# MATERIAL SAFETY DATA SHEET

## SECTION 1 — PRODUCT IDENTIFICATION

**Product identifier: GRAINAL, BATS ALLOYS**

**Product use:** Additive to the steel, superalloy, iron and related industries.
**Chemical family:** Metal

**Supplier name and address:**
***Shieldalloy Metallurgical Corporation***
545 Beckett Road
Suite 201
Swedesboro, NJ 08085
L7L 4X5

**Manufacturer's name and address:**
Refer to Supplier

**Emergency Telephone #: (800) 424-9300**

## SECTION 2 — CHEMICAL COMPOSITION/HAZARDOUS INGREDIENTS

| | | | OSHA | ACGIH | $LC_{50}$(ppm/4hr) | $LD_{50}$ (mg/kg) | |
|---|---|---|---|---|---|---|---|
| **Ingredients** | **CAS #** | **% (weight)** | **PEL ($mg/m^3$)** | **TLV ($mg/m^3$)** | **inh, rat** | **oral, rat** | **dermal, rabbit** |
| Iron | 7439-89-6 | 30-60 | N/Av | N/Av | N/Av | N/Av | N/Av |
| Titanium | 7440-32-6 | 10-30 | N/Av | N/Av | N/Av | N/Av | N/Av |
| Aluminum | 7429-90-5 | 10-30 | 15 (dust) | 10 (dust) | N/Av | N/Av | N/Av |
| Silicon | 7440-21-3 | 3-7 | 10 | 10 | N/Av | 3160 | N/Av |
| Zirconium | 7440-67-7 | 3-7 | N/Av | 5 | N/Av | N/Av | N/Av |
| Manganese | 7439-96-5 | 5-10 | 5 | 0.2 | N/Av | 8000 | N/Av |
| Chromium | 7440-47-3 | 0.1-1.0 | 1 | 0.5 | N/Av | N/Av | N/Av |
| Nickel | 7440-02-0 | 0.1-1.0 | 1 | 1.5 | N/Av | 5000 | N/Av |
| Boron | 7440-42-8 | 0.1 – 1.0 | N/Av | N/Av | N/Av | N/Av | N/Av |

## SECTION 3 — HAZARDS IDENTIFICATION

***POTENTIAL HEALTH EFFECTS***

**Target organs:** Lungs (dust).
**Signs and symptoms of short-term (acute) exposure:**

*Inhalation:* Dust may cause irritation to the lungs and respiratory system. Overexposure to dusts may cause respiratory irritation, pneumoconiosis, shortness of breath, fatigue, loss of appetite and incapacity to work. Overexposure to manganese can affect the Central Nervous System. Shortness of breath or dry cough are the first signs of overexposure. The manufacturer believes that there are no health hazards from working with material in lump form.

*Skin contact:* Dust may cause irritation. Prolonged exposure to nickel and nickel compounds can cause skin sensitization.

*Eye contact:* Contact with dust may cause mechanical irritation and conjunctivitis.

*Ingestion:* May be harmful if ingested, but unlikely.

**Effects of long-term (chronic) exposure:** Prolonged overexposure may affect the respiratory system and the Central Nervous System. This product contains Manganese. Excessive inhalation or ingestion of manganese can produce manganese poisoning. Chronic manganese exposures can lead to neurological problems such as apathy, drowsiness, weakness, spastic gait, paralysis, and other neurological problems resembling Parkinsonism. These symptoms can become progressive and permanent if not treated

**Other important hazards:** Refer to Section 11.

## SECTION 4 — FIRST AID MEASURES

**Inhalation:** Remove victim to fresh air. Give oxygen if breathing is difficult. If breathing has stopped, begin artificial respiration. Obtain medical attention.

**Skin contact:** Wash skin with soap and water while removing contaminated clothing. If irritation develops consult a physician.

**Eye contact:** Immediately flush eyes with copious amounts of water for at least 15 minutes. If irritation develops consult a physician.

