

GRILON - Fiber Specialties from EMS



GRILON[®]
EMS

creative, prompt, reliable

Presentation Overview

- **EMS-CHEMIE / EMS-GRILTECH**
- **GRILON Fiber for Composites**
- **Wet Laid Short Cut Fibers**
- **Elastic Bonding Yarns**
- **Spun Dyed Fibers**
- **Bicomponent and Specialty Fibers**

EMS-GRUPPE



Independent Group of Companies

**Worldwide leading Supplier of
High Performance Polyamides Polymers**

EMS-CHEMIE



Domat/Ems, Switzerland

EMS-GRILTECH

Griltex[®]
EMS

Hotmelt Adhesives

GRILON[®]
EMS

Fibers
Bonding Yarns



Development Partner



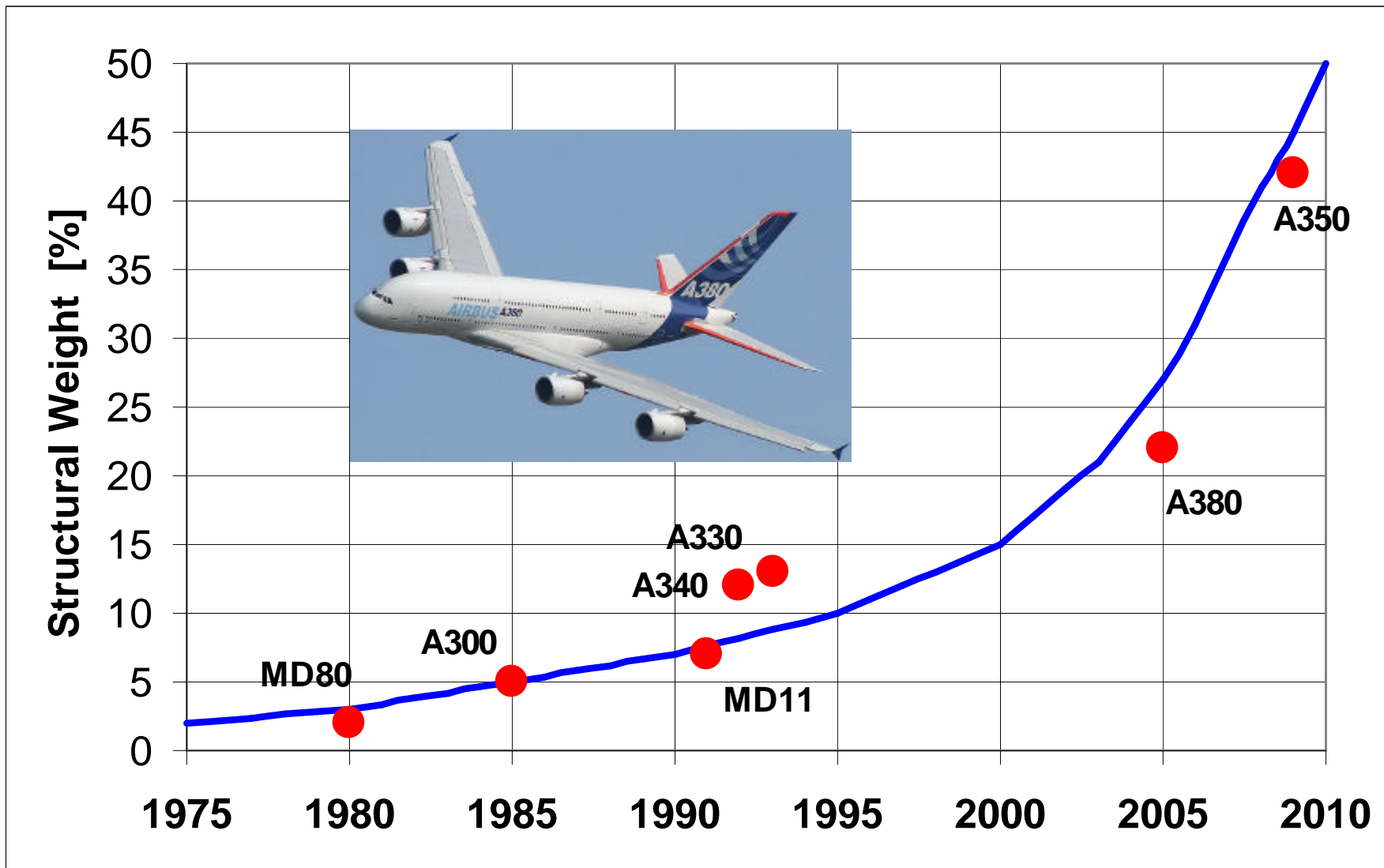
We offer:

- tailor-made products
- development of new products
- on site technical service
- analytical testing capabilities

