

The world of technical textiles

**New opportunities offered to the sector of
traditional textiles and development of innovative
applications in non-conventional sectors**

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“Technical Textiles”

are defined as

“textile material and products manufactured primarily for their technical performance and functional properties rather than their aesthetic or decorative characteristics”

Source: Textile Institute's publications

Technical Textiles:

Application areas

Product with special properties

Produced with special technologies

Product produced from special fibres

Application Areas



Indutech

Hometech



Mobiltech

Clothtech



Protech

Sporttech



Medtech



Buildtech



Geotech



Agrotech



Oekotech



Packtech

Technical Textiles

® Techtextil Fair Frankfurt

Production Technologies

Weaving

Knitting

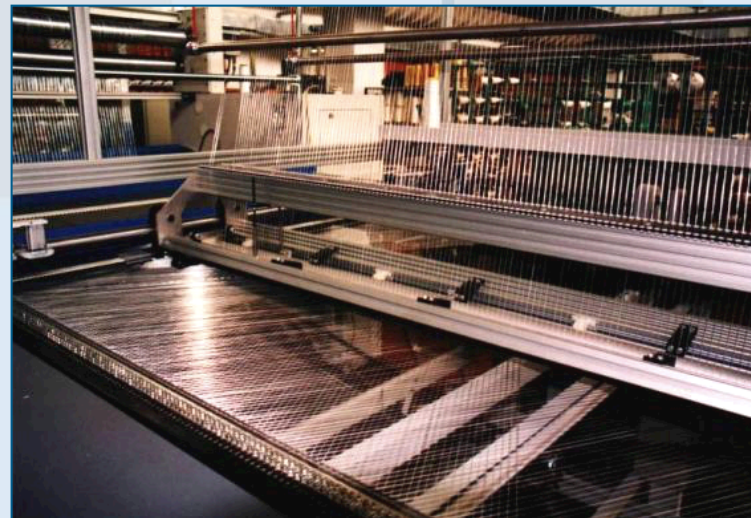
**warp knitting
weft knitting
stitch bonding**

Nonwovens

Laid scrims

Braiding

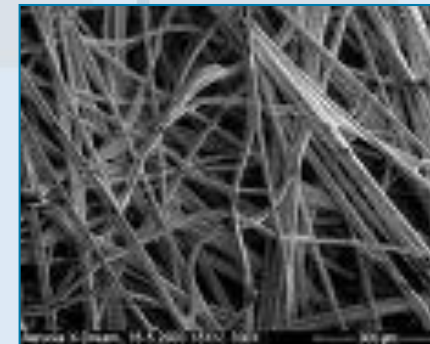
Rope-making etc.



Raw Material

Use of classic fibres:

Natural and synthetic fibres



Use of special fibres:

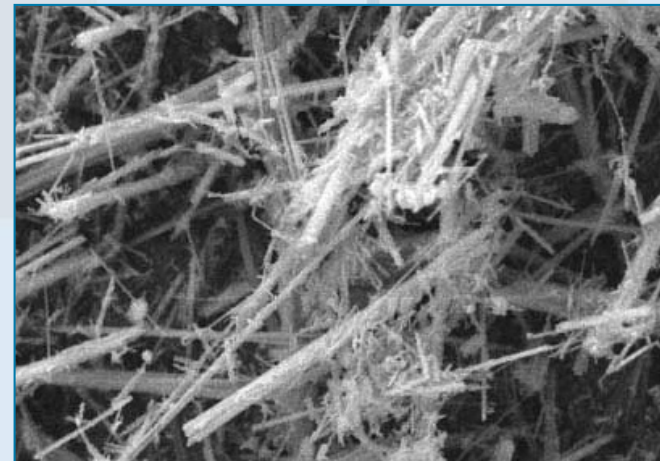
Hollow fibres

Highly oriented polymer fibres

Carbon fibres, metal fibres

Basalt fibres

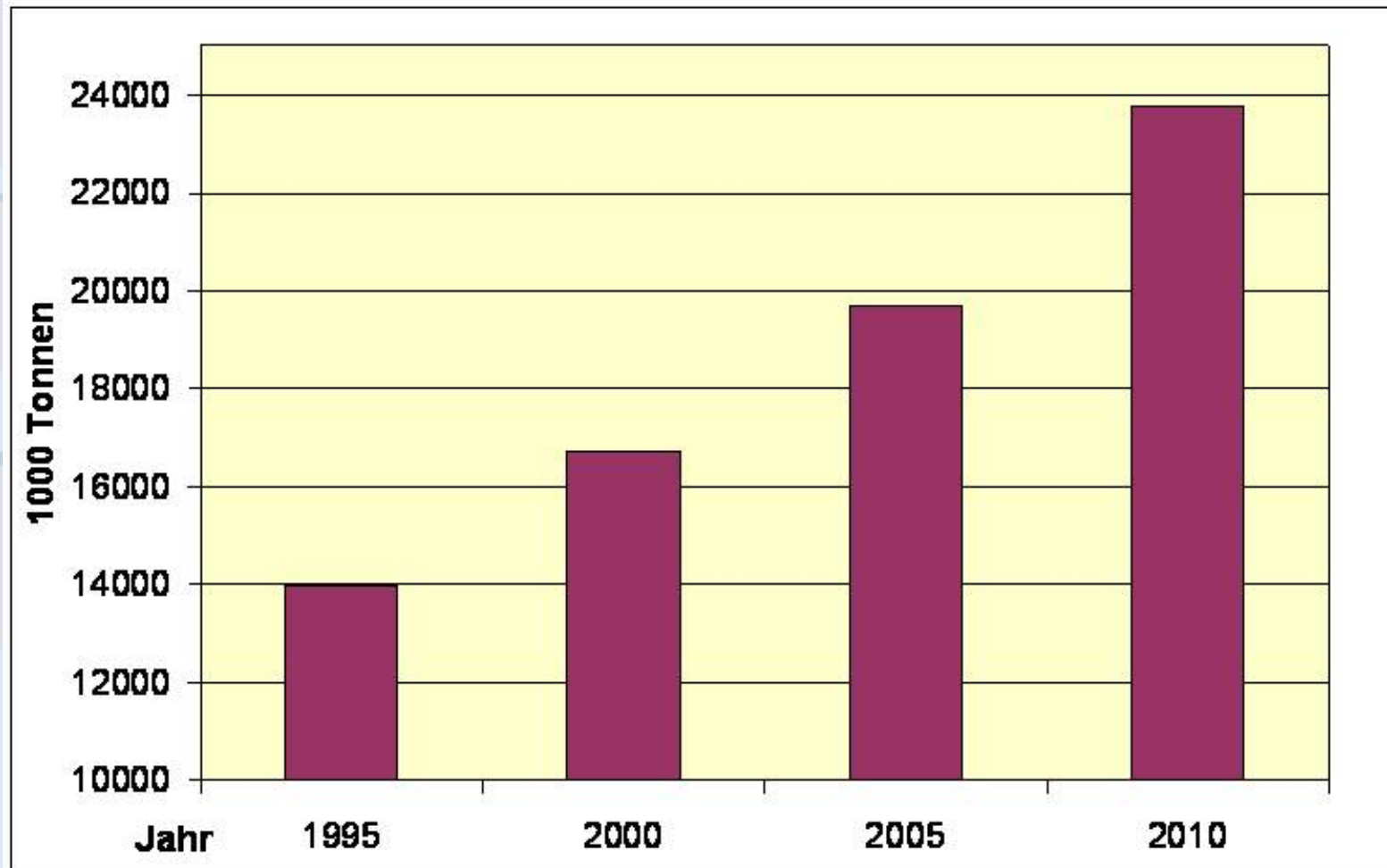
Ceramic fibres, glass fibres



Worldwide consumption of technical textiles and nonwoven



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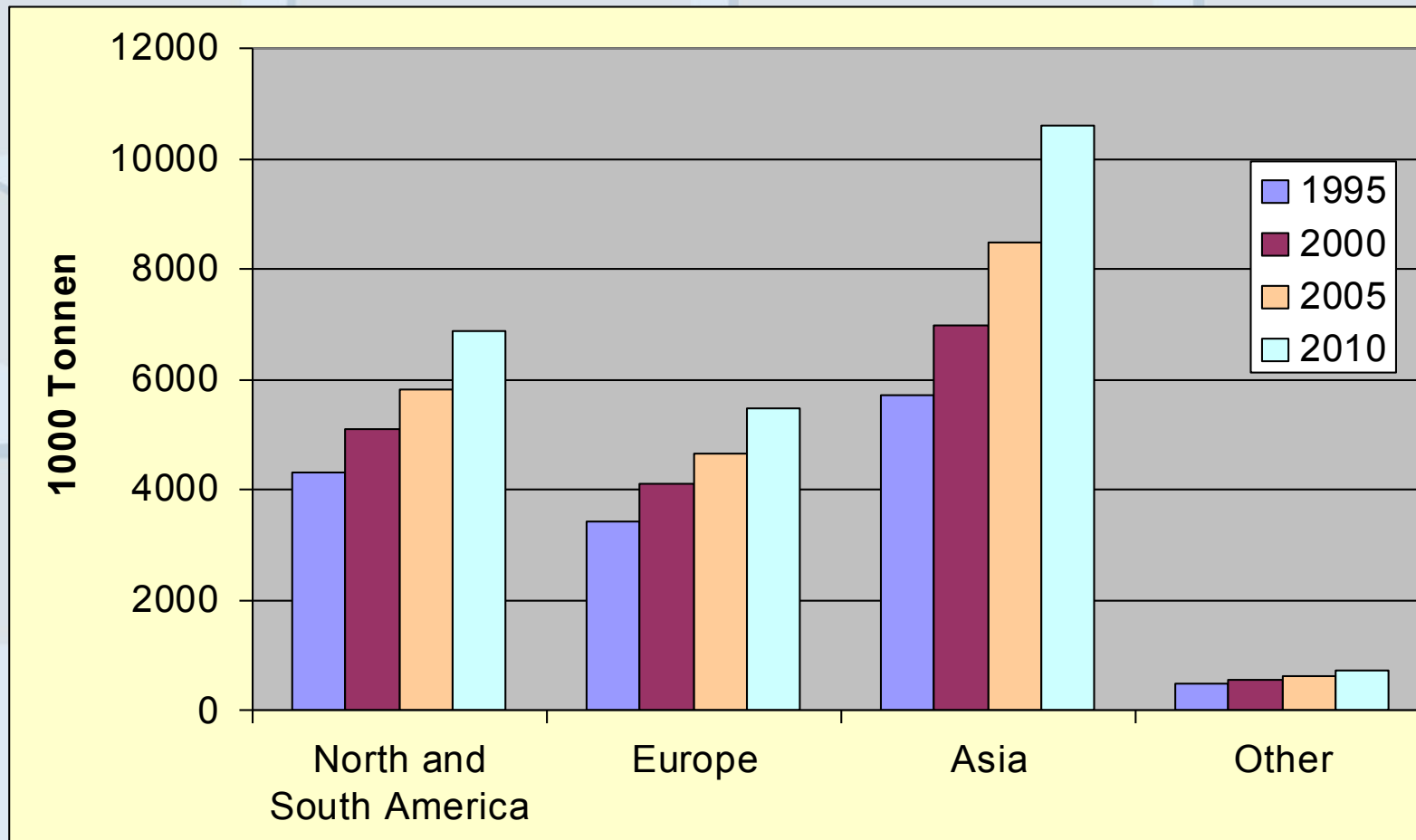


Quelle: World Market Forecast to 2010 / David Rigby 2002

Worldwide consumption of technical textiles and nonwovens



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Quelle: World Market Forecast to 2010 / David Rigby 2002

Worldwide consumption of technical textiles and nonwovens



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In 1000 tons

Region	1995	2000	2005	2010
North and South America	4327	5078	5811	6857
Europe	3417	4096	4665	5448
Asia	5708	6961	8482	10602
Other	472	556	623	724
Total	13924	16691	19581	23631

