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MSDS NO 21022	REV 1
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CUSTOMER CODE NO	

## MATERIAL SAFETY DATA SHEET

Complies with OSHA Hazard Communication Standard 29 CFR 1910.1200



### SECTION 1 - IDENTIFICATION

PRODUCT NAME OR NUMBER	ME-21022
PRODUCT TYPE	Thermal Spray Powder

### SECTION 2 - INGREDIENTS / HAZARD IDENTIFICATION

INGRED	CAS NUM	WEIGHT % RANGE	EXPOSURE LIMIT (mg/m3)	
			PEL	TLV
Chromium	*#§ 7440-47-3	1 - 5	1	0.01 as Insol Cr VI
Molybdenum	7439-98-7	3 - 7	15 total Part	10 Insol Compd (I)
Aluminum	* 7429-90-5	5 - 10	5 Resp Part	5 Resp Part
Nickel	*#§ 7440-02-0	60 - 100	1	0.2 Insol Compd as N

\* This Ingredient is listed as a Toxic Chemical in Subpart D (40CFR372), Subject to the reporting requirements of Section 313 of the Emergency Planning and Community right-To-Know Act of 1986.

# This ingredient is listed as a carcinogen or possible carcinogen by the NTP, IARC or OSHA 29 CFR 1910 (Z)

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

### SECTION 3: GENERAL HAZARD SUMMARY

Little or no hazards exist for arc welding electrodes and brazing rods before they are used in the welding process

WARNING! Potential health effects of product listed, and when used in association with welding, brazing, soldering, thermal spraying, or part preparation are listed below. See also Section 10 for more detailed information on the specific ingredients' exposure effects and Section 6 for hazardous decomposition products.

INHALATION: The fumes associated with the heating, welding, brazing, soldering or cutting metals can be dangerous to your health and overexposure can cause lung damage and/or other organ damage. Use adequate ventilation to keep below exposure limits. Keep fumes and gases from breathing zone - keep the welder's head out of the fumes. Aggravation of preexisting respiratory or allergic conditions may occur in some workers.

EYE / SKIN CONTACT: Arc Rays and Ultraviolet light can injure the eyes and burn skin. Liquid used in fluxes and chemical aids may cause irritation or possible chemical burns. Handle with care as shown in Section 8. Wear the proper eye, ear and body protection. Use chemical goggles, gloves and face shield for all fluxes and chemical aids. Electrical Shock can kill.

INGESTION: Danger! May be humful or fatal if swallowed.

THE PRIMARY ROUTE OF ENTRY of welding fumes, gases and dust is by inhalation. Skin, eye contact and ingestion may also occur with powders, pastes and liquids. The American Conference of Governmental Industrial Hygienists (ACGIH) recommended general limit for Welding Fume and nuisance dust, not otherwise classified, is 5 mg/m3 and 10 mg/m3, respectively. The 1991-1992 ACGIH states, "The TLV-TWA should be used as guides in the control of health hazards and should not be used as fine lines between safe and dangerous concentrations. MOST WELDING, EVEN WITH PRIMITIVE VENTILATION, DOES NOT PRODUCE EXPOSURE INSIDE THE WELDING HELMET ABOVE 5mg/m3. THAT WHICH DOES, SHOULD BE CONTROLLED." It is recommended to monitor for ingredients listed in Section 2 and decomposition products that have exposure limits below 5 mg/m3 (cadmium, chromium, chromium VI, nickel, etc.).

## SECTION 4: EMERGENCY FIRST AID MEASURES

**INHALATION OVEREXPOSURE:** Move victim to fresh air source. Contact a physician and advise on ingredients listed in Section 2.

**SKIN CONTACT:** Thoroughly wash hands or effected areas with soap and water to remove all residue. If rash or burn develops, consult a physician.

**EYE CONTACT:** Thoroughly flush eyes with water for at least 15 minutes to remove all residue. Obtain prompt medical advice for fluxes and chemical aids. Advise physician of ingredients listed in Section 2.

