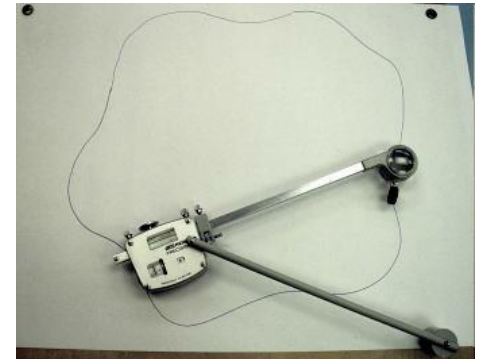




Fabric handle Color fastness



- ❑ Shape stability
 - ❑ Bending stiffness
 - ❑ Drapability
 - ❑ Crease recovery
- ❑ Color fastness (UV, washing, perspiration, rubbing, etc.)





Shape stability Washing I.

- ❑ ISO 5077:2007 „Textiles — Determination of dimensional change in washing and drying “
 - ❑ ISO 6330:2021 „Textiles — Domestic washing and drying procedures for textile testing“

- ❑ ISO 3759:2022 „Textiles — Preparation, marking and measuring of fabric specimens and garments in tests for determination of dimensional change“



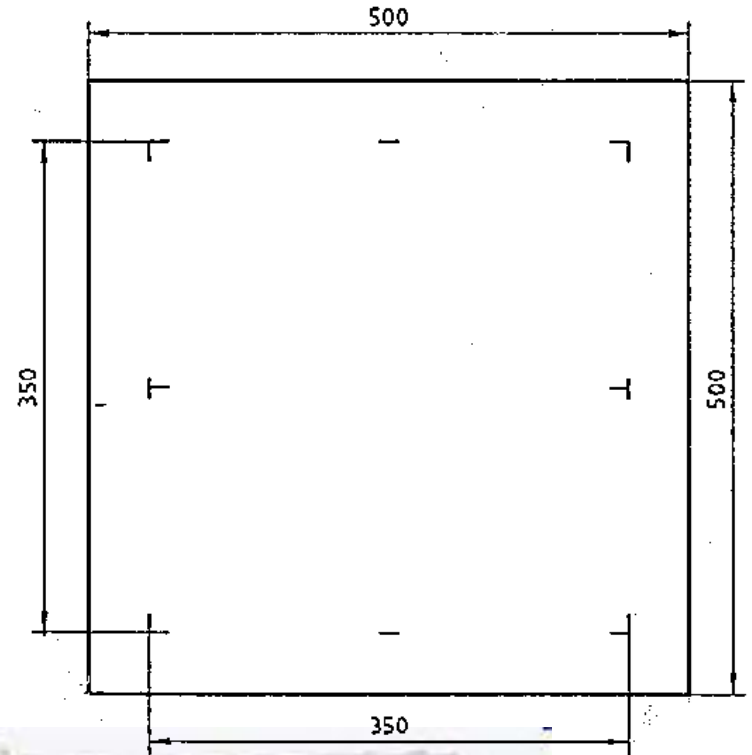


Shape stability Washing II.

$$S = \frac{l_s - l_0}{l_0} \cdot 100 [\%]$$

l_0 – initial shape,

l_s – shape after washing

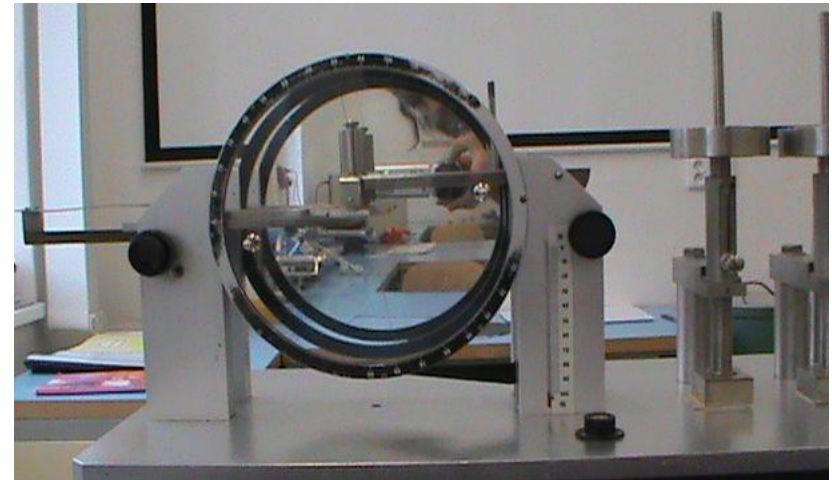
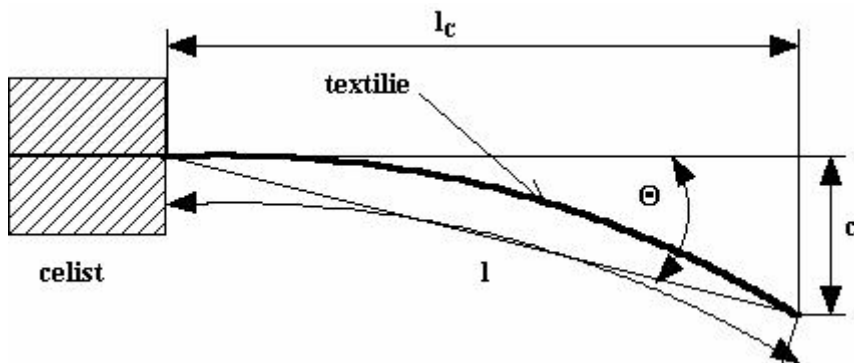




