1. Identification of the preparation and the company / undertakin.

1.1. Identification of the preparation.
- Product trade name: **RIOGUR F CD**
- Official transportation name: **EXPLOSIVE, BLASTING, TYPE E**

1.2. Use of the preparation. Monomethylamine Nitrate-based hydrogel explosive that is made from oxidizing salts and fuels and is detonator sensitive, for civil use in quarries, general mining and public construction work.

1.3. Company identification.
MAXAM Europe, S.A.
Avenida del Partenón Nº 16
28042 Madrid - SPAIN
Telephone: (+) (34) 917 220 217 / / Fax: (+) (34) 917 220 107
Listed in the Madrid Business Register. T.4118, Folio 54, Section 8, Page M-68433. Inscription 29ª. COMPANY VAT NUMBER A-78876331

1.4. Emergency telephone. (+) (34) 917 220 100 (from Monday to Friday from 08:00h to 20:00h)

2. Hazards identification.

Product classification. This explosive product is considered to be a 'dangerous' preparation according to section 2 of article 2 of the Legislation relating to classification, packaging and labelling of dangerous preparations (RD 255/2003, 28 February).

Risks (R Phrases): 3 and 5.
Cautionary warnings (S Phrases): 15, 16, 33, 35 and 41.
Note: See complete R and S phrases in section 16.

Risks to people.
May mass detonate as a result of: impact, friction, fire, spark or due to the vibration of a nearby explosion. Explosion produces a strong excess pressure and heat and may cause serious physical injury and even death.
IMPORTANT: Do not use this explosive in jobs that contain or may contain flammable gases and/or powders.
The smoke resulting from detonation and combustion is toxic. It contains nitrogen oxides (NOx) and odourless and colourless carbon oxides (CO and CO2). Symptoms caused by exposure to the detonation's toxic fumes are: headache, nausea, fatigue, confusion and fainting. It may also cause irritation in the respiratory system, bronchitis, and bronchopneumonia; in serious cases, acute pulmonary oedema and death may result.
IMPORTANT: In surface and interior blastings these residual fumes may migrate underground to confined spaces (including tunnels, wells, basements, etc.) where they accumulate and can remain for a long period of time. To enter these locations after an explosion, always follow the rules for entry into confined spaces and always verify that there are no toxic fumes present before entering.
Rock blasting may produce large-sized fragments, in non-stable positions, with risks of landslides and aerial projections.
Risks to the environment. The risks are those corresponding to the individual components. See also sections 6, 12 and 13 of this Safety Datasheet.

3. Composition / information on ingredients.

COMPONENT	%	DANGER SYMBOL	R PHRASES	S PHRASES	EINECS / CAS NO.
- Ammonium Nitrate	51 – 58	O.	8, 9 , 31, 36/37/38, 48/20/21	15, 16, 17, 21, 25, 26, 41	229-347-8 / 6484-52-2
- Sodium nitrate	4 – 7	O.	8	16, 41	231-554-3 / 7631-99-4
- Monomethylamine Nitrate	19- 24	E	2, 5	15, 16, 33, 35, 41	244-787-0 / 22113-87-7
- Aluminium	1 - 4	F	10, 15	2, 7/ 8, 43	231-072-3 / 7429-90-5
- Pentaerythritol tetranitrate	1-3	E	3, 5	15, 16, 33,35,41	201-084-3 / 78-11-5

Note: See complete R and S phrases in section 16.

