MATERIAL SAFETY DATA SHEET

SECTION I ♦ PRODUCT IDENTIFICATION

Product Type: NICKEL Alloy coated and bare electrodes (SMAW) for hardfacing.

Product Name: Rannik 40 | Rannik 50 | Rannik 60 | Rannik 99 coated

Specification: AWS 5.13
RNiCr-A | RNiCr-B | RNiCr-C | ENi-Ci

Manufacturer:
Rankin Industries, Inc.
8745 Production Ave. San Diego, CA 92121-2261
Telephone: 858/684-5000 Toll Free: 800/854-2159
FAX: 858/684-5008

SECTION II ♦ HAZARDOUS INGREDIENTS

IMPORTANT: This section covers the materials from which these products are manufactured. The fumes and gases produced when welding with normal use of these products are covered in Section V.

Hazardous Compounds	Cas No.	OHSA PEL mg/m^3	ACGIH TL V mg/m^3	Carcinogenicity	Weight %
Titanium Dioxide	13463-67-7	15	10 (20STEL)	0	0 - 5
Boron	1303-96-4	1	5	0	0 - 10
Manganese	7439-96-5	5 CLG	5 CLG	0	0 - 1
Silicon	7440-21-3	5	10	0	0 – 5
Tungsten	7440-33-7	None	5 (10 STEL)	0	0 – 3
Chromium	7440-47-3	1	0.5	Positive	0 – 20
Nickel	7440-02-0	1	1	Positive	Balance
Molybdenum	7439-98-7	15	10	0	0 – 4
Graphite	7781-75-5	NONE	15mppcf	0	0 – 15
Fluoride	7789-75-5	3	2.5 as F	0	0 – 2
Carbon	7440-44-0	NONE	15 mppcf	0	0 – 2
Iron	7439-89-6	10	5	0	0 -10
Cobalt	7740-48-4	0.05	0.05	0	0 -5

CLG: Ceiling Limit
STEL: Short Tem Exposure Limit

SECTION III ♦ PHYSICAL DATA

FORM: Coated Electrode MELTING POINT: 2150-2710 F COLOR: Gray metallic

SECTION IV ♦ FIRE AND EXPLOSION HAZARD DATA

(Nonflammable) Welding arc and sparks can ignite combustibles and flammables. Refer to American National Standard Z49.1, for fire prevention during the use of welding and allied procedures.

NFPA NUMERICAL CODES: Health Hazard – 0
Fire Hazard – 1
Reactivity Hazard - 0

SECTION V ♦ REACTIVITY DATA

The term "hazardous" should be interpreted as a term required and defined in the OSHA Hazard Communications Standard (29 CFR Part 1910.1200) and does not necessarily imply the existence of any hazard. These products as shipped are stable, non hazardous, nonflammable, nonexplosive and nonreactive

Hazardous Decomposition Products

Exposure limit: Welding fumes and gases cannot be classified simply. The composition and quantity of both are dependent upon the metal being welded, the process, procedure and electrodes used. Other conditions that 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 paint, plating, or galvanizing), the number of welders and the volume of 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 II. Fume and gas decomposition products and not the ingredients in the electrode, are important. The concentration of a given fume or gas component may decrease or increase by many times the original concentration in the electrode. Also, new compounds not in the electrode may form. Decomposition products of normal operation include those originating from the volatilization, reaction, or oxidation of the material shown in Section II, plus those from the base metal and coating, etc., as noted above.

Reasonably expected fume constituents of these products would include complex oxides of iron, manganese and silicon; secondarily complex oxides of chromium, nickel, molybdenum, titanium, calcium, sodium and potassium.

The present OSHA PEL for hexavalent chromium (CR+6) is 0.05 mg/m^3 that will result in a significant reduction from the 5mg/m3 general welding fume (NOC) level. The limit of 0.05 mg/m^3 for hexavalent chromium in these electrodes comes from the limit shown in OSHA table Z-2, which is for 0.1 mg of Cr03 + which calculates to 0.05 mg of Cr+6/m^3.

OSH PEL for nickel metal and soluble compounds is 1 mg/m^3. The ACGIH TLV for nickel metal is 1 mg/m^3 and TLV for soluble compounds is 0.1 mg/m^3. These limitations will also result in a significant reduction from the 5 mg/m^3 general welding fume (NOC) level.

Gaseous reaction products may include carbon monoxide and carbon dioxide.

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 ANI/AWS FI.1 "Method for Sampling Airborne Particles Generated by Welding and Allied Processes" available from the American Welding Society, P.O. Box 351040, Miami, FL 33135.

SECTION VI ♦ HEALTH HAZARD DATA

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

FUMES AND GASES: can be dangerous to your health. COMMON ENTRY IS BY INHALATION.

SHORT TERM (ACUTE): over exposure to welding fumes may result in discomforts such as: dizziness, nausea, or dryness or irritation of nose, throat, or eyes.

