



otelinox

Material Safety Data Sheet

A member of



corporation

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Edition A

Revision 1 2 3 4 5 6 7 8 9

MATERIAL SAFETY DATA SHEET

This material safety data sheet covers the stainless steel listed below:

STAINLESS STEEL GRADES		
<i>EN</i>	<i>ASTM</i>	<i>DIN</i>
1.4310(HT1)	301(HT1)	X10CrNi18-8
1.4310(HT3)	301(HT3)	X10CrNi18-8
1.4301(HT4)	301(HT4)	X10CrNi18-8
1.4310(HT1 6,4%Ni)	301(HT1 6,4%Ni)	X10CrNi18-8
1.4301	304	X5CrNi18-10
1.4301 (8,5%Ni)	304 (8,5%Ni)	X5CrNi18-10
1.4301 (9%Ni)	304 (9%Ni)	X5CrNi18-10
1.4306	304L	X2CrNi19-11
1.4307	304(D)L	X2CrNi18-9
1.4303	305	X4CrNi18-12
1.4828	309	X15CrNiSi20-12
1.4833	309S	X12CrNi23-13
1.4845	310S	X8CrNi25-21
1.4401	316	X5CrNiMo17-12-2
1.4404	316L	X2CrNiMo17-12-2
1.4571	316Ti	X6CrNiMoTi17-12-2
1.4541	321	X6CrNiTi18-10
1.4000	410S	X6Cr13
1.4016	430	X6Cr17
1.4510	439L(430Ti)	X3CrTi17

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

1.1 Identification of the substance or preparation

Cold rolled stainless steel strip and sheets.

1.2 Use of the substance/preparation

Stainless steel is used in automotive industry, electronic industry, chemical industry, foodstuff and beverage industry, construction industry, etc.

1.3 Company/undertaking identification

S.C. OTELINOX SA, 16, GAESTI STREET, TARGOVISTE, DAMBOVITA COUNTY, CODE 130087, ROMANIA

1.4 Emergency phone

0040 245 209 102 - 08⁰⁰-16⁰⁰
0040 245 209 477 - 16⁰⁰ - 08⁰⁰

2. HAZARDS IDENTIFICATION

Solid stainless steel products covered by this Material Safety Data Sheet are shipped as non-flammable, non-explosive, non-reactive articles and do not constitute a hazardous material in solid form.

2.1 Potential health effects

No carcinogenic effects resulting from exposure to stainless steel have been reported, either in epidemiological studies or in tests with animals.

2.2 Eye Contact

Dusts or particulates may cause mechanical irritation including pain, tearing, and redness. Scratching of the cornea can occur if eye is rubbed. Fumes may be irritating. Contact with the heated material may cause thermal burns.

2.3 Skin contact (Dermatological effects)

Stainless steels do not cause nickel sensitization by prolonged skin contact in human. However, nickel is classified as a skin sensitizer. It causes skin sensation in susceptible individuals through prolonged intimate contact with the skin (e.g. wearing jewelry).

2.4 Wounds

Nickel metal powder has caused tumors at the site of injection in rodents. However, studies do not suggest a significant risk for humans from nickel-containing prostheses.

2.5 Inhalation

Dust and fumes which may be produced as a by-product during grinding, polishing, abrasive blasting, welding, pickling and post-fabrication cleaning or similar processes may contain fumes of chromium (VI) oxides.

Dusts may cause irritation of the nose, throat, and lungs. Excessive inhalation of metallic fumes and dusts may result in metal fume fever, an influenza-like illness. It is characterized by a sweet or metallic taste in the mouth, accompanied by dryness and irritation of the throat, cough, shortness of breath, pulmonary edema, general malaise, weakness, fatigue.

2.6 Ingestion

There is no evidence that nickel and its inorganic compounds are carcinogenic when ingested. Nickel is generally recognized as safe as a direct human food ingredient.

3. COMPOSITION/INFORMATION ON INGREDIENTS

AUSTENITIC

<i>Nr. crt.</i>	<i>Component</i>	<i>CAS Number</i>	<i>% Weight</i>
1	Iron	7439-89-6	Balance
2	Carbon	7440-44-0	0.02-0.13
3	Manganese	7439-96-5	0.74-1.9
4	Silicon	7440-21-3	0.2-1.97
5	Phosphorus	7723-14-0	0.02-0.04
6	Sulfur	7704-34-9	0-0.012
7	Chromium	7440-47-3	16.5-24.78
8	Nickel	7440-02-0	6.35-19.23
9	Molybdenum	7439-98-7	0-2.39
10	Nitrogen	7727-37-9	0.01-0.083
11	Titanium	7440-32-6	0-0.44
12	Copper	7440-50-8	0-0.5
13	Cobalt	7440-48-4	0-0.8
14	Aluminium	7429-90-5	0-0.02
15	Vanadium	7440-62-2	0-0.05

