Highly functional protective fabrics with durable characteristics.

I Heyvaerts
Ronse 26/04/2018

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Overview

- Multi-functional fabrics for PPE
  - Demand
  - Standards
  - Materials
  - Processing
  - Characteristics

Product Range

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Available FR Fabric range

Blend	Weight g/m²	FR ISO 11612	Welding ISO 11611	Shrinkage	Electric Arc	Strength	Comfort	HI VIS
CO/PES FR Treated	330	A1 B1 C1 E1 F1	Class 1	-	Class 1	±	±	YE
MAC/CO	310	A1 B1 C1 E1 F1	Class 2	±	Class 1 ATPV 13,8	-	+	YE
Kermel Alpha™	230	A1 A2 B1 C1 F1	Class 1	+	Class 1 ATPV 9,8	+	++	-
LavaPro™	425	A1 B1 C1 E3 F1	Class 2	++	Class 2 ATPV 12,3	++	++	-
Hepta™	270	A1 B1 C1 F1	Class2	++	Class 1	++	++	YE OR RE
Tencel/CO/PES FR Treated	300	A1 B1 C1 E3 F1	Class1	++	Class 1	+	+	YE

Normative demands

- Protective fabric for welders
- HI-VIS orange
- Inherent FR
- Protection against electric arc
- Protection against liquid metals/chemicals
- Anti-static

End-user demands

- Comfortable to wear
- Light weight
- Washable in industrial laundry
- Resistant to snagging
- Durable: long lasting characteristics
- Excellent mechanical characteristics
- Large variety of colours

Several solutions depending End-Use

- Hi-VIS with inherent FR properties and welding protection: Hepta™ Range
- Inherent FR with high protection against liquid metals: Lava Pro™
- Inherent FR with high protection against Arc flash:

  Kermel Alpha™
- Inherent FR for Fire-fighters with excellent comfort:

  Ingrid
- FR treated with excellent shrinkage and protection: TenCoPe

HEPTA™ Materials

- Use of 7 functional fiber materials:
  - Polyester HI VIS dope dyed
  - M-Aramid: FR
  - P-Aramid: High temperature, reinforcement
  - Modacrylic: FR
  - Cellulosic: FR + comfort
  - Polyamide: reinforcement
  - Anti-static fiber

Hepta™ Processing

- Different blended yarns
- Double weave fabric
  - Outside: HI VIS
  - Inside: FR + comfort
- Short finishing route
  - Water and oil repellency with C6 FC
- No coatings

