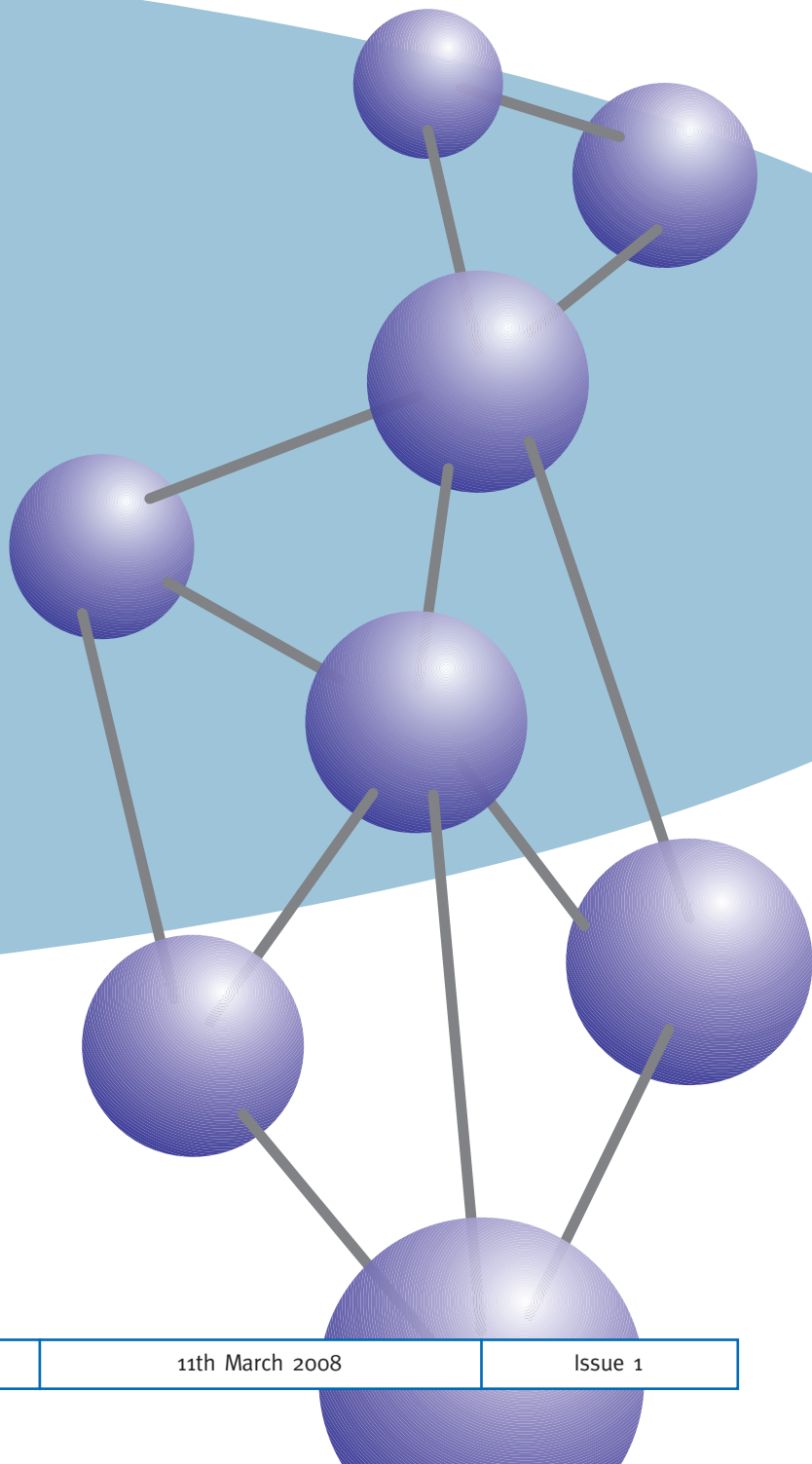
Material Safety Data Sheet

Stainless Steel Alloys



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1. Materials

Stainless steels, including FERMONIC 50, FERRALIUM 255 and the alloys 254, 316, S32760, 2507, S31803 and 2205.

2. Materials Supplier

Langley Alloys Ltd, Campbell Road, Stoke on Trent, ST4 4ER, UK
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3. Product Forms

Billets, blooms, bars, plate, sheet, tube, pipe, forged/rolled rings, open and closed die forgings and semi-finished machined products.

