Material Safety Data Sheet

Radnor Carbon Arc Electrodes

Section 1. Chemical product and company identification

Common names : **Carbon Arc Electrodes; Gouging Electrodes**
Trade name : Graphite, Copper-coated Electrodes
Supplier : Radnor Products, PO Box 6675, Radnor, PA 19087

In case of emergency : (866) 734-3438

Section 2. Hazards identification

Physical state : Solid (Rod)
Emergency overview : WARNING

CANCER HAZARD
CONTAINS MATERIAL WHICH CAN CAUSE CANCER.
CONTAINS MATERIAL WHICH CAUSES DAMAGE TO THE FOLLOWING ORGANS: KIDNEYS, LUNGS, LIVER, CARDIOVASCULAR SYSTEM, RESPIRATORY TRACT, SKIN, EYE, LENS OR CORNEA.

Avoid breathing dusts. This product contains a component which, in powdered form, may cause respiratory tract and eye irritation; however, since this component is bounded to the core metal, the risk of inhalation of is negligible, as is any possible cancer hazard associated with this material.

Routes of entry : Dermal contact; Eye contact; Inhalation; Ingestion.

Potential acute health effects

Eyes : Dust particules or fumes may cause eye irritation.

Skin : No known significant effects or critical hazards.

Inhalation : May cause respiratory tract irritation.

Ingestion : No known significant effects or critical hazards.

Potential chronic health effects : Carcinogenic effects: Classified 1 (Known to be human carcinogens.) by NTP, + (Proven.) by NIOSH [Silica crystalline, quartz]. Classified A2 (Suspected for humans.) by ACGIH, 2A (Probable for human.) by IARC [Silica crystalline, quartz].
Mutagenic effects: Not available
Teratogenic effects: Not available

Medical conditions aggravated by over-exposure : Repeated or prolonged exposure to the substance can produce target organ damage. Prolonged or repeated contact may cause eye irritation.

See toxicological information (section 11)

Section 3. Composition, Information on Ingredients

							CAS number	% by weight
United States								
Graphite, synthetic							7440-44-0	30 - 60
Copper							7440-50-8	10 - 30
Silica crystalline, quartz							14808-60-7	0.5 - 1
Canada								
Graphite, synthetic							7440-44-0	30 - 60
Copper							7440-50-8	10 - 30
Silica crystalline, quartz							14808-60-7	0.5 - 1
Mexico			Classification					
	UN number	**IDLH**	**H**	**F**	**R**	**Special**		
Graphite, synthetic	UN1361	-	1	2	0		7440-44-0	30 - 60
Copper	Not regulated	100 mg/m^3	0	0	0		7440-50-8	10 - 30
Silica crystalline, quartz	Not regulated	50 mg/m^3	2	0	0		14808-60-7	0.5 - 1

This material is classified hazardous under OSHA regulations in the United States, the WHMIS Controlled Product Regulation in Canada and the NOM-018-STPS-2000 in Mexico.

See Sections 8, 11 and 14 for details.

Section 4. First aid measures

Eye contact : Check for and remove any contact lenses. In case of contact with eyes, rinse immediately with plenty of water. Get medical attention if symptoms occur.

Skin contact : Wash with soap and water. Get medical attention if symptoms occur.

Inhalation : If inhaled, remove to fresh air. If not breathing, give artificial respiration. Get medical attention if symptoms appear.

Ingestion : Do not induce vomiting. Never give anything by mouth to an unconscious person. Get medical attention if symptoms appear.

Notes to physician : No specific antidote. Medical staff must contact Poison Control Center.

Section 5. Fire fighting measures

Flammability of the product : Non-flammable

Fire-fighting media and instructions : Use an extinguishing agent suitable for the surrounding fire.

Welding arcs and sparks can ignite combustibles. Refer to ANSI Z49.1 “SAFETY IN WELDING AND CUTTING” published by the American Welding Society for fire prevention and protection information during welding.

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions : Immediately contact emergency personnel. Keep unnecessary personnel away. Use suitable protective equipment.

Environmental precautions : Avoid dispersal of spilled material, runoff and contact with soil, waterways, drains and sewers.

Methods for cleaning up : If emergency personnel are unavailable, vacuum or carefully scoop up spilled material and place in an appropriate container for disposal by incineration. Avoid creating dusty conditions and prevent wind dispersal.

Section 7. Handling and storage

Handling : Wash thoroughly after handling.

Storage : Keep container tightly closed. Keep container in a cool, well-ventilated area.

Section 8. Exposure controls, personal protection

Engineering controls : Use process enclosures, local exhaust ventilation or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fumes or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit. If dust is generated and ventilation is inadequate, use NIOSH certified respirator that will protect against dust/mist.

