

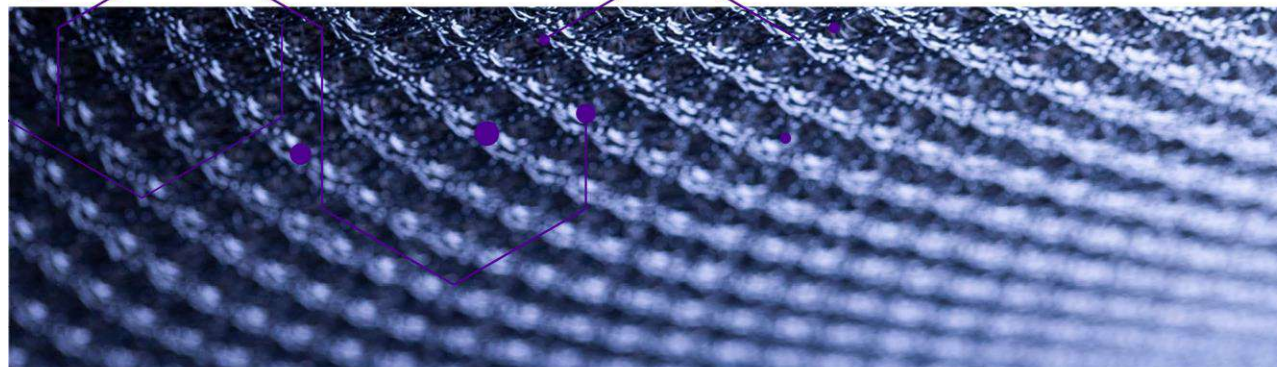
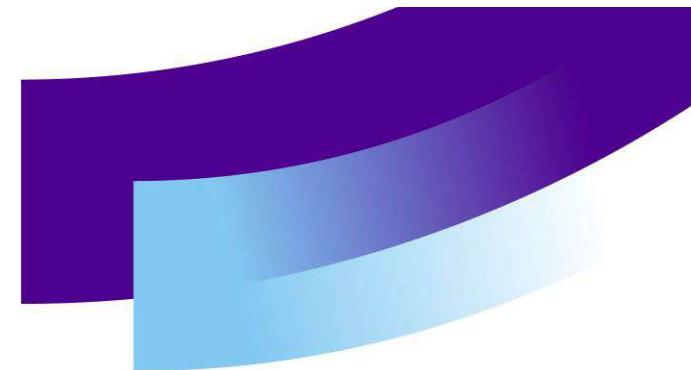


Leverage from
the EU
2014–2020

The project is funded by the REACT-EU
programme as a COVID-19 measure of
the European Union.



Innovation and competence ecosystem in Tampere region for sustainable and smart textiles





Vipuvoimaa
EU:lta
2014–2020

Hanke rahoitetaan REACT-EU-välineen määrärahoista osana Euroopan unionin COVID-19-pandemian johdosta toteuttamia toimia.



Pilot 1 – First material test results

**Final Seminar
25.5.2023**

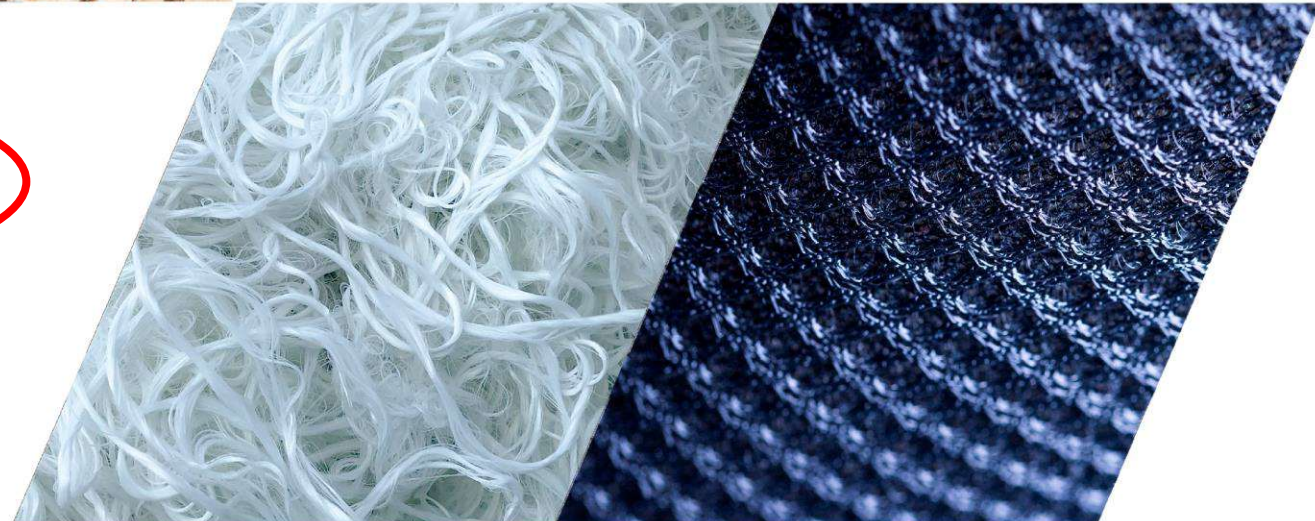
**Minna Varheenmaa, Tiina Ylinen & Marja
Rissanen TAMK**



