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MATERIAL SAFETY DATA SHEET

BAST B

SECTION 1. IDENTIFICATION OF THE CHEMICAL PRODUCT AND INFORMATION ON THE MANUFACTURER

1.1. Name of the chemical product
Fertilizer BAST B according to the requirements of TU U 20.1-30846143-002:2021 with amendments 1:2020

1.2. Recommendations and restrictions on the use of the chemical product
Professional use. Fertilizer.

1.3. Identification of the manufacturer of the chemical product
LLC "KRONA".
Postal address: 03118, Ukraine, Kyiv city, 116A, Kazatska street, office 202.
Production address: 09500, Ukraine, Kyiv region, Tarashcha city, 66, Vydna street.
Tel / fax: +38 044 374-50-43; Email: info@bast.land, website: www.bast.land

1.4. Emergency telephone number
For emergency medical care, contact your local medical facility.

SECTION 2. HAZARDS IDENTIFICATION

2.1. GHS classification of a substance or mixture
Physical hazards
Not classified
Health hazards
Hazard class 4 (low-hazard product). No health side effects expected while respecting the instructions for the use and storage of the product.
For toxicological information see Section 11.
Environmental hazards
Aquatic hazards
Toxic to aquatic organisms (class 3)
Ozone layer hazards
Not dangerous.

2.2. GHS label elements including precautions
Pictogram: not applicable
Signal word: not applicable
Brief hazard description:
H402

General precautionary statements
P102

Prevention precautionary statement
P273

Response precautionary statement
P301+P312
P330
P305+P351+P338
P308+P311

Storage precautionary statement
None

Disposal precautionary statement
P501

see SECTION 15 for the full text of the H-phrases and P-phrases listed above.

2.3. Other hazards not classified under GHS
No supplementary information available.

SECTION 3. COMPOSITION (INFORMATION ON INGREDIENTS)

Information on the composition of the product is confidential. The product data required to ensure the safety of the purchaser is presented in Sections 2, 4 - 14 of the MSDS.

SECTION 4. FIRST AID MEASURES

4.1. Description of necessary first aid measures
Production workers are supposed to undergo medical examination in accordance with existing local legislation. The workplace has to have a first aid kit with medicines for first aid.

Eye contact	Rinse eyes immediately with plenty of water for at least 15 minutes, keeping eyelids open. Remove contact lenses, if present and easy to do. After rinsing, put drops with 2% novocaine solution or 0.5% dicaine solution into eyes. Seek medical attention.
Skin contact	Wash with plenty of soap and water. If irritation develops, seek medical attention.
Inhalation	Avoid breathing vapor, aerosol or mist. If inhaled, move to fresh air. Seek medical attention if necessary.
Ingestion	Rinse the mouth with water. If the substance is ingested and the injured is conscious, give him or her a little water to drink. Do not induce vomiting unless directed by medical personnel. Seek medical attention if you feel unwell.
Protection of persons providing first aid:	You should not take any action that carries personal risk or if you do not have appropriate training.
Comments regarding the doctor:	Seek medical attention if symptoms develop. Contact a toxicologist immediately if a large amount of the product has been ingested or swallowed. In case of inhalation of decomposition products from the fire, symptoms may develop later. It may be necessary to leave the injured under medical supervision for 48 hours.

4.2. Potential extreme health impacts
No cases of poisoning or intoxication were recorded.

4.3. Potential chronic health side effects
No cases of poisoning or intoxication were recorded.

SECTION 5. FIRE AND EXPLOSION PROTECTION MEASURES

5.1. General characteristics of fire and explosion safety of the chemical product
Non-flammable and non-explosive.

5.2. Fire extinguishing agents

Recommended	Use extinguishing agents suitable for the surrounding fire.
Forbidden	Not established

5.3. Characteristics of the hazard caused by the products of combustion and thermal destruction
Decomposition products can be the following substances:
carbon dioxide, carbonic oxide, nitrogen oxides, metal oxides, ammonia.
Avoid breathing dust, vapors or vapors from burning materials. In case of inhalation of decomposition products from the fire, symptoms may develop later.

5.4. Personal protective equipment for firefighting operations
Firefighters should wear appropriate protective equipment.

