



SAFETY DATA SHEET

TECHNICAL IGNITER FOR RAIL WELDING WITH EASY-IGNITABLE ENDING

(not subject to Act No. 356/2003 Coll., on chemical substances and preparations)

Date of issue: March 3, 2008.

1.1. PRODUCT IDENTIFICATION

Classification for transport (according to IMDG Code, ADR, RID and ADN):

Subject: **Rail welding igniter**

UN No. and naming: **UN 0431 ARTICLES, PYROTECHNIC for technical purposes**

Classification code: **1.4 G**

Decision of the Czech Naval and Industrial Register No. NZ-0430-05)

1.2. PRODUCT USE

Technical igniter is designed for ignition of termite composition in a special welding set for maintenance of rail, and as glow igniter.

1.3. MANUFACTURER IDENTIFICATION

DRUTEP, družstvo Teplice, Skolní 22, Teplice, Postcode 415 83, Czech Republic

Phone: +420 417 534 007; Fax: +420 417 534 009.

dusovska@drutep.cz, www.drutep.cz

1.4. EMERGENCY PHONE NUMBERS:

Toxicological Information Centre, address:

Na Bojisti 1, Praha 2, Postcode 128 00, Czech Republic:

+420 224 919 293, +420 224 915 402, +420 224 914 575.

2. HAZARDOUSNESS IDENTIFICATION

2.1. PHYSICAL RISKS

Product is qualified as Class I hazardous article with classification code 1.4G, pyrotechnical article of T₀ sub-class.

Explosion:

In ordinary conditions of use, the product does not represent any serious danger. It is designed so that the level of its hazardousness was low, so that in case of firing or ignition no big fragments were shot out, and that these were in any case limited to such extent that would not interfere in any manner whatsoever during fire fighting and application of emergency provisions. Effects are mostly reduced to a piece without scattering of fragments of bigger dimensions or any major jeopardy to environment.

Fire:

Fire hazard, caused by flame or hot spots of temperature > 300°C, by stroke or friction. Any flammable sources and any manipulation with open fire need to be eliminated.

2.2. ADDITIONAL RISKS



SAFETY DATA SHEET

TECHNICAL IGNITER FOR RAIL WELDING WITH EASY-IGNITABLE ENDING

(not subject to Act No. 356/2003 Coll., on chemical substances and preparations)

Date of issue: March 3, 2008.

Harmful if swallowed.

3. INFORMATION ON COMPONENTS

Technical igniter contains pyrotechnic composition applied on wire, the end of which is provided with an easily-ignitable head.

The pyrotechnic composition contains < 70% of barium nitrate, < 20% of metal powder and bonding agent. According to Act No. 356/2003 Coll., as amended, barium nitrate is classified as harmful to human health (if inhaled and ingested).

Barium nitrate = $\text{Ba}(\text{NO}_3)_2$, CAS No.10022-31-8, ES (EINECS):233-020-5, Xn, R: 8-20/22

Aluminium Powder Pyro, CAS: 7429-90-5, ES (EINECS):231-072-3, F, R: 10-15.

4. FIRST AID MEASURES

4.1 GENERAL INFORMATION

In case of unauthorized handling (not following the Instructions for Use), Risk of injury resulting from the stated risks – burning!

Seek physician's help immediately.

4.2 IN CASE OF HALATION:

Remove to fresh air. Get medical attention if ill effects persist.

4.3 IN CASE OF SKIN CONTACT:

In case of repeated or long-term skin contact might induce irritation – rinse with water.

4.4 IN CASE OF EYE CONTACT:

Get medical attention immediately.

4.5 IN CASE OF INGESTION:

Harmful for human health if swallowed! Serve big amount of water, induce vomiting, then administer sodium sulphate (1 tablet/0.25 l of water). Get medical attention.

5. FIRE-FIGHTING MEASURES

5.1 SUITABLE EXTINGUISHERS: water, foam, powder

- and any means available – water, sand, soil – depending on the extent of fire.

5.3 SPECIAL DANGER – during burning releases toxic products NO_x

5.4 PROTECTIVE AIDS FOR FIRE-FIGHTERS: breathing apparatus and complete protective outfit.

6. MEASURES IN CASE OF ACCIDENTAL LEAK

6.2 Safety provisions for environment protection

Prevent from leak into sewerage; in case of leak competent authorities need to be informed.

7. HANDLING & STORAGE INSTRUCTIONS

7.1 HANDLING:



SAFETY DATA SHEET

TECHNICAL IGNITER FOR RAIL WELDING WITH EASY-IGNITABLE ENDING

(not subject to Act No. 356/2003 Coll., on chemical substances and preparations)

Date of issue: March 3, 2008.

Only person over 18 years of age is authorised to handle technical igniters, whilst being extremely careful and in well ventilated areas, out of the reach of flammable materials, and only in accordance with relevant technical instructions.

Any other use than ignition of termite composition in special welding set during rail welding is prohibited.

7.2 STORAGE

Technical igniters must be stored in the original containers from the manufacturer, separately from flammable and easily ignitable materials. They need to be stored in dry places and in such manner so that their temperature does not exceed 40°C (i.e. protect carefully against sparks, open fire, warmth and also dampness).

Storage has to be locked (access is permitted to authorised persons only), and equipped with adequate fire-stopping materials. Ban on smoking and open fire handling must be placed visibly in the storage. Technical igniters must be stored in such manner that human lives or health were not jeopardised in case of potential explosion or fire.

8. EXPOSURE LIMITATION

Air passage protection – not required.

Hand protection – suitable handling gloves.

Eye protection – goggles.

Skin protection – protective working clothes.

Work hygiene – eating, drinking and smoking during work are not allowed. After work, wash your hands.

9. PHYSICAL & CHEMICAL PROPERTIES

Physical state: solid (as a "rocket"), pyrotechnic composition with easily ignitable head, applied on wire

Colour: grey

pH of solution: 7.6

Odour: odourless

Ignition point: > 300°C

Igniters create temperature > 1300°C

10. STABILITY & REACTIVITY

10.1 Conditions that need to be avoided: high temperatures, sparks, fire, impacts, strokes, friction.

Might explode in composition with materials that support burning.

Sensitivity to hammer stroke:

For activation of lighting head (explosive decomposition or fulmination), energy of 10 J is required in test conditions.



SAFETY DATA SHEET

TECHNICAL IGNITER FOR RAIL WELDING WITH EASY-IGNITABLE ENDING

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For activation of igniter body (explosive decomposition or fulmination), energy of 20 J is required in test conditions.

Sensitivity to friction:

Load of 80 N is needed to activate the lighting head in test conditions.

Load of 240 N is needed to activate the igniter body in test conditions.

Sensitivity to outer fire effect:

No explosion occurred in test conditions, only ignition and fast burn-out.

10.2 Thermal stability < 40°C

In thermal stability determination no ignition occurred in test conditions, no decomposition signs occurred, no self-warmup was reported at the temperature to 75°C.

10.3 Chemical stability – stable under normal conditions.

10.4 Other conditions that need to be avoided: humidity

10.5 Additional information: pyrotechnic article, article of Class I hazardousness, classification code 1.4G.

Hazardous substance classified as explosive, classified upon the ADR convention to sub-class 1.4, shows only low level of explosion hazard. Effects are mostly limited to a piece without scattering of fragments of bigger dimensions or any major jeopardy to environment. Fire, acting externally, must not induce practically simultaneous explosion of the almost entire content of the piece.

11. TOXICOLOGICAL INFORMATION

11.1 ACUTE TOXICITY: The product is harmful to human health in case of ingestion;

- LD₅₀, orally, sewer-rat (mg.kg⁻¹): 355 (barium nitrate - content 50%)

11.2 ADDITIONAL EFFECTS: eye-irritating, irritates mucous membranes and upper air passages.

12. INFORMATION ON ECOLOGY

Leak to environment is not considered for pyrotechnic products intended for technical purposes, with regard to the way of their application.

Contains 50% barium nitrate

Ecotoxicity of barium nitrate

LC₅₀, 96 hours, fish (mg.l⁻¹): salmon 158 mg/l (like BaC12)

L.idus 870 mg/l (like BaC12)

Shellfish: 29 mg/l (barium nitrate)

Algae: 24 mg/Sc. quadricauda (Ba salts).

13. DISPOSAL RELATED INFORMATION

Removal of an igniter residue in common usage does not represent any danger.

After burn-out, cool the hot wire down and dispose in usual manner – municipal waste.

14. TRANSPORT RELATED INFORMATION

Transport classification for ADR, RID, ADN and IATA-DGR.

UN No.: 0431



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(not subject to Act No. 356/2003 Coll., on chemical substances and preparations)

Date of issue: March 3, 2008.

Hazardousness class: I

Transported material: UN 0431 ARTICLES, PYROTECHNIC, for technical purposes.

Classification code: 1.4G

Pyrotechnic articles can be only transported in prescribed, closed and undamaged containers. The containers must be secured on vehicle to avoid their free movement, driving at each other or falling down. During the time of loading, unloading and transport of pyrotechnic articles, smoking and open-fire handling are forbidden.

15. REGULATIONS RELATED INFORMATION

Health-protection, safety and environment- related information stated on the product label:

STORAGE CONDITIONS:

Igniters are only stored in their original containers, separately from flammable and easily ignitable materials, in dry places and in such manner that their temperature does not exceed 40°C. Smoking and open fire handling are not allowed in the storage areas. The storage must be equipped with fore-stopping materials. Pyrotechnic articles must be stored not to jeopardise human lives or health in case of potential explosion or fire.

INSTRUCTIONS FOR USE:

The igniter serves for ignition of termite composition – by fixing the igniter into the dose, exclusively in a special welding kit during maintenance of rails.

SAFETY INFORMATION:

During its burning, igniter generates temperature of 1300 to 1450°C, therefore must not be used for any other purposes than those that are stated above, and only by a worker familiarised with the function of the welding kit whilst following the prescribed procedures.

The igniter contains substances harmful to human health (barium nitrate - harmful to human health if inhaled or swallowed). In case of ingestion, serve plenty of water, induce vomiting, then administer sodium sulphate and get medical attention immediately. Avoid leak to environment.

16. ADDITIONAL INFORMATION

The Act No. 356/2003 Coll. on chemical substances and preparations does not apply to technical igniters (see Section 1 par. 4 of the quoted Act).

Explosion hazard in case of stroke, friction, fire or acting of other ignition sources.

Harmful to human health in case of inhalation and ingestion.

Training instructions: Get workers familiar with the recommended way of use, compulsory protection equipment, first-aid measures and also with prohibited pyrotechnic article handling. In usage, the procedures related to pyrotechnic devices need to be adhered to.

The stated data reflect our current knowledge however do not represent the guarantee of the product properties, therefore no contract relations arise.

1. Identification of the substance/mixture and of the company/business

1.1 Identification of the product

Product name: Adhesive paste
Hazardous component: Crystalline silica (quartz)
Calcium chloride

1.2 Use

Industrial

Paste used to make a seal between the mould and the rail when welding, only with RAILTECH products.

1.3 Information regarding the supplier of the safety data sheet



RAILTECH INTERNATIONAL
ZI du Bas Pré
59590 RAISMES

Tel: +33 (0)3 27 22 26 26
Fax: +33 (0)3 27 22 26 00

Contact details: fvanpeperstraete@railtech.fr

1.4 Emergency telephone number

Emergency telephone: +33 (0)1 45 42 59 59 (ORFILA)

2. Identification of dangers

2.1 Main dangers

Classification according to (CE) regulation n°1272/2008



GHS 07

H315, H319

2.2 Harmful effects on health

Inhalation: Not hazardous under normal conditions of use.

Skin: prolonged contact with the skin may cause irritation.

Eyes: Irritant for the eyes (during welding).

2.3 Means of exposure

Inhalation: no

Skin: yes

Eyes: yes

Ingestion : none, except accidental

2.4 Secondary hazard

Handling and heating is liable to release particles of alveolar crystalline silica into the workspace environment. Prolonged and/or massive inhalation of alveolar crystalline silica dust may cause pulmonary fibrosis-type conditions, generally referred to as silicosis.

3. Composition/information about ingredients

| Ingredients | CAS N° | EINECS N° | % weight | Dangers |
|---|------------|-----------|----------|--|
| SILICEOUS SAND (>97% quartz) contains less than 1% of alveolar quartz. | 14808-60-7 | 238-878-4 | 60 to 70 | Alveolar quartz <1%: Handling and heating is liable to release particles of alveolar crystalline silica into the workspace environment. Prolonged and/or massive inhalation of alveolar crystalline silica dust may cause pulmonary fibrosis-type conditions, generally referred to as silicosis. |
| CALCINED KAOLIN | 92704-41-1 | 196-473-8 | 20 to 30 | |
| BENTONITE | 1302-78-9 | 215-108-5 | 10 to 20 | |
| CALCIUM CHLORIDE | 10043-52-4 | 233-140-8 | 20 to 30 | Irritating, Xi (R36) |

4. First aid

Initial treatment in the event of mechanical deterioration or damage during use

Inhalation: Not affected.
Skin contact: Rinse with water.
Contact with eyes: In case of contact with the eyes, rinse immediately with plenty of water and seek medical advice.
Ingestion: Not affected.

5. Fire safety measures

5.1 Flammability rating

Non-combustible.

5.2 Extinguishing media

All the extinguishing agents may be used **(when not in use)**.

In the event of a fire during aluminothermic welding, use only dry sand to extinguish the fire.

Counterindications: DO NOT USE WATER



6. Measures to be taken in the event of accidental dispersion

6.1 Personal precautions

Avoid dust after welding.

6.2 Precautions for the environment

Avoid release to the environment.

Do not put into the sewage system, the ground or in drinking water.

7. Handling and storage

7.1 Handling

Avoid damage to the packaging.

7.2 Storage

Packaging type: Fragile
Keep out of rain and moisture

8. Exposure controls/personal protection

8.1 Control parameters

According to French legislation: According to French legislation, set by the Ministry of Labour 17/05/11 :

| Parameters | CAS N° | AEV (ppm) | AEV (mg/m ³) | ELV (ppm) | ELV (mg.m ⁻³) |
|----------------|------------|-----------|--------------------------|-----------|---------------------------|
| Alveolar dust | - | - | 5 | - | - |
| Inhalable dust | - | - | 10 | - | - |
| Quartz | 14808-60-7 | - | 0.1 | - | - |

In the presence of alveolar dust containing crystalline silica and other non-silicogenic dust, the exposure limit is set by the following formula: $Cns/Vns + Cq/0.1 + Cc/0.05 + Ct/0.05$ where Cns represents the concentration in non-silicogenic alveolar dust mg.m⁻³, Vns, the recommended average exposure value for alveolar dust without any specific effect (5mg.m⁻³), and Cq, Cc and Ct are the respective concentrations of quartz, cristobalite and tridymite in mg.m⁻³.