Innovation and competence ecosystem in Tampere region for sustainable and smart textiles

Pilot 1 'A relaxing garment providing haptic feedback'

Pilot 2 'A digital passport promoting responsibility, sustainability and transparency'



European Union
European Regional
Development Fund

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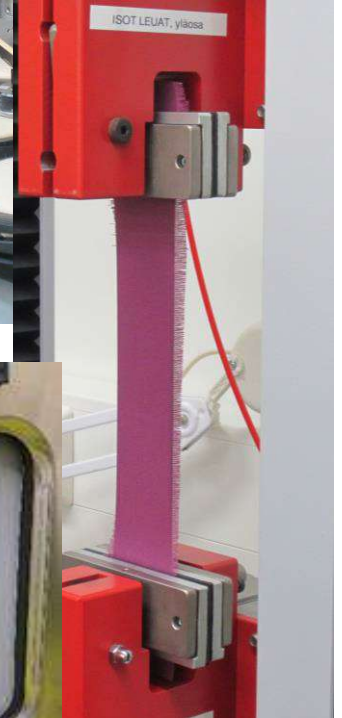
Sustainability and durability



Renewable
Recycled, Recyclable
Biobased



Durability in use, wear
and wash



Tested samples

Sample code ID	Raw material	Structure	Square mass
Knitted by TAMK			g/m ²
P1_6	100% CO	single knit	192
P1_7	100% PES	single knit	104
P1_8	Refibra	single knit	169
P1_9	100% CV Bambu	single knit	183
P1_10	100% CLY	single knit	154
P1_23	100% PTT	single knit	352
Reference fabrics			
P1_13	75% PA 25% EL	knitted	176
P1_14	100% PES	knitted	321
P1_15	90% PA 10% EL	knitted	168
P1_16	100% PES	knitted	185
P1_17	92% PES 8%SP	knitted	324
P1_18	51% PES 43%VI 6% EL	knitted	273
P1_19	100% CLY	woven	200
P1_20	100% PA	woven	227

Mass per square meter
SFS-EN 12127



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Dimensional & appearance changes in washings

SFS-EN 5077:2008
4N + line drying

Limitations:
xSmall amount of
the sample
*** raw knits

Sample code ID	Raw material	Structure	LENGTH [%]	WIDTH [%]	Appearance
Knitted by TAMK			LENGTH [%]	WIDTH [%]	Appearance
P1_6 ***	100% CO	single knit	-12,0 ^x	-8,5 ^x	Even wrinkling
P1_7 ***	100% PES	single knit	+2,0 ^x	-1,5 ^x	No remarkable change
P1_8 ***	Refibra	single knit	-14,5 ^x	-9,5 ^x	Some wrinkles
P1_9 ***	100% CV Bambu	single knit	-19,0 ^x	-5,0 ^x	Even wrinkling
P1_10 ***	100% CLY	single knit	-14,0 ^x	-8,0 ^x	Some wrinkles
P1_23 ***	100% PTT	single knit	-	-	-
Reference fabrics					
P1_13	75% PA 25% EL	knitted	-3	-2	No remarkable change
P1_14	100% PES	knitted	-1	0	Some very small wrinkles
P1_15	90% PA 10% EL	knitted	-1	-1	No remarkable change
P1_16	100% PES	knitted	0	0	No remarkable change
P1_17	92% PES 8%SP	knitted	-1,5	0,5	No remarkable change
P1_18	51% PES 43%VI 6% EL	knitted	-1,5	0,5	No remarkable change
P1_19	100% CLY	woven	-6,5	-1,5	Even wrinkling. Colour has faded a bit. The fabric feels "hard".
P1_20	100% PA	woven	-1	-1	Small wrinkling



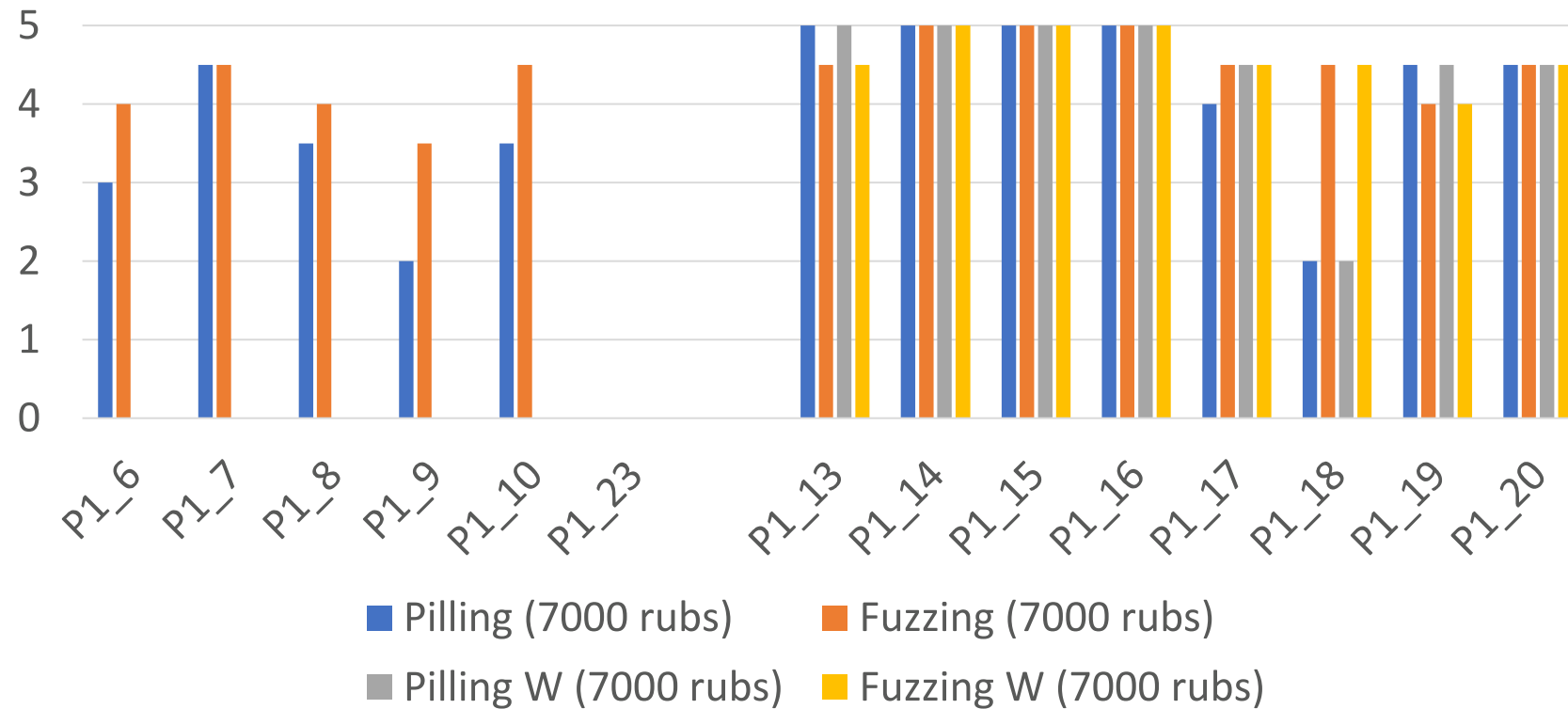
Euroopan unioni
Euroopan aluekehitysrahasto

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EU:lta
2014–2020

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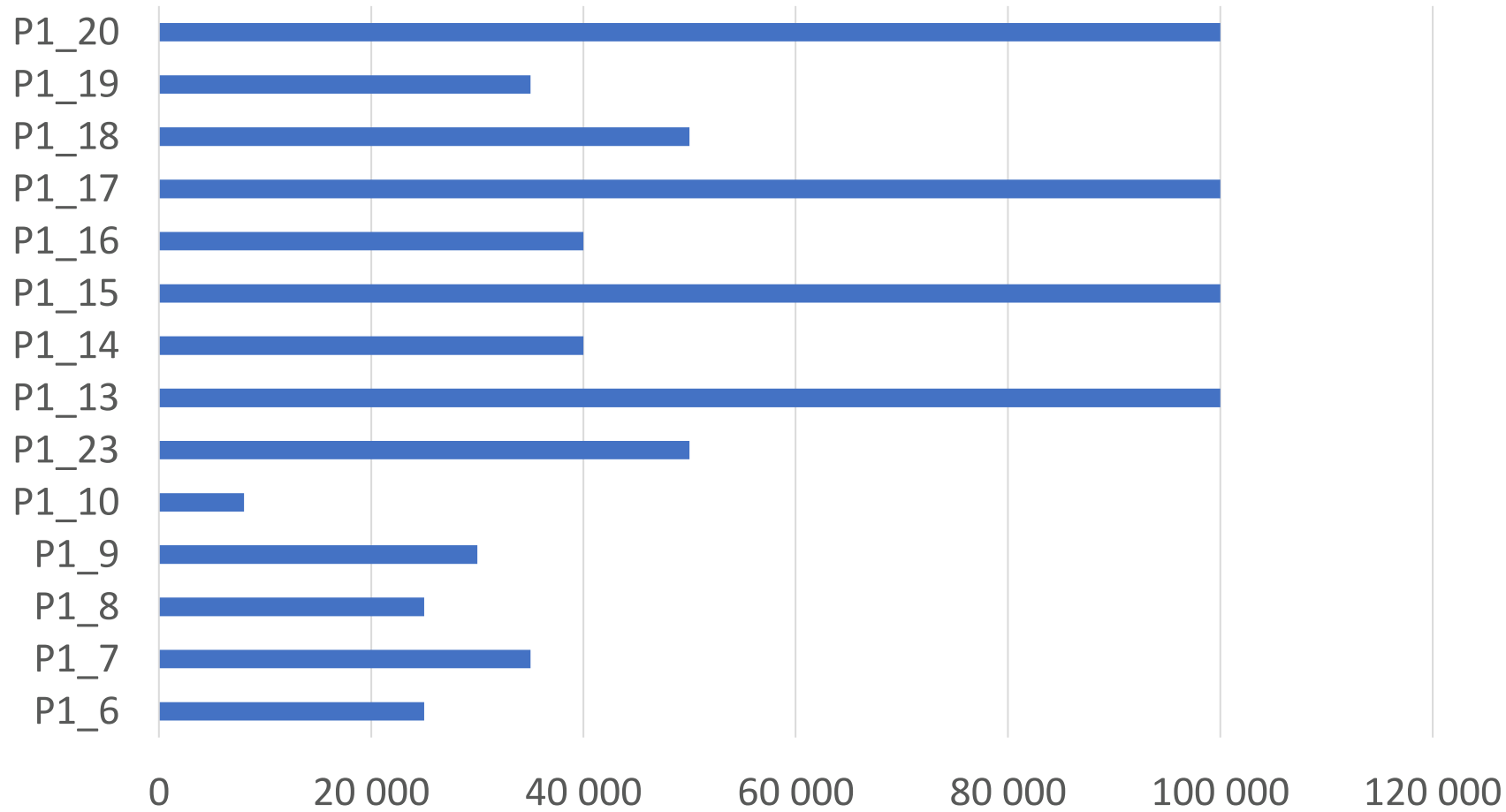
Pilling and Fuzzing, unwashed and washed (W) (SFS-EN ISO 12945-2)



Loading:

