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SAFETY DATA SHEET COMPLEX FERTILIZERS, NPK TYPE

According to EC Regulation no. 1907/2006 (REACH) / EC Regulation no. 1272/2008 / Regulation no. 830/ 2015.

SECTION 1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND THE COMPANY

1.1. Product identification

Name: COMPLEX FERTILIZERS NPK, NP OR NK TYPE
Other names: COMPLEX FERTILIZERS
Chemical formula: -
CAS number: -
EINECS number: -
ECHA reference number: for ammonium nitrate: 01- 2119490981- 27- 0064
ammonium sulphate: 01- 2119455044- 46- 0098
ammonium dihydrogenorthophosphate: 01- 2119488166- 29- 0047
diammonium hydrogenorthophosphate: 01- 2119490974- 22- 0044
potassium sulphate: 01- 2119489441- 34- 0029
calcium carbonate: 01- 2119486795- 18- 0070
calcium hydrogenorthophosphate: 01- 2119490064 - 41 - 0017

1.2. Relevant identified uses of the substance or mixture and uses advised against

Identified uses: chemical fertilizer

Uses advised against: none

1.3. Details concerning the supplier of the Safety Data Sheet

Producer:

Azomureș S.A.Tg.-Mureș, 300 Gheorghe Doja St., tel.0040-265 253 700, Romania

Fax: 0040-265 252 986, e-mail: office@azomures.com, www.azomures.com

e-mail (competent person responsible for the SDS): fds.azo@azomures.com

1.4. Emergency telephone number

The institution responsible with providing information in case of a health emergency is The National Institute for Public Health, Department for the International Sanitary Regulation and Toxicological Information.

Telephone: 0040-21.318.36.06, working hours: Monday – Friday from 8 a.m. to 3 p.m.

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SECTION 2. HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture

Complex fertilizers NPK, NP or NK type are inorganic, multi-constituent substances.

Complex fertilizers NPK, NP or NK type with an ammonium nitrate content of less than 70% (ex.: 22-22-0; 15-15-15; 16-16-16) are not considered hazardous during transportation, according to ADR, RID, IMDG.

Classification according to EC Regulation no. 1272/2008 (CLP)

The mentioned sorts are not classified according to Regulation no. 1272/2008 (CLP).

Human health hazard

This product is not dangerous if handled accordingly.

Nevertheless, the following aspects will be taken into consideration:

Skin contact : may cause irritation in case of prolonged contact

Eye contact : may cause irritation in case of prolonged or repeated contact

Ingestion : no toxic effects in case of small quantities, in large quantities it may cause gastrointestinal disorders, and, in extreme cases (especially in children) it may cause methaemoglobinaemia, the "blue baby syndrome" and cyanosis (blueness around the mouth).

Inhalation: large quantities of dust containing this product may cause irritation of the nose and airways; the symptoms include sore throat and cough.

Environmental hazards

No environmental hazard assessment was conducted as ammonium nitrate presents little danger for aquatic organisms.

Due to the reduced hazardous potential on aquatic organisms, and its main effect, eutrophication, the substance is not considered dangerous for the environment, according to Community/national Regulations.

Ignition or explosion hazard

The fertilizer itself is not combustible, but it may sustain combustion even in the absence of air.

At approx. 170 °C the substance melts, slowly decomposing into ammonia and nitric acid.

At over 200 °C the decomposition is accelerated and the decomposition reaction may turn into a chain reaction if no immediate measures for cooling are taken, by spraying a maximum quantity of water (actual flooding). Decomposition products (nitrogen oxides) catalyze the reaction, causing an explosion.

At high temperatures (over 400 °C) the fertilizer may ignite and burn, with simultaneous decomposition in nitrogen oxides. The decomposition may cause an explosion in case of contamination with incompatible materials, such as: fuels (gasoline, Diesel fuel), lubricants (petrolatum, oils), metallic powders and other materials specified in section 10.5.

2.2. Labelling

Labeling of the product is made according to (EC) 2003/2003 Regulations regarding fertilizers.

2.3. Other hazards

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Not known.

SECTION 3. COMPOSITION / INFORMATION ON INGREDIENTS

3.1. Chemical identity of the substance

The product must be considered: Substance

COMPLEX FERTILIZERS CONTAINING AMMONIUM NITRATE - a multi-constituent substance

Composition: ammonium nitrate - CAS: 6484-52-2

ammonium sulphate - CAS: 7783-20-2

calcium hydrogenorthophosphate - CAS: 7757-93-9

ammonium dihydrogenorthophosphate - CAS: 7722-76-1

diammonium hydrogenorthophosphate - CAS: 7783-28-0

potassium sulphate - CAS: 7778-80-5

calcium carbonate - CAS: 471-34-1

potassium chloride - CAS: 7447-40-7

Ammonium nitrate (hazardous in concentrations > 70%)

CAS number: 6484-52-2

EINECS number: 299-347-8

IUPAC name: ammonium nitrate

Molecular formula: H₃N.HNO₃

SMILES notation: [NH₄⁺].[O⁻] [N⁺](=O)[O⁻]

Molecular weight range: 80.0434

ECHA reference number: 01- 2119490981- 27- 0064

Typical concentration: >= 32% - <=75% (w/w)

