

Effect of Using Microfiber Yarns in Improving of Performance and Comfort Properties of Summer Clothing Fabrics

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Abstract:

Since the beginning of human life, clothing accompanies him and clings to him as a part of him. Therefore, it is called second skin, and this layer has the ability to protect the person from any external factors that may harm him, the basic requirements for clothes suitable for different conditions, whether hot, cold or wet, can be determined as follows: providing a feeling of physiological comfort, does not hinder movement, aesthetic appearance, endurance and longevity, easy care.

In recent years, there has been a significant of synthetic fibers, Microfibers have contributed to this major shift in both excellent endurance properties and desirable texture, which it is made of polyester, polyamide, polyacrylic , and viscose .It can mixed with cotton , linen , and wool with the wrinkles and ripples produced by the fibers , which give a high degree of air permeability , which is reflected on the quality and efficiency of the performance of the produced yarns and fabrics.

The research aims to study the specifications of summer clothing fabrics by determining the best raw materials for the produced fabrics and studying the basic requirement for summer clothing fabrics and the possibility of improving their job performance properties by studying some of the different mechanical properties on them, measuring them and then analyzing them.

Where 20 samples were produced, one warp was used for all samples 120/2 cotton, the number of warp threads 56 /cm, the fabric structure 1/1.

the research samples were prepared according to the variables set to test their effect on the properties of the produced samples, which first the difference in the weft material (cotton, polyester micro fiber, cotton & polyester micro fiber blended 66.6:33.3%, 50:50%, 33.3:66.6%), second the difference of weft thickness (20/1, 40/1, 60/1, 80/1) third the number of weft threads (20 ,24 ,36, 48, 19,21 ,32,42 ,18.6,21.5,34,44) / cm.

After testing the physical and mechanical properties on the executed samples to determine the extent of their ability to achieve the most appropriate performance characteristics of summer clothing fabrics (thickness, weight, water & moisture absorption, air permeability, elongation, tensile strength & elongation for fabric, fabric stiffness, crease recovery, drying rate, fabric pilling fabric abrasion resistance) .

Then the results were discussed and statistically analyzed to identify the sample that gives the best level of functional performance in the samples under study, it turns out that the sample number: 8 (42 weft threads/cm, weft thickness 80/1) then sample number 5 : (19 weft threads/cm, weft thickness 20/1) and sample number 7: (21 weft threads/cm, weft thickness 60/1) , gave the best results according to a total quality assessment method & all of them made from 100% polyester microfiber.

Keywords:

Properties - Summer Clothing Fabrics- Comfort Performance- Cotton- Physical & Mechanical Properties Microfiber

Research problem:

-^١The need to improve the functional and performance properties of summer clothing fabrics in order to make them suitable for final use.

research importance:

-^١Benefiting from the functional properties of microfiber yarns in improving the performance and comfort properties of summer clothing fabrics.

-^٢Clarifying the relationship between the different raw materials and the densities of the wefts to improve the performance and comfort properties of summer clothing fabrics.

-^٣Employing scientific research in developing the textile industry.

-^٤Production of summer clothing fabrics with new properties to expand the base of competition and marketing and the possibility of marketing them regionally and globally.

research aims:

Improving the properties of summer clothing fabrics by using microfiber fibers in order to improve the performance of summer clothing fabrics and increase the feeling of comfort for the users of these fabrics.

Research hypotheses:

-^١The use of microfiber yarns improves the performance of summer clothing fabrics.

-^٢The use of microfiber threads improves the comfort feature of summer clothing fabrics.

-^٣Reaching the best properties for the functional performance of summer clothing fabrics to reach the convenience of the consumer.

Research methodology: The research follows the analytical experimental method.

an introduction:

The main function of clothing is to cover the body in a way that allows it to be protected from the harmful effects of the surrounding environmental factors and variables. Among the importance of clothing is that the Messenger, may God's prayers and peace be upon him, said, "Praise be to God, who clothed me with what I cover my private parts and beautify with in my life." The Messenger of God, may God's prayers and peace be upon him, believed in it. Clothing is the most important textile product, as the thermal balance of the human body depends on it, and thus the feeling of comfort. Therefore, determining the requirements for each type of clothing arranged according to the degree and quality of each requirement for the conditions of use is considered one of the important matters on which the development of scientific foundations depends on the design and specifications of the quality of the worn fabrics.

Conclusion

-^١As shown in the previous table, the samples of 8:5 produced from 100% polyester microfiber gave the best results, and the best of them was sample No. 8 produced with a density of 42 wefts in thickness of number 80/1 for wefts, which gave a total quality of 84%,

then sample No. 7 produced with a density of 32 meat in the poison and from number 60/1 for the meats, and it is equal in quality level to the sample No. 5 and the producer with a density of 19 meat in the poison and from number 20/1 for the meats, and they gave a total quality rate of 82%, followed by sample No. 6 and the product with a density of 21 meat in the poison from No. 40/1 for the meats, which gave Total quality at a rate of 18%, then the samples came from 17:20, which was executed with a mixture of cotton 33.3% and polyester microfiber at a rate of 66.6%, with an average quality of 76%, then the samples from 13:16 mixed with a percentage of 50% cotton: 50% microfiber, with an average quality of 73%, then the samples from 12:9 of the mixture with a percentage of 33.3% cotton: 66.6% polyester microfiber, with an average quality of 67%, and the samples 1:4 executed with 100% cotton came as the lowest quality, with an average quality of 61%

-٢ The effect of research variables on the thickness of fabrics in mm: The study proved that the cotton samples recorded the highest thickness of the fabrics, followed by the mixed samples and finally the microfiber samples. The study also proved the inverse relationship between the number of thread and the thickness of the fabrics.

