

## TOOL STEELS

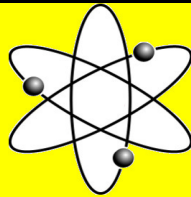
### Vulcan 999-HW

Universal Hot Work Tool Steel Electrode



<b>Type of Wire:</b>	Hot Work
<b>Description:</b>	Universal shock-resistant tool steel welding alloy designed to deposit dense, porous-free chromium-tungsten-molybdenum weld deposits. Responds well to hot work treatment and retains hardness up to 1000 degrees F.
<b>Typical Applications:</b>	Wide range of tool steel applications where no subsequent heat treatment is required including coldshears, header discs, blanking and bending discs, trim dies, punches, and sledge hammer faces.
<b>Procedures:</b>	Clean area of any slag, scale, rust, or drawing compounds. Preheat die blocks and other units where the entire working surface is to be welded to 800 degrees F. On other alloys, preheat and post-heat according to the base metal. Maintain temperature during welding. Hold electrode on a slight angle in the direction of travel and maintain a short arc gap. Use the stringer bead technique. Peen at the weld when hot to relieve stress. After welding, cool in still air to 300 degrees F. Post-heat at 1000 degrees F, holding at temperature at one hour per inch of thickness. Cool in still air to room temperature.
<b>Specs:</b>	<b>Hardness</b> <span style="float: right;">52 to 57 RC</span>
<b>Current/ Amperage For Each Size:</b>	<b>3/32" Dia.</b> 60-80 amps AC/DCEP (electrode +) <b>1/8" Dia.</b> 80-125 amps AC/DCEP (electrode +) <b>5/32" Dia.</b> 125-175 amps AC/DCEP (electrode +)
<b>Warnings:</b>	<b>Fumes and gases can be dangerous to your health. Arc rays can injure eyes and burn skin. Electric shock can kill. See "American National Standard Z49.1 <u>Safety to Welding and Cutting.</u>"</b>

**Manufactured by:**



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MATERIAL SAFETY DATA SHEET

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SECTION 1 – IDENTIFICATION

Trade Name: Vulcan 999-HW Manufacturer: Vulcan Systems, LLC
Emergency Telephone. No: (989)739-8050 5740 F-41, Oscoda, MI 48750

SECTION 2 – HAZARDOUS INGREDIENTS

This section covers the material from which this product is manufactured. The term "hazardous ingredients" should be interpreted as a term required and defined in OSHA hazard communication standard. This product contains toxic chemicals subject to the reporting requirements of section 313 of title III of SARA and CFR part 372.

Table with 5 columns: INGREDIENT, CASE NO., OSHA Permissible Exposure Limit (PEL), ACGIH Threshold Limit Value (TLV), and %. Rows include CARBON, MANGANESE, SILICON, CHROMIUM, MOLYBDENUM, TUNGSTEN, IRON, and VANADIUM.

SECTION 3 – PHYSICAL AND CHEMICAL CHARACTERISTICS

Material is solid steel rod with chemical and alloy coating. No hazard exists until this product is used in welding.

SECTION 4 – FIRE AND CHEMICAL CHARACTERISTICS

Non-flammable. Welding arc and sparks can ignite combustible and flammable products. Refer to the Canadian standard "Safety in Welding and Cutting and Allied Procedures" for fire prevention and protection information during the use of welding and allied procedure. Extinguishing Media – Co2 or Dry Chemical Extinguisher.

SECTION 5 – HAZARDOUS DECOMPOSITION PRODUCTS

Welding fumes cannot be classified simply. The composition and quantity of both are dependent on the metal being welded, the process, procedures, and electrodes used. Other conditions which also influence the composition and quality of the fumes and gases to which workers may be exposed include coating on the metal being welded (such as paint, plating, or galvanizing), the number of welders, 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, and presence of contaminants in the atmosphere (ie, chlorinated hydrocarbon vapors from cleaning & degreasing activities).

SECTION 6 – HEALTH HAZARD

The international agency for research on cancer (IARC) has indicated that nickel and certain nickel compounds are probably carcinogenic for humans, but that the specified compounds which may be carcinogenic cannot be specified precisely. Chromium has also been listed by IARC because of "sufficient evidence for the carcinogenicity of chromium and certain chromium compounds."

Route of entry - primarily the respiratory system, eyes and skin.

Effects of acute exposure - Short term overexposure to welding fumes may result in discomfort such as dizziness, nausea, or dryness or irritation of nose, throat, lungs, or eyes. (see section 5&7)

Effects of chronic exposure - Long term over exposure to welding fumes can result in chronic respiratory problems, iron build up in the lungs, bone erosion, reduced pulmonary functions and nervous disorders.

Irritancy of products - Aggravation of pre-existing respiratory of allergenic conditions may occur in some workers even if the concentration of the fume is maintained below the recommended limits. Some studies have shown a higher level of lung related problems among older welders who smoked than those who did not smoke.

Carcinogenicity - Nickel and chromium must be considered possible carcinogens under OSHA (29cfr19410.1200).

SECTION 7 – PRECAUTIONS FOR SAFE HANDLING AND USE

Read and understand manufacturer's instructions and the precautionary label on the product. See American National Standard z249.1 "Safety in Welding and Cutting" published by the American Welding Society. Maintain all exposure below the limits in section 5. Monitor the air to ensure that the levels are below the above mentioned limits. See AWS f1.1 "Methods for Sampling Airborne Particles Generated by Welding and Allied Procedures" and AWS f1.3 "Evaluating Constituents in the Welding Environment: A Sampling Strategy Guide."

Use enough ventilation, local exhaust at the arc, or both, to keep the fumes and gases below TLVs (threshold limit values) in the workers' breathing zone and the general area. Train the welder to keep his head out of the fumes. Use respirable fume respirator or air supplied respirator when welding in confined space or where local exhaust or ventilation does not keep exposure below the TLV.

Wear helmet or use a face shield with filter lens. Wear hand, head, and body protection, which help to prevent injury from radiation, sparks, and electrical shock. Train the welder not to touch live electrical parts and insulate himself from work and ground.

Prevent waste from contaminating the surrounding environment, discard any product, residue, disposable container or liner in an environmentally acceptable manner, in full compliance with federal, and local regulations.

SECTION 8 – FIRST AID PROCEDURES

If overcome by smoke or fumes, remove the victim to fresh air and call for medical aid. Employ first aid techniques recommended by the Red Cross.

Vulcan Systems, LLC, believes this data to be accurate, but no warranty, expressed or implied, is made.