= Full Service

GRILON Fiber for Composites

Trends of Composites Usage in Aircrafts

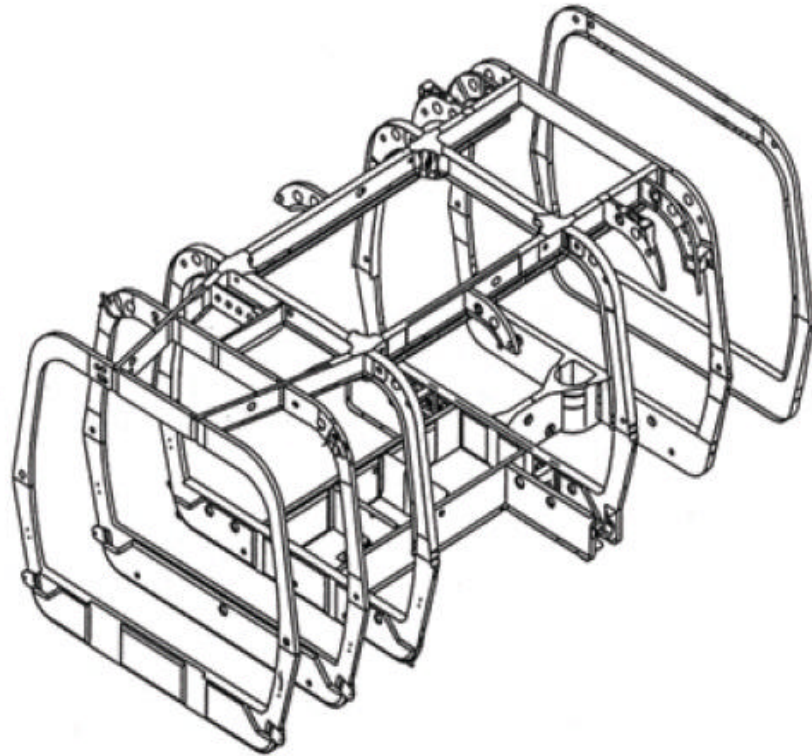


GRILON Fiber for Composites



GRILON Fiber for Composites

Composite Elements for Aircraft



**Structural
Frame Parts**

Side Part

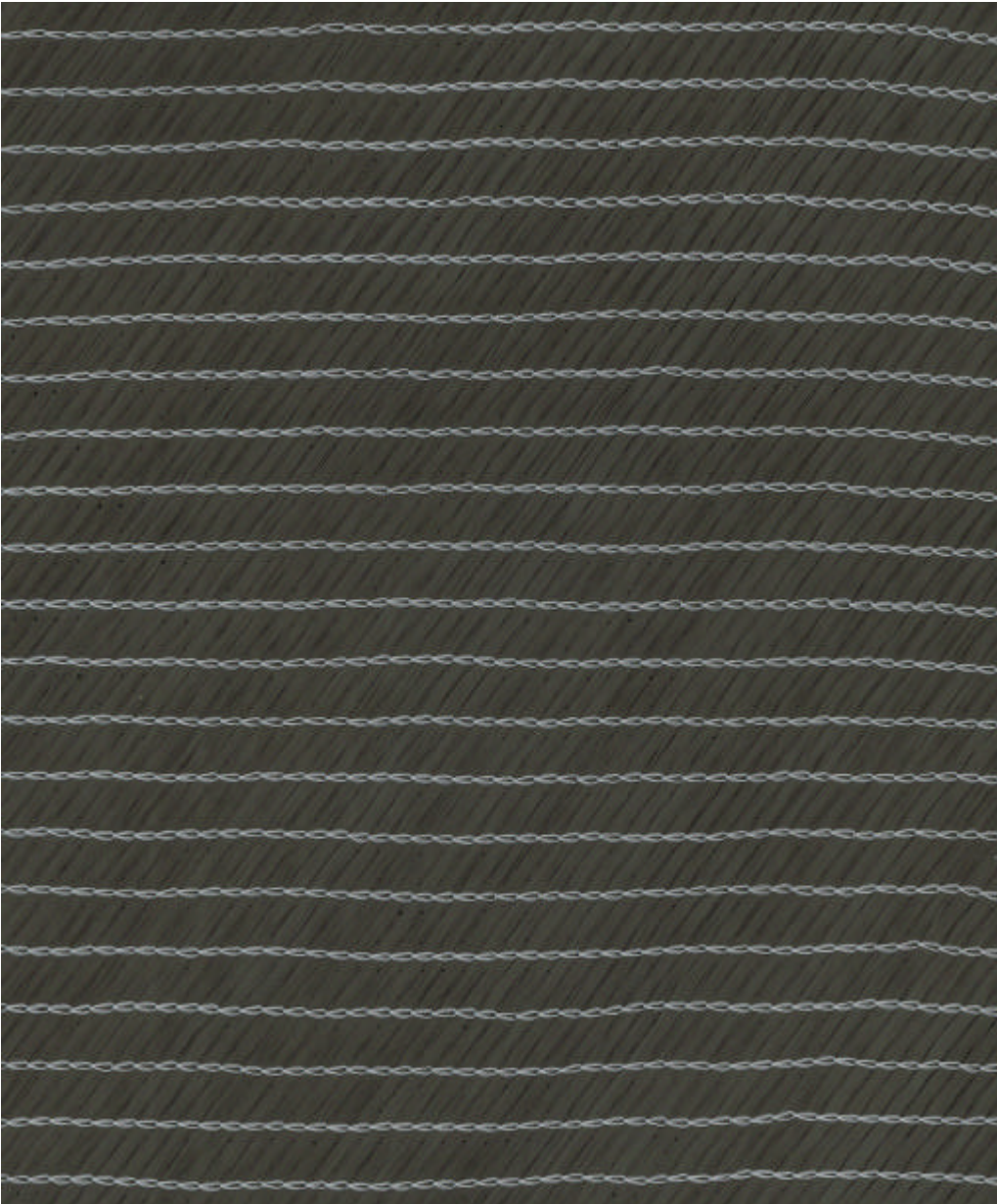


Door

GRILON Fiber for Composites

GRILON MS Yarn

- **Matrix Soluble Yarn**
- **Improves mechanical properties**
- **Thermo bonding as a prestabilisation of dry reinforcing fibers**
- **Improves impact resistance of the matrix**