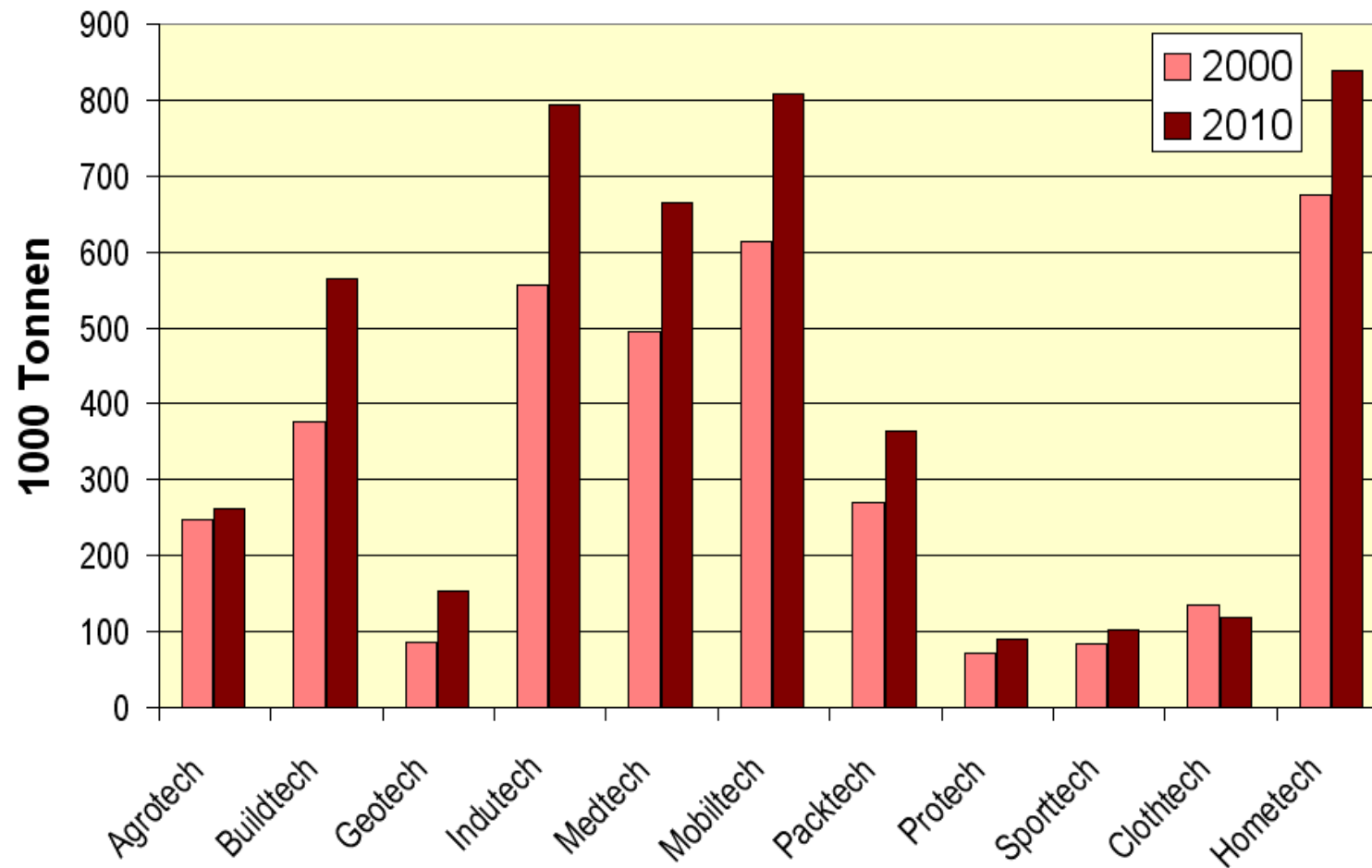
Source: World Market Forecast to 2010 / David Rigby 2002

Estimated growth rates of end-use consumption (world)

Application areas	2000 – 2005 % per year	2005 – 2010 % per year
Geotech	4,6	5,3
Buildtech	4,3	5,0
Medtech	4,6	4,3
Indutech	3,5	4,4
Protech	3,3	4,0
Agrotech	3,2	3,9
Packtech	3,2	3,8
Sporttech	3,1	3,7
Mobiltech	2,7	3,4
Clothtech	2,7	3,2
Hometech	2,7	2,7
Total	3,3	3,8

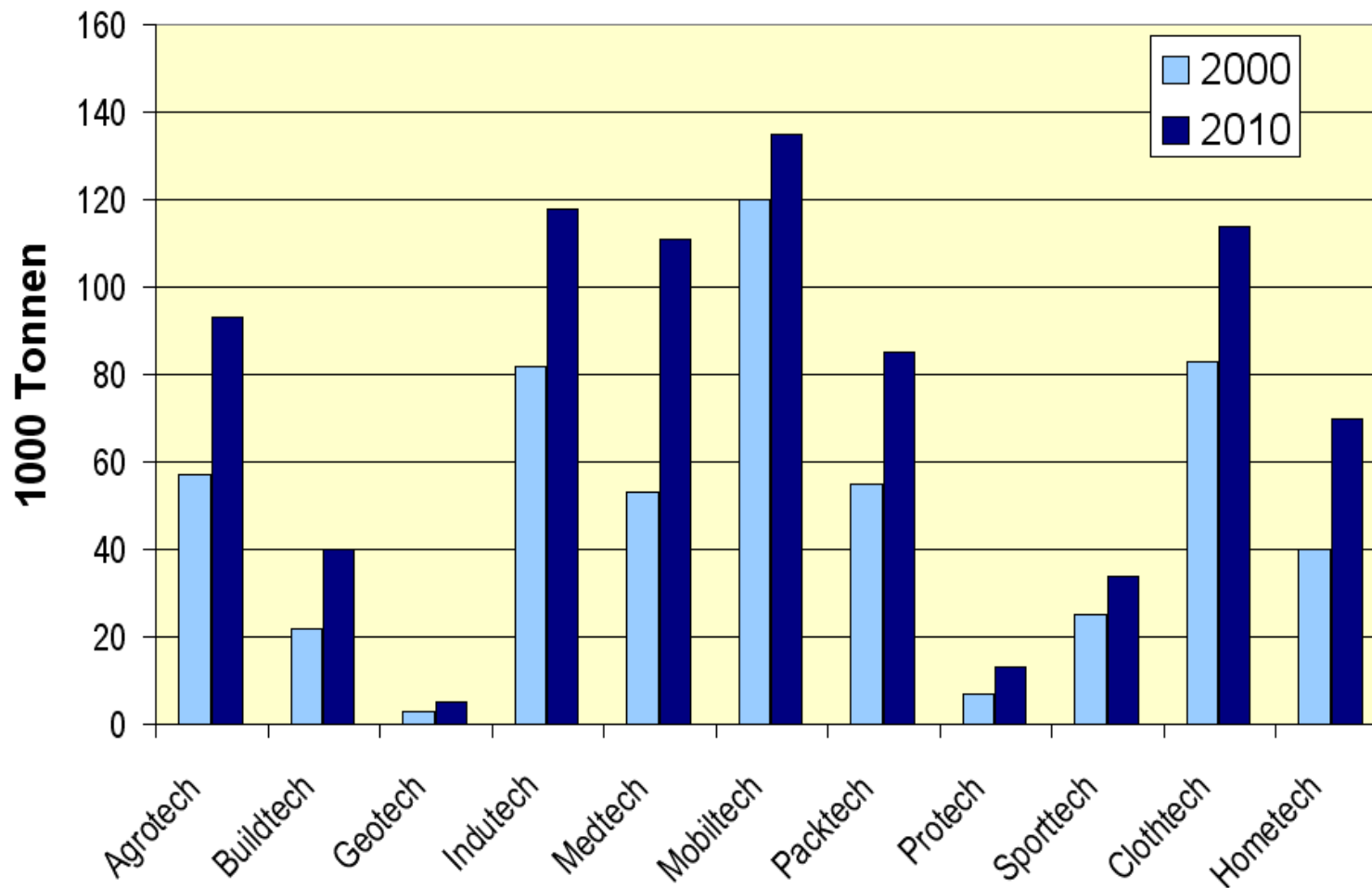
Quelle: World Market
Forecast to 2010 /
David Rigby 2002

