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1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product Identifier	Product name: PERUNIT E – underground explosive
1.2 Use of the Product:	Explosive for blasting operations. Do not use for other purposes.
1.3 Details of the Supplier of the MSDS:	
Name:	EPC-UK EXPLOSIVES
Address:	ROUGH CLOSE WORKS CARNFIELD HILL SOUTH NORMANTON ALFRETON DERBYSHIRE, DE55 2BE
Telephone Number:	+44 (0)1773 832253
Contact e-mail:	info@epc-groupe.co.uk
1.4 Emergency Telephone Number:	+44 (0)1773 832253

2. HAZARD IDENTIFICATION

2.1 Classification of Substance / Mixture

Classification According to EC Regulation (EC) 1272/2008

Expl. 1.1;	H201
Acute Tox. 1;	H310
Acute Tox. 2;	H300+H330
Eye Irrit. 2;	H319
STOT RE 2;	H373
Aquatic Chronic 3;	H412

2.2 Label elements

According to EC Regulation 1272/2008

Pictogram



Signal word

Danger

Hazard statement

H201 Explosive; mass explosion hazard

Regulation 1272/2008 stipulates in Annex 1, Art. 1.3.5 that explosives placed on the market with a view to obtaining an explosive or pyrotechnic effect can be labelled and packaged in accordance with the requirements for explosives only.

2.3 Other Hazards

The product does not meet the criteria for PBT, vPvB

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3. COMPOSITION/INFORMATION ON THE INGREDIENTS

3.2 Mixtures

Mixture of ammonium nitrate, ethyleneglycol dinitrate, glycerol trinitrate, monoethyleneglycol, nitrocellulose and other components not classified as dangerous.

Dangerous substance	Concentration range	EC Number	CAS Number	Classification
Ammonium Nitrate	ca 60.0	229-347-8	6484-52-2	Ox. Sol. 3; H272 Eye Irrit. 2; H319
Ethyleneglycol dinitrate	ca 20.0	211-063-0	628-96-6	Unst. Expl.; H200 Acute Tox. 1, H310 Acute Tox. 2, H300+H330 STOT RE 2; H373
Glycerol trinitrate	ca 10.0	200-240-8	55-63-0	Unst. Expl., H200 Acute Tox. 1, H310 Acute Tox. 2, H300+H330 STOT RE 2, H373 Aquatic Chronic 2, H411
Monoethyleneglycol	ca 2.5	203-473-3	107-21-1	Acute Tox. 4; H302 STOT RE 2, H373
Nitrocellulose	ca 1.2		9004-70-0	Expl. 1.1; H201

4. FIRST AID MEASURES

4.1 Description of First Aid Measures

General

In all cases keep the victim at physical and psychic rest and keep warm. Never give anything to an unconscious person. In heavy cases, always after contact with eyes and if swallowed, seek medical advice.

First Aid – Eyes:

Rinse with water for at least 15 minutes. Move to the physician, while continue rinsing.

First Aid – Skin:


Remove contaminated clothing. Wash affected area with soap and water and use skin protective cream.

First Aid – Ingestion:

Rinse mouth with fresh water. Seek medical advice.

First Aid – Inhalation:

Break off the exposition. Move the victim to fresh air (not in the sun). If not breathing, give artificial respiration.

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4.2. Most Important Symptoms and Effects, Both Acute and Delayed

The mixture causes headaches, pain in abdomen, dizziness, nausea.

4.3. Indication of Any Immediate Medical Attention and Special Treatment Needed

No data.

5. FIRE FIGHTING MEASURES

5.1 Extinguishing Media:

Suitable extinguishing media: water spray. Adapt extinguishing media to the kind of fire.
 Unsuitable extinguishing media: powders.

5.2 Special Hazards Arising from Product:

In case of fire there is an extreme danger of explosion. Try to prevent the spread of fire. If the fire is going to reach the product by do not attempt extinguish. Warn surroundings of danger of explosion and evacuate immediately to a safe distance.

In case of fire, toxic and irritant gases are formed.

5.3 Advice for Firefighters:

Self-contained breathing apparatus and protective clothing conforming to EN 469.
 Do not approach a fire which has reached or is near the explosives

6. ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures:

Avoid the free movement of persons in contaminated area. Wear personal protective equipment. Avoid spreading of the product. Avoid contact of spilled material with open fire, electric sparks and aggressive chemical compounds.

6.2 Environmental Precautions:

Avoid discharge to surface- and groundwater. If it is not possible, inform police and fire-fighters.


