

MATERIAL SAFETY DATA SHEET

Recorded in the Register

SDS registration No.70353562 24 27635

of March 30, 2012
Valid before March 30, 2017

Rosstandart

Data analytical center "Safety of materials and substances" Head /Signed/
FSUE "VNITsSMV"A.D. Kozlov
Seal*Seal: Data analytical center "Safety of materials and substances" FSUE "VNITsSMV" (illegible) All-Russian Science and Research Standardization Center, Federal State Unitary Enterprise OGRN 1027700169144. Moscow***NAME:**technical (in normative documentation)
chemical (in IUPAC)
trade
synonyms**Heavy Resin of Pyrolysis, grades A, B**
No
Heavy Resin of Pyrolysis, grades A, B
No**National product classification code:**
2 4 5 1 2 6**Customs commodity code:**
2 9 0 2 9 0 8 0 0 0**Designation and name of main normative, technical or informational document for products (GOST, TU, OST, (M)SDS etc.)****TU 38.10211256-89 with rev. 1, 2, 3, 4, 5 Heavy Resin of Pyrolysis. Technical requirements****HAZARD STATEMENT:****Signal word: Caution****Short (wording):** Low-hazardous substance according to the degree of impact on the body (acc. to GOST 12.1.007). Has general toxic, irritating, skin-resorptive effects. The product components belong to reprotoxic substances. Causes harmful effect on the environment. fire/explosion hazardous. Flammable liquid.**Detailed:** in 16 attached sections of the data sheet.

MAIN HAZARDOUS COMPONENTS	MPCw.a., mg/m ³	Class of hazard	CAS No.	EC No.
Benzapyrene	-/0.00015 (a)	1, K	50-32-8	200-028-5
Naphthalene	20 (p)	4	91-20-3	202-049-5
Methylnaphthalene (1,2-isomers)	20 (p)	4	1321-94-4	215-329-7
Dimethylbenzene (mixture of 2-, 3-, 4-isomers)	150/50 (p)	3	1330-20-7	215-535-7

APPLICANT: LLC Tomsknefteknhim city of Tomsk
(company's name) (city)**Applicant's type:** manufacturer, supplier, vendor, exporter, importer
(delete as applicable)**OKPO code:** 70353562

Hotline phone: (3822) 70-22-11

Head of the applicant company:/Signed/
(signature)
SealR.V. Tumasiev
(print name)*Seal: Tomsknefteknhim, Limited Liability Company, Tomsk, Russia*

IUPAC – International Union of Pure and Applied Chemistry

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

RCP – Russian Classification of Production

OKPO – Russian Business and Organization Classification

Customs code – Commodity Nomenclature for Foreign Economic Activities

CAS No. – number of the substance in the Register of Chemical Abstracts Service

EC No. – number of the substance in the Register of European chemical agency

MPC_{w.a.} – Maximal Permissible concentration in working area, mg/m³ (maximal one-time/shift- average)

Safety Data Sheet – Safety data sheet for chemicals (substance, mixture, material, wastes of industrial production)

The Safety Data Sheet is in compliance with:

- UN recommendations ST/SG/AC. 10/30 “GHS”;

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

Signal word – one of two words “**Hazardous**” or “**Caution**” (or “**None**”) is specified according GOST 31340-2007 “Warning labeling of chemicals . General Requirements”

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1. MATERIAL IDENTIFICATION AND INFORMATION ON MANUFACTURER AND/OR SUPPLIER

1.1 Identification of chemical product

1.1.1 Technical name:

Heavy Resin of Pyrolysis, grades A, B [1].

1.1.2 Brief recommendations on use: (including restrictions in use)

The product is used in the production of carbon black, coke, dark petroleum polymer resins, concrete superplasticizer, as a component of fuel oil. [1] Do not use in closed spaces or for domestic purposes.

1.2 Information on manufacturer and/or supplier

1.2.1 Full official name of company:

Limited liability company Tomskneftkhim

1.2.2 Mail address:

2 Kuzovlevsky Trakt building 202, Tomsk Russia, 634067

1.2.3. Telephone (including emergency line):

8 (3822) 70-33-33 , consulting time (Moscow time) from 06:00 to 15:00; 8 (3822) 70-22-11 - operator, 24-hour

1.2.4 Fax

8 (3822) 70-32-01

1.2.5 E-mail:

press@tnhk.ru

2 HAZARDS IDENTIFICATION

2.1 Степень опасности продукта в целом:


In terms of effect on human body the resin is classified as the 4 class of hazard (low-hazardous substances) [1,2].

2.2 Hygienic standards for the product generally the air of working area (MPC_{w.a.} or SRLI_{w.a.}):

None for the resin in general.

2.3 Labeling data (as per GOST 31340-07):

2.3.1 Hazard summary:

Symbols – “exclamation mark” 

Signal word – “Warning”. Flammable liquid. May cause harm in case of ingestion and inhalation of aerosol. May cause irritation in contact with skin and eyes [3].

[17].

2.3.2 Hazard prevention measures:

Precautions for safe handling:

- Keep away from fire, avoid contact with a heated surface;
- Use personal protection equipment, rubber gloves and frame goggles;
- After work wash your hands thoroughly. [3]

Emergency procedure:

- Extinguish using respiratory and eye protection, protective clothing;
- Use mechanical air-foam (OVP). powder PSB -3 (OP) as a extinguisher;
- Skin contact: take off all contaminated clothing immediately, wash the skin with plenty of water with soap;
- Eye contact: carefully rinse with water for several minutes. Remove contact lenses if you use them and if it is easy to do. Continue rinsing;
- If irritation occurs, seek medical advice ;
- Wash hands after handling [3].

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Safe storage :

- Store in a cool, well-ventilated place [3].

3 COMPOSITION/INFORMATION ON INGREDIENTS

3.1 General description:

3.1.1 Chemical name (IUPAC):

None [1].

3.1.2 Chemical formula:

None, as the product is a mixture of substances.

3.1.3 General description of the composition:

Mixture of aromatic mostly bicyclic and polycyclic hydrocarbons [1].

3.2 Components:

Components (name, CAS and EC numbers)	Weight ratio, %	MPC _{w.a.} , mg/m ³	Class of hazard	Information source
methylbenzene, CAS No.108-88-3, EC No.203-625-9	~3	150/50 (p)	3	[4, 5]
Ethylbenzene, CAS No.100-41-4, EC No.202-851-5		150/50 (p)	4	[4]
Dimethylbenzene (смесь 2-, 3-, 4-изомеров), CAS No.1330-20-7, EC No.215-535-7		150/50 (p)	3	[4]
1,3,5-trimethylbenzene (mesitylene), CAS No.108-67-8, EC No.203-604-4		30/10 (p)	3	[4]
1,2,4-trimethylbenzene (pseudocumene), CAS No.95-63-6, EC No.202-436-9		30/10 (p)	3	[4]
ethynylbenzene, CAS No.100-42-5, EC No.202-851-5		30/10 (p)	3	[4]
Indene, CAS No.95-13-6	~ 15	-	-	-
methylindene, CAS No.2177-47-1		-	-	-
alkylindene		-	-	-
naphtalene, CAS No.91-20-3, EC No.202-049-5	-50	20 (p)	4	[4]
methylnaphtalene (1, 2-isomers) CAS No.1321-94-4, EC No.215-329-7		20 (p)	4	[4]
alkylnaphtalenes		50 (p+a)	4	[4]
acenaphthene, CAS No.83-32-9		10(p+a)	3	[4]
alkylacenaphthenes	~ 10	-	-	-
alkyphenanthrene, CAS No.85-01-8		0,8 (a)	2	141
phenanthrene		-	-	-
diphenyl (*norm for dinyl: mixture 25 % of diphenyl+ 75 % diphenyl ester)	-5	10 (p+a)*	3*	-
alkyl diphenyls		10 (a)	4	[4]
fluorene	~5	-	-	-
alkylfluorene		-	-	-
anthracene	-2	-	-	-
alkylanthracenes		-	-	-
pyrene, CAS No.129-00-0	-0,5	0.03, (a), special protection for skin and eyes is required	1	[4]
banzapyrene, CAS No.50-32-8, EC No.200-028-5	-44 µ/g	-/0.00015(a)	1, carcinogen	[2,4]

Parameter	Norm for grades [1]	
	A	B
Volatilization temperature of 3% volume, °C, not lower	180	170

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Coking,%, not more	12.0	16.0
Mass fraction of water,%, not more	0.3	0.5
Mechanical impurities, % not more	0.01	0.01
Correlation Index, no less	125	120
Mass fraction of sodium ions,%, not more	0.005	0.01
Mass fraction of potassium ions,%, not more	0.0005	0.001

4 FIRST-AID MEASURES

4.1 Symptoms:

4.1.1 Poisoning by inhalation

Dizziness, headache, weakness, drowsiness, fatigue, impaired motion coordination, dizziness, watery eyes, coughing, nausea, vomiting, diarrhea [6, 7, 8, 9].

With repeated, prolonged action of low concentrations chronic poisoning may develop. The most frequent complaints are headaches, which are located mainly in the frontal region, dizziness, weakness, feeling of pressure and fullness in the eyeballs, fatigue, irritability, tearfulness, depressed mood, sleep disturbance (dysrhythmia: daytime sleepiness and insomnia at night). Unpleasant sensation in the heart, palpitations. During physical exercise-disruptions in the heart, shortness of breath, there is lack of appetite, indigestion, nausea, vomiting occasionally, bleeding gums, menstrual cycle disorder in females, a tendency to menorrhagia. Increased tendon reflexes, tremor of fingers on outstretched arms, bright autographism, excessive sweating, temperature asymmetry identical points of the body. These symptoms may be combined with changes in the blood (decreased white blood cells, platelets), but sometimes it can occur in isolation or preceded by changes in the peripheral blood. Neurasthenic syndrome gradually becomes asthenic condition, there is lethargy, weakness, sluggishness, lethargy, rapid exhaustion of the cortical processes, reduced memory and attention. Dryness, itching, and redness of the skin.

4.1.2 Skin:

Redness, dryness, itching [1].

4.1.3 Eyes:

"Sandpaper" in the eyes, watery eyes [9].

4.1.4 Per oral poisoning (if accidentally ingested):

Vomiting, pain in the stomach, abdominal pain, respiratory distress, increased heart rate, bleeding, convulsions, loss of consciousness, etc., but more expressed than in case of inhalation.

4.2 First aid depending on the harmful effect:

4.2.1 Poisoning by inhalation :

Fresh air (oxygen may be used), rest, warmth. If necessary, seek professional medical help, while with them should have information about the features of effects on the product/substance to which the exposure occurred [1,10].

With the development of chronic poisoning workers are subject to employment outside contact with this chemical, a course of treatment, medical supervision until complete elimination of symptoms of chronic poisoning.

4.2.2 Skin contact:

Remove. Wash with water and soap, apply oil rich cream or paste on the affected area [1]. Apply an aseptic bandage for burns [10].

4.2.3 Eye contact:

Wash with plenty of water keeping the eye wide open. If any irritation symptoms appear, consult the doctor[1].

4.2.4 Per oral poisoning :

Rinse mouth, give plenty of water. Do not induce vomiting [1]. Paraffin oil (200 ml) and charcoal (30 g). Lavage tube under the supervision of medical staff. Saline laxative. If necessary, seek medical advice [11].

4.2.5 Contraindications:

Adrenaline and adrenolytic drugs are contraindicated [11].

4.2.6 First aid means (first aid kit):

First aid kit with medicines and accessories for first aid cases.

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5 FIRE-FIGHTING MEASURES

5.1 General description of fire/explosion hazard:

Combustible liquid. In terms of explosion and fire risk resin production is classified as Category A in accordance with Fire Code NPB 105 and as Class P-1 (art. 18) under Federal Law No. 123. Explosion hazard category and group of product vapors with air is IIA according to GOST R 51330.11 and T1 according to GOST R 51330.5, respectively [1, 11, 12, 13]. When heated it may decompose forming toxic gases and vapors. Fires can cause burns and poisoning by gases [10]. The resin shall be handled in compliance with sanitary regulations and safety rules adopted for handling toxic flammables.

5.2 Fire/explosion hazard indices:

Flash point - not less than 75°C.

Self-ignition temperature: not lower than 400°C.

LEL - not less than 1.5 % vol., UEL - not more than 12 % vol.

Temperature limits of inflammation in the air: the lower limit is not lower than 80°C, the upper limit is not higher than 140°C [1].

5.3 Hazard caused by combustion products and/or thermal destruction:

During combustion carbon oxides, soot containing benzopyrene, and other harmful substances are emitted into the air. They have general toxic, highly irritating, allergenic and carcinogenic effects on human body [6, 8, 16].

5.4 Suitable extinguishers:

Mechanical air-foam, powder extinguishers [18], water spray with wetting agents [10].

5.5 Forbidden extinguishers:

Water jets, water with wetting agents OP-7, OP-10, NP-1, "slick water" (water solutions of polyoxyethylene), "viscous water" (aqueous polymer solutions), aqueous basic solutions [18].

5.6 Personal protective clothing for fire-fighting:

Fire proximity suits, turnover gear and firefighters equipment, personal respiratory and eye protection[19].

5.7 Special requirements for fire-fighting:

Cool the water tanks from a maximum distance [10].

6 ACCIDENTAL RELEASE MEASURES

6.1 Measures to prevent impact on people, environment, buildings etc. in emergency situations

6.1.1 Necessary general-purpose actions:

Isolate the dangerous area within a radius of at least 50 m. Enter the danger zone wearing protective clothes and breathing apparatus. Evacuate unauthorized people. Observe fire safety precautions. No smoking. Provide first aid to the injured [10].

6.1.2 Personal precautions: (emergency response teams and personnel):

In case of fire – fire-fighting suit complete with self-rescuer SPI-20 [10]. Oil-and-petrol resistant gloves made butyl-rubber dispersion, special footwear.

Staff: air-breathing apparatus in emergencies and self-rescuers to leave the fire zone.

6.2 Procedure for clean up in case of accidental release or emergency

6.2.1 Actions in case leakage, spilling (including precautions providing environmental protection):

Eliminate leaks with caution. Pump the contents into a good container or container for draining observing the conditions of mixing fluids. Block off large leakage by earthworks. Block off the spillage by earth wall, collect into dry containers, close tightly. Avoid the substance to get into waterways, sewers.

Neutralization: Pump out the substance from the lower areas in compliance with fire safety measures. Cover the spillage area with sand or other sorbent agent (in winter snow may be used as sorbent). Collect the sorbent contaminated with the substance into a sealed tare, cut off the surface layer of polluted soil, bring to the specially arranged dump area for disposal in compliance with precautions. Fill the cut areas with a fresh layer of soil. Call the professionals for neutralizing [10, 20].

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6.2.2 Fire-fighting procedure:

Enter the accident zone wearing protective clothes and breathing apparatus. Extinguish the fire from a maximum distance [10].

7 HANDLING AND STORAGE OF CHEMICAL PRODUCT

7.1 Safety precautions while handling

7.1.1 Security and collective protection equipment (including fire and explosion safety measures)

Production of the resin shall comply with safety rules PB 09-540 [21]. The following safety signs according to GOST R 12.4.026: P02 "Never use open flame or smoke", W01 "Fire hazard. Highly inflammable substances" [1, 22]. Fire concentration of the vapors in the air is defined by stationary automatic alarms of STM, STH types.

Electrical equipment and lighting should be made explosion-proof, the equipment and pipelines should be grounded according to "Electrical Installation Code" [1].

In the manufacture of the product and during its handling sanitary rules and safety regulations shall be observed, as well as the requirements under GOST 12.1.007 ensuring safe operation of service personnel: equipment should be sealed, avoid contact with skin or eyes, ingestion [1, 23].

7.1.2 Environmental protection measures:

Strict observance of process parameters. Sealed equipment, utilities and tare. Elimination of leaks. Elimination of product emissions to water bodies and soil [1, 23].

7.1.3 Recommendations for safe transportation :

Transportation in accordance with the Regulations concerning the Carriage of Dangerous Goods in force for a specific type of transport considering the requirements of GOST 1510-84 (according to the requirements set for petroleum aromatic products) [1, 24]. Observe fire safety.

Follow the conditions for container integrity during moving the product. The filling extent of tank-cars is set in accordance with the "Regulations concerning the Carriage of liquid goods in bulk in tank-wagons and hopper wagons for transportation of petroleum bitumen" and should not exceed capacity of the tank. The maximum filling is 95 % (by volume) [1, 25].

7.2 Storage

7.2.1 Terms and conditions of safe storage: (including the warranty shelf life, expiry date):

The resin is stored according to the requirements of GOST1510 (in accordance with the requirements established for the petroleum aromatic products).

The storage temperature is from -50°C to 50°C.

Warranty shelf life of the resin is three months from the manufacturing date [1, 24].

7.2.2 Incompatible substances and materials for storage:

Possibility to store the resin with other substances is defined by GOST 12.1.004. Do not store with oxidizing agents; substances that may form explosive mixtures thereof; self-inflammables and pyrophorics from air and water; substances capable of causing ignition; combustible substances; liquefied gases, acids, alkalis [1, 6, 9, 26].

7.2.3 Materials recommended for tare and packaging:

The resin is transported in tank-cars which shall comply with "Regulations concerning the Carriage of Dangerous Goods on Railway" and "Regulations concerning the Carriage of liquid goods in bulk in tank-wagons and hopper wagons for transportation of petroleum bitumen" [1, 25, 27].

7.3 Precautions and storage in household

Not used in household

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Parameters of working area subject to control (MPC_{w.a} or TSRAL_{w.a}):

The conditions in the work area shall comply with the requirements of SanPiN 2.2.4.548 and R2.2.2006. The content of harmful substances shall not exceed standards established in GN 2.2.5.1313. The substances that can be released into the workplace air are listed in para. 3.2. A specific list of the substances subject to control in the air of the working area shall be agreed with local authorities of the Federal Service on Customers' Rights Protection and Human

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Well-being Surveillance. Monitoring is performed according to the procedures duly approved at intervals in accordance with Annex 9 of the Guidelines R 2.2.2006-05 and agreed with the local authorities of the Federal Service on Customers' Rights Protection and Human Well-being Surveillance [1,4,28,29].

8.2 Measures to ensure the content of harmful substances in permissible concentrations:

Sealing of production processes and equipment. Production facilities must be equipped with forced ventilation in the form of general exhaust and dilution ventilation unit in accordance with GOST 12.4.021 [1.30].

8.3 Personal protection means for personnel:

8.3.1 General recommendations:

The workers shall be trained to use safe methods of work acc. to GOST 12.0.004-90 [31]. Obligatory medical examination during hiring and periodic medical examinations.

All activities related to the production and use of resins must be performed using special clothing and footwear according to Standard industry norms for free issue of special clothing, footwear and other personal protective equipment for personnel of chemical plants, which are certified and declared to comply with relevant technical regulations of the Customs Union "On the security of personal protective equipment" [1, 32, 33].

8.3.2 Respiratory protection (types of RPE):

When working in the areas with a concentration of harmful vapor exceeding MPC - filtering mask with A grade filter according to GOST R 12.4.251-2009, in enclosed space - the hose mask PSh-1 or PSh-2 or air-breathing apparatus, in production and laboratory facilities - PPE for respiratory system with grade A filters [1, 34].

8.3.3 Eye protection:

Suit for protection from general industrial pollution, polymer coated gloves, rubber or polymer gloves, leather boots with protective toepuff. Goggles – for handling procedures (drainage and filling) [1].

8.3.4 Personal protection means when using for household purposes:

Not used in household

9 PHYSICAL AND CHEMICAL PROPERTIES

9.1 Physical state:

Viscous liquid of brown colour with characteristic odour [1].

9.2 Parameters characterizing the main properties of the product, primarily hazardous ones: (temperatures, pH, solubility, coefficient n-octanol/water etc.)

Parameter [1]	Norm for grades	
	A	B
Kinematic viscosity at 50 °C, mm ² /s, max.	25	40
Density at 20 °C, g/cm ³ , min.	1.04	1.03

Solubility in water at 20°C – less than 150 mg/l [6].

Other components' solubility in water is various, from insoluble to good solubility [11].

The resin components are soluble in ethyl alcohol, benzene, diethyl alcohol, fats [6, 11].

Component	Density at 20 °C, g/cm ³ [11]	Vapors pressure, kPa (at T, °C) [11]	T _{melt.} , °C [11]	T _{boil.} , °C [11]
naphthalene	1.0253	0.0085 (20); 0.0218 (30); 1.33 (87.6)	80.3	218; 87.6(1.3)
1-methyl-naphthalene	1.0202	1.33 (107.6), 200 (278.2)	-30.6	244.6; 107.4(1.3)
2- methyl-naphthalene	1.0058	1.33 (104.9), 200 (274.4)	34.6	241.1; 104.7(1.3)
phenanthrene	1.066 (101)	7.5* 10 ⁻⁶ (20); 1.1*10 ⁻⁴ (39.2); 3.0*10 ⁻⁴ (48.8)	101	340; 210-215 (1.6)
indene	0.9957	1.33 (60.7)	-1.55	182.6;

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10 STABILITY AND REACTIVITY

10.1 Chemical stability (specify decomposition products for unstable products):

The resin does not react with water [1].

10.2 Reactivity:

Alkylated, halogenated, sulfonated, nitrated, oxidized [6], hydrogenated, chloridized [9].

10.3 Conditions to be avoided (including hazards in contact with incompatible substances and materials):

Heating. Handling with open flame, sparks [1].

11 TOXICOLOGICAL INFORMATION

11.1 General description of effect (hazard (toxicity) rate evaluation of effect on human body):

Low toxic substance (4 class of hazard) in terms of effect on human body when administered intragastrically [1, 2].

11.2 Routes of exposure:

Inhalation, oral, in contact with skin and eyes [1].

11.3 Target organs and systems:

Nervous system, respiratory system, skin, eyes, cardiovascular system, blood system, liver, kidneys, digestive system [1, 9].

11.4 Information on human health hazard in direct contact with chemicals as well as the consequences of such exposure (irritation effect on upper respiratory tracts, eyes, skin, including skin-resorptive and sensibilizing effects):

Irritating effect: skin – yes, eyes – yes [1]. Skin-resorptive effect: yes [1].

Substance vapors released from the resin cause irritation of the mucous membranes of the upper respiratory tracts, may cause disruption of normal functioning of the central nervous system, have toxic effects [1].

Sensibilizing effect: yes [7, 8, 9, 35], not determined [6].

11.5 Information about dangerous long-term effects on the body (influence on reproduction, carcinogenic effect, cumulateness):

Resin: No cumulateness. $K_{cum.} = 11.6$ [1, 2].

Benzopyrene: cumulateness - low, embryotropic, gonadotropic, teratogenic, mutagenic, carcinogenic effects are determined [8].

Naphthalene: cumulateness - moderate ($K_{cum} = 0.17$ acc. to Shtabsky). Embryotropic, gonadotropic, teratogenic, mutagenic effects are determined. Carcinogenic effect on human: not determined, on animals: weak [9].

Dimethylbenzenes: cumulateness – moderate. Embryotropic, gonadotropic, teratogenic effects are determined [6].

Styrene: cumulateness – low. Embryotropic, gonadotropic, teratogenic, mutagenic effects are determined [7].

Acenaphthene: carcinogenic effect – not determined [11].

11.6 Acute toxicity:

(DL₅₀, route, animal;

CL₅₀, exposure time (h), animal)

Type DL	Value (mg/kg)	Route, exposure time (h)	Animal
DL ₅₀	>5000	intragastrically	mouse [36]
DL ₅₀	7000	intragastrically	rat [2]
DL ₅₀	6000	intragastrically	mouse [2]
For dimethylbenzene [6]			
DL ₅₀	4300	intragastrically	rat
DL ₅₀	1548	abdominally	mouse
DL ₅₀	1700	subcutaneously	rat
	22084 mg/m ³	4	rat
CL ₅₀	50000 mg/m ³	2	mouse
For benzopyrene [8]			

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DL ₅₀	50	subcutaneously	rat
	500	abdominally	mouse
CL ₅₀	не установлена		
For naphthalene [9]			
DL ₅₀	490-1250	intragastrically	rat
DL ₅₀	580	intragastrically	mouse
DL ₅₀	1200	intragastrically	Guinea pig
DL ₀	1000	abdominally	rat
CL ₅₀	100	4	rat
For acenaphthene [11]			
LD ₅₀	600	abdominally	rat
For anthracene (technical) [11]			
LD ₅₀	4900	intragastrically	rat
For phenanthrene [11]			
LD ₅₀	1,8-2 g/kg	intragastrically	rat
For indene [11]			
LD ₅₀	1800	intragastrically	mouse
LD ₅₀	2300	intragastrically	rat
LC ₅₀	14000	4 h	rat
For pyrene [11]			
LC ₅₀	170	Death within 1-2 days	albino rat
LD ₅₀	800	Death within 2-8 days	mouse

11.7 Doses (concentrations) having minimal toxic effects:

Benzapyrene [8]

Value, size	Route	Exposure time	Animal
0.02 mg	intratracheal	One-time	rat
Max. non-blastomogenic effect			

2 mg, intratracheally, once per month, 1 year, rat (reduction of SH groups in serum, an increase in excretion of 17 - keto steroids in urine, activation of anaerobic glycoside in lungs);

5 mg, intratracheally, once per month, 3 mon, rat (by change of energetic metabolism in lungs);

SubTLirr. – 0.0000002 mg/m³, human;

Limchr. – 0.0000025 mg/kg, intragastrically, 6 mon, rat;

NEDch. – 0.00000025 mg/kg, intragastrically, 6 mon, rat;

15 mg (total dose), intratracheally, 3 mon, rat (change of energetic metabolism in lungs, liver, kidneys);

Naphthalene [9]

Type	Value, size	Route	Exposure time	Animal
-	10 mg/kg	intragastrically	30 days	rat
Weight gain retardation, reduction in ChE and ALT activity, decrease of creatinine and urea in the blood, number of erythrocytes, reticulocytes increase				
-	100 mg/m ³	Inhal.	6.5 mon.	rat
Weight gain retardation, increased oxygen consumption, changes in ChE activit; morphological changes in the lungs, liver, kidneys, myocardium, brain				
Limchr.	0.15 mg/kg	intragastrically	6 mon.	rat
(kidneys affect)				
MH/Exp.	0.015 mg/kg	intragastrically	6 mon.	rat
Limsp.	0.015 mg/kg	intragastrically	6 mon.	rat
(mutagenic effect)				

Dimethylbenzene [6]

A minimal lethal dose for a human in case by ingestion is 50 mg/kg;

A minimal lethal concentration for a human by inhalation is 44168 mg/m³, 6 h.;

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Limac – 200-400 mg/m³, inhal, 40 min., rabbit (by flexion reflex);
 Limac – 10000 mg/kg, on skin, rat;
 Lim_{odor} – 0.6 mg/m³, human;
 Lim_{egg} – 0.32 mg/m³, human;
 Subthreshold limit_{egg} – 0.2 mg/m³, human;
 Lim sv.ch. – 0.5-0.6 mg/m³, human.
 LimCchr. – 14 mg/m³, inhal., 3mon., 24-hour, rat (by changes in leukocytes);
 Limchr – 4 mg/kg, intragastrically, 6 mon., rat (eosinophilia, reticulocytosis);
 NEDch. – 0.1 mg/kg, intragastrically, 6 mon., rat;
 Lirach - 200 mg/kg, on skin, 4 mon., for 4 h., rat (by change in CIS, morphological composition of the peripheral blood).

Acenaphthene [11]

100 mg, one-time, intratracheally, rat, kidneys deterioration.

Anthracene [11]

Pure anthracene in concentration 170000 mg/kg does not cause death of mice.

Phenanthrene [11]

By inhalation of 12 mg/m³, rat, 3 mon., reduction of Hb in blood, decrease of erythrocytes, reticulocytes and leukocytosis.

Diphenyl [11]

Lim_{odor} = 0.06-0.24 mg/m³.

Indene [11]

Lim_{resid.} = 200 mg/m³ (rat), Lim_{odor} = 0.32 mg/m³ (human).

Lim = 3 mg/m³ rat, 105 days 24-h, inhal., ratio disbalance of sulfate fractions of urine, increased activity of cholinesterase in the blood and decrease in catalase activity in it.

0.15 and 0.6 mg/m³ – on observed effect level.

Pyrene [11]

10 mg/m³, rat, inhal., one-time, inhibition of the summation abilities of the nervous system.

3,6 mg/m³, rat, 4 mon. 4h., reduction of Hb in blood and erythrocytes, increase of blood sugar level, protein in the urine.

12 ECOLOGICAL INFORMATION

12.1 General characteristics of the impact on the environment (air, water, soil):

When released into the environment the resin has a toxic effect on biological objects in the air, water and soil. Contaminates water bodies [1].

12.2 Environment impact pathways:

Leak, spillage in the result of failure to observe of storage and transportation rules, improper disposal.

12.3 Observed adverse effects:

It changes organoleptic properties of water, giving it a smell, taste. In cases of MPC excess, there is peculiar smell in the air.

12.4 The most important characteristic of impact on environment:

12.4.1 Hygienic regulations:

Components	MPC _{air} or TSRAL _{air} , mg/m ³ (LHI ¹ , class of hazard)	or MPC _{water} ² or TCL _{water} , mg/l, (LHI, class of hazard)	MPC _{fish} ³ or TSRAL _{fish} , mg/l (LHI, class of hazard)	MPC or APC in soil, mg/kg, (LHI)	Reference

¹ LHI – limiting harmful index (tox. – toxicological; s.-t. – sanitary-toxicological, org. – organoleptic, refl. – reflectory, res. – resorptive, refl.-res. – reflectory- resorptive, fish. – fishery (change in the quality of commercial fishery species), gen. – general sanitary).

² The water of water bodies of household and drinking as well as social use.

³ The water of water bodies for fishery use (including marine).

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anthracene	0.01	-	-	-	[38]
acenaphthene	0.07	-	-	-	[381]
banzapyrene	-/0.1 µg/100 m ³ ; res.; 1	0.00001; s.-t.; K; 1	-	0.02; gen.	[39,41,42]
dimethylbenzene	0.2/-; refl.; 3	0.05; org. od.; 3	0.05; org.; 3	0.3; translocat.	[37,39,40,411]
indene	0.015	-	-	-	[38]
methylbenzene	0.6/-; refl.; 3	0.024; org. od.; 4	0.5; org.; 3	0.3; air migration.	[37, 39,41,42]
naphthalene	0.003/-; refl.; 4	0.01; org. od.; 4	0.004; tox; 3	-	[37, 39,40]
1,2,4-tri- methylbenzene	0.04/0.015; refl.-res.; 2	-	0.5; tox; 3	-	[37, 39]
1,3,5-tri- methylbenzene	0.1	-	0.5; s.-t.; 4	-	[37, 38]
phenanthrene	0.01	-	-	-	1381
ethenylbenzene	0.04/0.002; refl.-res.; 2	0.02. K; s.-t.; 1	-	0.1; air migration.	[39, 40,41]
ethylbenzene	0.02/-; refl.;3	0.002; org. od.; 4	0.001; tox; 3	-	[37, 39,421]
propylbenzene	-	0.2; org. od.; 3	-	-	[401]
diphenyl	-	0.002; s.-t.; 2*	0.01; tox; 2*	-	[37, 40]

Dimethylbenzene: Lim_{org. od.} – 0.05 mg/l; Lim_{org. taste} – 0.2 mg/l (taste); Lim_{gen.} – 0.1 mg/l [6].

Naphthalene: Lim_{org. od.} – 0.01 mg/l (odour); Lim_{org. taste} – over 0.01 mg/l (taste); Lim_{gen.} – 0.1 mg/l [9].

12.4.2 Ecotoxicity:

(CL, EC for fish, daphnia Magna, algae)

Type	Value (mg/l)	Species	Exposure time, h
Benzapyrene [8]			
EC	> 0.0001	Psettichthys melanostichus (changes in embryo)	
EC	0.01	Antithmnion plumula (red) (increase in population growth)	96
ED _{min}	40 м кг/кг	Increase in the number of fungi, reducing the number of saprophytic microorganisms	
Naphthalene [9]			
CL ₅₀	24	Cypnnodon variegates	24
CL ₅₀	1.4	Oncocotus hexacortnis	96
CL ₅₀	1.2	Oncorhynchus gorbuscha (pink salmon)	96
CL ₅₀	2.5	Pcnaeus aztecus	24
CL ₅₀	2.3	Callinectes sapidus	48
CL ₅₀	3.8	Neathes arenaceodentata	96
CL ₅₀	17	Daphnia Magna	24
CL ₅₀	8.6	Daphnia Magna	48
CL ₅₀	10	Acrosiphonia arcta	2
CL ₅₀	12	Phacodactylum tricornulum	4
Dimethyl benzenes [6]			
CL ₅₀	24	Centarchidae (black bass)	24
CL ₅₀	29	Phoxinus phoxinus (minnow)	24
CL ₅₀	35	Phoxinus phoxinus (minnow, for ethylbanzene)	24
CL ₅₀	17	Sparidae (sea bream)	96
CL ₅₀	86-308	Leiicuscus idus melanotus (golden orfe fish)	48
CL ₅₀	37	Sparidae (sea bream)	24

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CL ₅₀	27-42	Phoxinus phoxinus (minnow)	96
CL ₅₀	165	Daphnia Magna	24
EC ₅₀	200	Daphnia Magna	24
EC _{min}	137	Daphnia Magna	24
EC	10	Amphidinium carterae (inhibition of population growth)	48
EC	20	Skeletonema costatum (inhibition of population growth)	72
Styrene [7]			
CL ₅₀	9.1	Phoxinus phoxinus (minnow)	96
CL ₅₀	27	Daphnia Magna	24

12.4.3 Migration and transformation in the environment due to biodegradation and other processes (oxidation, hydrolysis etc.):

In the atmosphere and water volatile hydrocarbons migrate to fairly long distances. Organic contaminants may increase absorption of hydrocarbons in water, toluene and xylenes may be oxidized with ozone in water. They can be mostly removed from the environment, especially water, by oxidation under the influence of ultraviolet and hard visible radiation, but also by biodegradation under the influence of bacterial flora. May be transformed in the environment. Products of naphthalene transformation: naphthaquinone, benzofuranon and etoxybenzofuranon.

In the case of biodegradation new, unidentified substances appear. [11]

Stability in abiotic conditions $\tau_{1/2}$:

-/7-1 days - stable/[6],

-/30-7 days - highly stable/[9],

-/> 30 days - extremely stable/[8].

13 WASTES (RESIDUES) DISPOSAL CONSIDERATION

13.1 Safety measures when handling wastes, generated during handling, storage and transportation etc.

Accumulation and disposal of industrial waste shall be in accordance with the requirements of SanPiN 2.1.7.1322. Provide thorough sealing of containers, loading and unloading processes of resin. Keep away from heat. Avoid open flames and sparks [1, 43].

Wastes are dangerous for the environment.

Safety measures when handling wastes are similar to those used when handling the main product.

13.2 Methods and places of disposal (destruction) of wastes and contaminated package (tare):

In case of accidental emissions from equipment or spillage, cover the product with sand, do not use sparking tools for collecting into a sealed container and take in the special place provided for the further destruction by the established procedure [1]. Unsuitable for processing waste should be neutralized or disposed at the specially equipped waste disposal facilities on the basis of permits issued by local health and environmental authorities.

Oil-contaminated materials, oil sludge and waste packaging shall be buried.

When treating wastes, observe the requirements for hazardous waste management .

The tare is allowed to reuse after removing the residue subject to the requirements of GOST 1510 (Annex 2, Table 1) [24].

13.3 Recommendations on removal and disposal of wastes, generated during use in household:

The resin is not used in household.

14 TRANSPORT INFORMATION

14.1 UN number:

UN 3082 [27]

14.2 Proper shipping and/or transport name :

Liquid substance, hazardous for environment, n.o.s. (Heavy Resin of Pyrolysis) [27].

14.3 Types of transport:

May be transported in special tank-cars in accordance with the rules for transport of dangerous goods, valid for a specific type of transport subject to GOST 1510 (in accordance with the requirements for petroleum aromatics) [1,

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24]. It is allowed to transport the resin by sea, river, rail and road transport means by oil vessels, rail tank cars, tank trucks [24].

14.4 Hazard classification of cargo (acc. to GOST 19433 and UN recommendations on transportation of hazardous cargoes):

Class 9, Classification code 9063, hazard sign by sample No.9 [27, 44].

14.5 Transportation labeling (handling signs, main, optional and informational signs):

“Keep away from sun rays”, “Sealed package” are acc.to GOST 14192 [1,45].

14.6 Packing group (UN recommendations on transportation of hazardous cargoes):

III [1,46].

14.7 Information on danger during transportation by road:

Emergency measures code – 345 KE [47].

14.8 Emergency cards:

(railway, marine and road transportation)

No.906 [27], No.8 [48].

14.9 Information on danger for international freight traffic (acc. to Agreement on International Goods Transport by Rail, ADR, RID, IMDG Code, ICAO/IATA and others, including information on environmental hazards, including the “marine pollutants”).

Hazard identification 90, classification code M6 [27].

15 NATIONAL AND INTERNATIONAL REGULATORY INFORMATION

15.1 National legislation

15.1.1 Laws of the Russian Federation:

- Federal Law “On sanitary and epidemiological welfare of the population” No. 52-FZ dated 30.03.1999;
- Federal Law “On Environmental Protection” No. 7-FZ dated 10.01.2002;
- Federal Law “On technical regulation” No. 184-FZ dated 27.12.2002;
- Federal Law “On Production and Consumption Wastes” No. 89-FZ dated 24.06.1998;
- Federal Law “Technical regulations for fire safety requirements” No. 123-FZ dated 22.07.2008;

15.1.2 Documentation regulating the requirements for human and environment protection (certificates, sanitation and epidemiological conclusion etc.):

TU 38.1021256-89 with revisions 1, 2, 3, 4, 5.

15.2 International legislation

15.2.1 International conventions and agreements: (whether the product is subject to the Montreal Protocol, Stockholm Convention)

Not regulated [49].

15.2.2 Warning marking in EU countries (hazard symbols, R- and S-phrases etc.):

Hazard identification - R- phrases:

R 10- Flammable ,

R 36/37 - Causes irritation of eyes and respiratory organs.

Safety measures - S-phrases:

S 16 – Keep away from fire. No smoking;

S 23 – Do not breathe in vapours;

S 29 – Do not discharge into sewage;

S 36/37/39 - Wear suitable protective clothing and gloves, protective means for face and eyes and respiratory organs.

16 OTHER INFORMATION

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16.1 Information on revision (reissue) of the SDS:

Instead of SDS No. 70353562.24.22404 date 13.01.2010 in view of implementation of Revisions No.4, 5 to TU38.1021256-89.

16.2 List of data sources used for preparation of this Safety Data Sheet:

- 1 TU 38.1021256-89 with rev. 1-5 Heavy resin of pyrolysis. Specification.
- 2 Report on "Study of toxicity and harmful effects of the nature of products of petrochemical synthesis", Institute of Hygiene and Occupational Diseases, Moscow, 1988.
- 3 GOST 31340-2007 Warning labeling for chemicals. General requirements.
- 4 R-1 2.2.5.1313-03 Maximum permissible concentrations (MPC) of harmful substances in the air of the working area. Hygienic standards. Approved by Chief State Medical Officer of Russia on 27.04.2003.
- 5 GOST 12.1.005-88 SSBT. General hygiene requirements to the working area.
- 6 Information card of Potentially Hazardous Chemical Substances (Register of PHCS) VT No. 000525 dated 26.06.1995 for dimethylbenzene (mixture of isomers, xylene) .
- 7 Information card of Potentially Hazardous Chemical Substances (Register of PHCS) VT No. 000036 dated 13.04.1994 ethenylbenzene (styrene).
- 8 Information card of Potentially Hazardous Chemical Substances (Register of PHCS) VT No. 000387 dated 22.03.1995 for 3, 4 -benzapyrene .
- 9 Information card of Potentially Hazardous Chemical Substances (Register of PHCS) VT No.000378 dated 17.03.1995 for naphthalene .
- 10 Emergency card No.906. Emergency cards for dangerous goods carried by the railways of the CIS, the Republic of Latvia, Republic of Lithuania, Republic of Estonia (with amendments dated 21.11.2008 and 22.05.2009).
- 11 Harmful chemicals. Hydrocarbons. Halogenated hydrocarbons. Reference book. A.L. Bandman, G.A. Voytenko, N.V. Volkova and others, L.: Chemistry, 1990
- 12 Requirements for completeness of first aid kits with medical devices. Approved by the Order of Ministry of Health and Social Development of the Russian Federation no. 169 n dated 05.03.2011.
- 13 Rulebook "Definition of categories of rooms, buildings and outdoor facilities for fire/explosuion hazard" SP 12.13130.2009 approved by the Order of the Ministry of Emergency Situations of the Russian Federation No. 182 dated 25.03.2009.
- 14 GOST R 51330.1 1-99 Electrical ex-proof equipment. Part 12. Classification of mixtures of gases and vapors with air according to their maximum experimental safe gaps and minimum igniting currents.
- 15 GOST R 51330.5-99 Electrical ex-proof equipment. Part 4. Method for determining self-ignition temperatures.
- 16 Information card of Potentially Hazardous Chemical Substances (Register of PHCS) AT No. 000672 dated 25.10.1995 for carbon (II) oxide.
- 17 GOST R 51057-2001 Fire fighting equipment. Portable fire extinguishers. General technical requirements. Test methods.
- 18 A.Ya.Korolchenko , D.A.Korolchenko Fire/explosion hazard of substances and materials and extinguishing means. Reference book in 2 volumes, M.: "Pozhnauka", 2004
- 19 occupational health and safety rules for the subdivisions of the State Fire Service of the Ministry of Emergency Situations of Russia (POTRO-01-2002), approved and implemented by the Order of Ministry of Emergency Situations of Russia No. 630 dated31.12.2002.
- 20 Procedure for prevention and elimination of oil spills at facilities of LLC Tomskneftekhim, S-P, 2010.
- 21 PB 09-540-03 General rules of explosive safety for fire/explosion hazardous, chemical, petrochemical and refining industries, approved by the Resolution of Federal Committee for Mining and Industrial Supervision No. 29 dated 05.05.2003.
- 22 GOST R 12.4.026-2001 SSBT. Signalling colors. Safety signs and warning markings. Purpose and application rules. General technical requirements and specifications. Test methods.
- 23 GOST 12.1.007-76 SSBT. Harmful substances. Classification and general safety requirements.
- 24 GOST 1510-84 Petroleum and petroleum products. Labeling, packaging, transportation and storage.
- 25 Regulations for transportation of liquid cargoes in bulk in tank-wagons and hopper wagons for transportation bitumen approved by the Order of the Ministry of communication lines No.25 dated 18.06.2003.
- 26 GOST 12.1.004-91 SSBT. Fire safety. General requirements.
- 27 Rules of transportation of dangerous goods by railways approved by Council for Rail Transport of state-members of the Commonwealth, Minutes No. 15 of 05.04.1996 (as amended on 23.11.2007, 30.05.2008, 22.05.2009, in version of Minutes dated 14.05.2010, 21.10.2010).

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- 28 SanPin 2.2.4.548-96 Physical factors of working environment. Hygienic requirements for microclimate of industrial premises. Sanitary rules and regulations approved by the Decree of the State Committee on Sanitary and Epidemiology Surveillance No. 21 dated 01.10.1996.
- 29 R 2.2.2006-05 Guideline for hygienic evaluation of factors of the working environment and labor process. Criteria and classification of working conditions approved by Federal Service on Customers' Rights Protection and Human Well-being Surveillance on 29.07.2005.
- 30 GOST 12.4.021-75 SSBT. Ventilation systems. General requirements.
- 31 GOST 12.0.004-90 SSBT. Organization of labor safety training. General Provisions.
- 32 Cross-industry regulations of providing employees with special clothes, special footwear and other personal protective equipment approved by the Ministry of Health and Social Development of the Russian Federation No. 290n dated June 1, 2009.
- 33 Technical Regulations of the Customs Union "On the safety of personal protective equipment", approved by the Decision of the Commission of the Customs Union user No.878 on December 9, 2011.
- 34 GOST R 12.4.251-2009 SSBT. Personal respiratory protection. Gas and combination filters. General technical requirements. Test methods. Marking.
- 35 Information card of Potentially Hazardous Chemical Substances (Register of PHCS) VT No. 000039 dated 21.04.1994 for methylbenzene (toluene).
- 36 Minutes of toxicological and hygienic studies No. 1774/5-2009 dated 03.03.2009 of FGUZ Center of Hygiene and Epidemiology in the city of Moscow".
- 37 Water Quality Standards for fishery water bodies, including standards of maximum permissible concentrations of harmful substances in the waters of fishery water bodies approved by the Order of the Federal Fishery Agency No. 20 dated 18.01.2010.
- 38 Tentative safe exposure level of pollutants in the air of the residential areas: Hygienic standards. GN 2.1.6.2309-07, approved by the Resolution of the Chief State Medical Officer of Russia under No. 97 dated 19.12.2007.
- 39 GN 2.1.6.1338-03. Maximum permissible concentrations (MPC) of pollutants in the air of residential areas. Hygienic standards approved by Chief State Medical Officer of Russia on 21.05.2003.
- 40 GN 2.1.5.1315-03. Maximum permissible concentrations (MPC) of chemical substances in water bodies of potable and cultural and community uses. Hygienic standards approved by Chief State Medical Officer of Russia on 27.04.2003.
- 41 GN 2.1.7.2041-06. Maximum permissible concentrations (MPC) of chemicals in soil. Hygienic standards approved by Chief State Medical Officer of Russia on 19.01.2006.
- 42 GN 2.1.5.2280-07. Maximum permissible concentrations (MPC) of chemical substances in water bodies of potable and cultural and community uses. Additions and changes to No. 1 of GN 2.1.5.1315-03. Hygienic standards approved by the Resolution of the Chief State Medical Officer of Russian Federation No.75 dated 28.09.2007.
- 43 SanPin 2.1.7.1322-03 Hygienic requirements for the placement and disposal of industrial and consumption wastes approved by the Resolution of the Chief State Medical Officer of Russian Federation No. dated 30.04.2003.
- 44 Recommendations on Transport of Dangerous Goods. Standard Regulations. The fifteenth revised edition. United Nations, New York and Geneva, 2007 (ST/SG/AC.10/1/Rev.15).
- 45 GOST 14192-96 45 Marking of cargo.
- 46 Dangerous Goods Regulations. Appendices 1 and 2 and "Agreement on International Goods Transport by Rail", Ministry of communication lines, 1998.
- 47 Regulation of transport of dangerous goods by road approved by the Government Decree of the Russian Federation No.272 dated 15.04.2011.
- 48 RD 31.15.01-89 International Maritime Dangerous Goods Code approved by the Order of the Ministry of Marine of the USSR fNo.56 dated 03.05.1989.
- 49 List of ozone-depleting substances, which are subject to state regulation for import to the Russian Federation and export from the Russian Federation. Appendix No.1 to the Regulations of import to the Russian Federation and export from the Russian Federation of ozone-depleting substances and products containing them approved by the Government Decree of the Russian Federation No.563 dated 08.05.1996.