



MATERIAL SAFETY DATA SHEET

SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

Product Type	: CARBON STEEL AND LOW HYDROGEN ELECTRODES FOR SHIELDED METAL ARC WELDING
Sizes	: All
Application	: Arc Welding
Classification	: AWS A5.1
Manufacturer/Supplier Name	: THAI HANSA WELDING ELECTRODES CO., LTD
Telephone No	: +666-323-0605
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Website	: www.geminithailand.com

SECTION 2. HAZARDS IDENTIFICATION

Emergency Overview: Coated metal rods in varying colors. These products are normally not considered hazardous as shipped. Gloves should be worn when handling to prevent contaminating hands with product dust.

These products contain titanium dioxide which is possibly carcinogenic. These products contain quartz, but normally not in an inhalable fraction. Quartz can cause silicosis and may cause cancer.

Avoid eye contact or inhalation of dust from these products. 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 these products are used in a welding process, the most important hazards are heat, radiation, electric shock and welding fumes.

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.

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. 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.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

These products are preparations of core wire with extruded coating.

Ingredients	Reg. #	CAS#	EINECS#	Hazard Classification ⁽¹⁾	IARC ⁽²⁾	NTP ⁽³⁾	OSHA List ⁽⁴⁾
Aluminum Oxide	--	1344-28-1	215-691-6	No	--	--	--
Calcium Carbonate	--	1317-65-3	215-279-6	No	--	--	--
Calcium Fluoride	--	7789-75-5	232-188-7	No	--	--	--
Cellulose	--	7789-75-5	232-188-7	No	--	--	--
Iron and Iron Oxide	01-2119462838-24	7439-89-6	231-096-4	No	--	--	--
Manganese	--	7439-96-5	231-105-1	No	--	--	--
Mineral Silicates	All substances with CAS # of 14808-60-7 are considered to be quartz						
Bentonite Clays	--	1302-78-9	215-108-5	No	--	--	--
Chlorite	--	14808-60-7	238-878-4	T;R45	1	K	--
Feldspar	--	14808-60-7	238-878-4	T;R45	1	K	--
Hectorite	--	14808-60-7	238-878-4	T;R45	1	K	--
Pyrropholite	--	14808-60-7	238-878-4	T;R45	1	K	--
Wollanstonite	--	14808-60-7	238-878-4	T;R45	1	K	--
Zircon	--	14808-60-7	238-878-4	T;R45	1	K	--
Potassium Titanate		12030-97-6	234-748-6	No	--	--	--
Silicate Binder (Potassium Silicate)		1312-76-1	215-199-1	No	--	--	--
Silicate Binder (Sodium Silicate)		1344-09-8	215-687-4	No	--	--	--
Silicon	--	7440-21-3	231-130-8	No	--	--	--
Silicon Dioxide	--	14808-60-7	238-878-4	T;R45	1	K	--
Titanium Oxide	--	13463-67-7	236-675-5	No	2B	--	--
Zirconium Compounds	--	--	--	No	--	--	--

⁽¹⁾ Hazard Classification according to European Council Directive 67/548/EEC, for R-phrases, see Section 16.

⁽²⁾ Evaluation according to the International Agency for Research on Cancer.

1 –Carcinogenic to humans. 2A – Probably carcinogenic to humans. 2B – Possibly carcinogenic to humans.

⁽³⁾ Classification according to the 11th Report on Carcinogens, published by the US National Toxicology Program.

K – Known Carcinogen S – Suspect Carcinogen

⁽⁴⁾ Carcinogen listing according to OSHA, Occupational Safety & Health Administration (USA).

APPROXIMATE COMPOSITION (Wt. %)

Product Trade Name	6010	6011	6013	7016	7018*	7018-1*	7024
Aluminum Oxide	--	--	--	--	--	--	0.5 - 3
Calcium Carbonate	--	--	1 - 3	5 - 10	5 - 10	5 - 10	--
Calcium Fluoride	--	--	--	5 - 10	5 - 10	5 - 10	--
Cellulose	2 - 5	2 - 5	1 - 3	--	--	--	1 - 3
Iron	80 - 90	80 - 90	70 - 80	70 - 80	70 - 80	70 - 80	70 - 80
Iron Oxides	0.5 - 2	<1	--	--	--	--	--
Manganese	1 - 2	1 - 2	1 - 2	1 - 2	1 - 2	1 - 2	2 - 5
Mineral Silicates	<1	1 - 3	1 - 3	1 - 3	1 - 3	1 - 3	1 - 5
Potassium Titanate	--	1 - 3	--	--	--	--	--
Silicate Binder	1 - 3	1 - 3	1 - 3	1 - 3	1 - 3	1 - 3	1 - 3
Silicon	--	--	--	<1	<1	<1	<1
Silicon Dioxide	<1	<1	1 - 2	--	--	<1	--
Titanium Oxide	1 - 5	1 - 5	8 - 12	1 - 5	1 - 5	1 - 5	9 - 14
Zirconium Compounds	<1	<1	--	--	--	--	--
AWS Classification	E6010	E6011	E6013	E7016	E7018	E7018-1	E7024

* Also includes H4R designator

SECTION 4. FIRST AID MEASURES

Inhalation : If breathing has stopped, perform artificial respiration and obtain medical assistance immediately!
If breathing is difficult, provide fresh air and call physician.

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.

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.

