

# SAFETY DATA SHEET

(in accordance with Regulation (EU) 2015/830)



## AMMONIUM PERCHLORATE

Version: 6  
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### SECTION 1: IDENTIFICATION OF THE SUBSTANCE AND OF THE COMPANY/UNDERTAKING.

#### 1.1 Product identifier.

Product Name: AMMONIUM PERCHLORATE  
Chemical Name: AMMONIUM PERCHLORATE  
Index No: 017-009-00-0  
CAS No: 7790-98-9  
EC No: 232-235-1  
REACH Nº: 01-2119490079-30-0002

#### 1.2 Relevant identified uses of the substance and uses advised against.

Pyrotechnical compositions

#### Uses advised against:

Uses other than those recommended.

#### 1.3 Details of the supplier of the safety data sheet.

Company: **ALDEBARÁN SISTEMAS SL**  
Address: C/Jerónimo Zurita, 10, entlo izda, 50001  
City: Zaragoza  
Province: Zaragoza  
Telephone: 0034976796134  
E-mail: aldebaran@aldebaransistemas.com

#### 1.4 Emergency telephone number: 0034915620420 (Available 24 hours)

### SECTION 2: HAZARDS IDENTIFICATION.

#### 2.1 Classification of the substance.

In accordance with Regulation (EU) No 1272/2008:

Eye Irrit. 2 : Causes serious eye irritation.

Ox. Sol. 1 : May cause fire or explosion; strong oxidiser.

STOT RE 2 : May cause damage to organs through prolonged or repeated exposure.

#### 2.2 Label elements.

#### Labelling in accordance with Regulation (EU) No 1272/2008:

Pictograms:



Signal Word:

**Danger**

H statements:

H271 May cause fire or explosion; strong oxidiser.  
H319 Causes serious eye irritation.  
H373 May cause damage to organs through prolonged or repeated exposure.

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### P statements:

- P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.  
P220 Keep away from clothing and other combustible materials.  
P260 Do not breathe dust/fume/gas/mist/vapours/spray.  
P264 Wash ... thoroughly after handling.  
P280 Wear protective gloves/protective clothing/eye protection/face protection.  
P273 Avoid release to the environment  
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

### Contains:

AMMONIUM PERCHLORATE

### 2.3 Other hazards.

In normal use conditions and in its original form, the product itself does not involve any other risk for health and the environment.

## SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS.

### 3.1 Substances.

Chemical Name:	AMMONIUM PERCHLORATE
Index No:	017-009-00-0
CAS No:	7790-98-9
EC No:	232-235-1
REACH N°:	01-2119490079-30-0002

### 3.2 Mixtures.

Not Applicable.

## SECTION 4: FIRST AID MEASURES.

### 4.1 Description of first aid measures.

#### Inhalation.

Take the victim into open air; keep them warm and calm. If breathing is irregular or stops, perform artificial respiration.

#### Eye contact.

Remove contact lenses, if present and if it is easy to do. Wash eyes with plenty of clean and cool water for at least 15 minutes while pulling eyelids up, and seek medical assistance. Don't let the person to rub the affected eye.

#### Skin contact.

Call a physician if irritation persists

#### Ingestion.

Seek immediate medical attention.

### 4.2 Most important symptoms and effects, both acute and delayed.

Not data available

### 4.3 Indication of any immediate medical attention and special treatment needed.

Not data available

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### SECTION 5: FIREFIGHTING MEASURES.

#### 5.1 Extinguishing media.

##### Suitable extinguishing media:

Flood with water.

#### 5.2 Special hazards arising from the substance.

##### Special risks.

In case of large fire, fight remotely and evacuate if necessary. Depending on the decomposition conditions, the main products generated are toxic gases: NH<sub>3</sub>, HCl and NO<sub>x</sub>.

#### 5.3 Advice for firefighters.

The extinction waters must be collected to avoid contamination of the environment

##### Fire protection equipment.

Wear self-contained protective equipment and protective clothing.