6.3. Methods and material for containment and cleaning up

Sweep up spilled material and place in impermeable packages. Flush spill area with plenty of water. Dispose by explosion only in a place approved for disposal of explosives in accordance with national regulations relating to explosives.

6.4. Reference to other sections

More detailed disposal instructions see section 13, personal protective equipment see section 8.

7. HANDLING AND STORAGE

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7.1 Precautions for Safe Handling:

Handle in accordance with regulations relating to explosives. Keep away from open flame, heat, do not eat, drink or smoke. Maximum care should be taken during handling (lifting, transferring, opening of containers) and transportation. Keep away from combustible material. Take precautionary measures against static discharges. Observe personal hygiene measures. Wear suitable protective clothing and gloves. Wash thoroughly with soap and water after handling. Ensure drinking water is available for first-aid.

7.2 Conditions for safe storage , including any incompatibilities:

Store according to national regulations relating to explosives.
Maximum relative humidity 75 %. Recommended storage temperature -10 to +25 °C.

7.3 Specific end use(s)

Blasting operations. Observe safety regulations for processing of explosives.
To be used within 12 months after manufacturing (as per CE mark supplement dated 20/03/2017).

8. EXPOSURE CONTROL / PERSONAL PROTECTION

8.1 Control Parameters:

Occupational exposure limit values:
Exposures to Glycerol trinitrate and Ethyleneglycol dinitrate should be kept as low as is reasonably practical and certainly to below 0.2 ppm.

Ammonium nitrate

CAS 6484-52-2

DNEL

Users	Route of study	Effects	Time of exposure	Value
Workers	Inhalation	Systemic effects	Long-term	37.6 mg/m ³
Workers	Dermal	Systemic effects	Long-term	21.3 mg/kg/den
General population	Inhalation	Systemic effects	Long-term	11.1 mg/m ³
General population	Dermal	Systemic effects	Long-term	12.8 mg/kg/den
General population	Oral	Systemic effects	Long-term	12.8 mg/kg/den

PNEC

Freshwater	Marine water	Intermittent releases	STP	Sediment (freshwater)	Sediment (marine water)	Soil	Secondary poisoning
0.45 mg/l	0.045 mg/l	4.5 mg/l	18 mg/l	not available	not available	not available	No potential

Glycerol trinitrate

CAS 55-63-0

DNEL

Users	Route of study	Effects	Time of exposure	Value
Workers	Dermal	Systemic effects	Long-term	0.5 mg/kg/day
Workers	Dermal	Systemic effects	Acute/short term	2.5 mg/kg/day
General population	Oral	Systemic effects	Long-term	0.5 mg/kg/day

PNEC



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<u>Freshwater</u>	<u>Marine water</u>	<u>Intermittent releases</u>	<u>STP</u>	<u>Sediment (freshwater)</u>	<u>Sediment (marine water)</u>	<u>Soil</u>	<u>Secondary poisoning</u>
0.0198 mg/l	not available	0.0198 mg/l	not available	not available	not available	not available	No potential

Ethylene glycol

CAS 107-21-1

DNEL

Users

<u>Users</u>	<u>Route of study</u>	<u>Effects</u>	<u>Time of exposure</u>	<u>Value</u>
Workers	Inhalation	Systemic effects	Long-term	35 mg/m ³
Workers	Dermal	Systemic effects	Long-term	106 mg/kg/day
General population	Inhalation	Systemic effects	Long-term	7 mg/m ³
General population	Dermal	Systemic effects	Long-term	53 mg/kg/den

PNEC

<u>Freshwater</u>	<u>Marine water</u>	<u>Intermittent releases</u>	<u>STP</u>	<u>Sediment (freshwater)</u>	<u>Sediment (marine water)</u>	<u>Air</u>	<u>Soil</u>	<u>Secondary poisoning</u>
10 mg/l	1 mg/l	10 mg/l	199.5 mg/l	37 mg/kg	3.7 mg/kg	No potential	1.53 mg/kg	No potential

8.2 Exposure controls

8.2.1 Appropriate engineering controls

Process enclosures, local exhaust, general ventilation.

8.2.2 Personal protective equipment

Protective clothing shall be selected specifically for the working place, depending on concentration and quantity of the hazardous substances handled. All used personal protective equipment should conform to directive 89/686/EEC.

