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FEATURES OF THE PRODUCTION OF KNITWEAR WITHIN THE FRAMEWORK OF ASEZS THAT ARE IN DEMAND AMONG THE POPULATION

Abstract: in the article Based on their research, the authors formulated the so-called "recipes" for creating conditions under which the enterprises of the regions of the Southern Federal District and the North Caucasus Federal District for the manufacture of knitwear could produce competitive and popular products. Such a solution is possible if the heads of enterprises and regional branches of government in these regions combine their efforts through the use of innovative technological processes based on universal and multifunctional equipment to provide production with mobility, flexibility and the ability to maneuver the price of products that will be in demand not only in domestic markets with unstable demand, but also to be in demand abroad.

Key words: quality, preferences, demand, competitiveness, market, profit, demand, buyer, manufacturer, financial stability, sustainable TEP, priority, assortment policy, implementation, economic policy.

Language: English

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Introduction

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The history of the appearance of clothing goes far back into the depths of centuries, to the earliest stages of human development. The materialistic point of view connects the origin of clothing with climatic

conditions, and its development with the composition of the productive forces and means for its production.

Clothing, which originally arose mainly to protect the human body from adverse climatic conditions, atmospheric influences, under the influence of various historical, social and economic conditions, national characteristics, has undergone

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many changes, has reached a great variety of types and forms.

The relevance of the topic lies in the fact that in the assortment of garments and knitwear, clothing has the largest share. In addition, it is knitwear that occupies a significant part of the entire range in the demand markets. The formation of an assortment at enterprises is the most important task, since an optimally formed assortment is a guarantee for enterprises in obtaining the maximum profit.

Clothing is diverse and includes many types of products (more than two thousand types). The main types are coats, jackets, trousers, skirts, jackets, and dresses. They allow you to create sets of clothes for various purposes: for work, leisure, home, sports. The composition of these sets includes the same types of products, similar in design, but differing in materials, artistic and color design.

When classifying garments and knitwear, the purpose, raw materials and materials, the design and nature of the finish, the method of production, and dimensions are taken into account.

Industry and trade classifications are applied, which are given in the price lists for garments and knitwear and take into account the specifics of industry classifications. It is important for consumers to classify the range of clothing by purpose, as well as the main features of industry and trade classifications, which are convenient for studying the range of clothing.

The knitting industry is a relatively young branch of the textile industry, especially compared to spinning and weaving, which has a history of development dating back thousands of years. In Russia, mechanical knitwear production began to develop in the second half of the 19th century. The first knitwear factory was founded in St. Petersburg in 1855.

Man's dream of a universal material that combines the properties of a variety of tissues is one of the most ancient. High technologies in the textile industry have finally made it possible to approach the ideal: to create fabrics that are both thin and warm, light and strong, elastic and retain their shape. The word "knitwear" comes from the French tricot - "knit". This is the name of the canvas obtained from one or many threads by forming loops and their mutual interweaving. The fibers and the ways in which they are connected can be very different, so there are plenty of types of knitwear. Even from the same composition, taken in different proportions, woven by different methods, several different fabrics can be obtained.

Knitted products are products made by knitting by machine (on knitting machines) or by hand (on knitting needles). Also, the fabric can be obtained on looms by weaving, but this is a completely different technology that has nothing to do with knitwear. Thus, for a knitted product, a blank is first knitted, and then

it is cut and sewn. Sewing products are made by cutting fabric rolls. The knitted product is characterized by high extensibility and plasticity, which makes it possible to achieve a feeling of lightness and comfort.

The range of knitwear is very diverse. Knitted goods are classified according to a number of criteria.

Combination - an elegant tight-fitting women's shirt, worn over underwear directly under the dress in order to better fit the dress and emphasize the figure. Unlike a shirt, it has a longer length, thin straps or coat hangers, a narrowed waist and an extension to the bottom. The combination is the union of two items: shirts and pantaloons. Pantaloons are short-cut trousers that are narrower at the bottom. Their length usually varies: to the knee is the standard length. In addition, pantaloons can be shortened and elongated. T-shirt - sleeveless T-shirt, underwear. It can be used as an element of a sports uniform in some sports. Briefs - an item of underwear, short pants worn directly on the naked body. Traditional briefs cover the buttocks and genitals. There are briefs for men and women. Usually, traditional underpants are made from natural fabrics - cotton, silk and linen. Underpants - a part of men's underwear in the form of long pants made of soft and elastic fabric, worn under trousers in order to protect the body from cold and wind. Pajamas - men's and women's home or sleeping suit.

Polo is a sports shirt with a soft turn-down collar and a fastener to the middle of the chest. T-shirt - top shirt with short sleeves and polo closure. T-shirt (from English, T-shirt - short sleeves and camp resemble the letter "T") - a knitted shirt with a round collar and short sleeves. A peignoir (from French peignoir - to comb) is an elegant morning toilet, covering the torso and legs partially or completely, with or without sleeves, with a slit or fastener from top to bottom, worn over sleepwear. Sew peignoirs of a free silhouette, with or without lining; they can be bundled with a nightgown. Headsets - sets of lingerie from one fabric, one size, with the same finish. They consist of a shirt and pantaloons, a combination and pantaloons, a bra, pantaloons and a skirt. Headsets for youth may consist of a skirt, bikini-type pantaloons, as well as a shortened slip and pantalon-panties. Leggings - waist clothing, tightly fitting the lower body and legs to the ankle, each separately. Body - shoulder clothing for women and girls, tightly fitting the body, consisting of a bodice with sleeves (or without sleeves) and underpants, combined into one piece, worn over corsetry or directly on the body. Top - shoulder clothing for women and girls, covering the body partially or completely, without sleeves, on shoulder straps (or without them), with a fastener (or without it), worn on corsetry or directly on the body. tight-fitting torso, consisting of a bodice with sleeves (or without sleeves) and underpants, combined into one piece, worn over corsetry or directly on the body. Top

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- shoulder clothing for women and girls, covering the body partially or completely, without sleeves, on shoulder straps (or without them), with a fastener (or without it), worn on corsetry or directly on the body. tight-fitting torso, consisting of a bodice with sleeves (or without sleeves) and underpants, combined into one piece, worn over corsetry or directly on the body. Top - shoulder clothing for women and girls, covering the body partially or completely, without sleeves, on shoulder straps (or without them), with a fastener (or without it), worn on corsetry or directly on the body.

Coats can be single-breasted and double-breasted, extended at the bottom and adjacent to the waist line, unlined and lined, with long sleeves, sewn-in or raglan, with a collar, hood or cap, with patch or welt pockets, with a belt, etc.

Sweater - a piece of knitted clothing for the upper body without fasteners, with long sleeves and a characteristic high two- or three-layer collar that fits around the neck. The sweater is knitted from a thick or medium thickness of woolen or semi-woolen yarn on knitting needles or crocheted, less often on knitting machines. Various types of knitting are possible, "gum" of all types is used for the collar and cuffs. The decor on the front of the sweater has become widespread. A turtleneck is a type of sweater with a high collar made of thin yarn. A jumper is a product without a cut or with a cut that does not reach the end of the camp. Are issued with a collar and without a collar, with long, semi-long, short sleeves or without sleeves, with pockets and without them. A variation of the jumper is a pullover with a V-neck. Jackets - products with sleeves and with a cut in the entire length of the camp. They make jackets for women and men with sleeves of different lengths, with belts and without them, with collars, without collars, with pockets and without pockets.

Vests - sleeveless products with a full-length slit, with and without pockets. Vests are divided into men's and women's. Women's dresses come in a variety of styles that differ in the shape of the collar, the length and style of the sleeves, the presence of trim, etc. They produce dresses knitted, cut and combined, from bleached, dyed, variegated, printed, melange, embossed, etc. - Knitted woolen trousers with loop-like braid, tight-fitting legs. Trousers - an item of outerwear that covers the lower part of the body, including each leg separately, and covers the knees. In the classic version, the pants at the bottom reach the ankles or the top of the foot. Worn at the waist or on the hips. To fix the upper edge, a waist belt, straps, suspenders can be used. Often there is a width.

Stockings - a type of clothing for the lower legs. In the past, they were used by both women and men. In modern fashion - an item of women's clothing. Sock (pl. socks) - a short stocking that does not reach the knee. Gaiters are an element of a tracksuit and for warming the muscles of the lower leg.

Gloves - a type of clothing for the hands, unlike mittens - with compartments for each finger. Made from leather, rubber, fabric. Mittens are a piece of winter clothing for the hands, in which there are two compartments: one for the thumb, and the other for all other fingers. Mittens are more effective at keeping hands warm than gloves, as individual fingers freeze quickly. Berets - hats without fields of round or oval shape. A scarf is a long piece of cloth that is wrapped around the neck for utilitarian, aesthetic, or religious purposes. A scarf can be made from a wide variety of materials, from wool to cotton and lace. A bonnet is a knitted or sewn cover that covers the hair, may have ties under the chin.

There are many manufacturers of knitted outerwear, let's consider the most popular global brands that have proven themselves in the goods market.

The GLENFIELD brand is the highest quality knitwear known throughout the world. The quality of products under this name is the result of careful research on the selection of fibers and their processing. The company pays great attention to ensuring simple care for products, which is laid down at the production stage. GLENFIELD knitwear is presented in a large assortment and clothing collections are constantly updated, which attracts customers to choose this particular brand.

The famous knitting brand Missoni began its existence in 1953 with a small knitting workshop. The famous trading house "La Rinashente" was the first big customer. In 1966, his own brand appeared. On the equipment that was then available, it was possible to produce only smooth or striped fabrics. As you know, everything ingenious is simple, and therefore a way out of the situation was found quite quickly - knit stripes of different colors and widths, which can be arranged horizontally, vertically and diagonally. Soon, more complex ones were added to the first machines, on which it was possible to knit multi-colored zigzags. Thus, striped zigzags have become a symbol of the Missoni style. Another happy accident was the catwalk of the 67th, when the models showed a new collection of knitwear without bras, so as not to destroy the geometry of the dresses.

The main task of Missoni is to show the limitless possibilities of knitwear. Mixing different yarns, they invented new canvases and achieved their goal. The endless play of colors and shapes of knitwear is the hallmark of Missoni. At Missoni, knitwear transforms from a shapeless homemade material into an airy, clear and very seductive matter. In addition to the pattern, Missoni items are famous for impeccably smooth seams, thanks to which the joints of the parts are imperceptible. The third feature of Missoni is some kind of comprehensive versatility: these clothes are equally appropriate in the office, in the country and at a secular party.

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The German brand Marz is Germany's leading knitwear manufacturer, founded in 1920 in Munich by Wolfgang and Thea Marz. Today Marz is one of the most famous manufacturers of high quality knitwear in the modern classic segment.

Marz jersey is elegant, sporty, respectable and impeccably comfortable. Each model of the Marz trademark contains the knowledge and experience of an entire company that has been working for over 85 years to further develop its traditions.

Among the manufacturers of knitwear, one can also note H&M, GAP, Gerry Ross and many others.

Each foreign manufacturer of knitted outerwear has an established style and recognizable design of

products, due to which the consumer develops certain preferences for a particular brand.

