SECTION 1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING	
1.1. Product identifier	
Commercial product name	PULAN®MACRO
Synonyms	Ammonium nitrate N 32, Ammonium nitrate,
1.2. Relevant identified uses of the substance or mixture and uses advised against	
PULAN®MACRO is used in agriculture, as a mineral fertiliser.	
1.3. Details of the supplier of the safety data sheet	
Company name	Grupa Azoty Zakłady Azotowe „Puławy" S.A.
Company address	Al. Tysiąclecia Państwa Polskiego 13; 24-110 Puławy; Poland
Company telephone number	+48 (81) 886 34 31; +48 (81) 565 30 00 fax.: +48 (81) 565 28 56
E-mail	dyspozytor.zap@grupaazoty.com
1.4. Emergency telephone number	
Company shift dispatcher: + 48 (81) 565 23 00 (24 hours/7 days a week) Emergency telephone number: 112	
SECTION 2. HAZARDS IDENTIFICATION	
2.1. Classification of the substance or mixture	
Classification according to Regulation (EC) 1272/2008	
Hazard Class and Category Code(s)	**Ox. Sol. 3** - Oxidising solids, category 3 **Eye Irrit. 2** - Eye irritation, category 2
Hazard statement(s)	H272, H319
Environmental hazards	
Product is not classified as hazardous substance for environment.	
Health hazards	
Skin contact	Prolonged contact with skin may cause redness.
Eye contact	Causes eye irritation. Eye redness and eye pain may occur.
Ingestion	Ingestion of large amount of product may cause gastro -intestinal disturbances leading to vomiting, diarrhea, methemoglobin creation and thus cyanosis may occur.
Inhalation	Inhalation of product dusts may cause respiratory tract irritation.
Long term effects	Within a few hours after poisoning by ingestion, the following symptoms of methemoglobinemia may occur: - headache and dizziness, - nausea and vomiting, - psycho-motor agitation, anxiety and stupefaction,

	- weakness, exhaustion and physical effort intolerance, - dyspnoea, - chest pain, - sleepiness, - fainting, - cardiac dysrhythmia, - cyanosis.
Adverse physicochemical effects	Non flammable product. However, ammonium nitrate can assist other material to burn and may intensify fire. Decomposition of pure substance starts at temperature above melting point (see item 9.1). In confided spaces thermal decomposition may lead to explosion. Substances mentioned in Section 10.5. may catalyze decomposition process and thus fire – explosion hazard increases. If involved in a fire, ammonium nitrate decomposes with the release of toxic fumes of nitrogen oxides (NO_X) and ammonia (NH_3).
2.2. Label elements	
Hazard pictogram(s)	 **GHS03** **GHS07**
Signal Word	**Warning**
Hazard statement(s)	**H272:** May intensify fire; oxidizer. **H319:** Causes serious eye irritation.
Precautionary statement(s)	**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. **P280:** Wear protective gloves/protective clothing/eye protection/ face protection. **P305 + P351 + P338:** IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. **P337 + P313:** If eye irritation persists: Get medical advice/attention.
2.3. Other hazards	
The criteria accepted for persistent substances with bioaccumulative and toxic potential (Persistent, Bioaccumulative, Toxic – PBT) or very persistent and very bioaccumulative substances (very Persistent very Bioaccumulative - vPvB) are not applicable to the substances contained in the mixture.	
SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS	
3.1. Substances	
Not relevant.	
3.2. Mixtures	

Product identifier	PULAN®MACRO

Classification in accordance with Regulation (EC) 1272/2008

Chemical name	% (w/w)	EC Number	Registration number	Hazard Class	Hazard statement
Ammonium nitrate (V)	89,14-93,71%	229-347-8	01-2119490981-27-0025	Oxid. Solid 3 Eye Irrit. 2	H272 H319
Dolomite	5,79 - 10,66%	-	-	Not revelant	Not relevant

Full text of Hazard statements mentioned in this Section are listed in Section 16. For more details see Section 16.

