Grodno Azot
JOINT STOCK COMPANY
KHIMVOLOKNO
PRODUCTION AND TECHNOLOGICAL COMPLEX

PTC “KHIMVOLOKNO” JSC “GRODNO AZOT”

The history of **PTC «Khimvolokno» JSC «Grodno Azot»** dates back to December 11, 1971 and that was its construction commencement date.

First industrial yarn for cord fabric and mechanical rubber goods was produced on January 10, 1978. From that moment Grodno company of synthetic yarns has started its production activities.

In 1983 the enterprise was rearranged into Grodno Production Enterprise "Khimvolokno" and reorganization of the state enterprise into Joint Stock Company "Grodno Khimvolokno" was performed in 2002.

Since October 1, 2011 as per decision of extraordinary general meeting of shareholders of both JSC "Grodno Azot" and JSC "Grodno Khimvolokno" the latter was affiliated to JSC "Grodno Azot".

At present PTC «Khimvolokno» is a large manufacturer of polyamide and polyester yarns and fibres, as well as virgin polyamide-6 (PA-6) and PA-6 based composite materials, including:

- PA-6 /granulated/;
- polyamide light&heat-stabilized yarn including spun-dyed one;
- polyamide twisted yarn;
- polyester HMLS yarn;
- polyester twisted yarn;
- polyamide texturized BCF yarn, as well as twisted BCF Heat-set;
- cord fabric for tyre industry both greige and dipped made from polyamide 6, polyamide 6.6 and polyester yarns;
- industrial fabric;
- polymer composite materials;
- consumer goods.

Each of main kinds of goods is manufactured in wide assortment with different physical & mechanical properties and quality indices depending on application range.

Dipped heat-set cord fabrics

Dipped heatset cord fabrics (hereinafter referred to as cord fabrics) that possess high rubber adhesion are used as reinforcing material in production of pneumatic tyres.
The enterprise produces wide range of cord fabrics made of polyamide-6, polyamide-6.6, polyester.

Nylon (PA-6) cord fabric is characterized by high tenacity, moisture resistance, resistance to heat ageing, high durability at multiple tensile strains, stretching-compression and impact stress and to be used as carcass in pneumatic tyres for cars and trucks, agricultural machines.

There are mastered production and sales of 12 standard grades of nylon cord fabrics that are of demand at tyre manufacturers as high quality goods. Among fabric grades being produced there is a special demand in fabric grades with lower surface density such as: 30 (302) KNTS-P from the yarn of structure tex 187x1x2 and 22 (222) KNTS-P from yarn of structure tex 144x1x2.

Usage of cord fabric with lower surface density in construction of pneumatic tyres allows to reduce consumption per a tyre of not only cord fabric but rubber too, having reduced tyre weight while keeping its strength, whereby increasing tyre durability and reducing car fuel consumption.

Anid (PA6.6) cord fabric unlike to nylon cord fabric possesses higher resistance to heat ageing, higher durability and lower elongation that allows to reduce tyre wearing and increase tyre run life. Thanks to specific features, anid cord fabric is used for manufacture of tyres used in difficult road conditions and at high loads particularly for production of heavy and super heavy tyres, aircraft tyres. The company produces and sells 14 grades of cord fabric for reinforcement of tyres:
30 (302) ADU-P from the yarn of structure dtex 2100x1x2;

35(352) ADU-P (dtex 2100x1x2); 42(422) ADU-P (dtex 1880x1x3); 133 ADU-P, 133 A-P (dtex 940x1x2); 13ATLDU-P, 132 A-P (dtex 940x1x2); 25ATLDU-P (dtex 1880x1x2); 252 A-P (dtex 1880x1x2), 21(212) A-P (dtex 1400x1x2) and 10 grades of cord fabric for reinforcement of aircraft tyres: 13 A-P (A), 132 A-P (A), 133 A-P (A), 28 (282) A-P (A), 30 (302) A-P (A), 30 (302) ADU-P (A), 55 A-P (A).

Polyester cord fabric is used as carcass in pneumatic tyres for passenger cars and lightweight trucks. Polyester cord fabric in comparison with nylon (PA-6) and anid (PA-6.6) fabrics possesses higher moisture resistance and, as a consequence, is of less effect in tensile characteristics of fabric due to moisture influence. Tyres produced with polyester cord fabrics possess good wear resistance, low noise.

