endeavour

Alchemie

The Digital Materials Science Company

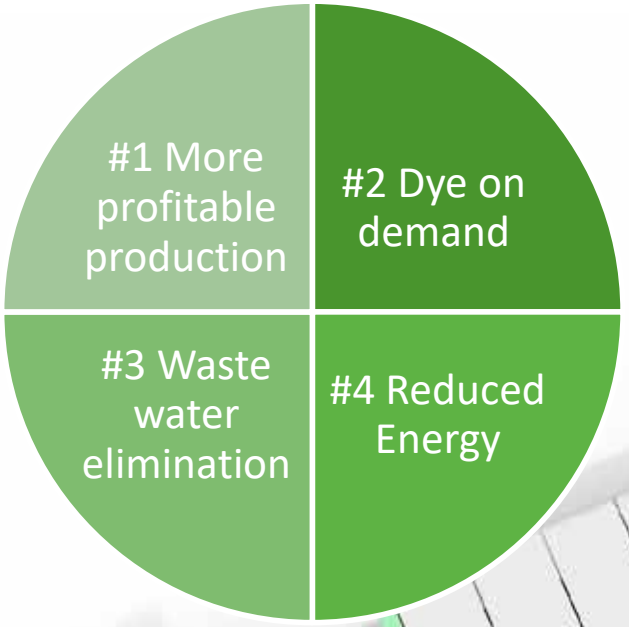
ENDEAVOUR:
WATERLESS SMART DYEING

Textile dyeing is polluting, costly and inflexible

- #2 global chemical pollution issue - due to wash water emissions
- Textile industry to consume 25% world's carbon budget by 2050
- Costly and energy intensive – significant carbon footprint and energy costs
- Inflexible production means excessive inventory requirements and high minimum order quantities and retail discounting

endeavour

Alchemie



1. Higher profit (>50%)
2. Dye on-demand – less inventory
3. Elimination of waste water (>95%)
4. Reduced Energy (~85%)

Endeavour – Key Benefits

MORE PROFITABLE PRODUCTION

DYE ON DEMAND

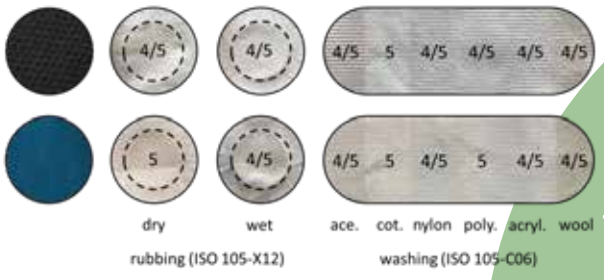
WASTE WATER ELIMINATION

REDUCED ENERGY

Endeavour – key benefits

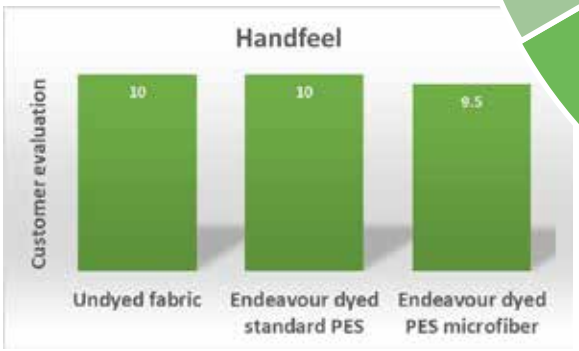
Endeavour delivers excellent fabric quality

Superior fastness vs exhaust dyeing



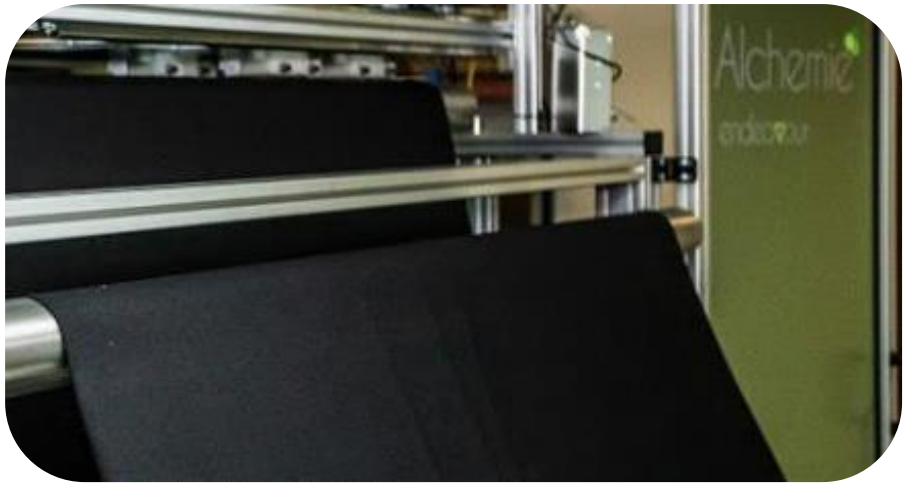
- Fastness expert-judged to be equivalent/superior to exhaust dyeing