In the market of Russian knitted goods, ten main manufacturers can be distinguished (Figure 1):

- 1) JSC "Volga Textile Company", Cheboksary
- 2) LLC PK "Firm "Rus", Ulyanovsk
- 3) OOO "Chance", Smolensk
- 4) CJSC "Ishimbay knitwear factory"
- 5) CJSC "Corporation "Gloria Jeans", Rostov-on-Don
- 6) OJSC "Sewing Factory", Prokhladny
- 7) Komatso LLC, Tikhvin
- 8) CJSC "Ruzteks", Ruzaevka
- 9) LLC "Orsk manufactory"
- 10) CJSC "Eurasia", Krasnoarmeysk

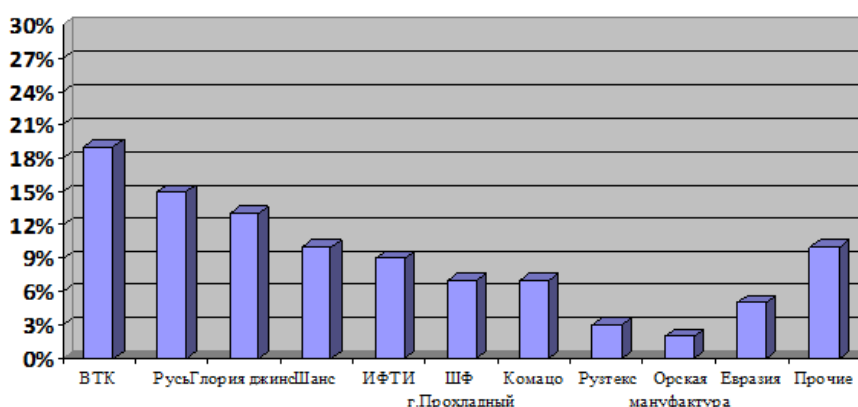


Figure 1 Domestic manufacturers of knitwear % of knitwear sold on the Russian market is produced by domestic manufacturers, and 69% - by foreign ones.

Assortment of knitted goods.

Knitted goods, depending on the function performed, are divided into knitwear and artificial fur.

Knitwear according to its purpose is divided into groups: outerwear, (outerwear), underwear, hosiery, gloves, pewter and shawls.

Intragroup classification is carried out according to the type of raw material, method of manufacture, type of weaving, type and class of knitting machine, finish, gender, age, nature of the support, size, length, types and varieties (types, styles).

According to the type of raw materials, knitwear is divided into products made of cotton, woolen, mixed yarn, chemical fibers, threads and their combinations.

According to the method of manufacturing, the products are divided into knitted regular shapes they are given in the knitting process), semi-regular (they are shaped when knitting parts of clothing), cut (made from knitted fabrics) and combined (with knitted cut parts).

The type of weave is determined by the location and order of the connection of the loops. Cross-knitted knitted weaves include smoothness, eraser, interlock, plated, fang, semi-fang and others, warp-knitted - chain, tights, cloth, satin, charme, fillet, etc.

According to the type of knitting machines, there are cross knitting (MK, CT, fan, elastic, etc.) and warp knitting (swivels, raschel and raschel-swivels). The machine class determines the density of the knitwear. On high-end machines, knitwear is produced from thinner threads and yarns.

By sex and age, knitwear is distinguished for men, women and children.

According to the nature of the support, knitted outerwear is divided into shoulder, waist, hosiery, gloves, hats. The sizes of knitwear and underwear are indicated in centimeters, height - in centimeters or in conditional numbers of lengths.

The sizes of the outer jersey are set in even units with an interval of 4 cm (for men's trousers - 6 cm) according to the following measurements: for shoulder products (jackets, jumpers, etc.) - by chest circumference; for men's trousers - according to the circumference of the waist; for trousers, women's breeches - according to the circumference of the hips. The growth of outerwear products is determined by the growth of a typical figure with an interval of 6 cm.

Dimensional characteristics of knitted products are indicated in table 1. Depending on the types of knitted products, three, two or one dimensional attribute is carried out on product labels (table 1).

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Table 1. Dimensional signs of knitwear

Gender and age groups	Height, cm	Girth, cm		
		chest	waist	hips
Men's	158, 164, 170, 172, 188	88, 92, 96, 100, 108, 112, 116, 120, 124, 128, 132, 136, 140	70, 76, 82, 88, 94, 100, 106, 112, 118, 124, 130, 136, 142, 148, 154	96, 100, 104, 108, 112, 116, 120, 124, 128, 132, 136, 140, 144, 148
Women's	146, 152, 158, 164, 170, 176	88, 92, 96, 100, 104, 108, 112, 116, 120, 124, 128, 132, 136, 140		
Children's	74, 80, 86, 92, 98, 104, 110,	48, 52, 56, 60, 64, 68, 72, 76, 80, 84,		
	116, 122, 128, 134, 140, 146, 152, 158, 164, 170, 176	88, 92, 96, 100, 104, 108		

Table 2. Classification of knitted clothing according to dimensional characteristics

Product type	Dimensional features
Adult clothing	
Suits, jumpsuits, combinations, pajamas, dresses, coat dresses, shirts	Height - bust - waist (hips)
Jackets, jumpers, sweaters, vests, jackets, jerseys, T-shirts	Height - bust
Trousers, underpants, leggings, shorts, skirts, pantaloons of types I and IV	Height - waist (hips)
Briefs, underpants, swimming trunks, pantaloons of types II and III	Waist (hips)
Children's clothing	
Jackets, sweaters, jackets, jumpers, shorts, suits, vests, T-shirts, sweatshirts, pajamas, long pantaloons	Height - bust
Suits, trousers	Height - bust
Short pantaloons, undershirts, bonnets, aprons, bibs	Bust

Outer jersey

Jackets - products with sleeves and with a slit along the entire length of the front. Women's jackets can be with or without a collar, and men's - only without a collar. Fastening mainly with buttons.

Jumpers (pullovers) - a type of knitwear with a fastener of limited length or without it, with or without sleeves, with a variety of neck designs.

Costumes can be men's, women's, children's and include two, three items. They may include trousers, a jacket or jumper, pants, a skirt. It can be a set of a dress and a vest, a sundress and a blouse or jumper.

Sports suits can be two-, three- and multi-subject.

Vests - products without sleeves and with a slit along the entire length of the front.

Sweaters are made without a fastener, with a high collar (at least 5 cm) - single or double and with long sleeves.

Coats - single-breasted or double-breasted products of various styles, from knitted fur or duplicated knitted fabric.

Sports jackets can have a one-piece back or a yoke back, can be with sleeves, with a fastener from front to bottom, with a warming pad, lining or without them, with or without a hood.

Dresses have a wide variety of styles depending on the silhouette and decoration. By design, they can be detachable along the waist line and not detachable, on a yoke, with or without pockets, a belt. Dresses are made with and without a collar, with sleeves in knit, raglan, one-piece, long, short and sleeveless.

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Blouses can be split or one-piece, front or back fastened, with or without sleeves and a collar. Blouses are tucked into a skirt or worn over it.

Skirts by design can be one-piece or swinging, with or without a clasp.

Pants are sewn in various styles. The slit in the upper part of men's trousers and for boys is decorated with a hidden zipper or buttons, and for girls trousers are made with a central zipper or from the side with a zipper, buttons.

Leggings - consist of a torso and legs. Depending on the length of the legs, they can be long or short. The legs of the leggings can end with laces or elastic weave with a earned edge.

Top shirts (clothing for men and boys) are produced with long and short sleeves, for wearing at the outlet (with a pocket on the chest), can be one-piece or on a yoke. Sew them with a collar with or without a stand.

Knitted underwear.

In terms of consumer properties and economy, knitted underwear is significantly superior to underwear made from fabrics. For its manufacture, cross-knitted and warp-knitted fabrics of various fibrous compositions of various structure are used (smooth, eraser, interlock, fang, semi-fang, skewered and raschel fabrics, etc.). Knitted underwear includes mainly household and sports products.

To household men's underwear include jerseys, underpants, shorts, headsets.

Sweatshirts - underwear knitwear with or without a fastener of limited length, with long or short sleeves. They can be day and night (with a one-piece knitted or sewn camp). The neckline is processed with an inlay, braid or in a hem. The bottom of long sleeves ends with an eraser or cuffs, short sleeves - in a hem.

Underpants are products consisting of two long or short legs connected to each other. They are made long, shortened, short and underpants. They can be with or without buttons. The range of underpants in terms of raw materials and finishes is similar to jerseys.

Pants are long and short. The torso of the panties is made entirely knitted with one or two seams and with a reinforcing bar.

Headsets - sets consisting of knitwear: sweatshirts and underpants and T-shirts, shorts and T-shirts, shorts and sweatshirts.

Household lingerie includes shirts, combinations, pantaloons, petticoats, headsets, peignoirs.

Shirts by appointment produce day and night. Each specified type is of three types: a semi-adjacent silhouette, extended or straight to the bottom; extended from top to bottom straight. Day shirts are also distinguished by the design of the top - with shoulder straps (sewn on or one-piece), with or without sleeves. Nightgowns produce a more complex

design with a long or short camp, with long and short sleeves or without them.

Combinations - jerseys with deep necklines and armholes, short sleeves or without them. They are produced in two types: a semi-adjacent silhouette, extended or straight to the bottom; extended silhouette from top to bottom. According to the design of the top, combinations come with short sleeves or straps and without them. They are made from swivel smooth and patterned weaves.

Pantaloons - a type of knitwear with legs. Depending on the length of the legs, they are of four types: long, short, knickers-panties, elongated. The torso of the pantaloons is made entirely knitted with one or two seams.

Bottom skirts are produced in two types: a silhouette extended from the top to the bottom, a straight silhouette. On the bottom of the product may have flounces or frills.

Headsets - sets consisting of a combination or shirt and pantaloons.

Peignoirs are dressing gowns made of silk jersey of different styles.

To household children's underwear include products of the same names as for adults. For toddlers and preschool children, blouses, undershirts, sandboxes, rompers, overalls, envelopes, caps, headsets are made.

Blouses have a straight or extended to the bottom camp, short or long sleeves, which can be set-in, raglan, kimono, one-piece. Front closure, back closure, shoulder or no closure. Blouses are made from plush, fleece and smooth knitted fabrics.

Vests - loose blouses with set-in sleeves, raglan or kimono, with a slit to the end of the camp, with ribbon or braid ties.

Sandboxes - briefs on shoulder straps with a breast or bodice.

Overalls are cut along the waistline and one-piece, with long, shortened or short legs.

Sports underwear includes T-shirts, sports jerseys, shorts, bathing suits.

T-shirts are made without sleeves, the neckline in front is larger than in the back.

Sports sweatshirts - products without fasteners, with a round neckline, long and short sleeves, are of two types - they are tucked into trousers or a skirt (with an elongated camp) or loose (with a shortened and short camp).

Hosiery.

Hosiery is the most common type of knitwear. They cannot be replaced by the corresponding types of fabrics. The range of hosiery for women and girls includes stockings, semi-stockings, tights, socks and heels; for men and boys - socks and semi-stockings.

Stockings by the nature of use are casual and elegant. Stockings are distinguished by the height and shape of the heel.

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Half-stockings, unlike stockings, cover only the foot and lower leg, have a shorter side (2 cm) with a rubber or latex vein. According to the types of raw materials used (with the exception of woolen), in terms of weaving and finishing, they do not differ from stockings. For children's stockings, unlike women's and men's, elastic thread is not used.

Tights - women's and children's leggings with a trace and a side with an elastic band.

Socks for men and teenagers have a long leg and a multi-colored knitted pattern or a solid color, women's and children's socks have a short leg, plain light colors or a simple pattern with a multi-colored border.

Footprints - products that cover the foot of the foot. They are made from elastic threads.

Sports products include sports half-stockings, leggings, knee pads and ankles.

Headwear and shawls

The assortment of this subgroup includes berets, cap-berets, hats, balaclavas, scarves, scarves, headsets.

Caps - headwear for adults and children with lapels, a visor, fields. They can be lined and unlined, with fleece, trimmed with braid, cords, pompoms, tassels. They are produced in the form of separate products or in a set with mittens, gloves, a scarf.

