



INCOMAG[®] Alloy 5

Hazardous Ingredients

Hazardous Ingredients	Calculated Composition	C.A.S. No	PEL ¹ –mg/m ³	TLV ² –mg/m ³
Nickel (Ni)	63	7440-02-0	1	1.5*
Magnesium (Mg)	16	7439-95-4	n.av.	n.av.

*as inhalable fraction

Physical and Chemical Data

Grey, odorless, metallic, conical pig in two weights: 3 lb. and 12 lb. (1.4 kg and 5.4 kg).

Ingredient	Mol. Wt.	Specific Gravity	m.p.°C	b.p.°C	Sol. In H ₂ O g/100ml
Ni	58.71	8.9	1453	2732	0
Mg	24.312	1.74	651	1107	0

Physical Hazards

Fire or Explosion Hazard

As supplied this product does not present a fire or explosion hazard. However, magnesium vapor liberated in the use of this product (eg. production of ductile iron) in contact with air at elevated temperatures can result in a violent explosion.

Also, finely-divided magnesium produced in the use of this product in contact with air at temperatures near the melting point of magnesium will ignite and burn with a white flame. Magnesium fires should be smothered with dry graphite or other suitable dry powders. (Consult National Fire Protection Association (NFPA) standards to determine suitable extinguishing media applicable to user operations.) Do not use foam, carbon tetrachloride, or carbon dioxide. Use of water can produce hydrogen gas and result in an explosion. Avoid direct viewing of magnesium fires to prevent eye injury.

In magnesium fire conditions, protect eyes and skin against flying particles.

A build-up of finely-divided magnesium from the use of this product should be prevented. If clean-up is necessary, see Spill, Leak and Disposal Procedure.

Health Hazards

Nickel

LD₅₀ ORAL RAT >9000 mg/kg

Inhalation:

The National Toxicology Program has listed nickel as reasonably anticipated to be a carcinogen based on the production of injection-site tumours. The International Agency for Research on Cancer (IARC) 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

INCO

Material

Safety

Data

Sheet

metallic nickel is possibly carcinogenic to humans. 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.

The inhalation of nickel powder has not resulted in an increased incidence of malignant lung tumours in rodents.

Repeated intratracheal instillation of nickel powder produced an increased incidence of malignant lung tumours in rats. Repeated intratracheal instillation of nickel powder did not produce an increased incidence of malignant lung tumours in hamsters when administered at the maximum tolerated dose. Single intratracheal instillations of nickel powder in hamsters at doses near the LD₅₀ produced an increased incidence of fibro sarcomas, mesotheliomas and rhabdomyosarcomas.

Inhalation of nickel powder at concentrations 15 times the PEL irritated the respiratory tract in rodents.

In 1997, the ACGIH categorized elemental nickel as: A5 "Not Suspected as a Human Carcinogen."

Skin Contact:

Prolonged and intimate contact with metallic nickel may cause irritation to the skin and nickel sensitivity, which may result in allergic skin rashes.

One case has been reported of asthma induced by external exposure to a nickel-containing skin clip and by skin contact with nickel.

Wounds:

Nickel metal powder has caused tumours at the site of injection in rodents. However, studies do not suggest a significant risk for humans from nickel-containing prostheses.

Ingestion:

The U.S. National Institute for Occupational Safety and Health (NIOSH) concluded there is no evidence that nickel and its inorganic compounds are carcinogenic when ingested. The U.S. Food and Drug Administration has affirmed that nickel is generally recognized as safe (GRAS) as a direct human food ingredient.

Pre-existing
Conditions:

Prolonged and intimate skin contact can cause an allergic skin rash in previously sensitized individuals.

Magnesium

Wounds:

Magnesium powder and magnesium alloy have caused necrotic gaseous tumours at the site of subcutaneous injection in experimental animals. No similar experiences have been reported in humans.

Open skin abrasions and wounds exposed to magnesium metal may be difficult to heal.

Ingestion:

The lowest lethal dose of magnesium (LD_{Lo}) is 230 mg/kg in dogs.

Inco

Material

Safety

Data

Sheet

Precautions for safe storage, handling and use

If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne nickel and magnesium oxide below the PELs⁴. If ventilation alone cannot so control exposure, use NIOSH-approved respirators selected according to OSHA 29 CFR 1910.134. 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. This product can react vigorously with acids to liberate hydrogen gas, which 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.

Spill, leak and disposal procedure

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 EPA and local regulations.

If clean-up of finely-divided magnesium arising from the use of this product is required, use non-sparking tools to prevent ignition. Do not vacuum. Carefully sweep up and store in tightly closed metal or fibre containers. Protect containers against physical damage. Store in a detached fire resistive building, protected from moisture and away from reactive substances such as chlorine, bromine, iodine, acids and all possible sources of ignition.

Emergency and first aid procedures

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

SARA Section 313 Supplier Notification

This product contains the following chemical(s) subject to the reporting requirements of Section 313 of the Emergency Planning and Community Right-to-Know Act of 1986 and of 40 CFR 372:

Nickel

Refer to the Hazardous Ingredients section of this MSDS for the appropriate CAS numbers and percent by weight.

INTERNATIONAL NICKEL INC.

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Note:

Inco believes that the information in this Material Safety Data Sheet is accurate. However, 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:

- ® Trademark of the Inco family of companies.
- 1 OSHA Permissible Exposure Limit
- 2 Threshold Limit Value of the American Conference of Governmental Industrial Hygienists.
- 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.
- 4 The PEL for magnesium oxide is 10 mg/m³. The TLV is 10 mg/m³. Exposure to magnesium oxide fume can result in metal fume fever.