FERRITIC

<i>Nr. crt.</i>	<i>Component</i>	<i>CAS Number</i>	<i>% Weight</i>
1	Iron	7439-89-6	Balance
2	Carbon	7440-44-0	0.01-0.058
3	Manganese	7439-96-5	0.17-0.68
4	Silicon	7440-21-3	0.12-0.53
5	Phosphorus	7723-14-0	0.017-0.037
6	Sulfur	7704-34-9	0-0.02
7	Chromium	7440-47-3	16-17.6
8	Nickel	7440-02-0	0.1-0.48
9	Molybdenum	7439-98-7	0-0.03
10	Nitrogen	7727-37-9	0.01-0.045
11	Titanium	7440-32-6	0.001-0.34

MARTENSITIC

<i>Nr. crt.</i>	<i>Component</i>	<i>CAS Number</i>	<i>% Weight</i>
1	Iron	7439-89-6	Balance
2	Carbon	7440-44-0	0.023-0.05
3	Manganese	7439-96-5	0.27-0.33
4	Silicon	7440-21-3	0.27-0.29
5	Phosphorus	7723-14-0	0.025-0.026
6	Sulfur	7704-34-9	0.004-0.005
7	Chromium	7440-47-3	13.2
8	Nickel	7440-02-0	0.07

4. FIRST AID MEASURES

After receiving the first-aid measure required, consult a medic if necessary. Examples of first-aid measures are given below.

Eye Contact

In case of overexposure to dusts or fumes, immediately flush eyes with plenty of water for at least 15 minutes occasionally lifting the eye lids. Get medical attention if irritation persists. Thermal burns should be treated as medical emergencies. Austenitic stainless steel particles are not magnetic and will not respond to a magnet over the eye.

Skin Contact

In case of overexposure to dusts or particulates, wash with soap and plenty of water. Remove and wash contaminated clothing. Get medical attention if irritation develops or persists. If thermal burn occurs, flush area with cold water and get immediate medical attention.

Inhalation

Not applicable to stainless steel in massive form. In case of overexposure to dusts or fumes, immediately remove victim from the adverse environment to fresh air and seek medical attention. If breathing has stopped, certified individuals should perform Cardiopulmonary Resuscitation. Keep affected person warm and at rest.

Ingestion

Not considered an ingestion hazard. However, if excessive amounts of dust or particulates are swallowed, treat symptomatically and supportively. Get medical attention immediately.

Notes to Medic

Inhalation of metal fume or metal oxides may produce an acute febrile state, with cough, chills, weakness, and general malaise, nausea, vomiting, muscle cramps, and remarkable leukocytosis. Treatment is symptomatic, and condition is self limited in 24-48 hours. Chronic exposure to dusts may result in pneumoconiosis of mixed type.

5. FIRE-FIGHTING MEASURES

Stainless steels in the solid form are not combustible.

Flash Point: Not applicable.

Auto-ignition Temperature: Not applicable.

Flammability Classification: Non-flammable. Will not support combustion.

Flammable Limits: Not applicable.

General Fire Hazard: None for solid formed product.

EXTINGUISHING METHOD: For solid formed product, as appropriate for surrounding fire. A fire involving finely divided particles should be treated as a Class D combustible metal fire.

Fire should be extinguished by a properly trained and experienced firefighter. Proper care should be taken in applying extinguishing agent and in allowing burning itself out.

FIRE FIGHTING EQUIPMENT: For solid formed product, as appropriate for surrounding fire.

UNUSUAL FIRE OR EXPLOSION HAZARDS: Steel products do not present fire or explosion hazards under normal conditions. Finely divided, suspended particulates may present a fire and explosion hazard in the presence of an ignition source. In addition, applied coatings may be combustible.

EXPLOSION DATA:

Sensitivity/Mechanical Impact: Not applicable for solid product

Sensitivity/Static Discharge: Not applicable for solid product

6. ACCIDENTAL RELEASE MEASURES

Not applicable to steel in solid state.

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED: Minimal problems with spills of this product would occur because of its solid form. The following precautions apply to spills involving finely divided particles:

- Shut off ignition sources; no flares, smoking or flames should be in or near hazard area.
- Minimize generation of dust; do not touch or walk through spilled material. Clean up using methods which avoid dust generation.
- Compressed air should not be used to clean up spills.
- During cleanup, skin and eye contact and inhalation of dust should be avoided as much as possible.
- Provide local exhaust or dilution ventilation as required.
- Collect material in compatible and appropriately labeled containers.
- For small dry spills, place material into clean dry container with a clean shovel, and cover loosely; move container from spill area.
 - Scrap should be reclaimed for recycling. Prevent materials from entering drains, sewers or waterways.
- Comply with local regulations regarding reporting of spills and waste disposal.