Bending stability I.

□ Method designed by Sommer

- Based on bending of fabric beam of ρ_s [kg.m⁻²]
- Length of specimen l [m], mass of specimen is bended under angle θ [°]





Bending stability II.

T_{Os} [kg.m] - bending moment $T_{Os} = \rho_s \cdot c^3$ [kg.m]

ρ_s [kg.m⁻²] - area density

c [m] - bending length of fabric

$$c = l \cdot \left(\frac{\cos(0,5\theta)}{8tg\theta} \right)^{\frac{1}{3}} \text{ [m]}$$

θ [°] - bending angle [°]

□ Modified method

$$T_{OG} = \rho_s \cdot b \cdot g \cdot c^3 \text{ [N.m}^2\text{]}$$

b [m] - width of textile specimen [m]

g [m.s⁻²] - acceleration of gravity (9,81) [m.s⁻¹]



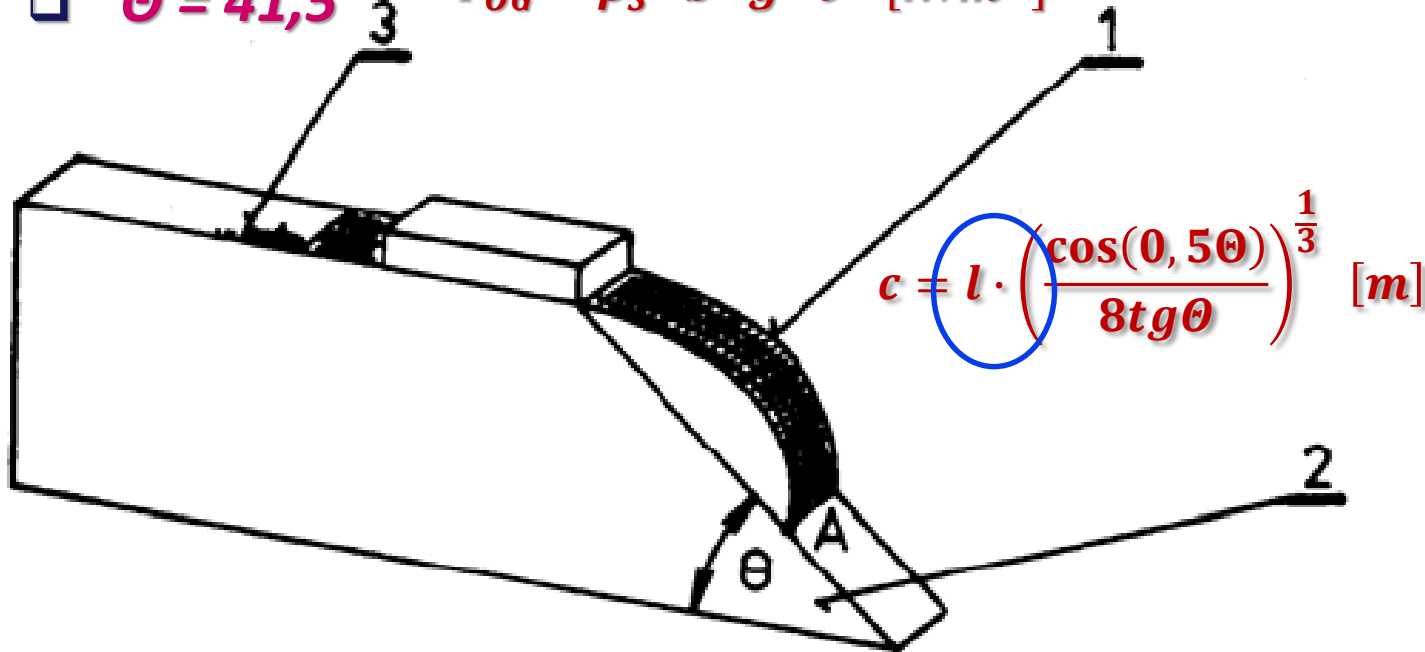
Bending stability III.

