



MATERIAL SAFETY DATA SHEET COVERED WELDING ELECTRODES

REF: _____

ARCOS ALLOYS
DIVISION OF HOSKINS MFG. CO.
#1 ARCOS DRIVE
MT. CARMEL, PA 17851
(717) 339-5200

MSDS NO. 206
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CHEMTREC 800-424-9300

SECTION I - PRODUCT TYPE

This MSDS is for covered welding electrodes. Arcos designations are listed in Section II.

SECTION II a- TRADENAME AND MAXIMUM DEPOSIT COMPOSITION¹

ARCOS DESIGNATION

STAINLESS STEEL ALLOYS²

	<u>Fe</u>	<u>Cr</u>	<u>Cu</u>	<u>Mn</u>	<u>Mo</u>	<u>Ni</u>	<u>Si</u>
307	Balance	21.5		4.8		10.7	
308	Balance	21.0		2.5		11.0	
309	Balance	25.0		2.5		14.0	
310	Balance	28.0		2.5		22.5	
316	Balance	20.0		2.5	3.0	14.0	
317	Balance	21.0		2.5	4.0	14.0	
320	Balance	21.0	4.0		3.0	36.0	
320 (NoCb)	Balance	21.0	4.0		3.0	36.0	
320LR	Balance	21.0	4.0	2.5	3.0	36.0	
630 (327)	Balance	16.8	4.0			5.0	
330	Balance	17.0		2.5		37.0	
347	Balance	21.0		2.5		11.0	
410	Balance	13.5				.6	
410NiMo	Balance	12.5				5.0	
502	Balance	6.0				.4	
505	Balance	10.5			1.0	.4	
700	Balance	23.0		2.5	5.0	26.0	
16-8-2	Balance	16.5		2.5	2.0	9.5	
7 Mo Plus	Balance	27.0		2.0	1.8	10.0	
RAB5H	Balance	25.0		2.5		16.0	4.5

COBALT-BASE ALLOYS²

	<u>Co</u>	<u>C</u>	<u>Cr</u>	<u>Mn</u>	<u>Mo</u>	<u>Ni</u>	<u>W</u>
Cobend 1, CoCr-C	Balance	3.0	33.0	1.0		3.0	14.0
Cobend 6, CoCr-A	Balance	1.4	32.0	1.0		3.0	6.0
Cobend 7, 227	Balance	.4	29.0	1.5	6.0	4.0	
Cobend 12, CoCr-B	Balance	1.7	32.0	1.0		3.0	9.5

¹Composition of HAZARDOUS INGREDIENTS (as defined by OSHA 29CFR1910 1200 and PA TITLE 34) 1% or greater by weight, except 01% or greater for nickel and chromium

²May be prefixed by E or MIL or a Suffix of 15 16 or ST

Section II b

Other ingredients in coating:

Calcium Fluoride
Calcium Carbonate (containing silica)
Titanium Dioxide
Sodium Silicate
Magnesium Carbonate (-15) Coating Only
Potassium Bichromate (-16) Coating Only and Other Alloys (.2%)
Potassium Silicate (-16) Coating Only and Other Alloys

SECTION III - HAZARDOUS INGREDIENTS¹

IMPORTANT - This section lists hazardous ingredients in the as shipped product.

INGREDIENT	PEL(TWA) ³	TLV-TWA ⁴	CAS# ⁵
Aluminum (Al)	15(5*)	10	7429-90-5
Cobalt (Co)	0.05	0.05	7440-48-4
Potassium Bichromate	C0.1	0.05	7778-50-9
Chromium (Cr)	1	0.5	7440-47-3
Copper (Cu)	1	1	7440-50-8
Manganese (Mn)	C5	5	7439-96-5
Molybdenum (Mo)	10	10	7439-98-7
Nickel (Ni)	1	1	7440-02-0
Tungsten (W)	5(STEL-10)	5	7440-33-7
Calcium Fluoride (As F)	2.5	2.5	7789-75-5
Calcium Carbonate (containing silica)	15(5*)	10	1317-65-3
Titanium Dioxide	10(5*)	10	13463-67-7
Magnesium Carbonate	15(5*)	10	546-93-0
Sodium Silicate	C2(As NaOH)	C2 (As NaOH)	1344-09-8
Potassium Silicate	None	None	1312-76-1
Iron	None	None	7439-89-6
Silicon	10(5)	10	7440-21-3

