1. PRODUCT AND COMPANY IDENTIFICATION

Trade Names: Kemex Underground

Product Description: Kemex Underground or Kemex U is a site mixed bulk emulsion explosives produced from emulsion matrix. Emulsion matrix is essentially an aqueous solution of ammonium nitrate emulsified in oil. Emulsion products may also contain sodium nitrate, fuel oil, and gassing agents. This product is designed for use in mining and other underground applications.

Recommended Use: Kemex Underground explosives are mixed on-site and intended for immediate use as a general explosive column charge in mining applications.

Manufacturer/Supplier: IRISH INDUSTRIAL EXPLOSIVES LTD

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MAYNOOTH BUSINESS CAMPUS,
MAYNOOTH,
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Telephone Number: 01 6549900

E-mail Contact: pcosgrove@kemek.ie

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2. HAZARD IDENTIFICATION

Main Hazards: The product is **EXPLOSIVE (E)**: Mass explosion hazard. Risk of explosion by shock, friction or fire**.**
The product is also **HARMFUL (X_n)** containing ingredients with a limited evidence of a carcinogenic effect (diesel fuel and thiourea).

After Detonation Fumes: Detonation of the explosive produces large quantities of suffocating gas. Toxic gases may also be formed.

Health Effects – Eyes: Irritant.

Health Effects – Skin: Repeated skin contact may de-fat the skin resulting in possible irritation and dermatitis.

Health Effects – Ingestion: Ingestion in larger quantities, may give rise to Gastro Intestinal Disorders and in extreme cases, particularly in children, formation of Methaemoglobin (Blue Baby Syndrome) and Cyanosis (indicated by blueness around the mouth).

3. COMPOSITION/INFORMATION ON THE COMPONENTS

Product's Significant Hazardous Ingredients

	EINECS / CAS Number	Hazard Symbols	Risk Phrases	Kemex U
				(%)
Ammonium Nitrate	EINECS 229-347-8 CAS 6484-52-2	O	R8, R9	>80
Process oil	EINECS 265-149-8 CAS 64742-47-8, or EINECS 265-149-8	X_n, X_i, N	R38, R51/53	4.5-6.5
Sodium Nitrate	EINECS 231-554-3 CAS 7631-9-4	O, X_n	R8, R22, R36	<15
Sodium Nitrite	EINECS 231-555-9 CAS 7632-00-0	O, T, N	R8, R25, R50	Up to 0.2

Other ingredients which are non hazardous or present in quantities below their hazardous significant level are not shown - See section 16 for meaning of R phrases.

4. FIRST AID MEASURES

First Aid – Eyes: Irrigate thoroughly with water for at least 15 minutes

First Aid – Skin: Wash thoroughly with soap and water

First Aid – Ingestion: Immediately drink plenty of water and seek medical advice

First Aid – Inhalation: Remove person to fresh air. If symptoms 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

Advice to Physicians: **Eyes** – Continue irrigation treatment as for chemical burns
Ingestion - Mild cases of methaemoglobinaemia will lead to cyanosis and in more severe cases may produce unconsciousness. After measuring the methaeglobin level, if cyanosis is present, inject 0.1-0.2 ml/kg body weight 1% methylene blue injection USP very slowly over several minutes. A more rapid injection rate leads to the formation of additional methaemoglobin. Repeat methaemoglobin measurement and repeat methylene blue injection depending on results.

5. FIRE FIGHTING MEASURES

Extinguishing Media: Use water based extinguishers to prevent fire reaching the Emex U

Special Hazards of Product: This material is explosive and may burn to detonation. If the fire looks likely to reach the Emex U retire to a safe distance and cordon off the area. Toxic and irritating gasses may be produced in a fire.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions: Wear gloves and overalls

Environmental Precautions: Do not allow to enter a water course

Spillages: Spillages at the point of use should be scooped up, e.g. with a plastic shovel and included with the explosives in a borehole. Other disposal methodsare referred to in section 13.

