CRONATRON WELDING SYSTEMS, INC.
MATERIAL SAFETY DATA SHEET
For Welding Electrodes, Wires and Rods for Joining and Hard facing
Prepared to meet the requirements of OSHA Hazard Communication Standard 29 CFR 1910.1200

SECTION I - IDENTIFICATION

MANUFACTURER/SUPPLIER'S NAME:
CRONATRON WELDING SYSTEMS, INC.
6510 NORTHPARK BLVD.
CHARLOTTE, NC 28216-2367

EMERGENCY PHONE NUMBER (24 hrs./day):
Rocky Mountain Poison & Drug Center
6510 NORTHPARK BLVD.
(303) 623-5716

INFORMATION PHONE NUMBER:
(704) 598-1225

PRODUCT NAME:
CRONAMIG 311M-FC CRONATIG 345T
CRONATIG 315T CRONATIG 346T
CRONAMIG 321M CRONATIG 347T
CRONATIG 321T CRONATIG 348T
CRONAMIG 331M CRONATIG 349
CRONATIG 344T CRONAMIG 375M
CRONAMIG 345M CRONAMIG 375M-FC
CRONAMIG 345M CRONAMIG 376M-FC

PRODUCT CLASSIFICATION:
MIG & TIG ALLOYS FOR
WELDING OF CARBON &
LOW ALLOY STEELS, CHROMIUM/
NICKEL ALLOYS & TOOL STEELS

HAZARDOUS MATERIAL
DESCRIPTION: NOT REGULATED

SECTION II - PRODUCT IDENTIFICATION AND INGREDIENTS (INCLUDING HAZARDOUS INGREDIENTS)

IMPORTANT: This section covers the materials from which the product is manufactured. The fumes and gases produced during welding with normal use of this product are covered in Section V. The term "Hazardous" in "Hazardous Materials, Hazardous Ingredients and Hazardous Decomposition Products" referred to in this document, should be interpreted as a term required and defined in OSHA Hazard Communication Standard 29 CFR 1910.1200 and it does not necessarily imply the existence of any hazard.

SEE TABLE 1 (PAGE 2) FOR COMPLETE PRODUCT INFORMATION, INCLUDING INGREDIENTS, PERCENTAGE RANGES, CAS NUMBERS, EXPOSURE LIMITS AND SECTION 313 REPORTING REQUIREMENTS. SEE SECTION VIII FOR CALIFORNIA PROPOSITION 65 INFORMATION.

SECTION III - PHYSICAL AND CHEMICAL DATA

These products as shipped are non hazardous, nonflammable, non explosive and non reactive.
Rating in accordance with National Fire Protection Association Code 704: Health 0; Flammability 0; Reactivity 0

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

NON-FLAMMABLE: Welding arcs and sparks can ignite combustibles. Refer to American National Standard Z49.1 for fire prevention during welding.

SECTION V - REACTIVITY DATA/HAZARDOUS DECOMPOSITION PRODUCTS

Hazardous Decomposition Products: Welding fumes cannot be classified simply. Their composition and quantity 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 paint, plating, or galvanizing), number of welds and volume of work area, quality and amount of ventilation, position of 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). The primary route of entry of welding fumes and gases is by inhalation.
# TABLE 1 - CRONATRON MIG & TIG ALLOYS FOR WELDING OF CARBON & LOW ALLOY STEELS, CHROMIUM/NICKEL ALLOYS & TOOL STEELS

## INGREDIENT PRESENT IN PRODUCT
(See Note 1 Below for Percent Range Code)

| INGREDIENT | CAS NUMBER | EXPOSURE LIMIT (mg/M³) | SOURCE | SECTION 313 REPORTING (Note 2 Below) | 311M-FC | 315T | 321M | 321T | 331M | 344T | 345T | 346T | 347T | 348T | 349T | 375M | 376M |
|-------------|------------|------------------------|--------|--------------------------------------|--------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Aluminum (Note A) | 7429-90-5 | 5 | (2) | Y | A | | | | | | | | | | | | | B |
| Aluminum Oxide | 1344-28-1 | 5 | (1) | | | | | | | | | | | | | | | |
| Barium Fluoride (Note B) | 7787-32-8 | 2.5 | (2) | Y | B | | | | | | | | | | | | | |
| Carbon | 7440-44-0 | 3.5 | (2) | A | A | A | A | A | A | A | B | A | A | A | | | |
| Chromium | 7440-47-3 | 0.5 | (2) | Y | B | B | B | A | B | | | | | | | | | |
| Columbium | 7440-03-1 | 5 | (2) | | | | | | | | | | | | | | | |
| Copper (Note A) | 7440-50-8 | 0.1 | (1) | Y | A | A | A | | | | A | NOTE (C) | | | | | | |
| Cryolite (Note B) | 15096-52-3 | 2.5 | (1) | | | | | | | | | A | | | | | | |
| Magnesium | 7439-95-4 | N.E. | | A | | | | | | | | | | | | | | B |
| Manganese (Note A) | 7439-96-5 | 1 | (2) | Y | B | B | B | B | A | A | B | A | B | B | B | | |
| Molybdenum | 7439-98-7 | 10 | (2) | A | B | B | B | A | A | | | | | | | | | |
| Nickel | 7440-02-0 | 1 | (2) | Y | | | | | | | | B | NOTE (D) | | | | | |
| Silicon | 7440-21-3 | 10 | (2) | A | A | A | A | A | A | A | A | A | A | A | A | A | A |
| Titanium Dioxide | 13463-67-7 | 10 | (2) | B | | | | | | | | | | | | | | |
| Tungsten | 7440-33-7 | 5 | (2) | | | | | | | | | | | | | | | |
| Vanadium | 7440-62-2 | N.E. | | B | A | A | A | A | | | | | | | | | | |
| Zirconium | 7440-67-7 | 5 | (2) | | | | | | | | | | | | | | | |
| PROP 65 (See Note 3) | - | - | - | - | C | C | C | C | C | C | C |

