BASF
We create chemistry

Elastollan® Thermoplastic Polyurethane Elastomers (TPU)

Film applications

Elastollan®

Elastollan® is the brand name for thermoplastic polyurethane (TPU) from BASF. It stands for maximum reliability, consistent product quality and cost efficiency. Elastollan® can be extruded into hoses, cable sheathing, belts, films and profiles, and can also be processed using blow molding and injection molding technologies. Over the last few decades, the numerous benefits of Elastollan® in all its forms – aromatic or aliphatic, very soft or glass fiber-reinforced, flame retardant or highly transparent – have been clearly demonstrated across every sector of industry.

This extensive product portfolio, which makes use of a variety of raw materials and formulations, is the starting point for successfully bringing innovation to customers.

We thrive on creative ideas and complex challenges – come and talk to us!

Films and Extrusion Coatings

Flexible films made from Elastollan® not only look appealing, they also protect, seal and provide adhesion. Elastollan® has such a versatile set of properties that it has numerous possible applications in sectors such as the automotive industry, construction, textile and medical.

Membranes
In textile membranes and medical membranes, Elastollan® offers high water-vapor permeability whilst still being wind- and waterproof, combined with good elasticity.

Roof linings
Elastollan® roof linings are characterized by their excellent mechanics, aging resistance and high water-vapor permeability. In practice, roof linings manufactured from Elastollan® are not only more durable, they show above-average tear strength and penetration resistance as well as good adhesiveness of the individual sheets under lathing and tiles.

Special Morphology
Even without the use of additional additives, the unique morphology of Elastollan® grades SP 806 and SP 883 produces a matte, non-blocking film surface. It is characterized by a low surface tension and very good adhesion to the substrate. The surface is particularly skin-friendly, which is vital for medical applications among others.

Thermal lamination
When it comes to good adhesion to all kinds of substrates, including films, sheets or indeed PU foam systems, Elastollan® is the material of choice. Our Elastollan® product portfolio will have the right melting temperature profile, elasticities and resistances for your application and laminate.

Films for flexible chamber systems
Applications which make use of flexible chamber systems demand materials which combine high tensile strength with elasticity and which are also easily weldable. The weld seams of lumbar supports must stay absolutely tight for years in spite of constant mechanical stress.

Color-fast film applications
Alongside typical TPU characteristics like elasticity and high mechanical resilience, Elastollan® grades that are based on aliphatic raw materials offer lasting color-fastness and excellent transparency. Known applications are glazing, surface protection in the automotive and electronics sectors and graphic films.

Innovative and particularly long-lasting: When used for a wear layer on heavily used flooring, Elastollan®'s strengths are evident in walking comfort, excellent damping properties and pleasant surface feel.

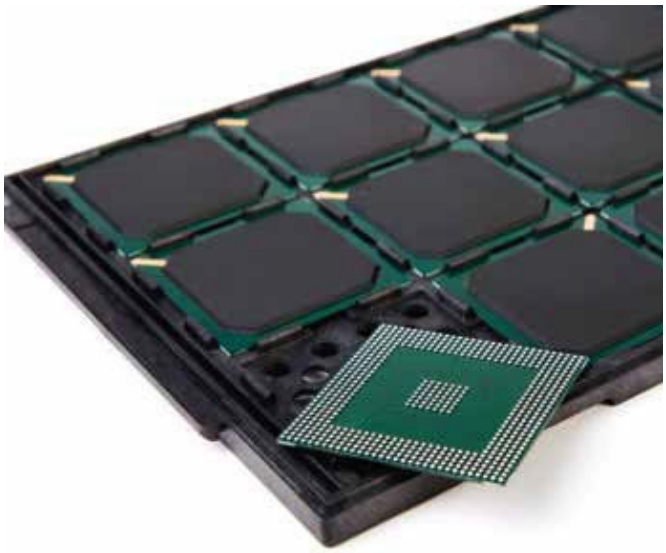
Photo: Fritz Egger GmbH & Co. KG

Properties
- Abrasion-resistant
- Flexible from -40 to +125 °C
- Resistant to cuts and tear propagation
- Resistant to microbes (polyether grades)
- Hydrolysis-resistant
- Resistant to oil and grease
- Resistant to ozone and high-energy radiation
- Highly elastic and extensible

