



SDS Revision Date: 01/14/2016

1. Identification

1.1. Product identifier

Product Identity Stainless Steel Grades: 16 - 6, 21 - 6 - 9, 303, 304 - 304L, 305, 309 - 309S,

31

Alternate Names Steel Grades: 16 - 6, 21 - 6 - 9, 303, 304 - 304L, 305, 309 - 309S

,310 - 310S, 316 - 316L, 317 - 317L, 321, 347 - 348, 403, 405, 410, 416, 430

,446,MSDS # : 500

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

Intended useSee Technical Data Sheet.Application MethodSee Technical Data Sheet.

1.3. Details of the supplier of the safety data sheet

Company Name TW Metals Company, Inc.

The Arboretum 760 Constitution Drive

Exton PA 19341

Emergency

CHEMTREC (USA) (800) 424-9300

2. Hazard(s) identification

2.1. Classification of the substance or mixture

Acute Tox. 5;H303 May be harmful if swallowed. (Not adopted by US OSHA)

Eye Irrit. 2;H319 Causes serious eye irritation.

Skin Sens. 1;H317 May cause an allergic skin reaction.

Resp. Sens. 1;H334 May cause allergy or asthma symptoms of breathing difficulties if inhaled.

Carc. 2;H351 Suspected of causing cancer.

STOT RE 1;H372 Causes damage to organs through prolonged or repeated exposure. Specific Target

Organs: (lungs)

2.2. Label elements

Using the Toxicity Data listed in section 11 and 12 the product is labeled as follows.



SDS Revision Date: 01/14/2016



H303 May be harmful if swallowed.

H317 May cause an allergic skin reaction.

H319 Causes serious eye irritation.

H334 May cause allergic or asthmatic symptoms or breathing difficulties if inhaled.

H351 Suspected of causing cancer.

H372 Causes damage to organs through prolonged or repeated exposure.

[Prevention]:

P201 Obtain special instructions before use.

P202 Do not handle until all safety precautions have been read and understood.

P261 Avoid breathing dust / fume / gas / mist / vapors / spray.

P264 Wash 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.

P280 Wear protective gloves / eye protection / face protection.

P285 In case of inadequate ventilation wear respiratory protection.

[Response]:

P302+352 IF ON SKIN: Wash with plenty of soap and water.

P304+312 IF INHALED: Call a POISON CENTER or doctor / physician if you feel unwell.

P305+351+338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do - continue rinsing.

P308+313 IF exposed or concerned: Get medical advice / attention.

P314 Get Medical advice / attention if you feel unwell.

P321 Specific treatment (see information on this label).

P333+313 If skin irritation or a rash occurs: Get medical advice / attention.

P337+313 If eye irritation persists: Get medical advice / attention.

P341 If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing.

P342+311 If experiencing respiratory symptoms: Call a POISON CENTER or doctor / physician.

P363 Wash contaminated clothing before reuse.

[Storage]:

P405 Store locked up.

[Disposal]:



SDS Revision Date: 01/14/2016

P501 Dispose of contents / container in accordance with local / national regulations.

3. Composition/information on ingredients

This product contains the following substances that present a hazard within the meaning of the relevant State and Federal Hazardous Substances regulations.

Ingredient/Chemical Designations	Weight %	GHS Classification	Notes
Iron CAS Number: 0007439-89-6	50 - 75	Not Classified	[1]
Chromium compounds (as Cr (III)) CAS Number: 0007440-47-3	10 - 25	Skin Sens. 1;H317 Resp. Sens. 1;H334 Eye Irrit. 2;H319 Aquatic Chronic 4;H413	[1][2]
Nickel CAS Number: 0007440-02-0	10 - 25	Carc. 2;H351 STOT RE 1;H372 Skin Sens. 1;H317 Aquatic Chronic 3;H412	[1][2]
Manganese compounds (as Mn) CAS Number: 0007439-96-5	5 - 10	Not Classified	[1][2]
Copper CAS Number: 0007440-50-8	1 - 5	Not Classified	[1][2]
Molybdenum CAS Number: 0007439-98-7	1 - 5	Not Classified	[1][2]
Aluminum (AI) CAS Number: 0007429-90-5	1 - 5	Flam. Sol. 1;H228 WaterReact. 2;H261	[1][2]
Silicon CAS Number: 0007440-21-3	1 - 5	Not Classified	[1][2]
Calcium CAS Number: 0007440-70-2	1 - 5	WaterReact. 2;H261	[1]
Cobalt compounds (as Co) CAS Number: 0007440-48-4	0.10 - 1.0	Resp. Sens. 1;H334 Skin Sens. 1;H317 Aquatic Chronic 4;H413	[1][2]

