



Safety Data Sheet

acc. to OSHA HCS

Printing date 04/03/2014

Reviewed on 04/01/2014

1 Identification

- **Product identifier**
- **Trade name: Thermanit GEW 316L-17**
- **CAS Number:** -
- **EINECS Number:** -
- **Application of the substance / the mixture** *Shielded Metal Arc Welding Electrode*
- **Details of the supplier of the safety data sheet**
- **Manufacturer/Supplier:**
*voestalpine Böhler Welding Austria GmbH
Böhler-Welding-St. 1
8605 Kapfenberg*
- **Telefon:** +43 (0) 3862 301-28-299
Fax: +43 (0) 3862 301-95-299
www.voestalpine.com/welding
- **Information department:**
*Product Optimization
DI Stefan Schormann
+43 3862 301 - 28291; stefan.schormann@voestalpine.com*
- **Emergency telephone number:** +43 3862 301-0

2 Hazard(s) identification

- **Classification of the substance or mixture**
The product is not classified according to the Globally Harmonized System (GHS).
- **Classification according to Directive 67/548/EEC or Directive 1999/45/EC**
*Chromium-VI compounds might occur, which are classified as carcinogenic.
Nickel oxides might occur, which are classified as carcinogenic.*
- **Health Hazards (acute and chronic)**
Shielded Metal Arc Welding Electrodes are non-hazardous solids at ambient temperature. Actual exposure should be determined by measuring the fume in the operator's breathing zone.
- *Compounds of Chromium in the fume should be considered possible carcinogens per OSHA29. CFR 1910. 1200. No clear association, however, has been established between Cr in welding fume and the development of cancer.*
- *Compounds of Nickel in the fume should be considered possible carcinogens per OSHA29. CFR 1910. 1200. No clear association, however, has been established between Ni in welding fume and the development of cancer.*
- *Short term overexposure to welding fumes may result in discomfort such as metal fume fever, dizziness, nausea, or dryness or irritation of nose, throat or eyes and may aggravate preexisting respiratory problems (e.g. asthma, emphysema).*
- *Exposure to extremely high levels of fluorides can cause abdominal pain, diarrhea, muscular weakness, and convulsions. In extreme cases it can cause loss of consciousness and death.*
- *Long term overexposure to welding fumes can lead to siderosis (iron deposits in lung) and may affect pulmonary function.*
- *Manganese overexposure can affect the central nervous system, resulting in impaired speech and movement.*

(Contd. on page 2)



Safety Data Sheet

acc. to OSHA HCS

Printing date 04/03/2014

Reviewed on 04/01/2014

Trade name: Thermanit GEW 316L-17

(Contd. of page 1)

The primary entry route for welding fumes and gases is by inhalation. Bronchitis and some lung fibrosis have been reported.

Repeated exposure to fluorides may cause excessive calcification of the bone and calcification of ligaments of the ribs, pelvis and spinal column. May cause skin rash.

Overexposure to hexavalent chromium present in welding fume bears the risk of lung cancer, asthma and damage to the nose and skin.

Overexposure to nickel present in welding fume bears the risk of lung cancer, asthma and damage to the nose and skin.

Arc rays can injure eyes and burn skin. Electric shock can kill. Before use, read and understand the manufacturer's instructions, MSDS's and your employer's safety practices.

Carcinogenicity

Nickel: The International Agency for Research on Cancer indicates nickel refining and "certain nickel compounds" were cancer-causing, but could not state with certainty which forms of nickel may be carcinogenic. The National Toxicology Program lists nickel powder, nickel subsulfide, nickel oxide, nickel carbonate, nickel carbonyl and nickelocene as substances "that may reasonably anticipated to be carcinogens". Because of this, the OSHA Hazard Communication Standard requires that everyone who manufactures or imports these substances or mixtures or alloys containing these substances must warn of a cancer hazard on their MSDS's and labels. This warning is mandated by OSHA even though studies have not demonstrated cancer risks associated with the use of nickel. Intramuscular injection and implantation of nickel powder produced localized tumors in rats and mice. Inhalation studies using animals showed no evidence of carcinogenicity.