Chromates present in the fume can cause irritation of the respiratory system, damage to lungs and asthma-like symptoms.

Nickel compounds in the fume can cause metallic taste nausea, tightness in the chest, fever and allergic reactions.

Fluorides can cause pulmonary edema bronchitis.

LONG TERM (CHRONIC): over exposure to welding fumes can lead to siderosis (iron deposits in the lung) and affect pulmonary function.

Long term over exposure to manganese compounds may affect the central nervous system. Symptoms include muscular weakness and tremors similar to Parkinson's disease. Behavioral changes and changes in handwriting may also appear. Employees exposed to manganese compounds should get quarterly medical examinations for early detection of manganism.

Studies have shown that production workers exposed to hexavalent chromium compounds have an increased incidence of lung cancers. Chromates may cause an ulceration and perforation of the nasal septum. Liver damage and allergic skin rash have been reported. Chromium VI compounds are required by OSHA to be considered carcinogenic.

Long term over exposure to nickel compounds may cause lung fibrosis or pneumoconiosis. Studies of nickel refinery workers indicated a higher incidence of lung and nasal cancers. Nickel and its compounds are considered as carcinogenic as required by OSHA.

Repeated over exposure to fluoride fumes may cause serious bone erosion and excessive calcification of the bones and ligaments of the ribs, pelvis and spinal column. Fluorides may also cause skin rash.

Shielding gases such as argon, helium and carbon dioxide are asphyxiates and adequate ventilation must be provided.

THRESHOLD LIMIT VALUE – The ACGIH 1985-86 recommended limit for welding fumes not otherwise classified (NOC) is 5 mg/m^3. TLV-TWA's should be used as a guide in the control of health hazards and not as fine lines between safe and dangerous concentrations. See Section V for specific fume constituents that may modify this TLV-TWA.

ARC RAYS - can injure eyes and burn skin.

HEAT RAYS – (infrared radiation from flame or hot metal) can injure eyes.

ELECTRICAL SHOCK – can kill.

NOISE – can damage hearing.

CARCINOGENICITY – Chromium and nickel and their compounds are on the IARC (International Agency for Research on Cancer) list and the NTP (National Toxicology Program) list as posing a carcinogenic risk to humans.

EMERGENCY AND FIRST AID PROCEDURES - Call for medical aid. Employ first aid techniques recommended by the American Red Cross.

WARNING: This product may contain or may produce a chemical known to the State of California to cause cancer. (California Health & Safety Code 25249.5 et seq.)

SECTION VII ♦ PRECAUTIONS FOR SAFE HANDLING AND USE/APPLICABLE CONTROL MEASURES

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 (29CFR1910). U.S. Government Printing Office, Washington, D.C. 20401 for more details on many of the following.

VENTILATION – Use enough ventilation, local exhaust at the arc, or both, to keep the fumes and gases below TLV's in the worker's breathing zone and the general area. Train the welder to keep his head out of the fumes.

RESPIRATORY PROTECTION – Use respirable fume respirator or air supplied respirator when welding in confines space or where local exhaust or ventilation does not keep exposure below TLV.

EYE PROTECTION - Wear helmet or use face shield with filter lens. As a rule of thumb, 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. Provide protective screens and flash goggles, if necessary, to shield others.

PROTECTIVE CLOTHING – Wear head, hand and body protection which help to prevent injury from radiation, sparks, and electrical shock. See ANSI Z49.1. At a minimum this includes welder's gloves and a protective face shield, and may include arm protectors, aprons, hats, shoulder protection, as well as dark substantial clothing. Train the weldor not to touch live electrical parts and to insulate himself from work and ground.

PROCEDURE FOR CLEANUP OF SPILLS OR LEAKS – Not applicable.

WASTE DISPOSAL METHOD – Prevent waste from contaminating surrounding environment. Discard any product, residue, disposable container or liner in an environmentally acceptable manner, in full compliance with federal, state and local regulations.

The information herein is supplied in good faith, but no warranties are expressed or implied.

For further information contact: Director of Quality
Rankin Industries, Inc.
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San Diego, CA 92121-2261

SECTION VIII ♦ DEFINITIONS

858/684-5000 Toll Free 800/854-2159 Fax 858/684-5008

CAS No.	Chemical Abstracts Service Number
OSHA	U.S. Department of Labor, Occupational Safety and Health Administration
PEL	Permissible Exposure Level (1983)
ACGIH	American Conference of Governmental Industrial Hygienists
TLV	Threshold Limit Value (1987-88)
TWA	Time Weighted Average
STEL	Short Term Exposure Limit
CLG	Ceiling Limit
NOC	Not Otherwise Classified
IARC	International Agency for Research on Cancer

NTP	National Toxicology Program

Revised August 22, 2006