

**Cross Industry Agreement - Matrix of microfibre loss test methods under development**

	<b>Institution 1 (Method A)</b>	<b>Institution 1 (Method B)</b>	<b>Institution 2</b>	<b>Institution 3</b>	<b>Institution 4</b>	<b>Institution 5 (Method A)</b>	<b>Institution 5 (Method B)</b>	<b>Institution 6</b>	<b>Institution 7</b>	<b>Institution 8</b>
	Test method to assess microfibre shedding of textiles during laundering	Test method to assess microfibre shedding of textiles during laundering	Test method to assess microfibre shedding of textiles during laundering	Test method to assess microfibre shedding of textiles during laundering	Quantification / Characterisation of textile fibres released in industrial laundering processes	Test method to assess microfibre shedding of textiles during domestic laundering	Test method to assess microfibre shedding of textiles during industrial laundering	Test method to assess microfibre shedding of textiles during laundering	Test method to assess microfibre shedding of textiles during laundering	Test method to assess microfibre shedding of textiles during laundering
	Combination of "Aachener Filztest" and modified version of ISO 105-C06	Modified version of ISO 105-C06	Modified version of AATCC TM 61-2003, option 2A	Modified version of ISO 105-C06	Modified version of ISO 105-C12	Modified version of ISO 105-C06	Modified version of ISO 105-C12	Modified version of ISO 105-C06 and C12	Modified version of ISO 105-C06	Modified version of ISO 105-C06
<b>Sample Preparation</b>										
Sample Pretreatment								Samples pre cleaned with a vacuum cleaner		Samples pre washed for 1min under tap

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Sample Size	100 x 40 mm	100 x 40 mm		100 x 40 mm?		100 x 40 mm?			270 x 130 mm	2 samples of 140mm diameter
Sample Weight										
Sample Makeup	rectangular	rectangular								round
Cutting										
Sealing	open / Laser Cut / Ultrasonic Welding	open / Laser Cut / Ultrasonic Welding	Samples sewn into pillow					Samples cut and edges welded to prevent fibre loss on cut edge	Samples hemmed with single overlock, folded & secured with a single lockstitch	flame sealed
Washing Process										
Apparatus	Washing Machine	Linitest / Polycolor	Laundrometer	Gyrowash		Linitest	Linitest	Gyrowash	Gyrowash	Linitest
Container Type	PE bottles	Stainless Steel				Stainless Steel				Stainless Steel
Liquor Quantity	150 ml	150 ml							360ml	500ml
Liquor Ratio										
Steel balls	10	10	50	10		10 (variation 0/10/20 balls)	25 inside / 25 outside bag	Samples sewn into pillow with balls inside	50	25

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Detergent Type	yes	yes	no	yes / no		w/o, liquid, solid tested			No	
Detergent Quantity										
Water Preparation										
Temperature	40°C	40°C	49°C	40°C		40°C (alternative test 60°C)	60°C	40°C	40°C	40°C
Time	45 min	45 min	45 min	45 min		45 min (alternative test 90min)	75 min	60 min	30 and 60 min	45 min
Turns		40 +/- 2 rpm	40 +/- 2 rpm	40 +/- 2 rpm						
Spin cycle										
Water Quality						distilled / hard tested			Distilled	Distilled
<b>Analysis</b>										

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Fibre loss assesment method (Gravimetric/ Weight Loss/Counting)	Gravimetric	Gravimetric	Gravimetric	digital microscopy and automatic counting software, and manual counting (number, length, mass)	• Dynamic image analysis (DIA) -> direct effluent assessment , no special sample preparation required (e.g. filtration)	Fibres manually counted on filter paper and extrapolated	Fibres manually counted on filter paper and extrapolated	Automatic Counting after Waste Water Filtration	Mass of fibres assessed using microbalance	Gravimetric
Filtration	yes	yes	yes	yes		yes	yes	yes	yes	yes
Filter Process			Buchner funnel/vacuum funnel			Peristaltic Pump	Peristaltic Pump		Sartorius funnel	250ml Schott, DURAN filtration unit
Filter	5µ stainless steel or 10µ paper filter or 10-16µ glass frit or 0,8µ millipore membrane	5µ stainless steel or 10µ paper filter or 10-16µ glass frit or 0,8µ millipore membrane	20µ / 353µ mesh	45µm cellulose nitrate membrane		5µ PVDF Filters	5µ PVDF Filters		1.6µ glass fibre filter	0,8µ or 5µ millipore membrane

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Filter Diameter	various	various	140 mm	47 mm		47 mm	47 mm		47 mm	47 mm
Filter Drying	Exsiccator	Exsiccator							Oven dry at 50°C for 6hrs or Dessicant for 12hrs	24-48 h room conditions
Remarks			Detergents not used to prevent clogging of filters	Experiments alternative wash temperatures (25, 40, 60, 80°C), cycle durations (1, 2, 4, 8 hours), and surfactants (linear alkylbenzene sulfonic acid at 0.75, 1.5, 2.25 g/L)						
Status			Final Draft Spring 2019	3 year PhD Program	3 year PhD Program					



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