Chromium: The International Agency for Research on Cancer and the National Toxicology Program indicates there is sufficient evidence for carcinogenicity of Chromium compounds both in humans and experimental animals. IARC notes that "the compounds responsible for the carcinogenic effect in humans cannot be specified". Studies with chromium metal and trivalent forms of chromium compounds have shown inadequate evidence for carcinogenicity in both animals and humans.

Theshold Limit Value: The ACGIH recommended general limit for Welding Fume NOC-(Not Otherwise Classified) is 5 mg/m³. The TLV-TWA is the time weighted average concentration for a normal 8-hour workday and a 40hour workweek, to which nearly all workers may be repeatedly exposed, day after day, without adverse effect. Limit Values are figures published by the American Conference of Government Inpoussièrerial Hygienists. Workers exposed to hexavalent chrome (Cr+6) are at an increased risk of developing lung cancer. It also possible that occupational exposure to (Cr+6) may result in asthma and damage to the nasal epithelia and skin. To avoid any risk follow the requirements of the OSHA rule for hexavalent chromium published on February 28, 2006 in the U.S. Federal register 71, pages: 10099-10385 which established an 8-hour timeweighted average (TWA) exposure limit of 5 micrograms of hexavalent chrome per cubic meter of air (5µg/m³).

Crystalline silica: The National Toxicology Program indicates there is sufficient evidence for the carcinogenicity or respirable crystalline silica in experimental animals. Increases in incidence of lung cancers have been found in inhalation studies in rats. An IARC working group reported there is limited evidence for the carcinogenicity of crystalline silica in humans. Other precautions: Electric shock from

• **Hazard description:** -

• **Information concerning particular hazards for human and environment:**

The product has to be labeled due to the calculation procedure of international guidelines.

• **Classification system:**

The classification was made according to the latest editions of international substances lists, and expanded upon from company and literature data.

• **Label elements -**

• **GHS label elements** Void

(Contd. on page 3)



Safety Data Sheet

acc. to OSHA HCS

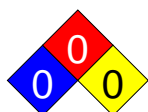
Printing date 04/03/2014

Reviewed on 04/01/2014

Trade name: **Thermanit GEW 316L-17**

(Contd. of page 2)

- **Hazard pictograms** Void
- **Signal word** Void
- **Hazard statements** Void
- **Classification system:**
- **NFPA ratings (scale 0 - 4)**



Health = 0
Fire = 0
Reactivity = 0

- **HMIS-ratings (scale 0 - 4)**



HEALTH *0 Health = *0
FIRE 0 Fire = 0
REACTIVITY 0 Reactivity = 0

- **Other hazards**
- **Results of PBT and vPvB assessment**
- **PBT:** Not applicable.
- **vPvB:** Not applicable.

3 Composition/information on ingredients

- **Chemical characterization: Mixtures**
- **Description:** Mixture of the substances listed below with nonhazardous additions.

· **Dangerous components:**

7439-89-6	iron	25-50%
7440-47-3	chromium	12.5-25%
13463-67-7	titanium dioxide	5-12.5%
7440-02-0	nickel ☠ T R48/23; ☒ Xn R40; ☒ Xi R43 Carc. Cat. 3 ⚠ Carc. 2, H351; STOT RE 1, H372; ⚠ Skin Sens. 1, H317	5-12.5%
14808-60-7	silicon dioxide ☒ Xn R20-48 ⚠ Acute Tox. 4, H332	2.5-5%
7439-98-7	molybdenum	≤2.5%
7439-96-5	manganese ☒ Xn R20-48 ⚠ Acute Tox. 4, H332	≤2.5%
1344-28-1	aluminium oxide	≤2.5%
· nonhazardous components:		
68476-25-5	Kali-Feldspat	2.5-5%
1317-65-3	calcium carbonate	2.5-5%

4 First-aid measures

- **Description of first aid measures**
- **General information:** No special measures required.

