

MATERIAL SAFETY DATA SHEET

Recorded in Register

ISR № 2 2 6 9 7 9 5 8 . 2 0 . 4 6 2 3 1 . B

dd «25» august 2020 r.

Valid

till «25» august 2025 r.

**Information-analytical center
"Safety of substances and materials"
Federal state unitary enterprise
"STANDARTINFORM"**

CEO _____/K.V. Leonidov

/

stamp.

N A M E:

technical (in scientific documentation)

Boric Acid

chemical (IUPAC)

Ortho- Boric Acid

Commercial

Boric acid

Synonyms

n/a

All Russia product classifier code

2 0 1 3 2 4 1 4 9

Customs statistics code:

2 8 1 0 0 0 9 0 0 0

Information about product registration

AT №000365 14.03.1995.

Name and abbreviation for the basic normative , technical or information document for the product (GOST, TU, OST, STO, (M)SDS и т.д.)

GOST 18704 – 78 « Boric Acid. Specifications» amendments.№ 1,2,3

DANGER CLASSIFICATION:

Signal word: **Danger**

Brief : moderately hazardous substance for human organisms, irritating. May pollute the environment.

Detailed: in 16 attached chapters of the MSDS

BASIC HAZARDOUS COMPONENTS	MPC (work zone), mg/m ³	Hazard class	CAS №	EC №
Ortho-boric acid (H ₃ BO ₃)	10	3	10043-35-3	233-139-2

APPLICANT: LLC DALNEGORSKY GOK, Dal'negorsk
(company name) (town)

Applicant type: Manufacturer, supplier, seller, exporter, importer

OKPO code: 2 2 6 9 7 9 5 8

Emergency telephone number: +7 (42373) 3-62-22

CEO of the Applicant Company: _____ / Rachkov D.N. /
(signature)

stamp.

ISR - Industrial Safety Register

FSUE – Federal State Unitary Enterprise

IUPAC – International Union of Pure and Applied Chemistry

GHS – UN recommendations ST/SG/AC.10/30 «Globally Harmonized System of Classification and Labeling of Chemicals »

OKII - All Russia classifier of products

OKIIO – All Russia classifier of companies and organizations

CAS No – number of a substance in the register of Chemical Abstracts Service

EC No – number of a substance in the register of the European Chemical Agency (used for products exported/imported into EC countries)

MPC – Maximum permissible concentration of substances in the air of the working zone, mg/m³ (maximum single/shift average)

The MSDS corresponds to:

- UN recommendations ST/SG/AC.10/30 ;

- EC Regulation № 1907/2006 concerning Registration, Evaluation, Authorization and Restriction of Chemicals , Annex II

Signal word: –either «**Danger**» or «**Handle with care**» (or «Not available»)is used in accordance with GOST 31340-2013 «Warning labeling of chemicals. Basic requirements»

Information about product registration – the number and date of the state registration, Certificate number and/or number of the Russian register of potentially hazardous chemical and biological substances

1. Chemical products identification and information about the manufacturer and/or supplier

1.1. Chemical products identification

- 1.1.1. Technical name: Boric acid
- 1.1.2. Brief recommendations for usage: Boric acid is used as one of components in optical (usage restrictions inclusive) glass production, for manufacturing of enamels, glazes, borax and electrolytic capacitors and in medicine.

1.2. Information about the manufacturer and/or supplier

- 1.2.1. Full official name of the company: LLC DALNEGORSKY GOK
- 1.2.2. Address: BLD.192/206, 50 LET OCTYABRYA PROSPECT, DAL-NEGORSK, PRIMORSKY REGION, 692446, RUSSIA
- 1.2.3. Telephone number, for emergency consultations, and time limits: +7 (42373)2-95-47 (from 9:00 to 18:00)
+7 (42373)3-61-13 (from 9:00 to 18:00)
+7 (42373)3-43-41
- 1.2.4. Fax: +7 (42373)3-43-41
- 1.2.5. E-mail: e-mail: mail@bor-acid.ru

2. Danger (dangers) identification

- 2.1. Degree of danger of the chemical product in general: Moderately hazardous substance, 3-rd class of hazard (GOST 12.1.007 – 76, GOST 12.1.005 – 88)

- 2.2. General sanitary norms for the product in the air of the work zone:

MPC of the working zone. – 10 mg/m³

2.3. Information about labeling (in accordance with GOST 31340-2013)

- 2.3.1 Signal word and hazard symbol

Danger



- 2.3.2. Hazard identification:

- H360: May damage fertility. May damage the unborn child

- 2.3.3. Safety precautions:

Safe handling measures:
- P201+202: do not use until the MSDS all the safety precautions have been read and understood;
- P280: use personal protective gloves/clothes, means of eyes and face protection.

