SAFETY DATA SHEET

Product: Britex® (Reforçador para detonação)

Revision: 02 | Date: 06/09/2017 | Pages: 1 /13

1- IDENTIFICATION

Product identifier:	Britex® (Reforçador para detonação)
Recommended use of the chemical and restrictions on use:	Initiation of less sensitive explosives as Anfomax and Bulk emulsions. It can also be used as enhancer of Cartridge emulsions.
Manufacturer's name:	Enaex Britanite
Address:	Rodovia Régis Bittencourt (BR 116), Km 01 sem número. Bairro Florestal - Quatro Barras – Paraná
Telephone number:	(41) 3671-8200
Emergency telephone number:	Emergence in the application: 0800 770 8099 Emergencies during transport: 0800 770 8099

2- HAZARDS IDENTIFICATION

Classification of the chemical:	Explosives – Division 1.1
Signal Word:	DANGER
Hazard statement(s):	Explosive; mass explosion hazard.
Symbol(s):	
Precautionary statement(s):	Keep away from heat, sparks, open flames and hot surfaces. - No smoking. Keep wetted with adequate material. Ground and bond container and receiving equipment. Do not subject to grinding, shock or friction. Wear face protection. In case of fire: evacuate area. Explosion risk in case of fire.

	Do NOT fight fire when fire reaches explosives. Store in accordance with local regulations. Dispose of contents/container in accordance with local regulations.
Classification system adopted:	OSHA HCS 29 CFR 1910.1200 Globally Harmonized System of Classification and Labeling of Chemicals (GHS), United Nations.
Other hazards which do not result in classification:	It is not expected other hazards.

3- COMPOSITION/INFORMATION ON INGREDIENTS

MIXTURE

Ingredients contributing to the classification:

Components	Concentration (%)	CAS number
Pentaerythritol tetranitrate	40 - 70	78-11-5
Trinitrotoluene	30 - 50	118-96-7

4- FIRST-AID MEASURES

Description of necessary measures

Inhalation:	Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or doctor/physician if you feel unwell. Take this SDS.
Skin contact:	Wash exposed skin with enough water to remove the material. In case of irritation: Consult a doctor. Take this SDS.
Eye contact:	Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. If eye irritation persists: Get medical advice/attention. Take this SDS.
Ingestion:	Do not induce vomiting. Never give anything by mouth to an unconscious person. Rinse the victim's mouth with water. Call a POISON CENTER or doctor/physician If you feel unwell. Take this

	SDS.
Most important symptoms and effects, acute and delayed:	Symptoms and effects are not expected after exposure to the product, only in case of coating mechanical violation.
Indication of any immediate medical attention and special treatment needed:	Avoid contact with the product to help the victim. Keep victim warm and quiet. Symptomatic treatment should comprise mainly supportive measures such as correction of electrolyte disturbances, metabolic, and respiratory support. In case of skin contact do not rub the affected site. In the case of explosion, the impact varies and can cause injury, bruises, fractures or burns. Check the hearing of the people who were close to the explosion.

5- FIRE-FIGHTING MEASURES

Extinguishing media:	Do not fight fire when it reaches the load. Explosion can occur.
Specific hazards arising from the chemical product:	Do not stay near the load during extinction of fire because the load can explode. Keep a safe distance. Very dangerous when exposed to excessive heat or other sources of ignition such as sparks, open flames or burning cigarettes and matches, welding operations, pilot lamps and electric motors. The combustion of the chemical or from containers may form toxic and irritant gases such as carbon monoxide, carbon dioxide. If the fire reaches the load, evacuate the area within a radius of at least 1600 meters, removing of the place, including emergency workers, because the load can explode.
Special equipment for the protection of firefighters:	Self-contained breathing apparatus (SCBA) operated in positive pressure mode and complete protective clothing.

6- ACCIDENTAL RELEASE MEASURES

Personal precautions:	Remove all sources of ignition. Prevent sparks or flames. Do not touch damaged containers or spilled material without the use of appropriate clothing. Avoid inhalation, contact with skin or eyes.
Protective equipment:	Use protective equipment as described in Section 8.
Emergency procedures:	It is recommended the installation of fire alarm system and leak

	detection in local storage and use of the product.
Methods and materials for containment:	Containment techniques may include bunding, covering of drains and capping procedures. Eliminate all sources of heat and keep away the combustible materials. Signal and isolate the area. Use only anti-sparking tools. Clean the area with the orientation of a specialist. Collect the product in plastic bags. Remove them to a safe place. For disposal, proceed according to Section 13 of this SDS.

