Material Safety Data Sheet (MSDS)

This MSDS has been compiled according to Directive 93/112/EC and OSHA Hazard Communication standard

NICKEL-CONTAINING STEELS AND ALL0YS

1. Identification of the preparation and of the supplying company

■ Preparation, according to EC Directive 67/548/EEC, in the form of massive nickel containing alloy in the form of plate or sheet.

■ The trade name of the preparation varies with its specific chemical composition. The trade names consist of CLC, followed by a material designation, e.g. 18.10 (L, N, LN, Ti, Nb), 17.12.2 (L, Ti, Nb), 17.13.5 (L, N…). For some grades, the trade names consist of UR, SIRIUS, FASTINOX, NUCL, SOLEIL, VIRGO, CRYELSO, CARELSO, SUPERELSO or another trade name owned by the supplying companies, and a designation.

■ Supplying companies :

INDUSTEEL Loire BP 368 Châteauneuf F-42803 RIVE-DE-GIER France	INDUSTEEL Creusot 56, rue Clemenceau F-71201 LE CREUSOT France	INDUSTEEL Belgium 266, rue de Chatelet B-6030 CHARLEROI Belgium

■ Solid material products covered by this MSDS are classified as articles and do not constitute a hazardous material in massive form under the terms of the OSHA Hazard communication standard. However, fumes, particles may determine potential risks which are described below.

2. Composition and Information on ingredient

Ingredient	CAS N°	Hazard Symbol	R-phrases
Nickel (Ni)	Xn		R40 and R43

The nickel content is at least 1%.

The chemical composition is :

- up to 35% Cr
- up to 80% Ni
- up to 20% Mn
- up to 20% Mo
- up to 35% Cu
- balance iron

Nickel is classified by EC Directive 67/548/EEC as a suspect carcinogen (category 3) and a skin sensitiser.

According to Directive 88/379/EEC, all preparations containing 1% Ni or more are classified in the same way.

3. Hazard identification

Hazard classification :	Xn	Harmful
Risk classification :	R40	Possible risks of irreversible effects
	R43	May cause sensitisation by skin contact

There are normally no hazards to man or the environment from the preparations in the forms supplied.

Dust and fume may be generated during fabrication, e.g. during welding, cutting and grinding (see section 8). Dust from grinding or machining will have the same composition as the preparation. Flame cutting or welding fumes will contain also oxides of iron and other constituent metals.

If airborne concentrations of dust and fume are excessive, inhalation over long periods may affect worker's health, primarily the lungs.

Regarding exposure limits, see section 15.
The preparation does not normally cause any allergic reaction by skin contact.

4. First-aid measures

- Inhalation : Not applicable
- Ingestion : Not applicable
- Skin contact : Not applicable (Physical injury possible by e.g. sharp edges)
- Eye contact : Not applicable (Physical injury possible by e.g. sharp edges)

5. Fire-fighting measures

The preparation is not combustible.

There are no special hazards or precautions associated with the preparation if in the vicinity of a fire.

6. Accidental release measures

Not applicable.

7. Handling and storage

7.1. Handling :
No special measures are necessary. However, normal precautions should be taken in order to avoid physical injury from e.g. sharp edges risk of accidental fall or slippage…

7.2. Storage :
No special design from storage rooms or vessels.
There are no special restrictions for the conditions of storage.

8. Exposure controls – personnal protection

8.1. Exposure limits :
There are no exposure limits for the preparation. Exposure limits apply to same constituent elements and certain of their compounds (Ni, Cr, Mn and Mo). See section 15.

8.2 Exposure controls :
Dust, fume and particles may be generated in use e.g. by cutting, grinding and welding processes, which may contain material subject to exposure limits.
To ensure that these limits are not exceeded, adequate general or local ventilation should be provided.

8.3. Personal protection :

In the processing of all metallic materials, exposure to fume and dust has to be kept below legally imposed limits. Suitable protection facilities should be provided.

If ventilation is inadequate, appropriate approved respiratory protection should be provided for those workers at risk of inhalation. Suitable clothes as well as hand protection should be worn where there is a risk of laceration, flying particles, burning or welding radiation or contact with oils during processing.

Avoid breathing fumes formed during welding or machining of the preparation. When needed, use breathing filters and efficient ventilations/exhaustion. Any dust from the preparation formed during e.g. grinding has to be kept away from food and beverages. Clothes contamined with dust should be cleaned by washing or suction, do not shake. No eating, drinking, smoking or snuffing in the working area.

