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NEW STRUCTURE SHL I RESEARCH ON DOUBLE - LAYER KNITTED FABRICS

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Abstract:
In the scientific work, in order to effectively use local raw materials, research was conducted on the physical and mechanical properties of two-layer knitted fabrics of a new structure made of polyacrylonitrile yarn.

Keyword: raw material, polyacrylonitrile, knitting, flat needle machine, double layer, air permeability, deformation.

The main issues facing enterprises specializing in the production of knitted products in our republic are to increase the export potential of our country, increase the range of products in the domestic and foreign markets, improve their quality, and produce imported substitute knitted products with high physical and mechanical properties using local raw materials. Expanding the production of consumer goods through the technological capabilities of knitting machines installed at enterprises and the effective use of local raw materials, and producing competitive, high-quality knitted products that can replace imports and meet the requirements of the domestic and foreign markets is one of the current problems [1-2] .

Expanding the range and improving the quality of knitted products, the effective use of various raw materials, the development of knitted fabrics with new structures, products today include not only all technological features, but also the adaptation of textiles to the rapidly and constantly changing fashion. Expanding the range of knitted products is aimed at creating new types of fabrics with new structures, improving the technological indicators and physical and mechanical properties of fabrics to meet consumer demands [3-6] .

knitted fabrics allows not only to study the types of fabrics created, but also to expand the range of knitted products by creating various knitted fabrics with new structures.

This scientific work is based on the need to expand the scope of application of local raw materials - yarns - in the textile industry, namely for the production of knitted fabrics and products. Studying the physical and mechanical properties of double-layer knitted fabrics from polyacrylonitrile yarn and introducing them into enterprises producing knitted products will help to improve the quality of products. It is known that polyacrylonitrile yarn is used in the production of outerwear and hosiery products. When knitted products are made from these yarns, the knitwear has high hygienic properties, as well as high shape retention and purchaseability. Therefore, in the scientific work, the physical and mechanical properties of the fabrics possible in the production of knitted products were studied using two-layer knitted fabrics.

The physical properties of knitted fabrics include: air permeability, water absorption, hygroscopicity, heat resistance, heat retention, as well as electrification.

The following are accepted indicators of the mechanical properties of knitted fabrics: strength and elongation at break, elongation under tension less than the breaking strength, resistance to single and repeated stretching, resistance to creasing and abrasion, shrinkage when processed in hot and humid conditions.

In order to study the physical and mechanical properties of 10 samples of two-layer knitted fabrics, the “SENTEX-UZ” certification laboratory at TTESI was was determined experimentally using modern equipment and the analysis results are presented in Table 1.

Table 1 Physical and mechanical properties of double-layer knitted fabrics

Indicators \ Options		1	2	3	4	5	6	7	8	9	10	
Air permeability , Vr cm ^{3}/cm ^{2} sec		44.46	29.52	51.83	37.35	49.90	52.8	93.1	100.8	89.9	48.3	GOST 1228-2014 100 (dm ^{3}/m ^{2} ·sec) not less
Breaking strength , Rr , N	By height	417	572	378	443	601	366	599	449	460	374	GOST 28554-90 not less than 80 N
	By width	330	466	657	721	818	359.5	548.5	439.5	419.5	968	
Elongation at break , L , %	By height	126	145	117	119	116	132.5	117.5	110	116	122	GOST 28554-90 I-0-40 % . II-41-100% III-more than 100%.
	By width	127	70	111	131	120	137.5	111.5	138	131.5	94	GOST 28554-90 I-0-40%.II-41-100% III-less than 100%.
Irreversible deformation , ε_n,%	By height	18	20	14	20	20	20	19	16	16	17	GOST 28882-90 5-20% more it's not
	By width	17	18	15	19	18	19	22	29	25	14	
Return strain , ε_o, %	By height	8 2	80	86	8 0	80	80	81	84	84	83	
	By width	83	8 2	85	81	82	81	78	71	75	86	
Elongation , %	By width	5	4	6	5	10	18	12	24	21	19	
Abrasion resistance, thousand cycles		25000 high	25000 high	25000 high	25000 high	25000 high	2650 0	2500 0	2380 0	28500	2950 0	GOST 16486-93 15-30 normal 30-100 must. more than 100 very
Thermal conductivity %		4.6	10.8	11	9.6	6	45.9	45.9	45	47.2	38.6	
Input U, %	bottom line	+1.2	+3.1	+1.8	+1.2	+1.2	0	0	+4.3	+2.5	+1.7	
	sweetie	+1.2	-1.25	+2.5	+1.2	+1.2	+2.5	+1.9	0	0	0	GOST 26667-85 6-8% not more than 8-10% not more than

Conclusion

1. Scientific research into new structured double-layer knitted fabrics made from polyacrylonitrile yarn creates the opportunity to use local raw materials on a large scale.
2. The production of double-layer knitted fabrics on flat-needle machines increases the technological capabilities of the machine and expands the range of fabrics and products.
3. Newly developed double-layer knitted fabrics are recommended for upper knitted products.

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