

**Section 1: Identification**

Product Name:	<b>VERSAlloy® 40, VERSAlloy 50, VERSAlloy 55 and VERSAlloy 60 Rods</b>		
Issue Date:	July 1, 2001		
Revision Date:	April 28, 2015 (supersedes all previous issues)		
Synonyms:	AWS A5.13-80 NiCr-A, NiCr-B, NiCr-C		
CAS Number(s):	See section 3		
Product Usage:	VERSAlloy® Hardfacing Rods		
Manufacturer:	<b>Rankin Industries / PMA Division</b> <b>400 S. Rockefeller Ave.</b> <b>Ontario, CA 91761 USA</b>	<b>Phone:</b> <b>Fax:</b> <b>E-Mail:</b> <b>Web Site:</b>	<b>909-483-3222</b> <b>909-483-3233</b> <a href="mailto:sales@rankin.com">sales@rankin.com</a> <a href="http://www.broco-rankin.com">www.broco-rankin.com</a>
Transportation Emergency Number:	Emergency Response & Training Solutions 1-800-924-6804 1-440-349-2700 CIN #: 3730		

**Section 2: Hazard(s) Identification**

**Possible Health Effects:** The alloys in solid form are generally not considered hazardous; however, if the material is in powder form or your process involves grinding, melting, welding, cutting, or other processes that causes a release of dust or fume, then hazardous levels of dust or fume of constituents of these alloys can create a health risk. Electric arc welding or oxy fuel welding may create one or more of the following health hazards:

**Fumes & Gases:** Can be dangerous to your health. COMMON ENTRY IS BY INHALATION.

**Short Term (acute):** Overexposure to welding fumes may result in discomfort such as dizziness, nausea, 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.

**Long Term (chronic):** overexposure to welding fumes can lead to Siderosis (iron deposits in the lungs) and affect pulmonary function.

Chromium VI compounds are required by OSHA to be considered carcinogenic. Long term exposure to Chromium and Chromium III Oxide dust can cause scaling, redness, itchiness, and a burning sensation on the skin.

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

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

**Arc Rays:** Can injure eyes and burn skin.

**Heat Rays:** (Infrared radiation from flame or hot metal) can injure eyes.

**Electroic Shock:** Can kill.

**Noise:** Can damage hearing.

**Carcinogenicity:** Chromium, nickel, cobalt, and their components are on the IARC and NTP lists as posing a carcinogenic risk to humans.

### Section 3: Composition / Information on Ingredients

Components of mixture*	CAS Number	Weight percentage**
Nickel	7440-02-0	70 – 86
Chromium	7440-47-3	6 – 16
Boron	7440-42-8	1 – 4
Iron	7439-89-6	2 – 5
Silicon	7440-21-3	1 – 5

\*This material is a homogenous metallic alloy of the components listed above.

\*\*This is a general reporting range and is not a product specification.

**Exposure limits:** See Section 8.

### Section 4: First Aid Measures

Exposure Route	Acute	Chronic (delayed)
<b>Eye contact</b>	Eye irritation. Flush with water for 15 minutes or until all particles are removed.	If irritation persists, seek medical attention.
<b>Skin contact</b>	Itching, irritation or rash. Remove contaminated clothing. Wash skin with mild soap and water.	If irritation or rash persists, seek medical attention.
<b>Inhalation</b>	Difficulty breathing, coughing, metal fume fever. Remove exposed person to fresh air. If not breathing administer CPR.	If symptoms persist seek medical attention.
<b>Ingestion</b>	Rinse mouth. If large amount, induce vomiting. Seek medical advice.	Seek medical attention.

**Never give anything by mouth to an unconscious person. Treat symptomatically and supportively. Call for medical aid. Employ first aid techniques recommended by the American Red Cross.**

### Section 5: Firefighting Measures

**Flash Point:** Not applicable for solid alloys.

**Flammable Limits:** Not applicable for solid alloys. These metal alloys are noncombustible under normal circumstances. Fine powders or dusts produced upon grinding, and cutting of certain metals can produce fire and explosion hazards, under special conditions. Do not create dust clouds.

**Extinguishing Media:** Dry Chemical or sand. Do not use water on metal dust fire.

**Special Fire Fighting Procedures:** Self-contained breathing apparatus should be worn when fighting metal dust fires.

**Unusual Fire and Explosion Hazards:** May occur with certain metal dust fires.

### Section 6: Accidental Release Measures

Metal scrap should be picked up using normal procedures, avoiding contact with sharp edges. Metal particulates, shavings, powders and granules should be cleaned up. Use a wet, sweeping action, taking care to avoid creating dust. Vacuum only with HEPA filtered equipment. Do not use compressed air for clean-up. Some fine metal powders may ignite or explode under specific conditions. Trained personnel using pre-planned procedures should respond to uncontrolled releases. Proper protective equipment should be used. In case of a spill, clear the affected area, protect people, and respond with trained personnel. For exposure to particulate levels above regulated levels, use rubber or nitrile gloves, chemically resistant suit and boots, and air purifying respirator with a HEPA filter. Sweep-up the spilled solid and place all spill residues in a double plastic bag and seal.

