



University of Maribor

Faculty of Mechanical Engineering

Smetanova ulica 17  
SI-2000 Maribor, Slovenia



# Laboratory Services/Analyses

Head of the LCPP: **prof. dr. Lidija Fras Zemljič**

E-Mail: [lidija.fras@um.si](mailto:lidija.fras@um.si)

Phone: +386 2 220 7909





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ANALYSIS/SERVICES	STANDARD	PRICE WITH NO TAXES (EUR)
<b>1. FIBRE TESTING</b>		
1.1. Qualitative chemical analysis		16,82
1.2. Quantitative chemical analysis		54,25
- Binary fibre mixtures	SIST ISO 1833	
- Ternary fibre mixtures	SIST ISO 5088	81,37
1.3. Determination of linear density	SIST EN ISO 1973	29,84
- Vibroscope method		27,12
- Gravimetric method		35,26
- Gravimetric method (from yarn)		24,41
1.4. Determination of micronaire value - cotton fibres	SIST ISO 2403	65,10
1.5. Determination of fibre diameter		65,10
- Microscopy (image analysis)		
1.6. Determination of fibre length and the length distribution of fibres (by measuring the length of individual fibres)	SIST ISO 6989	44,49
1.7. Chemical fibres: Determination of breaking force and elongation at break of individual fibres	SIST ISO 5079	52,08
- Dry state		
- Wet state		
1.8. Determination of the limit-viscosity of celluloses		94,94
- EWNN procedure	DIN 54 270	
<b>2. YARN TESTING</b>		
2.1. Determination of linear density (mass per unit length) by the skein method	SIST ISO 2060	20,62
- From fabric	ISO 7211 - 5	24,41
- From fabric, or knitwear	DIN 53 830 - 3	24,41
- Elastane	DIN 53 830 - 4	24,41
2.2. Determination of twist in yarns - Direct counting method	SIST EN ISO 2061	18,99
- From fabric	SIST ISO 7211 - 4	27,12





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2.3.	Determination of single-end breaking force and elongation at break	SIST EN ISO 2062	43,39
2.4.	Number of filaments in yarn		20,62
<b>3. FABRIC TESTING</b>			
3.1.	<b>Qualitative chemical analysis</b>		16,82
3.2.	<b>Quantitative chemical analysis</b>		
	Binary fibre mixture	SIST ISO 1833	54,25
	- Ternary fibre mixture	SIST ISO 5088	81,37
3.3.	- Determination of <b>width and length</b> of the fabric	SIST EN 1773	21,70
3.4.	Determination of <b>mass</b> of the fabric	SIST ISO 3801	
	- Per <b>unit length</b>		13,56
	Mass per <b>unit area</b>		13,56
	- Determination of <b>mass per unit area</b> using small samples	SIST EN 12127	13,56
3.5.	- Determination of <b>number of threads</b> per unit length	SIST EN 1049 - 2	16,82
3.6.	Determination of <b>thickness</b> of textiles and textile products	SIST EN ISO 5084	13,56
3.7.	Determination of <b>tensile properties</b> of fabrics	SIST EN ISO 13934 - 1	43,39
3.8.	Determination of <b>tear force</b> of trouser-shaped test specimens	SIST EN ISO 13937 - 2	35,26
3.9.	Determination of the recovery from creasing of a horizontally folded specimen of fabric by measuring the <b>angle of recovery</b>	ISO 2313 DIN 53 890	29,84
3.10.	Method for determination of bending length and flexural rigidity of fabrics on the principle of console bending	DIN 53 362 BS 3356	40,00
3.11.	Determination of <b>permeability</b> of fabrics to air	SIST EN ISO 9237	22,79
3.12.	Determination of <b>resistance to water penetration</b> – Hydrostatic pressure test	SIST EN 20811	24,41
3.13.	Determination of resistance to <b>surface wetting</b> (spray test)	SIST EN ISO 4920	19,53
3.14.	Determination of <b>water vapour transmission rate</b> - Gravimetric (dish) method	SIST ISO 2528	40,14
3.15.	<b>Oil repellency</b> -- Hydrocarbon resistance test	ISO 14419	19,53
3.16.	Determination of dimensional change in washing and drying	SIST EN ISO 25077 SIST EN ISO 3759	28,21
3.17.	Domestic washing and drying procedures for textile testing	SIST EN ISO 6330	36,67
3.18.	Determination of ease of ignition of vertically oriented specimens	SIST EN ISO 6940	40,14