Typical applications
- Protective film for mattresses
- Packaging films
- Ski and snowboard films
- Cushions for shoe inserts
- Breathable weatherproofing membranes for functional clothing
- Skinning acoustic PU damping parts in the automotive industry
- Roof linings
- Plaster films
- Emblems
- Seals

Special Elastollan® grades are also
- Adapted to matte surfaces
- Non-halogen-based flame retardant
- Adherent to reaction foams and laminating adhesives
- Suitable for deep drawing and thermoforming
- Scratch-resistant
- Suitable for welding and thermal laminating
- Color-fast
- Highly transparent
- Water-vapor permeable

Sheet extrusion / multilayer systems
A critical factor when it comes to combining typical thermoplastic sheet materials like ABS with Elastollan® is that they respond well to processing using co-extrusion techniques, as we demonstrating good layer adhesion. Elastollan® scores points for excellent surface mechanics, wear resistance and surface feel. Damping characteristics and abrasion resistance are critical for deep-drawable transport systems for high-grade, sensitive components. When it comes to trim parts for vehicle interiors or trucks, colorfastness and mattness are important factors in choosing the right materials.



Co-extruded surface films for transport packaging

Flame retardant films
Films made from halogen-free flame retardant Elastollan® are the innovative choice for heavily used floors in the transport and aviation sectors as well as commercial construction. It is both comfortable to walk on and has excellent wear resistance whilst having a low grammage.

Even decorative textiles such as e.g. roller blinds and flexible partitions can be equipped with flame retardant film laminates.

Elastollan®-based wear layer for floors, especially in trains and airplanes

Ski films
Icy pistes, damp and biting cold have nothing on cap films made from Elastollan®, thanks to its excellent scratch resistance, hydrolysis resistance and flexibility at low temperatures. High-grade decorative features are afforded the best possible protection by the transparent, UV-protected, reverse-printed surface film.

Transparent Elastollan® ski surface films

Masterbatches / Additives

BASF offers an extensive range of color masterbatches and additives which can be used as agents for processing and demolding, as cross-linking agents or for coloring the base polymer, for example.

Color	Corresponds to RAL	Conc
Yellow	1021/1018	133F
	1012	138
	1021	139
		V 2856
Orange	2004	201 F
	2003	202 F/1
Red	3000	315 F
		2941
Dark blue	5015	530/1
	5015	530/4
Light blue	5000	2939
		2947
	5003	2948
	5015	2949
Green	6028	602/1
	6001	618/1
	1805050	2945
Gray	7000	704
	7032	718
	7046	725
		2946
Black	9005	917/3
	9005	917/4
White	9010	955

Fig. 7: Extract from the Elastollan® portfolio of color masterbatches and additives

Demolding agents:

- Conc 950/1 – suitable for polyether- and polyester-based Elastollan® grades
- Conc 978 – suitable for polyether- and polyester-based Elastollan® grades, especially for low-viscosity grades
- Conc V 2871 – suitable for polyether- and polyester-based Elastollan® grades especially for low-viscosity grades
- Conc 2907 – suitable for polyether- and polyester-based Elastollan® grades with improved sliding friction properties (extrusion)
- Conc 2913 – suitable for polyether-based Elastollan® grades with reduced blooming behavior

Cross-linker concentrates for improving rebound and temperature resistance:

- X-Flex 2905 – bi-functional cross-linker
- X-Flex 2909 – bi- and tri-functional cross-linker

Abrasion enhancers:

- Conc V 2881/1 – especially for expanded Elastollan®
- Conc V 2821 – for improved sliding friction and reduced abrasion

