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

<table>
<thead>
<tr>
<th>1.1. Product identifier</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Trade name:</strong> ammonium nitrate.</td>
</tr>
<tr>
<td><strong>Chemical name:</strong> ammonium nitrate.</td>
</tr>
<tr>
<td><strong>Index number according to Regulation No. 1272/2008:</strong> not applicable.</td>
</tr>
<tr>
<td><strong>CAS number:</strong> 6484-52-2</td>
</tr>
<tr>
<td><strong>EC number:</strong> 229-347-8</td>
</tr>
<tr>
<td><strong>REACH registration number:</strong> 01-2119490981-27-XXXX</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>1.2. Relevant identified uses of the mixture and uses advised against</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1.2.1. Uses:</strong></td>
</tr>
<tr>
<td><strong>Industrial use</strong></td>
</tr>
<tr>
<td>- Industrial use [SU8, SU9]: Production of material (continuous and periodic production), including handling, warehousing, quality control;</td>
</tr>
<tr>
<td><strong>Professional use</strong></td>
</tr>
<tr>
<td>- Professional use [SU3, SU10]: Professional use in formulation of mixtures, use as an intermediate product and final industrial use (PC1, PC11, PC12, PC19, PC37).</td>
</tr>
<tr>
<td>- Professional use [SU22]: Professional use in formulation and final use (PC12).</td>
</tr>
<tr>
<td><strong>Further customer use</strong></td>
</tr>
<tr>
<td>- Further customer use [SU21]: Further use as fertilizers (PC12).</td>
</tr>
<tr>
<td><strong>1.2.2. Uses advised against:</strong> none.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>1.3. Details of the supplier of the safety data sheet</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Manufacturer:</strong> AB Achema</td>
</tr>
<tr>
<td><strong>Full address:</strong> Jonalaukio k., Ruklos sen., LT-55296</td>
</tr>
<tr>
<td><strong>Country:</strong> Lithuania</td>
</tr>
<tr>
<td><strong>Tel. No.:</strong> +370 349 56736</td>
</tr>
<tr>
<td><strong>URL website:</strong> <a href="http://www.achema.lt">www.achema.lt</a></td>
</tr>
<tr>
<td><strong>Person responsible for the Safety Data Sheet (with e-mail address):</strong> Vytautas Galeckas, <a href="mailto:v.galeckas@achema.com">v.galeckas@achema.com</a></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>1.4. Emergency telephone number</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Please contact:</strong> Poison Information and Control Office in the Republic of Lithuania by phone +370 52362052, cell phone +370 687 53378, on site <a href="http://www.apsinuodijau.lt/information-in-english">http://www.apsinuodijau.lt/information-in-english</a> or by the Common emergency Center by 112.</td>
</tr>
<tr>
<td><strong>Helpdesk services work:</strong> 24 hours a day, 365 days a year.</td>
</tr>
<tr>
<td><strong>Other remarks (language in which assistance is provided):</strong> assistance is provided in Lithuanian.</td>
</tr>
<tr>
<td>Telephone numbers of poison control centers in the European Economic Area: <strong>IRELAND</strong> (Dublin) +353 1 8379964; <strong>AUSTRIA</strong> (Vienna) +43 1 406 43 43; <strong>BELGIUM</strong> (Brussels) +32 70 245 245; <strong>BULGARIA</strong> (Sofia) +359 2 9154 409; <strong>CZECH REPUBLIC</strong> (Praha) +420 224 919 293; <strong>DENMARK</strong> (Copenhagen) 82 12 12 12; <strong>ESTONIA</strong> (Talinn) 112; <strong>GREECE</strong> (Athens) +30 10 779 3777; <strong>ICELAND</strong> (Reykjavik) +354 525 111, +354 543 543</td>
</tr>
</tbody>
</table>
SECTION 2. HAZARDS IDENTIFICATION

2.1 Classification of the substance
Classification in accordance with EC Regulation No. 1272/2008 [CLP]:
In Lithuanian
Oxidising solids Cat. 3,
Eye irritation Cat. 2

In English
Oxid. Solid 3, H272
Eye Irrit. 2, H319

2.2. Label elements
2.2.1. Labelling in accordance with EC Regulation No. 1272/2008 [CLP]:

Hazard pictogram(s):

Signal word: WARNING
Hazard statement(s):
H272 – May intensify fire; oxidiser.
H319 – Causes serious eye irritation.
Precautionary statement(s):
P210 – Keep away from heat/sparks/open flames/hot surfaces. — No smoking. Keep away from heat;
P220 – Keep/Store away from clothing/reducing agents/acids/alkali/sulphur/chlorates/chlorides/nitrates/permanganates/powder of metals and materials containing metals as follows: copper, nickel, cobalt, zinc and their alloys/combustible materials;
P221 – Take any precaution to avoid mixing with combustibles, reducing agents, acids, alkali, sulphur, chlorates, chlorides, nitrates, permanganates, powder of metals and materials containing metals as follows: copper, nickel, cobalt, zinc and their alloys;
P370+P378 – In case of fire: Use water for extinction;
P264 – Wash hands thoroughly after handling“;
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.

2.3 Other hazards
PBT/vPvB criteria: According to Annex XIII of Regulation (EC) No 1907/2006, no PBT and vPvB assessment has been conducted since ammonium nitrate is inorganic.
Other hazards: The product is non-flammable, but, in contact with combustible materials, increases the risk of ignition and can significantly increase the existing fire. Very soluble in water. Hygroscopic. May cause acute deterioration (see sub-section 4.1 of this SDS).

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS
3.1. Substances
According to the REACH Regulation No. 1907/2006 the product is a mono-constituent

<table>
<thead>
<tr>
<th>CAS Nr.</th>
<th>Index No. in accordance with Regulation (EB) No. 1272/2008</th>
<th>IUPAC name</th>
<th>Mass fraction, %</th>
<th>EC Nr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>6484-52-2</td>
<td>Not applicable</td>
<td>Ammonium nitrate</td>
<td>98,4 %</td>
<td>229-347-8</td>
</tr>
<tr>
<td>13446-18-9</td>
<td>Not applicable</td>
<td>Magnesium nitrate</td>
<td>1,33 %</td>
<td>233-826-7</td>
</tr>
</tbody>
</table>

SECTION 4. FIRST-AID MEASURES

4.1. Description of first aid measures
General information
The material can get through:
Inhalation: Remove the victim from exposure into fresh air immediately if adverse effects (e.g. dizziness, drowsiness or respiratory irritation) occur. If not breathing, give artificial respiration or if breathing is difficult, give oxygen and seek medical advice. Seek medical advice immediately when vapours are intensively inhaled.
Skin contact: Wash affected skin area with plenty of water and soap for at least 15 minutes thoroughly while removing contaminated clothing and shoes. Seek medical advice if irritation develops and persists.
Eye contact: Immediately wash eyes with plenty of running water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Remove contact lenses if present and easy to do. Seek medical advice if irritation develops and persists.
Ingestion: Remove the victim from exposure into fresh air immediately if adverse effects (e.g. dizziness, drowsiness or respiratory irritation) occur. If not breathing, give artificial respiration or if breathing is difficult, give oxygen and seek medical advice. Do not use mouth-to-mouth respiration. Seek medical advice immediately when vapours are intensively inhaled.

Individual protection measures recommended for first-aiders: Comply with general hygiene requirements. Wear suitable protective clothing and gloves.

4.2 Most important symptoms and effects
Inhaled: Respiratory tract irritation.
Skin Contact: Skin irritation.
Eye Contact: Eye irritation, pain.
Ingestion: Nausea, mucosal irritations.
Delayed effects: none known.

4.3 Indication of any immediate medical attention and special treatment needed
Note to physician: Fire extinguishing gas or ammonium nitrate thermal decomposition products (nitrogen oxides, ammonia) can cause respiratory irritation and damage by inhalation. Pulmonary damage may not occur immediately, but after a certain period of time. Give oxygen to breath, especially when the blues around the mouth.

SECTION 5. FIRE-FIGHTING MEASURES

5.1. Extinguishing media
Suitable: If fertilizer is not directly involved in the combustion process, use any best available measures. If fertilizer is directly involved in combustion process, use large quantities of water. In the case of a small fireplace, because the product is non-combustible, it can withstand burning, extinguishing with water. In the case of large
fireplaces, the product is non-combustible, but can withstand combustion. Extinguish with water. **Not suitable:** Do not use chemical extinguishers or chemical foam. Do not attempt to suppress the fire with steam or sand.

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

In case of fire, there is a potential option of explosion, especially if fertilizers are contaminated by inappropriate (incompatible) chemical substances. May be explosive in contact with flammable or organic substances and at confinement during fire. In case of fire, may produce hazardous decomposition products such as nitrogen oxides (NO, NO₂ etc.), ammonia (NH₃), amines.