Chemical identification of impurities

Calcium phosphate - CAS number: 10103-46-5

EINECS number: 233-283-6

Typical concentration: depending on the sort

Concentration limit: >=0 - <=1% (w/w)

Water - CAS number: 7732-18-5

EINECS number: 231-791-2

IUPAC name: water

Typical concentration: >=0.15% - <=0.45% (w/w)

Calcium fluoride - CAS number: 7789-75-5

EINECS number: 232-188-7

Typical concentration: depending on the so

Concentration limit: >=0 - <=7% (w/w)

SECTION 4. FIRST AID MEASURES

4.1. Description of the first aid measures

4.1.1 First aid instructions are provided depending on the relevant exposure routes.

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Skin contact: rinse the affected area with plenty of water. Remove contaminated clothing and shoes.

In case symptoms occur, seek medical advice.

Eye contact: rinse/irrigate eyes with plenty of water for 10 minutes; if irritation persists, seek immediately medical advice.

Ingestion: in case of ingesting the product, rinse mouth with water (only if the victim is conscious).

Do not induce vomiting. In case symptoms occur, seek medical advice.

Inhalation: in case of inhaling the product, remove victim to fresh air. In case symptoms occur, seek medical advice.

4.1.2 Recommendations:

Remove the victim from the area contaminated with dust or gas, keep the victim at rest in a warm area, even in the absence of symptoms; administer oxygen, especially in case of blueness around the mouth; artificial respiration must be used only as a last resort, in case of prolonged exposure.

4.2. The most important symptoms and effects, acute as well as delayed

Keep under medical observation for at least 48 hours, in order to prevent the development of a pulmonary edema or methaemoglobinaemia.

4.3. Indications concerning any emergency medical assistance and necessary special treatments

Note for the attending doctor: methaemoglobinaemia

SECTION 5. FIREFIGHTING MEASURES

5.1. Fire extinguishing means

Adequate extinguishing means

Small fires

The substance is not combustible. This product may sustain combustion. Use water to extinguish the fire.

Large fires

The substance is not combustible. This product may sustain combustion. Use water to extinguish the fire.

Inadequate extinguishing means

Do not use chemicals or foam to extinguish the fire, use sand or soil for emerging fires, if there is no water source available.

5.2. Special hazards caused by the substance or mixture

Unusual fire and explosion hazards

The substance may be explosive in contact with flammable or organic substances, or if it is confined during the fire.

Hazardous decomposition products and combustion products

In case of fire, hazardous decomposition products may be generated, such as nitrogen oxides (NO, NO₂ etc.), ammonia (NH₃), amines.

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Special procedures for fire extinguishing

Special measures are not necessary.

Wear adequate protection equipment. Use a self-contained breathing apparatus.

5.3. Advice for firefighters

Special procedures for fire extinguishing

Special measures are not necessary.

Wear adequate protection equipment. Use a self-contained breathing apparatus.

SECTION 6. ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1 For personnel not involved in emergency situations

(a) Protective equipment

Hand protection:

Protective gloves (heat resistant).

Eye protection:

Face protection equipment - tight safety goggles (plastic frame, polycarbonate lens) for chemical substances.

- face mask (polycarbonate) - in case of danger of nitrate splashes

Skin protection

Protective clothing:

Dust resistant overalls (breastplate duck overalls, coat).

Winter or summer shirt (natural fibers - duck)

Protective footwear:

Chemical and mechanical aggression resistant boots, with anti-static properties that allow usage in explosive environments (leather with rubber soles).

(b) Keep away from heat and fire sources

Use a self - contained breathing apparatus and adequate equipment for firefighting.

Open doors and windows to produce maximum ventilation of the room.

(c) Emergency procedures

In case of great danger, the surrounding area must be evacuated.

Avoid inhaling toxic fumes by standing up wind from the fire.

6.1.2. For the personnel involved in emergency situations

The personnel involved in emergency situations must wear duck, dust resistant equipment, chemical aggression resistant boots and protection mask.

6.2. Precautions for the environment

Avoid contamination of the soil and groundwater courses.

6.3. Methods and material for containing fires and for cleaning

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Containment and cleaning method for the dispersed substance

Dispersion and leakage of small quantities

Vacuum or collect the product in special containers, marked as waste. Clean the contaminated area using a large quantity of water. In case the spilled substance reaches into watercourses, inform local authorities.

Dispersion and leakage of large quantities

Vacuum or collect the products in special containers, marked as waste. Recycle if possible. Clean the contaminated area with a large quantity of water. In case the spilled substance reaches into watercourses, inform local authorities.

Inadequate techniques for containment and cleaning

Do not contain the spilled product using sawdust or any other combustible material.

Do not use plugs made from organic materials, such as wood, in order to stop leakage.

6.4. Reference to other sections

Note: see chapter Exposure control / individual protection, for information concerning personal protection equipment and the section Disposal considerations.

SECTION 7. HANDLING AND STORAGE

7.1. Precautions for safe handling

7.1.1 Recommendations for safe handling

Use adequate ventilation. A local exhaust ventilation system must be provided. Avoid all possible ignition sources (spark or flame). Avoid contamination with any source, including metals, dust or organic substances.

