The Investigation of Bending Rigidity of Textile Materials

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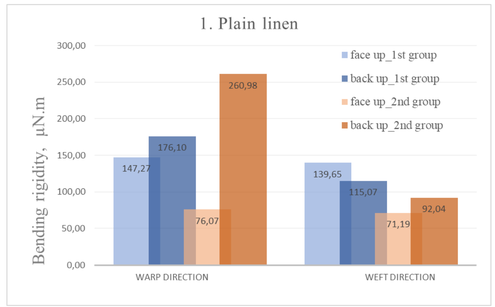
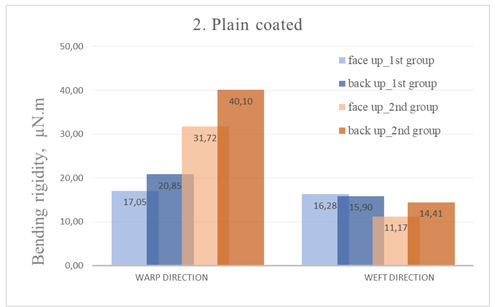
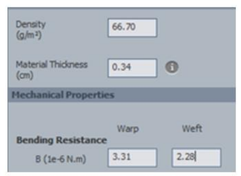
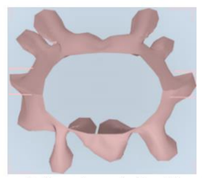
The aim of work is to investigate the conformity and differences between bending rigidity testing results, performed by two groups of pattern makers and to analyze their effect upon garment virtual simulation using Modaris 3D Fit software.

Fabric stiffness tests were performed according to standard BS 3356-1990. It is based on the cantilever length l corresponding to the angular deflection at 41.5°. Bending length C is half of the cantilever length l. Bending rigidity is calculated as follows: $B = W \cdot C^3 \cdot 9.807 \cdot 10^{-6}$, where W is the area density in g/m^2.

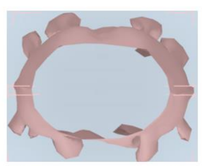






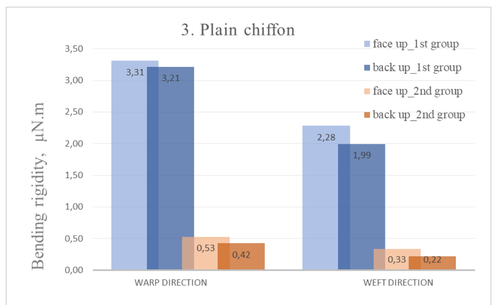


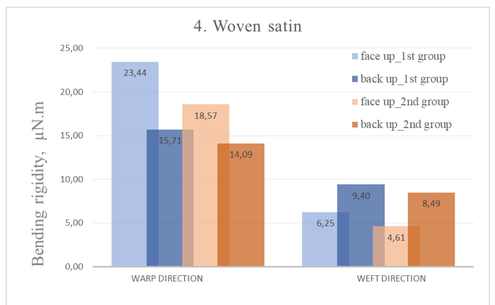
a) bending rigidity B in warp and weft directions defined by the *1st group* of pattern makers for *plain chiffon (3)* and 3D top and front views of draped skirt

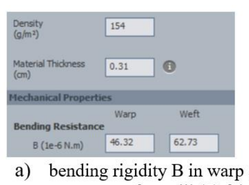


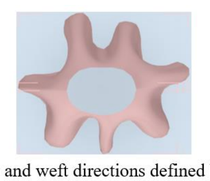
b) bending rigidity B in warp and weft directions defined by the 2nd group of pattern makers for plain chiffon (3) and 3D top and front views of draped skirt

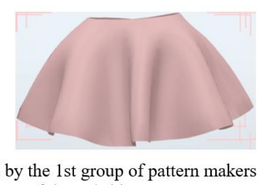
The results of simulation with Modaris 3D Fit software for *plain chiffon (3)*



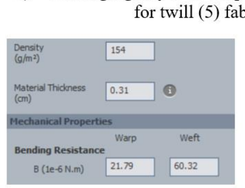


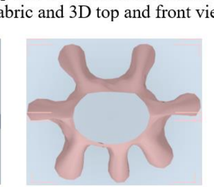






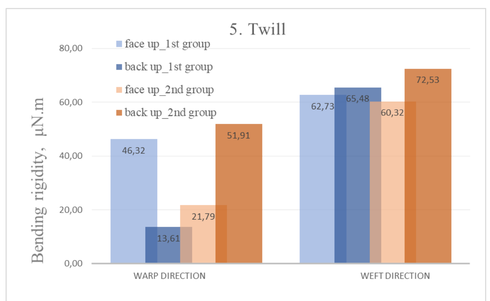
a) bending rigidity B in warp and weft directions defined by the 1st group of pattern makers for twill (5) fabric and 3D top and front views of draped skirt

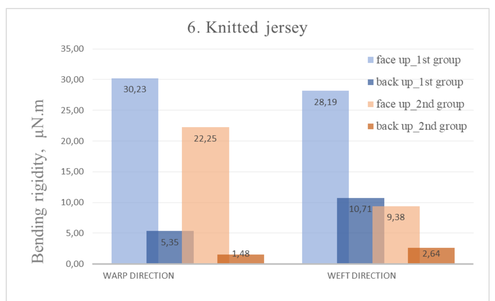




b) bending rigidity B in warp and weft directions defined by the 2nd group of pattern makers for twill (5) fabric and 3D top and front views of draped skirt

The results of simulation with Modaris 3D Fit software for *twill (5)*





No.	Type	Structure	Composition	Surface density, g/m^2	Thickness, mm
1.	woven	plain	100% linen	273,67	0,73
2.		plain coated	40% PES, 60% cotton	170,97	0,33
3.		plain chiffon	100% PES	66,70	0,34
4.		satin	100% cotton	126,07	0,34
5.		twill	100% PES	153,53	0,31
6.	knitted	jersey	100% PES	303,07	0,89

Bending rigidity B differences exist not only for different sides (face and back) of fabrics, but also for different directions (warp and weft). The important observation is that the difference between testing of two pattern makers groups existed and for certain fabrics it was significant, e.g. for plain chiffon it reached nearly 50%. It means that additional fabric testing skills must be trained in order to develop accurate patterns and close to real fitting of virtual garments.

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