7. HANDLING AND STORAGE

7.1 Handling

There are no special technical measures involved for handling stainless steels. Normal precautions should be taken to avoid physical injury from coiled or bundled products, possibly with sharp edges:

- Straps or bands, used to secure some products, should not be used for lifting. Coils and sheet packages may spring apart when the banding is removed and the banding itself could cause eye or other injury when tension is released.
- All products are likely to have sharp edges that could cause lacerations and flying particles may be produced when shearing.
- Suitable protective clothing and equipment, such as hand and eye protection, should be worn and systems of work adopted to take account of any hazards arising from the risk of fracturing or the release of tension when breaking open banding.
- Suitable racks should be used to ensure stability when stacking narrow coils.

Recommended Work Practices: Avoid breathing of and contact with fumes and dusts during processing. Use only with adequate ventilation. Wash thoroughly after handling and use, especially before eating, drinking or smoking.

7.2 Storage

Store in a dry location. Keep away from incompatible materials (see section 10, stability and reactivity). Avoid unnecessary wetting with water, contact with acids and high-humidity environments.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Exposure limit values

No permissible exposure limits or threshold limit value exists for steel.

8.2 Exposure controls

8.2.1 Occupational exposure controls

In the processing of all metallic materials, exposure to fume and dust must be kept below any legally imposed limits in each country.

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.

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.

Respiratory Protection

When exposure cannot be maintained below permissible limits during welding, brazing, machining, and other processes which may generate airborne contaminants use an appropriate respirator. A competent health and safety professional should be consulted for respirator selection, fit testing, and training.

Skin Protection

Suitable gloves for protection against physical injury and skin contact during handling and processing should be worn. Good personal hygiene practices should be followed including cleansing exposed skin with soap and water.

Eye Protection

Dust resistant safety goggles are recommended under circumstances where particles could cause mechanical injury such as grinding or cutting.

Other Protective Clothing or Equipment

Adequate footwear (safety shoes if necessary) and clothing that protects skin from prolonged or repeated contact.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 General information

Appearance: Varying from very light grey, to shiny metallic light grey to bright mirror.

Odor: Odorless

Physical state: Solid

9.2 Important health, safety and environmental information

pH - Not applicable

Boiling point: Not applicable

Flash point: Not applicable

Flammability (solid, gas): Not applicable

Explosive properties: Not applicable

Oxidizing properties: Not applicable

Vapor pressure: Not applicable

Solubility: Insoluble

Water solubility: Insoluble

Partition coefficient: Not applicable

Viscosity: Not applicable

Vapor density: Not applicable

Evaporation rate: Not applicable

Specific gravity ($H_2O = 1$): 7,7 – 8

Magnetic Properties: Austenitic stainless steel are non-magnetic in most supply conditions, but may be para-magnetic in some supply conditions (e.g.: cold worked-2H- finishing). Duplex, ferritic and martensitic stainless steel are magnetic.

10. STABILITY AND REACTIVITY

10.1 Stability

Stainless steels are stable and non-reactive under normal ambient atmospheric conditions.

10.2 Conditions to avoid

Not applicable.

10.3 Materials to avoid

Keep away from oxidizers, stainless steel reacts with strong acids to form explosive hydrogen gas and heat. Do not store near oxidizers.

10.4 Hazardous decomposition products

Not applicable.

11. TOXICOLOGICAL INFORMATION

11.1 Dust and fumes

Grinding, polishing, abrasive blasting or welding may produce stainless steel dust or fumes containing complex or mixed oxides (spinels) of its components. Over long periods, inhalation of excessive airborne levels may have long term health effects, primarily affecting the lungs, e.g. lung fibrosis, or pneumoconiosis. Overexposure to iron oxide can cause siderosis (deposits of iron in the lungs) which may affect pulmonary function. 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.

11.2 Iron

Excessive exposure of eyes to airborne iron dust can cause conjunctivitis, choroiditis, and retinitis. Chronic inhalation of excessive concentrations of iron oxide fumes or dusts may result in development of a benign pneumoconiosis, called siderosis, which is observable via X-ray.

No physical impairment of lung function has been associated with siderosis. Inhalation of excessive concentrations of iron oxide may enhance the risk of lung cancer development in workers

11.3 Chromium

exposed to pulmonary carcinogens.

Solid stainless steel does not contain hexavalent chromium. Chromium as Cr(VI) compound can be found in fumes and dust formed by grinding, polishing, abrasive blasting or welding of stainless steel. Cr(VI) compounds can also be formed by cleaning stainless steel with strong oxide formers at high pH. Cr(VI) is classified by Confirmed Human carcinogen.

