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● Bimodal HDPE Compositions

PE2NT11-285, PE2 NT11-285D

TU 2243-175-00203335-2007

Production method: gas-phase method of ethylene copolymerization at low pressure using the complex catalysts.

Application: PE compositions are intended for production of pipes and fittings, particularly for utility and drinking water supply, for compositions with marked stripes, and items that are produced by blow molding method as well as making high-strength thick films with thickness of 20 μm and greater.

No.	Parameter	Standard
		PE2NT11-285, PE2NT11-285D
1	Density, kg/m ³ at 23 °C at 20 °C	947-950 949-952
2	Melt Flow Index at 190 °C and 21.6 kgf, g/10 min.	5-9
3	Melt Flow Index (MFI21.6) spread within one batch, %, maximum	±10
4	Tensile yield strength, MPa, minimum	20
5	Elongation at break, %, minimum	600
6	Volatile weight content, mg/kg, maximum	350
7	Thermal stability at 200 °C, minimum	20
8	Stability at constant internal pressure at 80 °C, with initial wall stress 4.0 MPa, (on pipe samples d110 SDR 11) hr, minimum	165
9	Stability at constant internal pressure at 80 °C, with initial wall stress 2.8 MPa, (on pipe samples d110 SDR 11) hr, minimum	1000
10	Stability at constant internal pressure at 20 °C on pipe samples d32 SDR 11, hr, minimum with initial wall stress 12.4 MPa with initial wall stress 11.6 MPa	100 2500

Packaging, handling and storage: in PE and PP bags that provide products preservation and maintain its quality as per documents approved under the appropriate procedure. Transportation by combined roofed transport in accordance with rules of carriage related to this mode of transport.



Bimodal HDPE Composition of PE2NT11-285D grade is a prize-winner of "The 100 Best Russian Products of 2009" and "The Best Products of the Republic of Tatarstan of 2009" Contests

● HDPE Composition, PE100

PE2NT 11-9

TU 2243-174-00203335-2007

Production method: gas-phase method of ethylene copolymerization at low pressure using the complex catalysts.

Application: PE compositions are intended for production of pipes and fittings, particularly for utility and drinking water supply, for compositions with marked stripes, and items that are produced by blow molding method as well as making high-strength thick films with thickness of 20 μm and greater.

No.	Parameter	Standard
1	Density, kg/cm ³ at 23 °C at 20 °C	954-960 956-962
2	Melt Flow Index at 190 °C, g/10 min.: a) at 212 N (21.6 kgf) b) at 49 N (5 kgf)	5-7 0,1
3	MFI21,6/MFI2.16 ratio	100-170
4	MFI spread within one batch, %, maximum	±10
5	Tensile yield strength, MPa, minimum	21
6	Elongation at break, %, minimum	500
7	Carbon black weight content, %	2,0-2,5
8	Volatile weight content, mg/kg, maximum	350
9	Carbon black distribution type	I-II
10	Thermal stability at 200 °C, min., minimum	20
11	Slow propagation crack resistance at 80 °C, with initial wall stress 4.6 MPa, (on pipe samples d110 mm with SDR 11 or d160 mm with SDR 11) hrs, minimum	165 500
12	Gas component resistance at 80 °C, with initial wall stress 2 MPa, (on pipe samples d32 mm SDR 11) hrs, minimum	20
13	Resistance to rapid crack propagation at 0 °C, at maximum operating pressure exceeding 0.4 MPa 13.1 Small-scale method on pipe samples d110 mm with SDR 11, critical pressure pc, MPa, minimum 13.2 Full-scale method on pipe samples d160 mm with SDR 11, critical pressure pc, MPa, minimum	MOP/2,4-0,072 MOPx1,5
14	Stability at constant internal pressure at 20 °C on pipe samples d32 mm SDR 11 with initial stress, hrs, minimum 12.4 MPa 11.6 MPa	100 2500
15	Lower confidence bound of the stress-rupture strength, σLCL, MPa	≥10

Packaging, handling and storage are in PE and PP bags that provide products preservation and maintain its quality as per documents approved under the appropriate procedure. Transportation by combined roofed transport in accordance with the rules of carriage related to this mode of transport.



PE100 HDPE Composition of PE2NT11-9 grade is a prize-winner of "The 100 Best Russian Products of 2009" and "The Best Products of the Republic of Tatarstan of 2009" Contests

● **HDPE**

**PE2NT21-13, PE2NT22-12,
PE2NT26-16**

TU 2243-176-00203335-2007, rev. 1, 2

Production method: gas-phase method of ethylene copolymerization at low pressure using the complex catalysts.

Application: polyethylene of PE2NT21-13 and PE2NT22-12 grades are intended for processing by injection molding method into products for household and domestic use. Polyethylene of PE2NT26-16 grade is intended for processing by blow molding method into products for household and domestic use and for tape yarns production.

No.	Parameter	Standard		
		PE2NT22-13	PE2NT22-12	PE2nT26-16
1	Density, g/cm ³ at 23 °C at 20 °C	948-955 950-957	958-965 960-966	948-955 950-957
2	Melt Flow Index at 190 °C and at 2.16 kg, g/10 min.	4-7	6-9	0,8-1,6
3	MFI spread within one batch, %, maximum	±15	±15	±15
4	Number of impurities, pcs, maximum	10	10	10
5	MFI _{21,6} /MFI _{2,16} ratio	20-35	20-35	20-35
6	Tensile yield strength, MPa, minimum	25	28	—
7	Tear strength, MPa, minimum	17	17	30
8	Elongation at break, %, minimum	—	—	750
9	Stress cracking resistance, hrs, minimum	30	—	50

Packaging, handling and storage are in PE and PP bags that provide product preservation and maintain its quality as per documents approved under the appropriate procedure. Transportation by combined roofed transport in accordance with the rules of carriage valid for this mode of transport.



HDPE of PE2NT 22-12 grade is a prize-winner of "The Best Products of the Republic of Tatarstan of 2010" Contest

● HDPE Compositions

273-83, 273-95 Grades

TU2243-104-00203335-2005

Production method: gas-phase method

Application: HDPE compositions of 273-83 and 273-95 grades are intended to obtain by extrusion method the products of industrial, cultural and general use as well as articles in contact with food.

No.	Parameter	Standard for 273-83, 273-95 grades	
		superior quality	1st quality
1	Density, g/cm ³	0,950-0,955	
2	Melt Flow Index, g/10 min.	0,40-0,65	
3	MFI spread within one batch, %, maximum	±10	±18
4	Number of impurities, pcs, maximum	5	20
5	Ash weight content, %, maximum	0,04	0,06
6	Volatile weight content, %, maximum	0,09	0,10
7	Tensile yield strength, MPa, minimum	22,6 (230)	22,6 (230)
8	Tear strength, MPa (kgf), minimum	29,4 (300)	21,6 (220)
9	Elongation at break, %, minimum	700	450

Safety requirements, acceptance procedure, test methods, packaging, labeling, handling and storage as per GOST 16338-85. Packaging in PE bags, special soft containers etc. Transportation by any mode of transport in accordance with the rules of carriage.

● Transition Grades of HDPE Compositions

PE2NT11P-275, PE2NT11P-83, PE2NT11P1-83, PE2NT11P-285D, PE2NT11P1-285D, PE2NT05P1-83, PE2NT05P2-83, PE2NT05P3-83, PE2NT05P3-5, PE2NT76P1-73, PE2NT76P2-73, PE2NT76P3-73, 292-73 Grades

TU 2243-18200203335-2008, rev. 1

Production method: gas-phase method when production PE compositions at transition from one to another grade.

Application: PE compositions of PE2NT11P-275 grade (black color) is intended for non-pressure pipes production, including the production of corrugated pipes. PE compositions of PE2NT11P-83 and PE2NT11P1-83 grades (uncolored) are intended for processing by extrusion into non-pressure pipes and extrusion-type profiles. PE compositions of PE2NT11P-285D and PE2NT11P1-285D (uncolored) are intended for processing by extrusion into general-purpose films. PE compositions of PE2NT05P1-83 and PE2NT05P2-83 grades are intended for processing by extrusion into general-purpose articles, PE2NT05P3-83 and PE2NT05P3-5 grades for processing into film by extrusion. PE compositions of PE2NT76P1-73 grade is intended for processing by blow molding or other kind of molding into industrial-use articles. PE compositions of 292-73 grade is intended for manufacture by different processing methods of industrial-use articles.

No.	Parameter	Standard					Test method
		PE2NT 11P-275	PE2NT 11P-83 PE2NT 11P-285D	PE2NT 11P1-83 PE2NT-11P1-285D	PE2NT 05P1-83	PE2NT 05P2-83	
1	Density, g/cm ³ at 23 °C at 20 °C	945-958 947-960	947-954 949-956	947-954 949-956	939-941 941-943	938-940 940-942	as per 5.3
2	Melt Flow Index at 190 °C, g/10 min. a) 21.6 kgf b) 2.16 kgf c) 5.0 kgf	4,5-9,5	5-10	9,5-15,5	2,8-3,6	1,2-2,2	as per 5.4
3	MFI spread within one batch, %, maximum	±30	±30	±30	±25	±15	as per 5.5
4	Tensile yield strength, MPa, minimum				19	15	as per 5.6
5	Tear strength, MPa, minimum	25	25		25	25	as per 5.6
6	Elongation at break, %, minimum	400	400	300	700	700	as per 5.6
7	Number of impurities, pcs., maximum	25					as per 5.7

No.	Parameter	Standard					Test method
		PE2NT 05P3-83 PE2NT 05P3-5	PE2NT76 P1-73	PE2NT76 P2-73	PE2NT76 P3-73	292-73	
1	Density, g/cm ³ at 23 °C at 20 °C	922-935 924-937	950-961 952-963	950-961 952-963	950-961 952-963	952-961 955-963	as per 5.3
2	Melt Flow Index at 190 °C, g/10 min. a) 21.6 kgf b) 2.16 kgf c) 5.0 kgf	1,5-2,5	0,8-1,8	1,6-2,6	3,2-10,0	8-17	as per 5.4
3	MFI spread within one batch, %, maximum	±15	±30	±30	±25	±30	as per 5.5
4	Tensile yield strength, MPa, minimum	10					as per 5.6
5	Tear strength, MPa, minimum	25					as per 5.6
6	Elongation at break, %, minimum	700					as per 5.6
7	Number of impurities, pcs., maximum	25					as per 5.7

Packaging, handling and storage are in PE and PP bags that provide product preservation and maintain its quality as per documents approved under the appropriate procedure. Transportation by combined roofed transport in accordance with the rules of carriage valid for this mode of transport.

● HDPE Compositions

294-73, 295-73, 296-83, 297-285,
297-285D, 298-285, 298-285D
Grades

TU 2211-138-00203335-2007

Production method: gas-phase ethylene copolymerization at low pressure using carrier complex catalysts.

Application: HDPE composition of 294-73 grade intended for injection molding and production of large-size technical products of weight exceeding 250g and for the production of household and general items.

Composition of 294-73 grade is intended for blow molding and for the production of items of household and general application having volumes up to 10 liters and injection molding of items weighting up to 250g.

HDPE compositions of 296-83, 297-285, 297-285D, 298-285, 298-285D grades are intended for extrusion of items of technical as well as household and general application.

No.	Parameter	Standard					Test method
		294-73	295-73	296-83	297-285, 297-285D	298-285, 298-285D	
1	Density, g/cm ³	0,958-0,964	0,958-0,963	0,950-0,955	0,943-0,949	0,937-0,945	as per 5.4
2	Melt Flow Index, g/10 min.	17-25	2,6-3,2	0,40-0,65	0,40-0,75	0,30-0,70	as per 5.5
3	MFI spread within one batch, %, maximum	±15	±18	±18	±18	±18	as per 5.6
4	Number of impurities, pcs, maximum	25	25	25	25	25	as per 5.7
5	Ash weight content, %, maximum	0,05	0,05	0,06	0,06	0,05	as per 5.8
6	Volatile weight content, %, maximum	0,10	0,10	0,10	0,10	0,10	as per GOST 26359-84
7	Tensile yield strength, MPa, minimum	n/a	25,5 (260)	22,6 (230)	16,0 (163)	14,0 (137)	as per 5,9
8	Tear strength, MPa, minimum	ditto	23,5 (240)	21,6 (220)	19,6 (200)	17,0 (167)	ditto
9	Elongation at break, %, minimum	-«-	700	450	650	600	- « -

Packaging, handling and storage are in PE and PP bags that provide product preservation and maintain its quality as per documents approved under the appropriate procedure. Transportation by combined roofed transport in accordance with the rules of carriage valid for this mode of transport.

● HDPE Compositions, Film Grades

273-285, 293-285,
293-285D, 293-285CK(SC),
PE 80B-285, PE 80B-285D,
PE 80B-285SK(SC), PE 80G-285,
PE 80G-285D, PE 80G-285 SK(SC)
Grades

TU 2243-127-00203335-2000, rev. 1-4

Production gas-phase ethylene copolymerization at low pressure using complex catalysts.

Application: HDPE compositions are intended for processing by extrusion method into film used for cold foodstuff packaging and other purposes.

No.	Parameter	Standard			
		273-285		293-285, 293-285D, 293-285SK(SC)	PE 80B(G)-285, PE 80 B(G)-285D, PE 80B(G)-285SK(SC)
		superior quality	1st		
1	Density, g/cm ³	quality		0,943-0,949	0,937-0,943
2	Melt Flow Index, g/10 min.	0,3-0,6		0,4-0,7	0,4-0,8
3	MFI spread within one batch, %, maximum	±10	±18	±10	±12
4	Number of impurities, pcs, maximum	3	15	3	3
5	Ash weight content, %, maximum	0,04	0,06	0,06	0,06
6	Volatile weight content, %, maximum	0,09	0,1	0,09	0,09
7	Tensile yield strength, MPa, minimum	19		17	16
8	Tear strength, MPa, minimum	21,6		20,6	20,6
9	Elongation at break, %, minimum	700	450	700	700

Packaging, handling and storage are in PE and PP bags that provide product preservation and maintain its quality as per documents approved under the appropriate procedure. Transportation by combined roofed transport in accordance with the rules of carriage valid for this mode of transport.



HDPE Compositions of PE 80B-285D is a winner of "The 100 Best Russian Products of 2007" and "The Best Products of the Republic of Tatarstan of 2007" Contests



HDPE Compositions of 293-285D Film grade is a winner of "The 100 Best Russian Products of 2003" and "The Best Products of the Republic of Tatarstan of 2003" Contests

● PE Carbon Black Masterbatches

TU 6-05-1949-83 rev. 1-5

Production method: produced from LDPE of the appropriate grades and Low Pressure Polyethylene of Low, Medium and High Density with the average concentration of carbon black of 30% or 40% and required thermostabilizers allowed by Rospotrebnadzor for articles manufacture in contact with food, drinking water and for toys production.

Application: for production of HDPE and LDPE stabilized compositions.

No.	Parameter	Standard for grades 107-30 KTU-2, 153-30 KTU-2, 158-30 KTU-2
1	Volatile weight content, %, maximum	0,2
2	Carbon black weight content, %	(30+2), (40+3)

Safety requirements, acceptance procedure, test methods, packaging, labelling, transportation and storage in accordance with GOST 16338-85. Packaging in PE bags, special soft containers etc. Transportation by combined roofed transport in accordance with the rules of carriage valid for this mode of transport.

● MDPE Compositions for Pipes and Fittings of Gas Distribution Systems

PE80B-275,
PE80B-286 Grades

TU 2243-046-00203521-2004,
rev. 1

Production method: gas-phase ethylene copolymerization at low pressure using the modified complex catalysts.

Application: compositions are intended for pipes and fittings production of gas distribution systems as well as pressure pipes and fittings for domestic potable cold water supply systems.

No.	Parameter	Standard for PE80B-275, PE80B-286
1	Density, g/cm ³ at 20 °C at 23 °C	0,945-0,953 0,943-0,951
2	Melt Flow Index at 190 °C, g/10 min.: a) at 49 N (5 kgf) load b) at 212 N (21.6 kgf) load	0,35-0,70 6,5-16,0
3	MFI spread within one batch, %, maximum	±10
4	Tensile yield strength, MPa, minimum	17
5	Elongation at break, %, minimum	700
6	Carbon black weight content, %	2,0-2,5
7	Type of carbon black distribution	I-II
8	Thermal stabilizer weight content, %, minimum	0,27
9	Thermal stability at 200 °C, min., minimum	20
10	Volatile weight content, mg/kg, maximum	350
11	Slow propagation crack resistance at 80°C, with initial wall stress 4 MPa, hrs, minimum	165
12	Odor and taste of water extracts, in points, maximum	1
13	Gas component resistance at 80°C, with initial wall stress 2 MPa, hrs, minimum	20
14	Quick propagation crack resistance at 0oC, at maximum operating pressure exceeding 0.4 MPa	
14.1	Small-scale method on pipe samples d110 mm, critical pressure pc, MPa, minimum	MOP/2,4-0,072
14.2	Full-scale method on pipe samples d160 mm, critical pressure pc, MPa, minimum	MOPx1,5

Packaging, handling and storage are in PE and PP bags that provide product preservation and maintain its quality as per documents approved under the appropriate procedure. Transportation by combined roofed transport in accordance with the rules of carriage valid for this mode of transport.



MDPE for Pipes and Fittings of Gas Distribution Networks of PE80B-275 Grade is a winner of "The 100 Best Russian Products of 2001" Contest

● Blow Molded HDPE

**PE2NT74-15, PE2NT75-15
PE2NT76-17 Grades**

TU 2243-188-00203335-2009, rev. 1

Production method: gas-phase method.

Application: for blow molded articles.

No.	Parameter	Standard		
		PE2NT74-15	PE2NT75-15	PE2NT76-17
1	Density, g/cm ³ at 23 °C at 20 °C	946-953 949-955	950-956 952-958	955-961 957-963
2	Melt Flow Index at 190 °C and 49N (5 kgf), g/10 min.	1,5-2,0	1,8-2,6	2,3-3,3
3	MFI spread within one batch, %, maximum	—	—	±10
4	Number of impurities, pcs, maximum	—	—	5
5	Ash weight content, %, maximum	—	—	0,03
6	Volatile weight content, mg/kg, maximum	—	—	0,09
7	Tensile yield strength, MPa, minimum	26	26	26
8	Tear strength, MPa, minimum	30	30	30
9	Elongation at break, %, minimum	750	750	750
10	Stress cracking resistance, hrs, minimum	30	30	30

Packaging, handling and storage are in PE and PP bags that provide product preservation and maintain its quality as per documents approved under the appropriate procedure. Transportation by combined roofed transport in accordance with the rules of carriage valid for this mode of transport.



