



# Material Safety Data Sheet

## Identification of Product and company

Product Type	Masonry Reinforcement
Supplier	ACS Stainless Steel Fixings Ltd
Address	Cross Green Approach Cross Green Industrial Estate Leeds LS9 0SG
Telephone	0844 850 0860
Fax	+44 (0)113 3918209
Email	info@acsstainless.co.uk

## Composition/information on ingredients

Iron alloy with 10,5 – 30% Cr  
max. 38% Ni  
max. 11% Mn  
max. 8% Mo

Other elements may be present, such as Si, Cu, Ti. These are not classified as hazardous, or are below the concentration levels for classification of these alloys as hazardous.

## Hazard classification of product

Many stainless steels contain nickel as an essential alloying element. Nickel is classified in EC Directive 67/548/EEC as a suspect carcinogen (category 3 – R40) and as a skin sensitiser (R43). The classification rules of EC Directive 99/45/EC dictate that any preparations with equal to or more than 1% content of nickel must automatically be classified as suspect carcinogens (R40). Stainless steels do not cause nickel sensitisation by prolonged skin contact in humans. Nevertheless, all stainless steels with 1% or more nickel are classified as skin sensitisers.

## **Description of hazards**

There are no hazards of concern for man or the environment from stainless steels in the forms supplied. However, if an individual is already sensitised to nickel, prolonged skin contact with a few types of stainless steel may result in an allergic dermatological reaction. If prolonged skin contact is involved in the processing of this product, please contact the supplier for advice. No carcinogenic effects resulting from exposure to stainless steels have been reported, either in epidemiological studies or in tests with animals. Dust and fume may be generated during processing e.g. in welding, cutting and grinding. If airborne concentrations of dust and fume are excessive, inhalation over long periods may affect workers' health, primarily of the lungs.

## **First aid measures**

### **Inhalation**

Not applicable to stainless steels in the massive form. Inhalation of dust and/or fume from grinding, cutting and welding operations is unlikely to generate the need for specific first aid.

### **Skin and eye contact**

There are no special symptoms or effects associated with stainless steel. In the event of physical injury to the skin seek appropriate medical attention. In the event of physical injury to the eyes, seek immediate medical attention. Austenitic stainless steel particles are non-magnetic or only slightly magnetic and may not respond to a magnet placed over the eye. In such cases seek hospital treatment.

### **Ingestion**

Does not apply to stainless steel in the massive form.

## **Firefighting measures**

Stainless steels are not combustible. There are no special hazards or precautions associated with stainless steels if in the vicinity of a fire.

## **Accidental release measures**

Not applicable.

## Handling and storage

There are no special technical measures involved for handling stainless steel masonry reinforcement. Normal precautions should be taken to avoid physical injury from manual handling products, possibly with sharp edges. All products are likely to have sharp edges that could cause lacerations.

## Exposure controls/Personal protection

### Occupational exposure limits

There are no occupational exposure limits for stainless steels. Occupational exposure limits apply to some constituent elements (Ni, Cr, Mn, Mo) and certain of their compounds. Table 1 shows limits according to current legislation in the UK. Note that the OEL for welding fume is without prejudice to any occupational exposure limits for individual components in the fume.

Occupational exposure limits (mg/m<sup>3</sup>) in UK

Table 1

Substance	Limit	8h TWA	15 min TWA
Chromium, & its Cr(II), Cr(III) compounds as Cr	OES	0.5	
Chromium (VI) compounds as Cr	MEL	0.05	
Copper, fume as Cu	OES	0.2	
Iron oxide, fume as Fe	OES	5	10
Manganese and its inorganic compounds as Mn	MEL	0.5	
Manganese fume	OES	1	3
Molybdenum & its soluble compounds as Mo	OES	5	10
Molybdenum & its insoluble compounds as Mo	OES	10	20
Nickel, soluble compounds as Ni	MEL	0.1	
Nickel, insoluble compounds as Ni	MEL	0.5	
Nickel, organic compounds as Ni	OES	1	3
Welding fume, total	OES	5	

TWA= Time Weighted Average; OES= Occupational Exposure Standards;

MEL= Maximum Exposure Limit

## Exposure controls

In the processing of all metallic materials, exposure to fume and dust must be kept below any legally imposed limits. Dust and fume may be generated in use, e.g. by cutting, grinding and welding processes, which may contain materials subject to

exposure limits. To ensure these limits are not exceeded, adequate general or local ventilation or fume extraction should be provided.

