HYUNDAI WELDING

SAFETY DATA SHEET

SDS No : SDS-084-00
Issue Date : 2023-06-15

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

1.1 Product Identifier

Trade Name : S-316.16N

1.2 Relevant Identified uses of the substance or mixture and uses advised against

Relevant Identified uses : Arc Welding

1.3 Details of the supplier of the safety data sheet

NAME : HYUNDAI WELDING CO., LTD.

ADDRESS : WeWork. 15~17fl, 507, Teheran-ro, Gangnam-gu, Seoul, Republic of Korea

Tel. +82-2-6230-6051~89, Fax. +82-2-522-2030, 525-7317

WEBSITE : www.hyundaiwelding.com

1.4 Emergency telephone number : +31 10 313 6250

Available outside office hours : Yes

SECTION 2 : Hazard Identification

2.1 Classification of the substance or mixture

The products described in Section 1 are not classified as hazardous according to applicable GHS hazard classification criteria as required and defined in OSHA Hazard Communication Standard (29 CFR Part 1910.1200).

2.2 Label elements

Hazard Symbol – No symbol required

Signal Word – No signal word required

Hazard Statement – Not applicable

Precautionary Statement – Not Applicable

2.3 Other hazards

ARC RAYS

The welding arc can injure eyes and burn skin.

ELECTRIC SHOCK

Arc welding and associated processes can kill. See Section 8.

WELDING FUME AND GASES

Avoid breathing welding fumes and gases, they may be dangerous to your health. Always use adequate ventilation. Always use appropriate personal protective equipment.

Reducing exposure to welding fume (OSHA Fact Sheet, DSG FS-3647 03/2013)

- Workers should position themselves to avoid breathing welding fume and gases. For example, workers should stay upwind when welding in open or outdoor environments.
- General ventilation, the natural or forced movement of fresh air, can reduce fume and gas levels in the work area. Welding outdoors or in open work spaces does not guarantee adequate ventilation. In work areas without ventilation and exhaust systems, welders should use natural drafts along with proper positioning to keep fume and gases away from themselves and other workers.
- Local exhaust ventilation systems can be used to remove fume and gases from the welder's breathing zone. Keep fume hoods, fume extractor guns and vacuum nozzles close to the plume source to remove the maximum amount of fume and gases. Portable or flexible exhaust systems can be positioned so that fume and gases are drawn away from the welder. Keep exhaust ports away from other workers.
- Consider substituting a lower fume-generating or less toxic welding type or consumable.
- Do not weld in confined spaces without ventilation. Refer to applicable OSHA regulations (see list below).
- Respiratory protection may be required if work practices and ventilation do not reduce exposures to safe levels.

SECTION 3 : Composition/information on ingredients

3.1 Substance : Not relevant

3.2 Mixtures : The mixture contains these substances

Substance name	CAS/EC No.	Conc.(Wt%)	Classification	Hazard statement (H-phrase)	Notes
Iron	7439-89-6 / 231-096-4	45 to 55	-	-	-
Chromium	7440-47-3 / 231-157-5	15 to 20	-	-	-
Titanium dioxide	13463-67-7 / 236-675-5	8 to 15	Carc. 2	H351	-
Nickel [particle diameter < 1 mm]	7440-02-0 / 231-111-4	6 to 10	Carc. 2 STOT RE 1 Skin Sens. 1 Aquatic Chronic 3	H351 H372 H317 H412	-
Silicon dioxide	7631-86-9 / 231-545-4	4 to 7	-	-	-
Calcium carbonate	471-34-1 / 207-439-9	2 to 5	-	-	-
Aluminum oxide	1344-28-1 / 215-691-6	1 to 3	-	-	-
Manganese	7439-96-5 / 231-105-1	1 to 3	-	-	-
Molybdenum	7439-98-7 / 231-107-2	1 to 3	-	-	-
Calcium fluoride	7789-75-5 / 232-188-7	1 to 2	-	-	-

*** For full text of H-phrase : see SECTION 16.**

SECTION 4 : First aid measures

4.1 Description of first aid measures

INHALATION (during welding)

Remove to fresh air and keep at rest. If breathing is difficult or has stopped, administer artificial respiration as necessary. Seek medical attention.

