

1- IDENTIFICATIONCommercial identification:**GEMULSTAR V and GEMULSTAR V UMF**Chemical identification: without purpose, mixtureCompany: **TITANOBEL**

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Products	CE type attestation number	Agreement n°
GEMULSTAR V	0080.EXP.07.0031	XN 485 F
GEMULSTAR V UMF	0080.EXP.07.0031	XN 485F*

*extension of agreement

Use of the product: these emulsions are explosives mainly used in knocking down of rocks in quarries, mines and public labor work.

(SU2a: i.e.: mine concern)

VI index n°: without purpose

CAS n°: without purpose

REACH record n°: without purpose (mixture)

2 - IDENTIFICATION OF DANGERS

Danger of mass explosion, affecting almost the entire load practically instantaneously. In case of fire, risk of violent reaction with possible emission of harmful gases (nitrogen oxides NOx and carbon monoxide)

- contact with eyes: irritation

- contact with skin: redness and inflaming

- Although these explosives hardly burn, it is recommended not to subject these products to an intense heat, flames or any source of spark.

- Classification of these explosives

Classification in risk division 1.1 compatibility group D

- Danger symbol

E : Explosive

- Hazard statements**H201: explosive ; risk of mass explosion****H319: Causes serious eyes irritation****3 - COMPOSITION/INFORMATION ON THE COMPONENTS**

Preparation: mixture of mother-emulsion and microspheres

Dangerous matter contained in the mixture	Rate	Danger symbol	CAS N°	N° EINECS	Hazard statements
- Ammonium nitrate	about 70 %	O	6484-52-2	229-347-8	H272, H319
- Sodium nitrate	< 20 %	O	7631-99-4	231-554-3	H319
- Water					
- Mineral oil			8012-95-1		

- Meaning of the danger symbols:

O : Oxidant

- Codes for the hazard statements**H272: solid oxidizing substances****H319 : serious damages to eyes/eyes irritation****4 - FIRST AID**4.1 - General indication

In any case, see immediately a doctor

In case of fire , symptoms appear that may be bound to inhalation of combustion gases

Bring the person outside the contaminated area

If possible, give a dexamethasone spray for inhalation

If necessary, give some oxygen

In case of fainting, lay out and carry the person in a lateral stable position

In case of breathing stop, practise the artificial breath.

After aspiration of dusts, carry the wounded person outside to get fresh air, not polluted

If symptoms persist, for example caught see a doctor

Persons who breath combustion gases do not necessarily present immediately some intoxication symptoms

Patients must leave at least 48 hours under control

4.2 - After contact with skin

Wash with water and if necessary see a doctor

4.3 - Particular indication No purpose

In case of contact with eyes, wash immediately and abundantly with water separating the eyelids during at least 15 minutes and consult a specialist

In case of ingestion, do not give something to drink

Protection of rescuers: avoid extended contact with skin and dust inhalation

5 - FIRE FIGHTING MEASURES5.1 - General indications

Keep away all persons who are not allowed to be there
Inform the neighbors about the explosion's danger

5.2 - Extinction method nearly (the product is still not touched)

Fight against fire with all available ways (water, dry powder extinguishing, etc...)
In any case, avoid the fire reaches the product / material

When needed, drive all vehicles away from the fire

5.3 - Measures to take in case of fire on the product (the fire reaches the product or is going to)

Do not try to extinguish the fire, risk of explosion
Evacuate immediately the dangerous area and look for shelter
Inform the neighbors about the risk of explosion

5.3.1 - Adapted extinguish way

Do not try to extinguish the fire, risk of explosion

5.3.2 - Extinguish ways not to use against fire because of safety no purpose5.4 - Specific dangers bound to the mixture, its combustion products or gases

In addition to the explosion danger, in case of fire or heat, dangerous harmful gases emanation and vapor; as well as development of pyrolysis products, for example, carbon monoxide, nitrogen oxides (nitrated gases), ammoniac, must be expected

Don't breathe the gases / vapor / fumes of the explosion and/or the fire. Risk of development of harmful oedema on lung

Extinguish way:

Possibility by flooding with big quantity of water in case of the beginning of fire.

