



SAFETY DATA SHEET

Z SERIES SQUIB

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| Document Number | EH15006R004 |
| Issue | 2.0 |
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ACCORDING TO EC-REGULATIONS 1907/2006 (REACH), 1272/2008 (CLP) & 2015/830

1. SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1 Product identifier

Product Name Electric Squib: Z16, Z16A, Z17, Z17A.
CAS No. Article.
EC No. Article.
REACH Registration No. None assigned.

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified Use(s) Electric Squib.
Uses Advised Against Not known.

1.3 Details of the supplier of the safety data sheet

Company Identification Event Horizon Pyrotechnics Ltd
Address of Manufacturer The Old Brewery
Stagman Lane
Ashcott
Somerset
Postal code TA7 9QW
Telephone +44(0)1458 210280
Fax None.
E-mail info@precisionenergetics.co.uk

1.4 Emergency telephone number

Emergency Phone No. +44(0)1458 210280
Contact Event Horizon Pyrotechnics Ltd
National response center
Address National Poisons Information Service (Birmingham Centre)
City Hospital
Dudley Road,
Birmingham,
United Kingdom
Emergency Phone No. +00 448 706 006 266 NHS Direct - 0845 4647 or 111

2. SECTION 2: HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

Regulation (EC) No. 1272/2008 (CLP) Expl. 1.4 :Fire or projection hazard.

2.2 Label elements

Product Name According to Regulation (EC) No. 1272/2008 (CLP)
Electric Squib: Z16, Z16A, Z17, Z17A.

Hazard Pictogram(s)



Signal Word(s) GHS01
Warning
Hazard Statement(s) H204: Fire or projection hazard.
Precautionary Statement(s) P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P240: Ground and bond container and receiving equipment.
P250: Do not subject to grinding/shock/friction.
P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection.
P370+P380+P375: In case of fire: Evacuate area. Fight fire remotely due to the risk of explosion.
P501: Dispose of contents in accordance with local, state or national legislation.

Additional Information

Explosive Product Notice
PREVENTION OF ACCIDENTS IN THE USE OF EXPLOSIVES - The prevention of accidents in the use of explosives is a result of careful planning and observance of the best known practices. The explosives user must remember that he is dealing with a powerful force and that various devices and methods have been developed to assist him in directing this force. He should realize that this force, if misdirected, may either kill or injure both him and his fellow workers.

2.3 Other hazards

Product presents a hazard to health only when detonated or contents are released from encapsulated device. Harmful if swallowed. May cause irritation to the mucous membranes and upper respiratory tract.

2.4 Additional Information

WARNING - Use following consideration of the User Instructions. All explosives are



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dangerous and must be carefully handled and used following approved safety procedures either by or under the direction of competent, experienced persons in accordance with all applicable federal, state, and local laws, regulations, or ordinances. If you have any questions or doubts as to how to use any explosive product, DO NOT USE IT before consulting with your supervisor, or the manufacturer, if you do not have a supervisor. If your supervisor has any questions or doubts, he should consult the manufacturer before use.

3. SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

Product as supplied: Article.

Bead of dark grey powder deposited onto a plastic resin base and sealed in a clear lacquer membrane. The bead encloses a resistance wire in contact with insulated connecting wires.

3.1 Substances

Not applicable.

3.2 Mixtures

| HAZARDOUS INGREDIENT(S) | CAS No. | EC No. / REACH Registration No. | %W/W | Hazard Statement(s) | Hazard Pictogram(s) |
|-------------------------------|-----------|------------------------------------|---------|---|---------------------|
| Potassium perchlorate | 7778-74-7 | 231-912-9 01-2120021000-89-XXXX | 72 - 78 | Ox. Sol. 1 H271 Acute Tox. 4 H302 | GHS03 GHS07 |
| Zirconium powder (pyrophoric) | 7440-67-7 | 231-176-9 01-2119490102-49-XXXX | 22 - 28 | Pyr. Sol. 1 H250 Water-react. 1 H260 | GHS02 |

4. SECTION 4: FIRST AID MEASURES

4.1 Description of first aid measures

Inhalation If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing.

Skin Contact Wash hands and exposed skin after use.

Eye Contact Flush eyes with water for at least 15 minutes. Consult a physician.

Ingestion Unlikely route of exposure.