Blow Molding HDPE of PE2NT 76-17 grade is an award winner of "The 100 Best Russian Products of 2010" Contest and "The Best Products of the Republic of Tatarstan of 2010" Contest

● HDPE-based Cable Composition

271-274K Grade

TU 2243-167-00203335-2006

Production method: gas-phase method.

Application: HDPE composition of 271-274K Grade is intended for insulating of cable sheathing, cable covering and cables.

No.	Parameter	Standard	
		superior grade	1st grade
1	Density, g/cm ³	0,950-0,955	
2	Melt Flow Index at 49 N (5 kgf) load, g/10 min.	0,30-0,65	
3	MFI spread within one batch, %, maximum	±10	±15
4	Number of impurities, pcs, maximum	10	20
5	Tensile yield strength, MPa, minimum	22,6	
6	Tear strength, MPa, minimum	21,6	
7	Elongation at break, %, minimum	700	
8	Stress cracking resistance, hrs, minimum	500	
9	Loss tangent at 106 Hz, maximum	2x10 ⁻⁴	
10	Dielectric capacitivy at 106 Hz, maximum	2,4	
11	Electric strength (sample of 1 mm thickness) at 50 Hz AC, kV/mm, minimum	35	
12	Volatile weight content, mg/kg, maximum	0,10	0,15
13	Thermal stability at 200 °C, min., minimum	20	
14	Ash weight content, %, maximum	0,050	0,075

Safety requirements, acceptance procedure, test methods, packaging, labeling, handling and storage in accordance with GOST 16338-85. Packaging in PE bags, special soft containers etc. Transportation by combined roofed transport in accordance with the rules of carriage valid for this mode of transport.

● Butene-1

TU 2411-181-00203335-2008

Production method: dimerization of ethylene

Application: Butene-1 is used in production of Medium and Low Density PE as comonomer and as a component in compositions of hydrocarbon fractions of different application, for divinyl, methylethylketone, butylene oxide, secondary butyl alcohol, acetic acid etc.

No.	Parameter	Standard
1	Volume ratio of butene-1 %, min	96,3
2	Volume ratio of isobutylene, % max	0,2
3	Volume ratio of butene-2 (cis) and butene-2 (trans),% max	1,5
4	Volume ratio of n-butane and isobutene, % max	1,5
5	Volume ratio of 1,3-butadiene and propadiene,% max	0,0015
6	Volume ratio of total acetylenic, % max	0,0001
7	Volume ratio of methane+ ethane + propane	0,2
8	Volume ratio of ethylene, % max	n/a
9	Volume ratio of propylene, % max	0,002
10	Volume ratio of hexane, % max	3,0
11	Volume ratio of total carbonyl compositions,% max	0,0005
12	Volume ratio of hydrogen ,% max	0,01
13	Volume ratio of chlorides, % max	0,0001
14	Volume ratio of carbon oxide,% max	0,002
15	Volume ratio of carbon dioxide, % max	0,003
16	Volume ratio of water, % max	0,01
17	Volume ratio of spirits, % max	0,002
18	Volume ratio of total sulphur, % max	0,0001
19	Volume ratio of oxygen, % max	0,0005

Packaging, handling and storage: Butene-1 is filled up and transported in special rail and road tank cars or in other types of tanks designed for pressure.

● PE Pressure Pipes

GOST 18599-2001, rev. 1

Production method: Produced by continuous screw extrusion.

Application: for water supply pipelines including utility and drinking water supply at temperature from 0 to 40 °C as well as for other liquid and gaseous substances.

Wall thicknesses and nominal pressure of PE80 and PE100 pipes
in millimeters

	SDR41 S20		SDR33 S16		SDR26 S15		SDR 21 S10	
	Nominal pressure, 105 Pa (bar)							
PE 80	PN 3.2		PN 4		PN 5		PN 6.3	
PE 100	PN 4		PN 5		PN 6.3		PN 8	
Nominal outside diameter	wall thickness							
	nominal	max. deviation	nominal	max. deviation	nominal	max. deviation	nominal	max. deviation
50	—	—	—	—	2,0	+0,3(0,4)	2,4	+0,4(0,5)
63	—	—	2,0	+0,3(0,4)	2,5	+0,4(0,5)	3,0	+0,4(0,5)
90	2,2	+0,4(0,5)	2,8	+0,4(0,5)	3,5	+0,5(0,6)	4,3	+0,6(0,7)
110	2,7	+0,4(0,5)	3,4	+0,5(0,6)	4,2	+0,6(0,7)	5,3	+0,7(0,8)
160	4,0	+0,5(0,6)	4,9	+0,6(0,8)	6,2	+0,8(1,0)	7,7	+0,9(1,2)
225	5,5	+0,7(0,9)	6,9	+0,8(1,1)	8,6	+1,0(1,3)	10,8	+1,2(1,7)
280	6,9	+0,8(1,1)	8,6	+1,0(1,3)	10,7	+1,2(1,7)	13,4	+1,5(2,1)
315	7,7	+0,9(1,2)	9,7	+1,1(1,5)	12,1	+1,4(1,9)	15,0	+1,6(2,3)
355	8,7	+1,0(1,4)	10,9	+1,2(1,7)	13,6	+1,5(2,1)	16,9	+1,8(2,6)
400	9,8	+1,1(1,5)	12,3	+1,4(1,9)	15,3	+1,7(2,3)	19,1	+2,1(2,9)
500	12,3	+1,4(1,9)	15,3	+1,7(2,3)	19,1	+2,1(2,9)	23,9	+2,5(3,6)
630	15,4	+1,7(2,4)	19,3	+2,1(2,9)	24,1	+2,6(3,7)	30,0	+3,1(4,5)
710	17,4	+1,9(2,7)	21,8	+2,3(3,3)	27,2	+2,9(4,1)	33,9	+3,5(5,1)
800	19,6	+2,1(3,0)	24,5	+2,6(3,7)	30,6	+3,2(4,6)	38,1	+4,0(5,8)
900	22,0	2,3(3,3)	27,6	+2,9(4,2)	34,4	+3,6(5,2)	42,9	+4,4(6,5)
1000	24,5	+2,6(3,7)	30,6	+3,2(4,6)	38,2	+4,0(5,8)	47,7	+4,9(7,2)
1200	29,4	+3,1(4,5)	36,7	+3,8(5,6)	45,9	+4,7(6,9)	57,2	+5,9(8,6)

SDR is a nominal outside pipe diameter to nominal wall thickness ratio;

S is a pipe series;

PN is a nominal pressure that corresponds to constant max. operating water pressure at 20°C.



PE Pressure Pipes of PE 100 grade for utility and drinking water supply, black, blue, black with blue stripes, group No. 1, 2, 3, 4 is a prize winner of "The 100 Best Russian Products of 2009" and "Best Products of the Republic of Tatarstan of 2009" Contests.

PE Pressure Pipes for utility and drinking water supply of black color was awarded with diploma of 1st class in "The 100 Best Russian Products of 2003" Contest, prize winner in Republican Competition "The Best Products of Russia"

PE Pressure Pipes of Medium and Heavy type for utility and drinking water supply is an award winner of "The 100 Best Russian Products of 2001", and a prize winner in "The Best Products of Russia" Republican Competition

	SDR17,6 S8,3		SDR17 S8		SDR13,6 S6,3		SDR11 S5	
	Nominal pressure, 105 Pa (bar)							
PE 80	(PN 7,5)		PN 8		PN 10		PN 12,5	
PE 100	(PN 9,5)		PN 10		PN 12,5		PN 16	
Nominal outside diameter	wall thickness							
	nominal	max. deviation	nominal	max. deviation	nominal	max. deviation	nominal	max. deviation
20	—	—	—	—	—	—	2,0*	+0,3(0,4)
32	—	—	2,0*	+0,3(0,4)	2,4	+0,4(0,5)	3,0*	+0,4(0,5)
50	2,9	+0,4(0,5)	3,0	+0,4(0,5)	3,7	+0,5(0,6)	4,6	+0,6(0,7)
63	3,6	+0,5(0,6)	3,8	+0,5(0,6)	4,7	+0,6(0,8)	5,8	+0,7(0,9)
90	5,1	+0,7(0,8)	5,4	+0,7(0,9)	6,7	+0,8(1,1)	8,2	+1,0(1,3)
110	6,3	+0,8(1,0)	6,6	+0,8(1,0)	8,1	+1,0(1,3)	10,0	+1,1(1,5)
160	9,1	+1,1(1,4)	9,5	+1,1(1,5)	11,8	+1,3(1,8)	14,6	+1,6(2,2)
225	12,8	+1,4(2,0)	13,4	+1,5(2,1)	16,6	+1,8(2,5)	20,5	+2,2(3,1)
280	15,9	+1,7(2,4)	16,6	+1,8(2,5)	20,6	+2,2(3,1)	25,4	+2,7(3,9)
315	17,9	+1,9(2,7)	18,7	+2,0(2,9)	23,2	+2,5(3,5)	28,6	+3,0(4,3)
355	20,1	+2,2(3,1)	21,1	+2,3(3,2)	26,1	+2,8(4,0)	32,2	+3,4(4,9)
400	22,7	+2,4(3,5)	23,7	+2,5(3,6)	29,4	+3,1(4,5)	36,3	+3,8(5,5)
500	28,3	+3,0(4,3)	29,7	+3,1(4,5)	36,8	+3,8(5,6)	45,4	+4,7(6,9)
630	35,7	+3,7(5,4)	37,4	+3,9(5,7)	46,3	+4,8(7,0)	57,2	+5,9(8,6)
710	40,2	+4,2(6,1)	42,1	+4,4(6,4)	52,2	+5,4(7,9)	64,5	+6,6(9,7)
800	45,3	+4,7(6,8)	47,4	+4,9(7,2)	58,8	+6,0(8,9)	72,6	+7,4(10,9)
900	51,0	+5,2(7,7)	53,3	+5,5(8,0)	66,1	+6,8(10,0)	—	—
1000	56,6	+5,8(8,5)	59,3	+6,1(+8,9)	73,5	+7,5(11,1)	—	—
1200	68,0	+6,9(10,2)	71,1	+7,3(10,7)	—	—	—	—

	SDR9 S4		SDR7,4 S3,2		SDR6 S2,5	
	Nominal pressure, 105 Pa (bar)					
PE 80	PN 16		PN 20		PN 25	
PE 100	PN 20		PN 25		—	
Nominal outside diameter	wall thickness					
	nominal	max. deviation	nominal	max. deviation	nominal	max. deviation
10	—	—	—	—	2,0*	+0,3(0,4)
20	2,3	+0,4(0,5)	3,0*	+0,4(0,5)	3,4	+0,5(0,6)
32	3,6	+0,5(0,6)	4,4	+0,6(0,7)	5,4	+0,7(0,9)
50	5,6	+0,7(0,9)	6,9	+0,8(1,1)	8,3	+1,0(1,3)
63	7,1	+0,9(1,1)	8,6	+1,0(1,3)	10,5	+1,2(1,6)
90	10,1	+1,2(1,6)	12,3	+1,4(1,9)	15,0	+1,7(2,3)
110	12,3	+1,4(1,9)	15,1	+1,7(2,3)	18,3	+2,0(2,8)
160	17,9	+1,9(2,7)	21,9	+2,3(3,3)	26,6	+2,8(4,0)
225	25,2	+2,7(3,8)	30,8	+3,2(4,7)	37,4	+3,9(5,7)
280	31,3	+3,3(4,7)	38,3	+4,0(5,8)	46,5	+4,8(7,0)
315	35,2	+3,7(5,3)	43,1	+4,5(6,5)	52,3	+5,4(7,9)
355	39,7	+4,1(6,0)	48,5	+5,0(7,3)	59,0	+6,0(8,9)
400	44,7	+4,6(6,8)	54,7	+5,6(8,3)	66,4	+6,8(10,0)
500	55,8	+5,7(8,4)	68,3	+7,0(10,3)	—	—

● PE Pressure Pipes

GOST 18599-2001, rev. 1

Outside mean diameter and ovality of PE80, PE100 Pipes
in millimeters

<i>Outside diameter</i>		<i>Ovality after extrusion, max</i>
<i>Nominal</i>	<i>Max. deviation of outside mean diameter</i>	
10	+0,3	1,2
20	+0,3	1,2
25	+0,3	1,2
32	+0,3	1,3
50	+0,4 (+0,5)	1,4
63	+0,4 (+0,6)	1,5
90	+0,6 (+0,9)	1,8
110	+0,7 (+1,0)	2,2
160	+1,0 (+1,5)	3,2
225	+1,4 (+2,1)	4,5
280	+1,7 (+2,6)	9,8
315	+1,9 (+2,9)	11,1
355	+2,2 (+3,2)	12,5
400	+2,4 (+3,6)	14,0
500	+3,0 (+4,5)	17,5
630	+3,8 (+5,7)	22,1
710	+6,4	24,9
800	+7,2	28,0
900	+8,1	31,5
1000	+9,0	35,0
1200	+10,8	42,0

Packaging, handling and storage: bundles and packages.

Pipes are transported by any mode of transport. When shipping by water transport it is recommended to use bearing means for the palletization.

Pipes shall be kept at least 1.5 m away from the heaters indoor or under the shed excluding direct sun rays' exposure. It is allowed to storage the pipes in open-air sites not longer than 12 months.

Guaranteed storage life is two years from the date of production.

● PE Fittings for Pressure Pipes

TU 2248-143-00203335-2002, rev 1, 2

Production method: Injection molding, polyethylene pressure molding, melt polyethylene reel with further mechanical processing, combination of above mentioned methods and welding, as well as different types of parts welding from pipes as per GOST 18599.

Application: water pipelines, including household water supply at temperature from 0 to 40°C, as well as for the other liquid and gaseous substances to which the polyethylene is chemically resistant.

<i>Types and sizes</i>	
<i>Part type</i>	<i>Nominal outside diameter, mm</i>
<i>Parts for butt welding:</i>	
Flange bushing	63, 110, 160, 225, 280, 315, 355, 400, 500, 630, 710, 800, 900, 1000, 1200
Flush T-pipe	63, 110, 160, 225
Reducer	110x63, 160x110, 225x160, 315x225, 400x315, 500x315, 500x400, 630x400, 630x500
Elbow (90°)	63, 110, 160, 225
Elbow (45°)	63, 110, 160, 225
Flange bushing with welded pipe run	63, 110, 160, 225, 280, 315, 355, 400, 500, 630, 710, 800, 900, 1000, 1200
Flush T-pipe with welded pipe runs	63, 110, 160, 225
Reducer with welded pipe runs	110x63, 160x110, 225x160, 315x225, 400x315, 500x315, 500x400, 630x400, 630x500
Elbow (90°) with welded pipe runs	63, 110, 160, 225
Elbow (45°) with welded pipe runs	63, 110, 160, 225
Welded elbow (30°)	90, 110, 160, 225, 280, 315, 355, 400, 500, 630, 710, 800, 900, 1000, 1200
Welded elbow (45°)	90, 110, 160, 225, 280, 315, 355, 400, 500, 630, 710, 800, 900, 1000, 1200
Welded elbow (60°)	90, 110, 160, 225, 280, 315, 355, 400, 500, 630, 710, 800, 900, 1000, 1200
Welded elbow (90°)	90, 110, 160, 225, 280, 315, 355, 400, 500, 630, 710, 800, 900, 1000, 1200
Welded T-pipe (90°)	90, 110, 160, 225, 280, 315, 355, 400, 500, 630, 710, 800, 900, 1000, 1200
Non-flush welded T-pipe	110x63, 110x90, 160x63, 160x110, 225x63, 225x90, 225x110, 280x63, 280x110, 280x160, 280x225, 315x63, 315x90, 315x110, 315x160, 315x225, 315x280, 355x63, 355x110, 355x160, 355x225, 355x280, 355x315, 400x110, 400x160, 400x225, 400x280, 400x315, 400x355, 500x110, 500x160, 500x225, 500x315, 630x315, 630x400, 630x500, 710x315, 710x400, 710x500, 710x630, 800x400, 800x500, 800x630, 800x710, 900x400, 900x500, 900x630, 900x710, 900x800, 1000x400, 1000x500, 1000x630, 1000x710, 1000x800, 1000x900, 1200x500, 1200x630, 1200x710, 1200x800, 1200x900, 1200x1000
<i>Parts for butt-steam and electric socket welding:</i>	
Flange bushing with extended tail piece	63, 110, 160, 225
Plug with extended tail piece	63, 110, 160, 225
Flush T-piece with extended tail piece	63, 110, 160
Reducer with extended tail piece	110x63, 160x110, 225x160
Elbow (90°) with extended tail piece	63, 110, 160, 225

Packaging, handling and storage: packed parts are transported by any mode of transport in accordance with the appropriate transportation regulations valid for this mode of transport.

Storage conditions should exclude any mechanical damage or deformation of the articles as well as its surface to be prevented from contamination.

It is allowed to storage on shelves without package in bundles or individually in horizontal or vertical position in height of one row and indoors all parts to be kept at least 1 m away from the heaters.

● PE Pipes for Gas Pipelines

GOST R 50838-2009

Production method: continuous screw extrusion.

Application: polyethylene pressure pipes for underground gas lines conveying natural combustible gases intended as feedstock and fuel for industrial and general public use.

Outside mean diameter and ovality

in millimeters

Nominal outside diameter d_n	Mean outside diameter		Ovality after extrusion, Accuracy degree N, no more
	$d_{em, min}$	Maximum deviation, Accuracy degree B	
16	16,0	+0,3	1,2
20	20,0	+0,3	1,2
25	25,0	+0,3	1,2
32	32,0	+0,3	1,3
40	40,0	+0,4	1,4
50	50,0	+0,4	1,4
63	63,0	+0,4	1,5
75	75,0	+0,5	1,6
90	90,0	+0,6	1,8
110	110,0	+0,7	2,2
125	125,0	+0,8	2,5
140	140,0	+0,9	2,8
160	160,0	+1,0	3,2
180	180,0	+1,1	3,6
200	200,0	+1,2	4,0
225	225,0	+1,4	4,5
250	250,0	+1,5	5,0
280	280,0	+1,7	9,8
315	315,0	+1,9	11,1
355	355,0	+2,2	12,5
400	400,0	+2,4	14,0
450	450,0	+2,7	15,6
500	500,0	+3,0	17,5
560	560,0	+3,4	19,6
630	630,0	+3,8	22,1

Note: nominal outside diameter corresponds to mean outer diameter.



PE Pipes for Gas Pipelines of PE 80 GAS

SDR11 Grade having a nominal outside diameter of 63-125 mm and 140-225 mm, Group No. 1, 2, 3 is the winner "The 100 Best Russian Products of 2001, 2002" Contest

TPE 100 HDPE Pipes for Underground Gas Pipelines, Group No. 1, 2, 3 is the winner of "The 100 Best Russian Products of 2010" and "The Best Products of the Republic of Tatarstan of 2010" Contests

Толщины стенок и их предельные отклонения
in millimeters

Nominal outside diameter, d_n	SDR 26		SDR 21		SDR 17,6		SDR 17		SDR 13,6		SDR 11		SDR 9	
	Wall thickness, e_y													
	Nominal, e_n	Max. deviation	Nominal, e_n	Max. deviation	Nominal, e_n	Max. deviation	Nominal, e_n	Max. deviation	Nominal, e_n	Max. deviation	Nominal, e_n	Max. deviation	Nominal, e_n	Max. deviation
16	—	—	—	—	—	—	—	—	—	—	2,3*	+0,4	3,0*	+0,4
20	—	—	—	—	—	—	—	—	—	—	2,3*	+0,4	3,0*	+0,4
25	—	—	—	—	—	—	—	—	—	—	2,3	+0,4	3,0*	+0,4
32	—	—	—	—	—	—	—	—	2,4	+0,4	3,0	+0,4	3,6	+0,5
40	—	—	—	—	2,3	+0,4	2,4	+0,4	3,0	+0,4	3,7	+0,5	4,5	+0,6
50	—	—	2,4*	+0,4	2,9	+0,4	3,0	+0,4	3,7	+0,5	4,6	+0,6	5,6	+0,7
63	2,5*	+0,4	3,0	+0,4	3,6	+0,5	3,8	+0,5	4,7	+0,6	5,8	+0,7	7,1	+0,8
75	2,9*	+0,4	3,6	+0,5	4,3	+0,6	4,5	+0,6	5,6	+0,7	6,8	+0,8	8,4	+1,0
90	3,5	+0,5	4,3	+0,6	5,2	+0,7	5,4	+0,7	6,7	+0,8	8,2	+1,0	10,1	+1,2
110	4,2	+0,6	5,3	+0,7	6,3	+0,8	6,6	+0,8	8,1	+1,0	10,0	+1,1	12,3	+1,4
125	4,8	+0,6	6,0	+0,7	7,1	+0,9	7,4	+0,9	9,2	+1,1	11,4	+1,3	14,0	+1,5
140	5,4	+0,7	6,7	+0,8	8,0	+0,9	8,3	+1,0	10,3	+1,2	12,7	+1,4	15,7	+1,7
160	6,2	+0,8	7,7	+0,9	9,1	+1,1	9,5	+1,1	11,8	+1,3	14,6	+1,6	17,9	+1,9
180	6,9	+0,8	8,6	+1,0	10,3	+1,2	10,7	+1,2	13,3	+1,5	16,4	+1,8	20,1	+2,2
200	7,7	+0,9	9,6	+1,1	11,4	+1,3	11,9	+1,3	14,7	+1,6	18,2	+2,0	22,4	+2,4
225	8,6	+1,0	10,8	+1,2	12,8	+1,4	13,4	+1,5	16,6	+1,8	20,5	+2,2	25,2	+2,7
250	9,6	+1,1	11,9	+1,3	14,2	+1,6	14,8	+1,6	18,4	+2,0	22,7	+2,4	27,9	+2,9
280	10,7	+1,2	13,4	+1,5	15,9	+1,7	16,6	+1,8	20,6	+2,2	25,4	+2,7	31,3	+3,3
315	12,1	+1,4	15,0	+1,6	17,9	+1,9	18,7	+2,0	23,2	+2,5	28,6	+3,0	35,2	+3,7
355	13,6	+1,5	16,9	+1,8	20,1	+2,2	21,1	+2,3	26,1	+2,8	32,2	+3,4	39,7	+4,1
400	15,3	+1,7	19,1	+2,1	22,7	+2,4	23,7	+2,5	29,4	+3,1	36,3	+3,8	44,7	+4,6
450	17,2	+1,9	21,5	+2,3	25,5	+2,7	26,7	+2,8	33,1	+3,5	40,9	+4,2	50,3	+5,2
500	19,1	+2,1	23,9	+2,5	28,3	+3,0	29,7	+3,1	36,8	+3,8	45,4	+4,7	55,8	+5,7
560	21,4	+2,3	26,7	+2,8	31,7	+3,3	33,2	+3,5	41,2	+4,3	50,8	+5,2	—	—
630	24,1	+2,6	30,0	+3,1	35,7	+3,7	37,4	+3,9	46,3	+4,8	57,2	+5,9	—	—

* Wall thickness nominal value was increased in accordance with application conditions compared to those specified in GOST ISO 4065 for this SDR.

Maximum Operating Pressure to Load Factor Ratio

Max. operating pressure MOP, MPa	Design value of C load factor for max. operating pressure (MOP)*													
	PE 80 Pipes (MRS 8 MPa)							PE 100 Pipes (MRS 10 MPa)						
	SDR 26	SDR 21	SDR 17,6	SDR 17	SDR 13,6	SDR 11	SDR 9	SDR 26	SDR 21	SDR 17,6	SDR 17	SDR 13,6	SDR 11	SDR 9
0,3	2,1	2,7	3,2	3,3	4,2	5,3	6,7	2,7	3,3	4,0	4,2	5,3	6,7	8,3
0,4	—	2,0	2,4	2,5	3,2	4,0	5,0	2,0	2,5	3,0	3,1	4,0	5,0	6,2
0,6	—	—	—	—	2,1	2,7	3,3	—	—	2,0	2,1	2,6	3,3	4,2
0,8	—	—	—	—	—	2,0	2,5	—	—	—	—	—	2,5	3,1
1,0	—	—	—	—	—	—	2,0	—	—	—	—	—	2,0	2,5
1,2	—	—	—	—	—	—	—	—	—	—	—	—	—	2,1

* Data for gas operating temperature of 20°C

Packaging, handling and storage: Pipes are produced as runs, bundles and bobbins. Pipe runs are bundled into packages weighting up to 3 tons. Upon agreement with the Customers the block-packages to be formed from the packages weighing up to 5 tons.

Carriage by any mode of transport in accordance with the goods transport regulations.

Pipes are stored under the shed or indoor where the temperature and air humidity fluctuation does not differ considerably with outdoor conditions. It is allowed to storage outdoor not longer than 3 months.

● PE Fittings for Gas Pipelines

TU 6-19-359-97, rev. 1-6
TU 2248-200-00203335-2010

Production method: jet molding and press forming, winding-on.

Application: Parts are designed for pipe joints used for underground gas pipelines conveying combustible gas as per GOST- 5542 intended as feedstock and fuel for industrial and municipal domestic use at maximum operating pressure (MOP) up to 1.2 MPa and gas operating temperature range up to 40 °C.

It is allowable to use parts for pipelines of water-supply and sewerage systems, and for industrial pipelines.

<i>Physicochemical parameters:</i>	
<i>Part type</i>	<i>Nominal outside diameter, mm</i>
Elbow 90° version A	63, 110, 160, 225
Elbow 90° version B	63, 110, 160
Non-flush T-piece	63x32, 110x63, 160x110
T-piece	63, 110, 160, 225
Reducer	110x63, 160x110, 225x160, 315x225, 400x315, 500x315, 500x400, 630x400, 630x500
Flange bushing	63, 110, 160, 225, 280, 315, 355, 400, 500, 630
Elbow (45°)	63, 110, 160, 225
Elbow (45°) with extended tail-piece	63, 110, 160, 225
Elbow (90°) with extended tail-piece	63, 110, 160, 225
Flush T-piece with extended tail-piece	63, 110, 160
Flange bushing with extended tail-piece	63, 110, 160, 225
Blind with extended tail-piece	63, 110, 160, 225
Reducer with extended tail-piece	110x63, 160x110, 225x160

Packaging, handling and storage: PE and PP special soft containers, PE and PP polymer woven bags as per normative documents approved under the appropriate procedure. Transportation by all modes of transport.

Storage: under sheds or indoor where temperature and air humidity fluctuations do not differ considerably from the fluctuations outside. Parts to be protected from the direct sun.

● PE Compositions for Cable Industry

153-02 K, 153-10 K Grade

GOST 16336-77, rev. 1, 2

Production method: compositions are produced on basis of high pressure polyethylene (low density) and low pressure (high density) with stabilizers and other additives.

Application: compositions are used for lapping, cable sheaths and serving by extrusion method.

No.	Parameter	Standard			
		153-02 K		153-10 K	
		Superior quality	First quality	Superior quality	First quality
1	Density, g/cm ³	0,9185-0,922	0,9185-0,922	Не нормируют	
2	Melt Flow Index, g/10 min	0,21-0,39	0,21-0,39	0,21-0,39	0,21-0,39
3	MFI spread within one batch, %, maximum	±8	±12	±8	±12
4	Number of impurities, pcs., maximum	3	15	n/a	
5	Volatile weight content, %, maximum	n/a		0,07	0,10
6	Ash weight content, %, maximum	n/a		n/a	
7	Cracking resistance, hr, min	500		500	
8	Tensile yield strength, MPa (kgf/cm ²), minimum	9,8 (100)		9,8 (100)	
9	Tear strength, MPa (kgf/cm ²), minimum	13,7 (140)		13,7 (140)	
10	Elongation at break, %, minimum	600		600	
11	Extractable substance weight content, % maximum	0,5	0,6	0,5	0,6

Packaging, handling and storage are in PE and PP bags that provide product preservation and maintain its quality as per documents approved under the appropriate procedure. Transportation by all modes of roofed transport in accordance with the rules of carriage valid for this mode of transport.



PE Composition for Cable Industry of 153-10 K Grade is a winner of "The 100 Best Russian Products of 2009" and "The Best Products of the Republic of Tatarstan of 2009" Contests

● LDPE

GOST 16337-77, rev. 1-3

Production method: low density polyethylene is produced by high pressure ethylene polymerization in tubular reactors and reactors with agitator using of radical initiators.

Application: for production of bags, pipes, fittings, articles designed for food contact, toys, films and film articles, shaped-molded parts etc.

No.	Parameter	Standard for the grade												
		10803-020			11503-070			15313-003			15813-020			
		S/q	1st/q	2nd/q	S/q	1st/q	2nd/q	S/q	1st/q	2nd/q	S/q	1st/q	2nd/q	
1	Density, g/cm ³	0,9185±0,0015			0,9180+0,001			0,9205±0,0015			0,9190±0,002			
2	Melt Flow Index (rating value with tolerance)	2,0±10		2,0±15		7,0±15			0,3±30			2,0±25		
3	Spread of melt flow index in one batch, %, max	±5	±8	±12	±5	±10	±12	±6	±12	±15	±6	±12	±15	
4	Number of impurities, pcs, max	2	5	15	2	5	10	2	8	30	2	8	30	
5	Tensile yield point, Pa (kgf/cm ²), min	93x10 ⁵ (95)			93x10 ⁵ (95)			98x10 ⁵ (100)			93x10 ⁵ (95)			
6	Tear strength, Pa (kgf/cm ²), min	122x10 ⁵ (125)			98x10 ⁵ (100)			137x10 ⁵ (140)			113x10 ⁵ (115)			
7	Elongation at break, %, min	550			450			600			600			
8	Cracking resistance, hr, min	2			—			500			—			
9	Mass fraction of extractable substances, %, max													
	Superior quality	0,9			1,2			0,4			0,4			
1st and 2nd qualities	1,1			1,2			0,6			0,6				
10	Film appearance testing:													
	Superior quality:	B			B			A or B			A or B			
	1st quality:	B			B			B			B			
2nd quality:	C			C			C			C				
11	Odor and taste of aqueous extracts, in points, max	1			1			1			1			

Safety requirements, acceptance procedure, testing methods, package, labeling, transportation, and storage are in accordance with GOST 16337-77. Packaging in polyethylene bags, special soft containers etc. Carriage: by all modes of transport in accordance with the transportation rules.



LDPE of 15313-003 Grade is the winner of "The 100 Best Russian Products of 2010" Republican Contest



LDPE of 11503-070 UUP Grade is the winner of "The 100 Best Russian Products of 2006, 2007" Contest and the winner of "The 100 Best Russian Products of 2006, 2007" Republican Contest



LDPE of 11503-070 Grade is the winner of "The 100 Best Russian Products of 2002" and the winner of "The 100 Best Russian Products of 2002" Republican Contest

● LDPE Compositions, Film Type

108-76, 108-225, 158-76,
158-225 Grades

TU 6-05-1525-77 rev. No. 10

Production method: manufactured on the basis of standard PE 10803-20, 15803-20, 15813-020 Grades.

Application: designed for manufacture of films for milk and dairy products.

No.	Parameter	Standard	
		108-76, 108-225	158-76, 158-225
1	Number of granulated impurities, pcs, max	10	10
2	Melt flow rate, g/10min, within the range	1,7-2,3	1,5-2,5
3	Spread of melt flow index in one batch, %, max	±12	±12
4	Tensile yield point, MPa (kgf/cm ²), min	8,8 (90)	8,8 (90)
5	Tear strength, MPa (kgf/cm ²), min	11,3 (115)	10,3 (105)
6	Elongation at break, %, min	450	500
7	Number of impurities to 1m ² of the film, pcs, maximum size from 0.5 to 1.0mm incl. over 1.0 to 2.0 mm incl.	25	25
		5	5
8	Index of friction (statistic), within the range	0,1-0,25	0,1-0,25

Packaging, handling and storage are in PE and PP bags that provide product preservation and maintain its quality as per documents approved under the appropriate procedure. Transportation by all modes of roofed transport in accordance with the rules of carriage valid for this mode of transport.

● PE Masterbatch P2KP Colorants (P2KP 001 white)

TU 6-05-1565-83 rev. 1- 3

Production method: PE Masterbatch P2KP Colorants are produced on the basis of LDPE with high content of pigments.

Application: PE Masterbatch P2KP Colorants are used for coloring LDPE in extrusion process, cable insulation and for coloring general-purpose products, including articles in contact with food and toys in manufacture process by extrusion and jet molding methods. Colors of the PE masterbatch colorants are available as follows: white, grey and black.

No.	Parameter	Standard for grades and quality types		
		For Cable Masterbatches		For Masterbatches of b, c, d applications
		Superior quality	1st quality	
1	Pigmented PE color	In conformity with sample		To be agreed with Manufacturer and Customer
2	Melt Flow Index %, g/10 min, within the range: - on the basis of standard 10703-020, 10803-020 and 15803-020 grades - on the basis of standard 11503-070 and 16803-070 grades	1-3		0,5-3
		5-8		5-8
3	Heat resistance of color, min, min - at 220°C - at 250°C	15	15	15
		3	3	n/a
4	Number of pigment agglomerates of size: a) over 0,2 to 0,5 mm, pcs, max:			
	for masterbatches of all colors, except green, dark blue, blue	2	10	20
	for green, dark blue and blue masterbatches	30	60	80
	for masterbatches of P2KP 003 white, P2KP 103 red, P2KP 203 orange, P2KP 302 yellow, P2KP 402 green, P2KP 501 dark blue, P2KP 508 blue, P2KP 703 brown, P2KP 803 grey grades.	20	40	60
b) over 0,5 mm, pcs, max	none	1	2	
5	Heat resistance of PE coloring at 100°C	withstands 1400 hrs with no color change		—
6	Light resistance of color, Hrs	withstands 96 hrs with no color change		—
7	Dielectric loss tangent at frequency of 106 Hz, max	0,0006	0,0006	—
8	Dielectric capacitativity at frequency of 106 Hz, max	2,4	2,4	—
9	Electric strength at alternating voltage of the frequency of 50 Hz, kV/mm, min	40	40	—

Packaging, handling and storage are in PE and PP bags that provide product preservation and maintain its quality as per documents approved under the appropriate procedure. Transportation by all modes of roofed transport in accordance with the rules of carriage valid for this mode of transport.

*

- b) for general-purpose products coloring
- c) for products in contact with food coloring
- d) for toys coloring.

● Low Molecular Weight LDPE

TU 2211-060-00203521-2002

Application: as component parts of compositions, used in rubber technical industry, building industry, and other fields.

No.	Parameter	Standard for grades		
		NMPE-1	NMPE-2	NMPE-3
1	Appearance	Liquid or waxen or balm-type mass in the mixture of liquid fraction from light-gray to brown colors	Balm-type or waxen mass with possible existence of liquid fraction from light-gray to brown colors	Waxen mass or slip-cast blocks of pieces of different size from light-gray to brown colors
2	Melt dynamic viscosity, Mpa x sec, within the range	4-750	20-400	320-7400
3	Mass fraction of ash content, %, max	0,1	0,1	0,1
4	Melting point, °C within the range	-5 to +105	55-90	90-105
5	Mass fraction	0,5	0,5	0,5
6	of volatiles, %, max	25-90	35-90	90-105
7	Melting temperature, °C, within the range			

Packaging, handling and storage: the product is packaged in five and four-layer paper open-mouth bags as per GOST 2226-88 of NM grade with inner PE insert or in PE bags acc. to GOST 17811-78 or in steel drums acc. to GOST 5044-79.

● LDPE Compositions for Cord Articles

158BK-15, 158 BK-20,
158-125 Grades

TU 2243-187-00203335-2009

Production method: produced on the basis of LDPE of 15803-020 (15813-020) grades.

Application: to form the sealing coatings on the items of industrial use.

No.	Parameter	Standard for grades		
		158BK-15	158BK-20	158-125
1	Number of impurities, pcs, max	50	50	50
2	Tear strength, Pa (kgf/cm ²), min	6,5 (65)	5,0 (50)	4,0 (40)
3	Elongation at break, %, min	300	250	200
4	Freezing resistance, °C, max	minus 60	minus 50	minus 40
5	Softening point, °C, within the range	105-120	100-120	100-120

Packaging, handling and storage are in PE and PP bags that provide product preservation and maintain its quality as per documents approved under the appropriate procedure. Transportation by all modes of roofed transport in accordance with the rules of carriage valid for this mode of transport.

● Electrically Conductive PE Composition

P2ES-12U Grade

TU 2243-187-00203335-2010

Production method: produced on the basis of LDPE (GOST 16337-77), modified by carbon black, rubber and calcium stearate.

Application: the composition is designed for pipes production used for pneumatic conveying of the explosive material as well as for production of sheets applied for floor and table covering indoors where static electricity charges should be avoided as per working conditions.

No.	Parameter	Standard
1	Appearance	Black granules. Its size should be 1.4 to 5.0 mm in any direction
2	Tear strength, MPa (kgf/cm ²), min	9,5 (97,0)
3	Elongation at break, %, min	145
4	Volume electric resistance, Ω cm, max	1,0x10 ³
5	Melt flow index, g/10 min, within the range	0,1-1,5
6	Carbon black content, %, min	18,5
7	Mass fraction of volatiles, %, max	0,1

Safety requirements, acceptance procedure, test methods, packaging, labeling, handling and storage are in accordance with GOST 16337-77. The products are packaged in PE bags, special soft containers etc. Transportation by any modes of transport in accordance with goods transport regulations.

● LDPE-based Cable Compositions

**153-03K, 153-05K,
153-11K, 153-12K Grades**

TU 2243-167-00203335-2006

Production method: produced in form of pellets of natural or black color on the basis of standard 15303-003, 15313-003 grades.

Application: intended for insulation, cable coverings and cable shielding by extrusion method.

No	Parameter	Standard for the grade			
		153-03K, 153-05K		153-11K, 153-12K	
		p/q	1st/q	p/q	1st/q
1	Density, g/cm ³	0,9185-0,9240		n/a	
2	Melt Flow Index at 21.17 N (2.16 kgf), g/10 minimum	0,21-0,39		0,21-0,39	
3	Spread of melt flow index within one batch, %, maximum	±8	±12	±8	±12
4	Number of impurities, pcs, maximum	3	15	n/a	
5	Tensile yield point, MPa, minimum	9,8		9,8	
6	Tear strength, MPa, minimum	13,7		13,7	
7	Elongation at break, %, minimum	600		600	
8	Cracking resistance, hr, minimum	500		500	
9	Thermostability at 200°C, minimum	15		15	
10	Dielectric loss tangent at frequency of 106 Hz, maximum	3x10 ⁴		n/a	
11	Dielectric capacitivy at frequency of 106 Hz, maximum	2,3		ditto	
12	Electric strength (1 mm sample thickness)	40		-«-	
13	at alternating voltage of frequency 50 Hz, kV/mm, minimum	n/a		0,07	0,10
	Mass fraction of volatiles, %, maximum				

Safety requirements, acceptance procedure, test methods, packaging, labeling, handling and storage in accordance with GOST 16337-77. Packaging in PE bags, special soft containers etc. Carriage: all kinds in covered transportation facilities, which comply with shipping rules, valid for this kind of transport.

● **LDPE**

11503-070 UUP Grade

TU 2211-152-00203335-2003, rev. 1

Production method: LDPE is produced by ethylene polymerization at high pressure using reactors with agitator with use of radical initiators.

Application: for packaging and production of articles designed for food contact; for toys production; for production of articles permitted for parking medicine and closure.

No.	Parameter	Standard for 11503-070 UUP grade		
		s/q	1st/q	2d/q
1	Density, g/cm ³	0,9180±0,0010	0,9180±0,0010	0,9180±0,0010
2	Melt Flow Index (rating value), %, g/10 min.	7,0±15	7,0±15	7,0±15
3	Spread of melt flow index in one batch, %, max.	±5	±10	±12
4	Number of impurities, pcs, max.	2	5	10
5	Tensile yield point, MPa (kgf/cm ²), min.	93x10 ⁵ (95)	93x10 ⁵ (95)	93x10 ⁵ (95)
6	Tear strength, MPa, min.	98x10 ⁵ (100)	98x10 ⁵ (100)	98x10 ⁵ (100)
7	Elongation at break, %, min.	450	450	450
8	Mass fraction of extractable substances, %, max.	0,8	0,8	0,8
9	Process sampling for film appearance	B	B	C

Safety requirements, acceptance procedure, test methods, packaging, labeling, handling and storage are in accordance with GOST 16337-77. The products are packaged in PE bags, special soft containers etc. Transportation by any modes of transport in accordance with transport regulations for goods.



LDPE of 11503-070 UUP Grade is a winner of "The 100 Best Russian Products of 2006, 2007" and "The Best Products of the Republic of Tatarstan of 2006, 2007" Contests.

● LDPE Composition

108-14C Grade

TU 2211-112-00203335-2007

Production method: produced from LDPE of 10803-020 grade as per GOST 16337-77, using the carbon black and sliding additive.

Application: for production of light-proof PE bags with sliding effect used for light-sensitive materials packaging (roentgen and phototechnical films).

No.	Parameter	Standard for 108-14C
1	Melt flow index, g/10 min	1,7-2,3
2	Photochemical (foggy) effect on light-sensitive layer of roentgen film	not allowed

Safety requirements, acceptance procedure, test methods, packaging, labelling, handling and storage are in accordance with GOST 16337-77. The products are packaged in PE or PP bags. Transportation by any modes of roofed transport in accordance with transport regulations for goods.

● Polymer Compositions for Rotary Molding

M 115, M 168, M 115 SV Grade

TU 2243-133-00203335-2007

Production method: the composition is produced on the basis of LDPE of 11503-070 grade.

Application: compositions are designed for rotary molding production of large-capacity tanks and plastic articles, containers for bulk handling, europallets, road fences used for traffic stream redirection when construction and road works. Its structure and properties are not worse than the imported samples of linear low and middle density polyethylene of leading foreign producers like Borealis, DOW, Samsung etc. A sanitary-and-epidemiologic resolution is available. The materials are thermally stable during processing and are resistant to atmospheric oxygen and ultra-violet rays action.

No	Parameter	Standard	
		M 115 and M 168	M 115 SV
1	Density, g/cm ³	0.928-0.932	0.928-0.935
2	Melt Flow Index with tolerance, % g/min (at the load of 2.16 kgf).	2.5±25	min. 2.5
3	Tensile yield point, MPa (kgf/cm ²), min.	11.0 (112)	10.5 (107)
4	Tear strength, MPa (kgf/cm ²), min.	12.0 (122)	
5	Elongation at break, %, min.	500	

Safety requirements, acceptance procedure, test methods, packaging, labeling, handling and storage are in accordance with GOST 16337-77. The products are packaged in PE bags, special soft containers etc. Transportation by any modes of transport in accordance with transport regulations for goods.

● Bisphenol-A (Diphenilolpropane)

TU 2423-172-00203335-2007, rev. 1, 2

Production method: Bisphenol A is obtained by condensation of phenol and acetone in presence of catalyst.

Application: It is intended for production of polycarbonates, polysulfones, epoxy resins, lacquers, adhesives and other products.

Bisphenol A is produced in following grades: ВЧ, АП, А, Б, В. Grades ВЧ, АП are intended for production of optical grade polycarbonate; Grade А is used for production of molding and extrusion polycarbonates, as well as extra grade polysulfones and epoxy resins; Grade Б is intended for production of epoxy resins and lacquers; Grade В 1 sort is intended for production of epoxy resins, lacquers, adhesives and other products; Grade В 2 sort is intended for production of epoxy resins, adhesives and other products.

<i>Physical and chemical parameters:</i>							
No.	Grade	ВЧ	АП	А	Б	В	
						1st quality	2d quality
1	Appearance	Bulk product in the form of prills	Bulk product in the form of prills	Bulk product in the form of crystals, prills or flake			
2	Freezing point, C°, min	156,7	156,6	156,5	156,4	155,0	154,0
3	Melt chromaticity by platinum-cobalt scale, max 20	20	40	40	n/a		
4	Residue weight fraction upon ignition, %, max	0,0005	0,0005	0,002	0,005	0,005	0,005
5	Weight fraction of Iron, %, max	0,00005	0,00005	0,0001	0,0005	0,0002	0,0005
6	Weight fraction of main substance, %, min	99,9	99,8	n/a			
<i>Weight fraction of impurities:</i>							
7	Weight fraction of phenol, %, max	0,002	0,005	0,02	0,05	0,06	0,25
8	Weight fraction of 2,4-isomer, %, max	0,08	0,08	n/a			
9	Weight fraction of thrisphenol, %, max	0,017	0,04	n/a			
10	Weight fraction of chroman, %, max	0,001	n/a				
11	Weight fraction of water, %, max	0,08	0,08	0,2	0,2	0,2	0,3

Packaging, handling and storage is in disposable PP soft bags with polyethylene liner, in disposable PP soft bags with protective coating (laminated etc.) without PE liner in comply with documentation, approved under the appropriate procedure, including those related to import. Bisphenol-A weight in bag is (500±2,5) kg, (750±3,75) kg or (1000±5) kg or (1000±15) kg. Bisphenol-A is delivered by railway and road truck roofed transport in accordance with transport regulations, valid for related mode of transport. Bags and containers with Bisphenol-A are stored in dry covered storage facilities away from open fire sources.



Bisphenol-A (Diphenilolpropane) is a winner of "The 100 Best Russian Products of 2008" and "The Best Products of the Republic of Tatarstan of 2008" Contests

● Commercial Acetone

GOST 2768-84, rev. 1-2

Production method: Cumene method.

Application: it is used for synthesis of acetic anhydride, acetonecyanohydrine, diphenylpropane and other organic products, as well as a solvent in different branches of industry (varnish, paints etc.).

<i>Physical and chemical parameters:</i>				
No.	Parameter	Standard		
		Premium quality	First quality	Second quality
1	Appearance	Clear colourless liquid		
2	Weight fraction of Acetone, %, min	99,75	99,5	99,0
3	Density, $\rho_{20^{\circ}\text{C}}$, g/cm ³	0,789 - 0,791	0,789 - 0,791	0,789-0,792
4	Weight fraction of water, % max	0,2	0,5	0,8
5	Weight fraction of methyl alcohol, % max	0,05	0,05	n/a
6	Weight fraction of acids in conversion to acetic acid, % max	0,001	0,002	0,003
7	Resistance to oxidation by potassium permanganate, hrs, min	4	2	0,75

Packaging, handling and storage: commercial acetone is transported in rail tank-cars with upper drain valve or multi-purpose drain device, as well as in tank trucks, in aluminum, steel and galvanized barrels, in glass bottles.

Commercial acetone should be stored in steel, aluminum or galvanized tanks or barrels and in glass bottles in accordance with storage regulations for fire hazardous substances.



Commercial Acetone is a winner of "The Best Products of the Republic of Tatarstan of 2010" Contest

● Commercial Synthetic Phenol

GOST 23519-93

Production method: Cumene method

Application: the product is used in production of caprolactam, diphenylpropane, pharmaceutical drugs, phenolformaldehyde resins, ortocresol and oil additives for selective purification of oils and for other applications.

<i>Physical and chemical parameters:</i>				
No.	Parameter	Standard		
		Grade A	Grade B	Grade C
1	Appearance	White crystal substance (it is allowed pinkish or yellowish shade for Grade C)		
2	Freezing point, °C, min	40,7	40,6	40,4
3	Weight fraction of non-volatile residues, %, max	0,001	0,008	0,01
4	Optical density of phenol aqueous solution (8.3 g of Grade A; 8.0 g of Grade B; 5.0 g of Grade C in 100 cm ³ of water) at 20 °C, max	0,03	0,03	0,03
5	Optical density of sulphurized phenol, max	0,05	n/a	
6	Phenol melt chromacity by Platinum-Cobalt Scale, Hazen units, Manufacturer, max	5	n/a	
7	Weight fraction of water, %, max	0,03	n/a	
8	Total mass fraction of organic impurities, %, max	0,01	n/a	
9	incl. mesityl oxide, %, max	0,0015	0,004	n/a
	Total alpha-methyl styrene and isopropyl benzene (cumene), %, max	n/a	0,01	n/a

Packaging, handling and storage: phenol is delivered by railway transport in tanks equipped with heating devices.

Phenol in molten and solid state is stored in pressure-tight tanks.

The casing of tanks and vessels, pipelines should be made of stainless Cr-Ni steel, galvanized carbon steel or carbon steel. Tanks and pipelines to be made of solid aluminum as well.



Commercial Synthetic Phenol is a diploma winner of the 1st class for "The Best Products of the Republic of Tatarstan of 2006" Contest and a winner of "The Best Products of the Republic of Tatarstan of 2007" Contest

● Ethyl Benzene Fraction

TU 2415-195-00203335-2010

Production method: Ethyl benzene fraction is a by-product in production of isopropylbenzene in benzene alkylation by propane-propylene fraction in presence of aluminum trichloride.

Application: Ethylbenzene fraction is used as an ingredient of motor fuels.

<i>Physical and chemical parameters:</i>		
No.	Parameter	Standard
1	Appearance	Colorless or slightly yellow liquid, free of mechanical impurities and water
2	Fractional content: a) end boiling point °C, max b) total residue and losses, %, max	155 2,0

Packaging, handling and storage: Ethyl benzene fraction is delivered in rail tank-cars in accordance with valid regulations concerning the carriage of dangerous goods by rail.

Ethyl benzene fraction is stored in accordance with requirements of GOST 1510-84 section 4 (similar to petroleum aromatic).

● Alpha-Methylstyrene Fraction

TU 6-01-10-46-81, rev. 1-3

Production method: α -methylstyrene fraction is by-product of phenol and acetone production via isopropyl benzene hydroperoxide (cumene method).

Application: used for production of commercial α -methylstyrene.

<i>Physical and chemical parameters:</i>			
No.	Grade	Standard	
		First quality	Second quality
1	Appearance	Colorless or slightly yellow liquid	Colourless or yellow liquid
2	Density at 20 °C, g/cm ³	0,907-0,910	not lower than 0,900
3	Refractive index at 20 °C	1,5360-1,5388	not lower than 1,5320
4	Mass fraction of α -methyl styrene, %, min	95,0	90
5	Mass fraction of N-propylbenzene and styrene, %, max	0,5	n/a
6	Mass fraction of butyl benzene, %, max	0,5	0,7
7	Mass fraction of phenol, %, max	0,002	0,002

Packaging, handling and storage: α -methylstyrene fraction is shipped in tank cars in bulk.

● Polyalkylbenzene Resin

TU 2415-196-00203335-2010

Production method: polyalkylbenzene resin is a by-product of isopropyl benzene production

Application: used for national economics needs and Grade A is exported.

<i>Physical and chemical parameters:</i>			
No.	Parameter	Standard	Analysis method
1	Appearance	dark liquid	визуально
2	Initial boiling point, °C, min	150	GOST 2177-99
3	Flash point in open crucible, °C, min	80	GOST 4333-87
4	Mass fraction of free water, %, min	0,2	5,3

Packaging, handling and storage: polyalkylbenzene resin is shipped in rail tank-cars. Polyalkylbenzene resin is stored in accordance with GOST 1510-84 requirements (Section 4, similar to petroleum aromatics).

● Phenol Resin – By-product of Phenol Production

TU 2424-006-00151673-01, rev. 1, 2

Production method: Phenol resin is a by-product of phenol and acetone production by cumene method and of Bisphenol-A by phenol and acetone condensation.

Application: phenol resin is used in production of phenol-formaldehyde resins and carbon black as a binding component in by-product coke production.

<i>Physical and chemical parameters:</i>		
No.	Parameter	Standard
1	Appearance	Deep brown viscous liquid
2	Flash temperature determined in closed crucible, °C, min	62,0
3	Conditional viscosity at 80 0C, conditional degrees, max	8,0
4	Free water content	stands a test
5	Mass fraction of phenol, %, max	10,0
6	Alkali mass fraction, %, max	0,7
7	Mass fraction of mechanical impurities, % max	2,5

Note:

For JSC Kazanorgsintez it is acceptable to produce a phenol resin as per item no. 3 having a standard value not exceeding 10.0 conditional degrees and as per item no. 6 having a standard value not exceeding 0.9%.

Packaging, handling and storage: delivery in tank-cars of consigner (consignee) or in rented tank-cars equipped with heating device in accordance with valid regulations concerning the carriage of dangerous goods by rail or transportation in tank-cars, equipped with multipurpose drain and heating devices or in tank trucks. Storage in accordance with GOST 1510-84 requirements.

● Aqueous Solution of Sodium Phenolate

TU 2425-170-00203335-2007, rev. 1

Production method: aqueous solution of sodium phenolate is a by-product in production of phenol and acetone resulting from purification phenolic water and hydrocarbon fraction during their treatment with sodium hydroxide.

Application: Aqueous solution of sodium phenolate is used for disinfection, disinsection, dezacarization, dezinvacion of cattle-breeding object.

<i>Physical and chemical parameters:</i>			
No.	Parameter	Description and standard	Test method
1	Appearance	Liquid from light brown to deep brown color, it is acceptable the availability of insoluble hydrocarbons layer in water	5,3
2	Mass fraction of free sodium hydroxide, %, min	5,0	5,4 or 5,5
3	Mass fraction of sodium phenolates, % min	20,0	5,4 or 5,5

Packaging, handling and storage: it is permitted to fill the sodium phenolate into consumer's package like steel welded barrels as per GOST 13950, type 1A1 with capacity of 100-216.5 dm³, steel welded barrels as per GOST 6247, type I or II with capacity of 100-275 dm³, steel welded barrels as per GOST 17336, type I, with capacity of 100, 275 dm³, polymer euro-drums which provide the product preservation and its quality when transportation and storage. It is not permitted to fill the sodium phenolate into barrels fabricated from aluminium or aluminium-containing materials. Sodium phenolate is shipped by rail or road transport, by roofed transport in packages or in bulk by rail or road tank-cars in accordance with regulations concerning the carriage of dangerous goods for the related mode of transport.

Sodium phenolate is stored in sealed packages under the shelter or indoor warehouse facilities away from open fire, as well as in steel tanks at temperatures not below +8 °C. At negative temperatures it represents a frozen solidificated substance, which when heating-up transfers newly into initial state without property change. It is not allowed to store together with oxidants, acids and alkalis.

● Hydroxychloride Aluminum

TU 2471-202-00203335-2011

Production method: hydroxychloride aluminum is a product of benzene alkylation process by olefin, produced through washing out of reaction mass from the waste catalyst complex by steam condensate or water.

Application: used as a coagulant in the process of industrial wastewater treatment and also as an agent for carbonate deposits, phosphates and gelling removal in oil-and-gas industry.

<i>Physical and chemical parameters:</i>		
<i>No.</i>	<i>Parameter</i>	<i>Standard</i>
1	Appearance	Slightly yellow or gray color liquid with green shade
2	Mass concentration of basic material converted into AlCl ₃ g/dm ³	200-420
3	Mass concentration of suspended particles, g/dm ³ , max	1,5
4	Activity index of hydrogen ions, pH, max	2,0
5	Mass concentration of organic impurities, g/dm ³ , max	0,5

Note:

Value as per item No. 5 is determined when requested by consumer.

Packaging, handling and storage: it is permitted to fill the hydroxychloride aluminum into consumer's package like steel welded barrels as per GOST 13950, type 1A1 with capacity of 100-216.5 dm³, steel welded barrels as per GOST 6247, type I or II with capacity of 100-275 dm³, steel welded barrels as per GOST 17336, type I, with capacity of 100, 275 dm³, polymer euro-drums which provide the product preservation and its quality when transportation and storage. Hydroxychloride aluminum is shipped by rail or road transport, by roofed transport in packages or in bulk by rail or road tank-cars in accordance with regulations concerning the carriage of dangerous goods for the related mode of transport.

Hydroxychloride aluminum is stored in stainless steel or alloyed steel tanks or carbon steel tanks lined with acid proof tiles. It is allowed to store in carbon steel tanks at temperature not exceeding 40 °C.

● Polycarbonates

PC-003, PC-005, PC-007 Grades

TU 2226-173-00203335-2007, rev. 1-5

Production method: polycondensation in Diphenylcarbonate and Bisphenol-A melt.

Application: for articles production by extrusion and injection molding.

No.	Parameter	Standard								
		PC-003			PC-005			PC-007		
		superior quality	1st quality	2d quality	superior quality	1st quality	2d quality	superior quality	1st quality	2d quality
1	Melt flow index, g/10 min, at 1.2 kgf, @ temperature 300 °C	2,5±1,0	2,5±1,0	2,5±1,0	5,0±1,0	5,0±1,0	5,0±1,0	6,5±1,0	6,5±1,0	6,5±1,0
2	Spread of melt flow index within one batch, %, max	All spot samples shall correspond to item no. 1	42	50	All spot samples shall correspond to item no. 1	25	30	All spot samples shall correspond to item no. 1	20	25
3	Number of visible contaminations (impurities) pcs./100 g, max	—	—	—	5	10	n/a	5	10	n/a
4	Haze, %, max	1,0	1,0	n/a	0,8	0,8	1,0	0,8	0,8	1,0
5	Transmission factor, %, min	86	86	82	89	89	85	89	89	85
6	Refraction index at 20 °C, within	—	—	—	—	—	—	—	—	—
7	Tensile stress at yield, MPa, min	60	58	55	60	58	55	60	58	55
8	Elongation at break, %, min	90	90	75	100	100	80	120	100	80
9	Bending stress at max. sample load, MPa, min	90	90	80	90	90	80	90	80	70
10	Modulus of elasticity in flexure, MPa, min	2250	2250	2000	2250	2250	2000	2250	2250	2000
11	Isode impact strength, kJ/m ² , min	66	66	60	66	66	60	75	66	60
12	Compressive stress at yield, MPa, min	74	68	68	76	70	70	76	70	70
13	Vicat softening temperature °C, min	147	147	147	147	147	147	150	147	147
14	Blue and yellowness index for PC-L	1,0-2,5 —	n/a —	n/a —	1,6-2,2 1,35-1,65	1,0-3,5 —	n/a —	1,6-2,2 1,35-1,65	1,0-3,5 —	n/a —
15	Transparency and brightness index, min	89	89	n/a	90	90	n/a	90	90	n/a
16	Dielectric capacitvity at frequency of 106 Hz, max	—	—	—	3,1	n/a	n/a	3,1	n/a	n/a
17	Dielectric loss tangent, 106 Hz, max	—	—	—	0,009	n/a	n/a	0,009	n/a	n/a
18	Electrical strength kV/mm, min	—	—	—	20	n/a	n/a	20	n/a	n/a

<i>Brand assortment of high viscosity polycarbonates</i>						
PC-003	PC-003R					
PC-005	PC-005R	PC-005L	PC-005U	PC-005UL	PC-005RL	PC-005UR
PC-007	PC-007R	PC-007L	PC-007U	PC-007UL	PC-007RL	PC-007UR

Note:

Description of additional letter symbols to base grades as follows:

U – ultraviolet stabilizer;

R – improved antistick properties;

L – increased content of blue colorant.

Norms and requirements for PC quality parameters with additives are the same as for additives-free PC.

Packaging: the Polycarbonates are packaged in bags as per GOST 17811 or in similar polymer bags as per technical documentation approved under the appropriate procedure and related to import as well. The bags neck should be sealed in. Polycarbonates are also packaged in sealed soft special containers for bulk solids as per technical documentation approved under the appropriate procedure and related to import as well. Packages should be tightly sewed. Polycarbonate weight in bag should be (25±0.25) kg, in big-bag (750±3.75) kg, (850±4.25) kg, (1000±5.0) kg.

Handling and storage: transportation by any modes of roofed transport in accordance with transport regulations valid for the related mode of transport. To be stored indoors excluding direct sun and at least 1 m away from heating devices at temperature not exceeding 35 °C.

● Polycarbonates

PC-010, PC-015, PC-022 Grades

TU 2226-173-00203335-2007, rev. 1-5

Production method: polycondensation in Diphenylcarbonate and Bisphenol-A melt.

Application: for articles production by extrusion and injection molding.

No.	Parameter	Standard								
		PC-010			PC-015			PC-022		
		superior quality	1st quality	2d quality	superior quality	1st quality	2d quality	superior quality	1st quality	2d quality
1	Melt flow index, g/10 min, at 1.2 kgf, @ temperature 300 °C	10,0±1,5	10,0±1,5	10,0±1,5	15,0±1,5	15,0±1,5	15,0±1,5	22,0±2,0	22,0±2,0	22,0±2,0
2	Spread of melt flow index within one batch, %, max	All spot samples shall correspond to item no. 1	15	20	All spot samples shall correspond to item no. 1	12	20	All spot samples shall correspond to item no. 1	10	15
3	Number of visible contaminations (impurities) pcs./100 g, max	5	10	n/a	5	10	n/a	5	10	n/a
4	Haze, %, max	0,8	0,8	1,0	0,8	0,8	1,0	0,8	0,8	1,0
5	Transmission factor, %, min	89	89	85	89	89	85	89	89	85
6	Refraction index at 20 °C, within	—	—	—	—	—	—	—	—	—
7	Tensile stress at yield, MPa, min	60	58	55	60	58	55	60	58	55
8	Elongation at break, %, min	120	100	80	100	100	80	60	60	50

No.	Parameter	Standard								
		PC-010			PC-015			PC-022		
		superior quality	1st quality	2d quality	superior quality	1st quality	2d quality	superior quality	1st quality	2d quality
9	Bending stress at max. sample load, MPa, min	90	80	70	—	—	—	—	—	—
10	Modulus of elasticity in flexure, MPa, min	2250	2250	2000	—	—	—	—	—	—
11	Isode impact strength, kJ/m ² , min	75	66	66	66	66	66	63	57	57
12	Compressive stress at yield, MPa, min	76	70	70	—	—	—	—	—	—
13	Vicat softening temperature °C, min	150	147	147	147	147	147	147	147	147
14	Blue and yellowness index for PC-L	1,6-2,2 1,35-1,65	1,0-3,5 —	n/a —	1,6-2,2 1,35-1,65	1,0-3,5 —	n/a —	1,6-2,2 1,35-1,65	1,0-3,5 —	n/a —
15	Transparency and brightness index, min	90	90	n/a	90	90	n/a	90	90	n/a
16	Dielectric capacity at frequency of 106 Hz, max	3,1	n/a	n/a	3,1	n/a	n/a	3,1	n/a	n/a
17	Dielectric loss tangent, 106 Hz, max	0,009	n/a	n/a	0,009	n/a	n/a	0,009	n/a	n/a
18	Electrical strength kV/mm, min	20	n/a	n/a	20	n/a	n/a	20	n/a	n/a

Brand assortment of high viscosity polycarbonates						
PC-010	PC-010R	PC-010L	PC-010U	PC-010UL	PC-010RL	PC-010UR
PC-015	PC-015R	PC-015L	PC-015U	PC-015UL	PC-015RL	PC-015UR
PC-022	PC-022R	PC-022L	PC-022U	PC-022UL	PC-022RL	PC-022UR

Note:

Description of additional letter symbols to base grades as follows:

U – ultraviolet stabilizer;

R – improved antistick properties;

L – increased content of blue colorant.

Norms and requirements for PC quality parameters with additives are the same as for additives-free PC.

Packaging: the Polycarbonates are packaged in bags as per GOST 17811 or in similar polymer bags as per technical documentation approved under the appropriate procedure and related to import as well. The bags neck should be sealed in. Polycarbonates are also packaged in sealed soft special containers for bulk solids as per technical documentation approved under the appropriate procedure and related to import as well. Packages should be tightly sewed. Polycarbonate weight in bag should be (25±0.25) kg, in big-bag (750±3.75) kg, (850±4.25) kg, (1000±5.0) kg.

Handling and storage: transportation by any modes of roofed transport in accordance with transport regulations valid for the related mode of transport. To be stored indoors excluding direct sun and at least 1 m away from heating devices at temperature not exceeding 35 °C.



Polycarbonate for injection molded articles of PC-010U Grade is a winner of "The 100 Best Russian Products of 2010" and "The Best Products of the Republic of Tatarstan of 2010" Contests

● Polycarbonates

PC-075 Grade

TU 2226-173-00203335-2007, rev. 1-5

Production method: polycondensation in Diphenylcarbonate and Bisphenol-A melt

Application: for production by injection molding;

PC-075, PC-075D – polycarbonates, intended for optical articles production by injection molding (incl. CD, DVD and other disks) as well as manufacture of mixed composites with other plastics;

PC-075A, PC-075DA - polycarbonates, intended for production of articles by injection molding and manufacture of mixed composites with other plastics.

<i>Physical and chemical parameters:</i>					
No.	Parameter	PC-075	Standard for PC-075 grade varieties		
			PC-075A	PC-075D	PC-075DA
1	Melt flow index, g/10 min, at 1.2 kgf, @ temperature 300 °C	10,3±0,5	10,3±2,5	7,8±0,5	7,8 ± 2,5
2	Spread of melt flow index within one batch, %, max	All spot samples shall correspond to item no. 1			
3	Number of visible contaminations (impurities) pcs./100 g, max	—	—	—	—
4	Haze, %, max	0,8	0,8	0,8	0,8
5	Transmission factor, %, min	89	89	89	89
6	Refraction index at 20 °C, within	1,584-1,586	—	1,584-1,586	—
7	Tensile stress at yield, MPa, min	60	60	60	60
8	Elongation at break, %, min	50	50	50	50
9	Bending stress at max. sample load, MPa, min	90	90	90	90
10	Modulus of elasticity in flexure, MPa, min	2250	2250	2250	2250
11	Isode impact strength, kJ/m ² , min	—	—	—	—
12	Compressive stress at yield, MPa, min	—	—	—	—
13	Vicat softening temperature °C, min	—	—	—	—
14	Blue and yellowness index for	3,5 max			
15	PC-L	91	90	91	90
16	Transparency and brightness index, min	—	—	—	—
17	Dielectric capacitivy at frequency of 106 Hz, max	—	—	—	—
18	Dielectric loss tangent, 106 Hz, max	—	—	—	—
	Electrical strength kV/mm, min				

Note:

Polycarbonate of PC-075, PC-075D Grades is recommended in production of optical disks considering restrictions for technical documentation requirements according to which the product is manufactured, availability of visible contaminations is not permitted.

Packaging: the polycarbonate recommended for production of optical disks is packaged in soft containers for bulk materials with special inner liner produced in conditions of clean room as per technical documentation approved under the appropriate procedure and related to import as well. PE liner shall be heat sealed but container shall be tightly sewed.

Polycarbonate weight in big-bag shall be (750±3.75) kg, (1000±5.0) kg.

Polycarbonates of all grades except recommended for production of optical disks are packaged in bags as per GOST 17811 or in similar polymer bags as per normative or technical documentation approved under the appropriate procedure and related to import as well. The bags' necks should be heat sealed.

Handling and storage: transportation by any modes of roofed transport in accordance with transport regulations valid for the related mode of transport.

To be stored indoors excluding direct sun and at least 1 m away from heating devices at temperature not exceeding 35 °C.

● By-product of Ethylene Carbonate

TU 2435-180-00203335-2008

Production method: it is formed in the process of ethylene carbonate production, obtained by ethylene oxide interaction with carbon dioxide at presence of potassium iodide catalyst.

Application: applied as solvent for polymers and for polyacrylonitrile, polyamide, cellulose ester, as aromatic hydrocarbon extracting agents, for fabric dyeing intensification, in production of vinylene carbonate, ethylene glycol monomethacrylate, as raw material for glycol and plasticizer synthesis, as raw material for iodine production and other purposes.

No.	Parameter	Standard
1	Appearance	Solid substance from yellow to brown color. It is permitted color and structure non-uniformity
2	Mass fraction of ethylene carbonate, %, min	65
3	Mass fraction of potassium iodide, %, min	6

Packaging, handling and storage: melted product is filled up into steel barrels as per GOST 13950, 1A1 type, with capacity of 200, 216.5 m³; in polymer containers as cubic form with rated capacity of 1000, 1200, 1250 dm³ with metal grating on pallets as per the regulatory documentation approved under the appropriate procedure.

It is transported as carload shipment through railway service or by road transport in accordance with regulations concerning the carriage of dangerous goods.

It is stored in hermetically closed containers, in covered ventilated storehouses at least 2 m away from heating devices.

● Propylene

GOST 25043-87, rev. 1

Production method: propylene is produced by pyrolysis of hydrocarbon feedstock.

Application: propylene is used in production of polypropylene, nitrile of acrylic acid, isopropyl and butyl alcohols, isopropyl benzene, propylene oxide, glycerin and other organic products. The propylene of superior quality is meant for production of polypropylene.

<i>Physical and chemical parameters:</i>			
No.	Parameter	Standard	
		superior quality	1st quality
1	Volume content of propylene,%, min	99,8	99,0
2	Volume content of ethylene,%, max	0,005	0.01
3	Volume content of acetylene and methyl acetylene,%, max	0,001	0,005
4	Volume content of C4 hydrocarbons,%, max	0,002	0,05
5	Volume content of diene hydrocarbons (propadiene and butadiene),%, max	0,001	0,015
6	Volume content of ethane and propane,%, max	0,2	0,7
7	Mass concentration of sulfur, mg/m ³ , max	1	3
8	Mass fraction of water, % max		
	a) in product supplied by pipeline b) in product supplied in tank cars and cylinders	0,0005 0,02	n/a ditto
9	Content of free water	none	

Notes:

Standard for item No. 3 in the Table for propylene of superior quality intended for polypropylene production shall be not higher than 0.0005%.

Packaging, handling and storage: liquefied propylene is transported through pipeline and by special railway and road tank cars of consigner(consignee), designed for pressure.

Liquefied propylene is stored in high-pressure horizontal or spherical vessels.

● Waste Diesel Oil

TU 0258-199-00203335-2010, rev. 1

Production method: waste diesel oil is obtained when diesel oil is used as cooling or flushing cracked gas agent in the ethylene production.

Application: Waste diesel oil is shipped to petroleum storage depot and to export.

<i>Physical and chemical parameters:</i>					
No.	Parameter	Standard for grades			
		A	Б	В	Г
1	Density at (20±1) °C, g/sm ³ , max	0,9			
2	Flash point determined in closed cap, °C, min	30	25	15	5
3	Mass fraction of water, %, max	1,0	3,0	3,0	3,0
4	Mass fraction of mechanical impurities, %, max	1,0			

Packaging, handling and storage: waste diesel oil is shipped in tank cars equipped with upper drain or multipurpose drain device.

Waste diesel oil should be stored in metal tanks.

● Butylene-Butadiene Fraction

TU 2411-169-00203335-2007, rev. 1

Production method: butylene-butadiene fraction (BBF) is a by-product of ethylene production facilities.

Application: BBF is used as feed stock for synthetic rubber production.

<i>Physical and chemical parameters:</i>					
No.	Parameter	Standard for grades			
		A grade	Б grade	В grade	Г grade
1	Mass fraction of C ₄ hydrocarbons, %, min	98	98	95	85
2	Mass fraction of butadiene is 1.3, %, min	40	30	20	20
3	Mass fraction of C ₃ hydrocarbons, %, max	0,7		total	
4	Mass fraction of C ₅ hydrocarbons and higher, %, max	0,5	1,5	5,0	15

Packaging, handling and storage: butylene-butadiene fraction is shipped in special rail tank-cars designed for pressure.

BBF should be stored in high-pressure metal horizontal or spherical vessels.

● Pyrolysis Heavy Resin

TU 2451-190-00203335-2009

Production method: it is obtained as by-product in process of hydrocarbon gas pyrolysis.

Application: it is applied for production of technical carbon, coak, dark polmeric petroleum resin, as fuel oil component.

<i>Physical and chemical parameters:</i>			
No.	Parameter	Standard for grades	
		A grade	Б grade
1	Appearance	Liquid from brown to black color	
2	Mass fraction of water, %, max	20	30
3	Density at 20°C, g/cm ³	0,850-1,000	

Packaging, handling and storage:

Resin is shipped in private or rented railway tank cars of consigner (consignee), 15-1443 and 15-1547 types according to Appendix No. 1 to transport regulations for goods by tank-wagons in bulk and in hopper-type wagons for petroleum bitumen transportation by railway.

Resin is shipped in tank trucks in accordance with Transport regulations for dangerous goods and Guidance for hazardous cargo transportation by road.

Resin is stored according to GOST 1510-84 requirements. Storage temperature for product is from minus 50 °C to plus 40 °C.

● Pyrolysis Liquid Products Petroleum Resin of Type E

TU 2451-179-00203335-2008, rev. 1, 2

Production method: is obtained as by-product in process of hydrocarbon gas pyrolysis on ethylene production plants.

Application: it is applied as a feedstock for production of motor fuel, solvents and aromatic hydrocarbons.

No.	Parameter	Standard for grades							
		E-1	E-3	E-5	E-8	E-9	E-10	E-11	E-12
1	Appearance	Liquid from light-yellow to brown color, free of mechanical impurities			Liquid from light-yellow to brown color (greenish shade is permitted), free of mechanical impurities				
2	Density at 20°C, g/cm ³ , min	0,800	0,800	0,750	0,810	0,800	0,850	0,750	0,820
3	Fractional content:								
	3.1 initial boiling point, °C, min	35	35	35	72	35	50	30	35
	3.2 volume ratio of fraction, stripped up to 185 °C, %, min	—	—	—	—	85	90	70	75
	3.3 end boiling point, °C, max	270	270	230	170	220	220	220	270
4	Mass fraction of aromatic hydrocarbons (C ₆ -C ₈), %, min	45	55	60	85	55	70	50	50
5	Mass fraction of benzene, %, min	20	23	30	50	40	34	30	23
6	Mass fraction of water, %, max	1,0	1,0	1,0	1,0	1,0	1,0	1,0	1,0

No.	Parameter	Standard for grades					
		E-13	E-14	E-15	E-16	E-17	E-18
1	Appearance	Liquid from light-yellow to brown color (greenish shade is permitted), free of mechanical impurities			Liquid from light-yellow to brown color, free of mechanical impurities	Liquid from transparent to yellow color	Liquid from yellow to dark-brown color
2	Density at 20°C, g/cm ³ , min	0,800	0,810	0,700	0,800	0,800	0,800
3	Fractional content:						
	3.1 initial boiling point, °C, min	35	72	30	31	35	25
	3.2 volume ratio of fraction, stripped up to 185 °C, %, min	80	n/a	n/a	—	—	—
	3.3 end boiling point, °C, max	215	220	220	270	220	320
4	Mass fraction of aromatic hydrocarbons (C ₆ -C ₈), %, min	45	85 C ₇ -C ₉	—	40	—	—
5	Mass fraction of benzene, %, min	8	—	—	20	—	—
6	Mass fraction of water, %, max	1,0	1,0	1,0	1,0	1,0	3,0

Packaging, handling and storage:

Petroleum resin is shipped in private or rented railway tank cars of consigner (consignee), 15-1443 and 15-1547 types, according to Appendix No. 1 to transport regulations for goods by tank-wagons in bulk and in hopper-type wagons for petroleum bitumen transportation by railway.

Petroleum resin is shipped in tank trucks in accordance with Transport regulations for dangerous goods and Guidance for hazardous cargo transportation by road.

Petroleum resin is stored according to GOST 1510-84 requirements. Storage temperature for product is from minus 50 °C to plus 40 °C.

● Woven Polymer Bags for Bulk Materials

TU 2297-134-00203335-2001, rev. 1-4

Production method: sewing from polymer hose fabric.

Application: intended for packaging, handling and storage of bulk materials at temperatures from -40 °C to +90 °C.

1.1 Main parameters and properties

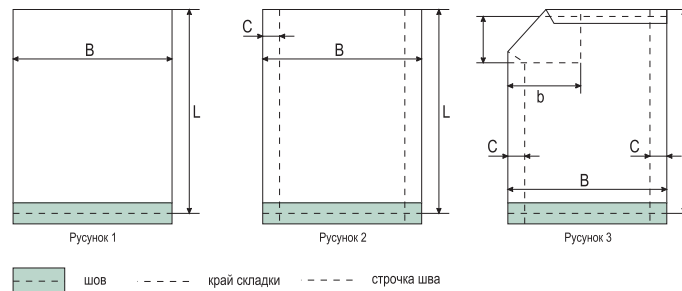
1.1.1 Bags depending on design can be produced of three types:

1. with open neck without side folds (Fig. 1);
2. with open neck and side folds (Fig. 2);
3. with flap (Fig. 3).

1.1.2 The bags can be of following types depending on the cloth used:

- A. bags of sleeve non-laminated cloth; B. bags of sleeve laminated cloth;
- B. bags of sleeve non-laminated cloth with film liner.

1.1.3 Bags are produced for maximum load weight of 25 and 50 kg, when bag volume is 95%.



Bag type	Length, cm	Width, cm	Flap dimensions, cm		Width of side fold, cm
	L	B	l	b	C
1	105±2	56±1	—	—	—
	90±1	75±2	—	—	—
	95±2	56±1	—	—	—
2	100±2	37±1	—	—	—
3	92±2	40±1	13,0±0,5	21,0±0,5	6,5±0,5
	85±2	37±1	13,0±0,5	18,0±0,5	6,5±0,5
	77±2	42±1	14,0±0,5	18,0±0,5	7,0±0,5

Bag name	Bag type	Number of threads, 10 cm		Breaking load of cloth band 50x200, N (kgf), min				Breaking load of bottom seam, N (kgf), min			
		haircloth	weft	Bags with maximum load weight				Bags with maximum load weight			
				50 kg		25 kg		50 kg		25 kg	
				haircloth	weft	haircloth	weft	50 kg	25 kg		
Woven polymer bags	1,2,3	40 ₋₁	40 ₋₁	700 (71)	700 (71)	600 (61)	600 (61)	294 (30)	270 (28)		

Note:

1. For bag production it is allowed to use cloth with other threads number per 10 cm if the strength characteristics are correspond to actual specifications.

2. Parameter plus tolerance "threads number per 10 cm" is not limited.

3. It is allowed for MPP bags of all A and B types with maximum load weight of 50 kg the cloth band's breaking load with 50x200 mm per haircloth and weft N (kgf), not less than 650 (66).

Note: other bag sizes production is allowed as upon with customer.

Packaging, handling and storage: bags of one type, kind and size are piled up to 1000 pieces with the order of 50 pieces and they are packaged under pressure into a stack. The stacks are covered up with polypropylene cloth or other packaging material and are bound with polypropylene band as per TU 2245-028-05766623. Other types of binder materials are allowed to use which provide quality, durability, integrity of the package and preservation of the product. Edges of the packaging cloth are strain-sewed so that the stitch (distance between adjacent needle punctures) is not more than 50 mm.

Bags transportation and storage are as per GOST 7000.

The guaranteed storage life of the bags is 12 months from date of production.

● Disposable Soft Polypropylene Containers for Bulk Materials

TU 2297-135-00203335-2001, rev. 1

Basic dimensions of containers should meet requirements shown in Table:

dimensions are shown in centimeters

Container legend	Width of hose fiber, A	Maximum load height, H max	Cord length, E	Diameter in load condition, D (reference)	Bottom size, LxB
МКР-ВСІ(2)-G ППР	180+3	200	45+5	115	90 _{±3} x 90 _{±3}
	180±3	200	45+5	115	90 _{±3} x 90 _{±3}
	120±2	140	45+5	76	60 _{±2} x 60 _{±2}
МКР-ВЛ4-G ППР	180+3	200	25±5	115	90 _{±3} x 90 _{±3}
	120+2	140	25±5	76	60 _{±2} x 60 _{±2}

Containers should meet requirements shown in the Table in terms of physical and mechanical parameters:

Container maximum capacity, m	Breaking load, N min		
	Container cloth		Bottom seam
	haircloth	weft	
1,0	1900	1400	900
0,7	1900	1400	900
0,5	1200	900	600

Cloth with breaking load, N, not less than 400 in any direction is used for gaiter and nozzle production.

Application: containers are meant for transportation by all modes of transport, freight operation and temporary storage of bulk products, including cold bulk food products. Containers for industrial use are designed for application at ambient temperature from minus 20 °C to plus 60 °C.

There are two types of containers:

C1(2) – single-link and dual-link containers;

Л4 – four-link containers.

Packaging, handling and storage: containers of the same type and size are packed under pressure into stacks up to 50 pieces. Stacks are sewed with polymer fabric. Before sewing stacks, packed in a cloth, are bound with polypropylene band as per TU 2245-028-05766623 or analogues bandaging material.

Containers are shipped by all modes of transport in accordance with the Goods Carriage Regulations.

Containers should be stored in covered storehouse facilities, protected against direct sun and atmospheric precipitations, at a distance of minimum 1 m from heating devices.

● Butyl Cellosolve, Commercial (Ethylene Glycol Monobutyl Ether)

TU 6-01-646-84, rev. 4

Production method: Oxyethylation of N-butanol.

Application: Industrial butyl cellosolve is used for butyl carbitol; as a solvent for resins, lacquers and paints; for metal separation, as a hydraulic liquid and for organic synthesis.

<i>Physicochemical parameters:</i>			
No.	Parameter	Standard	
		superior quality	first quality
1	Chromaticity, P/Co Scale, Hazen units, max	10	30
2	Density p204, g/cm ³	0,898-0,904	0,898-0,904
3	Mass fraction of butyl cellosolve, %, min	99,0	96,5
4	Water mass fraction, %, max	0,20	0,25
5	Mass fraction of acids (in conversion to acetic acid), %, max	0,005	0,005
6	Saponification number, mg of KOH per 1 g of butyl cellosolve, max	1,0	1,5
7	Compatibility with distilled water, at 20 °C	unlimited	unlimited
8	Index of refraction, within the range	1,416-1,422	1,416-1,422

Packaging, handling and storage: industrial butyl cellosolve is transported in special cylindrical tank vessels made of stainless steel, 12x18H1T grade, 15-1404 type, and in aluminum tank vessels of 15-1596 type.

Commercial Butyl Cellosolve is transported in barrels as carload in covered railroad tank cars by road truck and water transport as well as in railroad and road tank cars in compliance with the rules of cargo carriage.

Commercial Butyl Cellosolve is stored in tanks outdoors in compliance with requirements for storehouses for flammable and toxic substances.

The guaranteed storage life is 6 months from the date of production.



Commercial Butyl Cellosolve is a winner of "The 100 Best Russian Products of 2008" and "The Best Products of the Republic of Tatarstan of 2008" Contests

● Diproxamine 157

TU 6-14-614-76, rev. 6

Production method: based on interaction of ethylenediamine with propylene oxide, and further on with ethylene oxide and subsequent propylene oxidation of obtained polymer.

Application: Diproxamine 157 is used as an active base of demulsifying agents and inhibitors of paraffin depositions for petroleum industry, and as an additive for turbine oils.

<i>Physicochemical parameters:</i>		
<i>No.</i>	<i>Parameter</i>	<i>Standard</i>
1	Appearance	Transparent viscous liquid from yellow to brown color
2	Mass fraction of nitrogen, %, within the range	0,50 - 0,55
3	pH value of aqueous emulsion with mass fraction of diproxamine of 157. 5%, max	12
4	Mass fraction of ash, %, max	0,5

Packaging, handling and storage: Diproxamine 157 is transported in barrels in roofed railroad trucks and by road truck transport, in railroad and road tank cars in compliance with transport regulations for goods.

Diproxamine 157-100% should be stored in closed containers at storehouse facilities of semi-indoor type.

The guaranteed storage life is 12 months from the date of production.

● Diproxamine 157-65M

TU 2483-194-00203335-2010

Production method: based on interaction of ethylenediamine with propylene oxide and further with ethylene oxide and subsequent hydroxypropylation of the obtained polymer.

Application: Diproxamine 157-65M is used as an oil-refining industry demulsifying agent in petroleum and oil-refining industry.

<i>Physicochemical parameters:</i>		
<i>No.</i>	<i>Parameter</i>	<i>Standard</i>
1	Appearance	transparent homogeneous liquid, free of foreign inclusions
2	Mass fraction of base substance, %, within the range	63-67
3	Cloud point temperature of aqueous solution with mass fraction of 1%, °C, within the range	28-35
4	Mass fraction of nitrogen, %, in the range	0,31-0,38
5	Kinematic viscosity at 20 °C, mm ² /s, max	40
6	Solidification point °C, max	minus 45

Packaging, handling and storage: Diproxamine 157-65M is transported in barrels in covered vehicles as well as in bulk by rail and road tank cars.

Diproxamine 157-65M should be stored in closed containers at storehouse facilities of semi-closed type.

The guaranteed storage life for Diproxamine 157-65M is 1 year from the production date.

● Monoethanolamine

TU 2423-159-00203335-2004

Production method: interaction of ammonia or its water solution with ethylene oxide.

Application: it is used in gas and petroleum industry for absorption of acid gases and sulfur-containing organic compositions, monoethanolamine of the superior and the first quality is applied in pharmaceuticals, textile and varnish -and - lacquer industry as well as in plastics production process.

<i>Physicochemical parameters:</i>					
No.	Parameter	Standard			
		Superior quality	First quality	Second quality	Third quality
1	Mass fraction of monoethanolamine, %, min	98,8	98,0	95,0	78,0
2	Mass fraction of diethanolamine, %, max	0,6	1,0	2,0	7,0
3	Mass fraction of water, %, max	0,6	1,0	3,0	unlimited
4	Chromaticity, Hazen units, max	50	—	—	—
5	Density at 20 °C, g/cm ³	1,015-1,018	1,015-1,018	1,015-1,025	1,015-1,050

Packaging handling and storage: monoethanolamine is filled up into steel barrels. To be transported in roofed rail tank cars and roofed transport by road trucks as well as in private or rented rail or road tank cars.

Monoethanolamine is stored in hermetically sealed barrels under shelter or in storage facilities indoors away from heating devices as well as in outdoor storage tanks with inert-gas blanket at temperature from minus 40 °C to plus 50 °C.

It is not allowed a combined storage with caustic or aggressive products especially together with nitric acid or in presence of chlorine.

The monoethanolamine guaranteed storage life for superior and first qualities is one year, for second and third qualities is three years from the production date.



Commercial Monoethanolamine is a winner of "The Best Products of the Republic of Tatarstan of 2007" Contest

● Diethanolamine, Pure

TU 2423-178-00203335-2007, rev. 2

Production method: by rectification of commercial triethanolamine.

Application: it is used in organic synthesis process (for example, for absorption of acid gases and sulphurous compositions), as a reagent in analytical chemistry, in production of emulsifiers, detergents and cosmetic preparations.

<i>Physicochemical parameters:</i>		
No.	Parameter	Standard
1	Appearance	Heavy viscous transparent liquid or crystals from colorless to yellow color
2	Mass fraction of ethanolamines (in conversion to diethanolamine), %, min	98
3	n_D^{20} refractive index, within the range	1,4760-1,4790
4	Appearance of diethanolamine water solution with volume ratio of 50% (solubility in water)	Clear solution, insignificant opalescence is permitted
5	Crystallization point, °C, min	25,7

Packaging, handling and storage: diethanolamine pure is filled up in steel barrels of type I and II as per GOST 6247, type 1A1 and other containers ensuring its chemical resistance. Diethanolamine pure to be stored in hermetically sealed containers.

Diethanolamine is shipped in roofed transport by rail and road transport.

● Diethanolamine

TU 2483-151-00203335-2003, rev. 3

Production method: rectification of commercial triethylamine.

Application: diethanolamine is applied in organic synthesis process (for example, for absorption of acid gases and sulphurous composition), as an agent in analytical chemistry, in production of emulsifier, detergents and cosmetic preparations.

<i>Physicochemical parameters:</i>			
No.	Parameter	Standard	
		A grade	B grade
1	Appearance	Transparent viscous liquid or crystals, from light-yellow to light-brown color, opalescence is permitted	
2	Mass fraction of diethanolamine, %, min	98,0	55,0
3	Mass fraction of triethanolamine, %, max	1,0	40,0
4	Mass fraction of monoethanolamine, %, max	1,0	5,0
5	Mass fraction of water, %, max	0,3	1,0

Packaging, handling and storage: Diethanolamine is filled up into steel as per GOST 6274, types 1 and 2, with capacity of 200 dm³, into steel barrels as per GOST 13950, 1A1 type, with capacity of 200, 216.5 dm³.

It is permitted to fill diethanolamine into steel barrels of other capacities and into other tanks ensuring chemical resistance to packaged product, which provide product quality and its preservation. Barrels are filled with the product no more than 90% of its capacity.

A range of allowed negative deviations for net weight content from the rated value are listed in GOST 8.579.

It is transported in roofed road vehicles by rail or road transport.

● Triethanolamine

TU 2423-168-00203335-2007, rev. 1, 2

Production method: Grades A and B are achieved by ammonia oxiethylation ,Grade “ Clarified” is achieved by purified monoethanolamine oxiethylation.

Application: Industrial triethanolamine is the component of caoutchouc softeners, coolants,perfumery and cosmetics. Triethanolamine and highest fatty acids salts are used as detergents, emulsifying and wetting agents and lubricating substance. Triethanolamine is used also as absorbent of acid gases, corrosion inhibitor, accessory material in cement production, and as a feed stock for a number of organic synthesis in farmaceutical industry.

<i>Physicochemical parameters:</i>				
No.	Parameter	Standard for grades		
		“Clarified”	A grade	B grade
1	Appearance	Viscous transparent liquid	Transparent liquid, opalescence is permitted. From yellow to dark-brown color, greenish shade is allowable	
2	Chromaticity, Hazen units, max	50	—	—
3	Mass fraction of triethanolamine, % min	90,0	90,0	85,0
4	Mass fraction of diethanolamine, % max	n/a	9,0	13,0
5	Mass fraction of monoethanolamine, % max	n/a	1,0	2,0
6	Mass fraction of water, % max	1,0	0,5	1,0
7	Density at 20 °C, within the range, in g/cm ³	1,095-1,135	1,095-1,124	1,095-1,135

Packaging, handling and storage: commercial triethanolamine is filled up into steel barrels.

It is transported by as carload in roofed rail tank cars and both in private rail tank cars equipped with heating and rented, 15-898, 15-1603 type.

Commercial triethanolamine is stored in hermetically sealed barrels under the shelter or indoor storage facilities at least 2 meters away from heating devices, as well as outdoor storage tanks with inert-gas blanket at temperature from minus 40 °C to plus 80 °C.

Combined storage with caustic or aggressive products especially together with nitric acid or in presence of chlorine is not allowed.

The guaranteed storage life is 3 years from the date of production.

● Carbanox SKD-10

TU 6-13-121-98

Production method: interaction of oleic acid with ethylene oxide.

Application: intended for use from 3 to 5% water emulsions as antistatic, lubricating and finishing agent for chemical, natural and mixed fibers and as softener in flax- fibres production also as dispersing agent or emulsification agent for different dispersing media and as degreaser in detergents.

<i>Physicochemical parameters:</i>			
No.	Parameter	Standard	
		A	B
1	Appearance	Viscous oily liquid, brown	
2	Saponification number, mg of KOH/g, within the range	65-85	65-85
3	Acid number, mg of KOH/g, max	1,0	1,0
4	Mass fraction of water, %, max	1,5	10,0

Packaging, handling and storage: Carbonox SKD-10 is packaged in steel or aluminum barrels.

As agreed upon with customer the product can be packed in other types of container ensuring the product's preservation.

SKD-10 is stored in closed containers at indoor warehouse or sheltered to exclude exposure of direct sun.

● Oleox-5

TU 6-14-314-85, rev. 3, 4

Production method: by oxiethylation of oleic acid.

Application: Oleox-5 is used as an emulsifier, dispersing agent, antistatic agent and as a component of avivage, washing and cleaning agents in textile industry.

<i>Physicochemical parameters:</i>		
No.	Parameter	Standard
1	Appearance	Transparent liquid of yellowish-brown color free of mechanical impurities
2	Oleox-5 chromaticity by Iodine scale, mg of J2/100cm ³ , max	40
3	Saponification number, mg of KOH per 1g of Oleox-5, within the range	108-120
4	Iodine number, g of J/100g of oleox-5, within the range	50-70
5	pH value of aqueous emulsion with mass fraction of 5%, max	9,5
6	Oleox-5 blending in 5% number with petrolatum oil or industrial oil	Emulsion shall not break down and precipitate within one hour

Packaging, transportation and storage: Oleox-5 is filled up in steel barrels of 1A1,1A2 type as per GOST 13950-91 or in other barrels in compliance with normative documents, approved under the appropriate procedure and ensuring product quality and its preservation when shipping and storage.

The Oleox-5 labeled as «Oleoxes» to be shipped by carload via rail service or road transport.

The Oleox-5 to be stored in hermetically sealed steel containers of the manufacturer (consumer) in an indoor storage facilities.

It is allowed to store oleox-5 in storage facilities of semi-indoor type or sheltered to exclude direct sun exposure and atmospheric precipitations.

● Oleox-7

TU 6-14-286-78, rev. 4, 5

Production method: oxiethylation of oleic acid

Application: oleox-7 is used as an emulsifier, dispersing and antistatic agent and as a component of avivage, washing and cleaning agents in textile industry.

<i>Physicochemical parameters:</i>		
<i>No.</i>	<i>Parameter</i>	<i>Standard</i>
1	Appearance	Transparent liquid from light-yellow to fawn-coloured, free of mechanical impurities
2	Saponification number, mg of potassium hydroxide per 1g of Oleox-7, within the range	95-105
3	Iodine number, g of iodine per 100 g of Oleox-7, within the range	43-52
4	Hydrogen ion concentration (pH) of aqueous emulsion with mass fraction of 5%, max	8,5

Packaging, handling and storage: Oleox-7 is filled up in welded steel barrels, 1A, 1A2 type, as per GOST13950-91, or in other types of barrels as per normative documents, approved under the appropriate procedure and ensuring product quality and its preservation when shipping and storage.

The Oleox-7 labeled as «Oleoxes» to be shipped by carload via rail service or road transport.

It is stored in closed containers in the indoor warehouses.

● Oxanol CS-100

TU 6-36-1029-90

Production method: by oxiethylation of primary alcohols with C16-C20 fractions obtained by alumoorganic synthesis.

Application: the Oxanol CS-100 is used for enzyme production in pelletized form.

<i>Physicochemical parameters:</i>		
<i>No.</i>	<i>Parameter</i>	<i>Standard</i>
1	Appearance	solid white scales
2	Appearance of aqueous solution with preparation mass fraction of 10%	transparent, almost colorless solution, free of mechanical impurities
3	Chromaticity at 70°C (iodine scale), not higher	3
4	Hydrogen ions activity index (pH) of aqueous solution with mass fraction of 1%, within the range	6,0 - 8,0
5	Kinematic viscosity at 70°C, mm ² /s, within the range	190-230
6	Crystallization temperature, °C, within the range	48-52

Packaging, handling and storage: the Oxanol CS-100 is packed in double bags: outer is paper-made, inner is polyethylene-made, in steel barrels with PE lining bag, in non-returnable PE containers.

The product is stored in manufacturer's package at the indoor storage facilities.

● Textile-Auxiliary Substances. OS-20 Preparation

TU 2483-201-00203335-2010

Production method: interaction of higher synthetic fatty alcohols with ethylene oxide.

Application: Grade A is used in chemical industry as surface-active substance, Grade B is used in textile industry as antistatic agent and as leveling agent in the dyeing process.

<i>Physicochemical parameters:</i>		
<i>No.</i>	<i>Parameter</i>	<i>Standard</i>
1	Appearance at room temperature	waxy scales, from white to yellow color
2	Melt chromaticity by Iodine scale, mg of J ₂ /100 cm ³ solution, max	6
3	Appearance of aqueous solution with preparation mass fraction of 10%	transparent colorless or yellowish liquid, free of mechanical impurities. Opalescence is permitted
4	Optical density of aqueous solution with OS-20 mass fraction of 10%	0,4
5	pH value of aqueous solution with preparation mass fraction of 10%	8,0-10,5
6	Mass fraction of iron, %, max	0,003
7	Emulsifying ability	to pass the tests as per item no. 4.1
8	Cloud point of OS-20 preparation solution with preparation mass fraction of 1 % in sodium chloride solution with mass fraction of base substance of 5%, °C	86-96

Notes:

pH value is permitted to drop up to 6 during the storage period.

Packaging, handling and storage: OS-20 of A grade is packed in three-, four-layer paper bags, a polyethylene liner bag is inserted inside prior to packaging; OS-20 preparation of B grade is packed in steel barrels with double polyethylene liner bag and in heated rail tank cars as well.

OS-20 preparation is stored in manufacturer's package or in closed container in covered storagehouse.

● Polyethylene Glycol-4

TU 6-13-115-97

Production method: interaction of ethylene oxide with ethylene glycol.

Application: Polyethylene Glycol-4 is used as solvent for die flushing in the production process of polyester fibers.

<i>Physicochemical parameters:</i>		
<i>No.</i>	<i>Parameter</i>	<i>Standard</i>
1	Appearance at 20°C	colorless or slightly yellowish liquid, free of mechanical impurities
2	Hydroxyl number, mg of KOH/g, within the range	500-550
3	Mass fraction of water, %, max	1,0
4	Chromaticity by Iodine scale, mg of J ₂ /100 cm ³ , max	5,0
5	Mass fraction of iron, %, max	0,001

Notes:

Manufacturer and customer confirm about the necessity of "Mass fraction of iron" parameter determination when concluding a contract.

Packaging, handling and storage: polyethyleneglycole (PEG-4) is packed in steel barrels or steel tanks. It is stored in closed containers in an indoor storage facilities or under the shelter.

● Polyethylene Glycol-9

TU 2483-192-002303335-2009

Production method: interaction of ethylene oxide with ethylene glycol.

Application: PEG-9 is used in production of plasticizers and pharmaceutical preparations.

<i>Physicochemical parameters:</i>		
<i>No.</i>	<i>Parameter</i>	<i>Standard</i>
1	Appearance at (20±2)°C	liquid from slightly yellow to yellow color with faint characteristic odor
2	Hydroxyl number, mg of KOH per 1 g of PEG-9, within the range	260-290
3	Mass fraction of water, %, max	0,7
4	Chromaticity by Iodine scale, mg of J ₂ /100 cm ³ , max	3

Packaging, handling and storage: PEG-9 is packed into the steel barrels of A1 type as per GOST 13950-91 or in tank cars.

Other package types are also permitted as agreed upon with consumer.

● Polyethylene Glycol-13

TU 2483-191-002303335-2009

Production method: interaction of ethylene oxide with ethylene glycol.

Application: PEG-13 is used as a component part of epamine 06 preparation.

<i>Physicochemical parameters:</i>		
No.	Parameter	Standard
1	Appearance at (20 ± 2)° C	vaseline-like paste of light-yellow color
2	Melt appearance at (40 ± 1)°C	transparent solution of light-yellow color
3	Melt chromaticity by iodine scale at (40 ± 1)°C. 1 mg of J ₂ per 100 cm ³ , max	4
4	Hydrogen ion activity pH-value of aqueous solution with mass fraction of 1%, within the range	7-9
5	Hydroxyl number, mg of KOH per 1 g of polyethylene glycol-13, within the range	176-190
6	Mass fraction of water, %, max	0,3

Packaging, handling and storage: PEG-13 is packed in steel welded barrels of IA1, IA2 type as per GOST 13950-91 or in tank cars.

As agreed upon with consumer the other types of packaging are permitted as well.

● Polyethylene Glycol-35, Purified

TU 6-14-719-82, rev. 4

Production method: interaction of ethylene oxide with ethylene glycol.

Application: PEG-35 is applied as modifier in the production of viscoses and high-strength fiber for cord.

<i>Physicochemical parameters:</i>		
No.	Parameter	Standard
1	Appearance	transparent liquid free of mechanical impurities
2	Chromaticity in Hazen units, max	35
3	Mass fraction of water, %, within the range	35-40
4	Permanganate number, sec, minimum	2500
5	Acid or alkali neutralization number, mg of potassium hydroxide (KOH) per 1 g of PEG-35, max	0,1
6	Hydroxyl number, mg of potassium hydroxide KOH per 1 g of PEG-35, within the range	72-78

Packaging, handling and storage: PEG-35 is filled into steel barrels as per GOST13950-91, IA1, IA2 type.

The PEG-35 is stored in closed containers in covered or semi-closed storage facilities.

● Polyethylene Glycol-68

TU 2483-164-00203335-2005

Production method: interaction of ethylene oxide with polyethyleneglycol-9 in presence of catalyst.

Application: Polyethylene Glycol-68 is applied in the production of chemical fibres as a modifier for production of high-strength viscose cord.

<i>Physicochemical parameters:</i>		
<i>No.</i>	<i>Parameter</i>	<i>Standard</i>
1	Appearance	transparent liquid free of mechanical impurities
2	Chromaticity, Hazen units, max	40
3	Mass fraction of water, %, within the range	35-40
4	Permanganate number, sec, minimum	1000
5	Acid or alkali neutralization number, mg of KOH per 1 g of PEG-68, max	0,1
6	Hydroxyl number, mg of KOH per 1 g of PEG-68, within the range	34-40

Packaging, handling and storage: PEG-68 is filled into the steel welded barrels, rail and road tank cars.

The PEG-68 is stored in closed containers in covered storage facilities.

● Demulsifying Reagent of Reapon-4B Grade

TU 2226-005-10488057-94, rev. 1-5

Production method: alcoholate polymerization of propylene oxide with propylene glycol (or ethylene glycol) with subsequent final copolymerization with ethylene oxide.

Application: the product is intended for oilfield treating.

<i>Physicochemical parameters:</i>		
<i>No.</i>	<i>Parameter</i>	<i>Standard</i>
1	Appearance	transparent liquid free of mechanical impurities, from light yellow to light brown color
2	Mass fraction of solid residue, %	50-60
3	Clearing point, °C, within the range	45-65
4	Kinematic viscosity at 25°C, cSt (mm ² /s)	25-40
5	Solidifying point, °C, max	минус 50

Packaging, handling and storage: the demulsifying reagent Reapon-4B is shipped in rail tank-cars. The product to be stored in hermetically sealed containers. The guaranteed storage life is 1.5 (one and a half) year from the date of production.

● Synthanol ALM-10

TU 2483-203-00203335-2011

Production method: oxiethylation of primary higher alcohols with C₁₂ - C₁₄ fractions.

Application: Synthanol ALM-10 is used as a penetrating agent, emulsifying agent for degreasing of raw wool and metallic surfaces as well as an effective surface active agent in the production of detergents.

<i>Physicochemical parameters:</i>		
No.	Parameter	Standard
1	Appearance at (20 ± 5)°C	the dough from white to light-yellow color
2	Chromaticity of melt (Iodine scale) mg of J ₂ /100 cm ³	6
3	Hydrogen ion activity pH-value of Synthanol ALM-10 aqueous solution with 10% substance mass fraction, within the range	6,0-9,0
4	Cloud point temperature of preparation water solution with mass fraction of base substance of 1%, °C, within the range	84-92
5	Mass fraction of polyethylene glycols, %, max	4,0
6	Mass fraction of substances extracted by hexane, %, max	8,5

Packaging, handling and storage: Synthanol ALM-10 is packed in steel barrels of 100-200 dm³ capacity, heated steel tank cars. It is permitted to package the product in other types of containers, as agreed upon with customer. The Synthanol ALM-10 is stored in closed containers at warehouse facilities.

● Stearox-6

GOST 8980-75, rev. 3

Production method: interaction of stearic acid with ethylene oxide.

Application: Stearox-6 is used to impart soft tracery for semi-woolen, viscose and cotton fabrics, as a finishing agent in the production of chemical fibers, as an emulsifier in oil agent composition when man-made fibers weaving.

<i>Физико-химические показатели</i>			
No.	Parameter	Standard	
		superior quality	first quality
1	Appearance at (20 ± 2)° C	vaseline-like mass, cream color	syropy or pasty mass, yellow or light-brown color
2	Melted product appearance	viscous mass of light-brown color, free of mechanical Impurities	viscous mass of light-brown color, free of mechanical impurities
3	Water dispersion stability with mass fraction of 1%	to pass testing as per item no. 3.5	
4	Saponification number, mg of KOH per 1 g of Stearox-6	80-88	80-88
5	Mass fraction of ash, %, max	0,5	0,5
6	Mass fraction of iron, %, max	0,003	0,005
7	Water dispersion pH with mass fraction of 1%	7,0 - 9,0	7,0-9,0
8	Mass fraction of moisture, %, max	0,30	0,50

Packaging, handling and storage: Stearox-6 is packed into steel drums, steel barrels, steel barrels with double polyethylene liner bag, or other containers as agreed upon with customer (e. g. heated rail tank-cars). The Stearox-6 to be stored in covered warehouse facilities at temperature from 0 to 30°C.

● Ethylene Glycol

GOST 19710-83, rev. 3

Production method: by hydration of ethylene oxide.

Application: it is used in the production of synthetic fibers, resins, solvents, low-freezing and hydraulic fluids, and for other purposes.

<i>Physicochemical parameters:</i>			
No.	Parameter	Standard	
		superior quality	first quality
1	Mass fraction of ethylene glycol, %, min	99,8	98,5
2	Mass fraction of diethylene glycol, %, max	0,05	1,0
3	Color, Hazen units, max:		
	- in ordinary state	5	20
	- after boiling with hydrochloric acid	20	n/a
4	Mass fraction of residue after calcination, % max	0,001	0,002
5	Mass fraction of iron, %, max	0,00001	0,0005
6	Mass fraction of water, %, max	0,1	0,5
7	Mass fraction of acids in conversion to acetic acid, %, max	0,0006	0,005
8	Refractive index at 20°C	1,431-1,432	1,430-1,432
9	Transmission in ultra-violet spectral region, %, min, at wave-lengths, nm:	220	n/a
		275	n/a
		350	n/a
			n/a

Packaging, handling and storage: Ethylene glycol is filled into aluminum or rust-resistant steel barrels. As agreed upon with customer it is permitted to fill the ethylene glycol into steel ungalvanized barrels.

Barrels with ethylene glycol are shipped in roofed vehicles by all modes of transport as well as in bulk in rail tank vessels made of aluminum or rust-resistant steel. Upon agreement with the consumer it is transported in special rail tank cars with upper drain devices and carbon steel rail tank vessels.

Ethylene glycol is stored in sealed tanks made of aluminum, rust-resistant steel or aluminized steel.

Ethylene glycol is stored in barrels in covered unheated storage facilities.

It is not allowed to store the superior quality product in carbon steel barrels.

Barrels with ethylene glycol should be stored vertically. Barrels stack height should not be over than 3 tiers.

The guaranteed storage life of the superior quality ethylene glycol is one year; first quality is three years from the date of production.

● Diethylene Glycol

GOST 10136-77, rev. 5

Production method: by hydrolyzation of ethylene oxide.

Application: it is intended for organic synthesis industry, as an extractant of aromatic hydrocarbons, for natural gas drying and in some other branches of industry.

<i>Physicochemical parameters:</i>			
No.	Parameter	<i>Standard for diethyleneglycol grade</i>	
		<i>A grade OKP 24 2213 0100</i>	<i>B grade OKP 24 2213 0200</i>
1	Density at 20°C, g/cm ³	1,116-1,117	
2	Chromaticity, Hazen units, max	10	20
3	Mass fraction of organic impurities, %, max Including ethylene glycol, %, max	0,4	1,8
		0,15	1,0
4	Mass fraction of diethyleneglycol, %, min	99,5	98,0
5	Mass fraction of water, %, max	0,05	0,2
6	Mass fraction of acids, in conversion to acetic acid, %, max	0,005	0,01
7	Saponification number, mg of KOH per 1g of the product, max	0,1	0,3
8	Temperature limits of distillation at 101.3 kPa (760 mm, mercury column):		
	start of distillation, CO, min	244	241
	end of distillation, CO, max	249	250

Packaging, handling and storage: Diethylene glycol is filled into aluminum barrels with the capacity of 110 and 275 dm³ or into corrosion-resistant steel barrels. Upon agreement with the customer the diethylene glycol is filled into steel containers having the capacity of 100 to 275 dm³.

Diethylene glycol is stored in aluminum leak-proof vessels, corrosion-resistant steel or aluminized steel.

Barrels with Diethylene glycol are transported in closed vehicles by sea, road and rail transports as well as in rail and road tank-cars in accordance with shipping rules.

The guaranteed storage life is 1 year from the date of production.

● Triethylene Glycol, Commercial

TU 6-01-5-88, rev. 2

Production method: interaction is carried out by means of ethylene oxide iuration.

Application: the commercial triethylene glycol of A grade is used as a feedstock for production of oligoetheracrylates, polyetheracrylates and plasticizers as well as other organic synthesis products.

The commercial triethylene glycol, A grade, is also used for gas and air dewatering in the production of low-freezing liquids, oligoetheracrylates.

<i>Physicochemical parameters:</i>			
<i>No.</i>	<i>Parameter</i>	<i>Standard</i>	
		<i>A grade OKP 24 2214 0130</i>	<i>B grade OKP 24 2214 0140</i>
1	Appearance	clear liquid, free of mechanical impurities	
2	Mass fraction of triethylene glycol, %, max	98	90
3	Total mono-, di- and triethylene glycol mass fractions, % max Including monoethylene glycol	2 0,1	10 0,8
4	Mass fraction of water, %, max	0,1	0,3
5	Color, Hazen units, max	20	—
6	After boiling with hydrochloric acid	180	—
7	Density at 20°C, within the range of g/cm ³	1,123-1,124	1,121 min
8	Mass fraction of aldehyde on conversion to acetaldehyde, % max	0,01	—
9	Mass fraction of acids on conversion to acetic acid, % max	0,002	—
10	Mass fraction of peroxidates on conversion to iodine, % max	0,005	—

Packaging, handling and storage: the commercial triethylene glycol is filled into aluminum and steel barrels.

Triethylene glycol grade B is allowed to be filled into galvanized barrels.

The commercial triethylene glycol is shipped in bulk by special aluminum or rust-resistant steel rail tank vessels with upper drain device or as agreed upon with customer in carbon steel rail tank vessels.

● Tret-butyl Perbenzoate

TU 6-05-1997-85, rev. 5

Production method: interaction of sodium salt of tertiary butyl hydro peroxide with benzoyl chloride.

Application: it is used as a process initiator in the production of LDPE, polystyrene plastics and insulating varnish manufacture.

<i>Physicochemical parameters:</i>		
<i>No.</i>	<i>Parameter</i>	<i>Standard</i>
1	Appearance	transparent, yellowish liquid free of mechanical impurities
2	Chromaticity by Iodine Scale, 1 mg of J2 per 100 cm ³ , max	3
3	Density at 20°C, g/cm ³	1,042 ±0,005
4	Refractive index, n_D^{20}	1,4920-1,5020
5	Mass fraction of base substance, %, min	98,5
6	Mass fraction of active oxygen, % min	8,12
7	Mass fraction of tertiary butyl hydroperoxide, %, max	0,1
8	Mass fraction of ditertiary butyl peroxide, %,max	0,10
9	Mass fraction of iron, %, max	0,0003
10	Mass fraction of chlorides, %, max	0,010

Packaging, handling and storage: Tret-butyl perbenzoate is packed into polyethylene bottles with the capacity of 25 dm³, and polyethylene canisters with the capacity of 30 dm³.

Each bottle is placed into polyethylene liner bag, and then into steel drum with the capacity of 30 dm³.

Tret-butyl perbenzoate is transported as wagonload by rail service or road transport. It is stored at warehouse in cells and pallets. The height of stacked pallets is not greater than 3 lines.

● Synthanol ES-3

TU 38-5901268-90, rev. 1

Production method: Oxiethylation of primary superior alcohols of C₁₂-C₁₄ fractions.

Application: it is used as efficient emulsifying agent in composition of lubricant-cooling liquids.

<i>Physicochemical parameters:</i>		
<i>No.</i>	<i>Parameter</i>	<i>Standard</i>
1	Appearance	transparent or muddy liquid, from light-yellow to yellow color
2	pH value of aqueous solution with mass fraction of 10%, min	7,0
3	Mass fraction of water, %, max	0,5
4	Hydroxyl number, mg of KOH per 1 t of Synthanol ES-3,	162-182
	within the range	

Packaging, handling and storage: the Synthanol ES-3 is filled into welded steel barrels as per GOST13950-91, type 1A1, or other types which ensure quality and preservation of the product during transportation and storage as per standard documents approved under the appropriate procedure.

Packed Synthanol ES-3 labeled as «Synthanol» is transported by carload shipment via rail service or road transport.

It is also filled up in bulk in consignor (consignee) special tanks in accordance with Regulations for oil-bitumen carriage by rail transport filled in tank cars or hopper-type cars.

Synthanol ES-3 is stored in sealed steel vessels of the manufacturer or consumer. The product in barrels is stored in storage house facilities or under the shelter to prevent direct sun.

The guaranteed storage life is 1 year from the date of production.

● Proxanol 305, 50%

TU 2458-155-00203335-2004

Production method: interaction of ethylene glycol first with propylene oxide and then with ethylene oxide with alkaline catalyst.

Application: 50 % Proxanol 305 is used as an effective and universal demulsifying agent of oil emulsions, in textile industry - as a low-foaming penetrating agents in peroxide stoving and dyeing process, in artificial fibre industry – as a reducing die fouling agent, in processes of spinning of dyed in a bulk viscose silk, and as modifiers for high-strength viscose cord production.

<i>Physicochemical parameters:</i>		
<i>No.</i>	<i>Parameter</i>	<i>Standard</i>
1	Appearance at 20° C	Transparent or muddy liquid of yellow color free of mechanical impurities
2	Mass fraction of active material, %	50±2
3	Congelation temperature, ° C, not higher than	Minus 45
4	Temperature limits of solution blooming with concentration of 100 g/l in aqueous solution of NaCl with concentration of 50 g/l, °C	50 - 60

Packing, handling and storage: Proxanol 305 50% is filled into steel welded barrels, rail or truck tanks. It is stored in closed containers in half-closed storage rooms, or in the steel tanks preventing precipitation and dust ingress.

The Guarantee period of storage is 6 months.

● Proxamine 385, 50%

TU 2458-154-00203335-2004

Production method: interaction of propylene oxide with ethylenediamine with subsequent oxiethylation.

Application: Proxamine 385 50 % is used as an effective and universal demulsifying agent of oil emulsions, in textile industry - as a low-foaming penetrating agent in peroxide stoving and dyeing processes, in artificial fibre industry – as reducing die fouling agent, in processes of spinning of dyed in a bulk viscose silk, and as modifiers in high-strength viscose cord production.

<i>Physicochemical parameters:</i>		
<i>No.</i>	<i>Parameter</i>	<i>Standard</i>
1	Appearance at 20° C	Transparent or muddy liquid of yellow color
2	Mass fraction of active substance	50±2
3	Congelation temperature, ° C, not higher than	Minus 45
4	Temperature limits of solution blooming with concentration of 100 g/l in aqueous solution of NaCl with concentration of 50 g/l, °C	50 - 60

Packaging, handling and storage: 50% Proxamine 385 is filled into steel welded barrels, rail or truck tanks. It is stored in closed containers in half-closed storage rooms, or in the steel tanks.

● Proxamine 385

TU 6-36-00203335-95-94, rev. 4

Production method: interaction of propylene oxide with ethylenediamine with subsequent oxiethylation.

Application: Proxamine 385 is used as additive for galvanic coatings in production of tin-plates, as a modifier for chemical fibres production, as well as a demulsifying agent in petroleum production.

<i>Physicochemical parameters:</i>		
<i>No.</i>	<i>Parameter</i>	<i>Standard</i>
1	Appearance at 30° C	Dough, from cream to light brown color
2	Hydrogen ions activity index (pH) of a preparation aqueous solution with mass fraction of base substance of 5%, max	12
3	Mass fraction of nitrogen, %, within the range	0,35 - 0,43

Packaging, handling and storage: Proxamine 385 is transported in steel or aluminum barrels with the capacity of 100 - 275 cubic dm, in metal barrels with polyethylene coating, as well as in rail tanks with aluminum, stainless or carbon steel barrels.

● Cosintol-247

TU 2483-145-00203335-2003

Production method: oxiethylation of primary higher alcohols $C_{12} - C_{14}$.

Application: Cosintol is used as an effective nonionic surface-active substance in production of detergents and others household chemical goods.

<i>Physicochemical parameters:</i>		
<i>No.</i>	<i>Parameter</i>	<i>Standard</i>
1	Appearance at (20±5)°C	Viscous liquid or dense mass, from white to yellowish color, free of foreign inclusions
2	Hydrogen ions activity index (pH) of cosintol aqueous solution with mass fraction of base substance of 5 %, within the range	6 - 8
3	Cloud point temperature of cosintol water solution with mass fraction of 1%, °C, within the range	40 - 46
4	Mass fraction of polyethylene glycols, %, max	3
5	Mass fraction of ethylene oxide, %, max	0,001

Packaging, handling and storage: Cosintol is filled into steel welded containers according to GOST 13950-91 type I, II with capacity of 100, 200 cubic dm, or according to GOST 6247-79 type I and II with capacity of 200, 275 cubic dm. Packed cosintol under transporting name Synthanol is transported by wagonload in through railway service, or by motor transport according to the rules. It is also transported by filling up into special tanks with heating devices. Cosintol should be stored in closed storehouse. It is permitted to be stored in semi-closed storehouses not longer than for 1 month provided that there's no any ingress of direct sun and atmospheric precipitates.

The guaranteed storage life is 1 year after the date of production.

● Cosintol-248

TU 2483-147-00203335-2003

Production method: oxiethylation of primary higher alcohols C12 – C14 fractions

Application: Cosintol is used as an effective nonionic surface-active substance in production of detergents and others household chemical goods.

<i>Physicochemical parameters:</i>		
<i>No.</i>	<i>Parameter</i>	<i>Standard</i>
1	Appearance at (20±5)°C	Viscous liquid or dense mass, from white yellowish color, free of foreign inclusions
2	Melt colority, Hazen units, max	50
3	Cloud point temperature of water solution of the product with mass fraction of 1%, °C, within the range	55 - 70
4	Mass fraction of polyethylene glycols, %, not more than	3
5	Mass fraction of moisture, %, max	0,2
6	Acid number mg of KOH/g, max	0,2
7	Ash mass fraction, %, max	0,4

Packaging, handling and storage: Cosintol is filled up into the steel welded containers according to GOST 13950-91 type I and II with capacity of 100, 200 cubic dm, or according to GOST 6247-79 type I and II with capacity of 200, 275 cubic dm. Packed cosintol under transporting name "Synthanols" is transported by wagonload in through railway service, or by motor transport according to the rules. It is also transported by filling up into special tanks with heating devices. Cosintol should be stored in a closed storehouse. It is permitted to be stored in semi-closed storehouses not longer than for 1 month provided that there's no any ingress of direct sunlight and atmospheric precipitates.

The guaranteed storage life is 1 year after the date of production.

● Cosintol 242 (Syntanol-2)

TU 2483-189-00203335-2009

Production method: it is a mixture of polyoxyethylated esters of higher fatty alcohols C_{12} - C_{14} fractions.

Application: It is used as an effective nonionic surface-active substance in production of synthetic detergents and others household chemical goods.

<i>Physicochemical parameters:</i>		
<i>No.</i>	<i>Parameter</i>	<i>Standard</i>
1	Appearance at (45±5) °C	Clear colorless or yellowish liquid
2	Density at 700C, g/cm ³ , within the range	0,863-0,872
3	Chromaticity (iodine scale), mg of J ₂ /100 cm ³ , max	1
4	Hydrogen ions activity index (pH) of Cosintol hydrogen solution with mass fraction of base substance of 1 %, within the range	7-11
5	Mass fraction of polyethylene glycols, %, max	0,5
6	Mass fraction of water, %, max	0,2
7	Hydroxyl number, mg of KOH/g, within the range	196-209

Packing, handling and storage: Cosintol is filled up into IAI type steel welded barrels with capacity of 200-230 cubic dm or with capacity of 200, 275 cubic dm or other containers (drums, etc.) according to normative documentation by established procedure. It is transported by wagonload in through railway service, or by motor transport according to Dangerous goods transportation regulations. Cosintol should be stored in closed storehouse.

● Synthanox 1720-9

TU 6-14-293-79

Production method: Reaction of interaction between ethylene oxide and synthetic fatty acids C_{17} - C_{20} .

Application: It is used as emulsifier for wiredrawing emulsions.

<i>Physicochemical parameters:</i>		
<i>No.</i>	<i>Parameter</i>	<i>Standard</i>
1	Appearance	Dark-brown wax-like substance
2	Saponification number, mg of potassium hydroxyde per 1 g of Synthanox 1720-9, within the range	74-80

Packing handling and storage: It is packed into steel barrels with capacity of 200 cubic dm with double polyethylene liner. It is bulk transported in rail tank cars in accordance with Sipping Rules of Railways Ministry. Synthanox 1720-9 filled in barrels is transported by all types of transport in covered transportation vehicles in accordance with goods transportation regulations.

● Gaseous Oxygen, Commercial

GOST 5583-78, rev. 4

Production method: Gaseous technical and medical oxygen is obtained from atmospheric air by low-temperature rectification.

Application: Technical gaseous oxygen is used for gas-flame treatment of metals and other technical purposes.

<i>Physicochemical parameters:</i>			
No.	Parameter	<i>Standard per grades</i>	
		<i>Commercial oxygen</i>	
		<i>1 quality</i>	<i>2 quality</i>
1	Oxygen volume fraction, %, min	99,7	99,5
2	Water steam volume fraction, %, max	0,007	0,009
3	Carbon dioxide volume fraction, %, max	n/a	n/a
4	Carbon oxide content	n/a	n/a
5	Gaseous acids and bases content	ditto	ditto
6	Ozone and other oxidizing gases content	–«–	–«–
7	Odor	n/a	n/a

Packaging, labelling, handling and storage of gaseous technical oxygen are carried out in accordance with GOST 26460-85. Oxygen rated pressure at 20 0C when balloons filled, storied and transported should be $(14,7 \pm 0,5)$ MPa (150 ± 5 kgf/cm²). Transport labelling is carried out in accordance to GOST 14192-96 with application of manipulation sign "Keep out of sun rays", danger signs per GOST 19433-88. It is transported by all kinds of transportation in accordance with hazardous cargo tracking rules. It is stored in special warehouses or in open storage areas under the shed.

● Liquid Oxygen, Commercial

GOST 6331-78, rev. 3

Production method: it is produced from atmospheric air by low temperature rectification.

Application: Liquid commercial oxygen is used after its gasification for gas-flame treatment of metals and for other technical purposes.

<i>Physicochemical parameters:</i>			
No.	Parameter	<i>Standard for grades</i>	
		<i>Commercial oxygen</i>	
		<i>1st quality OKP 21 1411 0330</i>	<i>2d quality OKP 21 1411 0340</i>
1	Oxygen volume fraction, %, min.	99,7	99,5
2	Acetylene content	none	
3	Carbon dioxide volume in 1 dm ³ of liquid oxygen, cm ³ , at 20°C and 101,3 kPa (760 mm Hg column), max.	2,0	3,0
4	Oil content	none	
5	Carbon oxide content	n/a	
6	Gaseous acids and bases content	n/a	
7	Ozone and other oxidizing gases content	n/a	
8	Moisture and solid impurities content	Should pass testing per item 3.9	
9	Odor	n/a	

Packaging, handling and storage are carried out per GOST 26460-85. Liquid commercial oxygen is filled into special transport tanks and vessels intended for storage and transportation of cryogenic products.

Liquid commercial oxygen is transported by all types of transport in accordance with hazardous cargo tracking rules acting on this kind of transport and Regulations for Arrangement and Safe Operation of Pressure Vessels, approved by Rostekhnadzor. Liquid oxygen is transported in special tank wagon by railroad transport and in truck mounted gas distribution stations AGU-2M type and in transport tanks for liquid oxygen TRGHK-3 by automobile transport.



Higher-Purity Liquid Nitrogen is an award winner (1st class diploma) of "The Best Products of the Republic of Tatarstan of 2007" Contest.

● Liquid Nitrogen

GOST 9293-74, rev. 1-3

Production method: it is produced from atmospheric air by low temperature rectification.

Application: Liquid nitrogen is used as a refrigerant and (after gasification) for making inert atmosphere when manufactured, stored and transported of lightly oxidable products, at high temperature metal working processes that do not interact with nitrogen, for conservation the closed metal vessels and pipelines as well as for other purposes.

<i>Physicochemical parameters:</i>					
No.	Parameter	Standard for liquid nitrogen grades			
		Special purity		Higher purity	
		1 quality	2 quality	1 quality	2 quality
1	Nitrogen volume fraction, %, min.	99,999	99,996	99,99	99,95
2	Oxygen volume fraction, %, max.	0,0005	0,001	0,001	0,05
3	Water steam volume fraction in gaseous nitrogen, %, max.	0,0007	0,0007	0,0015	0,004
4	Oil content in gaseous nitrogen	n/a		Pass testing as per item 3.7	
5	Oil, solid impurities and moisture content in liquid nitrogen	Pass testing as per item 3.8			
6	Hydrogen volume fraction, %, max.	0,0002	0,001	n/a	
7	Volume fraction of sum of carbonaceous composition in conversion to CH ₄ , %, max.	0,0003	0,001	ditto	

Packaging, labeling, handling and storage: Liquid nitrogen is poured into transport tanks as per GOST 26460-85 designed for storage and transportation of cryogenic products, into special transport tanks and transport gasification facilities.

● Argon, Gaseous and Liquid

GOST 10157-79, rev. 1-3

Production method: it is made of atmospheric air by means of low temperature rectification.

Application: Designed for use as protection media during welding, cutting and fusing of active and rare metals and their alloys, aluminum, aluminum and magnesium alloys, stainless chromium-nickel heat-resistant alloys and different grades of steel alloy, as well as for metals refining in metallurgy.

<i>Physicochemical parameters:</i>			
No.	Parameter	Standard	
		Superior quality	1st quality
1	Argon volume fraction, %, min.	99,993	99,987
2	Oxygen volume fraction, %, max.	0,0007	0,002
3	Nitrogen volume fraction, %, max.	0,005	0,01
4	Volume fraction of water steam, %, max, that corresponds to temperature of argon saturation with water steam at 101,3 kPa (760 mm Hg column), °C, not higher	0,0009	0,001
		minus 61	minus 58
5	Volume fraction of sum of carbonaceous composition in conversion to CO ₂ , %, max.	0,0005	0,001

Packaging, labeling, transportation and storage: performed as per GOST 26460-85.

Nominal argon pressure at 20 °C during filling, storage, and transportation of cylinders should be (14.7±0.5) MPa or (150±5) kgf/cm². Returnable cylinders should have residual argon pressure not lower than 0.05 MPa.

Liquid argon is transported by automobile transport in truck mounted gas distribution stations AGU-2M type and in transport tanks as per GOST 17518-79.



Gaseous Argon is a winner of "The 100 Best Russian Products of 2009" and "The Best Products of the Republic of Tatarstan of 2009" Contests



● Contact information

Domestic Market Department	(843) 533-99-78
Bisphenol – A Polycarbonate	(843) 533-94-83
Phenol, Acetone, Oxygen, nitrogen, argon	(843) 533-94-79
Organic products (ethanolamines, ethylene glycols, synthanol, dedusters, etc.)	(843)533-94-80 (843) 533-94-81
Low Density Polyethylene	(843) 533-94-77 (843) 533-94-78
High Density Polyethylene	(843) 533-94-98 (843) 533-94-82
Polyethylene pipes and fittings	(843) 533-94-75 (843) 533-94-73 (843) 533-94-54
Fax for applications	(843) 533-97-94
Foreign Trade Department	+7(843) 533-99-76 +7(843) 533-95-77 +7(843) 533-94-26 +7(843)533-93-09
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