7- HANDLING AND STORAGE

Precautions for safe handling:	Handle in a well ventilated area or with general system of ventilation/local exhaust. Avoid dusts formation. Avoid exposure to the chemical. Avoid contact with incompatible materials. Keep away from heat, sparks, open flames and hot surfaces. - Do not smoke. Keep container tightly closed. Ground the container vessel and the receiver of the product during transfers. Only use anti-sparking tools. Avoid the accumulation of electrostatic charges. Use electrical equipment, ventilation and lighting explosion proof. Contaminated clothing should be changed and washed before reuse. Remove clothing and protective equipment contaminated before entering eating areas. Wash hands and face thoroughly after handling and before eating, drinking, smoking or going to the bathroom. Use personal protective equipment as described in Section 8.
Conditions for safe storage, including any incompatibilities:	Store in a well ventilated place away from sunlight. Keep container closed. Keep stored at room temperature. Keep away from high temperatures, ignition sources and incompatible materials. Incompatible with: Detonation initiators, acids, alkalis, oxidizing agents and reducing agents. Recommended packaging materials: Similar to the original packaging

8- EXPOSURE CONTROLS AND PERSONAL PROTECTION

Control parameters:

Occupational exposure limit:	Chemical or common name	TLV – TWA (ACGIH, 2016)	PEL – TWA (OSHA, 2006)	REL – TWA (NIOSH, 2010)
	Trinitrotoluene	0.1 mg/m^3	1.5 mg/m^3	0.5 mg/m^3

Biological limit:	- Trinitrotoluene: BEI (ACGIH, 2016): Methemoglobin in blood (During or end of shift): 1.5% da hemoglobin. B, Ns, Sq B: The determinant may be present in biological specimens collected from subjects who have not been occupationally exposed, at a concentration which could affect the interpretation of the results. Such background concentrations are incorporated in the BEI value. Ns: The determinant is nonspecific, since it is also observed after exposure to other chemical. Sq: The biological determinant is an indicator of exposure to the chemical, but the quantitative interpretation of measurement is ambiguous. These determinants should be used
Other limits and value:	Information regarding to: - Trinitrotoluene: 500 mg/m^3
Appropriate engineering controls:	Promote direct mechanical ventilation and exhaust system to the outside environment. These measures help reduce exposure to product. Maintain atmospheric concentrations of the constituents of the product below occupational exposure limits indicated.

Individual protection measures, such as personal protective equipment

Respiratory protection:	Use respiratory protection if ventilation or exhaust system is not adequate.
Hand protection:	PVC or latex gloves.
Eye protection:	Safety goggles.
Skin and body protection:	Use cotton clothing, apron with chemicals protection, safety shoes and

cream to protect the hands.

9- PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Packaging plastic/cardboard containing inside a solid explosive, orange to brown.
Odour:	Nonexistent.
Odor threshold:	Not available.
pH:	Not available.
Melting point/freezing point:	80°C
Initial boiling and boiling range:	Not available.
Flash point:	Not available.
Evaporation rate:	Not available.
Flammability (solid, gas):	Not available.
Upper/lower flammability or explosive limits:	215°C
Vapour pressure:	Not available.
Vapour density:	Not available.
Relative density:	Not available.
Solubility(ies):	Insoluble in water.
Partition coefficient: n-octanol/water:	Not available.
Auto-ignition temperature:	Not available.
Decomposition temperature:	Not available.
Viscosity:	Not available.
Other information:	Absolut density: 1.6 g/cm^3

10- STABILITY AND REACTIVITY	
Reactivity:	It is not expected that the product shows reactivity potential.
Chemical stability:	Product is stable under normal conditions of temperature and pressure.
Possibility of hazardous reactions:	Product may detonate on impact, shock, flame or lot of heat. The product can detonate in the presence of fire, intense heat and impact.
Conditions to avoid:	Elevated temperatures. Ignition sources and contact with incompatible materials.
Incompatible materials:	Detonation initiators, acids, alkalis, oxidizing agents and reducing agents.
Hazardous decomposition products:	Nitrogen oxides and carbon monoxide.

11- TOXICOLOGICAL INFORMATION	
Symptoms related to the physical, chemical and toxicological characteristics:	Symptoms and effects are not expected after exposure to the product, only in case of coating mechanical violation.
Delayed and immediate effects and also chronic effects from short- and long-term exposure	
Acute toxicity:	It is not expected that the product presents acute toxicity. Only in case of mechanical violation of the container. ATE (Acute Toxicity Estimate) ATE (oral): 1320 mg/kg Information related to: - Trinitrotoluene: LD_{50} (oral, rats): 660 mg/kg
Skin corrosion/irritation:	It is not expected that the product causes skin irritation.
Eye damage/irritation:	It is not expected that the product causes eye irritation.
Sensitization - respiratory or skin:	It is not expected that the product presents respiratory or skin sensitization potential.
Germ cell mutagenicity:	It is not expected that the product presents reproductive cell

	mutagenicity.
Carcinogenicity:	It is not expected that the product have carcinogenicity to humans. Information related to: - Trinitrotoluene: Possibly not carcinogenic to humans (Group 3 – IARC).
Toxic to reproduction:	It is not expected that the product presents reproductive toxicity.
Specific target organ toxicity (single exposure):	It is not expected that the product presents specific target organ toxicity by single exposure. Only in case of violation mechanical of the container causes effects on the cardiovascular system, resulting in lowering of blood pressure with fatigue, general malaise, headache and dizziness.
Specific target organ toxicity (repeated exposure):	It is not expected that the product present specific target organ toxicity by repeated exposure. Only in case of mechanical violation of the container may cause damage to the liver, eye, central nervous system and circulatory system through prolonged or repeated exposure. Trinitrotoluene exposure can cause nausea, vomiting, weakness, drowsiness, tremors and convulsions. May cause clouding of the cornea (cataract formation), which can damage the eyesight. Can damage red blood cells, with haemolysis and formation of methemoglobin, resulting in anemia. Can cause jaundice.
Aspiration hazard:	It is not expected that the product presents aspiration hazard.

