



WARD MANUFACTURING LLC  
**MATERIAL SAFETY DATA SHEET (MSDS) Page 2 of 5**  
 DATE: Dec, 1994  
**UPDATED July, 2008**

**SECTION II - HAZARDOUS COMPONENTS**

<b><u>INGREDIENT</u></b>	<b><u>CAS NO.</u></b>	<b><u>PERCENT</u></b>	<b><u>TLV</u></b>	<b><u>PEL</u></b>
Carbon	7440-44-0	2.5-4.0	N/E	N/E
Silicon	7440-21-3	1.5-3.0	10 mg/cu.m	15 mg/cu.m
Manganese	7439-96-5	0.4-0.8	C5 mg/cu-m as dust 1 mg/cu.m as fume	C5 mg/ou-m as dust
Nickel	7440-02-0	0.10	1 mg/cu.m	1 mg/cu.m
Chromium	7440-47-3	0.02-0.25	.5 mg/cu.m	1 mg/cu.m
Chromium (hexavalent)			.05 mg/cu.m	N/E
Aluminum	7429-90-5	0.003-0.20	10 mg/cu.m	N/E
Copper	7440-50-8	0.11-0.21	.2 mg/cu.m as fume 1 mg/cu.m as dust	.1 mg/cu.m as fume 1 mg/cu.m as dust
Iron	7439-89-6	92.9-96.6	5 mg/cu-m as fume	10 mg/cu.m as fume
Cerium	7440-45-1	0.01-0.40	N/E	N/E
Nitrogen	7727-37-9	0.002-0.15	N/E	N/E

Water insoluble hexavalent chromium is classified as a human carcinogen by the American Conference of Governmental Industrial Hygienists (ACGIH).

Approximately 66% of the total chromium (in welding fume) is hexavalent, and only 5% of that is insoluble. Considering the small amount of chromium in the casting, over-exposure to hexavalent chromium is not likely. (There is no hexavalent chromium in the alloy or its dust).

N/E means none established

N/A means not applicable

N/D means no data available.

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**SECTION III - OVERVIEW**

There are no chemical hazards from these castings in solid form.

Dust or fumes generated by machining, grinding, or welding on the castings will put contaminants in the air. Since the casting is more than 90 percent iron, most of the dust or fumes will be iron or iron oxide. There is no TLV for iron dust, but available information indicates that a concentration of 10 mg/cu.m. as if it were a nuisance dust, will serve as a guideline until a TLV is established.

High production dry machining of gray iron castings usually requires local exhaust ventilation.

Flame cutting, arc gouging, or welding on the casting generates iron oxide fume. Inhalation of too much iron oxide fume over a long time can cause siderosis, sometimes called "iron pigmentation" of the lung. It can be seen on a chest x-ray but causes little or no disability. Also see the Material Safety Data Sheet for the welding rod being used.

Welding or flame cutting may convert a fraction of the chromium to the water insoluble hexavalent (carcinogenic) form, but the chromium content of the castings is so low that over-exposure is not likely.

Nickel has been shown to cause cancer in laboratory animals. However, its potential to cause cancer in humans has not been determined. The nickel content of the casting is so low that over-exposure is not likely.

Other toxic metals in the alloy are present in small amounts that will not represent a hazard if copper dust and fume are adequately controlled.

Grinding on castings that have not been cleaned or that contain embedded silica will generate significant amounts of dust containing free silica, which can cause silicosis. Good local ventilation is frequently required to prevent over-exposure in this situation. If good ventilation is not available, use a NIOSH-approved dust respirator.

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**SECTION IV - PHYSICAL DATA**

Physical Description:	Solid, silver gray in color, no odor.
Boiling Point:	2750° C for iron
Vapor Pressure:	N/A
Vapor Density:	N/A
Solubility in Water:	N/A
Specific Gravity:	7.86 for iron
Percent Volatile By Volume:	N/A
Evaporation Rate:	N/A

**SECTION V - FIRE AND EXPLOSION DATA**

Castings will not burn or explode.

**SECTION VI - HEALTH HAZARD DATA**

<u>EYES:</u>	Metal particles in the eyes may cause irritation if not removed.
<u>SKIN:</u>	None known.
<u>BREATHING:</u>	Prolonged or repeated over-exposure to iron oxide produced in grinding or welding may cause siderosis.
<u>SWALLOWING:</u>	N/A
<u>NOISE:</u>	Grinding or machining Castings is noisy. The OSHA limit for noise averaged over 8 hours is 90 decibels (dBA), hearing conservation program required if exposure is over 85 dBA. If noise is at or above 90 dBA, you should wear ear muffs or ear plugs.

**FIRST AID**

<u>IF IN EYES:</u>	Metal particles should be removed by trained individuals such as a nurse or physician.
<u>IF ON SKIN:</u>	N/A
<u>IF BREATHED:</u>	(Fumes from welding): Move to fresh air.
<u>IF SWALLOWED:</u>	N/A

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**SECTION VII - REACTIVITY DATA**

HAZARDOUS POLYMERIZATION: Will not occur.  
STABILITY: Stable  
INCOMPATIBILITY: Iron may cause violent decomposition of hydrogen peroxide (52%)

**SECTION VIII - SPILL OR LEAK PROCEDURES**

- STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED -

If damaged, return castings to vendor or send to scrap reclaimer.

Collected dust from machining, welding, etc. may be classed as a "hazardous waste" depending on circumstances. Consult local authorities regarding disposal.

**SECTION IX - PROTECTIVE EQUIPMENT TO BE USED**

RESPIRATORY PROTECTION: Wear a NIOSH approved respirator for dusts or fume if concentrations exceed the TLV or PEL.

VENTILATION: Provide general ventilation and/or local exhaust if necessary to maintain concentrations below the TLV's.

PROTECTIVE GLOVES: Work gloves advisable for handling castings.

EYE PROTECTION: Safety glasses with side shields and/or face shields for particles (grinding). Welding goggles or helmet for welding.

OTHER PROTECTIVE EQUIPMENT: Wear a protective apron and gauntlets if arc air gouging or cutting, or welding on castings. If noise is at or above 90 dBA you should wear ear muffs or ear plugs.

**SECTION X - SPECIAL PRECAUTIONS OR OTHER COMMENTS**

STORAGE: Keep dry to reduce rusting.

The information herein is based on the vendors MSDS with additions as necessary to comply with current regulations. The information is believed to be accurate, but under the circumstances is not warranted to be.

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mdsgray.wpd