4. Chemical Compositions

Nickel alloys may contain various concentrations of the following elements, according to specification type. Non-specified elements may also be present as impurities at low concentrations (less than 0.30%).

Element concentration ranges are as follows:

Element	Symbol	Wt % Max	Element	Symbol	Wt % Max
Chromium	Cr	27.0	Copper	Cu	2.5
Nickel	Ni	18.5	Manganese	Mn	6.0
Iron	Fe	5.5	Molybdenum	Mo	5.0
Tungsten	W	1.0	Silicon	Si	2.0

5. Physical Data

Copper and its alloys are supplied as odourless solid metal products possessing a yellow colour. The materials are inert and chemically stable at ambient temperatures. In general, metal products do not present a fire or explosion hazard at normal temperatures.

6. Health & Safety Data

6.1 Handling

Metal products, due to weight and surface roughness considerations, will require appropriate lifting equipment and protective gloves and clothing for the purposes of safe handling.

6.2 Storage

Storage of metal products should utilise appropriate racking and stillage to adequately accommodate for the weight and size of articles. Under normal storage conditions, metal products do not present a health hazard from physical contact, ingestion or inhalation.

6.3 Secondary Processing

Secondary processes such as melting, welding, burning, brazing, grinding, cutting, slitting, milling and machining can generate metal fumes and airborne particles which may be dangerous to health.

These operations should be performed only in well ventilated areas.

Occupational exposure limits for elements and compounds are defined in the UK Health and Safety Executive Guidance Note EH40. For FERMONIC 50, FERRALIUM 255 and the alloys 254, 316, S32760, 2507, S31803 and 2205, the information is as follows:

Element	Eight hour average permissible exposure limit (PEL)	Eight hour average threshold limit value (TLV)
Copper	0.1mg/m^3, fume (as Cu) 1mg/m^3, dust and mist (as Cu)	0.2mg/m^3, fume (as Cu) 1mg/m^3, dust and mist (as Cu)
Chromium	1mg/m^3, metal and insoluble salts 0.5mg/m^3,Cr (III) compounds 0.1mg/m^3,Cr (VI) compounds	0.5mg/m^3, metal and Cr (III) salts 0.05mg/m^3,Cr (VI) water soluble compounds 0.01mg/m^3,Cr (VI) water insoluble compounds
Iron	10mg/m^3, as iron oxide, fume	5mg/m^3, as iron oxide, fume
Manganese	5mg/m^3 ceiling, Mn compounds and Mn fume (as Mn) compounds (as Mn)	0.2mg/m^3, elemental and inorganic
Molybdenum	5mg/m^3, as soluble compounds	0.5mg/m^3, as soluble compounds
Nickel	1mg/m^3, metal and insoluble salts	1.5mg/m^3, metal 0.1mg/m^3, soluble compounds 0.2mg/m^3,insoluble compounds
Silicon	15mg/m^3, total dust 5mg/m^3, respirable fraction	10mg/m^3, total dust
Tungsten	-	1.0mg/m^3, as soluble compounds

Over-exposure to metal fumes and dust particles may cause eye irritation, skin rash, and cause adverse effects to other organs.

Inhalation of metal fumes or dust particles may cause adverse health effects such as reduced lung function, nasal and mucous membrane irritation, nausea, vomiting and metal fume fever.

Note that chromium and nickel have been identified as potential human carcinogens.

7. Personal Protection

Personal protective equipment, including approved respirators or properly fitting dust/fume masks, should be used when welding, burning, brazing, cutting, slitting, grinding or machining steel and other alloy products.

Metallic materials may sometimes be protected with various coatings, oil or paints. In such cases, depending on the nature of the materials involved, special precautions should be taken when such articles are handled, welded, cut, burnt or similarly treated, as these operations may result in the formation of fumes or dust.

8. First Aid Procedures

8.1 Inhalation

In situations involving overexposure by inhalation, immediately transport the victim away from the exposure area to a fresh air environment. Seek medical attention and keep the victim warm and as comfortable as possible.

8.2 Skin Contact

Dust particles on skin should be thoroughly removed with soap and water.
Contaminated clothing should be removed and washed.

8.3 Eye

Foreign particles in the eye should be flushed out as soon as possible with copious amounts of running water. Seek medical attention.

8.4 Ingestion

Seek medical attention immediately.

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