



PRODUCT INFORMATION

INCO Discard Slag CCS (**Class D**)

INCO LIMITED
Ontario Division
Copper Cliff, Ontario
P0M 1N0

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INCO Discard Slag CCS is used in road and track bed construction.

HAZARDOUS INGREDIENTS

This product is a complex mixture of aluminum, magnesium, calcium and iron silicates, magnetite, and nickel sulfides and oxides.

Hazardous Ingredients	Calculated Composition	C.A.S. No.	Oral LD ₅₀ -rat	TLV ^{1,2} -mg/m ³
Nickel Sulfide(s)	0.1-1.0	n.av.	>5000 mg/kg ³	0.2* as Ni
Nickel Oxide (NiO)	0.1-1.0	1313-99-1	>5000 mg/kg	0.2* as Ni

* As inhalable fraction

PHYSICAL DATA

Black, glossy, odorless pieces of various sizes.

Ingredient	Mol. wt.	S.G.	mp °C	Sol. in H ₂ O g/100ml
Nickel Sulfide(s)	n.av.	n.av.	n.av.	0
Nickel Oxide	74.71	6.67	1990	0

FIRE OR EXPLOSION HAZARD

Not applicable.

REACTIVITY DATA

Not applicable.

TOXICOLOGICAL PROPERTIES⁴

The toxicological properties of this mixture are unknown. The toxicology of the ingredients is reported.

Nickel Oxide

LD₅₀ ORAL RAT > 5000 gm/kg

Inhalation:

Evidence for the association of nickel compound exposures and cancer risk comes mainly from workers in now obsolete nickel refining operations. The studies of nickel workers suggest that respiratory cancer risks are primarily related to exposure to relatively insoluble forms of nickel notably sulphidic and oxidic nickel at concentrations greater than 10mg/m³. Toxic respiratory effects in animals may be caused by reduced particle clearance capacity.

The International Agency for Research on Cancer (IARC) (ref. 4) in 1990 and the U.S. Tenth Report on Carcinogens (ref. 5) in 2002 concluded there was sufficient evidence that nickel compounds are carcinogenic to humans. The Report of the International Committee on Nickel Carcinogenesis in Man reported that workers who have been primarily exposed to nickel oxide showed some evidence of increased lung cancer.

The European Union Commission in 1991 classified nickel oxide and work involving exposure to dusts, fumes and sprays produced during the roasting and electrorefining of nickel-copper mattes as carcinogenic processes.

ACGIH has re-evaluated the data regarding the carcinogenicity of nickel and nickel compounds and has classified nickel oxide as a confirmed human carcinogen, Class A1.

There is some evidence that the inhalation of nickel oxide has resulted in an increased incidence of malignant lung tumors in rats. Inhalation of nickel oxide at concentrations 50 times the TLV, produced pneumoconiosis in hamsters. Repeated intratracheal instillation of nickel oxide produced an increased incidence of malignant lung tumors in rats.

Wounds:

Nickel oxide has caused tumors at the site of injection in rodents.

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.

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

Reproductive Toxicity: There is no evidence of mutagenesis. Animal experiments indicate that soluble nickel ingestion causes adverse effects on fetal development at a threshold oral exposure of 2.2 mg/Ni/kg/day by pregnant rats. Data are insufficient to determine if this effect occurs in humans and no regulatory agency has classified soluble forms of nickel as reproductive risks for humans.

Nickel Sulfide(s)

Inhalation: The National Toxicology Program has listed nickel subsulfide as reasonably anticipated to be a carcinogen based on the production of injection-site tumors. The International Agency for Research on Cancer (IARC) concluded there was sufficient evidence that nickel compounds are carcinogenic to humans and that crystalline nickel sulfides are carcinogenic to animals. Epidemiological studies of workers engaged in the oxidation of nickel subsulfide (Ni_3S_2) by dusty processes indicated the presence of a significant respiratory cancer hazard.

Rats exposed by inhalation to $\sim 1 \text{ mg Ni}_3\text{S}_2/\text{m}^3$ experienced an increased incidence of malignant lung tumors. Repeated intratracheal instillation of nickel subsulfide produced an increased incidence of malignant lung tumors in rats. Repeated intratracheal instillation of nickel subsulfide did not produce an increased incidence of malignant lung tumors in hamsters when administered at the maximum tolerated dose.

Wounds: Nickel subsulfide and crystalline nickel monosulfide (NiS) are potent experimental carcinogens in rodents by parenteral routes of administration. Ni_7S_6 has not been tested by this route but might act in a similar fashion.

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.

PREVENTIVE MEASURES

If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne nickel below the exposure limit. If ventilation alone cannot so control exposure, use NIOSH-approved respirators selected according to the Selection, Care and Use of Respirators CSA Z94.4-M1993. Maintain airborne nickel levels as low as possible.

INCO[®] Discard Slag CCS

4.

Wear suitable gloves. Wash skin thoroughly after handling. Launder clothing and gloves as needed.

If spilled, contain.

Should waste disposal be deemed necessary, follow the relevant governmental regulations.

FIRST AID MEASURES

Cleanse wounds thoroughly to remove any particles.

PREPARATION INFORMATION

Prepared by:

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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 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 The oral LD₅₀ rat provided is for nickel subsulfide (Ni₃S₂).
- 4 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.

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