SECTION 4. FIRST AID MEASURES

4.1. Description of first aid measures

General	Provide sufficient general and local ventilation. Installation of safety showers and eyewash stations is recommended at workplace.
Inhalation	Remove victim from the area of exposure to fresh air. Obtain medical attention if symptoms of poisoning occur.
Ingestion	If swallowed, give plenty of water to drink. Do not induce vomiting. Ingestion of small amounts of ammonium nitrate usually does not cause intoxication. Ingestion of large amount of ammonium nitrate may cause gastro - intestinal disturbances and methemoglobin creation. In some cases low blood pressure is also observed. Obtain medical attention.
Skin contact	Take off contaminated clothing. Wash contaminated skin with plenty of water. Get medical advice if symptoms of irritation occur.
Eye contact	Immediately flush eyes with plenty of water for about 15 minutes. Avoid strong water stream due to the risk of mechanical damage to cornea. Obtain ophthalmologists' assistance.

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

The mixture irritates eyes, dusts may cause respiratory tract irritation and result in skin redness. In the event of intake by ingestion, methemoglobinemia may occur with the following symptoms: headache, pressure drop, cardiac arrhythmias, dyspnoea and weakness. When 15% of haemoglobin converts to methemoglobin, cyanosis may occur.

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

Medical personnel ought to diagnose and possibly introduce treatment for methemoglobinemia.

SECTION 5. FIREFIGHTING MEASURES

5.1. Extinguishing media

Suitable extinguishing media	Not flammable. Use large amounts of water if involved in fire.
Unsuitable extinguishing media	Do not use foam and dry chemical extinguishers.
5.2. Special hazards arising from the substance or mixture	
For more details see item 2.1.	
5.3. Advice for firefighters	
Wear full chemical resistant protective clothing and positive pressure, self contained breathing apparatus.	
SECTION 6. ACCIDENTAL RELEASE MEASURES	
6.1. Personal precautions, protective equipment and emergency procedures	
For non-emergency personnel	
Suitable protective equipment	Depending on exposure route use: • protective glasses (according to EN 166 standard); • dust masks (according to EN 149 standard); • protective gloves (according to EN 374 and EN 388 standard); • protective goggles (according to EN 166 standard).
Emergency procedures	In case of high concentration of ammonium nitrate dusts evacuate the area of exposure.
For emergency responders	
Wear protective clothing, dust masks, protective gloves, protective goggles.	
6.2. Environmental precautions	
Avoid contamination of watercourses and drains with large amount of ammonium nitrate.	
6.3. Methods and material for containment and cleaning up	
Recommendations for preventing the spread of the spill and its elimination	Small spill and leak: Vacuum or sweep up material. Large spill and leak: Vacuum or sweep up material. Rinse affected area with large amounts of water. Reuse collected product as a fertiliser or give it away for further disposal.
6.4. Reference to other sections	
See section 8 for personal protective equipment and section 13 for waste disposal.	
SECTION 7. HANDLING AND STORAGE	
7.1. Precautions for safe handling	
Avoid inhalation of dust. Handle with care in accordance with good industrial hygiene and safety practice. Use personal protective equipment. Ensure proper cleanness of transport means. In order to prevent humidification avoid product exposure to atmospheric conditions and work in dry, clean and well – ventilated areas. Avoid open flame and high temperatures.	

7.2. Conditions for safe storage, including any incompatibilities

PULAN®MACRO should only be stored in its original packaging, in clean, dry and ventilated buildings, protected from the ground side from moisture penetration.

Store PULAN®MACRO on a substrate made of non-flammable materials, without channels, holes and depressions where the molten saltpetre could be trapped.

PULAN®MACRO can be stored in stable piles with a total weight not exceeding 300t of the product. The stacks should be separated from each other, walls, roof, heat sources (eg lamps and electrical appliances, heating installations) by a minimum distance of 1 m. Moreover, each stack should be able to access vehicles intended to transport the fertiliser in case of emergency.

Fertilizer in flexible Intermediate bulk containers (IBCs) with a unit weight not exceeding 600 kg should be stored in stacks with up to 2 layers. Fertilizer packed in sacks with a unit weight of 750 and 1000 kg must be stored in one layer only.

Repack the fertiliser in the damaged packaging, and it is imperative to collect the spills into a clean bag and separate from the pile.

