup> and its inorganic compounds (except nickel tetracarbonyl): water-soluble nickel compounds (as Ni) 0.5 mg/m <sup>3</sup> and its inorganic compounds (except nickel tetracarbonyl): nickel and water insoluble nickel compounds (as Ni)
WEL STEL (OEL STEL)*	0.3 mg/m <sup>3</sup>
Remark	Sk (Can be absorbed through the skin. The assigned substances are those for which there are concerns that dermal absorption will lead to systemic toxicity), Carc (Capable of causing cancer and/or heritable genetic damage (nickel oxides and sulphides)), Sen (Capable of causing occupational asthma (nickel sulphate))
Regulatory reference	EH40/2005 (Fourth edition, 2020). HSE
<b>Chromium (7440-47-3)</b>	
<b>United Kingdom - Occupational Exposure Limits</b>	
Local name	Chromium

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<b>Chromium (7440-47-3)</b>	
WEL TWA (OEL TWA)	0.5 mg/m <sup>3</sup> 0.5 mg/m <sup>3</sup> Chromium (II) compounds (as Cr) 0.5 mg/m <sup>3</sup> Chromium (III) compounds (as Cr)
WEL STEL (OEL STEL)*	1.5 mg/m <sup>3</sup>
Regulatory reference	EH40/2005 (Fourth edition, 2020). HSE
<b>United Kingdom - Biological limit values</b>	
Local name	Chromium VI
BMGV	10 µmol/mol creatinine Parameter: chromium - Medium: urine - Sampling time: Post shift
Regulatory reference	EH40/2005 (Fourth edition, 2020). HSE
<b>Molybdenum (7439-98-7)</b>	
<b>United Kingdom - Occupational Exposure Limits</b>	
Local name	Molybdenum
WEL TWA (OEL TWA)	10 mg/m <sup>3</sup> insoluble compounds (as Mo) 5 mg/m <sup>3</sup> soluble compounds (as Mo)
WEL STEL (OEL STEL)	20 mg/m <sup>3</sup> insoluble compounds (as Mo) 10 mg/m <sup>3</sup> soluble compounds (as Mo)
Regulatory reference	EH40/2005 (Fourth edition, 2020). HSE
<b>Cobalt (7440-48-4)</b>	
<b>United Kingdom - Occupational Exposure Limits</b>	
Local name	Cobalt
WEL TWA (OEL TWA)	0.1 mg/m <sup>3</sup> and Cobalt compounds (as Co)
WEL STEL (OEL STEL)*	0.3 mg/m <sup>3</sup>
Remark	Carc (cobalt dichloride and sulphate)(Capable of causing cancer and/or heritable genetic damage), Sen (Capable of causing occupational asthma)
Regulatory reference	EH40/2005 (Fourth edition, 2020). HSE
<b>Tungsten (7440-33-7)</b>	
<b>United Kingdom - Occupational Exposure Limits</b>	
Local name	Tungsten
WEL TWA (OEL TWA)	1 mg/m <sup>3</sup> and compounds (as W), soluble compounds 5 mg/m <sup>3</sup> and compounds (as W), insoluble compounds and others
WEL STEL (OEL STEL)	3 mg/m <sup>3</sup> and compounds (as W), soluble compounds 10 mg/m <sup>3</sup> and compounds (as W), insoluble compounds and others
Regulatory reference	EH40/2005 (Fourth edition, 2020). HSE
<b>Aluminium (7429-90-5)</b>	
<b>United Kingdom - Occupational Exposure Limits</b>	
Local name	Aluminium
WEL TWA (OEL TWA)	2 mg/m <sup>3</sup> alkyl compounds 2 mg/m <sup>3</sup> salts, soluble 10 mg/m <sup>3</sup> metal, inhalable dust 4 mg/m <sup>3</sup> metal, respirable dust
WEL STEL (OEL STEL)*	6 mg/m <sup>3</sup>
Regulatory reference	EH40/2005 (Fourth edition, 2020). HSE

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### Tantalum (7440-25-7)

#### United Kingdom - Occupational Exposure Limits

Local name	Tantalum
WEL TWA (OEL TWA)	5 mg/m <sup>3</sup>
WEL STEL (OEL STEL)	10 mg/m <sup>3</sup>
Regulatory reference	EH40/2005 (Fourth edition, 2020). HSE

#### 8.1.2. Recommended monitoring procedures

No additional information available

#### 8.1.3. Air contaminants formed

No additional information available

#### 8.1.4. DNEL and PNEC

No additional information available

#### 8.1.5. Control banding

No additional information available

### 8.2. Exposure controls

#### 8.2.1. Appropriate engineering controls

##### Appropriate engineering controls:

Ensure good ventilation of the work station. Use general ventilation, local exhaust ventilation, or process enclosure to keep the airborne concentrations below the permissible exposure limits. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure.

#### 8.2.2. Personal protection equipment

##### Personal protective equipment:

Personal protective equipment should be chosen according to national standards and in discussion with the supplier of the protective equipment.

Wear recommended personal protective equipment.

##### Personal protective equipment symbol(s):



#### 8.2.2.1. Eye and face protection

##### Eye protection:

Safety glasses with side guards should be worn to prevent injury from airborne particles and/or other eye contact with this product

#### 8.2.2.2. Skin protection

##### Skin and body protection:

Wear suitable protective clothing. Body protection should be chosen depending on activity and possible exposure

##### Hand protection:

Hand protection should be chosen depending on activity. Wear protective gloves. Use insulated gloves when handling this material hot

#### 8.2.2.3. Respiratory protection

##### Respiratory protection:

If dust are formed : For limited exposure, use P95 or N95 respirator. For prolonged exposure use an air- purifying respirator with high efficiency particulate air (HEPA) filters. Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirators if exposure limits are exceeded or symptoms are experienced.

#### 8.2.2.4. Thermal hazards

##### Thermal hazard protection:

Use insulated gloves, impervious apron, long sleeves and other protective clothing when handling this material hot.

#### 8.2.3. Environmental exposure controls

##### Environmental exposure controls:

Avoid release to the environment. Take measures to reduce or limit air emissions and releases to soil and the aquatic environment.

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### SECTION 9: Physical and chemical properties

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

Physical state	: Solid
Appearance	: Ingot.
Colour	: Metallic Grey
Odour	: Odourless.
Odour threshold	: Not available
pH	: Not available
pH solution	: Not available
Melting point	: 1482.2222 °C / 2700 °F
Freezing point	: Not applicable
Boiling point	: Not available
Flash point	: Not applicable
Flammability	: Non flammable
Explosive limits	: Not applicable
Lower explosion limit	: Not applicable
Upper explosion limit	: Not applicable
Vapour pressure	: Not available
Vapour pressure at 50°C	: Not available
Relative vapour density at 20°C	: Not applicable
Relative density	: 8 Water = 1
Density	: Not available
Solubility	: Negligible. Water: < 0.1 %
Partition coefficient n-octanol/water (Log Kow)	: Not available
Auto-ignition temperature	: Not applicable
Decomposition temperature	: Not available
Viscosity, kinematic	: Not applicable
Explosive properties	: Not available

#### 9.2. Other information

No additional information available

### SECTION 10: Stability and reactivity

#### 10.1. Reactivity

The product is non-reactive under normal conditions of use, storage and transport.

#### 10.2. Chemical stability

Stable under normal conditions of use.

#### 10.3. Possibility of hazardous reactions

Cast Ingot/billet is stable at ordinary temperature; however, caution should be taken with acids, bases, and oxidizers. Molten metal will react violently with water.

#### 10.4. Conditions to avoid

Avoid ignition sources. Incompatible materials. Avoid dust formation.

#### 10.5. Incompatible materials

Strong acids. Strong bases. Strong oxidizing agents.

#### 10.6. Hazardous decomposition products

Under normal conditions, exposure to cast ingots/billets presents few health hazards in itself. Thermal cutting and melting of ingots/billets may produce fumes containing the component elements and breathing those fumes may present potentially significant health hazards.

