Revision Date: 03/25/2015



SAFETY DATA SHEET

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: Jetweld® 2 Product Size: 1/4 in.

Other means of identification

SDS number: 200000000643

Recommended use and restriction on use

Recommended use: SMAW (Shielded Metal Arc Welding)

Restrictions on use: Not known. Read this SDS before using this product.

Manufacturer/Importer/Supplier/Distributor Information

Manufacturer/Supplier:

The Lincoln Electric Company 22801 Saint Clair Avenue Cleveland, Ohio 44117 USA Phone: +1 (216) 481-8100

The Lincoln Electric Company of Canada LP 179 Wicksteed Avenue Toronto, Ontario M4G 2B9 CANADA

Phone: +1 (416) 421-2600

Safety Data Sheet Questions: SDS@lincolnelectric.com

Arc Welding Safety Information: www.lincolnelectric.com/safety

24-Hour Emergency Response Telephone Numbers:

 Area
 Telephone

 USA/Canada/Mexico
 +1 (888) 609-1762

 Americas/Europe
 +1 (216) 383-8962

 Asia Pacific
 +1 (216) 383-8966

 Middle East/Africa
 +1 (216) 383-8969

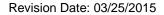
3E Company Access Code: 333988

2. HAZARDS IDENTIFICATION

Classified according to the criteria of the Globally Harmonized System of Classification and Labeling of Chemicals (GHS), OSHA Hazard Communication Standard (29 CFR 1910.1200) and the Canadian Controlled Products Regulations.

Hazard Classification

SDS_North America - 200000000643





Not classified as hazardous according to applicable GHS hazard classification criteria.

Label Elements

Hazard Symbol: No symbol

Signal Word: No signal word.

Hazard Statement Not applicable

Precautionary Statement Not applicable

Other hazards which do not result in GHS classification:

Electrical Shock can kill. If welding must be performed in damp locations or with wet clothing, on metal structures or when in cramped positions such as sitting, kneeling or lying, or if there is a high risk of unavoidable or accidental contact with work piece, use the following equipment: Semiautomatic DC Welder, DC Manual (Stick) Welder, or AC Welder with Reduced Voltage Control.

Arc rays can injure eyes and burn skin. Welding arc and sparks can ignite combustibles and flammable materials. Overexposure to welding fumes and gases can be hazardous. Read and understand the manufacturer's instructions, Safety Data Sheets and the precautionary labels before using this product. Refer to Section 8.

Substance(s) formed under the conditions of use:

The welding fume produced from this welding electrode may contain the following constituent(s) and/or their complex metallic oxides as well as solid particles or other constituents from the consumables, base metal, or base metal coating not listed below:

Chemical Identity	CAS-No.
Carbon dioxide	124-38-9
Carbon monoxide	630-08-0
Nitrogen dioxide	10102-44-0
Ozone	10028-15-6
Manganese	7439-96-5
Nickel	7440-02-0





3. COMPOSITION / INFORMATION ON INGREDIENTS

Reportable Hazardous Ingredients

Chemical Identity	CAS number	Content in percent (%)*	
Iron	7439-89-6	60 - 100%	
Manganese	7439-96-5	5 - 10%	
Sodium silicate	1344-09-8	3 - 7%	
Quartz	14808-60-7	1 - 5%	
Silicon	7440-21-3	0.5 - 5%	
Mica	12001-26-2	0.5 - 5%	
Carboxymethyl cellulose, sodium salt	9004-32-4	0.5 - 5%	
Aluminum oxide	1344-28-1	0.5 - 5%	
Iron oxide	1309-37-1	0.5 - 5%	
Limestone	1317-65-3	0.1 - 1%	
Cellulose, pulp	65996-61-4	0.1 - 1%	
Potassium silicate	1312-76-1	0.1 - 1%	
Silicon dioxide (amorphous)	7631-86-9	0.1 - 1%	
Hectorite	12173-47-6	0.1 - 1%	

^{*} All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

Composition Comments:

The term "Hazardous Ingredients" should be interpreted as a term defined in Hazard Communication standards and does not necessarily imply the existence of a welding hazard. The product may contain additional non-hazardous ingredients or may form additional compounds under the condition of use. Refer to Sections 2 and 8 for more information.

4. FIRST AID MEASURES

Ingestion: Unlikely due to form of product, except for granular materials. Avoid hand,

clothing, food, and drink contact with metal fume or powder which can cause ingestion of particulate during hand to mouth activities such as drinking, eating, smoking, etc. If ingested, do not induce vomiting. Contact a poison control center. Unless the poison control center advises

otherwise, wash out mouth thoroughly with water. If symptoms develop,

seek medical attention at once.

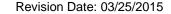
Inhalation: Move to fresh air if breathing is difficult. If breathing has stopped, perform

artificial respiration and obtain medical assistance at once.

Skin Contact: Remove contaminated clothing and wash the skin thoroughly with soap and

water. For reddened or blistered skin, or thermal burns, obtain medical

assistance at once.





Eye contact: Dust or fume from this product should be flushed from the eyes with

copious amounts of clean, tepid water until transported to an emergency medical facility. Do not allow victim to rub or keep eyes tightly closed.

Obtain medical assistance at once.

Arc rays can injure eyes. If exposed to arc rays, move victim to dark room, remove contact lenses as necessary for treatment, cover eyes with a padded dressing and rest. Obtain medical assistance if symptoms persist.