Nuisance particulates as respirable dust at 5mg/m³ (*Respirable Fraction)
(C-Ceiling Limit) (STEL - Short Term Exposure Limit)

SECTION IV - PHYSICAL DATA

Covered Welding Electrodes are solid wire with a flux coating.

SECTION V - FIRE AND EXPLOSION DATA

Nonflammable, however, arcs, sparks, and molten metal can ignite flammables and combustibles or cause explosions.

SECTION VI - REACTIVITY DATA

Welding and hot cutting fumes and gases cannot be classified simply. Their composition and quantity are dependent on the metal being welded, the procedures, processes and the type of wire or electrodes used. Other influencing factors are the presence of contaminants in the atmosphere. Decomposition products from the welding or cutting operation include those from the volatilization, reaction and/or oxidation of the materials in Section III and may include oxides of the metals, chromates, fluorides and complex metallics. Gaseous reaction products may include carbon monoxide, ozone and nitrogen oxides. Chlorinated solvents may be decomposed into toxic gases such as phosgene.

¹Composition of HAZARDOUS INGREDIENTS (as defined by OSHA 29CFR1910.1200 and PA TITLE 34) - 1% or greater by weight, except .01% or greater for nickel and chromium

²May be prefixed by E or MIL or a Suffix of 15, 16 or ST

³OSHA Permissible exposure limits (mg/m³) (Time Weighted Average)

⁴Threshold limit value Time Weighted Average (mg/m³) AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS (ACGIH)

⁵Chemical Abstract Services Number

When the electrodes and fluxes are consumed, the fume and gas decomposition products generated are different in form from the ingredients listed in Section III. New compounds not in the electrodes may form. The known gases and fumes that may form during welding or hot cutting and their exposure limits are noted in the following table:

	<u>PEL(TWA)¹</u>	<u>TLV-TWA²</u>	<u>CAS#³</u>
Aluminum Fume (Al)	5	5	7429-90-5
Carbon Monoxide	40(C229)	55	630-08-0
Chromium	1	0.5	7440-47-3
Chromium (Chromates)	0.1	0.05	Varies With Compound
Cobalt Fume (Co)	0.05	0.05	7440-48-4
Copper Fume (Cu)	0.1	0.2	7440-50-8
Fluorides (As F)	2.5	2.5	Varies With Compound
Iron Oxide Fume (As Fe)	10	5	1309-37-1
Magnesium Oxide Fume (MgO)	5*	10	1309-48-4
Manganese Fume (Mn)	1(STEL-3)	1	7439-96-5
Molybdenum (Mo) (Soluble)	5	5	7439-98-7
Nickel (Ni) (Soluble)	0.1	0.1	7440-02-0
Potassium Hydroxide (KOH)	C2	C2	1310-58-3
Tungsten (W) (Soluble)	1(STEL-3)	1	7440-33-7
Nitrogen Dioxide	(STEL-1.8)	6	10102-44-0
Ozone	0.2(STEL-.6)	C.2	10028-15-6
Phosgene	0.4	0.4	75-44-5

(PEL - TLV values are mg/m³) (C-ceiling limit) (*Respirable Fraction) (STEL-Short Term Exposure Limit)

The limit for welding fumes not otherwise classified is 5 mg/m³. Some elements or compounds will exceed their PEL's/TLV's before the total fumes exceed 5 mg/m³.

SECTION VII - HEALTH HAZARD DATA

This Product Poses No Health Hazard As Shipped
But May Pose A Health Hazard During Use.

Electric arc welding rays can injure eyes and burn skin.

Dust, fumes and gases can be dangerous to your health. Lung damage may result from overexposure.

