

SECTION 1: Identification

1.1. Identification

Product name : 316 Grade Stainless Steel

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

No additional information available

1.3. Details of the supplier of the safety data sheet

Swagelok
29495 F.A. Lennon Drive
Solon, OH 44139 - 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: Hazard(s) identification

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.

2.1. Classification of the substance or mixture

GHS-US classification

Acute Tox. 4 (Oral)	Harmful if swallowed
Eye Irrit. 2	Causes serious eye irritation
Resp. Sens. 1	May cause allergy or asthma symptoms or breathing difficulties if inhaled
Skin Sens. 1	May cause an allergic skin reaction
Carc. 1B	May cause cancer
STOT RE 1	Causes damage to organs through prolonged or repeated exposure

2.2. Label elements

GHS-US labeling

Hazard pictograms (GHS-US)



Signal word (GHS-US)

: Danger

Hazard statements (GHS-US)

: Harmful if swallowed
May cause an allergic skin reaction
Causes serious eye irritation
May cause allergy or asthma symptoms or breathing difficulties if inhaled
May cause cancer
Causes damage to organs through prolonged or repeated exposure

Precautionary statements (GHS-US)

Prevention

: Obtain special instructions before use
Do not handle until all safety precautions have been read and understood
Do not breathe dust
Avoid breathing dust Wash hands, forearms and face thoroughly after handling
Do not eat, drink or smoke when using this product
Contaminated work clothing must not be allowed out of the workplace
Wear protective gloves/protective clothing/eye protection/face protection
[In case of inadequate ventilation] wear respiratory protection

Response

: If swallowed: Call a poison center if you feel unwell
If on skin: Wash with plenty of water
If inhaled: If breathing is difficult, remove person to fresh air and keep comfortable for breathing

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If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
If exposed or concerned: Get medical advice/attention
Get medical advice/attention if you feel unwell
Specific treatment (see first aid measures on this label)
Rinse mouth
If skin irritation or rash occurs: Get medical attention
If eye irritation persists: Get medical advice
If experiencing respiratory symptoms: Call a poison center
Wash contaminated clothing before reuse

Storage : Store locked up
Disposal : Dispose of contents/container to meet all regulations

2.3. Other hazards

Other hazards not contributing to the classification : None.

2.4. Unknown acute toxicity (GHS US)

Not applicable

SECTION 3: Composition/Information on ingredients

3.1. Substances

Not applicable

3.2. Mixtures

Name	Product identifier	%	GHS-US classification
Iron	(CAS-No.) 7439-89-6	<= 90	Acute Tox. 4 (Oral), H302
Nickel	(CAS-No.) 7440-02-0	<= 30	Skin Sens. 1, H317 Carc. 1B, H350 STOT RE 1, H372
Molybdenum	(CAS-No.) 7439-98-7	<= 10	Acute Tox. 4 (Dermal), H312
Cobalt	(CAS-No.) 7440-48-4	<= 1	Flam. Sol. 1, H228 Resp. Sens. 1, H334 Skin Sens. 1, H317 Carc. 2, H351 Aquatic Chronic 4, H413
Tungsten	(CAS-No.) 7440-33-7	<= 1	Flam. Sol. 1, H228 Skin Irrit. 2, H315 Eye Irrit. 2A, H319
Tin	(CAS-No.) 7440-31-5	<= 1	Acute Tox. 4 (Oral), H302

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.

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

No additional information available

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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.