**INGESTION:** Call a physician and/or local Poison Control Center. Advise of ingredients listed in Section 2.

## SECTION 5: FIRE AND EXPLOSION HAZARD DATA

Refer to ANSI Z49.1 for fire prevention during the use of welding and allied processes.

**ELECTRODE/BRAZE/SOLDERS:** Generally nonflammable; welding arc, sparks and flames can ignite combustibles and flammables.

**THERMAL SPRAY POWDERS:** Nonflammable under normal working conditions. Metal powder dust may present a fire or explosion hazard under favorable conditions of particle size, dispersion, and strong ignition source. This is most prevalent with reactive metal powders such as aluminum. Refer to Chapter 11 of "Thermal Spraying", published by the American Welding Society, for more detail.

**FLUXES:** All E+C fluxes are nonflammable and are used as deoxidizers during welding, brazing or soldering operations.

**CHEMICAL AIDS:** Some E+C Chemical Aids are flammable. Refer to Section 2 and 10 of the MSDS and addition, and read the container label. When preparing workpiece with a flammable chemical aid, keep all welding sources, sparks and flames at least 20 feet from the workpiece until the flammable evaporates. Provide adequate ventilation.

**SPECIAL FIREFIGHTING PROCEDURES:** Toxic fumes may be produced --- use an approved Self Contained Breathing Apparatus. See Hazardous decomposition products in Section 6.

**EXTINGUISHING MEDIA:** CO<sub>2</sub>, dry chemical foam type.

**UNUSUAL FIRE AND EXPLOSION HAZARD:** Some fluxes and chemical aids may give off hydrogen chloride, phosgene and chlorine gases. Cans, under pressure, and flammables may explode.

## SECTION 6: REACTIVITY DATA HAZARDOUS DECOMPOSITION PRODUCTS

The term "hazardous" should be interpreted as a term defined in the OSHA Hazard Communication Standard (29 CFR 1910.1200) and does not necessary imply the existence of any hazard. Welding electrodes, brazing alloys and solder solids as shipped are stable, nonflammable, nonexplosive and in most cases nonreactive. Certain fluxes and chemical aids may be reactive - see Section 5 and the addition for those products. Fumes, gases and dusts given off during heating, welding, brazing, soldering, cutting or thermal spray processes cannot be classified simply. The composition and quantity of these are dependent upon the metal being welded, the process, procedures, and electrodes or other consumables used. Other conditions which also influence the composition and quantity of the fumes, gases and dusts that workers may be exposed to include: coatings on the workpiece (paint, galvanizing, plating), the number of workers and the volume of the work space, the quality and amount of ventilation, the position of the worker's head with respect to the fumes generated, as well as the presence of contaminants in the atmosphere (such as chlorinated hydrocarbon vapors from cleansing and degreasing activities.)

During welding, thermal spraying and allied processes, the fume and gas decomposition products generated are different in percent and form from the ingredients listed in Section 2. Decomposition products of normal operation include those originating from the volatilization, reaction or oxidation of the materials shown in Section 2, plus those of the base metal and coating, etc. as noted above.

Reasonably expected constituents of the fume may include: complex oxides of the metals listed in Section 2; the flux coatings may produce fluoride compounds, metal oxides, carbon and silica. Gaseous reaction products may include ozone, carbon monoxide, carbon dioxide, nitrogen oxides, and certain inert gases used as shielding gases. OSHA specifies that chromium VI compounds, nickel and its compounds must be considered as carcinogens because they are so classified by the NTP or IARC. Many welding and allied products contain chromium and nickel when listed in Section 2. While certain chromium and nickel compounds have been clearly shown to be animal and human carcinogens, more study is required to actually find if these compounds are present in welding fumes. For the safety of the worker, E+C chooses to designate all chromium and nickel containing compounds as carcinogen/or possible carcinogen by marking these ingredients with a pound sign (#) in Section 2. See Section 10 for decomposition of chromium containing products. Monitor for chromium, nickel and cadmium compounds when they are present in Section 2 since the exposure limits may be exceeded before the 5 mg/m<sup>3</sup> PEL/TLV for general welding fume. To our knowledge there are no reliable scientific studies which show that workers exposed to alloys containing chromium or nickel run increased risk of lung cancer because of exposure to the forms of nickel and chromium found in the fumes.