Forecast end-use consumption Western Europe



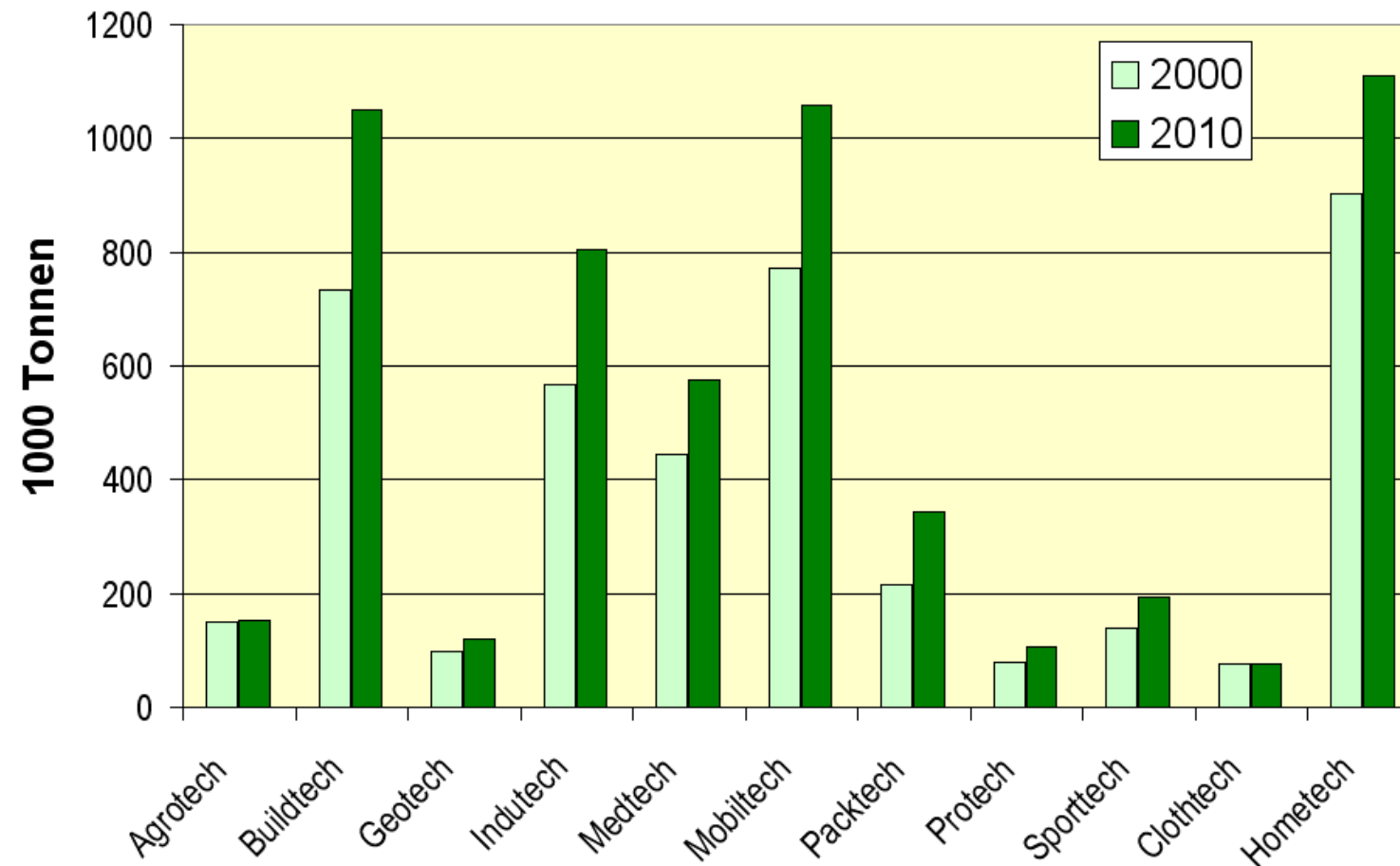
Quelle: World Market Forecast to 2010 / David Rigby 2002

