SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product form : Mixture
Product name : Electronic detonator
Product code : EX01010005_EN
Synonyms : E*STAR

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

1.2.1. Relevant identified uses

Main use category : Borehole detonators for initiation of industrial explosives. Restricted to professional users.

1.2.2. Uses advised against

No additional information available

1.3. Details of the supplier of the safety data sheet

AUSTIN DETONATOR s.r.o.
Jasenice 712
75501 Vsetín - Česká republika
T : +420 571 404 001 - F : +420 571 404 002
msds@austin.cz - www.austin.cz

1.4. Emergency telephone number

Country	Organisation/Company	Address	Emergency number	Comment
Czech Republic	Toxicological Information Centre Clinic of occupational disease	Na Bojišti 1, 128 08 Prague 2	Non-stop service: +420 224 919 293 or +420 224 915 402	www.tis-cz.cz; tis@vfn.cz

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No. 1272/2008 [CLP]

Explosives, Division 1.1	H201
Reproductive toxicity, Category 1A	H360Df
Hazardous to the aquatic environment — Chronic Hazard, Category 3	H412

Full text of hazard classes and H-statements : see section 16

Adverse physicochemical, human health and environmental effects

No additional information available

2.2. Label elements

Labelling according to Regulation (EC) No. 1272/2008 [CLP]

Hazard pictograms (CLP) :

GHS01 GHS08

Signal word (CLP) : Danger
Hazardous ingredients : lead diazide, lead azide; Pentaerythritol tetranitrate, P.E.T.N.
Hazard statements (CLP) : H201 - Explosive; mass explosion hazard.
H360Df - May damage the unborn child. Suspected of damaging fertility.
H412 - Harmful to aquatic life with long lasting effects.

Precautionary statements (CLP) : P201 - Obtain special instructions before use.
P210 - Keep away from heat, open flames, sparks, hot surfaces. No smoking.
P250 - Do not subject to friction, grinding, shock.
P273 - Avoid release to the environment.

P308+P313 - IF exposed or concerned: Get medical advice/attention.
P370+P380 - In case of fire: evacuate area.
P372 - Explosion risk in case of fire.
P401 - Store in dry and well ventilated areas, in temperatures -30 °C to +40 °C.
P501 - Dispose of contents/container must be in accordance with corresponding local regulations for disposal of packages and explosives.

Extra phrases : Explosives, as referred to in section 2.1 of Regulation (EC) No. 1272/2008, placed on the market with a view to obtaining an explosive or pyrotechnic effect shall be labelled and packaged in accordance with the requirements for explosives only.

2.3. Other hazards

Other hazards not contributing to the classification : The mixture doesn't meet the criteria for classification as PBT or vPvB substances and mixtures.
Physicochemical effect: Risk of explosion, an uncontrolled explosion may cause great physical damage.
In the assembled detonator, the hazardous substances are enclosed in a metal case that cannot be disassembled. These substances can be released only by detonation in the form of post-detonation reaction products.

SECTION 3: Composition/information on ingredients

3.1. Substances

Not applicable

3.2. Mixtures

Comments : Electric assembled detonator contains also chemicals that are not classified as hazardous, and various other components, such as wires, plug and plastic components.

