Ugitech SA
CS 90100 - Avenue Paul Girod - 73403 UGINE CEDEX

Ref. : AQ 1042374
Rev. : A
Date : 30/09/2022
Member of Swiss Steel Group

STAINLESS STEEL ARTICLES
PRODUCT SAFETY INFORMATION SHEET (SIS)
UGIWELD™ 318M

This information is provided in accordance with European Parliament and Council Regulation 1907/2006/EEC "REACH" and with reference to

- Regulation EC N°1272/2008 Classification, Labelling and Packaging (EU-GHS / CLP)
- Regulation EC N°790/2009 of 10 August 2009, ATP 1 of EC N°1272/2008 (including Ni and Ni compounds classification)
- Delegated Regulation EC N°217/2020, ATP 14 of EC N°1272/2008 (including Co classification update)

Important foreword

Products supplied by UGITECH are considered as articles within the scope of REACH in accordance with the EUROFER position paper on steel articles (*).

According to REACH-article 33, Safety Data Sheets as described in article 31 are not required for such products. Nevertheless UGITECH is willing to provide thorough safety and environmental information to its customers.

For ease of reading, the format of this information is similar to Materials Safety Data Sheets (MSDS) commonly available for chemical preparations in Europe and in other parts of the world (16 headings according to the recommendations of the Globally Harmonised System of Classification and Labelling of Chemicals).

Disclaimer

The information in this document was obtained from sources which we believe are reliable. However, the information is provided without any warranty, expressed or implied regarding the accuracy or correctness. The conditions of use, handling storage and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we will not assume any responsibility and disclaim liability for damage or expense connected with the handling, storage, use or disposal of the product.

(*) EUROFER position paper determining the borderline between preparations/articles for steel and steel products, 28 October 2008
http://www.eurofer.eu/Issues%26Positions/REACH/EUROFER%20position%20paper%20determining%20the%20borderline%20between%20preparations%20and%20articles%20for%20steel%20and%20steel%20products.%2028%20October%202008.pdf

Applicability

This Product Safety Information Sheet is valid for articles made of stainless steels grades suitable for welding applications and designated according to European standard and/or ISO practices.

This Product Safety Information Sheet is based on the general Product Safety Information Sheet **AQ 192 – Rev H – Date 27/09/2022**

According to the standard EN10020, stainless steel grades within the scope of this document are alloys containing Cr above 10.5% and C less than 1.2%.

For applications such as welding, the articles supplied by UGITECH may be covered or shipped with specific surface preparation or coatings made from different substances (wax, lubricant…).

The information in this document refers to the stainless steel wire article.

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1. Identification of products and company

Brand name

More specifically, this SIS is valid for the following UGITECH commercial designation: **UGIWELD™ 318M** and with reference to the following international standard(s): **ISO 14343-A G/W 19 12 3 Nb Si** including composition range information. More precise analysis of the specific batch may be given when an analysis certificates has been requested and issued.

Manufacturer
Importer
Supplier

UGITECH SA
Avenue Paul Girod
FR 73 403 Ugine CEDEX
ugitech.com

Department supplying information

Serge DULERM
Customer Technical Support & Development Manager
IWT 00866 (FR)
UGITECH
3-7 Chemin de Majornas - CS 31109
FR - 01009 BOURG en BRESSE Cedex
serge.dulerm@ugitech.com
Phone : +33 4 74 50 55 08
Cell : +33 6 20 17 13 75

This document was validated by: Pierre-Michel BONE - REACH Manager

2. Composition - Information on substances in stainless steel articles

Ni content depends on specific grade and will range from 0 to 30% Nickel (Ni) (CAS 7440-02-0)
Max. 25% Chromium (Cr) (CAS 7440-47-3)
Max. 5% Manganese (Mn) (CAS 7439-96-5)
Max. 6% Molybdenum (Mo) (CAS 7440--)
Max. 0.6%Cobalt (Co) (CAS 7440-48-4)

Other elements may be present, such as Silicon (Si), Copper (Cu), Titanium (Ti). These are not classified as hazardous, or are below the concentration levels for classification of the stainless steels as hazardous.