One recommended way to determine the composition and quantity of fumes and gases to which workers are exposed is to take an air sample inside the worker's helmet if worn or in the welder's breathing zone. See ANSI/AWS F1.1 available from the American Welding Society, P.O. Box 351040, Miami, FL 33135. Also from AWS is F1.3 "Evaluating contaminants in the Welding Environment - A Sampling Strategy Guide", which gives additional advice on sampling.

## SECTION 7: ACCIDENTAL SPILL MEASURES

Dispose of waste material, powders, grinding, or filter residues in an environmentally sensitive manner in accordance with Federal, State and Local regulations. Use appropriate measures to keep airborne dust levels contained in accordance with exposure levels of Section 2. See also Section 8 for proper safe handling and storage.

## SECTION 8: SAFE HANDLING AND STORAGE

Please read and understand the product label information for proper procedures and use. See ANSI Z49.1 "Safety in Welding and Cutting", and chapter 11 of "Thermal Spraying", published by the American Welding Society and OSHA publication 2206 (29 CFR 1910) for more detail.

**RESPIRATORY PROTECTION:** If the work station is not properly ventilated to exhaust all fumes, vapors and dusts below the recommended exposure limits, use a NIOSH approved respirator.

**VENTILATION:** Use enough general ventilation and local exhaust at the work site to keep all fumes and dust from the worker's breathing zone and the general area. Train welder to keep his/her face away from the fume/dust plume.

**EYE PROTECTION:** Wear helmet or use face shield with appropriate filter lens. Provide protective screens and flash goggles if necessary, to shield others. As a rule, start with a shade that is too dark to see the weld zone, then go to the next lighter shade which gives sufficient view of the weld zone.

**OTHER PROTECTIVE EQUIPMENT:** Wear hand, head, and body protection which help prevent injury from radiation, sparks and electrical shock. At a minimum, this includes welder's gloves and a protective face shield, and may include arm protectors, aprons, hats as well as dark, protective clothing. Train workers not to touch live electrical parts and to insulate themselves from work and electrical ground.

## SECTION 9: STATEMENT OF INTENT

WHILE WE BELIEVE THAT ALL INFORMATION PRESENTED HEREIN IS ACCURATE AND RELIABLE, THE DATA ARE NOT TO BE TAKEN AS A GUARANTEE OR REPRESENTATION OF ANY KIND FOR WHICH EUTECTIC CORPORATION ASSUMES LEGAL RESPONSIBILITY. THIS INFORMATION IS PRESENTED SOLELY FOR YOUR CONSIDERATION, INVESTIGATION, AND VERIFICATION. FOR MORE INFORMATION ABOUT THE INGREDIENTS LISTED, PLEASE REFER TO THE APPROPRIATE OSHA DOCUMENTS.

## SECTION 10: CHEMICAL HAZARDS INFORMATION / EFFECTS OF OVEREXPOSURE

See Section 2 for the specific ingredients contained in this product, the OSHA/ACGIH exposure limits, SARA title III and carcinogen listing.

**GENERAL WELDING FUMES:** (PEL/TLV = 5 mg/m<sup>3</sup>) Electric arc welding, brazing, soldering, or thermal spraying may create one or more of the following health hazards associated with the key ingredients listed in Section 2. Fumes, gases and dusts can be dangerous to your health. Certain medical studies have suggested that lung damage can result from overexposure to these fumes. Short term overexposure may result in dizziness, nausea, or dryness or irritation of nose, throat or eyes. Excessive overexposure may cause bronchial asthma, lung fibrosis, pneumoconiosis or siderosis (iron deposits in lung). See also Section 6.

