Italmagnésio Nordeste S.A.

MATERIAL SAFETY DATA SHEET

(29 CFR Part 1910.1200 – Hazard Communication)

PRODUCT: *FERRO SILICON ZIRCONIUM*

Prepared by Engº Michele Sarlo *Date prepared: January 10th 2007* **Revised on January 13th, 2014**

1. IDENTIFICATION OF PRODUCT AND PRODUCER

1.1 PRODUCT INFORMATION

1.1.1 Material / Product: Ferrosilicon Zirconium
1.1.2 Chemical: FeSiZr
1.1.3 Chemical Composition: Si = 43/52% Zr = 30/35% Fe = Balance
1.1.4 Classification:

1.2 MANUFACTURER INFORMATION

ITALMAGNÉSIO NORDESTE S/A
Address: R. Salvador Roberto, 1963 Telephone: (55 38) 3731-1451
Várzea da Palma, MG – Brazil
CEP 039260-000

2. COMPOSITON INFORMATION

2.1 PRODUCT INFORMATION

Si = 43/52% Zr = 30/35% Fe = Balance

2.2 COMPONENTS

nº. CAS	Significant ingredients	%
7440-21-3	Silicon	43/52
7440-67-7	Zirconium	30/35
7439-89-6	Iron	Balance

3. HAZARDOUS IDENTIFICATION

3.1 PRODUCT INFORMATION

NONE: alloys is non toxic in lump form and no residual injury is expected

3.2 HEALTH AND ENVIROMENT HAZARD DATA

3.2.1 Health Hazards: Ferro silicon alloys are of low toxicity in lump form. High concentrations of dust will cause some irritation in the eyes, nose and throat. No residual injury is expected. Inhalation of ferrosilicon alloy dust may cause begin pneumoconiosis similar to that caused by inhalation of a nuisance dust. Excessive inhalation of dust may cause mottling of the lungs (silicose).

3.2.2 Dangers for the environment: NONE

4. EMERGENCY AND FIRST AID PROCEDURES

4.1 INHALATION
Remove to fresh air

4.2 INGESTION
Not Applicable

4.3 CONTACT WITH SKIN
Wash with mild soap and water

4.4 CONTACT WITH EYES
Necessary flush with water to remove particles

5. FIRE AND EXPLOSION

5.1 APPROPRIATE AGENTS OF EXTINCTION:
Water ☐ CO2 ■ Foam ☐ Chemical dry powder ■

5.2 NON APPROPRIATE AGENTS OF EXTINCTION:
Water ■ CO2 ☐ Foam ■ Chemical dry powder ☐

5.3 SPECIAL MEASURES TO TAKE
Fire may also isolated and allowed to burn it self-out. Do not disturb the burning metal extinguish the fire.

5.4 PRODUCTS OF COMBUSTION
Not applicable.

5.5 SPECIAL RISK THAT HAVE IN EXPOSITION TO THE PRODUCTOR THE PRODUCTS OF COMBUSTION:
Not applicable.

5.6 SPECIAL PROTECTION FOR THE PERSONNEL OF IT FIGHTS AGAINST FIRES:
Not applicable.

6. MEASURES IN CASE OF ACCIDENTAL SPILLAGE

6.1 PERSONAL CAUTION
Avoid wet the material. None

6.2 PERSONAL PROTECTION
None

6.3 CAUTIONS FOR THE PROTECTION OF THE ENVIROMENT
Mask, gloves and glasses

6.4 DETOXICATION AND CLEANING
No toxic in lump form.

6.5 ADDITIONAL INDICATIONS
None

7. PRECAUTIONS FOR SAFE HANDLING AND STORAGE

7.1 HANDLING

7.1.1 General cautions

Avoid repacking material, which is wet in closed of sealed containers

7.1.2 Special

Cleanup personnel should wear appropriate respiratory protective equipment. Avoid use of compressed air to maneuver spills or leaks of fine material. Fine material should be swept up of vacuumed using explosion-proof equipment

7.2 STORAGE

7.2.1 Conditions of storage

It should be stored in a dry place

7.2.2 Temperature and products of decomposition

Not applicable.

7.2.3 Hazardous polymerization reactions/decomposition products

Phosphine, arsine and hydrogen may evolve due to excessive handling, the presence of moisture, or the disintegration of the alloy. Phosphine and arsine are highly toxic gases, which if allowed to concentrate, can cause serious health problems.

7.2.4 Materials to avoid

Nitric and Fluoridric acid and/or contact with moisture

8. LIMIT OF EXHIBITION / PERSONAL EQUIP PROTECTION

8.1 PERSONEL EQUIP PROTECTION:

8.1.1 Respiratory protection

In enclosed areas with excessive dusting and minimal ventilation, a self-contained breathing apparatus is required for entry. In well-ventilated, open areas, the use of respirator equipped is recommended.

8.1.2 Cutaneous protection

Protective gloves are recommended during handling as lump material may have sharp edges.