- **Decorative optic without visible stitch yarn**



GRILON Fiber for Composites

Weaving



Thermo bonding



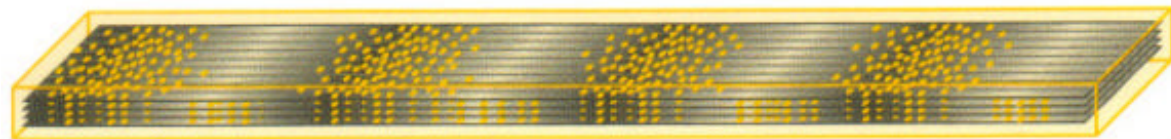
Pre-Forming



Resin Injection



Curing



GRILON Fiber for Composites

Dry Yarn



t: 0min; Temp: 60°C



t: 10min; Temp: 120°C



after Curing; Temp: 140°C



GRILON Fiber for Composites

GRILON MS Yarn

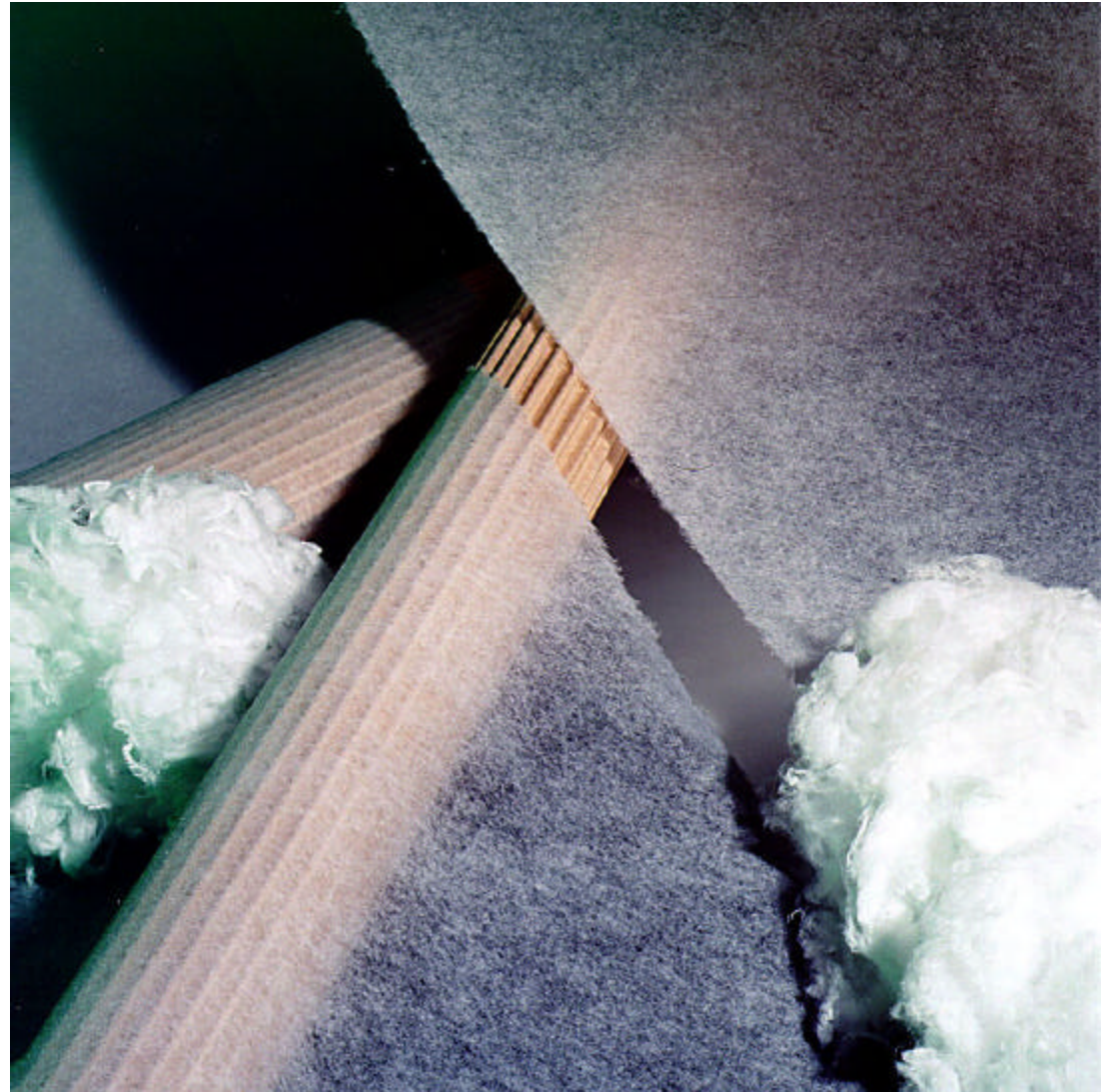
- Matrix Soluble Yarn
- Phenoxy Resin
- Carbon Fiber
Prestabilisation
- Homogenous Matrix
- JEC Innovation
Award 2007 in
Category: Process



GRILON Fiber for Composites

GRILON MS Staple Fiber

- EP 1306 NV
- EP 1308
- Phenoxy Resin
- Preform Stabilization as Nonwoven
- Homogenous Matrix

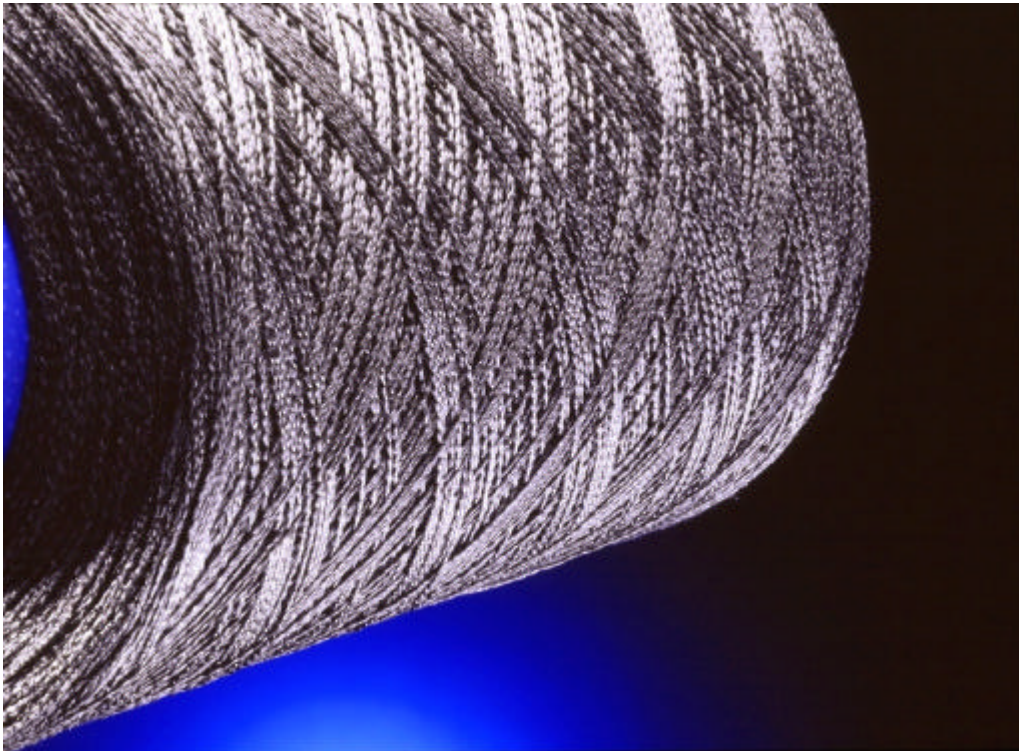


Grilon MS as Nonwoven

GRILON Fiber for Composites

Hybrid Yarn:

**GRILON HP 1200 Fibers
with Carbon / Aramide Fibers**



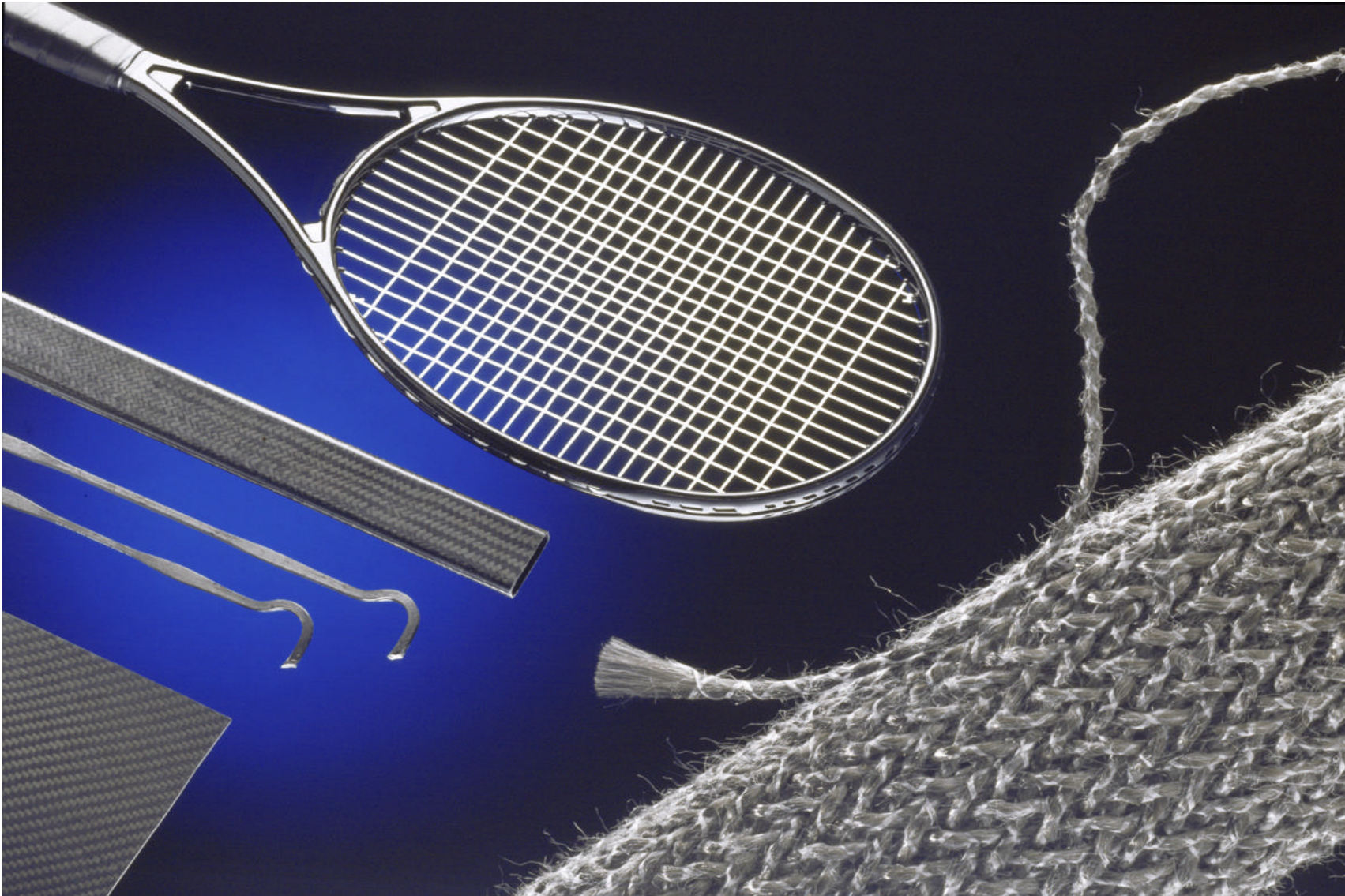
GRILON HP 1200 / Carbon Fiber



GRILON HP 1200 / Aramide Fiber

GRILON Fiber for Composites

Composites from Hybrid Yarns



GRILON Fiber for Composites



Hybrid Yarn:

- **Golf Caddy Mantis**
- **GRILON HP 1200 / Carbon**
- **JEC Innovation Award 2006 in Category: Sport & Leisure**
- **Cooperation with Schappe Techniques**

GRILON Fiber for Composites

Hybrid yarns: - Alinghi Watch (Limited Edition)