Shawls according to the season socks distinguish between winter and summer; according to the

manufacturing method - machine and hand knitting (they are made mainly from down with cotton and are called down); by region of manufacture - Orenburg, Penza; according to the design of the edge - with fringe, with or without a border; by size; excluding fringe) - from 70 x 70 to 130 x 130 (the dimensions of hand-knitted downy shawls can be indicated by the number of loops from 300 to 600).

Scarves are single and double. Single according to the method of manufacture are whole-knitted and cut. According to the design of the edge, scarves with fringe, tassels are distinguished, and according to the finish - one-colored, multicolored, fleece, etc. Scarves having a length of 150-180 cm and a width of 50-70 cm are called stoles.

Gloves and mittens

Gloves sewn by design are of two types: with a rectangular hem; with a hem extended towards the bottom.

Knitted gloves also distinguish between two types: five-fingered and two-fingered.

Mittens are made of two types: with a tucked thumb; with a large vialc, which is integral with the body. According to the production method, they are sewn and knitted, and according to the design - single and double.

Table 3. Factors influencing the choice of buyers

Factors	Number of people from the group who marked			Total marks (men)	Number of people from the group who marked			Total marks (women)
	A (men)	B (men)	B (men)		A (women)	B (women)	B (women)	
brand awareness	0	6	3	9	1	15	0	16
Price	9	6	4	19	9	30	6	45
Producing country	0	0	0	0	0	0	0	0
Ergonomics	13	15	10	38	14	29	12	55
Safety	2	3	4	9	8	5	4	17
Fashion Compliance	3	5	3	11	4	16	5	25
wear resistance	1	3	2	6	0	0	3	3
practicality	8	5	3	16	4	8	4	16
Type of raw material	3	2	1	6	2	5	2	9
Total Marks	39	45	30	114	42	108	36	186

By gender and age, gloves and mittens are divided into men's, women's and children's.

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Products of world brands

GLENFIELD Products



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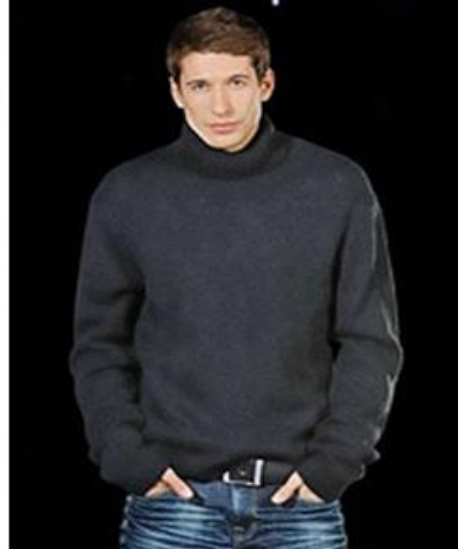
A



B



C



D



Products MARZ

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1- Bardotka; 2- batkin; 3- apache blouse; 4- blouse with a bow; 5- v-neck blouse; 6- blouse with a wrap; 7- blouse with halter collar and tie; 8 - blouse without fastener and collar; 9- military blouse; 10- blouse of blouses; 11- classic blouse; 12- cowboy.



Figure 2. Assortment of knitwear

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Outerwear from knitted fabrics

Coat products. Their main types are coats, short coats, raincoats, capes, jackets, jackets, vests.

A coat is a kind of swinging clothing with a front closure, with long mi and a collar. Separate models of women's summer coats can be without a collar, fasteners and with short sleeves. The coat collar can be replaced with a scarf or hood. Coats can be adjacent, semi-adjacent, straight and free silhouettes, and in shape - sports, strict, fantasy. Coats are made single-breasted and double-breasted, with an external and internal fastener. A variety of coat styles is achieved by changing the silhouette, cut, and finish.

Winter coats are made from pure wool and half-woolen fabrics, duplicated materials, as a rule, with a fur collar. The lining can be hinged (sewn), detachable and fastened together with batting.

Demi-season coats are similar in design to winter coats. They are made from lighter fabrics, natural and artificial leather. The lining can be up to the waist or to the bottom of the product.

Out-of-season coats - voluminous quilted products made of fabrics with waterproof or water-repellent impregnation, on synthetic insulation.

Summer coats are made from lightweight fabrics, usually single-breasted, with or without lining. Some models are made double-sided, without lining.

A short coat, unlike a coat, is produced in a shorter length (shortened). Their range is similar to coats.

Jackets from coats and short coats differ in length and sporty style. They are sewn in straight or semi-adjacent silhouettes. The bottom of the jackets is decorated with a stitched belt, elastic band or a threaded cord. The fastener can be on buttons, buttons and "lightning". They are sewn from cotton, half-woolen, synthetic fabrics, artificial and natural leather.

Raincoats have the same design as the coat. They are sewn from fabrics with waterproof or water-repellent impregnation and film materials.

Children's raincoats differ from adults mainly in size.

Capes are a type of cloak, but they do not have sleeves.

Costume and dress products. These include suits, jackets, jackets, jackets, blouses, vests, dresses, sundresses, bathrobes, blouses, shirts, skirts, trousers, overalls, semi-overalls.

Suits - complete clothing, consisting of two (two-piece suit), three (three-piece suit) or more items. Men's two-piece suits consist of a jacket and trousers; women's - from a jacket, skirt or trousers; three-piece suits are complemented by a vest - clothes without sleeves and a collar, with a fastener in the front. In suits for teenagers and children, a jacket or jacket can be replaced with a jacket or blouse. Sports suits

consist, as a rule, of a jacket or a blouse and trousers with low fasteners.

Jackets - men's and boys' clothing, with long sleeves, a slit from top to bottom, with a fastener. There are single-breasted and double-breasted jackets, adjacent and semi-adjacent silhouettes. Varieties of the jacket are blazer, tailcoat, tunic, tuxedo.

Jackets in design resemble men's jackets. By gender and age, they can be women's and children's. A kind of jacket is a cardigan (a straight elongated jacket without a collar).

Blouses - clothes of a free silhouette, worn out, with sleeves and a slit to the end of the camp or to the chest line.

Dresses - a type of clothing for women and girls, combining shoulder (bodice) and waist (skirt) products into one whole. By cut, they are one-piece and detachable along the waistline, adjacent, semi-adjacent, straight and free in silhouette. They are sewn with sleeves, collars or without them. Some models of dresses may have frills or wings instead of sleeves. There are everyday dresses (business), home (simple styles) and elegant (various styles). Varieties of dresses: dress-suit, dress-coat, dress-robe, dress-shirt, sundress.

Children's dresses come in simpler and more comfortable styles, depending on the age of the children.

Bathrobes - house dresses with a slit from the front to the bottom, with or without a fastener. Dressing gowns of a free silhouette for morning and evening dressing are called peignoirs.

Blouses - shoulder products, by the nature of the design, they are similar to the bodice of a detachable dress. Like dresses, they are sewn in a variety of styles: with or without a collar, sleeves, pockets, the back and front can have a yoke, pleats, tucks, trimmed with embroidery, lace, jabot, braid. Collars of blouses are turn-down, on the counter, shawl, figured.

Skirts - waist products, consisting of one or more panels. They are divided into women's and for girls, they can be with or without a slit to the bottom. According to the silhouette, the skirts are divided into straight and conical. A variety of skirts are culottes.

Pants are classified as waist products. They are for men, women, children, and seasonally - summer and winter. The bottom of the trousers, depending on the fashion, can be with or without cuffs. Depending on the fashion, the width of the bottom of the trousers and the degree of their fit change. The varieties of trousers include shorts, harem pants, golf pants, riding breeches, breeches.

Overalls - a jacket and trousers combined into one. May be with or without a hood.

Knitted underwear

Linen products include products worn on the body and corset products. By appointment, they are divided into household and sports; by gender and age

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- for men, women, children; by the nature of the support - on the shoulder and waist; also subdivided according to material, types, heights, chest girth, styles, seasonality (autumn-winter and spring-summer).

Men's underwear includes undershirts - they are produced with an open and closed collar, with or without a fastener for one or two buttons; pajamas - sleep sets, consisting of a jacket and trousers, are made from light cotton and silk fabrics; panties are made from bleached, smooth-haired or printed satin and calico; underpants - products with long or short legs with or without a fastener, swimming trunks can be double or single, laced or buttoned.

Women's underwear includes nightgowns, combinations, pajamas, bathing suits, underpants.

Night shirts are sewn of various lengths with and without sleeves.

Combinations have the most diverse finishes and cutout shapes, a semi-adjacent silhouette.

Women's pajamas differ from men's in more diverse styles and finishes.

Bathing suits can be two pieces (bra and briefs) or one piece (bra and briefs combined into one piece).

Children's underwear for boys and girls of school age includes the same items as for adults. The main types of underwear for newborns, toddlers and preschool children are undershirts, sliders, envelopes, bathing suits, bibs, caps.

Undershirts are a blouse with set-in sleeves, raglan or kimono, with a slit to the end of the camp, with ribbon or braid ties.

Rompers - a product in the form of semi-overalls (one-piece) or detachable on the straps with a breast or bodice.

Envelopes are issued with sleeves, hood or without them. They can be single or lined.

Bibs - short aprons for newborns to toddlers, worn on the chest.

Caps are two- or three-piece hats with ties in the front.

Corset products are subdivided according to the material, design to the degree of elasticity, types, styles, sizes.

The main types of corset products are bras, corsets, half corsets, graces, half graces, belts.

Knitted hats

Hats are divided into household and sports. Household hats according to the nature of use are divided into everyday and elegant; according to the type of materials used - from fabrics, felt, non-woven and knitted fabrics, leather, fur, shavings, straws, etc .; by seasonality - winter, summer, off-season; according to the method of manufacture - sewn, molded, knitted, glued and wicker; by gender and age - male, female, children; by rigidity - hard, semi-rigid and soft; in size (head circumference at the most convex points of the occiput 1 cm above the superciliary arches and 1.5 cm above the auricles); for adults - 53, 54, 55, 56, 57, 58, 59, 60 and 62, for children - 46, 47, 48, 50, 51, 52, 53, 54, 55, 56.

The styles of hats depend on the shape of the head, the presence and shape of the fields, and the visor. According to the shape, hats are divided into strict, sports and fantasies.

The main types of headwear are hats, caps, caps, hats, berets, caps for children, helmets, bonnets, hoods.

Hats - women's, men's and children's - headwear made of fabric or fur.

Caps - hats for men and boys with a visor and a wide band. They are sewn from woolen, cotton, linen fabrics using other materials. Caps for boys are produced in the following styles: captain, peakless cap, jockey.

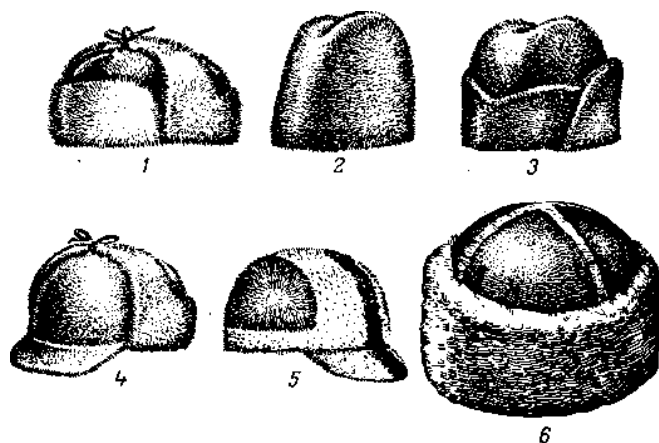


Figure 3 Styles of men's fur hats using knitted fabrics
1 - whole fur earflap; 2 - "gogol"; 3 - Moscow; 4 - "Leningrad"; 5 - finca; 6 - boyar.