Most important symptoms/effects, acute and delayed

Symptoms: Short-term (acute) overexposure to welding fumes may result in discomfort

such as metal fume fever, dizziness, nausea, or dryness or irritation of nose, throat, or eyes. May aggravate pre-existing respiratory problems

(e.g. asthma, emphysema).

Long-term (chronic) overexposure to welding fumes can lead to siderosis (iron deposits in lung), central nervous system effects, bronchitis and other

pulmonary effects. Refer to Section 11 for more information.

Hazards: Welding hazards are complex and may include physical and health hazards

such as but not limited to electric shock, physical strains, radiation burns (eye flash), thermal burns due to hot metal or spatter and potential health effects of overexposure to welding fume or dust. Refer to Section 11 for

more information.

Indication of immediate medical attention and special treatment needed

Treatment: Treat symptomatically.

5. FIRE-FIGHTING MEASURES

General Fire Hazards: As shipped, this product is nonflammable. However, welding arc and

sparks can ignite combustibles and flammable products. Read and understand American National Standard Z49.1, "Safety In Welding, Cutting and Allied Processes" and National Fire Protection Association NFPA 51B, "Standard for Fire Prevention During Welding, Cutting and Other Hot Work"

before using this product.

Suitable (and unsuitable) extinguishing media

Suitable extinguishing

media:

As shipped, the product will not burn. In case of fire in the surroundings:

use appropriate extinguishing agent.

Unsuitable extinguishing

media:

None known.

Specific hazards arising from

the chemical:

Welding arc and sparks can ignite combustibles and flammable products.





Special protective equipment and precautions for firefighters

Special fire fighting

procedures:

Use standard firefighting procedures and consider the hazards of other

involved materials.

Special protective equipment

for fire-fighters:

Selection of respiratory protection for fire fighting: follow the general fire precautions indicated in the workplace. Self-contained breathing apparatus

and full protective clothing must be worn in case of fire.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures If airborne dust and/or fume is present, use adequate engineering controls and, if needed, personal protection to prevent overexposure. Refer to

recommendations in Section 8.

Methods and material for containment and cleaning up

Clean up spills immediately, observing precautions in the personal protective equipment in Section 8. Avoid generating dust. Prevent product from entering any drains, sewers or water sources. Refer to Section 13 for

proper disposal.

Environmental Precautions: Avoid release to the environment. Prevent further leakage or spillage if safe

to do so.

7. HANDLING AND STORAGE

Precautions for safe handling:

Keep formation of airborne dusts to a minimum. Provide appropriate

exhaust ventilation at places where dust is formed.

Read and understand the manufacturer's instruction and the precautionary

label on the product. Refer to Lincoln Safety Publications at

www.lincolnelectric.com/safety. See American National Standard Z49.1, "Safety In Welding, Cutting and Allied Processes" published by the

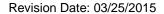
American Welding Society, http://pubs.aws.org and OSHA Publication 2206

(29CFR1910), U.S. Government Printing Office, www.gpo.gov.

Conditions for safe storage, including any incompatibilities:

Store in closed original container in a dry place. Store away from incompatible materials. Store in accordance with local/regional/national

regulations.



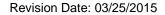


8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Control Parameters

Occupational Exposure Limits: US

Chemical Identity	Туре	Exposure Limit Values	Source
Iron	TWA	10 mg/m3	US. ACGIH Threshold Limit Values
Manganese - Fume as Mn	Ceiling	5 mg/m3	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
	REL	1 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards (2005)
	STEL	3 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards (2005)
Manganese - Inhalable fraction as Mn	TWA	0.1 mg/m3	US. ACGIH Threshold Limit Values (03 2014)
Manganese - Respirable fraction as Mn	TWA	0.02 mg/m3	US. ACGIH Threshold Limit Values (03 2014)
Sodium silicate	TWA	10 mg/m3	US. ACGIH Threshold Limit Values
Quartz - Respirable fraction.	TWA	0.025 mg/m3	US. ACGIH Threshold Limit Values (12 2010)
Quartz - Respirable.	TWA	2.4 millions of particles per cubic foot of air	US. OSHA Table Z-3 (29 CFR 1910.1000) (2000)
	TWA	0.1 mg/m3	US. OSHA Table Z-3 (29 CFR 1910.1000) (2000)
Quartz - Total dust.	TWA	0.3 mg/m3	US. OSHA Table Z-3 (29 CFR 1910.1000) (2000)
Quartz - Respirable dust.	REL	0.05 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards (2005)
Silicon - Total dust.	PEL	15 mg/m3	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
Silicon - Respirable fraction.	PEL	5 mg/m3	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
Silicon - Respirable.	REL	5 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards (2005)
Silicon - Total	REL	10 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards (2005)
Mica - Respirable fraction.	TWA	3 mg/m3	US. ACGIH Threshold Limit Values (12 2010)
Mica	TWA	20 millions of particles per cubic foot of air	US. OSHA Table Z-3 (29 CFR 1910.1000) (2000)
Mica - Respirable.	REL	3 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards (2005)
Carboxymethyl cellulose, sodium salt	TWA	10 mg/m3	US. ACGIH Threshold Limit Values
Aluminum oxide - Respirable fraction.	TWA	1 mg/m3	US. ACGIH Threshold Limit Values (12 2010)
	PEL	5 mg/m3	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
Aluminum oxide - Total dust.	PEL	15 mg/m3	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
Iron oxide - Respirable fraction.	TWA	5 mg/m3	US. ACGIH Threshold Limit Values (12 2010)
Iron oxide - Fume.	PEL	10 mg/m3	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02

