Alloy Steels (>1% Nickel)

Safety Data Sheet

1. Identification of the Substance and company

1.1

Other names:	Special purpose alloy steels, High Alloy Steels
Description:	Medium / High alloy steel cast into many forms and also hot and cold rolled with a nickel content >1%.

1.2 Relevant identified uses

Used in many applications such as construction, automotive, energy/power, transport, defence and security, engineering, consumer products, lifting and excavating and packaging.

1.3 Details of supplier

Company:	Liberty Speciality Steels Fox valley way Stocksbridge, Sheffield, S36 2JA
Telephone:	+44 (0) 114 2882361
Normal Hours:	Commercial / Technical support
Email:	contactus@libertyuk.com

1.4 Emergency contact

Emergency:	Contact Security Department

2. Hazards Identification

2.1 Classification

Alloy steel (>1% nickel) is defined as an article under REACH. However, some of the components do meet the requirements for classification as dangerous under the Classification, Labelling and Packaging of substances and mixtures (CLP) Regulations (EC 1272/2008). The classifications for all alloying elements is given in Section 3.

Activities such as mechanical working, such as dry grinding/sanding, or hot working, such as welding or flame cutting, may give rise to irritant dust/fumes. (From the constituents of the steel and consumables).

2.2 Label elements according to CLP regulations (EC) 1272/2008 No label required, no signal word required.

2.3 Other hazards

Pre-finished steel can have sharp edges and corners, and relevant precautions should be taken when handling and storing. Under normal conditions of use and storage these materials are stable and non-toxic. Some steels may be coated with a non-dangerous oil, prolonged exposure to which may give rise to skin irritation.

3. Composition / information on ingredients

This refers to steels having specified alloying elements such as carbon, silicon, chromium, manganese, molybdenum, vanadium, nickel, copper and aluminium with a total concentration of over 5% w/w or any steel with specified nickel content above 1% nickel. The concentrations of the alloying elements will vary according to customer requirements. For more details reference should be made to British or other

national/international standards or customer specification. Depending on customer preference there may be a protective or residual coating of oil on the sheet to prevent corrosion during transport/storage.

Table showing typical composition of alloy Steel (>1% nickel)

Product area	Substance	EINECS No.	CAS No.	Range (%) by weight	Classification (CLP Regs)
Steel substrate	Iron	231-096-4	7439-89-6	Balance	Not classified
	Carbon	231-153-3	7440-44-0	0.05 – 1.0	Not classified
	Manganese	231-105-1	7439-96-5	0.2 – 2.5	Not classified
	Chromium	231-157-3	7440-47-3	0.05 – 2.5	Not classified
	Molybdenum	231-107-2	7439-98-7	0.01 – 3.5	Not classified
	Vanadium	231-171-1	7440-62-2	0.0 – 1.0	Not classified
	Nickel (massive*)	231-111-4	7440-02-0	1.0 – 4.5	H350, H372, H317
	Copper	231-159-6	7440-50-8	0.01 – 0.5	Not classified
	Aluminium	231-072-3	7429-90-5	0.002 – 0.05	Not classified
* Massive form covers all sizes/forms above granular					

4. First aid measures

4.1 Description of first aid measures

Skin contact: Cuts (lacerations) to the skin from sharp steel edges should be treated as normal cuts and, if required, seek medical attention. Wash if contaminated with oil coating.

Eye contact: If particles enter the eye, wash the eye with running water for at least ten minutes. Seek medical advice if irritation persists.

Inhalation: If hot work such as welding / burning causes exposure to significant concentrations of fume, remove exposed personnel to fresh air. Seek medical attention if symptoms such as coughing persist.

Ingestion: None required.

4.2 Most important symptoms and effects The most important symptoms and effects for eye exposure are soreness and irritation.

4.3 Indication of any immediate medical attention or treatment Immediate medical attention is required if lacerations are deep.

5. Fire fighting measures

Alloy steel (>1% nickel) is non-flammable and has a melting point of >1 000°C.

6. Accidental release measures

Alloy steel (>1% nickel) is sold in solid massive form and an accidental spill could not occur.

7. Handling and Storage

7.1 Handling

Alloy steel (>1% nickel) is sold in many forms, sheet, coils, sections, tube, pipe, plate or as semi-finished products. Care should be taken when handling, as there may be sharp edges present. Where required the use of hard wearing (protective) gloves and overalls should be used to prevent cuts and abrasions. Care should be taken when lifting heavy loads and, where necessary, use appropriate lifting equipment to do so. Coil bundles may be secured by banding straps, which may have been fitted under tension so care should be taken when removing them. Steel products should never be lifted by retaining straps or bands since these may snap and release the load during lifting.

