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DEVELOPMENT OF WOMEN'S OUTERWEAR DESIGN PROJECT BY STUDYING THE PROPERTIES OF THERMAL INSULATION MATERIALS

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ANNOTATION

Clothing design- This is the development of lapping drawings of clothing details for an individual or custom figure. Especially the design of women's clothing requires high skill and experience from any seamstress. In this article, the author describes in detail the development of a women's outerwear design project by studying the properties of heat-insulating materials.

Keywords: fabric, warm clothing, outerwear, women's clothing, size, length, sewing, garment factories, design, etc.

INTRODUCTION

Clothing design emerged with the advent of sewn garments. The simplest design consists of pieces of fabric of various lengths and widths, which are considered the clothes of the ancient Greeks and Romans. All methods of designing garments differ in the accuracy of the cut, while the engineering methods are more precise. The development of clothing design is carried out by designers who know anatomy and anthropometry, methods of clothing design, physical and mechanical properties of fabrics and much more. As a rule, professional designers work in mass production factories of clothes, fashion houses, workshops and author's workshops. Clothing design emerged with the advent of sewn garments. The simplest design was the dress of the ancient Greeks and Romans, consisting of pieces of fabric of different lengths and widths.

The creation of a mass costume refers to also to industrial production and requires a serious design approach. On the design stages should be taken into account main factors influencing the form wearing a suit. An important role is played here by properties of the materials used. Today down jacket is the most comfortable and practical winter outerwear. This collection is an attempt at a new approach to the formation of the design of down jackets and expanded assortment of outerwear in general. To achieve this goal, the formula was a number of tasks were developed and solved sequentially:

1. Conduct a comparative data analysis on the properties of fluff of various animals and birds and aspects of its application in clothing;
2. Conduct a comparative analysis of properties down and artificial interlinings fishing in the assortment of women's outerwear;
3. Design a collection top row women's clothing for the youth group beaters;
4. Hold artistic designers cue analysis of collections and products using down of the Orenburg goat;
5. Develop technological conditions and outerwear manufacturing modes with goat down insulation.

In a collection designed for young reliable consumer group, are extended down parkas and down shorts, cropped to match high-waisted skirts her, capes and capes of various lengths with plushies and without. In addition, in the collection use massive collar collars, with needs that turn into headaches headwear resembling a current, as well as armlets and elongated gloves, made with large viscous. The collection's signature shades are ivory, warm shades of brown and grey, which are also confirmed by trends in 2013–2014. The color scheme of the collection is based on reading related warm shades. Such colors create a feeling of coziness and psychological "protect" in the cold season. Particular attention to decision color composition was given proportion weighting of sizes and configuration of color spots of different lightness as in each of a separate model, and when looking at the count lecture as a whole. A significant compositional device is a stitch made in the style of traditional ornament used in fluff your scarf.

In retail, there are different fabrics, having a film on the inside coverage, but their color range limits with one or two colors. This is not enough to embody the author's intention in the material graduation project. Therefore, for tailoring the collection was chosen raincoat fabric, duplicated by glue, in our case - knitted fabric. She is the one on the moment of creation of the collection was presented enough flowers. Adhesive coating prevents the migration of insulation on the surface of the product, and the two-layer structure is improved gives heat-shielding properties. Based on the characteristics of climatic conditions of our region, were developed designs of skirts below the knee and neckline shawl waist. Coat length varies to below. For a variety of assortment groups of clothes in the collection (based on ten fashion trends of the current season), consisting of parkas and shorts.

Thermal insulators are meant to reduce the rate of heat transfer by conduction, convention and radiation -- the standard methods by which heat transfers. This can be either in order to prevent heat loss or to keep heat out. In order to do this, all insulators share certain properties. The best thermal insulators have the lowest thermal conductivity; this is the property of a material that measures how well it can conduct heat through its mass. The lower the conductivity measure, the less well a material is able to conduct heat, thus enabling it to trap heat or protect contents from outside heat. Thermal insulators should also be resistant to heat, since they will likely be subject to heat on their surfaces because of the inability of heat to move through them. A thermal insulator without a high heat resistance quotient runs the risk of melting or burning. Air permeability is the property of a material to allow air to pass through its weave or pores. It is often attributed to materials such as those used in the manufacture of clothing. High air permeability means a lower level of thermal conductivity. Based mainly on thermal conductivity, some of the best and most common thermal insulation materials include fiberglass, which is made of spun threads of melted and fluffed glass, and foam, which has pockets of gas that do not conduct heat well.

All materials have a property scientists and engineers call thermal conductivity -- the ability to conduct heat. Some substances conduct heat very well, while others conduct heat poorly; both types of materials are useful in the right circumstances. For example, a frying pan should conduct heat efficiently, heating up quickly and keeping the same temperature across its surface for even cooking. An oven mitt, however, should conduct heat poorly to protect your hands from hot cookware. Metals are good conductors of heat because metal atoms share their outer electrons readily; this allows metal objects to transfer heat energy rapidly. Copper is one of the best heat conductors with a thermal conductivity of about 20,000 times greater than air. A few nonmetals also make good conductors of heat; diamond for example, has over twice the thermal conductivity of copper. Generally, however, most nonmetallic materials such as helium and sand are poor conductors of heat. Styrofoam is made of the plastic polystyrene, a nonmetallic solid with low thermal conductivity. In general, solids make better heat conductors than liquids or gases, and gases are the poorest of the three states of matter. Styrofoam is structured as microscopic air bubbles contained by relatively stiff walls. In addition to making the substance lighter, the bubbles reduce the material's thermal conductivity to a value only slightly higher than that of air. Although a simple Styrofoam container keeps things cold for long periods, it doesn't make them cold if they're already warm. And even though the material is a good thermal insulator, some heat does pass through it, albeit slowly. To counteract the heat that enters the cooler, and to chill items that might have been at room temperature, ice and cold packs reduce the cooler's interior temperature.