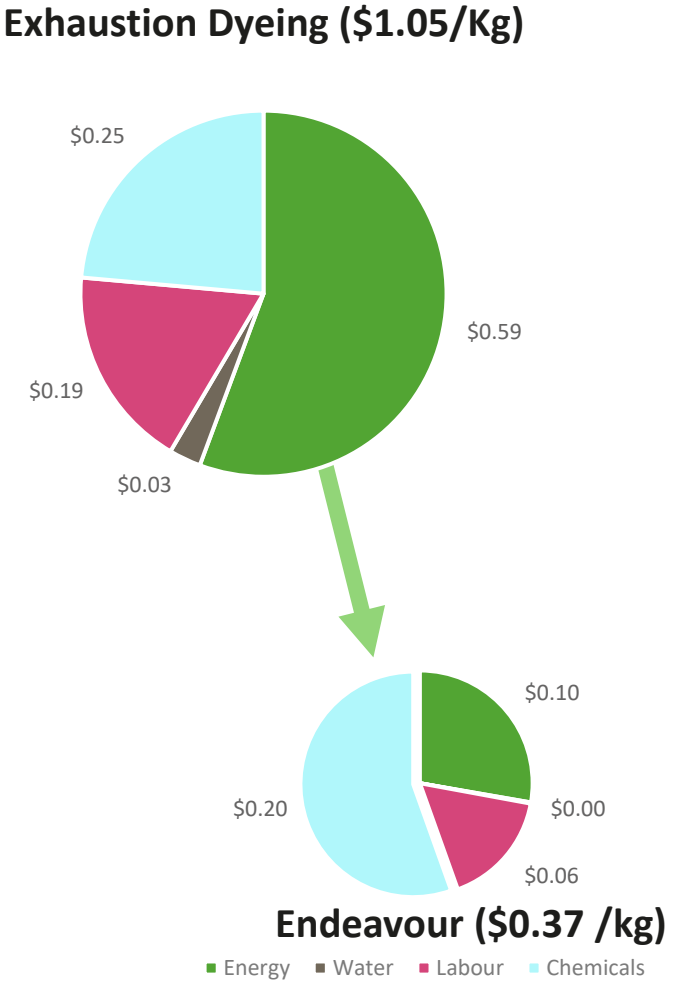
Digital colour matching capability



Process benefits

#1 More profitable production (>50%)





- Energy costs reduced by up to 85%
- Materials usage reduced by up to 30%
- High throughput process 4-20X faster than dyebaths
- TOTAL COST REDUCTION >50%

Process benefits

#2 Dye on demand

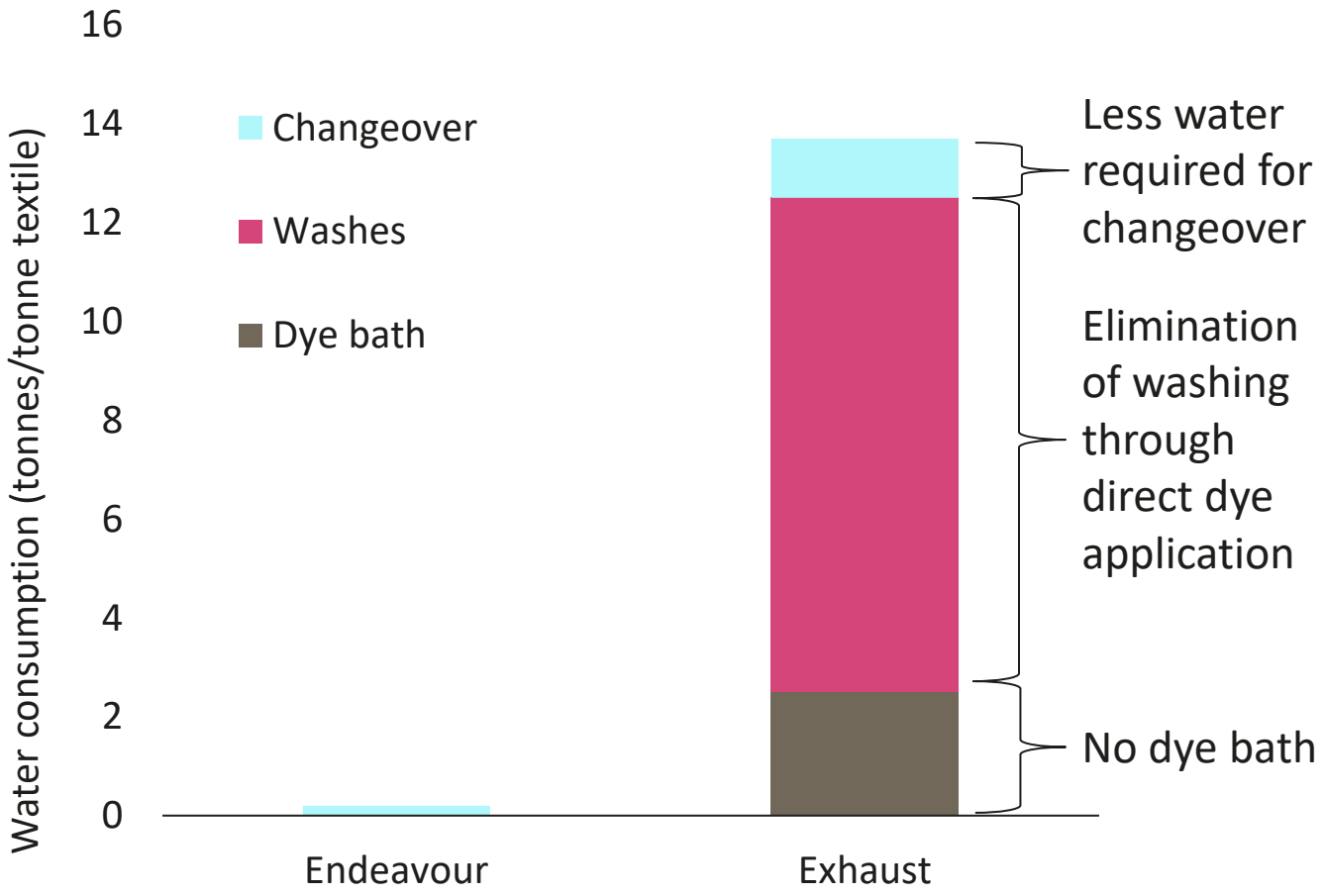
1.0 Solid Colour ▲

2.0 Solid Colour Changeover ▲

- Rapid automated changeover of colors
- Ultra-low minimum order quantities economically viable