4. First Aid measures.

Inhalation.
In the event of inhaling toxic fumes resulting from detonation or combustion, move the affected person away from the area and take them into the open air. Before moving the affected person away, you must make sure the fumes have completely lifted, or if this is not possible, suitable personal protection equipment should be worn (self-contained breathing apparatus, mask with an appropriate filter, etc.).
IMPORTANT: An immediate medical examination is required following any exposure to these toxic fumes. The risk of a pulmonary oedema is a potential after-effect of this exposure.
Contact with eyes. Clean with plenty of water for at least 15 minutes, especially under the eyelids. Seek urgent medical attention.
Contact with skin. Clean with plenty of soap and water.
Ingestion. Seek urgent medical attention.
Detonation.
In the event of injuries due to accidental detonation of the product, take the affected person to the nearest hospital.
In the event of injuries due to the impact of aerial projections or landslides, take the affected person to the nearest hospital.
In the event of a cardio-respiratory arrest, immediately proceed to give basic cardiopulmonary resuscitation. Contact the doctor.

5. Fire - fighting measures.

Fire of the product itself. If the fire is very close, or it is in the product itself, do not attempt to put the fire out. Move away to a safe distance, cut off the area and warn the authorities. NEVER ATTEMPT TO EXTINGUISH THE FIRE.
Fire near the product. If the fire is near the product, and if there is no risk of explosion, use an extinguishing agent appropriate for the fire. Use individual safety gear appropriate to the type of fire.

6. Accidental release measures.

a) Personal precautions.
Avoid any flame or heat source capable of causing sparks. Do not smoke.
Avoid any kind of collision or friction. Do not walk on any spilled product.
Cut off the spillage area.
b) Precautions to protect the environment.
In the event of spillage, the product should not go further than the limits of the factory and/or location where it is used, nor should it come into contact with the natural environment (surface and underground waters, etc) If it goes beyond the limits, the authorities must be notified.
c) Cleaning methods.
Clean up the spilled product manually, using tools that do not produce sparks.
If the packaging tears, seal it with adhesive tape.
Place any left over product in plastic bags then place these inside cardboard boxes and seal them with adhesive tape.
Place any left over product in a well-ventilated area away from products which are flammable or oxidants, etc. until it is to be destroyed. Destruction should be carried out as per section 13.

7. Handling and storage.

7.1. Handling.
Floors, clothing and shoes used must be anti-static.
Avoid knocks and sudden movements.
Do not open packages during transportation.
Tools used when handling the product must be made of non-ferrous material, such as copper, brass or wood.
Do not smoke.
7.2. Storage.
Store in premises authorized for these purposes; they should be dry, well-ventilated and away from direct sunlight.
Recommended storage temperature between 0ºC and +30ºC.
The product must only be stored with materials from permitted compatibility groupings according to transport regulations.
Do not store with flammable products, oxidants or primary explosives.
If the product is packaged in boxes, do not pile these excessively high.
Aim to ensure that the product with the earliest date of manufacture leaves the warehouse first.
The product quantities stored must comply with prevailing regulations.
Do not smoke or light a fire in the storage warehouses.
7.3. Specific uses. It is designed for contour blasting (pre-splitting and cutting), clearing, tunnels, and quarries.

8. Exposure control / personal protection.

8.1. Exposure limit values.
TLV= Threshold Limit Value; TLV-TWA= Weighted average in time; TLV-STEL= Short term exposure limit; TLV-C= Ceiling value.
Data obtained from the "List of professional exposure environmental limit values", issued by the National Institute for Occupational Safety and Health, in accordance with what is established in section 3 of article 5 of the RD 39/1997, of January 17th.

Substance	TLV-TWA	TLV-STEL	TLV-C	Critical effects on which the TLV is based
Aluminium	10 mg / m^3	-	-	Pneumoconiosis (baritosis)
Pentaerythritol tetranitrate	15 mg / m^3	-	-	Irritation