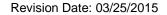




			2006)
Iron oxide - Dust and fume as Fe	REL	5 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards (2005)
Limestone - Total dust.	PEL	15 mg/m3	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
Limestone - Respirable fraction.	PEL	5 mg/m3	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
Limestone - Respirable.	REL	5 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards (2005)
Limestone - Total	REL	10 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards (2005)
Cellulose, pulp	TWA	10 mg/m3	US. ACGIH Threshold Limit Values
Potassium silicate	TWA	10 mg/m3	US. ACGIH Threshold Limit Values
Silicon dioxide (amorphous)	TWA	10 mg/m3	US. ACGIH Threshold Limit Values
	TWA	20 millions of particles per cubic foot of air	US. OSHA Table Z-3 (29 CFR 1910.1000) (2000)
	TWA	0.8 mg/m3	US. OSHA Table Z-3 (29 CFR 1910.1000) (2000)
	REL	6 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards (2005)
Hectorite	TWA	10 mg/m3	US. ACGIH Threshold Limit Values

Occupational Exposure Limits: CANADA

Chemical Identity	Туре	Exposure Limit Values	Source
Manganese - as Mn	TWA	0.2 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2) (07 2009)
	TWA	0.2 mg/m3	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007)
	TWAEV	0.2 mg/m3	Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents) (11 2010)
	8 HR ACL	0.2 mg/m3	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21) (05 2009)
	15 MIN ACL	0.6 mg/m3	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21) (05 2009)
Manganese - Fume as Mn	TWA	1 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment) (12 2008)
Manganese - Dust as Mn	TWA	5 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment) (12 2008)
Manganese - Fume as Mn	STEL	3 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment) (12 2008)
Manganese - Respirable fraction as Mn	TWA	0.02 mg/m3	Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act) (03 2014)
Manganese - Inhalable fraction as Mn	TWA	0.1 mg/m3	Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act) (03 2014)
Quartz - Respirable particles.	TWA	0.025 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table

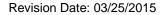




			2) (07 2009)
Quartz - Respirable fraction.	TWA	0.025 mg/m3	Canada. British Columbia OELs.
			(Occupational Exposure Limits for
			Chemical Substances, Occupational
			Health and Safety Regulation 296/97, as
			amended) (07 2007)
	TWA	0.025 mg/m3	Canada. Manitoba OELs (Reg. 217/2006,
			The Workplace Safety And Health Act)
			(03 2011)
Quartz - Respirable.	TWAEV	0.10 mg/m3	Canada. Ontario OELs. (Control of
			Exposure to Biological or Chemical
			Agents) (11 2010)
Quartz - Respirable fraction.	8 HR ACL	0.05 mg/m3	Canada. Saskatchewan OELs
			(Occupational Health and Safety
			Regulations, 1996, Table 21) (05 2009)
Quartz - Respirable dust.	TWA	0.1 mg/m3	Canada. Quebec OELs. (Ministry of Labor
			- Regulation Respecting the Quality of the
			Work Environment) (12 2008)

Occupational Exposure Limits: MEXICO

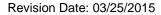
Chemical Identity	Type Exposure Limit Values S		Source
Manganese - as Mn	CPT	0.2 mg/m3	Mexico. Occupational Exposure Limit Values (03 2000)
Manganese - Fume as Mn	CPT	1 mg/m3	Mexico. Occupational Exposure Limit Values (03 2000)
	CTT	3 mg/m3	Mexico. Occupational Exposure Limit Values (03 2000)
Quartz	CPT	0.1 mg/m3	Mexico. Occupational Exposure Limit Values (03 2000)
Silicon	CPT	10 mg/m3	Mexico. Occupational Exposure Limit Values (03 2000)
	CTT	20 mg/m3	Mexico. Occupational Exposure Limit Values (03 2000)
Mica	CPT	3 mg/m3	Mexico. Occupational Exposure Limit Values (03 2000)
Aluminum oxide	CPT	10 mg/m3	Mexico. Occupational Exposure Limit Values (03 2000)
Iron oxide - as Fe	CTT	10 mg/m3	Mexico. Occupational Exposure Limit Values (03 2000)
	CPT	5 mg/m3	Mexico. Occupational Exposure Limit Values (03 2000)
Limestone	CTT	20 mg/m3	Mexico. Occupational Exposure Limit Values (03 2000)
	CPT	10 mg/m3	Mexico. Occupational Exposure Limit Values (03 2000)
Silicon dioxide (amorphous)	CPT	10 mg/m3	Mexico. Occupational Exposure Limit Values (03 2000)
Silicon dioxide (amorphous) - Respirable dust.	CPT	3 mg/m3	Mexico. Occupational Exposure Limit Values (03 2000)
Silicon dioxide (amorphous) - Inhalable particulate.	CPT	10 mg/m3	Mexico. Occupational Exposure Limit Values (03 2000)





