

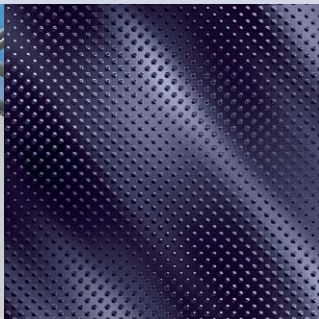
**Textile Effects**

# LivingTech—Coating

Tailor-made polymers for functional coatings



**Textile Competence**

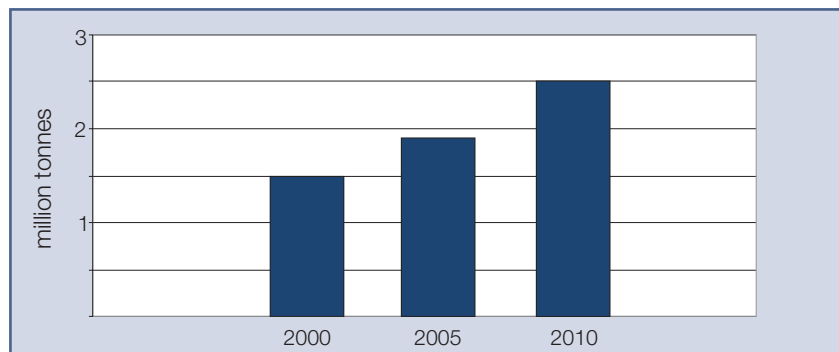


# LivingTech— Coating

Technical Textiles is one of the fastest growing segments in the textile industry. Replacing and complementing existing materials in fixed structures is the main factor for more cost effective developments.

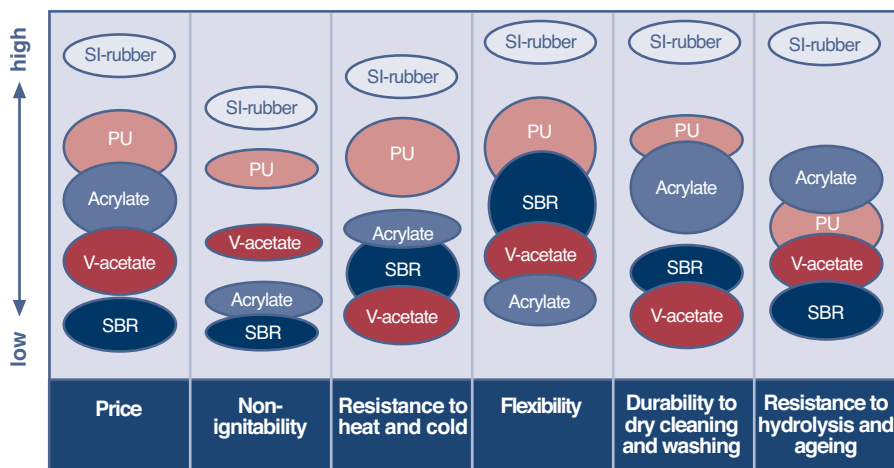
Optimizing mechanical properties and gaining additional advantages such as lightness, strength and resilience or resistance to many other factors, textiles are the carriers for functional coatings. The right selection of chemistry and coating processes contribute towards properties needed for the end use.