It is allowed to store nitrate fertilizers, such as: ammonium nitrate, nitro-chalk, calcium nitrate, potassium nitrate, sodium nitrate, fertilizers based on ammonium nitrate with a total nitrogen content above 28% next to each other in one storage room.

Do not store PULAN®MACRO together with the materials listed in 10.5.

The access to all storage rooms, both inside and outside, must be restricted only to the authorised persons.

In an PULAN®MACRO storage area, smoking, welding, and open flame are prohibited. Protect from direct sunlight, and from heating above 30°C.

Note: See section 9 for physical and chemical properties.

7.3. Specific end use(s)

PULAN®MACRO is used as a mineral fertiliser.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control parameters

Indicative occupational exposure limit values	Not established
Biological limit values	Not established

Ammonium nitrate DNEL (for workers)

Chronic toxicity; systemic effects	Exposure route: dermal	DNEL: 5.12 mg/kg bw/day
Chronic toxicity; systemic effects	Exposure route: inhalation	DNEL: 36 mg/m^3

Ammonium nitrate PNEC

STP	18 mg/l

8.2. Exposure controls	
Engineering measures	Use general ventilation.
Eye protection	In the event of exposure to a liquid product, use sealed, chemical-resistant protective goggles in accordance with EN 166.
Skin protection	Use protective clothing in accordance with PN EN ISO 13688-12.
Hand protection	Use protective gloves in accordance with EN 374 and EN 388.
Respiratory system protection	In the event of exposure to dust, use a dust mask in accordance with EN 149.
Environmental exposure controls	Prevent significant amounts of the product from getting into the municipal water and sewage system and water courses.
See the attached exposure scenarios for more details.	

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties	
Appearance	White or beige solid.
Odour	None
Odour threshold	Not relevant
pH	≥ 4.5 (10% aqueous solution of ammonium nitrate)
Melting point/freezing point	Ammonium nitrate: 169.6°C (p = 1013 hPa)
Initial boiling point and boiling range	Ammonium nitrate: decomposes at 210°C
Flash point	Not relevant (mixture is non – flammable)
Evaporation rate	No data
Flammability	Mixture is non – flammable; may intensify fire and oxidation
Upper/lower explosion limits	Not relevant (mixture is not explosive)
Vapour pressure	No data
Vapour density	Not relevant
Relative density	Ammonium nitrate: 1.72 at 20°C (water = 1)
Solubility In water	Ammonium nitrate: > 100 g/l at 20°C
Partition coefficient: n-octanol/water	Not relevant (inorganic mixture)

Auto-ignition temperature	Not relevant (mixture is non – flammable)
Decomposition temperature	Ammonium nitrate: ≥ 210°C
Viscosity	Not relevant (solid mixture)
Explosive properties	Non - explosive accordingly to the laboratory test, which was carried out in compliance with Regulation (EC) No. 2003/2003 of the European Parliament and Council of 13 October 2003 relating to fertilisers. Substance resistance to detonation transfer is reduced in presence of impurities and/or at high temperature. Heating in enclosed space, especially in presence of materials mentioned in item 10.5. may cause violent uncontrolled reaction or explosion.
Oxidising properties	Mixture is characterized with oxidizing properties.
9.2. Other information	
Solubility in organic solvents	Good solubility in pyridine, methanol, liquid ammonia. Limited solubility is observed in solvents such as: ethanol, acetone.
Granulometry	The product in the form of granules does not contain particles from the fraction that can be absorbed in the alveoli.
SECTION 10. STABILITY AND REACTIVITY	
10.1. Reactivity	
The main ingredient of PULAN®MACRO is ammonium nitrate, which is unstable when heated to high temperature (see section 5.2.). Ammonium nitrate is characterized with oxidizing properties and therefore reacts violently with combustible and/or reducing agents (see item 10.5). Aqueous solutions of ammonium nitrate are known to act like a weak acids.	
10.2. Chemical stability	
Product is stable under normal conditions.	
10.3. Possibility of hazardous reactions	
Reacts violently with combustible materials and/or reducing agents (see item 10.5.).	
10.4. Conditions to avoid	
Open flame, heating above melting point (see item 9.1.), exposure to atmospheric conditions (see item 7.2.), contact with incompatible materials (see item 10.5.).	
10.5. Incompatible materials	
Do not store PULAN®MACRO with fertilisers other than these specified in point 7.2. and avoid allowing ammonium nitrate to get in contact with materials that may react with it, or are combustible, that is, e.g., pesticides, disinfectants, herbicides, flammable materials, chlorates, hypochlorites, chlorinated organic compounds, bleaches, chromates, organic peroxides, organic compounds, alkalis, acids, sulfur, powdered metals (zinc, copper and copper alloys), organic materials such as hay, straw, oils, greases, grains, and animal fodder.	
10.6. Hazardous decomposition products	

Toxic nitrogen oxides (NO_x) and ammonia (NH_3).

