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Enriching lives through innovation

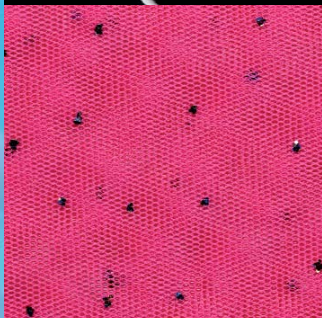
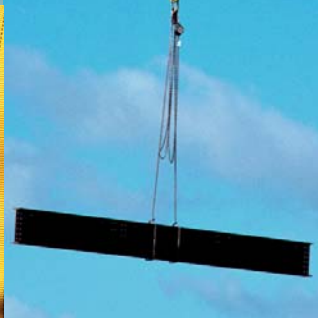
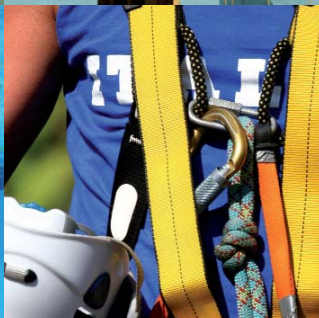
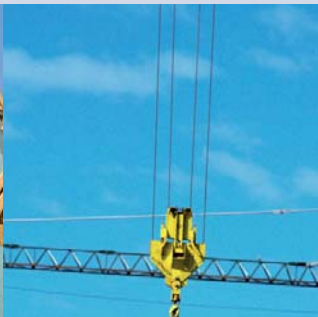
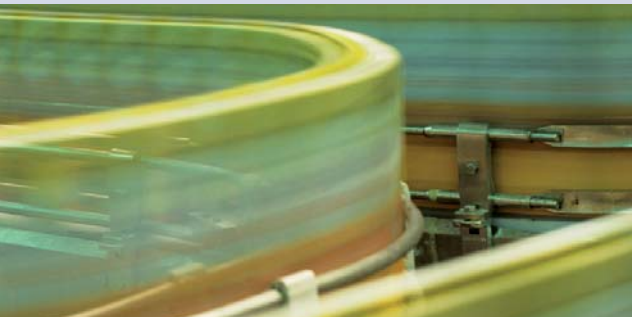
Textile Effects

LivingTech—Domestic and Industrial Textiles

High-performance applications for multifunctional products



Textile Competence



LivingTech—Domestic and Industrial Textiles

Function and performance

Technical Textiles used in domestic and industrial applications have to fulfill very high requirements in various key aspects. Products commonly used in these areas have a wide spectrum of specifications most of which are much more challenging in terms of technical performance and functional characteristics than with traditional materials and textiles.

Typical functional application areas are:

- Protection & barrier
- Cleaning & care
- Safety & strength
- Structure & support

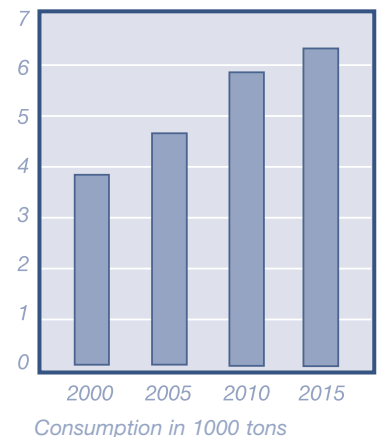
Innovation, efficiency and quality

Our products ensure that all requirements of these application areas are met in an ideal way.

Outlook

Technical textiles including nonwovens play a very important role for the textile fiber and finishing industry globally. Domestic and industrial textiles account for around one fourth of the value and volume of all the application areas for technical textiles. Growth rates remain above average as further opportunities are taken to introduce textile products into industrial processes. Furthermore, the rapid growth in the use of composites and fiber-reinforced concrete, but also as textile products increasingly replace traditional building materials in the form of both hidden components and end products in their own right.

Growth of Domestic and Industrial Textiles





Protection & barrier

Technical Textiles commonly used in this functional application area have either a protective or a barrier function. They protect and barricade against fluids, chemicals, dust and dirt, radiation, gases, moisture and extreme temperatures. Typical functional textiles with a protective effect are:

- Awnings
- Temporary protection textiles
- Tarpaulins

Technical Textiles with a barrier effect are:

- Roof underlayments
- Wall and ceiling reinforcements

These end articles achieve their excellent protective effects through a functional finishing or coating with which they protect against various radical influences.