(Contd. on page 4)



Safety Data Sheet

acc. to OSHA HCS

Printing date 04/03/2014

Reviewed on 04/01/2014

Trade name: Thermanit GEW 316L-17

(Contd. of page 3)

- **After inhalation:** Supply fresh air; consult doctor in case of complaints.
- **After skin contact:** Generally the product does not irritate the skin.
- **After eye contact:** Rinse opened eye for several minutes under running water.
- **After swallowing:** Seek medical treatment.
- **Most important symptoms and effects, both acute and delayed** No further relevant information available.
- **Indication of any immediate medical attention and special treatment needed**
No further relevant information available.

5 Fire-fighting measures

- **Extinguishing media**
- **Suitable extinguishing agents:** Suitable to surrounding conditions
- **Special hazards arising from the substance or mixture** No further relevant information available.
- **Advice for firefighters -**
- **Protective equipment:** No special measures required.

6 Accidental release measures

- **Personal precautions, protective equipment and emergency procedures**
Use respiratory protective device against the effects of fumes/dust/aerosol.
- **Environmental precautions:** No special measures required.
- **Methods and material for containment and cleaning up:** Pick up mechanically.
- **Reference to other sections**
No dangerous substances are released.
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

7 Handling and storage

- **Handling:**
- **Precautions for safe handling** Ensure that suitable extractors are available on processing machines
- **Information about protection against explosions and fires:** No special measures required.
- **Conditions for safe storage, including any incompatibilities**
- **Storage:**
- **Requirements to be met by storerooms and receptacles:** No special requirements.
- **Information about storage in one common storage facility:** Not required.
- **Further information about storage conditions:** None.
- **Specific end use(s)** No further relevant information available.

8 Exposure controls/personal protection

- **Control parameters**
- **Components with limit values that require monitoring at the workplace:**

7439-89-6 iron

EV 1* 5** mg/m³

*as iron; **welding fume

(Contd. on page 5)



Safety Data Sheet

acc. to OSHA HCS

Printing date 04/03/2014

Reviewed on 04/01/2014

Trade name: **Thermanit GEW 316L-17**

(Contd. of page 4)

7440-47-3 chromium	
EL	0.5 mg/m ³
13463-67-7 titanium dioxide	
EL	10 mg/m ³ IARC 2B
EV	10 mg/m ³ total dust
7440-02-0 nickel	
EL	0.05 mg/m ³ as Ni; ACIGH A1, IARC 1
14808-60-7 silicon dioxide	
EL	0.025 mg/m ³ ACGIH A2; IARC 1
7439-98-7 molybdenum	
EL	3* 10** mg/m ³ as Mo; *respirable **inhalable
7439-96-5 manganese	
EL	0.2 mg/m ³ as Mn; R
1344-28-1 aluminium oxide	
EL	10 mg/m ³
EV	10 mg/m ³ total dust

· **Additional information:** The lists that were valid during the creation were used as basis.

· **Exposure controls**

· **Personal protective equipment:**

· **General protective and hygienic measures:** Wash hands before breaks and at the end of work.

· **Breathing equipment:** Filter P2

· **Protection of hands:**

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.

Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture.

Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation

Heat protection gloves (non-combustible)

· **Penetration time of glove material**

The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.

· **Eye protection:** Safety glasses

· **Body protection:**

Protective work clothing

Wear hand, head, and body protection which help to prevent injury from radiation, sparks, and electrical shock. See ANSI Z49.1. At a minimum this includes welder's gloves and a protective face shield, and may include arm protectors, aprons, hats, shoulder protection, and well as dark substantial clothing. Train the welder not to touch live electrical parts and to insulate himself from work and ground.