4.2 Most important symptoms and effects, both acute and delayed

Product presents a hazard to health only when detonated or contents are released from encapsulated device. May cause irritation to the mucous membranes and upper respiratory tract. Contact may cause irritation and redness. Exposed individuals may experience eye tearing, redness and discomfort. Prolonged absorption can cause anemia and kidney injury from potassium perchlorate.

4.3 Indication of any immediate medical attention and special treatment needed

Unlikely to be required but if necessary treat symptomatically.

5. SECTION 5: FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable Extinguishing media Dry powder.

Unsuitable extinguishing media Water.

5.2 Special hazards arising from the substance or mixture

Fire or projection hazard.
Squib loads will explode and produce a large volume of hot, high velocity sparks, rapidly carrying fire to other squibs. Sensitive to friction, shock, heat, and electric current/electrostatic discharge. A single squib may throw incandescent sparks 10-15 feet, easily igniting other squibs. Radar and radio transmitters may set off non-shunted devices. Decomposes in a fire giving off toxic fumes: ZrO₂, KCl, and KOH in smoke when squibs burn, Hydrogen chloride.

5.3 Advice for firefighters

Evacuate area. DO NOT fight fire when fire reaches explosives. Fight fire remotely with normal precautions due to the risk of explosion. Fire fighters should wear complete protective clothing including self-contained breathing apparatus. Article is sensitive to Mechanical Impact and Friction.

6. SECTION 6: ACCIDENTAL RELEASE MEASURES

It is unlikely to present spillage or leakage hazard. Anticipated release would only be from a damaged device.

6.1 Personal precautions, protective equipment and emergency procedures

Use non-sparking tools. Wear protective gloves/protective clothing/eye protection/face protection/hearing protection.

6.2 Environmental precautions

Do not allow to enter drains, sewers or watercourses.

6.3 Methods and material for containment and cleaning up

Keep spilled material wet.

Large spillages: Consult the supplier for safe disposal of spillage waste and for decontamination of spillage area.

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6.4 Reference to other sections

See Also Section 8, 13

7. SECTION 7: HANDLING AND STORAGE

7.1 Precautions for safe handling

Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Do not subject to grinding/shock/friction. Store in accordance with local regulations. Ground and bond equipment and your person. Wear protective gloves/protective clothing/eye protection/face protection/hearing protection. Do not cut or alter device.

7.2 Conditions for safe storage, including any incompatibilities

In accordance with local regulations. Do not store improperly with other explosives (severe physical injury or death may occur from detonation).

Storage temperature
Storage life
Incompatible materials

Ambient.
Stable under normal conditions.
Palladium(II) Oxide, Molybdates, Tungstates, Alkali metal hydroxides, Alkali metal chromates, Organic materials, Powdered metals, Strong reducing agent.

7.3 Specific end use(s)

Electric Squib.

8. SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

8.1.1 Occupational Exposure Limits

| SUBSTANCE. | CAS No. | LTEL (8 hr TWA ppm) | LTEL (8 hr TWA mg/m ³) | STEL (ppm) | STEL (mg/m ³) | Note |
|-----------------------------|-----------|---------------------|------------------------------------|------------|---------------------------|------|
| Zirconium compounds (as Zr) | 7440-67-7 | | 5 | | 10 | |

United Kingdom UK Workplace Exposure Limits EH40/2005 (Fourth edition, published 2020)

8.2 Exposure controls

8.2.1. Appropriate engineering controls Use non-sparking ventilation systems, approved explosion-proof equipment, and intrinsically safe electrical systems. Ensure adequate ventilation. Handle in accordance with good industrial hygiene and safety practice.

8.2.2. Personal protection equipment



Eye Protection

Wear protective eyewear (goggles, face shield, or safety glasses).



Skin protection

Wear fire resistant or flame retardant clothing.



Respiratory protection

No personal respiratory protective equipment normally required.
Damaged device: A suitable dust mask or dust respirator with filter type P (EN143 or EN405) may be appropriate.



Thermal hazards

Not applicable.

8.2.3. Environmental Exposure Controls Do not allow to enter drains, sewers or watercourses.

9. SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Appearance

Article.
Bead of dark grey powder deposited onto a plastic resin base and sealed in a clear lacquer membrane. The bead encloses a resistance wire in contact with insulated connecting wires.

Odour

Colour : Grey/black (Powder.)