AP
AUDEMARS PIGUET
Le maître de l'horlogerie depuis 1875

AUDEMARS PIGUET COMPLICATIONS COLLECTIONS LATEST CREATIONS PARTNERSHIPS FOUNDATION

ROYAL OAK OFFSHORE ALINGHI TEAM
AUDEMARS PIGUET
LIMITED EDITION

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GRILON Fiber for Composites

Nonwoven with Carbon Fiber

GRILON PA46 Fiber



Carbon Fiber



Composites Nonwoven



GRILON Fiber for Composites

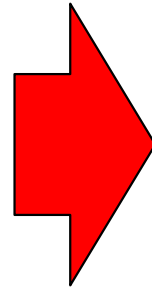
From Nonwoven to a Composites Film

Composites Nonwoven



textile, hairy, porous

**Pressure and
Temperature**



Composites Film



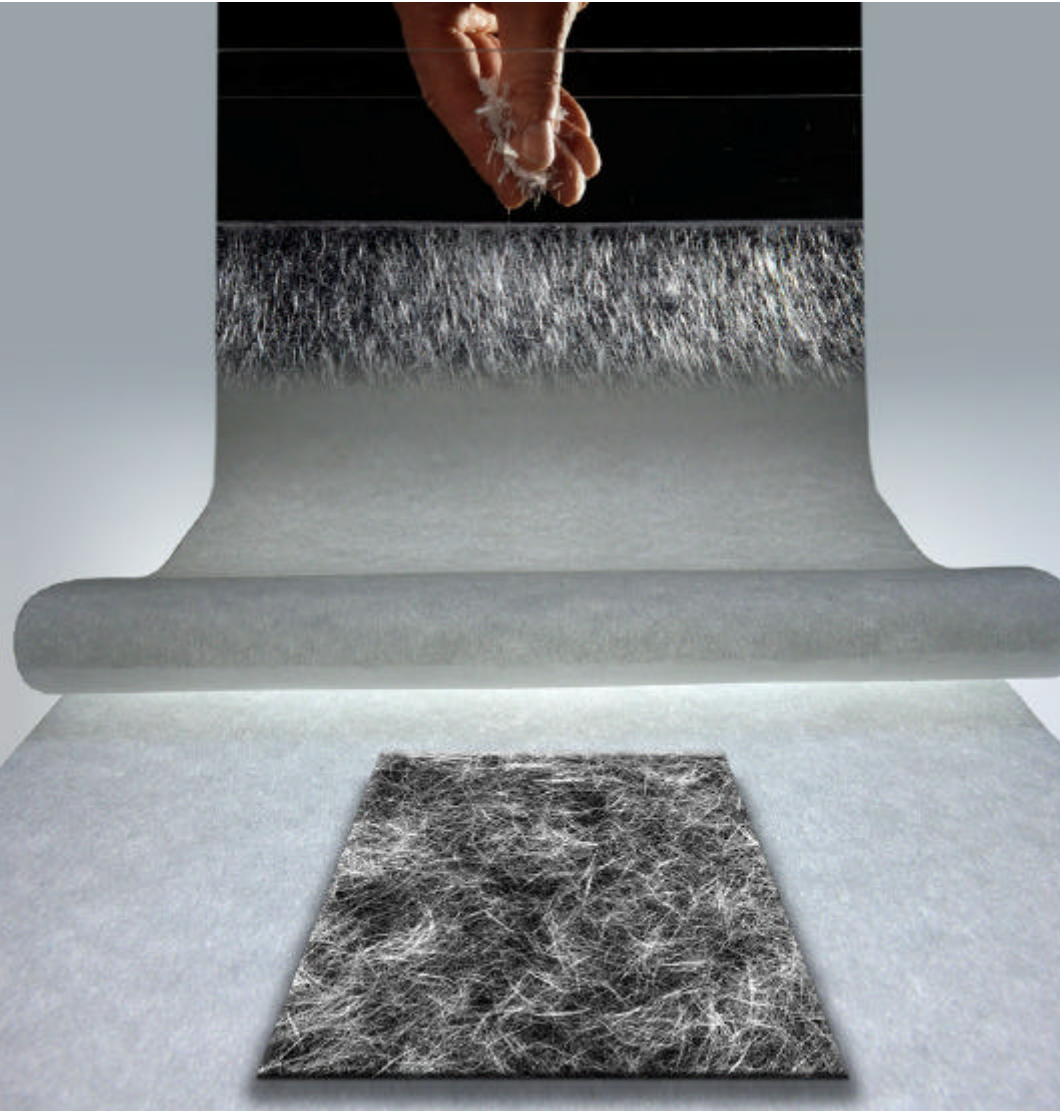
even, plain, smooth

GRILON Fiber for Composites

Composites Film (Fa. Frenzelit)



GRILON Wet Laid Short Cut Fiber



GRILON NV

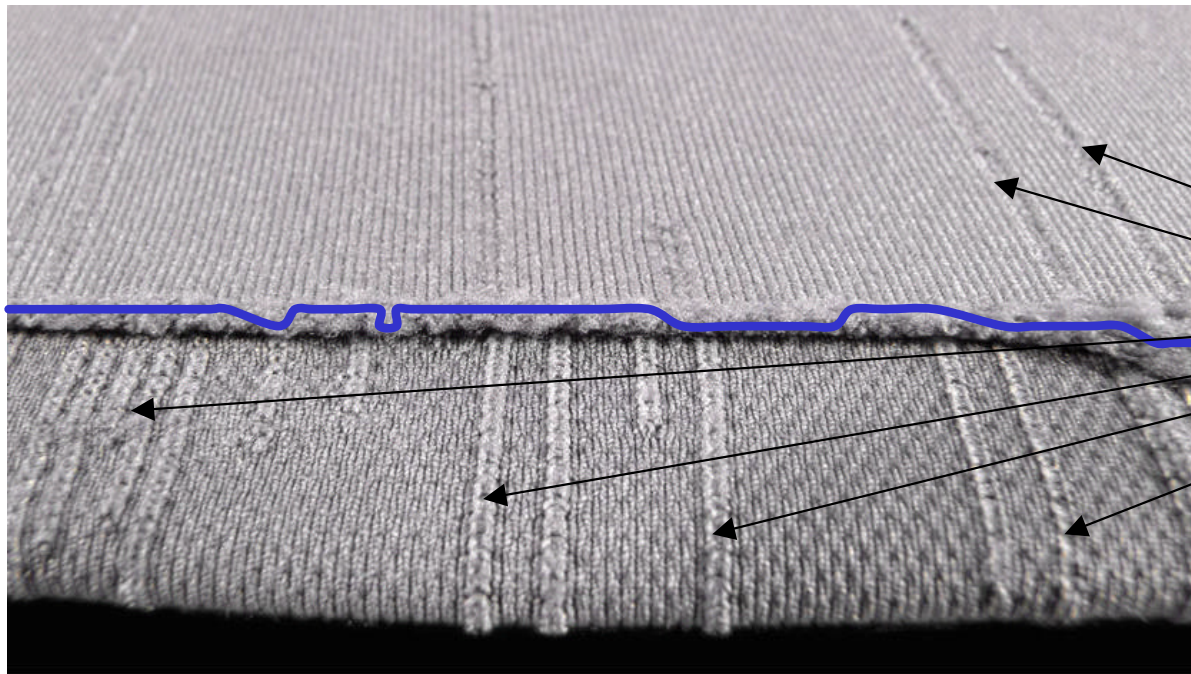
- Thermoplastic polymer
- 4 - 34 mm fiber length
- Mono- / Bicomponent

Paper with special effects....

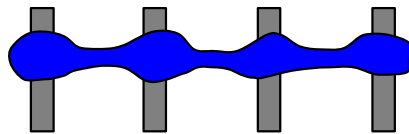
GRILON Elastic Meltbonding Yarn



GRILON Elastic Meltbonding Yarn



Ladder / Run



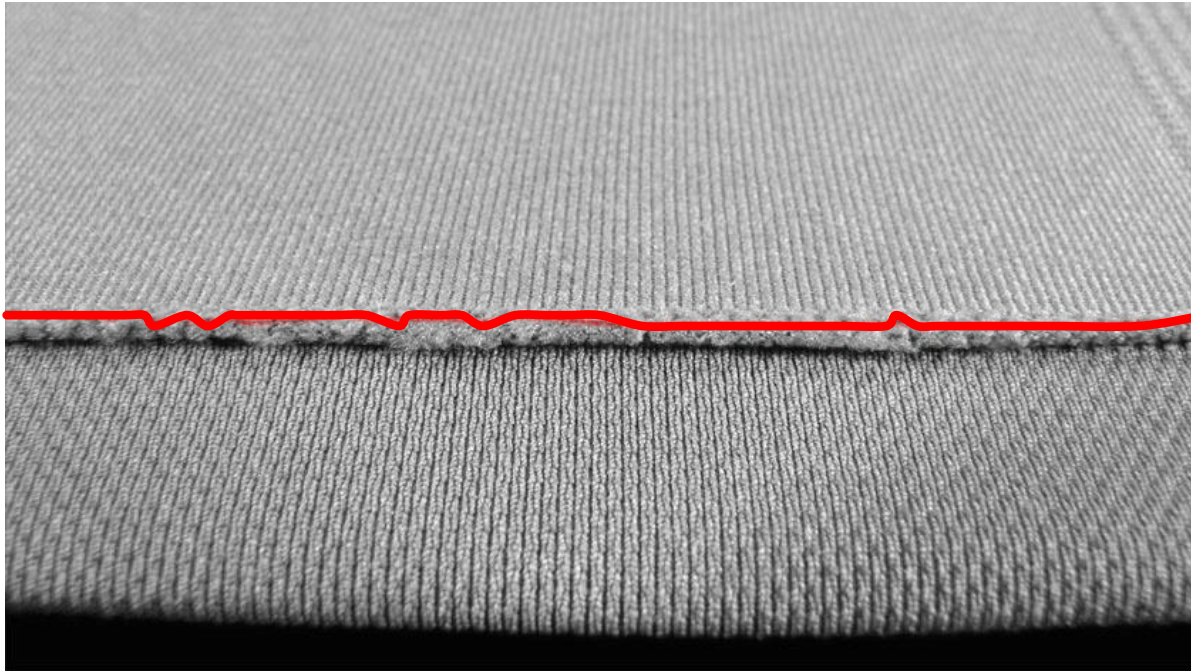
non elastic bonding yarn



break at the bonding points

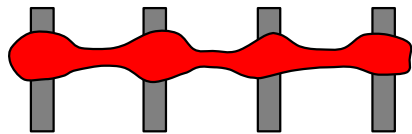
Stretching

GRILON Elastic Meltbonding Yarn

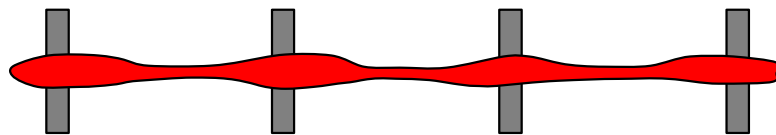


GRILON EP 1309

- for elastic apparels
- m.p. 125 - 130°C
- run proof



elastic bonding yarn



run proof bonding



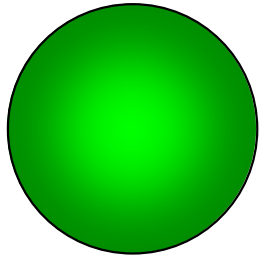
GRILON Spun Dyed Fibers



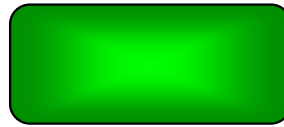
Advantages:

- Exact Color Reproduction
- Highest Color Fastness
- Low Environmental Cost
- Excellent Carding
- Small Quantities available