SECTION 11. TOXICOLOGICAL INFORMATION

11.1. Information on toxicological effects

Acute toxicity

Ingredient name	Route	Specie(s)	Result
Ammonium nitrate (100%)	Inhalation (30 min.)	-	Not relevant
	Ingestion	rat	LD_{50}: 2950 mg/kg
	Skin contact	rat	LD_{50}: >5000 mg/kg

Skin corrosion/irritation	There is no evidence of skin irritation. Prolonged contact may cause skin redness.
Serious eye damage/irritation	Mixture causes eye irritation.
Respiratory or skin sensitisation	There is no evidence for skin or respiratory tract sensitization. No classification.
Germ cell mutagenicity	There is no evidence for genotoxicity. No classification.
Carcinogenicity	There is no evidence for carcinogenicity. No classification.
Reproductive toxicity	There is no evidence for reproductive toxicity. No classification.
STOT (*Specific target organ Toxicity*) - single exposure	Not classified.
STOT-repeated exposure	Not classified.
Aspiration hazard	There is no evidence for aspiration hazards.

Symptoms related to the physical, chemical and toxicological characteristics

Inhalation	Inhalation of product dusts may cause respiratory tract irritation.
Ingestion	Ingestion of large amount of product may cause gastro-intestinal disturbances leading to vomiting, diarrhea, methemoglobin creation possibly resulting in cyanosis.
Skin contact	Prolonged contact may cause skin redness.
Eye contact	Contact with eye may cause eye irritation.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

The mixture irritates eyes, dusts may cause respiratory tract irritation and result in skin redness. In the event of intake by ingestion, methemoglobinemia may occur with the following symptoms: headache, pressure drop, cardiac arrhythmias, dyspnoea and weakness. When 15% of haemoglobin converts to methemoglobin, cyanosis may occur.

SECTION 12. ECOLOGICAL INFORMATION

12.1. Toxicity

Short-term (acute) toxicity:

Ingredient name	Test	Result
Ammonium nitrate (100%)	Fish	LC_{50} (48 h): 447 mg/l

12.2. Persistence and degradability

Biodegradability in case of inorganic chemicals is not required to Regulation (EC) 1907/2006.

12.3. Bioaccumulative potential

Bioaccumulation does not occur in case of ammonium nitrate.

12.4. Mobility in soil

Based on physico-chemical properties, ammonium nitrate is predicted to have a high mobility in soil.

12.5. Results of PBT and vPvB assessment

PBT and vPvB assessment is not relevant and it is not required for the substances of inorganic type.

12.6. Other adverse effects

Ammonium nitrate is not listed in the Regulation (EC) 1005/2009 as the substance potentially depleting the ozone layer.

SECTION 13. DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

Waste treatment methods	Reuse as a mineral fertiliser or give it away for further disposal. Avoid disposal into drains and sewers.
Package waste disposal	Dispose in accordance with national and local environmental regulations. Empty containers must be handed over to a licensed waste disposal contractor (package waste code 15 01 02).
Waste code	02 01 09 - Agrochemical waste other than those mentioned in 02 01 08.
Special precautions	See Section 7 for more details.
Relevant Community provisions	The disposal of this product and its packaging after use must conform to the requirements of environment protection and regulations referring to waste disposal as well as the requirements of local authorities.