In accordance with paragraph (i) of §1910.1200, the specific chemical identity and/or exact percentage (concentration) of composition has been withheld as a trade secret.

4. First aid measures

4.1. Description of first aid measures

General In all cases of doubt, or when symptoms persist, seek medical attention.

Never give anything by mouth to an unconscious person.

^[1] Substance classified with a health or environmental hazard.

^[2] Substance with a workplace exposure limit.

^[3] PBT-substance or vPvB-substance.
*The full texts of the phrases are shown in Section 16.





SDS Revision Date: 01/14/2016

Inhalation Remove to fresh air, keep patient warm and at rest. If breathing is irregular or stopped, give

artificial respiration. If unconscious place in the recovery position and obtain immediate

medical attention. Give nothing by mouth.

Eyes Immediately flush the eyes with large amounts of water for at least 15 minutes, alternately

lifting the upper and lower eyelids. After 5 minutes, if appropriate, remove contact lenses and continue flushing the eyes for an additional 15 minutes. Call a physician at once.

Skin Remove contaminated clothing. Wash skin thoroughly with soap and water or use a

recognized skin cleanser.

Ingestion Do not induce vomiting. Get medical attention.

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

Overview Stainless steel products in their solid state present no inhalation, ingestion or contact health

hazard. However, inhaling dusts, fumes or mists which may be generated during certain manufacturing procedures (burning, melting, welding, sawing. brazing. grinding and machining) may be hazardous to your health. Dusts may also be irritating to the

unprotected skin or eyes.

ACUTE EFFECTS: Excessive exposure to dusts / fumes may cause irritation of eyes, nose

or throat. Inhalation of dusts / fumes may result in metal fume fever (metallic taste in

mouth, dryness and irritation of throat, chills and fever).

CHRONIC EFFECTS: Prolonged inhalation of fumes or dusts may cause a variety of adverse health effects to the respiratory system, including (but not necessarily limited to) lesions of the mucous membrane, bronchitis, pneumonia and cancers fo the nasal cavity

and respiratory tract.

POTENTIAL HEALTH EFFECTS/MEDICAL CONDITIONS AGGRAVATED BY

EXPOSURE: Any pre-existing chronic respiratory condition (asthma, chronic bronchitis,

emphysema).

ROUTES OF ENTRY: Inhalation (dusts / fumes / mists), Contact with Skin and Eyes (dusts

/ mists), Ingestion (dusts).

Possible cancer hazard. Contains an ingredient which may cause cancer based on animal

data (See Section 3 and Section 15 for each ingredient). Risk of cancer depends on

duration and level of exposure. See section 2 for further details.

Inhalation May cause allergy or asthma symptoms of breathing difficulties if inhaled.

Eyes Causes serious eye irritation.

Skin May cause an allergic skin reaction.

Ingestion May be harmful if swallowed. (Not adopted by US OSHA)

5. Fire-fighting measures

5.1. Extinguishing media

Use what is appropriate for surrounding fire.

5.2. Special hazards arising from the substance or mixture

Hazardous decomposition: No hazardous decomposition data available.

Avoid breathing dust / fume / gas / mist / vapors / spray.

5.3. Advice for fire-fighters

Safety Data Sheet



Stainless Steel

SDS Revision Date: 01/14/2016

Nonflammable at low temperatures, but will burn at high temperatures.

ERG Guide No. ----

6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Put on appropriate personal protective equipment (see section 8).

6.2. Environmental precautions

Do not allow spills to enter drains or waterways.

Use good personal hygiene practices. Wash hands before eating, drinking, smoking or using toilet. Promptly remove soiled clothing and wash thoroughly before reuse.