□ Cantilever Test

- **ASTM D 1388**, Standard Test Method for Stiffness of Fabrics



- $\theta = 41,5^\circ$ $T_{OG} = \rho_s \cdot b \cdot g \cdot c^3 \text{ [N.m}^2\text{]}$

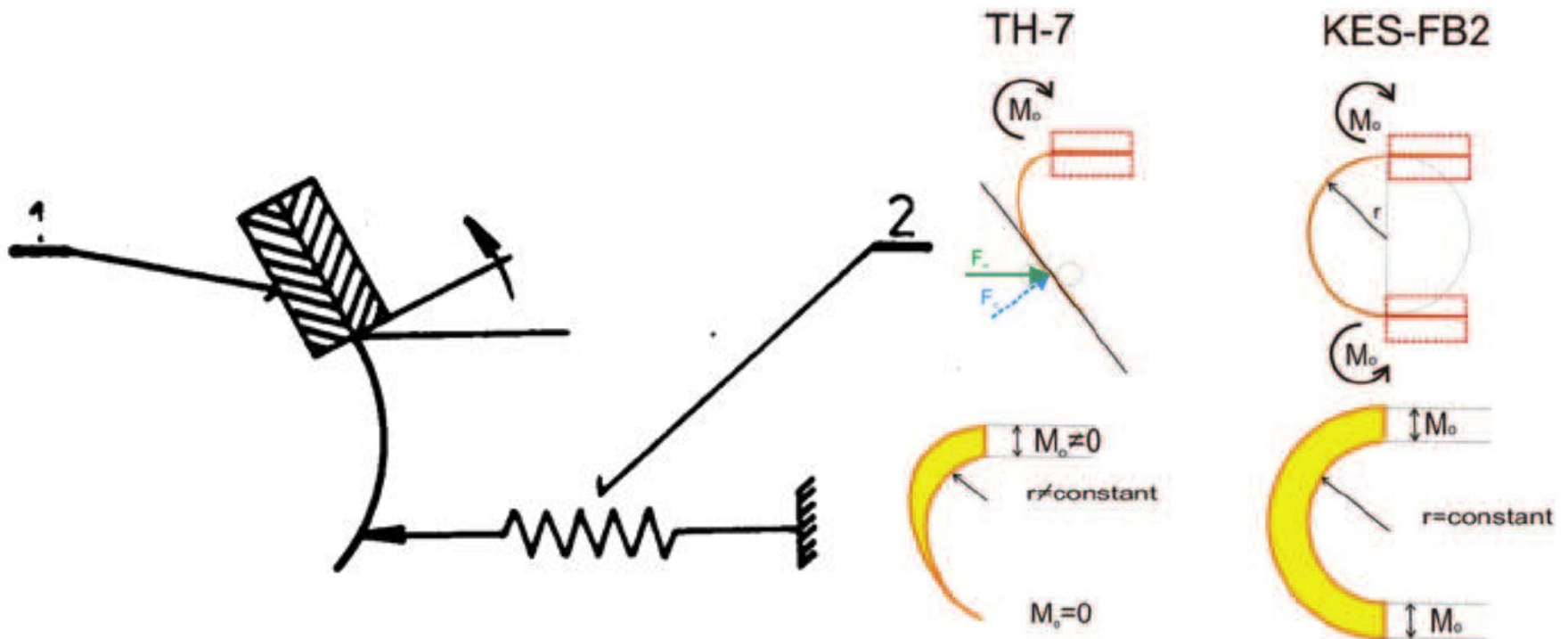




Bending stability IV.

□ Bending device TH 5 or KES

- ISO 9073-7:1995 „Textiles — Test methods for nonwovens — Part 7: Determination of bending length”



Scheme of bending moment on devices TH-7 and KES-FB-2. F_m : measured force; F_c : calculated force.