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### SECTION 11: Toxicological information

#### 11.1. Information on toxicological effects

Acute toxicity (oral) : Not classified (Based on available data, the classification criteria are not met)  
Acute toxicity (dermal) : Not classified (Based on available data, the classification criteria are not met)  
Acute toxicity (inhalation) : Not classified (Based on available data, the classification criteria are not met)

<b>Nickel (7440-02-0)</b>	
LD50 oral rat	> 9000 mg/kg bodyweight
<b>Chromium (7440-47-3)</b>	
LC50 Inhalation - Rat	> 5.41 mg/l air
<b>Molybdenum (7439-98-7)</b>	
LD50 dermal rat	> 2000 mg/kg bodyweight
<b>Titanium (7440-32-6)</b>	
LD50 oral rat	> 5000 mg/kg bodyweight
<b>Cobalt (7440-48-4)</b>	
LD50 oral	550 mg/kg
LD50 dermal rat	> 2000 mg/kg bodyweight
<b>Tungsten (7440-33-7)</b>	
LD50 oral rat	> 2000 mg/kg bodyweight
LD50 dermal rat	> 2000 mg/kg bodyweight
LC50 Inhalation - Rat	> 5.4 mg/l air
LC50 Inhalation - Rat (Dust/Mist)	> 5.4 mg/l
<b>Aluminium (7429-90-5)</b>	
LD50 oral rat	> 15900 mg/kg bodyweight
LC50 Inhalation - Rat	> 0.888 mg/l air
<b>Tantalum (7440-25-7)</b>	
LD50 oral rat	> 2000 mg/kg bodyweight
LC50 Inhalation - Rat	> 5.18 mg/l air
<b>Iron (7439-89-6)</b>	
LD50 oral rat	98.6 g/kg
Skin corrosion/irritation	: Not classified (Based on available data, the classification criteria are not met)
<b>Rhenium (7440-15-5)</b>	
pH	2.1 Temp.: 25 °C Concentration: 99,9 g/L
Serious eye damage/irritation	: Not classified (Based on available data, the classification criteria are not met)
<b>Cobalt (7440-48-4)</b>	
Serious eye damage/irritation, rabbit	Irritating to rabbits on ocular application
<b>Rhenium (7440-15-5)</b>	
pH	2.1 Temp.: 25 °C Concentration: 99,9 g/L
Respiratory or skin sensitisation	: May cause allergy or asthma symptoms or breathing difficulties if inhaled. May cause an allergic skin reaction.
Germ cell mutagenicity	: Suspected of causing genetic defects.

# Nickel Based Alloys

## Safety Data Sheet

According to REACH Regulation (EC) No 1907/2006, as retained and amended in UK law.

Carcinogenicity : May cause cancer (inhalation).

### Nickel (7440-02-0)

IARC group 2B - Possibly carcinogenic to humans

### Chromium (7440-47-3)

IARC group 3 - Not classifiable

### Cobalt (7440-48-4)

IARC group 2A - Probably carcinogenic to humans

Reproductive toxicity : May damage fertility.

### Molybdenum (7439-98-7)

LOAEL (animal/male, F0/P) 100 mg/kg bodyweight

NOAEL (animal/male, F0/P) 42.5 mg/kg bodyweight

### Tungsten (7440-33-7)

NOAEL (animal/male, F1) ≈ 160 mg/kg bodyweight

### Aluminium (7429-90-5)

NOAEL (animal/male, F0/P) 1000 mg/kg bodyweight

STOT-single exposure : Not classified (Based on available data, the classification criteria are not met)

STOT-repeated exposure : Causes damage to organs through prolonged or repeated exposure.

### Nickel (7440-02-0)

LOAEC (inhalation, rat, dust/mist/fume, 90 days) 0.004 mg/l air

STOT-repeated exposure Causes damage to organs through prolonged or repeated exposure.

### Chromium (7440-47-3)

LOAEC (inhalation, rat, dust/mist/fume, 90 days) ≥ 0.0044 mg/l air

### Molybdenum (7439-98-7)

NOAEC (inhalation, rat, dust/mist/fume, 90 days) > 0.1 mg/l air

### Cobalt (7440-48-4)

STOT-repeated exposure Causes damage to organs through prolonged or repeated exposure.