Hepta™ Processing

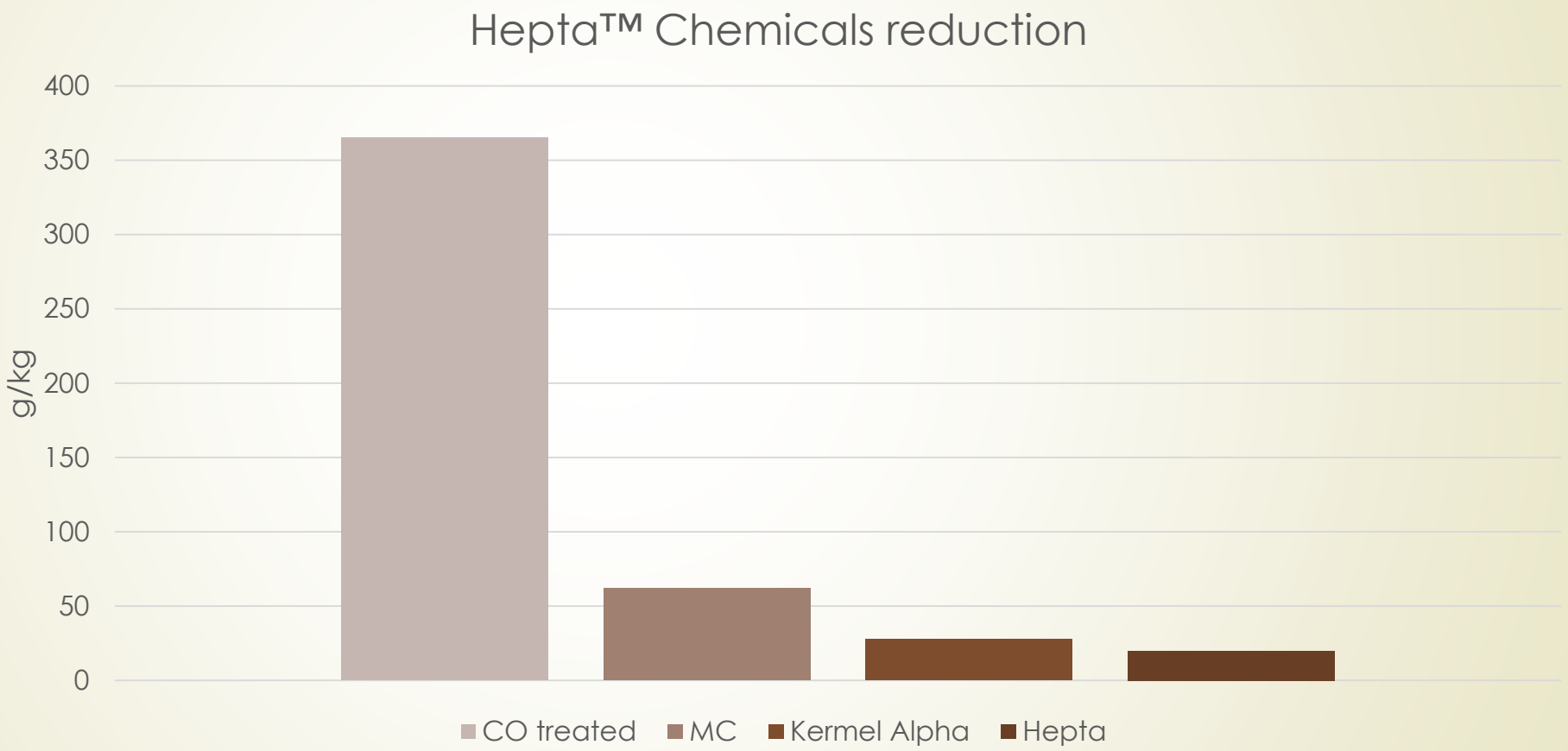
Conventional dyeing & finishing of treated cotton fabric

