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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)

ALUMINUM CASTINGS—700 SERIES

SDS SC-000-057 Rev. 12

DATE ISSUED

10/13

SECTION 1—PRODUCT IDENTIFICATION & COMPANY INFORMATION

PRODUCT NAME

ALUMINUM CASTINGS—700 SERIES

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

Includes Tenzaloy and 40E

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/WEB SITE

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 health hazards in their unaltered state.

OTHER HAZARDS

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 of these elements 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. Consult Section 8 for further information.

SECTION 3—COMPOSITION/INFORMATION ON INGREDIENTS

| CHEMICAL NAME/COMMON NAME/SYNONYM | Wt % | CAS NUMBER |
|-----------------------------------|-----------|------------|
| Aluminum (Al) | Balance | 7429-90-5 |
| Chromium (Cr) | 0.0–0.60 | 7440-47-3 |
| Copper (Cu) | 0.10–2.0 | 7440-50-8 |
| Iron (Fe) | 0.10–1.4 | 1309-37-1 |
| Magnesium (Mg) | 0.3–2.4 | 1309-48-4 |
| Manganese (Mn) | 0.40–0.60 | 7439-96-5 |
| Nickel (Ni) | <0.15 | 7440-02-0 |
| Titanium (Ti) | 0.15–0.25 | 7440-32-6 |
| Zinc (Zn) | 2.70–8.0 | 1314-13-2 |

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**

Non-combustible as supplied. Small chips, fine turnings and dust from processing may be readily ignitable.

EXTINGUISHING MEDIA

Not applicable to metal castings. Use Class D extinguishing agents on fines, dust or molten metal. Use coarse water spray on chips and turnings. DO NOT USE halogenated extinguishing agents on small chips/fines.

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 these castings in solid form.

| SUBSTANCE | ACGIH TLV mg/m³ | OSHA PEL mg/m³ |
|---|---------------------------------------|--------------------------------------|
| Aluminum (as Al) Total Dust Respirable Dust | N/E 1 (R) | 15 5 |
| Chromium (as Cr) | 0.5 | 1 |
| Copper (as Cu) Fume Dust and Mist | 0.2 1 | 0.1 1 |
| Iron (Fe) | N/E | N/E |
| Magnesium (as Mg) | N/E | N/E |
| Manganese and inorganic compounds (as Mn) | 0.02 (R) 0.1 (I) | 5 (C) |
| Nickel (Ni) | 1.5 (I) | 1 |
| Titanium (Ti) | N/E | N/E |
| Zinc (as Zn) | 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 of these elements 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/m³ | OSHA PEL mg/m³ |
|--|---------------------------------------|---------------------------------------|
| Aluminum oxide Total Dust Respirable Dust | N/E N/E | 15 5 |
| Chromium Compounds (as Cr) Chromium (II) inorganic compounds Chromium (III) inorganic compounds Chromium (VI) inorganic compounds, certain water insoluble Chromium (VI) inorganic compounds, water soluble Chromium (VI) all forms and compounds | N/E 0.5 0.01 0.05 N/E | 0.5 0.5 0.005 0.005 0.005 |
| Iron Oxide (Fe ₂ O ₃) | 5 (R) | 10 |
| Magnesium oxide | 10 (I) | 15 |
| Manganese fume (as Mn) | 0.2 | 5 (C) |
| Nickel compounds (as Ni) Nickel, Insoluble compounds Nickel, Soluble compounds Nickel oxide | 0.2 (I) 0.1 (I) 0.2 (I) | 1 1 1 |
| Titanium dioxide (as TiO ₂) Total dust | 10.0 N/E | N/E 15 |
| Zinc and compounds Zinc oxide total dust Zinc oxide respirable dust Zinc oxide fume | N/E N/E 2 N/E | N/E 15 5 5 |

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/ACGIH (American Conference of Industrial Hygienists)

PEL = Permissible Exposure Limit/OSHA (Occupational Safety & Health Administration)

STEL = Short Term Exposure Limit

mg/m³ = milligrams per cubic meter

PERSONAL PROTECTION

Proper hand and foot protection is recommended.