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3.19.	Measurement of <b>flame spread</b> properties of vertically oriented specimens	SIST EN ISO 6941	40,14
3.20.	Determination of <b>burning behaviour</b> by <b>oxygen index</b>	SIST EN ISO 4589 - 1 SIST EN ISO 4589 - 2	54,25
3.21.	<b>Abrasion resistance</b> of fabrics by the <b>Martindale method</b>		
	- Determination of specimen breakdown	SIST EN ISO 12947 - 2	67,81
	- Determination of mass loss	SIST EN ISO 12947 - 3	67,81
	- Assessment of appearance change	SIST EN ISO 12947 - 4	67,81
3.22.	Determination of fabric propensity to surface fuzzing and to <b>pilling</b> -- Part 2: Modified Martindale method	SIST EN ISO 12945 - 2	48,83
3.23	<b>Soaking</b> (capillarity)	DIN 53 924	30,00
3.24.	<b>Tests for Colour fastness</b>	SIST EN ISO 105 - B02	
	Colour fastness to <b>artificial light</b> : Xenon arc fading lamp test		
	- grade 1 - 3		21,70/10,86 **
	- grade 4		29,84/10,86 **
	- grade 5		46,11/10,86 **
	- grade 6		65,10/10,86 **
	- grade 7		81,37/10,86 **
	Colour fastness to <b>washing</b> / test 1, 40°C	SIST EN ISO 10105 – C01	27,66
	Colour fastness to <b>washing</b> / test 2, 50°C	SIST EN ISO 20105 - C02	27,66
	Colour fastness to <b>washing</b> / test 3, 60°C	SIST EN ISO 20105 - C03	27,66
	Colour fastness to <b>washing</b> / test 4, 95°C	SIST EN ISO 20105 - C04	27,66
	Colour fastness to <b>washing</b> / test 5, 95°C, 4h	SIST EN ISO 20105 - C05	32,01
	Colour fastness to <b>washing</b> / domestic and commercial laundering	SIST EN ISO 105 - C06	27,66
	Colour fastness to <b>water</b>	SIST EN ISO 105 - E01	16,82
	Colour fastness to <b>sea water</b>	SIST EN ISO 105 - E02	16,82
	Colour fastness to <b>chlorinated water</b>	SIST EN ISO 105 - E03	46,66/23,32 **
	Colour fastness to <b>perspiration</b> (acid and alkali).	SIST EN ISO 105 - E04	24,41
	Colour fastness to <b>spotting: Acid</b>	SIST EN ISO 105 - E05	15,73
	Colour fastness to <b>spotting: Alkali</b>	SIST EN ISO 105 - E06	15,73
	Colour fastness to <b>spotting: Water</b>	SIST EN ISO 105 - E07	15,73
	Colour fastness to <b>hot water</b>	SIST EN ISO 105 - E08	19,53
	Colour fastness to <b>bleaching: Sodium chlorite</b>	SIST EN ISO 105 - N01	19,53





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Colour fastness to <b>bleaching: Peroxide</b>	SIST EN ISO 105 - N02	22,24
Colour fastness to <b>dry heat</b>	SIST EN ISO 105 - P01	19,53
Colour fastness to <b>hot pressing</b>	SIST EN ISO 105 - X11	16,82
Colour fastness to <b>rubbing: Organic solvents</b>	SIST EN ISO 105 - D02	17,36
Colour fastness for rubbing	SIST EN ISO 105 - X12	16,28

#### 4. TEXTILES FINISHING

4.1. <b>Pre-treatment processes</b> (alkaline, acid, mercerisation, optical, chemical bleaching, ...)	By agreement
4.2. <b>Finishing processes optimisation</b>	By agreement
4.3. <b>Advanced finishing processes</b> (Environmentally friendly finishing processes: flame resistance, antimicrobial properties, conductivity, increase of hydrophilicity)	By agreement
4.4. <b>Testing of pre-treatment and finishing effects</b>	By agreement

#### 5. SURFACE AND INTERACTION PROPERTIES OF POLYMER MATERIALS

5.1. <b>Image Processing and Analysis</b> Microscope Axiotech 25 HD (+pol); Magnification: 50x -1000x, ZEISS; High resolution camera AxioCam MRC (D), ZEISS; Software: KS 300 Rel. 3.0; "true colour" analysis, ZEISS - Microscopy - Acquisition and transformation of image information into numerical form measuring imaged features - Surface morphology determination of textile materials (fibres, yarns, fabrics, non-woven) - Categorising and counting features and structures - Determining distribution and size of particles or phases in suspensions, emulsions and blends - Apportioning different phases in alloys	32,55/hour
5.2. <b>Microscopic Images</b> - HP Premium InkJet Heavyweight paper HP - HP Premium Plus Photo Paper /Glossy	2,72 / image 3,80 / image
5.3. Identification of polymer materials <b>surface properties</b> using <b>electrokinetic measurements</b> - Evaluation of adsorption properties - Determination of surface dissociation state	65,10 65,10
5.4. Identification of <b>hydrophilic/hydrophobic</b> character of polymer materials using <b>tensiometry</b> - Determination of contact angle	75,95





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5.5.	- Determination of surface free energy and tension		75,95
	Identification of <b>surface tension of liquids</b> using <b>tensiometry</b>		
	- Wilhelmy method	DIN 53 993, DIN 53 914	43,39
	- Du Noüy method	DIN 53 914	43,39
5.6.	Identification of <b>functional groups</b> of oriented polymers using <b>titration</b> methods		75,95
	- Determination of fibre damage		

## 6. OTHER ANALYSIS OF ORIENTED POLYMERS

6.1.	Wool - Determination of <b>dichloromethane-soluble matter</b>	SIST ISO 3074	48,28
6.2.	Determination of <b>pH of aqueous extract</b>	SIST EN 1413 ISO 3071	16,28
6.3.	Determination of <b>cellulose fibre damage</b>		
	- Fehling solution / <b>Copper number</b>		51,53
	Adsorption of basic dyes / <b>Methylene Blue dye</b>		57,50

Note: \*\* Price for the first sample / Price for each subsequent sample

The prices are in EUR, taxes are not included/ the analysis report is included in the price.

Head of the Laboratory for Characterization and Processing of Polymer Materials:

Prof. dr. Lidija Fras Zemljič

UNIVERSITY OF MARIBOR, Faculty of Mechanical Engineering, Laboratory for Characterization and Processing of Polymer Materials, Smetanova street 17, SI-2000 Maribor, Slovenia