Bleaching Mercerizing → Dyeing → FR-Finishing → FC-Finishing

Finishing of HEPTA™ fabric

Washing → FC-Finishing

Processing: Chemicals reduction



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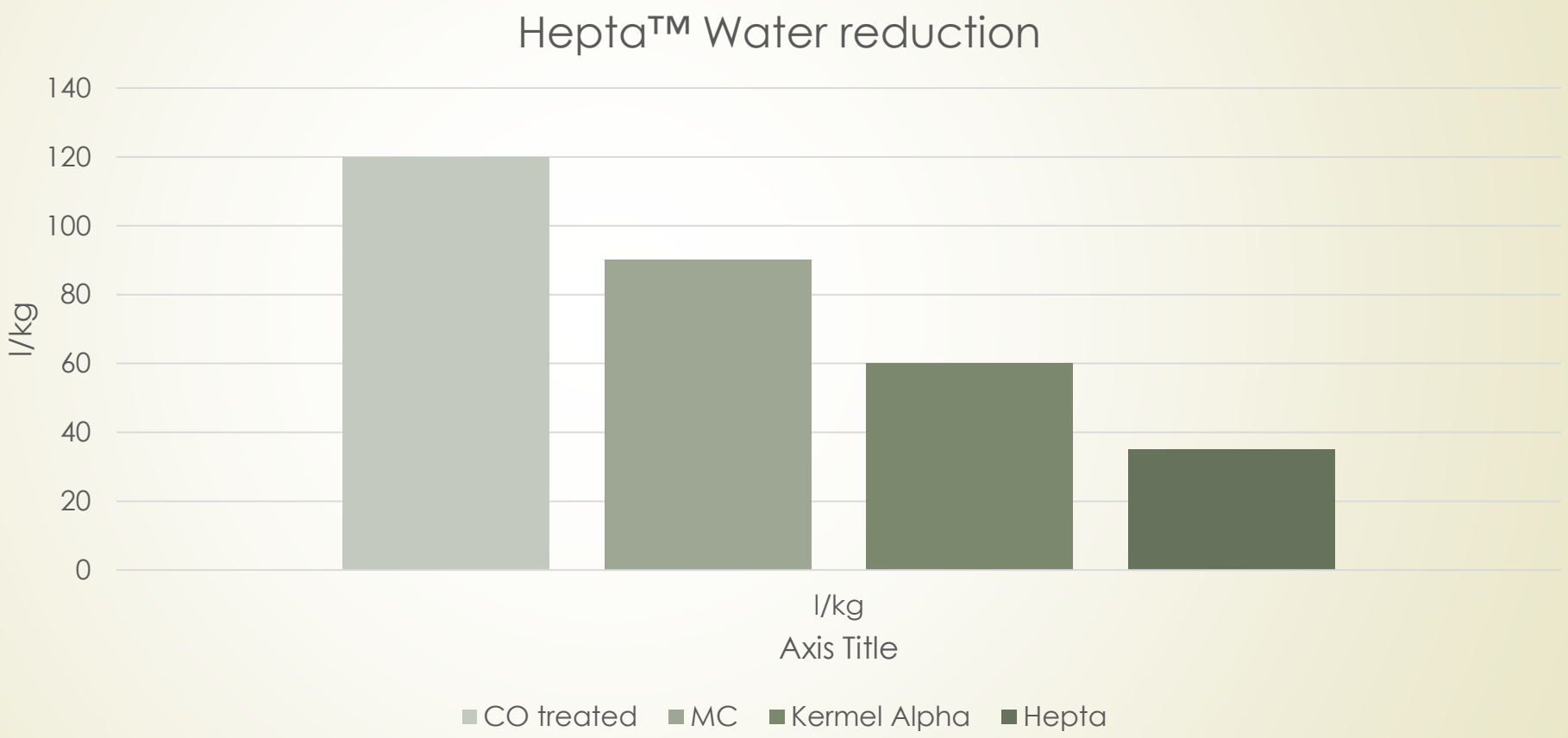
Processing: resources reduction



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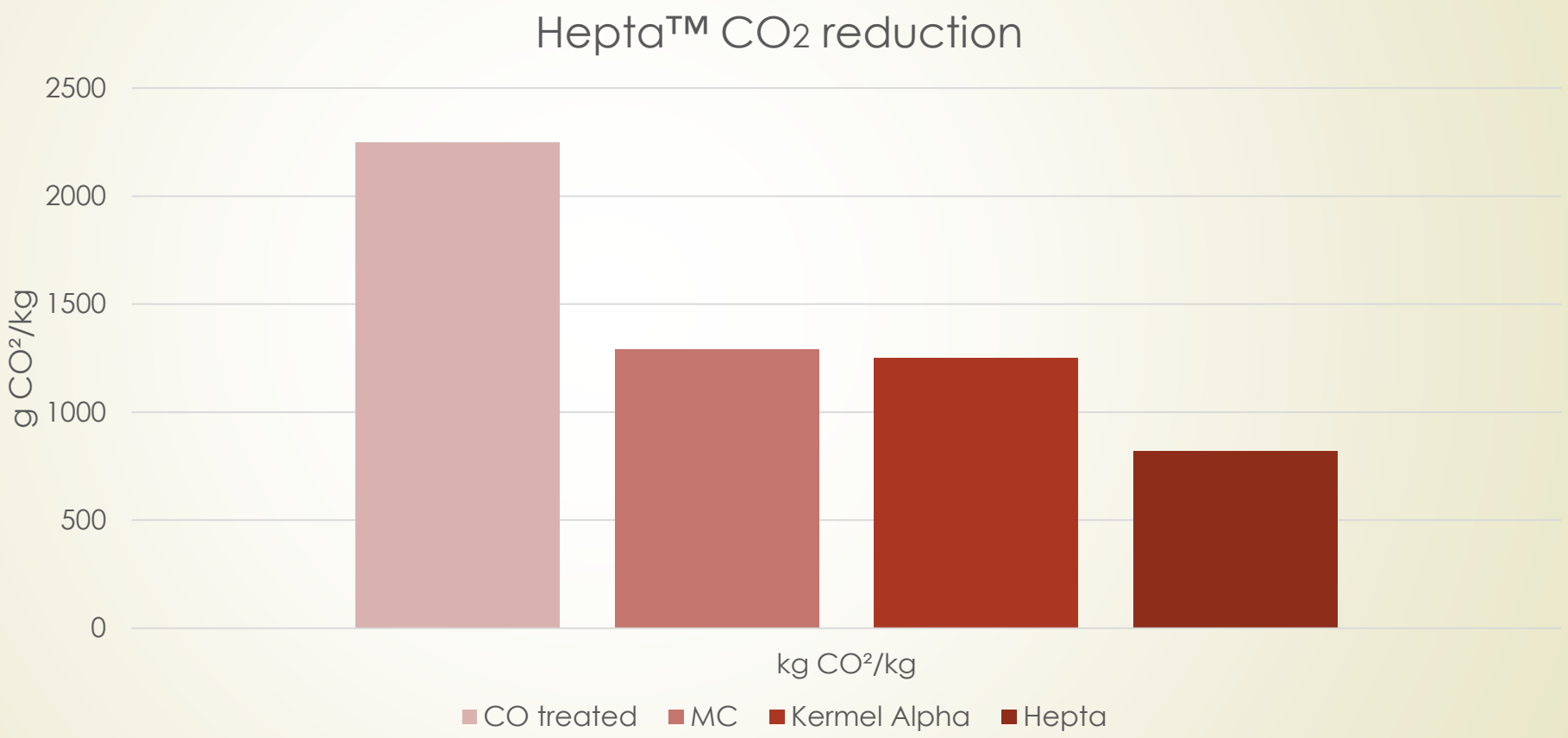
Processing: resources reduction



