Desmopan® – A high-tech material sets trends

DESMOPAN

– Universe

Desmopan® has got what many other materials do not have: an abundance of talent. And these talents can be combined to make all kinds of innovative products. As one of the world's leading suppliers of TPU, we know how!

Desmopan® is a thermoplastic polyurethane elastomer (TPU). It combines many of the valuable characteristics of rubber and thermoplastic materials, and, on top of that, benefits from the strengths of polyurethane chemistry, which is its chemical backbone. The trademark of TPUs is their rich variety and versatility. Material properties can be adjusted by the modular principle through careful selection of raw materials. Basically, every one of the talents displayed by Desmopan® can be tailored to the particular end-use. It is this flexibility that makes this TPU material so innovative.

The success story of Desmopan® in the automotive industry has spanned more than 30 years, and is set to continue.

Automotive

A material for all seasons

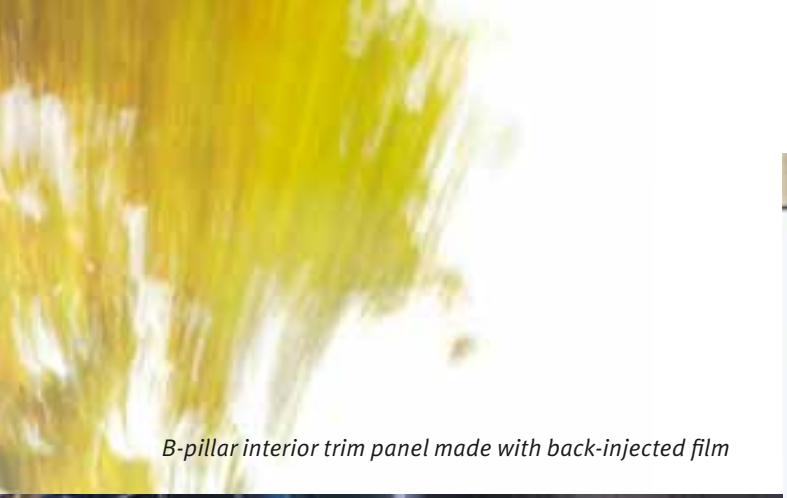
What vehicle designers love about our TPU materials is their outstanding wear and scratch resistance, their flexibility and their good resistance to oils and grease. Established applications include cable bushings, bearing shells and dust caps for supporting joints and guide joints.

Highly hydrolysis-resistant Desmopan® grades that are also highly resistant to microbial degradation are used for the production of cable sheathings and seals. High-impact, glass fiber-reinforced grades (R-TPU), which have a particularly low expansion coefficient and good damping behavior at a moderate elasticity modulus, are suitable for car components such as door sills and warm air ducts.

Combining hard and soft for a good grip

Desmopan® also has a lot to offer in terms of decoration, surface quality and tactile properties. This combination of properties is utilized, for example, in hard/soft technology, in which soft TPU grades are combined with various hard thermoplastics.

Typical applications inside the vehicle are center consoles and louvers overmolded with Desmopan® – a process that produces soft-touch finishes that feel like leather or velvet but are still highly scratch-resistant.



B-pillar interior trim panel made with back-injected film

Abrasion-resistant gearshift knobs with pleasant surface feel

Wear-resistant bearing shells and gasket joints

The same is true for Desmopan® gearshift knobs, which are also highly wear-resistant. In trays or holders, Desmopan® also exhibits sound-damping and dry slip-resistance qualities.

Outside the car, door sills, rear lights and brake lights produced using hard/soft technology can be provided with weather-resistant sealing lips of Desmopan® that remain flexible over a wide temperature range.

Hard/soft combinations for door sills

Automotive

Desmopan® in the vehicle interior

We have responded successfully to current trends in automotive design. Besides the traditional black, designers are increasingly using bright colors in automobile interiors. We have therefore developed Desmopan® grades that are based on aliphatic isocyanates with longer-term lightfastness.

With their unusually good flow properties, they are very easy to process by injection molding, and in car interiors the potential for parts produced by hard/soft technology is very good.

New trend – lightfast Desmopan®

Design-friendly materials for center consoles

Component featuring hard/soft technology

Chemical-resistant cable plugs

Hard/soft combinations as part of the instrument panel

You will find Desmopan® just about everywhere in the field of sports and leisure. It demonstrates its fitness in sports shoes and sports equipment, for example.

Sports & leisure

For more fun, joie de vivre and performance

Hard-wearing – reduced abrasion

In the sports&leisure industry, one trend follows close on the heels of the next. The result is a constant search for new materials with improved properties, which is why we developed Desmopan® grades with vastly reduced abrasion loss.