7.1.2 Recommendations concerning good general hygiene practices at the work place

(a) Do not eat, drink or smoke in the working area. "NO SMOKING" signs are to be placed in the working area.

(b) Wash hands thoroughly after each use.

(c) Remove contaminated clothing and protection equipment before entering lunch areas.

7.2. Safe storage conditions, including possible incompatibilities

The product should be stored temporarily only packaged, protected and well-ventilated areas.

The product should be stored away from sources of heat and fire.

Not to be stored together with flammable or incompatible materials.

Avoid contact with combustible substances and reducing agents.

Smoking and open fire is forbidden in storage spaces.

Stacking of bags should be made in such a way that any danger is avoided.

Fertilizers should not be stored together with other products.

7.3 Specific end use (s)

Specific end uses - chemical fertilizer.

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SECTION 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1. Control parameters

No official limits are specified.

Values recommended by ACGIH (1995-1996) for inhalable particles:

TLV/TWA: 10mg/m³

Relevant DNEL / DMEL values and NOAEL values are provided in the CSA for ammonium nitrate depending on the type of exposure for workers in an industrial setting and for the general public.

As no acute toxicity hazard was identified, that would lead to the classification of the substance according to CLP Regulation, the long-term DNEL value is considered sufficient to ensure that no effects occur from acute exposure to the substance.

No local effects were observed after dermal and inhalation exposures and no DNEL value for local effects was derived.

Repeated dose toxicity

Long-term systemic effects - dermal - DNEL: 21.3 mg/kg bw/d

NOAEL: 255.6 mg/kg bw/d

- inhalation - DNEL: 37.6 mg/m³

NOAEC: 451.2 mg/m³

DNEL values for human exposure are derived according to ECETOC guideline (final draft).

a) Workers exposure - dermal - DNEL: 21.3 mg/kg bw/d

- inhalation - DNEL: 37.6 mg/m³

b) Exposure of the general public - dermal - DNEL: 12.8 mg/kg bw/d

- inhalation - DNEL: 11.1 mg/m³

- oral - DNEL: 12.8 mg/kg bw/d

8.2. Exposure control

The information related to exposure control are provided in the Exposure Scenarios attached to the Safety Data Sheet.

8.2.1 Adequate technical controls

General measures at company level

The CSSM (The Committee for Work Health and Safety) was constituted at the company level, where the risk factors of professional injury and illness in the work place are assessed.

The evaluation of the risks of professional injury and illness at the work place was carried out by committees established by the management; preventive measures were taken to eliminate or to diminish the risks that cannot be avoided, having as purpose the work safety and health, reduction of work injuries and of professional illnesses.

The Chemical Plant:

- Risk evaluation when using dangerous chemical substances

- Ammonium Nitrate Plant II-III-ADEX (operation – chemists, packing machinists)

As a result of the analysis and evaluation of the risks at the work place:

The plan for prevention and protection at company level was elaborated and approved

A record is held of the work places of great danger and imminent danger of injury

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A situation of the hazardous chemical substances used in the work process is kept
The toxic gases, released by chemical substances at the work place, are monitored.
The health of the staff exposed to the action of chemical substances is supervised and monitored
The auditing of the safety and health at the work place is carried out, establishing the noncompliance with the law in force and taking measures to ensure compliance with such laws.
Statistics are drafted, referring to work accidents and professional illnesses caused by hazardous chemical substances.
Intervention teams in case of chemical accident with periodically instructed staff are organized at company level.
Authorized employees of the internal prevention and protection service perform the inspection of the work places according to the operational procedure.
The explosion protection document is elaborated according to Government Ordinance no. 1058/2006 for the following plants: Ammonia, Nitric Acid, and Ammonium Nitrate.
The equipment used in areas with danger of explosion is certified upon availability date.
Workers have access to personal instructions regarding the usage of dangerous chemical substances:

- The staff has individual protection equipment
- Measures of collective protection are ensured.

Collective protection measures for the source of risk – complex fertilizers NPK type

Technical Measures

Monitoring system of the main functioning parameters for the safety of the equipment (pressure, temperature, concentration, flow capacity, level etc), with acoustic and optical warning signals in case of malfunction.
Toxic gas, fire and explosion detectors
Protection devices – flange fenders on all the dangerous liquids layouts
Ammonia and nitric acid layouts painted in conventional colors
Signaling for work safety health and according to Government Ordinance no. 971/2006 (safety, warning, interdiction, obligation marks, delimitation of danger zones)
Ventilation systems.
Rescue showers for the danger of splashing with corrosive substances.
Water sources with upward jet (for washing the eyes in case of splashing)
Periodical ISCIR inspections of under-pressure equipment.
Toxic gases level control
Organization and provision of individual insulating protection equipment
Endowment and organization of medical help trained in case of gassing.

Administrative measures

Manufacturing regulation, work instructions regarding work safety and health and fire prevention.
Safety data sheets for hazardous substances.
Organization of an information system for surveillance and intervention:

- Action plan in case of fire
- Internal Emergency Plan (PUI).
- Evacuation action plan in emergency situations
- Action plan in case of earthquake
- Action plan for safe road transport (PSTR).

Authorization for the job position, employees in the production sector, maintenance, repair (mechanic, electric, automation) in technological installations.

