Required under USDL Safety and Health Regulations for Shipyard Employment (29 CFR 1915)

Occupational Safety and Health Administration

PORSF 11.3.125.1v1 NODATE

OMB No 1218-007

PRODUCT: STAINLESS STEEL WELDING ELECTRODES

PREPARED BY: DENNIS W. RAHOI

Section I

Manufacturer's Name
N. JUPPENLATZ CO. INC.

Address (Number, Street, City, State, and ZIP Code)
4949 S.E. 26TH AVE.
PORTLAND, OR. 97202

Trade Name and Synonyms
E308-16, E308H-16, E308L-16, E308L-16PW, E308L-16-VDX, E308L-16HX (MVR-HX-16), E248SV-15, E309-16, E309L-16, EP5-16 (309LMO-16), EP6-16P EP5-16VDX (309LMO-16), EP5-16HX (E309LMO-16), E310-16, EP7-16 (E312-16), E316-16, E316L-16, E316L-16PW, E316L-16VDX, E316L-16HX (SKR-HX-16), ESKR-16PW (E316L-16 with Mo 2.5-3.0), ESKR-16VDX (E316L-16), ESKR-16NF (E316L-16), EP6-15, E317L-16, E317L-16PW, ESLR-16, E347-16, E393M-15, E739S-15, E453S-16, E3RE60-16, E3RE60-PW, E223FAL-16PW, ESLX-16, ESLX-16PW, EP10-15 (E Ni Cr Fe 3), EP 12-15 (E Ni Cr Mo-12), EP12-R-15 (E Ni Cr Mo-12).

(SEE TABLE I FOR WELD METAL COMPOSITIONS)

Section II - Hazardous Ingredients

Filler Metal

Base Material	C.A.S.#	%Wt.	OSHA-PEL Mg/M³	ACGIH-TLV Mg/M³
Iron	7439-89-6	3-85	10 (Oxidefume)	5 (oxidefume)
Nickel	7440-02-0	0-80	1 (metal)	0.05
Chromium	7440-47-3	10-30	1 (metal)	0.5 (metal)
Manganese	7439-96-5	0-5.5	5 (dust)	5 (dust)
Molybdenum	7439-98-7	0-10	5	5
Copper	7440-50-8	0-2	0.1 (fume)	0.2 (fume)
Silicon	7440-21-3	0-2	None	10
Columbium	7440-03-1	0-2		
Titanium	7439-98-7	0-1	15 (dust)	5 (dust)

Coating

Limestone	1317-65-3	0-20%		10
Fluoride	14542-23-5	0-35		2.5
Titanium dioxide	13463-67-7	0-35		10
Silicates		0-30		N/A
Sodium Silicate	6834-92-0			N/A
Potassium Silicate	1312-76-1			
Zirconium Silicate	7440-42-6			5
Aluminum Silicate	1332-58-7			10

USEPA SF
1265477

Section III - Physical Data

Boiling Point (°F)	N/A	Specific Gravity (H_2O=1)	7-5-8.5
Vapor Pressure (mm Hg)	N/A	Percent Volatile by Volume (%)	N/A
Vapor Density (AIR=1)	N/A	Evaporation Rate _____ =1)	N/A

Solubility in Water
INSOLUBLE

Appearance and Odor
SOLID, ODORLESS METAL WITH BAKED COATING

Stainless steel welding electrodes are not combustible in the form they are shipped. During the welding process, arcs and sparks (weld spatter) can ignite combustibles and flammables. Note: See American National 249.1 for safe welding practices.

Section V - Health Hazard Data

Threshold Limit Value

No Federal limits. ACGIH (1983/84) has set a TWA value of 5 mg. for welding fumes as total particulates, not otherwise classified.

Welding fumes and gases cannot be classified easily; they are also different in content and product composition than from the original welding product. The chief component of welding fumes are ordinary oxides of the metal being welded and the welding electrode. However, electrode coatings contain fluorides and the fumes can thus contain more fluorides than oxides.

Conditions which influence the composition and quantity of the fumes and gases to which workers may be exposed also include: coatings on the metal being welded (such as paint, plating or galvanizing). The number of welders and the volume of the work 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).

The following lists some likely gas and fume compositional elements. It is always wise to determine their presence, especially to see if the specific TLV's and PEL's are exceeded before the 5 mg/m³ limit is reached. One recommended way to do this is to sample the air within a welder's helmet (or breathing zone if no helmet) as described in ANSI/AWS F1.1 available from the American Welding Society.