Performance

- UV stability
- Resistance to hydrolysis and ageing
- Light-fastness
- Water, oil and stain repellency
- Flame retardancy
- Breathability
- Alkaline resistance
- Antimicrobial

■ Roof underlayments

Roof underlayments are designed to protect the roof sheathing and structure from moisture and penetration. The market is classified into felts, foils and coated non-wovens (mainly PP, PES and fiberglass).



Roofing underlayment was originally used for temporary protection against the elements but is now an integral part of a house's overall roof system. Underlayment provides a vital second layer of protection on top of the sheathing to help keep moisture out.

Main technical requirements for roof underlayments are flame retardancy, water impermeability in combination with air permeability (breathability), tear resistance, durability (non-ageing), UV resistance, mold resistance.

■ Awnings

A textile awning is an architectural projection with a roof like structure that provides weather and sun protection, identity or decoration and is wholly supported by the building to which it is attached.

Awning fabrics have to fulfill very high standards in various aspects. The consumer expects highest performance with respect to UV stability, hydrolysis resistance and non-ageing effect, light-fastness, water repellency, dirt pick-up, mildew resistance, and flexibility.

■ Wall and ceiling reinforcements

Textile fiber mats are increasingly being used as indoor and outdoor concrete reinforcements to strengthen walls, ceilings and facades to reliably protect against cracks.

Glass fiber meshes and webs are commonly used in the initial construction of a building or at a later stage of the building's life for renovation and cracked surfaces.

The reinforcement material has to fulfill high requirements regarding tensile strength and elasticity. Furthermore the material has to be flame proof and alkaline resistant in combination with an excellent degree of stability. This stability is achieved with the application of the right bonding agent (polymer).





Cleaning & care

Typical Technical Textiles within this functional application area are filters in all variations to separate and purify industrial products, mainly gases and liquids, from all possible impurities (dust, dirt, pollen), as well as cleaning wipes to absorb dirt and oil in home and consumer applications as well as industrial areas.

Technical textiles with cleaning and care functionality:

- Filters
- Wipes

Performance

- Water retention
- Hydrophilicity
- Washability and cleanability
- Flame retardancy
- Water, oil and stain repellency
- Antistatic

Nonwovens—the key player in this area

■ Filters

Nonwovens are ideally suited to many filtration applications, combining relatively low cost with a largely open pore structure. The range of different nonwoven technologies available, as well as the possibility of using “composite” combinations of two or more types of material, results in a wide choice of solutions to most industrial and separation problems. Examples for possible application areas are:

- Dust and baghouse filters
- Air stream filtration
- Swimming pool filters
- Coolant filters
- Pleated cartridges
- Auto oil



These kind of filters have multiple performance requirements as they all have differentiated application areas with very specific needs.

Typical functions to fulfill are:

- Flame retardancy
- Oil and water repellency
- Cleanability
- Antistatic
- Temperature resistancy
- High dust binding capacity