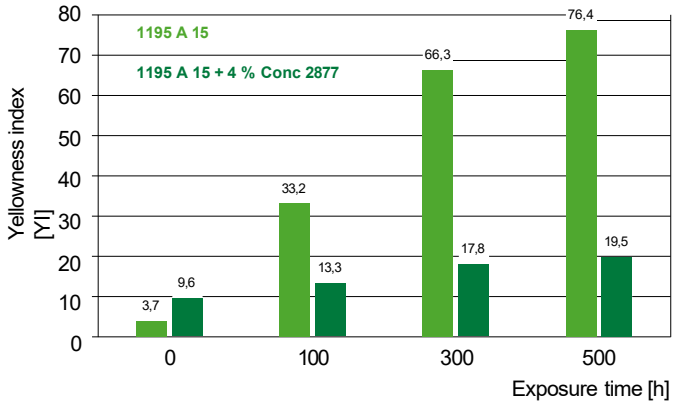
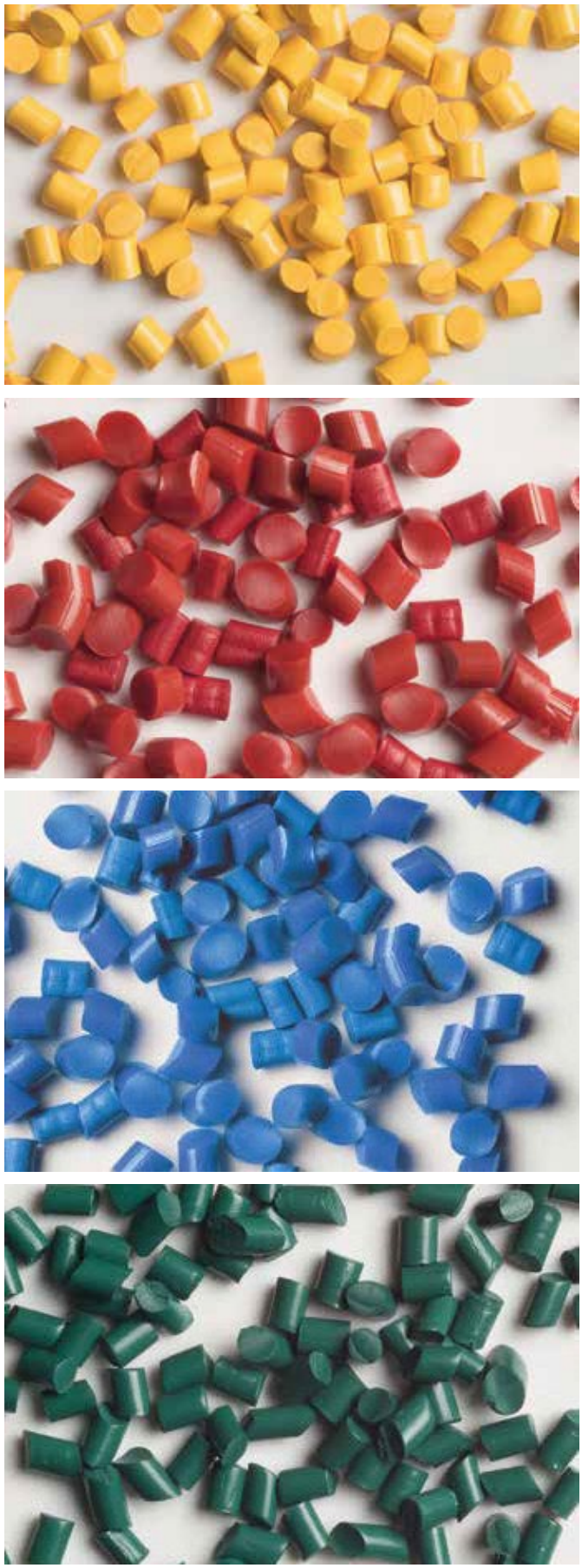


Fig. 8: Influence of Conc 2877 on the yellowness index, depending on the exposure time



UV-stabilizers:

- Conc 2876 – for polyester-based Elastollan® grades
- Conc 2877 – for polyether-based Elastollan® grades

Laser marking:

- Conc V 2804 B – antimony-free additive
- Conc 2918 – based on encapsulated antimony with improved contrast properties

Blowing agents:

- Conc V 2893 – chemical blowing agent – suitable for use in combination with physical blowing agents
- Conc V 2894, Conc 2919 – physical blowing agents

Others:

- Conc 926 – matting agents for extrusion
- Conc V 2464 – X-ray contrast agents
- Conc V 2880 – optical brighteners for reducing yellowing
- Conc 2908, Conc 2925 – for lending anti-static properties

Grades

Various grades are available for film applications.

