



University of Maribor

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ktmo

CHAIR OF TEXTILE MATERIALS AND DESIGN



LABORATORIJA ZA OBDELAVO IN
PRESKUŠANJE POLIMERNIH MATERIALOV

LABORATORY FOR CHARACTERIZATION
AND PROCESSING OF POLYMER MATERIALS

CATALOGUE OF ANALYSES AND SERVICES

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ANALYSES/SERVICES	STANDARD/METHOD
1. FIBRE TESTING	
1.1. Qualitative chemical analysis	SIST EN ISO 1833-1
1.2. Quantitative chemical analysis	
- Binary fibre mixtures	SIST EN ISO 1833-1
- Ternary fibre mixtures	SIST EN ISO 1833-2
1.3. Determination of linear density	SIST EN ISO 1973
- Vibroscope method	
- Gravimetric method	
- Gravimetric method (from yarn)	
1.4. Determination of the fibre diameter - Microscopy	
1.5. Determination of fibre the length and the length distribution of the fibres (by measuring the length of individual fibres)	SIST ISO 6989
1.6. Chemical fibres: Determination of breaking force and elongation at break of the individual fibres (Dry state/Wet state)	SIST EN ISO 5079
1.7. Determination of the intrinsic viscosity of cellulose	
- EWNN method	DIN 54270-1,3
2. YARN TESTING	
2.1. Determination of the linear density (mass per unit length) by the skein method	SIST ISO 2060
- From fabric	ISO 7211 - 5
- From fabric, or knitwear	DIN 53830-3
- Elastane	DIN 53830-4
2.2. Determination of twist in yarns - Direct counting method	SIST EN ISO 2061
- From fabric	SIST ISO 7211 - 4
2.3. Determination of single-end breaking force and elongation at break	SIST EN ISO 2062
3. FABRIC TESTING	
3.1. Qualitative chemical analysis	
3.2. Quantitative chemical analysis	
- Binary fibre mixture	SIST ISO 1833-1
- Ternary fibre mixture	SIST ISO 1833-2
3.3. Determination of width and length of the fabric	SIST EN 1773
3.4. Determination of the mass of the fabric	SIST ISO 3801
- Per unit length	
- Mass per unit area	
- Determination of mass per unit area using small samples	SIST EN 12127
3.5. Determination of the number of threads per unit length	SIST EN 1049-2
3.6. Determination of thickness of textiles and textile products	SIST EN ISO 5084
3.7. Determination of maximum force and elongation at maximum force using the strip method	SIST EN ISO 13934-1
3.8. Determination of tear force of trouser-shaped test specimens	SIST EN ISO 13937-2



Colour fastness to spotting: Water	SIST EN ISO 105-E07
Colour fastness to hot water	SIST EN ISO 105-E08
Colour fastness to bleaching: Sodium chlorite	SIST EN ISO 105-N01
Colour fastness to bleaching: Peroxide	SIST EN ISO 105-N02
Colour fastness to dry heat	SIST EN ISO 105-P01
Colour fastness to hot pressing	SIST EN ISO 105-X11
Colour fastness to rubbing: Organic solvents	SIST EN ISO 105-D02
Colour fastness for rubbing	SIST EN ISO 105-X12
3.25. Care labelling code using symbols	SIST EN ISO 3758

4. TEXTILES FINISHING

- 4.1 **The pre-treatment processes**
(alkaline, acid, mercerisation, optical, chemical bleaching, ...)
- 4.2. **The optimisation of the finishing processes**
- 4.3. **Advanced finishing processes**
(Environmentally friendly finishing processes: flame resistance, antimicrobial properties, conductivity, increasing hydrophilicity)
- 4.4. **The testing of pre-treatment and finishing effects**

5. SURFACE AND INTERACTION PROPERTIES OF POLYMER MATERIALS

- 5.1. **Microscopic analyses**
 - Morphology and surface properties of textile materials (fibres, yarns, flat textiles), films, foils and composites
 - Identification of fibres and material damage
 - Determination of the shape and size distribution of structures and/or particles in suspensions, alloys, and biological samples
- 5.2. Determination of the **surface properties of polymer materials** using **electrokinetic measurements**
 - Determination of the zeta potential or particle size (hydrodynamic radius) in a dispersion (single-point measurement)
 - Determination of the zeta potential or particle size as a function of the pH value in a dispersion
 - Determination of the zeta potential on solid surfaces (single-point measurement)
 - Determination of the adsorption of specific adsorbates on solid surfaces by analysing the zeta potential as a function of the pH value
 - Determination of zeta potential as a function of pH for solid materials
 - Determination of the isoelectric point of solids
- 5.3. Identification of the **hydrophilic/hydrophobic** character of polymeric materials using **goniometry**
 - Determination of the contact angle
 - Determination of the surface free energy and surface tension
- 5.4. Identification of the **surface tension of liquids** using **tensiometry**
 - Wilhelmy method
 - Du Noüy method

SIST EN 14210
DIN 53993
DIN 53914
- 5.5. Identification of **functional groups** of oriented polymers using **titration** methods
 - Determination of fibre damage



6. OTHER ANALYSES

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| 6.1. | Wool - Determination of dichloromethane-soluble matter | SIST ISO 3074 |
| 6.2. | Determination of pH of aqueous extract | SIST EN ISO 3071 |
| 6.3. | Determination of cellulose fibre damage
- Fehling solution / Copper number
- Adsorption of basic dyes / Methylene blue dye | |
| 6.4. | FTIR analysis | |