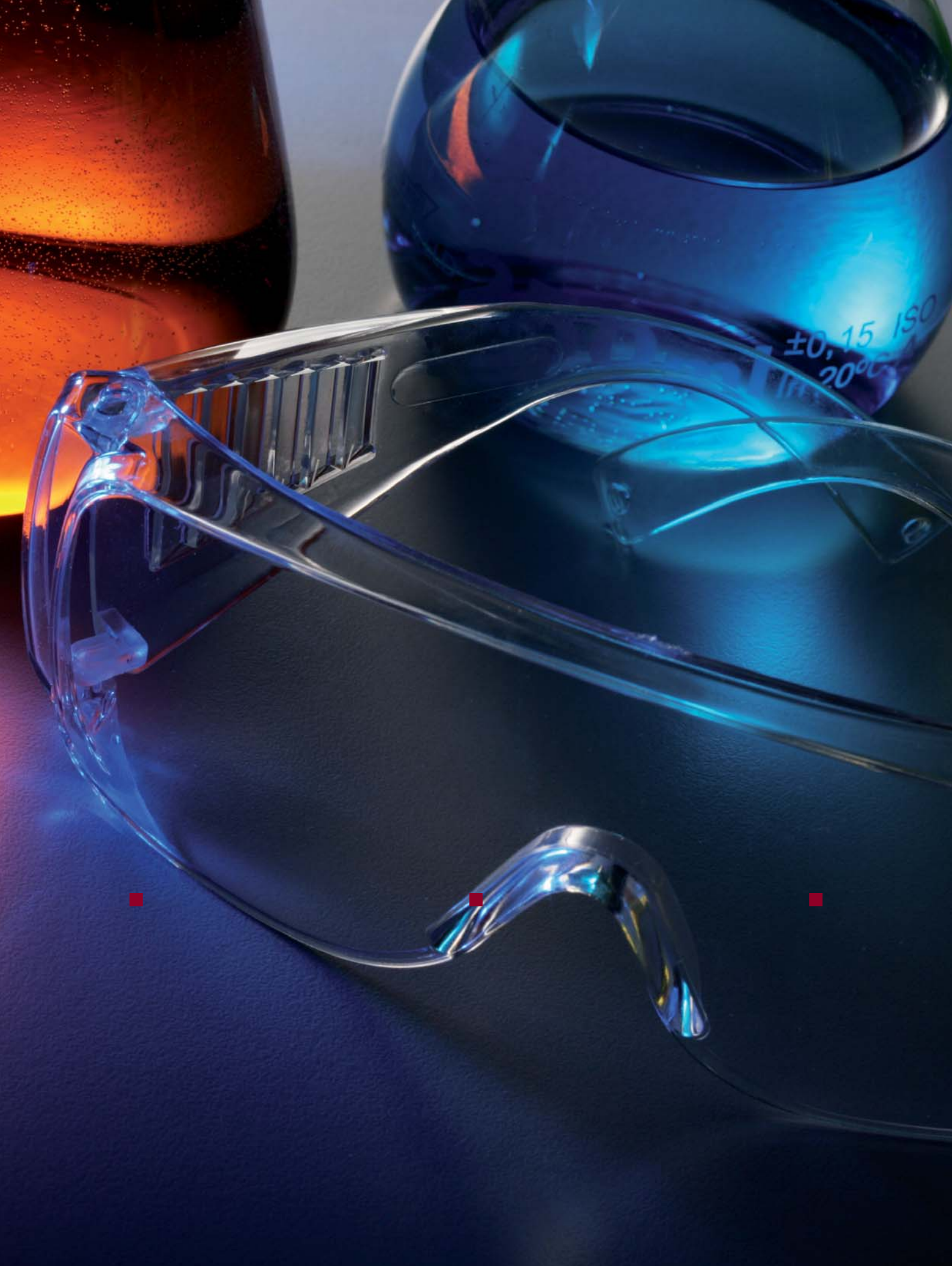
## Buildtech\* world end-use consumption



With the growing market in Buildtech\* for example, the requirements on quality and other effects for coating systems will also grow. The development of new products with alternative curing sources, or the formulation and production of compounds tailor-made to customers' requirements, is a major focus at Huntsman.