Drapability

- Fabric specimen is in free state draped over testing jaw, and shaded area is measured

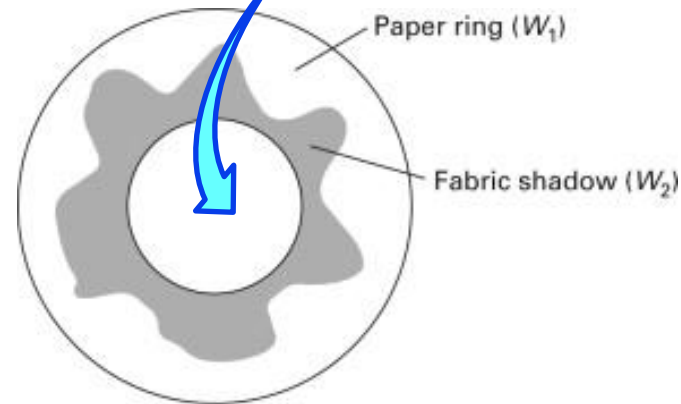
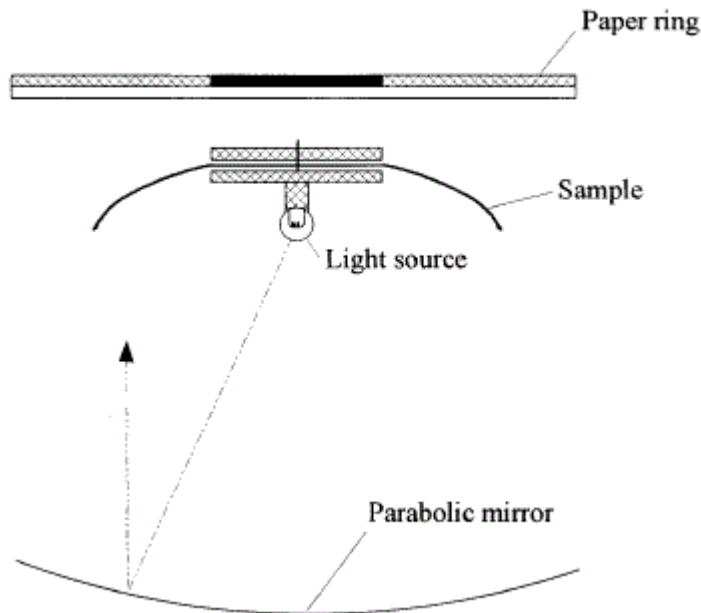


R_1 diameter of specimen [mm]

R_2 diameter of jaw [mm]

A shaded area [mm²]