### SECTION 6: ACCIDENTAL RELEASE MEASURES.

#### 6.1 Personal precautions, protective equipment and emergency procedures.

Handle the dispersed product with protective gloves and goggles and, in case of dust, a type 2 mask.

#### 6.2 Environmental precautions.

Prevent the contamination of drains, surface or subterranean waters, and the ground.

#### 6.3 Methods and material for containment and cleaning up.

Keep away incompatible products (organic materials, reducing agents). Collect the product by mechanical means and destroy it, avoid bumps and frictions

#### 6.4 Reference to other sections.

For exposure control and individual protection measures, see section 8.

For later elimination of waste, follow the recommendations under section 13.

### SECTION 7: HANDLING AND STORAGE.

Depending on the granulometry of ammonium perchlorate, handling and storage may require a special safety study to ensure that industrial operating conditions do not cause ammonium perchlorate to detonate.

#### 7.1 Precautions for safe handling.

Drive away from sources of heat and moisture (if possible in covered and well-ventilated rooms).

Limit shocks and friction.

Do not use in a paved area.

Avoid contact with incompatible substances (organic materials and reducing agents, especially fuels, oils, greases etc ...)

Avoid contact with eyes and skin (use appropriate personal protective equipment: goggles, gloves and mask in case of dust).

Avoid any contamination of the environment through sewers or water sources.

The milling of ammonium perchlorate can modify its physical and chemical characteristics: depending on the granulometry, it can be more prone to detonate. Before milling, consult SNPE Matériaou énergétiques to obtain adequate information.

Do not eat, drink or smoke during work, avoid contact with skin and eyes, wash hands regularly and wash work clothes and protective equipment.

#### 7.2 Conditions for safe storage, including any incompatibilities.

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No almacenar con agentes reductores, materiales orgánicos especialmente combustibles, aceites, grasas, etc.  
No almacenar con sustancias explosivas, puede detonar.  
No almacenar cerca de una fuente de calor.  
No almacenar en un área asfaltada.

Se recomienda que los tambores de perclorato amónico molido se almacenen en pequeños grupos, para asegurar que no haya propagación de la detonación. También pueden estar protegidos físicamente de cualquier impacto de fragmento a alta velocidad.

Materiales de embalaje recomendados: Almacenar en recipientes originales cerrados en áreas especialmente diseñadas para el almacenamiento de oxidantes compatibles.

Materiales de embalaje inadecuados: Evite utilizar cualquier otro tipo de envases.

Si tiene que haber un cambio de contenedor: No use recipientes metálicos hechos de metales que sean agentes reductores con un punto de fusión bajo, como aluminio, o recipientes de plástico (incluso autoextinguibles) y cualquier material combustible: cartón, paletas de madera, película de celulosa.

### 7.3 Specific end use(s).

Pyrotechnical mixtures

## SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION.

### 8.1 Control parameters.

The product does NOT contain substances with Professional Exposure Environmental Limit Values. The product does NOT contain substances with Biological Limit Values.

Concentration levels DNEL/DMEL:

Name	DNEL/DMEL	Type	Value
AMMONIUM PERCHLORATE CAS No: 7790-98-9 EC No: 232-235-1	DNEL (Workers)	Inhalation, Long-term, Systemic effects	0,28 (mg/m <sup>3</sup> )

DNEL: Derived No Effect Level, level of exposure to the substance below which adverse effects are not anticipated.

DMEL: Derived Minimal Effect Level, exposure level corresponding to a low risk, that risk should be considered a tolerable minimum.

### 8.2 Exposure controls.

#### Measures of a technical nature:

Provide adequate ventilation, which can be achieved by using good local exhaust-ventilation and a good general exhaust system.

