

SAFETY DATA SHEET

EMULFAN

Section 1: Product Identification

Product Trade Name:	EMULFAN 300S, 600S
Generic Name by SUCAMEC:	CARTRIDGED EMULSION OR HYDROGEL
Recommended Use and Restrictions:	<p>EMULFAN is an explosive agent based on explosive emulsion inside a plastic envelope containing sensitizing and energizing substances. EMULFAN has been designed to work in drills of intermediate diameters (diameters greater than 2 ½" and less than 3 ½") either as a bottom load or as a column load with plenty of water that cannot be evacuated or where it cannot be loaded by mechanized means.</p> <p>Its handling temperature range is from -8°C to 50°C.</p>

Provider Information

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Section 2: Hazards Identification
Substance or Mixture GHS Classification

Blasting explosive, type E

UN Number 0241

Class or Division 1.1D

Description		Hazard Identification
Physical Hazards	Explosives 1.1	H201 Explosive; danger of mass explosion.
Health Hazards	Acute Ingestion Toxicity, Cat. 4	H302 Toxic if swallowed.
	Skin irritation, Cat. 3	H316 Causes mild skin irritation.
	Eye irritation, Cat. 2B	H320 Causes eye irritation.
	Respiratory sensitization Cat. 1	H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.
Environmental Risks	Short-term hazard to the aquatic environment, Cat. 2	H401 Toxic to aquatic organisms.

Signal Word: Hazard.

GHS Label Element

Cautionary Advice
In terms of prevention

P210	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. Do not smoke.
P234	Keep only in original packaging.
P240	Grounding and equipotential bonding of the vessel and the receiving equipment.
P250	Avoid abrasion, shock and friction.
P261	Avoid breathing fumes.
P264	Wash hands thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P273	Do not release into the environment.
P280	Wear protective gloves, protective clothing, eye and ear protection.

In the event of interference

P330	Rinse mouth.
P301 + P317	IF SWALLOWED: seek medical attention.
P332 + P317	In case of skin irritation: seek medical advice.
P342 + P316	In case of respiratory symptoms: seek immediate emergency medical help.
P305 + P351 + P338	IF IN EYES: Rinse continuously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing.
P337 + P317	If eye irritation persists: Get medical advice.
P370 + P372 + P380 + P373	In case of fire: Risk of explosion. Evacuate area. DO NOT fight fire when fire reaches explosives.

For storage

P401	Store according to local regulations.
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For disposal

P501	Dispose of contents / container in accordance with local regulations.
P503	Ask the manufacturer / supplier for information on disposal / recovery / recycling.

Other hazards

No information is available.

Section 3: Composition / Information of components

Chemical Identity	Common Name	CAS Number	Concentration
Ammonium Nitrate	Not Applicable	6484-52-2	40.0 – 90.0%
Sodium Nitrate	Not Applicable	7631-99-4	5.0 – 40.0%
Thiourea	Not Applicable	62-56-6	0.0 – 3.0%
Aluminum	Not Applicable	7429-90-5	0.0 – 10.0%
Microspheres	Not Applicable	65997-17-3	0.0 – 5.0%

Section 4: First Aid Measures

Inhalation: Move exposed person to a place where he/she can breathe uncontaminated air. Get medical attention.

Skin Contact: Wash immediately with soap and water. If irritation, redness or burning sensation exists and persists, seek medical attention.

Eye Contact: Wash immediately with plenty of water for at least 15 minutes holding eyelids up. If irritation occurs, repeat rinsing and seek medical attention.

Ingestion: Do not induce vomiting. Rinse mouth and give water to drink. Never give liquids to an unconscious person. Seek medical attention immediately.

Most important symptoms / effects: Abdominal pain, nausea, vomiting, motor weakness, anemia.

Most acute symptoms / effects: Hypertension, abdominal pain, nausea, vomiting.

Delayed symptoms / effects: Abdominal cramps, anemia, anxiety, insomnia, motor weakness. Seek medical attention if they occur.

Immediate indications and special treatment: No information is available.

Section 5: Fire-fighting measures

Suitable extinguishing media: Do not fight fire. Evacuate area immediately, prevent access, do not breathe fumes from fire.

Specific hazards of the chemical: Heat under confined and/or special conditions may cause violent reaction or explosion. May detonate when subjected to fire or under severe impact. Risk of mass explosion in case of fire.

Special protective equipment and special precautions for fire-fighting equipment: Evacuate area in all directions 1.6 km or more. Allow fire to burn out. Do not allow personnel to pass. Clear area.