### 5.3. Advice for firefighters

Special measures: open doors and windows in the area to give maximum ventilation. Do not inhale smoke (which is toxic), stand upwind of the fire, ensure that fertilizers are not contaminated with lubricants or flammable materials. Wear protective work clothing, safety boots, protective gloves, eye, face and respiratory protective equipment according to LST EN 469 “Protective clothing for firefighters. Performance requirements for protective clothing for firefighters”. Use compressed air breathing apparatus if necessary.

### 5.4. Additional information

The water used for extinguishing which has been contaminated must be collected. Do not empty into drains or sewers.

## SECTION 6. ACCIDENTAL RELEASE MEASURES

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

**6.1.1. For personnel not involved in emergency situations:** Avoid contact with eyes, skin and clothing. Use respiratory protection according to LST EN 149 or a mask with filter A2B2E2K2P3 according to LST EN 405. For eye protection use a chemical resistant goggle complying with LST EN 166 if not using a mask.

**6.1.2. For the personnel involved in emergency situations:** Keep the product away from sources of ignition. Avoid dust formation when wind blows. Avoid walking on the spilt product and exposure to the dust. Use respiratory protection according to LST EN 149 or a respirator with filter A2B2E2K2P3 according to LST EN 405. Use chemical resistant goggles according to LST EN 166 in the event of fire, if a mask is not used. Use self-contained breathing apparatus if necessary.

### 6.2. Environmental precautions

Prevent the material from contact with soil, entering surface water or sanitary sewer system. Do not discharge directly to a water source. If accidental spillage or washings enter drains or watercourses contact local authority.

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

**6.3.1. Containment.** Protective barriers from the ground, sand. In the event of precipitation, cover the sewage systems.

**6.3.2. Cleaning up.** Disperse a small amount of product, vacuum it or soak it into properly labeled waste or waste containers, large bags. The place where the product was poured should then be washed with plenty of water. Do not pick up fertilizer using sawdust or other combustible materials. Dispose of large quantities of product, vacuumed or soaked in properly labeled waste or waste containers, large batches. If possible, waste should be recycled. Wash contaminated area with plenty of water. If the fertilizer enters the water body, inform the local state authority about this. Do not pick up fertilizer using sawdust or other combustible materials.

**6.3.3. Other information.** None.

### 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

**Protective measures.** Avoid contact with eyes, skin, and clothing. Use suitable personal protective equipment; wear goggles, gloves, working boots.

**Fire prevention measures.** Use with adequate ventilation. Local exhaust ventilation should be provided. Avoid contact with eyes, skin and clothing. Avoid creating dusty conditions and prevent wind dispersal. Keep product away from sources of ignition. Avoid contamination by any source including metals, dust and organic materials. Keep product away from moisture.

**Aerosol and dust prevention measures.** Use adequate ventilation. A local exhaust ventilation system must be used. When wind blowing, do not let dust build up and spread.

**Environmental precautions.** Do not allow to enter surface water or groundwater or sewage system.

**Recommendations concerning good general hygiene practices at the work place.** Do not eat, drink or smoke in work areas. Wash hands after use. Remove contaminated clothing and protective equipment before entering eating areas.

7.2. Conditions for safe storage, including any incompatibilities

Ammonium nitrate must be stored in accordance with the Minister of Agriculture of the Republic of Lithuania of 2013 December 9th in order No. 3D-825 “On Approval of Rules for Technological Design of Warehouses for Mineral Fertilizers and Plant Protection Products in the UAA TPT 10: 2013” (Official Gazette, 2013, No. 128-6540), as amended and supplemented thereafter.

Packed and bulk Ammonium Nitrate may be stored indoor, covered, dry, clean and ventilated warehouses. Recommended temperature in warehouses should be exposed not higher than 30 ºC, and air humidity, not higher than 50 %. The storehouse premises must be single-floor, without cellar or basement. Storehouse sections, where Ammonium Nitrate is stored, must be emptied and properly cleaned at least once in a year.

Packed Ammonium Nitrate may be stored in open storage sites only when it is protected from direct sunrays, atmosphere precipitation (rain, snow, bag should not stand in a water and water cannot aggregate on the bag), moisture. Big bags and packages of Ammonium Nitrate must be wrapped with water-proof membrane. Ammonium Nitrate cannot be kept in the temperature above 30 ºC. Ammonium Nitrate in bulk cannot be stored outside.

Bulk Ammonium Nitrate in farms may be stored in silos or closed bunkers in accordance with the requirements of the Guidelines for the storage, handling and transportation of bulk mineral fertilizers (2007) and the Guidelines for the Safe Farm Handling (2012) issued by the European Fertilizer Requirements.

Big bags of Ammonium Nitrate are stored in vertical position, stowed on pallets without any peered nails, screws, wooden chips or other sharp items that can damage big bags.

Ammonium Nitrate storage area at manufacturer and in port should be inaccessible to unauthorized personnel. Warnings “Entry by permit only”, “No smoking” and other safety requirements for storage of Ammonium Nitrate must be posted in prominent locations of storage area.

Strictly forbidden to smoke at storage area of Ammonium Nitrate, prohibits open heating and light sources. Product must be kept separately from heating sources or flame, stored away from moisture, flammable material, reducing agent, acid, alkali, sulphur, chloride, chloride of lime, chromate, nitrite, permanganate, metals powder (especially, zinc), materials that have cuprum, nickel, cobalt or alloys of above mentioned metals in it, sulphide, superphosphate.

Avoid Ammonium Nitrate storage in hot places or sunshine, tare damage, moisture, pollution with incompatible material (fertilizers, which possess elemental sulphur, urea, NPK, NP and NK urea basis), grease, and flammable material.

To be ensured that farms that use this fertilizer do not store it together with hay, straw, grain, diesel, grease. If Urea and Ammonium Nitrate are stored in the same warehouse, contact between these 2 substances should be avoided at any time, also in the event of fire.

There should be a sufficient distance between bulk product piles, in order to prevent the contamination with other
requirements. At a time in warehouse are allowed to hold from 1250 to 5000 t, if the object stored under the classification of ammonium nitrate correspond to the amount of lower-tier requirements. At a time in warehouse are allowed to hold from 5000 t and more, if the object stored under the classification of ammonium nitrate correspond to the amount of higher-tier requirements.

When storing the product in Lithuania in stationary containers with a volume of more than 50 m³, these containers must be registered with the state register management institution in accordance with the 2006 Chief State Labor Inspector of the Republic of Lithuania. August 1 order no. 1-178 “On the Approval of the List-Classification of Potentially Dangerous Equipment to be Registered in the State Register, Indicating Their Parameters”.

For storage of packed Ammonium Nitrate in open warehouses or sheds, there can not be more than 700 tons in pile and pile area can not be larger than 300 m². The anti-fire space between piles must be left not less than 6 m.

Exporting product to other countries, allowed storage quantity, heaps and piles size of Ammonium Nitrate must comply with the local country requirements.

Additional information on storage conditions. Product packaging must be protected against damage.

Note: See section 10 for information on product stability and reactivity.

Ammonium nitrate registration in the REACH documentation, which is not mentioned in sub-clause 1.2.1 of this
Safety Data Sheet and for which exposure scenarios are not included in this Safety Data Sheet, are listed below:

### 7.3 Specific final uses

#### Industrial use
1. Sampling, loading, filling, reloading, unloading, packing (loading / unloading) in devices that are adapted and not fitted.
2. Storage.
3. Material reloading into small containers (dedicated lines for filling, including weighing).
4. Quality control.
5. Use of ammonium nitrate in the manufacture of adhesives, sealants, explosives, fertilizers and water treatment chemicals.
6. Seed treatment or coating with fertilizers containing ammonium nitrate.
7. Use of ammonium nitrate for the synthesis of other substances.

#### Professional use
8. Spraying.
9. Non-industrial spraying of liquid fertilizers in open areas.
10. The introduction of liquid fertilizers into the soil.
11. The introduction in open spaces.
12. The introduction of liquid fertilizers in greenhouses into the soil.
13. Use of liquid fertilizers in greenhouses (non-industrial spraying).