Kapitanka - cap with a solid stand in front.
Peakless is different in that it does not have a visor.

Jockeyka - a summer children's cap made of fabrics or straws with a visor.

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Kepi - a soft headdress with a visor for men and boys. They are sewn from special cap or clothing fabrics and leather. There are many wedge caps, raglan, caps with tucks, fantasies. According to the season, socks are divided into winter, demi-season and summer, including the use of knitted fabrics.

Hats - headgear, consisting of a head, sides (fields) and a visor or without them. They are produced with or without lining, hard, semi-rigid and soft, of various styles depending on the height and shape of the head, the width of the margins (narrow and wide), the presence of additional processing and finishing (with perforation, stitching, cord, etc.) using knitted fabrics.

Berets are a type of hat with a rounded head and inward-turned edges.

Caps - fabric, knitwear or felt products in the shape of a boat.

Helmets - hats that fit tightly around the head with a clasp or ties under the chin.

Hoods - women's and girls' hats, tightly fitting the head with ties under the chin. The head of the hood can be with or without a side.

Hoods - free-form soft hats; can be an independent product or part of a coat and jacket, including the use of knitted fabrics

Consumer properties of goods - a set of properties that meet the needs or expectations of individual needs. All consumer properties inherent in knitwear can be divided into the following groups:

- properties that affect the service life;
- hygienic properties;
- aesthetic properties.

Properties affecting the service life of knitwear. These include strength, elongation, elongation, resilience and elasticity, molding properties, openness, wear resistance, dimensional stability, maintainability, cut through and edge curl.

The strength of knitwear depends on the type of raw material, the structure of yarn and threads, the weave and density of knitting, and the finish of the fabric. Compared to fabrics, its strength is somewhat lower due to the bending of the threads of the loop structure. The strength of the knitwear gradually decreases as the angle between the wale direction and the stretch direction increases, and the elongation increases. The elongation of knitwear is much greater than the elongation of fabrics, which is determined by its loop structure and is determined by the ability of the loops to change their shape under the influence of external forces, while changing the length of some sections of the loop due to others.

The extensibility of knitwear characterizes its ability to elongate under the action of loads that are less than breaking loads. It can be both a positive property (for hosiery and other products), and a negative one (for upper products). Elasticity - the ability of the fabric to take its original shape after removing the load that caused the deformation, is

determined by the amount of elastic deformation, which depends on the elasticity of the yarn and threads, knitting density, weave structure and type of finish. High elasticity have kulirnaya surface, two purl weave, interlock.

Raiseability in general is a negative property of knitwear that affects the service life of products. It is characterized by the ability of loops to slip out of each other when the thread breaks or is pulled. Threads made of wool, cotton fibers, textured, shaped twist have the highest coefficient of friction of a thread on a thread. Consequently, the unraveling of knitted fabrics from such threads is less than that of fabrics made from smooth threads. The unraveling depends on the twist of the threads, their thickness, elasticity, the angle of the thread wrapping around the thread, the length of the thread in the loop, the density of the knitwear, the type of finish, the direction and degree of its stretching at the time of the loop break. The wear resistance of knitwear, due to the complex effect of mechanical, physicochemical, bacteriological factors, is sometimes less than that of a fabric, since in knitwear a thread break due to abrasion can lead to loop descent.

Abrasion resistance depends on the type of fibers, the structure of the yarn (threads), the degree of fixation of the fibers in the yarn and the fabric, weave, density, surface nature, weight of 1 m² of the fabric, type of finish. Shape stability - the ability of knitwear to maintain within certain limits the size and shape under various influences - largely depends on the elastic properties of the fabric. Knitwear has high extensibility under uniaxial and biaxial loads and the ability to restore its original dimensions (shape stability). The greatest dimensional stability is characterized by fabrics of combined weaves, as well as those made of textured threads. The penetration of the fabric with a needle causes the descent of loops, reduces the quality of products, and shortens the service life. It depends on the fibrous composition, structure and properties of the threads (elongation of the coefficient of friction between the threads).

The twisting of the edges is typical for single-weave knitwear and is explained by the tendency of the loops located along the edges of the fabric to straighten. The curl of a knitwear depends on a number of factors; properties of fibers (from elasticity), thickness, structure, twist of threads, type of weave, density, finish of the fabric. So, due to the high elasticity - the guests of the woolen fibers, the fabrics made of woolen yarn twist more than knitwear made of cotton yarn "with an increase in knitting density, the twisting increases.

Hygienic properties of knitwear. These include: heat-shielding, windproof, air permeability, vapor permeability, dust permeability, pollution, hygroscopicity, electrification. The heat-shielding properties of knitwear depend not so much on the thermal conductivity of the fibers, but on its porosity,

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thickness, yarn structure, weave, finish, humidity, breathability. Knitwear has a greater porosity than fabrics, and therefore its heat-shielding properties are higher (in the absence of wind). Double-weave fabrics (interlock, fang, plaid, plush, etc.) have the best heat-shielding properties, since this structure of the fabric provides the presence of closed air pores, as well as tufted (bouffanted) fabrics and fabrics made from woolen and high-volume yarns and threads.

Windproof properties of knitwear are low, due to the high porosity of its loop structure. Air permeability - the ability of a material to pass air - depends on the porosity, the number and size of open pores, the type of yarn (threads), the thickness of the fabrics, the density of the fabric, the type of weave, the presence of a sizing, the moisture content of the fabric, etc. This indicator is higher due to the loop structure in knitwear than in textiles. Vapor permeability - the ability of a material to pass water vapor from an environment with a higher relative humidity to an environment with a lower humidity. It depends on the same factors as air permeability. A relatively large number of through pores in knitted fabrics in comparison with fabrics and their larger sizes, other things being equal, also ensure faster absorption of vaporous and liquid moisture by knitted fabrics.

The dust permeability of knitwear is determined by the same factors as air permeability and, in addition, depends on the size of the particles and the properties of the dust, the electrification of the fabrics, etc. The dust permeability of fabrics made from natural fibers is greater, while synthetic fabrics, which retain dust better, are less. Due to the high porosity, the dust permeability of knitwear is higher compared to products made of fabrics. Pollution The higher porosity and rough surface of knitwear, unlike many types of fabrics, also cause a number of its significant drawbacks - high dust permeability and dust capacity, which leads to increased contamination of some types of knitwear.

The hygroscopicity of knitwear is characterized by its ability to absorb and release water vapor; it is higher than in textile products. Knitwear made from woolen, cotton, viscose fibers has a higher hygroscopicity than knitwear made from acetate and synthetic fibers. Knitwear made from cellulose fibers quickly absorbs and releases moisture, from woolen - slowly. The rate of absorption and evaporation of moisture also depends on the structure of knitwear: the denser the fabric, the slower the process of absorption and evaporation of moisture proceeds. The thicker the fabric, the higher the linear density of the threads, the higher the electrification. Of the chemical fibers, nylon and acetate fibers have the highest electrification. Weaves are used to reduce electrification,

Aesthetic properties of knitwear. They are determined mainly by the integrity of the composition, style orientation, functionality of the model. The main

aesthetic properties of knitwear are texture, color design, gloss, transparency, haze, stiffness, drape, elasticity, creasing, shape stability during operation.

The main components (elements) of the composition and the means of its construction are lines, proportions, material, visual mass, decoration, rhythm. Style orientation characterizes the conformity of a knitted product and its properties to the requirements of fashion and style. The functionality of a knitted product characterizes the conformity of the shape, color, pattern, colors, finishes, properties of the fabric and accessories to the purpose of the product, depending on the gender and age of the consumer, the type of activity, the environment, climatic conditions, the area of operation, etc. The appearance of knitwear is influenced by the structure of the yarn and thread, the type of weave, pattern, density, thread length in the loop, porosity, surface texture, and the type of finish. Compared to fabrics, knitwear has less wrinkling due to its loop structure.

The aesthetic properties of knitwear depend on the color scheme, the nature and composition of the pattern of the fabrics used, the silhouette, shape and composition of the elements of the product itself. The use of canvases in accordance with the purpose of the product is important; a design that ensures the correct fit on the human figure, as well as the accuracy and care of workmanship and quality of finish. The appearance of knitted products and their compliance with the modern fashion direction largely depend on the correctness of modeling. When modeling knitwear products, the shape of individual parts is created both due to seams, darts, folds, and in the process of knitting knitwear by changing the structure of weaves. For example, to obtain an adjacent shape, weaves with different extensibility are used.

Clothing modeling is a kind of arts and crafts, the art of decorating people's household items.

The term "modeling" comes from the word "model", that is, a sample, and means the creation of a model, according to which products will be manufactured at sewing enterprises in the future.

Modeling clothes, creating a costume is a complex and difficult art that requires special knowledge, high skill, imagination and taste from artists, designers, technologists.

The art of modeling differs from other types of arts and crafts in that it is directly related to a person: creating a costume, a fashion designer works on shaping the appearance of a person. In this case, the costume plays an active role. A costume can reveal, emphasize, make certain external data of a person more vivid. With the help of a suit, you can visually increase or decrease the height and volume of the figure, give other proportions to parts of the body, hide body flaws. The color of the suit can also change the tone of the skin, increase the intensity of the color of the eyes, hair, face. Finally, a suit can reveal and emphasize the individual style of a person.

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Thus, clothing is one of the components that create a certain appearance of a person.

But the appearance of an individual to a certain extent generalizes the most characteristic features of the people of a given society.

The external data of people constitute only one side of the image - the visible, in other words - the external appearance. The other side of the image is made up of qualities. so-called internal order - is the inner world of man: character, temperament, spiritual and mental development, education, aesthetic taste, general culture.

Consequently, the costume is a means of external expression of the spiritual image of a person.

In order to create clothes that are in harmony with the image of the people of our era, the fashion designer must observe and study the aspirations, interests, tastes and requirements that society lives in, must be imbued with the spirit of our time, our era.

For our time, the phenomenon of interconnection and mutual influence of the fashion designer and the consumer is typical. The artist creates models of clothes, the most popular of which become fashionable. When choosing one or another type of clothing, a person focuses on fashion information, uses its main directions, while showing his individuality, his taste. There is a so-called interpretation of fashion, which in turn becomes the source of its further development by the fashion designer. The famous French artist Cardin said about this: "I take fashion from the street and return it back."

When modeling clothes, a fashion designer must proceed from the possibilities of production, taking into account the availability of the necessary raw materials.

An important condition for modeling is the artist's impeccable knowledge of the human figure, its plasticity and proportions, knowledge of the laws and rules of the harmonious combination of individual parts of clothing and the technology of its manufacture.

Clothing modeling is based on three principles:

- conformity of clothes to the external and internal appearance of a person;
- conformity of clothing to its purpose;
- compliance of the material used with the shape and purpose of clothing.

Clothing modeling at enterprises in the Republic of Belarus is carried out by full-time fashion designers who develop new models of products with, as a rule, recognizable and characteristic features of this brand. Also, on the basis of enterprises, collections of famous Belarusian designers are sewn, who are engaged in the development of models from knitted fabric. In the future, models from the collections are given to mass production under a joint name. In the markets, the most famous fashion designers working with knitwear are Lyudmila Labkova with the brand of the same

name, Petr Malkovich and the Malkovich brand, Fur Garden and many other talented artists.

The work of artists at enterprises is based on two directions:

- experimental work on the creation of fundamentally new forms and types of clothing based on new materials. Such modeling is called prospective;

- creation of samples of clothing models for industrial production on the basis of materials produced by the industry.