Sections II, III and VI list specific hazardous ingredients, reaction products and OSHA PEL's and ACGIH TLV's.

AGGRAVATION

Some workers may experience discomfort at concentrations below the threshold limit values and others may be affected by a pre-existing condition or other occupational illness because of the wide variation in individual susceptibilities.

PRIMARY ROUTE OF ENTRY

Fumes, gases and dust can be a health hazard thru inhalation.

ACUTE EXPOSURE

Short term exposure to welding fumes, gases or dust may result in discomfort such as dizziness, nausea, fever, dryness and/or irritation of nose, throat and eyes. Skin sensitivity may also be noted. Acute exposure can result in the same symptoms except to a greater degree as well as watery eyes, headache, breathing difficulty, frequent coughing and/or chest pains. Some toxic gases may cause pulmonary edema, asphyxiation and excessive exposure can be fatal.

CHRONIC EXPOSURE

Chronic exposure may result in neurological damage, lung fibrosis, pneumoconiosis and other lung diseases.

Nickel and Chromium are considered possible carcinogens under OSHA (29CFR 1910.1200.) The studies forming the basis for this classification were from operations other than welding of Chromium or Nickel. There is considerable controversy on the extent of the respiratory cancer problems due to nickel and chromium. In addition a small amount of silica is also present and it is listed as a probable carcinogen. Nevertheless exposures must be maintained below the levels specified in Section II and IV.

¹OSHA Permissible exposure limits (mg/m³) (Time Weighted Average)

²Threshold limit value Time Weighted Average (mg/m³) - AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS (ACGIH)

³Chemical Abstracts Service Number

EMERGENCY AND FIRST AID

In case of electrical shock, turn off power prior to removal from exposure area and administration of first aid.

INHALATION: Remove fresh air. If breathing is difficult administer oxygen. If not breathing begin artificial respiration. If no detectable pulse begin external heart massage.
SKIN: Wash affected area with soap and water.
EYES: Flush with large amounts of fresh water for at least 15 minutes.
INGESTION: Seek medical attention.

In all cases, seek medical attention for first aid.

SECTION VIII - PRECAUTIONS FOR SAFE HANDLING AND USE

VENTILATION

Use enough ventilation when cutting, grinding or welding to keep the dust, fumes and gases from the workers breathing zone and general area. Keep exposure below the limits specified in Sections III and VI.

RESPIRATORY PROTECTION

Use weld fume respirator or air supplied respirator when cutting, grinding or welding in a confined space or where local exhaust or general ventilation does not keep exposure below recommended limits.

Monitor the air quality inside the welder's helmet, if worn, and/or the worker's breathing zone to determine if a respirator is required and the type needed.

Use only NIOSH approved respirators.

EYE PROTECTION

Use OSHA approved goggles, glasses and/or face shield when cutting, grinding or welding. In addition, when hot cutting or welding, wear welding helmet or face shield with filter lens. Select welding lens shade from American Welding Society (AWS) publication F2.2.

PROTECTIVE CLOTHING

Wear gloves and flame retardant clothing when cutting, grinding or welding. Do not expose skin to radiation when hot cutting or welding. Provide protective screens to shield others.

SPILLS, LEAKS AND WASTE DISPOSAL

Clean up any grinding dust or waste residues and place in suitable Department of Transportation (DOT) approved containers and dispose of in full compliance with federal, state and local regulations. Avoid inhalation and skin exposure.

SECTION IX SARA TITLE III (Section 313, Toxic Chemicals)

NOTIFICATION

The ARCOS Welding Products listed in Section II of this Material Safety Data Sheet contain toxic chemicals subject to the reporting requirements of Section 313 of TITLE III of the Superfund Amendments and Reauthorization Act of 1986 and 40CFR Part 372 of the Federal Register.

Refer to the following sources for additional important information:

ANSI Z49.1 The American Welding Society
P.O. Box 351040
Miami, FL 33135

OSHA (29CFR 1910) U.S. Department of Labor
Washington, DC 20210

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