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SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Nickel (7440-02-0)		
OSHA	OSHA PEL (TWA) (mg/m ³)	1 mg/m ³

Molybdenum (7439-98-7)		
OSHA	OSHA PEL (TWA) (mg/m ³)	10 mg/m ³ (Inhalable fraction) 3 mg/m ³ (Respirable fraction)

Cobalt (7440-48-4)		
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
Melting point	: No data available
Freezing point	: No data available
Boiling point	: No data available
Flash point	: No data available
Relative evaporation rate (butyl acetate=1)	: No data available
Flammability (solid, gas)	: No data available
Explosion limits	: No data available
Explosive properties	: No data available
Oxidizing properties	: No data available
Vapor pressure	: No data available
Relative density	: No data available
Relative vapor density at 20 °C	: No data available
Solubility	: No data available
Log Pow	: No data available
Auto-ignition temperature	: No data available
Decomposition temperature	: No data available

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Viscosity : No data available
Viscosity, kinematic : No data available
Viscosity, dynamic : 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: Harmful if swallowed.

316 Grade Stainless Steel	
ATE US (oral)	1036.5458650858 mg/kg body weight
Iron (7439-89-6)	
LD50 oral rat	984 mg/kg
ATE US (oral)	984 mg/kg body weight
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
ATE US (oral)	5000 mg/kg body weight
ATE US (dermal)	2000 mg/kg body weight
ATE US (vapors)	5.84 mg/l/4h
ATE US (dust, mist)	5.84 mg/l/4h
Tin (7440-31-5)	
LD50 oral rat	700 mg/kg
ATE US (oral)	700 mg/kg body weight
Cobalt (7440-48-4)	
LD50 oral rat	6171 mg/kg
ATE US (oral)	6171 mg/kg body weight

Skin corrosion/irritation : Not classified
Serious eye damage/irritation : Causes serious eye irritation.

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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	: May cause cancer.

Nickel (7440-02-0)	
IARC group	2B - Possibly carcinogenic to humans
National Toxicology Program (NTP) Status	3 - Reasonably anticipated to be Human Carcinogen
In OSHA Hazard Communication Carcinogen list	Yes

Cobalt (7440-48-4)	
IARC group	2B - Possibly carcinogenic to humans

Reproductive toxicity	: Not classified
Specific target organ toxicity – single exposure	: Not classified

Specific target organ toxicity – repeated exposure : 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.

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.

SECTION 12: Ecological information

12.1. Toxicity

Nickel (7440-02-0)	
LC50 fish 1	> 100 mg/l (Exposure time: 96 h - Species: Brachydanio rerio)
EC50 Daphnia 1	> 100 mg/l (Exposure time: 48 h - Species: Daphnia magna)
LC50 fish 2	1.3 mg/l (Exposure time: 96 h - Species: Cyprinus carpio [semi-static])
EC50 Daphnia 2	1 mg/l (Exposure time: 48 h - Species: Daphnia magna [Static])

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.

Molybdenum (7439-98-7)	
Persistence and degradability	Not established.

Tungsten (7440-33-7)	
Persistence and degradability	Not established.

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.

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Molybdenum (7439-98-7)	
Bioaccumulative potential	Not established.
Tungsten (7440-33-7)	
Bioaccumulative potential	Not established.
Cobalt (7440-48-4)	
Bioaccumulative potential	Not established.

12.4. Mobility in soil

No additional information available

12.5. Other adverse effects

Effect on the global warming : No known effects from this product.

Other 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

Department of Transportation (DOT)

In accordance with DOT

Not regulated for transport

Transportation of Dangerous Goods

No additional information available

Transport by sea

No additional information available

Air transport

No additional information available

SECTION 15: Regulatory information

15.1. US Federal regulations

Iron (7439-89-6)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
Nickel (7440-02-0)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory Subject to reporting requirements of United States SARA Section 313	
CERCLA RQ	100 lb no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is >100 µm
SARA Section 313 - Emission Reporting	0.1 %
Chromium (7440-47-3)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory Subject to reporting requirements of United States SARA Section 313 Not subject to reporting requirements of the United States SARA Section 313	
CERCLA RQ	10 lb

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Manganese (7439-96-5)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory Subject to reporting requirements of United States SARA Section 313	
SARA Section 313 - Emission Reporting	1 %
Silicon (7440-21-3)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
Titanium (7440-32-6)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
Tin (7440-31-5)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
Niobium (7440-03-1)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
Cobalt (7429-90-5)	
Not listed on the United States TSCA (Toxic Substances Control Act) inventory Subject to reporting requirements of United States SARA Section 313	
Aluminum (7439-89-6)	
Subject to reporting requirements of United States SARA Section 313 as a dust.	