The process of creating both a perspective and an industrial model consists of two stages: the development of a project (composition) of the model and the implementation of the project in the material. Both stages from the birth of an idea expressed in a sketch to the embodiment of this idea in the appropriate materials are a creative process. It involves an artist (author), designer, master performer, fashion model. The leading role in this belongs to the artist.

Composition work. The work begins with a preparatory stage, in which the artist solves the following questions:

- for whom the model of clothes is created;
- what is its purpose;
- what form most closely matches the purpose of clothing;
- what color and texture solution should be taken to implement the artistic concept;
- what materials should be used to complete the project - compositions;
- in what production the model will be made in the future.

In solving all these issues, the artist can proceed from various sources, such as traditional folk art and national color, images of the surrounding nature, examples of classical and modern decorative art, etc. From the whole variety of decorative motifs, the author selects what is close to his creative personality, what, in his opinion, contributes to the solution of the tasks assigned to him. At the same time, it is necessary to take into account the dominant trend of fashion, expressed in forms, proportions, lines in clothes, the prevailing color scheme, the nature and type of decoration, etc.

At the end of the preparatory work, that is, the accumulation and selection of primary material, the artist proceeds to the most difficult and decisive period of creativity - the implementation of his project in the form of a sketch. The main requirements that apply to a sketch (drawing): clarity, expressiveness, completeness; perhaps a more complete display of artistic intent; modern way of doing it. Each idea is varied by the author in various sketches several times, either in shape and cut, or in color and details. The last, most satisfying version of the sketch for the author is discussed at the "small" or "internal" council, which includes highly qualified, experienced

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specialists - the chief artistic director, senior artists, designers, technologists and shop managers. Comprehensive discussion of sketches, comments and recommendations made at the council, improve the creative proposal of the artist. One of the decisive factors to which the council pays special attention, along with its aesthetic value, is the cost-effectiveness of the model in terms of its mass production in a garment enterprise. Approval of the sketches ends the first part of the creation of the model - compositional.

Implementation of the composition in the material. This work begins with the manufacture of patterns, i.e., components of the three-dimensional form of the product. At this stage of model creation, the constructor is included in the work. He must "read" the artist's intention, expressed in the sketch, and find the necessary means and methods for implementing the model in the material.

There are various methods for reproducing the shape of the model, and, consequently, for obtaining patterns:

- Technical design - building a drawing on a plane, i.e., designing the components of a three-dimensional form of a product on a plane. Cut out of fabric, these parts of the part are connected into a three-dimensional shape.

- Fake method - creating a form from the so-called mock-up fabric by the method of mock-up, tattoos (on a figure or mannequin). For this purpose, cotton calico of various articles is mainly used (when making a mock-up of a light dress) or linen and semi-linen edging (when making a mock-up of an outerwear product). Patterns are made by transferring the layout to a plane.

- The complex method includes both of the previous ones and is applied depending on the complexity of the individual details of the model.

Most often, dummy and combined methods of project implementation are used when creating a model of new, complex proportions, complex cut, in the presence of new constructive lines in the model. A layout made by one of the indicated methods is tried on a pre-selected fashion model. Trying on a real moving figure of a certain build allows you to identify the desired silhouette and the desired proportions, clarify the cut lines in accordance with the figure, the direction of the tucks, folds, outline the location of small details: valves, straps, pockets, etc. planes, specify the configuration of the clothing details, after which the patterns (patterns) are made again, taking into account all the necessary amendments.

According to the refined patterns, the product is cut out from the material selected for this model, which, after basting, is again tried on the fashion model. When trying on, the artist, designer and master performer discuss not only the general appearance of the model, but also its technological implementation, that is, the processing of each line and detail and the sequence of processing the entire product. This work is of great importance, because no matter how interesting the model is in its design, no matter how beautiful. No matter how it was performed, incorrect or poor processing will negate all its advantages. Precise and impeccable execution of a model sample contributes to its aesthetic value. The creative beginning in the profession of a tailor, especially when working with new fabrics.

Quality - a set of characteristics of an object related to its ability to satisfy stated and proposed needs. Factors affecting the quality of goods include factors that shape quality, factors that contribute to maintaining quality, and factors that contribute to improving quality (Figure 4).

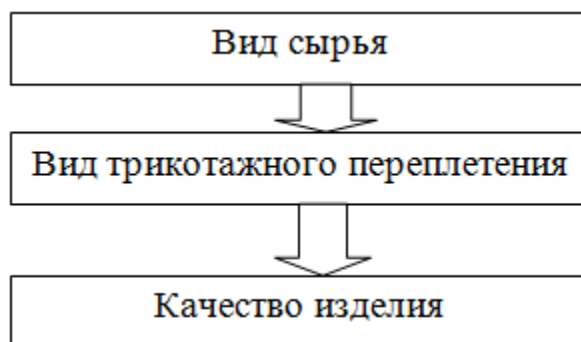


Figure 4. Factors that shape the quality of knitwear

Raw materials are one of the main factors that shape the quality of knitwear. Currently, knitting enterprises process almost all types and varieties of fibers and threads obtained from them. Threads consist of short or long elementary fibers of various nature. They are divided in the transverse direction into their constituent parts - fibers by unwinding.

At present, all types of raw materials are processed in the knitwear industry, including yarn from natural silk tows and from flax fibers mixed with synthetic ones; threads of various thicknesses and degrees of twist are used. Basically, yarn and threads of mixed fiber composition are used, which provides

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good hygienic properties of the fabrics, less shrinkage and creasing, good wear resistance.

Thin and threads from chemical raw materials are used for fabrics with increased surface smoothness (front and back), which should be easy to slide on the surface of the skin and outerwear. These are underwear, blouses and shirts. The shiny surface of the threads emphasizes the effect of shiny and matte stripes and shades. From threads of increased volume - textured - fabrics are obtained with a relief surface, increased thickness with a small mass of 1 m². Thick, loose yarn is used for fleece in fabrics for warm underwear or sportswear. Yarn and threads of increased twist give the fabric rigidity; the loop structure of such knitwear is uneven due to the increased tension of the thread when bent into loops, the twisting of the edges of the fabric increases, but its surface is less loose, more wear-resistant. Twisted yarn and threads are subjected to pre-treatment (steaming, stabilization, oiling) in order to balance their structure and relieve stress. The best yarn in terms of properties cannot be considered satisfactory if it does not meet the requirements of the product being produced or is not prepared for processing on equipment under modern production conditions. Incomplete readiness of raw materials for processing has a negative impact not only on the quality and grade of products, but also on the performance of the enterprise and the use of equipment.

The properties of a yarn for knitwear production are determined by studying the structure of the loops, the deformation of this structure, i.e. considering, first of all, the mechanical functions of the thread in the knitwear loop. If we imagine schematically a thread with a round cross section, then with an increase in the diameter of the thread, its resistance to bending will increase significantly. It is of interest to us to increase the diameter of the thread without increasing the number of fibers in the cross section. This is quite possible if the threads betray a loose structure. The loose structure of the yarn has many advantages, the main of which are:

- 1) increase in elastic resistance to bending and the ability to better restore the shape of the loop during deformation;
- 2) high quilting, which allows the use of threads of a lower linear density (by 10-15%) without increasing the density of knitting (reducing the length of the thread in the loop) and therefore without reducing the productivity of knitting machines;
- 3) lightening the weight of the product and giving it a pleasant softness to the touch;
- 4) increasing the thermal insulation properties of products;
- 5) improving the ability of yarn to be processed on knitting machines.

Among the most important requirements for raw materials, it is impossible not to point out the resistance of the thread to friction. The elasticity of

knitwear loops during deformation is associated with the friction of the threads on the thread (when the shape of the loop changes) and the friction between the fibers (when the thread is bent). Friction resistance in this case plays a very significant role. It can be reduced by reducing the coefficient of friction and improving the surface condition of the thread, which is achieved by waxing or emulsifying the thread, which reduces the coefficient of friction of the thread on the thread and on the thread guides of knitting machines. The smoothness of the surface of the thread, its cleanliness, the absence of impurities, cones, knots are necessary not only for the normal course of the thread processing process, but also to give knitwear elasticity, dimensional stability, and good appearance. Some knitting experts claim that the finishing of knitwear is intended to improve the properties of raw materials or correct their shortcomings. It is not right. Knitwear is formed from the thread, and the properties of the knitwear primarily depend on the initial properties of the thread.

For the production of good products, finishers must receive a full-fledged harsh jersey. The considered requirements are common for all types of threads intended for the production of knitwear. However, they do not exhaust all the requirements for raw materials. For example: yarn that does not meet the requirements of knitwear production includes: unwound cobs, on which yarn is missing more than 30% of the weight of the forging, yarn in broken containers, frayed, mixed numbers, moldy, dirty, oily, different shades.

According to the method of knitting, there are cross-knitted (kulir) and warp-knitted knitwear. The culinary method involves laying threads by successively bending and knitting them into loops in a horizontal direction. The fabric is made in the transverse direction. Such knitwear can be obtained from one system of threads in the form of a fabric, a finished product and individual parts. It is characterized by easy horizontal unraveling, i.e. in the opposite direction to knitting, and if the thread breaks, also vertically.

Knitwear is represented by a wide range: from thin smooth to voluminous fluffy fabrics and products. In obtaining a knitted fabric using a warp knitting method, a number of thread systems is involved, equal to the number of loops in a row (up to several hundred). This allows you to knit all the loops of the horizontal row at the same time. The fabric is growing in the longitudinal direction. Warp knitted fabrics are characterized by a small fineness and smoothness. The direction of the thread in knitwear is similar to the location of the weft threads in the fabric, and in warp-knitted - the location of the warp threads. Warp-knitted knitwear, in contrast to cross-knitted, has less extensibility and greater dimensional stability, the dissolution of the fabric is carried out only in the

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direction opposite to knitting. Cross-knitted (kulir) weaves are divided into main.

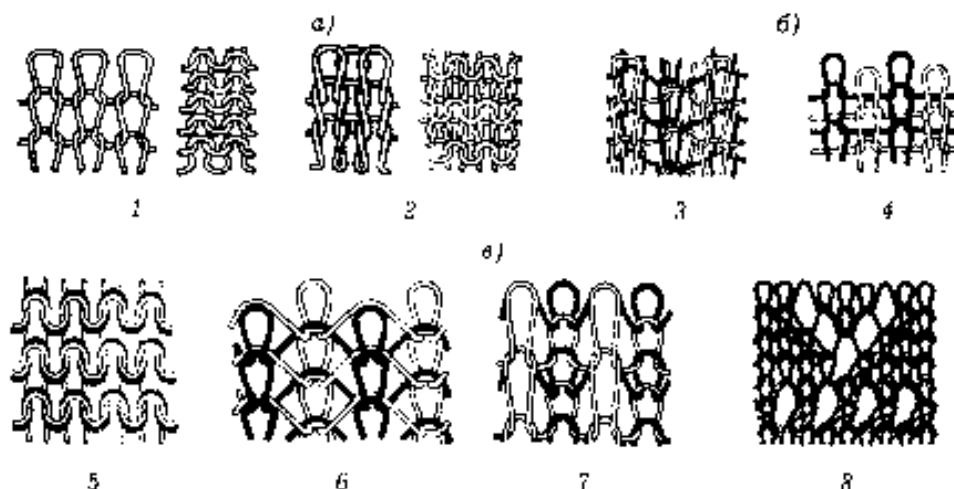


Figure 5. Cross-knitted (kulirny) knitted fabrics: a- main: 1 - smooth surface; 2 - eraser; b- derivatives: 3 - interlock; 4 - derivative surface; c - patterned: 5 - plated canvas; 6 - fang; 7 - semi-fang; 8 - openwork

