SAFETY DATA SHEET

This Safety Data Sheet complies with Annex II of 830/2015 amending EC No. 1907/2006, CLP directive 1272/2008, also in accordance with ISO 11014-1 and ANSI Z400.1

Dual Shield II 80-Ni1H4

Issued: 2018-01-14

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

1.1. Product identifier

Trade name	Dual Shield II 80-Ni1H4

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

Use	Arc Welding

1.3. Details of the supplier of the safety data sheet

SDS created by	TDS Team
Supplier	ESAB DENTON
Street address	2800 Airport Road Denton, TX 76207
Telephone	1-800-372-2123
Email	sdsrequest@esab.com
Web site	www.esab.com

1.4. Emergency telephone number

Emergency phone number	1-800-372-2123
Available outside office hours	No

Other

Classification:
AWS A5.29; E81T1-Ni1M-JH4
AWS A5.36; E81T1-M21A6-Ni1-H4; E81T1-M21P6-Ni1-H4

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Description	This product is not classified as hazardous according to applicable GHS hazard classification criteria as required and defined in OSHA Hazard Communication Standard (29CFR Part 1910.1200).

2.2. Label elements

More information	This product does not require labeling.

2.3. Other hazards

This product contains nickel, which is classified as toxic by prolonged inhalation, a skin sensitizer and a suspect carcinogen. This product contains cryolite which is classified as toxic and dangerous for the environment. This product contains titanium dioxide which is possibly carcinogenic. This product contains quartz, but normally not in an inhalable fraction. Quartz can cause silicosis and may cause cancer. Avoid eye contact or inhalation of dust from this product. Skin contact is normally no hazard but should be avoided to prevent possible allergic reactions. Persons with a pacemaker should not go near welding or cutting operations until they have consulted their doctor and obtained information from the manufacturer of the device.
When this product is used in a welding process, the most important hazards are welding fumes, heat, radiation and electric shock.
Fumes: Overexposure to welding fumes may result in symptoms like metal fume fever, dizziness, nausea, dryness or irritation of the nose, throat or eyes. Chronic overexposure to welding fumes may affect pulmonary function. Prolonged inhalation of nickel compounds above safe exposure limits can cause cancer. Overexposure to manganese and manganese compounds above safe exposure limits can cause irreversible damage to the central nervous system, including the brain, symptoms of which may include slurred speech, lethargy, tremor, muscular weakness, psychological disturbances and spastic gait.
Heat: Spatter and melting metal can cause burn injuries and start fires.
Radiation: Arc rays can severely damage eyes or skin.
Electricity: Electric shock can kill.

Other

Emergency Overview: Metal wires in varying colors. This product is normally not considered hazardous when transported. Gloves should be worn when handling to prevent cuts and abrasions.

SECTION 3: Composition/information on ingredients

3.2. Mixtures

Chemical name	***CAS No. EC No. REACH No.***	***Concentration***	***Classification***	***R-phrase H-phrase***
IRON	7439-89-6 231-096-4 Registered	>60%	- -	- -
Titanium oxide**	13463-67-7 236-675-5 -	5 - 10%	- -	- -
Manganese	7439-96-5 231-105-1 -	1 - 5%	- -	- -
Silicon	7440-21-3 231-130-8 -	0,5 - 1,5%	- -	- -
Cryolite	15096-52-3 239-148-8 -	<1%	- Aquatic Chronic 2, STOT RE 1, Acute Tox. 4 - inhalation	- H332, H372, H411
Magnesium	7439-95-4 231-104-6 -	0,1 - 1%	- -	- -
Nickel powder	7440-02-0 231-111-4 -	0,1 - 1%	- Carc. 2, Aquatic Chronic 3, Skin Sens. 1, STOT RE 1	- H317, H351, H372, H412
Aluminum oxide	1344-28-1 215-691-6 -	<0,5%	- -	- -
Iron oxide	1309-37-1 215-168-2 -	<0,5%	- -	- -
Potassium Oxide	12136-45-7 235-227-6 -	<0,5%	- -	- -
Quartz*	14808-60-7 238-878-4 -	<0,5%	- STOT RE 1	- H372
Sodium Oxide	12401-86-4 215-208-9 -	<0,5%	- -	- -
Zirconium oxide	1314-23-4 215-227-2 -	<0,5%	- -	- -
Carbon	7440-44-0 231-153-3 -	<0,2%	- -	- -

Product based on	This product is a preparation of flux-cored wire.