Process benefits

#3 Waste water elimination: < 95% waste water

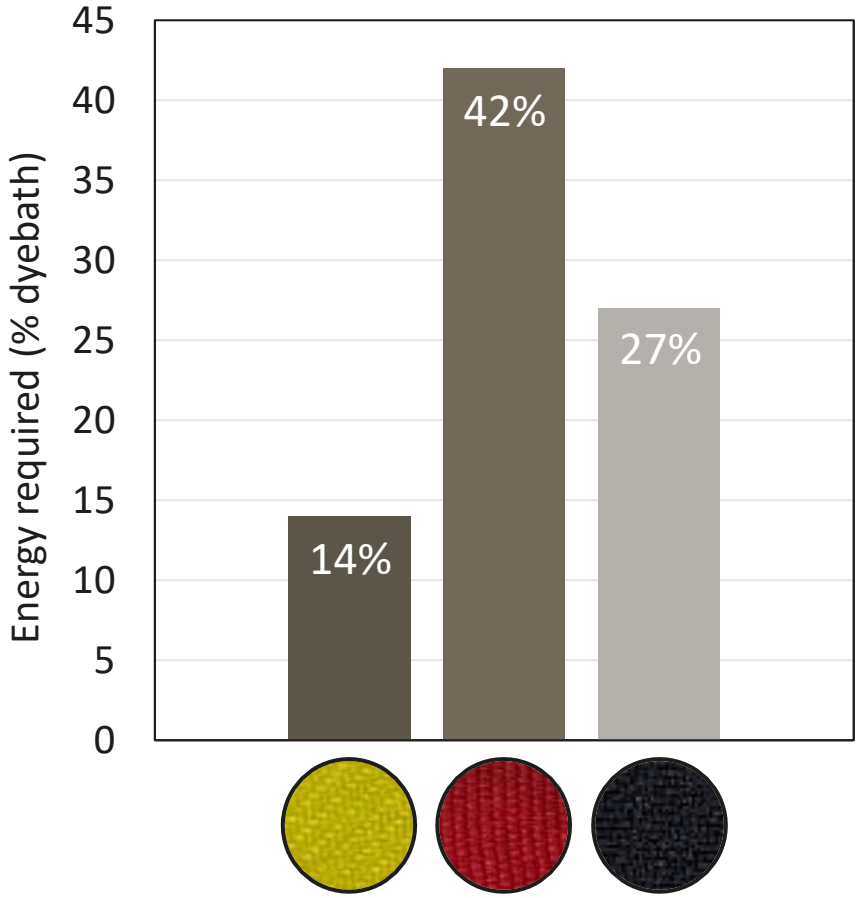


Process benefits

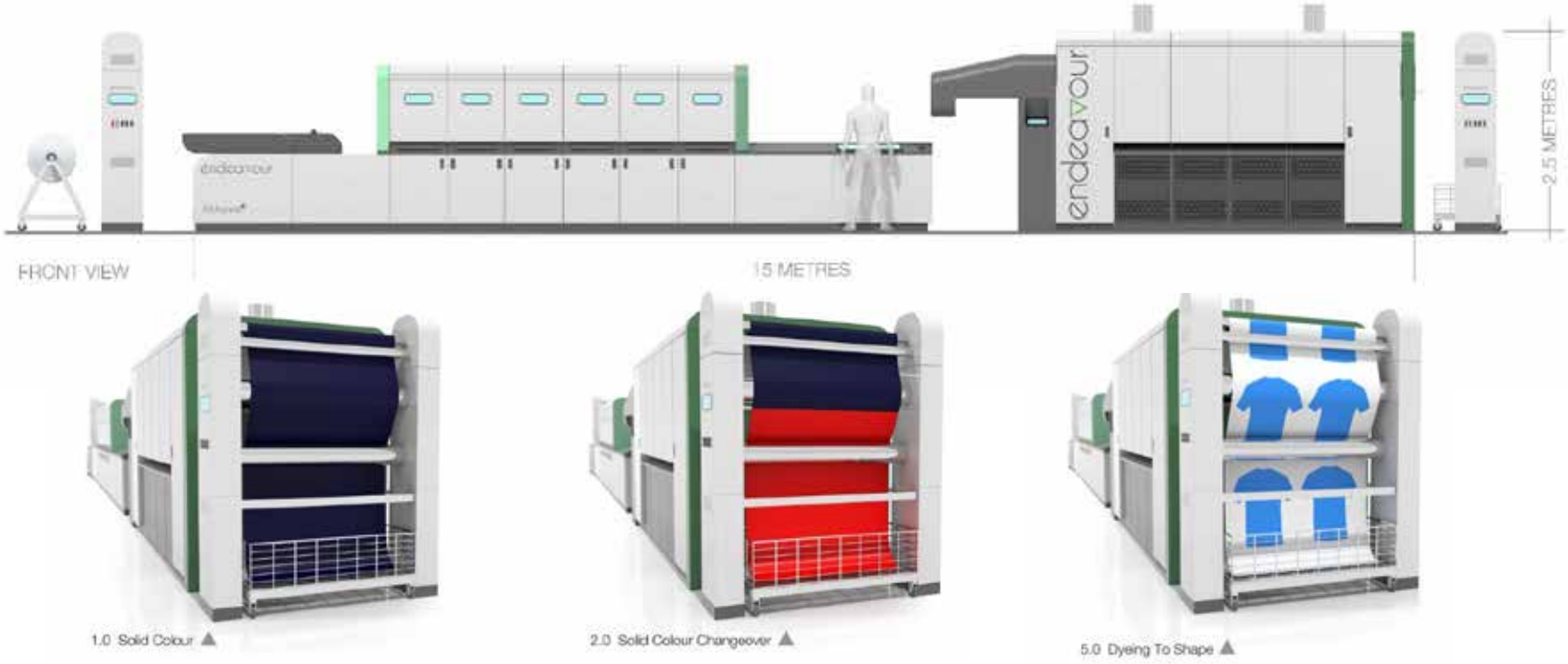
#4 Reduced carbon footprint

- Energy required reduced by up to 85%
- Reduction in chemicals usage
- Reduced losses/waste in supply chain
- > 25 tonnes CO_2 savings per machine