5.5. Special firefighting procedures
No.

5.6. Indicators of fire and explosion hazard

Special notes on fire hazard:	Not flammable.
Special notes on explosion hazard:	No.

SECTION 6. MEASURES FOR PREVENTING ACCIDENTS AND DEALING WITH EMERGENCIES

6.1. Personal safety precautions, protective equipment and emergency procedures

Individual safety precautions	In case of direct contact, fertilizers do not adversely affect human body, and are not the source of spread of infections. Handling them does not require special precautions. Production personnel should be provided with personal protective equipment, workwear, special footwear, glasses, according to the requirements of GOST 12.4.099, GOST 12.4.100, GOST 12.4.103, GOST 12.4.131, GOST 12.4.132, GOST 29057, GOST 29058, protective glasses according to the requirements of DSTU EN 1731, respiratory protective device - respirators, according to the requirements of DSTU GOST 12.4.041 and rubber gloves according to the requirements of GOST 20010.

Environment protection means:	Prevent diffusion of the spilled material and penetration into soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environment contamination (sewers, waterways, soil or air).

6.2 Spill and leak response

Small spill	Stop the spill if safe to do so. Remove containers from the area where the spill has occurred. Dilute with water and dry with a mop. Disposal is carried out through an authorized supplier responsible for waste disposal.
Large spill	Stop the spill if safe to do so. Remove containers from the area where the spill has occurred. Avoid entering drains, waterways, basements or confined spaces. Flush the leakage into the wastewater treatment installation or proceed as follows. Hold down and collect the leakage with non-flammable absorbent material such as sand, soil, vermiculite or diatomaceous earth and put into container for disposal. Disposal is carried out through an authorized supplier responsible for waste disposal. Note: see p.1 for emergency contact information and Section 13 for waste disposal

SECTION 7. STORAGE AND HANDLING Of THE CHEMICAL PRODUCT DURING LOADING/UNLOADING OPERATIONS

7.1. Chemical product storage rules
Fertilizers should be stored in original package, in closed warehouses, protected from atmospheric precipitation (rain, snow), soil water and direct sunlight.
The optimal storage temperature range is from (+5)°C to (+ 25)°C.

7.2. Safety measures during handling and transportation
Fertilizers are transported by all types of transport in accordance with the transport regulations effective on this type of transport.

During loading and unloading operations, transportation and storage of fertilizers, measures should be taken to prevent product contamination by foreign materials and impurities and to protect the environment from contamination by harmful substances.

7.3. Environment protection measures
Prevent the product from entering open soil, water sources, sewers.

7.4. Restrictions on the volume of stored products
There are no restrictions on the volume of stored products.

7.5. Special measures to create special storage conditions
Special measures to create special storage conditions are not required upon compliance with the requirements set forth in this Material Safety Data Sheet and regulatory documents.

7.6. End-user recommendations

Do not produce or inhale liquid fertilizer aerosols. In addition to workwear, gloves and eye protection, the use of effective respiratory protection is recommended (P2/P3 face-tight respirators) when servicing equipment to minimize the risk of inhalation of the product and ensure safe use during performing of the operation (see Section 8). According to the risk assessment, fertilization operations (fertilizers with boron content less than 5%) with the use of a tractor (liquid and pelletized fertilizers) and portable sprayers (liquid fertilizers), are safe.

SECTION 8. HAZARD CONTROL TOOLS AND PERSONAL PROTECTIVE EQUIPMENT

8.1. Parameters subject to mandatory control:

In the air of the working area:

Maximum allowable concentration of harmful substances in the air of the working area and microclimate of production facilities should comply with the requirements of GOST 12.1.005, DSN 3.3.6.042.

For nitrogen oxides (in terms of NO_2) - 5.0; phosphorus oxides (P_2O_5) - 1, zinc oxide (for Zn) - 0.5, copper oxide (for Cu) - 0.3, manganese oxide (for Mn) - 0.3, boron (for boric acid) - 10 (according to the requirements of GOST 12.1.005-88).

Noise level at workplaces should comply with the requirements of GOST 12.1.003 and DSN 3.3.6.037.