<b>Concentration:</b>	<b>100 %</b>
<b>Uses:</b>	<b>Pyrotechnical compositions</b>
<b>Breathing protection:</b>	
PPE:	Particle filter mask
Characteristics:	«CE» marking, category III. Made of filtering material, it covers nose, mouth and chin.
CEN standards:	EN 149
Maintenance:	Check for any tears, defects, etc. before use. Since it is disposable individual protection equipment, it should be replaced after use.
Observations:	Does not protect worker unless properly adjusted. Follow the manufacturer's instructions regarding suitable use of the equipment.
Filter Type needed:	P2
<b>Hand protection:</b>	
PPE:	Protective gloves against chemicals.



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Characteristics:	«CE» marking, category III.				
CEN standards:	EN 374-1, En 374-2, EN 374-3, EN 420				
Maintenance:	Keep in a dry place, away from any sources of heat, and avoid exposure to sunlight as much as possible. Do not make any changes to the gloves that may alter their resistance, or apply paints, solvents or adhesives.				
Observations:	Gloves should be of the appropriate size and fit the user's hand well, not being too loose or too tight. Always use with clean, dry hands.				
Material:	PVC (polyvinyl chloride)	Breakthrough time (min.):	> 480	Material thickness (mm):	0,35
<b>Eye protection:</b>					
PPE:	Protective goggles against particle impacts.				
Characteristics:	«CE» marking, category II. Eye protector against dust and smoke.				
CEN standards:	EN 165, EN 166, EN 167, EN 168				
Maintenance:	Visibility through lenses should be ideal. Therefore, these parts should be cleaned daily. Protectors should be disinfected periodically following the manufacturer's instructions.				
Observations:	Some signs of wear and tear include: yellow colouring of the lenses, superficial scratching of the lenses, scraping etc.				
<b>Skin protection:</b>					
PPE:	Anti-static protective clothing.				
Characteristics:	«CE» marking, category II. Protective clothing should not be too tight or loose in order not to obstruct the user's movements.				
CEN standards:	EN 340, EN 1149-1, EN 1149-2, EN 1149-3, EN 1149-5				
Maintenance:	In order to guarantee uniform protection, follow the washing and maintenance instructions provided by the manufacturer.				
Observations:	The protective clothing should offer a level of comfort in line with the level of protection provided in terms of the hazard against which it protects, bearing in mind environmental conditions, the user's level of activity and the expected time of use.				
PPE:	Anti-static safety footwear.				
Characteristics:	«CE» marking, category II.				
CEN standards:	EN ISO 13287, EN ISO 20344, EN ISO 20346				
Maintenance:	The footwear should be checked regularly				
Observations:	The level of comfort during use and acceptability are factors that are assessed very differently depending on the user. Therefore, it is advisable to try on different footwear models and, if possible, different widths.				

### SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES.

#### 9.1 Information on basic physical and chemical properties.

Appearance: Powder  
Colour: White  
Odour: N.A./N.A.  
Odour threshold: N.A./N.A.  
pH: 4,0-6,5 A 20°C  
Melting point: 150°C  
Boiling Point: N.A./N.A.  
Flash point: N.A./N.A.  
Evaporation rate: N.A./N.A.  
Inflammability (solid, gas): N.A./N.A.  
Lower Explosive Limit: N.A./N.A.  
Upper Explosive Limit: N.A./N.A.  
Vapour pressure: 0 Pa to 25°C  
Vapour density: N.A./N.A.

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Relative density: 1,95  
Solubility: 234 g/l a 20°C  
Liposolubility: N.A./N.A.  
Hydrosolubility: N.A./N.A.  
Partition coefficient (n-octanol/water): N.A./N.A.  
Auto-ignition temperature: N.A./N.A.  
Decomposition temperature: 300°C  
Viscosity: N.A./N.A.  
Explosive properties: N.A./N.A.  
Oxidizing properties: Very oxidizing

N.A./N.A.= Not Available/Not Applicable due to the nature of the product

### 9.2 Other information.

Pour point: N.A./N.A.  
Blink: N.A./N.A.  
Kinematic viscosity: N.A./N.A.  
N.A./N.A.= Not Available/Not Applicable due to the nature of the product

## SECTION 10: STABILITY AND REACTIVITY.

### 10.1 Reactivity.

If the storage conditions are satisfied, does not produce dangerous reactions.