Refer to paragraph 16.3 for the control values applicable in countries other than France.

8.2 Personal protection equipment

Respiratory protection:

Use an FFP3-type mask when welding.



Hand protection:

Use protective and heat-resistant gloves when welding.



Eye protection:

Wear protective welder's goggles when welding.



Protection of the skin and body:

Wear protective clothing (100% cotton) and safety shoes.



8.2 Hygiene measures

Wash hands after using the product.

Do not eat, drink or smoke.

9. Physical and chemical properties

Physical state: Solid

Colour: Rosy

Odour: None

pH: To be confirmed

Water solubility: Soluble

Characteristic temperatures:

Freezing point (°C): To be confirmed

Phase transition temperature (°C): Hardens at > 100°C

Flammability characteristics:

Flash point (°C): Not Applicable

Self-ignition temperature (°C): Not Applicable

10. Stability and reactivity

10.1 Stability

Stable in normal conditions.

10.2 Conditions to be avoided

Not affected.

10.3 Materials to be avoided

Not affected.

10.4 Dangerous reaction

Exothermic reaction during welding.

11. Toxicology information

11.1 Toxicology information

There are no toxicological risks under normal conditions of use.

11.2 Primary effects of irritation

Of the skin: May cause sensitization on contact with the skin.

Eyes: Irritant for the eyes, during use.

12. Environmental information

12.1 Information regarding toxic effects on the environment

Not assumed to be toxic.

In order to avoid any possible effects on the environment, observe the disposal and recycling regulations in force.

12.2 Biodegradability

Is not biodegradable.

12.3 Bioaccumulation potential

Undetermined.

CL50-24 hours- fish (mg/l): Undetermined

COD: Undetermined

BOD5: Undetermined

13. Considerations regarding disposal

13.1 Waste disposal

Destroy in compliance with the local/national safety regulations in force.

13.2 Treatment of soiled packaging

Mixed packaging (card, plastic, metal) must be disposed of and recycled separately, in compliance with decree n° 93-609 of 13 July 1994 and decree n° 92-377 of 1st April 1992 and 2002-540 of 18 April 2002 or with the national regulations in which the products are used.

13.3 Other data

| Waste coding | Label | Section |
|--------------|-----------|----------------------|
| 10.03.99 | Old tube | Specialised |
| 15.01.01 | Cardboard | Recycling / Recovery |
| 12.01.01 | Metal | Recycling / Recovery |

14. Information regarding transport

ADR/RID

Not Applicable

Tubes of adhesive paste are not classified as hazardous products and are therefore not subject to special transportation regulations.

15. Regulatory information

15.1 CE Labelling

Classification, packaging and labelling according to Directive 1999/45/CE.

15.2 Danger symbols and indications

15.2.1 H Phrases

Classification according to (CE) regulation n°1272/2008



GHS 07 H319, H315

H315: Causes irritation to the skin

H319: Causes severe irritation to the eyes

15.2.2 P Phrases

Classification according to (CE) regulation n°1272/2008

Adhesive paste alone:

P232: Protect from moisture.

When welding:

P260: Do not inhale the dust/smoke/fumes/gas/mists/vapours/aerosols.

P280: Wear suitable protective clothing, gloves and eye/face protection.

P223: Avoid all contact with water due to the risk of a violent reaction and spontaneous ignition.

P273: Avoid release to the environment.

16. Other information

16.1 Recommended use and restrictions

Not Applicable.

16.2 Additional information

16.2.1 List of risk phrases used

R36: Irritating to eyes.

H315: Causes irritation to the skin.

H319: Causes severe irritation to the eyes.

16.2.2 List of the safety advice or instruction phrases used

P232: Protect from moisture.

P260: Do not inhale the dust/smoke/fumes/gas/mists/vapours/aerosols.

P280: Wear suitable gloves/equipment for protecting eyes/face.

P223: Avoid all contact with water due to the risk of a violent reaction and spontaneous ignition.

P273: Avoid release to the environment.

16.2.3 List of abbreviations used in this sheet

GHS: Globally Harmonised System

CAS: Chemical Abstracts Service

AEV: Average Exposure Value over 8 hours

ELV: Exposure Limit Value over 15 minutes = Short term limit value (STLV).

CL50-24 hours- fish: Concentration that results in half of the fish population dying within 24hrs.

COD: Chemical Oxygen Demand.

BOD5: Biological Oxygen Demand over 5 days.

ADR= Agreement on Dangerous Goods by Road.

RID = Regulations concerning the Intl Transport of Dangerous Goods by Rail.

16.3 Other limit values for professional exposure

Each country has its own limit values for professional exposure; a non-exhaustive summary of ELVs and AEVs applicable outside French territory is offered. For countries not included, seek advice from the occupational health services or the Ministry of Labour of the countries concerned.

| Inhalable dust (total, without any specific effects) | | |
|---|--------------------------|--------------------------|
| Country | AEV (mg/m ³) | ELV (mg/m ³) |
| Austria | 10 | 20 |
| Belgium | 10 | |
| Denmark | 10 | 20 |
| France | 10 | |
| Germany (AGS) | 10 | 20 |
| Germany (DFG) | 4 | |
| Hungary | 10 | |
| Spain | 10 | |
| Sweden | 10 | |
| Switzerland | 10 | |
| USA – OSHA | 15 | |

| Alveolar dust (breathable) | | |
|-----------------------------------|--------------------------|--------------------------|
| Country | AEV (mg/m ³) | ELV (mg/m ³) |
| Austria | 5 | 10 |
| Belgium | 3 | |
| France | 5 | |
| Germany (AGS) | 3 | 6 |
| Germany (DFG) | 1.5 | |
| Hungary | 6 | |
| Spain | 3 | |
| Sweden | 5 | |
| Switzerland | 3 | |
| USA – OSHA | 5 | |

| QUARTZ CAS = 14808-60-7 | | |
|--------------------------------|--------------------------|-----|
| Country | AEV (mg/m ³) | ELV |
| Austria | 0.15 alveolar | |

| | | |
|-----------------|--|-------------------------------|
| Belgium | 0.1 | |
| Canada - Quebec | 0.1 | |
| Denmark | 0.3 inhalable 0.1 alveolar | 0.6 inhalable 0.2 alveolar |
| France | 0.1 alveolar | |
| Hungary | 0.15 alveolar | |
| Spain | 0.1 alveolar | |
| Sweden | 0.1 alveolar | |
| Switzerland | 0.15 alveolar | |
| Netherlands | 0.075 alveolar dust | |
| USA - NIOSH | 0.05 | |
| USA – OSHA | 30/(%SiO ₂ +2) total dust 10/(%SiO ₂ +2) alveolar | |

Values collected from the GESTIS database on the IFA (Institut für Arbeitsschutz der Deutschen Gesetzlichen Unfallversicherung) website (17/05/11).

The content and format of this safety data sheet comply with Directive 2001/58/CE.

Delegation of responsibility:

The information contained in this sheet comes from sources that we consider to be trustworthy. The methods for handling, storage, use or disposal of the product are beyond our control and cannot come under our jurisdiction.

For these reasons, amongst others, we decline any responsibility in the event of loss, damage or expenses caused by or linked in any way to the handling, storage, use or disposal of the product. This SDS has been drawn up and should be used exclusively for this product. Users' attention is also drawn to the potential risks incurred when a product is used for purposes other than that for which it was originally designed.

1. Identification of the substance/mixture and of the company/business

1.1 Identification of the product

Product name: Luting paste bucket

Hazardous component: Ethylene glycol
Bactericidal
Crystalline silica

1.2 Use

Industrial

Paste used to make a seal between the mould and the rail when welding, only with RAILTECH products.

1.3 Information regarding the supplier of the safety data sheet



RAILTECH INTERNATIONAL
ZI du Bas Pré
59590 RAISMES

Tel :+33 (0)3 27 22 26 26
Fax:+33 (03) 27 22 26 00

Contact details: fvanpeperstraete@railtech.fr

1.4 Emergency telephone number

Emergency telephone:+33 (0)1 45 42 59 59 (ORFILA)

2. Identification of dangers

2.1 Main dangers

Classification according to (CE) regulation n°1272/2008



GHS 07

H315, H319, H317

The heating of this product at very high temperatures is liable to release particles of alveolar crystalline silica into the workspace environment. Prolonged and/or massive inhalation of alveolar crystalline silica dust may cause pulmonary fibrosis-type conditions, generally referred to as silicosis.

2.2 Harmful effects on health

Inhalation: Not hazardous under normal conditions of use.

Skin: prolonged contact with the skin may cause irritation.

Eyes: Irritant for the eyes during welding.

Ingestion : No emergency care instructions.

2.3 Means of exposure

Inhalation : No
Skin : Yes
Eyes: Yes
Ingestion: None, except accidental

3. Composition/information about ingredients

| Ingredients | CAS N° | EINECS N° | % weight | Dangers |
|--|------------|-----------|----------|--|
| SILICEOUS SAND (>97% quartz) contains less than 1% of alveolar quartz. | 14808-60-7 | 238-878-4 | 40 to 55 | Alveolar quartz <1%: Handling and heating is liable to release particles of alveolar crystalline silica into the workspace environment. Prolonged and/or massive inhalation of alveolar crystalline silica dust may cause pulmonary fibrosis-type conditions, generally referred to as silicosis. |
| CALCINED KAOLIN | 92704-41-1 | 196-473-8 | 15 to 25 | |
| REFRACTORY CLAY | | | 1 to 10 | |
| BENTONITE | 1302-78-9 | 215-108-5 | 1 to 20 | Alveolar crystalline silica in bentonite dust <0.1% |
| ETHYLENE GLYCOL | 107-21-1 | 203-473-3 | 1 to 3 | Harmful, Xn (R22) |
| BACTERICIDE contains less than 1% of Chloro-methyl-isothiazolinone, CAS=55965-84-9 | | | < 1 | Corrosive, C (R34) |

4. First aid

Initial treatment in the event of mechanical deterioration or damage during use

| | |
|--------------------|---|
| Inhalation: | Not affected. |
| Skin contact: | Rinse with water. |
| Contact with eyes: | In case of contact with the eyes, rinse immediately with plenty of water and seek medical advice. |
| Ingestion: | Not affected. |

5. Fire safety measures

5.1 Flammability rating

Non-combustible.

5.2 Extinguishing media

All the extinguishing agents may be used **(when not in use)**.

In the event of a fire during aluminothermic welding, use only dry sand to extinguish the fire.

Counterindications: **DO NOT USE WATER.**



6. Measures to be taken in the event of accidental dispersion

6.1 Personal precautions

Avoid dust after welding.

6.2 Precautions for the environment

Avoid release to the environment.

Do not put into the sewage system, the ground or in drinking water.

7. Handling and storage

7.1 Handling

Avoid damage to the packaging.

7.2 Storage

Maintain temperature between -5°C and + 30°C

Packaging type: Not affected

8. Exposure controls/personal protection

8.1 Control parameters

According to French legislation, set by the Ministry of Labour 17/05/11 :

| Parameters | CAS N° | AEV (ppm) | AEV (mg/m ³) | ELV (ppm) | ELV (mg.m ⁻³) |
|-----------------|------------|-----------|--------------------------|-----------|---------------------------|
| Alveolar dust | - | - | 5 | - | - |
| Inhalable dust | - | - | 10 | - | - |
| Quartz | 14808-60-7 | - | 0.1 | - | - |
| Ethylene glycol | 107-21-1 | 20 | 52 | 40 | 104 |

In the presence of alveolar dust containing crystalline silica and other non-silicogenic dust, the exposure limit is set by the following formula: $Cns/Vns + Cq/0.1 + Cc/0.05 + Ct/0.05$ where Cns represents the concentration in non-silicogenic alveolar dust mg.m⁻³, Vns, the recommended average exposure value for alveolar dust without any specific effect (5mg.m⁻³), and Cq, Cc and Ct are the respective concentrations of quartz, cristobalite and tridymite in mg.m⁻³.

Refer to paragraph 16.3 for the control values applicable in countries other than France.

8.2 Personal protection equipment

Respiratory protection:

Use an FFP3-type mask when welding.



Hand protection:

Use protective and heat-resistant gloves when welding.



Eye protection:

Welder's goggles, when welding.



Protection of the skin and body:

Wear protective clothing (100% cotton) and safety shoes.



8.2 Hygiene measures

Wash hands after using the product.

Do not eat, drink or smoke.

9. Physical and chemical properties

Physical state: Solid

Colour: Brown

Odour: None

pH: To be confirmed

Water solubility: Soluble

Characteristic temperatures:

Freezing point (°C): To be confirmed

Phase transition temperature (°C): Hardens at > 100°C

Flammability characteristics:

Flash point (°C): Not Applicable

Self-ignition temperature (°C): Not Applicable

10. Stability and reactivity

10.1 Stability

Deterioration of the product for temperatures below 5°C and above 30°C.

A deterioration of the ethylene glycol in acetaldehyde may occur when heated to temperatures in excess of 500°C (toxicological detail no. 25 of the INRS) and particularly during aluminothermic welding.

10.2 Conditions to be avoided

Follow recommended storage temperatures.

10.3 Materials to be avoided

Not Applicable.

10.5 Dangerous reaction

Exothermic reaction during welding.

11. Toxicology information

11.1 Toxicology information

There are no toxicological risks under normal conditions of use.

11.2 Primary effects of irritation

Of the skin: May cause sensitization on contact with the skin.

Eyes: Irritant for the eyes, during use.

12. Environmental information

12.1 Information regarding toxic effects on the environment

Not assumed to be toxic.

In order to avoid any possible effects on the environment, observe the disposal and recycling regulations in force.

12.2 Biodegradability

Is not biodegradable.

12.3 Bioaccumulation potential

Undetermined.

CL50-24 hours- fish (mg/l): Undetermined

COD: Undetermined

BOD5: Undetermined

13. Considerations regarding disposal

13.1 Waste disposal

Destroy in compliance with the local/national safety regulations in force.

13.2 Treatment of soiled packaging

Mixed packaging (card, plastic, metal) must be disposed of and recycled separately, in compliance with decree n° 93-609 of 13 July 1994 and decree n° 92-377 of 1st April 1992 and 2002-540 of 18 April 2002 or with the national regulations in which the products are used.

13.3 Other data

| Waste coding | Label | Section |
|--------------|------------|-------------|
| 10.03.99 | Old bucket | Specialised |

14. Information regarding transport

ADR/RID

Not Applicable

The luting paste buckets are not classified as hazardous products and are therefore not subject to special transportation regulations.

15. Regulatory information

15.1 CE Labelling

Classification, packaging and labelling according to Directive 1999/45/CE.

15.2 Danger symbols and indications

15.2.1 H Phrases

Classification according to (CE) regulation n°1272/2008



GHS 07

H319, H315, H317

H315: Causes irritation to the skin

H317: May result in skin allergies

H319: Causes severe irritation to the eyes

15.2.2 P Phrases

Classification according to (CE) regulation n°1272/2008

Luting paste alone:

P232: Protect from moisture.

