

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product form : Article
 Product name : 316 Grade Stainless Steel

1.2. Relevant identified uses of the substance or mixture and uses advised against

1.2.1. Relevant identified uses

Industrial/Professional use spec : Industrial
 For professional use only

1.2.2. Uses advised against

No additional information available

1.3. Details of the supplier of the safety data sheet

Swagelok
 29495 F.A. Lennon Drive
 44139 Solon, OH - United States
 T 440-349-5600 - F 440-519-3304
www.swagelok.com

1.4. Emergency telephone number

Emergency number : **Infotrac:** North America: 1-800-535-5053 International: 1-352-323-3500

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No. 1272/2008 [CLP]

Steel products as shipped do not present an inhalation, ingestion, or contact health hazard. Operations however, such as welding, burning, sawing, brazing, grinding, and machining results in elevating the temperature of the product to or above its melting point or results in the generation of airborne particulates may present hazards.

Acute toxicity (oral) Category 4	H302
Respiratory sensitization, Category 1	H334
Skin sensitization, Category 1	H317
Carcinogenicity Category 2	H351
Specific target organ toxicity (repeated exposure) Category 1	H372
Hazardous to the aquatic environment - Acute Hazard Category 1	H400

Full text of H statements : see section 16

Adverse physicochemical, human health and environmental effects

No additional information available

2.2. Label elements

Labeling according to Regulation (EC) No. 1272/2008 [CLP]

Hazard pictograms (CLP) :



Signal word (CLP) : Danger

Hazardous ingredients : Iron; Nickel; Tin; Cobalt

Hazard statements (CLP) :

- H302 - Harmful if swallowed
- H317 - May cause an allergic skin reaction
- H334 - May cause allergy or asthma symptoms or breathing difficulties if inhaled
- H351 - Suspected of causing cancer
- H372 - Causes damage to organs through prolonged or repeated exposure
- H400 - Very toxic to aquatic life

Precautionary statements (CLP) :

- P201 - Obtain special instructions before use
- P202 - Do not handle until all safety precautions have been read and understood
- P260 - Do not breathe dust from machining

316 Grade Stainless Steel

Safety Data Sheet

according to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2015/830

P264 - Wash hands thoroughly after handling
P270 - Do not eat, drink or smoke when using this product
P272 - Contaminated work clothing should not be allowed out of the workplace
P273 - Avoid release to the environment
P280 - Wear personal protective equipment
P284 - During machining wear respiratory protection
P301+P312 - IF SWALLOWED: Call poison control if you feel unwell
P302+P352 - IF ON SKIN: Wash with plenty of water
P304+P340 - IF INHALED: Remove person to fresh air and keep comfortable for breathing
P314 - Get medical advice/attention if you feel unwell
P321 - Specific treatment (see first aid measures on this label)
P330 - Rinse mouth
P333+P313 - If skin irritation or rash occurs: Get medical advice/attention
P342+P311 - If experiencing respiratory symptoms: Call doctor
P362+P364 - Take off contaminated clothing and wash it before reuse
P391 - Collect spillage
P405 - Store locked up
P501 - Dispose of contents to meet all regulations

2.3. Other hazards

Other hazards not contributing to the classification :

SECTION 3: Composition/Information on ingredients

3.1. Substances

Not applicable

3.2. Mixtures

Name	Product identifier	%	Classification according to Regulation (EC) No. 1272/2008 [CLP]
Iron	(CAS-No.) 7439-89-6 (EC-No.) 231-096-4	<= 90	Acute Tox. 4 (Oral), H302
Nickel	(CAS-No.) 7440-02-0 (EC-No.) 231-111-4 (EC Index-No.) 028-002-00-7	<= 30	Skin Sens. 1, H317 Carc. 2, H351 STOT RE 1, H372 Aquatic Acute 1, H400
Chromium	(CAS-No.) 7440-47-3	<= 30	Aquatic Acute 1, H400 (M=10)
Molybdenum	(CAS-No.) 7439-98-7	<= 10	Acute Tox. 4 (Dermal), H312
Copper	(CAS-No.) 7440-50-8 (EC-No.) 231-159-6	<= 5	Aquatic Acute 1, H400 (M=10)
Tin	(CAS-No.) 7440-31-5 (EC-No.) 231-141-8	<= 1	Acute Tox. 4 (Oral), H302
Cobalt	(CAS-No.) 7440-48-4 (EC-No.) 231-158-0 (EC Index-No.) 027-001-00-9	<= 1	Resp. Sens. 1, H334 Skin Sens. 1, H317 Aquatic Chronic 4, H413

Full text of H-phrases: see section 16

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures general : Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label where possible).

First-aid measures after inhalation : If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing. If experiencing respiratory symptoms: Call a POISON CENTER or doctor/physician.

First-aid measures after skin contact : Remove affected clothing and wash all exposed skin area with mild soap and water, followed by warm water rinse. Wash with plenty of soap and water. If skin irritation or rash occurs: Get medical advice/attention. Specific treatment (see first aid measures on this label). Wash contaminated clothing before reuse.

First-aid measures after eye contact : Rinse immediately with plenty of water. Obtain medical attention if pain, blinking or redness persists.

First-aid measures after ingestion : Rinse mouth. Do NOT induce vomiting. Obtain emergency medical attention. Call a POISON CENTER or doctor/physician if you feel unwell.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms/effects after inhalation : May cause allergy or asthma symptoms or breathing difficulties if inhaled. May cause an allergic skin reaction.

Symptoms/effects after ingestion : Swallowing a small quantity of this material will result in serious health hazard.

316 Grade Stainless Steel

Safety Data Sheet

according to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2015/830

4.3. Indication of any immediate medical attention and special treatment needed

No additional information available

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Foam. Dry powder. Carbon dioxide. Water spray. Sand.

Unsuitable extinguishing media : Do not use a heavy water stream.

5.2. Special hazards arising from the substance or mixture

Fire hazard : Non-combustible, substance itself does not burn but may decompose upon heating to produce corrosive and/or toxic fumes.

5.3. Advice for firefighters

Firefighting instructions : Use water spray or fog for cooling exposed containers. Exercise caution when fighting any chemical fire. Prevent fire-fighting water from entering environment.

Protection during firefighting : Do not enter fire area without proper protective equipment, including respiratory protection.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures : May decompose at temperatures above 500F/260C to produce organo-chlorine compounds, organo-fluorine compounds, hydrogen fluoride, and chlorine gas.

6.1.1. For non-emergency personnel

Emergency procedures : Evacuate unnecessary personnel.

6.1.2. For emergency responders

Protective equipment : Equip cleanup crew with proper protection.

Emergency procedures : Ventilate area.

6.2. Environmental precautions

Prevent entry to sewers and public waters. Notify authorities if liquid enters sewers or public waters.

6.3. Methods and material for containment and cleaning up

Methods for cleaning up : On land, sweep or shovel into suitable containers. Minimize generation of dust. Store away from other materials.

6.4. Reference to other sections

See Heading 8. Exposure controls and personal protection.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Additional hazards when processed : Steel products as shipped do not present an inhalation, ingestion, or contact health hazard. Operations however, such as welding, burning, sawing, brazing, grinding, and machining results in elevating the temperature of the product to or above its melting point or results in the generation of airborne particulates may present hazards.

Precautions for safe handling : Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work. Provide good ventilation in process area to prevent formation of vapor. Avoid breathing dust from machining. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not breathe dust.

Hygiene measures : Do not eat, drink or smoke when using this product. Wash hands thoroughly after handling. Contaminated work clothing should not be allowed out of the workplace. Wash contaminated clothing before reuse.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Keep only in the original container in a cool, well ventilated place away from : children. Keep container closed when not in use.

Incompatible products : Strong bases. Strong acids.

Incompatible materials : Sources of ignition. Direct sunlight.

7.3. Specific end use(s)

No additional information available

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Nickel (7440-02-0)		
USA - NIOSH	NIOSH REL (TWA) (mg/m ³)	0.015 mg/m ³
USA - OSHA	OSHA PEL (TWA) (mg/m ³)	1 mg/m ³

316 Grade Stainless Steel

Safety Data Sheet

according to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2015/830

Chromium (7440-47-3)		
USA - NIOSH	NIOSH REL (TWA) (mg/m ³)	0.05 mg/m ³
Molybdenum (7439-98-7)		
USA - OSHA	OSHA PEL (TWA) (mg/m ³)	10 mg/m ³ (Inhalable fraction) 3 mg/m ³ (Respirable fraction)
Copper (7440-50-8)		
USA - NIOSH	NIOSH REL (TWA) (mg/m ³)	1 mg/m ³
USA - OSHA	OSHA PEL (TWA) (mg/m ³)	1 fibers/cm ³
Tin (7440-31-5)		
USA - NIOSH	NIOSH REL (TWA) (mg/m ³)	2 mg/m ³
Cobalt (7440-48-4)		
USA - NIOSH	NIOSH REL (TWA) (mg/m ³)	0.05 mg/m ³
USA - OSHA	Local name	Cobalt metal, dust, and fume (as Co)
USA - OSHA	OSHA PEL (TWA) (mg/m ³)	0.1 mg/m ³

8.2. Exposure controls

Appropriate engineering controls:

Good general ventilation should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. Ensure that dust handling systems (such as exhaust ducts, dust collectors, vessels and processing equipment) are designed in a manner to prevent the escape of dust into the work area (i.e. there is not leakage from the equipment).

Personal protective equipment:

Avoid all unnecessary exposure.

Hand protection:

Wear protective gloves

Eye protection:

Chemical goggles or safety glasses

Skin and body protection:

Impervious shoes

Respiratory protection:

In case of inadequate ventilation wear respiratory protection during machining.

Other information:

Do not eat, drink or smoke during use.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	: Solid
Color	: Colorless.
Odor	: Characteristic.
Odor threshold	: No data available
pH	: No data available
Relative evaporation rate (butyl acetate=1)	: No data available
Melting point	: No data available
Freezing point	: No data available
Boiling point	: No data available
Flash point	: No data available
Auto-ignition temperature	: No data available
Decomposition temperature	: No data available
Flammability (solid, gas)	: Non flammable
Vapor pressure	: No data available
Relative vapor density at 20 °C	: No data available

316 Grade Stainless Steel

Safety Data Sheet

according to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2015/830

Relative density	: No data available
Solubility	: No data available
Log Pow	: No data available
Viscosity, kinematic	: No data available
Viscosity, dynamic	: No data available
Explosive properties	: No data available
Oxidizing properties	: No data available
Explosion limits	: No data available

9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

No additional information available

10.2. Chemical stability

Not established.

10.3. Possibility of hazardous reactions

Not established.

10.4. Conditions to avoid

Direct sunlight. Extremely high or low temperatures.

10.5. Incompatible materials

Strong acids. Strong bases. Sodium, potassium, barium, calcium, finely divided zinc, aluminum, magnesium, and beryllium. Avoid aluminum threaded connections where galling and seizure may initiate a reaction. Reacts with amines, liquid fluorine, and liquid chlorine trifluoride.

10.6. Hazardous decomposition products

May decompose at temperatures above 500F/260C to produce organo-chlorine compounds, organo-fluorine compounds, hydrogen fluoride, and chlorine gas.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity (oral) : Oral: Harmful if swallowed.

Acute toxicity (dermal) : Not classified

Acute toxicity (inhalation) : Not classified

ATE CLP (oral)	1076.5191297824 mg/kg body weight
Iron (7439-89-6)	
LD50 oral rat	984 mg/kg
Nickel (7440-02-0)	
LD50 oral rat	> 9000 mg/kg
Molybdenum (7439-98-7)	
LD50 oral rat	5000 mg/kg
LD50 dermal rabbit	2000 mg/kg
LC50 inhalation rat (mg/l)	5.84 mg/l 4 hours
Tin (7440-31-5)	
LD50 oral rat	700 mg/kg
Cobalt (7440-48-4)	
LD50 oral rat	6171 mg/kg

Skin corrosion/irritation : Not classified

Serious eye damage/irritation : Not classified

Respiratory or skin sensitization : May cause allergy or asthma symptoms or breathing difficulties if inhaled. May cause an allergic skin reaction.

Germ cell mutagenicity : Not classified

Carcinogenicity : Suspected of causing cancer.

Reproductive toxicity : Not classified

Specific target organ toxicity – single exposure : Not classified

316 Grade Stainless Steel

Safety Data Sheet

according to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2015/830

Specific target organ toxicity – repeated exposure	: Causes damage to organs through prolonged or repeated exposure.
Additional information	: Causes damage to organs through prolonged or repeated exposure
Aspiration hazard	: Not classified
Potential Adverse human health effects and symptoms	: Based on available data, the classification criteria are not met. Harmful if swallowed.

SECTION 12: Ecological information

12.1. Toxicity

Aquatic acute	: Very toxic to aquatic life.
Aquatic chronic	: Not classified

Nickel (7440-02-0)	
LC50 fish 1	> 100 mg/l (Exposure time: 96 h - Species: Brachydanio rerio)
LC50 fish 2	1.3 mg/l (Exposure time: 96 h - Species: Cyprinus carpio [semi-static])
EC50 Daphnia 1	> 100 mg/l (Exposure time: 48 h - Species: Daphnia magna)
EC50 Daphnia 2	1 mg/l (Exposure time: 48 h - Species: Daphnia magna [Static])
EC50 72h algae [mg/l] 1	0.18 mg/l (Species: Pseudokirchneriella subcapitata)
EC50 96h algae [mg/l] (1)	0.174 - 0.311 mg/l (Species: Pseudokirchneriella subcapitata [static])
Chromium (7440-47-3)	
LC50 fish 1	14.3 mg/l Cyprinus carpio (Carp) 96 hours
EC50 Daphnia 1	0.07 mg/l Daphnia magna (Water flea) 48 hours
LOEC (acute)	2.4 mg/l Pimephales promelas (fathead minnow)-7d
NOEC (acute)	12 mg/l Pimephales promelas (fathead minnow)- 7d
Copper (7440-50-8)	
EC50 Daphnia 1	0.04 - 0.05 mg/l 48 hours
ErC50 (algae)	< mg/l
LOEC (chronic)	0.022 mg/l 96hours
NOEC (chronic)	0.004 mg/l 24 hours
Cobalt (7440-48-4)	
LC50 fish 1	100.01 mg/l zebra fish 96hours

12.2. Persistence and degradability

316 Grade Stainless Steel	
Persistence and degradability	Not established.
Iron (7439-89-6)	
Persistence and degradability	May cause long-term adverse effects in the environment.
Nickel (7440-02-0)	
Persistence and degradability	May cause long-term adverse effects in the environment.
Chromium (7440-47-3)	
Persistence and degradability	Not established.
Molybdenum (7439-98-7)	
Persistence and degradability	Not established.
Copper (7440-50-8)	
Persistence and degradability	May cause long-term adverse effects in the environment.
Cobalt (7440-48-4)	
Persistence and degradability	May cause long-term adverse effects in the environment.

12.3. Bioaccumulative potential

316 Grade Stainless Steel	
Bioaccumulative potential	Not established.
Chromium (7440-47-3)	
BCF fish 1	0.00133 mg/l Oncorhynchus mykiss (rainbow trout) - 30 d
Bioconcentration factor (BCF REACH)	1.03-1.22
Bioaccumulative potential	Not established.
Molybdenum (7439-98-7)	
Bioaccumulative potential	Not established.

316 Grade Stainless Steel

Safety Data Sheet

according to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2015/830

Copper (7440-50-8)	
Bioconcentration factor (BCF REACH)	108
Cobalt (7440-48-4)	
Bioaccumulative potential	Not established.

12.4. Mobility in soil

No additional information available

12.5. Results of PBT and vPvB assessment

No additional information available

12.6. Other adverse effects

Additional information : Avoid release to the environment

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Product/Packaging disposal recommendations : Dispose in a safe manner in accordance with local/national regulations.

Ecology - waste materials : Avoid release to the environment.

SECTION 14: Transport information

In accordance with ADR / RID / IMDG / IATA / ADN

14.1. UN number

UN-No. (ADR) : Not applicable

UN-No. (IMDG) : Not applicable

UN-No. (IATA) : Not applicable

UN-No. (ADN) : Not applicable

UN-No. (RID) : Not applicable

14.2. UN proper shipping name

Proper Shipping Name (ADR) : Not applicable

Proper Shipping Name (IMDG) : Not applicable

Proper Shipping Name (IATA) : Not applicable

Proper Shipping Name (ADN) : Not applicable

Proper Shipping Name (RID) : Not applicable

14.3. Transport hazard class(es)

ADR

Transport hazard class(es) (ADR) : Not applicable

IMDG

Transport hazard class(es) (IMDG) : Not applicable

IATA

Transport hazard class(es) (IATA) : Not applicable

ADN

Transport hazard class(es) (ADN) : Not applicable

RID

Transport hazard class(es) (RID) : Not applicable

14.4. Packing group

Packing group (ADR) : Not applicable

Packing group (IMDG) : Not applicable

Packing group (IATA) : Not applicable

Packing group (ADN) : Not applicable

Packing group (RID) : Not applicable

14.5. Environmental hazards

Dangerous for the environment : Yes

Marine pollutant : Yes

Other information : No supplementary information available

316 Grade Stainless Steel

Safety Data Sheet

according to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2015/830

14.6. Special precautions for user

- Overland transport

Not applicable

- Transport by sea

Not applicable

- Air transport

Not applicable

- Inland waterway transport

Not applicable

- Rail transport

Not applicable

14.7. Transport in bulk according to Annex II of Marpol and the IBC Code

Not applicable

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

15.1.1. EU-Regulations

Contains no REACH candidate substance

15.1.2. National regulations

No additional information available

15.2. Chemical safety assessment

No chemical safety assessment has been carried out

SECTION 16: Other information

Other information : None.

Full text of H- and EUH-phrases:	
Acute Tox. 4 (Dermal)	Acute toxicity (dermal) Category 4
Acute Tox. 4 (Oral)	Acute toxicity (oral) Category 4
Aquatic Acute 1	Hazardous to the aquatic environment - Acute Hazard Category 1
Aquatic Chronic 4	Hazardous to the aquatic environment - Chronic Hazard Category 4
Carc. 2	Carcinogenicity Category 2
Resp. Sens. 1	Respiratory sensitization, Category 1
Skin Sens. 1	Skin sensitization, Category 1
STOT RE 1	Specific target organ toxicity (repeated exposure) Category 1
H302	Harmful if swallowed
H312	Harmful in contact with skin
H317	May cause an allergic skin reaction
H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled
H351	Suspected of causing cancer
H372	Causes damage to organs through prolonged or repeated exposure
H400	Very toxic to aquatic life
H413	May cause long lasting harmful effects to aquatic life

SDS EU (REACH Annex II)

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product