

# A Study on Anisotropy of Bending Rigidity on Woven Fabric

김승진 이재곤 \*

부산대 공대 섬유공학과

\* 서울대 공대 섬유공학과

Anisotropy of bending rigidity on plain woven fabric was analysed for investigating the moment-curvature behavior of plain woven fabric bended in the biased direction. The theoretical formular on anisotropy of bending rigidity was derived by bias angle,  $\alpha$ , bending and torsional rigidity of constituent yarn, and was compared with experimental values.

The results are as follows:

1. Bending rigidity of plain woven low density fabric according to bias angle which the force in the intersecting point acts a little is calculated as following equation.

$$(B_F)_{\alpha} = B_f \sin^4 \alpha + J_f \sin \alpha \cos^3 \alpha + J_w \cos \alpha \sin^3 \alpha + B_w \cos^4 \alpha$$

2. In low density plain woven fabric which has yarn characteristic that bending rigidity of constituent yarn is larger than torsional rigidity, theoretical equation(41), is in accordance with equation(6) by the D.N.E. Cooper, and is in accordance with experimental results.
3. Bending rigidity of plain woven fabric at  $45^{\circ}$  in bias angle shows the smallest value, and the difference between theoretical and experimental values shows the largest one.