12- ECOLOGICAL INFORMATION

Ecotoxicity:	Product not classified as dangerous for the aquatic environment. Only in case of violation mechanical container. Information related to: - Trinitrotoluene: LC_{50} (*Pimephales promelas*, 96h): 2.4 mg/L - Pentaerythritol tetranitrate: LC_{50} (*Daphnia magna*, 48h): 8500 mg/L
Persistence and degradability:	The product does not have persistence and it is considered readily

	biodegradable.
Bioaccumulative potential:	It is not expected that the product presents bioacumulative potencial in aquatic organisms.
Mobility in soil:	Not determined.
Other adverse effects:	There are not known adverse environmental effects of the product.

13- DISPOSAL CONSIDERATIONS

Description of waste residues and information on their safe handling and methods of disposal, including the disposal of any contaminated packaging:	Must be disposed of as hazardous waste in compliance with local regulations. The treatment and disposal should be evaluated for each specific product. Keep the product remains in its original and properly closed. Disposal should be performed as established for the product. Do not reuse empty containers. These may contain product residues and should be kept closed and sent for proper disposal as established for the product.

14- TRANSPORT INFORMATION

International regulations	
Land:	U.S. DEPARTMENT OF TRANSPORTATION (DOT) Code of Federal Regulations (CFR)
UN number:	0042
UN proper shipping name:	BOOSTERS
Transport hazard class(es):	1.1D
Packing group:	NA
Sea:	IMO – International Maritime Organization International Maritime Dangerous Goods Code (IMDG Code)
UN number:	0042
UN proper shipping name:	BOOSTERS
Transport hazard class(es):	1.1D

Packing group:	NA
Marine pollutant:	The product is not considered a marine pollutant.
EmS:	F-B, S-X
Air:	IATA – International Air Transport Association Dangerous Goods Regulation (DGR)
UN number:	FORBIDDEN FOR AIR TRANSPORT
Environmentally hazardous:	The product is not considered environmentally hazardous.
Transport in bulk according to MARPOL 73/78, Annex II, and the IBC Code:	Consult regulations: - International Maritime Organization. MARPOL: Articles, protocols, annexes, unified interpretations of the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto, consolidated edition. IMO, London, 2006; - International Maritime Organization. IBC code: International code for the construction and equipment of shipping carrying dangerous chemicals in bulk: With Standards and guidelines relevant to the code. IMO, London, 2007.
Special precautions:	There is no need of special precautions.

15- REGULATORY INFORMATION

Safety, health and environmental regulations specific for the product:	International Labor Organization C170 Chemicals Convention, from June 25th, 1990: Occupational Safety and Health – Toxic Substances and Agents. Hazard Communication Standard (HCS) 29 CFR: 1910.1200 - Appendix A,B,C,D, E,F.

16- OTHER INFORMATION

This SDS was prepared based on current knowledge about the proper product handling and under normal conditions of use, in accordance with the application specified on the packaging. Any other use of the product involving their combination with other materials, and use various forms of those indicated, are the responsibility of the user. Warns that the handling of any chemical substance requires

the prior knowledge of its hazards for the user. In the workplace it is for the user company's product promotes training of its collaborators about the possible risks arising from exposure to the chemical.

SDS elaborated in June 2017.

Abbreviations:

ACGIH – American Conference of Governmental Industrial Hygienists
AIHA – American Industrial Hygiene Association
BEI – Biological Exposure Index
CAS – Chemical Abstracts Service
ERPG - Emergency Response Planning Guidelines
LEL – Lower Explosive Limit
UEL – Upper Explosive Limit
NIOSH – National Institute of Occupational Safety and Health
OSHA – Occupational Safety & Health Administration
PEL – Permissible Exposure Limit
REL – Recommended Exposure Limit
STEL – Short Term Exposure Limit
TLV – Threshold Limit Value
TWA – Time Weighted Average

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IARC – INTERNATIONAL AGENCY FOR RESEARCH ON CANCER. Available at: <http://monographs.iarc.fr/ENG/Classification/index.php>. Acess in: June 2017.

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U.S. ENVIRONMENTAL PROTECTION AGENCY. ECOSAR – Ecological Structure-Activity Relationships. Versão 1.11. Available at: <http://www.epa.gov/oppt/newchems/tools/21ecosar.htm>. Acess in: June 2017.

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