Additional exposure limits under the conditions of use: US

Chemical Identity	Type Exposure Limit Values			Source
Carbon dioxide	TWA	5,000 ppm		US. ACGIH Threshold Limit Values (12 2010)
	STEL	30,000 ppm		US. ACGIH Threshold Limit Values (12 2010)
	PEL	5,000 ppm	9,000 mg/m3	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
	STEL	30,000 ppm	54,000 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards (2005)
	REL	5,000 ppm	9,000 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards (2005)
Carbon monoxide	TWA	25 ppm		US. ACGIH Threshold Limit Values (12 2010)
	PEL	50 ppm	55 mg/m3	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
	REL	35 ppm	40 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards (2005)
	Ceil_Time	200 ppm	229 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards (2005)
Nitrogen dioxide	TWA	0.2 ppm		US. ACGIH Threshold Limit Values (02 2012)
	Ceiling	5 ppm	9 mg/m3	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
	STEL	1 ppm	1.8 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards (2005)
Ozone	PEL	0.1 ppm	0.2 mg/m3	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
	Ceil_Time	0.1 ppm	0.2 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards (2005)
	TWA	0.05 ppm		US. ACGIH Threshold Limit Values (03 2014)
	TWA	0.20 ppm		US. ACGIH Threshold Limit Values (03 2014)
	TWA	0.10 ppm		US. ACGIH Threshold Limit Values (03 2014)
	TWA	0.08 ppm		US. ACGIH Threshold Limit Values (03 2014)
Manganese - Fume as Mn	Ceiling		5 mg/m3	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
	REL		1 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards (2005)
	STEL		3 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards (2005)
Manganese - Inhalable fraction as Mn	TWA		0.1 mg/m3	US. ACGIH Threshold Limit Values (03 2014)
Manganese - Respirable fraction as Mn	TWA		0.02 mg/m3	US. ACGIH Threshold Limit Values (03 2014)
Nickel - Inhalable fraction.	TWA		1.5 mg/m3	US. ÁCGIH Threshold Limit Values (12 2010)
Nickel - as Ni	PEL		1 mg/m3	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
	REL		0.015 mg/m3	US. NIOSH: Pocket Guide to Chemical Hazards (2005)





Additional exposure limits under the conditions of use: CANADA

Chemical Identity	Туре	Exposure Li	Source	
Carbon dioxide	STEL	30,000 ppm	54,000 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Tab 2) (07 2009)
	TWA	5,000 ppm	9,000 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, ⁻ 2) (07 2009)
	TWA	5,000 ppm		Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97 amended) (07 2007)
	STEL	15,000 ppm		Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97 amended) (07 2007)
	TWA	5,000 ppm		Canada. Manitoba OELs (Reg. 217/: The Workplace Safety And Health A (03 2011)
	STEL	30,000 ppm		Canada. Manitoba OELs (Reg. 217/ The Workplace Safety And Health A (03 2011)
	STEV	30,000 ppm		Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents) (11 2010)
	TWAEV	5,000 ppm		Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents) (11 2010)
	8 HR ACL	5,000 ppm		Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21) (05 20
	15 MIN ACL	30,000 ppm		Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21) (05 20
	TWA	5,000 ppm	9,000 mg/m3	Canada. Quebec OELs. (Ministry of - Regulation Respecting the Quality Work Environment) (12 2008)
	STEL	30,000 ppm	54,000 mg/m3	Canada. Quebec OELs. (Ministry of - Regulation Respecting the Quality Work Environment) (12 2008)
Carbon monoxide	TWA	25 ppm	29 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, 7 2) (07 2009)
	TWA	25 ppm		Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97 amended) (07 2007)
	STEL	100 ppm		Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97 amended) (07 2007)
	TWA	25 ppm		Canada. Manitoba OELs (Reg. 217/: The Workplace Safety And Health A (03 2011)
	STEV	100 ppm		Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents) (07 2010)
	TWAEV	25 ppm		Canada. Ontario OELs. (Control of



				Exposure to Biological or Chemical
				Agents) (07 2010)
	8 HR ACL	25 ppm		Canada. Saskatchewan OELs
				(Occupational Health and Safety
		190 ppm		Regulations, 1996, Table 21) (05 2009) Canada. Saskatchewan OELs
	15 MIN	тэо ррпп		(Occupational Health and Safety
	ACL			Regulations, 1996, Table 21) (05 2009)
	TWA	35 ppm	40 mg/m3	Canada. Quebec OELs. (Ministry of Labor
	''''			- Regulation Respecting the Quality of the
		000	000 / 0	Work Environment) (12 2008)
	STEL	200 ppm	230 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment) (12 2008)
Nitrogen dioxide	STEL	5 ppm	9.4 mg/m3	Canada. Alberta OELs (Occupational
3		- 11		Health & Safety Code, Schedule 1, Table 2) (07 2009)
	TWA	3 ppm	5.6 mg/m3	Canada. Alberta OELs (Occupational
				Health & Safety Code, Schedule 1, Table 2) (07 2009)
	CEILING	1 ppm		Canada. British Columbia OELs. (Occupational Exposure Limits for
				Chemical Substances, Occupational
				Health and Safety Regulation 296/97, as
				amended) (07 2007)
	TWA	0.2 ppm		Canada. Manitoba OELs (Reg. 217/2006,
				The Workplace Safety And Health Act)
		Ennm		(03 2012) Canada. Ontario OELs. (Control of
	STEV	5 ppm		Exposure to Biological or Chemical
				Agents) (11 2010)
	TWAEV	3 ppm		Canada. Ontario OELs. (Control of
	''''\'			Exposure to Biological or Chemical
				Agents) (11 2010)
	8 HR ACL	3 ppm		Canada. Saskatchewan OELs (Occupational Health and Safety
				Regulations, 1996, Table 21) (05 2009)
	15 MIN	5 ppm		Canada. Saskatchewan OELs
	ACL			(Occupational Health and Safety
	7.02			Regulations, 1996, Table 21) (05 2009)
	TWA	3 ppm	5.6 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the
Ozone	STEL	0.3 ppm	0.6 mg/m3	Work Environment) (12 2008) Canada. Alberta OELs (Occupational
020110	0.25	о.о ррпп	o.o mg/mo	Health & Safety Code, Schedule 1, Table 2) (07 2009)
	TWA	0.1 ppm	0.2 mg/m3	Canada. Alberta OELs (Occupational
				Health & Safety Code, Schedule 1, Table
	Title	0.05 ppm		2) (07 2009) Canada. British Columbia OELs.
	TWA	о.оо ррпп		(Occupational Exposure Limits for
				Chemical Substances, Occupational
				Health and Safety Regulation 296/97, as
				amended) (07 2007)
	TWA	0.1 ppm		Canada. British Columbia OELs.
				(Occupational Exposure Limits for Chemical Substances, Occupational
				Health and Safety Regulation 296/97, as
				amended) (07 2007)
	TWA	0.08 ppm		Canada. British Columbia OELs.
	IVVA			(Occupational Exposure Limits for
				Chemical Substances, Occupational
				Health and Safety Regulation 296/97, as
				amended) (07 2007)