SECTION 14. TRANSPORT INFORMATION

14.1. UN number

2067

14.2. UN proper shipping name

Ammonium nitrate based fertiliser.	
14.3. Transport hazard class(es)	
5.1.	
14.4. Packing group	
III	
14.5. Environmental hazards	
Not applicable.	
14.6. Special precautions for user	
Follow rules and guidelines of the traffic code.	
14.7. Transport in bulk according to Annex II of MARPOL and the IBC Code	
Product name	Not applicable.
Ship type	Not applicable.
Pollution Category	Not applicable.
SECTION 15. REGULATORY INFORMATION	
15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture	
Authorisation	
Material is not subject to authorization according to Annex XIV of Regulation (EC) No. 1907/2006.	
Restrictions	
Ammonium nitrate is subject to following restrictions on the manufacture, placing on the market and use according to Annex XVII of EC Regulation No. 1907/2006: 1. Shall not be placed on the market for the first time after 27 June 2010 as a substance, or in mixtures that contain more than 28% by weight of nitrogen in relation to ammonium nitrate, for use as a solid fertiliser, straight or compound, unless the fertiliser complies with the technical provisions for ammonium nitrate fertilisers of high nitrogen content set out in Annex III to Regulation (EC) No 2003/2003 of the European Parliament and of the Council.	
Other UE regulations	
The main ingredient of PULAN®MACRO - ammonium nitrate is listed in Part 1 of Annex I to the Regulation (EU) 2012/18 of the European Parliament and of the Council of 4 July 2012 on the control of major-accident hazards involving dangerous substances, amending and subsequently repealing Council Directive 96/82/EC (also known as the Seveso III Directive). Ammonium nitrate is listed in Annex I to the Regulation (EU) 2019/1148 on the marketing and use of explosives precursors. Acquisition, introduction, possession or use by the general public is restricted. Any suspicious transactions and significant disappearances and thefts must be reported to the National Contact Point within 24 hours of considering or detection.	
15.2. Chemical safety assessment	

Grupa Azoty Zakłady Azotowe „Puławy" S.A. prepared a relevant chemical safety assessment for ammonium nitrate.	
SECTION 16. OTHER INFORMATION	
Changes made	Not revelant.
Legend to abbreviations and acronyms: Index number – is the nine-digit code that is assigned to chemical substances in part 3 of Annex VI (EC) 1272/2008. EC number - is the seven-digit code that is assigned to chemical substances that are commercially available within the European Union. CAS number - unique numerical identifier assigned by the Chemical Abstracts Service to every chemical substance. DNEL - is the level of exposure to a substance above which humans should not be exposed. PNEC - is the concentration below which exposure to a substance is not expected to cause adverse effects for environmental. LC_{50} - in toxicology, the median lethal dose, LD_{50} (abbreviation for "Lethal Dose, 50%"), LC_{50} (Lethal Concentration, 50%) of a toxic substance or radiation is the dose required to kill half the members of a tested population after a specified test duration. LD_{50} - in toxicology, lethal dose (LD) is an indication of the lethality of a given chemical substance. It represents the amount of a material, which results in death of 50% of a group of test animals. EC_{50} - effective concentration of a toxic substance at 50% mortality rate of the affected community being observed Log $K_{O/W}$ - is defined as the ratio of the molar concentrations of a chemical in n-octanol and water, in dilute solution. $K_{O/C}$ – is defined as the ratio of the molar concentrations of a chemical in organic carbon and water.	
References	Chemical Safety Reports for ammonium nitrate and as well for magnesium nitrate were applied during MSDS preparation. Ostra methemoglobinemia – przyczyny, objawy i leczenie /Acute methemoglobinemia – causes, symptoms and medical treatment/ - Tomasz Janus, Jacek Piechock, Anna Janus, /Anestezjologia i Ratownictwo Anaesthesiology and Medical Rescue/ 2015; 9: 327-333
Instruction	Personnel involved in dealing with the substance should be trained and work according to relevant HSE guidelines. Drivers who are responsible for transportation of the substance should be professionally trained in requirements of ADR.
Hazard statements referred to under headings 2 – 15	
H272: May intensify fire; oxidizer. **H319**: Causes serious eye irritation.	
NOTE: *The information in this Safety Data Sheet is given in good faith and belief in its accuracy based on our knowledge of the substance/mixture concerned at the date of publication. It does not imply the acceptance of*	

any legal liability or just responsibility whatsoever by the Company for the consequences of its use or misuse in any particular circumstances.