#### Further customer use
14. Field fertilization.
15. Use of fertilizers indoors.

### SECTION 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

#### 8.1. Control parameters

**Limit value of substance, preparation component in working ambient air:** none.

**Long-term exposure limit (IPRD):** not applicable to ammonium nitrate according to hygiene norm HN 23 in Lithuania.

**Short-term exposure limit (TPRD):** not applicable to ammonium nitrate according to hygiene norm HN 23 in Lithuania.

**Threshold limit value (NRD):** not applicable to ammonium nitrate according to hygiene norm HN 23 in Lithuania.

**Occupational exposure limit (s) according to Directive 98/24/EC:** not applicable for ammonium nitrate.

**Occupational exposure limit (s) according to Directive 2004/37/EC:** not applicable for ammonium nitrate.

**Any other national occupational exposure limits:** no data available.

**Non-limiting value (s) (DNEL):**
The assessment of the safe use of the substance was carried out in a qualitative way. The main toxic effect of this substance is eye irritation, for which the DNEL can not be determined, since the critical dosage is unknown. Since the minimal known systemic effects have been determined using a high amount of substance that is never exposed to human exposure (see DNEL), quantitative exposure assessment is not necessary.

The physicochemical properties of the DNEL product, which could have the greatest negative effect, are provided.

**Workers exposure**

<table>
<thead>
<tr>
<th>Exposure mode</th>
<th>Exposure type</th>
<th>Hazardous</th>
<th>Physicochemical property that could have the greatest negative effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inhalation</td>
<td>Systemic effect – long lasting</td>
<td>DNEL: 36 mg/m³</td>
<td>Toxicity ingested</td>
</tr>
<tr>
<td>Inhalation</td>
<td>Systemic effect -</td>
<td>The hazard is not known</td>
<td></td>
</tr>
</tbody>
</table>
### Ammonium nitrate

#### Effect acute

<table>
<thead>
<tr>
<th>Exposure Route</th>
<th>Systemic</th>
<th>Local</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inhalation</td>
<td>Local effect – long lasting</td>
<td>The hazard is not known</td>
</tr>
<tr>
<td>Inhalation</td>
<td>Local effect – acute</td>
<td>The hazard is not known</td>
</tr>
<tr>
<td>Dermal</td>
<td>Systemic effect – long lasting</td>
<td>DNEL: 5,12 mg/kg bw/day</td>
</tr>
<tr>
<td>Dermal</td>
<td>Local effect – long lasting</td>
<td>The hazard is not known</td>
</tr>
</tbody>
</table>

#### Dermal Local effect

- Long lasting: The hazard is not known
- Acute: No hazard identified

#### If in eyes

- Local effect: Low hazard

#### Predicted inactive concentration(s) PNEC

<table>
<thead>
<tr>
<th>Section</th>
<th>Hazardous</th>
<th>Comments / Grounds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fresh water</td>
<td>No effect was observed in all eco-toxicity studies with the highest recommended concentration of ammonium nitrate (nominal 100 mg/l). Therefore, on the basis of the ECHA document “Guidance on information requirements and chemical safety assessment. Part B: Hazard Assessment”, assessment of the impact of water bodies is not necessary and PNEC values are not derived.</td>
<td></td>
</tr>
<tr>
<td>See water</td>
<td>No effect was observed in all eco-toxicity studies with the highest recommended concentration of ammonium nitrate (nominal 100 mg/l). Therefore, on the basis of the ECHA document “Guidance on information requirements and chemical safety assessment. Part B: Hazard Assessment”, assessment of the impact of water bodies is not necessary and PNEC values are not derived.</td>
<td></td>
</tr>
<tr>
<td>Freshwater sediment</td>
<td>No effect was observed in all eco-toxicity studies with the highest recommended concentration of ammonium nitrate (nominal 100 mg/l). No data on eco-toxicity in sediment organisms. In addition, it is considered that such data are not necessary. Therefore, on the basis of the ECHA document “Guidance on information requirements and chemical safety assessment. Part B: Hazard Assessment”, assessment of the impact of water bodies is not necessary and PNEC values are not derived.</td>
<td></td>
</tr>
<tr>
<td>See water sediment</td>
<td>There is no probability of sediment exposure</td>
<td></td>
</tr>
</tbody>
</table>
| Microorganisms in sewage treatment system | PNEC STP: 18 mg/l | Exposure factor: 10
Extrapolation method: exposure factor
Available test data with sodium nitrate, which is similar in structure to ammonium nitrate, EC50> 1000 mg/l and NOx 180 mg/l. An assessment factor of 10 was used in accordance with the ECHA Guideline on Information Requirements and Chemical Safety Assessment, Section R.10. |
| Soil                     | No effect was observed in all eco-toxicity studies with the highest recommended concentration of ammonium nitrate (nominal 100 mg/l). No data on ecotoxicity to soil. In addition, it is considered that such data are not necessary. Therefore, on the basis of the ECHA document “Guidance on information requirements and chemical safety assessment. Part B: Hazard Assessment”, assessment of the impact of water bodies is not necessary and PNEC values are not derived. |                                                                                   |
| Air                      | No data available: It is proposed that the PNEC value should not be set.    |                                                                                   |
| Food chain               | No bioaccumulation potential                                               | According to Regulation (EC) No. hazard statements H373, H372, H360, H361 and H362 are excluded from the scope of Regulation (EC) No 1272/2008. The substance is highly water soluble and is therefore believed to have a low bioaccumulation potential. Therefore, on the basis of the ECHA document “Guidance on information requirements and chemical safety assessment. Part B: Hazard Assessment”, assessment of the impact of water bodies is not necessary and PNEC values are not derived. |
Ammonium nitrate

| Safety assessment Part B.7”, exposure assessment for the food chain is not necessary and the values for PNEC in the mouth are not derived. |

No additional material measurements / monitoring are required during product manufacture, storage, and product use. The product must be manufactured and used in a professional manner by the Minister of Social Security and Labor of the Republic of Lithuania and the Minister of Health of 2001 July 24 order No. 97/406 “On Approval of Regulations for the Protection of Workers from Chemical Agents at Work and for the Protection of Workers against the Exposure to Carcinogens and Mutagens at Work” (Official Gazette, 2001, No. 65-2396), as subsequently amended.

8.2. Exposure controls

8.2.1. Appropriate engineering controls: based on good manufacturing practice, appropriate supply-exhaust ventilation must be used. Prevent from accumulation of non-allowed concentrations of gases. Avoid concentrating on unauthorized dust concentrations. In addition to the places where the product is stored or recycled, have a shower. Use other good manufacturing practice experience.

8.2.2. Individual protection measures, such as personal protective equipment: The personal protective equipment must be used in accordance with good work-hygiene practices and must be used in conjunction with other control measures, including technical controls, ventilation and isolation. Additional good practices that can be carried out following a REACH risk assessment may include: appropriate restrictions; reducing the number of unprotected staff; isolation process; effective extraction, removal of contaminants; general ventilation in good level; manual work reduction; avoiding contact with contaminated tools and objects; regular cleaning of equipment and workstation; management / supervision by verifying the correct use of RMMs in compliance with OCs; staff training on good practice; personal hygiene.

8.2.2.1. Eye (face) protection: chemical resistant hermetic safety goggles according to LST EN 166, face protection shield according to LST EN 166.

8.2.2.2. Skin protection

Hand protection: adequate protection gloves according to LST EN 420, EN ISO 374-1 due to chemical protection, EN 388 due to mechanical protection. Protective gloves must be made of one of the materials listed in the table, at least as specified, for penetration of thickness and resistance.

<table>
<thead>
<tr>
<th>Glove material</th>
<th>Glove thickness, mm</th>
<th>Penetration time of glove material, min*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Butyl rubber - butyl</td>
<td>0.50</td>
<td>&gt; 480</td>
</tr>
<tr>
<td>Nitrile rubber/Nitrile latex</td>
<td>0.35</td>
<td>&gt; 480</td>
</tr>
<tr>
<td>Fluorocarbon rubber</td>
<td>n.m. 0.40</td>
<td>&gt; 480</td>
</tr>
<tr>
<td>Polychloroprene</td>
<td>n.m. 0.50</td>
<td>&gt; 480</td>
</tr>
<tr>
<td>Natural rubber/Natural latex</td>
<td>0.50</td>
<td>&gt; 480</td>
</tr>
<tr>
<td>Polyvinyl chloride</td>
<td>0.50</td>
<td>&gt; 480</td>
</tr>
</tbody>
</table>

* - the breakthrough time of the glove material is the time taken for the product to come in full contact with the glove. The shorter the penetration time, the less resistant the glove material to the product.

Skin protection creams do not adequately protect from the product. Please note that the penetration time of the glove material in this section has been set at 22 ° C and using pure ammonium nitrate. When using calcium ammonium nitrate consisting of a mixture of ammonium nitrate and dolomite, the time of penetration of the glove material should be similar in size. When working at a higher temperature, the resistance of the glove material may be considerably lower, and in such cases, the permitted life of the glove must be shortened. We recommend that when you start using a new type or other manufacturer's gloves, make sure that they are chemically and mechanically resistant to working conditions. If you have any questions about the suitability of the gloves, please contact the manufacturers / suppliers of gloves.

