

**MATERIAL SAFETY DATA SHEET**  
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No. \_\_\_\_\_

1

Issue Date 7/5/89**SECTION 1. PRODUCT DESCRIPTION**

## CAST AND SINTERED PERMANENT MAGNETS

|            | GRADE           | NOMINAL % COMPOSITION |    |    |    |    |      |
|------------|-----------------|-----------------------|----|----|----|----|------|
|            |                 | Al                    | Ni | Co | Cu | Ti | Fe   |
| ALNICO 1   | 1               | 12                    | 21 | 5  | 3  | -- | Bal. |
|            | 2               | 10                    | 19 | 13 | 3  | -- | Bal. |
|            | 3               | 12                    | 25 | -- | 3  | -- | Bal. |
|            | 4               | 12                    | 27 | 5  | -- | -- | Bal. |
|            | 5, 5 DG, 5 Col. | 8                     | 14 | 24 | 3  | -- | Bal. |
|            | 6               | 8                     | 16 | 24 | 3  | 1  | Bal. |
|            | 8, 9            | 7                     | 15 | 35 | 4  | 5  | Bal. |
| ALNICO 8HC |                 | 8                     | 14 | 38 | 5  | 8  | Bal. |

The product, as supplied, presents no health hazard unless it is abrasive ground, cut, machined, or melted. These procedures may produce hazardous amounts of metallic dusts or fumes. Such operations should be evaluated to determine if a health hazard exists.

**SECTION 2. INGREDIENTS AND HAZARDS**

| CAS NO.    | ELEMENT  | SYMBOL                    | ACGIH TLV *<br>(mg/m <sup>3</sup> ) | AIR CONTAMINATION    |
|------------|----------|---------------------------|-------------------------------------|----------------------|
| 7429-90-5  | Aluminum | Al                        | 10.0                                | As Al oxide          |
| 7440-02-0  | Nickel   | Ni                        | 1.0 **                              | Metal                |
| 7440-48-4  | Cobalt   | Co                        | 0.05                                | As metal fume & dust |
| 7440-50-8  | Copper   | Cu                        | 0.2                                 | As fume              |
|            |          |                           | 1.0                                 | As dust              |
| 13463-67-7 | Titanium | Ti (as TiO <sub>2</sub> ) | 10.0                                | Total dust           |
| 1309-37-1  | Iron     | Fe                        | 10.0                                | Total dust           |

\* American Conference of Governmental Industrial Hygienists, 1988-89. Threshold Limit Values (TLV) based on an 8 hour day, 40 hour week.

\*\* The 3rd Annual Report by National Toxicology Program lists nickel and certain nickel components as suspected carcinogens. If airborne concentrations exceed those specified, NIOSH approved respirator should be used.

**SECTION 3. PHYSICAL DATA**

|                      |   |
|----------------------|---|
| Specific gravity:    | 7.0 to 7.35                             |
| Appearance and odor: | Metallic silver/gray in color; no odor. |
| Melting point:       | 2300°F - 2550°F                         |
| Solubility:          | Not soluble                             |

#### SECTION 4. FIRE AND EXPLOSION DATA

Product is not combustible. Fine metal powders produced by dry grinding or machining may cause an explosive hazard. Control dust levels by utilizing wet machining or grinding processes, local exhaust ventilation, and good housekeeping. Keep dusts from ignition sources. If dusts should combust, use dry chemical extinguishing media, wear protective breathing apparatus and heat resistant clothing.

#### SECTION 5. REACTIVITY

Product is not reactive. Powders from product are incompatible with strong oxidizing agents such as concentrated nitric acid. Avoid generation of airborne dusts which could create fire and explosive hazard, (see Section IV).

#### SECTION 6. HEALTH HAZARDS

Primary route of entry: inhalation of generated airborne dust or fumes. Any long-term exposure to dusts exceeding recommended TLV levels may result in irritation to upper respiratory tract. Nickel is a suspected carcinogen and airborne dusts must be controlled to not exceed recommended threshold limit values.

Dusts in eyes may cause irritation. Flush eyes with water.

Prolonged skin contact with nickel and cobalt may cause allergic reaction in sensitive individuals.

Use good personal hygiene.

Avoid ingestion of dusts by not eating, drinking, or smoking in areas where dusts or fumes are generated.

#### SECTION 7. WASTE DISPOSAL

Dusts or fine scrap may be vacuumed or swept wet to keep airborne dust concentrations to a minimum.

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

#### SECTION 8. SPECIAL PROTECTION INFORMATION

Grinding or machining should be performed using coolants to reduce dusts. Adequate ventilation should be used when dry grinding or machining alloy. When operations create exposure levels exceeding TLV's, provide local exhaust ventilation. Use NIOSH approved respirator as required. Use safety glasses or goggles when handling, grinding, or machining product. Magnetized product may create personal hazards due to chipping, shattering, or pinching on impact. Use protective gloves, as required.

#### SECTION 9. SPECIAL PRECAUTIONS AND COMMENTS

Use good manufacturing practices and good housekeeping practices that will keep generated dusts to a minimum. Use personal protection equipment when required. Use good personal hygiene practices.