Odour threshold

Odourless.

pH

Not established.

Melting point/freezing point

Not applicable.

Initial boiling point and boiling range

77-82°C (170-180°F), Ignites.

Not applicable.



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| Flash Point | Not applicable. |
| Evaporation rate | Not applicable. |
| Flammability (solid, gas) | Not applicable. |
| Upper/lower flammability or explosive limits | Explosive Limit Ranges: 0.16 g/L (Zirconium powder). |
| Vapour pressure | Not applicable. |
| Vapour density | Not applicable. |
| Density (g/ml) | Not available. |
| Relative density | 5.7 (Water = 1) |
| Solubility(ies) | Solubility (Water) : Soluble (Potassium perchlorate). Solubility (Other) : Not known. |
| Partition coefficient: n-octanol/water | Not available. |
| Auto-ignition temperature | Not available. |
| Decomposition Temperature (°C) | Not available. |
| Viscosity | Not applicable. |
| Explosive properties | Fire or projection hazard. |
| Oxidising properties | Oxidising (Potassium perchlorate). |
| 9.2 Other information | None. |

10. SECTION 10: STABILITY AND REACTIVITY

10.1 Reactivity

Stable under normal conditions.

10.2 Chemical Stability

Stable under normal conditions.

10.3 Possibility of hazardous reactions

No hazardous reactions known if used for its intended purpose.

10.4 Conditions to avoid

Avoid friction, sparks, or other means of ignition.

10.5 Incompatible materials

Palladium(II) Oxide, Molybdates, Tungstates, Alkali metal hydroxides, Alkali metal chromates, Organic materials, Powdered metals, Strong reducing agent.

10.6 Hazardous decomposition products

No hazardous decomposition products known.

11. SECTION 11: TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

| | |
|--------------------------------|--|
| Acute toxicity | Product presents a hazard to health only when detonated or contents are released from encapsulated device. Harmful if swallowed. |
| Skin corrosion/irritation | Non-irritant. |
| Serious eye damage/irritation | Non-irritant. |
| Skin sensitization data | It is not a skin sensitiser. |
| Respiratory sensitization data | Not classified. |
| Germ cell mutagenicity | There is no evidence of mutagenic potential. |
| Carcinogenicity | No evidence of carcinogenicity. |
| Reproductive toxicity | Not classified. |
| Lactation | Not classified. |
| STOT - single exposure | None anticipated. |
| STOT - repeated exposure | None anticipated. |
| Aspiration hazard | None anticipated. |

11.2 Other information

Product presents a hazard to health only when detonated or contents are released from encapsulated device. May cause irritation to the mucous membranes and upper respiratory tract.

12. SECTION 12: ECOLOGICAL INFORMATION

12.1 Toxicity

| | |
|------------------------------------|--------------------------------|
| Toxicity - Aquatic invertebrates | Low toxicity to invertebrates. |
| Toxicity - Fish | Low toxicity to fish. |
| Toxicity - Algae | Low toxicity to algae. |
| Toxicity - Sediment Compartment | Not classified. |
| Toxicity - Terrestrial Compartment | Not classified. |

12.2 Persistence and Degradation

Not applicable.

12.3 Bioaccumulative potential

Not applicable.

12.4 Mobility in soil

Article: Insoluble in water.

12.5 Results of PBT and vPvB assessment

Not classified as PBT or vPvB.



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12.6 Other adverse effects

None.

13. SECTION 13: DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Dispose of this material and its container to an approved waste disposal plant.

13.2 Additional Information

Disposal should be in accordance with local, state or national legislation.

14. SECTION 14: TRANSPORT INFORMATION

14.1 UN number

UN No. 0432

14.2 UN proper shipping name

UN proper shipping name ARTICLES, PYROTECHNIC, FOR TECHNICAL PURPOSES

14.3 Transport hazard class(es)

ADR/RID

ADR/RID Class 1
ADR Classification Code 1.4S
Excepted Quantities E0
Mixed Packing Instructions for Packages P135
Mixed Packing Instructions for Packages MP23 MP24
ADR Transport Category 4
Tunnel Restriction Code E
Special Provisions for Carriage - Loading, Unloading and Handling CV1 CV2 CV3

Special Provisions for Carriage - Operation S1

IMDG

IMDG Class 1.4S
Excepted Quantities E0
Mixed Packing Instructions for Packages P135
IMDG EMS F-B, S-X
Stowage and Handling Category 01 SW1

ICAO/IATA

IATA Proper Shipping Name ARTICLES, PYROTECHNIC, FOR TECHNICAL PURPOSES
Excepted Quantities E0

Passenger and Cargo Aircraft Limited Quantities Packing Instructions Forbidden for transport by air.