The inside of the gloves should not contain powders which can cause hand skin allergies. Before using the gloves, please always make sure there are no tears, cracks, or other defects. When the work is finished, the gloves must be cleaned and washed thoroughly before they are dry. After work, care must be taken to the hand skin.
Other protective equipment: to wear full body working clothes in accordance with LST EN ISO 13688, wear working boot in accordance with LST EN ISO 20345 for the purpose of product packaging.

8.2.2.3. Respiratory protection: In the event of an accident (for example, accidentally pouring the product), wear mask according to LST EN 149. Do not use the same mask for longer than allowed by the duration of use. Wear dust protection mask with A2B2E2K2P3 filter according to LST EN 405.

8.2.2.4. Thermal protection: not necessary.

Hygiene measures: do not eat, drink or smoke while using the product. Strictly keep the product out of the skin, eyes or clothing. Keep away from food, drink and animal feed. Wash your hands every time you finish working with the product, and at the end of the day. After the work is done, take a shower. Remove contaminated clothing immediately. Do not breathe dust, vapors or aerosols.

8.2.3. Environmental exposure controls: ammonium nitrate washings in Lithuania must be disposed of in accordance with the Lithuanian Republic Law on Waste Management, in other countries – in accordance with national legislation.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a) Appearance: white granules at a temperature of 20 °C and a pressure of 101.3 kPa. Justification: The result of the registration of ammonium nitrate in the REACH documentation is summarized on the basis of data from three directories: The CRC Handbook of Chemistry and Physics (80th ed.), The Merck Index (12th ed.), Sax's Dangerous Properties of Industrial Materials (9th ed.).

Granulomere:
- between 1 mm and 4 mm, not less than 97%;
- between 2 mm and 4 mm, not less than 88%;
- smaller than 2 mm, not more than 5%;
- less than 1 mm, not more than 1.5%;
- more than 6 mm, not more than 0.0%.

b) Odor: odorless.

c) The appearance of a smell: none.

d) pH-value: not less than 5.0 (10% ammonium nitrate water solution).

e) Melting/Freezing temperature: 169.9 °C at a pressure of 101.3 kPa. Justification: The result of the registration of ammonium nitrate in the REACH documentation is summarized on the basis of data from these directories: The CRC Handbook of Chemistry and Physics (80th ed.), The Merck Index (12th ed.), Sax's Dangerous Properties of Industrial Materials (9th ed.). Ammonium nitrate starts to decompose at 210 °C.

f) Primary boiling temperature and interval of boiling temperature: Based on column 2 of Annex VII to the REACH Regulation, no clarification is given: it is not necessary to determine because the substance breaks down to a boiling point.

g) Flash-point: Based on column 2 of Annex VII to the REACH Regulation, no clarification is provided: ammonium nitrate is a solid material which decomposes below the melting point, so it is technically impossible to determine the flash point.

h) Speed of vaporization: Not applicable to solids.

i) Flammability: Nonflammable. Justification: Based on column 2 of Annex VII to the REACH Regulation according to the molecular structure and experience of ammonium nitrate using this material, ammonium nitrate is not flammable in contact with a source of ignition, water or air.

j) Limit values of flammability or explosion: ammonium nitrate fertilizers covered by UN No. 2067, does not have explosive properties.

k) Vapor pressure: According to section 1 of Annex XI to the REACH Regulation does not apply on a scientific basis. Justification. Based on the fact that ammonium nitrate is a solid which has a melting point high (169.6 ° C) and decomposes at 210 ° C, the ammonium nitrate registration in the REACH documentation concludes that the
**Ammonium nitrate**

<table>
<thead>
<tr>
<th>Property</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Vapor density:</strong></td>
<td>Not applicable to solids.</td>
</tr>
<tr>
<td><strong>Bulk density:</strong></td>
<td>Not less than 900 kg/m³, determined according to LST EN 1236.</td>
</tr>
<tr>
<td><strong>Solubility:</strong></td>
<td>Highly soluble in water: 1198 g/l at 0 °C; 1497 g/l at 10 °C; 1872 g/l at 20 °C. When dissolving ammonium nitrate, the temperature of the solution decreases significantly, therefore, in order to accelerate the dissolution of the ammonium nitrate, the solution must be warmed up.</td>
</tr>
<tr>
<td><strong>Partition coefficient: n-octanol/water:</strong></td>
<td>Based on column 2 of Annex VII to the REACH Regulation, no clarification is provided: ammonium nitrate is a solid material.</td>
</tr>
<tr>
<td><strong>Auto ignition temperature:</strong></td>
<td>The registration of ammonium nitrate in the REACH documentation states that, based on the structure of ammonium nitrate, transport information, it is considered that ammonium nitrate is not a self-heating substance. Justification: Ammonium nitrate is not a group that reacts with airborne oxygen. It is also based on the fact that materials at a temperature lower than their melting point is usually not self-heating, followed by self-ignition. Ammonium nitrate is widely used, but there is no evidence that it is characterized by spontaneous combustion. The material is not classified as a self-sustaining ADR. According to Section 1 of Annex XI to the REACH Regulation, studies are omitted through scientific justification.</td>
</tr>
<tr>
<td><strong>Decomposition temperature:</strong></td>
<td>&gt; 210 °C.</td>
</tr>
<tr>
<td><strong>Viscosity:</strong></td>
<td>According to Chapter 2 of Annex XI to the REACH Regulation, studies are omitted because it is technically impossible to carry out the study. Ammonium nitrate is a solid state of the aggregate, and the test must be carried out with liquid.</td>
</tr>
<tr>
<td><strong>Explosive properties:</strong></td>
<td>Ammonium nitrate fertilizers covered by UN No. 2067, does not have explosive properties. Ammonium nitrate registration according to the REACH dossier states: experience shows that in order to increase the risk of explosion due to ammonium nitrate, the following factors must be considered: storage of material in large quantities, contamination of any substance (including metals, acids, organic matter) and / or heating (also under fire). Ammonium nitrate fertilizers are specially formulated for high density, high purity, to minimize the risk of explosion.</td>
</tr>
<tr>
<td><strong>Oxidizing properties:</strong></td>
<td>Has oxidizing properties. Justification. The result of the registration of ammonium nitrate in the REACH dossier is derived from the ADR. When transporting ammonium nitrate (UN No. 2067), it is considered an oxidizing substance. UN 2067 transport classification: hazard class 5.1, packing group III. The oxidizing properties of ammonium nitrate depend on the granulomere composition of the product.</td>
</tr>
</tbody>
</table>

**SECTION 10. STABILITY AND REACTIVITY**

10.1. **Reactivity**
Stable under recommended storage and handling conditions (see section 7, handling and storage).

10.2. **Chemical stability**
Stable under recommended storage and handling conditions (see section 7, handling and storage).

10.3. **Possibility of hazardous reactions**
The product may explode if it is contaminated or mixed with the following materials: alkaline metals, aluminum (powder), ammonia, flammable materials, potassium, organic materials, reducers, water, alkylesters, aluminum chloride, antimony (powder), antimony trisulphate, barium nitrite, calcium chloride, carbide, chlorate, chlorine, cyan guanidine, dinitrotoluene, iron (III) chloride, formamide, urea, wood flour, potassium permanganate, carbon, hydrocarbonates, copper-iron (II) sulphide, copper oxide, metal powders, mineral oil, sodium hypochlorite, sodium nitrate, sodium perchlorate, oils, rust, sulfur, trinitroanizole, trinitrotoluene, waxes, sugar.
The product may explode if it is contaminated or blended with these chemical mixtures: 1) aluminum powder + calcium nitrate + formamide; 2) ammonium salts + acids; 3) acetic anhydride + nitric acid; 4) potassium + ammonium sulphate; 5) metal oxides + carbon; 6) superphosphate + organic matter + heat.
10.4. Conditions to avoid
When heated above 210 °C, nitrogen oxides and oxygen are released. In a closed burst, the fragmentation can go into explosion. Decomposition products: In contact with alkaline substances (e.g. lime) releases ammonia.

10.5. Incompatible materials
Combustible, oxidizing, reducing materials, strong acids and bases, sulphur, chlorates, chlorides, chromates, nitrates, permanganates, metal powder (especially zinc), substances containing copper, nickel, cobalt, zinc and their alloys substances, fertilizers containing sulphur, urea, NPK, NP and NK fertilizers. And other materials listed in section 10.

10.6. Hazardous decomposition products
Under normal conditions of storage and use, hazardous decomposition products should not be produced. In case of fire, nitrogen oxides (NOx).

