Comfo-Fil® Dye-able PP filaments

Characteristics of Comfo-Fil®

Conventional PP filament cannot be dyed because it has no polar group in its polymer chains. Instead, the color has to be imparted on the fiber-extrusion stage through solution dyeing.

Yen Sign has developed a revolutionary new polypropylene filament, Comfo-Fil® dye-able polypropylene filament, which fits the needs of facile dyeing and polypropylene characteristics by incorporating an additive within the polypropylene filament. The filament can be dyed using conventional dyes in a manner similar to that used for polyester filament.

Advantages of Comfo-Fil®

- Facile dyeing
- Anti-bacterial & deodorizing
- No allergic side effects
- Anti-pollutants, and energy-saving (low-temperature washing and quick dry effects)
- Light weight, good temperature preservation and heat prevention effects
- Quick drying and comfortable touch feelings

- Excellent humidity absorbing and perspiration effects

Property	PP	PET	Nylon	Acrylic	Cotton	Wool	Silk
Density(g/cm^3)	0.9	1.38	1.08	1.16	1.54	1.32	1.34
Aqueous stain resistance	excellent	good	poor	good	poor	poor	poor
Chlorine bleach resistance	excellent	good	good	good	good	poor	poor
Moisture regain(%)	0.05	0.4	4.5	2	8	16	11
Durability	excellent	excellent	good	poor	poor	poor	poor
Chemical and bacterial resistance	excellent	good	excellent	good	good	poor	poor
Insulation power	0.17	0.14	0.1	0.14	0.06	0.14	0.14

Source:Textile World, September/October 2006

1. Anti-bacterial properties of Comfo-Fil®

Anti-bacterial activity assessment of Comfo-Fil® fabrics					
Test bacteria	ATCC No. of bacteria	T(mm)	D(mm)	W(mm)	Contact Area
Staphylococcus aureus	ATCC NO.6538	25	25	0	No Growth
Escherichia Coli	ATCC NO.8739	25	25	0	No Growth
Klebsiella pneumonia	ATCC NO.4352	25	25	0	No Growth
Test method: AATCC 147:2004 Test Lab: SGS textile laboratory Date:2012/10/03 W:Width of clear zone of inhibition in mm T:Total diameter of fabric specimen and clear zone in mm D:Diameter of the fabric specimen in mm					

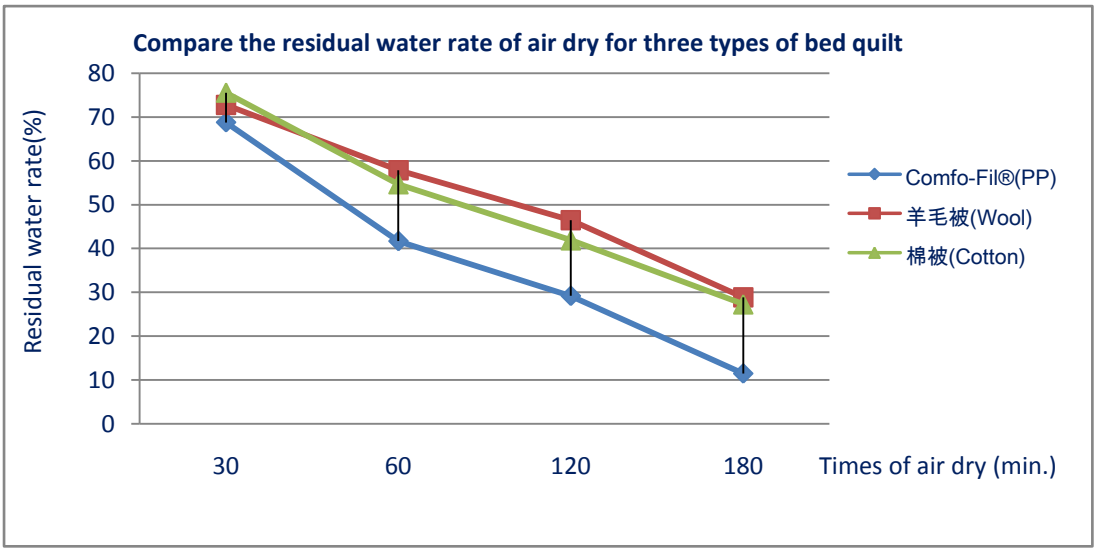
2. Thermal insulation properties of Comfo-Fil®

<table>
<tr><td colspan="4">Thermal insulation effect test of Comfo-Fil® Bed quilt</td></tr>
<tr><td colspan="2">Test items</td><td>Test results</td><td>Test method</td></tr>
<tr><td rowspan="3">Skin temp.
(℃)</td><td>Before test</td><td>31.1</td><td rowspan="3">1.Environmental condition:
18℃,65RH
2.Acclimation period:
10min.(without product)
Testing period:
30min.(with product)
3.Subject:Man (33 years old)
4.Test position:
Acclimation and testing period are both at the same lying posture.
5.Measuring point:
Central of the chest
6.Testing instrument:
LASER DOPPLER:
Blood flow meter</td></tr>
<tr><td>After test for
30min.</td><td>33.7</td></tr>
<tr><td>Difference(%)</td><td>+2.6</td></tr>
<tr><td colspan="4">Test Lab :TTRI (Taiwan Textile Research Institute)
Test date:2012/10/11</td></tr>
</table>