### Tungsten (7440-33-7)

NOAEC (inhalation, rat, dust/mist/fume, 90 days) > 0.652 mg/l air

### Aluminium (7429-90-5)

LOAEC (inhalation, rat, dust/mist/fume, 90 days) 0.05 mg/l air

NOAEL (subchronic, oral, animal/male, 90 days) 1034 mg/kg bodyweight

NOAEL (subchronic, oral, animal/female, 90 days) 1087 mg/kg bodyweight

### Tantalum (7440-25-7)

NOAEL (oral, rat, 90 days) 1000 mg/kg bodyweight

Aspiration hazard : Not classified (Based on available data, the classification criteria are not met)

### Nickel Based Alloys

Viscosity, kinematic Not applicable

### Other information

No additional information available

# Nickel Based Alloys

## Safety Data Sheet

According to REACH Regulation (EC) No 1907/2006, as retained and amended in UK law.

### SECTION 12: Ecological information

#### 12.1. Toxicity

Hazardous to the aquatic environment, short-term (acute) : Not classified (Based on available data, the classification criteria are not met)

Hazardous to the aquatic environment, long-term (chronic) : Not classified (Based on available data, the classification criteria are not met)

#### Chromium (7440-47-3)

EC50 - Crustacea [1]	13.1 – 14.7 mg/l
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#### Titanium (7440-32-6)

EC50 72h - Algae [1]	> 10000 mg/l
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#### Cobalt (7440-48-4)

LC50 - Fish [1]	100 mg/l
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EC50 - Crustacea [1]	> 890 µg/l
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EC50 - Crustacea [2]	5.89 mg/l
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#### Tungsten (7440-33-7)

LC50 - Fish [1]	> 181 mg/l
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EC50 - Crustacea [1]	> 163 mg/l
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EC50 72h - Algae [1]	> 17.7 mg/l
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NOEC chronic fish	≥ 9.8 mg/l
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#### Rhenium (7440-15-5)

EC50 - Crustacea [1]	> 68.16 mg/l
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EC50 72h - Algae [1]	72.15 mg/l
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EC50 72h - Algae [2]	155.25 mg/l
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#### Aluminium (7429-90-5)

EC50 72h - Algae [1]	1.05 mg/l
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EC50 72h - Algae [2]	0.2 mg/l
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#### Tantalum (7440-25-7)

LC50 - Fish [1]	> 1.76 µg/l
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#### Iron (7439-89-6)

LC50 - Fish [1]	8.65 mg/l
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LC50 - Other aquatic organisms [1]	106.3 mg/l
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EC50 - Crustacea [1]	> 100 mg/l
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EC50 - Crustacea [2]	> 10000 mg/l
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EC50 72h - Algae [1]	18 mg/l
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#### 12.2. Persistence and degradability

#### Nickel Based Alloys

Persistence and degradability	Not established.
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# Nickel Based Alloys

## Safety Data Sheet

According to REACH Regulation (EC) No 1907/2006, as retained and amended in UK law.

<b>Nickel (7440-02-0)</b>	
Persistence and degradability	Not rapidly degradable
<b>Chromium (7440-47-3)</b>	
Persistence and degradability	Not rapidly degradable
<b>Molybdenum (7439-98-7)</b>	
Persistence and degradability	Not rapidly degradable
<b>Titanium (7440-32-6)</b>	
Persistence and degradability	Not rapidly degradable
<b>Cobalt (7440-48-4)</b>	
Persistence and degradability	Not rapidly degradable
<b>Tungsten (7440-33-7)</b>	
Persistence and degradability	Not rapidly degradable
<b>Rhenium (7440-15-5)</b>	
Persistence and degradability	Not rapidly degradable
<b>Aluminium (7429-90-5)</b>	
Persistence and degradability	Not rapidly degradable
<b>Tantalum (7440-25-7)</b>	
Persistence and degradability	Not rapidly degradable
<b>Iron (7439-89-6)</b>	
Persistence and degradability	Not rapidly degradable