SECTION 11. TOXICOLOGICAL INFORMATION

11.1. Information on toxicological effects

**Acute toxicity:** does not fulfill the classification criteria according to Regulation (EC) No. 1272/2008.

**Human information:** no available data.

**Effects on animals:**

<table>
<thead>
<tr>
<th>Exposure dose / concentration</th>
<th>Routes</th>
<th>Method</th>
<th>Symptoms / delayed effects</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute oral toxicity</td>
<td>LD50: 2950 mg/kg bw Male/Female</td>
<td>OECD 401</td>
<td>Negative effects have not been established</td>
<td>Direct ATE Validation for Trusted Data</td>
</tr>
<tr>
<td>Acute dermal toxicity</td>
<td>LD50: &gt; 5000 mg/kg bw Male/Female</td>
<td>OECD 402</td>
<td>Negative effects have not been established</td>
<td>Direct ATE Validation for Trusted Data</td>
</tr>
<tr>
<td>Acute inhalation toxicity</td>
<td>LC50: &gt; 88.8 mg/kg bw Rats</td>
<td></td>
<td>Negative effects have not been established</td>
<td>Direct ATE Validation for Trusted Data</td>
</tr>
</tbody>
</table>

**Other information:** data not available.

**Assessment/Classification:** according to available data, the classification criterion does not match.

**Skin irritation or/and sensitization:** Not irritating. According to the available data, the product does not meet the criteria for classification in accordance with Regulation (EC) No. 1272/2008. Justification. Studies on rabbits (OECD 404 assay) showed no signs of skin irritation after exposure to 72 h (source: ammonium nitrate registration in REACH dossier).

**Serious eye damage / irritation:** Irritates eyes. In accordance with Regulation (EC) No 1272/2008 is classified as eye irritation cat. 2. Justification. Studies on rabbits (OECD 405 analytical method) have shown that ammonium nitrate is irritating to the eye (source: ammonium nitrate registration in REACH dossier).

**Sensitizing of the airways or skin:** have no sensitizing effects. In compliance with Regulation No. 1272/2008 preparation is not classified as sensitizing. Justification. Studies conducted with ammonium nitrate are not available. Investigations performed on a substance of similar structure - nitric acid ammonium calcium salt (calcium nitrate double salt) (OECD 429 analysis method) showed that this substance does not have a sensitizing effect. Based on this result, it has been found from the REACH documentation for registration of ammonium nitrate that ammonium nitrate has no sensitizing effect.

**Mutagenicity:** The product does not meet the criteria for classification in accordance with Regulation (EC) No. 1272/2008 (OECD 471, 473, experiments performed on structure-like compounds with nitric acid ammonium...
calcium salt; OECD 476, tests performed on a structurally similar compound – potassium nitrate) (source: ammonium nitrate registration in REACH dossier).


Reproductive toxicity: The product does not meet the criteria for classification in accordance with Regulation (EC) No. 1272/2008 (studies were carried out using OECD 422 method with a structurally similar substance - potassium nitrate). Studies result: oral 28-day NOAEL ≥ 1500 mg/kg bw/day (source: ammonium nitrate registration in REACH dossier).

Specific toxicity for particular organ (STOT) (one time effect): The product does not meet the criteria for classification in accordance with Regulation (EC) No. 1272/2008. 

Specific toxicity for particular organ (STOT) (repeated effect): The product does not meet the criteria for classification in accordance with Regulation (EC) No. 1272/2008.

Aspiration hazard: none.

SECTION 12. ECOLOGICAL INFORMATION

12.1 Toxicity
According to the available data, the product does not meet the criteria for the classification as hazardous to the environment in accordance with Regulation (EC) No 1272/2008.

Fish (short-term): 48-h LC₅₀: 447 mg/l (no guideline followed).
Fish (long-term): no data.
Daphnia magna (short-term): 48-h EC₅₀: 490 mg/l (no guideline followed, with potassium nitrate).
Daphnia magna (long-term): no data.
Algae: 10-d EC₅₀: > 1700 mg/l (seawater, no guideline followed, performed with potassium nitrate).
Inhibition of microbial activity: 3-h EC₅₀: >1000 mg/l, NOEC: 180 mg/l (OECD 209, with sodium nitrate).

12.2 Persistence and degradability
Biodegradation: standard test is not applicable as the substance is inorganic. In addition, in the anaerobic transformation of ammonium, one group of bacteria oxidizes ammonium to nitrite while another group oxidizes nitrite into nitrate. The average biodegradation rate in wastewater plant at 20 ºC is 52 g N/kg dissolved solid/day. Nitrate degradation is fastest in anaerobic conditions. In the anaerobic transformation of nitrate into N2, N2O and NH3, the biodegradation rate in wastewater plant at 20 ºC is 70 g N/kg dissolved solid/day.

Hydrolysis: no hydrolysable group is present, will completely dissociate into ions.

12.3 Bioaccumulative potential
Octanol-water partition coefficient (Kₐw): not relevant as the substance is inorganic, but considered to be low (based on high water solubility).
Bioconcentration factor (BCF): low potential for bioaccumulation (based on substance properties).

12.4 Mobility in soil
Adsorption coefficient: low potential for adsorption (based on substance properties).

12.5 Results of PBT and vPvB assessment
According to Annex XIII of Regulation (EC) No 1907/2006, no PBT and vPvB assessment has been conducted since 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


Ammonium nitrate waste according to Regulation (EU) No. 1357/2014 are classified as hazardous waste by HP 2 “Oxidising” hazard statement code H 272 “May increase fire, oxidizing agent”, HP 4 “Irritating – irritating to the skin and damaging the eyes” and HP 15 “Wastes that may contain some preceded by a hazardous property in which the primary waste was not directly labelled with danger phrase EUH044 “May explode if heated by a tight seal”. Ammonium nitrate waste in Lithuania must be managed in accordance with the Law on Waste Management in the Republic of Lithuania, in other countries, in accordance with the requirements of national legislation. Unpolluted ammonium nitrate waste can be used as bulk or liquid fertilizer (after dissolving in water) or to be handed over to waste management companies. The final product waste code is assigned by the waste manager / holder.

Waste of outer packaging of polypropylene that is not contaminated with ammonium nitrate or other materials according to Regulation (EU) No. 1357/2014 are classified as non-hazardous waste.

Ammonium nitrate waste inner packaging of polyethylene in accordance with Regulation (EU) No. 1357/2014 is classified as hazardous waste. The codes assigned to these wastes depend on the amount of residual ammonium nitrate remaining in the packaging waste. Waste of inner packaging of polyethylene containing up to 20% ammonium nitrate is assigned the codes HP 2 “Oxidising” Hazard Statement code H 272 “May increase fire, oxidizer” and HP 15 “Wastes that can have any of the following hazardous properties listed above: generates no primary waste directly” hazard statement EUH044 “May explode if heated in a sealed container”. Waste from ammonium nitrate packaging must be handed over to waste management companies. These waste in Lithuania must be handled in accordance with the Law on Packaging and Packaging Waste Management of the Republic of Lithuania, applicable waste management regulations, in other countries – in compliance with the requirements of national legislation. The final product waste code is assigned by the waste manager / holder.

Do not remove label, prepared according to Regulation (EC) No. 1272/2008, until package is thoroughly cleaned.

13.1.2. Waste disposal information.

Physical and chemical properties of the product are listed in Section 9.

13.1.3. Information related to sewage disposal.

It must be ensured that ammonium nitrate waste does not enter the sewage.

It is recommended not to encourage product disposal with waste water.

13.1.4. Other waste disposal guidelines.

All the fertilizer residues must be removed from the bag by gentle shaking.

SECTION 14. TRANSPORT INFORMATION

14.1. UN Number

2067

14.2. Proper shipping name

Ammonium nitrate, A1.

14.3. Transport hazard classes

5.1.

14.4. Packaging group

III

14.5. Other information

None.

14.6. Special precautions for users

None.

