SDS
SAFETY DATA SHEET

F Nickel Shot

Product Information

F Nickel Shot is used primarily for alloying.

Vale Canada 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_{50} -rat	Exposure Limit (TLV) [1,2] –mg/m³
Nickel (Ni)	92	7440-02-0	>9000 mg/kg	1.5*
Silicon (Si)	5	7440-21-3	n/a	10 (total dust)
Iron (Fe)	3	7439-89-6	n/a	n/a

*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)
Nickel	58.71	8.9	1453	2732
Silicon	28.086	2.33	1410	2355
Iron	89.86	3.4	1535	3000

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, $Ni(CO)_4$, a

toxic gas. Silicon can react under certain conditions with metal acetylides, metal carbonates, metal hexafluorides, oxidants and calcium.

Toxicological Properties

As a mixture the toxicological properties of this product are unknown. The toxicology of the reported ingredients is summarized below.

Nickel

Acute Toxicity:	
Oral:	Non toxic - LD_{50} ORAL RAT >9000 mg/kg
Inhalation:	No information available
Dermal:	No information available.
Corrosivity/Irritation:	
Respiratory Tract:	None
Skin:	See sensitization section.
Eyes:	Mechanical irritation may be expected.
Sensitization:	
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.
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.
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.
Chronic toxicity:	
Oral:	No information available
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.

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:
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.

Inhalation: 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. A recent animal (rat) inhalation study showed no increased respiratory cancer risk for nickel metal powder indicating that no carcinogen classification is warranted for nickel metal The U.S. National Toxicology Program has listed metallic nickel as reasonably anticipated to be a human carcinogen.

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:
Acute Toxicity:
Oral: LD_{50}: 3160 mg/kg [Rat].

Inhalation: No information available

Dermal: No Information available.

Corrosion/Irritation:
Respiratory Tract May cause respiratory tract irritation.

Skin: May cause skin irritation from frictional action.

Eyes: May cause eye irritation from frictional action.

Chronic Toxicity: No information available.

Silicon is defined by the American Conference of Governmental Industrial Hygienists as a nuisance particulate.

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

For skin rashes, seek medical attention. Cleanse wounds thoroughly to remove any particles.

Preparation Information

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Note:
Vale Canada believes that the information in this Material Safety Data Sheet is accurate. However, Vale Canada 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.*