7.2 Storage

Some products may be secured by using straps or bands, which could cause injury to eyes or other injuries when tension is released. There may be sharp edges present, which could cause lacerations. Store in an appropriate facility to prevent damage, use suitable racks or storage pallets. Lifting should always be carried out in a way that prevents injury to operators or damage to the lifting equipment.

8. Exposure controls and personal protection

8.1 Control parameters [occupational exposure limits (OELs)]

Please note these exposure limits are not always directly associated with the product but with possible exposures that may occur when performing certain activities.

OELs (GESTIS International Limit Values Institut fuer Arbeitsschutz der Deutschen Gesetzlichen Unfallversicherung (IFA) & EH40)

Country in EU with OEL for the relevant substance	Substance					
	Iron oxide (Fe_2O_3 & FeO) as iron		Nickel, water soluble compounds (as Ni)		Nickel, water insoluble compounds (as Ni)	
	8-h TWA (mg/m^3)	STEL (mg/m^3)	8-h TWA (mg/m^3)	STEL (mg/m^3)	8-h TWA (mg/m^3)	STEL (mg/m^3)
Austria	5.0 (resp)	10.0 (resp)	0.1	---	0.05	0.1
Belgium	5.0	---	0.1	---	0.1	---
Denmark	3.5	7.0	0.01	0.02	0.01	0.02
France	---	---	---	---	---	---
Germany (AGS)	---	---	---	---	---	---
Germany (DFG)	---	---	---	---	---	---
Hungary	6.0 (resp)	---	0.1	0.1	0.1	0.1
Poland	5.0	10.0	---	---	---	---
Spain	5.0	---	0.1	---	0.1	---
The Netherlands	---	---	---	---	---	---
United Kingdom	5.0	---	0.1	---	0.5	---
TWA – Time-weighted average measured over an 8-hour period STEL – Short-term exposure vimit Value – 15-minute duration Resp - Respirable fraction of dust						

Country in EU with OEL for the relevant substance	Substance					
	Manganese & Inorganic compounds (as Mn)		Molybdenum		Chromium (VI) compounds (as Cr)	
	8-h TWA (mg/m^3)	STEL (mg/m^3)	8-h TWA (mg/m^3)	STEL (mg/m^3)	8-h TWA (mg/m^3)	STEL (mg/m^3)
Austria	0.5	2.0	15.0	30.0	0.05	0.2
Belgium	0.2	---	10.0	---	0.05	---
Denmark	0.2	0.4	10.0	20.0	0.005	0.01
France	---	---	---	---	0.001	0.005
Germany (AGS)	0.5	---	---	---	---	---
Germany (DFG)	0.2	---	---	---	---	---
Hungary	5.0	20.0	15.0	60.0	---	0.05
Poland	0.3	---	4.0	10.0	---	---
Spain	0.2	---	10.0	---	0.01	---
The Netherlands	---	---	---	---	0.025	0.05
United Kingdom	0.5	---	10.0	20.0	0.05	---
TWA – Time-weighted average measured over an 8-hour period						
STEL – Short-term exposure limit value – 15-minute duration						
Resp - Respirable fraction of dust						
Nickel DNEL (derived no-effect level) Long-term (systematic) = 0.05 mg/m^3, Acute (local) = 1.6 mg/m^3						

8.2 Control Measures

Wear suitable gloves, overalls and eye/face protection when handling the pre-finished steel to prevent cuts and abrasions.

If hot work activities, such as welding or burning, or mechanical abrasion are to take place local exhaust ventilation (LEV) should be used to remove any fume/dust produced. When using LEV systems the manufacturers instructions and guidance should be followed at all times to maintain sufficient capture velocity and to ensure that the air cleaning system is in good working order. If a large amount of fume is generated and there is a risk that exposures may exceed relevant OELs, suitable and approved personal respiratory equipment (RPE) should be used in conjunction with the LEV. Ori-nasal respirators fitted with either a P2 or P3 filter (EN149: FFP2S / FFP3S) may be
used when fume levels are high, depending on the dust/fume concentration. Manufacturers' directions for use must be followed and, where applicable, an RPE face-fit test should be successfully completed before use.