Emergency measures:
- P308+311: in case of accident or if you feel unwell, seek medical advice immediately .

Safe storage measures:
- P405: storage in a locked warehouse.

3. Composition (information about components)

3.1. General information

3.1.1. Chemical name:

(IUPAC): Ortho-boric acid

3.1.2. Chemical formula:

H_3BO_3

3.1.3. General description of the substance

№	Parameter	Norms for grades		
		A OKII 2121710100	B OKII 2121710200	C OKII 2121710300
1	Appearance	Fine free flowing crystalline white powder		
2	Fraction of total mass of boric acid (H3BO3), % min	99.9	99.9	99.6
3	Fraction of total mass of chlorides (Cl), %, max	0.0001	0.001	n/a
4	Fraction of total mass of sulphates (SO ₄), %, max	0.0005	0.008	0.2
5	Fraction of total mass of iron (Fe), %, max	0.0002	0.0005	0.002
6	Fraction of total mass of heavy metals (Pb), %, Max	0.0005	0.001	0.001
7	Fraction of total mass of non soluble in water residue, % max	Should withstand test as per cl.4.8 GOST 18704-78	0.005	0.01
8	Fraction of total mass of calcium (Ca), % max	0.001	0.005	n/a
9	Fraction of total mass of arsenic (As), %, max	0.0001	0.0002	n/a
10	Fraction of total mass of phosphates (PO ₄), %, max	0.001	0.001	n/a
11	Fraction of total mass of residue non volatile at treatment with ethanol, % max	0.05	n/a	n/a
12	Residue on sieve with mesh (as per GOST 6613-86) % 04K max 0063K min	n/a n/a	10 70	15 75
13	Fraction of total mass of colouring impurities, % max: Vanadium (V) Cobalt (Co) Manganese (Mn) Copper (Cu) Nickel (Ni) Chrome (Cr)	N/A		

Remarks: B grade is used for production of optical glass, fiber glass, in medicine and for other purposes (GOST 18704-78).

3.2. Components

Components	Fraction of total mass, %	MPC of working zone., mg/m ³	Hazard class	Sources of information
H ₃ BO ₃	99.8	10	3	1.GOST 18704-78 2. Information chart of potentially hazardous chemical and biological substance, orthoboric acid, series AT № 000365 3. Maximum permissible concentrations (MPC) of hazardous substances in the air of the working zone ГН 2.2.5.1313-03

4. First aid measures

4.1. Symptoms

4.1.1. In cases of poisoning by inhalation

- irritation of upper respiratory tract, coughing, oedema of the throat mucous membrane

4.1.2. Influence on skin:

- hyperaemia, dermatitis

4.1.3. Contact with eyes:

- eye reddening, epiphora

4.1.4. In case of swallowing:

- sickness, vomiting, sometimes with blood, belly aches, diarrhea

4.2. First aid measures in case of affecting

4.2.1. In case of poisoning by inhalation:

- to provide fresh air to the person , to rinse his mouth with warm milk, leave him to rest.

4.2.2. Influence on skin:

- to gather boric acid from unprotected skin with a dry material, and rinse the damaged part of skin with flowing water and soap.

4.2.3. Contact with eyes:

- to rinse the eyes with a weak jet of clean water and drop 1 or 2 drops of sulfacetamide solution.

4.2.4. In case of swallowing :

- to rinse the stomach with warm water and active carbon (1 table spoonful per 0.5 l of water) and to take saline pergative. In case of necessity to use cardiovascular medicines.

4.2.5. Contraindications:

- n/a.

4.2.6. First aid medicines:

- active carbon , saline pergative, sulfacetamide solution.

5. Measures and means of fire and explosion prevention

5.1. General characteristics:

- boric acid is fire and explosion proof.

5.2. Indicators of fire and explosion risks: (GOST 12.1.044 and ГОСТ P 51330.0)

- n/a.

5.3. Risks caused by products of combustion and/or thermal destruction:

- at high temperatures boric acid is decomposed with formation of boron trioxide, which easily reacts with water and emits heat.

5.4. Recommended means of fire extinguishing:

- in case of ignition one should use any means of fire extinguishing.

5.5. Prohibited means of fire extinguishing:

- n/a.

5.6. Means of individual fire protection:

- standard means of personal protection for firemen, fire protecting suit and a self rescuer СПИ-20.

5.7. Special warning:

- in order to avoid thermal destruction one should prevent fire approach to the containers with boric acid.