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Hepta™ Characteristics

- Reference 7915 C6

Weight	ISO 3801 D5	270 g/m²	
Tensile strength	ISO 13934-1	1400 N	1200 N
Tearing Strength	ISO 13937-1	90 N	90 N
Shrinkage	ISO 15797	-2%	-2%
Pilling Martindale	ISO 12945-2	4-5	

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ISO 11612

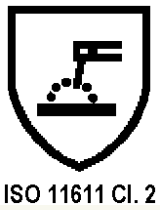
- Results after 50x industrial laundering at 75°C
- Flame propagation, surface ignition: A1
- Convective heat B1
- Radiant heat C1
- Contact heat F1

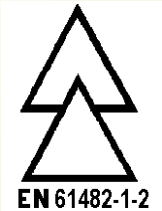
ISO 11611

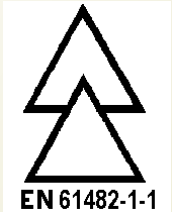
- Results after 50x industrial laundering at 75°C
- Flame propagation, surface ignition: A1
- Radiant heat Class 2
- Welding droplets Class 2

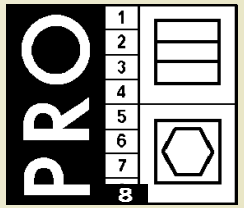
Hepta™ Performances

- Okotex 100 Class II
- Hi VIS Yellow, Orange, Red — ISO 20471
- Protection against heat and flames — ISO 11612 — A1 B1 C1 F1
- Firefighters: wildland clothing — EN 15614
- Protection for welders — ISO 11611 — Class 2
- Protection against liquid chemicals — ISO 13034
- Electrostatic characteristics — EN 1149-5
- Electric Arc (Box) — EN 61482-1-2 — Class 1
- Electric Arc (Open) — EN 61482-1-1 — ATPV 8,3 cal/cm²









