

世界纖維現況及PET纖維發展趨勢

Present status of world fiber production and
Development trend of Polyester Fiber

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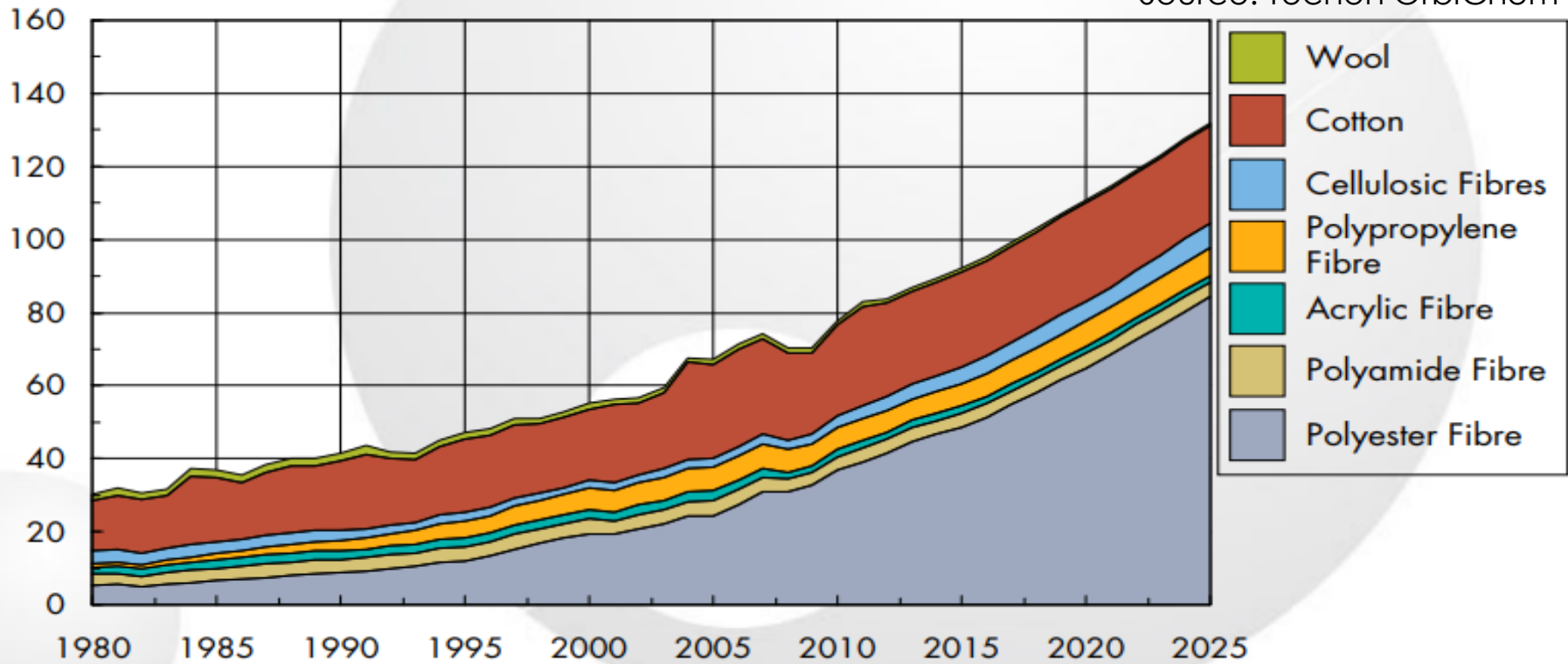
Sept. 18, 2017