Forecast end-use consumption Eastern Europe



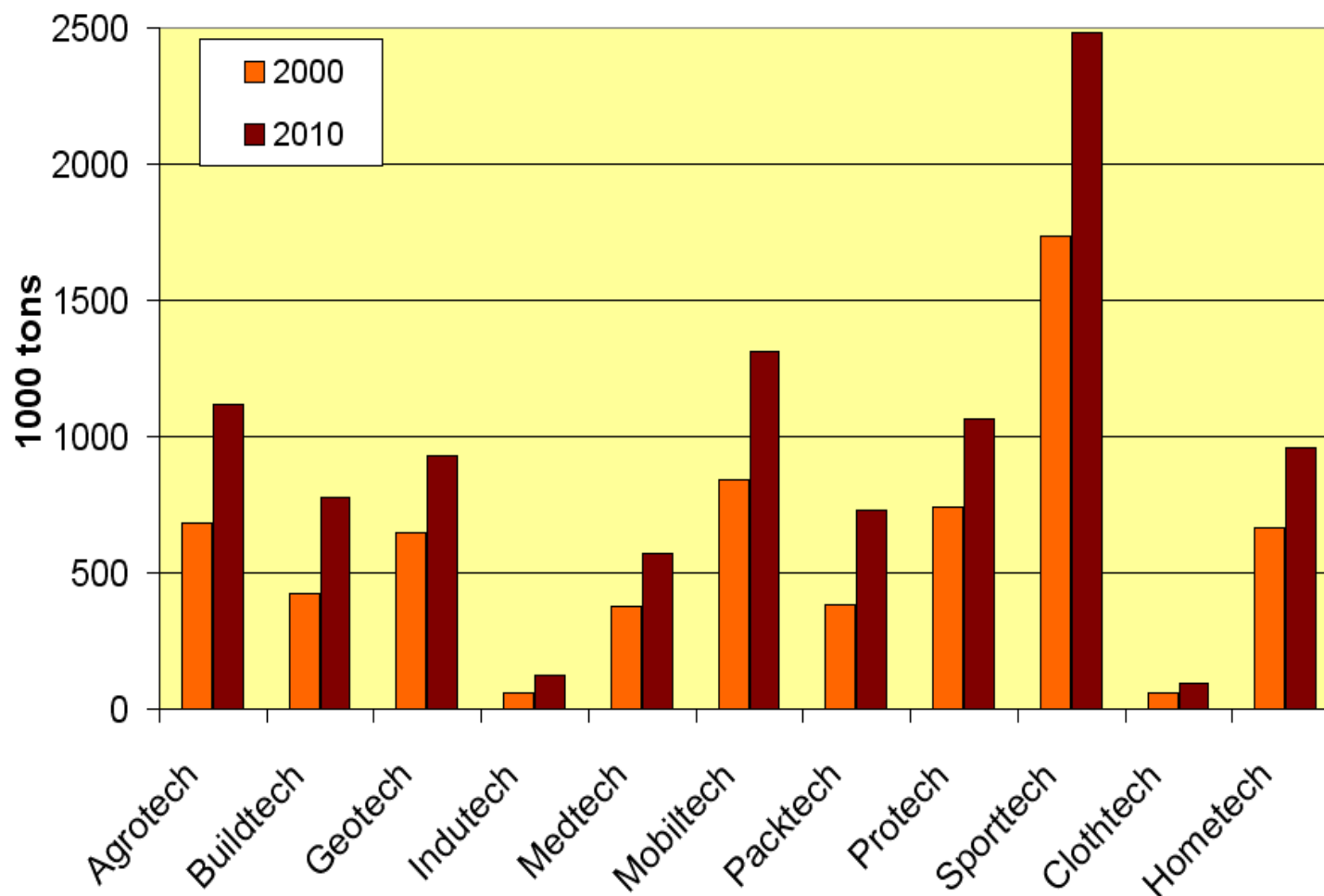
Quelle: World Market Forecast to 2010 / David Rigby 2002

Forecast end-use consumption North America



Quelle: World Market Forecast to 2010 / David Rigby 2002

Forecast end-use consumption Asia



Quelle: World Market Forecast to 2010 / David Rigby 2002

World production of technical textiles 1995-2012

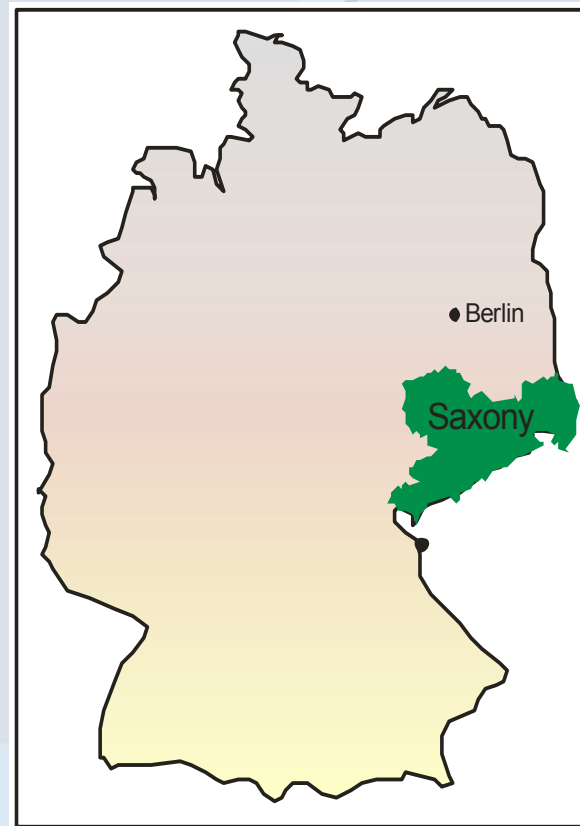
(1000 tones)	1995	2005	2012
Western Europe	1.079	1.287	1.135
Central/Eastern Europe	90	147	155
Turkey	45	150	175
Independent states			200
USA		1.900	1.800
Latin America		60	60
Asia	102	567	678

® CIRFS

Technical textiles in Saxony



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Saxony is located at
the borders to PL and CZ

Technical textiles in Saxony

General situation in the Federal State of Saxony:

→ After reunification most of the textile and clothing companies in Eastern Germany were closed and the number of employees in T/C was drastically reduced:

1989	318 000
1992	less than 50000
2009	12600

For those companies which „survived“, a re-orientation was necessary

- Find new growth markets such as technical textiles
- Diversification from conventional technologies and products into technical application fields (for instance from narrow braiding to conveyor belts and packaging material or from clothing to protective clothing)
- Close cooperation between researchers, producer and end-users

