

MATERIAL SAFETY DATA SHEET

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I. MATERIAL IDENTIFICATION

MATERIAL NAME: Austenitic Manganese Steel Castings: IndM; LCM; MLM; MSPC; SMC60; SMC62; SMC65; SMC67; SMC68; SMC69; SMC70; SMC71; SMC72

II. HAZARDOUS INGREDIENTS

ACGIH/OSHA

Chemical	CAS Number	%	OSHA 8-hr TWA	ACGIH 8-hr TWA
Carbon Black	1333-86-4	Trade Secret	3.5 mg/m ³	3.5 mg/m ³
**Manganese (Dust)	7439-96-5	6.0%-25.0%	5.0 mg/m ³	1.0 mg/m ³
**Manganese (Fume)	7439-96-5	6.0%-25.0%	1.0 mg/m ³	1.0 mg/m ³
Silicon	7440-21-3	Trade Secret	15.0 mg/m ³	10.0 mg/m ³
Molybdenum	7439-98-7	Trade Secret	15.0 mg/m ³	5.0 mg/m ³
**Aluminum	7429-90-5	0.1% MAX	15.0 mg/m ³	10.0 mg/m ³
Titanium	13463-67-7	Trade Secret	15.0 mg/m ³	10.0 mg/m ³
Iron	1309-37-1	Trade Secret	10.0 mg/m ³	5.0 mg/m ³
**Vanadium	7440-62-2	0.005%-0.2%	0.5 mg/m ³	0.5 mg/m ³
**Chromium	7440-47-3	0.1%-4.0%	1.0 mg/m ³	0.5 mg/m ³
**Sulfur	7446-09-5	0.002%-0.025%	13.0 mg/m ³	13.0 mg/m ³
**Phosphorus	7723-14-0	0.015%-0.05%	0.1 mg/m ³	0.1 mg/m ³

** This ingredient is subject to the reporting requirements of Section 313 of Title III, SARA 40 CFR, Part 372.

III. PHYSICAL CHARACTERISTICS

Melting Point: 1300 - 1450°C

Specific Gravity (@60°F): 7.84

Boiling Point (of iron dust): 3000°C

Vapor Pressure: 1mm Hg @ 1787°C
(of iron dust)

Solubility in water: insoluble

Appearance: dependent upon the processing method used and existing paints or coatings.

IV. PHYSICAL HAZARDS

Flash Point: information not available.

Autoignition Temperature (of solid iron in oxygen): 930°C

Flammability Limits: information not available.

Solid, massive form of material is not combustible. Fire and explosion hazards are moderate when material is in the form of dust and exposed to heat or flames, chemical reaction, or contact with powerful oxidizers.

Fire Extinguishing Methods: Use special mixtures of dry chemical or sand. Fire fighters should wear self-contained breathing apparatus and protective clothing.

V. CHEMICAL CHARACTERISTICS

Massive material is stable at ordinary temperatures, but dust presents moderate fire and explosion hazards. Material may be incompatible with acids, bases and oxidizers. Molten metal may react violently with water. For additional information, users should consult applicable references on individual component elements.

VI. EXPOSURE LIMITS

See Section II, Hazardous Ingredients.

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VII. HEALTH HAZARD DATA

TLV: See Section II

Primary Routes of Entry: inhalation into lungs of mixture in particulate/dust or gaseous form.

UNDER NORMAL HANDLING AND USE, EXPOSURE TO THE MASSIVE FORMS OF AUSTENITIC MANGANESE STEEL CASTINGS PRESENTS FEW HEALTH HAZARDS IN ITSELF. Thermal cutting, welding and melting of castings may produce fumes containing the component elements, and breathing these fumes may present potentially significant health hazards. Abrasive grinding of castings may produce dust containing component elements. The exposure levels in Section II are relevant to fumes and dusts. Special precautions should be taken if castings are contained; see Section X.

Chronic overexposure to iron oxide fume may cause an apparently benign pneumoconiosis (siderosis) with few or no symptoms. Overexposure to dusts and especially fumes containing component elements of these castings may cause skin, nose, mouth and eye irritation. Unknown whether this will aggravate pre-existing conditions. It is listed as a potential carcinogen by the International Agency For Research on Cancer (IARC).

FIRST AID:

Eye Contact: Flush well with running water to remove particulate. Get medical attention.

Skin Contact: Brush off excess dust. Wash area well with soap and water.

Inhalation: Remove to fresh air. Get medical attention.

Ingestion: Not applicable.

VIII. SPILL PROCEDURES

No special precautions are necessary for spills of bulk material. If large quantities of dust are spilled, remove by vacuuming or wet sweeping to prevent heavy concentrations of airborne dust. Clean-up personnel should wear respirators and protective clothing.

IX. PRECAUTIONS FOR SAFE HANDLING OR USE

Use general and local exhaust ventilation to keep airborne concentration of dust or fumes below the TLV's. Employees should wear MSHA or NIOSH approved respirators for protection against airborne dust or fumes.

Approved safety glasses or goggles should be worn when working with dusty material. Safety eyewash stations should be provided in close proximity to work areas.

Pre-employment and periodic medical examinations should include attention to pulmonary function. Chest x-rays should be included if symptoms are present.

Food should not be consumed in work area.

Special precautions should be taken if castings are contaminated; see Sections VIII and X.

X. CONTROL MEASURES

Use good housekeeping practices to prevent accumulations of dust and to keep airborne dust concentrations at a minimum. Avoid breathing dust or fumes.

Store material away from incompatible materials, and keep dust away from sources of ignition.

This material is potentially contaminated with coatings, paints, preservatives, cutting oils, and other components. If the material is contaminated, special precautions (such as process control and personal protective equipment, appropriate to the nature of the suspected contaminants) should be taken to avoid resulting exposures when handling, grinding, cutting (thermal or mechanical), and/or melting.

XI. DISPOSAL CONSIDERATIONS

Dispose of in accordance with local, state and federal regulations.

