

Combined strengths for customized cast elastomer solutions



Technical Details

Huntsman Polyurethanes, a global manufacturer of MDI, and Alberdingk Boley – a leading European supplier of water-based binders and 100% polyols – have teamed up to develop new concepts for two-component polyurethane cast elastomers.

This unique partnership provides customers with access to highly versatile elastomer solutions that can be engineered to achieve specific qualities for an array of industrial applications, depending on formulator needs.

Cast polyurethane elastomers are used in a variety of industries where items are manufactured from liquid raw materials that are processed and cured at room temperature. Chosen for their versatility and durability, cast elastomers typically consist of two-component systems, where the first element is – for example – a SUPRASEC® MDI variant, and the second is a polyol blend containing fillers, processing additives, a catalyst and other modifiers.

SUPRASEC®

The adaptability of Huntsman Polyurethanes' MDI technology makes it possible to embed specific properties in an elastomer, enabling it to meet many different end-use requirements.

In order to adjust the application viscosity, reactivity and other properties of the formulated elastomer system, custom pre-polymers can be tailor-made on request.

Isocyanate	Type	NCO-content (%)	Viscosity @ 25°C [mPa.s]	Average functionality
SUPRASEC® 5025	High functional	31	210	2,7
SUPRASEC® 2030	Mid functional	28,6	175	2,3
SUPRASEC® 2386	Low functional	30,2	40	2,09
SUPRASEC® 2020	Uretonimine-modified MDI	29,5	40	2,12
SUPRASEC® 2029	Prepolymer	24.5	500	2,12

ALBODUR®

Alberdingk Boley's ALBODUR® polymerization technology is equally flexible. It can aid the creation of special features that fulfil the needs of numerous industries that require elastomers, but also adhesive and coating systems. Custom made polyols can be developed by request. With an assortment of isocyanate and polyol blends available across respective Huntsman Polyurethanes and Alberdingk Boley portfolios, the elastomer options presented through this partnership are numerous.

To demonstrate the breadth of specific properties that can be achieved within a derived elastomer, details of several ALBODUR® polyols and SUPRASEC® isocyanates are listed below:

Polyol	Type	OH-Equivalent weight	OH Value [mg KOH / g]	Viscosity @ 25° C [mPas]
ALBODUR® 903	Low functional	432	130	600
ALBODUR® 921	Mid functional	258	218	600
ALBODUR® 941	High functional	176	319	500

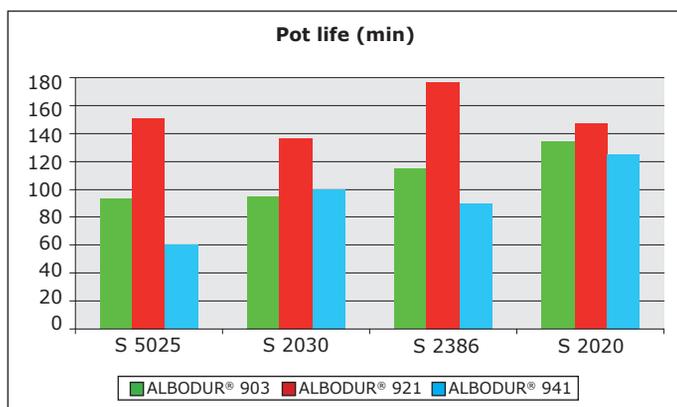


Fig 1: Pot life

General observations:

- Gel time > 60 minutes for all systems
- Water absorption < 1 % (one week immersed in water)

A combination of properties for two different isocyanates, used in conjunction with different polyols, is shown in Figures 2 and 3.

