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## High-Performance Raw Materials for Wood Coatings

**Bayhydrol® Bayhydur® Desmodur® Desmophen®**



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Bayhydrol® Bayhydur® Desmodur® Desmophen®



## Covestro – leading in material solutions

As the world's leading manufacturer of aliphatic and aromatic polyisocyanates, Covestro offers an extensive range of innovative products and solutions for the coatings and adhesives industries. As your customers become more demanding in their expectations for the quality, durability, workability and sustainability of your products, we can help you to turn these challenges into a competitive advantage. That is what drives us to push the boundaries of what is possible.

The key to creating added value for you, our customers, as well as for society and the environment is innovation. At Covestro, we innovate not only to address the key global challenges of population growth, urbanization, climate change, digitalization and increasing mobility; we innovate to have a sustainable business that enables us to live up to our business purpose of "making the world a brighter place." In the final analysis, this comes down to developing sustainable solutions that take the entire life cycle of a product into account. We are increasing our on-site efficiency, e.g., by recycling salt and water in our production plants. We are expanding our resource base, e.g., by turning CO<sub>2</sub> into a raw material in the manufacturing of plastics. And we are developing materials that are more energy-efficient and save natural resources.

In our Coatings, Adhesives, Specialties (CAS) segment, we systematically develop and supply aliphatic and aromatic isocyanates and their derivatives as well as polyurethane dispersions. Our raw materials are used for coatings, adhesives, sealants and specialty products, such as elastomers, high-quality films, 3D printing products, cosmetics, textiles and medical products. The main application areas are in the automotive, transportation, infrastructure, construction, wood processing and furniture industries. In this segment our innovative efforts are focusing on enhancing efficiency, improving quality, boosting sustainability and environmental aspects such as reducing solvent content.

We are proud of over 80 years of groundbreaking innovations. But we are not defined by our past. Even with decades of experience behind us, Covestro remains a young enterprise. In a corporate world that can often be dull and uninspiring, we want to act in a curious, courageous, and colorful way: trying out new things, questioning established ways, and pushing boundaries – for your benefit.





# Protecting and enhancing the beauty of wood

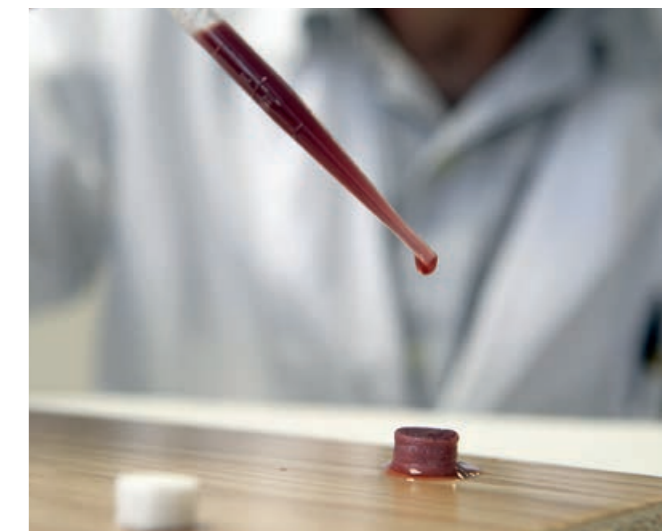
Everyone needs to live, eat and store clothes, cutlery, books, toys and numerous other things. Although these needs have remained more or less unchanged for centuries, the style and size of tables, shelves, cabinets and other pieces of furniture have changed very much. In the past, solid wood was the only material used for manufacturing furniture. Nowadays, we use a variety of wood-based materials or composites in combination with glass, plastic, ceramic or metal. The need to protect the surface of furniture depends on the type of substrate used and the usage patterns. Traditionally, solid wood and veneered furniture have been the substrates that convey haptic comfort, coziness, and a natural look and feel. If you look around, you will find more wooden substrates, such as the flooring that gives you a solid surface to walk and play on, or your door, a visiting card to any home. These wooden substrates need to be protected against chemical influences such as hand creams or scratches caused by keys or children's toys.

Covestro helps to bring the warmth of pure wood and the colorful beauty of wood-based parts into the homes of end consumers. We are constantly in dialogue with the industry players to determine

specific industry needs and develop solutions that help manufacturers to produce high-quality products – today and tomorrow.