Flexible Frisbee with outstanding flight characteristics

Golf shoes with flexible and durable soles

Wear-resistant studs for soccer shoes

Golf club with a soft-touch core

In particular, they are used to manufacture soles and heel taps by injection molding. Parts made from these grades are very easy to shape even at high wall thicknesses, which facilitates economical production with short cycle times.

Durable covers for golf balls

Desmopan® grades for a glimpse inside

Aromatic TPUs can be also be highly transparent, as evidenced by new extrudable and injection-moldable Desmopan® grades based on polyesters and polyethers. They can be used to produce transparent parts that show virtually no cloudiness even at wall thicknesses of up to six millimeters.

Sports & leisure

Tough shells for inline skates

Additional arguments for the use of Desmopan® include in particular high abrasion resistance and flexibility, but also good resilience and flexural strength. Its stiffness and toughness make it very well suited as a shell material for ski boots and inline skates. And our TPU material has proven its low-temperature impact resistance in the frames of sk and housing components for ski bindings.

Potential applications include wear-resistant “windows” for decoration or company logos even in the highly-stressed area of the sole. The polyether grades are also impact-resistant and flexible even in the icy cold. This makes them the material of choice for ski boots with a transparent outer shell that reveals the inside of the boot.

Snow chains made of Desmopan®

Transparency to showcase what’s important

sparent, impact-resistant ski binding components

Comfortable ski boot with transparent c

Coatings & films

Wear-resistant conveyor belts

Extruded films made of Desmopan® have been in use for some considerable time, for example as air-protected packaging. Even in their thinnest form, the films are extremely tear-resistant yet highly extensible. TPU is also highly compatible with textile fabrics and fleeces.

Desmopan® can also display its prowess in the form of a wafer-thin film. The combination of this film with other materials is highly promising.

Watertight and breathable films for rain jackets

Thin layers for tough surfaces

Elastic membrane packaging

The two materials can be combined by calendering, extrusion coating or powder coating. A key example of an industrial fabric of this kind is the underlay sheeting used in the construction industry.

Solar module with Desmopan® embedding film

TPU makes production of solar modules more economical

Solar modules can be produced more economically thanks to Desmopan®. With a tailor-made Desmopan® film, the lamination process can now be carried out continuously without a vacuum.

The savings result from a faster, simpler manufacturing process and lower investment costs.

Boat skins and rescue equipment

We have developed special Desmopan® grades for the coating of fabrics used for the skins of inflatable boats, collapsible canoes, life rafts, life jackets and oil barriers.

They can be designed in any color and, being thermoplastics, are more economical to process than the rubber that is otherwise used in this segment. Desmopan® skins are mechanically more scratch and tear-resistant than their PVC counterparts.

There is also good potential for the use of textiles coated with lightfast Desmopan® in automotive interiors, such as for interior door panels or as trunk covers.

The direct coating of textile fabrics and fleeces with TPU is becoming increasingly important. Whether as an extrusion or calender coating, a sintered powder or brush-on coating: the right material is always available.

Durable skins for inflatable boats

New trend – treating fleeces and fabrics with TPU

Transparent, extremely durable boat floors

Plastics for belts, hoses and cables are often exposed to extreme conditions. Generally speaking, these materials have to withstand a whole assortment of stresses at the same time, including high pressure, severe temperature changes and attack from chemical media.

Hoses. Cables. Belts. Profiles.

Pneumatic and hydraulic hoses with high compressive strength

No signs of weakness!

Toothed belts with outstanding wear resistance

Spiral hoses with high abrasion resistance

Whether used as sheathing for supply cables on oil platforms or for oceanographic measuring cables, Desmopan® is much in demand as a specialty material for cables and supply lines. It remains flexible even at low temperatures, contains no plasticizers and is robust in extended service thanks to its good abrasion, cut and tear resistance. With tubes and hoses, TPU has the added advantage over rubber of a high elasticity modulus and greater strength. The hoses can therefore be manufactured in lower wall thicknesses and still have a very good bursting resistance. Typical applications include pneumatic, irrigation and drainage hoses. When it comes to hydraulic and fire-fighting hoses, Desmopan® has yet another ace up its sleeve – it is unaffected by many chemical media. The high wear resistance and dynamic stability of our TPU materials is also very important when it comes to belts such as toothed belts, for example.

Light, hydrolysis-resistant woven fabric hoses

New trend – tailored-made customized solutions

The demands made on hoses, cables, belts and profiles, all of which are produced by extrusion, are far from being uniform. There is therefore no such thing as a universal material. Success comes from tailoring Desmopan® precisely to ...re it will be used.