SECTION 4: First aid measures

4.1. Description of first aid measures

Electric shock: Disconnect and turn off the power. Use a nonconductive material to pull victim away from contact with live parts or wires. If not breathing, begin artificial respiration, preferably mouth-to-mouth. If no detectable pulse, begin Cardio Pulmonary Resuscitation (CPR). call emergency physician to the scene of the accident. Call a physician immediately.

Inhalation	If breathing has stopped, perform artificial respiration and obtain medical assistance immediately! If breathing is difficult, provide fresh air and call physician.
Skin contact	For skin burns from arc radiation, promptly flush with cold water. Get medical attention for burns or irritations that persist. To remove dust or particles wash with mild soap and water.
Eye contact	For radiation burns due to arc flash, see physician. To remove dusts or fumes flush with water for at least fifteen minutes. If irritation persists, obtain medical assistance.

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

Not applicable

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

Not applicable

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media	No specific recommendations for welding consumables. Welding arcs and sparks can ignite combustible and flammable materials. Use the extinguishing media recommended for the burning materials and fire situation.

5.2. Special hazards arising from the substance or mixture

Not applicable

5.3. Advice for firefighters

Special protective equipment for fire-fighters	Wear self-contained breathing apparatus as fumes or vapors may be harmful.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Wear hand, head, eyes, ear and body protection like welders gloves, helmet or face shield with filter lens, safety boots, apron, arm and shoulder protection. Keep protective clothing clean and dry.

6.2. Environmental precautions

Refer to Section 13.

6.3. Methods and material for containment and cleaning up

Solid objects may be picked up and placed into a container. Liquids or pastes should be scooped up and placed into a container. Wear proper protective equipment while handling these materials. Do not discard as refuse.

6.4. Reference to other sections

Refer to Section 8 and Section 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Preventive handling precautions	Handle with care to avoid stings and cuts. Wear gloves when handling welding consumables. Avoid exposure to dust. Do not ingest. Some individuals can develop an allergic reaction to certain materials. Retain all warning and identity labels.

7.2. Conditions for safe storage, including any incompatibilities

Keep separate from chemical substances like acids and strong bases, which could cause chemical reactions.

7.3. Specific end use(s)

Arc Welding

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Exposure limits	Use industrial hygiene monitoring equipment to ensure that exposure does not exceed applicable national exposure limits. The following limits can be used as guidance. Unless noted, all values are for 8 hour time weighted averages (TWA). For information about welding fume analysis refer to Section 10.

National occupational exposure limits

Ingredient	*CAS no.*	*EC No.*	*Exposure limit mg/m3-ppm*		*Short-term exposure limit mg/m3-ppm*		*Ceiling exposure limit mg/m3-ppm*		*Remark*	*Source*	*Year*
Aluminum oxide	1344-28-1	215-691-6	5	-	-	-	-	-	Respirable Fraction	OSHA	2017
Cryolite	15096-52-3	239-148-8	2,5	-	-	-	-	-	as F	OSHA	2017
IRON	7439-89-6	231-096-4	-	-	-	-	-	-	-	OSHA	2017
Iron oxide	1309-37-1	215-168-2	10	-	-	-	-	-	Fume	OSHA	2017
Manganese	7439-96-5	231-105-1	-	-	-	-	5	-	-	OSHA	2017
Silicon	7440-21-3	231-130-8	5	-	-	-	-	-	Respirable fraction	OSHA	2017
Quartz*	14808-60-7	238-878-4	-	-	-	-	-	-	30 mg/m3/%SiO2+2, Total dust	OSHA	2017
Titanium oxide **	13463-67-7	236-675-5	15	-	-	-	-	-	Total dust	OSHA	2017
Zirconium oxide	1314-23-4	215-227-2	5	-	-	-	-	-	as Zr	OSHA	2017
Magnesium	7439-95-4	231-104-6	-	-	-	-	-	-	-	OSHA	2017
Potassium Oxide	12136-45-7	235-227-6	-	-	-	-	-	-	-	OSHA	2017
Sodium Oxide	12401-86-4	215-208-9	-	-	-	-	-	-	-	OSHA	2017
Carbon	7440-44-0	231-153-3	-	-	-	-	-	-	-	OSHA	2017
Nickel powder	7440-02-0	231-111-4	1	-	-	-	-	-	as Ni	OSHA	2017
Aluminum oxide	1344-28-1	215-691-6	15	-	-	-	-	-	Total dust	OSHA	2017

Silicon	7440-21-3	231-130-8	15	-	-	-	-	-	Total dust	OSHA	2017
Quartz*	14808-60-7	238-878-4	-	-	-	-	-	-	10 mg/m3/%SiO2+2, Respirable dust(quartz, tripoli)	OSHA	2017

8.2. Exposure controls

Not applicable

Other

Avoid exposure to welding fumes, radiation, spatter, electric shock, heated materials and dust. Train welders to avoid contact with live electrical parts and insulate conductive parts.