8.1.3 Ocular protection

Safety glasses

8.1.4 Other protection

N/A

8.2 GENERAL CAUTIONS:

The same that 7.1

8.3 PRACTICE HIGIENIC IN THE WORK:

The same that 7.1

8.4 CONTROLS OF EXHIBITION:

TLV/TWA (ACGIH): 10 MG/M^3 as Si

PEL/TWA (OSHA): 15 MG/M^3 as Si

PEL/TWA (OSHA):

8.5 SURVEY PROCEDURES AND / OR ANALYSYS:

Ventilation – Control exposure to below 10mg/m^3 as silicon 0,05% mg/m^3 as arsine and 0,3 mg/m^3 as phosphine.

9. PHYSICAL AND CHEMICAL CHARACTERISTICS

9.1 PHYSICAL STATE: Solid, may be in powdered from or granular form.

9.2	**ODOR:**	None
9.3	**COLOUR:**	Gray
9.4	**pH:**	Nil
9.5	**POINT INTERVAL OF BOIL:**	>2000°C
9.6	**MELTING POINT:**	1290/1315°C
9.7	**FLASH POINT:**	280 milli joules
9.8	**INFLAMATION / POINT INFLAMABILITY:**	Not applicable
9.9	**AUTO INFLAMABILITY:**	Nil
9.10	**LIMIT OF EXPLOSION:**	Not applicable
9.11	**PROPERTIES BURNING:**	Nil
9.12	**PRESSURE OF VAPOR:**	Not applicable
9.13	**DENSITY:**	3,0
9.14	**VISCOSITY:**	Not applicable
9.15	**SUPERFICIAL TENSION:**	Not applicable
9.16	**TEMPERATURE AND PRESSURA CRITICIZE:**	Not applicable
9.17	**SOLUBILITY IN WATER:**	Nil
9.18	**SOLUBILITY IN OTHER SOLVENTS:**	Nil
9.19	**COEFFICIENT OF REPARTO (N-OCTANOL/WATER):**	Nil
9.20	**DENSITY OF VAPOR:**	Nil
9.21	**OTHER DATA:**	

10. REACTIVITY DATA

10.1 STABILITY
Stable in all sizes

10.2 CONDITIONS TO AVOID
Avoid prolonged contact with moisture. Avoid adding wet product to molten materials. Ventilation should be supplied for areas of extended storage. Avoid generation of airborne dusts. Avoid generation of sparks of other ignition sources in the present dust.

10.3 MATERIALS TO AVOID
Avoid contacts with moisture and/or acids may liberate phosphine, hydrogen, arsine, silanes and other toxic or explosives gases.

10.4 THERMAL DECOMPOSION
Above 1300°C

10.5 PRODUCTS DANGEROUS RESULTANTS OF THE THERMAL DECOMPOSITION
Not applicable

10.6 REACT DANGEROUS
With acids or/and in contact with moisture

11. TOXICOLOGICAL INDICATION

11.1 DANGEROUS EFFECTS FOR THE HEALTH
Nil if lump form, high concentration of dust will cause some irritation in the eyes, nose and throat.

11.2 SHARP TOXICITY
Oral – LD 50

Skin – LD 50
Inhalation – LD 50

11.3 MEDICAL CONDITION AGGRAVATED FOR THE EXHIBITION

Inhalation – Remove to fresh air
Skin – Wash with mild soap and water
Eyes – Flush with water to remove particles
Ingestion – Not applicable

11.4 OTHER DATA:

12. ECOLOGICAL INFORMATION

12.1 FORMS AND POTENTIAL CONTAMINANTE

12.1.1 Persistence and degradability:
Not degradable
12.1.2 Mobility/bioaccumulation:
Nil

12.2 EFFECT ON THE ENVIROMENT

Nil

12.3 OTHER DATA

13. RELATIVE CONSIDERATIONS TO THE ELIMINATION

13.1 METHODS OF ELIMINATION OF THE PRODUCT (EXCESS)

Not applicable

13.2 LEGAL DISPOSITIONS

Waste disposal. Dispose of in accordance with local state and federal regulations

13.3 TYPES OF RESIDUALS / METHODS OF ELIMINATION OF RESITUAL

13.3 Pack polluted
Nil
13.3.1 1 Manipulation
Nil
13.3.1 2 Elimination
Nil
13.3.1 3 Legal dispositions
Wasted disposal – Dispose of in accordance with local state and federal regulations

14. TRANSPORT

14.1 SPECIAL CAUTIONS

Avoid Moisture

14.2 FOR THE TRANSPORT

14.3 IN LAND TRANSPORT

ADR/RID/TPC/RTF:
Class:

Number/letter:
Badger of danger:
Risk nº:
Substance nº:
nº UN:
Other indications:

14.4 RIVER TRANSPORT

AND/ADNR:
Class:
Number/leather:
Other indications:

14.5 MARITIME TRANSPORT

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14.6 AIR TRANSPORT

14.7 OTHER DATA

15. REGULATORY INFORMATION

15.1 OTHER DATA

Nº EU:

15.2 LABELED

Symbol of danger of the product:
Classification of toxicity:
Frases R:
Frases S:

16. ADDITIONAL INDICATION

The pick up information in this document corresponds the current state of our acknowledge in accordance the effective legal requirements about information, packed and labeled dangerous chemical substance. The criterion to observe the indication in this sheet of security is responsibility of the user and execution does not exempt him from the respect of the current legal laws (environment, security, hygiene and others).

Signature of Supervisor: