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Safety data sheet according to the REACH regulations as amended by EC Regulation 2015/0830

SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product Identifier	AMMOSPEX / AMMOBLAST ANFO
1.2 Use of the Product:	The product is an explosive used as a column charge in blasting and similar explosive usage
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:	01773 832253
Contact e-mail	info@epc-groupe.co.uk
1.4 Emergency Telephone Number:	01773 832253

SECTION 2. HAZARD IDENTIFICATION

2.1 Classification of Substance / Mixture

Classification According to EC Regulation 1272/2008

Eye Irrit. 2	H319 Causes serious eye irritation
Expl. 1.1	H201 Explosive; mass explosion hazard

2.2 Label elements

According to EC Regulation 1272/2008

Hazard Pictograms



Signal Word

Danger

Hazard statements

H319 Causes serious eye irritation.
H201 Explosive; mass explosion hazard.

Precautionary statements- Prevention

P210 Keep away from heat/ sparks/open flames/hot surfaces. — No smoking.
P280 Wear protective gloves/protective clothing/eye protection/ face protection.



For further information contact the Technical Service Dept at
EPC-UK Explosives Venture Crescent Alferton, Derbyshire DE55 7RA
Tel 01773 832253 Fax 01773 837683

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Precautionary statements- Intervention
Precautionary statements- Storage
Precautionary statements- Disposal

P372 Explosion risk in case of fire.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do – continue rinsing.
P401 Store in a safe and suitable place in accordance with legal requirements.
P501 Dispose of contents/container Dispose of the product/container in accordance with local regulations on the disposal of explosive and contaminated waste.

2.3 Other Hazards

May cause explosion or fire if handled improperly
Not PBT nor vPvB

SECTION 3. COMPOSITION/INFORMATION ON THE INGREDIENTS

3.1 Substances **Not applicable**

3.2 Mixtures

Dangerous substance	Concentration range	EC Number	CAS Number	Classification
Ammonium Nitrate	92.5-95.0%	229-347-8	6484-52-2	Eye Irrit. 2 H319 Oxid. Solid 3 H272
Fuels, diesel	5.0-7.5%	269-822-7	68334-30-5	Flam. Liq. 3; H226 Asp Tox 1; H304 Skin Irrit. 2; H315 Acute Tox. 4 H332 Carc. 2 H351 STOT RE 2; H373 (Thymus, liver, bone marrow) Aquatic Chronic 2; H411

SECTION 4. FIRST AID MEASURES

4.1 Description of First Aid Measures


General Call a doctor/physician if you feel unwell.

First Aid – Eyes: Rinse thoroughly with water for at least 15 minutes. Remove contact lenses if present and easy to do – continue rinsing. If eye irritation persists, consult an ophthalmologist.

First Aid – Skin: Wash the affected areas thoroughly with soap and plenty of water. If skin irritation persists: Get medical advice/attention.

First Aid – Ingestion: DO NOT INDUCE VOMITING. If conscious, give some water. Get medical attention if persistence.

SECTION 4. FIRST AID MEASURES (cont)

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First Aid – Inhalation: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Perform artificial respiration if breathing has stopped. Get medical attention.

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

Eye contact: After eye contact, a serious eye irritation is likely to occur.

Skin contact After skin contact, skin and mucous membranes' irritation may occur. A continuous contact with skin may lead to sensitization.

ingestion ANFO can be toxic if ingested. The symptoms can be headache, nausea and sleep disorders.

Inhalation Remove to well ventilated area. If problems persist, seek medical advice.

A person suffering from inhalation of after detonation fumes must be removed to fresh air, receive medical attention and stay under medical observation for at least 48 hours. The person should lie down until the doctor arrives.

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

Treat symptomatically

SECTION 5. FIRE FIGHTING MEASURES

5.1 Extinguishing Media: **DO NOT** fight the fire if it is near or has reached the explosives. Evacuate the area to a safe distance.

Appropriate: Large quantities of water must be used to cool and protect exposed material.

Inappropriate : not determined

5.2 Special Hazards Arising from Product: If the product is enveloped in flames, there is an immediate risk of explosion, so evacuate as quickly as possible, to at least 300 meters from the flames, and a greater distance may be required depending on the quantity of explosives. If possible seek shelter behind a natural or artificial barrier. Product combustion generates toxic fumes and gases, mainly carbon monoxide and nitrous fumes.

5.3 Advice for Firefighters: If the flames do not involve the product directly, extinguish them using the media recommended for the specific type of fire. Move the product away from the fire if possible.

If the fire directly involves the product, evacuate the area immediately to an upwind position to avoid breathing the fumes. There is an explosion risk in case of fire so **DO NOT** fight fire when it reaches explosives. Only if possible, fight the fire from a protected position, wearing self-contained breathing apparatus and using large quantities of water

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SECTION 6. ACCIDENTAL RELEASE MEASURES

- 6.1. Personal precautions, protective equipment and emergency procedures:** Personal Protective Equipment must be worn. Gather the dispersed product using anti-sparking tools and equipment (wood, plastic...). Eliminate all potential sources of ignition and avoid any action that could cause an impact, friction, sparking or a sudden rise in temperature.
- 6.2. Environmental Precautions:** Do not let the product get into the soil and water. Call the fire brigade if soil or water is contaminated.
- 6.3. Methods and material for containment and cleaning up** Place the product in a suitable container, preferably a cardboard box or canister that can be sealed after removal of the product.
Never use tools that generate sparks.
Keep anyone not involved in the operation well away from the danger area and inform them of the risk of explosion.
Contamination may increase the explosive's sensitivity to impact and friction.
- 6.4. Reference to other sections** Refer to sections 7, 8 and 13.

SECTION 7. HANDLING AND STORAGE

- 7.1. Precautions for Safe Handling:** Handle with care, bearing in mind the potential hazards.
Earth all electrical equipment present and any conductive item.
Keep the product well away from heat, direct sunlight and other sources of ignition, including combustible materials.
When handling the product, avoid ingesting or inhaling any solid particles that are formed. Do not eat, drink or smoke when handling the product. Wear disposable plastic, latex or rubber gloves to prevent contact with the skin.
Wash your hands thoroughly after handling the product. Remove contaminated clothes and PPE before entering areas where food and drink are consumed.
- 7.2. Conditions for safe storage, including any incompatibilities:** Store only in authorized areas that are suitable for the purpose and are licensed under the Explosives Regulation 2014.
Take measures to avoid the generation and accumulation of electrostatic charges. Keep the storage areas closed. Do not store in damp or humid conditions. Avoid thermal cycling. Keep boxes closed prior to use. The shelf life of the explosive is 12 months when stored under recommended conditions.
- All explosives and explosive items are chemically incompatible with acids, alkalis and highly reactive materials such as reducing agents and highly oxidizing agents (avoid chlorates and perchlorates).
- Requirements for registration under the COMAH regulations
Ammospex/Ammoblast is a UN 1.1D explosive and is classed as "P1A explosive" under COMAH. This means the applicable quantities are
For lower tier 10 tonne For upper tier 50 tonnes
- 7.3. Specific end use(s)** The product is supplied for use, testing and analysis by qualified personnel who have been fully trained to handle explosives.

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SECTION 8. EXPOSURE CONTROL / PERSONAL PROTECTION

8.1 Control Parameter:

8.1.2 OELs

Product

No limit values are known for ammonium nitrate
A limit of 100mg/m³ is quoted for fuel oil by some authorities e.g. ACGIH

After Detonation Fumes

Besides residual amounts of unreacted product, the after-detonation fumes may include the following gases:

UK / EU Standards:

Carbon Dioxide: 8 hr=5000 ppm, 9150 mg/m³; 15 min = 15,000 ppm, 27,400 mg/m³.

Carbon Monoxide: The value given in the 4th indicative OLEV is 8hr = 20 ppm, 23 mg/m³; Short term = 100 ppm, 117 mg/m³. Underground mining and tunnelling have a transition period to 21 August 2023, Until then the EH40 National values of 8 hr=30 ppm, 35 mg/m³; 15 min = 200 ppm, 232 mg/m³. can be used,

Nitrogen Monoxide: The value given in the 4th indicative OLEV is 8hr =2 ppm, 2.5 mg/m³. Underground mining and tunnelling have a transition period to 21 August 2023. Until then the original IOELV value of 8hr =25 ppm, 30 mg/m³ can be used, though users should aim for as low as reasonably practicable

Nitrogen Dioxide: The values given in the 4th indicative OLEV are 8hr =0.5 ppm, 0.96 mg/m³; Short term = = 1.0 ppm, 1.91 mg/m³. Underground mining and tunnelling have a transition period to 21 August 2023,

8.1.2 Recommended monitoring procedures

See BS EN 14042:2003

8.1.3 DNEL / PNEC

DNELs/DMELs

Product / ingredient name	Type	Exposure	Value	Population	Effects
ammonium nitrate	DNEL	Long term Dermal	21,3 mg/kg bw/day	Workers	Systemic
ammonium nitrate	DNEL	Long term Inhalation	37,6 mg/m ³	Workers	Systemic

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PNECs

Product / ingredient name	Type	Compartment Detail	Value	Method Detail
ammonium nitrate	PNEC	Fresh water	0,45 mg/l	Assessment Factors
ammonium nitrate	PNEC	Marine water	0,045 mg/l	Assessment Factors
ammonium nitrate	PNEC	Intermittent release	4,5 mg/l	Assessment Factors
ammonium nitrate	PNEC	Sewage Treatment Plant	18 mg/l	Assessment Factors

8.2 Exposure controls

Appropriate engineering controls	Provide appropriate exhaust ventilation at places where dust is formed.
Personal protective equipment	<p><u>Eye/face protection:</u> safety goggles are required in the presence of large amounts of powder during handling.</p> <p><u>Hand protection:</u> wear plastic, rubber or latex gloves. Disposable gloves are recommended to minimize cross-contamination with the explosive.</p> <p><u>Body protection:</u> the entire skin must be covered by suitable clothing. Any powder contaminating the skin must be removed immediately by washing in plenty of water. Work clothes must be antistatic, made of cotton for instance, and flame retardant.</p> <p><u>Respiratory protection:</u> not required during normal handling.</p> <p><u>Hygiene measures:</u> Do not eat, drink or smoke when using this product. Wash thoroughly after handling. Avoid contact with eyes, skin and clothing. Wash contaminated clothes before reuse.</p> <p><u>Other:</u> use appropriate anti-static footwear</p>
Environmental exposure controls	Not available

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Basic physical and chemical properties

(a) Appearance/ colour:	Homogeneous prilled granules (Amмосpex contained in a polyethylene cartridge, Ammoblast in bulk); off white /pink
(b) Odour:	Characteristic of fuel oil /diesel
(c) Odour threshold	Not available
(d) pH:	Not available. 10% solution of the AN in water will have a pH. of 4.5-7
(e) Melting point / Freezing Point	Not available
(f) Initial Boiling point and boiling range	Not available
(g) Flash point:	>100C
(h) Evaporation Rate:	Not available
(i) Flammability:	Not available

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SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES (cont)


9.1 Basic physical and chemical properties (cont)

(j) Upper / lower flammability or explosive limits	Not available
(k) Vapour pressure:	Not available
(l) Vapour density	Not available
(m) Relative Density	750-850 kg/m ³ , tapped density
(n) Solubility(ies)	Ammonium nitrate very soluble in water
(o) Partition coefficient (n-octanol / water):	Not available
(o) Auto-ignition temperature	Not available
(p) Decomposition temperature	>150 C
(r) Viscosity:	Not available
(s) Explosive properties	Detonation rate: 3000-4000 m/s. Ignition sensitivity: A primer cartridge is recommended
(t) Oxidizing properties	Not available

