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Meets the Requirements of OSHA Standard 29 CFR 1910.1200 Hazard Communication and EPA Supplier Notification Requirements under Section 313 of the Emergency Planning and Community Right-to-Know Act.

SAFETY DATA SHEET (SDS)

**CHROMIUM-ALLOYED STEEL CASTINGS**

SDS SC-000-019 Rev. 11

DATE ISSUED

10/13

**SECTION 1—PRODUCT IDENTIFICATION & COMPANY INFORMATION**

**PRODUCT NAME**

**CHROMIUM-ALLOYED STEEL CASTINGS**

**OTHER DESIGNATIONS:** ASTM (American Society for Testing & Materials) Specification No's., (ACI (Alloy Casting Institute) Alloy Designations—Grades)

**ASTM No's.:**

A128 / 128M-8  
 A217 /A217M-84  
 A356 / A356M-84  
 A389 / A389M-84  
 A426-80  
 A487 / A487M-84  
 A597 / A597M-84  
 A732 / A732M-84  
 A757 / A757M-84  
 MIL-S-15464B (Ships)

**ACI ALLOY DESIGNATIONS (GRADES)**

C  
 WC6, WC9, WC11, C5, C12  
 6, 8, 9, 10  
 C23, C24  
 CP5, CP5b, CP7, CP9, CP11, CP12, CP21, CP22  
 8N, 9N, 8Q, 9Q  
 CA-2, CH-12, CH-13, CO-1  
 7Q, 8Q, 12Q, 15A  
 D1N1, D1Q1, D1N2, D1Q2, D1N3, D1Q3  
 1, 2, 3

**PRODUCT IDENTIFICATION (Label Identifier)**

**MANUFACTURER'S NAME**

**STREET ADDRESS**

**EMERGENCY TELEPHONE NO.**

**MAILING ADDRESS**

**TELEPHONE NO.**

**CITY, STATE, ZIP CODE, COUNTRY**

**FAX NO.**

**E-MAIL ADDRESS/WEBSITE**

**RECOMMENDED USE OF CHEMICAL AND RESTRICTIONS ON USE**

Solid casting; no restrictions

**SECTION 2—HAZARD IDENTIFICATION**

**CLASSIFICATION**

Castings are metallic articles that do not present hazards in their original form.

**OTHER INFORMATION**

1. Grinding castings that have not been cleaned or that contain embedded sand may generate significant amounts of dust containing crystalline silica.
2. Fumes from hot processes may contain other compounds with different exposure limits. Dust or fumes generated by machining, grinding, welding or thermal cutting of the casting may produce airborne contaminants. Consult Sections 3 & 8 for further information.

**SECTION 3—COMPOSITION / INFORMATION ON INGREDIENTS**

CHEMICAL NAME/COMMON NAME/SYNONYM	Wt %	CAS NUMBER
Carbon (C)	0.20–1.35	7440-44-0
Chromium (Cr)	0.75–10.0	7440-47-3
Iron (Fe)	Remainder	7439-89-6
Manganese (Mn)	0.30–14.0	7439-96-5
Molybdenum (Mo)	0–1.75	7439-98-7
Nickel (Ni)	0–0.50	7440-02-0
Niobium (Nb) formerly Columbium (Cb)	0–1.2	7440-03-1
Silicon (Si)	0.20–2.00	7440-21-3
Sulfur (S)	0.025–1.00	7704-34-9
Tungsten (W)	0–1.70	7440-33-7
Vanadium ( V)	0–1.20	1314-62-1

**SECTION 4—FIRST AID MEASURES****EYE CONTACT:** Not applicable**SKIN CONTACT:** No special requirements**INGESTION:** Not applicable**INHALATION:** Not applicable**SECTION 5—FIREFIGHTING MEASURES****FLAMMABLE PROPERTIES:** Not applicable**EXTINGUISHING MEDIA:** Not applicable**PROTECTION OF FIREFIGHTERS:** Not applicable**SECTION 6—ACCIDENTAL RELEASE MEASURES**

Not applicable

**SECTION 7—HANDLING & STORAGE****RECOMMENDED STORAGE**

No special requirements

**PROCEDURES FOR HANDLING**

Proper hand and foot protection is recommended.

