MILLER AND COMPANY

MATERIAL SAFETY DATA SHEET

I. Product Identification:

Trade Name:	SILVERY IRON, SILVERY PIG, FERROSILICON, IRON SILICON
Manufacturer's Name:	Miller and Company LLC
Address:	9700 W. Higgins Road Suite 1000 Rosemont, IL 60018
Phone:	847-696-2400
Emergency Phone:	Chemtrec 800-262-8200
Prepared by:	H. F. Linebarger
Date:	July 18, 2011

II. Physical Data

Physical Appearance and Odor:	Metallic grey or silver solid. No Odor
Solubility:	Insoluble in water
Flash Point:	No flashpoint
Specific Gravity:	5 at 20 C
Melting Point:	Approx. 1200 – 1250 C
Reactivity:	May react slightly with water. See section VI
Boiling Point:	2300 C
Flammable Limits:	Dust finer than 100 mesh (U.S.) may be flammable. See section IV.

NFPA Rating (1) Health (1) Flammability (1) Reactivity (1) Other
0 = Insignificant 1 = Slight 2 = Moderate 3 = High 4 = Extreme

III. Ingredients

Component	*% by Weight*	*CAS No.*	*OSHA PEL[1] (mg/m^3)*	*ACGIH TLV[2]*
Iron	40 – 55	7439-89-6	N/A	N/A
Silicon	16 – 20	7440-21-3	10 5*	10
Manganese	0.01 to 3.0	7439-96-5	5	0.2
Chromium	0 – 0.3%	7440-47-3	1	0.5
Nickel	0.01 – 0.2	7440-02-0	1	1.5*
Titanium	0 – 0.25	7440-32-6	N/A	N/A
Silicon dioxide Amorphous Crystalline	 0 – 20 0 – 20	 69012-64-2 14808-60-7	 15 (total) 5* 0.05	 2 0.05*
Calcium oxide	0 – 2.0	1305-62-0	5	2

1 Occupational Safety and Health Final Rule Permissible Exposure Limits
2 American Conference of Governmental Industrial Hygienist Threshold Limit Values
* Respirable fraction determined using industrial hygiene methods

IV. Fire and Explosion Hazard Data

Combustibility: Based on combustibility test ferrosilicon dusts finer than minus 100 mesh (U.S.) is considered combustible. Dust can be ignited when suspended in air and will propagate flame but is not expected to generate enough pressure to explode. Lump material and plus 100 mesh material (U.S.) are not considered combustible.

Extinguishing Media: Class D fire. Use dry chemical, dry sand, or CO2 to smother fire. Fire may also be isolated and allowed to burn itself out.

V. Health Hazard Data

Exposure Limit Values: If employee exposure is limited to 5mg/M3, the ACGIH nuisance dust limit, then all OSHA and TLV limits for the components of ferrosilicon will be in compliance.

Signs and Symptoms of Overexposure to dust: Shortness of breath or dry cough is the first signs of overexposure to ferrosilicon dust. If such symptoms occur remove from exposure and seek medical attention.

Effects of Overexposure: Alloys are of low toxicity in lump form. A thorough search of the relevant literature has shown no evidence of health hazards associated with working with ferrosilicon lump form. If the recommended dust exposure limits are consistently exceeded the worker may experience irritation of the respiratory tract, shortness of breath, fatigue, loss of appetite and incapacity to work.

First Aid Procedures: For Primary Routes of Exposure:

Inhalation: Remove from dusty area to fresh air. If cough or irritation persists seek proper medical attention.

Skin Contact: No hazard associated with skin contact. Recommend proper personal hygiene before eating.

Eye Contact: Flush with copious amounts of water to ensure no particles remain in eye. If soreness or irritation persists seek proper medical attention.