## Section 7: Handling and Storage

- Use enough ventilation, local exhaust at the arc, or both, to keep 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.
- Use respirable fume respirator or air supplied when welding in confined space or where local exhaust or ventilation does not keep exposure below TLV.
- Wear helmets 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.
- Wear head, hand and body protection which helps 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 welder not to touch live electrical parts and to insulate himself from work and ground.
- Not a shelf life limited material.

## Section 8: Exposure Controls / Personal Protection

### Exposure Limits:

Components of mixture	CAS Number	OSHA PEL mg/m <sup>3</sup>	ACGIH TLV mg/m <sup>3</sup>
<b>Nickel</b>	7440-02-0	1.0	1.5
<b>Chromium</b>	7440-47-3	1.0	0.5
<b>Boron</b>	7440-42-8	15.0 (5.0 respirable)	10.0 as boron oxide
<b>Iron</b>	7439-89-6	10.0 as oxide fume	5.0 as respirable oxide
<b>Silicon</b>	7440-21-3	15.0 (5.0 respirable)	10.0

### Engineering Controls:

- Local exhaust ventilation may be necessary to control air contaminants to their exposure limits.
- Provide mechanical ventilation for confined spaces or if method of use warrants.

### Personal Protective Equipment:

- Gloves – work gloves or non-permeable gloves such as vinyl or latex.
- Eyes – safety glasses/goggles or face shield.
- Clothing – Cover-all, lab coat or normal work clothing.
- Respirator – NIOSH N-95 or N-100 filtering face-piece (dusk mask) or equivalent alternative is recommended for up to 10 times the exposure limits.

## Section 9: Physical and Chemical Properties

Physical State	Bare grey/metallic rod
Odor	Not applicable
Odor Threshold	Not applicable
PH	Not applicable
Melting Point / Freezing Point	1900°F - 2000°F
Boiling Point	Not determined
Flash Point	Not determined
Evaporation Rate (butyl acetate = 1)	None
Flammability	Non-flammable
LFL (LEL) lower flammability (explosive) limit	Not applicable
UFL (UEL) upper flammability (explosive) limit	Not applicable
Vapor Pressure	Not applicable
Vapor Density	Not applicable
Specific Gravity (Bulk Density)	~3.2 – 4.1
Solubility	Not soluble
Partition Coefficient (n-octanol/water)	Not determined
Autoignition Temperature	Not available
Decomposition Temperature	Not available
% VOC's	0%

## Section 10: Stability and Reactivity

- **Chemical Stability:** This material is stable.
- **Possibility of Hazardous Reactions:** Hazardous polymerization will not occur.
- **Conditions to Avoid:** None
- **Incompatible Materials:** Strong acids and/or oxidizers.
- **Hazardous Decomposition Products:** Intense heat may produce carbon monoxide and/or carbon dioxide and oxidizing conditions may produce oxides of the ingredients shown in Section 3. Oxides of these ingredients may be carcinogenic.

## Section 11: Toxicological Information

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, 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  $5 \text{ mg/m}^3$ . 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.

**\*This product contains a chemical known to the State of California to cause cancer.**

## Section 12: Ecological Information

- **Aquatic Toxicity:** Acute – None, Chronic – GHS Category 4

### Section 13: Disposal Consideration

- Material should be recycled to reclaim scrap metal value.
- If recycling is not possible, dispose of in accordance with local, state, and federal regulations for industrial wastes of this form.

### Section 14: Transport Information

DOT Classification	Not regulated unless greater than 100 lbs. per inner container.
UN Identification Number	Not regulated unless greater than 100 lbs. per inner container.
DOT Shipping Description	Not applicable unless greater than 100 lbs. per inner container.

### Section 15: Regulatory Information

Toxic Substances Control Act (TSCA)	All ingredients are listed on the TSCA inventory of chemical substances.
Superfund Amendments & Reauthorization Act (SARA)	This product contains Nickel and Chromium.
Resource Conservation & Recovery Act (RCRA)	This material is not a hazardous waste. It is Recyclable.
RoHS & REACH	None


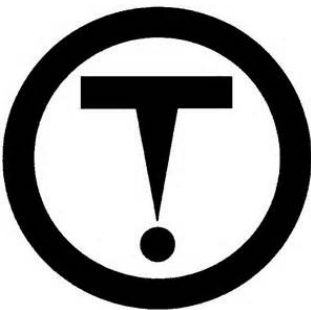
#### Hazard Codifications & Labeling Requirements

- H317 – May cause an allergic skin reaction (nickel).
- H351 – Suspected of causing cancer (nickel, chromium).
- H370 – Target organ (acute), respiratory apparatus, kidney.
- H372 – Target organ (chronic), respiratory apparatus.

### Section 16: Other Information

<b>NFPA Numbers (estimated)</b>	<b>Health: 1</b>	<b>Flammability: 0</b>	<b>Reactivity: 0</b>
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**WHMIS Category: Class D, Division 2: Nickel and Chromium**



The information supplied herein follows the guidelines of WHMIS, GHS, OSHA Hazard Communication Standard 29 CFR 1910.1200 and California Proposition 65, to the best of our knowledge, is accurate and complete. The recommended hygiene and handling practices are believed to be appropriate for the use of this material. However, it is up to the end user to review this information and establish their own procedures and guidelines, based upon their particular application(s). Rankin Industries assumes no responsibility for damage or injury resulting from the end use of this product.