Ventilation of industrial premises should comply with the requirements of DSTU B.A.3.2-12.

8.2. Set parameters control measures

Strict adherence to the parameters of processing method.

8.3. Personal protective equipment information

8.3.1. General recommendations

Ensure the correct organization of workplaces, supervision over the availability and good condition of equipment, instruments, tools, fences, safety, ventilation and other sanitary-engineering installations.

8.3.2. Respiratory protection. Not required.

8.3.3. Eye protection. Glasses or face mask.

8.3.4. Skin protection. Rubber gloves, workwear, rubber shoes.

Workwear and PPE according to the requirements of GOST 12.4.099 and GOST 12.4.100, DSTU 7239.

It is obligatory for employees to undergo safety instructions.

It is prohibited to store and consume food in production and storage facilities.

Hygiene measures: Thoroughly wash hands, forearms and face after handling chemicals, before eating, smoking and using the toilet, and at the end of the work shift. Wash contaminated clothing before reuse. A washbasin or water is required to clean the eyes/skin.

Personal protective equipment (Pictograms)

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES OF THE CHEMICAL PRODUCT

9.1. Important information on physical and chemical properties

The physical state	yellowish liquid
Odor (odor threshold)	Not determined
Melting / freezing point	-15°C
Viscosity	Dynamic: Not determined. Kinematic: Not determined.
pH factor	7.0-9.0
Density, g/cm3	1.4
Solubility (in a specific environment).	fully soluble in water

9.2. Other information

Initial boiling point and boiling range, flash point, ignition temperature, spontaneous ignition temperature, decomposition point, upper / lower ignition limit or explosive limit, vapor pressure (depending on the temperature), vapor density (depending on the pressure), partition coefficient of n-octanol / water - not applicable.

SECTION 10. STABILITY AND REACTIVITY

10.1 Chemical stability

The product is stable under condition that the storage recommendations are met.

10.2. Possibility of hazardous reactions.

Under normal conditions of storage and use, hazardous reactions do not occur.

10.3. Conditions to avoid

Contamination by any source, including metals, dust and organic materials, should be avoided.

10.4. Incompatible substances and materials

There is no data

10.5. Hazardous decomposition products

Under normal conditions of storage and use, hazardous decomposition of the product is not possible.

SECTION 11. TOXICOLOGICAL INFORMATION

11.1. Information on the likely routes of exposure

Through the respiratory system. No, the product is not volatile.
In case of contact with the eyes and skin. Possible, if personal safety measures are not observed.
If swallowed. No, except for cases of accidents.

11.2. Information on toxicological effects

Acute toxicity

Criterion	Result	Biological species	Reference source
LD_{50} oral	> 2000-5000 mg/kg	Wistar Han rat	Toxicological and hygienic passport for BAST fertilizers
LD_{50} dermal	> 4000 mg/kg	Wistar Han rat	Toxicological and hygienic passport for BAST fertilizers

Conclusion/Generalization: According to OECD 423 (OECD Guideline for Testing of Chemicals “Acute Oral Toxicity - Acute Toxic Class Method”) in accordance with the Globally Harmonized System of Classification and Labelling of Chemicals (GHS), BAST B, solution, belongs to Hazard class 4 (low hazard).

Chronic toxicity
No significant exposure or critical hazard data known.
Skin corrosion / irritation

Result	Biological species	Reference source
Does not irritate the skin	Wistar Han rat	Toxicological and hygienic passport for BAST fertilizers

Serious eye damage / eye irritation

Result	Biological species	Reference source
Minimum middle	Rabbit	Toxicological and hygienic passport for BAST fertilizers

Conclusion/Generalization: Fertilizer BAST B, solution, does not have irritating effect on the eyes and belongs to Toxicity category IV.

Skin sensitization

Result	Biological species	Reference source
Does not have a sensitizing effect on the organism of guinea pigs	Guinea pig	Toxicological and hygienic passport for BAST fertilizers

Conclusion/Generalization: Fertilizer BAST B, solution, does not have a sensitizing effect and belongs to Toxicity category IV.

Mutagenicity
No significant exposure or critical hazard data known.

Teratogenicity
No significant exposure or critical hazard data known.

Reproductive toxicity

The product contains Boron in a form of boric acid, a substance with 2-aminoethanol, which is not classified as toxic to reproduction under the European Classification and Labeling System for Hazardous Substances CLP/GHS.

Carcinogenicity
No significant exposure or critical hazard data known.

11.2. Delayed and immediate effects, from short-term and long-term exposure

Short-term exposure

Potential immediate effects	There is no evidence of any significant effects or harmful properties of this product.
Potential delayed effects	There is no evidence of any significant effects or harmful properties of this product.

Long-term exposure

Potential immediate effects	There is no evidence of any significant effects or harmful properties of this product.
Potential delayed effects	There is no evidence of any significant effects or harmful properties of this product.

SECTION 12. INFORMATION ON ENVIRONMENTAL EFFECTS

12.1. Assessment of possible impacts on the environment
While meeting the requirements of transportation, storage, handling rules and application technology, pollution of water sources, soil and atmosphere is unlikely.

12.2. Data on stability and transformation in the environment
There is no evidence of any significant effects or harmful properties of this product.

12.3. Ecotoxicity indicators

Criterion	Result	Biological species	Reference source
LC_{50}	8 237.4 µl/kg of dry soil	Earthworms	Research report “Environmental assessment of the impact of BAST fertilizer grade "BAST B" on soil biota". Institute of Agroecology and Environmental Management of the National Academy of Agrarian Sciences of Ukraine.

Conclusion/Generalization: Does not show toxic effects on soil microbiota. According to the classification of toxicity of pesticides for soil objects, it is classified as low-toxic.

Assessment of toxicity to the aquatic environment

Product / component name	Criterion	Biological species	Result	Exposure	Reference source

2-aminoethanol borate	OECD 203 Acute toxicity LC50 Fresh water	Fish	>100 mg/l	96 h	IUCLID 5
	OECD 202 Acute toxicity EC50 Fresh water	Daphnia	423 mg/l	48 h	IUCLID 5

Conclusion/Generalization: Hazardous to aquatic life.

12.4. Migration data (in soil)

There is no data.

12.5. Hygienic standards in environmental media

In the air of the atmosphere:
P_2O_5 (phosphorus oxide) - 0.05, maximum one time concentration - 0.15, NO_2 (nitric oxide): - 0.4 (acceptable daily dose), 0.06 (maximum one time concentration), boron (for boric acid) - 0.2 (DSP 201-97 “State Sanitary Rules for the Protection of Atmospheric Air of the Settlements from the Contamination with Chemical and Biological Substances”).
In soil:
In soil, maximum allowable concentration, mg/kg: nitrates (NO_3) - 130.0, P_2O_5 (phosphorus oxide) - 200, Pb - 6, Co - 5, Ni - 4, Cu - 3, Zn - 23 (according to “Maximum allowable concentrations (MAC and approximate permissible concentration (APC) of chemical substances in the soil”) dated November 19, 1991.
In the water of the reservoirs for general purposes:

MAC, mg/kg: Nitrates - 45.0, phosphorus oxide (P_2O_5) - 1.2 (general sanitary), Cu - 1, Zn –1, Co - 0.1, Pb - 0.03, Cd - 0.001, Fe - 0.3 (according to Sanitary Regulations and Norms No. 460-88 dated October 01, 1989); Co-0.1, Cu-1, Zn-1, Pb -0.03, Cd-0.001, Ni-0.1 (according to “Collection of sanitation and hygiene regulations and methods for monitoring harmful chemicals in the environment media”, Moscow, 1991, p. 370).

12.6. Other types of adverse impact

There is no known significant impact or significant hazard.

SECTION 13. WASTE (RESIDUE) DISPOSAL RECOMMENDATIONS

Disposal in accordance with local regulations.

SECTION 14. TRANSPORTATION INFORMATION

14.1. UN Number
Not applicable

14.2. UN proper shipping name
Fertilizer BAST B

14.3. Category of vehicles
All categories of covered vehicles

14.4 Transport hazard class(es)
Non-hazardous cargo

14.5. Transport marking and labeling, packing group number
Not applicable

14.6. Information on whether chemical products refer to marine and aquatic pollutants
Not refer

14.7. Recommendations for safe transportation
Special precautions are not necessary except mentioned in Section 7

SECTION 15. NATIONAL AND INTERNATIONAL LEGISLATION INFORMATION

15.1. Information on legislation regulating the handling of the chemical products
1. GHS (Rev.5) (2013) Globally Harmonized System of Classification and Labeling of Chemicals.
2. Regulation (EC) No 1907/2006 of the European Parliament and of the Council.
3. European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR).
4. Regulation (EC) No 1272/2008 of the European Parliament and of the Council on classification, labelling and packaging of substances and mixtures.
5. SP 1.2.1170-02 “Hygienic requirements for the safety of agrochemicals”.
6. SanPiN 1.2.1077-01 “Hygienic requirements for storage, application and transportation of pesticides and agrochemicals”.
7. Law of Ukraine “On pesticides and agrochemicals”.

15.2. Information on documentation regulating the requirements for the protection of humans and the environment

1. Law of Ukraine No. 4004-XII dated 24.20.1994 “On Ensuring Sanitary and Epidemic Safety of the Population”
2. Workwear and PPE - GOST 12.4.099; GOST 12.4.100; DSTU 7239.
3. GOST 12.4.103-83 SSBT. Special protective clothes, personal means of hand and legs protections.
4. DSTU 4462.3.01: 2006 Environment protection. Waste management. Operations procedure.
5. DSTU 4944: 2008 Agrochemistry. Establishment of allowable concentration of harmful substances.
6. Law of Ukraine "On the protection of the surrounding natural environment"

15.3. Information on international warning labels
Hazard class - 4 (low-hazard substance)

Brief hazard description:
H402 Hazardous to aquatic life

General precautionary statements:
P102 Keep out of reach of children.

Prevention precautionary statement

P273	Avoid release to the environment.

Response precautionary statement

P301+P312	IF SWALLOWED: Get medical attention if you feel unwell.
P330	Rinse mouth.
P302+P352	IF ON SKIN: Wash with plenty of soap and water
P305+P351+P338	IF CONTACT WITH EYES: Rinse cautiously with plenty of water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308+P311	IF exposed or concerned: Get medical attention.

Storage precautionary statement
None.

Disposal precautionary statement

P501	Dispose of contents in accordance with local regulations.

SECTION 16. OTHER INFORMATION

16.1. List of data sources used in the compilation of the material safety data sheet

1. DSTU GOST 30333-2009 “Safety data sheet for chemical products”.
2. Regulation (EC) No 1907/2006 of the European Parliament and the Council.
3. GHS (Rev.5) (2013) Globally Harmonized System of Classification and Labeling of Chemicals.
4. SanPiN 1.2.1077-01 “Hygienic requirements for storage, application and transportation of pesticides and agrochemicals”.
5. SP 1.2.1170-02 “Hygienic requirements for the safety of agrochemicals”.
6. Technical specifications TU U 20.1-30846143-001: 2016 BAST FERTILIZERS with rev. No.1: 2020
7. GOST 12.4.034-85. Personal respiratory protective equipment.
8. GOST 12.4.103-83 SSBT. Special protective clothes, personal means of hand and legs protections. 9. Harmful chemicals. L. Chemistry, 1989.
10. Research report “Environmental assessment of the impact of BAST fertilizer grade "BAST B", solution, on soil biota”.
11. Toxicological and hygienic passport for BAST fertilizers. - Kyiv, 2017, Research Center of Preventive Toxicology, Food and Chemical Safety named after L.I. Medved of the Ministry of Health of Ukraine, 16 pp.

This product is for professional use only. The data specified in this Material Safety Data Sheet should be available to everyone whose work involves the chemical product. The data are consistent with the information we have and are intended to characterize the chemical product, health and safety aspects at work, and environmental protection. The information in the Material Safety Data Sheet will be supplemented when new data on the impact of the chemical product on health and the environment, on preventive measures to reduce hazards or its complete avoidance, become available. The information specified in this Material Safety Data Sheet does not disclose other specific properties of the chemical product. We are not responsible for the consequences of using the product for purposes other than that intended.