In view of current changes in market trends, regulations and VOC in general, we are developing resins, hardeners and dispersions to be used as the basis for high-performance coatings for our coating customers. We provide answers to the issues of indoor air quality, self-cleaning and -healing surfaces as well as high chemical and mechanical resistance. After all, we have solutions for wood-based products that give you the soft and natural touch of natural wood and also the required protection against stains and abrasion.

Whether one-component, two-component or UV-curing, our waterborne polyurethane coating raw materials provide suitable answers to your coating formulation requirements. In line with our mission "to make the world a brighter place," we are constantly improving our products to enable you to formulate polyurethane-based coatings that fulfill the highest performance demands and current or upcoming environmental standards in this industry.



## Today's top trends in surface protection

- **Consumer health awareness:** A growing sense of health consciousness is driving the trend towards waterborne solutions for wood coatings. This trend is also a direct response to the increasing demand for a more responsible use of our planet's limited resources and increasing environmental awareness. Waterborne wood coatings are less harmful to the environment and human health than solvent-borne products.
- **Sustainability/longevity:** The growing demand for surfaces that are durable and look good for longer – triggered not least by the sharing economy – as well as higher-than-ever consumer expectations are influencing present-day and future surface technologies.
- **Bio-based raw materials:** Renewable raw materials are becoming an increasingly important factor in the responsible use of natural resources and reduction of greenhouse gas emissions.
- **Natural, honest materials:** In our increasingly fast-moving, volatile and uncertain world, the desire for a sense of comfort, homeliness and well-being is greater than ever. Natural look-and-feel surfaces and substrates seek to satisfy such desires.
- **Automation:** As globalization heightens the cost pressures on furniture manufacturers or joinery firms in Europe, they are increasingly seeing automation ("Industry 4.0") as the solution to this challenge.

## Helping you meet market demands

At Covestro, we help to bring the warmth of pure wood and the colorful beauty of wooden structures and components into domestic and work environments. We regularly talk to key industry players to determine your specific needs and develop solutions that help manufacturers to produce high-quality wood products. In response to today's trends we are developing resins, hardeners and dispersions to be used as a basis for high-performance coatings. We are providing answers to the issues of indoor air quality, easy-to-clean and self-healing surfaces as well as high chemical and mechanical resistance. We engage with our partners to find solutions for your day-to-day operations, and by applying our own insight and foresight methods, we can also help you get fit for the future.



We strive to offer a variety of solutions with the aim of reaching perfection. We achieve this through the ongoing work of our specialist teams, driven by the desire to continually improve our products and services. This involves a constant search for new solutions, each one more economical, more environmentally friendly, and more advanced than preceding products. This is the path we have taken, and the challenge that inspires us. Today and tomorrow.

## Building blocks for sustainable performance and process efficiency

### Solutions to enhance your process efficiency

Nowadays, the quality demands made on industrial processes are very high. This is equally true of the cost-cutting requirements. However, both goals can be achieved by increasing process efficiency. At Covestro, we have a wide range of solutions designed to enhance your process efficiency. Why not take advantage of our know-how? These solutions will benefit your bottom line.

### Sustainability

Sustainability is at the heart of the Covestro strategy. We inspire innovation and drive growth through profitable products and technologies that benefit society and reduce the impact on the environment.

Our coatings, adhesives and specialty products and solutions contribute to sustainability through:

- **Saving energy – fast and smart**

Polyurethane systems represent a benchmark in productivity and process efficiency in many industries. We strive to further push the limits of efficiency by developing game-changing new solutions.

- **Reducing waste**

We offer solutions such as innovative 1K technologies that enable our value chain partners to use materials more efficiently and reduce waste.

- **Cutting emissions**

Bayhydur® and Desmodur® grades are key enablers for low-emission solutions in the coatings and adhesives industries – waterborne and high solids/100% solids!

- **Responsible management of natural resources**

Highly durable PU-based coatings and adhesives significantly extend the lifetime of a coated product and thus help to prolong resource use.

- **Closing the loop (circularity)**

Through economically viable products made from bio-based raw materials – with no deterioration in performance – we help our customers and value chain partners to reduce their carbon footprint and offer solutions that incorporate renewable building blocks.