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3. Hazard classification

The only substances important for hazard classification of stainless steel in the solid form are Ni and potentially Co.

In accordance with (EC) Regulations 1272/2008 (CLP) and 790/2009 (CLP-ATP1), Ni is classified as a carcinogen category 2, Specific Target Organ Toxicity Repeated Exposure 1 and skin sensitizer 1. The CPL Regulation has introduced changes in the classification of Ni when compared with the Dangerous Substance and Dangerous Preparations Directives, which it superseded for mixtures starting 2015 June 1st.

As a result, stainless steels containing above 10%Ni, if considered as mixtures are classified as carcinogen category 2.

Since 1 October 2021, Co is classified as Carcinogenic (C) category 1B (H350), Reprotoxic (R) category 1B (H360F) and Mutagen (M) category 2 (H341). Marketed substances and mixtures (excluding articles) must comply with CLP requirements. As such, the labelling and the Safety Data Sheet must mention them as soon as the mass/mass concentration is greater than or equal to 0.1%.

Concerning articles, Co is not classified in the ECHA list of SVHC at the date of issue of this document. As such, the downstream communication obligation does not apply when the concentration is greater than or equal to 0.1% mass/mass.

Since 1 October 2021, Co metal and its alloys in concentration greater than 0.1% weight by weight are no longer permitted to the non-professional public. However, articles containing Co metal are not subject to this restriction, nor is the supply of Co metal and its alloys for strictly professional use.
In addition, the regulation specific to devices for medical use imposes for some of them containing Co in a concentration equal to or higher than 0.1% mass/mass to comply with the new requirements of EU regulation 2017/745. Consequently, for these applications, Ugitech's sales department should be contacted to select the appropriate grades.

Description of hazards

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.

Dust and fume quantity as well as composition depend on specific implementation, on parent and welding material. Different alloying elements (including Cr and Ni) may be found under various oxidized forms in welding fumes.

Welding or allied processes should only be performed by trained workers. Guidance such as American National Standard Z49.1 and German BGR-220 give valuable information on Safety in Welding and Cutting

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4. First Aid Measures

Inhalation Not applicable to stainless steels in the massive form.

Inhalation of dust and/or fume from welding, grinding, and cutting: operations are unlikely to generate the need for specific first aid

Skin and eye contact There are no special symptom or effect associated with stainless steels.

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. Stainless steel particles may not always respond strongly to a magnet placed over the eye. In such cases seek hospital treatment

Ingestion Does not apply to stainless steels in the massive form.

5. Firefighting measures

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

Unusual fire or explosion hazard may rise from finely divided, suspended particulates in the presence of heat, sparks or flames. Such unstable atmosphere have been reported in sand blasting and grinding. The use of water should be avoided as it may cause explosive hydrogen gas generation.

6. Accidental release measures

Not applicable.

7. Handling and storage

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 bundled products (e.g. sections, rods, bars etc.) may spring apart when the banding is removed and the banding itself could cause eye or other injury when tension is released.
- Certain products may, as a result of processing, be brittle or have residual stress that might cause fracture or significant deformation.
- Some 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.

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8. Exposure controls/Personal protection

Occupational exposure limits

There is no specific occupational exposure limit for stainless steel articles.

Occupational exposure limits (OEL) apply to some constituent elements (Ni, Cr, Mn, Cu, Mo …) and certain of their compounds.

There is no worldwide definition of exposure (short term, time-weighted average, ceiling limits, permissible values, recommended values) and the OEL limits are set to slightly different values in the different parts of the World (countries and even states or provinces within a country).

Table A shows limits acceptable according to current legislation in France (10) and Germany.