**METAL FUME FEVER:** Can be caused by inhalation of certain metallic compounds during the welding, heating brazing, soldering or cutting operations. Symptoms are similar to influenza type sickness including chills, fever, head and muscle ache, tightness of chest, dryness of nose and mouth, muscular pain, nausea and vomiting. Symptoms usually occur within several hours after overexposure and may last 6 - 24 hours. Consult a physician immediately if any of these symptoms develop after welding operation.

**GENERAL NUISANCE DUSTS:** (Titanium dioxide, aluminum dioxide, zirconium oxide, calcium carbonate, volclay, etc: LISTED AS PARTICLES NOT OTHERWISE CLASSIFIED, TLV/PEL = 10/15 mg/m<sup>3</sup>). Most nuisance dusts are inert, nontoxic and chemically nonirritating. Skin contact has shown no problems other than possible drying and mechanical irritation. Eye contact can produce particulate irritation. Does not seem to be absorbed by the body through ingestion. Excessive inhalation can produce mild pulmonary irritation and possible non-disabling slight fibrosis of the lungs.

**AMMONIA CHLORIDE:** Overexposure to dust and fumes may be irritating to the eyes, nose and lungs. Ingestion may be harmful. Avoid moisture and heat, hazardous decomposition products may include ammonia and hydrogen chloride. Keep away from strong acids and bases. NFPA/HMIS 200.

**BARIIUM COMPOUNDS:** Short term overexposure to soluble barium compounds may cause aching eyes, rhinitis, frontal headache, wheezing, laryngeal spasms, salivation or anorexia. Long term overexposure to soluble barium compounds may cause nervous disorders and may have deleterious effects on the heart, circulatory system and musculature.

**BORON OXIDES:** (Borax, Borates, Boric Acid) Oxides of boron are white, crystalline solids that form boric acid (mild acid) in the presence of moisture. Overexposure will likely cause mild irritation of the respiratory system, eyes and an open skin wounds. Ingestion may cause nausea, vomiting, diarrhea or erythematous flush. All effects are reversible.

**CADMIUM & Cd COMPOUNDS:** Cadmium fume can affect the body if it is inhaled. Overexposure causes irritation of the nose and throat. If enough has been inhaled, after a delay of several hours, may develop metal fume fever. Death may occur in some instances. Repeated or prolonged overexposure may cause loss of smell sense, ulceration of the nose, shortness of breath, kidney damage and mild anemia. Exposure to cadmium fume has also been reported to cause increased incidence of cancer of the prostate in men.

**CALCIUM OXIDE:** Calcium oxide can affect the body if inhaled, ingested or contact with eyes or skin. Short term overexposure causes irritation to the nose, eyes, throat and skin. Severe burns may result from contact. It may also cause bronchitis and pneumonia if excessive inhalation of fumes. Repeated or prolonged overexposure may cause irritation of the skin, ulceration and perforation of the nasal septum. Calcium oxides may attack some forms of plastics, rubber, or coatings.

**CHROMIUM & Cr COMPOUNDS:** See also Section 6 - Hazardous decomposition products. Chromium VI compounds may be produced during welding with chromium containing consumables. Good practice requires the reduction of worker exposure to chromium VI materials by using proper ventilation or fume removal, workers should also wash hands and change clothes after welding. Monitor for chromium VI since the TLV is 0.05 mg/m<sup>3</sup> and may be exceeded before reaching the

5 mg.m3 PEL/TLV limits for general welding fume. Short term overexposure from inhalation of chromium VI can cause irritation of the respiratory system, lung damage and asthma type symptoms. Chromium VI salts can cause severe injury and death if ingested, can cause ulcers on skin, can burn eyes and cause allergic reactions. Studies of long term overexposure to chromium VI have shown that production workers exposed to hexavalent chromium compounds have an excess of lung cancer, and these compounds are required to be listed as carcinogens by OSHA. Absorption through the skin can cause systematic poisoning primarily affecting the kidneys and liver.