### Waterborne PU systems for demanding surfaces

We have developed high-performance waterborne solutions for highly demanding coating applications. Our polyurethane (PU) building blocks offer superior performance in coating systems, e.g., robustness, good mixing ability between resin and hardener, high mechanical, chemical and scratch resistance, very good film formation, and fast blocking. Besides naturally fulfilling all indoor emission and low-odor requirements for manufactured furniture, joinery or parquet flooring, our low-VOC waterborne PU building blocks help you and your customers achieve your sustainability targets.

### What we do

As a world-leading polymer and material science company, we inspire innovation and drive growth through profitable products and technologies that benefit society and reduce the impact on the environment.

### Who does all this?

It's our people! And the way we work together as one global team following a set of six elementary principles – value creation, sustainability, innovation, focus on people, safety and fair play. This is our formula for success.







#### Quality & supply security

Our products are of outstanding quality and we offer supply security – worldwide.

Covestro, the world's leading manufacturer of aliphatic and aromatic polyisocyanates, offers an extensive range of raw materials and services for the coatings and adhesives industries. This allows the very latest technology to be used extremely effectively for a variety of applications.

Our global setup enables you to increase your competitive advantage.

#### What we offer:

- A global network of research & development centers where our staff are dedicated to offering solutions for the coatings and adhesives industries.
- A unique setup and worldwide network of state-of-the-art production sites ensuring short lead times and supply chain flexibility.
- Outstanding product quality through fulfilling the requirements of state-of-the-art quality, environmental and safety (HSEQ) as well as energy management standards; we are proud of having enjoyed ISO 9001, ISO 14001, ISO 18001 and ISO 50001 certifications for many years.

Covestro is your reliable partner for polyurethane chemistry.



# Market- and customer-oriented – for your benefit

Our wide range of products is the outcome of our ongoing efforts to develop raw materials that meet the needs of the market. We offer a variety of customized raw materials and building blocks for the formulation of your wood coatings – all tried-and-tested solutions for a wide variety of wood coating applications. As a system supplier we are also well equipped to develop raw material packages in which our products are tailored to create the strongest possible package solution. This saves you time, money and a great deal of trial and error. As our range of products is one of the broadest and largest on the market, we are able to offer constructive solutions and highly effective support.

## **A global partnership**

If you operate on an international basis, you can expect the same from your business partners. We are one of the world's leading suppliers of raw materials for wood and furniture coatings. Our experienced team provides technical backup all over the world, and our specialist laboratories support our customers in all the key furniture manufacturing centers of Europe, North America, Japan and China. Most of our products are registered in chemical inventories and therefore ready for sale in the most important markets. Moreover, we have agencies in more than 100 countries.

## **Closer to the customer**

At Covestro, we do our utmost to be as innovative as possible – so you enjoy the best possible solutions and service. It is an obligation we feel as result of our century of expertise and experience in this field. What our customers and the furniture industry in general demand defines the focus of our development efforts, e.g., in new technologies, time-saving application and cost-effectiveness. We supply products for water- and solvent-borne technologies that serve application methods such as spraying, roller or curtain coating and brushing. Our aim is always to develop raw materials that improve the performance of your products, reduce your process costs by optimizing curing processes, deliver excellent mechanical and chemical resistance, and thus increase the durability of your customers' end products. Our waterborne and waterborne UV-curing raw material portfolio is capable of solving any formulation problem – now and in the future.

Our short processes save you time, increase productivity and help you to meet your targets in terms of sustainable and environment-friendly processes and products. Ultimately, it is your customers who will be grateful.





# Innovations for quality and the environment

Our research scientists have always worked to develop new products and processes that meet market needs. Our Bayhydrol®, Bayhydrol® UV and Bayhydur® product ranges are impressive examples of the innovations achieved over the last two decades. But not wanting to rest on our laurels, we are constantly reviewing and improving both our products and processes. We have implemented a DIN EN ISO 9001 quality system and all our European facilities have been certified to this standard. This enables us to supply our customers with consistent high quality; after all, your satisfaction with our products and processes is our measure of success. Ensuring the environmental compatibility of our products is

another key task for our research scientists. For example, a key contribution to the development of environmentally friendly coatings was made with our water-thinnable Bayhydrol® and Bayhydur® products for air-drying, force-drying and radiation-curing coatings. Moreover, our orientation to the needs of the market drives us to find solutions to other problems, such as reducing emissions or disposing of waste in an environmentally sound manner.