SKIN CONTACT (during welding)

Wash contaminated area thoroughly with soap and water. Remove and wash contaminated clothing. If a persistent rash or irritation occurs, seek medical attention.

EYE CONTACT (during welding)

Immediately flush eyes with large amounts of running water for at least 15 minutes, lifting the upper and lower eyelids. Get medical attention

INGESTION

Ingestion is considered unlikely due to product form. However, if swallowed do not induce vomiting.
Seek medical attention. Advice to doctor: treat symptomatically.

4.2 Most important symptoms and effects, both acute and delayed

Acute exposure to welding fume and gases can result in eye, nose and throat irritation, dizziness and nausea.
Prolonged exposure to welding fume may cause lung damage and various types of cancer, including lung, larynx and urinary tract.
Health effects from certain fumes may include metal fume fever, stomach ulcers, kidney damage and nervous system damage.
Prolonged exposure to manganese fume can cause Parkinson's-like symptoms.

4.3 Indication of any immediate medical attention and special treatment needed

Treat symptomatically.

SECTION 5 : Firefighting measures

This Product as shipped are nonreactive, nonflammable, non-explosive and essentially nonhazardous until welded.

5.1 Extinguishing media

Suitable extinguishing media :

Use extinguishing media appropriate for surrounding fire (dry chemical, foam, water spray, carbon dioxide).

Unsuitable extinguishing media :

No data available.

5.3 Special hazards arising from the substance or mixture

Welding arcs and sparks can ignite combustibles and flammable products.

5.3 Advice for firefighters

In the event of a fire, wear self-contained breathing apparatus and protective clothing.

SECTION 6 : Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

For Non-emergency personnel :

Wear appropriate personal protective equipment as specified in Section 8. Ensure adequate ventilation.

For Emergency responders :

No data available.

6.2 Environmental precautions

Avoid dispersal of spilled material and contact with soil, ground and surface water, drains and sewers.

6.3 Method and material for containment and cleaning up

Advice on how to contain a spill :

Covering of drains

Advice on how to clean up a spill :

Take up mechanically.

Other information relating to spill and release :

Collect the material in labeled containers and dispose of according to local and regional authority requirements

6.4 Reference to other sections

Refer to section 8 of the SDS

SECTION 7 : Handling and storage

7.1 Precaution for safe handling

Welding may produce fumes, gases and dust hazardous to health. Avoid breathing these fumes, gases and dust.

Use adequate ventilation. Avoid contact with skin, eyes and clothing. Do not eat, drink and smoke in work areas.

Wear appropriate personal protective equipment as specified in Section 8.

7.2 Conditions for safe storage, including any incompatibilities

Store in cool, dry and well-ventilated place. Keep away from incompatible materials such as acids and strong bases.

Keep away from heat and open flame.

7.3 Specific end use(s)

Arc Welding

SECTION 8 : Exposure controls and protection

8.1 Control parameters

The following limits can be used as guidance. Unless noted, all values are for 8 hour time weighted averages (TWA).

Substance name	CAS/EC No.	Source	Exposure Limit Values	Source

Iron	7439-89-6 / 231-096-4	OSHA	-	No PEL
Chromium	7440-47-3 / 231-157-5	OSHA	0.5 mg/m3	Cr(Ⅱ&Ⅲ) inorganic
		ACGIH	0.0005 mg/m3	Chromium(Ⅵ) compound
Titanium dioxide	13463-67-7 / 236-675-5	OSHA	15 mg/m3	Total dust
Nickel	7440-02-0 / 231-111-4	ACGIH	1.5 mg/m3	elemental
		ACGIH	0.1 mg/m3	Soluble inorganic
		ACGIH	0.2 mg/m3	Insoluble inorganic
Silicon dioxide	7631-86-9 / 231-545-4	UK WEL	10 mg/m3	Inhalable dust
		UK WEL	4 mg/m3	respirable dust
Calcium carbonate	471-34-1 / 207-439-9	OSHA	15 mg/m3	Total dust
		OSHA	5 mg/m3	Respirable
Aluminum oxide	1344-28-1 / 215-691-6	OSHA	5 mg/m3	Respirable
Manganese	7439-96-5 / 231-105-1	ACGIH	0.1 mg/m3	elemental and inorganic
		ACGIH	0.02 mg/m3	as Mn
Molybdenum	7439-98-7 / 231-107-2	OSHA	15 mg/m3	Total dust
		ACGIH	0.5 mg/m3	Soluble compounds
		ACGIH	3 mg/m3	Insoluble (Respirable)
Calcium fluoride	7789-75-5 / 232-188-7	ACGIH	-	-