**COBALT & Co COMPOUNDS:** Short term overexposure may cause pulmonary irritation, cough, dermatitis & weight loss. Repeated overexposure can produce reduced pulmonary functions, diffuse nodular fibrosis of lungs and respiratory hypersensitivity.

**COPPER & Cu COMPOUNDS:** The inhalation of fresh copper oxide fume may cause metal fume fever. No adverse long term health effects have been reported in literature.

**FLUORIDE COMPOUNDS:** (Such as K, Ca, Al, Na, Fluorspar, Cryolite, etc. are listed as Fluoride fume.) Fluoride dust can affect the body if inhaled or if it comes in contact with eyes or skin, or if it was swallowed. Short term overexposure may cause irritation of the eyes and respiratory tract. Fluorides usually have a soapy or salty taste and may cause nausea, vomiting, abdominal pain, bleeding of the stomach, shortness of breath, convulsions, muscular weakness or disturbed vision, if ingested. Compounds may give off HF gases in fire and form strong acids in the presence of moisture. Long term overexposure may cause excessive calcification of the bones, ligaments of the ribs, pelvis and spinal column. May also cause skin burns and/or rash.

**GLYCERINE:** (As mist) Contact with eyes may cause slight transient eye irritation. Prolonged skin contact may cause mild irritation. Ingestion single oral dose toxicity is low. High temperatures may generate vapor levels sufficient to cause irritation of the respiratory system.

**GRAPHITE:** (Natural, Synthetic, Amorphous Graphite) Graphite may contain small amounts (0 - 3.5% wt) of crystalline Silica and (4 - 10% wt) of Fused Silica. Excess inhalation may result in irritation of the mucous membranes and long term inhalation may result in Silicosis. See description for SILICA. Dust may cause irritation of the eyes. Graphite causes slippery conditions.

**HYDROXIDES:** Sodium and Potassium Hydroxides are strong alkali and are corrosive to any tissue with which they come in contact. The severity of exposure will determine the health effects - mild irritation to severe burns wherever contact is made.

**IRON & IRON COMPOUNDS:** Overexposure to iron or iron compounds in fume may lead to general irritation of the respiratory tract if inhaled. Long term overexposure may cause siderosis which may also affect pulmonary function. Lungs will clear in time when exposure ceases.

**KAOLIN:** (Aluminum Silicate) Kaolin is classified as nuisance dust by ACGIH. Crystalline Silica is present in trace levels (less than 1% by weight).

**MAGNESIUM / Mg OXIDE:** The inhalation of magnesium oxide fume may cause metal fume fever. Long term adverse health affects are not known.

**MANGANESE:** (Also related compounds such as Manganese Dioxide.) Overexposure to manganese and its compounds may cause metal fume fever characterized by chills, fever, upset stomach, vomiting, irritation of the throat and aching of the body. Excessive overexposure may effect the central nervous system. Symptoms may include muscular weakness and tremors. Behavioral changes and changes in handwriting may also appear. Workers exposed to manganese compounds should receive quarterly medical examinations for early detection of manganese poisoning.

**MOLYBDENUM:** Overexposure to molybdenum and insoluble molybdenum compounds may affect the body if they are inhaled, ingested or if they contact the eyes. Molybdenum trioxide has caused irritation of the eyes, nose, and throat, weight loss and digestive disturbances in animals. Long term effects are not known.

**NICKEL & Ni COMPOUNDS:** Short term effects from overexposure to the inhalation of nickel fumes may include metallic taste, nausea, tightness of chest, fever, or allergic reactions. Skin and eye contact may also cause allergic reactions. To prevent contact allergies, wash hands and change clothes after use. Long term overexposure to nickel and nickel compounds may cause lung fibrosis or pneumoconiosis. Studies of the nickel refinery workers indicated a higher incidence of lung and nasal cancers. Nickel and its compounds are required to be labeled carcinogenic by OSHA, NTP, or IARC.