CA

(Contd. on page 6)



Safety Data Sheet

acc. to OSHA HCS

Printing date 04/03/2014

Reviewed on 04/01/2014

Trade name: **Thermanit GEW 316L-17**

(Contd. of page 5)

9 Physical and chemical properties

· **Information on basic physical and chemical properties**

· **General Information**

· **Appearance:**

Form:	Solid
Color:	According to product specification
· Odor:	Odorless
· Odour threshold:	Not determined.

· **pH-value:** Not applicable.

· **Flash point:** Not applicable.

· **Flammability (solid, gaseous):** Not determined.

· **Decomposition temperature:** Not determined.

· **Auto igniting:** Product is not selfigniting.

· **Danger of explosion:** Product does not present an explosion hazard.

· **Explosion limits:**

Lower:	Not determined.
Upper:	Not determined.
Relative density	Not determined.
Vapour density	Not applicable.
Evaporation rate	Not applicable.
Water:	Insoluble.

· **Partition coefficient (n-octanol/water):** Not determined.

· **Dynamic:** Not applicable.

· **Kinematic:** Not applicable.

· **Organic solvents:** 0.0 %

· **Other information** No further relevant information available.

10 Stability and reactivity

· **Reactivity**

· **Chemical stability**

· **Thermal decomposition / conditions to be avoided:**

No decomposition if used and stored according to specifications.

· **Possibility of hazardous reactions** No dangerous reactions known.

· **Conditions to avoid** No further relevant information available.

· **Incompatible materials:** No further relevant information available.

· **Hazardous decomposition products:**

Reasonably expected fume constituents of this product would include:

- Copper oxide.
- copper oxide.
- Chromoxide.
- Nickel oxide.
- Cobalt oxide.

(Contd. on page 7)



Safety Data Sheet

acc. to OSHA HCS

Printing date 04/03/2014

Reviewed on 04/01/2014

Trade name: Thermanit GEW 316L-17

(Contd. of page 6)

The present OSHA PEL (Permissible Exposure Limit) - published in the U.S. Federal Register 71, pages: 10099-10385 - for hexavalent Chromium (Cr +6) is 0.005 mg/m³ which will result in a significant reduction from the 5 mg/m³ general welding fume (NOC) level. It applies to soluble chromates of the types found in covered stainless electrode fumes.

No dangerous decomposition products known.

Reasonably expected gaseous constituents would include Carbon monoxide and Carbon dioxide. Ozone and nitrogen oxides may be formed by the radiation from the arc. One recommended way to determine the composition and quantity of fumes and gases to which workers are exposed is to take an air sample from inside the welder's helmet if worn or in the worker's breathing zone. See ANSI/AWS F1.1 and ANSI/AWS F1.2-1992. In order to determine and evaluation of the existing problem areas, the standards EN ISO15011 –parts 1,4 can also be applied.

11 Toxicological information

· **Information on toxicological effects**

· **Acute toxicity:**

· **Primary irritant effect:**

· **on the skin:** No irritant effect.

· **on the eye:** No irritating effect.

· **Sensitization:** No sensitizing effects known.

· **Additional toxicological information:**

Workers exposed to hexavalent chrome (CrVI) are at an increased risk of developing lung cancer. It is also possible that occupational exposure to (CrVI) may result in asthma, and damage to the nasal epithelia and skin. To avoid any risk follow the requirements of the OSHA rule for hexavalent chromium published on February 28, 2006 in the U.S. Federal Register, pages:10099-10385 which established an 8-hour time-weighted average (TWA) exposure limit of 5 micrograms of hexavalent chrome per cubic meter of air (5 µg/m³). This is a considerable reduction from the previous PEL of 1 milligram per 10 cubic meters of air (1 mg/10 m³, or 100 µg/m³) reported as Probably Chromium(VI)oxide, which is equivalent to a limit of 52 µg/m³ as (Cr+6)). This rule also contains ancillary provisions for worker protection such as requirements for exposure determination, preferred exposure control methods, including a compliance alternative for a small sector for which the new PEL is infeasible, respiratory protection, protective clothing and equipment, hygiene areas and practices, medical surveillance, recordkeeping, and start-up dates that include four years for the implementation of engineering controls to meet the PEL.