■ Wipes

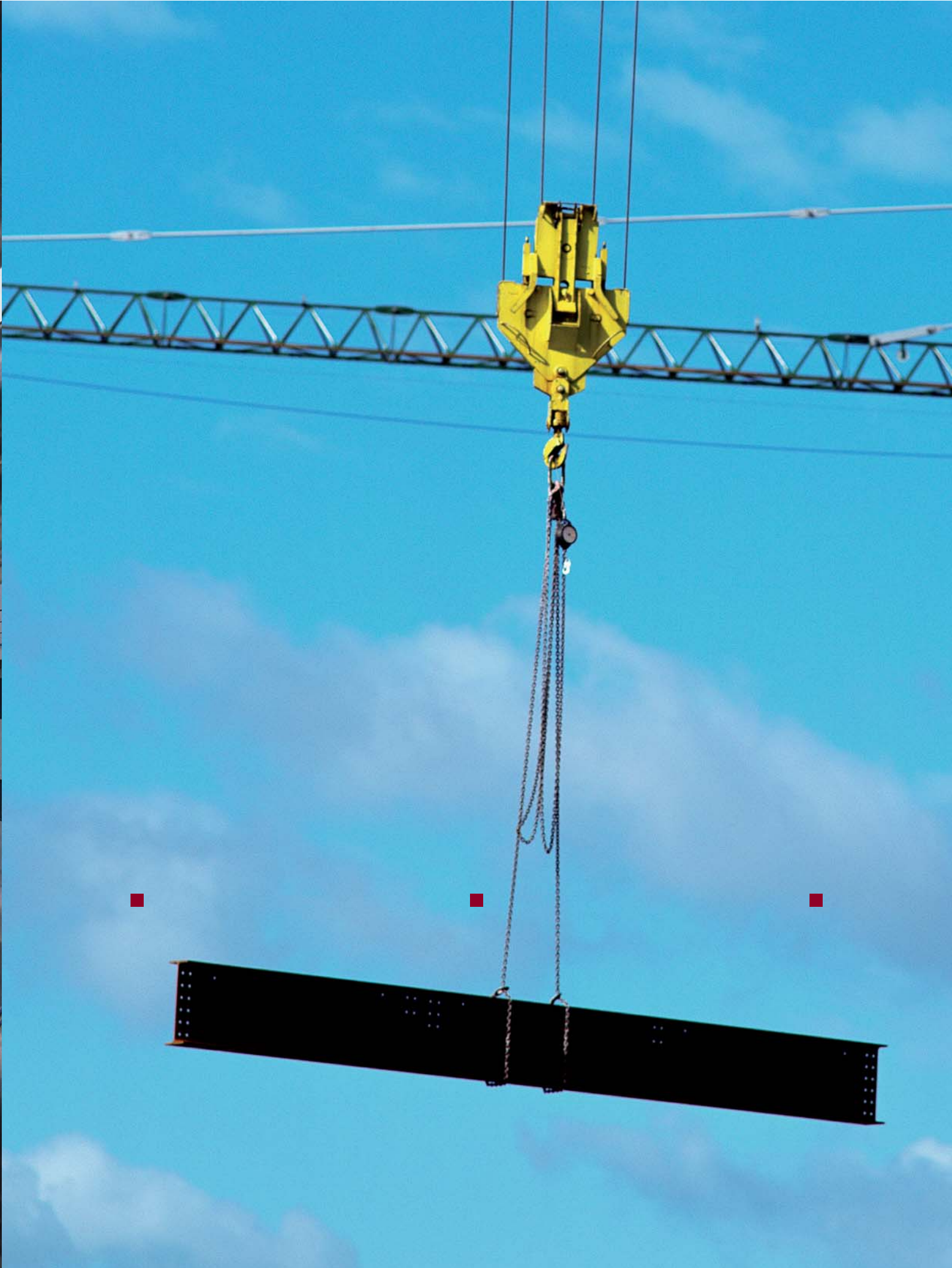
Recent growth in the overall wipes market has been mostly in pre-moistened wipes for consumer applications. However, industrial wipes represent an estimated 30 % of the total wipe market and are expected to show strong growth rates in the future. They include dry and pre-moistened wipes used in:

- Manufacturing
- Automotive
- Transportation
- Machinery
- Aerospace
- Surface preparation and painting
- Electronic equipment and components
- Electricals
- Pharmaceutical and medical
- Graphic arts
- Nuclear
- Food processing and service applications

Key requirements for wipes are:

- High water retention
- Chemical resistance
- Easy washability and cleanability
- Hydrophilicity
- High durability and stability
- Antimicrobial
- High dirt/dust binding capacity
- Antistatic





Safety & strength

Belts, ropes and nets are gaining increasing importance in industrial applications. The lifting web market for example is an important value-added area. These webs are used extensively for more delicate lifting operations—e.g. vehicle recovery and pipe laying.

Other application areas are:

- Safety nets
- Cargo nets
- Fishing nets
- Safety harnesses

Performance

- Light-fastness
- UV stability
- Strength and flexibility
- Chemical resistance
- Abrasion resistance

■ Safety nets

Places where safety and strength as fall protection nets is required are:

- Children's playgrounds
- Amusement parks

Statistics show that every year many 100,000 children are admitted to hospital emergency rooms as a result of playground injuries.

