

# Vale Inco F Nickel Shot

## Product Information

Vale Inco F Nickel Shot is used primarily for alloying.

Vale Inco Limited  
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Chemtrec 24 hr Emergency No. 1-800-424-9300

WHMIS Classification: D2B

## Hazardous Ingredients

| Hazardous Ingredients | Composition | C.A.S. No | Oral LD <sub>50</sub> -rat | Exposure Limit (TLV) <sup>1,2</sup> -mg/m <sup>3</sup> |
|-----------------------|-------------|-----------|----------------------------|--|
| Nickel (Ni)           | 92          | 7440-02-0 | >9000 mg/kg                | 1.5*   |
| Silicon (Si)          | 5           | 7440-21-3 | n.av.                      | 10 total dust  |
| Iron (Fe)             | 3           | 7439-88-5 | n.av.                      | n.av   |

\*as inhalable fraction

## Physical Data

Silver-grey, odourless metal spheres of approximately -1/4 inch to +30 mesh (-6.4 mm to + .48 mm).

| Ingredient | Mol. Wt. | Specific Gravity | Melting Point (°C) | Boiling Point (°C) | Solubility in H2O g/100ml |
|------------|----------|------------------|--------------------|--------------------|---------------------------|
| Nickel     | 58.71    | 8.9              | 1453               | 2732               | 0                         |
| Silicon    | 28.086   | 2.33             | 1410               | 2355               | 0                         |
| Iron       | 89.86    | 3.4              | 1535               | 3000               | 0                         |

## Fire or Explosion Hazard

Not applicable.

## Reactivity Data

Like other metals, nickel can react with acids to liberate hydrogen gas that can form explosive mixtures in air. Under special conditions nickel can react with carbon monoxide in reducing atmospheres to form nickel carbonyl, Ni(CO)<sub>4</sub>, a toxic gas. Silicon can react under certain conditions with metal acetylides, metal carbonates, metal hexafluorides, oxidants and calcium.

## Toxicological Properties<sup>3</sup>

### **Nickel**

*Acute Toxicity:*

## MATERIAL SAFETY DATA SHEET

**MSDS**

- a) *Oral:* Non toxic - LD<sub>50</sub> ORAL RAT >9000 mg/kg
- b) *Inhalation:* One case has been reported of a fatality following extreme exposure at an estimated 382 mg Ni/m<sup>3</sup>. A plasma spraying operative died of pneumonia 13 days after exposure to nickel powder particles. The post mortem diagnosis was shock lung.
- c) *Dermal:* No information available.

*Corrosivity/Irritation:*

- a) *Respiratory Tract:* None
- b) *Skin:* See sensitization section.
- c) *Eyes:* Mechanical irritation may be expected.

*Sensitization:*

- a) *Respiratory tract:* Nickel metal induced asthma is very rare. 3 case reports are available; the data is not sufficient to conclude that nickel metal is classified as a respiratory sensitizer.
- b) *Skin:* Nickel metal is a well-known skin sensitizer. Direct and prolonged skin contact with metallic nickel may induce nickel allergy and elicit nickel allergic skin reactions in those people already sensitized to nickel, so called nickel allergic contact dermatitis.
- c) *Preexisting conditions:* Individuals known to be allergic to nickel should avoid contact with nickel whenever possible to reduce the likelihood of nickel allergic contact dermatitis reactions (skin rashes). Repeated contact may result in persistent chronic palmar/hand dermatitis in a smaller number of individuals, despite efforts to reduce or avoid nickel exposure.

*Repeated dose toxicity:*

- a) *Oral:* No information available
- b) *Inhalation:* Animal studies (rats) show that repeated dose inhalation of nickel damages the lung. Chronic inflammation, lung fibrosis and accumulation of nickel particles were observed.
- c) *Dermal:* Direct and prolonged skin contact with nickel metal may cause nickel sensitization resulting in nickel allergic contact dermatitis /skin rash.

*Mutagenicity /*

*Reproductive toxicity:* No data.

*Carcinogenicity:*

- a) *Ingestion:* The U.S. National Institute for Occupational Safety and Health (NIOSH) concluded that there is no evidence that nickel metal is carcinogenic when ingested.
- b) *Inhalation:* There is limited information available from inhalation and intratracheal studies in animals. The U.S. National Toxicology Program has listed metallic nickel as reasonably anticipated to be a human carcinogen. To date, there is no evidence that nickel metal causes cancer in humans based on epidemiology data from workers in the nickel producing and nickel consuming industries.

The International Agency for Research on Cancer (IARC)(Vol 49) found there was inadequate evidence that metallic nickel is carcinogenic to humans but since there was sufficient evidence that it is carcinogenic to animals, IARC concluded that metallic nickel is possibly carcinogenic to humans (Group 2B). In 1997, the ACGIH categorized elemental nickel as: A5 "Not Suspected as a Human Carcinogen". Epidemiological studies of workers exposed to nickel powder and to dust and fume generated in the production of nickel alloys and of stainless steel have not indicated the presence of a significant respiratory cancer hazard

- Silicon** Silicon is defined by the American Conference of Governmental Industrial Hygienists as a nuisance particulate.
- Lead** Lead compounds tested for carcinogenicity by the International Agency for Research on Cancer (IARC) were almost all soluble salts. Nevertheless, IARC concluded that there was sufficient evidence that lead and inorganic lead compounds were carcinogenic to animals.
- Lead in all its forms is considered a cumulative poison normally entering the body by ingestion and inhalation. Poisoning by lead can result in anemia; nervous system disorders characterized by weakness and palsy (i.e. wrist drop); and chronic renal disease.

### Preventative Measures

If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limits. If ventilation alone cannot so control exposure, use NIOSH-approved respirators selected according to the current edition of the Selection, Care and Use of Respirators CSA Z94.4. Maintain airborne nickel levels as low as possible.

Avoid repeated skin contact. Wear suitable gloves. Wash skin thoroughly after handling. Launder clothing and gloves as needed. Do not store near acids. If spilled, pick up product and replace in original container.

Nickel-containing waste is normally collected to recover nickel values. Should waste disposal be deemed necessary, follow the relevant governmental regulations.

### First Aid Measures

If exposure to nickel carbonyl is suspected, seek medical attention immediately. For skin rashes, seek medical attention. Cleanse wounds thoroughly to remove any particles.

### Preparation Information

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**Note:**  
***Vale Inco believes that the information in this Material Safety Data Sheet is accurate. However, Vale Inco makes no express or implied warranty as to the accuracy of such information and expressly disclaims any liability resulting from reliance on such information.***

#### **Footnotes:**

- 1 Threshold Limit Value of the American Conference of Governmental Industrial Hygienists.*
- 2 Exposure Limits for user operations will depend on the relevant governmental regulations.*
- 3 Describes possible health hazards of the product supplied. If user operations change it to other chemical forms, whether as end products, intermediates or fugitive emissions, the possible health hazards of such forms must be determined by the user.*