The surface is characterized by a flat, smooth front surface formed by the front loops and a rough surface formed by the purl loops. The front and back sides are very different from each other. It has good extensibility, vapor and air permeability. Easily dissolves and twists around the edges, which complicates cutting and sewing products. The eraser is an alternation of front and back looped vertical columns along the front and back sides of the canvas. The alternation of facial and purl columns can be different: one - front and one - purl, two facial and two purl, as well as other combinations. Distinctive properties of the eraser are high elasticity, less spreading in comparison with the surface, high extensibility in width, good dimensional stability. A group of derivative weaves. Interlock is obtained by cross-weaving two erasers. On the front and back sides, only the front loops are visible even with strong stretching. The centers of the front loops on both sides of the fabric coincide, since the loops are located "back to back". Two threads are involved in the formation of each horizontal row of the canvas. Characteristics of interlock are low extensibility and blooming, abrasion resistance, elasticity and heat protection. The derivative surface is an alternation on the front side of the rows of facial and purl loops. Both sides of the canvas have the same appearance. Cloths are dense embossed. The centers of the front loops on both sides of the fabric coincide, since the loops are located "back to back". Two threads are involved in the formation of each horizontal row of the canvas. Characteristics of interlock are low extensibility and blooming, abrasion resistance, elasticity and heat protection. The derivative surface is an alternation on the front side of the rows of facial and purl loops. Both sides of the canvas have the same appearance. Cloths

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A group of patterned weaves. Plated (cover) weaves are produced by simultaneously laying two loops of different colors or fibrous composition. Varieties are: smooth plated weaves, in which, when two threads are laid simultaneously, the cover thread goes to the front surface, and the ground thread goes to the wrong side, and patterned plated weaves, which are obtained by alternately knitting the cover or ground thread. Cloths have a beautiful appearance. Smooth weaves differ from patterned ones in greater density, extensibility and wear resistance. Fang is obtained on the basis of an eraser by alternating in each horizontal row knitted facial loops and untied purl loops, but having a crochet. Both sides of the canvas are the same and look like an eraser, but the purl loops are clearly visible even without stretching the canvas in width. In a semi-fang, each even row is knitted like an eraser 1x1, odd - like a fan. The front and back sides resemble an eraser, but differ in the

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shape of the front loops: on the one hand, they have a more elongated shape, on the other, they are more rounded. Unlike a fan, a semi-fang is more extensible, has a lower mass, density, and heat protection. Compared to the eraser, fang and semi-fang have less extensibility, but greater thickness, mass and strength. has a lower mass, density and thermal insulation.

Compared to the eraser, fang and semi-fang have less extensibility, but greater thickness, mass and strength. Compared to the eraser, fang and semi-fang have less extensibility, but greater thickness, mass and strength.

Warp weaves can also be main, industrial and patterned (Figure 6).

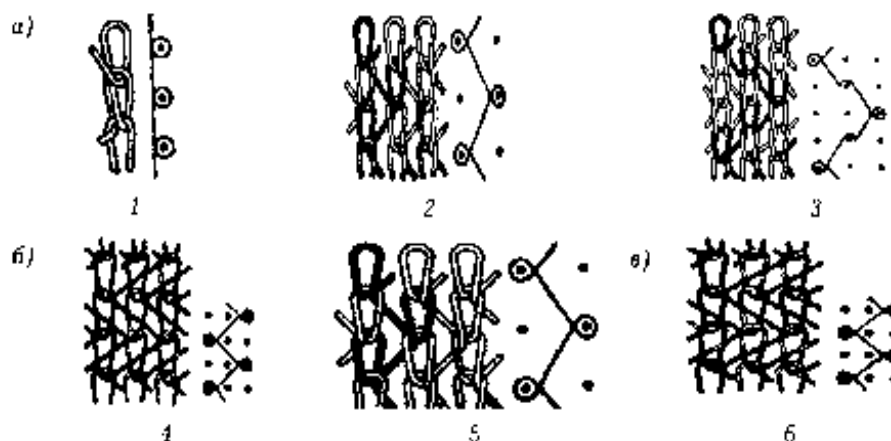


Figure 6. Warp knitted fabrics: a - main: 1 - chain; 2 - tights; 3 - atlas; b - derivatives: 4 - cloth; 5 - charm; c) - patterned: 6 - sirloin

Group of main weaves. A chain is a loop column obtained from one loop by laying it on the same needle. Dissolves in the opposite direction of knitting, has little stretch. Used as a fringe in scarves and shawls, as well as for combination with other weaves. Tricot (2) is produced by shifting the vertical course of the thread after knitting a loop by one needle to the left or right. It is characterized by greater extensibility and looseness, therefore it is used to obtain combined weaves. Atlas is a single weave, when each thread sequentially forms loops, first in one direction, then returns back. The canvas has a transverse stripe, which is especially noticeable when using colored threads. Atlas is characterized by curled edges.

A group of derivative weaves. Cloth is obtained by knitting loops not in the next row, as in tights, but through one row. On the wrong side of the fabric, the broaches between the loops form a pattern in the form of a "herringbone" located across the fabric. Compared to tights, the cloth is less stretchy and loose, but heavier and denser. Charme (5) is made by knitting loops through two rows, so the broaches on

the wrong side are longer than in the cloth and form a dense covering. To increase the heat protection, the resulting covering can be subjected to napping. Charme is heavier and thicker than cloth, but less unraveling and stretching.

A group of patterned weaves. The plated (cover) weaves are distinguished by the presence of a pattern obtained by changing the color of individual loops in a certain pattern. To obtain them, two differently colored threads are used: one goes to the front surface of the canvas, the other to the wrong side. The most common weaves are leotard-leotard, cloth-cloth, leotard-cloth, leotard-charm, satin-cloth, satin-leotard. They have a slight extensibility and blooming, beautiful appearance. Loin, as well as openwork, in cross-knitted weaves, is distinguished by the presence of a pattern of holes (of various shapes and sizes) obtained in the knitting process. The basis for the production of sirloin cloths are tights, cloth, satin, combined weaves.

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Figure 7. - Evaluation of the quality of the consumer level of products

Quality assessment is understood as control (checking) of the consumer level of product quality based on the results of the analysis. Analysis is the presentation by experts of the necessary information about the quality of a product or value judgments. Analysis of the quality of garments is carried out by three methods: organoleptic, measuring and sociological.

The organoleptic method is the most common, simple and affordable. Quality is analyzed with the help of human senses and sensations, therefore the accuracy and reliability of the values of product property indicators depend on the qualifications, practical experience, and abilities of specialists who evaluate quality. The main means of the organoleptic method are the sense organs (organ of vision and touch receptors). The organ of vision - the eye - is able to perceive the visual sensations of the form (silhouette), composition (the nature of the division of parts), color, surface condition and integrity. Touch receptors perceive various tactile sensations: touch, pressure, comfort in static and dynamic, heat or cold. The organoleptic method determines the quality of the fit of the product on the figure of the mannequin and the quality of the manufacturing technology.

The measuring method evaluates the quality of products by controlling the linear measurements of products, the frequency of stitches, the size of defects in the appearance of materials and paired parts of clothing. The main means of the measuring method are: non-folding measuring ruler, tape measure, ring gauge, triangle, textile magnifier, protractor, tested in accordance with GOST 8.001-80. Methods for measuring the main and auxiliary linear measurements of products must comply with GOST 4103-82.

The main linear measurements of products include: back length, back width, product width at the armhole level, sleeve length, collar length, product width along the waist line, product width at the level of the hip line. This method also determines the frequency of stitches in lines, the number of unified parts in the design of clothing and the size of defects. The measuring method can determine the quality of clothing processing, which is characterized by such indicators as the accuracy of reproducing the shape and dimensions of the product, its individual parts and assemblies, as well as the accuracy of the location of the product on the human figure. The accuracy that characterizes the quality of clothing manufacturing is the degree of approximation of the manufactured product to the calculated nominal prototype. Templates are used to assess the accuracy of the shape reproduction of individual parts and lines of products.

Sociological methods for assessing the quality of products are aimed at solving optimization problems, that is, improving and developing the activities of any functional service, assortment or quality level of products. Examples of such studies are analysis of the assortment structure, expert evaluation of product quality. In the light industry, the methods of questioning and interviewing are widely used. Knitwear is a textile fabric or a product obtained by knitting, so any knitted material is a system of loops connected in the longitudinal and transverse directions. Knitted fabric consists of two perpendicularly intersecting systems of threads. The longitudinal threads are called the warp, and the transverse threads are called the weft. The primary element of the knitwear structure is the loop. It is a spatial curve, the shape of which affects the properties of the web. The shape of the loops is varied: rounded,

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wide, narrowed, elongated. In height, loops of normal size, reduced and enlarged are distinguished. The higher the loop and the more the thread is straightened, the lighter the canvas appears as a result of the directed reflection of light. The loops, connecting with each other horizontally, form looped rows, vertically - looped columns. The distance between the centers or points of the same name of two adjacent loops along the line of the loop row is called the loop step. Knitwear is divided into warp knitting and knitwear. In the warp knitting, each thread forms one loop in the loop row and goes to the next row. In knitwear, each thread sequentially forms loops of one loop row. One thread is enough to form one loop row of knitwear. To form a loop row of warp knitwear, as a rule, as many threads are required as there are loops in the loop row. Knitwear and warp knitwear can be either single or double. Single knitwear is produced on machines with one needle bed, and double knitwear is produced on machines with two needle beds.

According to the classification, all knitted weaves are divided into main (weaves with the simplest structure) and derivatives (a combination of several identical main weaves mutually knitted so that looped columns of another same weave are placed between the stitches of one weave). On the basis of each of the classes of these groups, patterned and combined weaves (weaves that consist of weaves of several classes) can be formed.

To obtain fabric in the simplest case, two systems of threads (warp and weft) are needed. Knitwear can be knitted entirely from one thread. As well as knitwear can be made in the following ways:

- cutting;
- semi-regular;
- regular.

The cutting method consists in cutting the knitted fabric, i.e. cut out from it the details of the products according to the patterns and connect them on a sewing machine, giving the products the necessary shape. This method is used to manufacture underwear and outerwear, as well as most of the glove products. This method of manufacturing products is characterized by significant waste of knitted fabric, reaching 18-23% when cutting linen products and up to 25-28% when cutting upper products. This technology is used for low-cost products in mass production and linen knitwear. Positive for this method is the possibility of manufacturing products of various models and high productivity of knitting machines.

The semi-regular method differs from the previous one in that the knitted fabric is knitted on a circular knitting machine in the form of tubular coupons. The coupons are separated from one another with the help of a dividing loop row so that the lower edge of the coupon has a solid, non-unfolding loop

row that does not require sewing. The consumption of knitted fabric per product with a semi-regular manufacturing method is 3-5% less than with a cutting method due to the absence of side seams and hem allowances for the bottom of the product; in addition, the time for cutting and sewing is 8-10% less.

The semi-regular method is most common in the manufacture of outerwear, and can also be used for the manufacture of lingerie with the necessary knitting equipment. Products made in this way have the great advantage of achieving the best fit and fit of the product.

The regular way of making a product is that the products are knitted entirely without seams or individual parts are knitted along the contour, and then sewn with a chain stitch. This method is characterized by the most economical use of raw materials. However, knitting the details of the product requires more labor than knitting in a semi-regular way. This method is used when knitting upper products from expensive material.

The last two technologies are most applicable in exclusive small-scale production, because they make it possible to achieve high quality products, a maximum range of products and a quick change of models.

The knitwear wardrobe is divided into four main groups according to equipment classes (how many needles fit in one inch of a knitting machine (one English inch is 25.4 mm):

- 1 group 2.5 - class 3 (shaped products, hand knitting);
- 2 group 5 - 8 class (jackets, vests, coats);
- 3rd group 10 - 14 class (skirts, trousers, jumpers);
- 4 group 16-24 class (linen jersey).

