**SAFETY DATA SHEET (SDS)**

**DUCTILE IRON / COMPACTED GRAPHITE IRON (CGI) CASTINGS**

SDS SC-000-042 REV. 12
DATE ISSUED: 09/2015

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

**PRODUCT NAME**
DUCTILE IRON and COMPACTED GRAPHITE IRON (CGI) CASTINGS

**OTHER DESIGNATIONS:** ASTM (American Society for Testing & Materials) Specification No's.

**PRODUCT IDENTIFICATION (Label Identifier)**
DUCTILE IRON

**MANUFACTURER’S NAME**
Chris Erhart Foundry & Machine Co.

**STREET ADDRESS**
1240 Mehring Way

**EMERGENCY TELEPHONE NUMBER**
513-421-6550

**MAILING ADDRESS**
1240 Mehring Way

**TELEPHONE NUMBER**
513-421-6550

**CITY, STATE, ZIP CODE, COUNTRY**
CINCINNATI, OHIO, 45203, USA

**FAX NUMBER**
513-421-6552

**E-MAIL ADDRESS / WEBSITE**
Erhart@erhart.com / www.erhart.com

**RECOMMENDED USE OF CHEMICAL AND RESTRICTIONS OF USE**
Solid Casting; No Restrictions

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**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.

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

<table>
<thead>
<tr>
<th>CHEMICAL NAME/COMMON NAME/SYNONYM</th>
<th>Wt. %</th>
<th>CAS NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon ('C)</td>
<td>3.0 – 4.3</td>
<td>7440-44-0</td>
</tr>
<tr>
<td>Chromium (Cr)</td>
<td>0.02 – 0.13</td>
<td>7440-47-3</td>
</tr>
<tr>
<td>Copper (Cu)</td>
<td>0.01 – 1.5</td>
<td>7440-50-8</td>
</tr>
<tr>
<td>Iron (Fe)</td>
<td>87.7 – 95.1</td>
<td>7439-89-6</td>
</tr>
<tr>
<td>Magnesium (Mg)</td>
<td>0.0001 – 0.10</td>
<td>7439-95-4</td>
</tr>
<tr>
<td>Manganese (Mn)</td>
<td>&lt; 1.2</td>
<td>7439-96-5</td>
</tr>
<tr>
<td>Molybdenum (Mo)</td>
<td>0.01 – 0.50</td>
<td>7439-98-7</td>
</tr>
<tr>
<td>Nickel (Ni)</td>
<td>0.1 – 2</td>
<td>7440-02-0</td>
</tr>
<tr>
<td>Silicon (Si)</td>
<td>1.8 – 4</td>
<td>7440-21-3</td>
</tr>
<tr>
<td>Tin (Sn)</td>
<td>0.1 – 0.15</td>
<td>7440-31-5</td>
</tr>
</tbody>
</table>

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**SECTION 4 – FIRST AID MEASURES**
### 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 CONTROL / PERSONAL PROTECTION

**ENGINEERING CONTROLS**

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

<table>
<thead>
<tr>
<th>SUBSTANCE</th>
<th>ACGIH TLV mg / m3</th>
<th>OSHA PEL mg / m3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon (C)</td>
<td>N/E</td>
<td>N/E</td>
</tr>
<tr>
<td>Chromium (Cr)</td>
<td>0.5</td>
<td>1</td>
</tr>
<tr>
<td>Copper (Cu)</td>
<td>1.8 – 4</td>
<td>1</td>
</tr>
<tr>
<td>Iron (Fe)</td>
<td>N/E</td>
<td>N/E</td>
</tr>
<tr>
<td>Magnesium (Mg) Oxide</td>
<td>10 (I)</td>
<td>15</td>
</tr>
<tr>
<td>Manganese (Mn)</td>
<td>0.02 (R); 0.1 (I)</td>
<td>5 (C)</td>
</tr>
<tr>
<td>Molybdenum (Mo) insoluble</td>
<td>10 (I); 3 (R)</td>
<td>15</td>
</tr>
<tr>
<td>Nickel (Ni)</td>
<td>1.5 (I)</td>
<td>1</td>
</tr>
<tr>
<td>Silicon (Si)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Dust</td>
<td>N/E</td>
<td>15</td>
</tr>
<tr>
<td>Respirable Dust</td>
<td>N/E</td>
<td>5</td>
</tr>
<tr>
<td>Tin (Sn)</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