The enterprise produces polyester cord fabrics 18PDU-P (tex 148x1x2), 21 PDU-P (tex 167x1x2), 27 PDU-P (tex 220x1x2) from HMLS (high modulus low shrinkage) polyester yarns.

All assortment of cord fabrics and for nylon fabrics starting from initial stage (polyamidation of caprolactam) till final stage (dipping and heatsetting) is produced at the company, on high-technology equipment of leading global producers of equipment.
Cord fabrics produced meet world level by qualitative characteristics and are of demand on cord fabric markets.
Main advantages of cord fabrics are as follows:

- high strength
- absence of knots (seams)
- high evenness of warp yarn distribution along fabric width
- high evenness of physical and mechanical data of warp yarns

Besides standard grades PTC "Khimvolokno" JSC "Grodno Azot" produces dipped cord fabrics under customers' specifications

NYLON DIPPED CORD FABRIC

It is used in tyre industry as reinforcing material for manufacturing pneumatic tyres

Fabric grade, KNTS-P	123 KNTS-P	21/212 KNTS-P	22/222 KNTS-P Instead of 23/232	22/222 KNTS-P Instead of 25/252	30/302 KNTS-P	35/352 KNTS-T-P
Cord fabric structure, dtex	935x1x2	1440x1x2	1440x1x2	1440x1x2	1870x1x2	1550x1x3
Breaking strength, N, min	120/118	201 / 196	211 / 206	211 / 206	290 / 285	328 / 325
Thickness, mm	0,55±0,03	0,66±0,03	0,62±0,03	0,62±0,03	0,75±0,03	0,78±0,03
Stiffness, cN	max 200	max 350/300	245±50	245±50	max 350/300	245±50
Twist direction	ZZS					
Hot air shrinkage at 160° C, 20 min, %, max	7,5					
Elongation %: -at break - at 20N -at 39 N	20,0±2,0 5,0 ±1,0 7,5±1,0	23,0±2,0 3,0±1,0 6,0±1,0	22,0±2,0 3,0±1,0 6,0±1,0	22,0±2,0 3,0±1,0 6,0±1,0	23,0±2,0 3,0±1,0 6,0±1,0	22,0±2,0 2,5±1,0 5,5±1,5
Adhesion, N, min	100	130	130	130	137	170
Twist per 1 m: -single twist -cord twist	460 ±20 460 ±20	370±20 360±20	350±20 330±20	350±20 330±20	326±20 318±20	225±20 220±20
Total number of ends per 10 cm : - by warp - by weft	64 ± 1 9 ± 1	111±1/89±1 7±1/9±1	106±1/84±1 7±1	112±1/89±1 7±1	99±1/79±1 7±1/9±1	91±1/79±1 7±1
Dip pick up ,%	4,5±1,0					
Fabric width, cm	140±2					

PACKING

Dipped cord fabric preliminarily wound on a shell is packed in the way as follows:

- a roll is wrapped up with foamed polyethylene of 3 mm thickness. Each roll end is put on with two cardboard circles with bags consisting moisture absorbing substance preliminarily fixed on it. A roll together with a shell is wrapped up with black polyethylene stretch-foil of 23 μm thickness and 15-25 revolutions of packing machine, and is put on with a case of polypropylene industrial fabric.

TRANSPORTATION

Cord fabric is carried in 40’ containers, boxcars and trucks

POLYESTER DIPPED CORD FABRIC

It is used in tire industry as reinforcing material for manufacturing pneumatic tires

Style	18 PDU-P	21 PDU-P	27 PDU-P
Cord fabric structure, dtex	1480x1x2	1670x1x2	2200x1x2
Tensile strength, N , min	178,0	200,0	265,0
Thickness, mm	0,63±0,03	0,69±0,03	0,80±0,03
Stiffness, cN	90-190		
Twist direction	ZZS		
Hot air shrinkage at 160° C, 20 min, %, max	2,0±0,5		
Elongation % - at load - at load - at break	(20H) 1,8±0,5 (39H) 3,5±0,6 17,0±2,0	(39H) 2,8±0,5 (90H) 5,9±1,0 17,0±2,0	(45H) 2,2±0,5 (90H) 5,7±1,0 17,0±2,0
Adhesion, N, min	137	150	157
Twist per 1 m Single twist Cord twist	 380±20 370±20	 350±15 350±15	 325±15 325±15
Total number of ends per 10 cm, pcs - by warp - by weft	 115±1 8±1	 80±1 8±1	 92±1 8±1
Dip pick up ,%	3,0±1,0	2,4±1,0	3,0±1,0
Fabric width, cm	140±2,0		
Number of ends per fabric width	1613	1120	1288
Nominal linear density of cotton-PA 66 weft yarn , tex	22		
Actual moisture, %, max	0,8		

