



MSDS NO: HB-CE
REVISED: SEPTEMBER 1992
CH-4324

MATERIAL SAFETY DATA SHEET

For U.S. Manufactured Welding Consumables and Related products

May be used to comply with OSHA's Hazard Communication Standard, 29 CFR 1910.1200 and Superfund Amendments and Reauthorization Act (SARA) of 1986 Public Law 99-499. Standard must be consulted for specific requirements.

SECTION 1 - IDENTIFICATION

Manufacturer/Supplier Name:	HOBART BROTHERS COMPANY	Telephone No: (513) 332-4000
Address:	600 WEST MAIN STREET, TROY, OH 45373	Emergency No: (513) 332-4000
Trade Name For:	"GROUP A": 60AP, 335A, 335C, 12, 12A, 447A, 447C, 14A, 24, 728, 1139, 7024-1 & PRIMAFIXE	Classification: AWS A5.1
Trade Name For:	"GROUP B": 18, 418, 718, 718MC, 18AC, 418SR, 716, 718C & 718MC-1	Classification: AWS A5.1
Trade Name For:	"GROUP C": 70AP, 80AP, 90AP, HOBALLOY 8018CL, C2, C3 CONTAIN NO CHROMIUM	Classification: A5.5 Low Alloy
	8018B2, B2L, 9018B3, B3L CONTAIN NO NICKEL	
	7018A1, 10018D2 CONTAIN NO CHROMIUM AND NICKEL	
	9018M, 10018M, 11018M, 12018M & 10018M1	
Product Type For:	"GROUP A" SHIELDED METAL ARC WELDING (SMAW) CARBON STEEL	
Product Type For:	"GROUP B" SHIELDED METAL ARC WELDING (SMAW) LOW HYDROGEN CARBON STEEL	
Product Type For:	"GROUP C" SHIELDED METAL ARC WELDING (SMAW) LOW HYDROGEN, LOW ALLOY STEEL	

SECTION 2 - HAZARDOUS MATERIALS

IMPORTANT

This section covers the materials from which this product is manufactured. The fumes and gases produced during welding with normal use of this product are covered by Section 5. The term "hazardous" in "Hazardous Materials" should be interpreted as a term required and defined in OSHA Hazard Communication Standard (29 CFR Part 1910.1200). The chemicals or compounds reportable by Section 313 of SARA are marked by the symbol $\#$.

GROUP A

INGREDIENT	%WEIGHT	CAS NO.	EXPOSURE LIMIT (mg/m ³)	
			OSHA PEL	ACGIH TLV
IRON ⁺	70-90	7439-89-6	5 R [*]	10
MANGANESE	1-6	7439-96-5	5 CL ^{**} (Dust)	5 (Dust)
TITANIUM DIOXIDE	2-10	13463-67-7	5 R [*]	10
POTASSIUM SILICATE	<5	1312-76-1	Nothing Found	Nothing Found
SODIUM SILICATE	3-15	1344-09-8	Nothing Found	Nothing Found

GROUP B

INGREDIENT	%WEIGHT	CAS NO.	EXPOSURE LIMIT (mg/m ³)	
			OSHA PEL	ACGIH TLV
IRON ⁺	70-90	7439-89-6	5 R [*]	10
MANGANESE	<2	7439-96-5	5 CL ^{**} (Dust)	5 (Dust)
TITANIUM DIOXIDE	<5	13463-67-7	5 R [*]	10
POTASSIUM SILICATE	2-6	1312-76-1	Nothing Found	Nothing Found
SODIUM SILICATE	1-4	1344-09-8	Nothing Found	Nothing Found
FLUORSPAR	1-8	7789-75-5	2.5 (as F)	2.5 (as F)