It thus makes sense to do everything possible to prevent accidents at these amusement parks or playgrounds.

That's where the installation of safety nets comes in.

Safety nets need to be strong and reliable to protect people from severe injuries.



■ Cargo nets

Cargo nets are used mainly in the transportation industry (flight cargo nets, automobile cargo nets) for the following purposes:

- Reverse protection of goods in closed transport systems, containers and several other means of transportation
- For side protection
- Protection above the top of the goods on the ground and sidewise

■ Safety harnesses

A safety harness is an apparatus designed to protect people working at high altitudes from falling. The harness is attached with a rope or cable to a stationary object and to the worker via cloth straps. A harness designed for someone to hang from is not strictly a safety harness as it is not failsafe, but rather a primary apparatus. Some safety harnesses are used in combination with a shock absorber, which is used to regulate deceleration when the end of the rope is reached. Occupations which may involve the use of safety harnesses:

- Roofers
- Window washers
- Fly crews
- Construction workers
- Crane operators
- Bridge painters

Depending on their end use, belts, ropes and nets have very high requirements with respect to:

- Light-fastness
- Dirt, oil and water repellency
- Sea water stability
- UV stability
- Non-ageing
- High durability and stability
- Strength and flexibility
- High abrasion resistance





Structure & support

Technical Textiles commonly used to give a defined structure to a specific end product or to work as carrier material primarily need to have a certain strength and durability to repeated mechanical forces. This permanent resistance is achieved through factors such as fiber selection, fabric construction and applied finishing respectively coating.

Representative functional textiles with a structure and support giving character are:

- Conveyor belts
- Coated abrasives

These types of end products are used in various industries and applications with very demanding mechanical and chemical influences and therefore need to be of top quality.

Performance

- Durability to mechanical influences
- Resistance to hydrolysis and ageing
- Light-fastness
- Water repellency
- Flame retardancy
- Temperature resistance
- Flexibility

Conveyor belt fabrics

Conveyor belts are extensively used to transport industrial and agricultural materials, such as grain, coal and ores.



The conveyor belt market can be split into three broad segments:

- Heavy duty: principally bulk carriers (quarrying, mining, generating)
- Light/medium duty: a wide range of relatively light belts mainly for unit handling, food processing and general industrial/processing
- Specialist belts for the textile, graphical and other industries (filtration, printers' blankets, nonwoven felts) for specific functions other than pure conveying

The requirements for the different types of conveyor belts are as varied as there are numbers of application areas for this kind of belts. Main requirements are:

- FDA approval for food industry
- Resistance to hydrolysis
- Easy cleanability
- Temperature resistance
- Flexibility to cold and heat
- Good adhesion to ground fabric
- High light-fastness
- High resistance to ageing
- Water repellency
- Flame retardancy

Coated abrasives

An abrasive is a material that is used to smooth, or, in some cases, roughen another softer material through extensive rubbing.



Abrasive and polishing cloths are used in the rough to fine grinding stage of surface preparation both industrially and domestically. They are necessary for the production of machines, vehicles and household products.

The main types of backing for abrasive and polishing cloths are woven cloth made from PES, CO, CV, PA and blends of these.

Typical application areas/key industries for all kind of abrasive cloth are:

- Steel industry
- Car manufacturing industry
- Furniture industry
- Chipboard industry
- Glass industry

Key requirements for abrasive cloth are:

- High temperature stability
- Hardness
- Flexibility
- Durability against mechanical influence



HUNTSMAN

Enriching lives through innovation

Region Europe

Huntsman Textile Effects (Germany) GmbH
Rehlinger Straße 1
86462 Langweid a. Lech, Germany
Telephone +49 8230 41-0
Fax +49 8230 41-370
infotexeuropa@huntsman.com

Region Americas

Huntsman International LLC
Textile Effects
4050 Premier Drive
High Point, NC 27265, USA
Telephone +1 800 822 1736
Fax +1 336 801 2808
infotexamericas@huntsman.com

Region Asia

Huntsman (Guangdong) Ltd.
Textile Effects
Flying Geese Mountain Industrial Park
Shilou Town, Panyu District, Guangzhou
511447, PR China
Telephone +86 20 8484 5100
Fax +86 20 8484 5222
infotexasia@huntsman.com

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