-٣ The effect of the research variables on the tensile strength of the fabrics in the longitudinal direction (warp): The study proved that the microfiber samples affected the research variables on the weight per square meter of the fabrics: The study proved that the cotton samples recorded the highest weight per square meter of fabrics, followed by the mixed samples and finally the microfiber samples, as proven The study is the inverse relationship between the number of thread and the weight per square meter of fabrics.

-٤ The highest tensile strength was recorded for the fabrics in the longitudinal direction, followed by the mixed samples and finally the cotton samples. The study also proved the inverse relationship between the thread number and the tensile strength of the fabrics in the longitudinal direction (the warp.)

-٥ The effect of research variables on the tensile strength of fabrics in the transverse direction (weft): The study proved that microfiber samples recorded the highest tensile strength of fabrics in the transverse direction, followed by mixed samples and finally cotton samples. The casual (meat.)

-٦ The effect of research variables on the elongation ratio of fabrics in the longitudinal direction (warp): The study proved that the effect of different weft materials on the elongation of the fabric in the longitudinal direction is significant.

-٧ The effect of research variables on the percentage of elongation of fabrics in the transverse direction (weft): The study proved that microfiber samples recorded the highest elongation of fabrics in the transverse direction, followed by mixed samples and finally cotton samples. the meat.(

-٨ The effect of the research variables on the air permeability of fabrics: The study proved that the microfiber samples recorded the highest air permeability, followed by the mixed samples and finally the cotton samples.

-٩ The effect of research variables on the stiffness of fabrics in the longitudinal direction (warp): The study proved that the cotton samples recorded the stiffness of fabrics in the warp direction, followed by the mixed samples and finally the microfiber samples.

١٠- The effect of research variables on the stiffness of fabrics in the transverse direction (weft): The study proved that the cotton samples recorded the stiffness of the fabrics in the weft direction, followed by the mixed samples and finally the microfiber samples.

١١- The effect of research variables on fabrics' resistance to wrinkling in the longitudinal direction (warp): The study proved that microfiber samples recorded the highest resistance to wrinkling in the longitudinal direction, followed by blended samples and finally cotton samples.

١٢- The effect of the research variables on the resistance of fabrics to wrinkle in the transverse direction (weft): The study proved that the microfiber samples recorded the highest resistance to wrinkle in the direction of the wefts, followed by the mixed samples and finally the cotton samples. the meat.(

١٣- The effect of research variables on the water absorption of fabrics: The study proved that cotton samples recorded the highest water absorption, followed by mixed samples and finally microfiber samples. The study also proved the inverse relationship between the number of thread and the ability of fabrics to absorb water.

١٤- The effect of the research variables on the resistance of fabrics to the topper: The study proved that the microfiber samples recorded the highest resistance to the topper, followed by the mixed samples and finally the cotton samples.

15- The effect of the research variables on the resistance of fabrics to friction (loss in thickness or weight): The study proved that the microfiber samples recorded the highest resistance to friction, followed by the mixed samples and finally the cotton samples.

References:

- 1- easim ealaa muhamad 'ahmad (tahdid 'ansab walqawanin albanayiyh waltajhiz litaqyim alkhawas aljamalih li'aqmishat alqumsan alsayfih almakhlutihi) , majistir qism alghazl walnasij waltiriku , kuliyyat alfunun altatbiqiat , jamieuh hulwan , 2014 ma.
- 2- muhamad subraa ('iikhtibarat almansujati) , silsilat alkutub altiknuluji , niqabat musamimaa alfunun altatbiqayh , alqahirah 2003 ma.
- 3- wahid yusif mahmud salih (tasmim 'aqmashuh bitarkibat binayiyh tatawayim mae aihhtiajat alaihtiajat alfisyuluji walharakayh limalabis alriyadih lilmueaqin bdnyaan) , risalat dukturah , qism alghazl walnasij waltiriku , kuliyyat alfunun altatbiqiat , jamieuh hulwan , 2003 ma.
- 4- fatin muhamad eabd altawaab muhamad (maeayir tahqiq khasiyat alraahah faa 'aqmishat almalabis alsayfih) , risalat dukturah , qism alghazl walnasij waltiriku , kuliyyat alfunun altatbiqiat , jamieuh hulwan , 2008 ma.
- 5- 'ahmad mahmud eabduh alshaykh (alkhamat alnasjih walmula'amuh alwazifiah lilmalabis mutaeadidat altabaqat wa'atharuha ealaa al'iihsas bialraahihi) , majistir qism alghazl walnasij waltiriku , kuliyyat alfunun altatbiqiat , jamieuh hulwan , 2004 ma.
- 6- yasmin eabd aleaziz muhamad (tahqiq alsifat almumayazah lil'iintiqaal alhararaa khilal tabaqat al'aqmashih litahsin khawas alhimayih walraahih libaed al'aqmashih alwaqih , majistir , qism alghazl walnasij waltiriku , kuliyyat alfunun altatbiqiat , jamieuh hulwan , 2011 ma.
- 7- jihan mahir tah aljundaa (astikhdam baed al'alyaf alhadithat fi al'ada' alwazifi) , dukturah qism alghazl walnasij waltiriku , kuliyyat alfunun altatbiqiat , jamieuh hulwan , 2006 ma.
- 1- ASTM-Standards test methods for fabric stiffness – D 1388-64 .
- 2- ASTM-Standards test methods for fabric Crease Recovery– D 1295.