The chemical and physical makeup of a fabric determine its heat capacity and its heat conductivity. For example, the natural fibers of cotton absorb water more readily than the synthetic material used to make polyester. This is important in retaining heat because water near the skin can evaporate and cool the wearer. Additionally, if a piece of fabric is thick and loosely woven, it will hold more air than a more tightly-woven piece of fabric. This is helpful in retaining warmth because air, a poor thermal conductor, is itself an insulator. Also, the surface area of a fabric should be as small as possible to hold warmth, because more area means a greater surface for heat loss. Thermal insulation, as provided by clothing, is a complicated area due to the complex nature of thermal conductance and the different proportions of air and fibre found in clothing. The presence of moisture further complicates this problem, and so this section shall deal with the transmittance and storage of dry sensible heat only. For further information please see Section 9.7, where the interaction of heat and moisture will be addressed.

Below 26–30 °C the body needs insulation provided by clothing to maintain homeostasis and thermal comfort. The thermal requirements of clothing are dictated by the ambient conditions and the activity level of the individual. In cold weather, it is desirable to store heat within clothing to remain in thermal comfort. As ambient temperature increases, the heat storage requirement decreases, and at ambient temperatures above 26 °C the thermal insulation required from clothing is nil. A similar trend is seen at different activity levels: during low levels of activity, when a person may be static for a long period of time, high levels of heat storage are required to remain thermally comfortable. As the level of activity and heat produced by the body increases, the necessity for storage of heat within clothing is eradicated. Under most conditions, thermal comfort can be maintained by tailoring the clothing to the ambient temperature and activity level, but this is not always possible. When a high-output activity is carried out in low ambient conditions (situations often encountered during outdoor sports), then the thermal requirements of clothing can be complex. During periods of lighter activity or rest, the participant will need to store heat and will require that their clothing provide thermal resistance; but during periods of intense activity where large amounts of heat energy are produced, it is essential that the clothing can release this to the environment. Much theoretical and experimental research has been carried out in the field of thermal insulation, and it is generally agreed that factors affecting the thermal behaviour of clothing include the heat exchange with clothing (conduction, convection, radiation, evaporation), dry thermal insulation, transfer of moisture and vapour through clothing (e.g. sweat, rain), compressions (e.g. caused by high wind), pumping effects (caused by body movement), air penetration (e.g. through fabrics, vents and openings), and subject posture.

Lightweight insulation used to be straightforward, you bought fleece, it came in three weights - 100, 200 or 300 and the higher the number, the warmer - and bulkier - it was. If you were going somewhere very cold and dry, you might choose down instead. But things have changed, now fleece is under attack not just from more complicated, designer fleece - yes, really - but from lightweight, shelled, synthetic garments, shelled microfleece and even lightweight down tops. They all have different pros and cons, so here's a run through to help you choose from the wide range of lightweight insulation things. Insulation all works in the same basic way - it traps air which has been warmed by your body close to your skin and minimises heat loss. If there's no wind, the warmed air will sit there regardless. If there's any sort of breeze, the wind will strip the warm air away, your body will have to warm a new layer of air and you'll lose heat. The more air you can trap, the warmer the garment will be relative to its weight - but windproofing matters too. As far as lightweight insulation goes then, it's all about how much air you can trap with as little weight as possible. But of course there's more to it than that - wind resistance will make the garment warmer in real world use, while more or less breathability will affect its suitability for active use, as will technical features like hoods, baffles and cut. Standard fleece, however, has limited wind resistance, which means that worn on its own in windy conditions, trapped air is rapidly stripped away, making some sort of additional shell advisable in anything other than completely still weather. If you run remotely warm, anything warmer than a microfleece may well be too warm in temperate climates. It's also relatively bulky for the amount of air trapped, something that's tackled by new more 'furry' looking fleeces, which use pile-type fibres or grid patterns to improve their warmth-to-weight and bulk ratios. Again, few of these offer any wind resistance. These make fantastic all-round hill garments and add perhaps the additional thermal warmth of a thick baselayer. Ultimately, breathability depends on the outer windproof shell fabric. Really closely woven windproofs don't breathe that well, however, and you might want to look at wind resistant rather than windproof, with better breathability and wicking performance. The choice is yours though - whether you run hot, in which case you might want to go for wind resistant, or a rather cooler person, in which case windproof might be better for you. Garments of this type are almost soft shell - great for active use on the hill, but not really warm enough for prolonged stops when you'll need additional warmth. The totally windproof versions can feel clammy when teamed with a waterproof shell.

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