Technical textiles in Saxony

Application fields	Number of companies in Saxony
Agrotech	10
Buildtech	16
Geotech	11
Hometech	43
Indutech	33
Medtech	22
Mobiltech	40
Oekotech	8
Packtech	17
Protech	32
Sporttech	12

In total: about 190 companies

Diversification into technical textiles in Saxony

Master assortment	New products / Business segment
Socks/Hosiery	Functional socks for diabetics/ Orthopaedic articles
Cloths for outerwear	Fabrics from film tapes for sun protection
Silk fabrics for bed-linen	Antistatic fabric for clean room clothing
Elastic laces for lingerie	Spacer fabrics for upholstery
Bed and table linen (woven)	Cover fabrics for cars
Shoe textiles	Interior textiles for cars
Laces and curtains	Sensor integrated carbon fibre lamella
Laces and curtains	Flexible floor heating systems, functional bandages
Curtains and table linen	Textile cooling sleeve
Curtains and table linen	Knitted 3D-structures for slush moulding
Laces and curtains	Embroidered sensors in fibre composites

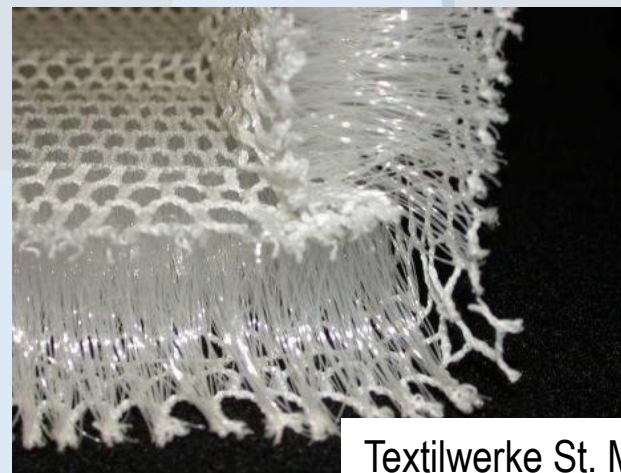
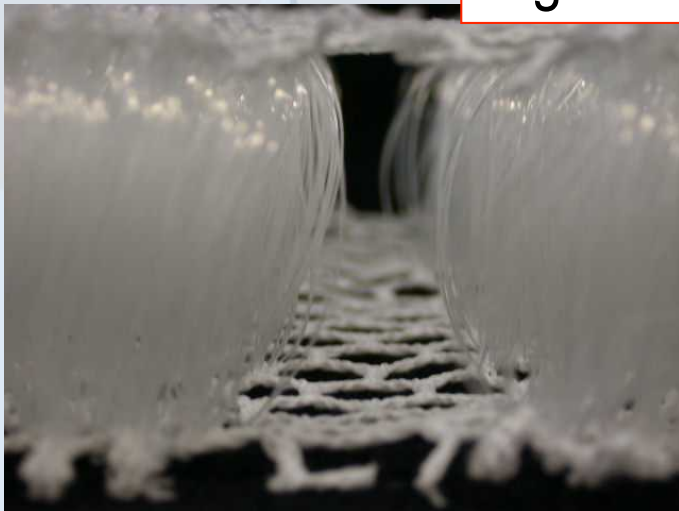
Example of diversification into technical textiles



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HighDistance® - Products



Textilwerke St. Michel GmbH & Co. KG



KARL MAYER



Industrial textiles - Indutech



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Conveyor belts



Textile filter

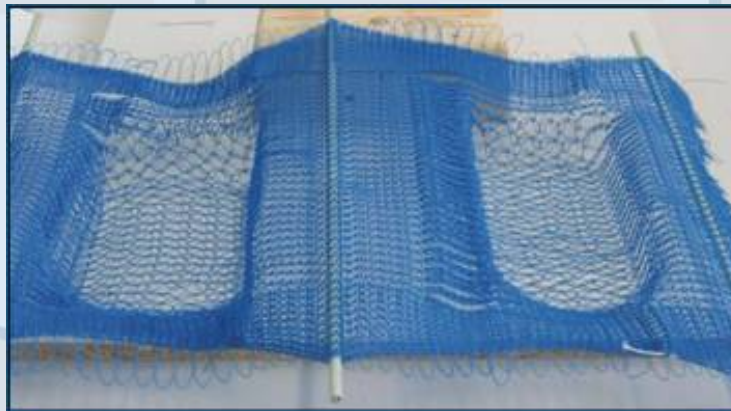
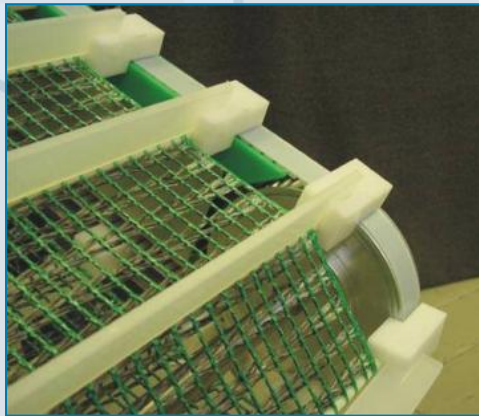


Insulation
material

..textile reinforced parts, backing material, tubes, hoses, sealings



Leight weight conveyor belt with inserted rods or pools



- application in food industry, textile industry or paper industry
- low tension to tight the belt is required
- no sliding of belts by means of lateral guidance

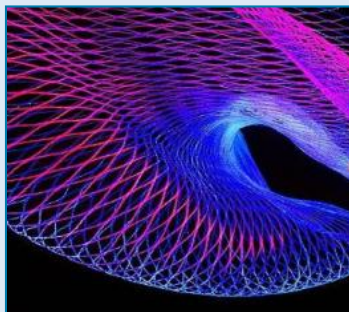


Industrial textiles - Indutech

Lighting textiles



- based on optical fibres which are inserted in a net-like structure
- application as lighting sails, lighting of emergency areas, ceilings or for decoration





Land - Air - Water:

Road vehicles, rail vehicles

Aircrafts, space travel

Shipbuilding

safety systems, airbags, tires, car elements, upholstery, car interior, carpets, heat insulation, sound insulation, filters, cable insulation, tarpaulins, protective covers for land crafts, boats, aircrafts, sailcloth, inflatable boats, special equipment for military vehicles, envelopes of balloons etc.