PACKING

Dipped cord fabric preliminarily wound on a shell is packed in the way as follows:

- a roll is wrapped up with foamed polyethylene of 3 mm thickness. Each roll end is put on with two cardboard circles with bags consisting moisture absorbing substance preliminarily fixed on it. A roll together with a shell is wrapped up with black polyethylene stretch-foil of 23 μm thickness and 15-25 revolutions of packing machine, and is put on with a case of polypropylene industrial fabric.

TRANSPORTATION

Cord fabric is carried in 40’ containers, boxcars and trucks

ANIDE (PA-66) DIPPED CORD FABRIC

It is used in tire industry as reinforcing material for manufacturing pneumatic tires

Fabric grade	30 ADU-P	302 ADU-P	35 ADU-P	352 ADU-P	13 ATLDU-P	132 ADU-P	25 ATLDU-P	133 ADU-P
Cord fabric structure	2100x1x2	2100x1x2	2100x1x2	2100x1x2	940x1x2	940x1x2	1880x1x2	940x1x2
Breaking strength, N, min	304	304	340	340	135	135	260	135
Thickness, mm	0,80±0,05	0,80±0,05	0,78±0,03	0,78±0,03	0,56±0,04	0,56±0,04	0,74±0,04	0,56±0,04
Stiffness, cN	max 250	max 250	max 250	max 250	140±60	140±60	175±75	max 200
Twist direction	ZZS							
Hot air shrinkage (t^o = 160 ^oC, t= 20 min) % - 4,0±0,8 * If agreed with a customer other test methods and correspondingly other nominal values are admitted								
Elongation %: - at 20 N - at 39 N - at 44 N - at 100 N - at break	2,0±0,5 4,0±1,0 - 9,0±0,9 22,0±2,0	2,0±0,5 4,0±1,0 - 9,0±0,9 22,0±2,0	2,0±0,5 4,0±0,9 - 9,0±0,9 22,0±2,0	2,0±0,5 4,0±0,9 - 9,0±0,9 22,0±2,0	4,9±1,0 8,0±1,0 - - 20,0±2,0	4,9±1,0 8,0±1,0 - - 20,0±2,0	2,5±1,0 5,5±1,0 - - 22,0±2,0	- - 8,7±0,9 - 19,0 min
Adhesion, N, min	170	170	170	170	100	100	147	100
Twist per 1 m: -single twist -cord twist	305±20 305±20	305±20 305±20	305±20 305±20	305±20 305±20	470±20 470±20	470±20 470±20	330±20 330±20	470±20 470±20
Total number of ends per 10 cm : - by warp -by weft	96±1 8±1	76±1 8±1	96±1 8±1	76±1 8±1	132±1 11±1	94±1 9±1	94±1 11±1	63±1 8±1
Dip pick up ,%	5,0±1,0	5,0±1,0	5,0±1,0	5,0±1,0	5,0±1,0	5,0±1,0	5,0±1,0	5,0±1,0
Fabric width, cm	140±2	140±2	140±2	140±2	140±2	140±2	140±2	140±2
Total cords, pcs	1340	1070	1340	1070	1848	1316	1316	880
Nominal linear density: cotton-anide weft, tex cotton weft, tex	22	22	22	22	22 -	- 25, 30	22 -	22 -
Actal moisture, %, max	1,0							

PACKING

Dipped cord fabric preliminarily wound on a shell is packed in the way as follows:
- a roll is wrapped up with foamed polyethylene of 3 mm thickness. Each roll end is put on with two cardboard circles with bags consisting moisture absorbing substance preliminarily fixed on it. A roll together with a shell is wrapped up with black polyethylene stretch-foil of 23 mm thickness and 15-25 revolutions of packing machine, and is put on with a case of polypropylene industrial fabric.

TRANSPORTATION

Cord fabric is carried in 40’ containers, boxcars and trucks

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THANK YOU FOR YOUR ATTENTION!