**Ingestion:** Unlikely route of exposure. Obtain medical attention.

## SECTION 5 — FIRE FIGHTING MEASURES

**Fire hazards/conditions of flammability:** Dust finer than 100 mesh can be flammable. Based on combustibility test, dust can be ignited when suspended in air and will propagate flame but is not expected to generate sufficient pressure to explode. Fires or explosion may be initiated by exposing any concentrated dust suspension in an enclosed industrial area to a spark or flame.

**Flash point (Method):** N/Ap

**Lower flammable limit (% by volume):** N/Ap

**Upper flammable limit (% by volume):** N/Ap

**Explosion data:** *Sensitivity to mechanical impact:* N/Av
*Sensitivity to static discharge:* N/Av

**Oxidizing properties:** N/Av

**Auto-ignition temperature:** N/Av

**Suitable extinguishing media:** Do not use water. Use dry chemical, dry sand or $CO_2$ to smother fire.

**Special fire-fighting procedures/equipment:** Firefighters should wear proper protective equipment and self-contained breathing apparatus where exposure to toxic fumes is possible. Fire may be isolated and allowed to burn itself out. Do not disturb burning metal while extinguishing the fire.

**Unusual fire and explosion hazards:** N/Av

**Hazardous combustion products:** Small amount of hydrogen may be produced in the presence of moisture.

## SECTION 6 — ACCIDENTAL RELEASE MEASURES

**Personal precautions:** Avoid dust cloud formation. Sweep up and return to container. Keep dust away from sources of ignition. Wear personal protective equipment during cleanup. Restrict access to area until completion of clean-up. All persons dealing with clean-up should wear the appropriate protective equipment especially where exposure to dust or fume is possible. Take precautions to prevent fumes from coming in contact with employee clothing.

**Environmental precautions:** If dusts are present, ensure dusts do not enter air. Notify the appropriate authorities as required.

**Spill response/Cleanup:** Use clean-up procedure that minimizes exposure to dust. Place all material in a closed container.

**Prohibited materials:** None known.

## SECTION 7 — HANDLING AND STORAGE

**Safe handling procedures:** Avoid contact with eyes, skin and clothing. Wear suitable protective equipment. Training the workers on the potential health hazards associated with product dust or fume is important. Enclosures, ventilation systems, engineering controls, or respiratory protective equipment should be utilized where inhalation exposure in excess of the limits is a possibility. Secondary inhalation exposures could occur when removing or laundering the clothing. Avoid and control operations which create dusting. Do not breathe fumes or dust. Use with adequate ventilation. An inert atmosphere is recommended for powders with more than 50% minus 200 mesh. Clean fine dust from equipment before beginning repairs. Keep away from moisture.

**Storage requirements:** Store in a cool, dry area away from incompatible materials.

**Incompatible materials:** Acids, strong oxidizers, strong bases and moisture.

## SECTION 8 — EXPOSURE CONTROLS AND PERSONAL PROTECTION

**Ventilation and engineering controls:** Use general or local exhaust ventilation to meet TLV requirements.

**Respiratory protection:** Respiratory protection is required if the airborne dust concentration exceeds the TLV and PEL levels. Use NIOSH/MSHA approved dust respirators.

**Protective gloves:** Impervious gloves appropriate to the material if skin contact with dusts is expected. Advice should be sought from glove suppliers.

**Eye protection:** Safety glasses. Safety goggles for extended usage.

**Other protective equipment:** Where exposure to dust or fume is possible use protective clothing, eyewash fountain and safety shower.

