

CHEMICAL PRODUCT SAFETY DATA SHEET

(Safety Data Sheet)

Entered in the Register

MSDS Reg. No. 00203335 24 42742

Dated: July 11, 2016

Valid thru: July 11, 2021

Rosstandart

Information and analytical center
"Safety of compounds and materials"

Manager _____ A.A. Toporkov
seal

Federal State Unitary Enterprise "VNII SMT"

DESCRIPTION:

Technical name (as per normative documents)

Bisphenol A (Diphenylolpropane)

Chemical name (as per IUPAC)

2,2-(4,4'-Dihydroxyphenyl)propane

Commercial name

Bisphenol A (Diphenylolpropane), grades "BЧ", "AII", "A", "Б", "B" – 1st and 2nd qualities

Synonyms

2,2-bis(4-Hydroxyphenyl)propane, 4,4'-dioxyphenyldimethylmethane, 4,4'-(1-methylethylidene)bisphenol, 4,4'-isopropylidenediphenol

OKP (Russian Classification of Production) Code:
242351

TN VED (Trade classification for foreign economic activities) Code:
2007230000

Reference designation and title of main normative, technical or informative document for the product (GOST, TU, OST, STO, (MSDS etc.)

TU (Technical Specifications) 2423-172-00203335-2007 "Bisphenol A (Diphenylolpropane)"

HAZARD CHARACTERISTICS:

Signal word: Hazardous

Short (verbal): A moderately hazardous compound as regards its effect on the organism as per GOST 12.1.007. Skin contact may cause an allergic reaction. In case of contact with eyes causes irreversible consequences. May cause irritation of the upper respiratory tract. It is assumed that this substance can negatively impact the reproductive performance or the unborn child. A solid flammable compound. Can contaminate water bodies.

Detailed: in the 16 sections of the safety data sheet attached hereto.

MAIN HAZARDOUS COMPONENTS:

Bisphenol A (Diphenylolpropane)

MPC_{w,z},
mg/m³

5

Hazard class

3

CAS No.

80-05-7

EC No.

201-245-8

APPLICANT: PJSC Kazanorgsintez
(company name)

Kazan
(city)

Applicant type: manufacturer, vendor, seller, exporter, importer

OKPO Code: 00203335

Emergency phone No.: (843) 533-94-48

Applicant's Manager:

(signature)

(R.A. Safarov)
(name)

seal

Safety data sheet (SDS) conforms with the UN Recommendations ST/SG/AC.10/30 "GHS"

- IUPAC** – International Union of Pure and Applied Chemistry
- GHS** – UN Recommendations ST/SG/AC.10/30 “Globally Harmonized System of Classification and Labelling of Chemicals”
- OKP** – All-Russian Products Classifier
- OKPO** – All-Russian Classifier of Enterprises and Organizations
- TN VED** – Commodity Nomenclature of Foreign Economic Activities
- CAS No.** – substance No. in the Chemical Abstracts Service register
- EC No.** – substance No. in the European Chemicals Agency register
- MPCw.z.** – maximum permissible concentration of a chemical substance in air of a working zone, mg/m³
- Safety Data Sheet** – chemical product safety data sheet (substance, mixture, material, waste of industrial production)
- Signal word** – a word used to focus attention on the degree of danger of the chemical products and chosen in accordance with GOST 31340-2013

1. Chemical product identification; Manufacturer or vendor information

1.1 Chemical product identification

- 1.1.1 Technical name Bisphenol A (Diphenylolpropane) [1].
- 1.1.2 Brief recommendations for application (including application restriction): Bisphenol A is produced of the following grades, differentiated by the purpose:
 “BЧ” and “AII” grades are intended for production of optical grade polycarbonate as well as for polycarbonates of molding and extrusion grades;
 - “A” grade is intended for production of molding and extrusion grade polycarbonates, and also polysulfones and epoxy resins;
 - “B” grade is intended for production of epoxy resins and varnishes;
 - “B” grade of 1st quality – for production of epoxy resins, varnishes, adhesives and other products;
 - “B” grade of 2nd quality – for production of epoxy resins, adhesives and other products [1].
 No restrictions at application for its intended purpose [1].

1.2 Manufacturer or vendor information

- 1.2.1 Full official name of the Company Public Joint Stock Company “Kazanorgsintez”
- 1.2.2 Address (postal and legal) ul. Belomorskaya, 101, Kazan, 420051
- 1.2.3 Phone number, including that for emergency calls, time limits: (843) 533-94-48, 512-33-15
8 a.m. – 5 p.m.
- 1.2.4 Fax: (843) 533-97-94, 533-97-21, 533-93-54
- 1.2.5 E-mail: standart@kos.ru

2. Hazards identification

- 2.1 The degree of hazard of chemical products in general (information on the hazard classification in accordance with the legislation of the Russian Federation (GOST 12.1.007-76) and GHS) According to GOST 12.1.007: by degree of effect on the human body Bisphenol A is referred to the 3rd class of hazard – moderately hazardous substances [1-5].
 By effect on the human body (as per GHS):
 - as chemical products, having sensibilizing action – 2nd class of danger;
 - by exposure to the eyes – 1st class of hazard;
 - as chemical products having selective toxicity to target organs and/or systems at single exposure – 3rd class of hazard;
 - as chemical products affecting the reproductive function – 2nd class of hazard [4,6]

2.2 Information on precautionary labelling (GOST 31340-2013)

- 2.2.1 Signal word “Hazardous” [4,8].
- 2.2.2 Hazard symbol “Exclamation mark”, “Liquids, spilling from two test

glasses and corrosive to metal and hand”, “Hazardous to human health” [4,8].

2.2.3 Hazard statement
(H-phrases)

H317: skin contact may cause allergic reaction;
H318: eye contact causes irreversible consequences;
H335: may cause irritation of the upper respiratory tracts;
H361: it is assumed that this substances may negatively affect the reproductive performance or the unborn child [4,8].

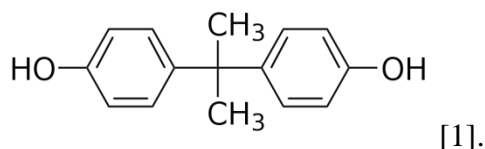
3.

Composition (information on components)

3.1 General information on product

3.1.1 Chemical name (as per IUPAK) 2,2-(4,4-Dihydroxyphenyl) propane [1].

3.1.2 Chemical formula $C_{15}H_{16}O_2$



3.1.3 General characteristics of the grades range
(including brand assortment;
method of production)

Bisphenol A is produced by condensation of phenol with acetone in the presence of catalyst [1].

3.2 Components

(name, CAS and EC number, weight content (total shall be 100%), MPCw.z. or temporary MPCw.z., hazard classes, references to data sources)

Table 1 [1,9]

| Components (name) | % wt | | | | | Occupational exposure standard | | CAS No. | EC No. | |
|----------------------|-------------|-------------|-----|---|--------|-----------------------------------|-------------------------------|---------|-----------|-----------------|
| | BЧ | AII | A | Б | B | | MPCw.z., mg/m ³ | | | Hazard class |
| | | | | | copr 1 | copr 2 | | | | |
| Bisphenol A | min 99.9 | Min 99.8 | n/a | | | 5 | 3 | 80-05-7 | 201-245-8 | |

4. First aid measures

4.1 Observed symptoms

- 4.1.1 In case of poisoning by inhalation (breathing-in): Bitterness in mouth, headache, nausea, discoordination of movements [1,5,10].
- 4.1.2 In case of contact with skin Redness, peeling, and possible pigmentation. At prolonged exposure - dermatitis. In melted condition causes burns [1,2,10].
- 4.1.3 In case of contact with eyes Lacrimation, aglia, eyelid oedema [1,10].
- 4.1.4 In case of entering into the organism (swallowing) Dizziness, vomiting, weakness. [1,5,10].

4.2 First aid measures for affected person

- 4.2.1 Inhalation Fresh air, rest, warmth, clean clothes. Hospitalization if necessary [1,5].
- 4.2.2 Skin contact Remove contaminated clothing and shoes. Flush skin using warm running water with soap [1,5].
- 4.2.3 Eye contact Rinse with warm running water (for at least 15 minutes) with widely opened palpebral fissures. If you have symptoms of irritation, consult a doctor [1,5].
- 4.2.4 Ingestion Rinse oral cavity with water, drink plenty of liquids, take activated charcoal, saline laxative, induce vomiting. Seek medical advice [1,5].
- 4.2.5 Counterindication N/a [1, 2, 5].

5. Measures and resources to ensure fire and explosion safety

- 5.1. General characterization of the fire and explosion hazard (as per GOST 12.1.044-89) Flammable substance [11].
Air-borne dust is explosive. Settled dust is inflammable. [2].
- 5.2. Fire and explosion hazard indicators (set of indicators according GOST 12.1.044-89 and GOST 30852.0-2002: Flash point, °C: 217 (open cup)
Inflammation temperature, °C: 240
Self-ignition temperature, °C 510
Melting point, °C: 156
Boiling temperature, °C: 190 (at pressure 133, 322 Pa)
Lower concentration limit of flame propagation, g/m³: 42

[1,2,5,12].

- 5.3. Combustion and/or thermal destruction products and its specific hazards
- Thermal destruction products, which comprise carbon oxides, phenol, and other organic compounds are hazardous for personnel.
- Carbon oxide (carbon monoxide) – breaks transportation and transfer of oxygen to tissues, developing oxygen lack of an organism to which nervous and cardiovascular systems are especially sensitive. Affects the blood system, thyroid gland, immune system, digestive tract.
- Poisoning symptoms: headache, giddiness, sleepiness, nausea, vomiting, skin vasodilatation, vision weakening, loss of consciousness [13].
- Carbon dioxide (carbon dioxide) – has a narcotic action. In conditions of fire causes an acceleration of respiration and intensifying of pulmonary ventilation, thereby promoting larger entering in an organism of the toxiferous substances which are contained in burning products; has a vasodilating effect.
- Poisoning symptoms: an acceleration of pulse, increase in arterial pressure, headache, giddiness, fatigue, loss of consciousness, death at long-term exposure of high concentrations [14].
- Phenol (MPC_{w.z.} of.=1/0.3 mg/m³, the 2nd class of hazard) – poison. When inhaled causes functions disturbance of the nervous system. Vapors irritate the eye mucosa and upper respiratory tracts.
- Symptoms: headache, giddiness, sneezing, cough, flaccidity, nausea, loss of consciousness [15].
- 5.4. Recommended fire extinguishing means
- Sprayed water with a wetting agent, CO₂, air-mechanical foam, sand, felted and others [1,2,12].
- 5.5. Forbidden fire extinguishing means
- N/a [1,2,12].
- 5.6. Personal protection equipment to be used during fire-fighting (PPE for fire-fighters)
- Fire-resistant suit, complete with self-rescue breathing apparatus SPI-20 [1,16].
- 5.7. Fire-fighting specifics
- A melt can form during burning/fire-fighting. Polymer packaging can be involved in burning process.
- 6. Measures for preventing and elimination of emergency situations and their consequences**
- 6.1. Measures for preventing hazardous effects on humans, environment, buildings, structures in case of accidents and emergency situations

- 6.1.1. Required activities general
Relocate railcar to a safe area. Isolate the hazardous zone within a radius no less than 50 m. Remove the personnel not involved in the elimination of the emergency situation from the hazardous zone. Observe the fire safety measures. Do not smoke. Eliminate the sources of fire and sparks. Provide first aid to victims. Provide medical examination for affected persons [16].
- 6.1.2. Personal protection equipment (PPE of emergency team)
Field-protective suit “JI-1” or “JI-2” complete with an industrial gas mask with a box of brand A, B [1.16].
- 6.2 Sequence of activities during elimination of accidents and emergency situations**
6. 2.1. Required activities in case of leakage, dumping or spillage: (including safety measures providing environment protection)
When Bisphenol A spillage, to prevent formation of dust, moisten spilled material by spraying water, then collect it to tanks and send for recycling. Wash out the surface of floor with soap and water. Do not allow to enter into water reservoirs, basements, sewers.
6. 2.1. Actions in case of fire
Enter the emergency area only in protective clothes and breathing device. Eliminate sources of fire and sparks. Extinguish at a maximum distance as per par. 5.4 [16].

7. Handling and storage rules of chemical substances while performing loading and unloading operations

7.1 Safety measures when handling chemical substances

- 7.1.1 Systems of engineering safety measures)
Input-exhaust ventilation with local suctions in areas of maximum air pollution. The tightness of the process equipment, means of delivery, packaging, product packaging processes. Electrical equipment and artificial lighting shall be performed in an explosion-proof design. Use non-sparking tools. In packaging and transportation comply with the rules of protection against static electricity. The use of personal protective equipment, to provide the personnel work places with primary fire extinguishing means [1,2].
- 7.1.2 Measures for environment protection
Control of equipment, packaging sealing. Compliance with the rules of storage and transportation of the product. Periodic monitoring of substances in the air of the working area, the analysis of industrial effluents on the content of harmful substances within permissible concentrations, air purification to acceptable standards of harmful substances content before being discharge into the air [1].
- 7.1.3 Recommendation on safe transportation and handling
Bisphenol A is transported by railway and motor transport in sheltered vehicles in compliance with the shipping rules effective in the corresponding type transport industry. When carriage by railway vehicles the Bisphenol shall be transported using carload shipments [1].

7.2 Storage rules of chemical products:

- 7.2.1 Safe storage life and conditions
The product is packed in polypropylene soft disposable

(including warranty period of storage, shelf life, incompatible substances and materials when storing)

containers with polyethylene liner or polypropylene containers with protective coating (laminated or others) without a plastic liner. Also packed in polyethylene bags. Containers and bags on pallets are further packaged in a plastic sleeve and forming the pallets. Stored in a dry sheltered warehouses, away from sources of ignition. Guaranteed shelf life is 1 year from the date of manufacture. Materials incompatible in storage are oxidants, acids, alkalis [1,2,5].

7.2.2 Packing and wrapping materials (including fabrication materials)

Polyethylene, polypropylene [1].

7.3 Safety measures and rules for household storage

N/a

8. Monitoring facilities over hazardous exposure and individual protective equipment

8.1 Working zone parameters subject to mandatory monitoring (MPCw.z. or temporary MPCw.z.)

MPCw.z. = 5 mg/m³ (aerosol) [9]

8.2 Measures to limit the content of hazardous compounds within permissible concentrations

Supply and exhaust ventilation with local suction in places where air is most contaminated. Sealed packaging. Regular air monitoring in working area [1, 17].

8.3 Individual protective equipment for personnel

8.3.1 General recommendations

Avoid direct contact with the product (aerosol). To use personal protection equipment. Smoking and eating only in a special place. All the personnel handling the product must undergo preliminary and periodic medical examinations, and shall be trained for providing the first aid. [1].

8.3.2 Protection of respiratory organs (Types of RPE respiratory protective equipment)

No protection is required under usual working conditions. In emergency situations filtering respirators, filter masks with a box brand "ДОТ-600" shall be used; in confined space hose gas masks type "ПШ-1" or "ПШ-2" [1,18,19].

8.3.3 Protective equipment (material, type)
(Special clothing, footwear, hand protection, eye protection)

Specialized clothes from cotton fabric, special footwear, protective goggles with side shields [1,20-23].

8.3.4 Individual protective measures in household use

Not applicable.

9. Physical and chemical properties

9.1. Physical state (aggregate state, color, odor)

Solid substance (crystals, pellets, flakes) with a weak odor [1,2,5].

9.2. Parameters characterizing the main properties of the product (temperature, pH, solubility)

Density – 1.04 g/cm³.
Solubility:
in water at 25°C - 300 mg/l [2]

coefficient n-octanol/water, and other parameters specific to this type of product)

in fat: poorly.
pH – 7-8 (301 mg/l)
Soluble in alcohols, acetone, ether, carboxylic acids, dioxane, aqueous alkalis [5].

10. Stability and reactivity

10.1. Chemical stability

(for non-stable products to indicate decomposition products)

The product is stable provided the storing and handling conditions are observed [1].

10.2. Reactivity

Undergoes alkylation, oxidation, halogenation, sulfonation; forms adducts; enters into polycondensation reactions [5].

10.3. Conditions to be avoided (including hazardous changes upon contact with incompatible substances and materials)

Interaction with oxidizing agents, acids, alkalis. Avoid open flames, sources of ignition [1,2,5].

11. Toxicity

11.1. General characteristic of effect

(evaluation of hazard (toxicity) level effect on the human body and the outstanding features of hazard display)

Moderately hazardous substance by degree of impact on the human body. Irritant. Causes of acute and chronic toxicity [1,2,5].

11.2. Routes of exposure

(inhalation, oral, skin and eyes contact)

Inhalation. Contact with skin and eyes. If swallowed. [1,2,5].

11.3. Affected organs, tissues and systems in human

Central nervous and respiratory systems, red blood shoot, liver, kidney [1,5].

11.4. Information about effects hazardous for health upon direct exposure to the compound; consequences of such exposures

(irritating to the upper respiratory tracts, eyes, skin; skin-resorptive and sensitizing effect)

In case of contact with eyes causes irreversible consequences. Irritant effect on the skin and upper respiratory tracts.

Sensitizing and skin-resorptive action – Yes [1,4,5].

11.5. Information on hazardous long-term effects of organism exposure (effects on the reproductive function, carcinogenic activity, cumulative effects other chronic effects)

Embryotropic, gonadotropic, teratogenic effect – yes. Mutagenic effect – yes. However the evaluation of the IARC is not confirmed.

Carcinogenic activity:

humans - not studied,

animals - weak. However the evaluation of the IARC is not confirmed.

The cumulative effect is moderate [4,5].

11.6. Acute toxicity indicators:

(DL₅₀, route of entry (intra-gastric, cutaneous), animal specimen; CL₅₀, exposure time (hr), animal specimen

DL₅₀ = 4100-5200 mg/kg, intra-gastric, mice

DL₅₀ = 3000 mg/kg, cutaneous, rabbit;

CL₅₀ > 1700 mg/m³, mice, 2 hr [4,5].

12. Effect on environment

12.

- 12.1 General characteristics of the effects on environmental objects: (air, water, soil, including observable signs of exposure) Can contaminate the air. Changes organoleptic properties of water, giving it a smell and taste [5].
- 12.2 Routes of impact on the environment In case of failure to comply with handling, storage, and transportation rules, accidents, emergency situations, and in case of poorly organized distribution and disposal of waste.

12.3 The most important characteristics of impact on the environment

12.3.1 Hygienic regulations (MPC in atmosphere, water, incl. fish farms, soil)

Table 2 [24-27]

| Components | MPC _{in the atmospheric air} or Temporary MPC _{in the atmospheric air} mg/m ³ (LC ¹ , hazard class) | MPC _{water} ² or temporary MPC _{water} , mg/l, (LC, hazard class) | MPC _{fish farms} ³ or temporary MPC _{fish farms} , mg/l (LC, hazard class) | MPC or temporary MPC soil, mg/kg (LC) |
|-------------|---|--|---|---------------------------------------|
| Bisphenol A | 0.04 | 0.01 (org. flavor, 4) | none | none |

- 12.3.2 Environmental toxicity indicators (CL, EC, NOEC for fish, Magna daphnia, algae and others) Stability in abiotic conditions $t_{1/2} = 30-7$ days – highly stable. [5]
 Acute toxicity for fish:
 CL₅₀ = 7.5 mg/l, Cyprinodon variegatus, 96 hr;
 CL₅₀ = 15 mg/l, Orizias latipes, 48 hr;
 CL₅₀ = 9.9 mg/l, Brachydanyo (zebra-fish), 96 hr;
 CL₅₀ = 4-4.7 mg/l, Pimephales promelas, 96 hr;
 CL₅₀ = 9.4 mg/l, Menidia, 96 hr.
 Acute toxicity for Magna daphnia:
 EC₅₀ = 16 mg/l, 48 hr.
 Toxicity for algae (in a culture):
 EC₅₀ = 1 mg/l, Skeletonema costatum (diatoms), 96 h;
 Effects discovered with model ecosystems:
 EC₁₀ > 320 mg/l, Pseudomonas putida (Bacteria), 18 h. [4,5].

- 12.3.3 Migration and conversions in environment due to biodestruction and other processes (oxidation, hydrolysis etc.) It undergoes conversions in the environment.

¹ LC – lethal concentration (tox. – toxicological, s.-t. – sanitary-toxicological; org. - organoleptic; refl. – reflexive; res. – resorptive; refl.-res. reflexo- resorptive; fish f. - fisheries (change of commodity qualities of commercial aquatic organisms); gen. san. – general sanitary; ^K) - carcinogen).

² Water of water objects of drinking and cultural-domestic water use

³ The water of water bodies having fishery value (including marine)

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|---------------------------------|---------------------------------|------------------|
| Bisphenol A (Diphenylolpropane) | MSDS Reg. No. 00203335.24.42742 | Page 11 of 12 |
| | Valid thru July 11, 2021. | |

13. Recommendation on waste disposal or elimination

- | | |
|---|--|
| 13.1. Safety measures for handling waste formed during consumption, storage, transportation, etc. | Safety measures for waste disposal are similar to those handling the product. Personnel shall be acquainted with physical and chemical properties of the product and shall be trained on safety measures when handling. Loading – unloading operations shall be motorized. |
| 13.2. Information about the places and methods of neutralization, recycling or disposal of waste products, including wrapping materials (packing) | Waste and spoiled product to collect from the place of accident in a sealed container and transport for disposal to places agreed with “Rosprirodnadzor” (Federal Supervisory Natural Resources Management Service) [28]. |
| 13.3. Recommendations on disposal of wastes formed during domestic use of the products | Not applicable |

14. Information during shipment (transportation)

- | | |
|---|--|
| 14.1 UN number (in accordance with the UN Recommendations on the transport of dangerous goods) | Not subject to the rules [29]. |
| 14.2 Proper shipping name and/or transportation name: | Bisphenol A (diphenylolpropane) of “BЧ”, “AII”, “A”, “Б”, “B” grades - first and second qualities [1]. |
| 14.3 Applied mode of transportation | Railway and motor transport. [1]. |
| 14.4 Hazardous cargo classification as per GOST 19433-88: - class - subclass - classification code (GOST 19433-88 and rail transport) - number(s) drawing(s) sign(s) of danger | Not classified [30]. |
| 14.5 Hazard goods classification as per UN Recommendations on the transport of dangerous goods: - class - additional hazard - UN packing group | Not classified as dangerous goods [29,30]. |
| 14.6 Transport labeling (handling symbols according to GOST 14192-96) | “Keep from sunlight”, “Keep from moisture” [31]. |
| 14.8 Emergency cards | 345D [17]. |

| | | |
|---------------------------------|---------------------------------|------------------|
| Bisphenol A (Diphenylolpropane) | MSDS Reg. No. 00203335.24.42742 | Page 12 of 12 |
| | Valid thru July 11, 2021. | |

(during carriage by rail, sea etc.)

15. International and domestic legislation

- 15.1. Federal Laws of the Russian Federation “On technical regulation”;
“On the environmental protection”
- 15.1.2. Documents regulating the requirements for protection of people and environment The product is not included in the Unified List of goods, under proper sanitary and epidemiological supervision.
- 15.2. International conventions and agreements N/a
(regulated by the Montreal Protocol, Stockholm Convention etc.)

16. Additional information:

- 16.1 Information on revisions (reedition) of MSDS The MSDS developed instead of MSDS reg. No. 00203335.24.25823 due to expiry of the period of validity