Section 6: Measures to be taken in case of accidental release

Personal Precautions: Only trained and authorized personnel must take actions in emergency situations.

Personal Protective Equipment: Gloves, safety glasses with side protection, work clothes, safety shoes.

Emergency Procedures:

- Restrict access to the spill area.
- Remove sources of heat and ignition.
- Do not allow access to unauthorized personnel.
- Minimize the number of people in the risk area.
- All equipment used in handling the spill should be grounded.
- Use non-sparking equipment and tools when handling the material.
- Do not touch or walk over spilled material.

Environmental precautions: Take precautions to prevent contamination of streams and drains.

Methods and materials for isolation and cleaning up: Spilled material should be placed in properly identified containers, do not use metal objects or any tools that may produce sparks. Place the product in marked containers. Decontaminate the spill area. Dispose of the material under supervision of qualified personnel.

Section 7: Handling and Storage

Precautions for Safe Handling

Operational and Technical Measures to avoid exposure: This product should be handled by qualified and authorized personnel in the use of the explosive. Handle with extreme care, bearing in mind that this product is sensitive under certain conditions of shock, friction, spark and fire.

Other precautions: The handling temperature range of EMULFAN is from -8°C to 50°C.

Storage Conditions

Conditions for Safe Storage: It will be stored only with compatible products. The ammunition dump designed for storage shall comply with all the requirements established by current regulation. The warehouse must be a dry, fresh, clean, and ventilated area with electrical connection to the earth. Must be stored in powder magazines at temperatures between 5 °C and 30 °C.

Incompatible Substances and Mixtures: Do not store with corrosive, volatile, combustible, acid and base chemical substances, or metallic elements.

Section 8: Exposure control / personal protection

Control parameters

No value is recorded for this specific material; however, exposure limits are described, according to international standards, for particulate matter and decomposition products:

Product name: AMMONIUM NITRATE, SODIUM NITRATE

Dusts not otherwise classified: 8hr TWA = 10 mg/m³

Nitrogen dioxide: 8hr TWA = 5.6 mg/m³ (3 ppm), 15 min STEL=9.4 mg/m³ (5 ppm)

Mineral oils: 8hr TWA = 5 mg/m³

Appropriate engineering controls

Apply engineering measures to comply with occupational exposure limits. Eye drop stations. Ventilation system.

If safe exposure levels could be exceeded in the handling and application of this material, engineering controls such as local exhaust ventilation should be considered. If safe exposure levels are achieved, engineering controls are not required, following a detailed and documented risk assessment using personnel.

Personal Protective Equipment (PPE)

Eye Protection: Safety glasses fitted to the contour of the face that meet ANSI/ISEA Z87.1-2015 requirement.

Skin and Body Protection: Safety clothing and footwear should be appropriate according to current regulations, e.g. cotton uniform to avoid static charge build-up.

Respiratory Protection: Not required during handling. During combustion of EMULNOR3000 5C there is a risk of inhalation exposure, use flue gas respirator complying with ANSI/ASSE Z88.2 - 2015.

Thermal Hazards: Not applicable.

Hand Protection: The use of protective gloves made of impermeable material with chemical resistance is recommended. They may be made of nitrile or better, complying with the UNE-EN-420:2004 standard.

Section 9: Physical and chemical properties

Physical State: Semi-solid pasty mass in plastic cartridges.

Color: Gray

Odor: Odorless.

Melting Point / Freezing Point: Not applicable.

Boiling point or initial boiling point and boiling range: Not applicable.

Flammability: Flammable product.

Lower and upper explosion limit / flammability limit: No information is available.

Flash Point: No information is available.

Autoignition Temperature: No information is available.

Decomposition Temperature: No information is available.

pH: No information is available.

Kinematic Viscosity: No information is available.

Solubility: Insoluble in water.

Partition coefficient n-octanol/water (logarithmic value): No information is available.

Vapor Pressure: No information is available.

Relative density (ENULFAN 300S; EMULFAN 600S): $1.24 \pm 0.10 \text{ g/cm}^3$; $1.28 \pm 0.10 \text{ g/cm}^3$

Vapor relative density (air=1): No information is available.

Particle Characteristics: No information is available.

Section 10: Stability and Reactivity

Reactivity: Explosive

Chemical Stability: Product is stable at normal recommended environmental conditions of storage and handling. Risk of explosion due to energy, shock, fire or other sources of ignition. Capable of explosive detonation, decomposition or reaction, but requires a strong initiation source or must be heated in confinement.

