

Izvorni znanstveni članek *Original Scientific Paper*

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Vpliv materiala na kakovost šiva

Influence of the material on the seam quality

Za raziskavo vpliva materiala na kakovost šiva so bile izbrane tkanina iz bombažnih vlaken, tkanina iz poliestrnih vlaken in tkanina iz regeneriranih celuloznih vlaken (viskozni vlaken) v vezavi platno. Izmerjene so bile mehanske lastnosti tkanine, med drugim tudi dimenzijska stabilnost. Tkanine smo šivali s spojnim šivom, enkrat in dvakrat pošitim spojnim šivom s sukancem iz 100-odstotne poliestrne oplaščene preje. Po šivanju, likanju, enkratnem, trikratnem, petkratnem in desetkratnem pranju z vmesnimi likanji sta bili izmerjeni pretržna sila šiva in dolžina konture šiva, ki je bila pred šivanjem 50 cm. Raziskava je pokazala, da ima največje pretržno silo šiva poliestrna tkanina, in sicer po šivanju in posameznih pranjih, najnižjo pretržno silo šiva pa ima tkanina iz regeneriranih celuloznih vlaken. Statistična analiza je pokazala, da število pranj nima pomembnega vpliva na pretržno silo šiva in da so razlike med vrednostmi pretržne sile po posameznih pranjih zgolj naključne. Nasprotno pa je statistična analiza pokazala, da ima vrsta izbranega šiva pomemben vpliv na pretržno silo šiva. Rezultati so pokazali, da je prišlo do največje spremembe dolžine konture šiva pri tkanini iz regeneriranih celuloznih vlaken, ki ima najmanjšo dimenzijsko stabilnost in zato največje krčenje. Statistična analiza je potrdila, da ima število pranj pomemben vpliv na spremembo dolžine konture šiva. Prav tako na spremembo dolžine konture šiva po posameznih pranjih pomembno vpliva vrsta izbranega šiva.

Ključne besede: tkanina, šiv, pretržna sila, dimenzijska stabilnost, kontura šiva

To explore the influence of material on seam quality, the fabric from cotton yarn, polyester yarn and viscose yarn were chosen for canvas weave. The mechanical properties of fabric and dimensional stability were measured. Fabrics were sewn with superimposed seam 1.01.01 and two types of lapped seams 2.02.03 and 2.02.05 with the polyester sewing thread from core spun yarn. After sewing and ironing and 1-, 3-, 5- and 10-times machine washings with ironings between, the breaking force of the seam and length of the seam were measured. The length of the seam was amount-ed before sewing 50 cm. The results of the research showed that the highest breaking force of the seam contained fabric from polyester yarn after sewing and after ten washings; meanwhile, the lowest breaking force contained fabric from viscose yarn. Statistical analysis demonstrated that the number of washes did not influence seam strength, which suggests that the differences between the val-

ues of breaking force of the seams after more washings occurred by chance. In contrast, the statistical analysis demonstrated that the seam sort significantly influences the breaking force of the seam. The greatest changes in seam length were observed in the viscose fabric. Also, viscose fabric has the lowest dimensional stability and greatest shrinkage. Statistical analysis confirmed that the number of washings influences changes in seam length. Additionally, an important influence on changes in seam length after washings was seam sort and type.

Key words: fabric, seam, breaking force, dimensional stability, the seam length

Pregledni znanstveni članek *Review*

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Barva in optični pojavi na tkanini

Colour and Optical Phenomena on Fabric

Namen preglednega članka je sistematično predstaviti in opisati najpomembnejše dejavnike, pojave in lastnosti, ki sodelujejo pri nastanku barve na tkaninah. V prvem delu so predstavljeni nekateri optični pojavi (refleksija, absorpcija, sipanje), ki so poleg opazovalca in svetlobnega vira pogoj za dojetje barve preje in tkanine. Osrednji del članka vključuje opis vpliva konstrukcijskih parametrov na optične pojave in posledično barvo preje in tkanine. Predstavljene so primarne lastnosti vlaken, preje in tkanin, ki povzročajo naravno obarvanost in s katerimi ustvarjamo enostavne barvno-teksturine učinke: surovinska sestava vlaken, vrsta in oblika preje, konstrukcijski parametri tkanine (gostota, vezava, presevanje v tkanini). Pregled je nadgrajen z opisom kompozicijskih lastnosti, s katerimi dosegamo zahtevnejše barvne in reliefne učinke. Tu so vključeni: barvno sosledje, razmerje med številom osnovnih in votkovnih veznih točk, razporeditev veznih točk, pojav presevanja, flotiranje niti, posebni reliefni učinki, barvno oblikovanje in odnos med barvami, ki s konstrukcijo sooblikujejo končni videz tkanega izdelka.