### **Personal protection**

In accordance with European and national health and safety regulations, it is necessary to assess the need for personal protection equipment and appropriate approved respiratory protection should be provided for those workers at risk of inhalation. Suitable hand and eye protection should be worn where there is a risk of laceration, flying particles, burning or welding radiation or contact with oils.

### **Physical and chemical properties**

Appearance: Solid; metallic grey, ranging from dull to bright polished. Occasionally supplied with oxidised, blue/black surfaces.

Odour: Odourless

Water solubility: Insoluble

Melting: 1370°C - 1520°C

Density: 7.7-8.1 kg/dm<sup>3</sup>

Thermal expansion (RT to 100°C): 10-16 x10<sup>-6</sup> m/m°C

Thermal conductivity (RT): 12-30 W/m°C

Magnetic: Austenitic stainless steels are non-magnetic in most supply conditions, but may be para-magnetic in some supply conditions (Permeability 1.005-1.1). Duplex, ferritic and martensitic stainless steels are ferro-magnetic.

### **Stability and reactivity**

Stainless steels are stable and non-reactive under normal ambient atmospheric conditions. May react in contact with strong acids to release gaseous acid decomposition products, e.g. hydrogen, oxides of nitrogen. When heated to very high temperatures fumes may be produced (e.g. by cutting, welding or melting operations).

### **Toxicology data**

Chronic toxicology, oral or inhalation

Stainless steels may contain nickel, which has been classified in EC Directive 67/548/EEC as a suspect carcinogenic substance, Category 3 (i.e. "causing concern for man... but available information is not adequate for making a satisfactory assessment"). The exposure route of concern is inhalation. These stainless steel products are in massive form, not capable of being inhaled. The requirements of EC Directive 99/45 EC are such that all mixtures, solutions and alloys with more than 1% nickel must be classified in the same way as nickel itself, by default. There is no direct evidence of carcinogenic effects

of stainless steels in man, nor indirect evidence from animals tested by relevant routes, i.e. inhalation or ingestion. In other studies, using non-relevant routes in animals, alloy with up to 40% nickel caused no significant increase in cancer. During mechanical working, flame cutting or welding, stainless steel dust, or fumes containing complex or mixed oxides (spinels) of its constituents, may be formed. Over long periods, inhalation of excessive airborne levels may have long term health effects, primarily affecting the lungs. However, studies of workers exposed to nickel powder and dust and fumes generated in the production of nickel alloys and stainless steels have not indicated a respiratory cancer hazard. Welding and flame cutting fumes may contain hexavalent chromium compounds. Studies have shown that some hexavalent chromium compounds can cause cancer. However, epidemiological studies amongst welders indicate no extra increased risk of cancer when welding stainless steels, compared with the slightly increased risk when welding steels that do not contain chromium.

### **Dermatological toxicity**

Nickel is classified as a skin sensitiser. It causes skin sensitisation in susceptible individuals through prolonged intimate contact with the skin (e.g. wearing of jewellery).

The requirements of EC Directive 99/45/EC are that all mixtures, solutions and alloys with 1% or more of nickel must, by default, also be classified as skin sensitisers. Numerous patch tests have established that most stainless steels do not cause sensitisation. However, studies have shown that, in some individuals already sensitised to nickel, close and prolonged skin contact with the re-sulphurised free-machining types of stainless steel with 0.15-0.35% S (EN 1.4105, 1.4523, 1.4305, 1.4570) may cause an allergic reaction.

### **Other observations**

Long-term experience of stainless steels in the most varied applications has demonstrated that these very resistant material are eminently suitable where hygiene is of paramount importance (e.g. food processing and food preparation). The UK Health & Safety Executive's publication "Control of fume arising from electric arc welding of stainless steel" indicates that there is some risk of developing asthma from compounds of chromium VI and nickel in the fume from stainless steel welding. However, stainless steel welding fume did not meet the European Union classification criteria required for inclusion in as a substance capable of causing asthma.

### **Ecological data**

No known harmful effects. No special precautions are required.

### **Disposal considerations**

Surplus and scrap (waste) stainless steel is valuable and in demand for the production of prime new stainless steel. Recycling routes are well-established, and recycling is therefore the preferred disposal route. Disposal to landfill is not harmful to the environment, but it is a waste of resources and therefore less desirable than recycling.

### **Transport data**

No special precautions required.

### **References used in preparing this sheet**

Outokumpu Stainless Ltd

### **Declaration**

The information given in this safety data sheet is based on the present level of our knowledge and experience. The data sheet describes the products with respect to safety requirements. The data given is not intended as a confirmation of product properties and does not constitute a legal contractual relationship, nor should it be used as the basis for ordering these products.