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Work safety and health training for Azomures employees, in all stages (upon hiring, at work, periodically, supplementary) and work safety and health instruction for the employees from the companies that perform services based on contract and for the persons that are on the platform with the employer's permission, related to:

- risk of professional injury and illness at the work place
- minimal requests of health and safety of work, stipulated by legal regulations applicable to the specific activity at the work place
- tasks and responsibilities of the employees
- usage of work equipment and individual protection equipment
- prevention and protection measures, action plan in case of danger
- giving first aid to the injured at the work place

Risk management measures for human health

During ammonium nitrate manufacturing process, eyes might be exposed to dust in concentrations that cause irritations. If existing control measures are applied (technical control measures and personal protection equipment, based on the classification and labeling as H272 and H319), the substance is not hazardous for workers.

8.2.2 Personal protection measures, such as personal protection equipment

Technical measures: provide a ventilation system, where necessary.

Hygiene measures: do not eat, drink or smoke while handling the product. Wash hands after handling and before eating, smoking or using the toilet, as well as at the end of the working period.

(a) Respiratory protection:

Personal protection during production activities - breathing apparatus
- protective mask

(b) Hand protection:

Protective gloves (heat resistant).

(c) Eye protection:

Face protection equipment - tight safety goggles (plastic frame, polycarbonate lens) for chemical substances.
- face mask (polycarbonate) – in case of danger of nitrate splashes

(d) Skin protection:

Protective clothing:

Dust resistant overalls (breastplate duck overalls, coat);

Winter or summer shirt (natural fibers - duck);

Protective footwear:

Chemical and mechanical aggression resistant boots, with anti-static properties that allow usage in explosive environments (leather with rubber soles).

8.2.3 Environmental exposure control

Recommendations on personal protection apply for high levels of exposure.

Select the personal protection equipment depending on the type of risk.

Risk management measures for the environment

Due to the low toxicity of ammonium nitrate for aquatic organisms and its regulation by various European/national regulations, a risk and environmental exposure assessment is not considered necessary for ammonium nitrate.

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SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES
9.1. Information concerning the main physical and chemical properties

a) Aspect of the substance/mixture

Physical state: granules

Color: white-gray

b) Odor: odorless

No.	Physical and chemical properties of the substance / mixture	Unit	Value for the substance /mixture	Remarks
c)	pH		>4.5	In solution of 100g/L
d)	Boiling point/ boiling temperature range	°C	>210	Decomposes before boiling
e)	Melting/ freezing point	°C		Depending on the composition; it may decompose before melting.
f)	Flammability	% vol.		Nonflammable (based on molecular structure).
i)	Vapor pressure	Pa	Negligible	At room temperature
j)	Surface tension			No surface activity (based on molecular structure).
k)	Water solubility	g/L		Soluble
l)	Partition coefficient n-octanol/water	Log Kow		Not necessary as the substance is inorganic.
m)	Viscosity	Cp		Testing method not applicable for solids; relevant for liquids.
n)	Auto-flammability	°C		Does not self-ignite.
o)	Explosive properties			Non explosive
p)	Oxidizing properties			No oxidizing properties
s)	Bulk density	kg/m ³	950 -1150	
t)	Stability in organic solvents and identity of the relevant decomposition products			Not necessary if the substance is inorganic.

9.2. Additional information

No available additional information.

SECTION 10. STABILITY AND REACTIVITY
10.1. Reactivity

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Complex fertilizers react with combustible substances (e.g. Diesel fuel, lubricants etc.) and incompatible materials: reducing agents, acids, bases, chlorates, chlorides, chromates, nitrites, permanganates, metallic powders.

10.2. Chemical stability

The product is stable in normal storage, handling and usage conditions.

In order to increase product stability, anti-caking agents are used.

Anti-caking - Additive of unknown composition

IUPAC name: additive of unknown composition

10.3. Hazardous reactions potential

If heated at very high temperatures, over 170 °C and over 200 °C, ammonium nitrate may cause an explosion at any moment, especially if contaminated with combustible substances, organic substances, coal, oil, or if ammonium nitrate is confined in closed spaces (pipes, containers, tankers with metallic walls).

The product is prone to chemical self-ignition when it comes into contact with readily oxidizing organic substances, finely divided metals, superphosphates.

10.4. Conditions to avoid

The product decomposes when heated. Avoid confined spaces.

10.5. Incompatible materials

Reducing agents, strong acids and bases, metallic powders, combustible materials, chromates, zinc, copper and its alloys, chlorates.

10.6. Hazardous decomposition products

Nitrogen oxides (NO, NO₂) released during ammonium nitrate decomposition are highly toxic.