When welding:

P260: Do not inhale the dust/smoke/fumes/gas/mists/vapours/aerosols.

P280: Wear suitable protective clothing, gloves and eye/face protection.

P223: Avoid all contact with water due to the risk of a violent reaction and spontaneous ignition.

P273: Avoid release to the environment.

16. Other information

16.1 Recommended practices and restrictions

Not Applicable.

16.2 Additional information

16.2.1 List of risk phrases mentioned

R22: Harmful if swallowed.
R34: Causes burns.
H319: Causes severe irritation to the eyes.
H317: May result in skin allergies
H315: Causes irritation to the skin.

16.2.2 List of the safety advice phrases used

P232: Protect from moisture.
P260: Do not inhale the dust/smoke/fumes/gas/mists/vapours/aerosols.
P280: Wear suitable protective clothing, gloves and eye/face protection.
P223: Avoid all contact with water due to the risk of a violent reaction and spontaneous ignition.
P273: Avoid release to the environment.

16.2.3 List of abbreviations used in this sheet

GHS: Globally Harmonised System
CAS: Chemical Abstracts Service
AEV: Average Exposure Value over 8 hours
ELV: Exposure Limit Value over 15 minutes = Short term limit value (STLV).
CL50-24 hours- fish: Concentration that results in half of the fish population dying within 24hrs.
COD: Chemical Oxygen Demand.
BOD5: Biological Oxygen Demand over 5 days.
ADR= Agreement on Dangerous Goods by Road.
RID = Regulations concerning the Intl Transport of Dangerous Goods by Rail.

16.3 Other limit values for professional exposure

Each country has its own limit values for professional exposure; a non-exhaustive summary of ELVs and AEVs applicable outside French territory is offered. For countries not included, seek advice from the occupational health services or the Ministry of Labour of the countries concerned.

| |
|---|
| Inhalable dust (total, without any specific effects) |
|---|

| Country | AEV (mg/m ³) | ELV (mg/m ³) |
|---------------|--------------------------|--------------------------|
| Austria | 10 | 20 |
| Belgium | 10 | |
| Denmark | 10 | 20 |
| France | 10 | |
| Germany (AGS) | 10 | 20 |
| Germany (DFG) | 4 | |
| Hungary | 10 | |
| Spain | 10 | |
| Sweden | 10 | |
| Switzerland | 10 | |
| USA – OSHA | 15 | |

| Alveolar dust (breathable) | | |
|----------------------------|--------------------------|--------------------------|
| Country | AEV (mg/m ³) | ELV (mg/m ³) |
| Austria | 5 | 10 |
| Belgium | 3 | |
| France | 5 | |
| Germany (AGS) | 3 | 6 |
| Germany (DFG) | 1.5 | |
| Hungary | 6 | |
| Spain | 3 | |
| Sweden | 5 | |
| Switzerland | 3 | |
| USA – OSHA | 5 | |

| QUARTZ CAS = 14808-60-7 | | |
|--------------------------------|--|-------------------------------|
| Country | AEV (mg/m ³) | ELV |
| Austria | 0.15 alveolar | |
| Belgium | 0.1 | |
| Canada - Quebec | 0.1 | |
| Denmark | 0.3 inhalable 0.1 alveolar | 0.6 inhalable 0.2 alveolar |
| France | 0.1 alveolar | |
| Hungary | 0.15 alveolar | |
| Spain | 0.1 alveolar | |
| Sweden | 0.1 alveolar | |
| Switzerland | 0.15 alveolar | |
| Netherlands | 0.075 alveolar dust | |
| USA - NIOSH | 0.05 | |
| USA – OSHA | 30/(%SiO ₂ +2) total dust 10/(%SiO ₂ +2) alveolar | |

| Ethylene glycol (ethane-1.2-diol), vapour, CAS = 107-21-1 | | | | |
|--|-----------|--------------------------|-----------|--------------------------|
| Country | AEV (ppm) | AEV (mg/m ³) | ELV (ppm) | ELV (mg/m ³) |
| Austria | 10 | 26 | 20 | 52 |
| Denmark | 10 | 26 | 20 | 52 |
| European Union | 20 | 52 | 40 | 104 |
| France | 20 | 52 | 40 | 104 |
| Germany (AGS) | 10 | 26 | 20 | 52 |
| Germany (DFG) | 10 | 26 | 20 | 52 |
| Italy | 20 | 52 | 40 | 104 |
| Poland | | 15 | | |
| Sweden | 10 | 25 | 20 | 50 |
| Switzerland | 10 | 26 | 20 | 52 |
| Netherlands | | 52 | | |
| England | 20 | 52 | 40 | 104 |

Values collected from the GESTIS database on the IFA (Institut für Arbeitsschutz der Deutschen Gesetzlichen Unfallversicherung) website (17/05/11).

The content and format of this safety data sheet complies with Directive 2001/58/CE.

Delegation of responsibility:

The information contained in this sheet comes from sources that we consider to be trustworthy. The methods for handling, storage, use or disposal of the product are beyond our control and cannot come under our jurisdiction.

For these reasons, amongst others, we decline any responsibility in the event of loss, damage or expenses caused by or linked in any way to the handling, storage, use or disposal of the product. This SDS has been drawn up and should be used exclusively for this product. Users' attention is also drawn to the potential risks incurred when a product is used for purposes other than that for which it was originally designed.

1. Identification of the substance/mixture and of the company/business

1.1 Identification of the product

Product name: Luting paste cartridge
Hazardous component: Sodium silicate
Ethylene glycol
Crystalline silica (quartz)

1.2 Use

Industrial

Paste used to make a seal between the mould and the rail when welding, only with RAILTECH products.

1.3 Information regarding the supplier of the safety data sheet



RAILTECH INTERNATIONAL
ZI du Bas Pré
59590 RAISMES

Tel: +33 (0)3 27 22 26 26
Fax: +33 (0)3 27 22 26 00

Contact details: fvanpeperstraete@railtech.fr

1.4 Emergency telephone number

Emergency telephone: +33 (0)1 45 42 59 59 (ORFILA)

2. Identification of dangers

Classification according to (CE) regulation n°1272/2008



GHS 07

H315, H319

The heating of this product at very high temperatures is liable to release particles of alveolar crystalline silica into the workspace environment. Prolonged and/or massive inhalation of alveolar crystalline silica dust may cause pulmonary fibrosis-type conditions, generally referred to as silicosis.

2.2 Harmful effects on health

Inhalation: Not hazardous under normal conditions of use.

Skin: prolonged contact with the skin may cause irritation.

Eyes: Irritant for the eyes during welding.

2.3 Means of exposure

Inhalation: no
Skin: yes
Eyes: yes
Ingestion: none, except accidental

3. Composition/information about ingredients

| Ingredients | CAS N° | EINECS N° | % weight | Dangers |
|---|------------|-----------|----------|--|
| SILICEOUS SAND (>97% quartz) contains less than 1% of alveolar quartz. | 14808-60-7 | 238-878-4 | 25 to 35 | Alveolar quartz <1%: Handling and heating is liable to release particles of alveolar crystalline silica into the workspace environment. Prolonged and/or massive inhalation of alveolar crystalline silica dust may cause pulmonary fibrosis-type conditions, generally referred to as silicosis. |
| SODIUM SILICATE | 15859-24-2 | 215-687-4 | 15 to 25 | Irritating, Xi (R41, R38) |
| ALUMINIUM TRIHYDRATE Al(OH) ₃ | 21645-51-2 | 244-492-7 | 10 to 15 | |
| BENTONITE | 1302-78-9 | 215-108-5 | 10 to 15 | Crystalline silica in the dust <2% |
| ETHYLENE GLYCOL | 107-21-1 | 203-473-3 | 1 to 5 | Harmful, Xn (R22) |

4. First aid

Initial treatment in the event of mechanical deterioration or damage during use

Inhalation: Not affected.
Skin contact: Rinse with water.
Contact with eyes: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
Ingestion: Not affected.

5. Fire safety measures

5.1 Flammability rating

Noncombustible product.

5.2 Extinguishing media

All the extinguishing agents may be used **(when not in use)**.

In the event of a fire during aluminothermic welding, use only dry sand to extinguish the fire.

Counterindications: **DO NOT USE WATER**



6. Measures to be taken in the event of accidental dispersion

6.1 Personal precautions

Avoid breathing in the dust, after welding.

6.2 Precautions for the environment

Avoid release to the environment.

Do not put into the sewage system, the ground or in drinking water.

7. Handling and storage

7.1 Handling

Avoid damage to the packaging.

7.2 Storage

Keep in the original packaging cartons.

Maintain temperature between -5°C and + 30°C

Packaging type:

Fragile.

Keep out of rain and moisture.

Keep the packaging the right way up.

8. Exposure controls/personal protection

8.1 Control parameters

According to French legislation, set by the Ministry of Labour 17/05/11 :

| Parameters | CAS N° | AEV (ppm) | AEV (mg/m ³) | ELV (ppm) | ELV (mg.m ⁻³) |
|-----------------|------------|-----------|--------------------------|-----------|---------------------------|
| Alveolar dust | - | - | 5 | - | - |
| Inhalable dust | - | - | 10 | - | - |
| Quartz | 14808-60-7 | - | 0.1 | - | - |
| Ethylene glycol | 107-21-1 | 20 | 52 | 40 | 104 |

In the presence of alveolar dust containing crystalline silica and other non-silicogenic dust, the exposure limit is set by the following formula: $Cns/Vns + Cq/0.1 + Cc/0.05 + Ct/0.05$ where Cns represents the concentration in non-silicogenic alveolar dust mg.m⁻³, Vns, the recommended average exposure value for alveolar dust without any specific effect (5mg.m⁻³), and Cq, Cc and Ct are the respective concentrations of quartz, cristobalite and tridymite in mg.m⁻³.

Refer to paragraph 16.3 for the control values applicable in countries other than France.

8.2 Personal protection equipment

Respiratory protection:

Use an FFP3-type mask when welding.



Hand protection:

Use protective and heat-resistant gloves when welding.



Eye protection:

Wear protective welder's goggles when welding.



Protection of the skin and body:

Wear safety clothing (100% cotton) and safety shoes.



8.2 Hygiene measures

Wash hands after using the product.

When using do not eat, drink or smoke.

9. Physical and chemical properties

Physical state: pasty/ viscous solid.

Colour: beige.

Odour: none.

pH: To be confirmed.

Water solubility: soluble.

Characteristic temperatures:

Freezing point (°C): Not Applicable.

Phase transition temperature (°C): Hardens at > 100°C

Flammability characteristics:

Flash point (°C): Not Applicable.

Self-ignition temperature (°C): Not Applicable.

10. Stability and reactivity

10.1 Stability

Deterioration of the product for temperatures below 5°C and above 30°C.

A deterioration of the ethylene glycol in acetaldehyde may occur when heated to temperatures in excess of 500°C (toxicological detail no. 25 of the INRS) and particularly during aluminothermic welding.

10.2 Conditions to be avoided

Follow recommended storage temperatures.

10.3 Materials to be avoided

Not Applicable.

10.5 Dangerous reaction

Exothermic reaction during welding.

11. Toxicology information

11.1 Toxicology information

There are no toxicological risks under normal conditions of use.

11.2 Primary effects of irritation

Of the skin: May cause sensitization on contact with the skin.

Eyes: Irritant for the eyes during use.

12. Environmental information

12.1 Information regarding toxic effects on the environment

Not assumed to be toxic. In order to avoid any possible effects on the environment, observe the disposal and recycling regulations in force.

12.2 Biodegradability

Is not biodegradable.

12.3 Bioaccumulation potential

Undetermined.

CL50-24 hours- fish (mg/l): Undetermined

COD: Undetermined

BOD5: Undetermined

13. Considerations regarding disposal

13.1 Waste disposal

Destroy in compliance with the local/national safety regulations in force.

13.2 Treatment of soiled packaging

Mixed packaging (card, plastic) must be disposed of and recycled separately, in compliance with decree n° 93-609 of 13 July 1994 and decree n° 92-377 of 1st April 1992 and 2002-540 of 18 April 2002 or with the national regulations in which the products are used.

13.3 Other data

They may be disposed of in landfill or recycled according to eco-friendly requirements.

| Waste coding | Label | Section |
|---------------------|--------------|----------------------|
| 10.03.99 | Old tube | Specialised |
| 15.01.01 | Cardboard | Recycling / Recovery |
| 15.01.02 | Plastic | Recycling / Recovery |

14. Information regarding transport

ADR/RID

Not Applicable

Luting tubes are not classified as hazardous products and are therefore not subject to special transportation regulations.

15. Regulatory information

15.1 CE Labelling

Classification, packaging and labelling according to EC regulation 1272/2008.

15.2 Danger symbols and indications

15.2.1 H Phrases

Classification according to (CE) regulation n°1272/2008



GHS 07

H319, H315

H319: Causes severe irritation to the eyes

H315: Causes irritation to the skin

15.2.2 P Phrases

Classification according to (CE) regulation n°1272/2008

Luting paste alone:

P232: protect from moisture.

When welding:

P260: Do not inhale the dust/smoke/fumes/gas/mists/vapours/aerosols.

P280: Wear suitable protective clothing, gloves and eye/face protection.

P223: Avoid all contact with water due to the risk of a violent reaction and spontaneous ignition.

P273: Avoid release to the environment.

16. Other information

16.1 Recommended use and restrictions

Not Applicable.

16.2 Additional information

16.2.1 List of risk phrases used

R22: Harmful if swallowed.
R38: Irritating to skin.
R41: Risk of serious damage to eyes.
H319: Causes severe irritation to the eyes.
H315: Causes irritation to the skin.

16.2.2 List of the safety advice phrases used

P232: Protect from moisture.
P260: Do not inhale the dust/smoke/fumes/gas/mists/vapours/aerosols.
P280: Wear suitable protective clothing, gloves and eye/face protection.
P223: Avoid all contact with water due to the risk of a violent reaction and spontaneous ignition.
P273: Avoid release to the environment.

16.2.3 List of abbreviations used in this sheet

GHS: Globally Harmonised System.
CAS: Chemical Abstracts Service.
AEV: Average Exposure Value over 8 hours.
ELV: Exposure Limit Value over 15 minutes = Short term limit value (STLV).
CL50-24 hours- fish: Concentration that results in half of the fish population dying within 24hrs.
COD: Chemical Oxygen Demand.
BOD5: Biological Oxygen Demand over 5 days.
ADR= Agreement on Dangerous Goods by Road.
RID = Regulations concerning the Intl Transport of Dangerous Goods by Rail.