Name	Product identifier	%	Classification according to Regulation (EC) No. 1272/2008 [CLP]
Lead diazide, lead azide substance listed as REACH Candidate	(CAS-No.) 13424-46-9 (EC-No.) 236-542-1 (EC Index-No.) 082-003-00-7 (REACH-no) 01-2119475503-38	<= 3	Unst. Expl, H200 Acute Tox. 4 (Oral), H302 Acute Tox. 4 (Inhalation), H332 Acute Tox. 4 (Inhalation:dust,mist), H332 Repr. 1A, H360Df STOT RE 2, H373 Aquatic Acute 1, H400 Aquatic Chronic 1, H410
Zirconium powder (pyrophoric) (*)	(CAS-No.) 7440-67-7 (EC-No.) 231-176-9 (EC Index-No.) 040-001-00-3	<= 1	Water-react. 1, H260 Pyr. Sol. 1, H250
Potassium perchlorate (**)	(CAS-No.) 7778-74-7 (EC-No.) 231-912-9 (EC Index-No.) 017-008-00-5	<= 1	Ox. Sol. 1, H271 Acute Tox. 4 (Oral), H302
Aluminium	(CAS-No.) 7429-90-5 (EC-No.) 231-072-3 (EC Index-No.) 013-001-00-6	<= 0.1	Pyr. Sol. 1, H250 Water-react. 2, H261
Nitrocellulose	(CAS-No.) 9004-70-0 (EC Index-No.) 603-037-00-6	<= 0.1	Expl. 1.1, H201
Pentaerythritol tetranitrate, P.E.T.N.	(CAS-No.) 78-11-5 (EC-No.) 201-084-3 (EC Index-No.) 603-035-00-5 (REACH-no) 01-2119557827-23	<= 22	Expl. 1.1, H201

Comments : * The mixture is introduced in the market as a solid substance. The mixture is not in contact with air or water. The classification Water-react.1 H260 a Pyr. Sol. 1 H250 is not relevant for this mixture.

** The mixture is introduced in the market as a solid substance. The mixture is not in contact with air. The classification Ox. Sol. 1 H271 is not relevant for this mixture.

Full text of H-statements: see section 16

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures general : In the assembled detonator, the mixture is enclosed in a metal case that cannot be disassembled. If used in accordance with section 1.2, the exposition is not possible. The exposition can occur only in case of detonation in the form of post-detonation reaction products. Detonation may cause burns and injuries. In case of any suspicion, seek medical advice.

First-aid measures after inhalation : Interrupt the exposition, move the exposed person to the fresh air. Keep the person warm and at rest. If the symptoms of respiratory system irritation (e.g. heavy breathing) persist, look for the medical help.

First-aid measures after skin contact : In case of detonation, there is a risk of burns, general injuries and injuries caused by splinters. Seek medical advice.

First-aid measures after eye contact : In case of detonation, there is a risk of general injuries and injuries caused by splinters. Seek medical advice.

First-aid measures after ingestion : Rinse mouth, seek medical advice.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms/effects after inhalation : In case of inhalation of post-detonation reaction products, an irritation of respiratory system and a headache may occur.

Symptoms/effects after skin contact : Injuries, burns.

Symptoms/effects after eye contact : Injuries, burns.

Symptoms/effects after ingestion : Not relevant.

4.3. Indication of any immediate medical attention and special treatment needed

No special means are stated.
If any health troubles appear or in case of doubt, please inform the doctor and provide the information from this safety sheet.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Fire in the product cannot be extinguished with any fire-fighting equipment as it is explosive material.

Unsuitable extinguishing media : Not stated.

5.2. Special hazards arising from the substance or mixture

Fire hazard : If a building containing the product is on fire, a high risk of explosion is involved. Perform an urgent evacuation of the building and its surroundings. Notify the Integrated Rescue System. Don’t inhale the gasses of the fire because they contain heavy metals (lead). The combustion residues and contaminated extinguishing liquids must be disposed of according to valid regulations.

5.3. Advice for firefighters

Firefighting instructions : During the fire of the product, keep the safe distance, use suitable breathing protection (isolation device), or self-contained breathing apparatus.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures : The measures to be taken in case of accidental leakage (e.g. traffic accident) depend on the scale of the accident and an expert opinion of a specialist.

6.1.1. For non-emergency personnel

Emergency procedures : Warn away the trespassers.Remove possible sources of initiation and thermal agitation (open fire, electric sparks etc.).In case of risk of an explosion, evacuate the buildings and the surrounding area.Use appropriate means suitable for work to prevent contact with skin and eyes. Follow the direction in section 7 and 8.