Mobile textiles – Mobiltech

Unfilled or filled 3D nonwovens for composite structures



Hat rack

- two pre-needled nonwovens are combined by a special technology
- filled with powder or solid substance → pressed into parts



Mobile textiles – Mobiltech

Preforms from carbon filaments

application in automotive
and aircraft industry

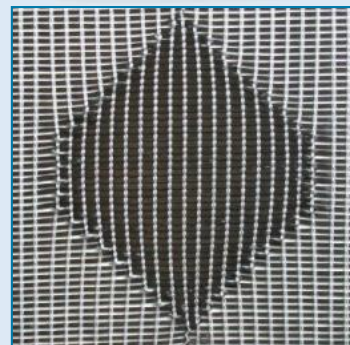
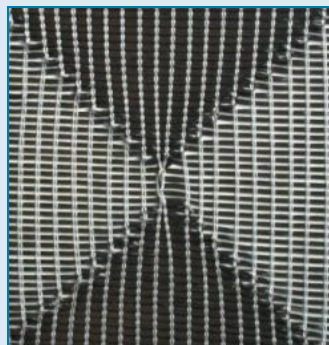


Curved structures



Cavities

Local reinforcement



Profiles



Functional textiles



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Protective clothing – Protech



**Warning
clothing**



**Protective clothing
for firefighters**



**Protective
clothing for
welders**



**Protective
gloves**



Sports textiles - Sporttech



**Protective clothing
for racing drivers**



**Functional
protective
clothing**



Medical textiles - Medtech

dressing material, textile goods for hospitals, textile material in protheses, orthoses textiles for surgery, rescue services etc.



Packaging textiles - Packtech

packaging material and nets, sacks and big bags, protective cover systems, tarpaulins



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Agrotextiles - Agrotech

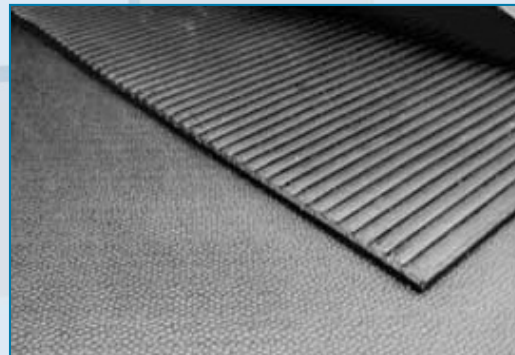


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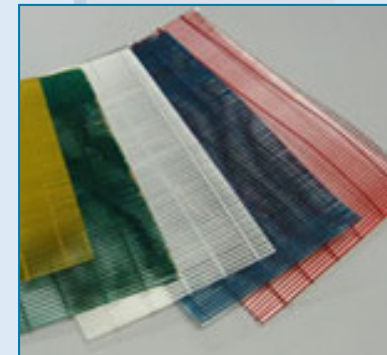
soil covering material horticulture + agriculture, textile drainage systems, textile irrigation systems, woven fabrics + knitted fabrics for providing shade, greenhouse equipment, sealing sheets, tarpaulins (Agrotextiles), temporary agricultural buildings