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

General : Move to fresh air and call for medical aid.

SECTION 5. FIRE FIGHTING MEASURES

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. Wear self-contained breathing apparatus as fumes or vapors may be harmful.

SECTION 6. ACCIDENTAL RELEASE MEASURES

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.

Personal precautions : refer to Section 8.

Environmental precautions : refer to Section 13.

SECTION 7. HANDLING AND STORAGE

Handling :

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.

Storage :

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

SECTION 8. EXPOSURE CONTROL/PERSONAL PROTECTION

Avoid exposure to welding fumes, radiation, spatter, electric shock, heated materials and dust.

Engineering measures:

Ensure sufficient ventilation, local exhaust, or both, to keep welding fumes and gases from breathing zone and general area. Keep working place and protective clothing clean and dry. Train welders to avoid contact with live electrical parts and insulate conductive parts.

Check condition of protective clothing and equipment on a regular basis.

Personal protective equipment:

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. Use special care when welding painted or coated steels since hazardous substances from the coating may be emitted. 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.

Use industrial hygiene monitoring equipment to ensure that exposure does not exceed applicable national exposure limits. The following limits can be used as guidance. For information about welding fume analysis refer to Section 10.

Substance	CAS#	ACGIH TLV ⁽¹⁾ mg/m ³	OSHA PEL ⁽²⁾ mg/m ³
Aluminum Oxide	1344-28-1	1**(as Al)	15*,5**
Calcium Carbonate	1317-65-3	withdrawn	15*,5**
Calcium Fluoride (as F)	7789-75-5	2.5	2.5
Cellulose	9004-34-6	10	15*,5**
Iron and Iron Oxides	7439-89-6	5**	10(fume)
Manganese and inorganic compounds (as Mn)	7439-96-5	0.02**,0.1***	5 ceiling
Manganese, fume, as Mn	7439-96-5	0.02**,0.1***	5 ceiling
Mineral Silicates (no exposure anticipated)			
All substances with CAS # of 14808-60-7 are considered to be quartz.			
Bentonite Clays	1302-78-9	None	None
Chlorite Silica-Crystalline-Quartz	14808-60-7	0.025**	10 mg/m ³ ####/ %SiO ₂ +2
Feldspar Silica-Crystalline-Quartz	14808-60-7	0.025**	10 mg/m ³ ####/ %SiO ₂ +2
Hectorite Silica-Crystalline-Quartz	14808-60-7	0.025**	10 mg/m ³ ####/ %SiO ₂ +2
Pyropholite Silica-Crystalline Quartz	14808-60-7	0.025**	10 mg/m ³ ####/ %SiO ₂ +2
Wollastonite Silica-Crystalline Quartz	14808-60-7	0.025**	10 mg/m ³ ####/ %SiO ₂ +2
Zircon Silica-Crystalline-Quartz	14808-60-7	0.025**	10 mg/m ³ ####/ %SiO ₂ +2
Potassium Titanate	12030-97-6	None	None
Silicate Binder (Potassium Silicate & Sodium Silicate)	1312-76-1 1344-09-8	None None	None None
Silicon	7440-21-3	Withdrawn	15*,5**
Silicon Dioxide (Quartz)	14808-60-7	0.025**	10 mg/m ³ ####/ %SiO ₂ +2
Sodium Titanate (Powder)	12034-34-3	None	None
Titanium Oxide	13463-67-7	10	15*
Zirconium & Zirconium Compounds (as Zr)	7440-67-7	5,10 (STEL)	5

⁽¹⁾ Threshold Limit Values according to American Conference of Governmental Industrial Hygienists, 2014

⁽²⁾ Permissible Exposure Limits according to the Occupational Safety & Health Administration (USA)

Unless noted, all values are for 8 hours times weighted averages (TWA).

* Total dust, ** Respirable fraction, *** Inhalable fraction.

Respirable dust

NOTE: Some of these products may not contain all of the materials listed. For details of composition, refer to the COMPOSITION TABLES in Section 3.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance : Solid, non-volatile with varying color.

Melting Point : >1300°C/>2300°F

SECTION 10. STABILITY AND REACTIVITY

General : These products are only intended for normal welding purposes.

Stability : These products are stable under normal conditions.

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

When these products are 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 manual metal arc welding varies with welding parameters and dimensions but is generally no more than 5 to 15 g/kg consumable. Fumes from these products may contain compounds of the following chemical elements: Fe, O, Mn, Zr, F, Na, Si, K, Ca, Al, Mg and Ti. The rest is not analyzed, according to available standards.

Refer to applicable national exposure limits for fume compounds, including those exposure limits for fume compounds found in Section 8. Manganese has a low exposure limit, 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

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.

Chronic toxicity : Overexposure to welding fumes may affect pulmonary function. 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. Prolonged inhalation of titanium dioxide above safe exposure limits can cause cancer. 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.

SECTION 12. ECOLOGICAL INFORMATION

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

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.

SECTION 14. TRANSPORT INFORMATION

No international regulations or restrictions are applicable.

SECTION 15. REGULATORY INFORMATION

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

THAI HANSA WELDING ELECTRODES CO., LTD. requests the users of these products to study this Material Safety Data Sheet (MSDS) and become aware of product hazards and safety information. To promote safe use of these products 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 these products.
- Request such customers to notify employees and customers for the same product hazards and safety information.

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