8.2. Exposure controls.
8.2.1. Occupational exposure controls.
a) Respiratory protection: This is not normally necessary in well-ventilated areas. A mask with an appropriate filter must be worn when entering badly ventilated areas after an explosion.
b) Hand protection: Neoprene (Np) / PVC gloves. Do not eat, drink or smoke without first cleaning your hands well.
c) Eye protection: Use safety goggles and a helmet to protect against possible projections.
d) Skin protection: Anti-static work overalls. Use safety footwear with a conductive sole and reinforced toes.
8.2.2. Environment exposure controls.
Avoid contact with the natural environment and particularly with water. See also section 12 "Ecological Information" of this Safety Datasheet.
- Anion nitrate reference value (NO^{3-}): Maximum level in drinking water: 50 mg / l (European Directive 80/778/CEE and European Directive 98/83/CE).
- Ammonium cation (NH^{4+}) reference value: Maximum level in drinking water: 0.5 mg / l (European Directive 80/778/CEE and European Directive 98/83/CE). Maximum level in rivers so as to not endanger marine life, 1 mg / l (European Directive 78/659/CEE).

9. Physical and chemical properties.

9.1. General information.
- Appearance: Grey coloured pasty solid.
- Smell: Does not present any particular smell.

9.2. Important health, safety and the environmental information.

Parameter	Value	Test method
- Decomposition point	$\geq$ 170ºC	UNE 31 017
- Detonation temperature	$\geq$ 200ºC	UNE 31 017
- Impact sensitivity	$\geq$ 98 J	UNE 31 016
- Friction sensitivity	$\geq$ 294 N	UNE 31 018
- Density	1.04 – 1.20 g / cm^3	ITEUN EXP – 516
- Water resistant	COMPLIES	ITEUN EXP – 515
- pH	3.5 – 5.5	ITECOR - 006
- Water solubility (Ammonium nitrate)	192 g / 100 ml water at 20ºC	
- Water solubility (Sodium nitrate)	92.1 g / 100 ml water at 25ºC	

10. Stability and reactivity.

10.1. Conditions to avoid. The product is stable under normal storage conditions throughout its useful life. Avoid heat sources. Risk of mass explosion in the event of fire, friction or collision.
10.2. Materials to avoid. Avoid contact with acids and bases.
10.3. Hazardous decomposition products.
- Nitrogen monoxide (NO)
- Nitrogen dioxide (NO_2)
- Carbon monoxide (CO)
- Carbon Dioxide (CO_2)

11. Toxicological information.

Inhalation. Explosion and combustion produce toxic fumes; do not approach the area where the explosion took place unless you are certain that they have completely lifted.
Ingestion. No data available.
Contact with skin.
Short term exposure to Ammonium Nitrate causes irritations, and may have an effect on the blood, leading to the production of methaemoglobin.
Short term exposure to Sodium Nitrate causes irritations, and may have an effect on the blood, leading to the production of methaemoglobin. The effects may not immediately appear.
Contact with eyes. Contact with eyes may cause irritation of the eye mucus.

12. Ecological information.

12.1. Ecotoxicity.
- Ammonium nitrate reference value:

Toxicity in fish: 74000 µg/ l 48 hours LC50 (Lethal).
Toxicity in invertebrates: 70,000 µg/ l 0.17 days (Physiological).
- Sodium nitrate reference value:

Toxicity in fish: 573000 µg/ l 96 hours LC50 (Lethal).
Toxicity in invertebrates: 77,200 µg/ l 120 hours LC 50 (Paralysation).
Toxicity in algae: 120,000 µg/ l 1 year (Photosynthesis).
- Aluminium reference value:

Toxicity in fish: 293 µg/ l 7 hours LETH (Lethal).
Toxicity in invertebrates: 2600 µg/ l 24 hours LC50 (Lethal).
- Pentaerythritol tetranitrate reference value:

Toxicity in fish: Between 320,000 and 1,000,000 µg / l 96 hours LC50 (Lethal).
Toxicity in invertebrates: 8500000 µg/ l 48 hours (Lethal).
12.2. Mobility. No data available. Parameter under study.
12.3. Persistence and degradability. No data available. Parameter under study.
12.4. Bioaccumulative potential.
- Aluminium reference value: 36 µg/ l 56 hours BCF (Waste).

12.5. Other adverse effects.
- Ammonium nitrate reference value: Oral – rats, dose– lethal – 505, LD50 2217 mg/ kg.

Pentaerythritol tetranitrate damages the marine environment.

