

# TRANSITION GRADES OF HDPE COMPOSITIONS

**PE2NT11P-275, PE2NT11P-83, PE2NT11P-285D, PE2NT11P1-83,  
PE2NT11P1-285D, PE2NT76P-73, PE2NT76P1-73, PE2NT76P2-73,  
PE2NT76P3-73, 292-73, PE2NT21P-13, PE2NT16P-11 grades**

TU 2243-182-0203335-2008, rev. 1, 2, 3, 4

Following specifications are applicable for the transition grades of HDPE compositions produced at transition from one grade to another one:

- PE compositions of black PE2NT11P-275 grade for production of gravity pipes, including corrugated pipes;
- PE compositions of non-colored PE2NT11P-83, PE2NT11P1-83 grades are intended for extrusion to produce gravity pipes and extrusion profiles;
- PE compositions of non-colored PE2NT11P-285D, PE2NT11P1-285D grades are intended for extrusion of general purpose-films;
- PE compositions of PE2NT76P-73, PE2NT76P1-73, PE2NT16P-11 grades are intended for production of industrial articles by extrusion blow molding and other kinds of molding;
- PE compositions of PE2NT76P2-73, PE2NT76P3-73, PE2NT21P-13 are for production of industrial articles by extrusion blow molding and other kinds of molding
- PE composition of 292-73 grade is intended for various kinds of processing to produce industrial articles.

No.	Parameter	Grade specification				
		PE2NT11P-275	PE2NT11P-83, PE2NT11P-285D	PE2NT11P1-83, PE2NT11P1-285D	PE2NT76P-73	PE2NT76P1-73
1	Density, kg/cm <sup>3</sup>					
	at 23°C	945 – 958	947 – 954	947 – 954	945 – 953	950 – 961
	at 20°C	947 – 960	949 – 956	949 – 956	947 – 955	952 – 963
2	Melt flow Index (MFI) at 190°C, g/10 min.:					
	a) at load of 21.6 kgf	4.5 – 9.5	5.0 – 10.0	9.5 – 15.5		
	b) at load of 2.16 kgf					
	c) at load of 5.0 kgf				0.6 – 1.2	0.8 – 1.8
3	Melt flow Index spread within one batch, %, maximum	±30	±30	±30	±30	±30
4	Tensile yield strength, MPa, minimum					
5	Tensile stress at break, MPa, minimum	25	25			
6	Elongation at break, %, minimum	400	400	300		
7	Number of inclusions, pcs, maximum	25	25	25	50	25

Note: Specifications for PE2NT21P-13 and PE2NT16P-11 grades as for 4-6 parameters are optional till 01.01.2018

No.	Parameter	Grade specification				
		PE2NT76P2-73	PE2NT76P3-73	292-73	PE2NT21P-13	PE2NT16P-11
1	Density, kg/cm <sup>3</sup>					
	at 23°C	950 – 961	950 – 961	952 – 961	938 – 950	923 – 940
	at 20°C	952 – 963	952 – 963	955 – 963	940 – 952	925 – 945
2	Melt flow Index (MFI) at 190°C, g/10 min.:					
	a) at load of 21.6 kgf					
	b) at load of 2.16 kgf				3.0 – 5.0	2.5 – 3.7
	c) at load of 5.0 kgf	1.6 – 2.6	3.2 – 10.0	8.0 – 17.0		
3	Melt flow Index spread within one batch, %, maximum	±30	±30	±30	±30	±30
4	Tensile yield strength, MPa, minimum				10	10
5	Tensile stress at break, MPa, minimum				15	15
6	Elongation at break, %, minimum				400	500
7	Number of inclusions, pcs, maximum	25	25	25	50	50

*Note:* Specifications for PE2NT21P-13 and PE2NT16P-11 grades as for 4-6 parameters are optional till 01.01.2018

**Packaging, handling and storage:** in PE and PP bags assuring products' preservation and maintaining their quality as per documentation approved under the appropriate procedure. Transportation by combined roofed transport in accordance with rules of carriage related to this mode of transport.

Warranty shelf life – 5 years from production date.

# HDPE COMPOSITIONS

## PE2NT22T-12, PE2NT76T-17, PE2NT21T-13, 296-83, 297-285, 297-285Д, 298-285, 298-285D grades

TU 2211-138-00203335-2007, rev. 1– 5

Following specifications are applicable for HDPE of PE2NT22T-12, PE2NT76T-17, PE2NT21T-13, 296-83, 297-285, 297-285D, 298-285, 298-285D grades produced by gas-phase method at low-pressure copolymerization of ethylene over supported complex catalysts. HDPE composition of 294-73 grade is intended for production of articles by injection molding and manufacturing of large-size industrial articles exceeding 250 g as well as cultural and household commodities.

HDPE composition of 295-73 grade is intended for production of cultural and household articles by blow molding to produce blown articles with capacity up to 10 l as well as for small industrial articles up to 250 g and cultural and household commodities.

Compositions of 296-83, 297-285, 297-285D grades are used for extrusion of industrial along with cultural and household articles.

HDPE compositions of PE2NT22T-12, PE2NT21T-13 grades are intended for injection molding of industrial large-size articles exceeding 250 g of weight.

Composition of PE2NT76T-17 grade is used for blow molded articles of capacity up to 10 l as well as for molding of small industrial articles up to 250 g.

No.	Parameter	Grade specification					
		ПЭ2НТ 22Т-12	ПЭ2НТ 21Т-13	ПЭ2НТ 76Т-17	296-83	297-285, 297-285Д	298-285, 298-285Д
1	Density, g/cm <sup>3</sup>	0.960 – 0.966	0.950 – 0.960	0.957 – 0.963	0.950 – 0.955	0.943 – 0.955	0.937 – 0.945
2	Melt flow index (MFI), g/10 min.	6.0 – 9.0	3.0 – 7.0	2.3 – 3.3	0.40 – 0.65	0.20 – 0.75	0.30 – 0.70
3	Melt flow index spread within one batch, %, maximum	±15	±18	±18	±18	±18	±18
4	Number of inclusions, pcs, maximum	25	50	25	25	25	25
5	Ash, % wt, maximum	–	–	–	0.06	0.06	0.06
6	Volatiles, % wt, maximum	0.10	–	0.10	0.10	0.10	0.10
7	Tensile yield strength, MPa, minimum	–	–	25.5 (260)	22.6 (230)	16.0 (163)	14.0 (143)
8	Tear stress at break, MPa, minimum	–	–	23.5 (240)	21.6 (220)	19.6 (200)	17.0 (174)
9	Elongation at break, %, minimum	–	–	700	450	650	600

**Packaging, handling and storage:** in PE and PP bags assuring products' preservation and maintaining their quality as per documentation approved under the appropriate procedure. Transportation by combined roofed transport in accordance with rules of carriage related to this mode of transport.

Warranty shelf life – 5 years from production date.

# FILM COMPOSITIONS OF HDPE

**273-285, 293-285, 293-285D, 293-285SK(SC), PE80B-285, PE80B-285D, PE80B-285SK(SC), PE80G-285, PE80G-285D, PE80G-285SK(SC) grades**

TU 2243-127-00203335-2000, rev. 1 – 8

**Production method:** low-pressure gas-phase copolymerization of ethylene over complex catalysts.

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

No.	Parameter	Grade specification			
		273-285, 273-285D		293-285, 293-285D, 293-285SK(SC)	PE 80B(G)-285, PE 80B(G)-285D, PE 80B(G)-285SK(SC)
		extra	1st gr.		
1	Density, g/cm <sup>3</sup> , at 20°C	0.949 – 0.952		0.943 – 0.949	0.937 – 0.943
2	Melt flow index (MFI) at 190°C, g/10 min	0.3 – 0.6		0.4 – 0.7	0.4 – 0.8
3	Melt flow index spread within one batch, %, maximum	±10	±18	±10	±12
4	Number of inclusions, pcs, maximum	3	15	3	3
5	Ash, % wt, maximum	0.04	0.06	0.06	0.06
6	Volatiles, % wt, maximum	0.09	0,1	0.09	0.09
7	Tensile yield strength, MPa, minimum	19		17	16
8	Tensile stress at break, MPa, minimum	21.6		20.6	20.6
9	Elongation at break, %, minimum	700	450	700	700

**Packing, handling and storage:** in PE and PP bags assuring products' preservation and maintaining their quality as per documentation approved under the appropriate procedure. Transportation by combined roofed transport in accordance with rules of carriage related to this mode of transport.

Warranty shelf life – 2 years.



HDPE composition of PE 80B-285D film grade is a winner of «100 Best Goods of Russia» (2007) and «Best Goods of the Republic of Tatarstan» (2007) Contests.



HDPE composition of 293-285D film grade is a winner of «100 Best Goods of Russia» (2013 ) and the republic-wide competition «100 Best Goods of Russia» (2013).

HDPE composition of 293-285D film grade is I-stage diploma winner of «Best Goods of the Republic of Tatarstan» (2016) and diploma-winner of «100 Best Goods of Russia» (2016) Contests.