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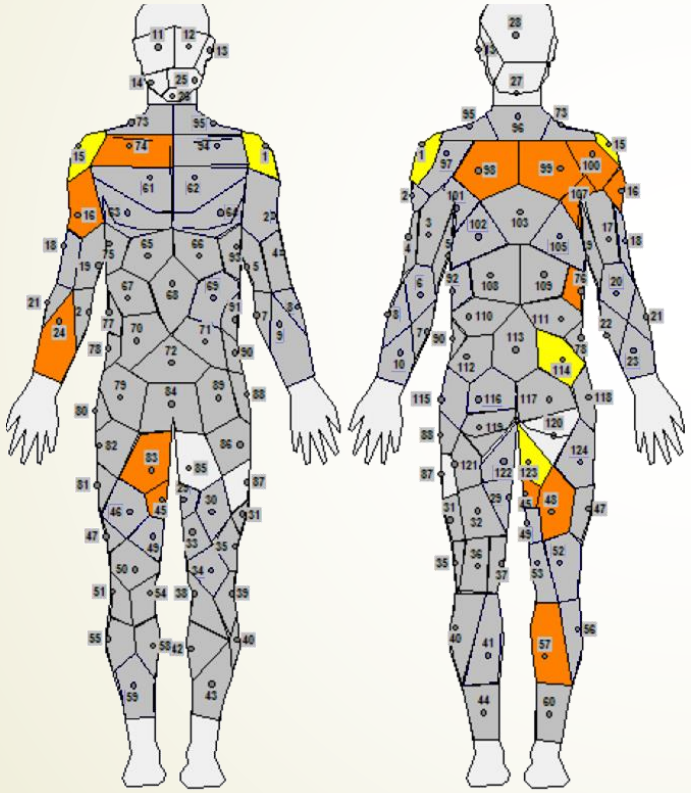
Lava Pro™ Range

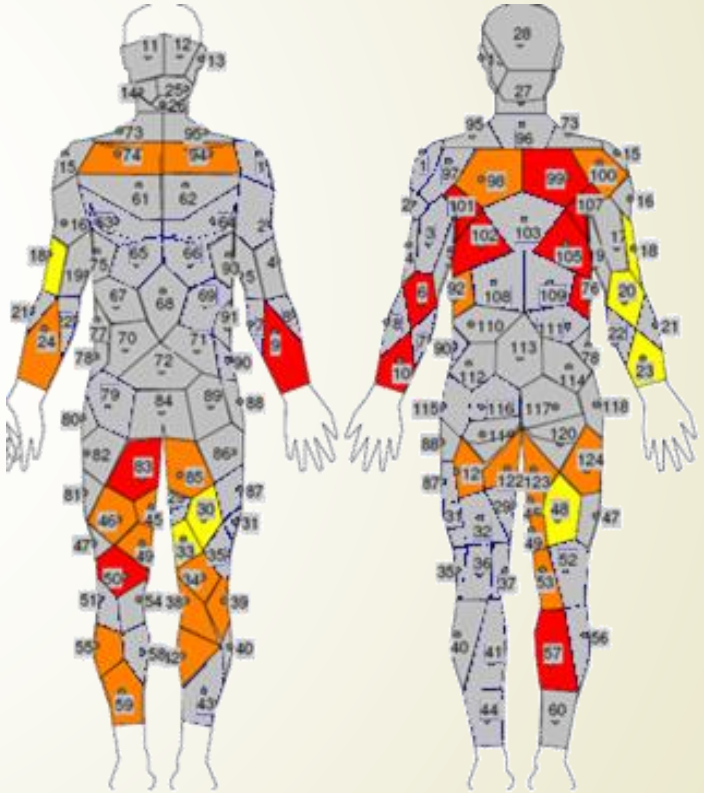
- LAVApro is produced using inherent flame resistant fibers, which provide protection over the lifetime of the garments.
- The main component is LENZING FR.
- Excellent protection against molten iron.
- Even better comfort than cotton.
- Easily dyeable in any colour.
- The second component is para-aramid.
- Shrinkage is excellent, less than 3% after 5 industrial laundrings.
- Prevents break-open.

No 3rd degree Burns

Lava Pro



100% Aramid



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Kermel Alpha™

- Inherent FR with face changing components
- Light weight with high protection to Arc flash
- Good mechanical strength
- Excellent results in industrial laundry.

INGRID: optimal protection and breathebility combined

- Mixture of Lenzing FR / Kermel and Para aramid
- Incredible wash performances without loss of protection or colour
- Excellent thermal insulation for a very light weight
- High mechanical performances
- No break open.

Developping optimal protection

- The know-how of all these products lies in an exact combinaition of specific fibers to achieve optimal performance and comfort.
- The vertical integration from fiber to ready fabric gives us the advantage of optimalising already in fiber the specific demands of our customers.
- Being partner of our suppliers gives us the opportunity to optimalise products using different aspects of different fibers and combining them to achieve performances that would never be met with one specific fiber. We search for an excellent value/cost ratio, always keeping in mind that the safety of the end-user is the goal of our efforts.