Substance	France Average Value (VME) mg/m³	France Max. value (VLCT) mg/m³	Germany Average Value mg/m³	Germany Max. value mg/m³
Chromium (metallic and Chromium III)	2			
Chromium VI, measured as Cr (**)	0,001	0,005	0,05 (E)	0,2
Copper (dust), measured as Cu	1	2	1 (E)	4
Copper (fumes)	0,2		0,1 (A)	0,4
Iron oxide (Fe_2O_3) measured as Fe	5			
Manganese (fumes), measured as Mn	1		0,5 (E)	2
Molybdenum (soluble compounds) as Mo	5	10	5 (E)	20
Nickel (metallic)	1		0,5 (E)	2
Nickel (oxide), measured as Ni	1		0,5 (E)	2

(E) = inhalant – (A) = alveolar – (**) Cr VI classified as CMR

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Table B shows exposure limits of a few elements and compounds according to the current legislation or recommendations in the United States of America (*).

Substance	US- OSHA Average (TWA) mg/m³	US-NIOSH Average (REL-TWA) mg/m³	US-NIOSH Ceiling value (STEL-TWA) mg/m³
Chromium (metallic)	1,0	0,5	
Chromium (trioxide), measured as Cr	0,5	0,5	-
Chromium VI, measured as Cr (**)	0,05	0,005	
Cobalt (metallic)	0,1	0,05	
Copper (dust), measured as Cu	1 (0,1 fumes)	1 (0,1 fumes)	
Iron (Fe_2O_3) (fumes), measured as Fe	10	5 (fumes and dust)	
Manganese (fumes), measured as Mn	5 *(PEL-C)*	1	3
Molybdenum (soluble compounds) as Mo	15 (5)		
Nickel (metallic)	1	0,015	

(*) legal values are different in the different States. (**) Cr VI considered occupational carcinogen

The above tables are to be considered as indicative and in case of welding of stainless steels, the user should locally refer to the local applicable values.

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 or state.

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 during processing.

Hand protection equipment such as gloves is also important to avoid direct skin contact as skin sensitizer elements are present in the Ni containing stainless steels.

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9. Physical and chemical properties

Appearance: Solid - metallic grey, ranging from dull to bright polish. Occasionally supplied with oxidized, blue/black surfaces.

Odour: odourless

Water solubility: insoluble

Melting: 1325°C to 1530°C

Density: 7.7 – 8.3 kg/dm^3

10. Stability and reactivity

Stainless steels are stable and non-reactive under normal ambient atmospheric conditions. They 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, grinding or melting operations).

11. Toxicological data

Chronic toxicity, oral or inhalation

This specific stainless steel contains above 1% Ni - which has been classified in EC CLP as a suspect carcinogenic substance, Category 2 (i.e. "causing concern for man... but available information is not adequate for making a satisfactory assessment") - should also be classified as Carcinogenic Cat 2.

However, the exposure route of concern is inhalation. These Ni-containing stainless steels products are in massive form, not capable of being inhaled.

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 Ni powder and dust and fumes generated in the production of Ni alloys and stainless steels have not indicated a respiratory cancer hazard.

In the case of stainless steels, welding and flame cutting fumes may contain chromium oxides and hexavalent chromium compounds. Studies have shown that some hexavalent chromium compounds can cause cancer.

Dermatological toxicity

Ni is classified as a skin sensitizer. It causes skin sensitisation in susceptible individuals through prolonged intimate contact with the skin (e.g. jewellery including piercing items).

According to REACH Regulation, Ni containing alloys shall not be used:

(a) in all post assemblies which are inserted into pierced ears and other pierced parts of the human body unless the rate of Ni release from such post assemblies is less than 0,2 µg/cm2/week (migration limit).

(b) in articles intended to come into direct and prolonged contact with the skin such as: earrings, necklaces, bracelets and chains, anklets, finger rings, wrist-watch cases, watch straps and tighteners, rivets, zippers and metal marks, when these are used in garments, if the rate of Ni release from the parts of these articles coming into direct and prolonged contact with the skin is greater than 0.5 µg/cm2/week.

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Dermatological toxicity	The standards EN 1811 adopted by the European Committee for Standardisation (CEN) shall be used as the test method.
(continued)	Some stainless steels having high Ni content or with above 0.10% S may not be appropriated for such uses. In such cases, testing of the final article is required.

12. Ecological data

No known harmful effects. No special precautions are required.

13. Disposal considerations

Surplus and scrap (waste) stainless steel is valuable and in demand for the production of prime new Ni containing alloys including stainless steels.