	TWA	0.2 ppm		Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007)
	TWAEV	0.1 ppm	0.2 mg/m3	Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents) (07 2010)
	STEV	0.3 ppm	0.6 mg/m3	Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents) (07 2010)
	15 MIN ACL	0.15 ppm		Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21) (05 2009)
	8 HR ACL	0.05 ppm		Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21) (05 2009)
	CEILING	0.1 ppm	0.2 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment) (12 2008)
	TWA	0.20 ppm		Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act) (03 2014)
	TWA	0.05 ppm		Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act) (03 2014)
	TWA	0.08 ppm		Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act) (03 2014)
	TWA	0.10 ppm		Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act) (03 2014)
Manganese - as Mn	TWA		0.2 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2) (07 2009)
	TWA		0.2 mg/m3	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) (07 2007)
	TWAEV		0.2 mg/m3	Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents) (11 2010)
	8 HR ACL		0.2 mg/m3	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21) (05 2009)
	15 MIN ACL		0.6 mg/m3	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21) (05 2009)
Manganese - Fume as Mn	TWA		1 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment) (12 2008)
Manganese - Dust as Mn	TWA		5 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment) (12 2008)
Manganese - Fume as Mn	STEL		3 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment) (12 2008)
Manganese - Respirable fraction as Mn	TWA		0.02 mg/m3	Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act) (03 2014)
Manganese - Inhalable fraction as Mn	TWA		0.1 mg/m3	Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act) (03 2014)



Nickel	TWA	1.5 mg/m3	Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2) (07 2009)
	TWA	0.05 mg/m3	Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended) (05 2013)
Nickel - Inhalable fraction.	TWA	1.5 mg/m3	Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act) (03 2011)
Nickel - Inhalable - as Ni	TWAEV	1 mg/m3	Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents) (11 2010)
Nickel - Inhalable fraction as Ni	8 HR ACL	1.5 mg/m3	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21) (05 2009)
	15 MIN ACL	3 mg/m3	Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21) (05 2009)
Nickel	TWA	1 mg/m3	Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment) (12 2008)

Additional exposure limits under the conditions of use: MEXICO

Chemical Identity	Туре	Exposure Li	mit Values	Source
Carbon dioxide	CPT	5,000 ppm	9,000 mg/m3	Mexico. Occupational Exposure Limit Values (03 2000)
	CTT	15,000 ppm	27,000 mg/m3	Mexico. Occupational Exposure Limit Values (03 2000)
Carbon monoxide	CTT	400 ppm	400 mg/m3	Mexico. Occupational Exposure Limit Values (03 2000)
	CPT	50 ppm	55 mg/m3	Mexico. Occupational Exposure Limit Values (03 2000)
Nitrogen dioxide	CTT	5 ppm	10 mg/m3	Mexico. Occupational Exposure Limit Values (03 2000)
	CPT	3 ppm	6 mg/m3	Mexico. Occupational Exposure Limit Values (03 2000)
Ozone	Р	0.1 ppm	0.2 mg/m3	Mexico. Occupational Exposure Limit Values (03 2000)
Manganese - as Mn	CPT		0.2 mg/m3	Mexico. Occupational Exposure Limit Values (03 2000)
Manganese - Fume as Mn	CPT		1 mg/m3	Mexico. Occupational Exposure Limit Values (03 2000)
	CTT		3 mg/m3	Mexico. Occupational Exposure Limit Values (03 2000)
Nickel	CPT		1 mg/m3	Mexico. Occupational Exposure Limit Values (03 2000)

Appropriate Engineering Controls

Ventilation: Use enough ventilation, local exhaust at the arc, or both 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. **Keep exposure as low as possible.**





Individual protection measures, such as personal protective equipment

General information: Exposure Guidelines: Threshold Limit Values (TLVs) and Biological

Exposure Indices (BEIs) are values published by the American Conference of Government Industrial Hygienists (ACGIH). ACGIH Statement of Positions Regarding the TLVs® and BEIs® states that the TLV-TWA should be used as a guide in the control of health hazards and should not be used to indicate a fine line between safe and dangerous exposures. See Section 10 for information on potential fume constituents of health interest. Threshold Limit Values are figures published by the American

Conference of Government Industrial Hygienists.

Maximum Fume Exposure GuidelineTM (MFEG)TM for this product (based on content of Manganese) is 0.2 mg/m3. This exposure guideline is calculated using the most conservative value of the ACGIH TLV or OSHA

PEL for the stated substance.

Eye/face protection: Wear helmet or use face shield with filter lens shade number 12 or darker

for open arc processes. No specific lens shade recommendation for submerged arc processes. Shield others by providing screens and flash

goggles.