6.3. Methods and material for containment and cleaning up

No special procedures needed.

7. Handling and storage

7.1. Precautions for safe handling

Minimize activities which may generate dusts, mists or fumes. Keep areas well ventilated. Use suitable equipment to move materials.

See section 2 for further details. - [Prevention]:

7.2. Conditions for safe storage, including any incompatibilities

Handle containers carefully to prevent damage and spillage.

Incompatible materials: Strong Acids (such as Sulfuric, Hydrochloric, Nitric).

See section 2 for further details. - [Storage]:

7.3. Specific end use(s)

No data available.

8. Exposure controls and personal protection

8.1. Control parameters

Exposure

CAS No.	Ingredient	Source	Value
0007429-90-5	Aluminum (Al)	OSHA	TWA 15 mg/m3 (total) TWA 5 mg/m3 (resp)
		ACGIH	TWA: 1.o mg/m3 Revised 2008,
		NIOSH	TWA 10 mg/m3 (total) TWA 5 mg/m3 (resp)
		Supplier	No Established Limit





SDS Revision Date: 01/14/2016

0007439-89-6	Iron	OSHA	No Established Limit
		ACGIH	No Established Limit
		NIOSH	No Established Limit
		Supplier	No Established Limit
0007439-96-5 Man	Manganese compounds (as Mn)	OSHA	C 5 mg/m3 *See specific listings for specific compounds.
		ACGIH	TWA: 0.2 mg/m3 R
		NIOSH	TWA 1 mg/m3 ST 3 mg/m3 *See specific listings for specific compounds.
		Supplier	No Established Limit
0007439-98-7	Molybdenum	OSHA	TWA 15 mg/m3 [*Note: The PEL also applies to other insoluble molybdenum compounds (as Mo).]
		ACGIH	TWA: 0.5 mg/m3 (soluble) TWA: 3 mg/m3 (insoluble respriable) 10 mg/m3 (insoluble inhalable)
		NIOSH	no established RELs
		Supplier	No Established Limit
0007440-02-0	Nickel	OSHA	TWA 1 mg/m3 [*Note: The PEL does not apply to Nickel carbonyl.]
		ACGIH	Insoluble TWA: 0.05 mg/m3 A1, 1, (I) Soluble TWA: 0.05 mg/m3 A1, 1, 2B, (I)
		NIOSH	Ca TWA 0.015 mg/m3 [*Note: The REL does not apply to Nickel carbonyl.]
		Supplier	No Established Limit
0007440-21-3	Silicon	OSHA	TWA 15 mg/m3 (total) TWA 5 mg/m3 (resp)
		ACGIH	No Established Limit
		NIOSH	TWA 10 mg/m3 (total) TWA 5 mg/m3 (resp)
		Supplier	No Established Limit
0007440-47-3	Chromium compounds (as Cr (III))	OSHA	TWA 1 mg/m3 [*Note: The PEL also applies to insoluble chromium salts.]
		ACGIH	TWA: 0.5 mg/m3 (III)
		NIOSH	TWA 0.5 mg/m3
		Supplier	No Established Limit
0007440-48-4	Cobalt compounds (as Co)	OSHA	TWA 0.1 mg/m3
		ACGIH	TWA: 0.02 mg/m3 2B
		NIOSH	TWA 0.05 mg/m3
		Supplier	No Established Limit
0007440-50-8	Copper	OSHA	TWA 1 mg/m3 [*Note: The PEL also applies to other copper compounds (as Cu) except copper fume.]
		ACGIH	TWA: 0.2 mg/m3 (fume) 1 mg/m3 (dusts and mists)
		NIOSH	TWA 1 mg/m3 [*Note: The REL also applies to other copper compounds (as Cu) except Copper fume.]
		Supplier	No Established Limit
0007440-70-2	Calcium	OSHA	No Established Limit
		ACGIH	No Established Limit
		NIOSH	No Established Limit
		Supplier	No Established Limit

The exposure limits for nuisance dust are: OSHA PEL: 15 mg/m3 (50 mppcf*) TWA, ACGIH 10 mg/m3.