**SECTION 8—EXPOSURE CONTROLS/ PERSONAL PROTECTION****ENGINEERING CONTROLS**

None Required. There are no health hazards from castings in solid form.

SUBSTANCE	ACGIH TLV mg/m <sup>3</sup>	OSHA PEL mg/m <sup>3</sup>
Carbon (C)	N/E	N/E
Chromium (Cr)	0.5	1
Iron (Fe)	N/E	N/E
Manganese (Mn)	0.02 (R); 0.1 (I)	5 (C)
Molybdenum (Mo)	N/E	N/E
Nickel (Ni)	1.5 (I)	1
Niobium (Nb) formerly Columbium (Cb)	N/E	N/E
Silicon (Si)		
Total dust	N/E	15
Respirable dust	N/E	5

Sulfur	N/E	N/E
Tungsten (W)	5; 10 (STEL)	N/E
Vanadium ( V)	N/E	N/E

**SUPPLEMENTAL INFORMATION**

Grinding castings that have not been cleaned or that contain embedded sand may generate significant amounts of dust containing crystalline silica.

Fumes from hot processes may contain other compounds with different exposure limits than those listed above. Dust or fumes generated by machining, grinding, welding or thermal cutting of the casting may produce airborne contaminants. Exposure limits for the most common contaminants are offered as reference. Please consult a competent person for guidance on exposure assessment and controls. **In particular, Hexavalent Chromium is an OSHA Expanded Health Standard; refer to OSHA 29 CFR 1910.1026- Chromium (VI) for complete requirements.**

SUBSTANCE	ACGIH TLV mg/m <sup>3</sup>	OSHA PEL mg/m <sup>3</sup>
Chromium Compounds (as Cr)		
Chromium (II) inorganic compounds	N/E	0.5
Chromium (III) inorganic compounds	0.5	0.5
Chromium (VI) inorganic compounds, certain water insoluble	0.01	0.005
Chromium (VI) inorganic compounds, water soluble	0.05	0.005
Chromium (VI) all forms and compounds	N/E	0.005
Iron Compounds		
Iron oxide (Fe <sub>2</sub> O <sub>3</sub> ) fume	N/E	10
Iron oxide (Fe <sub>2</sub> O <sub>3</sub> )	5 (R)	N/E
Molybdenum Compounds (as Mo)		
Insoluble compounds (as Mo)	10 (I); 3 (R)	N/E
Soluble compounds (as Mo)	0.5 (R)	5
Total Dust	N/E	15
Nickel Compounds (as Ni)		
Insoluble, inorganic compounds	0.2(I)	1
Soluble, inorganic compounds	0.1(I)	1
Nickel oxide	0.2(I)	1
Tungsten compounds (as W)		
Metal and insoluble compounds, (as W)	5; 10 (STEL)	N/E
Soluble compounds (as W)	1; 3 (STEL)	N/E
Vanadium		
Respirable dust (as V <sub>2</sub> O <sub>5</sub> )	0.05 (I)	0.5 (C)
Fume (as V <sub>2</sub> O <sub>5</sub> )	N/E	0.1 (C)
Vanadium and inorganic compounds	N/E	N/E

**TERMS**

All exposure limits referenced above are 8 hour time weighted averages (TWA) unless otherwise noted.

- N/E = None Established
- C = Ceiling
- I = Inhalable fraction
- R = Respirable fraction
- TLV = Threshold Limit Value/American Conference of Industrial Hygienists (ACGIH)
- PEL = Permissible Exposure Limit / OSHA
- STEL = Short term exposure limit
- mg/m<sup>3</sup> = milligrams per cubic meter

**PERSONAL PROTECTION:**

Proper hand and foot protection is recommended.