SECTION 11. TOXICOLOGICAL INFORMATION

Toxicokinetics (absorption, metabolism, distribution and elimination)

The results of the studies on absorption, metabolism, distribution and elimination:

Based on low MW, high water solubility, assumed low logPow high absorption is expected. However, the ion formation of the substance immediately when in contact with a fluid decreases the absorption. Therefore, 50% absorption is taken for oral, dermal and inhalation exposure

11.1. Information on toxicological effects

The relevant hazard classes for which information is provided are:

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- (a) Acute toxicity
- (b) Skin corrosion / irritation
- (c) Eye irritation / damage
- (d) Sensitization of the skin or the respiratory system
- (e) Mutagenicity germ cell
- (f) Carcinogenicity
- (g) Toxicity for reproduction
- (h) STOT (specific target organs of toxicity) – unique exposure
- (i) STOT (specific target organs of toxicity) – repeated exposure
- (j) Aspiration hazard

11.1.1 Information for each hazard class

- (a) Acute toxicity - oral LD50 > 2000 mg/kg bw
 - dermal LD50 > 5000 mg/kg bw
 - inhalation LC50 > 88.8 mg/l
 - other routes – no available information

Ammonium nitrate does not have to be classified for acute oral, dermal or inhalation toxicity as all LD50/LC50 tested values exceed the highest value used for classification according to CLP Regulation.

Repeated dose toxicity

Oral 28 days - NOAEL \geq 1500 mg/kg bw/d (with potassium nitrate)

52 weeks - 256 mg/kg bw/d (with ammonium sulphate)

Inhalation 2 weeks - NOAEL \geq 185 mg/m³ air

Dermal – no available studies

Value used for CSA (oral route): NOAEL: 256 mg/kg bw/d (with ammonium sulphate)

Value used for CSA (route: inhalation): NOAEC \geq 185 mg/m³ (2 weeks)

Based on available data, ammonium nitrate is not classified according to CLP Regulation for repeated dose toxicity.

(b) Skin corrosion/irritation

Ammonium nitrate does not cause skin irritations and is not corrosive.

(c) Serious eye damage / irritation

Ammonium nitrate is irritating for the eyes.

(d) Sensitizing of the airways and skin

No available data on sensitization of the respiratory system.

Ammonium nitrate is not classified according to CLP Regulation for skin sensitization.

Value used for CSA: not sensitizing for the skin

Value used for CSA: not sensitizing for the respiratory system.

(e) Mutagenicity

Based on the results of in vivo and in vitro studies, ammonium nitrate is not considered genotoxic.

Value used for CSA: genetic toxicity: negative.

(f) Carcinogenicity

Not carcinogen (tests using ammonium sulphate).

(g) Toxicity for reproduction

Oral 28 days - NOAEL \geq 1500 mg/kg bw/d (with potassium nitrate)

Ammonium nitrate is not classified according to CLP Regulation with regard to reproduction and developmental toxicity.

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(h) STOT (specific target organs of toxicity) – unique exposure - conclusive but not sufficient for classification

(i) STOT (specific target organs of toxicity) – repeated exposure - conclusive but not sufficient for classification

(j) Aspiration hazard - there is no data available

11.1.2 The data in this subsection apply to the ammonium nitrate in the form under which it is placed on the market – no data available.

11.1.3 The results of experimental studies by route of exposure:

The acute toxicity after oral administration – the studies were conducted on rats and mice.

For rat: LD50: 2950 mg/kg – key study; experimental result

LD50: 2800 mg/kg, LD50: 2462 mg/kg, LD50: 4500 mg/kg supporting studies

For mouse: LD50: 2085 mg/kg – supporting studies; experimental result

The acute toxicity after administration by inhalation - the studies were conducted on rats.

LC50: > 88,8 mg/L - supporting studies; experimental result

The acute toxicity after dermal administration - the studies were conducted on rats.

LD50: > 5000 mg/kg

Ammonium nitrate must not be classified for acute oral toxicity, dermal and inhalation toxicity, because all the values used for the LD50/LC50 tests are more than the highest value that is used in the classification of the CLP Regulation.

11.1.4 For the following hazard classes: STOT – single exposure, STOT – repeated exposure, aspiration hazard – conclusive but not sufficient for classification.

11.1.5 Information on the likely routes of exposure

The likely routes of exposure are ingestion (swallowing), inhalation or skin / eyes exposure - there are no known health effects.

11.1.6 Symptoms related to the physical, chemical and toxicological characteristics

No data available.

11.1.7 The known delayed and immediate effects and the chronic effects of long term exposure and short term exposure

The toxicological tests were made on rats, tests for skin irritation / eyes, the respiratory tract were made on rabbits.

There is no conclusive data on the effects of delayed or chronic of long term or short-term exposure.

11.1.8 Interactive effects

No data available.

11.1.9 Absence of specific data

No data available.

SECTION 12. ECOLOGICAL INFORMATION

12.1. Toxicity

Aquatic compartment (including sediments)

Toxicity data

The main toxic component in ammonium salts is ammonia. Recent assessments concerning ammonia toxicity show that both ionized and un-ionized forms are toxic.

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For this reason a common toxicity model is proposed, in which ammonia is more toxic at elevated pH values and ammonium ion contributes to toxicity at lower pH values.

Short-term toxicity for fish

Values used for CSA: LC50 for static water fish: 447 mg/L (at 48 hours).

Long-term toxicity for fish

No data available.

Short-term toxicity for aquatic invertebrates

Values used for CSA: EC50/LC50 for fresh water invertebrates: 490 mg/L

Long-term toxicity for aquatic invertebrates

There are no available long-term studies for aquatic invertebrates.

Algae and aquatic plants

Value used for CSA: EC50/LC50 for fresh water algae: >1700 mg/L

NOEC for fresh water algae: 1700 mg/L

Sediment organisms

The chemical safety assessment does not indicate the need for a study concerning the effects on sediment organisms.