Personal protection

Eyes : Wear helmet or use a face shield with the appropriate filter lens. Provide protective screens and flash goggles, if necessary to shield others. Consult ANSI Z49.1

Respiratory : A NIOSH approved respirator should be worn when airborne dust and fume concentrations exceed the applicable limits for Tungsten, Lanthane or other welding materials. A NIOSH approved fume respirator when welding in confines spaces. All appropriate requirements set forth in 29 CFR 1910.134 should be met. Under extreme exposure conditions when airborne concentrations may be above the protection factor of an air-purifying respirator, use a positive-pressure, air-supplied respirator. Appropriate standards for use of respiratory protection (such as 29 CFR 1910.134 and Z49.1) should be consulted.

Hands : Leather gloves

Skin/Body : Head, hand and body protection to prevent injury from arc radiation, sparks and electrical shock must be worn. Consult ASNI STD Z49.1

Personal protection in case of a large spill : Safety glasses, goggles or face shield. Impervious gloves. Full suit. Boots. Wear NIOSH-approved self-contained breathing apparatus or equivalent and full protective gear.

Product name	Exposure limits
United States	
Graphite, synthetic	**ACGIH (United States).** TWA: 10 mg/m³ 8 hour(s). Form: Nuisance particulates
Copper	**ACGIH TLV (United States, 1/2005).** TWA: 1 mg/m³ 8 hour(s). Form: All forms TWA: 0,2 mg/m³ 8 hour(s). Form: Fume **NIOSH REL (United States, 12/2001).** TWA: 1 mg/m³ 10 hour(s). Form: Dusts and mists **OSHA PEL (United States, 8/1997).** TWA: 150 µg/m³ 8 hour(s). Form: All forms
Silica crystalline, quartz	**ACGIH TLV (United States, 1/2005).** TWA: 0,05 mg/m³ 8 hour(s). Form: Respirable fraction **NIOSH REL (United States, 12/2001).** TWA: 0,05 mg/m³ 10 hour(s). Form: All forms **OSHA PEL 1989 (United States, 3/1989).** TWA: 0,1 mg/m³ 8 hour(s). Form: Respirable dust
Canada	
Graphite, synthetic	**ACGIH TLV (United States).** TWA: 10 mg/m³ 8 hour(s). Form: Nuisance particulates
Copper	**ACGIH TLV (United States, 1/2005).** TWA: 1 mg/m³ 8 hour(s). Form: All forms TWA: 0,2 mg/m³ 8 hour(s). Form: Fume
Silica crystalline, quartz	**ACGIH TLV (United States, 1/2005).** TWA: 0,05 mg/m³ 8 hour(s). Form: Respirable fraction
Mexico	
Graphite, synthetic	**NOM-010-STPS (Mexico, 9/2000).** CPT: 10 mg/m³ 8 hour(s). Form: All forms CPT: 2 mg/m³ 8 hour(s). Form: Powder
Copper	**NOM-010-STPS (Mexico, 9/2000).** CCT: 2 mg/m³ 15 minute(s). Form: Powder and dust CCT: 2 mg/m³ 15 minute(s). Form: Dust CPT: 1 mg/m³ 8 hour(s). Form: Powder and dust CPT: 0,2 mg/m³ 8 hour(s). Form: Dust
Silica crystalline, quartz	**NOM-010-STPS (Mexico, 9/2000).** CPT: 0,1 mg/m³ 8 hour(s). Form: All forms

Consult local authorities for acceptable exposure limits.

Section 9. Physical and chemical properties

Physical state : Solid (Rod)

Color : Black

Odor : Odorless

Melting/freezing point : Weighted average: 1112.71°C (2034.9°F)

Specific gravity : Weighted average: 1.93 (Water = 1)

Vapor pressure : The highest known value is 0.1 kPa (1 mm Hg) (at 20°C) (Copper).

Dispersibility properties : Not dispersible in cold water, hot water.

Solubility : Insoluble in cold water, hot water.

Section 10. Stability and reactivity

Stability and reactivity : The product is stable.

Incompatibility with various substances : Incompatible with some strong acids.

Hazardous polymerization : Will not occur.

Section 11. Toxicological information

Acute Effects

Eyes : Dust particules or fumes may cause eye irritation.

Skin : No known significant effects or critical hazards.

Inhalation : May cause respiratory tract irritation.

Ingestion : No known significant effects or critical hazards.

Potential chronic health effects : Carcinogenic effects: Classified 1 (Known to be human carcinogens.) by NTP, + (Proven.) by NIOSH [Silica crystalline, quartz]. Classified A2 (Suspected for humans.) by ACGIH, 2A (Probable for human.) by IARC [Silica crystalline, quartz].
Mutagenic effects: Not available
Teratogenic effects: Not available

Target organs : Contains material which causes damage to the following organs: kidneys, lungs, liver, cardiovascular system, upper respiratory tract, skin, eye, lens or cornea.