### 10.2 Chemical stability.

Stable under normal conditions of use.

### 10.3 Possibility of hazardous reactions.

May cause fire or explosion; strong oxidiser.  
Neutralization can occur on contact with bases.  
Thermal decomposition may occur.

### 10.4 Conditions to avoid.

Avoid any source of ignition.  
Avoid bumps and frictions.  
There is a risk of explosion in case of pressure cooking below 2MPa

### 10.5 Incompatible materials.

Avoid the following materials:  
Mixture with reducing agents.  
Organs increase sensitivity and reactivity.

### 10.6 Hazardous decomposition products.

Depending on conditions of use, can be generated the following products:

- Oxygen.
- Corrosive vapors or gases.
- Oxidizing gases or vapors.

## SECTION 11: TOXICOLOGICAL INFORMATION.

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### 11.1 Information on toxicological effects.

a) acute toxicity;

#### ORAL

Method: OECD Guideline 423  
EU Method B.1 tris (Acute Oral Toxicity- Acute toxic Class Method)  
Specie: Rat  
LD50: >2000 mg/kg  
Conclusion: Not classified  
Remarks: Material test: anhydrous sodium perchlorate.

#### INHALATION

ConclusiOn: Not studies available.

#### DERMAL

Method: OECD Guideline 402(Acute dermal Toxicity)  
Specie: Rat  
LD50: >2000 mg/kg bw  
Conclusion: Not classifies  
Remarks : Material test: anhydrous sodium perchlorate.

b) skin corrosion/irritation;

Method: OECD Guideline 404 (Acute Dermal Irritation/corrosión)  
EU Method B.4 (Acute Toxicity- Dermal Irritation/corrosión)  
Specie: Rabbit  
Conclusion: Not irritating  
Remarks: Under the experimental conditions of this body, the test ítem anhydrous sodium perchlorate was slightly irritant when applied toically to rabbits. However, according to the classification criteria laid down in Council Directive 67/548/EEC, the test ítem was considered non irritant.

c) serious eye damage/irritation;

Method: OECD Guideline 405 (Acute Eye Irritation/Corrosion)  
EU Method B5 (Acute Toxicity- Eye Irritation/Corrosion)  
Specie: Rabbit  
Conclusin: Category 2: Causes serious eye irritation.

d) respiratory or skin sensitisation;

Method: OECD Guideline 429 (Skin Sensitisation: Local Lymph Node Assay)  
EU Method B.42 (Skin Sensitisation: Local Lymph Node Assay)  
Specie: Mouse  
Conclusin: No sensitiising.

e) germ cell mutagenicity;

#### IN VITRO

Method: OECD Guideline 476 (In vitro Mammalian Cell Gene Mutation Test)  
EU Method B.17 (Mutagenicity - In vitro Mammalian Cell Gene Mutation Test))  
Specie: Mouse lymphone L5178Y cells.  
Conclusion: Negative

#### IN VIVO

Method: EPA OTS 798.5395 (In vivo Mammalian Cytogenics Test: erythrocyte Miaomcleus Assay)  
Specie: Mouse  
Conclusion: Negative

f) carcinogenicity;

Not studies available

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g) reproductive toxicity;

Method:

EPA OPPTS 870.3800 (Reproduction and Fertility Effects)  
EPA Pesticides Assessment Guidelines. Subdivision F)  
JMAFF.59 NohSan No.4200  
OECD Guideline 414 (Prenatal Developmental Toxicity Study)  
OECD Guideline 416 (Two Generation Reproduction Toxicity Study)

Specie:

Rat

Remarks:

Reproduction of NOAEL was 0.3 mg / kg / day, in the absence of effects on reproductive function at the doses investigated.