Other aquatic organisms

No available information.

PNEC derivation - PNEC aqua (fresh water): 0.45 mg/L

PNEC aqua (marine water): 0.045 mg/L

PNEC aqua (intermittent releases): 4.5 mg/L

PNEC in sediments - PNEC values for sediments should be calculated using the equilibrium partitioning method (EPM) in EUSES, by using the PNEC aqua and the log Kow. For inorganic substances the PNEC value cannot be derived.

Due to the low toxicity of ammonium nitrate for aquatic organisms and its regulation by different European/national laws, the hazard and environmental exposure assessment is not considered necessary.

Terrestrial compartment - studies scientifically unjustified.

Atmospheric compartment - no available data.

Microbiological activity in STP

Toxicity for aquatic micro-organisms

Value used for CSA: EC50/LC50 for aquatic micro-organisms: >1000 mg/L

NOEC aquatic micro-organisms: 180 mg/L

PNEC for STP: 18 mg/L

The Urban Wastewater Directive (1991) sets standards for the collection and treatment of wastewater from homes and some industrial sectors.

12.2. Persistence and degradability

Abiotic degradability

Ammonium nitrate completely dissociates in water. No additional information is requested/available.

Biotic degradability

Studies are not necessary as the substance is inorganic. The biodegradation rate in wastewater treatment plants is of 52 g N/kg dissolved solid/day at 20 °C.

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In the anaerobic transformation of nitrate into N₂, N₂O and NH₃, the biodegradation rate in wastewater plant at 20 °C is 70 g N/kg dissolved solid/day at 20 °C.

Hydrolysis - ammonium nitrate is completely dissociated into ions in water: NH₄⁺ and NO₃⁻. Therefore, testing is considered not necessary.

Photolysis - in air, water, soil - no available data

Biodegradation - inorganic substances are not biodegradable (based on chemical properties).

12.3. Potential for bioaccumulation

The partition coefficient octanol - water (K_{ow}): not relevant as the substance is inorganic, but it is considered low (based on high water solubility).

The bioconcentration factor (BCF) - low potential for bioaccumulation (based on substance's properties).

12.4. Mobility in soil

Adsorption/desorption

Adsorption coefficient - low potential for adsorption (based on substance's properties).

Volatilization - no available data.

Distribution modeling - no available data.

12.5. PBT and vPvB assessment results

In accordance with Annex XIII of the EC Regulation no. 1907/2006, PBT and vPvB assessments have not been conducted as ammonium nitrate is inorganic.

12.6. Other adverse effects

There is no information concerning other adverse effects on the environment.

SECTION 13. DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

Disposal methods

Wastes must be disposed of in compliance with national and local regulations. Controlled biodegradation in wastewater treatment is possible.

Relevant provisions of the harmonized EU legislation and domestic legislation regarding waste.

National legislation in force:

Law no. 211/2011 concerning wastes treatment.

Law no. 265/2006 – The Law on environment protection.

Law no. 249/2015 related to the packaging and waste packaging management.

GD no. 856/2002 - The evidence of wastes management, with subsequent modifications.

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Law on labor security and health no. 319/2006, GD no. 1425/2006 on approving the Methodological Norms for the enforcement of the provisions set by the Law on labor security and health no. 319/2006, GD no.355/2007 on the surveillance of workers' health with subsequent modifications. Decision no. 1061/2008 on transport of hazardous or non-hazardous wastes on Romanian territory, with subsequent modifications.

UE Legislation in force:

Regulation (EC) no. 1907/2006 of the European Parliament and of the Council regarding the Registration, evaluation authorization and restriction of chemicals (REACH).

Regulation (EC) no. 1272/2008 of the European Parliament and of the Council on the classification, labeling and packaging of substances and mixtures.

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

European Agreement concerning the International Carriage of Dangerous Goods by Rail (RID).

SECTION 14. TRANSPORT INFORMATION

Complex fertilizers NPK, NP or NK type with an ammonium nitrate content less than 70% (ex.: 22-22-0; 15-15-15; 16-16-16) and capable of self-sustaining decomposition are classified under UN 2071, class 9 and are not considered hazardous during transportation, according to ADR, RID, IMDG.

14.1. UN number: 2071

14.2. UN name for dispatch: AMMONIUM NITRATE BASED FERTILIZER

14.3 Transportation hazard class (classes): 9

14.4. Special provisions: 193

Air Transport

14.1. UN number: 2071

14.2. UN name for dispatch: AMMONIUM NITRATE BASED FERTILIZER

14.3 Transportation hazard class (classes): 9

14.4. Packaging group: Group III

Packing instruction: 958 for limited quantities of maximum 200 kg (total gross mass per package)

Y 958 for limited quantities of maximum 30 kg G (total gross mass per package)

Special provisions: A89 for quantities of maximum 200 kg (total gross mass per package)

A90 for quantities of maximum 30 kg G (total gross mass per package)

14.5. Environmental hazards

No available information.

14.6. Special precautions for users

The material classification number is **UN 2071**, with special provision **193**; a provision classifying these fertilizers in accordance with the procedure described in the Part III Manual of Testing Criteria; section 39.