**POTASSIUM NITRATE:** (Salt Peter) Effects of overexposure - mildly irritating to the eyes, skin and mucous membranes. Prolonged inhalation of dusts may cause irritation of the respiratory system. When involved in fire, can yield toxic gaseous oxides of nitrogen. Spontaneous reaction may occur with easily oxidizable material, increases flammability of any combustible material.

**POTASSIUM OXALATE:** (Oxalic Acid) Fumes may affect the body if inhaled or contact with eyes or skin. The fumes may cause mild irritation or burns depending on the amount of overexposure. Excessive inhalation may cause systemic poisoning with symptoms such as pain in throat, esophagus and stomach.

**SILICA:** (Crystalline Silica, Quartz Dust, Sand, Fused Silica, Silicates) Crystalline Silica can effect the body if inhaled. Repeated overexposure to Silica dust may cause Silicosis or scarring of the lungs with chronic cough and shortness of breath. Silica has a disputed listing as a Group 2A carcinogen by the IARC based on limited evidence in humans and sufficient evidence in animals.

**SILICON, SILICON OXIDES:** (Amorphous Silica) Short term overexposure may pose as a possible eye irritant. Repeated inhalation of amorphous silica can cause pneumoconiosis or non disabling fibrosis of the lung.

**SILVER:** (Ag, and certain soluble silver compounds) Can affect the body if inhaled, ingested or contact with skin. Overexposure can cause discoloration/darkening of the eyes, nose, throat and skin. Silver nitrate is strongly corrosive and can cause burns.

**TIN & Sn COMPOUNDS:** Tin and Tin compounds can affect the body if inhaled or if they make contact with eyes and skin. Short term overexposure toxicity is low. The compounds may cause irritation of the skin, eyes and throat. Long term overexposure affects are not known.

**TUNGSTEN.W CARBIDE:** Tungsten Carbide Incompatibility: - Produces violent reaction with Iodine Pentafluoride and lead oxide. Burns with incandescence if heated to dull red with nitrogen oxide and fluorine gases. Reacts with flame when chlorine trifluoride is present. Short term overexposure to Tungsten Carbide dust by inhalation may cause coughing, dyspnea, soreness in the chest, weight loss, bronchitis and asthma. May also cause pulmonary fibrosis and radiological changes in the lung. May cause contact dermatitis upon skin contact since particles are sharp. Eye contact may cause irritation. Chronic overexposure to WC by inhalation may cause "Hard Metal Lung" with symptoms as described above.

**UREA:** Urea is a weak basic compound, not usually considered hazardous in normal use. Upon exposure to heat and moisture, it may hydrolyze to corrosive ammonium carbamate and toxic cyanuric acid. Fine powder is treated as a nuisance dust. May cause mild irritation to the eyes, skin and throat. NFPA/HMIS 110.

**VANADIUM/V OXIDES:** The hazard information given in Section 2 for Vanadium is listed as Vanadium Pentoxide dust. Overexposure may cause irritation of the eyes, nose, throat and respiratory tract. A greenish discoloration of the tongue may result. Repeated overexposure may produce more severe symptoms as mentioned and also chronic bronchitis or allergic skin rash.

**ZINC & Zn COMPOUNDS:** Zinc oxide fumes are usually given off when zinc is heated such as heating of galvanized coating and can affect the body if inhaled. Short term overexposure may cause metal fume (see separate description). Severe and prolonged exposure to Zinc oxide may cause pulmonary edema and pneumonia.

**ZIRCON:** (As Zirconium Fume - Zirconium Silicate) May effect the body if inhaled. Overexposure may cause irritation of the respiratory system. Zirconium silicate is insoluble and considered inert, although it is possible to form granuloma in the lungs and skin.