Emergency prevention measures

6.1. Measures of prevention hazardous effects on people, environment, buildings, constructions in cases of emergency

6.1.1. General required actions:

Facilities where boric acid is handled should be equipped with plenum exhaust ventilation of working places and periodically the ambient air condition should be controlled. Technological and dust removal equipment should be hermetically sealed, all the equipment should be corrosion proof.

6.1.2. Personal protective equipment:

Workers handling boric acid should strictly follow safety precautions and use personal protective equipment. Eating at a work place is not allowed.

Respiratory organs protection:

- use of any filtering respirators as per GOST 12.4.034 – 85

Protective clothes:

- protective clothes as per GOST 12.4.103-83

Eyes protection:

- goggles as per GOST 12.4.013 -85.

Hands protection:

- protective gloves as per GOST 12.4.103-83

6.2. Actions at emergency situations

6.2.1. Actions in cases of leakage and spillage:

Technological loss of non polluted boric acid solutions or spillages of finished products are fed back into the technological cycle. Polluted spilled product

is gathered in containers and utilized. Polluted solutions of boric acid are pumped to sewage facilities.

6.2.2. Actions in cases of fire:

In cases of fire in the warehouses with boric acid one should use any means of fire extinguishing, and prevent its approach to containers with boric acid

Rules of storage and handling

7.1. Safety precautions

7.1.1. Safety precautions and protective equipment

- ventilation of the production facilities; hermetic sealing of technological and dust removal equipment, all the equipment should be corrosion proof, the ambient air condition should be controlled.

There should not be any sources of open fire in places where boric acid is handled.

7.1.2. Environment protection measures:

One should prevent the penetration of boric acid and its production waste into sources of potable water, its solutions into soil and its dust into the air, using recommendations of clause 7.1.1. of the present MSDS.

7.1.3. Recommendations for safe transportation:

For safe transportation of packed boric acid one should follow the transportation rule existing for this particular type of transport.

7.2. Storage rules

7.2.1. Terms and conditions of safe storage:

Packed boric acid should be stored in warehouses with natural ventilation, without any artificial regulating of climate conditions. In case the product is kept in the original package of the supplier the hazardous products of decomposition are not formed. Boric acid bags should be kept in stacks of 7 layers high maximum. Boric acid packed in soft containers (so called Big Bags) is stored in one tier in warehouses.

The warranty period (in case of keeping to conditions of storage) is stipulated by GOST 18704 -78 and is equal to three years since the date of manufacturing. When the warranty period is expired the boric acid lot (or certain amount of product of the lot) before recycling should be checked for contract specification or specified technical literature correspondence.

7.2.2. Substances and materials incompatible at storage:

Should not be kept with organic substances.

7.2.3. Materials recommended for package:

Market containers:

40 kg bags, 38kg bags, 35 kg bags, 25 kg bags

- polypropylene with polyethylene layer in accordance with specifications of a supplier (the quality of the product should not change during transportation and storage);

- paper valve bags in accordance with the specifications of a supplier;

- polypropylene valve bags;

Packing containers:

-Soft single use containers of 900, 700, 675 and 650

kg (Specifications 2297-078-00209729-97);

- Big bags made of profiled woven polypropylene with inner valve (1t, 0.8t, 0.35t, 0.25t)

Shipping containers:

- 2 ton big bags (for packing of 80 pieces of 25 kg polypropylene bags or 50 pieces of 40 kg bags)

It is allowed to use big bags in accordance with specifications of a supplier (the quality of the product should not change during transportation and storage) and Sea Bulk Power Loner Bulk System PTX-013C.

Not used for domestic purposes.

7.3. Safety precautions and rules of safety in private life:

8. Hazard exposure control and personal protective equipment

8.1. Parameters of a working zone, subject to a mandatory control (content of H_3BO_3):

MPC of a working zone. – $10\text{mg}/\text{m}^3$
(polarographic method of determination)

8.2. Measures for keeping the concentration of hazardous substances within the permissible limits.

All the facilities, where boric acid is stored or packed into shipping containers, must be equipped with exhaust ventilation with periodic control of H_3BO_3 concentration in the air of the working zone. Vessels (bunkers) with boric acid should be constantly controlled for being hermetically sealed , as well as the integrity of the pipelines and pneumatic pumps.

8.3. Personal protective equipment

8.3.1. General recommendations:

Personnel handling boric acid should follow all safety precautions and use personal protective equipment. Eating at a working place is not allowed.

8.3.2. Protection of respiratory organs:

- use of any filtering respirators as per GOST 12.4.034 – 85.

8.3.3. Protective clothes (type):

- protective clothes as per GOST 12.4.103-83.

8.3.4. Personal protective equipment in private life:

- not used for domestic purposes.

9. Physical and chemical properties

9.1. Physical state:
(aggregate state, color, smell)

Fine free flowing crystalline white powder without any odour.

9.2. Parameters, characterizing the basic qualities of the product, hazardous ones in the first place:

- bulk density for the product with particle size of 2mm max

$1.46\text{g}/\text{cm}^3$

- heat of solution at 18°C

$5.4\text{ kcal}/\text{gmol}$

- heat of formation

$261.55\text{ kcal}/\text{gmol}$

-water solubility at 20°C

$50\text{g}/\text{l}$

Presence of nitrates and sulphates of alkali metals increases water solubility of boric acid

- solubility in other solvents

In alcohols: ethanol, methanol and others.

10. Stability and chemical activity

10.1. Chemical stability:

- the product is stable up to 100°C and does not need any stabilizer.

10.2. Chemical activity:

- a very weak acid, forming salts

10.3. Conditions that should be avoided:
(including contacts with non compatible substances and materials)

- when boric acid is affected by chemically active substances there are no dangerous reactions for people. When being heated above 100°C the product gradually loses water, transforming into methaboric acid (HBO₂) and further into anhydrous boric acid.

11. Toxicological aspect

11.1. General information about the effect (the level of hazardous effect (toxicity) on an organism)

The product is a moderately hazardous substance, 3- rd class of hazard (GOST 12.1.007 – 76, GOST 12.1.005 – 88)

11.2. Routes of administration:

- through respiratory organs,
- contact with skin and eye mucous membrane,
- in cases of casual swallowing

11.3. Affected organs, tissues and human systems:

Central nervous system, alimentary canal, liver, kidneys, heart, peripheral nervous system, upper respiratory tract.

11.4. Information about dangerous health effects while contacting with the substance and consequences of these effects:

Boric acid irritates damaged skin, mucous membranes of eyes and respiratory organs. Casual boric acid swallowing causes the reduction of appetite, sickness, vomiting, and as a consequence, erythematic eruption. Boric acid has a skin resorptive effect.

- inhalation
- eye contact
- skin contact
- swallowing

- irritation of upper respiratory tract, coughing, oedema of the throat mucous membrane
- eye reddening, epiphora
- hyperaemia, dermatitis,
- sickness, vomiting, sometimes with blood, belly ache, diarrhea

11.5. Information about distant in time dangerous consequences of organism effecting:

- mutagenic effect
- carcinogenic effect
- cumulation
- embryotropic effect
- gonadotropic effect
- teratogenic effect

Not determined
Was not studied
moderate
effect
effect
effect

11.6. Acute toxicity indications:
(LD₅₀), route of administration (oral, dermal),
animal type;

LD_{min} – 2660-5140 mg/kg , oral, rats
LD_{min} – 2430 mg/kg, dermal, human
LD₅₀ – 3450 mg/kg, oral, mice
LD₅₀ – 1240 mg/kg, intravenous injections, mice

LC₅₀ , exposure time (h), animal type:

LC - 28 mg/m³ (exposure time for the rats is 4 h.)
15-20g (oral, human)

11.7. Minimum toxic concentrations:

LC_{min ch} – 9.6mg/m³, инг., 4h., rats, (general toxic effect)
MPC_{ch} – 1.5 mg/kg, oral, 4 months., rats (general toxic effect)
MPC_{ch.at.} – 0.04mg/m³, (toxic effect on embryo)

12. Effect on environment

12.1. General effect on environment:
(atmosphere air, water basins, soil)

Boric acid concentrations in water, air and soil exceeding the permissible ones effect vital activities of plants, animals and micro organisms.

Boron concentration in soil exceeding 700mg/kg of dry substance is toxic. For most sensitive agricultural plants (beans, cabbage, citric plants and fruit trees) the toxic dose is equal to 100mg/kg of dry weight. Some plants accumulate boron compounds (beet, cotton plant).

Concentration of boron containing substances in soils exceeding 30mg/kg (in terms of boron) causes boric enteritis of agricultural animals.

Soil biota: some micro organisms, extracted from soils and active silt, can accumulate boron compounds.

12.2. Routes of effecting the environment:

- in cases of breaking the rules of handling, storage, transportation, waste discharge as well as accidents and emergency situations, the product may be a source of the environmental pollution.

12.3. Indications of the effect:

- possible effects: soil degradation, change of organoleptic qualities of water, fish and protozoa death.