7. HANDLING AND STORAGE

Handling: No smoking – no sources of ignition. Keep product clean and free from contamination

Storage: Should not usually be stored - bulk loaded at point of use. If loaded holes are left overnight, a sentry should be placed. Any storage of product in a container or package would need to comply with the Mine Managers scheme of transit

8. EXPOSURE CONTROL / PERSONAL PROTECTION

UK Occupational Exposure Standards: There is no occupational exposure standard for the products themselves. The ingredients in the products include Oil: 8hr TWA for oil mist 5mg/m^3.

Respiratory Protection: Not applicable

Hand Protection: Wear gloves. Suitable gloves may include: Nitrile, Neopene, Fluor-elastomer or PVC

Eye Protection: Wear safety glasses

Body Protection: Wear overalls.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State: Viscous fluid containing varying amounts of suspended solids.

Colour: Light brown/white

Odour:	Slightly oily/diesel smell. May also smell of vinegar
pH:	Ca 5
Explosive Properties:	Emex U is a UN Class 1 explosive
Solubility in Water (kg/m^3):	Essentially insoluble, though water will leach ammonium nitrate out of the Emex U over time
Density (kg/m^3):	950 - 1050
Decomposition Temp. (deg C):	> 150 ° C

10. STABILITY AND REACTIVITY

Stability:	Stable at normal temperatures, but will crystallise within 1 month
Conditions to Avoid:	High temperatures, impact, friction, flames, sparks and static discharge
Materials to Avoid:	Acids and Bases
Hazardous Decomposition Products:	Besides residual amounts of unreacted product, the after detonation fumes may include the following gases (figures are their workplace exposure limits): **Carbon Dioxide**: 8 hr=5000 ppm, 9150 mg/m3; 15 min = 15,000 ppm, 27,400 mg/m3 **Carbon Monoxide**: 8 hr=30 ppm, 35 mg/m3; 15 min = 200 ppm, 232 mg/m3. **Nitrogen Monoxide**: The previous OES for nitrogen monoxide (8hr =25 ppm, 31 mg/m3) was withdrawn, as it may not be adequate to protect occupational health. The CHAN where the HSE recommended that exposure to nitrogen monoxide should not exceed 1 ppm has been suspended. Users should aim to follow ALARP (as low as reasonably practical) principles (see ref [1]). **Nitrogen Dioxide**: The previous OES for nitrogen dioxide (8hr = 3 ppm, 5.7 mg/m3) has been withdrawn, as it may not be adequate to protect occupational health. The amounts of toxic gases produced will depend on many variables such as method of initiation, rock type, humidity etc. Generally do not approach the blast area until the fumes have dissipated.

11. TOXICOLOGICAL INFORMATION

Eyes: May cause irritation following contact.

Skin: Mildly irritant. Prolonged and repeated contact may be harmful to the skin. Prolonged and repeated contact with the fuel oil/gas oil present in Kemex 70 may lead to more serious skin disorders including skin cancer.

Inhalation: Avoid breathing vapours as in high concentration these may be irritating

Ingestion: The following are LD50 values for ingredients in Emex U

***Emex U*:**

Ammonium Nitrate	>2,000 mg/kg (rat)
Process Oil	>5,000 mg/kg (rat)
Sodium Nitrate	>4.500 mg/kg (rat)
Sodium nitrite	85 mg/kg

The ingestion of ammonium nitrate can produce methaemoglobinaemia (see section 4).

12. ECOLOGICAL INFORMATION

Ecotoxicity: None

Mobility: Kemex U is a viscous liquid. The water soluble Ammonium nitrate will be leached out of the Kemex U by water over time.
The mobility of the various ingredients:
Ammonium Nitrate: When not protected by the emulsion, the ammonium nitrate dissolves freely in water.
Process Oil: Some mobility in soils

Persistence/ Degradability: ***Ammonium Nitrate:*** The ammonium nitrate follows the natural nitrification/denitrification cycle.
Process oil: Readily biodegradable
Process oil: Inherently biodegradable with hydrocarbon components degraded by microorganisms. Lighter components volatilise, and in air undergo photolysis to give half lives of less than a day. Photoxidation of liquid hydrocarbons on water surfaces also contributes to the loss process. Adsorbed hydrocarbons from gas oils will slowly degrade, both in water and soil.