6.1.2. For emergency responders

No additional information available

6.2. Environmental precautions

Do not allow the mixture to enter into sewer, water system (underground water, surface water) or soil.

6.3. Methods and material for containment and cleaning up

Methods for cleaning up : Pick up the spilled product mechanically using spark-free tools. Collect the product in approved and properly labelled containers. Disposal of damaged product may be performed only by an authorized person. Disposal of the contaminated material must be in accordance with section 13.

6.4. Reference to other sections

See Section 8 and 13 of this safety data sheet.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Handle the products with increased care. Keep away from heat, sparks, open flame and hot surfaces. Protect from electrostatic discharge. No smoking.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Store in dry and well ventilated areas in temperatures from -30 °C to +40 °C. Keep the package closed tightly. Storage room must be locked. Do not store together with drugs, foodstuffs, drinks and forage.

7.3. Specific end use(s)

Borehole detonators for initiation of industrial explosives.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Lead diazide, lead azide (13424-46-9)		
	Local name	Lead compounds as Pb (except alkyl compounds)
Czech Republic	TWA (mg/m³)	0.05 mg/m³ (P*)
Czech Republic	TLV-STEL (mg/m³)	0.2 mg/m³ (P*)
United Kingdom Australia	TWA (mg/m³)	0.15 mg/m³
New Zealand South Africa	TWA (mg/m³)	0,1 mg/m³

P*- The exposure level is determined by lead poisoning blood test.

Aluminium (7429-90-5)		
United Kingdom	Local name	Aluminium
United Kingdom	WEL TWA (mg/m³)	2 mg/m³ alkyl compounds 2 mg/m³ salts, soluble 10 mg/m³ metal, inhalable dust 4 mg/m³ metal, respirable dust

8.2. Exposure controls

Appropriate engineering controls:

Follow the usual basic precautions for handling explosives. Avoid inhaling of gases after the detonation.

Personal protective equipment:

Not necessary, if the product is used in accordance with section 1.2.
Eye/face protection: Use protective glasses if needed.
Protection of skin (whole body): Don't eat, drink and smoke during work. Use clothes suitable for work that do not accumulate the static charge (cotton).
Hands protection: Wash your hands by warm water and soap after work and treat your skin by suitable reparation means.
Respiratory protection: After detonation use the dust filter.

Thermal hazard protection:

Not stated.

Environmental exposure controls:

Not necessary, if the product is used in accordance with section 1.2.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	:	Solid
Colour	:	No data available
Odour	:	odourless.
Odour threshold	:	No data available
pH	:	No data available
Relative evaporation rate (butylacetate=1)	:	No data available
Melting point	:	142 °C (PETN)
Freezing point	:	No data available
Boiling point	:	No data available
Flash point	:	No data available
Auto-ignition temperature	:	190 °C (PETN)
Decomposition temperature	:	No data available
Flammability (solid, gas)	:	Flammable
Vapour pressure	:	No data available
Relative vapour density at 20 °C	:	No data available
Relative density	:	No data available
Solubility	:	insoluble in water.
Log Pow	:	No data available
Viscosity, kinematic	:	No data available
Viscosity, dynamic	:	No data available
Explosive properties	:	Velocity of detonation: 8400 m/s (PETN).
It does not have oxidising properties	:	No data available
Explosive limits	:	No data available

9.2. Other information

Fat solubility	:	Insoluble

SECTION 10: Stability and reactivity

10.1. Reactivity

The product is stable if used according to subsection 1.2 and if stored according to subsection 7.2.

10.2. Chemical stability

The product is stable if used according to subsection 1.2 and if stored according to subsection 7.2.

10.3. Possibility of hazardous reactions

May detonate if heated to temperature above 100 °C.May malfunction upon long-term exposure of Al-shell to acidic environment.

10.4. Conditions to avoid

May detonate with impact or friction. May detonate if exposed to open fire, radiant heat, high frequency or electrostatic energy.

10.5. Incompatible materials

Acids and alkalis.