Elastollan Series	Unique Property	Product	Type	Hardness	Processing
600	Excellent transparency	690 A	Ester	90A	Cast extrusion
SPB	High transparency	SPB 85 A 13U	Ester	85A	Blown film
		SPB 95 A 13U	Ester	95A	Cast extrusion
1100	Excellent hydrolytic stability	1160 A 13	Ether	75A	Calendaring
		1180 A 10	Ether	80A	Cast extrusion
		1185 A 10	Ether	85A	Blown film, Cast extrusion
		1190 A 10	Ether	90A	Cast extrusion
		1195 A 10	Ether	95A	Cast extrusion
1300	Highly breathable	1385A12	Ether	85A	Solution cast
		1390A12	Ether	90A	Solution cast
SP	Elastic Non-woven sheet	SP 9579	Ester	80A	Melt blown
N	Bio-based	N 95 A	Ester	95A	Cast extrusion

Details are available at https://plastics-rubber.basf.com/global/en/performance_polymers/products/elastollan.html

Recycling

Protecting the environment and sustainable use of resources are laid down in BASF's corporate objectives.

Thermoplastic polyurethanes can usually be recycled in environmentally compatible ways
(ecology, product safety and cost efficiency factors have to be examined on a case by case basis):

1. Materials recycling
Waste TPU and TPU-molded parts are re-granulated for the purposes of recycling.
Max. 30 % milled reclaimed TPU can be added to original granulate.

2. Thermal recovery
Only a small proportion of thermoplastic polyurethanes cannot be introduced back into processing.
These TPUs are used in electricity generation, in modern waste incineration plants.