Likely Gas & Fume Constituents

Solids

Constituent	C.A.S. #	PEL	TLV
Chromates (CrO_3)	1333-82-0	0.1Cl	0.05 (as Cr)
Nickel (Ni)	7440-02-0	1	1
Manganese (Mn)	7439-96-5	SCL	1 CL (fume)
Iron (Fe)	7439-89-6	5	10 (fume)
Calcium Fluoride (F)	7789-75-5	2.5 (as F)	2.5 (as F)

Note: Nickel could be present as oxide (NiO), manganese present as dioxide (MnO_2), and Iron present as several different oxides (Fe°, Fe_2O_3 Fe_3O_4)

Gases

Constituent	C.A.S. #	PEL	TLV
Nitric Oxide (No)	10102-43-9	25 ppm	25 ppm
Nitrogen Dioxide (NO_2)	10102-43-9	5 ppm	3 ppm
Dinitrogen Tetroxide (N_2O_4)	10544-72-6	5 ppm	3 ppm
Ozone (O_3)	10028-15-6	.2	100 ppb
Phosgene	75-44-5	.4	.4

(PEL/TLV values in mg/m³)

Effects of Overexposure

ACUTE: Welding fumes may induce metallic taste, nausea, tightness of chest, fever, dizziness, dryness or irritation to nose or throat. Specific elements in the fume could also cause allergic reactions, low back pain, fatigue, headache, and some irritation and corrosion to mucous membranes.

CHRONIC: Long term exposure may cause bronchial asthma, lung fibrosis, pneumoconiosis or "siderosis". "Manganism" affects central nervous system. Nickel and chromium as elements or some compounds are listed by IARC and NTP as suspect human carcinogens. Siderosis is also possible if exposure

TABLE I

WELD METAL COMPOSITION										STANDARD DESIGNATION	
Electrode type AVESTA	Coating	C	Si	Mn	Cr	Ni	Mo	Other	Ferrite	AWS A5.4/A5.11	W.-Nr.
393 M	Bas.	0,06	0,3	1,0	14					E 410-15	1.4009
739 S	Bas.	0,06	0,3	2,0	14	0,8	1,0	N 0,10		–	–
248 SV	Rut.	0,025	0,6	3,3	16	5,5	1,2	N 0,12		–	–
453 S	AC/DC	0,025	1,0	1,2	26	5,5	1,5	N 0,17		–	1.4820
3RE60	AC/DC	0,025	0,8	1,2	19	6	2,7	N 0,17	~40%	–	–
3RE60-PW	AC/DC	0,025	1,0	1,3	19	9	2,7		~24 FN	–	–
223 FAL-PW	AC/DC	0,025	0,9	0,9	22	9,5	3,0	N 0,13	~25 FN	–	(1.4462)
MVR	Rut.	0,025	0,6	1,4	20	9,5			2-12 FN	E 308 L-15	1.4316
MVR	Bas.	0,035	0,3	2,1	20	9,5			2-12 FN	E 308 L-15	1.4316
MVR	AC/DC	0,020	0,9	1,3	19,5	10			2-12 FN	(E 308 L-16)	1.4316
MVR-H	AC/DC	0,030	0,9	1,2	20	10			4-12 FN	(E308 L-16)	1.4316
MVR-PW	AC/DC	0,025	0,9	1,3	19,5	10			2-12 FN	(E 308 L-16)	1.4316
MVR-VDX	AC/DC	0,020	0,8	1,0	19,5	10			2-12 FN	E 308 L-16	1.4316
MVNb	Rut.	0,035	0,7	1,3	19,5	9,5		Nb ≥ 10xC	2-12 FN	E 347-15	1.4551
MVNb	Bas.	0,045	0,2	2,0	19,5	9,5		Nb ≥ 10xC	2-12 FN	E 347-15	1.4551
MVNb	AC/DC	0,030	1,0	1,1	19	10		Nb ≥ 10xC	2-12 FN	E 347-16	1.4551
316 L	AC/DC	0,025	0,8	1,1	19	12	2,3		2-12 FN	E 316 L-16	–
SKR	Rut.	0,025	0,5	1,5	18,5	12,5	2,8		2-12 FN	(E 316 L-15)	1.4430
SKR	Bas.	0,035	0,3	2,0	18,5	12,5	2,8		2-12 FN	(E 316 L-15)	1.4430
SKR	AC/DC	0,020	0,9	1,2	18,5	13	2,8		2-12 FN	(E 316 L-16)	1.4430
SKR-H	AC/DC	0,030	0,9	1,2	18,5	13	2,8		4-12 FN	(E 316 L-16)	1.4430
SKR-PW	AC/DC	0,020	0,9	1,0	18,5	12,5	2,8		2-12 FN	(E 316 L-16)	1.4430
SKR-VDX	AC/DC	0,020	0,8	1,0	18,0	12	2,8		2-12 FN	E 316 L-16	1.4430
SKNb	Rut.	0,035	0,6	1,3	18	12	2,7	Nb ≥ 10xC	4-12 FN	(E 318-15)	1.4576
SKNb	Bas.	0,045	0,2	2,1	18	12	2,7	Nb ≥ 10xC	4-12 FN	(E 318-15)	1.4576
SKNb	AC/DC	0,030	0,9	0,9	18	12	2,7	Nb ≥ 10xC	4-12 FN	(E 318-16)	1.4576
SNR-PW	AC/DC	0,020	0,9	1,2	18,5	14	3,6		2-10 FN	E 317 L-16	–
SLR	Bas.	0,030	0,5	1,9	18	14	4,5		2-10 FN	–	1.4447
SLR	AC/DC	0,020	0,9	1,1	17,5	14	4,5		2-10 FN	–	1.4447
310	Bas.	0,12	0,4	2,3	26	20,5			0 FN	E 310-15	1.4842
310	AC/DC	0,10	0,5	2,3	26	20,5			0 FN	E 310-16	1.4842
253 MA	AC/DC	0,05	1,3	0,8	21,5	10,5		N 0,18 RE	2-10 FN	–	–
SLX	AC/DC	0,030	0,6	1,7	20	25	4,7	Cu 1,5	0 FN	–	(1.4507)
SLX-PW	AC/DC	0,025	0,9	1,7	20	25	4,7	Cu 1,5	0 FN	–	(1.4507)
309 L	AC/DC	0,025	0,8	1,2	24	13,5			11-18 FN	E 309 L-16	1.4332
P5	Bas.	0,035	0,3	2,3	22,5	13	2,7		11-18 FN	E 309 Mo-15	–
P5	AC/DC	0,020	0,8	1,3	22,5	13,5	2,7		11-18 FN	E 309 Mo-16	–
P5-PW	AC/DC	0,025	1,0	1,0	22,5	13,5	2,7		8-20 FN	(E309MoSi-16)	–
P5-VDX	AC/DC	0,025	1,0	1,0	22,5	14	2,7		8-20 FN	(E309MoSi-16)	–
SKR-NF	Rut.	0,025	0,6	2,3	18,5	15,5	2,7	N 0,17	0 FN	–	1.4433
P6	Bas.	0,030	0,3	5,1	18,5	17,5	2,7	N 0,17	0 FN	–	–
P7	AC/DC	0,12	0,9	1,0	29	9,5			~40%	(E 312-16)	–
P10	Bas.	0,025	0,6	7,0	16	Rest		Nb 2 Fe 7	0 FN	E NiCrFe-3	(2.4807)
P12	Bas.	0,025	0,5	2,0	21	Rest	9,0	Nb 2 Fe 4	0 FN	(E NiCrMo-3)	(2.4831)