World Fiber Production 1980~2025

Million Metric Tons

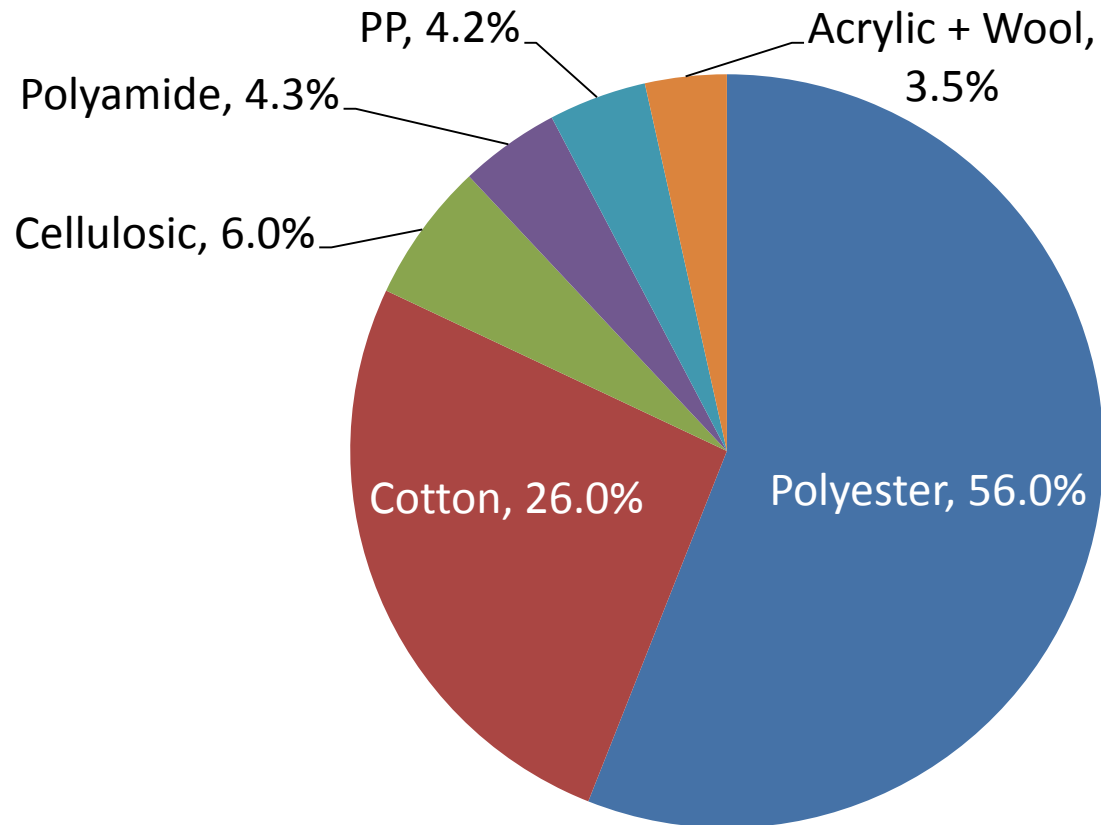
Source: Tecnon OrbiChem



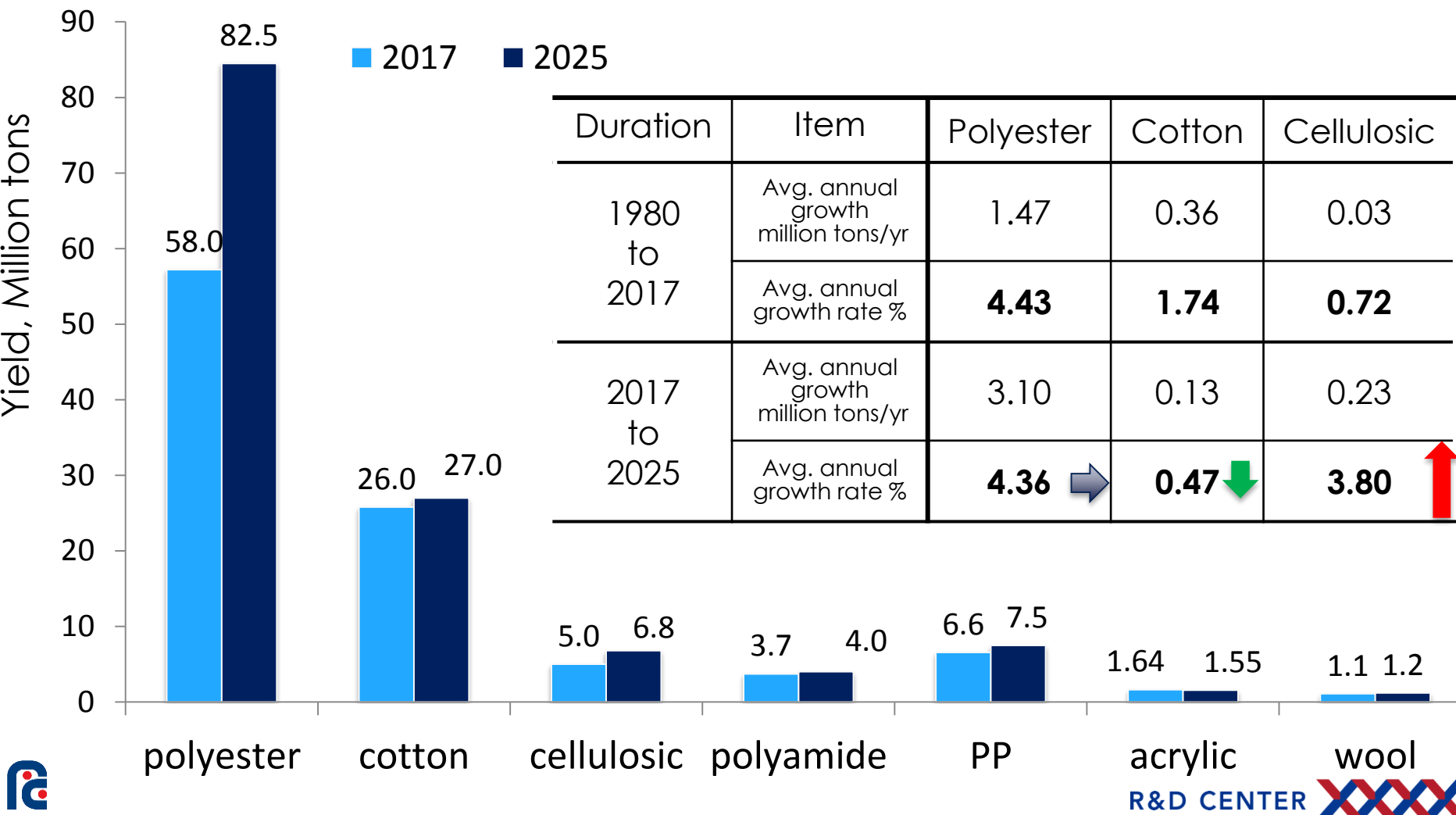
From 1980-2017	1980 yield Million tons	2017 yield Million tons	Total growth by yield Million tons	Total growth %	Average annual growth Million tons/yr	Average annual growth rate (%/yr)
Polyester	5.0	58	53	1060	1.47	4.43
Cotton	13.1	26	12.9	98	0.36	1.74
Cellulosic	3.8	5	1.2	32	0.03	0.72

