MATERIAL SAFETY DATA SHEET (MSDS)

This Safety Data Sheet complies with Regulation (EC) No.1907/2006,

1. PRODUCT IDENTIFICATION

Product Name	**:**	Stainless Steel Welding Wire
Product Brand	**:**	**Nevinox**
Product Specifications	**:**	AWS/ASME SFA 5.9, EN ISO 14343A & EN ISO 14343B
Product Classification	**:**	307 Si (18 8 Mn), ER 308, ER 308L, ER 308LSi, ER 309, ER 309L, ER 309LSi, ER 310, ER 312, ER 316, ER 316L, ER 316LSi, ER 347, ER 430 and 430LNb
Recommended use	**:**	Arc welding
Manufacturer's Name & address	**:**	Nevatia Steel & Alloys Pvt. Ltd. 904, Lodha Supremus, 9th Floor, Dr. E Moses Road, Mumbai –400 018. India
Contact Person	**:**	**Sanjay Pangam**
E mail ID	:	sanjay@nevatiasteel.com
Emergency Telephone No.	**:**	101

2. HAZARD IDENTIFICATION

2.1 Classification: The products are odourless. The products are neither flammable nor reactive. Welding wires are non-hazardous at room temperature. Welding wires do not require labelling under chemical product classification and labelling regulation.

2.2 : Information pertaining to special dangers for human and environment

The products are odourless. The products are neither flammable nor reactive. Welding wires are non-hazardous at room temperature. These products are not expected to cause adverse effect on Human, Plant or animal life.

However during welding process, additional potential hazards are likely. These are:

Heat
Spatter, molten metal and arc rays can cause burn, injuries and start fires if come in contact with combustible materials

Radiation
Arc rays can damage eyes or skin

Electric shock
Electric shock can be fatal.

Fumes
Fumes produced during welding consist of complex metal oxides, fluorides, and silicates from the weld materials and Gaseous fume such as ozone and nitrogen oxides from the action of arc radiation on the atmosphere, and carbon monoxide and dioxide from the oxidation of carbon in the components and from the shielding gas. Inhalation of these fumes and gases may lead to irritation of the nose, throat and eyes. Over exposure or over inhalation of high levels of fumes may result in harmful effects to the respiratory system, central nervous system and lungs.

Fumes and gases produced during welding process may cause long term adverse effects in the environment if released directly into the atmosphere. Welding fumes from the arc processes which use the wires can produce carbon dioxide gas, which is dangerous to the ozone layer.

3. DETAILS OF COMPOSITION

These products consist of a solid stainless steel wire. The wire is continuously wound on reels, spools or in bulk packs, or supplied in straight cut lengths.

Details of the composition of the wires covered by this data sheet are given below.