AJG 87
RECEIVED
COLUMBIA FORGE
& MACHINE

The primary route of entry is through inhalation. Get fresh air and rest. Oxygen can be a breathing help. Remove worker to an uncontaminated area and call a physician.

If eye contact is the problem, irrigate immediately with plenty of water for 15 minutes. Call a physician.

For skin contact with irritants, rinse with plenty of water and then wash with soap and water. Remove contaminated clothing. Protect area with dry sterile dressing.

Section VI - Reactivity Data

Stability			Conditions to Avoid
	Unstable		
	Stable	X	These products are nonflammable, noxexplosive, and non reactive.

Section VII - Spill or Leak Procedures N/A

Steps to be Taken in Case Material is Released or Spilled

Section VIII - Special Protection Information

Respiratory Protection (Specify Type)

Use respirable fume respirator or air-supplied respirator when welding in confined space or where local exhaust does not keep exposure below TLV/PEL. Use enough ventilation and/or local exhaust at the arc to keep the fume below TLV/PEL in the workers breathing zone. Train each welder to proper head placement.

Protective Clothing: Wear head, hand, and body protection to help prevent injuries from radiation, sparks and electrical shock. Train welders not to touch live electrical parts and to insulate his/her body from the work or ground. Be familiar with ANSI Z49.1.

Eye Protection Wear helmet or face shield with the darkest filter lens possible without sacrificing safety.

Section IX - Special Precautions

Precautions to be Taken in Handling and Storing

NONE

Other Precautions

NOTES:

REFERENCES: 1. Threshold Limit Values and Biological Exposure Indices for 1985-86, American Conference of Governmental Industrial Hygienists. 2. Permissable Exposure Limits (mg/m.^{3}) OSHA (29CFR1910). 3. Handbook of Toxic and Hazardous Chemicals and Carcinogens, 2nd Edition, by Marshall Sittig, Princeton University, Noyes Publications. 4. Method of Sampling Airborne Particulates Generated by Welding and Allied Processes", AWS F1.1, American Welding Society, P.O. Box 351040, Miami, FL 33135.

NAME OF INDIVIDUAL SUPPLYING INFORMATION: