POLYETHYLENE

HIGH DENSITY POLYETHYLENE

Produced under License Agreement with Stavrolen Technology Inc.

HDPE 273-79	pipe grade(black)
PE2NT76-17	blow molding grade
HDPE 273-83	pipe grade (P63, natural)
HDPE 293-285D	film grade
PE80-285D	pipe grade (PE80, natural)
PE2NT22-12	injection grade

MAIN QUALITY SPECIFICATIONS

	273-79	PE2NT76-17	273-83	293-285D	PE80-285D	PE2NT22-12
Density, g/sm3	0.957-0.964		0.95-0.955	0.943-0949	0.940-0943	0.958-0965 0.960-0966
20˚C	- -	0.957-0.966		-	-	-
23˚C		0.955-0.963		-	-	-
Melt flow index (g/10min at 190 Co, 5 kg)	0.3-0.5	2,3-3,3	0.4-0.65	0.5-0.7	0.5-0.8	-
Melt flow index at 190 Co and 2,16kk loas, g/10 min	-	-	-	-	-	6-9
MFI range within one lot, %, not more than	-	-	-	-	-	+/- 15
Number of inclusions, not more	-	-	-	-	-	10
MFI 21, 6/MFI2, 16 Ratio	-	-	-	-	-	20-35
Yield limit value at extension, Mpa, not less than	-	-	-	-	-	28
Volatile mass fraction, %, not more than	-	-	-	0.09	-	-
Typical tensile strength at yield, Mpa, not less than	-	-	-	17	-	-
MFI dispersion within a batch limit, %, not more	+/- 10	-	+/- 10		0.09	-
Number of inclusions, not more	Not specified	-	5		-	-
Tensile strength, MPa (kgF/cm2), not less	21.6 (220)	-	22.6(230)	20.6	16	17
Tensile elongation at break, %, not less than	-	-	-	700	-	-
Breaking strength, MPa (kgF/cm2), not less	24.5 (250)	-	29.4(300)	-	20.6	-
Relative elongation at break, %, not less	700	-	700	-	700	500
Mass content of ash, %, not more	-	-	0.04	-	-	-
Mass content of volatiles, %, not more	-	-	0.09	-	-	-
Melt flow index distribution within a batch?%, not more than	-	+/- 10	-	-	-	-

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Yield strength, at extension, MPa, not more than	-	26	-	-	-	-
Tensile strength, Mpa, not more than	-	30	-	-	-	-
Relative elongation at break,%,not more, than	-	750	-	-	-	-
Crack resistance, hour, not less, than	-	30	-	-	-	-

(GOST/TU TU 2243-175-00203335-2007)

Production method: One reactor process. Formulation of stabilization includes in the contents primary and secondary thermo stabilizers, as well as process additive, which provides improved processability of the material and appearance of articles.

Application: Compounds of low pressure polyethylene, bimodal type, PE2NT11-285D are designated to be used for production of pipes and connecting parts, including utilities and potable water supply, compounds for marking strips, articles by blow molding and for production of high strength films with thickness of 20 μm and more.

MAIN QUALITY SPECIFICATIONS	
	GRADE
	PE2NT11-285D
Density, g/cub. cm at 23°C at 20°C	**0.947-0.950 0.949-0.952**
Melt flow index at 190°C, load 21, 6 kgs, g/10 min	**5.0-9.0**
MFR21, 6/MFR 2, 16	**100-170**
Melt flow index range within one lot, % not more than	**+/-10**
Yield limit value at extension, MPa, not less than	**20**
Relative elongation at break, % not less than	**600**
Thermal stability at 200°C, min., not less than	**20**
Mass fraction of volatiles, mg/kg, not more	**450**
Odor and flavor of water extractions, value, not higher, than	**1**
Resistance to slow crack propagation at 80°C and initial stress in pipe wall 4,6 MPa (in pipe samples d32 mm with SDR 11) h. not less, than	**165**
Resistance to gas components at 80°C and initial stress in pipe wall 2 MPa (in pipe samples d32 mm with SDR 11) h. not less than	**20**
Resistance to quick crack propagation at 0° C at maximum operational pressure more than 0,4 MPa in pipe line (in pipe samples 110 mm of critical pressure pc (method S4), MPa, not less than	**MOP/2, 4-0,072**
Resistance at constant internal pressure at 20° C, at initial stress in pipe walls 12,4 MPa (in pipe samples d110 SDR 11) h. not less than	**100**
Resistance at constant internal pressure at 80° C, at initial stress in pipe walls 5,5 MPa (in pipe samples d110 SDR 11) h. not less than	**165**
Resistance at constant internal pressure at 80° C, at initial stress in pipe walls 5,0 MPa (in pipe samples d110 SDR 11) h. not less than	**165**

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(GOST/TU TU 2243-175-00203335-2007)

Production method: One reactor process. Formulation of stabilization includes in the contents primary and secondary thermo stabilizers, as well as light stabilizer- industrial carbon.
Operational parameters: Transportation and storage in accordance with GOST 16338-85,GOST P 50838-95.

Application: Compounds of low pressure polyethylene, bimodal type, PE2NT11-9 are designated to be used for production of pressure pipes and connecting parts for engineering pipe works.

MAIN QUALITY SPECIFICATIONS		
	PE2NT11-9 (black)	
	Value	Test metod
Density, g/cub. cm at 23°C at 20°C	954-960 956-962	to 5.3
Melt flow index at 190°C, load 21, g/10 min At load of 212 H (21,6 kgf) 49H (5kgf)	5-7 0.1	to 5.4
MFR21, 6/MFR 2, 16	100-170	to 5.5
Melt flow index range within one lot, % not more than	+/- 10	to 5.6
Yield limit value at extension, MPa, not less than	21	to 5.7
Relative elongation at break, % not less than	500	ditto
Mass fraction of carbon black, %	2.0-2.5	to GOST 26311-84
Mass fraction of volatiles, mg/kg, not more	350	to GOST 26359-84
Type of carbon black distribution	I-II	to 5.8
Thermal stability at 200g, min. not less than	20	to 5.9
Odor and flavor of water extractions, value, not higher, than		
Resistance to slow crack propagation at 80°C and initial stress in pipe wall 4,6 MPa (in pipe samples d110 mm with SDR 11 or d160 with SDR 11) h. not less, than	165 500	to 5.10
Resistance to gas components at 80°C and initial stress in pipe wall 2 MPa (in pipe samples d32 mm with SDR 11) h. not less than	20	to 5.11
Resistance to quick crack propagation at 0° C at maximum operational pressure more than 0,4 MPa in pipe line 1. Small scale method with pipes of d110 with SDR 11 Critical pressure, MPa, not less 2. Large scale method with pipes of d160 mm, Critical pressure, Mpa, not less, than	MOP/2.4-0.072 MOPx1.5	To 5.12 To 5.13
Resistance at constant internal pressure at 20° C, at initial stress in pipe d32 mm with SDR 11 at initial pressure, h not less than 12.4 MPa 11.6 MPa	100 2500	to GOST P50838-95
Low confidence limit of prolonged strength, QLLC. MPa	≥10	to GOST ISO 12162

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LOW DENSITY and LINEAR LOW DENSITY POLYETHYLENE (GOST 16337-77)

Produced under License Agreement with Univation Technology Inc.

The product is used for production of colorable and not colorable articles, including electro-technical ones, film, and also for articles contacting with foodstuff.

Application:

LDPE 15313-003	nylon bags, detergent containers
LDPE 15813-020	table cloth, greenhouse cover, canopy
LDPE 10803-020	air bubble packing
LDPE 11503-070	high flow film grade

MAIN QUALITY SPECIFICATIONS					
	LDPE 15313-003 film grade	**LDPE 15813-020 film grade**	**LDPE 10803-020 film grade**	**LDPE 11503-070**	**LLDPE UNIPOL HRP18H10AX**
Density, g/cm^3	0.9206 +/- 0.0015	0.9190 +/- 0.0002	0.9185 +/- 0.0015	0.9180 +/- 0.0010	0.9160 +/- 0.0040
Melt flow index, (g/10 min, 190 C°, 2.16 kg)	0.3 +/-30%	2.0+/-25%	2.0+/-10%	7.0+/-15%	0.8 – 1.2
MFI dispersion within batch limits, %, not more	+/-6 (HG) +/-12 (FG)	+/-6 (HG) +/-12 (FG)	+/-5 (HG) +/-8 (FG)	+/-5 (HG) +/-10 (FG)	+/-10
Inclusions, off, not more	2 (HG) 8 (FG)	2 (HG) 8 (FG)	2 (HG) 5 (FG)	2 (HG) 5 (FG)	
Melt flow ratio, MFR(21.6) / MFR(2.16)					13-23
Ash content, %, not more	Not specified	Not specified	Not specified	Not specified	0.05
Volatile matters, %, not more					0.09
Technical Test of appearance of film				B	
Tensile Strength, MPa, not more*	* The Values of these items will be determined by the result of production output.				-
Breaking Strength, MPa, not more*					-
Relative elongation at break, %, not less*					-
NOTE: 'HG' stands for 'High Grade' and 'FG' stands for 'First Grade'.					

Packaging, Transportation, Storage

The product is shipped in 4-5 layer paper bags, PE bags, thereby the weight in PE bag should be (20,0 +/- 0.3) or (25,0 +/- 0.3) kgs and in containers: (200 +/- 3), (350 +/- 5) or (1000 +/- 15) kgs. The product is shipped by all kinds of vehicle and it should be stored indoors with no access for direct sunlight.