· **Carcinogenic categories**

· **IARC (International Agency for Research on Cancer)**

7440-47-3	chromium	3
13463-67-7	titanium dioxide	2B
7440-02-0	nickel	1
14808-60-7	silicon dioxide	1
7789-75-5	calcium fluoride	3
7440-48-4	cobalt	2B

· **NTP (National Toxicology Program)**

7440-02-0	nickel	R
14808-60-7	silicon dioxide	K

12 Ecological information

· **Toxicity**

· **Aquatic toxicity:** No further relevant information available.

· **Persistence and degradability** No further relevant information available.

(Contd. on page 8)



Safety Data Sheet

acc. to OSHA HCS

Printing date 04/03/2014

Reviewed on 04/01/2014

Trade name: Thermanit GEW 316L-17

(Contd. of page 7)

- **Behavior in environmental systems:**
- **Bioaccumulative potential** No further relevant information available.
- **Mobility in soil** No further relevant information available.
- **Additional ecological information:**
- **General notes:** Generally not hazardous for water
- **Results of PBT and vPvB assessment**
- **PBT:** Not applicable.
- **vPvB:** Not applicable.
- **Other adverse effects** No further relevant information available.

13 Disposal considerations

- **Waste treatment methods**
- **Recommendation:** Must be specially treated adhering to official regulations.
- **Uncleaned packagings:**
- **Recommendation:** Disposal must be made according to official regulations.

14 Transport information

- | | |
|--|--|
| · UN-Number | - |
| · Transport hazard class(es) | - |
| · TDG, IMDG, IATA | |
| · Class | - |
| · Environmental hazards: | |
| · Marine pollutant: | No |
| · Special precautions for user | Not applicable. |
| · Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code | Not applicable. |
| · Transport/Additional information: | Not dangerous according to the above specifications. |
| · UN "Model Regulation": | - |

15 Regulatory information

- **Safety, health and environmental regulations/legislation specific for the substance or mixture**
- **Sara**

· **Section 355 (extremely hazardous substances):**

7440-47-3	chromium
7723-14-0	phosphorus

· **Section 313 (Specific toxic chemical listings):**

7440-47-3	chromium
7440-02-0	nickel
7439-96-5	manganese

(Contd. on page 9)



Safety Data Sheet

acc. to OSHA HCS

Printing date 04/03/2014

Reviewed on 04/01/2014

Trade name: Thermanit GEW 316L-17

(Contd. of page 8)

1344-28-1	aluminium oxide
7440-50-8	copper
7440-48-4	cobalt
7429-90-5	aluminium powder (pyrophoric)
554-13-2	lithium carbonate
7723-14-0	phosphorus

· TSCA (Toxic Substances Control Act):

7439-89-6	iron
7440-47-3	chromium
13463-67-7	titanium dioxide
7440-02-0	nickel
68476-25-5	Kali-Feldspat
14808-60-7	silicon dioxide
1317-65-3	calcium carbonate
7439-98-7	molybdenum
7439-96-5	manganese
1344-28-1	aluminium oxide
7789-75-5	calcium fluoride
1313-59-3	Sodium Oxide
9004-34-6	Cellulose
7440-50-8	copper
1308-38-9	dichromium trioxide

· Proposition 65

· Chemicals known to cause cancer:

7440-02-0	nickel
14808-60-7	silicon dioxide
7440-48-4	cobalt

· Chemicals known to cause reproductive toxicity for females:

None of the ingredients is listed.