Optimizing the details

We offer, for example, Desmopan® grades that are hard, but can still be extruded. They can be used to manufacture pneumatic hoses with even higher compressive strength and mechanical resistance. This would create a true alternative to specialty polyamides. To make hoses more flexible, on the other hand, we have developed more soft grades with hardnesses of around 60 to 70 Shore A.

Reliable, rugged and versatile – engineers, in particular, appreciate these strengths of Desmopan® when it comes to designing high-performance machines and engineering components.

Agriculture. Industry. Mechanical engineering.

Durable animal identification tags

A hard-wearing, all-around talent

Traditional applications for Desmopan® in industry and mechanical engineering include rollers for transport trucks, all kinds of seals and gaskets, conveyor rolls, screen elements for ore extraction and sliding protective rings for the steel cables of diamond saws. For such injection molded parts, our TPU's outstanding wear resistance is indispensable, but so too is its dynamic load-bearing resistance, good damping properties, resilience and good chemical resistance.

Desmopan® also helps farmers to sow and harvest their crops. All kinds of different harrows and picking prongs, for example, are made of the TPU. Another major and particularly demanding application is animal marking tags made of Desmopan®.

Desmopan® also demonstrates its durability in hoof boots for horses.

Highly abrasion-resistant rollers

Hoof boot for racehorses

Flexible bollards

Desmopan® is constantly revealing surprising new talents – talents that are opening up more and more applications in the construction of machinery and apparatus, especially with new technologies.

Agriculture. Industry. Mechanical engineering.

Abrasion-resistant handles

New trend – new material properties, new opportunities

Wear-resistant holders

Easy-to-grip soft-touch surfaces

Wear-resistant, tactile floor markings

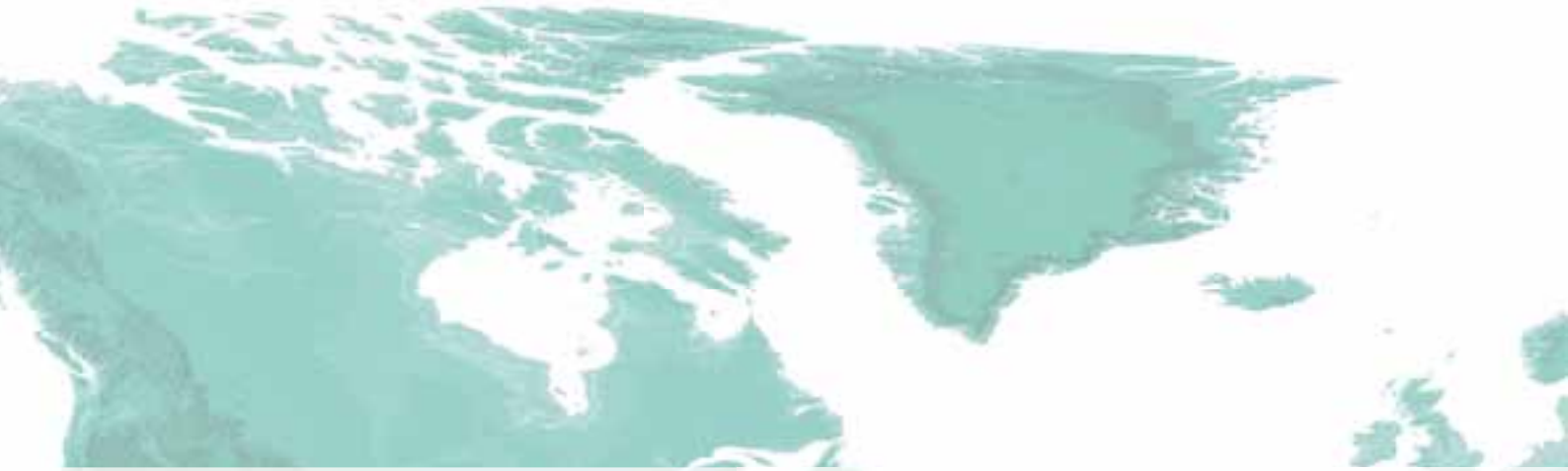
Soft, yet free of plasticizers

Many plastic grips and handles for machines, devices and even furniture are overmolded with Desmopan® in hard/soft technology to achieve a soft-touch surface with good grip.

We offer soft Desmopan® grades that have hardnesses of only 60 – 80 Shore A and are also free of plasticizers. These TPU grades are thus an attractive alternative to other thermoplastic elastomers of comparable hardness.