## ADDITIONAL INFORMATION FOR FLUXES AND CHEMICAL AIDS

**This section provides additional information specifically for the hazards, handling and safe use of fluxes and chemical aids used for welding, brazing, soldering, and part preparation for welding related tasks.**

### SECTION 6: REACTIVITY DATA

	FLUXES & INERT CHEMICAL AIDS -----	FLAMMABLE -----
STABILITY:	STABLE	STABLE
CONDITIONS TO AVOID:	NONE	HEAT, FLAME, SPARKS
HAZARDOUS POLYMERIZATION:	NONE	NONE
INCOMPATIBILITY:	STRONG ACIDS, CYANIDES, SULFIDES	N/A
HAZARDOUS DECOMPOSITION:	IN THE PRESENCE OF WATER AND HEAT FLUXES MAY GIVE OFF HCL & HF.	SEE SECTION 5

### SECTION 7: ACCIDENTIAL SPILL MEASURES

If a flux or chemical aid is accidentally spilled, contain spill, absorb, and sweep up. Flush area with water to an approved chemical drain. Dispose of in an environmentally sensitive manner in accordance with Federal, State and Local regulations. Use appropriate measures to keep airborne dust levels contained in accordance with exposure levels of Section 2. See also Section 8 for proper safe handling and storage.

### SECTION 8: SAFE HANDLING AND STORAGE

Please read and understand the product label information for proper procedures and use.

**RESPIRATORY PROTECTION:** If the work station is not properly ventilated to exhaust all fumes, vapors and dusts below the recommended exposure limits, use a NIOSH approved respirator.

**SKIN PROTECTION:** Wear chemical & oil impervious gloves. Always wash hands thoroughly after use. Use full protective equipment normally used in welding/brazing operations so as to prevent skin contact.

**VENTILATION:** Use enough general ventilation and local exhaust at the work site to keep all fumes and dust from the workers breathing zone and the general area. Train welder to keep his/her face away from the fume/dust plume.

**EYE PROTECTION:** Wear chemical tight goggles. Do not wear contact lenses. Wear face shield with appropriate filter lens recommended for the specific welding operation.

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## SECTION 10: CHEMICAL HAZARDS INFORMATION

(See Section 2 for the OSHA/ACGIH exposure limits,

**CHLORIDE COMPOUNDS:** (Zinc Chloride and Generally Not Listed - Calcium Chloride, Sodium Chloride, etc.) Overexposure may cause severe irritation or burns of the eyes and skin. Chloride compounds will form strong acids in the presence of water and may give off HCL gas in fire. Ingestion may cause nausea.

**ETHYL ACETATE:** Can affect the body if inhaled, ingested or if it comes in contact with the eyes or skin. Short term overexposure may cause irritation of the eyes, nose or throat. Severe overexposure may cause weakness, drowsiness and unconsciousness. Prolonged skin contact may cause irritation.

**ETHYL ALCOHOL:** (Ethanol, denatured Ethy Alcohol) Warning - Flammable! Keep away from sparks, flame and heat. Use adequate ventilation. High vapor concentration may cause upper respiratory tract irritation and narcosis. Liquid and vapor contact can cause eye irritation.

**ETHYLENE GLYCOL:** (Regular) Can affect the body if contact with eyes, open skin wounds, or if ingested. Single does oral toxicity is moderate. Excessive ingestion may cause central nervous system effects, pulmonary and kidney effects, serious injury or even death. Inhalation of vapors may cause respiratory irritation. Ethylene Glycol is present in small percentages by weight of E+C fluxes and should pose very little problems to the welder if proper ventilation procedures are used.

**HYDROCHLORIC ACID:** WARNING - STRONG ACID - HANDLE WITH CARE! CAUTION - Contact with common metals, produces hydrogen, which forms explosive mixtures in air. HCL in fluxes is a reagent grade 36 - 38%, balance water. Corrosive liquid may cause permanent visual and tissue damage. Use chemical goggles, gloves, and proper clothing. Excessive inhalation may cause pulmonary edema, circulatory failure, respiratory system failure, and collapse. If ingested, may be fatal, severe burns to the mouth, throat and stomach, nausea, vomiting. NFPA/HMIS 300.