Ventilation Ensure sufficient ventilation, local exhaust, or both, to keep welding fumes and gases from breathing zone and general area. Use special care when welding painted or coated steels since hazardous substances from the coating may be emitted. Use respirator or air supplied respirator when welding or brazing in a confined space, or where local exhaust or ventilation is not sufficient to keep exposure values within safe limits.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance	Steel wire
Appearance, colour	Varying color
Appearance, physical state	Solid
Auto-ignition temperature	Not applicable
Decomposition temperature	No data available
Evaporation rate	Not applicable
Explosive properties	Not applicable
Flammability (solid, gas)	Not applicable
Flash point	Not applicable
Initial boiling point and boiling range	No data available
Melting point	>1000°C / >1800oF
Melting point / freezing point	Not applicable
Odour	Not applicable
Odour treshold	Not applicable

Oxidising properties	Not applicable
Partition coefficient: n-octanol / water	Not applicable
pH	Not applicable
pH value	Not applicable
Relative density	No data available
Solubility	No data available
Upper / lower flammability or explosive limits	No data available
Vapour density	Not applicable
Vapour pressure	Not applicable
Viscosity	Not applicable
Volatility	Not applicable

9.2. Other information

Not applicable

SECTION 10: Stability and reactivity

10.1. Reactivity

Reactivity	Contact with chemical substances like acids or strong bases could cause generation of gas.

10.2. Chemical stability

Chemical stability	This product is stable under normal conditions.

10.3. Possibility of hazardous reactions

Possibility of hazardous reactions	Not applicable

10.4. Conditions to avoid

Conditions to avoid	This product is only intended for normal welding purposes.

10.5. Incompatible materials

Incompatible materials	Not applicable

10.6. Hazardous decomposition products

Hazardous decomposition products	When this product is used in a welding process, hazardous decomposition products would include those from the volatilization, reaction or oxidation of the materials listed in Section 3 and those from the base metal and coating. The amount of fumes generated from this product varies with welding parameters and dimensions, but is generally no more than 5 to 15 g/kg consumable. Fumes from this product may contain compounds of the following chemical elements: Fe, O, Mn, Ni, Zr, F, Na, Si, K, Al, Mg and Ti. The rest is not analyzed, according to available standards.

Other

Refer to applicable national exposure limits for fume compounds, including those exposure limits for fume compounds found in Section 8.
Manganese and nickel have low exposure limits, in some countries, that may be easily exceeded.
Reasonably expected gaseous products would include carbon oxides, nitrogen oxides and ozone. Air contaminants around the welding area can be affected by the welding process and influence the composition and quantity of fumes and gases produced.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Information on toxicological effects	Inhalation of welding fumes and gases can be dangerous to your health. Classification of welding fumes is difficult because of varying base materials, coatings, air contamination and processes. The International Agency for Research on Cancer has classified welding fumes as possibly carcinogenic to humans (Group 2B).
Acute toxicity	Overexposure to welding fumes may result in symptoms like 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/skin sensitization	No data available
Germ cell mutagenicity	No data available
Genotoxicity	No data available
Carcinogenicity	*This product contains substance(s) that may cause cancer, which is/are classified as Carcinogenic to humans as per IARC. **This product contains substance(s) that may cause cancer, which is/are classified as Possibly carcinogenic to humans as per IARC. This product contains or produces a chemical known to the state of California to cause cancer and birth defects (or other reproductive harm). (California Health & Safety Code § 25249.5 et seq.)
Repeated dose toxicity	No data available
Reproductive toxicity	No data available
STOT-single exposure	No data available
STOT-repeated exposure	No data available
Aspiration hazard	No data available
LD50 Oral	No data available