GROUP C

INGREDIENT	%WEIGHT	CAS NO.	EXPOSURE LIMIT (mg/m ³)	
			OSHA PEL	ACGIH TLV
IRON ⁺	70-90	7439-89-6	5 R [*]	10
MANGANESE	<2	7439-96-5	5 CL ^{**} (Dust)	5 (Dust)
TITANIUM DIOXIDE	<5	13463-67-7	5 R [*]	10
POTASSIUM SILICATE	2-6	1312-76-1	Nothing Found	Nothing Found
SODIUM SILICATE	1-4	1344-09-8	Nothing Found	Nothing Found
FLUORSPAR	1-8	7789-75-5	2.5 (as F)	2.5 (as F)
NICKEL	<2	7440-02-0	1	1 ^{***}
CHROMIUM	<2	7440-47-3	1	0.5
MOLYBDENUM	<1	7439-98-7	5 R [*]	10

+ - As A Nuisance Particulate

* - Respirable Fraction.

$\#$ - Reportable material under Section 313 of SARA.

** - Ceiling Limit.

*** - (1991-1992 ACGIH listed under Notice of Intended Changes as AI - Confirmed Human Carcinogen. Limits of 0.05 mg/m³ are proposed and should be considered as trial limits.)

SECTION 3 - PHYSICAL/CHEMICAL CHARACTERISTICS

Not Applicable

SECTION 4 - FIRE AND EXPLOSION HAZARD DATA

Welding consumables applicable to this sheet as shipped are nonreactive, nonflammable, nonexplosive and essentially nonhazardous until welded. Welding arcs and sparks can ignite combustibles and flammable products. See American National Standard Z49.1 referenced in Section 7.

SECTION 5 - REACTIVITY DATA

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, procedures 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 zinc, 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).

When the electrode is consumed, 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 from the base metal and coating, etc., as noted above.

It is understood, however, that the elements and/or oxides to be mentioned are virtually always present as complex oxides and not as metals. (Characterization of Arc Welding Fume: American Welding Society.) The elements or oxides listed below correspond to the ACGIH categories located in TLV (Threshold Limit Values for Chemical Substances and Physical Agents in the Workroom Environment).

Reasonably expected constituents of the fume would include: Primarily complex oxides of iron; secondarily complex oxides of manganese, silicon and titanium. Groups B and C may have fluorides present. Group C may also contain chromium and chromium (VI) compounds, nickel and nickel compounds, and molybdenum compounds.

GROUP A

INGREDIENT	CAS NO.	EXPOSURE LIMIT (mg/m ³)	
		OSHA PEL	ACGIH TLV
IRON OXIDE	1309-37-1	10 (as Fe)	5 (as Fe)
MANGANESE	7439-96-5	1,3 STEL****	1,3 STEL
TITANIUM DIOXIDE	13463-67-7	5 R	10
SILICA (AMORPHOUS)	60676-86-0	0,1 R	0,1 R

GROUP B

INGREDIENT	CAS NO.	EXPOSURE LIMIT (mg/m ³)	
		OSHA PEL	ACGIH TLV
IRON OXIDE	1309-37-1	10 (as Fe)	5 (as Fe)
MANGANESE	7439-96-5	1,3 STEL****	1,3 STEL
TITANIUM DIOXIDE	13463-67-7	5 R	10
SILICA (AMORPHOUS)	60676-86-0	0,1 R	0,1 R
FLUORIDES	-----	2,5 (as F)	2,5 (as F)

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GROUP C

INGREDIENT	CAS NO.	EXPOSURE LIMIT (mg/m ³)	
		OSHA PEL	ACGIH TLV
IRON OXIDE	1309-37-1	10 (as Fe)	5 (as Fe)
MANGANESE	7439-96-5	1,3 STEL****	1,3 STEL
TITANIUM DIOXIDE	13463-67-7	5 R	10
SILICA (AMORPHOUS)	60676-86-0	0.1 R	0.1 R
FLUORIDES	—	2.5 (as F)	2.5 (as F)
NICKEL SOLUBLE	—	0.1 (as Ni)	0.1 (as Ni)
NICKEL COMPOUNDS	—	1 (as Ni)	1 (as Ni)
CHROMIUM OXIDE (as Cr(II),Cr(III))	—	0.5 (as Cr(II),Cr(III))	0.5 (as Cr(II),Cr(III))
CHROMIUM (Insoluble, as Cr(VI))	—	0.1 CL (as Cr(VI))	0.05, A1* (as Cr(VI))
MOLYBDENUM	7439-98-7	5 R	10