## Coating aspects are determined both by various technical features and by price





# Coating— making it possible

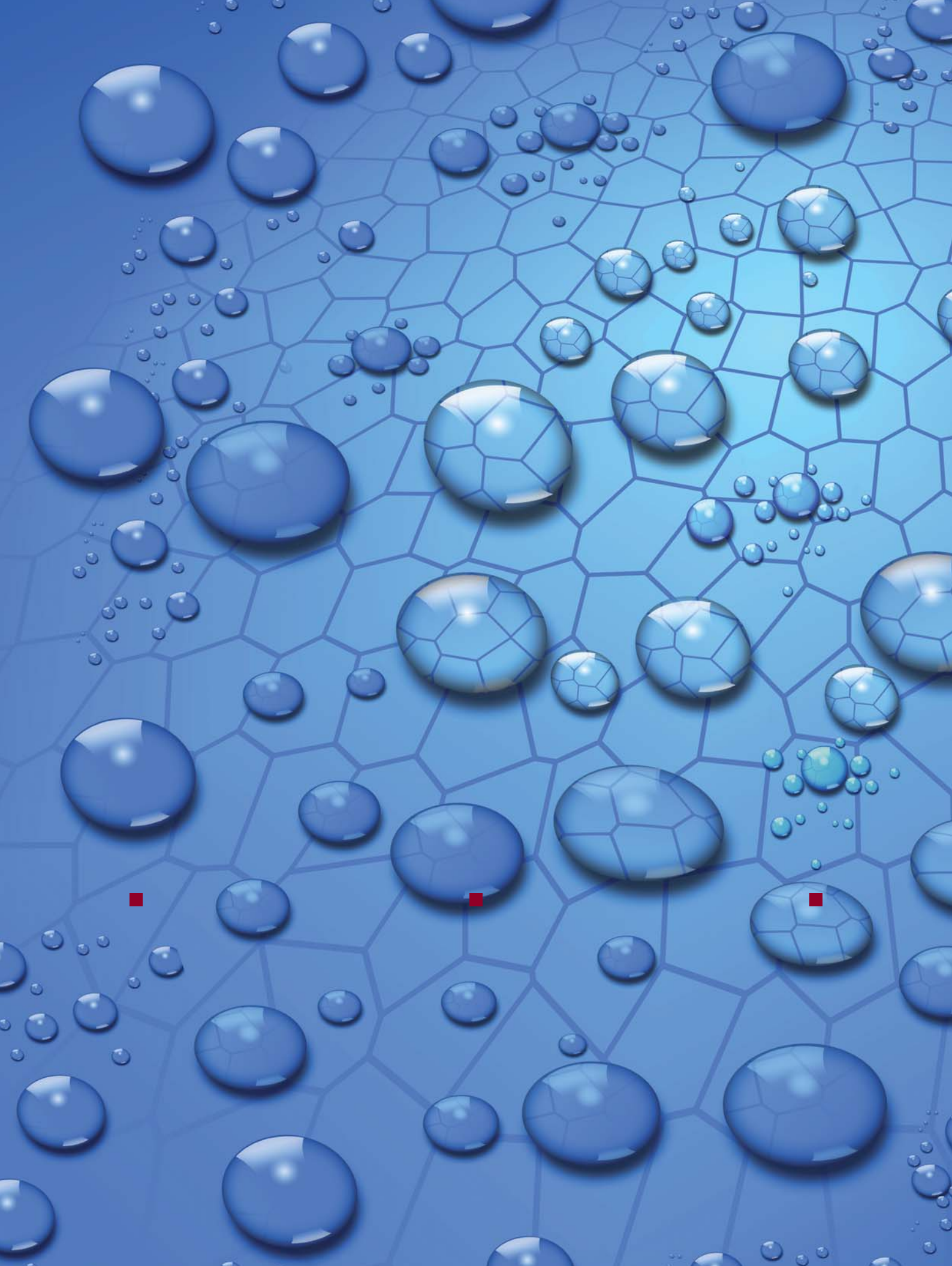
Achieving high level properties in coating technical textiles requires implicit knowledge of the fabric, the polymers with their strengths and weaknesses, and the technology. The combination of science, experience and systematic testing is the qualification for functional coating.

Besides the right selection and combination of polymers, depending on end use and technical properties, Huntsman possesses expertise in intercalation of additives and pigments into the polymer matrix. Typical effect additives and pigments are: flame retardants, expanding and matting agents, pigments for metallic and glass reflection, daylight and night fluorescence, various color and glitter effects.

Coating technology is based on several processes which can markedly influence the characteristics and quality of the coated fabric. Here too Huntsman is intimately acquainted with all relevant processes such as paste coating, stable foam-, meta stable foam- and instable foam-coating and finishing as well as dot coating and transfer coating.