16.3 Other limit values for professional exposure

Each country has its own limit values for professional exposure; a non-exhaustive summary of ELVs and AEVs applicable outside French territory is offered. For countries not included, seek advice from the occupational health services or the Ministry of Labour of the countries concerned.

| Inhalable dust (total, without any specific effects) | | |
|---|--------------------------|--------------------------|
| Country | AEV (mg/m ³) | ELV (mg/m ³) |
| Austria | 10 | 20 |
| Belgium | 10 | |
| Denmark | 10 | 20 |
| France | 10 | |
| Germany (AGS) | 10 | 20 |
| Germany (DFG) | 4 | |
| Hungary | 10 | |
| Spain | 10 | |

| | | |
|-------------|----|--|
| Sweden | 10 | |
| Switzerland | 10 | |
| USA – OSHA | 15 | |

| Alveolar dust (breathable) | | |
|-----------------------------------|--------------------------|--------------------------|
| Country | AEV (mg/m ³) | ELV (mg/m ³) |
| Austria | 5 | 10 |
| Belgium | 3 | |
| France | 5 | |
| Germany (AGS) | 3 | 6 |
| Germany (DFG) | 1.5 | |
| Hungary | 6 | |
| Spain | 3 | |
| Sweden | 5 | |
| Switzerland | 3 | |
| USA – OSHA | 5 | |

| QUARTZ CAS = 14808-60-7 | | |
|--------------------------------|--|-------------------------------|
| Country | AEV (mg/m ³) | ELV |
| Austria | 0.15 alveolar | |
| Belgium | 0.1 | |
| Canada - Quebec | 0.1 | |
| Denmark | 0.3 inhalable 0.1 alveolar | 0.6 inhalable 0.2 alveolar |
| France | 0.1 alveolar | |
| Hungary | 0.15 alveolar | |
| Spain | 0.1 alveolar | |
| Sweden | 0.1 alveolar | |
| Switzerland | 0.15 alveolar | |
| Netherlands | 0.075 alveolar dust | |
| USA - NIOSH | 0.05 | |
| USA – OSHA | 30/(%SiO ₂ +2) total dust 10/(%SiO ₂ +2) alveolar | |

| Ethylene glycol (ethane-1.2-diol), vapour, CAS = 107-21-1 | | | | |
|---|-----------|--------------------------|-----------|--------------------------|
| Country | AEV (ppm) | AEV (mg/m ³) | ELV (ppm) | ELV (mg/m ³) |
| Austria | 10 | 26 | 20 | 52 |
| Denmark | 10 | 26 | 20 | 52 |
| European Union | 20 | 52 | 40 | 104 |
| France | 20 | 52 | 40 | 104 |
| Germany (AGS) | 10 | 26 | 20 | 52 |
| Germany (DFG) | 10 | 26 | 20 | 52 |
| Italy | 20 | 52 | 40 | 104 |
| Poland | | 15 | | |
| Sweden | 10 | 25 | 20 | 50 |
| Switzerland | 10 | 26 | 20 | 52 |
| Netherlands | | 52 | | |
| England | 20 | 52 | 40 | 104 |

Values collected from the GESTIS database on the IFA (Institut für Arbeitsschutz der Deutschen Gesetzlichen Unfallversicherung) website (17/05/11).

The content and format of this safety data sheet comply with Directive 2001/58/CE.

Delegation of responsibility:

The information contained in this sheet comes from sources that we consider to be trustworthy. The methods for handling, storage, use or disposal of the product are beyond our control and cannot come under our jurisdiction.

For these reasons, amongst others, we decline any responsibility in the event of loss, damage or expenses caused by or linked in any way to the handling, storage, use or disposal of the product. This SDS has been drawn up and should be used exclusively for this product. Users' attention is also drawn to the potential risks incurred when a product is used for purposes other than that for which it was originally designed.

1. Identification of the substance/mixture and of the company/business

1.1 Identification of the product

Product name: Refractory moulds
Hazardous component: Cement
Sodium silicate
Crystalline silica (quartz)

1.2 Use

Industrial (See technical specifications for detailed information).

Refractory part used only for the aluminothermic reaction with the suitable Railtech Portion for welding on track.

1.3 Information regarding the supplier of the safety data sheet



RAILTECH INTERNATIONAL
ZI du Bas Pré
59590 RAISMES

Tel: +33 (0)3 27 22 26 26
Fax: +33 (0)3 27 22 26 00

Contact details: fvanpeperstraete@railtech.fr

1.4 Emergency telephone number

Emergency telephone: +33 (0)1 45 42 59 59 (ORFILA)

2. Identification of dangers

2.1 Main dangers

Classification according to (CE) regulation n°1272/2008



GHS 07 H315, H319, H335

2.2 Harmful effects on health

Inhalation: May irritate the respiratory system (during the aluminothermic reaction).

Skin: Prolonged contact with the skin may cause irritation.

Eyes: Irritant for the eyes during welding.

2.3 Means of exposure

Inhalation: yes (during the aluminothermic reaction).

Skin: yes

Eyes: yes (during the aluminothermic reaction).

Ingestion: none, except accidental

2.4 Secondary hazard

Handling and heating is liable to release particles of alveolar crystalline silica into the workspace environment. Prolonged and/or massive inhalation of alveolar crystalline silica dust may cause pulmonary fibrosis-type conditions, generally referred to as silicosis.

3. Composition/information about ingredients

| Ingredients | CAS N° | EINECS N° | % weight | Dangers |
|---|---|-----------|----------|--|
| SILICEOUS SAND (>97% quartz) contains less than 1% of alveolar quartz. | 14808-60-7 | 238-878-4 | 70 to 85 | Alveolar quartz <1%: Handling and heating is liable to release particles of alveolar crystalline silica into the workspace environment. Prolonged and/or massive inhalation of alveolar crystalline silica dust may cause pulmonary fibrosis-type conditions, generally referred to as silicosis. |
| CHAMOTTE (CALCINED KAOLIN) | 92704-41-1 | 296-473-8 | 5 to 10 | |
| ZIRCON SAND | 14940-68-2 | 239-019-6 | 0 to 25 | |
| PORTLAND CEMENT | 65997-15-1 | 266-043-4 | <1 | Irritating, XI (R37/38, R41, R43) |
| IRON OXIDE (Fe ₂ O ₃) | 1309-37-1 | 215-168-2 | <1 | |
| SODIUM SILICATE | 1344-09-8 | 215-687-4 | 5 to 10 | Irritating, Xi (R38/41) |
| FELT | 142 844-00-6 (silicoaluminate fibres) | 266-046-0 | <1 | Irritating, Xi (R38,R49) |

4. First aid

Initial treatment in the event of mechanical deterioration or damage during use

Inhalation: No special first aid measures. Move out of the contaminated area and consult a specialist.
Skin contact: Rinse with water.
Contact with eyes: In the event of contact with the eyes, rinse immediately with plenty of water and consult a specialist, if discomfort or irritation develops.
Ingestion: Not affected.

5. Fire safety measures

5.1 Flammability rating

Noncombustible product.

5.2 Extinguishing media

All the extinguishing agents may be used. **(When not in use)**

In the event of a fire during aluminothermic welding, use only dry sand to extinguish the fire.

Counterindications: DO NOT USE WATER



5.3 Particular risks

In the event of a fire, protection from smoke must be provided using suitable breathing apparatus.

6. Measures to be taken in the event of accidental dispersion

6.1 Personal precautions

Avoid breathing in the dust.

6.2 Precautions for the environment

Dispose of waste through channels that are regulated by the public authorities.

Do not put into the sewage system, the ground or in drinking water.

6.3 Cleaning solutions

Sweep up the product that has been poured out without creating dust.

7. Handling and storage

7.1 Handling

Minimise any dust emitted during the packaging process.

Avoid damage to the packaging.

7.2 Storage

Keep in a dry and cool place, out of the rain and away from moisture (to avoid any damage to the mould).

Keep in the original packaging cartons.

Type of packaging for the kit: Fragile.
Keep out of rain and moisture.

8. Exposure controls/personal protection

8.1 Control parameters

According to French legislation, set by the Ministry of Labour 17/05/11 :

| Parameters | CAS N° | OEL (fibres/cm3) | AEV (mg/m ³) | ELV (ppm) | ELV (mg.m ⁻³) |
|---------------------------|--------------|------------------|--------------------------|-----------|---------------------------|
| Alveolar dust | - | - | 5 | - | - |
| Inhalable dust | - | - | 10 | - | - |
| Quartz | 14808-60-7 | - | 0.1 | - | - |
| Refractory Ceramic Fibres | 142,844-00-6 | 0,1 | - | - | - |

In the presence of alveolar dust containing crystalline silica and other non-silicogenic dust, the exposure limit is set by the following formula: $Cns/Vns + Cq/0.1 + Cc/0.05 + Ct/0.05$ where Cns represents the concentration in non-silicogenic alveolar dust mg.m⁻³, Vns, the recommended average exposure value for alveolar dust without any specific effect (5mg.m⁻³), and Cq, Cc and Ct are the respective concentrations of quartz, cristobalite and tridymite in mg.m⁻³.

Refer to paragraph 16.3 for the control values applicable in countries other than France.

8.2 Personal protection equipment

Respiratory protection:

Use an FFP3-type mask when welding.



Hand protection:

Use protective and heat-resistant gloves when welding.



Eye protection:

Wearing safety eyewear and welding eyewear when welding.



Protection of the skin and body:



Wear protective clothing (100% cotton) and safety shoes.

8.2 Hygiene measures

Wash hands after using the product.

When using do not eat, drink or smoke.

9. Physical and chemical properties

Physical state: solid.

Colour: orange-coloured red.

Odour: none.

pH: To be confirmed.

Water solubility: soluble.

Characteristic temperatures:

Freezing point (°C): Not Applicable.

Decomposition temperature (°C) : > 1650°C

Flammability characteristics:

Flash point (°C): Not Applicable.

Self-ignition temperature (°C): Not Applicable.

10. Stability and reactivity

10.1 Stability

Deterioration of the mould over time.

During use, transformation of the silica.

10.2 Conditions to be avoided

Contact with humidity (deterioration of the product and risks during the aluminothermic reaction).

10.3 Materials to be avoided

Contact with acids.

10.5 Dangerous reaction

Exothermic reaction during welding.

11. Toxicology information

11.1 Toxicology information

Given that each raw material forming the pre-fabricated mould, is mixed, gassy and dried, there is no toxicological risk under normal conditions of use.

11.2 Primary effects of irritation

Of the skin: May cause sensitization on contact with the skin.
Eyes: Irritant for the eyes, during use.
Inhalation: May cause irritation to the respiratory system during use.

12. Environmental information

12.1 Information regarding toxic effects on the environment

Not assumed to be toxic. In order to avoid any possible effects on the environment, observe the disposal and recycling regulations in force.

In order to avoid any harm to the environment, the waste from the moulds must be kept out of the rain. moulds.

12.2 Biodegradability

Is not biodegradable.

12.3 Bioaccumulation potential

Undetermined.

CL50-24 hours- fish (mg/l): Undetermined

COD: Undetermined

BOD5: Undetermined

13. Considerations regarding disposal

13.1 Waste disposal

Destroy in compliance with the local/national safety regulations in force.

13.2 Treatment of soiled packaging

Various types of packaging (cardboard, plastic...) must be disposed of and recycled separately in accordance with decree no. 93-609 of 13 July 1994 and decree no.92-377 of 1 April 1992 or the national regulations for the countries in which the products are used.

13.3 Other data

The unused moulds may be disposed of in landfill sites or recycled in accordance with environmental preservation regulations.

14. Information regarding transport

ADR/RID

Not Applicable

The moulds are not classified as hazardous products and are not therefore subject to special transportation regulations.

15. Regulatory information

15.1 CE Labelling

Classification, packaging and labelling according to EC regulation 1272/2008.

15.2 Danger symbols and indications

15.2.1 H Phrases

Classification according to (CE) regulation n°1272/2008



GHS 07

H315, H319, H335

H315: Causes irritation to the skin

H319: Causes severe irritation to the eyes

H335: May irritate the respiratory system.

15.2.2 P Phrases

Classification according to (CE) regulation n°1272/2008

Mould alone:

P232: Protect from moisture.

P260: do not inhale the dust/smoke/fumes/gas/mists/vapours/aerosols.

P262: Avoid contact with eyes, skin or clothing.

When welding:

P280: Wear suitable protective clothing, gloves and eye/face protection.

P223: Avoid all contact with water due to the risk of a violent reaction and spontaneous ignition.

P273: Avoid release to the environment.

16. Other information

16.1 Recommended use and restrictions

See the instructions when using the product.

16.2 Additional information

16.2.1 List of risk phrases used

R37: Irritating to respiratory system

R38: Irritating to skin.

R41: Risk of serious damage to eyes.

R43: May cause sensitization by skin contact.

R49: May cause cancer by inhalation.

H319: Causes severe irritation to the eyes.

H315: Causes irritation to the skin.

H335: May irritate the respiratory system.

16.2.2 List of the safety advice phrases used

P232: Protect from moisture.

P260: Do not inhale the dust/smoke/fumes/gas/mists/vapours/aerosols.

P262: Avoid contact with eyes, skin or clothing.

P280: Wear suitable protective clothing, gloves and eye/face protection.

P223: Avoid all contact with water due to the risk of a violent reaction and spontaneous ignition.

P273: Avoid release to the environment.

16.2.3 List of abbreviations used in this sheet

GHS: Globally Harmonised System.

CAS: Chemical Abstracts Service.

AEV: Average Exposure Value over 8 hours.

ELV: Exposure Limit Value over 15 minutes = Short term limit value (STLV).

CL50-24 hours- fish: Concentration that results in half of the fish population dying within 24hrs.

COD: Chemical Oxygen Demand.

BOD5: Biological Oxygen Demand over 5 days.

ADR= Agreement on Dangerous Goods by Road.

RID = Regulations concerning the Intl Transport of Dangerous Goods by Rail.