The higher the class, the thinner the product and vice versa. Accordingly, for the outer jersey in relation to the first three.

There are the following stages of knitwear production:

- Pre-treatment of yarn, checking the yarn for defects in accordance with GOST 6611-55 "Textile yarn and threads. Test methods";
- Knitting coupons (large patch);
- Washing coupons;
- Drying coupons;
- Coupon stripping;
- Cut coupons;
- Sewing assembly of products;
- Interoperative ironing;
- Handmade;
- Final ironing;
- Acceptance of each product in terms of quality;
- Packing, marking of products;
- Warehousing, storage, shipping products.

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Figure 8. Technological cycle for the production of knitted fabrics

The sum of all stages gives the technological cycle of production, and the quality of knitwear will also affect the quality of each stage. Some manufacturers do not perform one or more of the above steps in order to reduce the time and cost of production, which, of course, negatively affects the quality of the products as a whole.

Thus, the main stages of the technological production of outer knitwear depend on the method of manufacturing the product: cutting, regular, semi-regular. In production, it is important to consistently

follow the described stages to obtain high-quality products.

Equipment used in knitting fabric.

The fabric for the production of knitted products is of two types:

- a) culinary
Smooth
bouffant
- b) warp knitted.

Depending on these types, different equipment is used.

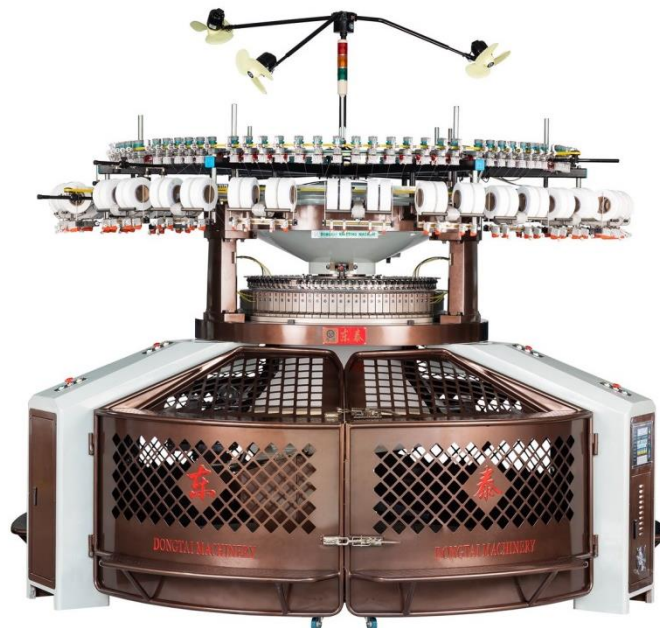


Figure 9. Machine MS-5 for the production of a spun smooth fabric

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The culinary smooth fabric, the most common in underwear production, is produced mainly from cotton fabric. MC-5 circular knitting machine serves as the main machine for the production of a single knitted fabric. This machine, when processing cotton yarn, operates with a peripheral speed of the cylinder

equal to 0.6-0.7 m/c. Depending on the diameter of the cylinder, the machines have a different number of needles and loop-forming systems and, accordingly, different performance:

Table 4.

Cylinder diameter, mm	Number of needles	Number of looping systems
350	952	42
400	1092	48
450	1228	54
500	1356	60

With an increase in the number of loop-forming systems, the productivity of the machine increases.

Culinary fleece is used in the production of both underwear and outerwear.

Lined weave fabric based on satin stitch is the most common for warm, linen, sports and children's outerwear.



Figure 10. Machine MT for the production of knitted fabric lined weave

The main machine for the production of lined weave fabric is a single circular knitting machine MT, the characteristics of which are given in table 5.

Table 5.

Cylinder diameter, mm	Number of needles	Number of looping systems
450	816	4 or 5
500	906	5 or 6
550	996	7 or 8

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When using cotton yarn, the peripheral speed of the needle cylinder is 1.7 m/cand higher, and the

productivity of the machine is 6.5-8 кг/ч lined weave fabrics.



Figure 11. Machine Koket-E2 for the production of warp knitted fabric

The main machine for the production of warp-knitted fabric is the Koket-E2 machine. Knitting speed 1800 loop rows per minute. Sectional spools with warp threads are installed on the machine, the length of the thread wound on the spool is 60,000 m. roll weight of 100 kg or more. The drive mechanism

allows you to adjust the knitting speed in accordance with the quality of the threads and their breakage.

The working width of the Koket-E2 machine can be selected from the following six values given in Table 6.

Table 6.

Working width of the machine, mm	Maximum knitting speed, <i>ряд/мин</i>
2134	1800
2362	1800
3200	1600
3429	1600
4267	1400
4496	1400

Since the machine can knit a fabric of any width or several fabrics with a total width that fits into the maximum working width of the machine, some efficiency from the use of wide machines is possible. The productivity of a machine with a working width of 4267 mm is about 80% of the productivity of two machines with a working width of 2134 mm.

Single-needle stitching-overlocking machines are most widely used for grinding product parts with simultaneous trimming and overcasting of cuts.

Domestic car 208 cells. has a straight needle and sews a three-thread overlock stitch. The frequency of rotation of the main shaft is 500 min-1. Stitch length 1.5-3.2 mm. Seam width 2.5-4 mm.

The equipment used in the sewing of the product.

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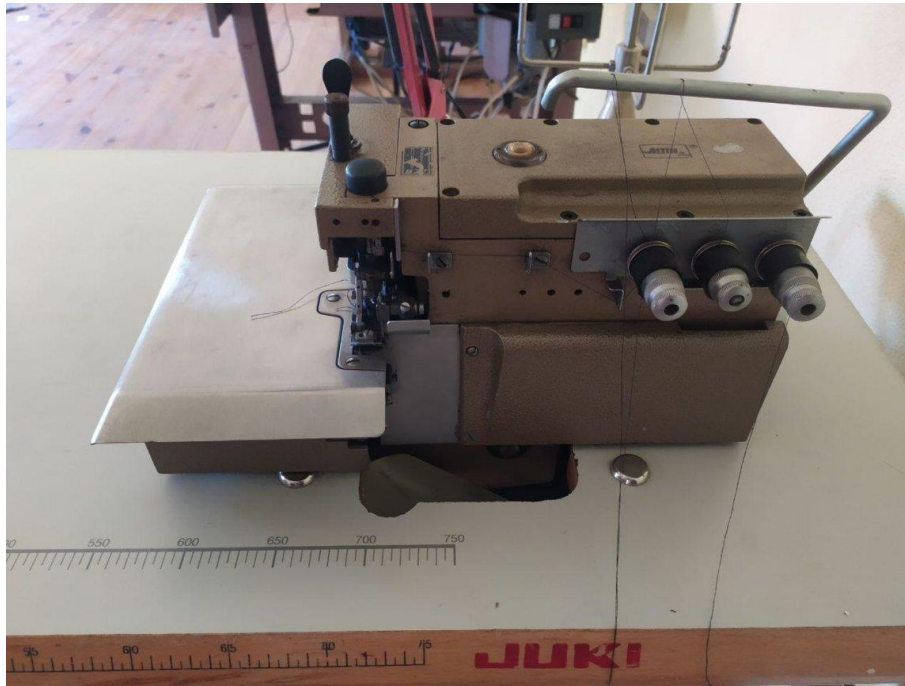


Figure 12. Machine 8515/110 class. for sewing a three-thread overlock stitch

Machine 8515/110 class. association "Textima" performs a three-thread overcasting stitch. The frequency of rotation of the main shaft is 8000 min⁻¹. Stitch length from 0.6 to 3.2 mm. The machine is equipped with a thread cutter and a part stacker.

For processing sections of a belt, underpants, underpants, etc. the two-needle machine 1476 is used, performing a three-thread flat chain stitch. The machine is equipped with a device for feeding, guiding and tensioning the elastic band. The

frequency of rotation of the main shaft is 500 min⁻¹. Stitch length 1.8-2.8 mm.

Auxiliary equipment.

We can refer to auxiliary equipment: machines for rewinding yarn (winding machines), rulers for measuring the length of the thread in the loop when knitting the fabric, dyeing machines AK-220T for dyeing the fabric, centrifuges for squeezing the fabric, presses and irons used in wet heat treatment and etc.

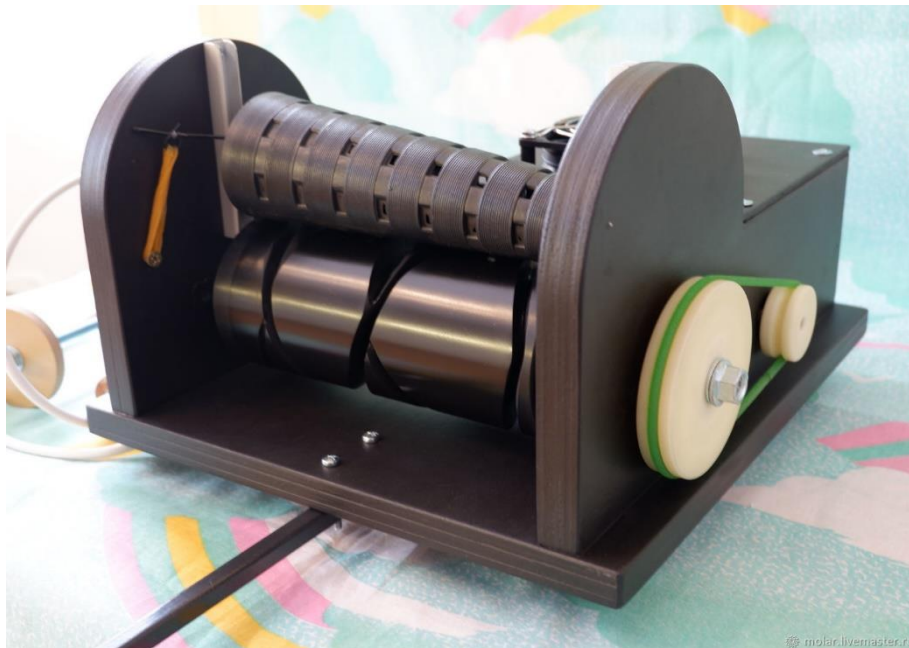


Figure 13. Machine AK - 220T for rewinding yarn (winding machine)

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To transport the fabric after knitting, parts after cutting, as well as auxiliary materials (buttons,

threads, button hooks, etc.), belt and cradle conveyors, as well as floor shelves and trolleys are used.



Figure 14. Single knitting machines mod. SYX-3 by "Jymberca"

In the knitting shop, modern circular knitting equipment is installed, which allows producing a variety of fabrics according to their structure. For example, satin stitch, elastic, double elastic smooth and patterned, press, etc. In the manufacture of the fabric, single knitting machines mod. SYX-3 by

"Jymberca" class 24, mod. FX - JS / 72 by Monarch Kniffing Machinery, class 24, new equipment from Mayer & Cie (Germany) class 24 and 28 can be installed in the knitting shop, allowing the production of a new range of lightweight knitted fabrics, the need for which is very high.



Figure 15. Luft-roto-plus ejector dyeing machines for the production of bleached, plain-dyed, printed fabric in a wide range of colors

In the dyeing and finishing shop, modern dyeing ejector machines "Soft-stream", "MCS", a new dyeing machine "Luft-roto-plus" with an aerodynamic dyeing effect are installed. With the help of these machines, we are able to produce fabrics in bleached, plain-dyed, printed form in a wide range of colors. The use of the Santex finishing line contributes to obtaining a high-quality canvas. The machine is equipped with an

electronic control panel, which makes the process more reliable and convenient. SSHSM "Elitex" and "Bruckner" are used for drying and stabilizing knitted fabrics. Technological process parameters are set on the control panel. The machines are equipped with devices for cutting the edge, which further facilitates the process of laying the fabric for cutting.