- 155 g knitted
- 415 g woven

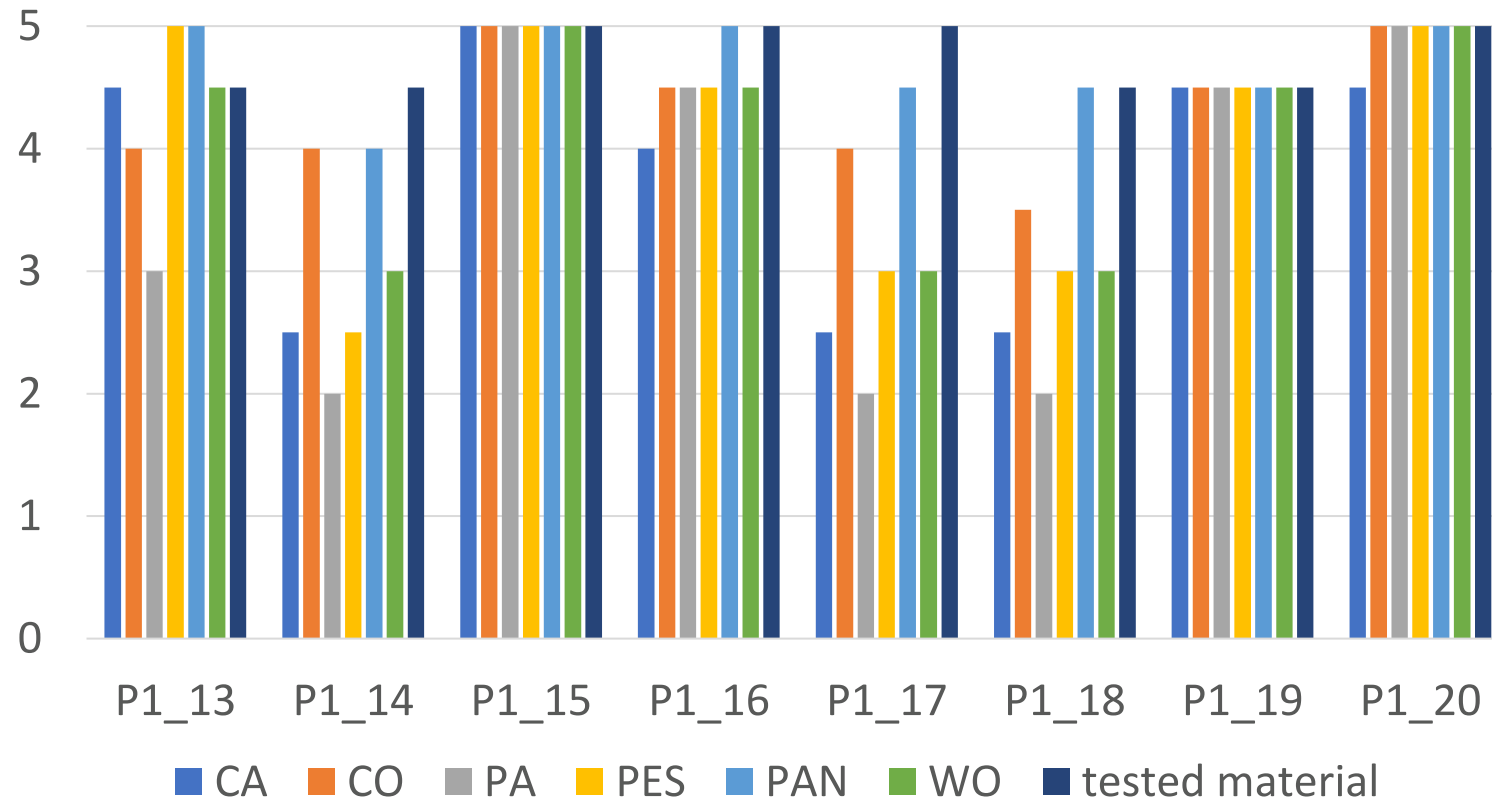
Martindale. Abrasion resistance (number of rubs) SFS-EN ISO 12947-2



Notes:

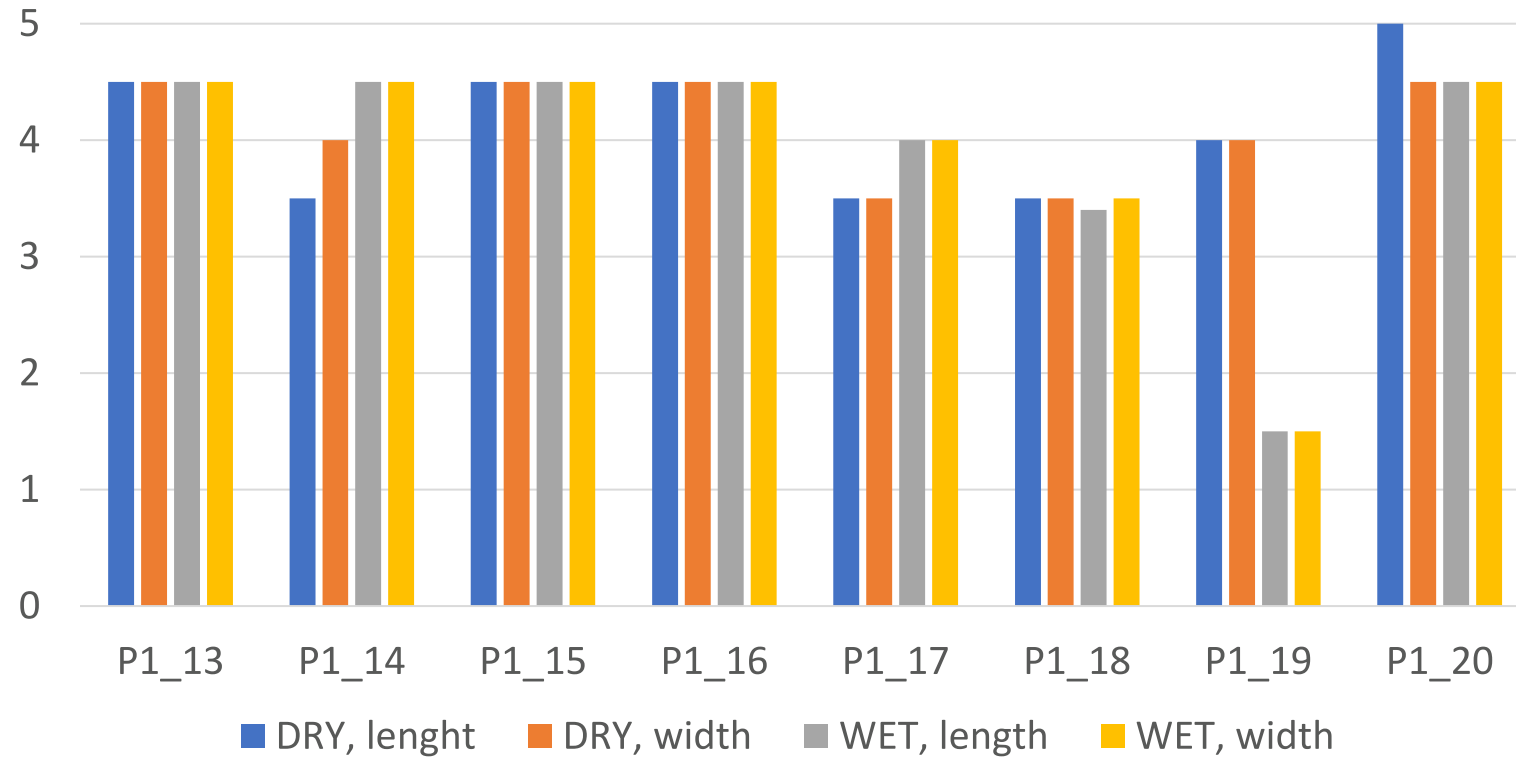
- Load 12 kPa
- Test stopped at 100000 cycles
- P1_23 Test stopped at 50000 cycles
- Small amount of samples P1_6-P1_23

Colour fastness to laundering SFS-EN ISO 105-C06



Reference materials
tested only.

Colour fastness to rubbing SFS-EN ISO 105-X12



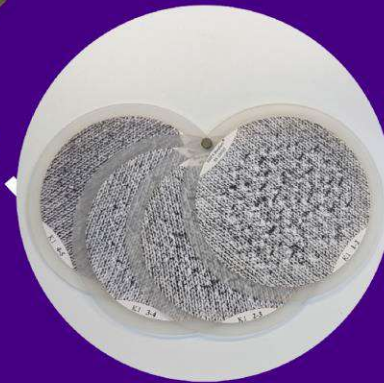
Reference materials
tested only.



...to great sustainable and smart textiles!



From raw material...



Leverage from the EU 2014-2020

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Tampereen ammattikorkeakoulu

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PIRKANMAA



Kiitos!

Thank you !

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