$$D = \frac{A - \pi R_2^2}{\pi R_1^2 - \pi R_2^2} \cdot 100 [\%]$$

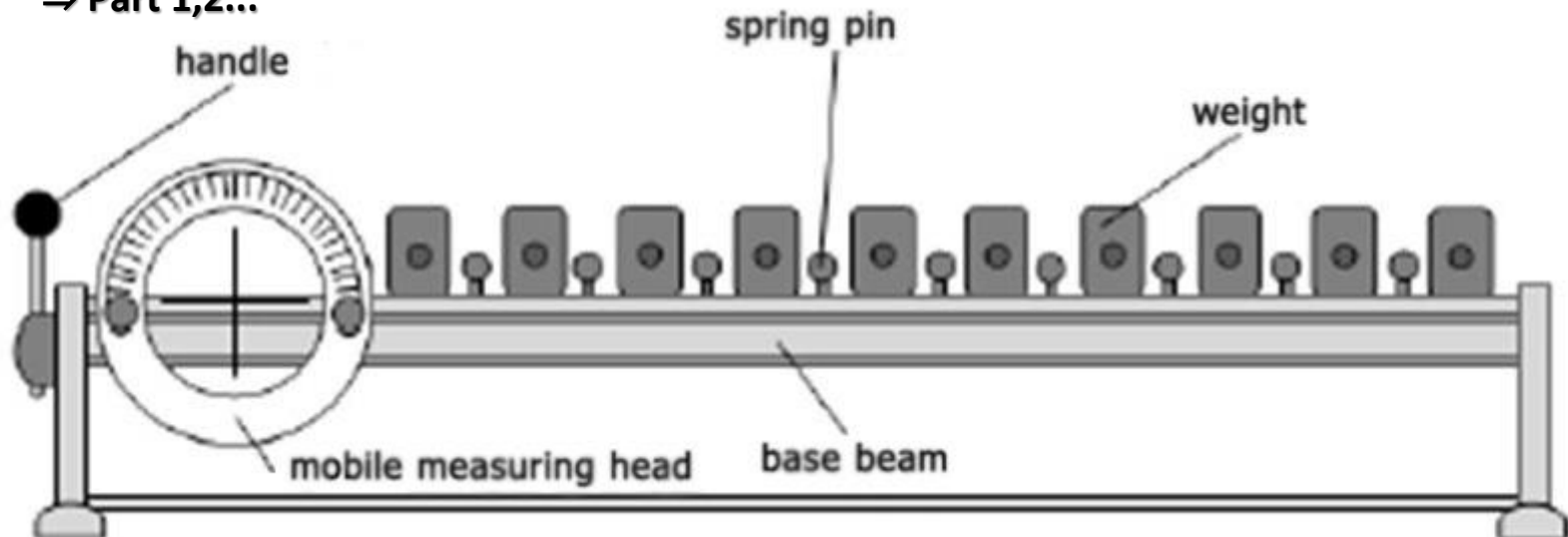
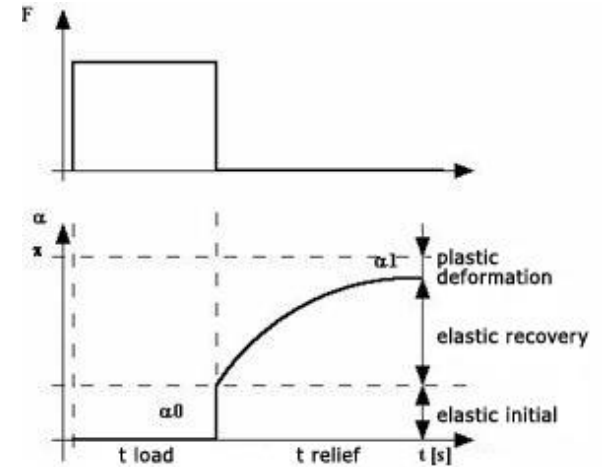
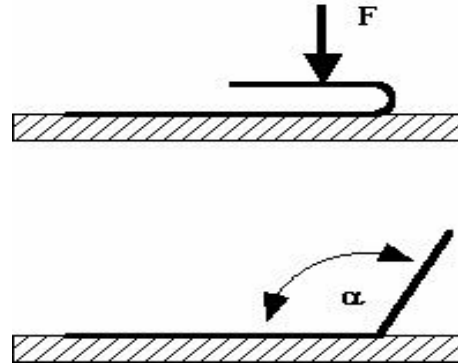




Crease recovery I.

Measurement of recovery angle

- UMAK device
- **ISO 2313 -1,2:2021**
"Textiles — Determination of the recovery from creasing of a folded specimen of fabric by measuring the angle of recovery ⇒ Part 1,2..."





Crease recovery II.