**Notes:**
A. as Fumes; B. as Fluorides; C. Not in 375M-FC; D. Not in 375M
1. Percent Range Code - A = less than 1%, B = 1 to 10%, C = 11 to 30%, D = 31 to 60%, E = 61 to 100%
2. “Y” indicates chemical is reportable under SARA Title III, Section 313. (Reportable chemicals also noted by shading).
3. “C” denotes cancer causing, “R” denotes birth defects or other reproductive harm causing, “C/R” denotes both cancer and birth defects or other reproductive harm causing.

**Sources:**
(1) Occupational Safety and Health Administration, 29 CFR 1910.1000, Permissible Exposure Limit (PEL)
(2) American Conference of Governmental Industrial Hygienists (ACGIH), Threshold Limit Value (TLV)
(3) Not known; nuisance particulate concentration per ACGIH is 10 mg/M³
When the electrode is consumed, the fume and gas decomposition products are different in percent and form from the ingredients listed in Section II. Decomposition products include those originating from the volatilization, reaction, or oxidation of the materials shown in Section II plus those from base metal, coating, etc. as noted above. These components are virtually always present as complex compounds and not as metals (Characterization of Arc Welding Fume: American Welding Society).

Reasonably expected fume constituents would include fluorides and complex oxides of the metals present in the electrodes. Fume limits for Cr VI (0.05 mg/M³), Ni (1 mg/M³) or Cu (0.1 mg/M³), when present, may be reached before the general fume level of 5 mg/M³ is reached. Monitor fumes for these elements when indicated. Gaseous reaction products may include carbon monoxide and carbon dioxide. Ozone and nitrogen oxides may be formed by 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.

**SECTION VI - HEALTH HAZARD DATA**

**Threshold Limit Value:** The ACGIH recommended general limit for welding fume NOC (Not Otherwise Classified) is 5 mg/M³. The ACGIH 1984-85 preface states: “The TLV-TWA should be used as guides in the control of health hazards and should not be used as firm lines between safe and dangerous concentrations.” See Section V for specific fume constituents which may modify this TLV.

**Effects of Overexposure:** FUMES AND GASES can be dangerous to your health. Aggravation of preexisting respiratory or allergic conditions may occur in some workers. SHORT-TERM (ACUTE) OVEREXPOSURE to welding fumes may result in discomfort such as: dizziness, nausea, or dryness or irritation of nose, throat, or eyes. LONG-TERM (CHRONIC) OVEREXPOSURE may lead to siderosis (iron deposits in the lungs) and is believed by some investigators to affect pulmonary function. ARC RAYS can injure eyes and burn skin. ELECTRIC SHOCK can kill. See Section VII.

**Emergency & First Aid Procedures:** Call for medical aid. Employ first aid techniques recommended by the American Red Cross.

<table>
<thead>
<tr>
<th>Carcinogenicity (when present)</th>
<th>NTP?</th>
<th>IARC Monographs?</th>
<th>OSHA Regulated?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cr, Ni</td>
<td>Cr, Ni</td>
<td>Cr</td>
<td></td>
</tr>
</tbody>
</table>

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

Read and understand the manufacturer's instructions and the precautionary label on this 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), US Government Printing Office, Washington, DC. 20402 for more detail on the following:

**Ventilation:** Use enough ventilation, local exhaust at the arc, or both, to keep the fumes and gases below the 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 supplies respirator when welding in confined 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 which 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 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.
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.

SECTION VIII - REGULATORY DATA

REPORTING:
The chemicals reportable under Section 313 of the Emergency Planning and Community Right-to-Know Act (Title III of the Superfund Amendments and Reauthorization Act of 1986) are shaded and noted with a "Y" in the "SECTION 313 REPORTING" column of Table 1 on Page 2.

PURSUANT TO PROPOSITION 65: WARNING; Some products covered by this MSDS contain substances listed by the State of California as known to cause cancer. (California Health & Safety Code §25249.5 et seq.) (SEE "PROP 65" INFORMATION AT THE BOTTOM OF TABLE 1 ON PAGE 2 FOR PRODUCT IDENTIFICATION.)

SECTION IX - PREPARATION INFORMATION

The information contained herein is based on data considered accurate. However, no warranty is expressed or implied regarding the accuracy of these data or the results to be obtained from the use thereof.

Vendor assumes no responsibility for injury to vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Additionally, vendor assumes no responsibility for injury to vendee or third persons proximately caused by abnormal use of the material even if reasonable safety procedures are followed. Furthermore, vendee assumes the risk in his use of the material.

PREPARED BY: Chris Croy (704) 598-1225
DATE PREPARED: April 15, 2001
REVISION: Revision 9