◈ Eye protection	⇨ Use safety glasses when needed
◈ Skin protection	⇨ Use protective clothes

9. Physical and chemical properties

- ► Appearance : Solid
- ► Odour : Odourless
- ► Melting point/melting range : 1400 – 1535°C
- ► Flash point : Not applicable
- ► Flamability : The substance is not flamable
- ► Auto flamability : The substance is not auto-flamable
- ► Explosive properties : the substance is not explosive
- ► Oxidising properties : not applicable
- ► Vapour pressure : not applicable
- ► Density at 20°C : 7.7 – 8.3 g/cm^3
- ► Solubility : not soluble in water or oil
- ► Thermal expansion : 2 X 10^{-6} – 18 X 10^{-6} C^{-1} (mean value 20 – 100°C)
- ► Thermal conductivity at 20°C : 10 – 60 W (m. °C)$^{-1}$
- ► Magnetic : Duplex, ferritic and martensitic steels are ferromagnetic, permeability at 20°C : typically 10-200. Austenitic steels are not ferromagnetic, but can show slight ferromagnetism, permeability at 20°C : 1.005-1.1.
- ► Resistivity at room temperature : approximately 0.8 μΩm.

10. Stability and reactivity

The preparation is stable and does not react at normal ambient temperature conditions.

■ <u>At high temperatures</u> :

Prolonged service at elevated temperatures may embrittle the preparation depending on its specific chemical composition. Contact the supplier for further information.

■ <u>In contact with acids</u> :

The preparation can, under certain circumstances, react with acids. During these reactions, toxic and/or flammable or explosive gases can be formed.

11. Toxicological information

The preparation contains nickel, which has been classified in EC Directive 67/548/FEC as a carcinogenic substance (category 3, i.e. causing concern for man… but available information is not adequate for making a satisfactory assessment) by inhalation or ingestion.

The conventions of Preparation Directive 88/379/EEC are such that all mixtures, solutions and alloys with at least 1% Nickel have to be classified in the same way, by default.

However, to our knowledge, no carcinogenic effects resulting from exposure to the preparation have been reported, either in epidemiological studies or in tests with animals. Long-term experience of the preparation in the most varied applications has demonstrated that a number of these materials being very resistant, they are eminently suitable where hygiene is of paramount interest (food, pharmaceuticals, water distribution…).

Nickel is also classified as a skin sensitiser, through prolonged intimate contact with the skin of some individuals (e.g. wearing of jewellery). However, (see also section 3, Hazards identification) the preparation does not normally cause any allergic reactions.

The products are in massive form, not capable of being inhaled or ingested, and as such present no toxic hazard.

During mechanical working, flame cutting or welding, steel dust or fumes containing oxides 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, dust and fumes generated in the production of nickel alloys and stainless steels have not indicated a respiratory cancer hazard.

- Acute toxicity, oral or inhalatory : Not applicable
- Acute dermatological toxicity : None
- Acute irritation/causticity, skin and eyes : None

12. Ecological data

No known harmful effects. No precautions are required. The preparation is normally inert in aqueous solutions.

13. Disposal considerations

The preparation should be recycled to as large extent as possible since it is a valuable raw material in production of steels. Information can be given by the supplier.

14. Transport information

There are no special precautions. Non-dangerous goods.

15. Regulatory information

■ There are no exposure limits for steels. Limits are applicable for some constituent elements and the compounds. These elements may be contained in dust and fume during processing of products.

■ These limits are valid in France and are given for information for other countries.

Average occupational exposure limit (mg/m^3)

Chrome (metal, Cr)	0,5 mg/m^3
Cr_2O_3,Cr content	0,05 mg/m^3
Chrome VI, Cr content	0,05 mg/m^3
Copper (dust)	1 mg/m^3
Copper (fumes)	0,2 mg/m^3
Manganese (fumes), Mn content	1 mg/m^3
Molybdenum solubles, Mo content	5 mg/m^3
Nickel (metal)	1 mg/m^3
Ni O_2, Ni content	1 mg/m^3

■ Local laws and regulations should carefully be observed and respected.

The preparation has been classified as category 3 "suspense carcinogen" according to ED Directive 67/548 EEC with the following phrases :

Hazard classification	Xn Harmful
Risk classification	R40 possible risks of irreversible effects R43 may cause sensitisation by skin contact
Safety classification	S22 Do not breathe dust S36 Wear suitable protective clothing

Nickel containing products in direct prolonged contact with the skin must not release more than 0,5 mg/cm^2/week of Ni as per EN 1811.
All covered products normally respect this limit.

Since the preparation is in massive form, there is no obligation to label the product.

16. Other information

The data and information given in this MSDS are based on our present knowledge. However, they shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.