Energy Savings

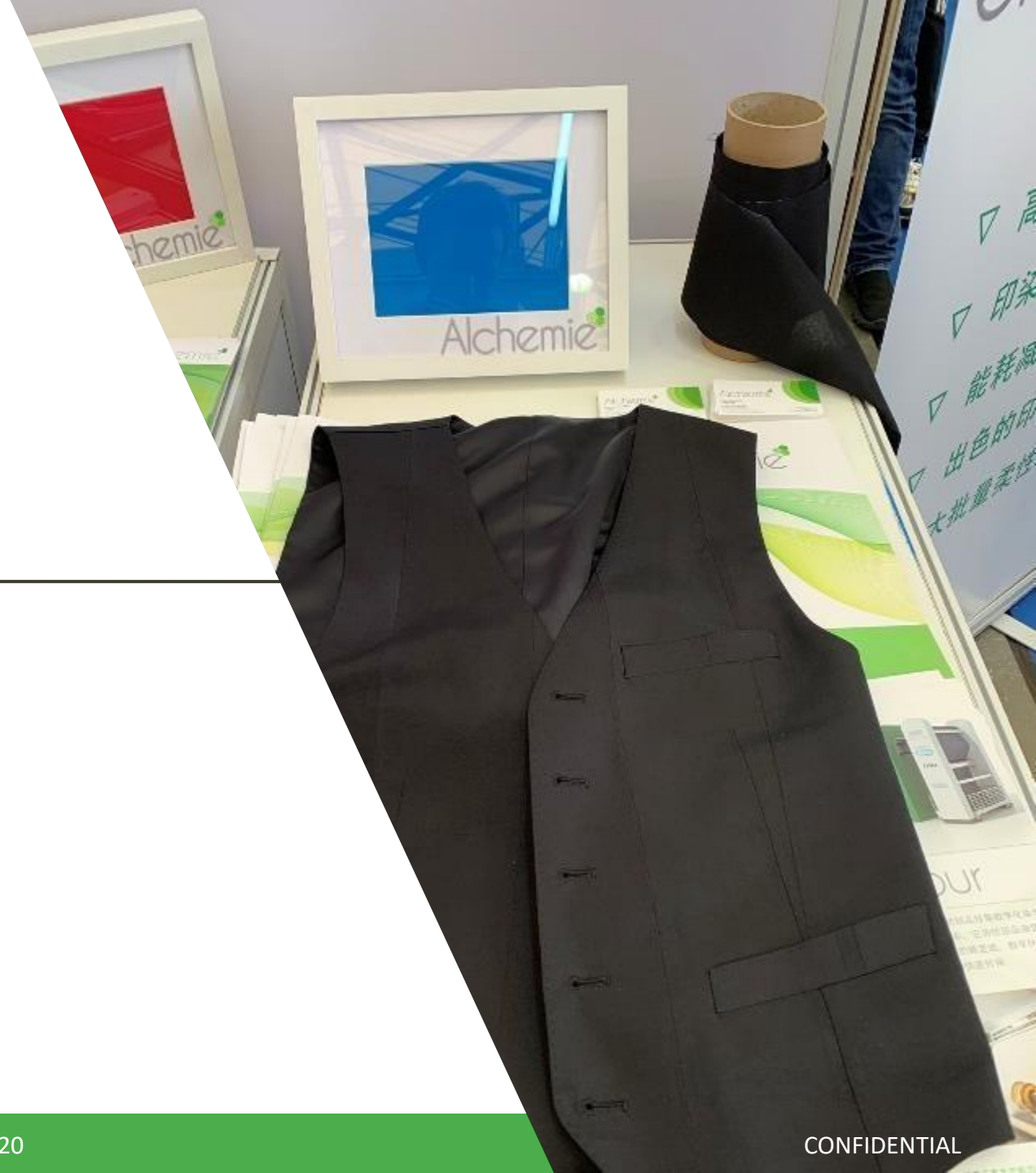


Production lines – available for delivery



- Roll-to-roll direct to fabric digital dyeing solution
- 25 m min-1 / 1.8m wide
- Up to 500 gsm
- Polyester and other textile materials

endeavour

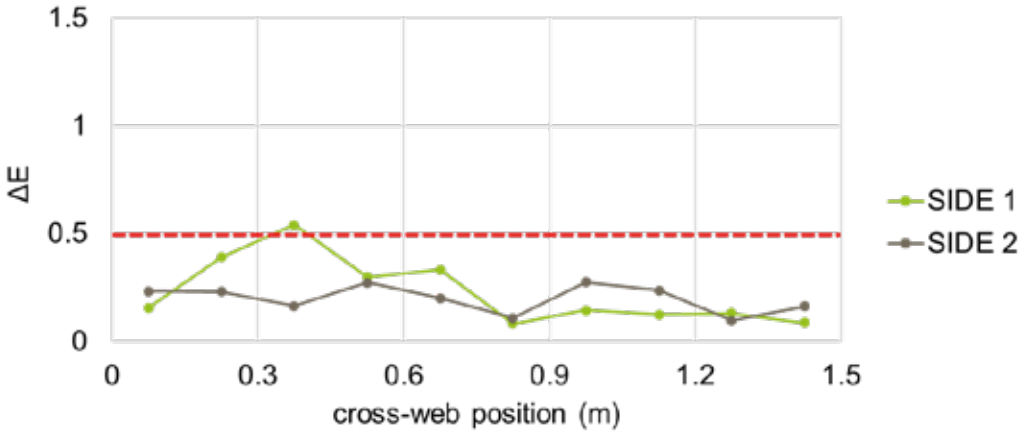


APPENDIX

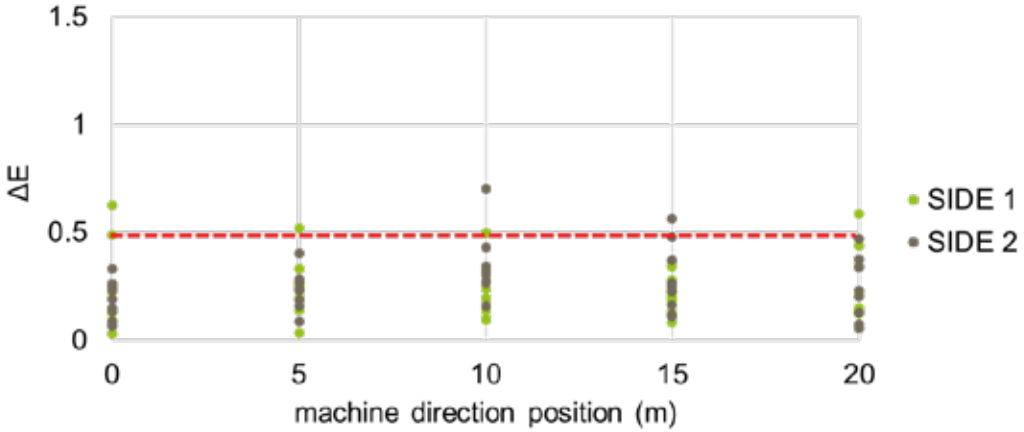
Process Data

Excellent colour consistency

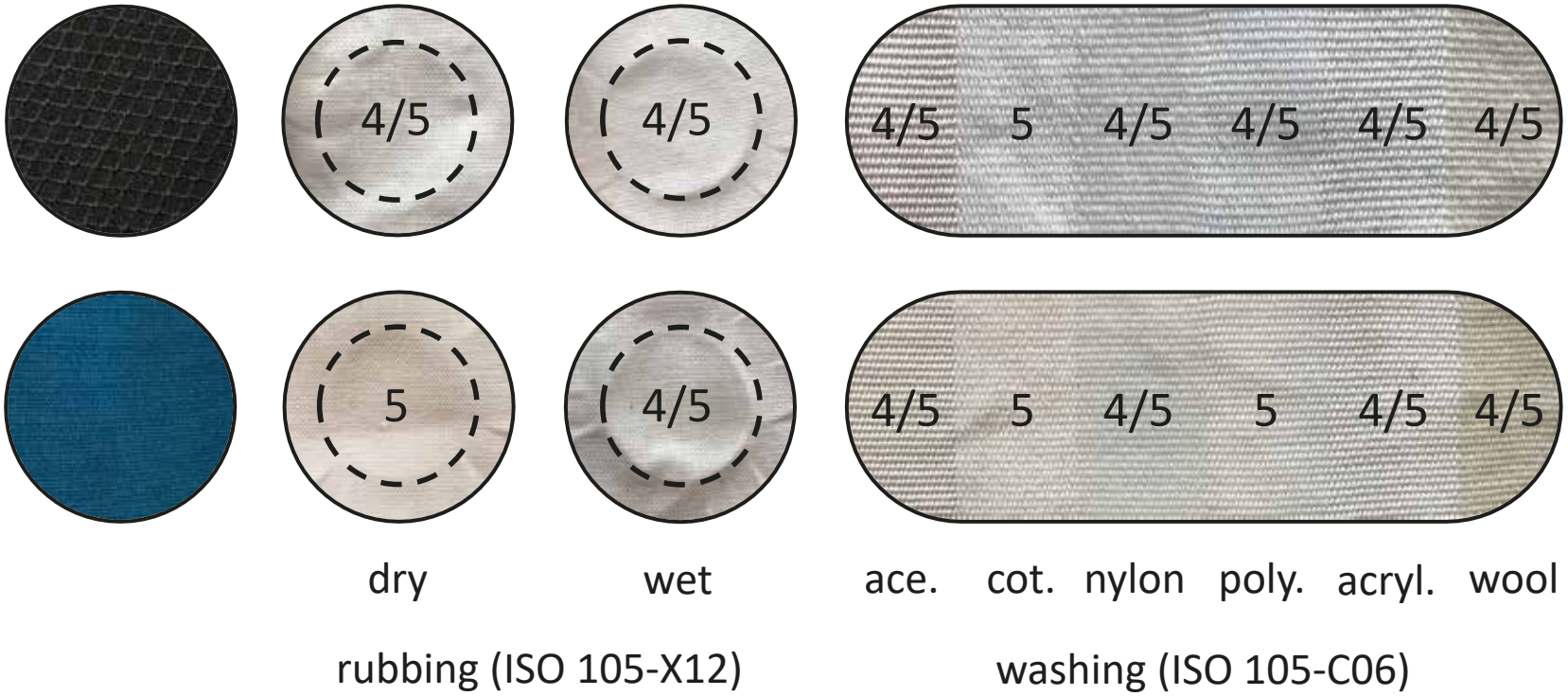
Cross-web direction colour consistency (ΔE)



Machine direction colour consistency (ΔE)



Superior fastness vs exhaust dyeing



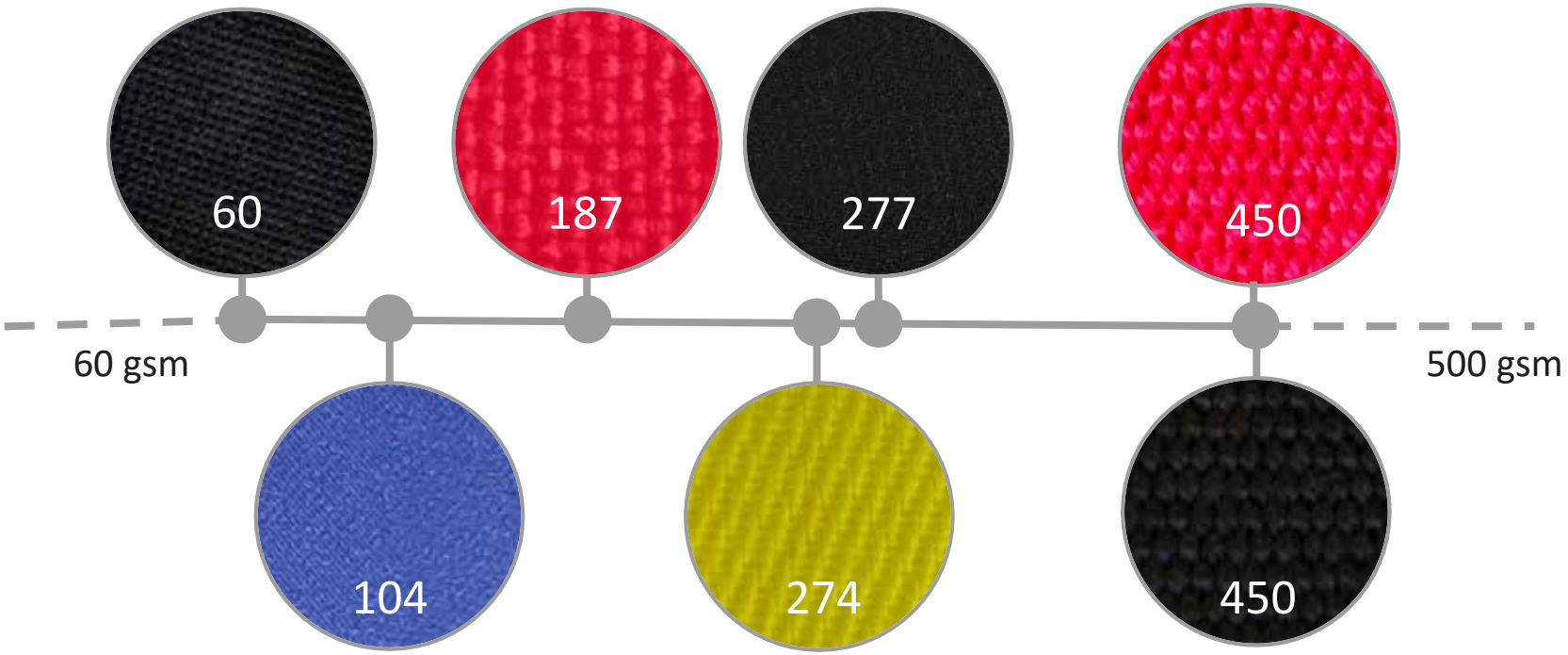
- Fastness expert-judged to be equivalent/superior to exhaust dyeing