Recycling routes are well-established, and recycling is therefore the preferred disposal route. Disposal to landfill may not be harmful to the environment, but it is a waste of resources and therefore less desirable than recycling.

For dust and welding residues, recycling could be managed as well as waste treatment but disposal should be avoided.

14. Transport data

No special precautions required.

15. Regulatory references

Classification and labelling requirements	Nickel (CLP entry-028-002-00-7, CAS-No7440-02-0, EINECS-No231-111-4)
	Table below provides a direct comparison of the hazard classification of nickel provided by these items of legislation.
	In accordance with CLP, stainless steels with Ni<1% are not classified and those containing above 1%Ni are classified as Carc Cat 2.

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Hazard according to EU Regulation 1272/2008 (CLP) and 790/2009	**CLP pictogram (*)**	**Hazard Statement according to CLP**
Carc Cat 2	 (GHS08)	H351: Suspected of causing cancer (state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard) : inhalation route
Skin Sens 1	 (GHS07)	H317: May cause an allergic skin reaction
STOT RE 1		H372 : Causes damage to organs(state all organs affected, if known) through prolonged or repeated exposure (state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard)

(*) labelling is not necessary in Europe in the massive form

Cobalt (CLP entry-027-001-00-9, CAS-No7440-48-4, EINECS-No231-158-0)

Hazard according to EU Regulation 1272/2008 (CLP)	**CLP pictogram**	**Hazard Statement according to CLP**
Carcinogenic category 1B	 (GHS08)	H350 : May cause cancer
Mutagen category 2	 (GHS08)	H341 : Suspected of causing genetic defects
Reprotoxic category 1B	 (GHS08)	H360F : May damage fertility
Resp. Sens. Cat 1	 (GHS08)	H334: May cause allergy or asthma symptoms or breathing difficulties if inhaled
Skin Sens. Cat 1	 (GHS07)	H317: May cause an allergic skin reaction
Aquatic Chronic Cat 4	no pictogram	H413: May cause long lasting harmful effects to aquatic life

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From 1 October 2021, Co is classified as Carcinogenic (C) category 1B (H350), Reprotoxic (R) category 1B (H360F) and Mutagen (M) category 2 (H341). Marketed substances and mixtures (excluding articles) must comply with CLP requirements. As such, the labelling and the Safety Data Sheet must mention them as soon as the mass/mass concentration is greater than or equal to 0.1%.
Concerning articles, Co is not classified in the ECHA list of SVHC at the date of issue of this document. As such, the downstream communication obligation does not apply when the concentration is greater than or equal to 0.1% mass/mass. However, the regulation specific to medical devices requires some of them containing Co in a concentration higher than 0.1% mass/mass to comply with the new requirements of EU regulation 2017/745. Consequently, for these applications, Ugitech's sales department should be contacted to select the appropriate grades.

16. Other information

Materials for food contact

The Council of Europe published "Guidelines on metals and alloys used as food contact materials" in April 2013 as a reference document to ensure that metallic materials used in contact with food comply with the provisions of Article 2.2 of Directive 89/109/EEC (materials adapted to contact with food). The document includes a section on stainless steels and a paragraph on Ni.

The Swedish laboratory KTH has tested certain stainless steels according to the guidelines and used citric acid as food simulant (9). The use of citric acid in the new test guideline is relevant as it is commonly present in both acidic and alkaline food.

Those studies show that:

- None of the constituent alloying elements of stainless steel are released in amounts exceeding their corresponding release limits (SRLs), stipulated in the CoE protocol.
- Metal release rates decrease with time due to a gradually improved passivation of the stainless steel surface.
- Amounts of released metals diminish upon repeated use

Materials for medical devices

If Co content is a requirement for your market applications, you should specify this in the consultation and our Quality Metallurgy Department will propose a grade to meet your requirements in accordance with Regulations

- (EU) 2020 / 217 of 4 October 2019 which came into force on 1 October 2021 for Co
- (EU) 745 / 2017 of 5 April 2017 which came into force for Co on 26 May 2021.