In case of fire of the product in the warehouse or during the transport: do not intervene, but quickly go far from the fire and close the accesses.

Note: protection of persons who intervene: isolating respiratory devices because of the emission of harmful gases (nitrogen oxides NOx and carbon monoxide).

6 - MEASURES TO TAKE IN CASE OF ACCIDENTAL DISPERSION6.1 - Avoid contact with the unpackaged product with skin and eyes6.2 - Individual cautions

Collect carefully and with adapted individual protection (see § 8)

6.3 - Caution for the protection of the environment

In case of accidental spreading, do not leave the widespread product. Do not discharge to dumps or sewers

6.4 - Cleaning methods

Carry out in a packaging recommended by Titanobel (see § 14) respecting all safety measures bound to manipulation and write on the new packaging the identification of the product. Then, wash meticulously the ground using much water. The recovered product will be dropped in a mine hole before it's end filling.

In case of some particular problem, contact Titanobel.

7 - HANDLING AND STORAGE7.1 - Handling

Technical measures and cautions: during these operations, keep the product away from heat, flames and sparks, avoid any impact or friction. It is strictly forbidden to smoke and to use naked fires.

Using advice: avoid contact with incompatible matters (see paragraph 10). Avoid contact with eyes.

7.2 - Storage

Technical measures: no purpose for explosives produced on the site as the products are used as soon as they are produced.

Storage conditions: keep the product in its original packaging in a temperate warehouse

Storage period: it is recommended to use the Gémulsite 80 within 6 months following the date of production

Incompatible matters: do not store with products out of class 1 as well as products from class 1 but which compatibility group would be different from D or S.

Packaging material: the storage will be made in packaging recommended by Titanobel (see § 14)

7.3 - Particular using

Comply with the regulation (see paragraph 15) and the technical sheet of the product

8 - EXPOSURE CONTROL / INDIVIDUAL PROTECTION8.1 - V. L. I. without purpose8.2 - V. L. E. P.

Nothing to point out in usual using conditions. Nowadays, no exposure limit value for ammonium nitrate, sodium nitrate and aluminum granules (for Gémulsite 100)

8.3 Individual protection equipment

- Protection of the eyes: glasses recommended

- Protection of the body: all handlings must be done with suitable clothes and leather gloves

- Specific hygiene measures: do not eat, drink with contaminated hands.

9 - PHYSICAL AND CHEMICAL PROPERTIES9.1 - Physical / form

The Gémulsite 60 looks like a granular solid with an average diameter of 2 mm coated of emulsion. The Gémulsite 80 and 100 look like a fluid paste scattered with white grains

- Color of the mixture: ivory
- Odor : nor particular odor
- Specific temperatures for change of physical state:

The Gémulstar V becomes thick under 0° C. A break-up can appear between the 2 phases of the emulsion around +100° C

- Flash point > 140° C
- Density ≈ 1.2

9.2 - Important safety indications and sanitary and environment protection

Real acidity value (pH)	not applicable
Ebullition point / ebullition area	not applicable
Inflamability	not applicable
Risk of explosion	can explode, especially with impurities, firing inclusion or strong heat
Burning characteristic	not applicable
Vapor pressure	not applicable
Division rate (n,-octanol/eau)	not applicable
Viscosity	not applicable
Vapor density	not applicable
Vaporization speed	not applicable

9.3 - Pyrotechnical Safety Characteristic

Auto-inflammation's temperature by progressive heating:

Test SNPE 47 (PV/47/14/91/012) (NF T70-504)	Fumes if temperature ≥ 182° C
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Behavior of explosive in bulk:

- Sensitivity to friction

Test SNPE 16 (CSE 3.51/J1) (PV 16/14/03/004) (NF T70-503)	ISF:0 % positive knocks at 353 N
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- Sensitivity to shock drop weight BAM

Test SNPE 14 (CSE 3.41/I1) (PV 14/14/03/003)

ISF: frequency 3 to 4 positive results on 30 to 50.1 J (0% positive (NF T70-500) at maximum 50.1 J)