14.7. Transport in bulk according to Annex II of Marpol 73/78 and the IBC Code

The product's hazard class is the Ammonium Nitrate Based Fertilizer UN 2067 (Ammonium nitrate based fertilizer
In accordance with Regulation (EC) 1907/2006 (REACH), Annex II with all subsequent amendments and supplements and EC Regulation No. 830/2015

**Ammonium nitrate**

<table>
<thead>
<tr>
<th>SECTION 15. REGULATORY INFORMATION</th>
</tr>
</thead>
</table>

**15.1 Safety, health and environmental regulation/legislation specific for the substance or mixture**

**EU legislation:**
- European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR);
- The International Rule for Transport of Dangerous Substances by Railway (RID);
- The International Maritime Dangerous Goods (IMDG);
- International Convention for the Prevention of Pollution from Ships (MARPOL 73/78);
- The International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk (International Bulk Chemical Code) (the IBC Code).**

**Domestic legislation (Lithuania):**
- Applicable Law on Waste Disposal of the Republic of Lithuania;
- Applicable Law on Package and Package Waste Handling of the Republic of Lithuania;
- HN23 Maximum Allowable Concentrations of Hazardous Chemical Substances and Preparations in Working Environment. General Requirements;
- HN36 Banned and Restricted Substances;
- Applicable Regulations for Workers “Protection against the Impact of Chemical Factors” and Regulations for Workers “Protection against Carcinogens and Mutagens Impacts”;
- Applicable Procedure of Safety Data Sheet Requirements and Supply thereof to Professional Users;
**Ammonium nitrate**

- Applicable Rules on Labeling of Items (Products) to be Sold in Lithuania and Referring Price thereof;
- Applicable Rules on Waste Disposal;
- Chief State Labor Inspector of the Republic of Lithuania in 2006 August 1 Order no. 1-178 “On the Approval of the List-Classification of Potentially Dangerous Equipment to be Registered in the State Register, Indicating Their Parameters”.
- LST EN 149 “Respiratory protective devices. Filtering half masks for protection against particles. Requirements, testing, marking”;
- LST EN 166 “Personal eye protection. Technical requirements”;
- LST EN 388 “Protective gloves against mechanical hazards”;
- LST EN 469 “Protective clothing for firefighters. Performance requirements for firefighting protective clothing”;
- LST EN ISO 13688 “Protective clothing. General requirements (ISO 13688: 2013)”;
- LST EN ISO 20345 “Personal protective equipment. Safe footwear (ISO 20345: 2011)”.

**Additional information about the relevant Community provisions on safety, health and the environment for the product:**


**Product Restrictions on Regulation (EU) No.98/2013:** Ammonium nitrate is indicated in Regulation (EU) No. In Annex II to Regulation (EC) No 98/2013, economic operators selling, using, and protecting ammonium nitrate must, in accordance with Regulation (EU) No 98/2013 to report suspicious transaction of this substance, material disappearances and theft or theft or loss of theft to a national contact point in the Member State in which the suspicious transaction occurred.
15.2 Chemical safety assessment
In accordance with REACH Article 14, a Chemical Safety Assessment has been carried out for this substance. See Annex.

SECTION 16. OTHER INFORMATION

Revision date: 2020.07.20
Version: 10.0
Revision No. 0
Issuing date: 2020.07.20

(i) A clear evidence of added, deleted or modified information:
The following changes were made to the safety data sheet as compared to the previous version:
- sub-section 1.2.1: the name of the further use of the product has been changed and the product category PC11 has been deleted.
- Annex of SDS: the name of the further use of the product has been changed and the product category PC11 has been deleted.

(ii) List of abbreviations and acronyms used throughout the Safety Data Sheet:
ATE – acute toxicity estimate;
ADR – European Agreement on Dangerous Goods by Road;
IATA – International Air Transport Organization;
IMO – International Marine Organization;
RID – Regulations Concerning the International Carriage of Dangerous Goods by Rail;
SMGS – International Agreement on Carriage of Loads by Rail;
CLP – Classification, Labeling and Packaging Regulation; Regulation (EC) No 1272/2008;
CAS – Chemical Abstracts Service;
DNEL – Derived No-Effect value;
EC No. – EINECS ir ELINCS numbers;
EU – European Union;
ECHA – European Chemicals Agency;
EINECS – European List of Existing Commercial Chemical Substances;
ELINCS – European Register of Substances;
Eye Irrit. 2 – eye irritating 2 category;
UN – United Nations;
Cow – octanol-water partition coefficient;
LD50 – Lethal dose for 50% of tested population;
LC50 – Lethal concentration of 50% of tested population;
HS – Hygiene Standard;
IMSCBC – International Code for the Carriage of Dangerous Goods by Sea;
Oxid. Solid 3 – oxidizing solids, 3 category;
PBT – Persistent, Bio accumulative, Toxic;
PNEC(s) – Forecast(-s) no effect(-s) concentration(-s);
SDS – Safety Data Sheet;
vPvB – very Persistent, very Bio accumulative.

(iii) Bibliography:
1) Registration of Ammonium Nitrate under the REACH dossier, published on the website of the European Chemicals Agency (data downloaded as of January 29, 2019);
2) ECHA Guidance on information requirements and chemical safety assessment. Part B: Hazard Assessment
Ammonium nitrate

(iv) Relevant precautionary phrases:
H272 – May intensify fire; oxidizer;
H319 – Causes serious eye irritation;
H360 – May damage fertility or the unborn child;
H361 – Suspected of damaging fertility or the unborn child;
H362 – May cause harm to breast-fed children;
H372 – Causes damage to organs through prolonged or repeated exposure exposure cause the hazard;
H373 – May cause damage to organs through prolonged or repeated exposure exposure cause the hazard;
P210 – Keep away from heat/sparks/open flames/hot surfaces. No smoking;
P220 – Keep/Store away from clothing/reducing agents/acids/alkali/sulphur/chlorates/chlorides/ nitrates/permanganates/powder of metals and materials containing metals as follows: copper, nickel, cobalt, zinc and their alloys/combustible materials;
P221 – Take any precaution to avoid mixing with combustibles, reducing agents, acids, alkali, sulphur, chlorates, chlorides, nitrates, permanganates, powder of metals and materials containing metals as follows: copper, nickel, cobalt, zinc and their alloys;
P370+P378 – In case of fire: Use water for extinction;
P370+P378 – In case of fire: Use water for extinction;
P264 – Wash hands thoroughly after handling;
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.

(v) Training Advice:
To ensure the protection of people and the environment, people who manufacture, handle and use this product must be trained to work with hazardous substances, hazardous materials, calcium ammonium nitrate properties, have adequate hygiene skills, first aid principles and information on emergency procedures. This safety data sheet must be made available to those working with the product. Persons must be instructed before working with the product.

NOTE. The information provided in this safety data sheet is correct to the best of our knowledge, information, and belief at the date of its publication. The information given is designed only as guidance for safe handling, use, processing, storage, transportation, disposal, and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

Release info: This version replaces all previous documents.
ANNEX

Exposure scenarios:

1 Exposure scenario (1): Manufacturing of the substance including handling, storage and quality controls;
2 Exposure scenario (2): Industrial use for formulation of preparations/articles, intermediate use and end-use in industrial settings;
3 Exposure scenario (3): Professional use in formulation of preparations and end-use;
4 Exposure scenario (4): Consumer end-use of fertilizers.

| 1. Exposure scenario (1) Manufacturing of the substance including handling, storage and quality controls |
| Use descriptors related to the life cycle stage | SU8/9 PROC1/2/3/8a/8b/9/14/15 ERC1 |
| Name of contributing environmental scenario (1) and corresponding ERC | 1. Manufacturing of substances (ERC1) |
| List of names of contributing worker scenarios (2) and corresponding PROC | 1. Use in closed process, no likelihood of exposure (PROC1) |
| | 2. Manufacturing in a closed continuous process, with occasional exposure (PROC2) |
| | 3. Use in closed batch process (synthesis or formulation) (PROC3) |
| | 4. Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities (PROC8a) |
| | 5. Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities (PROC8b) |
| | 6. Transfer of substance or preparation into small containers (dedicated filling line, including weighing) (PROC9) |
| | 7. Production of preparations* or articles by tabletting, compression, extrusion, pelletisation (PROC14) |
| | 8. Use as laboratory reagent (PROC15) |

2.1 Contributing scenario (1) controlling environmental exposure

Environmental release during manufacturing ERC1
An environmental assessment has not been performed as the substance does not meet the criteria for being classified as dangerous for the environment.