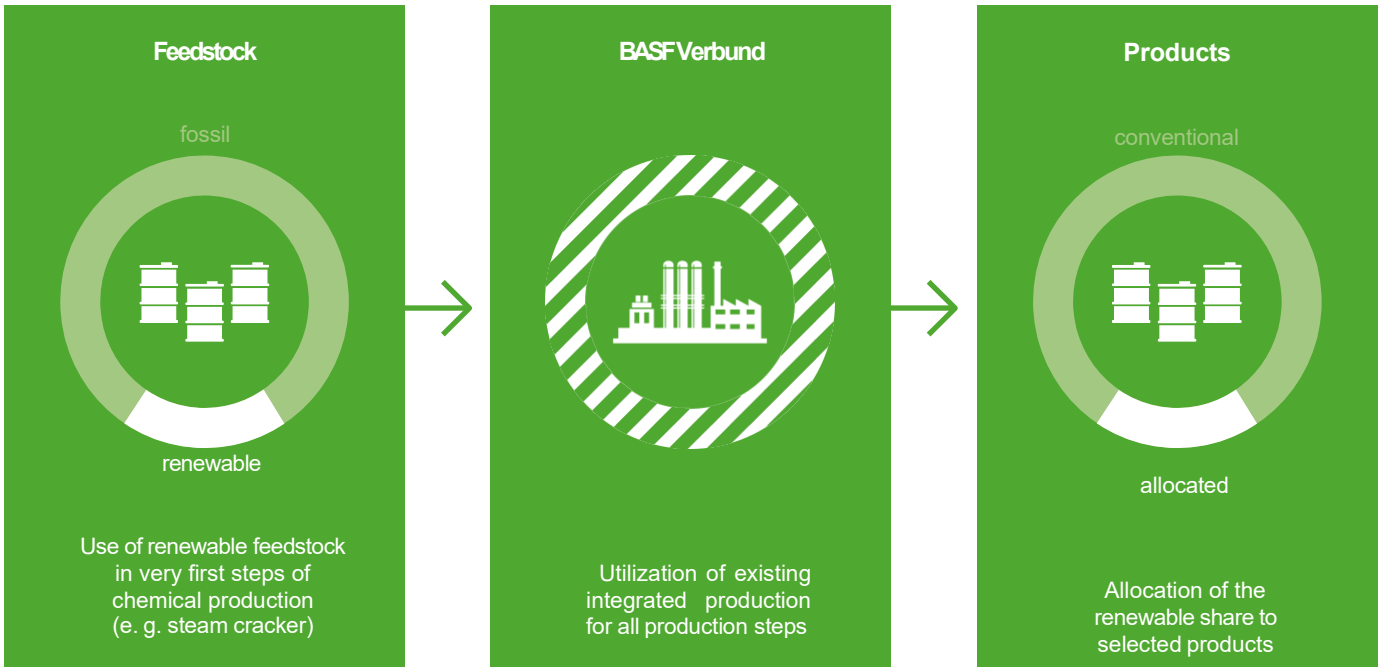
Biomass Balance

BASF's biomass balance approach contributes to the use of renewable raw materials in its integrated production system and can be applied to the majority of the products in its portfolio.

BASF developed the innovative "biomass balance method" together with TÜV SÜD, in which fossil resources in the current Production Verbund are replaced by renewable resources with sustainability certification. The formulation and quality of the corresponding end products remain unchanged. In this process, renewable raw materials are used as feedstock at the very beginning of production in the Verbund, and allocated to the respective sales products using the novel certification method. The certified products thus contribute to sustainable development by saving fossil resources and reducing greenhouse gas emissions.

Benefits of the biomass balance approach:

- Drives the use of renewable resources
- Fossil resource saving
- Reduced greenhouse gas emissions
- Independently certified
- Same product quality and properties
- Ready-made solution for our customers



Certification

BASF has established a closed chain of custody from the renewable feedstock it uses through to the final product. An independent certification confirms that BASF has replaced the required quantities of fossil feedstock for the sold biomass balanced product with renewable feedstock in the production site (www.tuev-sued.de/rr-id).

This certified approach is also valid for the Elastollan® product range of BASF. Please get in touch!

Disclaimer:

BASF makes no warranties, express or implied, concerning the suitability of Product for use in any medical device and pharmaceutical applications. BASF does not claim suitability of Product for any specific medical device or pharmaceutical applications including packaging of parenteral and ophthalmic products as well as inhalers and, therefore, the decision on the use of Product for a specific application is solely at your own risk. It is the responsibility of the medical device or pharmaceutical manufacturer to determine that the medical device or pharmaceutical application manufactured using the Product is safe, lawful and technically suitable for the intended use.

Provided an agreement can be reached which takes into account the circumstances of each individual case and a disclaimer is accepted by the customer BASF is prepared to supply plastics for individual medical applications within risk class II (with the exception of implants) including packaging of parenterala and ophthalmic products as well as inhalers.

Should a customer wish to use BASF plastics in applications within risk class III which are not implants, sale is possible only in very exceptional cases (not including commodities) at the special request of the customer. However, a detailed risk assessment has to be provided.

BASF does not supply its plastics for the manufacture of implants in any risk class.

Selected product literature:

- Elastollan® – Product Range
- Elastollan® – Material Properties
- Elastollan® – Processing Recommendations

Note
The data contained in this publication are based on our current knowledge and experience. In view of many factors that may affect processing and application of our product, these data do not relieve processors from carrying out their own investigations and tests; neither do these data imply any guarantee of certain properties, nor the suitability of the product for a specific purpose. Any descriptions, drawings, photographs, data, proportions, weights, etc. given herein may change without prior information and do not constitute the agreed contractual quality of the product. It is the responsibility of the recipient of our products to ensure that any proprietary rights and existing laws and legislation are observed.
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Further information on Elastollan®
can be found on the Internet:
www.elastollan.de

Please visit our websites:
www.plastics.basf.com
www.plastics.basf.de

Request of brochure:
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If you have technical questions of the products, please contact the Elastollan®-Infopoint:

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