## **Newly developed all-in-one compounds are our speciality to fulfill performance requirements, such as:**

- flame retardant effects with different durabilities
- variable handle
- antislip
- watertight
- breathable
- oil and water repellent
- abrasion resistant
- pigmented



# Coating— Acrylate

Acrylates are very versatile in their performance. Depending on the chemical basis they can form either a soft, tacky and elastic film or a hard, dry and brittle film. Due to hydrolysis resistance they are qualified for coatings which are used outdoors under changing weather conditions.

Acrylates significantly improve useful properties like abrasion resistance, water repellence and/or watertight effects; they are durable against home launderings and can be combined with various additives like flame retardants or oil repellents.

- Roller- and vertical blinds
- Sun shades
- Upholstery
- Belts

## ■ Sun and light protection

Sun and light protection both indoors and outdoors need colorfast dyes with no shade change or yellowing. The fabric is stabilized by stiffening. Several windings and extreme temperature changes should not impair this effect. To comply with legal requirements the blinds or rollers have to be flame retardant according to miscellaneous national and international standards.



## ■ Soil repellence

Awnings or sunshades need stabilizing by stiffening in combination with water repellent effects, and for outdoor use a soil repellent effect is beneficial. Extreme climate changes should not influence the stiffness and repellent effect. This is why the coated material is tested under extreme temperature conditions.

**Variations of Acrylates—DICRYLAN® A, F and TA allow variation of characteristics**

soft >>	<< hard
transparent >>	<< filled, colored
stiff >>	<< elastic
dry >>	<< tacky

## ■ Abrasion and flame retardance

Upholstery in public buildings, theaters, hotels, all areas which are frequented by large numbers of people, is subject to extreme abrasion. Back coatings of upholstery fabric anchors the pile in the fabric, protects against seam slippage and in combination with a flame retardant auxiliary, it fulfills the safety standard for flammability and burning behavior.