### 12.3. Bioaccumulative potential

No additional information available

### 12.4. Mobility in soil

No additional information available

### 12.5. Results of PBT and vPvB assessment

#### Nickel Based Alloys

This substance does not meet the PBT criteria of UK REACH regulation, annex XIII

This substance does not meet the vPvB criteria of UK REACH regulation, annex XIII

#### Component

Nickel (7440-02-0)	This substance does not meet the PBT criteria of UK REACH regulation, annex XIII This substance does not meet the vPvB criteria of UK REACH regulation, annex XIII
Chromium (7440-47-3)	This substance does not meet the PBT criteria of UK REACH regulation, annex XIII This substance does not meet the vPvB criteria of UK REACH regulation, annex XIII
Molybdenum (7439-98-7)	This substance does not meet the PBT criteria of UK REACH regulation, annex XIII This substance does not meet the vPvB criteria of UK REACH regulation, annex XIII
Titanium (7440-32-6)	This substance does not meet the PBT criteria of UK REACH regulation, annex XIII This substance does not meet the vPvB criteria of UK REACH regulation, annex XIII
Cobalt (7440-48-4)	This substance does not meet the PBT criteria of UK REACH regulation, annex XIII This substance does not meet the vPvB criteria of UK REACH regulation, annex XIII

# Nickel Based Alloys

## Safety Data Sheet

According to REACH Regulation (EC) No 1907/2006, as retained and amended in UK law.

Component	
Tungsten (7440-33-7)	This substance does not meet the PBT criteria of UK REACH regulation, annex XIII This substance does not meet the vPvB criteria of UK REACH regulation, annex XIII
Rhenium (7440-15-5)	This substance does not meet the PBT criteria of UK REACH regulation, annex XIII This substance does not meet the vPvB criteria of UK REACH regulation, annex XIII
Aluminium (7429-90-5)	This substance does not meet the PBT criteria of UK REACH regulation, annex XIII This substance does not meet the vPvB criteria of UK REACH regulation, annex XIII
Tantalum (7440-25-7)	This substance does not meet the PBT criteria of UK REACH regulation, annex XIII This substance does not meet the vPvB criteria of UK REACH regulation, annex XIII
Iron (7439-89-6)	This substance does not meet the PBT criteria of UK REACH regulation, annex XIII This substance does not meet the vPvB criteria of UK REACH regulation, annex XIII

### 12.6. Other adverse effects

Ozone : Not classified (Based on available data, the classification criteria are not met)

## SECTION 13: Disposal considerations

### 13.1. Waste treatment methods

Regional waste regulation	: Disposal must be done according to official regulations.
Waste treatment methods	: Dispose of contents/container in accordance with licensed collector's sorting instructions.
Sewage disposal recommendations	: Disposal must be done according to official regulations.
Product/Packaging disposal recommendations	: Comply with applicable regulations for solid waste disposal. Disposal must be done according to official regulations. Dispose of this material and its container at hazardous or special waste collection point. Refer to all applicable national, international and local regulations or provisions.
Additional information	: Do not re-use empty containers.
Ecological waste information	: Avoid release to the environment.

## SECTION 14: Transport information

In accordance with ADR / IMDG / IATA / ADN / RID

ADR	IMDG	IATA	ADN	RID
<b>14.1. UN number</b>				
Not regulated for transport				
<b>14.2. UN proper shipping name</b>				
Not regulated	Not regulated	Not regulated	Not regulated	Not regulated
<b>Transport document description</b>				
Not regulated	Not regulated	Not regulated	Not regulated	Not regulated
<b>14.3. Transport hazard class(es)</b>				
Not regulated	Not regulated	Not regulated	Not regulated	Not regulated
<b>14.4. Packing group</b>				
Not regulated	Not regulated	Not regulated	Not regulated	Not regulated
<b>14.5. Environmental hazards</b>				
Not regulated	Not regulated	Not regulated	Not regulated	Not regulated
No supplementary information available				

# Nickel Based Alloys

## Safety Data Sheet

According to REACH Regulation (EC) No 1907/2006, as retained and amended in UK law.