16.3 Other limit values for professional exposure

Each country has its own limit values for professional exposure; a non-exhaustive summary of ELVs and AEVs applicable outside French territory is offered. For countries not included, seek advice from the occupational health services or the Ministry of Labour of the countries concerned.

| Inhalable dust (total, without any specific effects) | | |
|---|--------------------------|--------------------------|
| Country | AEV (mg/m ³) | ELV (mg/m ³) |
| Austria | 10 | 20 |
| Belgium | 10 | |
| Denmark | 10 | 20 |
| France | 10 | |
| Germany (AGS) | 10 | 20 |
| Germany (DFG) | 4 | |
| Hungary | 10 | |
| Spain | 10 | |
| Sweden | 10 | |
| Switzerland | 10 | |
| USA – OSHA | 15 | |

| Alveolar dust (breathable) | | |
|-----------------------------------|--------------------------|--------------------------|
| Country | AEV (mg/m ³) | ELV (mg/m ³) |
| Austria | 5 | 10 |
| Belgium | 3 | |
| France | 5 | |
| Germany (AGS) | 3 | 6 |
| Germany (DFG) | 1.5 | |
| Hungary | 6 | |
| Spain | 3 | |
| Sweden | 5 | |
| Switzerland | 3 | |
| USA – OSHA | 5 | |

| QUARTZ CAS = 14808-60-7 | | |
|--------------------------------|--|-------------------------------|
| Country | AEV (mg/m ³) | ELV |
| Austria | 0.15 alveolar | |
| Belgium | 0.1 | |
| Canada - Quebec | 0.1 | |
| Denmark | 0.3 inhalable 0.1 alveolar | 0.6 inhalable 0.2 alveolar |
| France | 0.1 alveolar | |
| Hungary | 0.15 alveolar | |
| Spain | 0.1 alveolar | |
| Sweden | 0.1 alveolar | |
| Switzerland | 0.15 alveolar | |
| Netherlands | 0.075 alveolar dust | |
| USA - NIOSH | 0.05 | |
| USA - OSHA | 30/(%SiO ₂ +2) total dust 10/(%SiO ₂ +2) alveolar | |

| Refractory Ceramic Fibres | | |
|----------------------------------|-------------------------------|-------------------------------|
| Country | OEL (fibres/cm ³) | ELV (fibres/cm ³) |
| Austria | | |
| Belgium | | |
| Canada - Quebec | | |
| Denmark | | |
| European Union | | |
| France | 0.1 | |
| Germany (AGS) | | |
| Germany (DFG) | | |
| Hungary | | |
| Italy | | |
| Japan | | |
| Poland | | |
| Spain | | |
| Sweden | | |
| Switzerland | | |

| | | |
|-------------|--|--|
| Netherlands | | |
| USA - NIOSH | | |
| USA – OSHA | | |
| England | | |

Values collected from the GESTIS database on the IFA (Institut für Arbeitsschutz der Deutschen Gesetzlichen Unfallversicherung) website (17/05/11).

The content and format of this safety data sheet comply with Directive 2001/58/CE.

Delegation of responsibility:

The information contained in this sheet comes from sources that we consider to be trustworthy. The methods for handling, storage, use or disposal of the product are beyond our control and cannot come under our jurisdiction.

For these reasons, amongst others, we decline any responsibility in the event of loss, damage or expenses caused by or linked in any way to the handling, storage, use or disposal of the product. This SDS has been drawn up and should be used exclusively for this product. Users' attention is also drawn to the potential risks incurred when a product is used for purposes other than that for which it was originally designed.

1. Identification of the substance/mixture and of the company/business

1.1 Identification of the product

Product name: One shot crucible
Hazardous component: Phenolic resin (Alkaline Resol)
Crystalline silica

1.2 Use

Industrial

Refractory part used only for the aluminothermic reaction with the suitable Railtech Portion for welding on track.

1.3 Information regarding the supplier of the safety data sheet



RAILTECH INTERNATIONAL
ZI du Bas Pré
59590 RAISMES

Tel: +33 (0)3 27 22 26 26
Fax: +33 (0)3 27 22 26 00

Contact details: fvanpeperstraete@railtech.fr

1.4 Emergency telephone number

Emergency telephone: +33 (0)1 45 42 59 59 (ORFILA)

2. Identification of dangers

2.1 Main dangers

This product does not meet the hazardous substance classification criteria as set out in the CE 1272/2008 regulations and the 67/548/CEE directive.

However, the handling and heating of the product is liable to emit particles of alveolar crystalline silica into the workplace atmosphere. Prolonged and/or massive inhalation of alveolar crystalline silica dust may cause pulmonary fibrosis-type conditions, generally referred to as silicosis.

2.2 Harmful effects on health

Inhalation: Uncomfortable for the respiratory system (during aluminothermic reactions).

Skin: Prolonged contact with the skin may cause irritation.

Eyes: Irritant for the eyes (during welding).

2.3 Means of exposure

Inhalation: yes (during the aluminothermic reaction).

Skin: yes

Eyes: yes (during welding).

Ingestion: none, except accidental

3. Composition/information about ingredients

| Ingredients | CAS N° | EINECS N° | % weight | Dangers |
|---|------------|-----------|----------|--|
| SILICEOUS SAND (>97% quartz) contains less than 1% of alveolar quartz. | 14808-60-7 | 238-878-4 | 95 | Alveolar quartz <1%: Handling and heating is liable to release particles of alveolar crystalline silica into the workspace environment. Prolonged and/or massive inhalation of alveolar crystalline silica dust may cause pulmonary fibrosis-type conditions, generally referred to as silicosis. |
| ALKALINE RESOL | - | - | 3 | C: corrosive; R35; R43 |

4. First aid

Initial treatment in the event of mechanical deterioration or damage during use

Inhalation: No special first aid measures. Move out of the contaminated area and consult a specialist.

Skin contact: Rinse with water.

Contact with eyes: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

Ingestion: Not affected.

5. Fire safety measures

5.1 Flammability rating

Noncombustible product (when not in use).

5.2 Extinguishing media

All the extinguishing agents may be used (**when not in use**).

In the event of a fire during aluminothermic welding, use **only dry sand to extinguish the fire**.

Counterindications: DO NOT USE WATER



5.3 Particular risks

In the event of a fire, protection from smoke must be provided using suitable breathing apparatus.

6. Measures to be taken in the event of accidental dispersion

6.1 Personal precautions

Avoid breathing in the dust.

6.2 Precautions for the environment

Avoid release to the environment.

Do not put into the sewage system, the ground or in drinking water.

6.3 Cleaning solutions

Do not sweep when dry.

7. Handling and storage

7.1 Handling

Minimise any dust emitted during the packaging process.

Avoid damage to the packaging.

7.2 Storage

Keep in a dry and cool place, out of the rain and away from moisture (to avoid any damage to the crucible).

Keep in the original packaging cartons.

Packaging type: Fragile.
Keep out of rain and moisture.
keep the packaging the right way up.

8. Exposure controls/personal protection

8.1 Control parameters

According to French legislation, set by the Ministry of Labour 17/05/11 :

| Parameters | CAS N° | AEV (ppm) | AEV (mg/m ³) | ELV (ppm) | ELV (mg.m ⁻³) |
|----------------|------------|-----------|--------------------------|-----------|---------------------------|
| Alveolar dust | - | - | 5 | - | - |
| Inhalable dust | - | - | 10 | - | - |
| Quartz | 14808-60-7 | - | 0.1 | - | - |

In the presence of alveolar dust containing crystalline silica and other non-silicogenic dust, the exposure limit is set by the following formula: $Cns/Vns + Cq/0.1 + Cc/0.05 + Ct/0.05$ where Cns represents the concentration in non-silicogenic alveolar dust mg.m⁻³, Vns, the recommended average exposure value for alveolar dust without any specific effect (5mg.m⁻³), and Cq, Cc and Ct are the respective concentrations of quartz, cristobalite and tridymite in mg.m⁻³.

Refer to paragraph 16.3 for the control values applicable in countries other than France.

8.2 Personal protection equipment

Respiratory protection:

Use an FFP3-type mask when welding.



Hand protection:

Use protective and heat-resistant gloves when welding.



Eye protection:

Wear protective welder's goggles when welding.



Protection of the skin and body:

Wear protective clothing (100% cotton) and safety shoes.



8.2 Hygiene measures

Wash hands after using the product.

When using do not eat, drink or smoke.

9. Physical and chemical properties

Physical state: solid.

Colour: rosy beige.

Odour: slight smell of resin during use.

pH: To be confirmed.

Water solubility: soluble.

Characteristic temperatures:

Freezing point (°C): Not Applicable.

Decomposition temperature (°C) : > 1650°C

Flammability characteristics:

Flash point (°C): Not Applicable.

Self-ignition temperature (°C): Not Applicable.

10. Stability and reactivity

10.1 Stability

Deterioration of the resin over time.

During use, decomposition of the one shot crucible and emergence of a layer of slag tray on the inside.

10.2 Conditions to be avoided

Contact with humidity (deterioration of the product and risks during the aluminothermic reaction).

10.3 Materials to be avoided

Contact with acids.

10.5 Dangerous reaction

Exothermic reaction during welding.

11. Toxicology information

11.1 Toxicology information

Given that each raw material forming the one shot crucible, is mixed, gassy and dried, there is no toxicological risk under normal conditions of use.

11.2 Primary effects of irritation

Of the skin: May cause sensitization on contact with the skin.
Eyes: Irritant for the eyes, during use.
Inhalation: May cause irritation to the nose and throat during use.

12. Environmental information

12.1 Information regarding toxic effects on the environment

Not assumed to be toxic. In order to avoid any possible effects on the environment, observe the disposal and recycling regulations in force.

In order to avoid any possible harm to the environment, the one shot crucible waste must be stored away from rainwater.

12.2 Biodegradability

Is not biodegradable.

12.3 Bioaccumulation potential

Undetermined.

CL50-24 hours- fish (mg/l): Undetermined

COD: Undetermined
BOD5: Undetermined

13. Considerations regarding disposal

13.1 Waste disposal

Destroy in compliance with the local/national safety regulations in force.

Must be treated specially (one shot crucible with and without metal).

13.2 Treatment of soiled packaging

Cardboard packaging must be disposed of and recycled separately, in compliance with decree n° 93-609 of 13 July 1994 and decree n° 92-377 of 1st April 1992 or with the national regulations in which the products are used.

13.3 Other data

They may be disposed of in landfill or recycled according to eco-friendly requirements.

| Waste coding | Label | Section |
|--------------|-------------------|----------------------|
| 10.09.07/08 | One shot crucible | Controlled waste |
| 15.01.02 | Plastic | Recycling / Recovery |
| 12.01.01 | One shot crucible | Controlled waste |
| 15.01.01 | Cardboard | Recycling / Recovery |

14. Information regarding transport

ADR/RID

Not Applicable

The one shot crucibles are not classified as hazardous products and are therefore not subject to special transportation regulations.

15. Regulatory information

15.1 CE Labelling

Classification, packaging and labelling according to EC regulation 1272/2008.

15.2 Danger symbols and indications

Not Applicable.

15.2.1 H Phrases

Not Classifiable according to EC regulation no.1272/2008

15.2.2 P Phrases

Classification according to (CE) regulation n°1272/2008

One shot crucible

P232: Keep container dry.

P260: Do not breathe dust.

When welding:

P260: Do not inhale the dust/smoke/fumes/gas/mists/vapours/aerosols.

P280: Wear suitable protective clothing, gloves and eye/face protection.

P223: Avoid all contact with water due to the risk of a violent reaction and spontaneous ignition.

P273: Avoid release to the environment.

16. Other information

16.1 Recommended practices and restrictions

Not Applicable.

16.2 Additional information

16.2.1 List of risk phrases used

C: corrosive

R35: Causes severe burns

R43: May cause sensitization by skin contact

16.2.2 List of the safety advice phrases used

P232: Keep container dry.

P260: Do not breathe dust.

P260: Do not inhale the dust/smoke/fumes/gas/mists/vapours/aerosols.

P280: Wear suitable protective clothing, gloves and eye/face protection.

P223: Avoid all contact with water due to the risk of a violent reaction and spontaneous ignition.

P273: Avoid release to the environment.

16.2.3 List of abbreviations used in this sheet

GHS: Globally Harmonised System

CAS: Chemical Abstracts Service

AEV: Average Exposure Value over 8 hours

ELV: Exposure Limit Value over 15 minutes = Short term limit value (STLV).

CL50-24 hours- fish: Concentration that results in half of the fish population dying within 24hrs.

COD: Chemical Oxygen Demand.

BOD5: Biological Oxygen Demand over 5 days.

ADR= Agreement on Dangerous Goods by Road.

RID = Regulations concerning the Intl Transport of Dangerous Goods by Rail.

16.3 Other limit values for professional exposure

Each country has its own limit values for professional exposure; a non-exhaustive summary of ELVs and AEVs applicable outside French territory is offered. For countries not included, seek advice from the occupational health services or the Ministry of Labour of the countries concerned.

| Inhalable dust (total, without any specific effects) | | |
|---|--------------------------|--------------------------|
| Country | AEV (mg/m ³) | ELV (mg/m ³) |
| Austria | 10 | 20 |
| Belgium | 10 | |
| Denmark | 10 | 20 |
| France | 10 | |
| Germany (AGS) | 10 | 20 |
| Germany (DFG) | 4 | |
| Hungary | 10 | |
| Spain | 10 | |
| Sweden | 10 | |
| Switzerland | 10 | |
| USA – OSHA | 15 | |

| Alveolar dust (breathable) | | |
|-----------------------------------|--------------------------|--------------------------|
| Country | AEV (mg/m ³) | ELV (mg/m ³) |
| Austria | 5 | 10 |
| Belgium | 3 | |
| France | 5 | |
| Germany (AGS) | 3 | 6 |
| Germany (DFG) | 1.5 | |

| | | |
|-------------|---|--|
| Hungary | 6 | |
| Spain | 3 | |
| Sweden | 5 | |
| Switzerland | 3 | |
| USA – OSHA | 5 | |

| QUARTZ CAS = 14808-60-7 | | |
|-------------------------|--|-------------------------------|
| Country | AEV (mg/m ³) | ELV |
| Austria | 0.15 alveolar | |
| Belgium | 0.1 | |
| Canada - Quebec | 0.1 | |
| Denmark | 0.3 inhalable 0.1 alveolar | 0.6 inhalable 0.2 alveolar |
| France | 0.1 alveolar | |
| Hungary | 0.15 alveolar | |
| Spain | 0.1 alveolar | |
| Sweden | 0.1 alveolar | |
| Switzerland | 0.15 alveolar | |
| Netherlands | 0.075 alveolar dust | |
| USA - NIOSH | 0.05 | |
| USA – OSHA | 30/(%SiO ₂ +2) total dust 10/(%SiO ₂ +2) alveolar | |

Values collected from the GESTIS database on the IFA (Institut für Arbeitsschutz der Deutschen Gesetzlichen Unfallversicherung) website (17/05/11).

The content and format of this safety data sheet comply with Directive 2001/58/CE.

Delegation of responsibility:

The information contained in this sheet comes from sources that we consider to be trustworthy. The methods for handling, storage, use or disposal of the product are beyond our control and cannot come under our jurisdiction.

For these reasons, amongst others, we decline any responsibility in the event of loss, damage or expenses caused by or linked in any way to the handling, storage, use or disposal of the product. This SDS has been

drawn up and should be used exclusively for this product. Users' attention is also drawn to the potential risks incurred when a product is used for purposes other than that for which it was originally designed.

1. Identification of the substance/mixture and of the company/business

1.1 Identification of the product

Product name: Refractory moulds
Hazardous component: Cement
Sodium silicate
Crystalline silica (quartz)

1.2 Use

Industrial (See technical specifications for detailed information).
Refractory part used only for the aluminothermic reaction with the suitable Railtech Portion for welding on track.