Skin Protection

Hand Protection: Wear protective gloves. Suitable gloves can be recommended by the glove

supplier.

Other: Protective Clothing: Wear hand, head, and body protection which help to

prevent injury from radiation, sparks and electrical shock. See 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 substantial clothing. Wear dry gloves free of holes or split seams. Train the welder not to permit electrically live parts or electrodes to contact skin . . . or clothing or gloves if they are wet. Insulate yourself from the work piece and ground using dry plywood, rubber mats or other dry insulation.

Respiratory Protection: Keep your head out of fumes. Use enough ventilation and local exhaust to

keep fumes and gases from your breathing zone and the general area. An approved respirator should be used unless exposure assessments are

below applicable exposure limits.

Hygiene measures: Do not eat, drink or smoke when using the product. Always observe good

personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing

and protective equipment to remove contaminants.

Determine the composition and quantity of fumes and gases to which workers are exposed by taking an air sample from inside the welder's helmet if worn or in the worker's breathing zone. Improve ventilation if exposures are not below limits. See ANSI/AWS F1.1, F1.2, F1.3 and F1.5,

available from the American Welding Society, www.aws.org.

Revision Date: 03/25/2015



9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Steel rod with extruded flux coating

Physical state: Solid Form: Solid

Color: No data available. Odor: No data available. Odor threshold: No data available. :Ha Not applicable Melting point/freezing point: No data available. Initial boiling point and boiling range: No data available. Flash Point: Not applicable **Evaporation rate:** Not applicable Flammability (solid, gas): No data available.

Upper/lower limit on flammability or explosive limits

Flammability limit - upper (%):

Flammability limit - lower (%):

Explosive limit - upper (%):

Explosive limit - lower (%):

Vapor pressure:

Vapor density:

Relative density:

No data available.

No data available.

Not applicable

Not applicable

No data available.

Solubility(ies)

Solubility in water:
Solubility (other):
No data available.
Partition coefficient (n-octanol/water):
No data available.
No data available.
No data available.
No data available.
Viscosity:
No data available.
No data available.

10. STABILITY AND REACTIVITY

Reactivity: The product is non-reactive under normal conditions of use, storage and

transport.

Chemical Stability: Material is stable under normal conditions.

Possibility of Hazardous

Reactions:

No data available.

Conditions to Avoid: Avoid heat or contamination.





Incompatible Materials: No data available.

Hazardous Decomposition Products:

Welding fumes and gases cannot be classified simply. The composition and quantity of both are dependent upon the metal being welded, the process, procedure and electrodes used. Other conditions which also influence the composition and quantity of the fumes and gases to which workers may be exposed include: coatings on the metal being welded (such as paint, plating, or galvanizing), the number of welders and the volume of the worker area, the quality and amount of ventilation, the position of the welder's head with respect to the fume plume, as well as the presence of contaminants in the atmosphere (such as chlorinated hydrocarbon vapors from cleaning and degreasing activities.)

When the electrode is consumed, the fume and gas decomposition products generated are different in percent and form from the ingredients listed in Section 3. Decomposition products of normal operation include those originating from the volatilization, reaction, or oxidation of the materials shown in Section 3, plus those from the base metal and coating, etc., as noted above. Reasonably expected fume constituents produced during arc welding include the oxides of iron, manganese and other metals present in the welding consumable or base metal. Hexavalent chromium compounds may be in the welding fume of consumables or base metals which contain chromium. Gaseous and particulate fluoride may be in the welding fume of consumables which contain fluoride. Gaseous reaction products may include carbon monoxide and carbon dioxide. Ozone and nitrogen oxides may be formed by the radiation from the arc.

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Ingestion: Health injuries from ingestion are not known or expected under normal use.

Inhalation: Potential chronic health hazards related to the use of welding consumables

are most applicable to the inhalation route of exposure. Refer to Inhalation

statements in Section 11.

Skin Contact: Arc rays can burn skin. Skin cancer has been reported.

Eye contact: Arc rays can injure eyes.





Symptoms related to the physical, chemical and toxicological characteristics

Inhalation: Short-term (acute) overexposure to welding fumes may result in discomfort

such as metal fume fever, dizziness, nausea, or dryness or irritation of nose, throat, or eyes. May aggravate pre-existing respiratory problems (e.g. asthma, emphysema). Long-term (chronic) overexposure to welding fumes can lead to siderosis (iron deposits in lung), central nervous system effects, bronchitis and other pulmonary effects. Respiratory exposure to the crystalline silica present in this welding electrode is not anticipated during normal use. Respiratory overexposure to airborne crystalline silica is known to cause silicosis, a form of disabling pulmonary fibrosis which can be progressive and may lead to death. Crystalline silica is on the IARC (International Agency for Research on Cancer) and NTP (National Toxicology Program) lists as posing a cancer risk to humans.

Information on toxicological effects

Acute toxicity (list all possible routes of exposure)

Oral

Product: Not classified

Specified substance(s):

Iron

LD 50 (Rat): 98.6 g/kg LD 50 (Rat): 1.1 g/kg LD 50 (Rat): 2,700 mg/kg

Carboxymethyl cellulose,

sodium salt Limestone

Sodium silicate

LD 50 (Rat): 6,450 mg/kg

Dermal

Product: Not classified

Inhalation

Product: Not classified

Specified substance(s):

Carboxymethyl cellulose, LC 50 (Rat, 4 h): 5,800 mg/m3

sodium salt

Aluminum oxide LC 50 (Rat, 1 h): 7.6 mg/l

Repeated Dose Toxicity

Product: Not classified

Skin Corrosion/Irritation

Product: Not classified

Serious Eye Damage/Eye Irritation

Product: Not classified

Respiratory or Skin Sensitization

Product: Not classified

Carcinogenicity

Product: Arc rays: Skin cancer has been reported.

