

Revision: 003

Date: 13 May 2003

1. IDENTIFICATION OF THE SUBSTANCE AND COMPANY UNDERTAKING

General Chemical Name Aluminium powder

Intended or recommended uses of substance: Research & Chemical production.

Supplier (Distributor)

New Metals & Chemicals Ltd
Newmet House, Rue de St. Lawrence
Waltham Abbey, Essex, EN9 1PF
Telephone: +44(0) 1992 711111

2. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredient name	Concentration /range	*Classification	CAS No	EINECS No
Aluminium powder	100%	F: R15-17	7429-90-5	231-072-3

*see 16. OTHER INFORMATION for full text of R-phrases

3. HAZARD IDENTIFICATION

As a finely divided powder or dust it is highly flammable. It may be harmful by inhalation & cause irritation to respiratory tract and eyes. May also cause sensitisation by skin contact. Ingestion can cause nausea, vomiting, diarrhoea and abdominal pains. Inhalation may cause irreversible effects.

Contact with water liberates extremely flammable hydrogen.

May cause dialysis dementia and aluminosis.

4. FIRST AID MEASURES

Inhalation	Move the patient to fresh air and administer 100 percent humidified supplemental oxygen with assisted ventilation as required. If breathing has ceased DO NOT use mouth-to-mouth respiration apply artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask. Seek immediate medical attention.
Skin Contact	Flush skin with copious quantities of water. Remove and destroy all contaminated clothing and shoes. Seek immediate medical attention.
Eye Contact	DO NOT allow patient to rub or keep eyes closed. Irrigate with copious quantities of water for at least 15 minutes. Flush under eyelids by lifting lid. DO NOT use a static eye bath. Seek immediate medical attention.
Ingestion	DO NOT induce vomiting. If patient is conscious and alert, wash out mouth with water. Give nothing by mouth if patient is unconscious. Seek immediate medical attention.

Note: Effects of exposure (inhalation, ingestion or skin contact) to substance may be delayed. Ensure that medical personnel are aware of the materials involved, and take precautions to protect themselves.

5. FIRE FIGHTING MEASURES

Precautions against fire and explosion

Powder is highly flammable and contact with water liberates extremely flammable hydrogen gas.

Finely divided powder present a fire hazard and is easily ignited. Explosive reactions may occur when present as a concentrated airborne dust in the presence of an open flame, or when in contact with oxidising agents at high temperatures. Bulk dust when damp with water may heat spontaneously. Finely divided aluminium is pyrophoric or spontaneously flammable in air. Keep away from sources of ignition. No smoking. Take precautionary measures against static discharges.

Suitable extinguishing media

DO NOT USE water directly on fire. Use dry sand, diatomaceous earth or dry salt. Do NOT get water inside containers. Cool containers with flooding quantities of water until well after fire is out. For small fires use dry sand or sodium chloride. Large fires must be isolated and allowed to burn out. Avoid water effluent from entering drains.

Extinguishing media which must not be used for safety reasons

Water, carbon dioxide, foam, halogenated hydrocarbons and extinguishing media which contain oxygen except dry sand. See above.

Special exposure hazards arising from the substance itself and its combustion products - including any gaseous by-products

Fire may produce irritating, and/or toxic gases. Hydrogen gas may build up in confined spaces

Special protective equipment for fire fighters

Wear self-contained breathing apparatus and full chemical protective clothing. Decontamination must follow before removal of gear. Show documents to the emergency services.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions

Remove or extinguish ALL ignition sources. Turn off hot air heating system. Evacuate all but essential authorised control personnel. Wear self-contained breathing apparatus and gloves to avoid inhalation, skin and eye contact. Provide sufficient ventilation. Structural firefighters` protective clothing provides limited protection in fire situations ONLY; it is not effective in spill situations.

Environmental Precautions

Prevent entry into drains, surface and ground water, soil and confined areas.

Methods for Cleaning Up

Only trained, authorised personnel should be involved. Fully encapsulating protective clothing and self contained breathing apparatus should be worn for spills and leaks with no fire. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.

DO NOT put water directly on leak, spill area or inside container. Keep combustibles (wood, paper, oil etc) away from spilled material. Cover spills with dry sand, dry diatomaceous earth or dry salt followed with plastic sheet to minimise spreading or contact with water. To avoid dust formation do not dry sweep. Do not vacuum. Use clean non-sparking tools to collect material and place it into loosely covered plastic containers.

Place residues in a closed plastic container, suitably marked, and dispose of through a licensed waste disposal contractor.

7. HANDLING AND STORAGE

Precautions for safe handling

To be handled by qualified and trained staff only.

Handle in a fume cupboard or dedicated LEV room.

Avoid all contact with water.

Avoid breathing dusts and direct or contact with skin and eyes.