2.2 Contributing scenario (2) controlling worker exposure for manufacturing of the substance including handling, storage and quality controls

All Process Categories are covered by this contributing scenario as all Operational Conditions (OCs) and
## Ammonium nitrate

### Risk Management Measures (RMMs) are identical.

PROC1/2/3/8a/8b/9/14/15

### Product characteristic

<table>
<thead>
<tr>
<th>Product related conditions, e.g. the concentration of the substance in a mixture, the physical state of that mixture (solid, liquid; if solid: level of dustiness), package design affecting exposure</th>
<th>Solid, low dustiness</th>
</tr>
</thead>
</table>

### Amounts used

<table>
<thead>
<tr>
<th>Amounts used at a workplace (per task or per shift); note: sometimes this information is not needed for assessment of worker's exposure</th>
<th>Not applicable.</th>
</tr>
</thead>
</table>

### Frequency and duration of use/exposure

<table>
<thead>
<tr>
<th>Duration per task/activity (e.g. hours per shift) and frequency (e.g. single events or repeated) of exposure</th>
<th>More than 4 hours per day</th>
</tr>
</thead>
</table>

### Human factors not influenced by risk management

<table>
<thead>
<tr>
<th>Particular conditions of use, e.g. body parts potentially exposed as a result of the nature of the activity</th>
<th>Not applicable</th>
</tr>
</thead>
</table>

### Other given operational conditions affecting workers exposure

<table>
<thead>
<tr>
<th>Other given operational conditions: e.g. technology or process techniques determining the initial release of substance from process into workers environment; room volume, whether the work is carried out outdoors/indoors, process conditions related to temperature and pressure.</th>
<th>Indoors</th>
</tr>
</thead>
</table>

### Technical conditions and measures at process level (source) to prevent release

<table>
<thead>
<tr>
<th>Process design aiming to prevent releases and hence exposure of workers; this in particular includes conditions ensuring rigorous containment; performance of containment to be specified (e.g. by quantification of residual losses or exposure)</th>
<th>Not applicable</th>
</tr>
</thead>
</table>

### Technical conditions and measures to control dispersion from source towards the worker

| Engineering controls, e.g. exhaust ventilation, general ventilation; specify effectiveness of measure | 1. Containment as appropriate  
2. Good standard of general ventilation |
|---|---|

### Organizational measures to prevent /limit releases, dispersion and exposure

<table>
<thead>
<tr>
<th>Specific organizational measures or measures needed to support the functioning of particular technical measures (e.g. training and</th>
<th>Not applicable</th>
</tr>
</thead>
</table>
supervision). Those measures need to be reported in particular for demonstrating strictly controlled conditions (to justify exposure based waiving).

### Conditions and measures related to personal protection, hygiene and health evaluation

| Personal protection, e.g. wearing of gloves, face protection, full body dermal protection, goggles, respirator; specify effectiveness of measure; specify the suitable material for the PPE (where relevant) and advise how long the protective equipment can be used before replacement (if relevant) | 1. Chemical goggles |

### 3. Exposure information and reference to its source

#### Information for contributing scenario 1

An environmental assessment has not been performed as the substance does not meet the criteria for being classified as dangerous for the environment.

#### Information for contributing scenario 2

A qualitative approach was used to conclude safe use for workers. The leading toxicological effect is eye irritation (local endpoint), for which no DNEL can be derived as no dose-response information is available. As minimal systemic effects were only noted at such high levels of substance that humans are normally not exposed to (see DNELs), a quantitative assessment is not considered necessary.

### 4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

No additional risk management measures, besides those that are mentioned above, are needed to guarantee safe use for workers.

### 5. Additional good practice advice beyond the REACH CSA

Additional good practices (Operational Conditions and Risk Management Measures) beyond the REACH Chemical Safety Assessment established within Chemical Industry are also advised and communicated through Safety Data Sheets. Such as:

- Containment as appropriate;
- Minimize number of staff exposed;
- Segregation of the emitting process;
- Effective contaminant extraction;
- Good standard of general ventilation;
- Minimization of manual phases;
- Avoidance of contact with contaminated tools and objects;
- Regular cleaning of equipment and work area;
- Management/ supervision in place to check that RMMs in place are being used correctly and OCs followed;
- Training staff on good practice;
- Good standard of personal hygiene.
1. Exposure scenario (2)
Industrial use for formulation of preparations/articles, intermediate use and end-use in industrial settings.

| Use descriptors related to the life cycle stage | SU3/10<br>PC1/11/12/19/37<br>PROC1/2/3/5/8a/8b/9/13/15<br>ERC2/6a |
| Name of contributing environmental scenario (1) and corresponding ERC | 1. Formulation of preparations (ERC2)<br>2. Industrial use resulting in manufacture of another substance (use of intermediates) (ERC6a) |
| List of names of contributing worker scenarios (2) and corresponding PROC | 1. Use in closed process, no likelihood of exposure (PROC1)<br>2. Use in closed, continuous process with occasional controlled exposure (PROC2)<br>3. Use in closed batch process (synthesis or formulation) (PROC3)<br>4. Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact) (PROC5)<br>5. Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities (PROC8a)<br>6. Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities (PROC8b)<br>7. Transfer of substance or preparation into small containers (dedicated filling line, including weighing) (PROC9)<br>8. Treatment of articles by dipping and pouring (PROC13)<br>9. Use as laboratory reagent (PROC15) |

2.1 Contributing scenario (1) controlling environmental exposure
Formulation of preparations (ERC2) and industrial use resulting in manufacture of another substance (use of intermediates) (ERC6a)
An environmental assessment has not been performed as the substance does not meet the criteria for being classified as dangerous for the environment.

2.2 Contributing scenario (2) controlling worker exposure for industrial use for formulation of preparations/articles, intermediate use and end-use in industrial settings.
All Process Categories are covered by this contributing scenario as all Operational Conditions (OCs) and Risk Management Measures (RMMs) are identical.
PROC1/2/3/5/8a/8b/9/13/15

**Product characteristic**

| Product related conditions, e.g. the concentration of the substance in a mixture, the physical state of that mixture (solid, liquid; if solid: level of dustiness), package | Solid, low dustiness<br> Liquid |
Ammonium nitrate

<table>
<thead>
<tr>
<th>design affecting exposure</th>
</tr>
</thead>
</table>

**Amounts used**

Amounts used at a workplace (per task or per shift); note: sometimes this information is not needed for assessment of worker’s exposure

| Not applicable |

**Frequency and duration of use/exposure**

Duration per task/activity (e.g. hours per shift) and frequency (e.g. single events or repeated) of exposure

| More than 4 hours per day |

**Human factors not influenced by risk management**

Particular conditions of use, e.g. body parts potentially exposed as a result of the nature of the activity

| Not applicable |

**Other given operational conditions affecting workers exposure**

Other given operational conditions: e.g. technology or process techniques determining the initial release of substance from process into workers environment; room volume, whether the work is carried out outdoors/indoors, process conditions related to temperature and pressure.

| Indoors |

**Technical conditions and measures at process level (source) to prevent release**

Process design aiming to prevent releases and hence exposure of workers; this in particular includes conditions ensuring rigorous containment; performance of containment to be specified (e.g. by quantification of residual losses or exposure)

| Not applicable |

**Technical conditions and measures to control dispersion from source towards the worker**

Engineering controls, e.g. exhaust ventilation, general ventilation; specify effectiveness of measure

1. Containment as appropriate
2. Good standard of general ventilation

**Organizational measures to prevent /limit releases, dispersion and exposure**

Specific organizational measures or measures needed to support the functioning of particular technical measures (e.g. training and supervision). Those measures need to be reported in particular for demonstrating strictly controlled conditions (to justify exposure based waiving).

| Not applicable |
### Conditions and measures related to personal protection, hygiene and health evaluation

| Personal protection, e.g. wearing of gloves, face protection, full body dermal protection, goggles, respirator; specify effectiveness of measure; specify the suitable material for the PPE (where relevant) and advise how long the protective equipment can be used before replacement (if relevant) | 1. Chemical goggles |

### 3. Exposure information and reference to its source

#### Information for contributing scenario 1

An environmental assessment has not been performed as the substance does not meet the criteria for being classified as dangerous for the environment.

#### Information for contributing scenario 2

A qualitative approach was used to conclude safe use for workers. The leading toxicological effect is eye irritation (local endpoint), for which no DNEL can be derived as no dose-response information is available. As minimal systemic effects were only noted at such high levels of substance that humans are normally not exposed to (see DNELs), a quantitative assessment is not considered necessary.

### 4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

No additional risk management measures, besides those that are mentioned above, are needed to guarantee safe use for workers.

### 5. Additional good practice advice beyond the REACH CSA

Additional good practices (Operational Conditions and Risk Management Measures) beyond the REACH Chemical Safety Assessment established within Chemical Industry are also advised and communicated through Safety Data Sheets. Such as:
- Containment as appropriate;
- Minimize number of staff exposed;
- Segregation of the emitting process;
- Effective contaminant extraction;
- Good standard of general ventilation;
- Minimization of manual phases;
- Avoidance of contact with contaminated tools and objects;
- Regular cleaning of equipment and work area;
- Management/supervision in place to check that RMMs in place are being used correctly and OCs followed;
- Training staff on good practice;
- Good standard of personal hygiene;

### 1. Exposure scenario (3)

#### Professional use in formulation of preparations and end-use

<table>
<thead>
<tr>
<th>Use descriptors related to the life cycle stage</th>
<th>SU22</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PC12</td>
</tr>
<tr>
<td></td>
<td>PROC1/2/8a/8b/9/11/15/19</td>
</tr>
</tbody>
</table>
Name of contributing environmental scenario (1) and corresponding ERC

1. Wide dispersive indoor use of reactive substances in open systems (ERC8b)
2. Wide dispersive outdoor use of reactive substances in open systems (ERC8e)

List of names of contributing worker scenarios (2) and corresponding PROC

1. Use in closed process, no likelihood of exposure (PROC1)
2. Use in closed, continuous process with occasional controlled exposure (PROC2)
3. Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities (PROC8a)
4. Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities (PROC8b)
5. Transfer of substance or preparation into small containers (dedicated filling line, including weighing) (PROC9)
6. Non industrial spraying (PROC11)
7. Use as laboratory reagent (PROC15)
8. Hand-mixing with intimate contact and only PPE available (PROC19)

2.1 Contributing scenario (1) controlling environmental exposure

Wide dispersive indoor use of reactive substances in open systems (ERC8b) and wide dispersive outdoor use of reactive substances in open systems (ERC8e).