2017 World Fiber Production

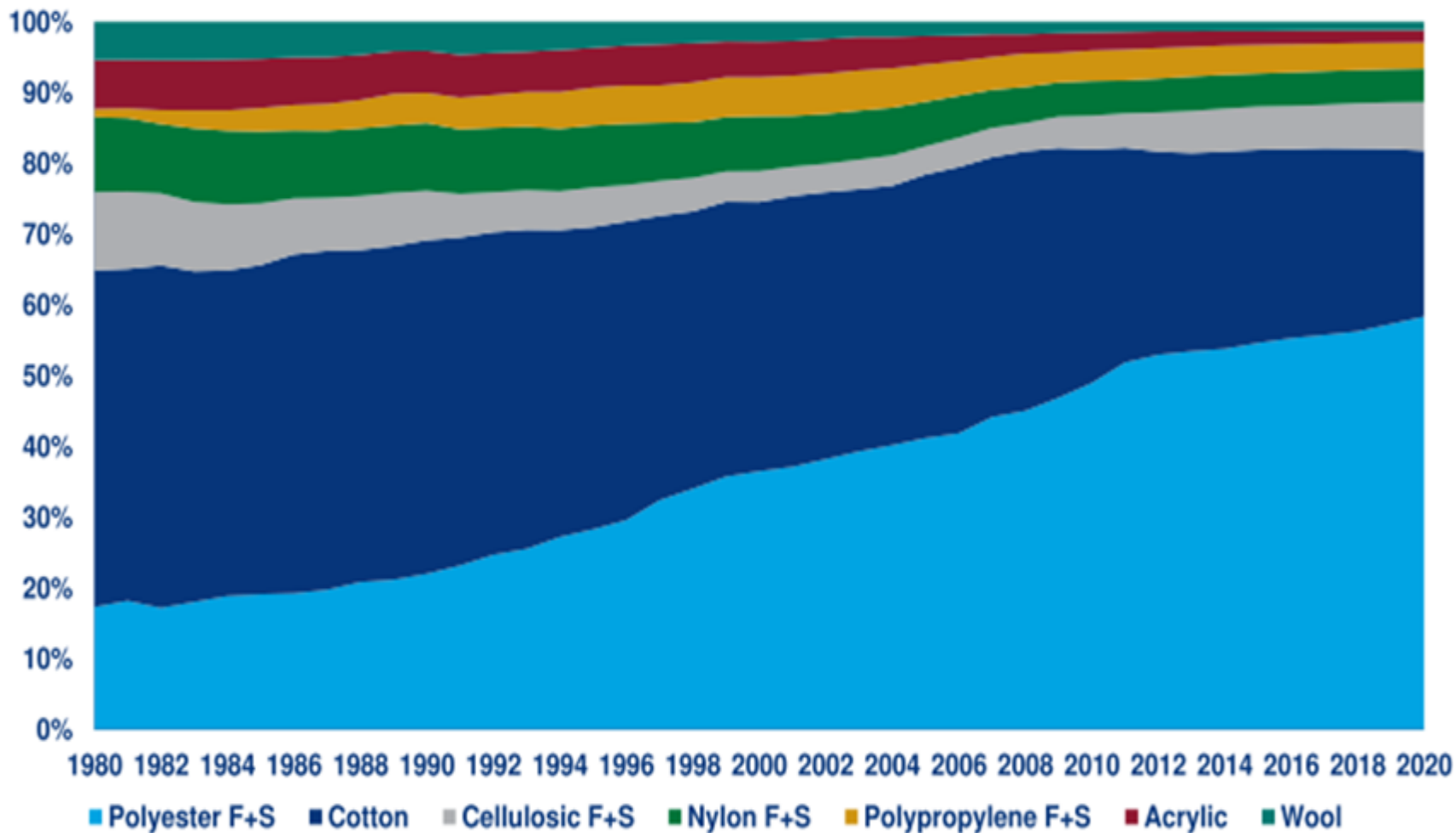
- At 2017, total fiber yield: 100 Million tons