SDS Revision Date: 01/14/2016

Carcinogen Data

CAS No.	Ingredient	Source	Value			
0007429-90-5 Aluminum (Al)		OSHA	Select Carcinogen: No			
		NTP	Known: No; Suspected: No			
		IARC	Group 1: No; Group 2a: No; Group 2b: No; Group 3: No; Group 4: No;			
0007439-89-6	Iron	OSHA	Select Carcinogen: No			
		NTP	Known: No; Suspected: No			
		IARC	Group 1: No; Group 2a: No; Group 2b: No; Group 3: No; Group 4: No;			
0007439-96-5	Manganese compounds (as Mn)	OSHA	Select Carcinogen: No			
		NTP	Known: No; Suspected: No			
		IARC	Group 1: No; Group 2a: No; Group 2b: No; Group 3: No; Group 4: No;			
0007439-98-7	Molybdenum	OSHA	Select Carcinogen: No			
		NTP	Known: No; Suspected: No			
		IARC	Group 1: No; Group 2a: No; Group 2b: No; Group 3: No; Group 4: No;			
0007440-02-0	Nickel	OSHA	Select Carcinogen: Yes			
		NTP	Known: Yes; Suspected: Yes			
		IARC	Group 1: No; Group 2a: No; Group 2b: Yes; Group 3: No; Group 4: No;			
0007440-21-3 Silicon		OSHA	Select Carcinogen: No			
		NTP	Known: No; Suspected: No			
		IARC	Group 1: No; Group 2a: No; Group 2b: No; Group 3: No; Group 4: No;			
0007440-47-3 Chromium compounds (as Cr (III))		OSHA	Select Carcinogen: No			
		NTP	Known: No; Suspected: No			
		IARC	Group 1: No; Group 2a: No; Group 2b: No; Group 3: Yes; Group 4: No;			
0007440-48-4	Cobalt compounds (as Co)	OSHA	Select Carcinogen: Yes			
		NTP	Known: No; Suspected: No			
		IARC	Group 1: No; Group 2a: No; Group 2b: Yes; Group 3: No; Group 4: No;			
0007440-50-8	Copper	OSHA	Select Carcinogen: No			
		NTP	Known: No; Suspected: No			
		IARC	Group 1: No; Group 2a: No; Group 2b: No; Group 3: No; Group 4: No;			
0007440-70-2	Calcium	OSHA	Select Carcinogen: No			
		NTP	Known: No; Suspected: No			
		IARC	Group 1: No; Group 2a: No; Group 2b: No; Group 3: No; Group 4: No;			

8.2. Exposure controls

Respiratory Wear NIOSH approved dust / mist / fume respirator when welding or burning this metal.

Eyes Face shields (welding or burning), Safety glasses (cutting or grinding).

Skin Use appropriate protective clothing such as welding aprons and gloves when welding or

burning.

Engineering Controls

Provide adequate ventilation. Where reasonably practicable this should be achieved by the use of local exhaust ventilation and good general extraction. If these are not sufficient to maintain concentrations of particulates and any vapor below occupational exposure limits

suitable respiratory protection must be worn.





SDS Revision Date: 01/14/2016

using toilet. Promptly remove soiled clothing and wash thoroughly before reuse.

See section 2 for further details. - [Prevention]:

9. Physical and chemical properties

AppearanceMetal SolidOdorOdorless

Odor thresholdNot determinedpHNot MeasuredMelting point / freezing pointNot Measured

Initial boiling point and boiling range NA

Flash Point

Evaporation rate (Ether = 1)

Flammability (solid, gas)

Not Measured

Not Applicable

Upper/lower flammability or explosive limits Lower Explosive Limit: Not Measured

Upper Explosive Limit: Not Measured

Vapor pressure (Pa) NA
Vapor Density NA

Specific Gravity 7.45- 8.02
Solubility in Water Insoluble
Partition coefficient n-octanol/water (Log Kow) Not Measured

Auto-ignition temperature NA

Decomposition temperatureNot MeasuredViscosity (cSt)Not Measured

9.2. Other information

No other relevant information.

10. Stability and reactivity

10.1. Reactivity

Hazardous Polymerization will not occur.

10.2. Chemical stability

Stable under normal circumstances.