- Sensitivity to shock drop weight 30 kg

Test SNPE n° 17 (CSE 3.44/I4) (NF T70-501)

On product like: HLNP ≥ 4 m and HLNR ≥ 4 m (PV 17/14/07/002)

On dry product: HLNP ≥ 4m and HLNR ≥ 4m (PV 17/14/07/003)

- Outdoors explosion in gutter

Test SNPE 20 (CSE 3.21/L1) (NF T70-507)	Failure to prime
Sensitivity to priming: test CSE 3.73/P3	Gémulstar V: detonator 0.8 g PETN
Test CSE 3.79/P3	(aluminum tube)
Critical diameter of detonation Test CSE 4.25/Q5	Gémulstar V comprise between 25 and 30 mm

10 - STABILITY REACTIVITY

10.1 - Conditions to avoid

Mechanical influences (for ex. shock, crushing, friction, collision)

Fire, sparks or any other sources of ignition

Temperatures higher than 50° C

Contact with the substances pointed out in paragraph 10.4

10.2 - Stability

In normal conditions, the product is stable chemically. However, in case of an anomaly in the appearance or the behavior of the explosive (gazing freeing, strong odor, significant segregation, warming), the product must be isolated and the anomaly has to be immediately pointed out to the technical department of Titanobel

10.3 - Harmful decomposition products

In the event of fire and/or failure to comply with some of the following prescriptions: possibility of freeing of nitrogen oxides and carbon monoxide

10.4 - Materials to avoid:

Avoid contact with alkalis, amines, strong acids, alkaline metals, copper, zinc and washing powders.

11 - TOXICOLOGICAL INFORMATION

11.1 - Acute toxicity: until this day, no evaluation has been made on the mixture

11.2 - Exposure way: Ingestion, inhalation, eyes and skin

11.3 - Acute effects / symptoms

Following symptoms have been pointed out:

For oil phase	For mineral nitrates
- lightly irritating to skin	- Irritating to skin
- lightly irritating to eyes	- Irritating to eyes

11.4 - Chronicle effect

After exposure/prolonged or repeated contact: eruption or dermatosis

11.5 - Substances/ individual components

Ammonium Nitrate

Acute toxicity (LD₅₀ oral, rat (mg/kg)) = 2217

Weakly irritation/caustic effect (for skin and eyes)

After ingestion, gastro-intestinal trouble, possibly development of methemoglobine after reduction (desoxidation) from nitrate in nitrite, cyanosis.

12 - ECOLOGICAL INFORMATIONS, until this day, no evaluation has been made on the mixture12.1 - Ecotoxicity

Ammonium nitrate:

Toxicity for fishes: mainly depending on the real acidity value (pH) and the kind of fish

LC₅₀ = 74 mg/l/48 h (Cyprinus carpio)

Toxicity for water flea:

EC₅₀ = 555 mg/l/ (Daphnia magna)

Toxicity for algae:

EC₅₀ = 83 mg/l/ (Scenedesmus quadricauda)

Oils/emulsifiers: toxic to aquatic organisms, may cause long- term adverse effects in the aquatic environment

12.2 - Persistence and degradability

The ammonium nitrate is a substance existing in an ionogene shape and also in the natural life cycles (for example nitrogen) and can easily transform in other elements of these life cycles. Nevertheless, see § 12.5 This fuel/gazole is biodegradable

12.3 - Potential of bioaccumulation

The potential bioaccumulation of the mixture is very low because those of the raw material is also very low

12.4 - Results of the evaluation of PBT's properties (persistent, bio-accumulable and harmful)

Until this day, no evaluation has been made

12.5 - Other harmful effects

Excessive supply of ammonium nitrate can bring eutrophisation of water and over fertilization of the ground. The handling of this substance must be imperatively carefully made. By care in handling this product and a using complying prescriptions, there will be no harmful effect possible

13 - CONSIDERATION RELATIVE TO ELIMINATIONWaste and residue

The product must not be abandoned, it must be collected in order to be evacuated in accordance with the recommendation stipulated in paragraph 6 then, stored under supervision according with recommendations stipulated in paragraph 7. If only a small quantity is involved, the recovered product can be destroyed after establishment of a particular register by the operator, by placing it in contact with primed charges

For significant quantities: consult the supplier's distribution depot who will supply with information of recovery conditions.

Do not mix up with other incompatible residues (see paragraph 10).

In any case, comply with the regulation in force. In the event of difficulties, it is advised to take contact with Titanobel.

This product has a strict time limit of one year after the date of production indicated on the packaging.

Soiled packaging

The cardboard packaging contaminated by traces of product will be carefully examined to check that they are empty ; they may be burnt on the sites of use, nowadays' best technique (see BREF-OFC) in accordance with the safety instructions of the establishment, or shipped back to Titanobel according to the conditions defined between the two parties to be treated inside the destructions' channels.

14 - INFORMATION RELATIVE TO TRANSPORT

14.1 - The Gémulstar V is directly delivered on the site of use

Classification to transport in recognized packaging

Official description for transport :

MINE EXPLOSIVE (BLASTING) E TYPE

- Road ways: number 4°, 1.1 D, ONU n) 0241

Recognized packaging: rigid plastic or composite GRV with an internal plastic container

IBC 100, particular packaging disposition B10

15 - LEGISLATION INFORMATION

Symbol	E	Explosive
Codes for the hazard statements	H 201	Explosive, risk of mass explosion
	H 319	Cause serious eyes irritation
	H 351	May cause cancer

Safety advices	P 210	Keep away from heat/sparks/open flames/ warm surfaces - Do not smoke
	P 250	Avoid abrasions/shocks/friction
	P 280	Wear protection gloves and a protection equipment for eyes and face
	P370+P380	In case of fire, evacuate the area
	P 372	Risk of explosion in case of fire
	P 373	In case of fire and/or explosion, do not breathe the fumes
	P302+P352	In case of contact with skin: wash thoroughly with water and soap
	P305+P351 +P338	In case of contact with eyes: rinse carefully with water during several minutes. Keep off contact lens if the victim has some and if they can easily be removed. Go on rinsing.
	P 401	Store in accordance with regulations
	P 501	Eliminate the content/packaging by cremation in an installation according to regulations

Principal French laws and regulation in force nowadays:

- Defense code modified and application's decision
- Environmental Code (**the storage comes under the heading of ICPE 4220 nomenclature**)
- **Labor code and especially decree n° 2013-973**
- Decree n° 92-1164 modified on 22.10.1992 and it application's decision
- Decree n° 87-231 and it application's decision
- TMD Decree in force
- General rules of the Extractive Industry (RGIE) - Title Explosives
- The product comes under **the European Directive 2014/28/UE**

This list is not exhaustive and does not, in any case, dispense user from taking account of the whole official laws applying to his activity.

16 - OTHER INFORMATIONS / WARNING

This form fills up the technical manual of use but don't replace it. The information is based on our knowledge relative to the concerned product, at date which is indicated. They are given in good faith. The attention of the users is pointed out on the possible risks incurred when the product is used to other employment than those for which it is conceived.

Particularly, these products must be handled only by operators having knowledge of the explosives in accordance to regulation and the usual rules of trade; they are intended to be used as explosives for blasting rocks in mines, quarries and public works.

For any other use or particular use, Titanobel takes no responsibility,

It is up to the user under its own responsibility to do as follows:

- elaborate the safety measures regarding the use of the products taking in account especially the data of this form,
- reflect to all users and all handlers the adapted safety data and warn against the risks mentioned in the whole documentation relative to the use of these products.
- to make sure that the users who are going to handle/or use these products are trained to their use and their handle.

This enumeration must be in no case considered as exhaustive. It does not exonerate the recipient from checking that no other duty is prescribed by regulation other than those mentioned and especially those able to govern his own activity regarding possession and handling of explosives for which he is the only responsible.

The technical departments of Titanobel are at the disposal of the users to bring, within the limits of their knowledge assistance on the topics.

Advice: modifications facing the previous version appear **bold and blue**