9.2 Other information Not available

SECTION 10. STABILITY AND REACTIVITY

10.1 Reactivity:	Impact, friction, electrostatic discharge, excessive temperature rise, naked flames and other causes of ignition can cause explosion. Fire can lead to explosion.
10.2 Chemical Stability	Stable under the recommended storage and use conditions and at moderately elevated temperatures and pressures. German assay at 120°C with methyl violet. No variation after 2h 30'.
10.3 Possibility of hazardous Reactions	When the product is exposed to heat, there is a risk for explosion at temperatures well below the auto-ignition temperature
10.4 Conditions to avoid	Keep away from heat, sparks, naked flames and hot surfaces. Do not smoke. Avoid scratching, impact, shock and friction.
10.5 Incompatible materials	Copper and its alloys, bromates, chlorates, chlorites, hypochlorites, nitrites, perchlorates, permanganates, powdered metals, acids and bases. highly reactive materials such as reducing agents and highly oxidizing agents
10.6 Hazardous Decomposition Products:	Some Nitrogen Oxides, Oxides of Carbon, including Carbon Monoxide may be produced when the product is detonated. The amount of toxic gases produced will depend on many variables such as method of initiation, rock type, humidity etc. In the event of a fire, larger quantities of Nitrous fumes and carbon monoxide may be released

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SECTION 11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

(a) acute toxicity

ANFO is toxic when inhaled or ingested. Exposure to the product by ingestion or inhalation can generate acute or chronic symptoms such as headache, nausea and sleep disorders.

Product / ingredient name	Result	Species	Dose	Exposure	References
ammonium nitrate					
	LD50 Oral	Rat	2.950 mg/kg OECD 401	Not applicable.	IUCLID 5
	LD50 Dermal	Rat	> 5.000 mg/kg OECD 402	Not applicable.	

(b) skin corrosion / irritation

Prolonged and repeated contacts can irritate the skin.

(c) Serious eye damage / irritation

Causes serious eye irritation. Powder in the eyes can cause considerable discomfort and lacrimation. Can cause sleep disorder, irritation, sensitization and epileptic convulsions.
May persist for several days.

Product / ingredient name	Result	Species	Score	Exposure	Observation	References
ammonium nitrate	Eyes - Irritant OECD 405	Rabbit	Not applicable.		Not applicable.	IUCLID 5

(d) Respiratory or skin sensitisation

Inhalation and continuous skin contact may lead to sensitization.

(e) Germ Cell Mutagenicity

Not available
No known significant effects or critical hazards from ammonium nitrate.

(f) carcinogenicity

Not available. No known significant effects or critical hazards from ammonium nitrate

(g) reproduction toxicity

Not available. No known significant effects or critical hazards from ammonium nitrate

Product / ingredient name	Maternal toxicity	Fertility	Development toxin	Species	Dose	Exposure	References
ammonium nitrate	Not applicable	Negative	Negative	Rat	Oral : > 1500 mg/kg bw/day OECD 422	28 days	IUCLID 5

(h) STOT – single exposure

Not available
Not available

(i) STOT –repeated exposure

Not available

(j) aspiration hazard

Not available

SECTION 11. TOXICOLOGICAL INFORMATION (CONT)

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11.2 Other Information

Respiratory irritation

The powder irritates the airways and can cause sneezing and coughing. Large quantities can cause headache, lack of appetite, malaise, vomiting, dizziness, fluctuations in blood pressure and fainting.

Potential chronic health effects (ammonium nitrate)

Result	Species	Dose	Exposure	References
Chronic NOAEL Oral	Rat	256 mg/kg OECD 422	28 days	IUCLID 5
Sub-acute No-observable-effect-concentration Dusts and mists Inhalation	Rat	> 185 mg/kg OECD 412	2 weeks 5 hours per day	IUCLID 5

SECTION 12. ECOLOGICAL INFORMATION

12.1 Toxicity:

Environmental dispersion causes severe ecological impacts because the product contains ammonium nitrate, which is highly soluble in water, leading to eutrophication of algae. From ammonium nitrate

	Result	Species	Exposure	Reference
LC50	650 mg/L	Fish	24 hours	
LC50 Fresh water	447 mg/l	Fish	48 hours	IUCLID 5
LC50	340 mg/L	Daphnia	24 hours	
EC50 Fresh water	490 mg/l	Daphnia	48 hours	IUCLID 5
LC50	2.5 mg/L	Algae	5 days	
EC50 Salt water	1.7 mg/l	Algae	10 days	IUCLID 5

No known significant effects or critical hazards from ammonium nitrate.

From Fuel oil

Toxic to aquatic life with long lasting effects. Experimental studies on samples of gas oils show acute aquatic toxicity values typically in the range 2-20 mg/L. These values are consistent with the predicted aquatic toxicity based on their hydrocarbon compositions

LL50 (Oncorhynchus mykiss): 21 mg/L, 96 h (WAF)

NOEL (Oncorhynchus mykiss): 10 mg/L, 96 h (WAF)

NOEL (Oncorhynchus mykiss): 0.083 mg/L, 14 days (WAF) (estimated using PETROTOX computer model)

EL50 (Daphnia magna): 210 mg/L, 48 h (WAF)

NOEL (Daphnia magna): 46 mg/L, 48 h (WAF)

NOEL (Daphnia magna): 0.2 mg/L, 21 days (WAF) (estimated using PETROTOX computer model)

EL50 (Pseudokirchnerella subcapitata): 10 mg/L, 72 h (biomass)

NOEL (Pseudokirchnerella subcapitata): 1 mg/L, 72 h (biomass)

EL50 (Pseudokirchnerella subcapitata): 22 mg/L, 72 h (growth rate)

NOEL (Pseudokirchnerella subcapitata): 1 mg/L, 72 h (growth rate)

EL50 (Tetrahymena pyriformis): > 1,000 mg/L, 40 h (estimated using PETROTOX computer model)

NOEL (Tetrahymena pyriformis): 3.217 mg/L, 40 h (estimated using PETROTOX computer model)


SECTION 12. ECOLOGICAL INFORMATION (CONT)

12.2 Persistence and

Fuel oil



For further information contact the Technical Service Dept at
 EPC-UK Explosives Venture Crescent Alfreton, Derbyshire DE55 7RA
 Tel 01773 832253 Fax 01773 837683

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Degradability:

Based on the known or expected properties of individual components, the product is not expected to be readily biodegradable. Some components are expected to be persistent however other components will be easily degraded by microorganisms under aerobic conditions.

For Ammonium Nitrate

No known significant effects or critical hazards.

12.3 Bioaccumulation potential;

For Fuel oil

Components have measured or predicted Log Kow values in the range 3.9 – 6 or above and therefore have a high potential to bioaccumulate. In practice, lower molecular weight compounds will be readily metabolised and the actual bioaccumulation potential of higher molecular weight compounds is limited by the low water solubility and large molecular size.

For ammonium nitrate

No known significant effects or critical hazards.

12.4 Mobility in soil

For Fuel oil

The product components are immiscible in water and will float on the surface of water. Lower molecular weight components will evaporate from the surface, reducing the risk to aquatic organisms. In air the hydrocarbon components undergo photodegradation by hydroxyl radicals with half lives in the range of less than one day. The majority of components will be adsorbed onto sediment.

Adsorption is the predominant process on release to soil. Adsorbed components will slowly degrade in both water and soil

For ammonium nitrate

This product may move with surface or groundwater flows because its water solubility is: high

12.5 Result of PBT and vPvB Assessment:

The product does not contain substances assessed to be PBT or vPvB

12.6 Other Adverse Effects

None known

SECTION 13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods:

Considering the potential risk associated with the kind of product, it must only be disposed by personnel specifically trained for the purpose.