Do not get in eyes, on skin or on clothing. Do not ingest or inhale.

Wash or decontaminate after handling. Wash hands before eating. Discard contaminated shoes.

Keep container tightly closed.

See section 8 for personal protective equipment.

Precautions for safe storage

Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances (see section 10). Keep away from water.

Do not store in metal containers without plastic lining.

Store away from oxidising agents, halogens, acids, alkalis and combustible materials.

Specific use

Research and alloy manufacture.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Use only in properly operating fume cupboard designed for hazardous chemicals having an average face velocity of at least 100 feet per minute. Large handlings must be conducted in a properly constructed LEV room with decontamination facilities.

Exposure limit values

Ingredient name	OES LTEL	OES STEL	MEL (LT)	MEL (ST)
Aluminium metal	10mg/m ³			

Occupational exposure controls

Eye protection	Wear appropriate protective eyeglasses, chemical safety goggles or full-face shield to European Standard EN 166.
Hand protection	Wear appropriate gloves. Gloves of nitrile or PVC may be used as single splash disposable gloves and must be discarded immediately after use. Gloves should comply with European Standard EN 374-3 class 3.
Skin protection	Use one or more of the following personal protection equipment as necessary. Full chemical protective suit to EN 465 standard, PVC apron, helmet and boots.
Respiratory protection	If product is not used in a fume cupboard wear full face or hood compressed airline breathing apparatus to EN 139 or EN 270/271 alternatively use self contained breathing apparatus to EN 137. This equipment should always be available on standby.
Ingestion	Do not eat, drink or smoke when using this product. Do not ingest. Exhibit the strictest hygiene control.

Environmental exposure controls

No specific environmental legislation applies in the EU at present; however in accordance with best practice only use in a fume cupboard or with local exhaust ventilation. In case of fire, spillage or leakage, prevent material from entering watercourses, sewers, soil or atmosphere.

9. PHYSICAL AND CHEMICAL PROPERTIES

General information

Appearance Silver/grey powder

Odour Odourless

Important health, safety and environmental information

pH N/A

Boiling point/boiling range 2327⁰C

Melting point/melting range 660⁰C

Flash point N/A

Flammability (solid, gas) Highly flammable. Finely divided powder is pyrophoric in air

Autoignition temperature Depending on particle size and atmospheric condition material may auto ignite

Explosive properties N/A

Oxidising properties Not oxidising

Vapour pressure 1mm_{Hg} at 1284⁰C

Relative density 2.70g/cm³ at 20⁰C

Solubility

-water solubility insoluble in cold or hot water

-fat solubility

(solvent - oil to be specified) N/A

10. STABILITY AND REACTIVITY

Conditions to avoid Stable under normal temperatures and pressures. An oxide film forms in moist air which protects metal from corrosion

Materials to avoid Acids and alkalis

Oxidising agents

Interhalogens

Halogens

Sulphur

Ammonia

Mercury and mercury salts

Reacts explosively with ammonium nitrate and persulphate, bismuth trioxide, bromates, carbon tetrachloride, chlorinated hydrocarbons, chlorine trifluoride, chloroform, copper oxide, fluorochloro-lubricants, lead oxide, magnesium & potassium perchlorate & methyl bromide.

An explosion may occur when aluminium is mixed with: nitrate-nitrite & organic matter, nitrates, performic acid, silver chloride, sodium carbonate, sodium peroxide & carbon dioxide, sodium sulphate, sulphates, trichloroethylene & zinc peroxide.

A violent reaction or flaming is likely in the reaction of chromic anhydride and aluminium powder. Aluminium reacts vigorously in sodium hydroxide. Aluminium powder and iodine in close contact will ignite spontaneously.

Ignition may occur if aluminium powder is mixed with halogens, carbon disulphide or methyl chloride.

Hazardous decomposition products Aluminium oxides may be formed which are irritant and toxic.

11. TOXICOLOGICAL INFORMATION

Aluminium in the massive form does not present a high risk to health, however it can be hazardous in the form of powder or dusts and fumes that may arise from machining, melting, welding or brazing operations.

Effects from eye contact.	Dusts or fume may cause eye irritation. Symptoms include redness, watering and irritation.
Effects from skin contact	May cause skin irritation and sensitisation. Dermatitis, delayed hypersensitivity, telangiectases and granulomas may occur from dermal contact.
Effects from inhalation	Irritating to respiratory system. Material in the form of dust may cause lung damage and disorders such as bronchitis, emphysema, interstitial fibrosis, asthma,

pneumoconiosis (aluminosis), pulmonary edema pneumothorax, encephalopathy, weakness, incoordination lung granulomatosis and epileptiform seizures.