**SECTION 9—PHYSICAL & CHEMICAL PROPERTIES**

<b>APPEARANCE /PHYSICAL STATE</b> Solid, silver gray in color	
<b>ODOR/ODOR THRESHOLD</b> None	<b>VAPOR DENSITY</b> Not applicable
<b>MELTING POINT/FREEZING POINT</b> 2744-3199°F (1504-1704°C)	<b>SPECIFIC GRAVITY (relative density)</b> 0.28 lb/in <sup>3</sup> (7.74 g/cm <sup>3</sup> ) for cast alloy steels
<b>BOILING POINT</b> 5000°F (2750°C) for iron	<b>VAPOR PRESSURE</b> Not applicable
<b>FLASH POINT</b> Not applicable for solid castings	<b>EVAPORATION RATE</b> Not applicable
<b>FLAMMABILITY</b> Not flammable	<b>SOLUBILITY IN WATER</b> Insoluble
<b>UPPER AND LOWER FLAMMABILITY LIMITS</b> Not applicable for solid castings	<b>pH</b> Not applicable
<b>AUTO IGNITION TEMPERATURE</b> Not applicable	<b>VISCOSITY</b> Not applicable
<b>DECOMPOSITION TEMPERATURE</b> Not applicable	<b>PARTITION COEFFICIENT</b> Not applicable

**SECTION 10—STABILITY & REACTIVITY**

<b>CHEMICAL STABILITY</b> Stable	
<b>CONDITIONS TO AVOID</b> None	
<b>REACTIVITY</b> Not reactive	<b>INCOMPATIBLE MATERIALS</b> None
<b>HAZARDOUS DECOMPOSITION PRODUCTS</b> None	<b>POSSIBILITY OF HAZARDOUS REACTIONS</b> Not applicable

**SECTION 11—TOXICOLOGICAL INFORMATION**

<b>POTENTIAL HEALTH EFFECTS</b>	
<b>EYE CONTACT:</b>	None
<b>SKIN:</b>	None
<b>INGESTION:</b>	None
<b>INHALATION:</b>	None

Carcinogen Classification of Ingredients				
INGREDIENT	OSHA	NTP	IARC	TARGET ORGAN
Nickel (metal)	NL	K	2B	Lung, Nose
<b>TERMS</b> <b>OSHA—Occupational Safety &amp; Health Administration</b> Y = Listed as a Human Carcinogen <b>NTP—National Toxicology Program</b> K = Known to be a Human Carcinogen R = Reasonably Anticipated to be a Human Carcinogen (RAHC) <b>IARC—International Agency for Research on Cancer</b> 1 = Carcinogen to Humans 2A = Probably Carcinogenic to Humans 2B = Possibly Carcinogenic to Humans 3 = Unclassifiable as to Carcinogenicity in Humans 4 = Probably not Carcinogenic to Humans <b>Other</b> NL = Not Listed				
SECTION 12—ECOLOGICAL INFORMATION				
<b>ECOTOXICITY</b> Not applicable		<b>PERSISTENCE AND DEGRADABILITY</b> Not applicable		
<b>BIOACCUMULATION POTENTIAL</b> Not applicable		<b>MOBILITY IN SOIL</b> Not applicable		
<b>OTHER ADVERSE EFFECTS</b> Not applicable				
SECTION 13—DISPOSAL CONSIDERATIONS				
Recover or recycle if possible. Dispose of according to federal, state and local regulations. Dust collected from machining, welding, etc. may be classified as a hazardous waste. Consult federal, state and local regulations.				
SECTION 14—TRANSPORT INFORMATION				
<b>US DEPARTMENT OF TRANSPORTATION (DOT)-HMR (Hazardous Materials Registration)</b> Not Regulated		<b>CANADIAN TRANSPORTATION OF DANGEROUS GOODS (TDG)</b> Not regulated		
<b>UN SHIPPING NAME</b> Not regulated		<b>UN NUMBER</b> Not regulated		
<b>TRANSPORT HAZARD CLASS</b> Not regulated		<b>PACKING GROUP</b> Not regulated		
<b>ENVIRONMENTAL HAZARDS</b> None		<b>LABEL(S) REQUIRED?</b> No		
<b>TRANSPORT IN BULK</b> Not applicable		<b>SPECIAL SHIPPING INFORMATION</b> Not applicable		
SECTION 15—REGULATORY INFORMATION				
<b>US-OSHA (Hazard Communication Standard)</b> Reference 29 CFR 1910.1200 and 1910.1000. A finished casting is an article as defined in the OSHA Hazard Communication Standard 29CFR 1910.1200 (c). Dust or fumes generated by cleaning, machining, grinding, or welding of the casting may produce airborne contaminants, such as chromium, iron, manganese, molybdenum, nickel, silicon, vanadium and silica. For hexavalent chromium references see 29 CFR 1910.1026.				