1.3 Information regarding the supplier of the safety data sheet



RAILTECH INTERNATIONAL
ZI du Bas Pré
59590 RAISMES

Tel: +33 (03) 27 22 26 26
Fax: +33 (03) 27 22 26 00

Contact details: fvanpeperstraete@railtech.fr

1.4 Emergency telephone number

Emergency telephone: +33 (0)1 45 42 59 59 (ORFILA)

2. Identification of dangers

2.1 Main dangers

Classification according to (CE) regulation n°1272/2008



GHS 07

H315, H319, H335

2.2 Harmful effects on health

Inhalation: May irritate the respiratory system (during the aluminothermic reaction).
Skin: Prolonged contact with the skin may cause irritation.
Eyes: Irritant for the eyes during welding.

2.3 Means of exposure

Inhalation: yes (during the aluminothermic reaction).
Skin: yes
Eyes: yes (during the aluminothermic reaction).
Ingestion: none, except accidental

2.4 Secondary hazard

Handling and heating is liable to release particles of alveolar crystalline silica into the workspace environment. Prolonged and/or massive inhalation of alveolar crystalline silica dust may cause pulmonary fibrosis-type conditions, generally referred to as silicosis.

3. Composition/information about ingredients

| Ingredients | CAS N° | EINECS N° | % weight | Dangers |
|---|------------|-----------|----------|--|
| SILICEOUS SAND (>97% quartz) contains less than 1% of alveolar quartz. | 14808-60-7 | 238-878-4 | 70 to 85 | Alveolar quartz <1%: Handling and heating is liable to release particles of alveolar crystalline silica into the workspace environment. Prolonged and/or massive inhalation of alveolar crystalline silica dust may cause pulmonary fibrosis-type conditions, generally referred to as silicosis. |
| CHAMOTTE (CALCINED KAOLIN) | 92704-41-1 | 296-473-8 | 5 to 10 | |
| ZIRCON SAND | 14940-68-2 | 239-019-6 | 0 to 25 | |
| PORTLAND CEMENT | 65997-15-1 | 266-043-4 | <1 | Irritating, Xi (R37/38, R41, R43) |
| IRON OXIDE (Fe ₂ O ₃) | 1309-37-1 | 215-168-2 | <1 | |
| SODIUM SILICATE | 1344-09-8 | 215-687-4 | 5 to 10 | Irritating, Xi (R38/41) |

4. First aid

Initial treatment in the event of mechanical deterioration or damage during use

Inhalation: No special first aid measures. Move out of the contaminated area and consult a specialist.

Skin contact: Rinse with water.

Contact with eyes: In the event of contact with the eyes, rinse immediately with plenty of water and consult a specialist, if discomfort or irritation develops.

Ingestion: Not affected.

5. Fire safety measures

5.1 Flammability rating

Noncombustible product.

5.2 Extinguishing media

All the extinguishing agents may be used. **(When not in use)**

In the event of a fire during aluminothermic welding, use only dry sand to extinguish the fire.

Counterindications: DO NOT USE WATER



5.3 Particular risks

In the event of a fire, protection from smoke must be provided using suitable breathing apparatus.

6. Measures to be taken in the event of accidental dispersion

6.1 Personal precautions

Avoid breathing in the dust.

6.2 Precautions for the environment

Dispose of waste through channels that are regulated by the public authorities.

Do not put into the sewage system, the ground or in drinking water.

6.3 Cleaning solutions

Sweep up the product that has been poured out without creating dust.

7. Handling and storage

7.1 Handling

Minimise any dust emitted during the packaging process.

Avoid damage to the packaging.

7.2 Storage

Keep in a dry and cool place, out of the rain and away from moisture (to avoid any damage to the mould).

Keep in the original packaging cartons.

Type of packaging for the kit: Fragile.
Keep out of rain and moisture.

8. Exposure controls/personal protection

8.1 Control parameters

According to French legislation, set by the Ministry of Labour 17/05/11 :

| Parameters | CAS N° | AEV (fibres/cm3) | AEV (mg/m ³) | ELV (ppm) | ELV (mg.m ⁻³) |
|----------------|------------|------------------|--------------------------|-----------|---------------------------|
| Alveolar dust | - | - | 5 | - | - |
| Inhalable dust | - | - | 10 | - | - |
| Quartz | 14808-60-7 | - | 0.1 | - | - |

In the presence of alveolar dust containing crystalline silica and other non-silicogenic dust, the exposure limit is set by the following formula: $Cns/Vns + Cq/0.1 + Cc/0.05 + Ct/0.05$ where Cns represents the concentration in non-silicogenic alveolar dust mg.m⁻³, Vns, the recommended average exposure value for alveolar dust without any specific effect (5mg.m⁻³), and Cq, Cc and Ct are the respective concentrations of quartz, cristobalite and tridymite in mg.m⁻³.

Refer to paragraph 16.3 for the control values applicable in countries other than France

8.2 Personal protection equipment

Respiratory protection:

Use an FFP3-type mask when welding.



Hand protection:

Use protective and heat-resistant gloves when welding.



Eye protection:

Wearing safety eyewear and welding eyewear when welding.



Protection of the skin and body:

Wear protective clothing (100% cotton) and safety shoes.



8.2 Hygiene measures

Wash hands after using the product.

When using do not eat, drink or smoke.

9. Physical and chemical properties

Physical state: solid.

Colour: orange-coloured red.

Odour: none.

pH: To be confirmed.

Water solubility: soluble.

Characteristic temperatures:

Freezing point (°C): Not Applicable.

Decomposition temperature (°C) : > 1650°C

Flammability characteristics:

Flash point (°C): Not Applicable.

Self-ignition temperature (°C): Not Applicable.

10. Stability and reactivity

10.1 Stability

Deterioration of the mould over time.

During use, transformation of the silica.

10.2 Conditions to be avoided

Contact with humidity (deterioration of the product and risks during the aluminothermic reaction).

10.3 Materials to be avoided

Contact with acids.

10.5 Dangerous reaction

Exothermic reaction during welding.

11. Toxicology information

11.1 Toxicology information

Given that each raw material forming the pre-fabricated mould, is mixed, gassy and dried, there is no toxicological risk under normal conditions of use.

11.2 Primary effects of irritation

Of the skin: May cause sensitization on contact with the skin.
Eyes: Irritant for the eyes, during use.
Inhalation: May cause irritation to the respiratory system during use.

12. Environmental information

12.1 Information regarding toxic effects on the environment

Not assumed to be toxic. In order to avoid any possible effects on the environment, observe the disposal and recycling regulations in force.

In order to avoid any harm to the environment, the waste from the moulds must be kept out of the rain. moulds.

12.2 Biodegradability

Is not biodegradable.

12.3 Bioaccumulation potential

Undetermined.

CL50-24 hours- fish (mg/l): Undetermined

COD: Undetermined

BOD5: Undetermined

13. Considerations regarding disposal

13.1 Waste disposal

Destroy in compliance with the local/national safety regulations in force.

13.2 Treatment of dirty packaging

Various types of packaging (cardboard, plastic...) must be disposed of and recycled separately in accordance with decree no. 93-609 of 13 July 1994 and decree no.92-377 of 1 April 1992 or the national regulations for the countries in which the products are used.

13.3 Other data

The unused moulds may be disposed of in landfill sites or recycled in accordance with environmental preservation regulations.

14. Information regarding transport

ADR/RID

Not Applicable

The moulds are not classified as hazardous products and are not therefore subject to special transportation regulations.

15. Regulatory information

15.1 CE Labelling

Classification, packaging and labelling according to EC regulation 1272/2008.

15.2 Danger symbols and indications

15.2.1 H Phrases

Classification according to (CE) regulation n°1272/2008



GHS 07

H315, H319, H335

H315: Causes irritation to the skin

H319: Causes severe irritation to the eyes

H335: May irritate the respiratory system.

15.2.2 P Phrases

Classification according to (CE) regulation n°1272/2008

Mould alone:

P232: Protect from moisture.

P260: do not inhale the dust/smoke/fumes/gas/mists/vapours/aerosols.

P262: Avoid contact with eyes, skin or clothing.

When welding:

P280: Wear suitable protective clothing, gloves and eye/face protection.

P223: Avoid all contact with water due to the risk of a violent reaction and spontaneous ignition.

P273: Avoid release to the environment.

16. Other information

16.1 Recommended use and restrictions

See the instructions when using the product.

16.2 Additional information

16.2.1 List of risk phrases used

R37: Irritating to respiratory system
R38: Irritating to skin.
R41: Risk of serious damage to eyes.
R43: May cause sensitization by skin contact.
H319: Causes severe irritation to the eyes.
H315: Causes irritation to the skin.
H335: May irritate the respiratory system.

16.2.2 List of the safety advice phrases used

P232: Protect from moisture.
P260: Do not inhale the dust/smoke/fumes/gas/mists/vapours/aerosols.
P262: Avoid contact with eyes, skin or clothing.
P280: Wear suitable protective clothing, gloves and eye/face protection.
P223: Avoid all contact with water due to the risk of a violent reaction and spontaneous ignition.
P273: Avoid release to the environment.

16.2.3 List of abbreviations used in this sheet

GHS: Globally Harmonised System.
CAS: Chemical Abstracts Service.
AEV: Average Exposure Value over 8 hours.
ELV: Exposure Limit Value over 15 minutes = Short term limit value (STLV).
CL50-24 hours- fish: Concentration that results in half of the fish population dying within 24hrs.
COD: Chemical Oxygen Demand.
BOD5: Biological Oxygen Demand over 5 days.
ADR= Agreement on Dangerous Goods by Road.
RID = Regulations concerning the Intl Transport of Dangerous Goods by Rail.

16.3 Other limit values for professional exposure

Each country has its own limit values for professional exposure; a non-exhaustive summary of ELVs and AEVs applicable outside French territory is offered. For countries not included, seek advice from the occupational health services or the Ministry of Labour of the countries concerned.

| Inhalable dust (total, without any specific effects) | | |
|---|--------------------------|--------------------------|
| Country | AEV (mg/m ³) | ELV (mg/m ³) |
| Austria | 10 | 20 |
| Belgium | 10 | |
| Denmark | 10 | 20 |
| France | 10 | |
| Germany (AGS) | 10 | 20 |
| Germany (DFG) | 4 | |
| Hungary | 10 | |
| Spain | 10 | |
| Sweden | 10 | |
| Switzerland | 10 | |
| USA – OSHA | 15 | |

| Alveolar dust (breathable) | | |
|-----------------------------------|--------------------------|--------------------------|
| Country | AEV (mg/m ³) | ELV (mg/m ³) |
| Austria | 5 | 10 |
| Belgium | 3 | |
| France | 5 | |
| Germany (AGS) | 3 | 6 |
| Germany (DFG) | 1.5 | |
| Hungary | 6 | |
| Spain | 3 | |
| Sweden | 5 | |
| Switzerland | 3 | |
| USA – OSHA | 5 | |

| QUARTZ CAS = 14808-60-7 | | |
|--------------------------------|--------------------------|-----|
| Country | AEV (mg/m ³) | ELV |
| Austria | 0.15 alveolar | |
| Belgium | 0.1 | |
| Canada - Quebec | 0.1 | |

| | | |
|-------------|--|-------------------------------|
| Denmark | 0.3 inhalable 0.1 alveolar | 0.6 inhalable 0.2 alveolar |
| France | 0.1 alveolar | |
| Hungary | 0.15 alveolar | |
| Spain | 0.1 alveolar | |
| Sweden | 0.1 alveolar | |
| Switzerland | 0.15 alveolar | |
| Netherlands | 0.075 alveolar dust | |
| USA - NIOSH | 0.05 | |
| USA – OSHA | 30/(%SiO ₂ +2) total dust 10/(%SiO ₂ +2) alveolar | |

Values collected from the GESTIS database on the IFA (Institut für Arbeitsschutz der Deutschen Gesetzlichen Unfallversicherung) website (17/05/11).

The content and format of this safety data sheet comply with Directive 2001/58/CE.

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1. Identification of the substance/mixture and of the company/business

1.1 Identification of the product

Product name: Thermic starter

Hazardous component: ALuminium (stabilised powder), CAS n° 7429-90-5

1.2 Use

Industrial.

Thermic starter for aluminothermic welding.

1.3 Information regarding the supplier of the safety data sheet



RAILTECH INTERNATIONAL
ZI du Bas Pré
59590 RAISMES

Tel: +33 (0)3 27 22 26 26

Fax: +33 (0)3 27 22 26 00

Contact details: fvanpeperstraete@railtech.fr

1.4 Emergency telephone number

Emergency telephone: +33 (0)1 45 42 59 59 (ORFILA)

2. Identification of dangers

2.1 Main dangers

Classification according to (CE) regulation n°1272/2008

H261: Releases flammable gases, on contact with water, category 2

2.2 Harmful effects on health

Inhalation: None excluding use.

Skin: None excluding use.

Eyes: None excluding use.

2.3 Means of exposure

Inhalation: no

Skin: no

Eyes: no

Ingestion: none, except accidental

2.4 Fire or explosion

The aluminothermic composition contained in the thermic starter does not have explosive properties according to standard NF T20-038.

In normal usage conditions, the product **is not explosive**.

Avoid contact with any strong source of heat or ignition with a **temperature > 1200°C**.

2.5 Other dangers


Reaction with water, oxidizing agents releasing **hydrogen** (H₂).

During its use:

Very strong exothermic reaction (+2000°C). Risk of molten metal projection.

- Stand well back during the reaction ! Risk of burns.

3. Composition/information about ingredients

| Ingredients | CAS N° | EINECS N° | % weight | Dangers |
|---|-----------|-----------|------------|--|
| IRON OXIDE (Fe ₃ O ₄) | 1317-61-9 | 215-277-5 | 70 to 80 % | |
| ALUMINIUM (stabilised powder) | 7429-90-5 | 231-072-3 | 10 to 30 | Highly flammable Solid  F; R11, R15 H261, H228 (appendix VI of the CLP regulation") |

4. First aid

Initial treatment in the event of mechanical deterioration or damage during use

- Inhalation:** No special first aid measures. Move out of the contaminated area and consult a specialist.
- Skin contact:** Not affected.
- Contact with eyes:** In case of contact with eyes, rinse immediately with plenty of water and consult a specialist, if discomfort or irritation develops.

Ingestion: Not affected.

5. Fire safety measures

5.1 Flammability rating

Not Highly flammable.

5.2 Extinguishing media

In the event of a fire, use **dry sand only** to the exclusion of any other product to extinguish the fire.

Counterindications : The use of **water** to extinguish a fire started by aluminothermic reactants is strictly forbidden.



5.3 Particular risks

Avoid all contact with sources of ignition or heat > 1200°C. or.

May degrade at high temperatures, releasing hydrogen.

6. Measures to be taken in the event of accidental dispersion

6.1 Precautions for the environment

Avoid release to the environment.