Product disposal

Avoid or reduce the generation of waste to a minimum.

Collect waste in appropriate containers in accordance with the applicable regulations, ready for disposal using approved methods. The buildings where waste containers are kept must be properly equipped and authorized by the competent authorities. Waste must never be discharged into the drains or waterways.

Under the supervision of a trained competent person the product may be disposed of by detonation in a shot hole or by burning on an approved burning ground. For further guidance see the HSE /CBI Explosives Industry Group, "Guidance for the Safe Management of the Disposal of Explosives".

Container Disposal:

The accepted method for destroying empty boxes is burning

SECTION 14. TRANSPORT INFORMATION

14.1 UN Number :

UN 0082

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- 14.2 UN Proper Shipping Name :** EXPLOSIVE, BLASTING, TYPE B
- 14.3 Transport Hazard Classes:** 1.1D
- 14.4 Packing Group :** Not assigned, but treat as PG II
- 14.5 Environmental Hazards** -
- 14.6 Special Precautions for User** Not available
- 14.7 Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code** Not available

SECTION 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
Control of Substances Hazardous to Health regs 2002, as amended
Control of Major Accident Hazard Regulations 2015
Explosives Regulations 2014, as Amended

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

15.2 Chemical Safety Assessment

Not available

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SECTION 16. OTHER INFORMATION

MSDS first issued: 03/1996

(a) Changes

Issue	Issue Date	Changes
7	05/2012	Minor changes
8	10/11/2016	Completely re-written complying EC reg 2015/0830
8.1	26/04/2017	New Logo. Added word "Section" to each section heading.
9	07/06/2018	Section 2.3, 5.1, 7.2, 8.1 11 and 12 amended. Footer logo updated

(b) Abbreviations and acronyms

PBT: Persistent, Bioaccumulative, Toxic
vPvB: very Persistent and very Bioaccumulative

(c) References

- Guidance for the Safe Management of the Disposal of Explosives, January 2007".
- ADR "European Agreement regarding the International Carriage of Dangerous Goods by Road".
- RID "European Agreement regarding the International Carriage of Dangerous Goods by Rail".
- IMO/IMDG "International Maritime Transport of Dangerous Goods".
- ADN "European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways".
- Registration files available on the ECHA website : <http://echa.europa.eu/web/guest/information-on-chemicals/registered-substances> :CAS# 6484-52-2.

(d) Evaluation method for mixtures Not applicable

(e) Relevant hazard Statements and Precautionary statements

H201 Explosive; mass explosion hazard
H226 Flammable liquid and vapour
H228 Flammable solid
H261 In contact with water releases flammable gas
H272 May intensify fire; oxidizer
H304 May be fatal if swallowed and enters airways
H315 Causes skin irritation
H319 Causes serious eye irritation.
H332 Harmful if inhaled
H351 Suspected of causing cancer
H373 May cause damage to organs through prolonged or repeated exposure
H411 Toxic to aquatic life with long-lasting effects

P210 Keep away from heat/ sparks/open flames/hot surfaces. — No smoking.
P280 Wear protective gloves/protective clothing/eye protection/ face protection.
P372 Explosion risk in case of fire.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do – continue rinsing.
P401 Store in a safe and suitable place in accordance with legal requirements.
P501 Dispose of contents/container Dispose of the product/container in accordance with local regulations on the disposal of explosive and contaminated waste.

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SECTION 16. OTHER INFORMATION (cont)

- (f) Advice on training
not available

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship. By using suitable industrial safety precautions, it is paramount to make sure that the relevant exposition measures at the work place are adhered to, and negative health effects are avoided.

Notice:

FOR FURTHER INFORMATION CONTACT
EPC-UK EXPLOSIVES EXPLOSIVE ENGINEERING DEPARTMENT