10.6. Hazardous decomposition products

Detonation gasses containing lead, NOx.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity : Not classified

lead diazide, lead azide (13424-46-9)	
TDL0, orally, sewer-rat, 14 weeks intermittently (mg/kg)	3920 mg/kg (Data according to the database TOMES/RTECS, Vol. 75)

Pentaerythritol tetranitrate, P.E.T.N. (78-11-5)	
LD50 oral rat	1660 mg/kg (Database TOMES/RTECS, Vol. 75)

Potassium perchlorate (7778-74-7)	
TDL0, orally, sewer-rat, 14 weeks intermittently (mg/kg)	7890 (Data according to the database TOMES/RTECS, Vol. 75)

Skin corrosion/irritation : Based on available data, the classification criteria are not met.

Serious eye damage/irritation : Based on available data, the classification criteria are not met.

Respiratory or skin sensitisation : Based on available data, the classification criteria are not met.

Germ cell mutagenicity : Based on available data, the classification criteria are not met.

Carcinogenicity : Based on available data, the classification criteria are not met.

Reproductive toxicity : May damage the unborn child. Suspected of damaging fertility.

STOT-single exposure : Based on available data, the classification criteria are not met.

STOT-repeated exposure : Based on available data, the classification criteria are not met.

Aspiration hazard : Based on available data, the classification criteria are not met.

Other information : Lead and its compounds are partly excreted by kidneys, partly deposited inside body, especially bones. After long-term and high exposition, a chronic lead poisoning disease may develop, which is exhibited by failure of haemoglobin production, encephalopathy and also by paralysis of peripheral nerves. Lead and its compounds are known for their bioaccumulative effect and lead to irreversible health damage. Further lead and its compounds may damage unborn child and reproduction capability of humans. It is necessary to take this information into account in considering possibility of acquiring lead-poisoning disease caused by long term exposition (e.g. at work).

SECTION 12: Ecological information

12.1. Toxicity

Ecology - general : The mixture is classified as chronic toxic - category 3 in terms of its effect on the aquatic environment. Harmful to aquatic life with long lasting effects.

Potassium perchlorate (7778-74-7)	
LC50 fish 1	2800 mg/l (SDS)
EC50 Daphnia 1	803 - 1077 mg/l (SDS)

12.2. Persistence and degradability

No additional information available

12.3. Bioaccumulative potential

Pentaerythritol tetranitrate, P.E.T.N. (78-11-5)	
Bioconcentration factor (BCF REACH)	17 (SDS)
Log Kow	2.4 (SDS)

12.4. Mobility in soil

Pentaerythritol tetranitrate, P.E.T.N. (78-11-5)	
Log Koc	2.81 (SDS)

12.5. Results of PBT and vPvB assessment

Component	
Lead diazide, lead azide (13424-46-9)	This substance/mixture does not meet the PBT criteria of REACH regulation, annex XIII This substance/mixture does not meet the vPvB criteria of REACH regulation, annex XIII

12.6. Other adverse effects

Additional information : Not stated.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste treatment methods : Dispose in accordance with corresponding regulations. Disposal of defect or damaged product is performed in accordance with instruction from manufacturer or in accordance with local regulation. Disposal may be performed only by the authorized person. For the classification of waste and its removal corresponding to the waste producer.

Ecology - waste materials : Empty packages are handed over to person/company authorized to recycle packages. Contaminated packages are disposed in accordance with corresponding local regulations for disposal of packages and explosives.