· Chemicals known to cause reproductive toxicity for males:

None of the ingredients is listed.

· Chemicals known to cause developmental toxicity:

554-13-2	lithium carbonate
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· Cancerogenity categories

· EPA (Environmental Protection Agency)

7440-47-3	chromium	D
7439-96-5	manganese	D
7440-50-8	copper	D
1308-38-9	dichromium trioxide	D, CBD
1330-43-4	boric acid, disodium salt	I (oral)
7723-14-0	phosphorus	D

· TLV (Threshold Limit Value established by ACGIH)

7440-47-3	chromium	A4
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(Contd. on page 10)



Safety Data Sheet

acc. to OSHA HCS

Printing date 04/03/2014

Reviewed on 04/01/2014

Trade name: Thermanit GEW 316L-17

(Contd. of page 9)

13463-67-7	titanium dioxide	A4
7440-02-0	nickel	A5
14808-60-7	silicon dioxide	A2
7439-98-7	molybdenum	A3
1344-28-1	aluminium oxide	A4
7789-75-5	calcium fluoride	A4
1308-38-9	dichromium trioxide	A4
7440-48-4	cobalt	A3
7429-90-5	aluminium powder (pyrophoric)	A4
1330-43-4	boric acid, disodium salt	A4

· **NIOSH-Ca (National Institute for Occupational Safety and Health)**

13463-67-7	titanium dioxide
7440-02-0	nickel
14808-60-7	silicon dioxide

· **OSHA-Ca (Occupational Safety & Health Administration)**

None of the ingredients is listed.

· **Canadian substance listings:**

· **Canadian Domestic Substances List (DSL)**

7439-89-6	iron
7440-47-3	chromium
13463-67-7	titanium dioxide
14808-60-7	silicon dioxide
7439-98-7	molybdenum
7439-96-5	manganese
1344-28-1	aluminium oxide
7789-75-5	calcium fluoride
1313-59-3	Sodium Oxide
9004-34-6	Cellulose
7440-50-8	copper
1308-38-9	dichromium trioxide
7440-48-4	cobalt
7440-21-3	silicon
7429-90-5	aluminium powder (pyrophoric)

· **Canadian Ingredient Disclosure list (limit 0.1%)**

7440-47-3	chromium
7440-48-4	cobalt

· **Canadian Ingredient Disclosure list (limit 1%)**

14808-60-7	silicon dioxide
7439-98-7	molybdenum
7439-96-5	manganese
1344-28-1	aluminium oxide

- **GHS label elements** Void
- **Hazard pictograms** Void
- **Signal word** Void
- **Hazard statements** Void

(Contd. on page 11)



Safety Data Sheet

acc. to OSHA HCS

Printing date 04/03/2014

Reviewed on 04/01/2014

Trade name: Thermanit GEW 316L-17

(Contd. of page 10)

· **Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

· **Department issuing MSDS:** Product Optimazation

· **Contact:** DI Stefan Schormann

· **Date of preparation / last revision** 04/03/2014 / -

· **Abbreviations and acronyms:**

IMDG: International Maritime Code for Dangerous Goods

IATA: International Air Transport Association

ACGIH: American Conference of Governmental Industrial Hygienists

EINECS: European Inventory of Existing Commercial Chemical Substances

ELINCS: European List of Notified Chemical Substances

CAS: Chemical Abstracts Service (division of the American Chemical Society)

NFPA: National Fire Protection Association (USA)

HMIS: Hazardous Materials Identification System (USA)

TRGS: Technische Regeln für Gefahrstoffe (Technical Rules for Dangerous Substances, BAuA, Germany)

Acute Tox. 4: Acute toxicity, Hazard Category 4

Skin Sens. 1: Sensitisation - Skin, Hazard Category 1

Carc. 2: Carcinogenicity, Hazard Category 2

STOT RE 1: Specific target organ toxicity - Repeated exposure, Hazard Category 1

CA