Nets for root balls



Mats for animals



Shading textiles



GREAT VARIETY OF APPLICATIONS



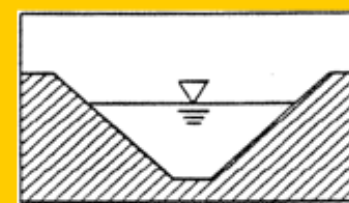
reservoirs,dams



liquid waste



solid waste



canals



roads



railways



foundations, retaining walls



erosion-
control
systems



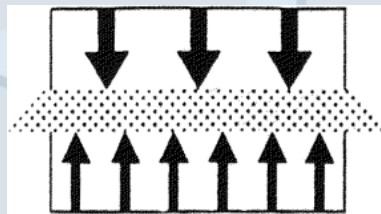
tunnel
construction



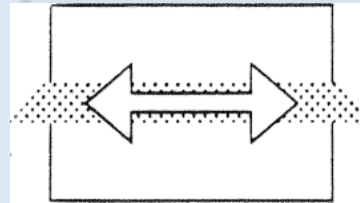
drainage
systems



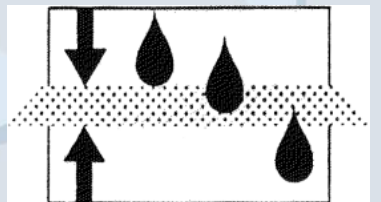
Functions of Geosynthetics



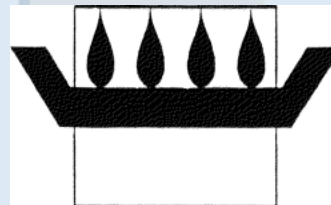
Separation



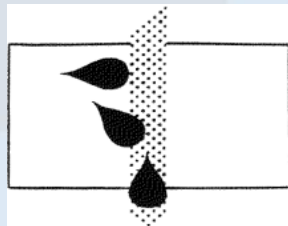
Reinforcement



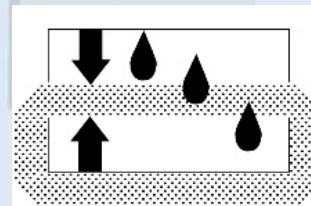
Filtration



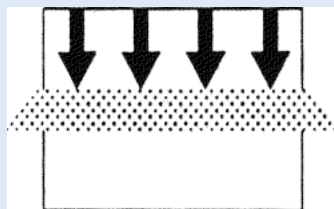
Barrier



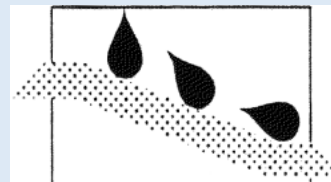
Drainage



Packaging



Protection



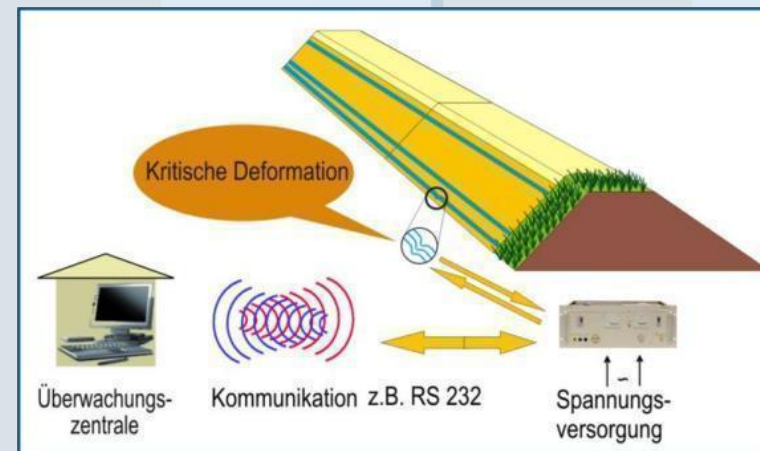
**Surface erosion
control**

**DIN EN
ISO
10318**



Geotextiles - Geotech

Sensor-based geotextiles for dike monitoring



- geotextiles with integrated optical sensors
- geotextiles are integrated in the landside dike slope
- in case of deformation a signal is sent to a monitoring centre → reaction in time is possible to prevent dike failure





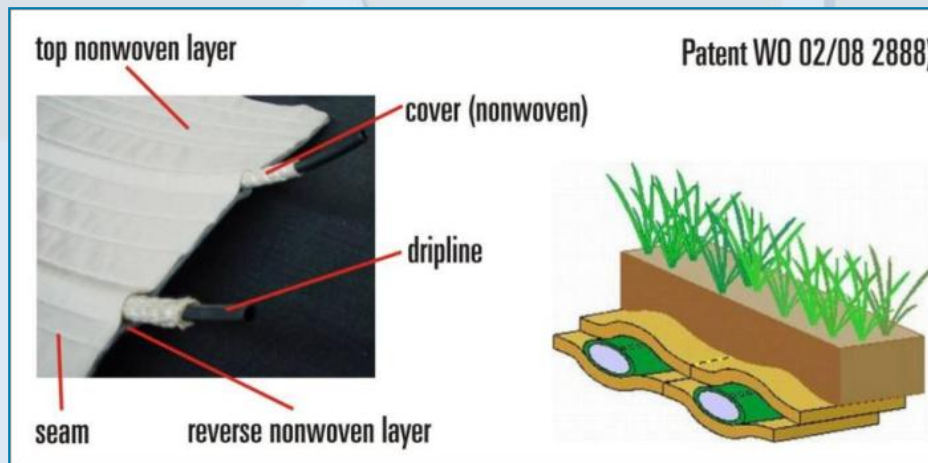
Geotextiles - Geotech

Geogrids for reinforcement of embankments



- reinforcement of the surface soil layer of embankments
- thick rope like structures are inserted
- for storing and draining of water
- erosion protection

Multifunctional irrigation and plant bedding mats



- two layers of nonwovens containing parallel fixed perforated flexible tubes
- greening independent of weather conditions
- optimized water distribution directly into the root area of plants

Textiles for building – Buildtech

textile reinforcement, lightweight construction materials, pipes, insulations (cold, heat, sound), textile roofings, textile membranes loadbearing structures, sunscreen Textiles, textile heating systems, textile-reinforced structural components, mouldings, tents



Textile membrane



Textile drainage



Textile roof-greening



Summary



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Effects influencing the growth in technical textiles:

Push-effect:

New material offer new applications

Pull-effect:

New applications require new materials

Economical effects:

High added value due to specialisation instead of mass production with low added value

Ecological effects:

New light-weight materials, biodegradable materials, renewable materials to save resources, material substitution

Functional effects:

Products with new functions stimulate the market (RFID, Smart textiles, ...)

Legislative effects:

New requirements and standards lead to new innovative products

Summary



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Potential for diversification of the textile and clothing industries

Existing product groups	Technologies	Fields of diversification	Partner branches
Ornamental trimmings	Braiding Tubular weaving Rope making	Filters Implants Insulating materials	Medical technology Automotive suppliers Process engineering
Plauen laces (table linen, curtains)	Embroidering	Composites Implants Protective clothing	Synthetic materials Medical technology
Fabrics for clothing and habitation (furniture, decoration, bed linen)	Weaving Finishing	Car interior Protective clothing Warning clothing Operating textiles	Synthetic materials Chemical industry

Potential for diversification of the textile and clothing industries

Existing product groups	Technologies	Fields of diversification	Partner branches
Yarns for home-textiles and clothing	Spinning Twisting Texturing	Textiles for medical rehabilitation Sports textiles Protective clothing	Chemical industry
Narrow fabrics Belts	Narrow fabric weaving	Conveyor belts Packaging materials Technical belts	Light weight construction Drive engineering Materials handling
Knitwear	Knitting	Car interior Filters Reinforcements	Light weight construction Synthetic materials
Clothing	Making up	Protective clothing Operating textiles Sportswear	Chemical industry

Perspective development of technical textiles

The European textile industry is an industrial branch favoured within the Lead market especially in the areas of

- Technical textiles for the automotive industry
- Technical textiles in environment
- Functional/protective textiles

A long term dominant global market position can be built up and maintained above all in the sector of technical textiles.

Source: Lead Market
Center for European Economic Research
Report of July 2002

Suggestions to be successful in Technical Textiles

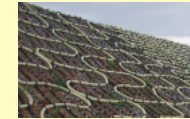
- Cooperation in cross-sectoral networks (suppliers, producers, R&D institutions) and use the potential of conventional/classical technologies
- Participation in joint initiatives to bundle competencies
- Work together with local authorities for regional strategies
- Involvement in European initiatives or Expert groups to be informed on European strategies and policies in T&C
- Involvement in European projects → networking
- Protect “your” products, technologies and ideas → be aware of IPR



Buildtech



Geotech



Mobiltech



Agrotech



Protech



Medtech



Clothtech



Homotech



Indutech



Oekotech



Sporttech



Packtech