Chromium as metal or Cr(II) and Cr(III) oxides is listed as not classifiable as a human carcinogen. However, epidemiological studies amongst welders indicate no extra risk of cancer when welding stainless steels, compared to the slightly increased risk when welding steels that do not contain chromium.

11.4 Nickel

For stainless steels there is no direct evidence of carcinogenic effects in man, nor indirect evidence from animals tested by relevant routes, inhalation or ingestion. In other studies, using non-relevant routes in animals, alloys with up to 40% nickel caused no significant increase in cancer.

Epidemiological studies of workers exposed to nickel powder and to dust and fume generated in the production of nickel alloys and of stainless steel have not indicated the presence of

11.5 Molybdenum and Copper

a significant respiratory cancer hazard.

Both molybdenum and copper are necessary nutritional elements. High doses of molybdenum may antagonize absorption of copper. Likewise, high doses of copper may antagonize absorption of molybdenum. Overexposure to molybdenum causes anemia, gout-like syndrome and increases uric acid levels. In experimental animals molybdenum toxicity causes weight loss, harmful changes of the liver, kidneys, and bones and impaired reflexes.

Elemental silicon is an inert material which appears to lack the property of causing fibrosis in lung bones. However, slight pulmonary lesions have been reported in laboratory animals from intra-tracheal injections of silicon dust. Silicon may cause chronic respiratory effects. Crystalline

11.6 Silicon

silica (silicon dioxide) is a potent respiratory hazard. However, the likelihood of crystalline silica generation during normal processing is very remote.

11.7 Manganese

Overexposure to manganese can result in central nervous system effects referred to as manganism, including symptoms of muscular weakness, impaired speech and tremors similar to Parkinson's disease.

11.8 Cobalt

The classification of cobalt is valid for alloys. Cobalt dust may cause an asthma-like disease. Cobalt is classified as "Confirmed Animal Carcinogen with Unknown Relevance to Humans".

11.9 Other observations

Long-term experience of stainless steels in the most varied applications has demonstrated that these very resistant materials are eminently suitable where hygiene is of paramount importance (e.g. food processing and food preparation).

12. ECOLOGICAL INFORMATION

Not applicable for solid steel product in its as shipped form. Articles produced from solid product are not an ecological hazard. No information found on specific product to establish its effect if released into the environment in finely divided form. The solid product is not expected to migrate easily into soil or groundwater based upon its insoluble form, however, finely divided material can become mobile in water and contaminate soil and groundwater. This material may persist in the environment for long periods, based upon its corrosion resistant, insoluble, and non-biodegradable properties. In addition, heavy metals may contaminate the food chain and ultimately be consumed by humans. Some components will react with oxygen to form metallic oxides, the rate of oxidation depends upon prevailing conditions (iron oxidizes most rapidly in moist air).

12.1 Ecotoxicity

Not applicable.

12.2 Mobility

Not applicable.

12.3 Persistence and degradability

No data available.

12.4 Bioaccumulative potential

No data available.

12.5 Results of PBT assessment

Not applicable.

12.6 Other adverse effects

Not applicable.

13. DISPOSAL CONSIDERATIONS

Product dusts from processing may be classified as a hazardous waste, depending on various properties of the dust (e.g. toxicity, solubility, flammability). Solid waste generated from product processing should be classified by a competent environmental professional and disposed, processed, or recycled in accordance with local regulations; prevent materials from entering drains, sewers, or waterways.

14. TRANSPORT INFORMATION

In the case of heavy product, exercise care for prevention of load shifting. It is desirable to cover the product with tarpaulin in order to prevent infiltration of rain water. During transportation must be assured the stability of the products.

14.1 Hazardous materials description/Proper shipping name

Not applicable for solid formed alloy product.

14.2 Hazard class

Not applicable for solid formed alloy product.

14.3 Identification number

Not applicable for solid formed alloy product.

15. REGULATORY INFORMATION

2002/95/EC Directive “RoHS”

1935/2004 Directive regarding “Food contact materials”

67/548/EC Directive regarding “Dangerous substances”

1907/2006 REACH

16. OTHER INFORMATION

The compliance with EU Directives was declared based on test results performed in accredited laboratories; test report no. TURR0939569 for compliance with Directive 2002/95/EC and test reports no. L-9125-E, L-9124-E, L-9123-E, L-9122-E, L-8006-E, L-8007-E, L-8008-E, L-8009-E and L-8010-E for compliance with Directive 1935/2004/EC.

All information, recommendations and suggestions appearing herein concerning the product are based upon data believed to be reliable. It is user’s responsibility to determine the safety, toxicity, and suitability for their own use of the product describe herein.

This information is not intended to serve as a complete regulatory compliance document. This information is offered as a guide to the MSDS user. No guarantees can be made whether the user will be in complete or correct compliance with all applicable regulations when this MSDS is used. It is the user’s responsibility to comply with all regulations.