10.3. Possibility of hazardous reactions

No data available.

10.4. Conditions to avoid

No data available.

10.5. Incompatible materials

Strong Acids (such as Sulfuric, Hydrochloric, Nitric).



SDS Revision Date: 01/14/2016

10.6. Hazardous decomposition products

No hazardous decomposition data available.

11. Toxicological information

Acute toxicity

Ingredient	Oral LD50, mg/kg	Skin LD50, mg/kg	Inhalation Vapor LC50, mg/L/4hr	Inhalation Dust/Mist LC50, mg/L/4hr	Inhalation Gas LC50, ppm
Iron - (7439-89-6)	30,000.00, Rat - Category: NA	No data available	No data available	No data available	No data available
Chromium compounds (as Cr (III)) - (7440-47-3)	422.00, Rat - Category: 4	No data available	No data available	No data available	No data available
Nickel - (7440-02-0)	No data available	No data available	No data available	No data available	No data available
Manganese compounds (as Mn) - (7439-96-5)	9,000.00, Rat - Category: NA	500.00, Rabbit - Category: 3	19.00, Rat - Category: 4	No data available	No data available
Copper - (7440-50-8)	2,500.00, Rat - Category: 5	>2,000.00, Rat - Category: 5	No data available	5.11, Rat - Category: NA	No data available
Molybdenum - (7439-98-7)	No data available	No data available	No data available	No data available	No data available
Aluminum (Al) - (7429-90-5)	No data available	No data available	No data available	No data available	No data available
Silicon - (7440-21-3)	No data available	No data available	No data available	No data available	No data available
Calcium - (7440-70-2)	No data available	No data available	No data available	No data available	No data available
Cobalt compounds (as Co) - (7440-48-4)	6,171.00, Rat - Category: NA	No data available	No data available	No data available	No data available

Note: When no route specific LD50 data is available for an acute toxin, the converted acute toxicity point estimate was used in the calculation of the product's ATE (Acute Toxicity Estimate).

Classification	Category	Hazard Description	
Acute toxicity (oral)	5	May be harmful if swallowed. (Not adopted by US OSHA)	
Acute toxicity (dermal)		Not Applicable	
Acute toxicity (inhalation)		Not Applicable	
Skin corrosion/irritation		Not Applicable	
Serious eye damage/irritation	2	Causes serious eye irritation.	
Respiratory sensitization	1	May cause allergy or asthma symptoms of breathing difficulties if inhaled.	



SDS Revision Date: 01/14/2016

Skin sensitization	1	May cause an allergic skin reaction.	
Germ cell mutagenicity		Not Applicable	
Carcinogenicity	2	Suspected of causing cancer.	
Reproductive toxicity		Not Applicable	
STOT-single exposure		Not Applicable	
STOT-repeated exposure	1	Causes damage to organs through prolonged or repeated exposure.	
Aspiration hazard		Not Applicable	

12. Ecological information

12.1. Toxicity

Toxic to aquatic life

Aquatic Ecotoxicity

Ingredient	96 hr LC50 fish, mg/l	48 hr EC50 crustacea, mg/l	ErC50 algae, mg/l
Iron - (7439-89-6)	Not Available	Not Available	Not Available
Chromium compounds (as Cr (III)) - (7440-47-3)			580.00 (72 hr), Chlorella pyrenoidosa
Nickel - (7440-02-0)	Not Available	Not Available	Not Available
Manganese compounds (as Mn) - (7439-96-5)	40.00, Daphnia magna	Not Available	Not Available
Copper - (7440-50-8)	0.0103, Pimephales promelas	0.0025, Daphnia magna	0.018 (72 hr), Pseudokirchneriella subcapitata
Molybdenum - (7439-98-7)	Not Available	Not Available	Not Available
Aluminum (Al) - (7429-90-5)	Not Available	Not Available	Not Available
Silicon - (7440-21-3)	Not Available	Not Available	Not Available
Calcium - (7440-70-2)	Not Available	Not Available	Not Available
Cobalt compounds (as Co) - (7440-48-4)	100.00, Danio rerio	Not Available	0.05 (72 hr), Pseudokirchneriella subcapitata

12.2. Persistence and degradability

There is no data available on the preparation itself.