SECTION 9—PHYSICAL & CHEMICAL PROPERTIES

APPEARANCE/PHYSICAL STATE

Solid, silver color

ODOR/ODOR THRESHOLD

None

VAPOR DENSITY

Not applicable

MELTING POINT/FREEZING POINT

Approximately 488-646°C (910-1195°F)

SPECIFIC GRAVITY (relative density)

2.2.56–2.64 g/cm³ for aluminum

| | |
|---|--|
| BOILING POINT 2326 °C (4220 °F) for aluminum | VAPOR PRESSURE Not applicable |
| FLASH POINT Not applicable for solid castings | EVAPORATION RATE Not applicable |
| FLAMMABILITY Not flammable | SOLUBILITY IN WATER Insoluble |
| UPPER AND LOWER FLAMMABILITY LIMITS Not applicable for solid castings | pH Not applicable |
| AUTO IGNITION TEMPERATURE Not applicable | VISCOSITY Not applicable |
| DECOMPOSITION TEMPERATURE Not applicable | PARTITION COEFFICIENT Not applicable |

SECTION 10—STABILITY & REACTIVITY

| | |
|--|---|
| CHEMICAL STABILITY Stable as shipped | |
| CONDITIONS TO AVOID Not applicable to castings. Fine metal dust or powder produced by grinding or polishing aluminum metal can burn or explode and must be protected from ignition sources such as grinding sparks, etc. | |
| REACTIVITY Castings are not reactive. Under some conditions metal chips, fines and dust may be incompatible with water, halogenated solvents, strong oxidizers, acids and alkalis, and iron oxide and may ignite or explode. | INCOMPATIBLE MATERIALS Not applicable to castings. |
| HAZARDOUS DECOMPOSITION PRODUCTS None | POSSIBILITY OF HAZARDOUS REACTIONS Not applicable to castings |

SECTION 11—TOXICOLOGICAL INFORMATION

| | |
|---------------------------------|------|
| POTENTIAL HEALTH EFFECTS | |
| EYE CONTACT: | None |
| SKIN: | None |
| INGESTION: | None |
| INHALATION: | None |

Carcinogen Classification of Ingredients

| INGREDIENT | OSHA | NTP | IARC | TARGET ORGAN |
|-----------------------------------|------|-----|------|--------------|
| Chromium (metal) | NL | NL | 3 | Lung, Nasal |
| Chromium VI, (hexavalent) | Y | K | 1 | |
| Nickel, Insoluble compounds as Ni | NL | K | NL | Lung, Nasal |
| Nickel, Soluble compounds as Ni | NL | K | NL | |
| Nickel, Elemental | NL | R | 2B | |

TERMS**OSHA—Occupational Safety & Health Administration**

Y Listed as a Human Carcinogen

NTP—National Toxicology Program

K Known to be a Human Carcinogen

R Reasonably Anticipated to be a Human Carcinogen (RAHC)

IARC—International Agency for Research on Cancer

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

OTHER

NL Not Listed

SECTION 12—ECOLOGICAL INFORMATION**ECOTOXICITY**

Not applicable

PERSISTENCE AND DEGRADABILITY

Not applicable

BIOACCUMULATION POTENTIAL

Not applicable

MOBILITY IN SOIL

Not applicable

OTHER ADVERSE EFFECTS

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**US DEPARTMENT OF TRANSPORTATION (DOT)-HMR**

Not Regulated

CANADIAN TRANSPORTATION OF DANGEROUS GOODS (TDG)

Not regulated

UN SHIPPING NAME

Not regulated

UN NUMBER

Not regulated

TRANSPORT HAZARD CLASS

Not regulated

PACKING GROUP

Not regulated

ENVIRONMENTAL HAZARDS

None

LABEL(S) REQUIRED?

No

TRANSPORT IN BULK

Not applicable

SPECIAL SHIPPING INFORMATION

Not applicable

SECTION 15—REGULATORY INFORMATION**USA-OSHA (Hazard Communication Standard)**

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 aluminum dust, aluminum oxide, chromium, copper, iron, magnesium oxide, manganese, nickel, titanium dioxide, zinc oxide and silica. For chromium references see 29 CFR 1910.1026.

USA-EPA (Toxic Substances Control Act—TSCA)

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

USA-EPA (SARA Title III)

Releases to the environment of Chromium, Copper, Manganese, Nickel and Aluminum (dust or fume only), may be subject to reporting under Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.

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.

CANADIAN 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.)

U.S. 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.

| | |
|--|---|
| <p><u>PRODUCT IDENTIFIER</u></p> <p style="font-size: 24pt; margin: 0;">SC-000-057 Rev. 12</p> <p style="font-size: 24pt; margin: 0;">ALUMINUM CASTINGS-700 SERIES</p> | |
| <p><u>SUPPLIER IDENTIFICATION</u></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><u>HAZARD PICTOGRAMS</u></p> <p style="text-align: center;">None*</p> <hr/> <p><u>SIGNAL WORD</u></p> <p style="text-align: center;">None*</p> |
| <p><u>PRECAUTIONARY STATEMENTS</u></p> <p style="text-align: center;">None*</p> | <p><u>HAZARD STATEMENTS</u></p> <p style="text-align: center;">None*</p> |
| <p>*Castings do not present hazards in their original form.</p> <p>OTHER INFORMATION</p> <ol style="list-style-type: none"> 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 of the SDS for further information. | |