LD50 Dermal	No data available
LC50 Inhalation	No data available
Routes of exposure	No data available
Symptoms related to the physical, chemical and toxicological characteristics	No data available
Mixture versus substance information	No data available
Delayed and immediate effects as well as chronic effects from short and long-term exposure	No data available
Interactive effects	No data available
Toxicity in case of skin contact	No data available
Absence of specific data	No data available
Toxicity in case of eye contact	No data available
Mixtures	No data available
Toxicity in case of ingestion	No data available

Other

Acute effects	No data available
Long term effect	Chronic toxicity: Overexposure to welding fumes may affect pulmonary function. Prolonged inhalation of nickel compounds above safe exposure limits can cause cancer. Overexposure to manganese and manganese compounds above safe exposure limits can cause irreversible damage to the central nervous system, including the brain, symptoms of which may include slurred speech, lethargy, tremor, muscular weakness, psychological disturbances and spastic gait. Inhalable quartz is a respiratory carcinogen however the process of welding converts crystalline quartz to the amorphous form which is not considered to be a carcinogen.
Information to doctor	No data available

SECTION 12: Ecological information

12.1. Toxicity

Acute toxicity	No data available
Toxicity	No data available
Aquatic	No data available

Soil	No data available
Acute fish toxicity	No data available
Acute algae toxicity	No data available
Acute crustacean toxicity	No data available
Chronical toxicity	This product contains Nickel powder which is classified as harmful to aquatic organisms by 1272/2008 CLP Directive and may cause long-term adverse effects in the aquatic environment. This product contains cryolite, which is classified by CLP Directive Regulation (EC) No 1272/2008 , as toxic to aquatic organisms and may cause long-term adverse effects in the aquatic environment.

12.2. Persistence and degradability

Persistence and degradability	No data available
Decay/transformation	No data available

12.3. Bioaccumulative potential

Bioaccumulative potential	No data available

12.4. Mobility in soil

Mobility	No data available

12.5. Results of PBT and vPvB assessment

Results of PBT and vPvB assessment	No data available

12.6. Other adverse effects

Other adverse effects	No data available

Other

Welding consumables and materials could degrade/weather into components originating from the consumables or from the materials used in the welding process. Avoid exposure to conditions that could lead to accumulation in soils or groundwater.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Disposal considerations	Discard any product, residue, disposable container or liner in an environmentally acceptable manner, in full compliance with federal and local regulations. Use recycling procedures if available. USA RCRA: This product is not considered hazardous waste if discarded. Residues from welding consumables and processes could degrade and accumulate in soils and groundwater. Welding slag from this product typically contain mainly the following components originating from the powder filling of the flux cored wire: Fe, O, Mn, Ni, Zr, F, Na, Si, K, Al, Mg and Ti.

SECTION 14: Transport information

14.1. UN number

Not applicable

14.2. UN proper shipping name

Not applicable

14.3. Transport hazard class(es)

Not applicable

14.4. Packing group

Not applicable

14.5. Environmental hazards

Not applicable

14.6. Special precautions for user

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

EU regulations	Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation 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, labelling 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) 2015/830 of 28 May 2015 amending Regulation (EC) No 1907/2006 of the European Parliament and the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) DIRECTIVE 2008/98/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL. of 19 November 2008. on waste and repealing certain Directives. European Parliament and Council Directive 94/62/EC of 20 December 1994 on packaging and packaging waste.

Other regulations, limitations and legal regulations	Poland Regulations: ACT of 25 February 2011 on the chemical substances and their mixtures(OJ # 63, poz. 322). Regulation of the Minister of Labour and Social Policy of 6 June 2014 on Maximum Permissible Concentration and Intensity of Agents Harmful to Health in the Working Environment (Dz. u. z. 2014, poz 817). The Act on Waste of 14 December 2012, Journal of Laws of 2013, item 21 with amendments Act of 13th June 2013 on packaging management and packaging waste (Journal of Laws of 2013, item 888). Regulation of the Minister of the Environment of 9 December 2014 on waste catalogue (Journal of Laws of 2014, item 1923). Regulation of the Minister of Economy of 21 December 2005. Concerning essential requirements for personal protective equipment (Journal. Laws No. 259, item. 2173). Regulation of the Minister of Health of 2 February 2011 on tests and measurements of factors harmful to health in the working environment (the Journal of Laws 2011, no. 33, item 166). USA Regulations : USA: This product contains or produces a chemical known to the state of California to cause cancer and birth defects (or other reproductive harm). (California Health & Safety Code § 25249.5 et seq.) CERCLA/SARA Title III Reportable Quantities (RQs) and/or Threshold Planning Quantities (TPQs): Product is 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 potential subject to annual SARA 313 reporting. See Section 3 for weight percent. Manganese: 1.0% de minimis concentration Nickel Powder: 0.1% de minimis concentration Aluminium oxide: 1.0% de minimis concentration Canada: WHMIS classification: Class D; Division 2, Subdivision A International Inventories: Australia: The substance(s) in this product is/are in compliance with the inventory requirements of Australian Inventory of Chemical Substances (AICS) United States EPA Toxic Substance Control Act: All constituents of this product are on the TSCA inventory list or are excluded from listing. Canadian Environmental Protection Act (CEPA): All constituent(s) of this product is/are on the Domestic Substance List (DSL).

15.2. Chemical safety assessment

Chemical safety assessment	No data available

Other

Read and understand the manufacturer's instructions, your employer's safety practices and the health and safety instructions on the label.
Observe any federal and local regulations. Take precautions when welding and protect yourself and others.
WARNING: Welding fumes and gases are hazardous to your health and may damage lungs and other organs. Use adequate ventilation.
ELECTRIC SHOCK can kill. ARC RAYS and SPARKS can injure eyes and burn skin.
Wear correct hand, head, eye and body protection.

SECTION 16: Other information

Changes to previous revision	This Safety Data Sheet has been revised due to modifications to Sections 1-16.
References to key literature and data sources	Refer to ESAB "Welding and Cutting - Risks and Measures", F52-529 “Precautions and Safe Practices for Electric Welding and Cutting” and F2035 “Precautions and Safe Practices for Gas Welding, Cutting and Heating” available from ESAB, and to: www.esab.com
Phrase meaning	Acute Tox. 4 - inhalation - Acute toxicity, inhalation, hazard category 4 Aquatic Chronic 2 - Hazardous to the aquatic environment — Chronic hazard category 2 Aquatic Chronic 3 - Hazardous to the aquatic environment — Chronic hazard category 3 Carc. 2 - Carcinogenicity, hazard category 2 Skin Sens. 1 - Skin sensitisation, hazard category 1 STOT RE 1 - Specific Target Organ Toxicity — Repeated exposure, hazard category 1 H317 - May cause an allergic skin reaction. H332 - Harmful if inhaled. H351 - Suspected of causing cancer. H372 - Causes damage to organs through prolonged or repeated exposure. H411 - Toxic to aquatic life with long lasting effects. H412 - Harmful to aquatic life with long lasting effects.

Other

Additional information	USA: Contact ESAB at www.esabna.com or 1-800 ESAB-123 if you have any questions about this SDS. American National Standard Z49.1 Safety in Welding and Cutting, ANSI/AWS F1.5 Methods for Sampling and Analyzing Gases from Welding and Allied Processes, ANSI/AWS F1.1 "Method for Sampling Airborne Particles Generated by Welding and Allied Processes", AWSF3.2M/F3.2 "Ventilation Guide for Weld Fume", 550 North Le Jeune Road, Miami Florida 33135. Safety and Health Fact Sheets available from AWS at www.aws.org. OSHA Publication 2206 (29 C.F.R. 1910), U.S. Government Printing Office, Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250-7954 American Conference of Governmental Hygienists (ACGIH), Threshold Limit Values and Biological Exposure Indices, 6500 Glenway Ave., Cincinnati, Ohio 45211, USA. NFPA 51B “Standard for Fire Prevention During Welding, Cutting and Other Hot Work” published by the National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169 UK: WMA Publication 236 and 237, "Hazards from Welding fume”, ”The arc welder at work, some general aspects of health and safety". Germany: Accident prevention regulation BGV D1, "Welding, cutting and related procedures" Canada: CSA Standard CAN/CSA-W117.2-01 "Safety in Welding, Cutting, and Allied Processes". This product has been classified according to the hazard criteria of the CPR and the SDS contains all of the information required by the CPR. ESAB requests the users of this product to study this Safety Data Sheet (SDS) and become aware of product hazards and safety information. To promote safe use of this product a user should: notify its employees, agents and contractors of the information on this SDS and any product hazards/safety information.furnish this same information to each of its customers for the products Request such customers to notify employees and customers for the same product hazards and safety information. The information herein is given in good faith and based on technical data that ESAB believes to be reliable. Since the conditions of use is outside our control, we assume no liability in connection with any use of this information and no warranty expressed or implied is given. Contact ESAB for more information.