FAQ : Fabric Handle and related Properties

3. Calculate the Bending modulus of plain fabric in N/m^2 with the following details

   Fabric GSM - 200

   Fabric thickness - 0.41 mm

   Bending length - 20 mm

Answer:

Bending Modulus $= (12 \times G \times 10^{-6} / T^3)$

Flexural Rigidity (G) $= M \times C^3 \times 10^3$

$= 0.02 \times 10^3 \times 10^3$

$=20000$

Bending Modulus $= (12 \times 20000 \times 10^{-6}) / 0.041^3$

$= 3482\ kg/cm^2$

4. A fabric, with mass per unit area of 250 g/m^2, has flexural rigidity 275 μNm. What will be the overhanging length, if the tip of the specimen has to reach a plane inclined at 14.2^o below the horizontal plane?

Answer:

$275 = 250 * C^3 * 9.807 * 10^{-6}$

$C^3 = (275*10^6) / (250*9.807) = 48.226$ mm

$X = (\cos(\Theta/2) / 8 \tan\Theta)^{1/3}$

$= (\cos 7.1^o / 8\tan 14.2^o)^{1/3}$

$= (0.4902)^{1/3}$

$L = C / X = 48.226 / (0.4902)^{1/3} = 61.2$ mm

5. Explain briefly about KESF? What are all the fabric properties may obtain from the same?

Answer:

KESF is used to measure the fabric handle value by objective machine-based system which will give consistent and reproducible results. The fabric handle value derived by entirely based on the physical and mechanical properties of fabrics.

The following are the fabric properties may obtain from KESF,

S. No	Major fabric property		Definition
1	Tensile	LT	Linearity of load extension curve
2		WT	Tensile energy
3		RT	Tensile Resilience
4	Shear	G	Shear Rigidity
5		2HG	Hysteresis of shear force at 0.5^{o}
6		2HG5	Hysteresis of shear force at 5^{o}
7	Bending	B	Bending Rigidity
8		2HB	Hysteresis of Bending moment
9	Lateral Compression	LC	Linearity of Compression thickness curve
10		WC	Compresssional energy
11		RC	Compresssional Resilience
12	Surface Characteristics	MIU	Co-efficient of friction
13		MMD	Mean deviation of MIU
14		SMD	Geometrical Roughness
15	Fabric Construction	W	Fabric Weight per unit area
16		T_o	Fabric thickness

6. Briefly explain formability, Hygral expansion? State the advantages of FAST in the Garment industry.

Answer:

Formability:

It can be described in scientific terms as "a measure of the ability of a fabric to absorb compression in its own plane without buckling".

Formability is a direct indicator of the likelihood of Seam Pucker occurring either during or after sewing.

Low Formability = Tendency to Pucker

Hygral Expansion:

Hygral Expansion is the reversible change in the dimension of the fabric that occurs when the moisture content of the fibres is altered. Using FAST, Hygral Expansion is defined as the percentage change in dimensions of the relaxed fabric from wet to dry.

Advantages of FAST in garment Industry:

FAST can tell one how well a fabric will perform

Abnormal FAST *Fabric Fingerprints* point to potential problem areas

Fabric Fingerprints can be used for

- Fabric specifications
- Developing new fabrics
- Comparing fabric finishing routs
- Assessing stability of finished fabrics
- Predicting tailoring performance
- Final garment appearance