Possible applications include spring elements, integral hinges, molded-in sealing lips, impact strips and bellows. The grades are also suitable for overmolding plastic grips and handles. They also adhere well to many engineering thermoplastics.

With customized service packages from the idea to the product, we help you to reduce your time-to-market.

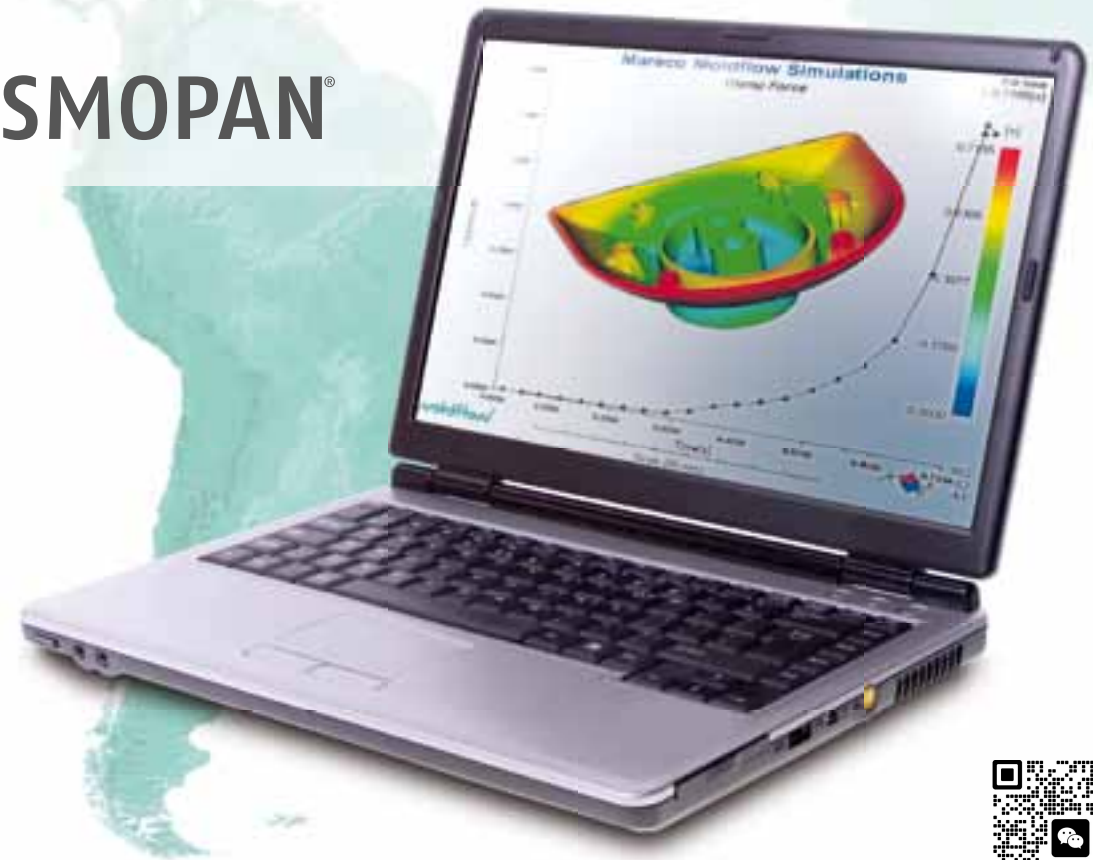


All-around service to make products successful quickly

Our primary objective is to cooperate closely with you to fully exploit the potential of Desmopan®. We are not afraid to break new ground and take risks. In fact, we have consolidated our market reputation as an innovation-driven company by doing precisely that. We want you to be successful. That is why we have put together five service modules for you:

- ***Customer advice***
- ***Research and development***
- ***Technical service laboratory***
- ***Testing technology***
- ***Internet TechCenter***

BAYER DESMOPAN®



Service

Customer advice – personalized and market-oriented

Our colleagues from Marketing and Business Development accompany you from the initial idea for an application to the start of production, and will take your individual requirements into account. They know their way around your markets. They can advise you on the choice of materials, provide material data, help with the design of a component and make suggestions on part and mold design.

You can also access our know-how in condensed form. We do more than just present new technologies and materials to you. We want to work directly with you to conceive actual projects.

The TechCenter – information at the click of a mouse

By visiting our website, you can view or download a wide range of informative material, from product and material safety data sheets and the explanation of key properties from an applications perspective to a detailed presentation of processing techniques and their special features for the processing of TPU.

The TechCenter also includes an archive of the quarterly electronic newsletter that is also available to you.

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