12.3. Bioaccumulative potential

Not Measured

12.4. Mobility in soil

No data available.

12.5. Results of PBT and vPvB assessment

This product contains no PBT/vPvB chemicals.

12.6. Other adverse effects

No data available.



SDS Revision Date: 01/14/2016

13. Disposal considerations

13.1. Waste treatment methods

Observe all federal, state and local regulations when disposing of this substance.

14. Transport information

DOT (Domestic Surface

Transportation)

Transportation) Not Applicable

ICAO/IATA

14.1. UN number 14.2. UN proper shipping

Not Regulated

Not Regulated Not Regulated Not Regulated Not Regulated

IMDG: Not Applicable

IMO / IMDG (Ocean

Air Class: Not Applicable

14.3. Transport hazard class(es)

Applicable

Sub Class: Not Applicable

14.4. Packing group

Not Applicable

DOT Hazard Class: Not

Not Applicable

Not Applicable

14.5. Environmental hazards

IMDG Marine Pollutant: Yes:

14.6. Special precautions for user

No further information

15. Regulatory information

Regulatory Overview The regulatory data in Section 15 is not intended to be all-inclusive, only selected

regulations are represented.

Toxic Substance Control Act (TSCA) All components of this material are either listed or exempt from listing on the TSCA

Inventory.

WHMIS Classification D₂A

US EPA Tier II Hazards Fire: No

Sudden Release of Pressure: No

Reactive: No

Immediate (Acute): Yes Delayed (Chronic): Yes

EPCRA 311/312 Chemicals and RQs (lbs):

Chromium compounds (as Cr (III)) (5,000.00)

(5,000.00)Copper Nickel (100.00)

EPCRA 302 Extremely Hazardous:

Phosphorus



SDS Revision Date: 01/14/2016

EPCRA 313 Toxic Chemicals:

Aluminum (AI)

Chromium compounds (as Cr (III))

Cobalt compounds (as Co)

Copper

Manganese compounds (as Mn)

Nickel

Proposition 65 - Carcinogens (>0.0%):

Cobalt compounds (as Co)

Nickel

Proposition 65 - Developmental Toxins (>0.0%):

To the best of our knowledge, there are no chemicals at levels which require reporting under this statute.

Proposition 65 - Female Repro Toxins (>0.0%):

To the best of our knowledge, there are no chemicals at levels which require reporting under this statute.

Proposition 65 - Male Repro Toxins (>0.0%):

To the best of our knowledge, there are no chemicals at levels which require reporting under this statute.

New Jersey RTK Substances (>1%):

Aluminum (Al)

Calcium

Chromium compounds (as Cr (III))

Copper

Manganese compounds (as Mn)

Molybdenum

Nickel

Silicon

Pennsylvania RTK Substances (>1%):

Aluminum (Al)

Calcium

Chromium compounds (as Cr (III))

Copper

Manganese compounds (as Mn)

Molybdenum

Nickel

Silicon

16. Other information





SDS Revision Date: 01/14/2016

The information and recommendations contained herein are based upon data believed to be correct. However, no guarantee or warranty of any kind, expressed or implied, is made with respect to the information contained herein. We accept no responsibility and disclaim all liability for any harmful effects which may be caused by exposure to our products. Customers/users of this product must comply with all applicable health and safety laws, regulations, and orders.

The full text of the phrases appearing in section 3 is:

H228 Flammable solid.

H261 In contact with water releases flammable gases.

H317 May cause an allergic skin reaction.

H319 Causes serious eye irritation.

H334 May cause allergic or asthmatic symptoms or breathing difficulties if inhaled.

H351 Suspected of causing cancer.

H372 Causes damage to organs through prolonged or repeated exposure.

H412 Harmful to aquatic life with long lasting effects.

H413 May cause long lasting harmful effects to aquatic life.

The information contained herein is furnished without warranty of any kind. The above information is believed to be correct but does not purport to be all inclusive and should be used only as a guide. Users should make independent determinations of the suitability and completeness of information from all sources to assure proper use and disposal of these materials and the safety and health of employees and customers.

End of Document