15.2. International regulations

CANADA

Iron (7439-89-6)	
Listed on the Canadian DSL (Domestic Substances List)	
WHMIS Classification	Uncontrolled product according to WHMIS classification criteria
Nickel (7440-02-0)	
Listed on the Canadian DSL (Domestic Substances List)	
WHMIS Classification	Class D Division 2 Subdivision A - Very toxic material causing other toxic effects Class D Division 2 Subdivision B - Toxic material causing other toxic effects
Manganese (7439-96-5)	
Listed on the Canadian DSL (Domestic Substances List)	
WHMIS Classification	Class D Division 2 Subdivision A - Very toxic material causing other toxic effects
Titanium (7440-32-6)	
Listed on the Canadian DSL (Domestic Substances List)	
Tin (7440-31-5)	
Listed on the Canadian DSL (Domestic Substances List)	
WHMIS Classification	Uncontrolled product according to WHMIS classification criteria
Niobium (7440-03-1)	
Listed on the Canadian DSL (Domestic Substances List)	

EU-Regulations

No additional information available

National regulations

Iron (7439-89-6)
Listed on the AICS (Australian Inventory of Chemical Substances) Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China) Listed on the Korean ECL (Existing Chemicals List) Listed on NZIoC (New Zealand Inventory of Chemicals) Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances) Listed on INSQ (Mexican National Inventory of Chemical Substances) Listed on CICR (Turkish Inventory and Control of Chemicals)

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Nickel (7440-02-0)

Listed on the AICS (Australian Inventory of Chemical Substances)
Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)
Listed on the Korean ECL (Existing Chemicals List)
Listed on NZIoC (New Zealand Inventory of Chemicals)
Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)
Japanese Pollutant Release and Transfer Register Law (PRTR Law)
Listed on the Canadian IDL (Ingredient Disclosure List)
Listed on INSQ (Mexican National Inventory of Chemical Substances)
Listed on CICR (Turkish Inventory and Control of Chemicals)

Tin (7440-31-5)

Listed on the AICS (Australian Inventory of Chemical Substances)
Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)
Listed on the Korean ECL (Existing Chemicals List)
Listed on NZIoC (New Zealand Inventory of Chemicals)
Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)
Listed on the Canadian IDL (Ingredient Disclosure List)
Listed on INSQ (Mexican National Inventory of Chemical Substances)
Listed on CICR (Turkish Inventory and Control of Chemicals)

15.3. US State regulations

Nickel (7440-02-0)

U.S. - California - Proposition 65 - Carcinogens List	U.S. - California - Proposition 65 - Developmental Toxicity	U.S. - California - Proposition 65 - Reproductive Toxicity - Female	U.S. - California - Proposition 65 - Reproductive Toxicity - Male	No significant risk level (NSRL)
Yes	No	No	No	

Cobalt (7440-48-4)

U.S. - California - Proposition 65 - Carcinogens List	U.S. - California - Proposition 65 - Developmental Toxicity	U.S. - California - Proposition 65 - Reproductive Toxicity - Female	U.S. - California - Proposition 65 - Reproductive Toxicity - Male	No significant risk level (NSRL)
Yes	No	No	No	

Nickel (7440-02-0)

U.S. - Massachusetts - Right To Know List
U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List
U.S. - Pennsylvania - RTK (Right to Know) - Special Hazardous Substances
U.S. - Pennsylvania - RTK (Right to Know) List

Tin (7440-31-5)

U.S. - Massachusetts - Right To Know List
U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - Pennsylvania - RTK (Right to Know) List

Cobalt (7440-48-4)

U.S. - New Jersey - Right to Know Hazardous Substance List

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