IARC Monographs on the Evaluation of Carcinogenic Risks to Humans:

Quartz Overall evaluation: 1. Carcinogenic to humans.





US. National Toxicology Program (NTP) Report on Carcinogens:

Quartz Known To Be Human Carcinogen.

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050):

No carcinogenic components identified

Germ Cell Mutagenicity

In vitro

Product: Not classified

In vivo

Product: Not classified

Reproductive Toxicity

Product: Not classified

Specific Target Organ Toxicity - Single Exposure

Product: Not classified

Specific Target Organ Toxicity - Repeated Exposure

Product: Not classified

Aspiration Hazard

Product: Not classified

Other Effects: Organic polymers may be used in the manufacture of various welding

consumables. Overexposure to their decomposition byproducts may result in a condition known as polymer fume fever. Polymer fume fever usually occurs within 4 to 8 hours of exposure with the presentation of flu like symptoms, including mild pulmonary irritation with or without an increase in body temperature. Signs of exposure can include an increase in white blood cell count. Resolution of symptoms typically occurs quickly, usually

not lasting longer than 48 hours.

Additional toxicological Information under the conditions of use:

Symptoms related to the physical, chemical and toxicological characteristics under the condition of use Inhalation:

Specified substance(s):

Manganese Overexposure to manganese fumes may affect the brain and central nervous

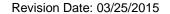
system, resulting in poor coordination, difficulty speaking, and arm or leg

tremor. This condition can be irreversible.

Nickel and its compounds are on the IARC and NTP lists as posing

respiratory cancer risk, and are skin sensitizers with symptoms ranging from

slight itch to severe dermatitis.





Additional toxicological Information under the conditions of use:

Acute toxicity

Inhalation

Specified substance(s):

Carbon dioxide LC Lo (Human, 5 min): 90000 ppm
Carbon monoxide LC 50 (Rat, 4 h): 1,300 mg/l
Nitrogen dioxide LC 50 (Rat, 4 h): 88 ppm
Ozone LC Lo (Human, 30 min): 50 ppm

IARC Monographs on the Evaluation of Carcinogenic Risks to Humans:

Specified substance(s):

Nickel Overall evaluation: 2B. Possibly carcinogenic to humans.

US. National Toxicology Program (NTP) Report on Carcinogens:

Specified substance(s):

Nickel Reasonably Anticipated to be a Human Carcinogen.

12. ECOLOGICAL INFORMATION

Ecotoxicity

Acute hazards to the aquatic environment:

Fish

Product: Not classified.

Specified substance(s):

Sodium silicate LC 50 (Western mosquitofish (Gambusia affinis), 96 h): 1,800 mg/l Mortality

Aquatic Invertebrates

Product: Not classified.

Specified substance(s):

Manganese EC50 (Water flea (Daphnia magna), 48 h): 40 mg/l Intoxication

Sodium silicate EC50 (Water flea (Ceriodaphnia dubia), 48 h): 22.94 - 49.01 mg/l Intoxication EC50 (Water flea (Ceriodaphnia dubia), 48 h): 46.04 - 165.37 mg/l Intoxication

sodium salt

Chronic hazards to the aquatic environment:

Fish

Product: Not classified.

Aquatic Invertebrates

Product: Not classified.

Toxicity to Aquatic Plants

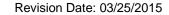
Product: Not classified.

Persistence and Degradability

Biodegradation

Product: No data available.

SDS_North America - 200000000643





Bioaccumulative Potential

Bioconcentration Factor (BCF)

Product: No data available.

Mobility in Soil: No data available.

13. DISPOSAL CONSIDERATIONS

General information: The generation of waste should be avoided or minimized whenever

possible. When practical, recycle in an environmentally acceptable, regulatory compliant manner. Dispose of non-recyclable products in accordance with all applicable Federal, State, Provincial, and Local

requirements.

Disposal Instructions: Discharge, treatment, or disposal may be subject to national, state, or local

laws.

14. TRANSPORT INFORMATION

DOT

UN Number:

UN Proper Shipping Name: NOT DG REGULATED

Transport Hazard Class(es)

Class: NR
Label(s): –
Packing Group: –

Marine Pollutant: Not regulated.

Special precautions for user:

IMDG

UN Number:

UN Proper Shipping Name: NOT DG REGULATED

Transport Hazard Class(es)

Class: NR Label(s): -

EmS No.:

Packing Group: -

Marine Pollutant: Not regulated.