16.2. List of data sources used in preparing of the safety data sheet

1. TU 2423-172-00203335-2007 “Bisphenol A (Diphenylolpropane)” Rev. No. 1-4.
2. GOST 12138-86 Diphenylolpropane technical. Technical specifications.
3. GOST 12.1.007-76 SSBT. Harmful substances. Classification and General safety requirements.
4. Website of the European Chemical Agency: access mode <http://echa.europa.eu/information-on-chemicals>.
5. Information card of potentially hazardous chemical and biological substances. 2,2-(4,4'-Dihydroxyphenyl) propane. The certificate of state registration, series VT No. 000221. -M: “РПОХиБВ”(Potentially Hazardous Chemical and Biological Substances Register of RF), 1995.
6. GOST 32419-2013 Hazard classification of the chemical products. General requirements.
7. GOST 32424-2013 Hazard classification of the chemical products by impact on the environment. Main provisions.
8. GOST 31340-2013 Precautionary labels for chemical products. General requirements.
9. GN 2.2.5.1313-03. The maximum permissible concentration (MPC) of harmful substances in the air of working area (as amended on September 16, 2013).
10. Harmful substances in industry. Handbook. Vol. 1. Organic substances. Edited by N.V. Lazarev and E.N. Levina.-L.: Chemistry, 1976.
11. GOST 12.1.044-89 OCCUPATIONAL SAFETY STANDARDS. Fire and explosion hazard of substances and materials. Nomenclature of indices and methods of their definition.
12. Handbook. Fire and explosion hazard of substances and materials and means of extinguishing. Vol. 2. A. Ya. Korolchenko, D. A. Korolchenko, – M. Association “Fire science”, 2004.
13. Information card of potentially hazardous chemical and biological substances. Carbon oxide. Certificate of state registration series under No. 000672. -M: Cohiba, 1995.
- 14 Information card of potentially hazardous chemical and biological substances. Carbon dioxide. Certificate of state registration series at No. 000071. -M: “РПОХиБВ”(Potentially Hazardous Chemical and Biological Substances Register of RF), 1994.
- 15 Information card of potentially hazardous chemical and biological substances. Phenol. Certificate of state registration No. VT 000400.-M.: “РПОХиБВ”(Potentially Hazardous Chemical and Biological Substances Register of RF), 1995
16. Emergency card No. 904. Emergency cards for dangerous goods transported by railway in CIS, Latvian Republic, Lithuanian Republic, Estonian Republic (as amended on November 20, 2013).
17. GOST 12.1.005-88 OCCUPATIONAL SAFETY STANDARDS. General hygiene requirements for air in working area.
18. GOST 12.4.041-2001 OCCUPATIONAL SAFETY STANDARDS. Personal protective filtering

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|---------------------------------|---------------------------------|------------------|
| Bisphenol A (Diphenylolpropane) | MSDS Reg. No. 00203335.24.42742 | Page 13 of 12 |
| Valid thru July 11, 2021. | | |

respiratory equipment. General technical requirements.

19. GOST 12.4.121-2015 OCCUPATIONAL SAFETY STANDARDS. Gas masks. General technical conditions.

20. GOST 12.4.011-89 OCCUPATIONAL SAFETY STANDARDS. Safety equipment. General requirements and classification.

21. GOST 12.4.280-2014 OCCUPATIONAL SAFETY STANDARDS. Special clothing for protection from general industrial pollution and mechanical impacts. General technical requirements.

22. State standard 12.4.137-2001 Special footwear with leather top to protect from oil, petroleum products, acids, alkalis, non-toxic and explosive dust. Specifications.

23. GOST 12.4.253-2013 OCCUPATIONAL SAFETY STANDARDS. Personal equipment for eye protection. General technical conditions.

24. GN 2.1.6.2309-07 Temporary MPC of pollutants in the air of settlements (as amended on 10.12.2014).

25. GN 2.1.5.1315-03 Maximum permissible concentration (MPC) of chemical substances in water bodies of drinking and cultural-domestic water use (as amended on 16.09.2013).

26. Quality standards in water bodies of fishery significance, including maximum permissible concentrations of harmful substances in waters of water bodies of fishery, confirmed by the order No. 20 of the Federal Agency for fishery from 18.01.2010.

27. GN 2.1.7.2041-06 Maximum permissible concentration (MPC) of chemicals in the soil.

28. SanPiN 2.1.7.1322-03 Hygienic requirements to placing and neutralisation of production wastes and consumption.

29. Regulations Concerning the Carriage of Dangerous Goods by Rail (as amended with revisions and additions on 23.11.2007, 30.05.2008, 22.05.2009, 20.11.2013).

30. GOST 19433-88 Hazardous cargo. Classification and labelling.

31. GOST 14192-96 Labelling of goods

32. Safety data sheet for Bisphenol A, REACHLaw Ltd. dd. 05.04.2011.