Woven, non-woven and knitted polyesters

woven non-woven knitted

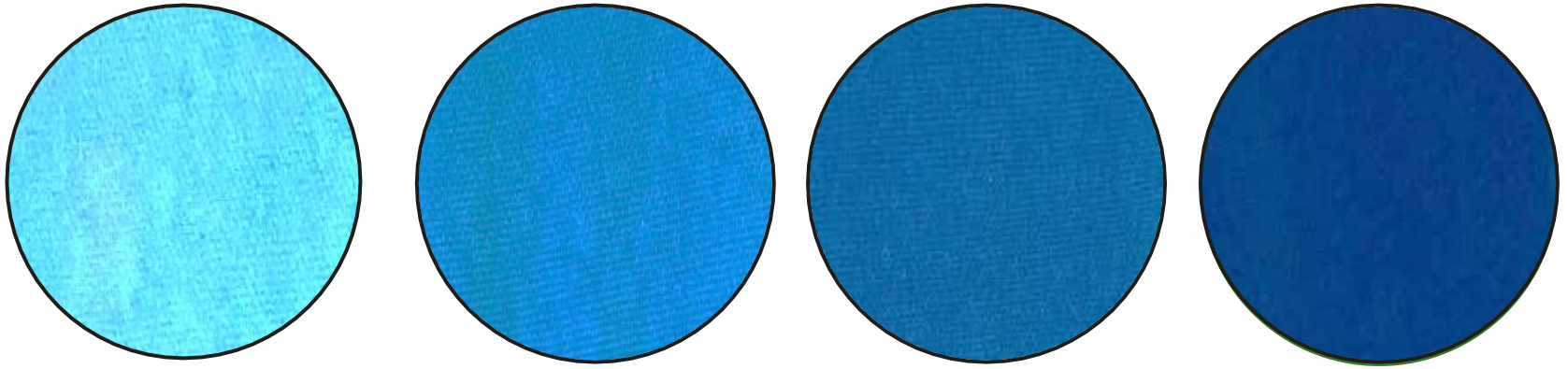
- First generation Endeavour launched for 100% polyester substrates

Up to 500 gsm basis weights demonstrated



- Endeavour demonstrated with 100% polyester from 60 gsm up to 450 gsm

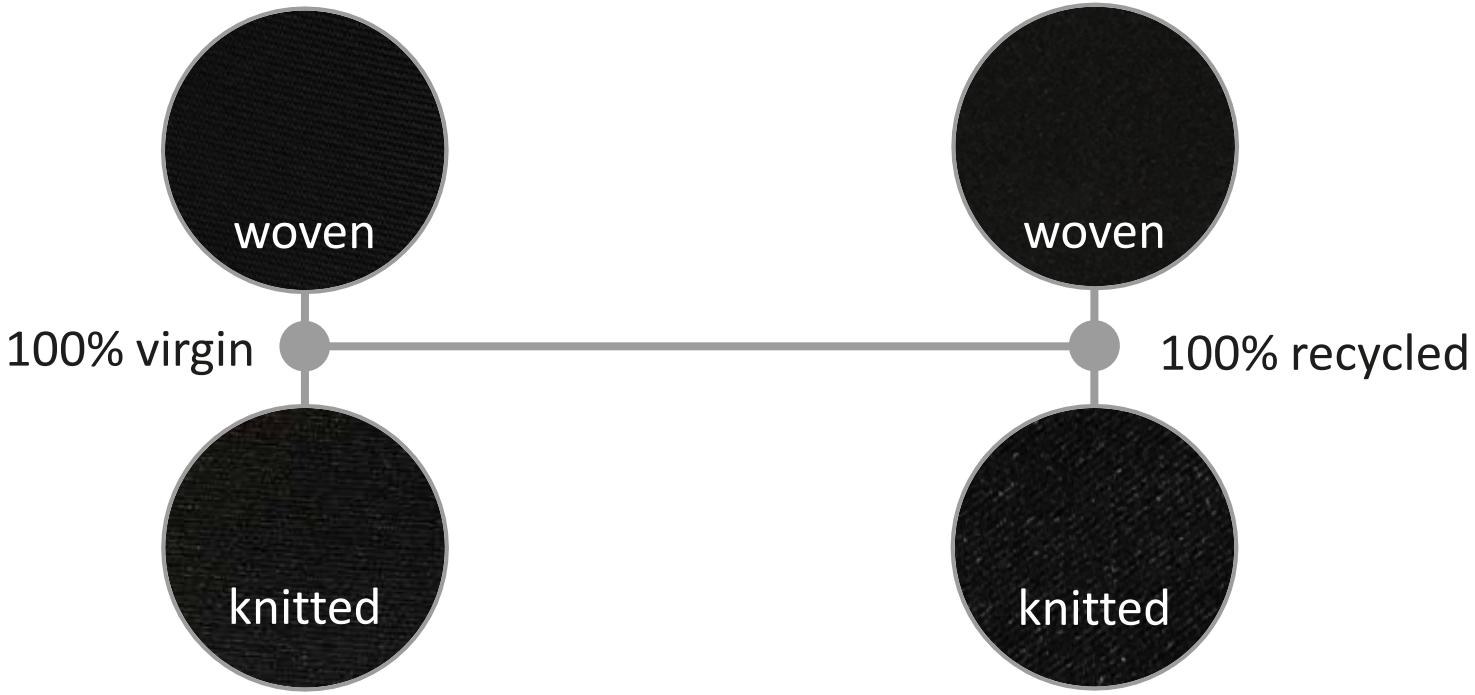
Digital shade control



0.375% 0.75% 1.5% 3.0%

- We can control the colour shade using our digital application technology
- This enables precise shade matching with no trial runs – colours can be accurately dialled into the process based on process intelligence