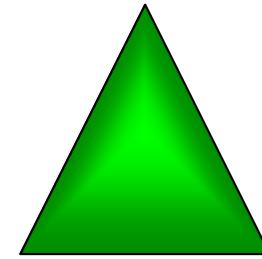
Profiles, Cross-Section



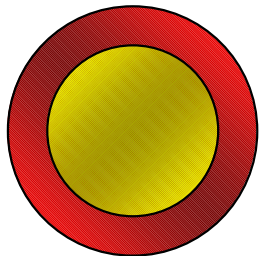
round



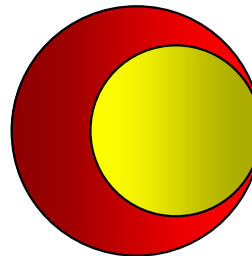
flat



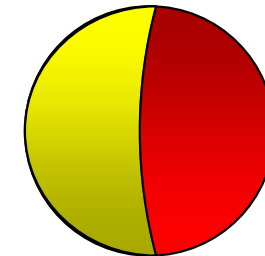
trilobal



concentric



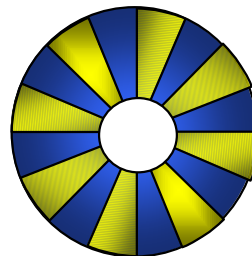
eccentric



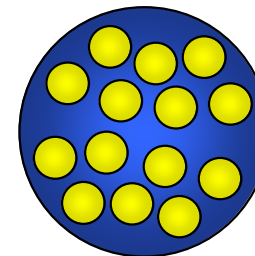
side by side



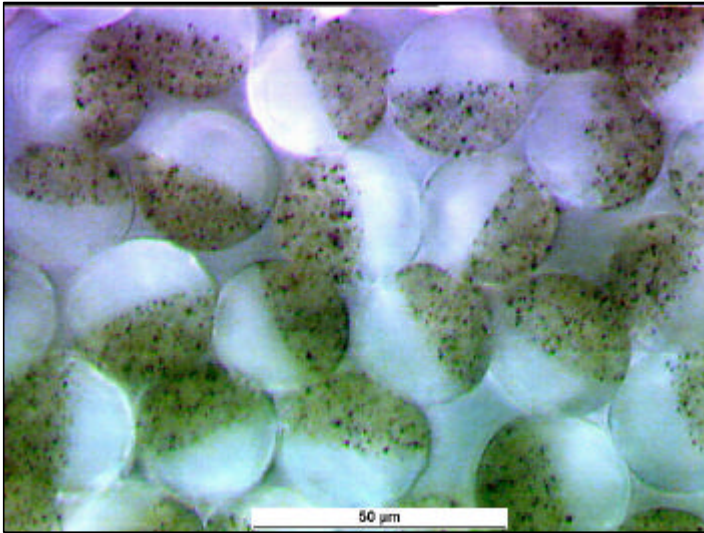
hollow pie wedge



island in the sea



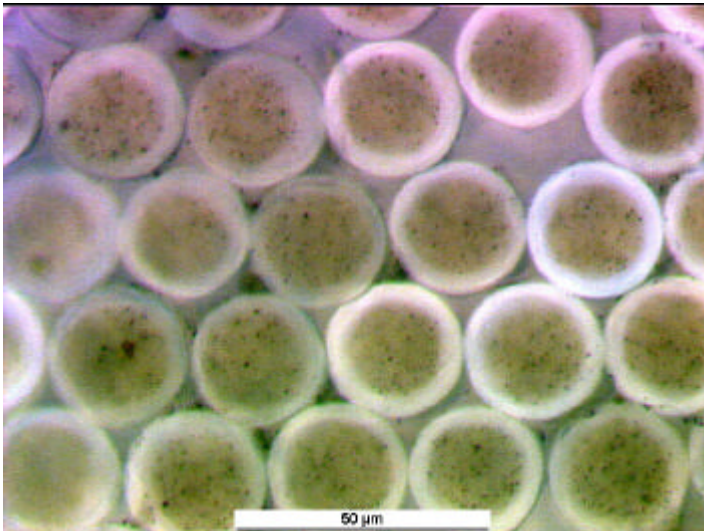
Profiles, Cross-Section



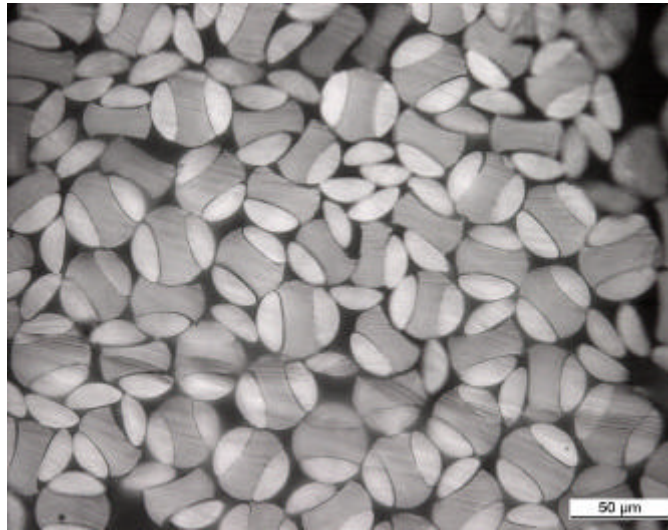
Side by Side 50:50



Sandwich 1:1:1



Core / Sheat 50:50



Splitfiber 1:2:1

**Bicomponent
Fiber by
EMS-GRILTECH**

Development Partner for Specialty Fibers



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