Future Fiber Growth Prediction (2017-2025)

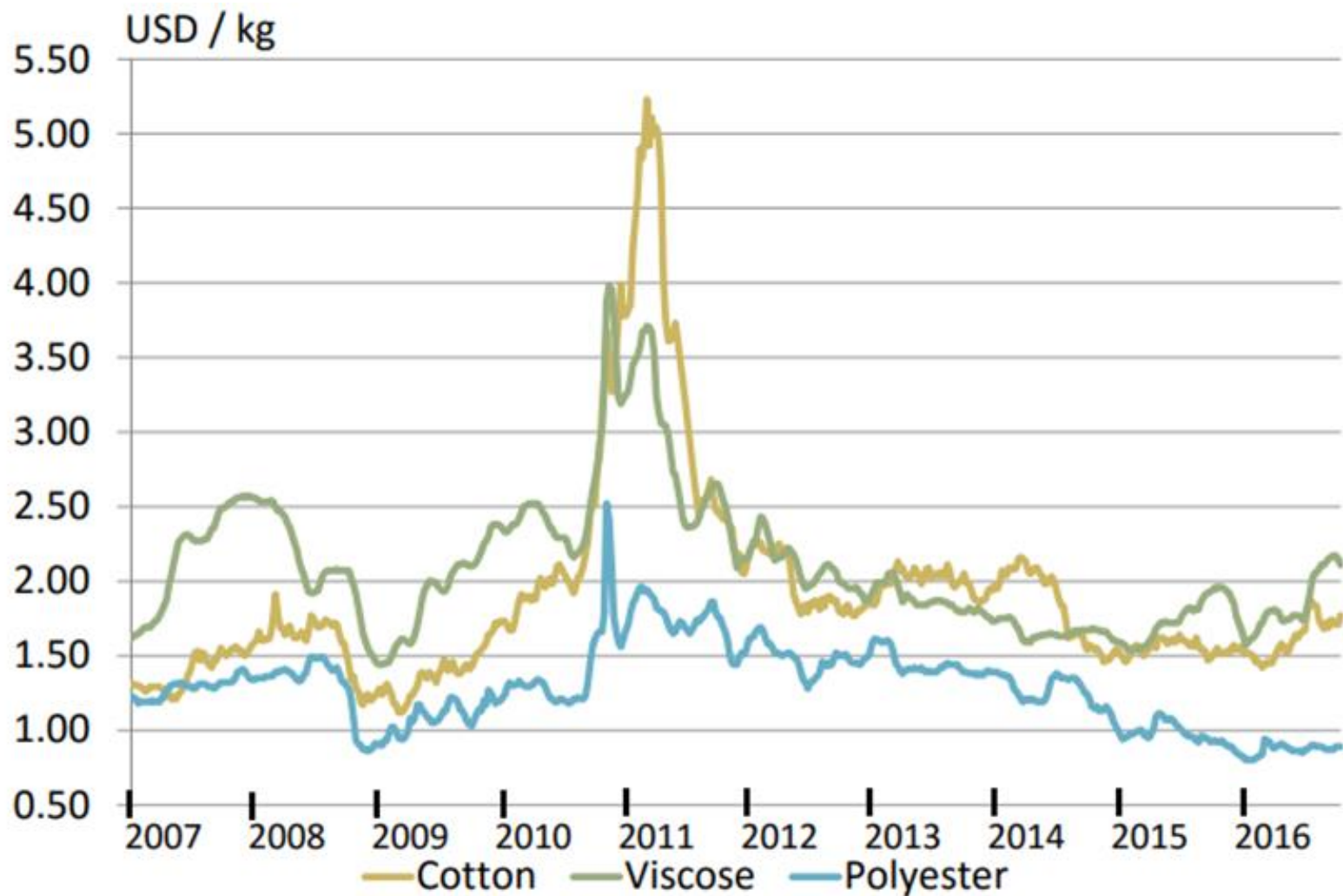


World fiber mill consumption share



Source: PCI Wood Mackenzie Red Book 2016

Viscose, Polyester and Cotton price: Last 10 Year



Fibers cost and Properties

Fiber	Cotton	Rayon	Polyester	Nylon	Acrylic	PP	Wool
Price, USD/Kg Sep.,20 17	1.7	2.0	1.2	2.5	2.0	2.5	14
Strength	++	+	+++	+++	++	+++	-
Dimensional Stability	+	-	+++	+++	+++	+++	-
Moisture region	+++	+++	-	++	+	-	+++
Wrinkle recovery	-	-	+++	++	++	++	-
Resistance to Pilling	+++	+++	-	+	-	++	+
Abrasion resistance	+	-	+++	+++	+	+++	++
Static charge	+++	+++	-	+	+	-	+++

+++ : excellen; ++ : Good ; + : Fair ; – : deficient

- Rayon's properties are nearly the same as Cotton.
- PET has the best cost performance ratio



The Present State of Polyester fiber modification

Item	Physical	Chemical
Hydrophobic (non-breathable)	<ul style="list-style-type: none">• Special Cross section• Microfiber	<ul style="list-style-type: none">• Hydrophilic modification
Hand feel	<ul style="list-style-type: none">• Crimp (bulky)• Microfiber	<ul style="list-style-type: none">• Surface coating
Static charge	<ul style="list-style-type: none">• Anti static Filler	<ul style="list-style-type: none">• Hydrophilic modification
Pilling	<ul style="list-style-type: none">• Low molecular weight• Vortex spinning	<ul style="list-style-type: none">• Copolymerization



1. Adding more functionality In PET fiber



Moisture management

- Easy dry: **TopCool+®**
- Fluorine-free DWR Polyester :
TopDry® Zero



Thermal Regulation

- nIR reflection: **Solarfree^{Red}**
- Infrared absorption: **Sunex®**
- Heating by moisture vapor condensing
TopHeat+
- Cooling by fast water evaporation
TopCool+



Health & Hygiene

- Anti-microbial: **Eagelon®**
- Odor management: **Topfresh**



Hand Feel

- Nylon-like hand feel: **Topsoft**



2. Sustainability

- FENC owns 2 PET recycle plants, one in Taiwan, one in Japan with total 90,000 tons capacity

Recycling

- **BTB/BTF** (physical recycling)
- **Future FTF** (Chemical recycling)
Pilot plant ready by mid-2018

BTB: bottle to bottle

BTF: bottle to fiber

FTF: fabric to fabric



Dyeing & finishing

- **Waterless dyeing (scCO₂)**
- **Solvent/Water free Coating**
- **Novel Dyes for Dope Dyeing**
- **Low temp. dye-able**

Environmental friendly technology

- **PFC free DWR yarn**
 - Intrinsic
 - Coating on fiber
- **Antimony free PET**
- **Recycle PET-based water-proof and breathable film**



Conclusion

- I. Polyester fiber will continue to grow at an accelerating speed in the foreseeable future
 - Low petro price
 - Advancement in manufacturing technology(PX, TPA, EG, PET)
 - Continuously adding more functionality
 - More sustainable technologies: FTF recycling, fluorine-free coating, antimony free PET, waterless dyeing, dope dyed etc.
- II. Cotton supplier and industries should keep an eye on the future development of cellulosic fibers





Thank you for your attention