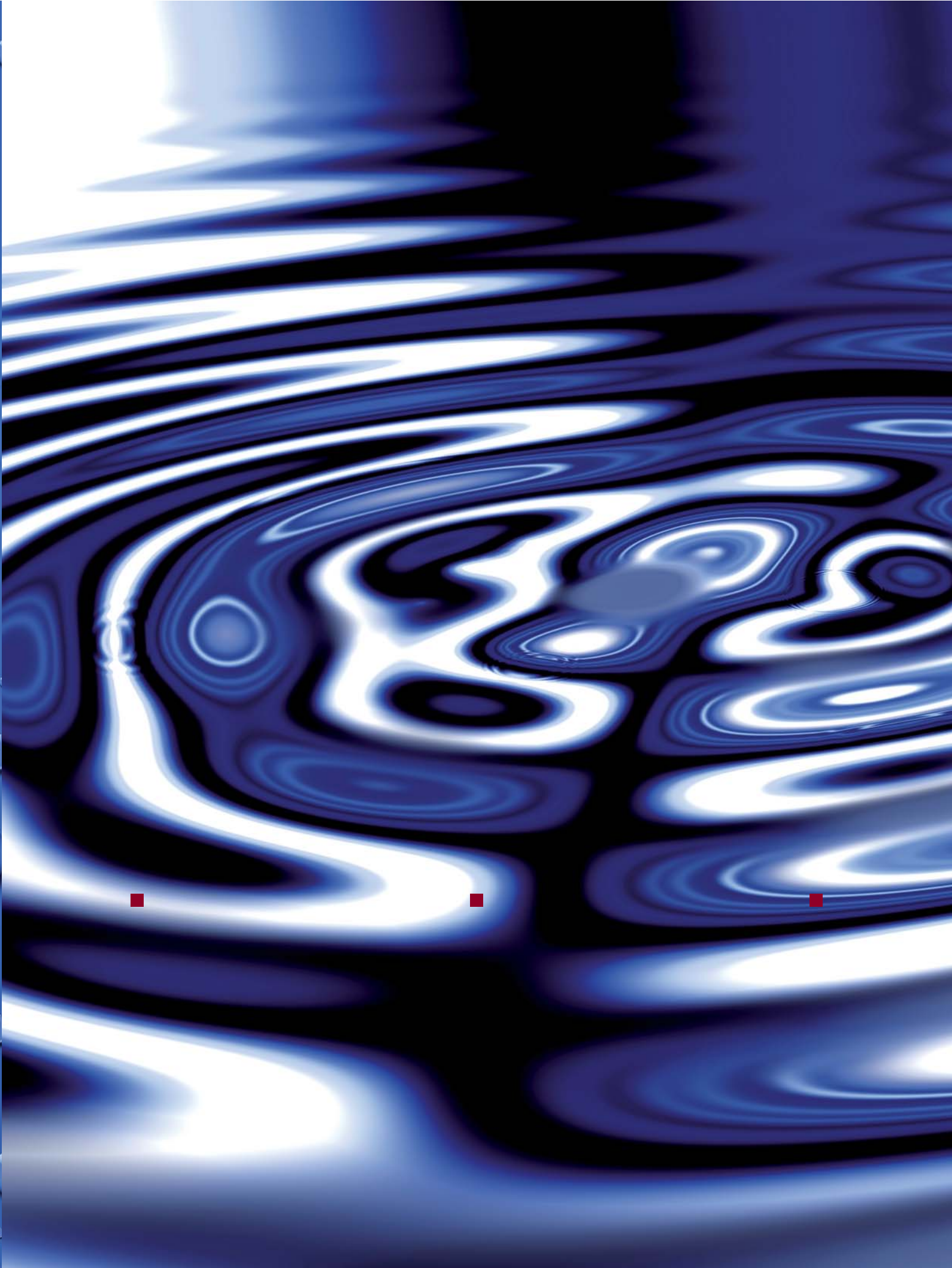
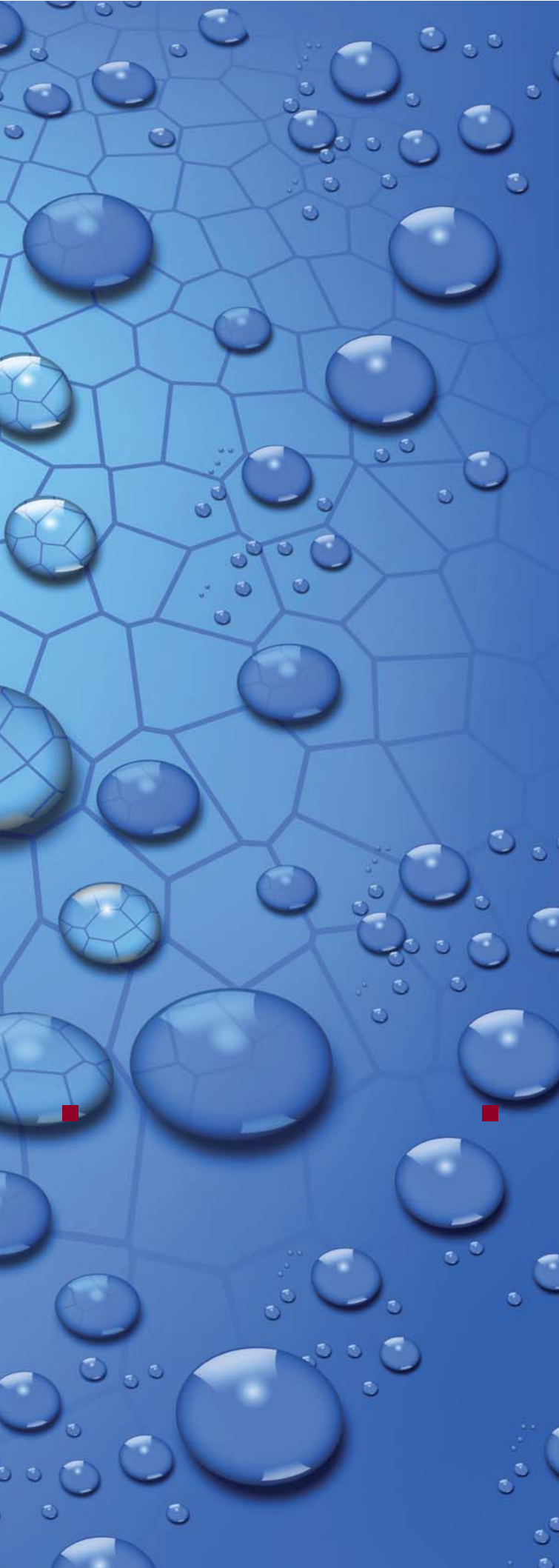