The maximum dose was not based on the dose-limiting toxicity but on the antithyroid effects, which limits the sensitivity of the study for the classification of the effects on fertility.

h) STOT-single exposure;

Not conclusive data for classification.

i) STOT-repeated exposure;

Product classified:

Specific target organ toxicity following a repeated exposure, Category 2: May cause damage to organs through prolonged or repeated exposure.

j) aspiration hazard;

Not conclusive data for classification.

### SECTION 12: ECOLOGICAL INFORMATION.

#### 12.1 Toxicity.

##### ACUATIC TOXICITY

Toxicity		Water MEDIA type	Total Exposure duration	Specie	Value
Fish	Short-term	Fresh water	96 h	Oncorhynchus mykiss	LC50>200 mg/l NOEC= 100 mg/l
	Long-term	Fresh water	96 h	Oncorhynchus mykiss	LC10=EC10=NOEC=12 mg/l
Aquatic invertebrates	Short-term	Fresh water	48 h (static)	Daphnia magna	EC > 341 mg/l
	Long-term	Fresh water			LC10=EC10=NOEC=12 mg/l
Aquatic algae and cyanobacteria		Fresh water	72 h	Pseokirchneriella Subcapitata	EC50 ≥ 505 mg/l
Microorganisms		Fresh water	3 h	Activated Sludge of a predominantly domestic sewage	EC50>1000 mg/l
Sediments		Fresh water			LC10=EC10=NOEC=467 mg/kg sediment dw

##### Terrestrial toxicity

Toxicity to soil macroorganism except arthropods

Short term EC50 o LC50 for soil macroorganisms: 2550 mg / kg soil dw

Toxicity to terrestrial plants

Bibliographic analysis supports the idea that perchlorate is not toxic to plants.



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### 12.2 Persistence and degradability.

#### Biodegradation in water

The test is not scientifically justified as ammonium perchlorate is inorganic.

#### Biodegradation in water and sediment

Biodegradation in sediment and water and identification of degradation products are not required according to Annex IX because of a combination of three aspects:

For sediments, no adsorption to sediment is expected.

Degradation is unlikely and highly dependent on media, bacterial and nitrate contents, so that as a worst case it seems more relevant to consider an absence of degradation.

Investigation of degradation is not useful for PBT/vPvB assessment as there is not relevant bioaccumulation in fish.

#### Biodegradation in soil

Biodegradation in soil and identification of degradation products are not required according to Annex IX because of a combination of three aspects:

No adsorption to soil is expected.

Degradation is unlikely and highly dependent on media, bacterial and nitrate contents, so that as a worst case it seems more relevant to consider an absence of degradation.

Investigation of degradation is not useful for PBT/vPvB assessment as there is not relevant bioaccumulation in fish.

### 12.3 Bioaccumulative potential.

BCF (aquatic species) = 0,35 l/kg ww

Terrestrial bioaccumulation is not a REACH requirement

### 12.4 Mobility in soil.

Koc a 20°C = 86,03

### 12.5 Results of PBT and vPvB assessment.

No information is available about the results of PBT and vPvB assessment of the product.

### 12.6 Other adverse effects.

No information is available about other adverse effects for the environment.

## SECTION 13 DISPOSAL CONSIDERATIONS.

### 13.1 Waste treatment methods.

Do not dump into sewers or waterways. Waste and empty containers must be handled and eliminated according to current, local/national legislation.

Follow the provisions of Directive 2008/98/EC regarding waste management.

## SECTION 14: TRANSPORT INFORMATION.

Transport following ADR rules for road transport, RID rules for railway, ADN for inner waterways, IMDG for sea, and ICAO/IATA for air transport.

**Land:** Transport by road: ADR, Transport by rail: RID.

Transport documentation: Consignment note and written instructions

**Sea:** Transport by ship: IMDG.

Transport documentation: Bill of lading

**Air:** Transport by plane: ICAO/IATA.

Transport document: Airway bill.

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### 14.1 UN number.