**** - STEL-Short Term Exposure Limit

*A1 - Confirmed Human Carcinogen.

Gaseous reaction products may include carbon monoxide and carbon dioxide. Ozone and nitrogen oxides may be formed by the radiation from the arc. 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 welder's helmet if worn or in the worker'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.] At a minimum, materials listed in this section should be analyzed.

SECTION 6 - HEALTH HAZARD DATA

Permissible Exposure Limit and Threshold Limit Value:

The exposure limit for welding fume has been established at 5mg/m³ with OSHA's PEL and ACGIH's TLV. See Section 5 for specific fume constituents which may modify the PEL and TLV.

Effects of Overexposure

Electric arc welding may create one or more of the following health hazards:

ARC RAYS can injure eyes and burn skin.

ELECTRIC SHOCK can kill. See Section 7.

FUMES AND GASES can be dangerous to your health.

PRIMARY ROUTES OF ENTRY are the respiratory system, eyes and/or skin.

SHORT-TERM (ACUTE) OVEREXPOSURE EFFECTS:

WELDING FUMES - May result in discomfort such as dizziness, nausea or dryness or irritation of nose, throat or eyes.

IRON OXIDE - None are known. Treat as nuisance dust or fume.

MANGANESE - Metal fume fever characterized by chills, fever, upset stomach, vomiting, irritation of the throat and aching of body. Recovery is generally complete within 48 hours of the overexposure.

TITANIUM DIOXIDE - Irritation of respiratory system.

SILICA (AMORPHOUS) - Dust and fumes may cause irritation of the respiratory system, skin and eyes.

FLUORIDES - Fluoride compounds evolved may cause skin and eye burns, pulmonary edema and bronchitis.

NICKEL, NICKEL COMPOUNDS - Metallic taste, nausea, tightness in chest, metal fume fever, allergic reaction.

CHROMIUM - Inhalation of fume with chromium (VI) compounds can cause irritation of the respiratory tract, lung damage and asthma-like symptoms. Swallowing chromium (VI) salts can cause severe injury or death. Dust on skin can form ulcers. Eyes may be burned by chromium (VI) compounds. Allergic reactions may occur in some people.

MOLYBDENUM - Irritation of the eyes, nose and throat.

LONG TERM (CHRONIC) OVEREXPOSURE EFFECTS:

HOBBART BROTHERS COMPANY believes this data to be accurate and to reflect qualified expert opinion regarding current research. However, HOBBART BROTHERS COMPANY cannot make any express or implied warranty as to this information.

ANSI Z49.1 The American Welding Society, P.O. Box 351040, Miami, FL 33135 - OSHA (29 CFR 1910) U.S. Department of Labor, Washington, DC 20210.

material does not create exposures which exceed PEL/TLV. Always use exhaust ventilation. Refer to the following sources for important additional information.

SPECIAL PRECAUTIONS: IMPORTANT: Maintain exposure below the PEL/TLV. Use industrial hygiene monitoring to ensure that your use of this equipment is acceptable manner, in full compliance with Federal, State and Local regulations.

WASTE DISPOSAL: Prevent waste from contaminating surrounding environment. Discard any product, residue, disposable container or liner in an environmentally acceptable manner.

PROCEDURE FOR CLEANUP OF SPILLS OR LEAKS: Not applicable

at dark non-reflective clothing. Train the welder not to touch live electrical parts and to insulate himself from work and ground.