Soft acrylates cover the surface of upholstery fabric with a transparent film and protect against abrasion. The color is not influenced and the fabric looks new much longer.

### Martindale Test Method for abrasion resistance



Upholstery fabric showing excellent performance



# Coating—Polyurethane and silicone rubber

## Polyurethane

Thanks to a special chemistry, extremely flexible and resilient coatings are possible. Depending on soft handle, polyurethanes are used on apparels or light weight fabrics such as paragliders. The foam coating process supports the feature of softness and elasticity.

Selected process conditions (paste- vs. foam-coating) and products of the DICRYLAN® P range enable breathable or wind tight effects in combination with water repellent and watertight properties.

The coated fabric can withstand extreme temperatures. The elasticity returns after warming a cooled fabric and the soft, dry handle is reinstated after cooling down a heated fabric. For this reason polyurethane coatings are used for fabrics which have to prove their effectiveness under extreme conditions.

## Silicone rubber

Fabrics coated with silicone rubbers (DICRYLAN® SRE, SRU and WRU) are resistant to ageing caused by UV-light or extreme climate fluctuations. They retain transparency and are predestined for coatings in Buildtech\* and Indutech\* end use as well as for boat covers and sail cloths. Silicone coated fabrics are also appropriate as end use fabrics which are worn close to the skin, because they possess no culture medium to bacteria.

- Medical mattresses
- Textile architecture
- Air sport fabric
- Filters
- Apparel (trekking)
- Sail cloth

## Functional apparel

Functional sportswear which protects against wind, rain and hypothermia, has to be light in weight, breathable and of course fashionable. Combinations of foam and paste coating with DICRYLAN® P products meet these requirements.



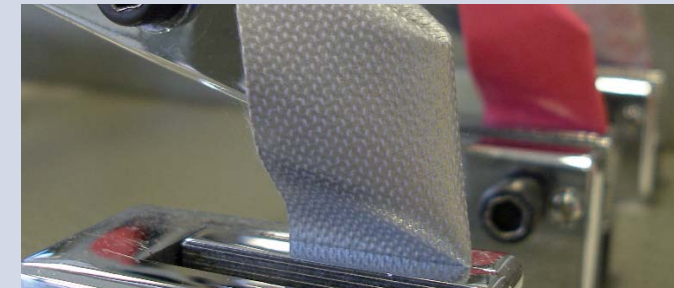
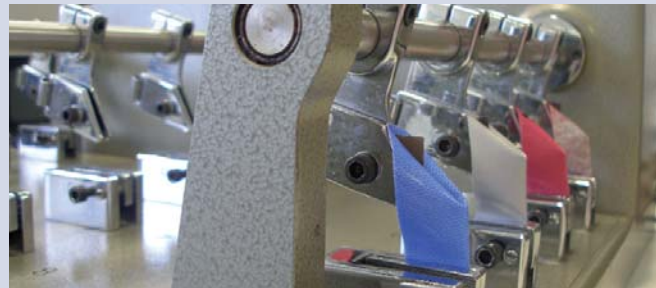
Regardless of whether people are physically active in hot or cold areas, functionality will be maintained.