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Figure 16. High-performance cutting and spreading complex "Gerber"

The fleet of sewing equipment is constantly updated and expanded. These are the machines of the firms "Rimoldi" (Italy), "Yamato" (Japan), "Pfaff" (Germany), "Juki" (Japan).

For laying and cutting the fabric, the enterprise purchased a high-performance cutting and spreading complex "Gerber".

It is only important to remember that an important task for enterprises is to attract new partners and search for new markets. Raw materials are one of the main factors that shape the quality of knitwear. Currently, knitting enterprises process almost all types and varieties of fibers and threads obtained from them.

Threads consist of short or long elementary fibers of various nature. They are divided in the transverse direction into their constituent parts - fibers by unwinding.

According to the type of raw materials used, knitted fabrics and products are divided into three groups:

- from yarn - these are threads consisting of short fibers formed as a result of torsion;

- from threads consisting, as a rule, of long monofilaments and having different twists;

- from various combinations of yarn and threads.

At present, all types of raw materials are processed in the knitwear industry, including yarn from natural silk tows and from flax fibers mixed with synthetic ones; threads of various thicknesses and degrees of twist are used. Basically, yarn and threads of mixed fiber composition are used, which provides good hygienic properties of the fabrics, less shrinkage and creasing, good wear resistance.

Consider the raw materials used for the production of knitwear in comparison with materials for the production of other types of knitwear, for greater clarity.

Linen fabrics are produced mainly from cotton, cotton-lavsan, cotton-polynose, cotton-viscose yarn, as well as from viscose, acetate and polyamide complex yarns. A number of fabrics are made from half-woolen and pure-woolen yarn. Cloths for outer knitwear are made from all types of raw materials; hosiery - mainly from polyamide threads, cotton and half-woolen yarn.

Depending on the purpose of the fabric, threads of different structures are selected: yarn of various spinning methods and degrees of twist, single-filament and twisted complex threads from chemical raw materials, shaped twist threads, textured threads, and in different combinations - twisted yarn with complex threads, textured threads - with yarn etc.

Thin and smooth threads from chemical raw materials are used for fabrics with increased surface smoothness (front and back), which should easily slide over the surface of the skin and outerwear. These are underwear, blouses and shirts. The shiny surface of the threads emphasizes the effect of shiny and matte stripes and shades. From threads of increased volume - textured - fabrics are obtained with a relief surface, increased thickness with a small mass of 1 m². Thick, loose yarn is used for fleece in fabrics for warm underwear or sports outerwear.

Yarn and threads of increased twist give the fabric rigidity; the loop structure of such knitwear is uneven due to the increased tension of the thread when bent into loops, the twisting of the edges of the fabric increases, but its surface is less loose, more wear-resistant. Twisted yarn and threads are subjected to pre-treatment (steaming, stabilization, oiling) in order to balance their structure and relieve stress.

The best yarn in terms of properties cannot be considered satisfactory if it does not meet the requirements of the product being produced or is not

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prepared for processing on equipment under modern production conditions.

Incomplete readiness of raw materials for processing has a negative impact not only on the quality and grade of products, but also on the performance of the enterprise and the use of equipment.

The wide range of requirements for raw materials for knitwear is due to the very large variety of the products themselves. For example, requirements for the structure of the thread are imposed, ranging from nylon monofilament for thin stockings and ending with loose woolen and synthetic yarn for pullovers and jackets.

The properties of a yarn for knitwear production are determined by studying the structure of the loops, the deformation of this structure, i.e. considering, first of all, the mechanical functions of the thread in the knitwear loop.

If we imagine schematically a thread with a round cross section, then with an increase in the diameter of the thread, its resistance to bending will increase significantly. It is of interest to us to increase the diameter of the thread without increasing the number of fibers in the cross section. This is quite possible if the threads betray a loose structure. The loose structure of the yarn has many advantages, the main of which are:

- increase in elastic resistance to bending and the ability to better restore the shape of the loop during deformation;

- high zastylistost, allowing the use of threads of lower linear density (by 10-15%) without increasing the density of knitting (reducing the length of the thread in the loop) and therefore without reducing the productivity of knitting machines;

- lightening the mass of the product and giving it a pleasant softness to the touch; 4) increasing the thermal insulation properties of products;

- improving the ability of yarn to be processed on knitting machines.

A thread (yarn) of a loose structure is especially necessary for the manufacture of upper knitwear. For linen products that should fit the body well, you need not a stiff thread, but a very flexible one, consisting of fine fibers, but a loose structure that can maintain the shape of a loop. For winter hosiery, a thread of a loose structure is needed, and for most other hosiery, a denser, twisted thread is desirable. For women's stockings, the densest thread, such as monofilament, with minimal curling is preferred to make the stocking appear thinner.

The loose structure of the yarn is achieved due to reduced twist, which is associated with a decrease in the strength of the yarn. If for fabric strength is the main property of the thread, then for knitwear this property is of secondary importance.

For knitwear, the evenness of the thread in thickness and twist is more important than for fabric products.

The structure of knitwear loops is such that a short piece of thread is bent several times, intertwining with itself and forming loops located next to each other. The thread in each loop, as it were, folds in half, which is why its unevenness becomes pronounced. A group of loops is formed from a thickened or thinned section of the thread, easily distinguishable from neighboring ones. With periodic unevenness of the thread, a defect is obtained, known as zebra.

Thus, the requirements for raw materials in terms of thread evenness are based on the structural features of knitwear loops.

Among the most important requirements for raw materials, it is impossible not to point out the resistance of the thread to friction. The elasticity of knitwear loops during deformation is associated with the friction of the threads on the thread (when the shape of the loop changes) and the friction between the fibers (when the thread is bent). Friction resistance in this case plays a very significant role. It can be reduced by reducing the coefficient of friction and improving the surface condition of the thread, which is achieved by waxing or emulsifying the thread, which reduces the coefficient of friction of the thread on the thread and on the thread guides of knitting machines.

The smoothness of the surface of the thread, its cleanliness, the absence of impurities, cones, knots are necessary not only for the normal course of the thread processing process, but also to give knitwear elasticity, dimensional stability, and good appearance. Some experts in knitwear argue that the finishing of knitwear is intended to improve the properties of raw materials or correct their shortcomings. It is not right. Knitwear is formed from the thread, and the properties of the knitwear primarily depend on the initial properties of the thread. For the production of good products, finishers must receive a full-fledged harsh jersey.

The considered requirements are common for all types of threads intended for the production of knitwear. However, they do not exhaust all the requirements for raw materials. For example: yarn that does not meet the requirements of knitwear production includes: not home-spun cobs, on which yarn is missing more than 30% of the weight of the forging, yarn on broken containers, frayed, mixed numbers, moldy, dirty, oily, different shades.

External defects of yarn on skeins include: tangled and broken threads, foreign and oily threads, loose ends, large knots, thickening and thinning of the thread, bumps, different tone.

The determination of external defects of raw materials is carried out by visual inspection of the surface of the packages (bobbins, skeins) or by winding the yarn on a screen board. The defectiveness

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of the yarn is determined by counting the number of defects on a certain length in comparison with the standards established in the relevant GOSTs. The methodology for checking raw materials of all types is carried out in accordance with GOST 6611-55 "Textile yarn and threads. Test Methods".

All types of threads and yarns are checked for the following basic physical and mechanical properties: thickness, strength, twist (number of twists per 1 m), moisture content (% of absolutely dry weight). The physical and mechanical properties of raw materials should be checked under certain conditions of humidity and temperature of the room in which the test is performed. In GOST 10681-63, these conditions are defined: temperature $-20 + 8$ °C, relative humidity - 65%.

According to the current GOSTs, the following winding density indicators are established: for viscose silk in the range of 0.7-0.8 g / cm³. The density of winding cotton, woolen and semi-woolen yarn is not regulated by GOSTs.

Yarn that does not comply with the requirements of this standard may be used for other industries, provided that it complies with the requirements established for this industry.

Thus, knitted fabrics from various threads and yarns are used for the manufacture of upper knitwear, the quality of the fabric must comply with GOST 28554-90 "Knitted fabric general specifications" and other regulatory documents.

Conclusion

It should be noted that knitwear is a fashion hit of the 21st century. Knitted smooth stoles with a printed pattern, sexy, casual sweaters with deep cutouts, sleeves with slits, tight dresses with wide belts, long cardigans are a nice new detail in the wardrobe of any fashionista. Today, on the catwalks of the world, you can see models knitted according to traditional technology from specially processed strips of leather or even further.

Considered for some time to be suitable only for underwear, today knitwear is rightfully considered the most democratic clothing. It is indispensable for leisure, sports and even for a business wardrobe: a turtleneck under a jacket has long become a classic.

As a result of the research carried out, the following conclusions can be drawn:

1. In the assortment of knitwear, you can find almost any part of your wardrobe: from socks to fashionable coats.

2. The product can become competitive, i.e. take a worthy place among analogues only if it meets such an elusive and significant concept as quality. A more stringent requirement is compliance with standards.

3. Quality is the main characteristic of the product. This is the ability of a branded product to perform its functions. The concept of quality includes durability, reliability, accuracy, ease of operation,

repair and other valuable properties, the absence of defects or defects.

4. The basis for determining the grade are defects - their type, size, quantity, location on the parts and details of the product. Distinguish between the first and second grades of garments.

The product must meet the needs of consumers: physical technically, operationally, aesthetically, at a price.

A product can contribute to the satisfaction of hidden (subconscious) needs - status, age, psychological, spiritual, and then success in the market is guaranteed.

In addition, today modern technologies make it possible to make a knitted thing much more practical and durable through the use of mixed (containing additives) threads. The most popular additives are lycra and tactel. The product containing them becomes more wearable, elastic and does not stretch even after washing. Raw materials and equipment play a decisive role in the production of knitwear.

Thus, the knitwear production, formed within the framework of the ASEZ on the basis of the mining towns of the Rostov region, together with shoe, clothing and leather goods enterprises, will be the most in demand, guaranteeing stable technical and economic indicators for enterprises, a stable financial condition, employment of the population and a real improvement in their social status.

The need to improve the quality management system at domestic enterprises is due to the following important reasons:

- Firstly, this is an increase in the confidence of potential consumers in the products that will be produced by domestic enterprises.

- Secondly, it is an opportunity to significantly strengthen its position in existing markets, as well as significantly expand its spheres of influence by entering new domestic and foreign markets.

- Thirdly, this is a significant increase in labor productivity of any industrial enterprise, which is expected to introduce a QMS using effective management.

The choice of light industry enterprises as an object for assessing the effectiveness of the socio-psychological factor in the implementation of the QMS is due to the fact that these enterprises are characterized by the presence of highly qualified workers and specialists. Thus, the Policy of goals and objectives of the QMS will be implemented much more professionally and at a lower cost due to three main aspects: employee involvement, process approach and systematic approach. In addition, the personnel of light industry enterprises are more effectively able to realize the goals and objectives of the QMS also because control activities are more professionally carried out to fulfill the following situations: persuasion, execution of delegated powers, creation of conditions for increasing productivity and

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effective use of the business qualities of employees.

The task of increasing competitiveness is especially urgent for those enterprises that, due to external factors (increased competition due to globalization, the global financial crisis) and internal (inefficient management), have lost their competitive

positions in the domestic and foreign markets. In response to negative processes in the external environment, the processes of regionalization and the creation of various network structures are intensifying, one of which is the union of commodity producers and the state.

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