3. Anti-static properties of Comfo-Fil®

Anti-static test of Comfo-Fil® fabric		
Item	Test method	Test result
Nylon rubbing fabric		
Warp	AATCC 115:2005	0
Weft		0
Polyester rubbing fabric		
Warp	AATCC 115:2005	0
Weft		0
Test Lab : SGS textile laboratory Test conditions: 22±2℃,65±2% RH Date:2012/10/30		

4. Quick dry properties of Comfo-Fil ®

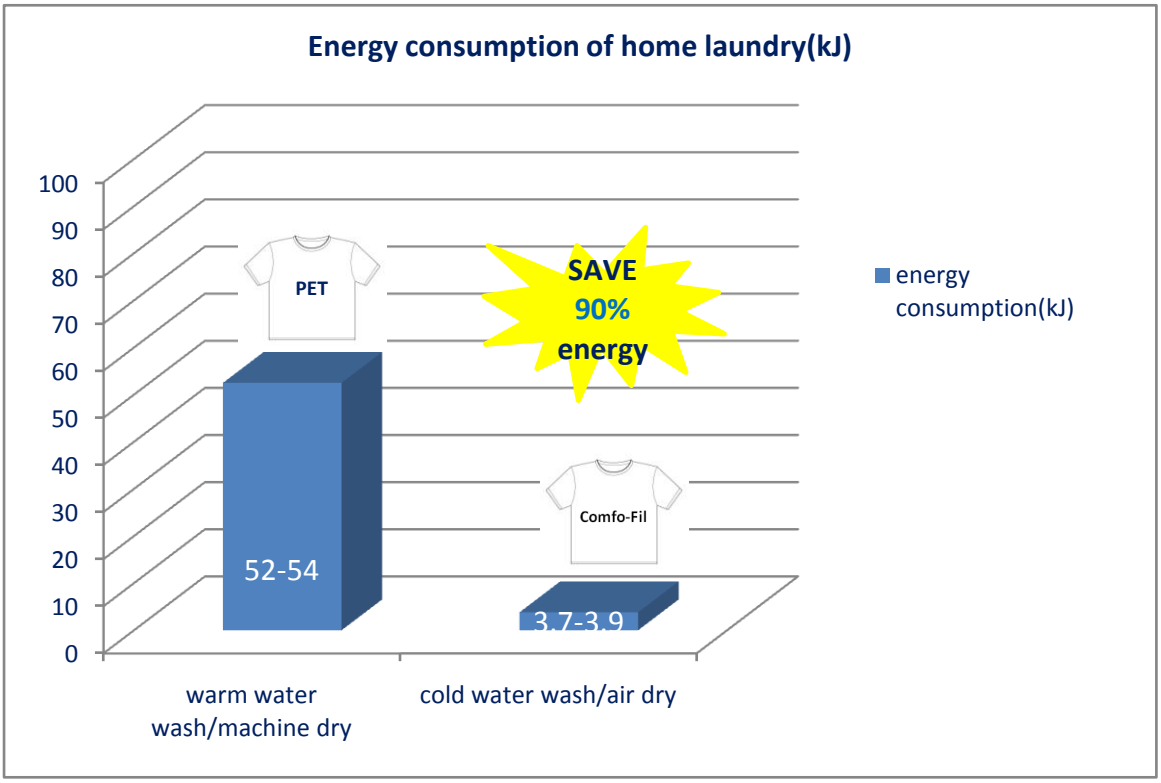


5. One-Way transport & comfort of Comfo-Fil®

AATCC 195-2011	Wetting		Absorption		Max Wetted		Spreading		Accumulative one-way transport	OMMC
	Time		Rate		Radius		Speed			
	(s)		(%/s)		(mm)		(mm/s)			
Item	Top	Bottom	Top	Bottom	Top	Bottom	Top	Bottom	index (%)	
Mean	3	2	19	59	25	30	5.7	7.5	641	0.89
Grade	4	5	2	4	5	5	5	5	5	5
Test date:Apr.24.2013 Test Lab.:Taiwan Textile Research Institute Test condition:21±1 ℃ ,65±2 % RH Test sample: PP 48% PET52% Knitting fabrics										

6. Eco-friendliness of Comfo-Fil®

From the aspect of consumed energy of the clothing, 82% is from consumer used, 17% from manufacturing and 1% from disposal (Franklin Associates, Ltd. 1993). Comfo-Fil® is characterized with excellent energy saving performances because it is quick drying and low-temperature laundering.



Source: Franklin Associates, Ltd., 1993

Applications of Comfo-Fil®

Professional sportswear, casual wear, thermal insulation underwear, uniform, baby wear, swimsuit, diving wear, yoga wear, bike wear, bedding, socks, medical textiles, gloves, and so on.