Symptoms include difficulty in breathing, tightness in chest, cough, dyspnea, wheezing, chest pain, and occasionally bleeding from the larynx, windpipe or lungs and asthma

Effects from ingestion Ingestion may cause nausea, congestive failure, abdominal pain , vomiting, convulsions and diarrhoea.

- (a) Acute toxicity (oral, inhalation, dermal)
 - Aluminium has been shown to have a low toxicity when ingested but may be harmful if ingested in large quantities.
 - LD₅₀ and LC₅₀ values have not been determined.
 - There is experimental evidence that in animals inhalation of aluminium dust aggravated pulmonary tuberculosis.
 - There is considerable evidence that aluminium is neurotoxic in experimental animals.
- (b) Corrosivity/irritation (eye, skin, respiratory tract) not tested/no data
- (c) Sensitisation (skin, respiratory)
 - Aluminium has been shown to be a potential skin sensitiser
- (d) Repeated-dose toxicity not tested/no data
- (e) Mutagenicity
 - Aluminium is not suspected as being a mutagen.
- (f) Carcinogenicity
 - There is no evidence that aluminium is carcinogenic.
- (g) Reproductive toxicity (fertility, developmental)
 - There is no evidence that aluminium is a teratogen

12. ECOLOGICAL INFORMATION

- (1) Ecotoxicity
 - (a) Aquatic toxicity
 - (i) acute and chronic for fish not tested/no data
 - (ii) “ “ “ “ daphnia not tested/no data
 - (iii) “ “ “ “ algae not tested/no data

(iv) “ “ “ “ other aquatic plants not tested/no data

(b) Soil toxicity

(i) macro organisms	not tested/no data
(ii) micro organisms	not tested/no data
(iii) birds	not tested/no data
(iv) bees	not tested/no data
(v) plants	not tested/no data
(vi) fauna	not tested/no data

No data has been found to suggest that aluminium is involved in any biological transformations in the aquatic environment.

(2) Mobility

Insufficient data available.

(3) Persistence and degradability

Insufficient data available

(4) Bioaccumulation potential

Insufficient data available

(5) Other adverse effects

None known

13. DISPOSAL CONSIDERATIONS

All waste material to be contained in a plastic sealed bin, duly marked, and disposed of as special waste through a licensed waste contractor in accordance with “The Special Waste Regulations 1996”. See sections 6 and 7.

14. TRANSPORT INFORMATION

<u>Airfreight (IATA)</u>	<u>Seafreight (IMDG)</u>	<u>Road (ADR)</u>	<u>Rail (RID)</u>
(a) UN number		1396	
(b) Class		4.3	
(c) Proper shipping name		Aluminium powder, uncoated	

(d)	Packing group	II
(e)	Marine pollutant (if applicable)	N/A
(f)	Other applicable information	N/A

15. REGULATORY INFORMATION

F Highly Flammable

Risk Phrases:

- 15: Contact with water liberates extremely flammable gases.
- 17: Spontaneously flammable in air.

Safety Phrases:

- 7/8: Keep container tightly closed and dry.
- 43: In case of fire, use dry sand or salt. Never use water.

This material is subject to the COSHH regulations 2002. See COSHH Essentials for further information.

16. OTHER INFORMATION

R Phrases Full Text:

- 15: Contact with water liberates extremely flammable gases.
- 17: Spontaneously flammable in air.

This material should only be handled by qualified, trained chemists, fully familiar with its dangerous properties. During use or handling, a minimum of two persons should always be available.

Chemicals (Hazard Information and Packaging for Supply) Regulations 2002

Approved classification and labelling guide. Chemicals (Hazard Information and Packaging for Supply) Regulations 2002 Guidance on Regulations L131

Approved Supply List. Information Approved for the Classification and labelling of Substances and Preparations Dangerous for Supply. Chemicals (Hazard Information and Packaging for Supply) Regulations 2002. Approved List L129

Control of Substances Hazardous to Health Regulations 2002

Health and Safety at Work Act 1974

COSHH Essentials: Easy Steps to Control Chemicals. Control of Substances Hazardous to Health Regulations

Occupational Exposure Limits 2001/2002 EH40

European Inventory of Existing Commercial Substances (EINECS) available on the European Chemicals Bureau website at www.ecb.jrc.it/existing-chemicals

First Aid at Work. The Health and Safety (First Aid) Regulations 1981. Approved Code of Practice and Guidance L74

Personal Protective Equipment (EC Directive) Regulations 1992

The Selection, Use and Maintenance of Respiratory Protective Equipment: A Practical Guide HSG53

Cost and Effectiveness of Chemical Protective Gloves for the Workplace.

Guidance for Employers and Health and Safety Specialists. HSG206

Environmental Protection Act 1990 c43

Environmental Act 1995 c25

The Special Waste Regulations 1996

The Dangerous Substances and Explosive Atmospheres Regulations 2002