Potential for Carcinogenicity: Ferrosilicon is not listed as a carcinogen or a potential carcinogen by the National Toxicology program of the U.S. Public Health Service, nor has it been found to be a carcinogen or a potential carcinogen by OSHA or the International Agency for Research for Cancer. Glencore Ltd. is not aware of any data indicating that ferrosilicon produces or has the potential to produce cancer. The International Agency for Research on Cancer (ARC) has determined that "nickel and certain nickel compounds" are "probably carcinogenic to humans" but the nickel compounds responsible for the effect have not been specified. The American Industrial Hygiene Association has also concluded that there is no epidemiological evidence of increased risk of respiratory cancer in the refining of oxide nickel ores or "in any other specifically nickel of occupational exposure".

VI. Reactivity Data

Stability: Stable as lump and fines.

Conditions to Avoid: Avoid contact with moisture during extended storage for 50% ferrosilicon and pulverized silvery iron. Ventilation should be supplied in areas of extended storage. No special conditions for lump silvery iron.

Material to Avoid: Strong oxidizers, acids, and moisture.

Hazardous Reaction/Decomposition Products: For 50% ferrosilicon and pulverized silvery iron small amounts of arsine, phosphine and hydrogen may evolve in the presence of moisture and acids. For lump silvery iron no hazardous/decomposition product expected.

Hazardous Polymerization: Will not occur.

VII. Spill, Leak and Disposal Information

Environmental Impact: No special procedures required.

Procedures if Material is Spilled: Fine material should be swept up or vacuumed. Avoid using compressed air to maneuver spills or leaks of fine material. No problems associated with spills or leaks of lump material. Keep wet material separated from dry material.

Waste disposal or repack information: Avoid repacking wet material in sealed containers. Dispose of in accordance with applicable Federal, State and Local Regulations.

VIII. Employee Protection Information

Eye Protection: Normal industrial eye protection practices should be employed. Recommended use of safety glasses with side shields.

Skin Protection: Protective gloves are recommended during handling. Lump material may have sharp edges, as with other metal dusts avoid contamination of clothing. Recommended use of steel toe safety shoes or boots during handling of lump material. Good personal hygiene practices should always be followed.

Respiratory Protection: In dusty areas use Niosh approved schedule 21C respirator.

Ventilation: Local for dusty locations. No special requirements under ordinary conditional of use and adequate ventilation.

IX. Special Precautions

Handling: No special precautions required.

Storage: Dry covered storage recommended for 50% ferrosilicon and pulverized silvery iron. No special requirements for lump silvery iron. Dispose of containers as ordinary refuse.

Milling: No problems associated with sizing to 100 mesh (U.S.). Precautions such as dusty collection systems are advisable when sizing minus 100 mesh (U.S.). An inert atmosphere is recommended for milling ferrosilicon with more than 50% minus 325 mesh (U.S.). Grinding wet material may be hazardous due to the possibility of hydrogen evolution.

X. Toxicological Data

Acute Toxicity Studies: No toxicity studies have been made on this product.

XI. Precautionary Label Information

Warning: Harmful if inhaled or ingested. This product contains about 0.1 – 0.2% nickel in the metallic state. The International Agency for Research on Cancer has determined that "nickel and certain nickel compounds" are "probably carcinogenic to humans" but the nickel compounds responsible for the effect have not been specified. The American Industrial Hygiene Association has also concluded that there is no epidemiological evidence of increased risk of respiratory cancer in the refining of oxide nickel ores or "in any other specifically nickel occupational exposures". If dust from this product is finer than 100 mesh, it can be flammable and explosive if dispersed in air.

XII. Transportation Information

DOT Proper Shipping Name and Code: Not Applicable

Information given herein offered in good faith as accurate, but without guarantee. Conditions of use and suitability of the product for particular uses are beyond our control; all risks of use of the product are therefore assumed by the user, and we expressly disclaim all warranties of every kind and nature, including warranties of merchantability and fitness for a particular purpose in respect to the use or suitability of the product. Nothing is intended as a recommendation for uses which infringe valid patents or as extending license under valid patents. Appropriate warning and safe handling procedures should be provided to handlers and users.

July 18, 2011