## Functional building

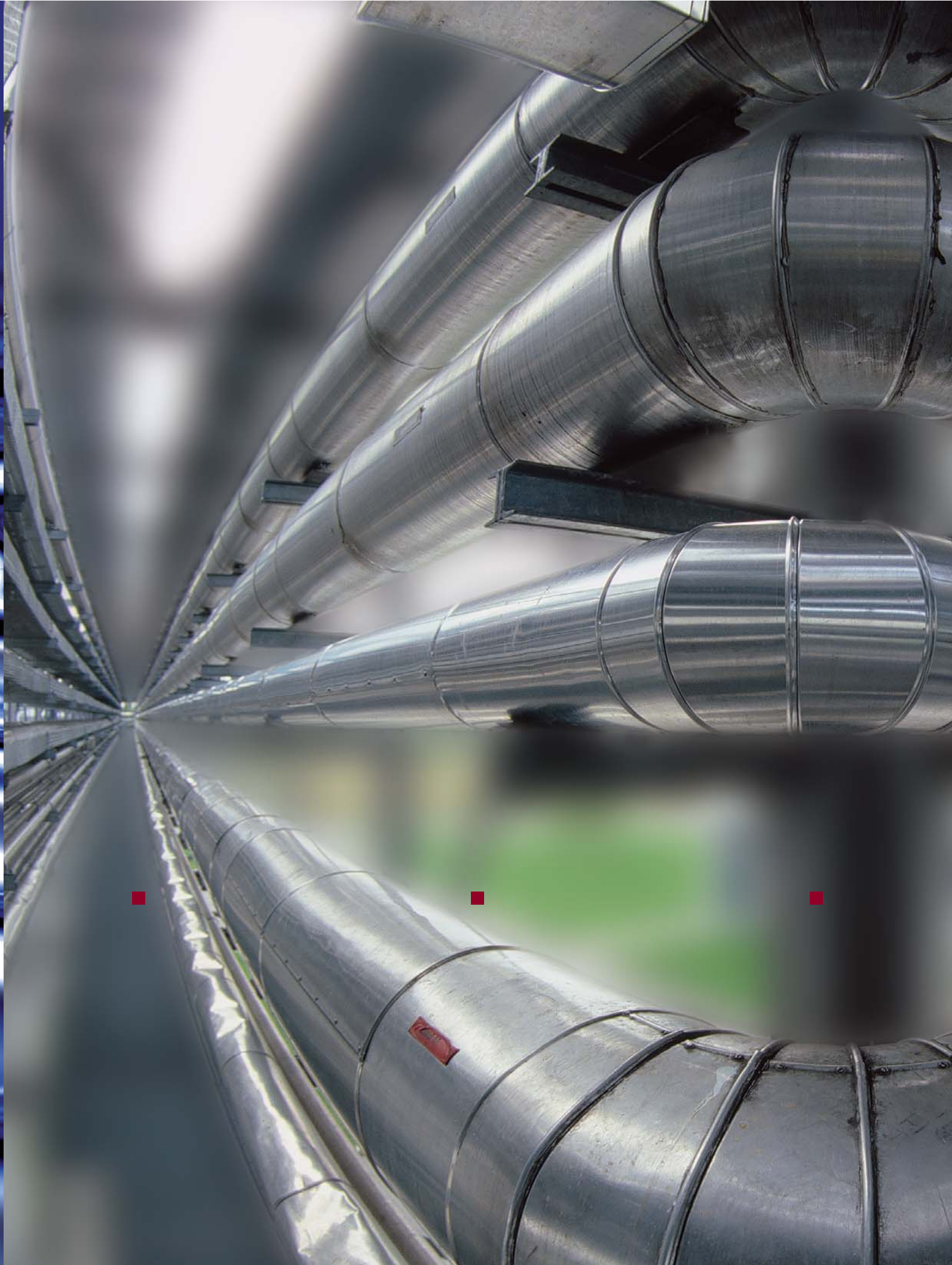
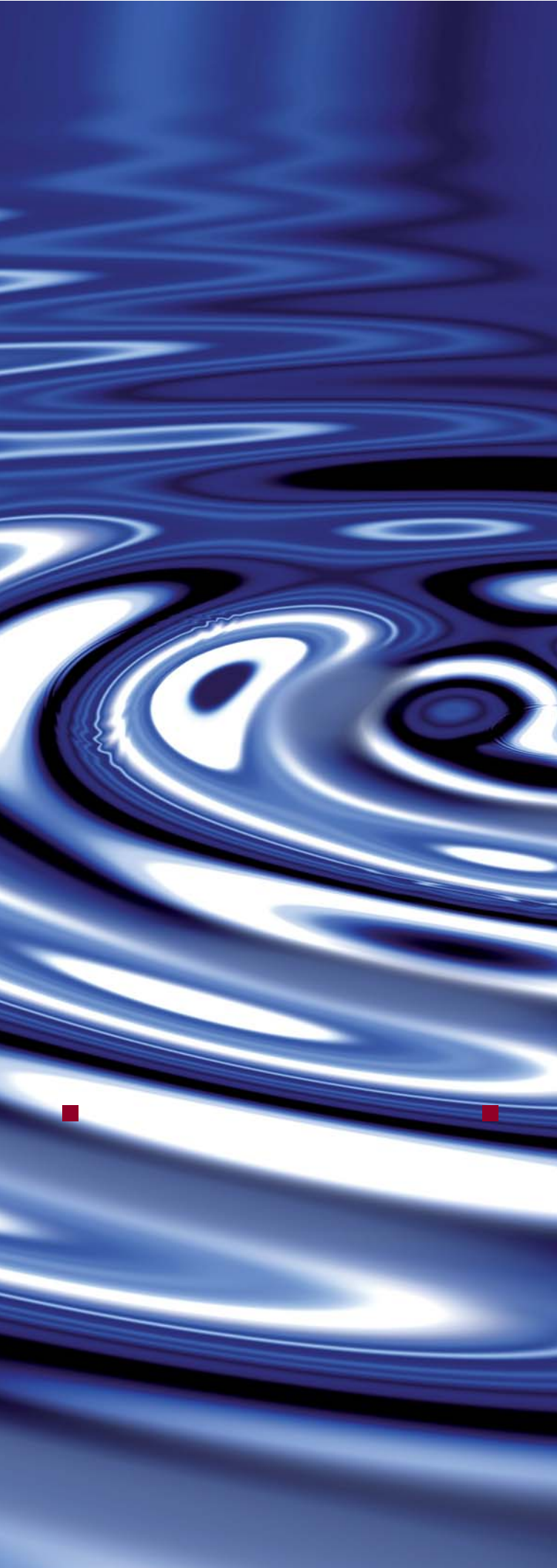
Transparency with UV-protection is a main target for fabrics used in Buildtech\* segments. Because silicone coatings have a minimal ageing tendency they are preferred for tarpaulin, providing resistance to rain and sun with high flexibility and wind tightness.