Eye and face protection - chemical goggles;

Skin protection - protective gloves depending on operation conforming EN 374, protective clothing, boots, cap;

Respiratory protection – in case of fumes discharge use respiratory protection mask with filter A2 conforming EN 133.

8.2.3 Environmental exposure controls

Avoid release to the environment. If it is impossible, substance should be removed safely from the place of leakage. In case of leakage of substance to air or water sources, soil or sewer system, inform relevant authorities about leakage.

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SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Basic physical and chemical properties

(a) Appearance/ colour:	Plastic material of red colour
(b) Odour:	characteristic odour of nitroesters
(c) Odour threshold	not available
(d) pH:	not available
(e) Melting point / Freezing Point	not applicable
(f) Initial Boiling point and boiling range	not applicable
(g) Flash point:	> 190 °C
(h) Evaporation Rate:	not applicable
(i) Flammability:	not applicable – explosive
(j) Upper / lower flammability or explosive limits	not applicable
(k) Vapour pressure,:	not applicable
(l) Vapour density	not applicable
(m) Relative Density	Bulk density: 1.30 g/cm ³ .
(n) Solubility(ies)	insoluble in water
(o) Partition coefficient (n-octanol / water):	not available
(p) Auto-ignition temperature	not applicable – explosive
(q) Decomposition temperature	not applicable
(r) Viscosity:	not applicable
(s) Explosive properties	Expl. 1.1
(t) Oxidising properties	not applicable – explosive

9.2 Other information

Impact sensitivity: min. 5 J.

Lower sensitivity to friction, electric spark, high detonation initiation sensitivity.

Soluble in acetone, ethyl acetate, partly soluble in benzene and toluene.

10. STABILITY AND REACTIVITY

10.1 Reactivity:	Explosive
10.2 Chemical Stability	Stable under normal conditions.
10.3 Possibility of hazardous Reactions	Unknown
10.4 Conditions to avoid	Temperatures above 50 °C, strong impact, friction, direct sunlight.
10.5 Incompatible materials	Strong acids and alkalis.
10.6 Hazardous Decomposition Products:	Oxides of nitrogen and carbon

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11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

- (a) acute toxicity Fatal if swallowed (category 2), in contact with skin (category 1) or if inhaled (category 2).
Ammonium nitrate LD50: 2950 mg.kg-1, oral, rat
Glycerol trinitrate LD50: 685 mg.kg-1, rat, oral
Glycerol trinitrate LD50: >9 mg.kg-1, rat, dermal
Ethyleneglycol dinitrate LD50: 616 mg.kg-1, rat, oral
Monoethyleneglycol LD50: 7.712 mg.kg-1, rat, oral
Monoethyleneglycol LD50: > 2.5 mg.l-1, rat, inhalation
Nitrocellulose LD50: >5000 mg.kg-1, rat, oral
- (b) skin corrosion / irritation Does not contain these substances (or less than classification limit)
- (c) Serious eye damage / irritation Causes serious eye irritation. (Eye Irrit. 2; H319)
Ammonium nitrate – irritating, rabbit, Hansen E
- (d) Respiratory or skin sensitisation Does not contain these substances (or less than classification limit)
- (e) Germ Cell Mutagenicity Does not contain these substances (or less than classification limit)
- (f) carcinogenicity Does not contain these substances (or less than classification limit)
- (g) reproduction toxicity Does not contain these substances (or less than classification limit)
- (h) STOT – single exposure Does not contain these substances (or less than classification limit)
- (i) STOT –repeated exposure May cause damage to organs through prolonged or repeated exposure.
STOT RE 2; H373
- (j) aspiration hazard Does not contain these substances (or less than classification limit)

11.1 Likely routes of exposure Through inhalation, skin exposure and ingestion.

12. ECOLOGICAL INFORMATION

12.1 Toxicity:

Harmful to aquatic life with long lasting effects.

	Result	Species	Exposure
Ammonium nitrate	LC50	Fish	447 mg.l-1 (48 h)
Glycerol trinitrate	LC50	Fish	: 3.48 mg.l-1
Glycerol trinitrate	LC50	Invertebrates	17,83 mg.l-1 (48 h)
Glycerol trinitrate	EC50	Algae	1,15 mg.l-1 (96 h)
Ethyleneglycol dinitrate	LC50	Fish	1.9 mg.l-1
Monoethyleneglycol	LC50	Fish	72860 mg.l-1 (96 h)
Monoethyleneglycol	EC50	Invertebrates	100 mg.l-1 (48 h)
Monoethyleneglycol	EC50	Algae	6500 - 13000 mg.l-1 (96 h)

12.2 Persistence and Degradability:

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Not established.

12.3 Bioaccumulation potential:

Not established.

12.4 Mobility in soil

Solubility of ethyleneglycol dinitrate and glycerol trinitrate in water is relatively low (5 – 6.8 g/l and 1.4 g/l respectively). Nitrocellulose is practically insoluble in water.

12.5 Result of PBT and vPvB Assessment:

Assessment was not carried out.

12.6 Other Adverse Effects

Lack of data.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods:

Product disposal: Sweep up spilled material carefully and place in impermeable packages. Flush spill area with plenty of water. Under the supervision of an expert, the product may be destroyed by detonation or by burning at an approved site. For more guidance see the HSE/CBI Explosives Industry Group publication: "Guidance for the Safe Management of the Disposal of Explosives", January 2007.

Container Disposal: The accepted method for disposing of the empty boxes is burning on site. Double check that the boxes are empty.

Waste codes / waste designations according to EWC:

16 04 03 N Other waste explosives

14. TRANSPORT INFORMATION

14.1 UN Number : UN0081

14.2 UN Proper Shipping Name : EXPLOSIVE, BLASTING, TYPE A

14.3 Transport Hazard Classes: 1

14.4 Packing Group :


14.5 Environmental Hazards: no

14.6 Special Precautions for User: no

14.7 Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code: not applicable

14.8 Other applicable information:

for ADR/RID

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Classification code: 1.1D
Label: 1
for IMDG
EmS F-B, S-Y
for IATA Air transport is forbidden

15. REGULATORY INFORMATION

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

UK Legislation

Carriage of Dangerous Goods Regulations 2009, as amended – implementing ADR Classification (Hazard Information and Packaging for Supply) Regs 2009, as amended.
Control of Substances Hazardous to Health regs 2002, as amended
Control of Major Accident Hazard Regulations 2015

EC Regulations

Registration Evaluation, Authorisation and Restriction of Chemicals Regulations 2006, as amended
Classification Labelling and Packaging Regulations 2008, as amended

EU Regulations

Regulation (EC) No 1907/2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), in the wording of later regulations
Regulation (EC) No 1272/2008 on classification, labelling and packaging of substances and mixtures (CLP), in the wording of later regulations
Dangerous Substances Directive 67/548/EHS
Dangerous Preparations Directive 1999/45/ES
European Waste Catalogue (EWC)

15.2 Chemical Safety Assessment

Assessment was not carried out

16. OTHER INFORMATION

MSDS first issued:

(a) Changes

Issue	Issue Date	Changes
2	23/02/17	Completely rewritten to include latest supplier's information
3	24/10/17	Section 7.3 shelf life increased from 9 months to 12 months

(b) Abbreviations and acronyms

CAS Chemical Abstracts Service
EN European standard
EWC The European Waste Catalogue
CLP Regulation No. 1272/2008/EC

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REACH	Regulation No. 1907/2006/EC
PBT	Persistent, bioaccumulative and toxic
vPvB	very persistent and very bioaccumulative
ADR	The European Agreement concerning the International Carriage of Dangerous Goods by Road
RID	Regulations concerning the International Transport of Dangerous Goods by Rail
IMDG	The International Maritime Dangerous Goods
IATA	The International Air Transport Association
Acute Tox. 1	Acute toxicity, Category 1
Acute Tox. 2	Acute toxicity, Category 2
Acute Tox. 4	Acute toxicity, Category 4
Aquatic Chronic 2	Hazardous to the aquatic environment chronic, Category 2
Aquatic Chronic 3	Hazardous to the aquatic environment chronic, Category 3
Expl. 1.1	Explosive, Division 1.1
Eye Irrit. 2	Serious eye damage/eye irritation, Category 2
Ox. Sol. 3	Oxidising solid, Category 3
STOT RE 2	Specific target organ toxicity — repeated exposure, Category 2

(c) Relevant Hazard Statements and Precautionary statements

Unst. Expl. Unstable Explosive
H200 Unstable explosives.
H201 Explosive; mass explosion hazard.
H272 May intensify fire; oxidiser.
H302 Harmful if swallowed.
H310 Fatal in contact with skin.
H319 Causes serious eye irritation.
H373 May cause damage to organs.
H300 + H330 Fatal if swallowed or if inhaled
H411 Toxic to aquatic life with long lasting effects.

(d) Advice on training

Handling of this product should only be allowed by qualified persons.