Excellent performance with recycled polyester



- Demonstrated technical equivalence recycled vs virgin polyester

Successfully dyed 4 mm spacer fabrics and tapes

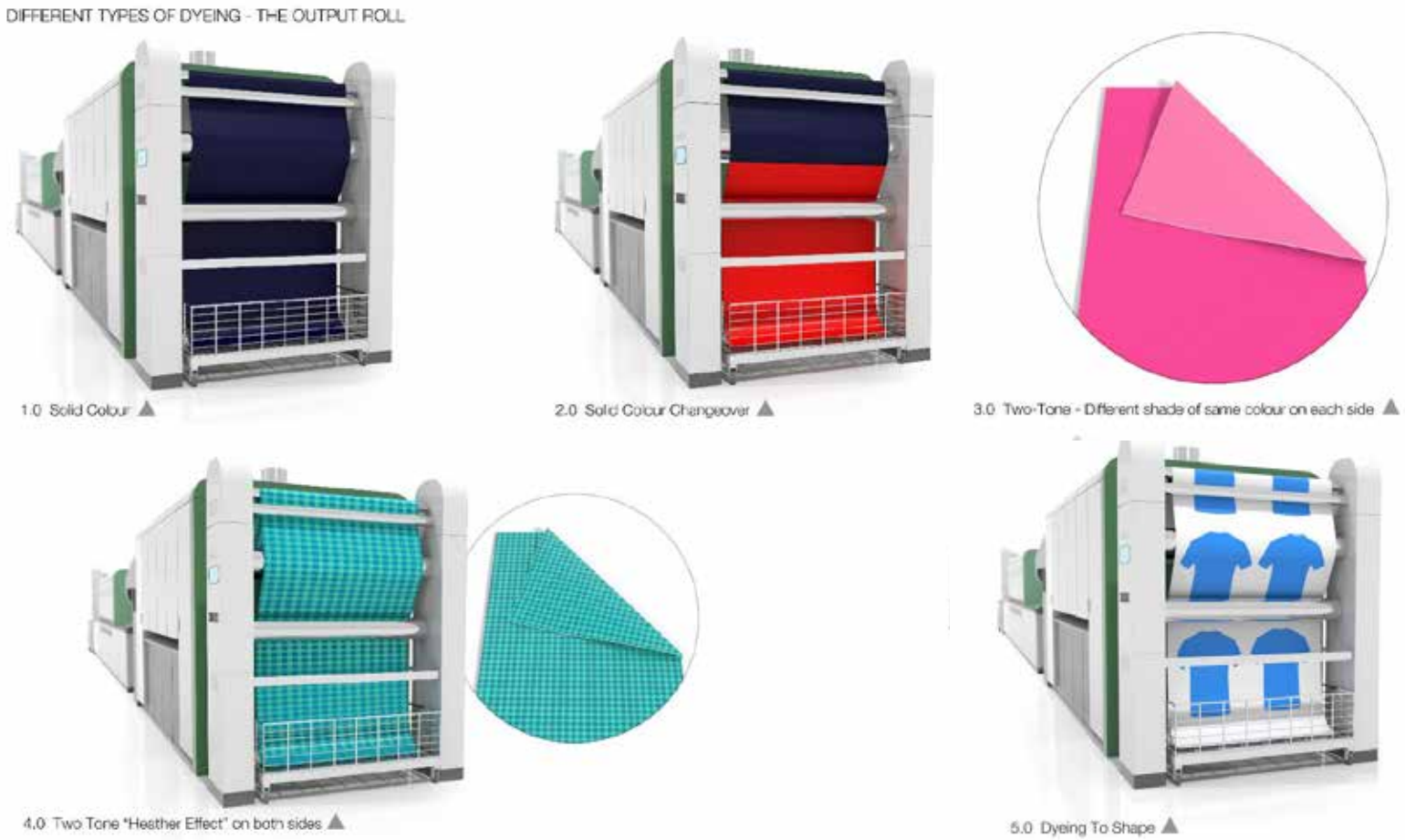
3 mm spacer

4 mm spacer

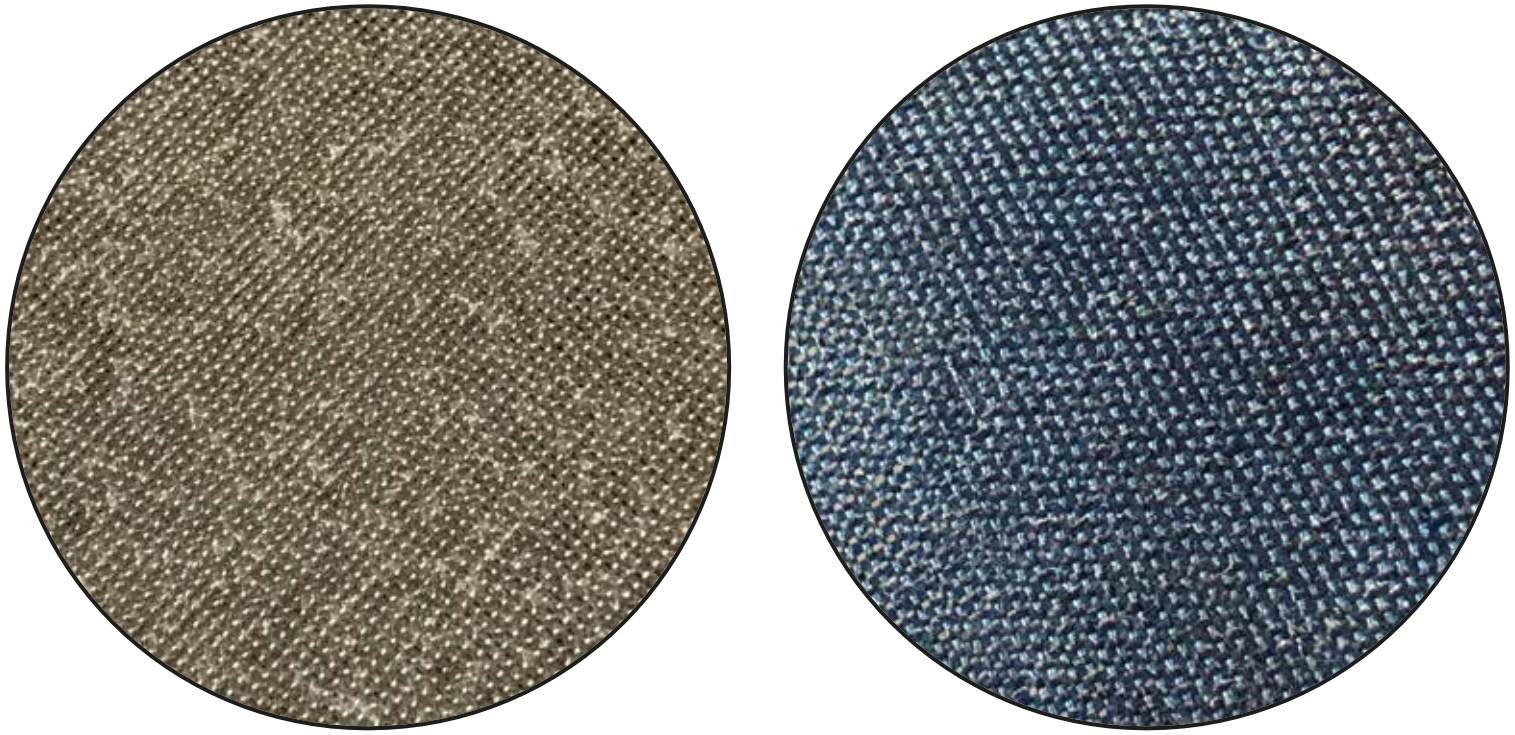
tapes

- Endeavour demonstrated on spacer fabrics up to 4 mm thickness