UN No: UN1442

### 14.2 UN proper shipping name.

Description:

ADR: UN 1442, AMMONIUM PERCHLORATE, 5.1, PG II, (E)  
IMDG: UN 1442, AMMONIUM PERCHLORATE, 5.1, PG II  
ICAO/IATA: UN 1442, AMMONIUM PERCHLORATE, 5.1, PG II

### 14.3 Transport hazard class(es).

Class(es): 5.1

### 14.4 Packing group.

Packing group: II

### 14.5 Environmental hazards.

Marine pollutant: No

### 14.6 Special precautions for user.

Labels: 5.1



Hazard number: 50

ADR LQ: 1 kg

IMDG LQ: 1 kg

ICAO LQ: 2,5 kg

Provisions concerning carriage in bulk ADR:

VC1 Carriage in bulk in sheeted vehicles, sheeted containers or sheeted bulk containers is permitted.

VC2 Carriage in bulk in closed vehicles, closed containers or closed bulk containers is permitted.

AP6 If the vehicle or container is made of wood or other combustible material, an impermeable surfacing resistant to combustion or a coating of sodium silicate or similar substance shall be provided. Sheeting shall also be impermeable and non-combustible.

AP7 Carriage in bulk shall only be as a full load.

Transport by ship, FEm – Emergency sheets (F – Fire, S - Spills): F-H,S-Q

Proceed in accordance with point 6.

IMDG Code segregation group: 13 Perchlorates

### 14.7 Transport in bulk according to Annex II of MARPOL and the IBC Code.

The product is not transported in bulk.

## SECTION 15: REGULATORY INFORMATION.

### 15.1 Safety, health and environmental regulations/legislation specific for the substance.

The product is not affected by the Regulation (EC) No 1005/2009 of the European Parliament and of the Council of 16 September 2009 on substances that deplete the ozone layer.

The product is not affected by Regulation (EU) No 528/2012 concerning the making available on the market and use of biocidal products.

The product is not affected by the procedure established Regulation (EU) No 649/2012, concerning the export and import of dangerous chemicals.

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### 15.2 Chemical safety assessment.

No Chemical Safety Assessment has been carried out for this substance/mixture by the supplier.

### SECTION 16: OTHER INFORMATION.

Classification codes:

Eye Irrit. 2 : Eye irritation, Category 2

Ox. Sol. 1 : Oxidising solid, Category 1

STOT RE 2 : Specific target organ toxicity following a repeated exposure, Category 2

Sections changed compared with the previous version:

1,2,3,4,5,6,7,8,10,11,12,16

It is advisable to carry out basic training with regard to health and safety at work in order to handle this product correctly.

Abbreviations and acronyms used:

ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road.

CEN: European Committee for Standardization.

DMEL: Derived Minimal Effect Level, exposure level corresponding to a low risk, that risk should be considered a tolerable minimum.

DNEL: Derived No Effect Level, level of exposure to the substance below which adverse effects are not anticipated.

PPE: Personal protection equipment.

IATA: International Air Transport Association.

ICAO: International Civil Aviation Organization.

IMDG: International Maritime Code for Dangerous Goods.

RID: Regulations Concerning the International Transport of Dangerous Goods by Rail.

Key literature references and sources for data:

<http://eur-lex.europa.eu/homepage.html>

<http://echa.europa.eu/>

Regulation (EU) 2015/830.

Regulation (EC) No 1907/2006.

Regulation (EU) No 1272/2008.

The information given in this Safety Data Sheet has been drafted in accordance with COMMISSION REGULATION (EU) 2015/830 of 28 May 2015 amending Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC.

The information in this Safety Data Sheet on the Preparation is based on current knowledge and on current EC and national laws, as far as the working conditions of the users is beyond our knowledge and control. The product must not be used for purposes other than those that are specified without first having written instructions on how to handle. It is always the responsibility of the user to take the appropriate measures in order to comply with the requirements established by current legislation. The information contained in this Safety Sheet only states a description of the safety requirements for the preparation, and it must not be considered as a guarantee of its properties.

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