**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.
### Chromium Compounds (as Cr)

<table>
<thead>
<tr>
<th>Compound Type</th>
<th>TLV</th>
<th>PEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chromium (II) inorganic compounds</td>
<td>N/E</td>
<td>0.5</td>
</tr>
<tr>
<td>Chromium (III) inorganic compounds</td>
<td>0.5</td>
<td>0.5</td>
</tr>
<tr>
<td>Chromium (VI) inorganic compounds, certain water soluble</td>
<td>0.01</td>
<td>0.005</td>
</tr>
<tr>
<td>Chromium (VI) inorganic compounds, water soluble</td>
<td>0.05</td>
<td>0.005</td>
</tr>
<tr>
<td>Chromium (VI) all forms and compounds</td>
<td>N/E</td>
<td>0.005</td>
</tr>
</tbody>
</table>

### Copper Compounds (as Cu)

<table>
<thead>
<tr>
<th>Compound Type</th>
<th>TLV</th>
<th>PEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fume, as Cu</td>
<td>0.2</td>
<td>0.1</td>
</tr>
<tr>
<td>Dusts and mists, as Cu</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

### Iron Compounds

<table>
<thead>
<tr>
<th>Compound Type</th>
<th>TLV</th>
<th>PEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iron Oxide (Fe2O3) fume</td>
<td>N/E</td>
<td>10</td>
</tr>
<tr>
<td>Iron Oxide (Fe2O3)</td>
<td>5®</td>
<td>N/E</td>
</tr>
</tbody>
</table>

### Nickel Compounds (as Ni)

<table>
<thead>
<tr>
<th>Compound Type</th>
<th>TLV</th>
<th>PEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insoluble, inorganic compounds</td>
<td>0.2 (I)</td>
<td>1</td>
</tr>
<tr>
<td>Soluble, inorganic compounds</td>
<td>0.1 (I)</td>
<td>1</td>
</tr>
<tr>
<td>Nickel oxide</td>
<td>0.2 (I)</td>
<td>1</td>
</tr>
</tbody>
</table>

### Tin Compounds (as Sn)

<table>
<thead>
<tr>
<th>Compound Type</th>
<th>TLV</th>
<th>PEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tin oxide &amp; inorganic compounds, except SnH4</td>
<td>2</td>
<td>N/E</td>
</tr>
<tr>
<td>Inorganic compounds, except oxides, as Sn</td>
<td>N/E</td>
<td>2</td>
</tr>
<tr>
<td>Tin oxides, as Sn</td>
<td>2</td>
<td>N/E</td>
</tr>
</tbody>
</table>

### 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
- **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 gray in color

#### ODOR / ODOR THRESHOLD

- None

#### MELTING POINT / FREEZING POINT

- Approximately 2350 °F (1300 °C)

#### BOILING POINT

- 5000 °F (2750 °C) for iron

#### FLASH POINT

- Not applicable for solid castings

#### FLAMMABILITY

- Not flammable

#### AUTO IGNITION TEMPERATURE

- Not applicable

#### UPPER AND LOWER FLAMMABILITY LIMITS

- Not applicable for solid castings

#### VAPOR DENSITY

- Not applicable

#### SPECIFIC GRAVITY (relative density)

- 7.85 g/cm³ for iron

#### VAPOR PRESSURE

- Not applicable

#### EVAPORATION RATE

- Not applicable

#### SOLUBILITY IN WATER

- Insoluble

#### VISCOSITY

- Not applicable

#### pH

- Not applicable
<table>
<thead>
<tr>
<th>DECOMPOSITION TEMPERATURE</th>
<th>PARTITION COEFFICIENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not applicable</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

**SECTION 10 – STABILITY & REACTIVITY**

**CHEMICAL STABILITY**

Stable

**CONDITIONS TO AVOID**

None

**REACTIVITY**

Not Reactive

**INCOMPATIBLE MATERIALS**

None

**HAZARDOUS DECOMPOSITION PRODUCTS**

None

**POSSIBILITY OF HAZARDOUS REACTIONS**

Not applicable

**SECTION 11 – TOXICOLOGICAL INFORMATION**

**POTENTIAL HEALTH EFFECTS**

**EYE CONTACT:** None

**SKIN CONTACT:** None

**INGESTION:** None

**INHALATION:** None

**CARCINOGEN CLASSIFICATION of INGREDIENTS**

<table>
<thead>
<tr>
<th>INGREDIENT</th>
<th>OSHA</th>
<th>NTP</th>
<th>IARC</th>
<th>TARGET ORGAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nickel (metal)</td>
<td>NL</td>
<td>R</td>
<td>2B</td>
<td>Lung, Nose</td>
</tr>
</tbody>
</table>

**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 to 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 (HAZARDOUS MATERIALS REGISTRATION**

Not Regulated

**CANADIAN TRANSPORTATION OF DANGEROUS GOODS (TDG)**

Not Regulated
SECTION 15 – REGULATORY INFORMATION

US-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 chromium, copper, iron, magnesium, manganese, nickel, tin, silicon and silica. For hexavalent chromium references see 29CFR 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, Copper, Manganese and Nickel, 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 SUBSTANCES 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
’09/2015

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.