Ključne besede: tkanina, preja, barva, optični pojavi, konstrukcijske lastnosti

The purpose of the scientific review paper is to systematically present and describe the most significant factors and parameters, which influence the colour of woven fabrics. In the first part, optical phenomena, such as refraction, reflection, absorption, and scattering, are described. These phenomena are necessary, beside the observer and a light source, for visual sensation of the colour of threads and woven fabrics. The main part of the paper deals with the influence of constructional parameters on the colour of threads and woven fabrics. Primary parameters of fibres, threads and fab-

rics, such as raw material, type and shape of yarn, constructional parameters (thread spacing, weave, reflectance) are presented. With these parameters, simple colour and texturing effects can be achieved. Furthermore, the review gives the description of some methods and compositional parameters, which enable complex colour effects. In that part, the paper analyses colour repeat, ratio of the number of warp to weft interlacing points, distribution of interlacing points, foundation reflectance, thread floating, special texturing effects, colour design, and the relationship between different colours (contrast, harmony), which coupled with the construction, participate in creation of final visual appearance of woven fabrics. **Key words:** woven fabric, threads, constructional parameters, colour, optical phenomena

Izvirni znanstveni članek *Original Scientific Paper*

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Deformacija Ittnovega barvnega kroga v barvnih sistemih CIE $L^*a^*b^*$ in CIE xy

*Deformation of Itten's colour circle in colour systems CIE $L^*a^*b^*$ and CIE xy*

Znanstveniki se že stoletja ukvarjajo z naukom o barvah in postavljajo različne barvne sisteme, ki bi čim bolj realno pokazali postavitev barv v prostoru in razmike med posameznimi barvami. Med umetniki je zelo razširjena likovna teorija švicarskega umetnika Johannesesa Ittna, ki je definirala kontrastne in harmonične barve in barvne sestave na osnovi dvanajstdelnega barvnega kroga in barvne krogle. Naše raziskovalno delo je temeljilo na Ittnovi teoriji.

Želeli smo ugotoviti, če imajo barvne harmonije tudi v CIE-barvnem prostoru kakšne skupne značilnosti in če lahko tudi v CIE-barvnem prostoru predvidevamo, katere barve so med seboj harmonične. Želeli pa smo ugotoviti tudi, ali likovna teorija velja, če jo prenesemo v CIE-barvni prostor, ki se uporablja predvsem za znanstvene namene.

Ugotavljali smo, kakšne so značilnosti barvnih akordov, ki so lahko harmonični ali neharmonični, v CIE-barvnem prostoru in če jih lahko primerjamo z Ittnovimi ugotovitvami, po katerih si komplementarni barvi v barvnem krogu stojita nasproti, primarne, sekundarne in terciarne barve pa med seboj tvorijo trikotnik. **Ključne besede:** barvna metrika, barvni prostor CIE Lab, diagram CIE xy, Ittnova barvna teorija, barvne harmonije, barvni akordi in barvni kontrasti

Scientists have been studying colours and colour harmonies for centuries and have tried to arrange them in different colour systems; which show the most real arrangement of colour in the

space and spacing between them. Today, most artists follow colour scheme theory by Swiss painter Johannes Itten, who explained the contrasts and harmonies of colours with the help of the colour circle and colour sphere in his book The Art of Colour. His theory was also the basis of our research work.

The aim of this research was to find out how colour harmonies function in CIE-colour spaces – whether they share any common characteristics, and if it is possible to anticipate which colours are harmonious. We also wanted to find out the correctness of the art colour theory when transferred into CIE-colour space, which is primarily used for scientific purposes.

*We concentrated on the characteristics of colour accords, which can be harmonious or inharmonious, in the CIE-colour space, and the possibility of comparing them with Itten's theory, where complementary colours stand opposite to each other in the colour circle, while primary, secondary and tertiary colours form a triangle. **Key words:** colorimetry, CIE – colour systems, CIE xy diagram, Itten's colour theory, colour harmony, colour contrasts.*