**US-EPA (Toxic Substances Control Act–TSCA)**

All components of these products are on the TSCA inventory list or are excluded from listing.

**US-EPA (SARA Title III)**

Releases to the environment of **Chromium, Manganese, Nickel and Vanadium** may be subject to reporting under Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 72.

**CANADA-WHMIS (Workplace Hazardous Materials Information System)**

This SDS has been prepared according to the hazard criteria of the Controlled Product Regulations (CPR) and the SDS contains the information required by the CPR.

**CANADA DSL (Domestic Substance List) Inventory Status**

All components of these products are on the DSL Inventory.

**CEPA (Canadian Environmental Protection Act)**

Chromium and nickel are on the CEPA Priorities Substances Lists

**EINECS No. (European Inventory of Existing Commercial Chemical Substances)**

All components of these products are on the EINECS list.

**RoHS (Restriction of Certain Hazardous Substances) Compliance**

Castings comply with RoHS

**CALIFORNIA PROPOSITION 65 Compliance**

WARNING: This product contains or produces chemicals known to the State of California to cause cancer and birth defects (or other reproductive harm). (California Health & Safety Code 25248.5 et seq.)

**US STATE REGULATORY INFORMATION**

Some of the components listed in Section 3 may be covered under specific state regulations.

**SECTION 16—OTHER INFORMATION****SDS SHEET PREPARED BY**

American Foundry Society, Inc.  
Occupational Safety & Health Committee (10-Q)

**DATE**

10/13

**NOTE**

This data and label information is offered in good faith as typical values and not as a product specification. No warranty either expressed or implied is hereby made. The recommended industrial hygiene and safe handling procedures are believed to be generally applicable. However, each user should review the recommendations in specific context of the intended use and determine if they are appropriate.

Addendum: Label Information

<p><b><u>PRODUCT IDENTIFIER</u></b></p> <p>SC-000-019 Rev. 11</p> <p>CHROMIUM-ALLOYED STEEL CASTINGS</p>	
<p><b><u>SUPPLIER IDENTIFICATION</u></b></p> <p>Company Name _____</p> <p>Street Address _____</p> <p>Mailing Address _____</p> <p>City _____ State _____</p> <p>Zip/Postal Code _____ Country _____</p> <p>Emergency Phone Number _____</p> <p>Other Info _____</p>	<p><b><u>HAZARD PICTOGRAMS</u></b></p> <p>None*</p> <hr/> <p><b><u>SIGNAL WORD</u></b></p> <p>None*</p>
<p><b><u>PRECAUTIONARY STATEMENTS</u></b></p> <p>None*</p>	<p><b><u>HAZARD STATEMENTS</u></b></p> <p>None*</p>
<p>*Castings do not present hazards in their original form.</p> <p><b>OTHER INFORMATION</b></p> <ol style="list-style-type: none"> <li>1. Grinding castings that have not been cleaned or that contain embedded sand may generate significant amounts of dust containing crystalline silica.</li> <li>2. Fumes from hot processes may contain other compounds with different exposure limits. Dust or fumes generated by machining, grinding, welding or thermal cutting of the casting may produce airborne contaminants. Consult Sections 3 &amp; 8 of the SDS for further information.</li> </ol>	