

The influence of the waterproof membrane on the thermal comfort properties of multi-layer clothing system

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Abstract

In this paper two multilayer fabric systems intended for fire-fighters were tested in order to determine the basic parameters of the thermal comfort. The thermal comfort was evaluated effectively by measuring the thermal properties of clothing on the Sweating Guarded Hotplate (skin model). The first assembly is composed from the external layer, middle layer (thermal insulation) and internal layer (moisture barrier - hydrophilic polyurethane (PU) membrane coated on knitted fabric). The second one contains external layer, middle layer (thermal insulation) and an internal layer (liner). Both analysed assemblies contain the same external layer and middle layer.

These layers were tested as monolayer and in multi-layer clothing systems. The influence of the membrane on the thermal resistance (R_{ct}) and water vapour resistance (R_{et}) of the multi-layer fabric system was discussed.

When the combinations of different materials are used for a multi-layer fabric system, the thermal comfort is dependent not only on the properties of each monolayer but also on the manner in which they act together. The sum of R_{ct} values of individual layers is close to the measured R_{ct} of the ensemble composed of the corresponding layers. In contrast with the thermal resistance, the total water vapor resistance of a combination of textiles layers is not always equal to the sum of the single resistances. The results showed that the monolayer acting as a moisture barrier has a considerable influence on the overall water vapour transport abilities. The position of the moisture barrier in the assembly is also important in the overall value of water vapour resistance of the multi-layer system.

Keywords: moisture barrier, hydrophilic polyurethane membrane, multi-layer textile system, protective clothing, resistance of water-vapour, Sweating Guarded Hotplate (skin model).

The Quality of Woven Fabrics as a Hint about the Skirts' Quality, Designed for Business Women

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Abstract

This article deals with subjective and objective evaluations of several wool type-woven fabrics with different fibres composition and properties, selected by considering the quality profile expected for skirts for business women, as a case study for a "ready-to-wear pencil skirt collection".

Regarding the subjective evaluation, the activity was conducted on computer-assisted workstations. The handle sensations of a team of master students, trained according to the AATCC Evaluation Procedure 5-2011 for the primary handle attributes, were “translated” into experimental results, through the fast processing of the STAT-HAND original software.

In order to make a connection between the subjective evaluation and the objective evaluation, the following handle bipolar attributes connected with quality characteristics of the selected fabrics, were considered: the flexibility / stiffness evaluation versus the fabric flexural rigidity measurement, the thinness/ thickness evaluation versus the fabric thickness measurement and the lightness /heaviness evaluation versus the fabric weight measurement.

The research was focused on emphasizing the needs of the customary textile materials selection for specific end-use in garment manufacturing. It was also demonstrated that for the appropriate results in the product design, should be best to approach both, the sensory comfort estimated during the contact with fabric when handled (as a subjective evaluation) and the quality control strategy (as an objective evaluation). As it is a specific niche, we expect that business women will select their skirts to match their demands considering fashion, quality and last but not least, sensorial comfort.

Keywords: woven fabric, comfort, subjective evaluation, objective evaluation, STAT-HAND software;

Nonconventional technology for production of decorative cushions

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Abstract

On the market there is a high demand for decorative cushions, essential components of the sofas. The market are offering lines for the production but at big price and, consequently, the TAPARO Company, Romania, propose achieving a production line of decorative cushions with the original conception but with reasonable price. For this was used the recovered equipments from cotton spinning mills, but and equipment own conception. The decorative cushion is from the same material like the sofa and the cushion basket is made of nonwoven textile and filled with a mixture of polyester fiber and polyurethane sticks. Maintaining of the cushion geometry for a long time depends on the size and weight of cushion and of the basket of cushion with multiple cells. In the paper are presents the changes did on the spinning machines to be used with new function and also achived the machinery of own conception. Also in the paper, are showed the quality characteristics of the decorative cuchions.