Bioaccumulation Potential: Ammonium nitrate does not show any bioaccumulation potential
Process oils: have the potential to bio accumulate, but metabolic processes may reduce this tendency

13. DISPOSAL

Product Disposal: The product is an explosive and must be treated as such. Under the supervision of an expert, the product may be

destroyed by detonation in a borehole or by burning at an approved site. For more guidance see the Guidelines issued by Irish Industrial Explosives and printed on the reverse of the delivery docket

14. TRANSPORT INFORMATION

Irish Transport Information: The product is produced by mixing on site for immediate use, so it would not be transported normally. If it is transported, it must be in accord with the appropriate regulations. For road there is the Carriage of Dangerous Goods by Road Regulations 2007 SI 288, These are aligned with ADR, as required by Council directive 2008/68/EC, but may have additional requirements /modifications .

EU Transport : Road transport must be in accordance with ADR 2009

UN Number : 0241

UN Class : 1.1 D

UN Name: Explosive, Blasting, Type E

14. TRANSPORT INFORMATION continued...

Labelling Information: Labelled in accordance with CPL regulations S.I No 116 of 2003 (substances) and S.I No 62 of 2004 (preparations), as amended and the Carriage of Dangerous Goods by Road Regulations 2007.

15. REGULATORY INFORMATION

Hazard Symbols, Risk Phrases and Safety Phrases

Product	Hazard Symbols	Risk Phrases	Safety Phrases
Emex U	E, X_n	R2, R40	S35, S36/37

Irish Legislation: Carriage of Dangerous Goods by Road Regulations 2007.SI 288.
Explosives Act 1875.
Safety, Health and Welfare at Work (Quarries) Regulations (2008)
CPL regulations S.I No 116 of 2003 (substances) and S.I No 62 of 2004 (preparations), as amended

EC Regulations: Registration, Evaluation, Authorisation and Restriction of Chemicals, EC Reg 1907/2006, as amended.
Classification, Labelling and Packaging of Substances and Mixtures, EC Reg 1272/2008.

Note this does not apply to mixtures until June 2015, as such this data sheet does not show the labelling requirements under this reg.

16. OTHER INFORMATION

MSDS first issued: 03/99
This issue is an update modifying the whole of the document.

Meaning of R phrases

R2	Risk of explosion by shock, friction, fire or other sources of ignition
R8	Contact with combustible material may cause fire.
R9	Explosive when mixed with combustible material.
R22	Harmful if swallowed.
R25	Toxic if swallowed.
R26/27/28	Very toxic by inhalation, in contact with the skin and if swallowed.
R33	Danger of cumulative effect.
R36/37/38	Irritating to eyes, respiratory system and skin.
R40	Limited evidence of a carcinogenic effect.
R50	Very toxic to aquatic organisms.
R50/53	Very toxic to aquatic organisms, may cause long term adverse effect in the aquatic environment.
R51/53	Toxic to aquatic organisms, may cause long term adverse effect in the aquatic environment.
R52/53	Harmful to aquatic organisms, may cause long term adverse effect in the aquatic environment.
R63	Possible risk of harm to the unborn child.
R65	Harmful may cause lung damage if swallowed

Meaning of S phrases

S35	This material and its container must be disposed of in a safe way.
S36/37	Wear suitable protective clothing and gloves.
S61	Avoid release to the environment. Refer to special instruction/safety data sheets.

Notice: **FOR FURTHER INFORMATION CONTACT IRISH INDUSTRIAL EXPLOSIVES CUSTOMER SERVICES DEPARTMENT.**