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References to key data

Note that all of the data on the potential health effects of stainless steel, including those which might occur during manufacture and processing, which were available up to 1998 are reviewed in the reference No. 1 below. Even if this review was written in 1999 it remains an interesting document.

- H J Cross, J Beach, L S Levy, S Sadhra, T Sorahan, C McRoy: Manufacture, processing and use of stainless steel: A Review of the Health Effects. Prepared for Eurofer by the Institute of Occupational Health, University of Birmingham, 1999. Manufacture, processing and use of stainless steel: A review of the health effects, EUROFER, 1999 http://www.eurofer.org/index.php/eng/News-Publications/Publications
- N Becker: Cancer mortality among arc welders exposed to fumes containing chromium and nickel. Results of a third follow-up: 1989–1995.
- Report of the International Committee on Nickel Carcinogenesis in Man: Scand J, Work Environ Health 1990, 16; 1–82
- WIL Research Laboratories, I. (2002). A 4-week range-finding inhalation toxicity study of nickel metal in albino rats, WIL Research Laboratories, Inc.: 1-319.
- Inhalation carcinogenic study with nickel metal powder in Wistar rats. A.R. Olier et al., Toxicology and Applied Pharmacology 233 (2008) 262-275
- International Agency for Research on Cancer. Chromium, nickel and welding. 'IARC Monograph on the Evaluation of Carcinogenic Risks to Humans'. Lyon: IARC 1990.
- BG rules for occupational health and safety, BGR 220, "welding fumes", jan.2006
- Metals and Alloys used in food contact materials and articles, EDQM, CoE, 2013, 1st Edition, ISBN 978-92-871-7703-2, Specific chapter on Stainless Steels pp165, www.edqm.eu
- Surface changes and metal release in the presence of citric acid for food applications Stainless steel grades 201, 304, 204, 2101, 316L, 430, and EN1.4003, December, 2014, KTH Royal Institute of Technology, Division of Surface and Corrosion Science, Sweden
- INRS ED 984, Valeurs limites d'exposition professionnelle aux agents chimiques en France, oct. 2016, http://www.inrs.fr/media.html?refINRS=ED%20984

References to European and national legislation

- Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)
- Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures
- Regulation (EC) No 790/2009 1st Adaptation to Technical Progress (ATP) to the CLP Regulation
- Delegated Regulation (EC) No 217/2020 14th Adaptation to Technical Progress (ATP) to the CLP Regulation (completely in force after October 4th 2021)
- Art.R44-12 du Code du travail, Decret Français n°2008-244 du 7 mars 2008
- Arrêté français du 30 juin 2004 modifié par l'arrêté du 6 octobre 2007 et par l'arrêté du 9 mai 2012 liste les Valeurs limites règlementaires indicatives

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References to standards

- Designation and composition of stainless steels
  - EN-10088-1:2014 - Stainless steels — Part 1: List of stainless steels
  - EN-10095:1999 – Heat-resisting steels and alloys
  - EN-10302:2008 – Creep resisting steels and alloys
  - EN-ISO-14343 :2017 - Welding consumables -- Wire electrodes, strip electrodes, wires and rods for fusion welding of stainless and heat resisting steels – Classification
  - ISO 15510:2014 - Stainless steels – chemical composition
  - ASTM A959-19 - Standard Guide for specifying harminized standard grade composition for wrought stainless steels
  - AWS-A5.9/A5.9M :2012 : Specification for Bare Stainless Steel Welding Electrodes and Rods
- EN 1811:2011+A1:2015 Reference test method for release of nickel from products intended to come into direct and prolonged contact with skin.
- NSF/ANSI 51:2019 International Standard for "Food equipment materials"
- AWS/ ANSI Z49.1:2012 American National Standard "Safety in welding, cutting, and allied processes" http://www.aws.org/standards/page/ansi-z491

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.

Terms and definitions (Ref. Guide ISO 51)		
	Harm:	Physical injury or damage to health of people or damage to property or the environment
	Hazard:	Potential source of harm
	Risk:	Combination of the probability of occurrence of harm and the severity of that harm
	Safety:	No acceptable risk