249.1. At a minimum this includes welder's gloves and body protection which help to prevent injury from radiation, sparks and electrical shock. See ANSI Z49.1. As a minimum use face shield, protective face shield, and may include arm protectors, aprons, hats, shoulder protection as well as eye protection. Wear helmet or use face shield with filter lens. As a rule of thumb begin with Shade Number 14. Adjust if needed by selecting the next lighter and/or darker shade number. Provide protective screens and flash goggles, if necessary, to shield others.

EYE PROTECTION: Wear helmet or use face shield with filter lens. As a rule of thumb begin with Shade Number 14. Adjust if needed by selecting the next lighter and/or darker shade number. Provide protective screens and flash goggles, if necessary, to shield others.

RESPIRATORY PROTECTION: Use NIOSH approved or equivalent fume respirator or air supplied respirator when welding in confined space or where local exhaust or ventilation does not keep exposure below PEL/TLV.

and the general area. Train the welder to keep his head out of the fumes.

VENTILATION: Use enough ventilation, local exhaust at the arc or both, to keep the fumes and gases below PEL/TLV in the worker's breathing zone.

Government Printing Office, Washington, DC 20402 for more detail on any of the following.

Read and understand the manufacturer's instructions and the precautionary label on the product. See American National Standard Z49.1: Safety in Welding and Cutting published by the American Welding Society, P.O. Box 351040, Miami, FL 33135 and OSHA Publication 2206 (29 CFR 1910), U.S. Government Printing Office, Washington, DC 20402 for more detail on any of the following.

SECTION 7 - PRECAUTIONS FOR SAFE HANDLING & USE/APPLICABLE CONTROL MEASURES

compounds and hexavalent chromium (Cr VI) are listed under Proposition 65. This product contains chemicals which are known to the State of California to cause cancer. Nickel, certain nickel compounds and hexavalent chromium (Cr VI) may be generated during welding.

CARCINOGENICITY

Nickel, chromium (with the exception of metallic chromium and chromium (III)) must be considered as carcinogens under OSHA (29 CFR 1910.1200).

Eyes & Skin: If irritation or flash burns develop after exposure, consult a physician.

EMERGENCY AND FIRST AID PROCEDURES

Call for medical aid. Employ first aid techniques recommended by the American Red Cross.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Persons with pre-existing impaired lung functions (asthma-like conditions).

NICKEL, NICKEL COMPOUNDS: Prolonged overexposure may result in loss of appetite, weight loss, loss of muscle coordination, difficulty in breathing and anemia. (VI) compounds.

CHROMIUM: Ulceration and perforation of nasal septum. Respiratory irritation may occur with symptoms resembling asthma. Studies have shown that chromium production workers exposed to hexavalent chromium (III) compounds. Good practice requires the reduction of employee exposure to chromium (III) compounds.

NICKEL, NICKEL COMPOUNDS: Lung fibrosis or pneumoconiosis. Studies of nickel refinery workers indicated a higher incidence of lung and nasal cancers.

SILICA (AMORPHOUS): Research indicates that silica is present in welding fume in the amorphous form. Long term overexposure will cause pneumoconiosis. Noncrystalline forms of silica (amorphous silica) are considered to have little fibrotic potential.

TITANIUM DIOXIDE: Pulmonary irritation and slight fibrosis.

IRON, IRON OXIDE FUMES: Can cause siderosis (deposits of iron in lungs) which some researchers believe may affect pulmonary function. Lungs will clear in time when exposure to iron fumes and its compounds ceases. Iron and magnetite (Fe₃O₄) are not regarded as fibrogenic materials. Lungs disease. Behavioral changes and changes in handwriting may also appear. Employees overexposed to manganese compounds should receive quarterly medical examinations for early detection of manganism.

WELDING FUMES: Excess levels may cause bronchial asthma, lung fibrosis, pneumoconiosis or "siderosis."