Prevent entry into the sewage system, the ground and drinking water (risk of release of hydrogen on contact with water).

6.2 Cleaning solutions

Gather the spilled substance and avoid creating dust.

Store the dry product in its original packaging and avoid contact with water.

If the product is wet do not use it; throw the product away.

7. Handling and storage

7.1 Handling

To be used only:

- A member of staff who has previously read the instructions for use,
- With the recommended equipment from the group RAILTECH INTERNATIONAL,
- To ignite an aluminothermic reactant of the group RAILTECH INTERNATIONAL to the explicit exclusion of any other use.

- If the latter is located in the environment suitable for its use.

The safety catch must always be "clipped on" and is only to be removed during use.

Avoid damage to the packaging.

7.2 Storage

Store in its original packaging, in a dry place with adequate ventilation.

Keep away from heat, sparks, flames and any source of ignition.

Do not expose the thermic starters to electric currents.

Packaging type: Cardboard.
Keep out of rain and moisture.

8. Exposure controls/personal protection

8.1 Control parameters

According to French legislation, set by the Ministry of Labour 17/05/11:

| Parameters | CAS N° | AEV (ppm) | AEV (mg/m ³) | ELV (ppm) | ELV (mg.m ⁻³) |
|-----------------------------|-----------|-----------|--------------------------|-----------|---------------------------|
| Iron (vapours) | 1309-37-1 | - | 5 | - | - |
| Aluminium (welding vapours) | 7429-90-5 | - | 5 | - | - |

Refer to paragraph 16.3 for the control values applicable in countries other than France.

8.2 Personal protection equipment during installation of the starter

Respiratory protection:

Not affected.

Hand protection:

Use the handling gloves.



Eye protection:

Not affected.

Protection of the skin and body:

Wear protective clothing.



8.2 Hygiene measures

Wash hands after using the product.

When using, do not eat, drink or smoke.

9. Physical and chemical properties

Physical state: solid.

Colour: grey and black.

Odour: none.

pH: not applicable.

Water solubility: insoluble.

Characteristic temperatures:

Freezing point (°C): Not Applicable.

Decomposition temperature (°C): Not Applicable.

Flammability characteristics:

Flash point (°C): Not Applicable.

Self-ignition temperature (°C): > 1200°C.

Explosivity characteristics:

Only concerns Aluminium pellets (risk of release of hydrogen on contact with water).

Minimum explosive concentration: undetermined.

Minimum ignition energy: undetermined.

10. Stability and reactivity

10.1 Stability

Stable in normal conditions. If not exposed to moisture.

10.2 Conditions to be avoided

Extremely high or extremely low temperatures (>12°C and < -00°C).

10.3 Materials to be avoided

Contact with acids.

10.5 Dangerous reaction

Release of hydrogen with water.

Exothermic reaction during welding.

May agglomerate on contact with moisture.

10.6 Dangerous decomposition product

Risk of releasing vapours containing iron and aluminium trioxide during welding.

11. Toxicology information

11.1 Toxicology information

To date, no harmful effects have been identified in the normal conditions of use and when the usual industrial hygiene measures are taken..

12. Environmental information

12.1 Information regarding toxic effects on the environment

Not assumed to be toxic. In order to avoid any possible effects on the environment, observe the disposal and recycling regulations in force.

12.2 Biodegradability

Is not biodegradable.

12.3 Bioaccumulation potential

Undetermined.

13. Considerations regarding disposal

13.1 Waste disposal

Destroy in compliance with the local/national safety regulations in force.

13.2 Treatment of soiled packaging

After sorting, recycle as appropriate.

Mixed packaging (card, plastic, metal) must be disposed of and recycled separately, in compliance with decree n° 93-609 of 13 July 1994 and decree n° 92-377 of 1st April 1992 and 2002-540 of 18 April 2002 or with the national regulations in which the products are used.

| Waste coding | Label | Section |
|--------------|-----------|----------------------|
| 15.01.02 | Plastic | Controlled waste |
| 12.01.01 | Metal | Recycling / Recovery |
| 15.01.01 | Cardboard | Recycling / Recovery |

14. Information regarding transport

ADR – RID – IMDG – OACI – ADN - ADNR

Not Applicable

The thermic starter is not classified as a hazardous product and so is not subject to the specific transport regulations for dangerous goods.

15. Regulatory information

As the product is non-hazardous and not easily flammable, the regulation for Classified Installations for the Protection of the Environment (section 1450) does not apply.

15.1 CE Labelling

Classification, packaging and labelling according to EC regulation 1272/2008.

15.2 Danger symbols and indications

Not Applicable.

15.2.1 H Phrases

Classification according to (CE) regulation n°1272/2008

H261: Contact with water releases flammable gases.

15.2.2 P Phrases

Classification according to (CE) regulation n°1272/2008

When not in use:

P232: Protect from moisture.

During use:

P260: Do not inhale the dust/smoke/fumes/gas/mists/vapours/aerosols.

P280: Wear protective gloves/clothing.

P223: Avoid all contact with water due to the risk of a violent reaction and spontaneous ignition.

P273: Avoid release to the environment.

16. Other information

16.1 Recommended use and restrictions

See the notice on use of the product.

16.2 Additional information

16.2.1 List of risk phrases used

R15: Contact with water releases extremely flammable gases.

R11: Highly flammable.

H261: Contact with water releases flammable gases.

16.2.2 List of the safety advice phrases used

P232: Protect from moisture.

P260: Do not inhale the dust/smoke/fumes/gas/mists/vapours/aerosols.

P280: Wear suitable protective clothing, gloves and eye/face protection.

P223: Avoid all contact with water due to the risk of a violent reaction and spontaneous ignition.

P273: Avoid release to the environment.

16.2.3 List of abbreviations used in this sheet

GHS: Globally Harmonised System

CAS: Chemical Abstracts Service

AEV: Average Exposure Value over 8 hours

ELV: Exposure Limit Value over 15 minutes = Short term limit value (STLV).

CIPE: Classified installations for the protection of the environment.

ADR= Agreement on Dangerous Goods by Road.

RID = Regulations concerning the Intl Transport of Dangerous Goods by Rail.

IMDG=International Maritime Dangerous Goods.

ICAO=International Civil Aviation Organisation.

During use:

Very strong exothermic reaction upon ignition of the starter.

Stand well back during this reaction! Risk of burns.

16.3 Other limit values for professional exposure

Each country has its own limit values for professional exposure; a non-exhaustive summary of ELVs and AEVs applicable outside French territory is offered. For countries not included, seek advice from the occupational health services or the Ministry of Labour of the countries concerned.

| Iron oxide/Iron vapours, CAS = 1309-37-1 / 1345-25-1 | | | | |
|--|-----------|--------------------------|-----------|--------------------------|
| Country | AEV (ppm) | AEV (mg/m ³) | ELV (ppm) | ELV (mg/m ³) |
| Austria | | 5 (alveolar) | | 10 (alveolar) |
| Belgium | 2 | 5 | | |
| Canada - Quebec | | 5 | | |
| Denmark | | 3.5 | | 7 |
| Hungary | | 6 (alveolar) | | |
| Poland | | 5 | | 10 |
| Spain | | 5 | | |
| Sweden | | 3.5 | | |
| Switzerland | | 3 (alveolar) | | |
| USA - NIOSH | | 5 (total) | | |
| USA - OSHA | | 10 | | |
| England | | 5 | | 10 |

| Aluminium (welding vapour) | | |
|----------------------------|--------------------------|--------------------------|
| Country | AEV (mg/m ³) | ELV (mg/m ³) |
| Belgium | 5 | |
| Canada - Quebec | 5 | |
| Denmark | 5 | 10 |
| France | 5 | |

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1. Identification of the substance/mixture and of the company/business

1.1 Identification of the product

Product name: Mix of particles for welding

Hazardous component: Aluminium

1.2 Use

Industrial

Mix of particles used only for the aluminothermic reaction, with suitable Railtech refractory parts for welding on track.

1.3 Information regarding the supplier of the safety data sheet



RAILTECH INTERNATIONAL
ZI du Bas Pré
59590 RAISMES

Tel: +33 (0)3 27 22 26 26
Fax: +33 (0)3 27 22 26 00

Contact details: fvanpeperstraete@railtech.fr

1.4 Emergency telephone number

Emergency telephone: +33 (0)1 45 42 59 59 (ORFILA)

2. Identification of dangers

2.1 Main dangers

Classification according to (CE) regulation n°1272/2008

H261: Contact with water releases flammable gases.

2.2 Harmful effects on health

Inhalation: May cause irritation to the respiratory system when pouring the portion in the crucible.

Skin: Prolonged contact with the skin may cause irritation.

Eyes: Irritation to the eyes (when pouring the portion in the crucible).

2.3 Means of exposure

Inhalation: yes

Skin: yes

Eyes: yes

Ingestion: none, except accidental

2.4 Fire or explosion

The "welding portion" product is classified as **not easily flammable**.

Following the regulatory tests (C.E.E-A.10) carried out on the "welding portion" product, the product is classified as not easily flammable. The CIPE regulations (environmental code: book 5, title 1) for easily flammable products do not therefore apply.

In normal usage conditions, the product is **not explosive**.

Avoid contact with any strong source of heat or ignition with a **temperature > 1200°C**.

2.5 Other dangers

Reaction with water, oxidizing agents releasing **hydrogen** (H₂).

During its use:

Very strong exothermic reaction (+2000°C). Risk of molten metal projection.

- Stand well back during the reaction ! Risk of burns.

3. Composition/information about ingredients

| Ingredients | CAS N° | EINECS N° | % weight | Dangers |
|---|------------------------|-----------|----------|---------------------------------------|
| IRON OXIDE (Fe ₃ O ₄) | 1317-61-9215- 277-5 | 50 to 70 | | |
| ALUMINIUM | 7429-90-5 | 231-072-3 | 10 to 30 | Highly flammable Solid F; R11, R15 |
| ½ SIZE SHOT (97% 7439-89-6 iron) | | | 5 to 20 | |
| CAST IRON (96% 7439-89-6 iron) | | | 1 to 5 | |
| FERROMANGANESE CARBIDE | 12604-53-4 | | 0.5 to 3 | |
| SILICON CARBIDE (SiC) | 409-21-2 | 206-991-8 | 0.5 to 3 | |

4. First aid

Initial treatment in the event of mechanical deterioration or damage during use

| | |
|--------------------|---|
| Inhalation: | No special first aid measures. Move out of the contaminated area and consult a specialist. |
| Skin contact : | Rinse with water. |
| Contact with eyes: | In the event of contact with the eyes, rinse immediately with plenty of water and consult a specialist, if discomfort or irritation develops. |
| Ingestion: | Not affected. |

5. Fire safety measures

5.1 Flammability rating

Not Highly flammable.

5.2 Extinguishing media

In the event of a fire, only **use dry sand** to extinguish the fire.

Counterindications: **Do not use water.**



5.3 Particular risks

Avoid all contact with sources of ignition or heat > 1200°C.

May degrade at high temperatures, releasing hydrogen.

6. Measures to be taken in the event of accidental dispersion

6.1 Precautions for the environment

Avoid release to the environment.

Prevent entry into sewers, ground and drinking water (risk of release of hydrogen on contact with water).

6.2 Cleaning solutions

Gather the spilled substance and avoid creating dust.

Keep the product dry in suitable containers closed with a watertight lid.

If the product is wet do not use it; throw the product away.

7. Handling and storage

7.1 Handling

Do not create dust when handling.

Avoid damage to the packaging.

7.2 Storage

Keep in the packaging in which it was delivered, away from moisture, sparks, naked flames and all sources of heat or ignition.

When conducting tasks that generate flames, sparks or hot points, the "Fire Permit" procedure must be followed.

Smoking is prohibited in the store room (or area) - this ban must be displayed.

Packaging type: Plastic.
Keep out of rain and moisture.

8. Exposure controls/personal protection

8.1 Control parameters

According to French legislation, set by the Ministry of Labour 17/05/11:

| Parameters | CAS N° | AEV (ppm) | AEV (mg/m ³) | ELV (ppm) | ELV (mg.m ⁻³) |
|--|-----------|-----------|--------------------------|-----------|---------------------------|
| Manganese fumes | - | - | 1 | - | - |
| Iron (vapours) | 1309-37-1 | - | 5 | - | - |
| Aluminium (welding vapours) | 7429-90-5 | - | 5 | - | - |
| Dust particles with no particular effect | - | - | 10 | - | - |

Refer to paragraph 16.3 for the control values applicable in countries other than France.

8.2 Personal protection equipment

Respiratory protection:

Use an FFP3-type mask when welding.



Hand protection:

Use protective and heat-resistant gloves when welding.



Eye protection:

Wear protective goggles when welding.



Protection of the skin and body:

Wear protective clothing (100% cotton) and safety shoes.



8.2 Hygiene measures

Wash hands after using the product.

When using, do not eat, drink or smoke.

9. Physical and chemical properties

Physical state: powder and granules.

Colour: grey and black.

Odour: none.

pH: 10.7.

Water solubility: insoluble.

Characteristic temperatures:

Freezing point (°C): Not Applicable.

Decomposition temperature (°C): Not Applicable

Flammability characteristics:

Flash point (°C): Not Applicable.

Self-ignition temperature (°C): > 1200°C.

Explosivity characteristics:

Only concerns Aluminium pellets (risk of release of hydrogen on contact with water).

Minimum explosive concentration: >40g/m³

Minimum ignition energy: > 15mj

10. Stability and reactivity

10.1 Stability

Stable in normal conditions. If not exposed to moisture.

10.2 Conditions to be avoided

Extremely high or extremely low temperatures (>1200°C and < -5°C).

10.3 Materials to be avoided

Contact with acids.

10.5 Dangerous reaction

Release of hydrogen with water.

Exothermic reaction during welding.

May agglomerate on contact with moisture.

10.6 Dangerous decomposition product

Risk of generating vapours containing iron, manganese and aluminium trioxide during welding.

11. Toxicology information

11.1 Toxicology information

To date, no harmful effects have been identified in the normal conditions of use and when the usual industrial hygiene measures are taken..

12. Environmental information

12.1 Information regarding toxic effects on the environment

Not assumed to be toxic. In order to avoid any possible effects on the environment, observe the disposal and recycling regulations in force.

12.2 Biodegradability

Is not biodegradable.

12.3 Bioaccumulation potential

Undetermined.

13. Considerations regarding disposal

13.1 Waste disposal

Destroy in compliance with the local/national safety regulations in force.

13.2 Treatment of soiled packaging

After sorting, recycle as appropriate.