Grade	Weight %										Nearest Equivalent Standards		
	C	Mn	P	S	Si	Cr	Ni	Mo	Cu	Nb	AWS A5.9/5.9M	EN ISO 14343 A	EN ISO 14343 B
307Si	0.04 - 0.14	5.50 - 7.50	0.03	0.02	0.65- 1.20	18.00-20.00	8.00 - 9.80	0.30	0.30	-	-	18 8 Mn	-
ER 308	0.08	1.00 - 2.00	0.03	0.02	0.30 - 0.65	19.50 - 21.00	9.00 - 11.00	0.30	0.30	-	ER308	-	308
ER 308L	0.03	1.30 - 2.10	0.03	0.02	0.30 - 0.65	19.50 - 21.00	9.00 - 11.00	0.30	0.30	-	ER 308L	19 9 L	(308L)
ER 308LSi	0.03	1.30 - 2.10	0.03	0.02	0.65 - 1.00	19.50 - 21.00	9.00 -11.00	0.30	0.30	-	ER 308LSi	19 9 LSi	(308LSi)
ER 309	0.12	1.00 - 2.50	0.03	0.02	0.30 - 0.65	23.00 -25.00	12.00 - 14.00	0.30	0.30	-	ER 309	(22 12 H)	309
ER 309L	0.03	1.40 - 2.20	0.03	0.02	0.30 - 0.65	23.00- 25.00	12.00 - 14.00	0.30	0.30	-	ER 309L	23 12 L	(309L)
ER 309LSi	0.03	1.40 - 2.20	0.03	0.02	0.65 - 1.00	23.00- 25.00	12.00 - 14.00	0.30	0.30	-	ER 309LSi	23 12 LSi	(309LSi)
ER 310	0.08 - 0.15	1.30 - 2.10	0.03	0.02	0.30 - 0.65	25.00 - 27.00	20.00 - 22.00	0.30	0.30	-	ER 310	(25 20)	310
ER 312	0.15	1.30 - 2.10	0.03	0.02	0.30 - 0.65	29.00 - 31.00	8.00 - 10.00	0.50	0.50	-	ER 312	29 9	312
ER 316	0.08	1.00 - 2.50	0.03	0.02	0.30 - 0.65	18.00 - 20.00	11.00 - 13.00	2.00 - 3.00	0.30	-	ER 316	-	316
ER 316L	0.03	1.30 - 2.10	0.03	0.02	0.30 - 0.65	18.00 - 20.00	11.00 - 13.00	2.50 - 3.00	0.30	-	ER316L	19 12 3 L	(316L)
ER 316L	0.03	1.30 - 2.10	0.03	0.02	0.30 - 0.65	18.00 - 20.00	11.00 - 13.00	2.00 - 3.00	0.30	-	ER316L	(19 12 3 L)	316L
ER 316LSi	0.03	1.30 - 2.10	0.03	0.02	0.65 - 1.00	18.00 - 20.00	11.00 - 13.00	2.50 - 3.00	0.30	-	ER 316LSi	19 12 3 LSi	(316LSi)
ER 316LSi	0.03	1.30 - 2.10	0.03	0.02	0.65 - 1.00	18.00 - 20.00	11.00 - 13.00	2.00 - 3.00	0.30	-	ER 316LSi	(19 12 3 LSi)	316LSi
ER 347	0.08	1.30 - 2.10	0.03	0.02	0.30- 0.65	19.00 - 21.00	9.00 - 11.00	0.30	0.30	10XC - 1.0	ER 347	19 9 Nb	(347)
ER 430	0.10	0.60	0.03	0.02	0.50	16.00 - 17.00	0.50	0.50	0.50	-	ER 430	(17)	430
430LNb	0.03	0.60	0.03	0.02	0.50	15.50 – 17.0	0.50	0.50	0.75	8XC – 1.20	-	(18 L Nb)	430LNb

Remarks: Single values shown in the table are maximum values. Two values shown indicate minimum and maximum limits for a range.

Ingredients	REACH Reg #	CAS#	EINECS#	Hazard classification*
Iron	-	7439-89-6	231-096-4	No
Manganese	-	7439-96-5	231-105-1	No
Silicon	-	7440-21-3	231-130-8	No
Molybdenum	-	7439-98-7	231-107-2	No
Copper	-	7440-50-8	231-159-6	No
Chromium	-	7440-47-3	231-157-5	No
Nickel	-	7440-02-0	231-111-4	Carc. Cat 3: R40 T: R48/23 R43

* Hazard Classification according to European Council Directives 67/548/EEC,for R-Phrases, please refer section 15.

4. FIRST AID MEASURES

During welding process:

Inhalation : Bring the patient in fresh air. If necessary use artificial respiration.

Skin Exposure : If skin burns, submerge affected area in cold water until burning sensation ceases and refer for immediate medical attention.

Eye Exposure : Irrigate eye with water, cover with damp dressing. Patient must seek immediate medical attention if irritation persists.

Ingestion : If swallowed, do not induce vomiting and do not give fluids. Seek medical attention.

Electric shock : Disconnect electric supply and seek immediate medical attention.

5. FIRE FIGHTING MEASURES

Product is not flammable. No specific measures required prior to welding but Welding should not be carried out in the presence or near flammable materials.

In case of unusual fire and explosion hazards, these products may decompose and produce iron fumes, mixture of nickel, copper and metal oxides. Under such condition use fire-extinguishing media appropriate for surrounding materials. No special fire fighting procedure required.

6. ACCIDENTAL RELEASE MEASURES

These products are solid and are not flammable. Spill and leak response is not applicable.
Wear proper protective equipment while handling this material. Good practice for handling should be adopted to prevent physical injuries.
Refer
Section 8 for Personal precaution &
Section 13 for Environmental precautions.

7. HANDLING AND STORAGE

Welding wires can give rise to physical injuries when reels, spools, bulk packs or packages are lifted or handled incorrectly. Wear gloves and other protective equipments while handling welding wire to avoid physical injury or cut.

Welding wire should be stored away from Chemical substances like strong acid or alkali which may cause chemical reaction.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Welding place and protective equipment should be kept clean and dry. Welders should not touch live electrical parts, and should insulate themselves from the work and the ground. Manufacturer's guidelines for the use of electrical welding machines should be observed at all times.
Welders and co-workers should be educated and trained about the health hazards associated with welding fume.
Good ventilation or fume extraction system at the welding zone should be used to control the fumes and gases produced during welding.

Personal Protection

- Welders and co-workers should wear protective clothing and eye protection.
- Suitable clothes for welding should be worn such as non light reflective fire proof overalls, leather apron, welding helmet, leather boots spats and gloves
- Welders & co worker should wear suitable hand protection such a welding gloves or gauntlets of a suitable standard for protection against hot metal, sparks and spatter.
- Welders should wear a welding helmet fitted with the appropriate optical welding filter. Suitable protective welding screens and goggles should be provided.

Chemical Name	CAS#	Exposure limit in air (mg/m^3)			
		ACGIH-TLV		OSHA-PEL	
		TWA	STEL	TWA	STEL
Iron	7439-89-6	5	NE	10	NE
Manganese	7439-96-5	0.2	NE	1(vacated 1989 PEL)	5
Silicon	7440-21-3	10	NE	15(total dust), 5(respirable fraction)	NE
Molybdenum	7439-98-7	10	NE	15	NE
Copper	7440-50-8	0.2 (fumes) and 1(dust& mists)	NE	0.1(fume) & 1 (dusts& mists)	NE
Chromium	7440-47-3	Metal : 0.5, (Cr.VI): 0.01 *(Cr.VI): 0.05	NE	Metal: 1.0 *(Cr.VI): 0.005 (Cr.VI): 0.005	NE
Nickel	7440-02-0	1.5(inhalable fraction)	NE	1	NE

- * water soluble Cr.VI.
- TWA: Time weighted average;
- STEL : Short term exposure limit/ ceiling limit;
- The threshold limit value is 5 mg/m3.
- Single vales shown are maximum, unless otherwise specified.
- NE : Not Established

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state	:	Solid
Colour	:	Silver coloured, may be shiny or matt
Form	:	Metal wire or rod
Odour	:	Odourless
pH	:	Not applicable
Vapour pressure	:	Not applicable
Vapour Density	:	Not applicable
Boiling point/ range	:	3000^{0}C
Melting Point	:	~1500^{0}C
Solubility in water	:	Insoluble
Specific gravity	:	7.8 -8.0 g/cm^3
Explosive/ignition point	:	Non flammable. No fire/explosion hazard exists

10. STABILITY AND REACTIVITY

Stability	:	Stable
Decomposition products	:	Mixture of metal oxides, carbon dioxide and carbon monoxide. For additional information, refer AWS publication, 'Fumes and Gases in the welding Environment '
Material to Avoid	:	Strong acids, strong oxidisers, halogens, phosphorous
Hazardous Polymerisation	:	Will not occur
Condition to avoid	:	uncontrolled exposure to extreme temperature and incompatible material

Inhalation of the fumes/gases produced during welding are dangerous to health and may lead to irritation to the nose throat and eyes.

Over exposure may affect your health including dizziness, nausea, dryness or may lead to irritation to the nose, throat and eyes.

Over exposure to welding fumes and dust may affect respiratory function with symptoms such as asthma, impaired respiratory and lung function, chronic bronchitis. Welding fumes and dust may contain chromium and nickel compound which are suspected of being cancer causing agents.

Iron oxide is unlikely to cause any significant health effects. The fume particles however accumulate in the lungs and lead to siderosis.

Overexposure or inhalation of excessive amounts of manganese has been shown to affect pulmonary function, blood and may cause irreversible central nervous system damage.

The main health effects of nickel are skin dermatitis (nickel 'itch') and it being classified as a potential human lung carcinogen. It may also cause nasal cancer.

Chromium can produce respiratory effects such as nasal ulceration and possible lung cancer. It can also cause contact skin dermatitis.

Ozone and Nitrogen oxides can produce eye, respiratory and lung irritation and also can produce longer term lung effects

Carbon monoxide (CO) which may produced during welding, has affinity for oxygen carrying blood haemoglobin causing fatigue, weakness, dizziness and eventual unconsciousness and

possible death. Carbon dioxide (CO 2) can exert some toxic properties by increasing pulse and heart rate.

Unprotected skin exposed to UV and IR radiation from the welding arc may burn or redden, and UV radiation is potentially a carcinogen. UV radiation can affect the unprotected eye by producing an acute condition known as 'arc eye'.

11. TOXICOLOGICAL INFORMATION

Inhalation of the fumes/gases produced during welding are dangerous to health and may lead to irritation to the nose throat and eyes.

Acute Toxicity:
Over exposure may affect your health including dizziness, nausea, dryness or may lead to irritation to the nose, throat and eyes.

Chronic Toxicity
Over exposure to welding fumes and dust may affect respiratory function with symptoms such as asthma, impaired respiratory and lung function, chronic bronchitis. Welding fumes and dust may contain chromium and nickel compound which are suspected of being cancer causing agents.

Iron oxide is unlikely to cause any significant health effects. The fume particles however accumulate in the lungs and lead to siderosis.

Overexposure or inhalation of excessive amounts of manganese has been shown to affect pulmonary function, blood and may cause irreversible central nervous system damage.
The main health effects of nickel are skin dermatitis (nickel 'itch') and it being classified as a potential human lung carcinogen. It may also cause nasal cancer.

Chromium can produce respiratory effects such as nasal ulceration and possible lung cancer. It can also cause contact skin dermatitis.

Ozone and Nitrogen oxides can produce eye, respiratory and lung irritation and also can produce longer term lung effects

Carbon monoxide (CO) which may produced during welding, has affinity for oxygen carrying blood haemoglobin causing fatigue, weakness, dizziness and eventual unconsciousness and possible death. Carbon dioxide (CO 2) can exert some toxic properties by increasing pulse and heart rate.

Unprotected skin exposed to UV and IR radiation from the welding arc may burn or redden, and UV radiation is potentially a carcinogen. UV radiation can affect the unprotected eye by producing an acute condition known as 'arc eye'.

12. ECOLOGICAL INFORMATION

These products are not expected to cause adverse effect on plant or animal life. Fumes and gases produced during welding process may cause long term adverse effects in the environment if released directly into the atmosphere. Welding fumes from the arc processes which use the wires can produce carbon dioxide gas, which is dangerous to the ozone layer.

13. DISPOSAL CONSIDERATIONS

Scrap and surplus can be recycled and reused. If not, should be disposed of as general waste in compliance with federal and local regulation.

14. TRANSPORT INFORMATION

No special requirements are necessary in transporting these products. No international regulations or restrictions are applicable.

15. REGULATORY INFORMATION

Read & follow manufacturer instructions. Take precaution while welding .welding fumes and gases are hazardous to health. Wear personal protective equipments. Good ventilation should be provided to ensure that all hazardous ingredients in the fume are kept below their individual occupational exposure standards in breathing zones.

a. OHS Act No 85 0f 1993 General Safety Regulations 9.
b. SABS 0238 (SANS 10238) Welding and Thermal Cutting Processes – Health and Safety
c. **SARA Title III:** The following metallic compounds are listed as SARA 313 Toxic Chemicals and depending on your usage may be subject to annual reporting: Chromium, Copper, Manganese, and Nickel.
d. **TSCA:** All material contained within this product are on the TCSA Inventory List.
e. **California Health & Safety Code & 25249.5 et.sq.** This product, when used for welding or cutting, produces fumes or gases which contain chemicals known to cause cancer

According to EC directive 88/379/EEC, the products are classified due to content of nickel

R-phrases:	**R40**	**-Limited evidence of carcinogenic effect**
	R43	**-May cause sensitization by skin contact**
	R48/20	**-Harmful and danger of serious damage to health by prolonged exposure through inhalation**
S-phrases:	**S2**	**Keep out of the reach of children**
	S22	**Do not breathe dust**

S24 **Avoid contact with Skin**
S37 **Wear suitable Gloves**

16. OTHER INFORMATION

Nevatia Steel requests the users of this product to read this Materials Safety Data Sheet carefully before usage. Further information can be obtained from the American National Standard Z49.1 Safety in Welding and Cutting. The information contained in this Material Safety Data Sheet relates only to the specific materials designated and may not be valid for such material used in combination with any other material or in any process.

Information is given in good faith and is based on the latest information available to Nevatia Steel and is, to the best of our knowledge and belief. However, no representation, warranty or guarantee is made as to the accuracy, reliability or completeness of the information, and we assume no responsibility and disclaim any liability incurred in using this information.

****