Possibility of Hazardous Reactions: A major fire may involve an explosion hazard. An adjacent detonation may also involve an explosion hazard. A massive explosion may occur due to shock, friction, fire or other ignition sources. Explosion creates the projection of shrapnel.

Conditions to Avoid: Heat. Keep away from open flames, hot surfaces and sources of ignition. Static discharge (electrostatic discharge). Do not subject to grinding / shock / friction. Avoid contact with other chemicals. Avoid contact with flammable substances.

Incompatible Materials: Incompatible with strong acids and bases. Incompatible with metallic elements.

Hazardous Decomposition Products: Ammonia (NH_3), Oxides of nitrogen (NO_x), Carbon monoxide (CO), Carbon dioxide (CO_2).

When heated to decomposition (unconfined), ammonium nitrate produces nitrous oxide, white ammonium nitrate fumes and water. When mixed with strong acids and occasionally during blasting, it produces an irritating toxic brown gas, mainly nitrogen dioxide. When molten it can decompose violently.

Section 11: Toxicological Information

Acute Toxicity (DL 50, CL 50): No information is available.

Corrosion / Irritation: None under normal handling conditions. In some cases, prolonged contact with the explosive mass may cause mild skin irritation.

Serious Eye Damage/Eye Irritation: May cause mild eye irritation.

Respiratory or Skin Sensitization: Flue gases may cause respiratory sensitization.

Germ Cell Mutagenicity: No information is available.

Carcinogenicity: No information is available.

Reproductive Toxicity: No information is available.

Specific Target Organ Systemic Toxicity – Single Exposure: No information is available.

Specific Target Organ Systemic Toxicity – Repeated Exposures: No information is available.

Aspiration Hazard: No information is available.

Section 12: Ecotoxicological Information

Ecotoxicity: Avoid contact with waterways and soils.

Persistence and Degradability: No information is available.

Bioaccumulative Potential: No information is available.

Soil Mobility: No information is available.



Other adverse effects: No information is available.

Section 13: Information regarding the disposal of products

Recommended and approved methods for safe disposal: All waste must be handled according to national regulations. Small quantities or deteriorated explosives can be destroyed by placing them in an auger containing a good explosive. For large quantities of damaged or deteriorated explosives, please notify Famesa Explosivos S.A.C.

Recommended and approved methods for disposal of contaminated containers/packaging: Burn under controlled conditions while strictly following national procedures.

Section 14: Transport Information

Mode of transport applied	Road	Sea	Air
National and international regulations	SUCAMEC / Law 28256	IMO / IMDG	IATA / DGR
UN Number	0241	0241	Forbidden
Proper UN Shipping Name	Blasting explosive, type E	Blasting explosive, type E	Not Applicable
Transport classification	1.1D	1.1D	Not Applicable
Label			Not Applicable
Packaging group	II	II	Not Applicable
Environmental hazards	No information is available	No information is available	No information is available
Bulk transport according with IMO instruments	Not Applicable	Not Applicable	Not Applicable

Section 15: Regulatory Information

National Regulations

- Regulation on the Control of Explosives for Civil Use – Peru (SUCAMEC)
- Law No. 28256: “Law regulating the Land Transportation of Hazardous Materials and Hazardous Wastes”.

International Regulations

- Globally Harmonized System of Classification and Labeling of Chemicals (GHS), United Nations, 8th version.
- International Maritime Dangerous Goods Code (IMDG Code), IMO, 2018 edition.
- Dangerous Goods Regulations (DGR), IATA, Issue 62.

Section 16: Other Information

This safety data sheet has been prepared by professionals from the areas of Industrial Safety, Environment, Quality Control, Research and Development and the Occupational Physician of Famesa Explosivos.

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Abbreviations and Acronyms

DL50 – Lethal dose for 50% of the population tested.

CL50 – Lethal concentration for 50% of the population tested.

UN - United Nations Organization.

BOD - Biochemical Oxygen Demand.

TWA - Time Weighted Average Concentration.

CAS - Chemical Abstracts Service.

PBT - Persistent, Bioaccumulative and Toxic Substances.

vPvB - Very Persistent and Very Bioaccumulative Substances.

Disclaimer of Liability

Famesa Explosivos S.A.C., hereinafter Famesa, has prepared this safety data sheet based on our extensive knowledge at the date of issue, on chemical health hazards, material safety and general guidance on how to handle the material safely in the workplace. Since Famesa cannot anticipate or control the conditions of use of the product, each user must, prior to handling, evaluate and control the risks of the product.

If you need clarification and/or further information, please contact FAMESA EXPLOSIVOS S.A.C. through our telephone and/or mail indicated in section 1 of this document.