An environmental assessment has not been performed as the substance does not meet the criteria for being classified as dangerous for the environment.

2.2 Contributing scenario (2) controlling worker exposure for professional use in formulation of preparations and end-use

All Process Categories are covered by this contributing scenario as all Operational Conditions (OCs) and Risk Management Measures (RMMs) are identical.

PROC1/2/8a/8b/9/11/15/19

Product characteristic

Product related conditions, e.g. the concentration of the substance in a mixture, the physical state of that mixture (solid, liquid; if solid: level of dustiness), package design affecting exposure

Solid, low dustiness
Liquid, >25% substance in the product

Amounts used

Amounts used at a workplace (per task or per shift); note: sometimes this information is not needed for assessment of worker’s exposure

Not applicable

Frequency and duration of use/exposure
### Duration per task/activity (e.g. hours per shift) and frequency (e.g. single events or repeated) of exposure

<table>
<thead>
<tr>
<th>Duration per task/activity</th>
<th>More than 4 hours per day</th>
</tr>
</thead>
</table>

### Human factors not influenced by risk management

<table>
<thead>
<tr>
<th>Particular conditions of use, e.g. body parts potentially exposed as a result of the nature of the activity</th>
<th>Not applicable</th>
</tr>
</thead>
</table>

### Other given operational conditions affecting workers exposure

<table>
<thead>
<tr>
<th>Other given operational conditions: e.g. technology or process techniques determining the initial release of substance from process into workers environment; room volume, whether the work is carried out outdoors/indoors, process conditions related to temperature and pressure.</th>
<th>Indoors or outdoors</th>
</tr>
</thead>
</table>

### Technical conditions and measures at process level (source) to prevent release

<table>
<thead>
<tr>
<th>Process design aiming to prevent releases and hence exposure of workers; this in particular includes conditions ensuring rigorous containment; performance of containment to be specified (e.g. by quantification of residual losses or exposure)</th>
<th>Not applicable</th>
</tr>
</thead>
</table>

### Technical conditions and measures to control dispersion from source towards the worker

| Engineering controls, e.g. exhaust ventilation, general ventilation; specify effectiveness of measure | 1. Containment as appropriate  
2. Good standard of general ventilation  
3. Avoid splashing. Use specific dispensers and pumps specifically designed to prevent splashes/spills/exposure to occur |
|----------------------------------------------------------------------------------------------------------------|-----------------|

### Organizational measures to prevent/limit releases, dispersion and exposure

<table>
<thead>
<tr>
<th>Specific organizational measures or measures needed to support the functioning of particular technical measures (e.g. training and supervision). Those measures need to be reported in particular for demonstrating strictly controlled conditions (to justify exposure based waiving).</th>
<th>Not applicable.</th>
</tr>
</thead>
</table>

### Conditions and measures related to personal protection, hygiene and health evaluation

<table>
<thead>
<tr>
<th>Personal protection, e.g. wearing of gloves, face protection, full body dermal protection, goggles, respirator; specify effectiveness of measure; specify the suitable material for the PPE (where relevant) and advise how long the protective equipment can be used before</th>
<th>1. Chemical goggles</th>
</tr>
</thead>
</table>
3. Exposure information and reference to its source

Information for contributing scenario 1

An environmental assessment has not been performed as the substance does not meet the criteria for being classified as dangerous for the environment.

Information for contributing scenario 2

A qualitative approach was used to conclude safe use for workers. The leading toxicological effect is eye irritation (local endpoint), for which no DNEL can be derived as no dose-response information is available. As minimal systemic effects were only noted at such high levels of substance that humans are normally not exposed to (see DNELs), a quantitative assessment is not considered necessary.

4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

No additional risk management measures, besides those that are mentioned above, are needed to guarantee safe use for workers.

5. Additional good practice advice beyond the REACH CSA

Additional good practices (Operational Conditions and Risk Management Measures) beyond the REACH Chemical Safety Assessment established within Chemical Industry are also advised and communicated through Safety Data Sheets. Such as:

- Containment as appropriate;
- Minimize number of staff exposed;
- Segregation of the emitting process;
- Effective contaminant extraction;
- Good standard of general ventilation;
- Minimization of manual phases;
- Avoidance of contact with contaminated tools and objects;
- Regular cleaning of equipment and work area;
- Management/supervision in place to check that RMMs in place are being used correctly and OCs followed;
- Training staff on good practice;
- Good standard of personal hygiene;

1. Exposure scenario (4)
Consumer end-use of fertilizers.

Use descriptors related to the life cycle stage SU21

PC12

ERC8b/8e/10a

Name of contributing environmental scenario (1) and corresponding ERC

1. Wide dispersive indoor use of reactive substances in open systems (ERC8b)
2. Wide dispersive outdoor use of reactive substances in open systems (ERC8e)
3. Wide dispersive outdoor use of long-life articles and materials with low release (ERC10a)

List of names of contributing consumer 1. Fertilizers (PC12)
### 2.1 Contributing scenario (1) controlling environmental exposure

Wide dispersive indoor use of reactive substances in open systems (ERC8b), wide dispersive outdoor use of reactive substances in open systems (ERC8e) and wide dispersive outdoor use of long-life articles and materials with low release (ERC10a).

An environmental assessment has not been performed as the substance does not meet the criteria for being classified as dangerous for the environment.

### 2.2 Contributing scenario (2) consumer end-use of fertilizers

All Product Categories are covered by this contributing scenario as all Operational Conditions (OCs) and Risk Management Measures (RMMs) are identical. Exposure to eye irritating dilutions can occur during consumer use of fertilizers (PC12).

<table>
<thead>
<tr>
<th>Product characteristic</th>
<th>Solid, low dustiness</th>
<th>Liquid</th>
<th>Products containing ≥10% and &lt;10%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amounts used</td>
<td>Amounts used per event</td>
<td>Not applicable</td>
<td></td>
</tr>
<tr>
<td>Frequency and duration of use/exposure</td>
<td>Duration of exposure per event and frequency of events; please note: Tier 1 exposure assessment usually refers to external event exposure, without taking into account the duration and frequency of the event (see Guidance Chapter R.15);</td>
<td>Not applicable</td>
<td></td>
</tr>
<tr>
<td>Human factors not influenced by risk management</td>
<td>Particular conditions of use, e.g. body parts potentially exposed; population potentially exposed (adults, children)</td>
<td>Not applicable</td>
<td></td>
</tr>
<tr>
<td>Other given operational conditions affecting workers exposure</td>
<td>Other operational conditions e.g. room volume, air exchange rate, outdoor or indoor use</td>
<td>Indoors or outdoors</td>
<td></td>
</tr>
<tr>
<td>Conditions and measures related to information and behavioral advice to consumers</td>
<td>Safety advice to be communicated to consumers in order to control exposure, e.g. technical instruction, behavioral advice;</td>
<td>Avoid splashing</td>
<td></td>
</tr>
<tr>
<td>Conditions and measures related to personal protection and hygiene</td>
<td>Personal protection, e.g. wearing of gloves, face protection, full body dermal protection, 1. If ≥10% of ammonium nitrate: Use chemical goggles</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Ammonium nitrate

| goggles, respirator; specify effectiveness of measure; specify the suitable material for the PPE (where relevant) and advise how long the protective equipment can be used before replacement (if relevant). | 2. If <10% of ammonium nitrate: no personal protection needed  
3. Instructions addressed to the consumer via product labeling |

3. Exposure information and reference to its source

Information for contributing scenario 1

An environmental assessment has not been performed as the substance does not meet the criteria for being classified as dangerous for the environment.

Information for contributing scenario 2

A qualitative approach was used to conclude safe use for consumers. The leading toxicological effect is eye irritation (local endpoint), for which no DNEL can be derived as no dose-response information is available. As minimal systemic effects were only noted at such high levels of substance that humans are normally not exposed to (see DNELs), a quantitative assessment is not considered necessary.

4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

No additional risk management measures, besides those that are mentioned above, are needed to guarantee safe use for workers/consumers for use of fertilizers:  
If ≥10% ammonium nitrate: Use chemical goggles  
If <10% ammonium nitrate: No personal protection needed

The End of Safety Data Sheet.