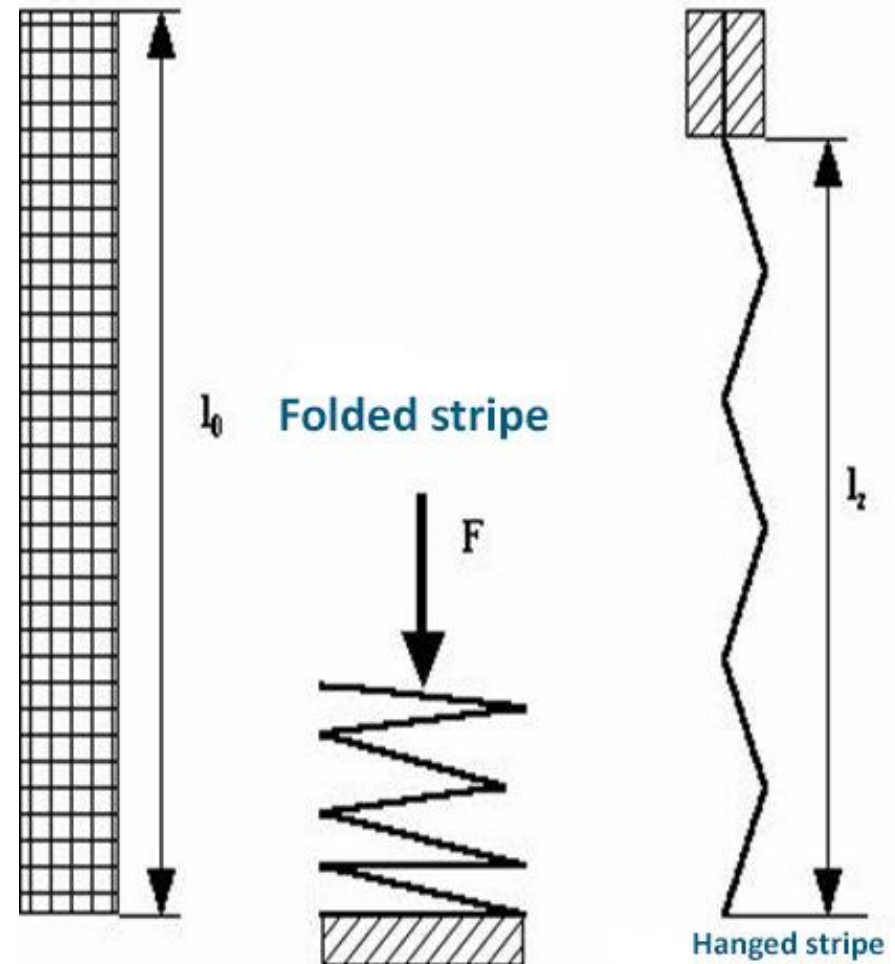
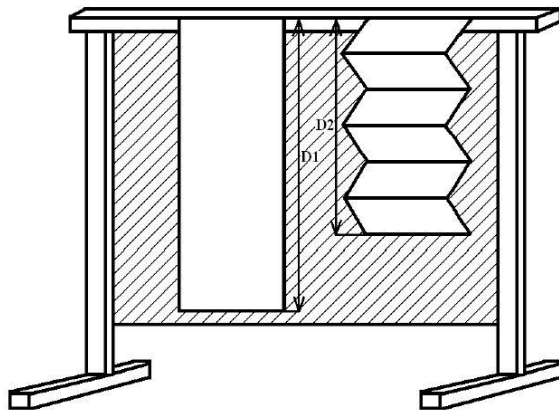
□ Folded stripe method

l_z - length after measurement [m]

l_0 - initial length of fabric [m]

□ Recovery Z [%]

$$Z = \frac{l_z}{l_0} \cdot 100 [\%]$$





Crease recovery III.

□ Method AKU

$$Z = \frac{h_z}{h_0} [1]$$

- ISO 9867:2022 "Textiles — Evaluation of the wrinkle recovery of fabrics — Appearance method"





Color fastness

- ❑ **ISO 105-A01:2010** „ *Textiles — Tests for colour fastness — Part A01: General principles of testing* “
- ❑ **ISO 105-A02:1993**
 - ❑ *Textiles — Tests for colour fastness — Part A02: Grey scale for assessing change in colour*
- ❑ **ISO 105-A03: 2019**
 - ❑ *Textiles — Tests for colour fastness — Part A03: Grey scale for assessing staining*
- ❑ **ČSN EN ISO 105-(A01-Z11)**
 - set of standards for color fastness
 - ❑ Color fastness in water
 - ❑ Color fastness in washing
 - ❑ Color fastness in chemical cleaning
 - ❑ Color fastness in perspiration
 - ❑ Color fastness in steam-heat (ironing)
 - ❑ Color fastness in light (UV radiation)

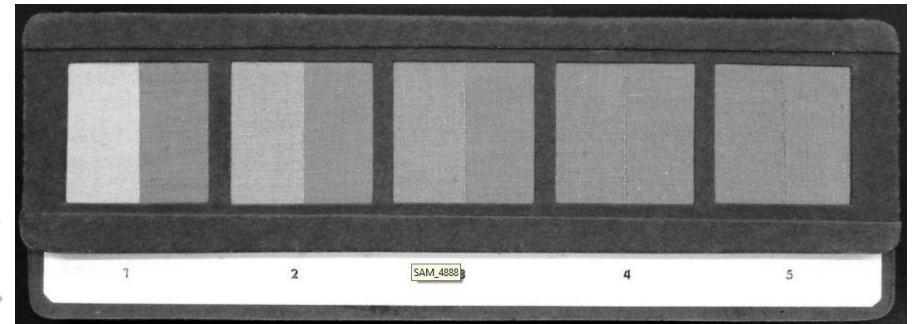




Color fastness

□ ISO 105-A02:1993

- *Textiles — Tests for colour fastness — Part A02: Grey scale for assessing change in colour*



□ ISO 105-A03: 2019

- *Textiles — Tests for colour fastness — Part A03: Grey scale for assessing staining*