**Permissible exposure levels:** See Section 2.

## SECTION 9 — PHYSICAL AND CHEMICAL PROPERTIES

**Physical form, colour and odour:** Solid. Silver gray lump. No odour.

**Odour threshold:** N/Ap
**Boiling point:** N/Av
**Vapour pressure:** Effectively 0 at 20°C
**Coefficient of oil/water distribution:** N/Av
**Vapour density:** N/Ap
**Evaporation rate:** N/Ap

**pH:** N/Ap
**Freezing point:** (Melting) 1340-1500°C
**Solubility in water:** Insoluble, negligible.
**Specific gravity (water = 1):** 5.0-5.8
**Volatile organic compounds (VOC's):** N/Av
**Percent Volatile by Weight:** N/Av

## SECTION 10 — REACTIVITY AND STABILITY DATA

**Stability and reactivity:** Stable under the recommended storage and handling conditions prescribed. Hazardous polymerization will not occur.

**Conditions to avoid:** Stable under ambient pressure and temperature. Small amount of hydrogen may be produced in the presence of moisture.

**Materials to avoid:** Incompatible materials (see Section 7).

**Hazardous decomposition products:** Small amount of hydrogen may be produced in the presence of moisture.

## SECTION 11 — TOXICOLOGICAL INFORMATION

**$LD_{50}$:** See Section 2

**$LC_{50}$:** See Section 2

**Routes of exposure:** Eye contact, skin contact, inhalation.

**Toxicological data:** This product may cause mild irritation as a nuisance dust to skin, eyes and respiratory tract.

**Carcinogenicity:** This product contains nickel in the metallic state. IARC has determined that nickel and certain nickel compounds are probably carcinogenic to humans (Group 2B). ACGIH concluded that there is a possible association of respiratory cancer with inhalation of dust and fumes from nickel sulphide roasting operation.

**Teratogenicity, mutagenicity, other reproductive effects:** N/Av

**Sensitization to material:** Prolonged exposure to nickel and nickel compounds can cause skin sensitization.

**Synergistic materials:** N/AV

## SECTION 12 — ECOLOGICAL INFORMATION

**Environmental effects:** This product is insoluble in water. The product should not be allowed to enter drains or water courses or be deposited where it can affect localized environmental conditions.

**Important environmental characteristics:** N/Av

**Aquatic toxicity:** There is no data available on the product itself.

## SECTION 13 — WASTE DISPOSAL

**Handling for disposal:** Handle waste according to recommendations in Section 7.

**Methods of disposal:** Dispose in accordance with all applicable federal, provincial, and local regulations.

## SECTION 14 — TRANSPORTATION INFORMATION

**Transportation of Dangerous Goods Clear Language (CLR) information:** This product is not regulated.

## SECTION 15 — REGULATORY INFORMATION

**WHMIS information: Class D2A** – Materials Causing Other Toxic effects, Very Toxic Material; **Class D2B** – Materials Causing Other Toxic Effects, Toxic Material.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and this MSDS contains all the information required by the CPR.

**CEPA information:** All ingredients are listed on the DSL/NDSL.
**TSCA information:** All ingredients are listed on the TSCA inventory.

## SECTION 16 — OTHER INFORMATION

**Legend:** ACGIH – American Conference of Governmental Industrial Hygienists
CAS – Chemical Abstract Service
CEPA – Canadian Environmental Protection Act
CPR – Controlled Products Regulations
DSL – Domestic Substances List
IARC – International Agency for Research on Cancer
Inh. – Inhalation
LC – Lethal Concentration
LD – Lethal Dosage
N/Ap – Not Applicable
N/Av – Not Available
NDSL – Non-Domestic Substances List
NIOSH – National Institute for Occupational Safety and Health
PEL – Permissible Exposure Limit
TDG – Transportation of Dangerous Goods Act
TLV – Threshold Limit Value
TSCA – Toxic Substances Control Act
WHMIS – Workplace Hazardous Material Information System

**References:**
-ACGIH, Threshold Limit Values for Chemical Substances and Physical Agents & Biological Exposure Indices for 2002.
-Canadian Centre for Occupational Health and Safety, CCInfoWeb databases, 2003 (Chempendium and RTECs).
-International Agency for Research on Cancer Monographs, Supplement 7, 1988.
-Material Safety Data Sheets from manufacturer.

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**Telephone number:** 800-762-2000
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