Special remarks on other toxic effects on humans : Not available

Section 12. Ecological information

Products of degradation : These products are carbon oxides. Some metallic oxides.

Section 13. Disposal considerations

Waste disposal : The generation of waste should be avoided or minimized wherever possible. Avoid dispersal of spilled material, runoff and contact with soil, waterways, drains and sewers. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional and local authority requirements.

Consult your local or regional authorities.

Section 14. Transport information

Classification

Mexico/TDG/DOT/ IMDG/IATA : Not regulated

NAERG : Not applicable

Label

Not applicable

Additional information

Not applicable

DOT

Marine pollutant

Marine pollutant (P)

Section 15. Regulatory information

United States

HCS Classification : Target organ effects

U.S. Federal regulations : TSCA : All components listed.
SARA 302/304/311/312 extremely hazardous substances: No products were found.
SARA 302/304 emergency planning and notification: No products were found.
SARA 302/304/311/312 hazardous chemicals: Graphite, natural.; Graphite, synthetic; Copper
SARA 311/312 MSDS distribution - chemical inventory - hazard identification: Graphite, natural.: Immediate (acute) health hazard; Graphite, synthetic: Fire hazard, Immediate (acute) health hazard, Delayed (chronic) health hazard; Copper: Immediate (acute) health hazard
Clean Water Act (CWA) 307: Copper
Clean Water Act (CWA) 311: No products were found.
Clean Air Act (CAA) 112 accidental release prevention: No products were found.
Clean Air Act (CAA) 112 regulated flammable substances: No products were found.
Clean Air Act (CAA) 112 regulated toxic substances: No products were found.

SARA 313

	Product name	CAS number	Concentration
Form R - Reporting requirements :	Copper	7440-50-8	10 - 30
Supplier notification :	Copper	7440-50-8	10 - 30

SARA 313 notifications must not be detached from the MSDS and any copying and redistribution of the MSDS shall include copying and redistribution of the notice attached to copies of the MSDS subsequently redistributed.

State regulations : Pennsylvania RTK: Graphite, natural: (generic environmental hazard); Copper: (environmental hazard, generic environmental hazard)
Massachusetts RTK: Graphite, natural; Copper
New Jersey: Silica crystalline, quartz; Copper

WARNING: This product contains a chemical known to the State of California to cause cancer.

Ingredient name	Cancer	Reproductive	No significant risk level	Maximum acceptable dosage level
Silica crystalline, quartz	Yes	No	No	No

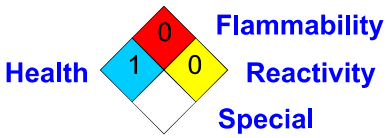
Canada

WHMIS (Canada) : Class D-2A: Material causing other toxic effects (Very toxic).

DSL : All components listed.

Mexico

Classification :



International regulations

International lists : All components listed are listed on major international inventories or exempted from being listed in Australia (AICS), Europe (EINECS/ELINCS), Korea (TCCL), Japan (METI/MOL), Philippines (RA6969).

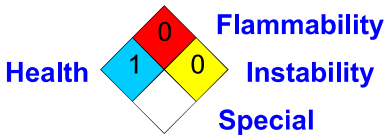
Section 16. Other information

Label requirements : CANCER HAZARD
CONTAINS MATERIAL WHICH CAN CAUSE CANCER.
CONTAINS MATERIAL WHICH CAUSES DAMAGE TO THE FOLLOWING ORGANS: KIDNEYS, LUNGS, LIVER, CARDIOVASCULAR SYSTEM, RESPIRATORY TRACT, SKIN, EYE, LENS OR CORNEA.

Hazardous Material Information System (U.S.A.) :

Health	*	1
Fire hazard		0
Reactivity		0
Personal protection		C

National Fire Protection Association (U.S.A.) :



References : ANSI Z400.1, MSDS Standard, 2004. - Manufacturer's Material Safety Data Sheet. - 29CFR Part1910.1200 OSHA MSDS Requirements. - 49CFR Table List of Hazardous Materials, UN#, Proper Shipping Names, PG. - Canada Gazette Part II, Vol. 122, No. 2. Registration SOR/88-64, 31 December 1987. Hazardous Products Act "Ingredient Disclosure List" - Canadian Transport of Dangerous Goods, Regulations and Schedules, Clear Language version 2005. - Official Mexican Standards NOM-018-STPS-2000 and NOM-004-SCT2-1994.

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