Special precautions for user: -

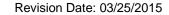
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IATA				
UN Number: Proper Shipping Name:	NOT DG REGULATED			
Transport Hazard Class(es):	NOT DO REGULATED			
Class:	NR			
Label(s):	-			
Packing Group: Environmental Hazards	– Not regulated.			
Special precautions for user:	–			
Other information				
Passenger and cargo aircra	Allowed.			
Cargo aircraft only:	Allowed.			
TDG				
UN Number:				
UN Proper Shipping Name: Transport Hazard Class(es)	NOT DG REGULATED			
Class:	NR			
Label(s):	-			
Packing Group:	— Net as an detect			
Marine Pollutant: Special precautions for user:	Not regulated.			
opodiai productiono for door.				
15. REGULATORY INFORMATION	N			
Regulations:	This product has been classified according to the hazard criteria of the Canadian Controlled Products Regulations, Section 33, and the MSDS contains all required information.			
US Federal Regulations				
US. OSHA Specifically Regulated None present or none present in	Substances (29 CFR 1910.1001-1050) regulated quantities.			
CERCLA Hazardous Substance L	.ist (40 CFR 302.4):			
Manganese	Reportable quantity: Included in the regulation but with no data values. See regulation for further details.			
Superfund Amendments and Rea	authorization Act of 1986 (SARA)			
Hazard categories				
X Acute (Immediate) X Chror	nic (Delayed) Fire Reactive Pressure Generating			

SARA 302 Extremely Hazardous Substance

None present or none present in regulated quantities.





SARA 304 Emergency Release Notification

Chemical Identity RQ

Manganese Included in the regulation but with no data values. See regulation for

further details.

SARA 311/312 Hazardous Chemical

Chemical Identity	Threshold Planning Quantity
Iron	10000 lbs
Manganese	10000 lbs
Sodium silicate	10000 lbs
Quartz	10000 lbs
Silicon	10000 lbs
Mica	10000 lbs
Carboxymethyl cellulose,	10000 lbs
sodium salt	
Aluminum oxide	10000 lbs
Iron oxide	10000 lbs
Limestone	10000 lbs
Cellulose, pulp	10000 lbs
Potassium silicate	10000 lbs
Silicon dioxide	10000 lbs
(amorphous)	
Hectorite	10000 lbs

SARA 313 (TRI Reporting)

	Reporting threshold for	Reporting threshold for manufacturing and	
Chemical Identity	other users	processing	
Manganese	10000 lbs	25000 lbs.	

Clean Water Act Section 311 Hazardous Substances (40 CFR 117.3)

None present or none present in regulated quantities.

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130):

None present or none present in regulated quantities.

US State Regulations

US. California Proposition 65

Quartz Carcinogenic.

WARNING: 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 Section 25249.5 et seq.)

US. New Jersey Worker and Community Right-to-Know Act

Manganese Listed Quartz Listed

US. Massachusetts RTK - Substance List

Manganese Listed Quartz Listed





US. Pennsylvania RTK - Hazardous Substances

Manganese Listed Quartz Listed

US. Rhode Island RTK

Manganese Listed

Inventory Status:

Australia AICS: On or in compliance with the inventory

Canada DSL Inventory List:

One or more components are not listed or are exempt from listing.

EINECS, ELINCS or NLP: On or in compliance with the inventory

Japan (ENCS) List: One or more components are not listed or are exempt from listing.

Korea Existing Chemicals Inv.

(KECI):

On or in compliance with the inventory

Canada NDSL Inventory: One or more components are not listed or are exempt from listing.

US TSCA Inventory: One or more components are not listed or are exempt from listing.

New Zealand Inventory of

Chemicals:

On or in compliance with the inventory

Japan ISHL Listing: One or more components are not listed or are exempt from listing.

Japan Pharmacopoeia Listing: One or more components are not listed or are exempt from listing.

China Inv. Existing Chemical

Substances:

On or in compliance with the inventory

Philippines PICCS: On or in compliance with the inventory

16. OTHER INFORMATION

Definitions:

The Maximum Fume Exposure Guideline™ (MFEG)™ is a guideline limit for total welding fume exposure for a specific consumable product which may be used by employers to manage worker exposure to welding fume where that product is used. The MFEG™ is an estimate of the level of total welding fume exposure for a given product above which the exposure limit for one of the fume constituents may be exceeded. The exposure limits referenced are the American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Value (TLV®) and the U.S. OSHA Permissible Exposure Limit (PEL) whichever limit is lower. The MFEG™ never exceeds 5 mg/m³ which is the maximum recommended exposure limit for total welding fume. The MFEG™ is intended to serve as a general guideline to assist in the management of workplace exposure to welding fume and does not replace the regular measurement and analysis of worker exposure to individual welding fume constituents.





The Maximum Dust Exposure Guideline™ (MDEG)™ is provided to assist with the management of workplace exposures where granular solid welding products or other materials are being utilized. It is derived from relevant compositional data and estimates the lowest level of total airborne dust exposure, for a given product, at which some specific constituent might potentially exceed its individual exposure limit. The specific exposure limits referenced are the American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Value (TLV®) and the U. S. OSHA Permissible Exposure Limit (PEL), which ever value is the lowest. The MDEG™ is never greater than 10 mg/m³ as this is the airborne exposure guideline for total particulate (total dust). The MDEG™ is intended to serve as a general guideline to assist in the management of workplace exposure and does not replace the regular measurement and analysis of worker exposure to individual airborne dust constituents.

Revision Date: 03/25/2015

Most recent revision(s) are noted by the bold, double bars in the left-hand

margin throughout this document.

Further Information: Additional information is available by request.

Disclaimer: The Lincoln Electric Company urges each end user and recipient of this SDS

to study it carefully. See also www.lincolnelectric.com/safety. If necessary, consult an industrial hygienist or other expert to understand this information and safeguard the environment and protect workers from potential hazards associated with the handling or use of this product. This information is believed to be accurate as of the revision date shown above. However, no warranty, expressed or implied, is given. Because the conditions or methods of use are beyond Lincoln Electric's control, we assume no liability resulting from the use of this product. Regulatory requirements are subject to change and may differ between various locations. Compliance with all applicable Federal, State, Provincial, and local laws and regulations remain the

responsibility of the user.