### Bally-flexometer test



Coated technical fabrics showing high flexibility under different climate conditions.



# Coating— SBR latex

Styrene butadiene polymer dispersions are cost effective alternatives for several end uses where optical aesthetic is of secondary importance.

As polyurethanes or acrylics, the film hardness can be varied widely ranging from soft, sticky to extremely hard, harsh.

Due to these properties as well as good cold flexibility, the ability to be mixed with fillers and other solids and good foamability a lot of end use articles can be considered.

- Carpet back coating
- Glass fiber applications
- Abrasive materials
- Shoe materials
- Automotive elements

SBR lattices can be applied by common application methods, be it pad application, paste and/or foam coating.

## ■ Shoe materials

A shoe construction consist of different elements. These elements are mainly the shoe front and back cap, the bootleg, different insoles (fixed and inserted) and the profile sole. SBR lattices are applied on caps and insoles for stiffening and bonding for example.

The applied polymers need to be heat moldable.



## ■ Carpet back coating

SBR lattices are used as precoat and secondary backing, very often in combination with various fillers and flame retardants, as carpet backing. Main functions are pile anchoring, improved loop resistance, mechanical stability and flame retardancy.

Furthermore, shock absorption, subsonic noise absorption and insulation are well known effects.

## ■ Automotive industry

Typical automotive elements which are treated with SBR lattices are interior carpets and rear trunk linings.

Main features for these end use articles are: improved mechanical stability, heat moldability, flame retardancy, bonding and stiffening and non-fogging.





# HUNTSMAN

Enriching lives through innovation

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