Keywords: fiber, polyester, polyurethane,sticks, mixture, cushion

The effect of cottonised flax and hemp as eco-friendly substitutes for cotton on the comfort properties of knitted fabrics

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Abstract

The paper presents the results of a research concerning the effect of partial cotton replacement by cottonised flax and hemp on the comfort properties of knitted fabrics. Rotor spun yarns of 59 tex and 100 tex linear density from 30% cottonised flax/70 % cotton, 30% cottonised hemp/70 % cotton and 100 % cotton blends obtained on the cotton spinning system have been used to produce 1 x 1 rib knitted fabrics on a manual flat knitting machine. The comfort properties of the knitted fabrics such as porosity, air resistance, water vapour resistance and thermal resistance have been evaluated.

Keywords: cottonised flax yarn, cottonised hemp yarn, knitted fabrics, comfort properties.

Quality Optimization of Expanded Polystyrene Products using the Taguchi Method

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Abstract

The process for optimizing a quality characteristic (density) of expandable polystyrene is highlighted in the present study. The main purpose of the expandable polystyrene is the pre-expansion in the foam machine in the plant.

Six parameters – factors which are considered as the most important factors for the pre-expansion according to the production manager are selected in order to enhance quality of the expandable polystyrene. These are the raw material inserted in the machine, stirrer speed, pressure in first, second and third steaming periods and the duration of the second steaming period.

A tree-level, six factors L18, orthogonal array was planned according to the Taguchi method to design the experiments. Signal to noise ratio was calculated for each trial and through ANOVA analysis and response tables the conditions that influence the products density were identified. Although the optimum conditions were determined.

Keywords: Polystyrene, expanded polystyrene, Taguchi method, orthogonal array, quality optimization, ANOVA, design of experiments

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Fancy yarns for fashionable fabrics: recent developments

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Abstract

Manufacture of yarns with a high degree of regularity is one of the most important aims for spinners. However, for some application, a certain degree of irregularity is required to produce fabrics with a particular appearance such as uneven surface that gives the feeling of moving, or variations of colour intensity that make the fabrics more interesting for customers. The yarns characterised by these desirable irregularities, called effect yarns or fancy yarns, are produced by using some devices that deliberately creates "defects" in yarns like discontinuities in their structure and/or in their colour.

During the last several years, on the clothing market as well as in the furnishing and home textiles sectors, the demands for refined fabrics with more distinguishing features increased continuously. Consequently, the demand for fancy yarns used for manufacturing new and modern fabrics has grown accordingly and denim fabrics industry is one of the bigger markets for this type of yarns.

The paper presents the solutions for producing effect yarns currently offered by the textile machinery producers, as response to the customers' demands for spinning machines more flexible, highly productive and easy to operate, able to manufacture a large variety of regular or fancy yarns, specially designed for particular applications and affordable.

Keywords: fancy yarns, spinning machine, denim fabrics, yarn structure

Comparison study of the technical characteristics of electric battery storage systems for residential use

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Abstract

One of the major energy issues of our days is the reliable and effective energy production and supply of the electricity network. During the recent years a rapid development and implementation of the Renewable Energy Sources is worldwide experienced. On one hand, many Gigawatts of grid-connected renewables are installed and on the other many Megawatts of hybrid renewable systems for residential use are installed making use of electric battery systems, in order to cover all energy and power needs during all day. New battery types are developed and many companies have made tremendous progress providing a variety of electricity storage products.

The purpose of this research is firstly to highlight the necessity and also the importance of the use of energy storage systems and secondly, through detailed technical simulation analysis using HOMER Pro optimization software, to compare the technical characteristics and performance of energy storage systems of various leading companies when installed in a residential renewable energy system with a specific load. Results concerning the operation of the system and the choice of a storage system are derived.

New Innovation model for Random node Route Stability under ad hoc network

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Abstract

Ad Hoc Network is a collection of mobile wireless devices or nodes. The transmission range of wireless nodes can communicate directly in this innovation model. The Ad Hoc Networks are the selection of the optimal pass between any two nodes. In the existing innovation Model, the work is considers nodes moving along nonrandom patterns where nodes start moving from the same location. In proposed innovation model the nodes are moving along random direction. The links along the path may fail and an alternate path must be found. We propose an approach to improve the efficiency of reactive routing protocols. New innovation model we study the problem of selecting an optimal route.

Key words: Mobile Ad Hoc Networks, Routing, Modeling and Analysis, MANET protocols.

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