12.4. The most important parameters of effecting environment

12.4.1. Sanitary norms:

Components	MPC _{atm.} (class of hazard)	MPC _{water} , (class of hazard)	MPC fish breeding (class of hazard)	MPC soil	Information sources
H ₃ BO ₃	MPC _{atm.} — 0.02mg/m ³ , 3-rd class of hazard	MPC _{water.} — 0.5mg/m ³ , 2-nd class of hazard	MPC _{fish breeding.} - 0.1mg/l, 3-rd class of hazard	Not studied	Information chart of a potentially hazardous chemical and biological substance, «Ortho- boric acid», series AT № 000365

12.4.2. Ecological toxicity :

- acute toxicity for fish:

LC₅₀ - 6250 mg/l, *Rutilus rutilus*, exposure time is 48h.

- acute toxicity for daphnia Manga:

LC₅₀ – 2 mg/l, exposure time is 504h
226 mg/l, exposure time is 48h.

12.4.3. Migration and transformation in ambient as a result of biological decomposition and other processes (oxidation, hydrolysis, etc.):

- transformation in ambient

Not transformable

- biological dissimilation

Was not studied

13. Recommendations for waste removal

13.1. Waste handling precautions (waste of use, storage and transportation)

Precautions are described in clauses 7 and 8 of the present MSDS

13.2. Information about places and methods of waste neutralization, utilization and liquidation , (package material inclusive):

Spillages, got as a result of an accident or package breaking during transportation, are collected into a dry vessel and sent to a neutralization plant and further burial or returned into the technological process (depends on the results of the analysis of the product sample).

Product spillages, depending on the degree of their pollution, are returned to a specific stage of the technological process; industrial effluents are pumped to a neutralization station; solid waste from a tailing pond may be used in subsidiary productions or buried in accordance with the existing waste utilization plan; used elements of package (bags, single use containers) are burnt; non combustible waste may be destroyed by any suitable way.

13.3. Recommendation for domestic waste:

- not used for domestic purposes.

14. Information for transportation

14.1. UN number:

Boric acid is not a dangerous substance for transportation

14.2. Shipping and/or transportation name:

Boric acid GOST 18704-78

14.3. Types of transport:

Boric acid, packed in shipping containers, is allowed to be transported by all means of transport in accordance with the existing Rules of Cargo Transportation for a specific transport.

14.4. Cargo class of danger:

Not classified

(according to GOST 19433 and UN recommendations for dangerous goods transportation)

14.5. Shipping marks:

It is necessary to print the following on containers: the manipulation mark «Protect from moisture», signal word

(manipulation marks; basic, subsidiary and information inscriptions)

“Danger”, the following pictogram:



hazard statement and precautions stated in clause 2 of the present MSDS.

Additional information:

1. Name of the product and its grade
2. Manufacturer and its trade mark
3. Lot number
4. Date of production
5. Weight
6. GOST No.

14.6. Class of package:

Packing is done in accordance with technical documentation or specifications of a contract, as the product is not classified as a dangerous one

(in accordance with UN recommendations for dangerous cargo transportation)

14.7. Information about danger while transporting on trucks:

The product is not classified as a dangerous cargo

14.8. Accident cards:

None

(railway, sea vessels and other transport)

14.9. Danger statement for international cargo transportation:

The product is not classified as a dangerous one

(ADR, RID, IMDG Code, ICAO/IATA)

15. Information about national and international legislation

15.1. National legislation

15.1.1. Laws of the Russian Federation:

According to the Russian Federation law «On consumer rights protection» and GOST 18704-78 «Boric acid. Specifications» each lot of the product, whatever its amount is (number of places), should have a Certificate of quality, Certificate of origin (for exporting). Every unit of the product should have a label of a specified type. Rules of boric acid handling are in accordance with the following laws «On technical regulations», «On environmental protection», «On sanitary and epidemiologic control».

In legislation of the Russian Federation there are no any limitations for boric acid shipment and any additional demands for safety during production and processing of the product.

15.1.2. Human health and environment protection documents (certificates, etc.)

Primorskiy krai territorial department of the Federal Service for Supervision of Customer Rights Protection and Human Well Being issued a sanitary and epidemiological certificate № 25.30.2/1.252.M 000093.11.05 dd 16.11.2005 for boric acid production.

15.2. International legislation

15.2.1. International conventions and agreements:

(is it in accordance with Montreal protocol, Stockholm convention, etc.)

Ortho-boric acid is registered in accordance with REACH regulations dd. 24.06.2008.

15.2.2. Warning marking in EU countries: (pictograms, signal words, hazard statements, etc.)

Any additional marking for export products is not required. The marking should correspond to clauses 2.3 and 14.5 of the present MSDS

16. Additional information

16.1. Revision information:

This is the first edition of the MSDS