**METHANOL:** (Methyl Alcohol: WARNING - FLAMMABLE!) Harmful if swallowed. Skin contact and vapors reaching the eyes can cause irritation. Swallowing or breathing high concentrations may produce headaches, nausea, weakness, drowsiness, vomiting, drunkenness, blurred vision, blindness or death. Prolonged repeated exposure can cause digestive disturbances and failure of vision, liver and kidneys.

**MINERAL OIL:** (As mist - petroleum based lubricants) Inhalation of large amounts of mineral oil mist may cause adverse respiratory affects. May cause pulmonary effects. Prolonged skin exposure may cause a dermatitis. Not known to be an eye irritant.

**NAPHTHA:** (Coar Tar: WARNING - FLAMMABLE!) Keep away from heat and ignition sources. Short term overexposure to Naphtha can cause light-headedness, drowsiness, and unconsciousness. It may also cause mild irritation of the eyes, nose and skin. May cause exacerbation of respiratory disease symptoms due to increased irritation. Coal tar naphtha is a non-uniform mixture of aromatic hydrocarbons and may contain benzene.

**NITRIC ACID:** WARNING! - STRONG ACID CORROSIVE - Handle with care! - CAUTION - Contact with common metals, produces hydrogen, which forms explosive mixtures in air. Nitrogen oxides may be given off when burned. Corrosive liquid - may cause permanent visual and tissue burn damage. Use chemical goggles, gloves, and proper clothing. Excessive inhalation may cause pulmonary edema, circulatory failure, respiratory system failure, and collapse. If ingested, may be fatal, severe burns to the mouth, throat and stomach, nausea, vomiting. NFPA/HMIS 300.

**STARCH:** (Pregelatinized, chemically modified potato starch) Completely biodegradable. Allowed to be used in the food packaging industry as 21 CFR 178.3520 Industrial Starch, Modified. Avoid heat and flames. Products of combustion may be hazardous. Treat as nuisance dust. Used only in E+C EXFLUX 1005 Flux remover.

**SULFURIC ACID:** WARNING! STRING ACID CORROSIVE - HANDLE WITH CARE! CAUTION - Contact with common metals, produces hydrogen, which forms explosive mixtures in air. A violent exothermic reaction occurs with water. Sulfur dioxides may be given off when burned. Corrosive Liquid - may cause permanent visual and tissue burn damage. Use chemical goggles, gloves, and proper clothing. Excessive inhalation may cause pulmonary edema, circulatory failure, respiratory system failure, and collapse. If ingested, may be fatal, severe burns to the mouth, throat and stomach, nausea, vomiting. NFPA/HMIS 302.

**TALC, Non asbestos:** (Soapstone, Magnesium Silicate Hydrate) Normally treated as a nuisance dust. Can affect the body if inhaled or contact with eyes. Repeated inhalation of talc dust may cause scarring of the lungs and shortness of breath, chronic cough, and heart failure.

**VEE-GUM:** (Magnesium Aluminum Silicate, Hydrated) Hazardous ingredients are crystalline silica present 2 - 4% by weight VEE-GUM amount. Because of VEE-GUM hydrated form, little or no release of silica is expected unless the application involves further grinding. See Silica for details.

**VM&P NAPHTHA:** (Petroleum Solvent: Warning - FLAMMABLE!) Clear water like liquid with bland petroleum odor. Contains approx. 87% wt of C7-C8 saturated hydrocarbons, 5% Toluene, 6% Xylene, and 2% Ethylbenzine (see Section 2). Keep product away from ignition sources. Flammable limits in air 0.9% - 7%. High vapor concentrations are irritating to the eyes and respiratory tract and may cause headaches, dizziness, unconsciousness, and other central nervous system effects, including death.