13. Disposal considerations.

Any residue must be destroyed by taking into account the regulations contained in the European Directives 75/442/CEE and 91/689/CEE.
Destruction of explosives should be carried out by specialised personnel, using controlled processes and installations authorised by the competent bodies.
Consult your manufacturer and/or distributor.

14. Transportation information.

ADR / IMDG

- Identification no. (ONU No.)	UN 0241
- Official transportation name	EXPLOSIVE, BLASTING, TYPE E
- Classification code (Division and Compatibility Group)	1.1 D
- Packaging group / Container	II
- Packaging instructions	P116 / IBC100
- Danger label example	NO. 1

15. Regulatory information.

1. REGULATIONS:
- Directive 93/15/EEC of 5 April1993 on the harmonization of the provisions relating to the placing on the market and supervision of explosives for civil uses.
- Directive 1999/45/CE of the European Parliament and of the Council of 31 May 1999 concerning the approximation of the laws, regulations and administrative provisions of the Member States relating to the classification, packaging and labelling of dangerous preparations.
- Council Directive 92/32/EEC of 30 April 1992 amending for the seventh time Directive 67/548/EEC on the approximation of the laws, regulations and administrative provisions relating to the classification, packaging and labelling of dangerous substances.
- Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006, only in relation to the Safety Data Sheets in which guidelines have been established to produce safety datasheets for dangerous preparations.

2. OTHER REGULATIONS:
- Legislation and standards relating to use, transportation and storage of explosives.
- Legislation and standards relating to entry into bounds and confined spaces.

16. Other information.

- This product must be handled carefully and only by authorised personnel.
- This product must be stored, handled and used in accordance with good industrial health procedures and must conform to applicable legislation. Always follow all laws, state and/or regional and/or local standards referring to transport, storage and use of this product.

- The R and S phrases are the following:

Preparation

R PHRASES	
R – 3	Alto riesgo de explosión por choque, fricción, fuego u otras fuentes de ignición.
R – 5	Heating may cause an explosion.
S PHRASES	
S – 15	Keep away from heat.
S – 16	Keep away from sources of ignition – No Smoking!.
S – 33	Take precautionary measures against static discharges.
S – 35	This material and its container must be disposed of in a safe way.
S – 41	In case of fire and/or explosion do not breath fumes.

Components

R PHRASES	
R – 2	Risk of explosion by shock, friction, fire or other source of ignition.
R – 5	Heating may cause an explosion.
R – 8	Contact with combustible material may cause fire.
R – 9	Explosive when mixed with combustible material.
R – 10	Flammable.
R – 15	Contact with water liberates extremely flammable gases.
R – 31	Reaction with acids giving off dangerous gases.
R – 36/37/38	Irritating to eyes, respiratory system and skin.
R – 48/20/21	Harmful: danger of serious damage to health by prolonged exposure through inhalation and in contact with the skin.
S PHRASES	
S – 2	Keep out of the reach of children.
S – 7/8	Keep container tightly closed and dry.
S – 15	Keep away from heat.
S – 16	Keep away from sources of ignition – No Smoking!.
S – 17	Keep away from combustible material.
S – 21	When using do not smoke.
S – 25	Avoid contact with eyes.
S – 26	In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S – 33	Take precautionary measures against static discharges.
S – 35	This material and its container must be disposed of in a safe way.
S – 41	In case of fire and/or explosion do not breath fumes.
S – 43	In case of fire, use sand or soil. Neve use water.

The information contained in this Safety Datasheet is based on our current knowledge and experiences relating to the product with regards to safety, health and the environment, which consequently means that we cannot guarantee that this information is complete or precise. This information does not guarantee the product's properties.
It is the user's responsibility to determine the appropriate use of this information and the described product, the training of its employees regarding the product's risks and the precautionary measures to minimize this risk. The user is also responsible for complying with applicable legislation relating to this product with regards to health, safety and the environment.