Granules NPK fertilizers are classified in the category of fertilizers containing up to 70% ammonium nitrate and not more than 0.4% total combustible materials / organic substances expressed in

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carbon equivalent or less than 45% ammonium nitrate and without limitation of the total combustible materials, meet the criteria for this UN number and are not subject to the requirements of ADR.

No danger label is placed on the transportation means. The fertilizer must pass the “through test”. The fertilizer passes the “through test”, it is classified as C type fertilizer and does not present any risks during marine transport (IMDG).

For air transport the marking of packages containing limited quantities up to a maximum of 30 kg total gross mass per package (according to ICAO technical instructions), shall be carried out by applying a square - shaped mark, set at an angle 45° (diamond - shaped). The top and bottom portions and the surrounding line shall be black, the central area shall be white. The minimum dimensions shall be 100 mm x 100 mm and the minimum width of the line forming the diamond shall be 2 mm (Fig. 1).



Fig.1 Mark for packages containing limited quantities

Each delivery is accompanied by the declaration of conformity.

According to the provisions of EC Regulation no. 2003/2003, package labels will include the following legible specifications: substance name, producer’s full name and address, nominal weight, product identifiers.

All transports will be accompanied by the transport documents appropriate for transported goods, according to the legislation in use.

14.7. Bulk transport, according to Annex II to MARPOL convention and IBC Code

Not applicable.

SECTION 15. REGULATORY INFORMATION

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

Relevant information regarding the domestic legislation

Law on labor security and health no. 319/2006, GD no.1425/2006 on approving the Methodological Norms for the enforcement of the provisions set by the Law on labor security and health no. 319/2006, GD no. 355/2007 on the surveillance of workers’ health with subsequent modifications.
Law no. 265/2006 for the amendment of GEO no.195/2005 on environment protection
Decision no. 1391/2006 for the approval of the Regulation concerning the application of Government Emergency Ordinance no. 195/2002 regarding traffic on public roads, with subsequent amendments and supplements.

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ISCIR technical prescriptions in use.

Law no. 278/2013 on industrial emissions.

Relevant information regarding the EU legislation

Regulation (EC) no. 1907/2006 of the European Parliament and of the Council regarding the Registration, evaluation authorization and restriction of chemicals (REACH).

Regulation (EC) no. 1272/2008 of the European Parliament and of the Council on the classification, labeling and packaging of substances and mixtures.

Regulation (EU) no. 286/2011 by the Commission from 10.03.2011 amending Regulation (EC) no. 1272/2008.

Regulation (EC) no. 830/2015 of the Commission from date of 28.05.2015 amending Regulation (EC) no. 1907/2006.

Regulation (EU) No 98/2013 of the European Parliament and of the Council of 15 January 2013 on the marketing and use of explosives precursors.

EC no. 2003/2003 regulation of the European Parliament regarding fertilizers with its subsequent amendments relating to EN standards drawn up by the European Committee for Standardization.

Regulation (EU) No 98/2013 of the European Parliament and of the Council of 15 January 2013 on the marketing and use of explosives precursors.

European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR), 2019 edition.

Regulation referring to the International Carriage of Dangerous Goods by Rail (RID), 2019 edition

International Maritime Dangerous Goods (IMDG), 2017 edition.

Dangerous goods air transport regulations (IATA), edition 2020.

Other regulations

“This product is not subject to Regulation (EU) 98/2013, but all suspicious transactions, disappearances and thefts shall be reported to the relevant authority.”

15.2 Chemical safety assessment

NPK complex fertilizers contain ammonium nitrate for which a chemical safety assessment (CSA) was conducted and a chemical safety report (CSR) was issued.

SECTION 16. ADDITIONAL INFORMATION

a) A clear evidence of added, deleted or modified information

Version number	Date	Page number	Evolution of the information
version 1	13.06.2017	2, 16	At page 2 and 16, section 2, chapter 2.1 and section 14, were introduced the NPK sorts 18-18-0+10SO ₃ +5MgO and 19-19-0+7SO ₃ +4MgO.

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Version 2	21.06.2017	2, 16	At page 2 and 16, section 2, chapter 2.1 and section 14, was introduced the NPK sort 14-8-20+17SO ₃
version 3	12.07.2017	2, 16	At page 2 and 16, section 2, chapter 2.1 and section 14, were introduced the NPK sorts 15-7-19, 14-8-20 and 13-9-19.
Version 4	17.07.2017	2, 16	At page 2 and 16, section 2, chapter 2.1 and section 14, were introduced the NPK sorts 22-6-12+3SO ₃ +0.05B+0.05Zn and 22-6-12+10SO ₃ +0.05B+0.05Zn
version 5	21.07.2017	2, 16	At page 2 and 16, section 2, chapter 2.1 and section 14, was introduced the NPK sort 12-11-18
version 6	10.11.2017	2, 17	At page 2 and 16, section 2, chapter 2.1 and section 14, was introduced the NPK sort 13-9-19+1MgO+0.02Zn+0.02B
version 7	13.03.2018	2, 18	At page 2 and 16, section 2, chapter 2.1 and section 14 the sorts have been removed.
version 8	15.10.2018	7	At page 7, section 7.2 has changed in accordance with current legislation.
version 9	12.04.2019	6, 16	At page 6, section 7.2 has been reformulated. At page 16, section 14 has changed in accordance with ADR 2019 edition.
version 10	25.06.2019	17	At page 17, section 15.1 "Other regulations" have been introduced.
version 11	02.07.2020	16, 17, 18	At page 16, section 14 air transport has been introduced and on page 17, section 14.6 the marking of packages containing limited quantities for air transport has been introduced. At page 18 completed with IATA regulations, 2020 edition.