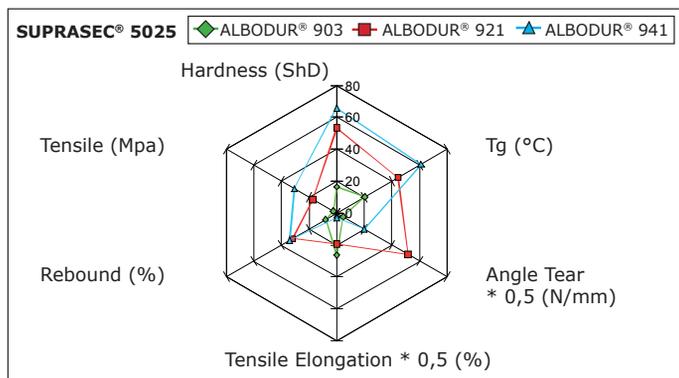


Fig 2: Physical properties of SUPRASEC® 5025

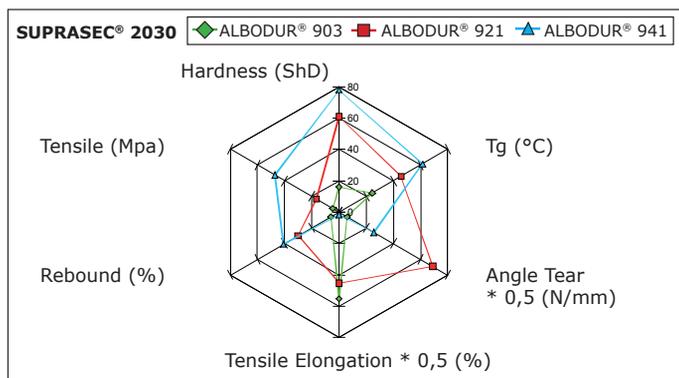


Fig 3: Physical properties of SUPRASEC® 2030



Alberdingk Boley GmbH is a leading German producer of water-based binders for coatings and finishes of all substrates. Originally established in 1828, Alberdingk Boley is the leading European supplier of castor oil and linseed oil as well as its derivatives. Thanks to their broad range of applications, water-based polyurethane and acrylate dispersions today form the basis of the company's product portfolio. Launched in 2005, the new generation of ALBODUR® 100% polyols,

based on renewable resources, successfully combines the company's vast background in oleochemicals with its state-of-the-art technologies for polymerization.

Based in Krefeld (Germany) and with facilities in Kerpen (Germany), Greensboro (USA) and Shenzhen (China), the independent, privately-owned company operates worldwide. In 2011, 300 employees generated a turnover of approx. € 190 M.

Worldwide network for unrivalled customer service

The combined expertise and global reach of Huntsman Polyurethanes and Alberdingk Boley is of significant benefit to polyurethanes customers and formulators around the world.

Disclaimer Alberdingk Boley GmbH:

The aforesaid information is based on our present state of knowledge and shall inform about our products and their application possibilities. It is not intended to assure certain characteristics of the products and their suitability for precise application fields. The advisory service does not exonerate you from an independent examination of our advices and products on your own with regard to their suitability for the methods and purposes intended. Downstream applications, use and processing of our products as well as of the products produced due to our application technology advices are carried out beyond our control possibilities and come therefore under your area of responsibility exclusively. Products including "VP" in their label are trial products during test stage. For these products Alberdingk Boley is only able to provide preliminary characteristics without obligation. Subject to change without prior notice. ALBODUR® is a registered trademark of Alberdingk Boley or an affiliate thereof in one or more, but not all, countries.

Different isocyanates were tested with ALBODUR® 903

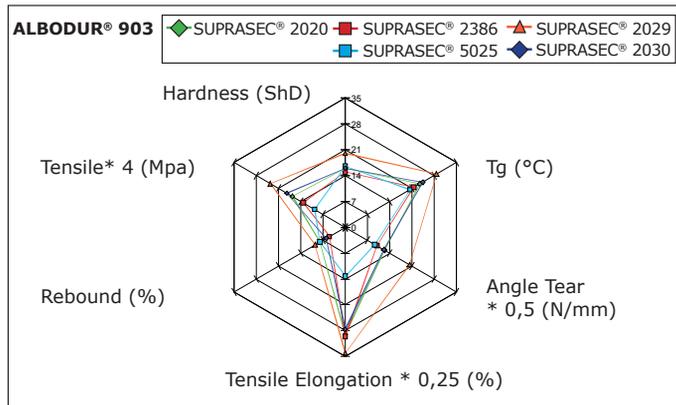


Fig 4: Physical properties of ALBODUR® 903 in combination with different isocyanates

Conclusion:

By selecting the correct combination of SUPRASEC® isocyanates and ALBODUR® polyols, formulators can improve specific physical / mechanical properties, creating a wider application window than is currently possible with solutions available to the existing cast elastomer market.

To support this decision-making process, Huntsman Polyurethanes and Alberdingk Boley work closely with their customers, providing practical, hands-on advice regarding formulation, processing and handling requirements, so the correct outcomes can be realized in elastomer development.



Enriching lives through innovation

Huntsman Polyurethanes is part of Huntsman, a global manufacturer and marketer of differentiated chemicals. Huntsman's operating companies manufacture products for a variety of global industries, including chemicals, plastics, automotive, aviation, textiles, footwear, paints and coatings, construction, technology, agriculture, health care, detergent, personal care, furniture, appliances and

packaging. Originally known for pioneering innovations in packaging and, later, for rapid and integrated growth in petrochemicals, Huntsman has approximately 12,000 employees and operates from multiple locations worldwide. The Company had 2011 revenues of over \$11 billion. For more information about Huntsman, please visit the company's website at: www.huntsman.com.

Alberdingk Boley contact details:

ALBODUR® range: albodur@alberdingk-boley.de
More information about Alberdingk Boley and the complete product range can also be found on the company's website at: www.alberdingk-boley.de

For more information about Huntsman Polyurethanes please contact: ACE@huntsman.com or go to: www.huntsman.com

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