Mixed packaging (card, plastic...) must be disposed of and recycled separately, in compliance with decree n° 93-609 of 13 July 1994 and decree n° 92-377 of 1st April 1992 and 2002-540 of 18 April 2002 or with the national regulations in which the products are used.

| Waste coding | Label | Section |
|--------------|-----------------|----------------------|
| 10.03.99 | Welding portion | Specialised |
| 10.02.02 | Slag tray | Recycling / Recovery |
| 15.01.02 | Dirty plastic | Controlled waste |
| 12.01.01 | Metal | Recycling / Recovery |
| 15.01.01 | Cardboard | Recycling / Recovery |

14. Information regarding transport

ADR/RID

Not Applicable

The welding portions are not classified as hazardous products and are not subject to special transportation regulations pertaining to hazardous goods.

15. Regulatory information

As the product is non-hazardous and not easily flammable, the regulation for Classified Installations for the Protection of the Environment (section 1450) does not apply.

15.1 CE Labelling

Classification, packaging and labelling according to EC regulation 1272/2008.

15.2 Danger symbols and indications

Not Applicable.

15.2.1 H Phrases

Classification according to (CE) regulation n°1272/2008

H261: Contact with water releases flammable gases.

15.2.2 P Phrases

Classification according to (CE) regulation n°1272/2008

Welding portion alone:

P232: Protect from moisture.

When welding:

P260: Do not inhale the dust/smoke/fumes/gas/mists/vapours/aerosols.

P262: Avoid contact with eyes, skin or clothing.

P280: Wear suitable protective clothing, gloves and eye/face protection.

P223: Avoid all contact with water due to the risk of a violent reaction and spontaneous ignition.

P273: Avoid release to the environment.

16. Other information

16.1 Recommended use and restrictions

See the instructions when using the product.

16.2 Additional information

16.2.1 List of risk phrases used

R15: Contact with water releases extremely flammable gases.

R11: Highly flammable.

H261: Contact with water releases flammable gases.

16.2.2 List of the safety advice phrases used

P232: Protect from moisture.

P260: Do not inhale the dust/smoke/fumes/gas/mists/vapours/aerosols.

P262: Avoid contact with eyes, skin or clothing.

P280: Wear suitable protective clothing, gloves and eye/face protection.

P223: Avoid all contact with water due to the risk of a violent reaction and spontaneous ignition.

P273: Avoid release to the environment.

16.2.3 List of abbreviations used in this sheet

GHS: Globally Harmonised System

CAS: Chemical Abstracts Service

AEV: Average Exposure Value over 8 hours

ELV: Exposure Limit Value over 15 minutes = Short term limit value (STLV).

CIPE: Classified installations for the protection of the environment.

ADR= Agreement on Dangerous Goods by Road.

RID = Regulations concerning the Intl Transport of Dangerous Goods by Rail.

During use:

Very significant exothermic reaction (+2000°C) when portion is ignited.

Stand well back during this reaction! Risk of burn.

16.3 Other limit values for professional exposure

Each country has its own limit values for professional exposure; a non-exhaustive summary of ELVs and AEVs applicable outside French territory is offered. For countries not included, seek advice from the occupational health services or the Ministry of Labour of the countries concerned.

| Breathable manganese (CAS = 7439-96-5) fumes / dust | | |
|--|--------------------------|--------------------------|
| Country | AEV (mg/m ³) | ELV (mg/m ³) |
| Canada - Quebec | 1 | 3 |
| Denmark | 0.1 | 0.2 |
| France | 1 | |
| Germany (DFG) | 0.02 | 0.16 |
| Sweden | 0.2 | |
| USA - NIOSH | 1 | 3 |
| USA – OSHA | | 5 |
| England | 0.5 | |

| Iron oxide/Iron vapours, CAS = 1309-37-1 / 1345-25-1 | | | | |
|---|-----------|--------------------------|-----------|--------------------------|
| Country | AEV (ppm) | AEV (mg/m ³) | ELV (ppm) | ELV (mg/m ³) |
| Austria | | 5 (alveolar) | | 10 (alveolar) |
| Belgium | 2 | 5 | | |
| Canada - Quebec | | 5 | | |
| Denmark | | 3.5 | | 7 |
| Hungary | | 6 (alveolar) | | |
| Poland | | 5 | | 10 |
| Spain | | 5 | | |
| Sweden | | 3.5 | | |
| Switzerland | | 3 (alveolar) | | |
| USA - NIOSH | | 5 (total) | | |
| USA – OSHA | | 10 | | |

| | | | | |
|---------|--|---|--|----|
| England | | 5 | | 10 |
|---------|--|---|--|----|

| Aluminium (welding vapour) | | |
|--|--------------------------|--------------------------|
| Country | AEV (mg/m ³) | ELV (mg/m ³) |
| Belgium | 5 | |
| Canada - Quebec | 5 | |
| Denmark | 5 | 10 |
| France | 5 | |
| Inhalable dust (total, without any specific effects) | | |
| Country | AEV (mg/m ³) | ELV (mg/m ³) |
| Austria | 10 | 20 |
| Belgium | 10 | |
| Denmark | 10 | 20 |
| France | 10 | |
| Germany (AGS) | 10 | 20 |
| Germany (DFG) | 4 | |
| Hungary | 10 | |
| Spain | 10 | |
| Sweden | 10 | |
| Switzerland | 10 | |
| USA – OSHA | 15 | |

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MATERIAL SAFETY DATA SHEET

INTRODUCTION.

This Material Safety Data Sheet contains information relevant to all types of resinoid abrasive products. Reference must be made to the relevant product code when carrying out assessments.

SECTION 1 PRODUCT IDENTIFICATION AND MANUFACTURE

MANUFACTURER'S / SUPPLIERS NAME.

NAME AND ADDRESS

Saint-Gobain Abrasives Limited
Doxey Road
Stafford ST16 1EA

TEL NO. (01785) 222000
FACSIMILE (01785) 213487

CHEMICAL NAME AND SYNONYMS

Resinoid Abrasive Products.
Signified by the letter 'B' in the product mark.
A typical mark is 12A 148 R9B ACAA

TRADE NAMES AND SYNONYMS

Brand – Flexovit, Norton and Baystate
Resinoid Grinding Wheels, Cutting-Off and Reinforced
Cutting-off Wheels, Depressed Centre Wheels, Unituf,
Unilastic and Unilec Wheels, Cups, Saucers, Dishes, Rings,
Cones, Plugs, Cylinders, Discs, Segments, Sticks, Blocks
Hones, Mounted Points and Mounted Wheels.

SECTION 2 COMPOSITION / INFORMATION ON INGREDIENTS

Products may contain one or a combination of the following:

CHEMICAL NAME

Silicon Carbide
Aluminium Oxide
Zirconium Aluminium Oxide
Cured resins; Phenolic and others.

| CONSTITUENT | CAS. No. | RANGE BY % MASS | EH40 DESIGNATION mg m ⁻³ 8hr TWA | | EH40 STANDARD |
|-----------------|-----------|-----------------------|--|------------|------------------|
| | | | Total Inhalable | Respirable | |
| Cured Resin | N/A | 1-35 | 10 | 4 | OES |
| Silicon Carbide | 409-21-2 | 30 -50 | 10 | 4 | OES |
| Aluminium Oxide | 1344-28-1 | 10-95 | 10 | 4 | OES |
| Zirconium Oxide | 1314-23-4 | 4-40 | - | 5 | OES |
| Iron Pyrites | 1309-36-0 | 1-35 | - | 5 | OES |
| Copper Powder | 7440-50-8 | 30-90 | - | 1* | OES |

*The use of copper wheels involves immersion in liquid, so will not liberate particulate into the atmosphere.

Some products may contains glass fibre reinforcement.

IMPREGNATES

Some resinoid products may contain wax as an impregnate within the structure.

| | | | | | |
|----------------|-----------|------|------------|---|-----|
| Wax (Paraffin) | 8002-74-2 | 1-20 | 2(as fume) | - | OES |
|----------------|-----------|------|------------|---|-----|

BUSHING MATERIAL

As well as plain bore grinding wheels, bushed products are available and may contain one or more of the following materials.

| | | | | | |
|---|---|--|----|---|-----|
| Polystyrene Plastic | 713-020-005 | 0-5 | - | - | - |
| Mastic bore lining consisting of: Calcium Carbonate | 1317-65-3 | | 10 | 4 | OES |
| Talc (Magnesium Silicate) | 14807-96-6 | | 10 | 4 | OES |
| Adhesive | 67-64-1 | | 10 | 4 | OES |
| Lithopone | 1309-37-1 | | 10 | 4 | OES |
| Graphite | 7440-44-0 | | 10 | 5 | OES |
| Glass Fibres | 14808-60-7 1344-28-1 13463-67-7 1309-48-4 1303-86-2 1313-50-3 1305-78-8 12136-47-7 | 53 – 60 11 – 15.5 0 – 3 10 – 12.5 0 – 9 <1 10 – 12.5 <1 | 10 | 4 | OES |

These materials are not in the grinding zone and consequently do not present a hazard in normal use.

SECTION 3 SUBSTANCE HAZARD IDENTIFICATION

Resinoid grinding wheels are not considered a hazardous product under CHIP regulations. In normal use users are advised to maintain particulate exposure below the Occupational Exposure Limit for nuisance dusts as defined in the latest EH40 publication.

Some hazards associated with the use of impregnated wheels are:-

Wax impregnation; heat build up may produce low level wax fumes.

SECTION 4 FIRST AID MEASURES

Nuisance dust will be generated when dry grinding therefore LEV control should be applied if levels need controlling below the OES for nuisance dusts.

| | |
|---------------------|--|
| INHALATION | If a major exposure occurs, exposed personnel should be removed to fresh air until the level of air borne particulate subsides. Medical attention should be sought if breathing difficulties are experienced. |
| SKIN CONTACT | Wash exposed skin with water. Mechanical abrasion may occur on exposed skin increasing the potential of bacteria or other substance attack, e.g. from coolant oils. If irritation occurs seek medical attention. |
| EYE CONTACT | Due to the abrasive nature of particulate, irritation may occur. Eyes should be flushed copiously and medical attention sought if symptoms persist. |

| SECTION 5 | FIRE FIGHTING MEASURES |
|------------------|-------------------------------|
|------------------|-------------------------------|

Abrasive grain is none combustible. Cured Organic Bonded grinding wheels will burn in a fire generating toxic fumes. Impregnated wheels may evolve normal combustion products and or Sulphur dioxide.

| SECTION 6 | ACCIDENTAL RELEASE MEASURES |
|----------------------------------|---|
| PERSONAL PROTECTION | If conditions are dusty a dust mask should be worn. If there is a potential for eye contact eye protection is recommended. |
| ENVIRONMENTAL PRECAUTIONS | Waste particulate must be bagged and sealed then disposed of as general waste. |
| METHODS FOR CLEARING UP | Once cured resinoid bonded products are inert. Spillage's should be cleaned up by wet sweeping or vacuum. |

| SECTION 7 | HANDLING AND STORAGE |
|---|--|
| HANDLING PRECAUTIONS | Use of the grinding wheels must be in compliance with the 'Safety in the Use of Abrasive Wheels' HS(G) 17 available from HSE books. Also refer to F.E.P.A Safety Code for the Use, Care and Protection of Abrasive Wheels. The user should ensure correct product selection according to operating conditions. |
| STORAGE INCLUDING ANY SPECIAL REQUIREMENTS | Resinoid wheels should be protected from acid oil and frost and excessive temperature variation in storage. Machine coolant (if used) will cause the wheel to be out of balance if allowed to gather in one half of the wheel. Coolant should be drained or spun off before storage. Reference to the above documents will identify the relevant storage requirements for a given product type. Providing the product is stored cool and dry, away from direct sunlight The shelf life of an Organic Bonded grinding wheel is 3 years. |

| SECTION 8 | EXPOSURE CONTROL/PERSONAL PROTECTION |
|--|--|
| ENGINEERING CONTROLS /VENTILATION | LEV must be provided if the OES standard as stated in the latest edition of EH40 for nuisance particulate is exceeded. |
| RESPIRATORY PROTECTION | Dust masks may be worn for low level short term exposure only. |
| EYE PROTECTION | Impact resistant eye protection must be worn when using grinding wheels. |
| HAND/SKIN PROTECTION | If regular exposure to abrasive particulate occurs gloves and overalls are recommended. |

| SECTION 9 | PHYSICAL AND CHEMICAL PROPERTIES |
|--------------------------------|---|
| BOILING POINT °C | - |
| FLASH POINT °C | - |
| SOLUBILITY IN WATER | Not miscible |
| VAPOUR PRESSURE | N/A |
| IGNITION TEMPERATURE °C | - |

| SECTION 10 STABILITY AND REACTIVITY PROPERTIES | |
|--|---|
| STABILITY | Very stable |
| CONDITIONS TO AVOID | Sudden excessive pressure. Side loading on cutting off wheels. Jamming wheels into the work piece. Cutting off wheels should always be reinforced on portable machines. Modifications of the product. Consult your Saint-Gobain Abrasives technical representative for advice. |
| COMBUSTION PRODUCTS | Wheels may evolve toxic gases in a fire |

| SECTION 11 TOXICOLOGICAL INFORMATION | |
|--------------------------------------|------------|
| ACUTE TOXICITY:- | None known |

| SECTION 12 ECOLOGICAL INFORMATION | |
|-----------------------------------|---|
| DEGRADABILITY | Will degrade in time. If any doubt occurs the product should be re-tested before use. |
| ACUTE FISH TOXICITY | None known |
| WATER HAZARD CLASSIFICATION | N/A |

| SECTION 13 DISPOSAL CONSIDERATIONS | |
|------------------------------------|---------------|
| DISPOSAL METHODS | General waste |

| SECTION 14 TRANSPORT INFORMATION | |
|---|--|
| Special transportation precautions do not apply. However care should be taken to avoid mechanical damage during transportation. | |

| SECTION 15 REGULATORY INFORMATION | |
|-----------------------------------|--|
| PRODUCT LABEL DETAILS - PER CHIP | |

| | |
|----------------------------|-------------------------------------|
| PRODUCT TRADE NAME | Resinoid (bonded) Abrasive Products |
| HAZARD SYMBOL | Not classified as hazardous |
| RISK PHRASE No's & WORDS | N/A |
| SAFETY PHRASE No's & WORDS | N/A |

Specific regulations governing the use of abrasive products has been extensively revoked. For guidance as to the general requirements reference should be made to the requirements under the European (6 pack) regulations and any revisions.

| SECTION 16 OTHER INFORMATION | |
|---------------------------------|--|
| TRAINING ADVISE | In accordance with the requirements of the provision and use of work equipment regulations 1992, users of grinding wheels must be trained in the appropriate wheel mounting course, be certified and deemed competent to use and mount grinding wheels. |
| RECOMMENDED USES & RESTRICTIONS | <p>Use of the grinding wheels must be in compliance with the 'Safety in the Use of Abrasive Wheels HS(G) 17 available from HSE books.</p> <p>Also refer to F.E.P.A Safety Code for the Use, Care and Protection of Abrasive Wheels.</p> <p>The user should ensure correct product selection according to operating conditions.</p> |