b) List of abbreviations and acronyms used throughout the Safety Data Sheet

SDS	- Safety Data Sheet
ECHA	- European Chemicals Agency
EC	- European Commission
ESIS	- European Chemical Substances Information System
(FE) EFMA	- Fertilizers Europe (European Fertilizer Manufacturers Association)

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REACH	- EC Regulation No. 1907/2006 of the European Parliament and Council concerning the registration, evaluation, authorization and restriction of chemical substances
CSR	- Chemical Safety Report
CSA	- Chemical Safety Assessment
ES	- Exposure Scenario
DNEL	- Derived no effect level
DMEL	- Derived minimal effect level
PNEC	- Predicted No Effect Concentration
BCF	- Bioconcentration factor
NOAEL	- No observed adverse effect level
NOAEC	- No Observed Adverse Effects Concentration
ECETOC	- European Center for Ecotoxicology and Toxicology of Chemicals
EUSES	- The European Union System for the Evaluation of Substances
STP	- Sewage Treatment Plant
EC50	- Concentration of toxic material for which 50% of the tested organisms survive
LD50	- Lethal dose for 50% of the tested population
LC50	- Lethal concentration for 50% of the tested population
STOT	- Specific target organ toxicity
PBT	- Persistent, Bioaccumulative, Toxic
vPvB	- very Persistent, very Bioaccumulative
MRR	- Measures of risk reduction
HG	- Government Decision
OUG	- Government Emergency Ordinance
UN	- United Nations
ISCIR	- State Inspection for the Control of Boilers, Under-Pressure Vessels and Lifting Devices
ACGIH	- American Conference of Governmental Industrial Hygienists
ADR	- European Agreement referring to the International Carriage of Dangerous Goods by Road, 2019 edition.
RID	- Regulation referring to the International Carriage of Dangerous Goods by Rail (RID), 2019 edition.
IMDG	- Regulations referring to the maritime transportation of hazardous substances (IMDG), 2017 edition.
IATA	- International Air Transport Association (Dangerous goods air transport regulations)
OACI (ICAO)	- International Civil Aviation Organization (Technical Instructions)
MARPOL	- International Convention for the Prevention of Pollution From Ships
IBC	- International Code for the Construction Equipment of Ships Carrying Dangerous Chemicals in Bulk
GESTIS	- Information system on hazardous substances of the German Social Accident Insurance
w/w	- mass unit
b/w	- body weight

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c) Bibliography

GESTIS Database - Material Safety Data Sheets

Amuliu Proca, Gabriel Stănescu - Substanțe și produse utilizate în industria chimică-pericol de incendiu - pericol de explozie – toxicitate (Substances and products used in the chemical industry-fire hazard-explosion hazard-toxicity), 1984

Studies according to the Chemical Safety Report

Guidance on safe use – The joint/individual ECHA Registration file for the substance

Official Journal of the European Union – EU Regulation no. 830/2015 of the European Council of 28.05.2015

EFMA - Guidance for the Compilation of Safety Data Sheets for Fertilizer Materials.

ESIS - European Chemical Substances Information System

Official Journal of the European Union – EC Regulation no. 1907/2006 of the European Parliament and Council concerning the registration, evaluation, authorization and restriction of chemical substances (REACH)

ADR - European Agreement referring to the International Carriage of Dangerous Goods by Road, 2019 edition

RID - Regulation referring to the International Carriage of Dangerous Goods by Rail (RID), 2019 edition

IMDG - Regulations referring to the maritime transportation of hazardous substances, 2017 edition

IATA - Dangerous goods air transport regulations, edition 2020

Relevant hazard statements / Relevant precautionary phrases

For ammonium nitrate in the composition of NPK complex fertilizers of the sorts mentioned before relevant hazard statements:

H 272 – May intensify fire; oxidizer

H 319 – Causes serious eye irritation

Precautionary statements: Prevention

P210 – Keep away from heat/sparks/open flames/hot surfaces. No smoking.

P220 – Keep/Store away from clothing/combustible materials (lubricants, Diesel fuel, oil, paints etc.)

P 264 – Wash hands thoroughly after handling

P 280 – Wear protective gloves (heat resistant)/protective clothing (powder resistant overalls)/tight safety goggles/ face mask

Intervention

P 370 + P 378 – In case of fire use plenty of water (flooding). Use dust or carbon dioxide extinguishers for cooling;

P 305+351+338 – If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P 337+ P313 – if irritation persists see the doctor.

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Note:

The information included in this safety data sheet is based on the data available at the time of publication.

The client and the user assume all risks regarding usage, handling and storage of this product.

There are no guarantees for the product in case of improper handling, transport and storage of the product, not complying with the specifications of the Technical Specification and the Safety Data Sheet.