SECTION 14: Transport information

In accordance with ADR / RID / IMDG / IATA / ADN

ADR	IMDG	IATA	ADN	RID
14.1. UN number				
0255	0255	Not applicable	Not applicable	0255
14.2. UN proper shipping name				
DETONATORS, ELECTRIC	DETONATORS, ELECTRIC	Not applicable	Not applicable	DETONATORS, ELECTRIC
Transport document description				
UN 0255 DETONATORS, ELECTRIC	UN 0255 DETONATORS, ELECTRIC, 1.4B	Not applicable	Not applicable	UN 0255 DETONATORS, ELECTRIC
14.3. Transport hazard class(es)				
1.4B	1.4B	Not applicable	Not applicable	1.4B
		Not applicable	Not applicable	
14.4. Packing group				
Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
14.5. Environmental hazards				
Dangerous for the environment : No	Dangerous for the environment : No Marine pollutant : No	Not applicable	Not applicable	Dangerous for the environment : No
No supplementary information available				

Extra UN N°: Using the UN number depends on the type of package.

UN 0030
UN proper shipping name: DETONATORS, ELECTRIC, for blasting
Transport hazard class: 1.1B
Label number: 1

UN 0456
UN proper shipping name: DETONATORS, ELECTRIC, for blasting
Transport hazard class:1.4S
Label number: 1.4

14.6. Special precautions for user

- Overland transport

No data available

- Transport by sea

No data available

- Air transport

Not applicable

- Inland waterway transport

Not applicable

- Rail transport

No data available

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

Not applicable

SECTION 15: Regulatory information

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

15.1.1. EU-Regulations

Contains no REACH substances with Annex XVII restrictions

Contains a substance on the REACH candidate list in concentration ≥ 0.1% or with a lower specific limit: Lead diazide, Lead azide (EC 236-542-1, CAS 13424-46-9)

Contains no REACH Annex XIV substances

15.1.2. National regulations

No additional information available

15.2. Chemical safety assessment

Not available.

SECTION 16: Other information

Other information : a) Instructions for training: Training for handling and use of explosives and detonators.
b) Advised limitations of use: Restricted to professional users.
c) Important data sources: MSDS of substances manufacturers, expert databases.
d) Purpose of safety sheet: The aim of the safety data sheet is to enable users to take precautions relating to health and safety at work and environmental protection.
e)The procedure for classifying the mixture according to EC Regulation no. 1272/2008: The conventional method.

Full text of H- and EUH-statements:

Acute Tox. 4 (Inhalation)	Acute toxicity (inhal.), Category 4
Acute Tox. 4 (Inhalation:dust,mist)	Acute toxicity (inhalation:dust,mist) Category 4
Acute Tox. 4 (Oral)	Acute toxicity (oral), Category 4
Aquatic Acute 1	Hazardous to the aquatic environment — Acute Hazard, Category 1
Aquatic Chronic 1	Hazardous to the aquatic environment — Chronic Hazard, Category 1
Aquatic Chronic 3	Hazardous to the aquatic environment — Chronic Hazard, Category 3
Expl. 1.1	Explosives, Division 1.1
Ox. Sol. 1	Oxidising Solids, Category 1
Pyr. Sol. 1	Pyorphoric Solids, Category 1
Repr. 1A	Reproductive toxicity, Category 1A
STOT RE 2	Specific target organ toxicity — Repeated exposure, Category 2
Unst. Expl	Explosives, Unstable explosives
Water-react. 1	Substances and Mixtures which, in contact with water, emit flammable gases, Category 1
Water-react. 2	Substances and Mixtures which, in contact with water, emit flammable gases, Category 2
H200	Unstable explosives.
H201	Explosive; mass explosion hazard.
H250	Catches fire spontaneously if exposed to air.
H260	In contact with water releases flammable gases which may ignite spontaneously.
H261	In contact with water releases flammable gases.
H271	May cause fire or explosion; strong oxidiser.

H302	Harmful if swallowed.
H332	Harmful if inhaled.
H360Df	May damage the unborn child. Suspected of damaging fertility.
H373	May cause damage to organs through prolonged or repeated exposure.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.
H412	Harmful to aquatic life with long lasting effects.

Classification and procedure used to derive the classification for mixtures according to Regulation (EC) 1272/2008 [CLP]:

Expl. 1.1	H201	Expert judgment
Repr. 1A	H360Df	Expert judgment
Aquatic Chronic 3	H412	Expert judgment

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product