8.2 Exposure control

Ventilation :

Use enough ventilation or local exhaust during all welding operations to keep the fumes and gases from the worker's breathing zone and the general area. Train the welder to keep his head out of the fumes.

Respiratory protection :

If ventilation is insufficient, use appropriate respirator or self-contained breathing apparatus.

Eye/face protection :

Wear eye protection during welding operations, helmet and/or face shield with filter lens shade number 12 or darker.

Skin protection :

Wear appropriate protective (welding) gloves during welding.

Other (Protective 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 as well as dark non-synthetic clothing.

Train the welder not to touch live electrical parts and to insulate himself from work and ground.

SECTION 9 : Physical and chemical properties

9.1 INFORMATION ON BASIC PHYSICAL AND CHEMICAL PROPERTIES

Physical state	solid (massive form)
Colour	No data available
Odour	No data available
Melting point/ freezing point	>1000℃(1800F)
Boiling point or initial boiling point and boiling point range	No data available
Flammability	No data available

Lower and upper explosive limits	No data available
Flash point	No data available
Auto-ignition temperature	No data available
Decomposition temperature	No data available
pH	No data available
Kinematic viscosity	No data available
Solubility	No data available
Partition coefficient n-octanol/water	No data available
Vapour pressure	No data available
Density and/or relative density	No data available
Relative vapour density	No data available
Particle characteristics	No data available

9.2 Other information

No data available.

SECTION 10 : Stability and reactivity

10.1 Reactivity

This product is non-reactive under normal conditions of use, storage and transport.

10.2 Chemical stability

The product is stable under normal conditions.

10.3 Possibility of hazardous reactions

No data available.

10.4 Conditions to avoid

Avoid exposure to heat or other sources of contamination.

10.5 Incompatible materials

No data available.

10.4 Hazardous decomposition products

Metal oxide fumes and gases are produced during welding.

Hexavalent chromium compounds may be in the welding fume of consumables or base metals which contain chromium.

Nickel compounds may be in the welding fume of consumables or base metals which contain Nickel.

Ozone and nitrogen oxides may be formed by the radiation from the arc during welding.

SECTION 11 : Toxicological information

11.1 Information on hazard classes as defined in Regulation (EC) No 1272/2008

Acute toxicity :

Overexposure to welding fumes may result in symptoms such as metal fume fever, dizziness, nausea, dryness or irritation of the nose, throat or eyes.

Skin corrosion/irritation :

No data available.

Serious eye damage/irritation :

No data available.

Respiratory or skin sensitisation :

No data available.

Germ cell mutagenicity :

No data available.

Carcinogenicity :

Nickel is classified as a group 2B (possibly carcinogenic to humans) of IARC classifications.

Titanium dioxide is classified as a group 2B (possibly carcinogenic to humans) of IARC classifications.

Arc ray has been reported to cause skin cancer.

Reproductive toxicity :

No data available.

STOT-single exposure :

No data available.

STOT-repeated exposure :

No data available.

Aspiration hazard :

No data available.

11.2 Information on other hazards

Manganese :

Inhaling Maganese can irritate the nose, throat and lungs causing coughing, wheezing and.or shortness of breath.

Exposure to Manganese fume can cause a flu-loke illness calleed “metal fume fever“.

Repeated exposure can cause permanent vrain damage, early symptoms include changes in speech, balance, mood and personality, lossof facial expressions, poor muscle coordination, muscle cramps, twitching and tremors.

The later symptoms are identical to Parkinson’s disease.

Nickel :

Nickel and Nickel compounds are on the IARC and NTP lists as posing respiratory cancer risk.

Inhaling Nickel fume can irritate the nose, throat and lungs.

Exposure to Nickel can cause a flu-loke illness calleed “metal fume fever“.

Nickel can cause headache, dizziness, nausea, vomiting, a skin allergy and an asthma-like allergy.

Inhaling Nickel can cause a sore and/or a hole in the bone(septum) dividing the inner nose.

Chrome (VI)

Hexagonal Chrome and its compounds are on the IARC and NTP lists as posing respiratory cancer risk.

Chromate contain the hexavalent of chromium. Inhaling Chrome fume can irritate the nose and throat.

Exposure to Chrome can cause a flu-loke illness calleed “metal fume fever“.

Chrome may cause a skin allergy and an asthma-like allergy.

Inhaling Chrome can cause a sore and/or a hole in the bone(septum) dividing the inner nose.

SECTION 12 : Ecological information

12.1 TOXICITY

Acute toxicity :

No data available.

Chronical toxicity :

Nickel is classified as harmful to aquatic organisms by 1272/2008 CLP Directive and may cause long-term adverse effect in the aquatic environment.

12.2 Persistence and degradability

No data available.

12.3 Bioaccumulative potential

No data available.

12.4 Mobility in soil

No data available.

12.5 Result of PBT and vPvB assessment

No data available.

12.6 Endocrine disrupting properties

No data available.

12.7 Other adverse effects

No data available.

SECTION 13 : Disposal consideration

13.1 Waste treatment methods

Use recycling procedures if available. Discard any product, packaging, disposable container etc. in an environmentally acceptable manner, Dispose of non-recyclable product in compliance with federal, state, provincial and local regulations. Residues from welding consumables and processes could accumulate in soil and groundwater.

SECTION 14 : Transport information

The Mixture is not subject to international regulation on transport of dangerous goods.

14.1 UN number

Not applicable

14.2 UN proper shipping name

Not applicable

14.3 Transport hazard class

Not applicable

14.4 Packaging group

Not applicable

14.5 Environmental hazards

Not applicable

14.6 Special precaution for user

Not applicable

14.7 Maritime transport in bulk according to IMO instruments

No data available.

SECTION 15 : Regulatory information

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

Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC.

Regulation (EC) No 1272/2008 of the European parliament and of the Council of 16 December 2008 on classification, labeling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006.

Commission Regulation (EU) No 453/2010 of 20 May 2010 amending Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH).

Commission Regulation (EU) 2015/830 of 28 May 2015 amending Regulation (EC) No 1907/2006 of the European Parliament and the Council on the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH).

CANADIAN WHMIS (Workplace Hazardous Materials Information System) Classification

Class D; Division 2, Subdivision A

CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA) :

All constituents of these products are on the Domestic Substance List (DSL).

US OSHA Specially Regulated Substances (29 CFR 1910.1001~1052)

None present or none present in regulated quantities

United States EPA Toxic Substance Control Act

All constituents of these products are on the TSCA inventory list or are excluded from listing.

CERCLA/SARA TITLE III

Reportable Quantities (RQs) and/or Threshold Planning Quantities (TPQs)

Products on this SDS are a solid solution in the form of a solid article.

Spills or releases resulting in the loss of any ingredient at or above its RQ require immediate notification to the National Response Center and to your Local Emergency Planning Committee.

EPCRA/SARA TITLE III 313 TOXIC CHEMICALS

The following metallic components are listed as SARA 313 “Toxic Chemicals” and potentially subject to annual SARA 312 reporting: Chromium, Manganese, Nickel. See Section 3 for weight percentage.

SECTION 16 : Other information

GHS Hazard Statement

The following Hazard Statements, provided in the OSHA Hazard Communication Standard (29 CFR Part 1910.1200) correspond to the columns labeled “GHS Hazard Statements” within Section 3 of this safety data sheet.

H317 : May cause an allergic skin reaction.

H351 : Suspected of causing cancer.

H372 : Causes damage to organs through prolonged or repeated exposure.

H412: Harmful to aquatic life with long-lasting effects.

Instructions for the training:

Product handling instruction shall be included into the educational system about the safety work (initial training, training at the workplace, repeated training) according to specific conditions at the workplace.

Purpose of SDS:

Purpose of this SDS is to provide relevant information for users of product to ensure proper handling and control of risks/hazards.