- Narrow-web tapes dyed successfully with widths as low as 15 mm

New innovation opportunities

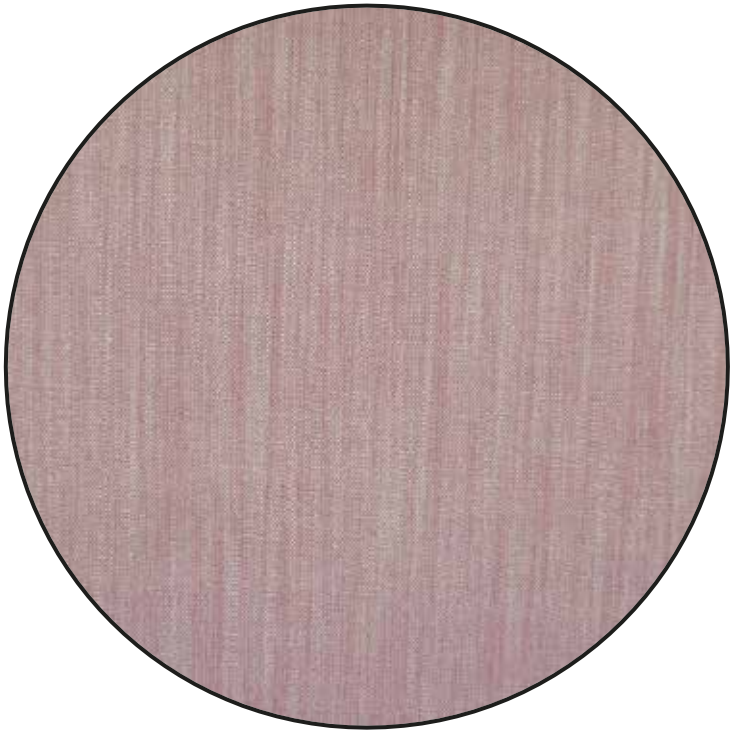


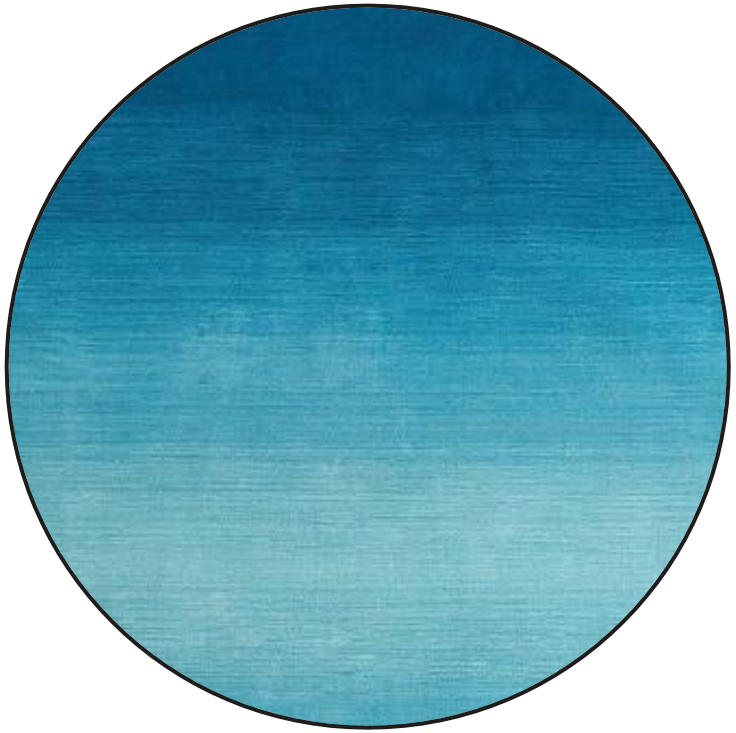
Multi-substrate dyeing



- We have demonstrated multi-substrate pigment dyeing using proprietary chemistry

New visual effects





- We can deliver unique dye patterning and visual effects