

MATERIAL SAFETY DATA SHEET

May 27, 2004

Attn: Safety Director

SC-000-042 Rev. 1 Date 11.20.85 Code 14-04

Conforms to requirements of OSHA Standard 1910.1200 "Hazard Communication" and to various States "Employee Right to Know" Laws Copyright 1985 American Foundrymen's Society.

SECTION I – PRODUCT IDENTIFICATION

This MSDS is supplied for:

Ductile Iron

ASTM ALLOY DESIGNATION

A536-80

65-45-12

60-40-18

80-55-06

Vendor Name and Address: ABT, Inc., P.O. Box 835, Murdock Road, Troutman NC 28166

Emergency Phone Number: (704) 528-9806

Fire Hazard Class: Health: 0 Flammability: 0 Reactivity: 0

The Fourth Diamond (None=0 Extreme=4)

CAUTION! Welding, cutting or grinding on this casting will generate toxic dust and fumes.

SECTION II – HAZARDOUS COMPONENTS

INGREDIENT	CAS NO.	PERCENT	TVL	PEL
Carbon	7440-44-0	3.0 - 4.3	N/E**	N/E**
Silicon	7440-21-3	1.8 - 4.0	10 mg/m ³	15 mg/m ³
Manganese	7439-96-5	< 1.2	C5 mg/m ³ as dust 1 mg/m ³ as fume	C5 mg/m ³ as dust
Nickel	7440-02-0	0.01 – 1.50	1 mg/m ³	1 mg/m ³
Chromium	7440-47-3	0.02 – 0.13	0.5 mg/m ³ 0.05 mg/m ³	1 mg/m ³ N/E **
Chromium (hexavalent)				
Molybdenum	7439-98-7	0.01 – 0.75	10 mg/ m ³	15 mg/ m ³
Sulfur	7704-34-9	0.02	N/E **	N/E **
Phosphorus	7723-14-0	< 0.05	1 mg/ m ³	0.1 mg/ m ³
Aluminum	7429-90-5	0.03 – 0.06	10 mg/ m ³	N/E **
Copper	7440-50-8	0.01 – 0.90	1 mg/ m ³ as dust 0.2 mg/ m ³ as fume	1 mg/ m ³ as dust 0.1 mg/ m ³ as fume
Iron	7439-89-6	87.7 – 95.1	5 mg/ m ³ as fume	fume
Cerium	7440-45-1	< 0.3	N/E **	10 mg/ m ³ as fume
Magnesium	7439-95-4	0.02 – 0.1	10 mg/ m ³ as oxide fume	N/E ** 15 mg/ m ³ as oxide fume

** N/E = None Established

SECTION II – HAZARDOUS COMPONENTS (CONT'D)

The American Conference of Governmental Industrial Hygienists (ACGIH) classifies water insoluble hexavalent chromium as a human carcinogen. 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, overexposure to hexavalent chromium is not likely.

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 casting will put contaminants in the air. Since the casting is over 85% iron, most of the dust or fumes will be iron or iron oxide. There is no TVL for iron dust, but available information indicates that the TVL for nuisance dust will serve as a guideline until a TLV is established.

High production dry machining of ductile 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 casting 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 overexposure is not likely.

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 overexposure in this situation. If good ventilation is not available, use a NIOSH-approved dust respirator. Other toxic metals in the alloy are present in small amounts that will not represent a hazard if copper dust and fumes are adequately controlled.

SECTION IV – PHYSICAL DATA

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

*N/A means not applicable.

SECTION V – FIRE AND EXPLOSION DATA

Castings will not burn or explode.

SECTION VI – HEALTH HAZARD DATA

Eyes: Metal particles in the eyes may cause irritation if not removed.
Skin: None known.
Breathing: Prolonged or repeated overexposure to iron oxide produced in grinding or welding may cause siderosis.
Swallowing: N/A *
Noise: 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 earmuffs or earplugs.

FIRST AID

If in Eyes: a trained individual such as a nurse or physician should remove Metal particles.
If on Skin: N/A*
If Breathed: (Fumes from Welding) Move to fresh air.
If Swallowed: N/A*

*N/A means not applicable.

SECTION VII – REACTIVITY DATA

Stability: Stable
Hazardous Polymerization: Will not occur
Incompatibility: Iron may cause violent decomposition of hydrogen peroxide (52% by weight or greater).

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 fumes if concentrations exceed the TVL or PEL.
Ventilation: Provide general ventilation and/or local exhaust if necessary to maintain concentrations below the TVL’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 (welding).
Other Protective Equipment: Wear a protective apron and gauntlets if arc-air gouging, cutting, or welding on castings. If noise is at or above 90 dBA, you should wear earmuffs or earplugs.

SECTION X – SPECIAL PRECAUTIONS OR OTHER COMMENTS

Storage: Keep dry to reduce rusting.

This MSDS was prepared on 5/27/04 by J. Guthrie, Manager, Material Safety.