Property	Value used
Physical State at 20°C/ 1 013 hPa	Solid
Form	Alloy steel (>1% nickel) is a hard, dense silver/grey coloured metallic solid
Melting point	1 450-1 520°C at 1 013 hPa (steel)
Boiling point	Not applicable
Relative density	7.85 kg/dm^3 at 20°C
Vapour pressure	Not applicable steels due to high melting point >1 000°C
Surface tension	Not applicable, steels are an inorganic solid with very low aqueous solubility
Flash point	Not applicable, steels are an inorganic solid with a high melting point >1 000°C
Flammability	Non-flammable
Explosive properties	Non-explosive
Oxidising properties	No
Viscosity	Solid

10. Stability and reactivity

The product is stable under normal conditions. When heated to high temperatures (>1 000°C) it may give rise to fumes (iron oxide and nickel). In contact with strong acids, steels may release gaseous acid decomposition products (e.g. hydrogen, oxides of nitrogen) and metals will be dissolved in the acid. For chromium-containing steels, contact with strong oxidising agents at high pH (e.g. alkaline cleaners at pH 10-14) may result in the formation of Cr (IV) compounds at ambient temperatures.

11. Toxicological information

Under the normal applications of this product, health effects should not occur owing to the low risk of exposure to minimal hazard material. If activities mechanical activities, such as dry grinding or machining, or hot work, such as welding and burning, are carried out dust / fume will be produced which may irritate the respiratory system at high airborne concentrations. The principal route of entry into the body is via inhalation of fume/dust.

Acute toxicity

Exposure to high fume/dust concentrations in air may cause respiratory irritation and can be potentially harmful if inhaled into the body in large amounts over long time periods. This is not expected under normal conditions of use of the product.

Skin corrosion / irritation

Fumes/dust released during mechanical working or hot work are not known to be irritant.

Eye damage / irritation

Fumes/dust released during mechanical working or hot work are not known to be irritant.

Respiratory / Skin sensitisation

Fumes/dust arising from mechanical working or hot work may potentially cause sensitisation owing to the presence of nickel above 0.1%. Skin Sens. 1 H317: May cause an allergic skin reaction (nickel).

Germ cell mutagenicity No effect.

Carcinogenicity
Nickel is classified as Carc.2 suspected of causing cancer if present above 0.1%.

Reproductive toxicity No effect.

Repeated dose toxicity - Inhalation
Exposure to iron oxide fume, in excessive concentrations and over long periods of time, may cause a benign condition called siderosis.
Repeated inhalation could lead to cumulative effects. This condition is not expected under normal conditions of use of the product. Repeated exposure to dusts and or fumes containing nickel above 0.1% increases the risk of damage to the respiratory system.

12. Ecological information

There are no known harmful effects from the product on the environment. Under normal conditions of use exposure to the environment should not occur.

12.1 Toxicity

No effect.

12.2 Persistence and Degradability

No effect.

12.3 Bioaccumulative potential

No effect.

12.4 Mobility in soil

No effect.

12.5 Results of PBT and vPvB assessment

Alloy steel (>1% nickel) is not PBT or vPvB.

13. Disposal considerations

Steel products are 100% recyclable and should be recycled at ”end of life” in all situations.

14. Transport information

Alloy steel (>1% nickel) is not classified as dangerous under CLP Regulations (EC) 1272/2008 so there is no requirement for transport information. None of the sub-headings in this section is applicable for this product.

15. Regulatory information

15.1
Alloy steel (>1% Nickel) specifications are covered by numerous ISO standards. All steels covered by this safety data sheet comply with the packaging and packaging waste EC Directive 94/62/EEC on heavy metal content, the Restriction of Hazardous substances directive 2002/95/EC and the End of Life Vehicle directive 2000/53/EC. The iron manufactured and used to produce this steel product has been registered under REACH along with any other component where a registration was required.

15.2
A chemical safety assessment has not been carried out as alloy steel (>1% nickel) is defined as an article under REACH and does not require an assessment, plus it is not classified as dangerous under the CLP Regulations (EC)1272/2008.

16. Other Information

Revision
This safety data sheet (SDS) has been produced / revised in line with Annex II of the REACH Regulations (2006) as guidance only, as articles do not require a SDS. Information in this safety data sheet is supplied to inform the customer and should be used where necessary.
This revision is the current version dated **May 2017** *Changes:* Re-brand to Liberty Speciality steels, reference to coated products, other Tata Steel references, minor formatting edits, Changed website link to GESTIS.

Previous Versions: **May 2015** - *Changes: deleted references to Dangerous Substances Directive to comply with June 2015 requirements CLP. Also minor edits.*

Hazard and Precautionary Statements according to CLP Regulations (EC)1272/2008): No hazard statements.

References

GESTIS International Limit Values Institut fuer Arbeitsschutz der Deutschen Gesetzlichen Unfallversicherung (IFA) – website:

http://www.dguv.de/ifa/gestis/gestis-internationale-grenzwerte-fuer-chemische-substanzen-limit-values-for-chemical-agents/index-2.jsp

EH40 Workplace Exposure Limits, 2005 as amended (2012) – HSE UK
ECHA website – Nickel

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