Passenger and Cargo Aircraft Limited Quantities Max net Qty Forbidden for transport by air.

Passenger and Cargo Aircraft Packing Instructions 135

Passenger and Cargo Aircraft Max net Qty 25Kg

Cargo Aircraft Packing Instructions 135
Cargo Aircraft Max net Qty 100Kg

Special Provisions A802
Emergency Response Guidebook (ERG) Code 3L

Labels

Labels 1.4

14.4 Packing group

Packing group

14.5 Environmental hazards

Environmental hazards Not classified as a Marine Pollutant.

14.6 Special precautions for user

Special precautions for user Not known.

14.7 Transport in bulk according to Annex II of Marpol and the IBC Code

No information available

15. SECTION 15: REGULATORY INFORMATION

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

European Regulations - Authorisations and/or Restrictions On Use

Candidate List of Substances of Very High Concern for Authorisation Not listed.

REACH: ANNEX XIV list of substances subject to authorisation Not listed.

REACH: Annex XVII Restrictions on the manufacture, placing on the market and use of certain dangerous substances, Zirconium powder (pyrophoric) (7440-67-7).

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mixtures and articles

Community Rolling Action Plan (CoRAP) Not listed.

Regulation (EC) N° 850/2004 of the Not listed.

European Parliament and of the Council
on persistent organic pollutants

Regulation (EC) N° 2037/2000 on Not listed.

substances that deplete the ozone layer

Regulation (EU) N° 649/2012 of the Not listed.

European Parliament and of the Council
concerning the export and import of
hazardous chemicals

National regulations

Wassergefährdungsklasse (Germany)

Potassium perchlorate (WGK 1 - low hazard to waters).

15.2 Chemical Safety Assessment

A REACH chemical safety assessment has not been carried out.

16. SECTION 16: OTHER INFORMATION

The following sections contain revisions or new statements:

14

LEGEND

Hazard Pictogram(s)



GHS01

GHS02: GHS: flame

GHS03: GHS: flame over circle

GHS07: GHS: exclamation mark

Hazard classification

Acute Tox. 4 : Acute toxicity, Category 4

Ox. Sol. 1 : Oxidising solid, Category 1

Pyr. Sol. 1 : Pyrophoric solid, Category 1

Water-react. 1 : Substance or mixture which in contact with water emits flammable gas, Category 1

Hazard Statement(s)

H204: Fire or projection hazard.

H250: Catches fire spontaneously if exposed to air.

H260: In contact with water releases flammable gases which may ignite spontaneously.

H271: May cause fire or explosion; strong oxidiser.

H302: Harmful if swallowed.

Precautionary Statement(s)

P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

P234: Keep only in original packaging.

P240: Ground and bond container and receiving equipment.

P250: Do not subject to grinding/shock/friction.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection.

P370+P380+P375: In case of fire: Evacuate area. Fight fire remotely due to the risk of explosion.

P401: Store products enclosed, in original packaging.

P501: Dispose of contents in accordance with local, state or national legislation.

Acronyms

ADN : European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways

ADR : European Agreement concerning the International Carriage of Dangerous Goods by Road

CAS : Chemical Abstracts Service

CLP : Regulation (EC) No 1272/2008 on classification, labelling and packaging of substances and mixtures

EC : European Community

EINECS : European Inventory of Existing Commercial Chemical Substances

IATA : International Air Transport Association

IBC : Intermediate Bulk Container

ICAO : International Civil Aviation Organization

IMDG : International Maritime Dangerous Goods

LTEL : Long term exposure limit

PBT : Persistent, Bioaccumulative and Toxic

REACH : Registration, Evaluation, Authorisation and Restriction of Chemicals

RID : Regulations concerning the International Carriage of Dangerous Goods by Rail



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STEL : Short term exposure limit
STOT : Specific Target Organ Toxicity
UN : United Nations
vPvB : very Persistent and very Bioaccumulative

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