### 14.6. Special precautions for user

#### Overland transport

Not regulated

#### Transport by sea

Not regulated

#### Air transport

Not regulated

#### Inland waterway transport

Not regulated

#### Rail transport

Not regulated

### 14.7. Transport in bulk according to Annex II of Marpol 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. National regulations

##### UK REACH Annex XVII (Restriction List)

This product contains no substance(s) listed on UK REACH Annex XVII (Restriction List) equal to or above the level of SDS disclosure

##### UK REACH Annex XIV (Authorisation List)

This product contains no substance(s) listed on UK REACH Annex XIV (Authorisation List) equal to or above the 0.1% level of disclosure

##### UK REACH Candidate List (SVHC)

This product contains no substance(s) listed on the UK REACH Candidate List (SVHC).

##### GB PIC Regulation (Prior Informed Consent)

This product contains no substance(s) listed on the GB PIC List equal to or above the level of SDS disclosure

##### POP Regulation (Persistent Organic Pollutants)

This product contains no substance(s) listed on the GB POP List equal to or above the level of SDS disclosure

##### Ozone Regulation (S.I. No. 168 of 2015)

This product contains no substance(s) listed on the GB Ozone Depletion List equal to or above the level of SDS disclosure

##### Control of Poisons and Explosives Precursors Act

This product contains no substance(s) listed as a reportable poison on the Control of Poisons and Explosives Precursors Regulations equal to or above the level of SDS disclosure

This product contains no substance(s) listed as a regulated poison on the Control of Poisons and Explosives Precursors Regulations equal to or above the level of SDS disclosure

This product contains substance(s) listed on the Control of Poisons and Explosives Precursors Regulations equal to or above the level of SDS disclosure: Aluminium powders - 7429-90-5

This substance is not listed as a regulated poison on the Control of Poisons and Explosives Precursors Regulations

##### Drug Precursors Regulation (EC 273/2004)

This product contains no substance(s) listed on the GB Drug Precursors List equal to or above the level of SDS disclosure

#### 15.1.2. Other Information

### 15.2. Chemical safety assessment

No additional information available

# Nickel Based Alloys

## Safety Data Sheet

According to REACH Regulation (EC) No 1907/2006, as retained and amended in UK law.

### SECTION 16: Other information

#### Full text of H- and EUH-statements:

Acute Tox. 4 (Oral)	Acute toxicity (oral), Category 4
Aquatic Acute 1	Hazardous to the aquatic environment – Acute Hazard, Category 1
Aquatic Chronic 3	Hazardous to the aquatic environment – Chronic Hazard, Category 3
Aquatic Chronic 4	Hazardous to the aquatic environment – Chronic Hazard, Category 4
Carc. 1B	Carcinogenicity, Category 1B
Carc. 2	Carcinogenicity, Category 2
Eye Irrit. 2	Serious eye damage/eye irritation, Category 2
Muta. 2	Germ cell mutagenicity, Category 2
Repr. 1B	Reproductive toxicity, Category 1B
Resp. Sens. 1	Respiratory sensitisation, Category 1
Skin Sens. 1	Skin sensitisation, Category 1
STOT RE 1	Specific target organ toxicity – Repeated exposure, Category 1
STOT RE 2	Specific target organ toxicity – Repeated exposure, Category 2
H302	Harmful if swallowed.
H317	May cause an allergic skin reaction.
H319	Causes serious eye irritation.
H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H341	Suspected of causing genetic defects.
H350	May cause cancer.
H351	Suspected of causing cancer.
H360F	May damage fertility.
H372	Causes damage to organs through prolonged or repeated exposure.
H373	May cause damage to organs through prolonged or repeated exposure.
H400	Very toxic to aquatic life.
H412	Harmful to aquatic life with long lasting effects.
H413	May cause long lasting harmful effects to aquatic life.

#### Classification and procedure used to derive the classification for mixtures according to Regulation (EC) 1272/2008 [CLP]:

Resp. Sens. 1	H334	Calculation method
Skin Sens. 1	H317	Calculation method
Muta. 2	H341	Calculation method
Carc. 1B	H350	Calculation method
Repr. 1B	H360F	Calculation method
STOT RE 1	H372	Calculation method

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.