Over the past century, Covestro has set many global milestones in the development of raw materials for wood coatings:

- 1905** Cellit: A raw material for low-flammable coatings
- 1943** Desmodur®: The first use of aromatic polyisocyanates as curing agents in coatings
- 1960** Desmodur® N: Another step forward in the development of polyurethane coatings
- 1965** Desmodur® HL: An aromatic/aliphatic polyisocyanurate (TDI/HDI)
- 1966** Desmodur® IL: A TDI-based polyisocyanurate
- 1981** Desmophen® A 450: The first fast-drying polyacrylate
- 1987** Bayhydrol®: A water-thinnable binder
- 1994** Bayhydur® and Bayhydrol®: Ideal for aqueous two-pack polyurethane coatings
- 1997** Bayhydrol® UV: UV-curable polyurethane dispersions
- 2002** Bayhydur®: A new generation of hydrophilic polyisocyanates with excellent chemical resistance
- 2005** Bayhydrol®: Solvent-free PU and PU-PAC dispersions
- 2008** Bayhydrol® U: A solvent-free, OH-bearing PU dispersion for 2K waterborne systems
- 2015** Desmodur® eco N: The first bio-based polyurethane hardener with 70% renewable content
- 2017** Bayhydur® eco: The first bio-based waterborne polyurethane hardener with 61% renewable content

## Meeting your specific needs

Our market-leading position is based, not least, on a regular exchange of expertise and experience with our partners in the coatings industry. This ongoing dialogue with our customers enables us to continually pick up ideas for developing new or improved products. And we have a completely open mind with regard your challenges and the

specific industry needs. In that respect, our Coatings Application & Development experts will be pleased to be of assistance anywhere in the world. Simply contact our technical staff and they will invest all their creativity to develop the suitable solutions and test them under near-service conditions.





# Our technologies and products – your competitive advantage

There are many good reasons why polyurethane building blocks are an ideal solution for wood coatings: their high quality, ability to enhance the natural properties of wood, resistance to solvents and chemicals, toughness and flexibility, to mention just a few. These building blocks enable the formulation of both clear coats and pigmented systems, which yield high-gloss, high-bodied films with excellent flow properties and outstanding mechanical properties, for example. Another reason for the popularity of polyurethane coatings is their highly variable property profile. Our polyurethane coating systems can be tailored for a specific application by varying the molecular structure of the soft segments, the distribution and length of the hard segments, or the molecular weight and degree of chain branching. The many decades of expertise and experience we have gained as the inventors of polyurethane chemistry enable us to deliver the customized solutions you need through the selection of the most suitable polyisocyanate and polyol components:

- 1K and 2K solvent-borne systems based on highly branched polyols and crosslinkers
- Waterborne 1K and 2K polyurethane coatings consisting of aqueous dispersions, in many cases combined with a water-dispersible polyisocyanate
- Waterborne UV-curing polyurethane dispersions containing acrylic double bonds, which can additionally be crosslinked by radical polymerization to achieve high-quality coatings

## Form and function in furniture

The furniture in a home, office or garden, wood-based front doors and windows or terracing has an aesthetic significance that goes well beyond their mere functionality. The raw materials we develop for formulating wood coatings help to maintain the look and feel of wood-based furniture despite such potentially damaging chemical influences as hand creams or everyday scratches. In the case of wood-based front doors, garden furniture, terracing and other outdoor applications, the excellent mechanical properties and wide variety of application technologies polyurethane coatings offer are a key advantage.

## Perfection in parquet flooring

What have parquet flooring and PU-based coatings in common? They are both designed for a long life cycle, are very resistant and are superior to alternative solutions. Our raw materials developed for formulating industrial or site-applied coatings for parquet flooring help to protect the beautiful looks of a parquet floor. Whether 1K, 2K or UV-curing, our waterborne-based PU coating raw materials are the right answers to your coating formulation requirements. Besides, we are constantly working to improve our products to enable you to formulate PU-based coatings that fulfill the highest performance and environmental standards in the industry.

## Protective coatings for joinery products

The polyurethane-based raw materials we develop for the formulation of protective coatings for joinery products help to protect front doors and other highly visible wood-based products against a wide variety of harmful chemical influences.



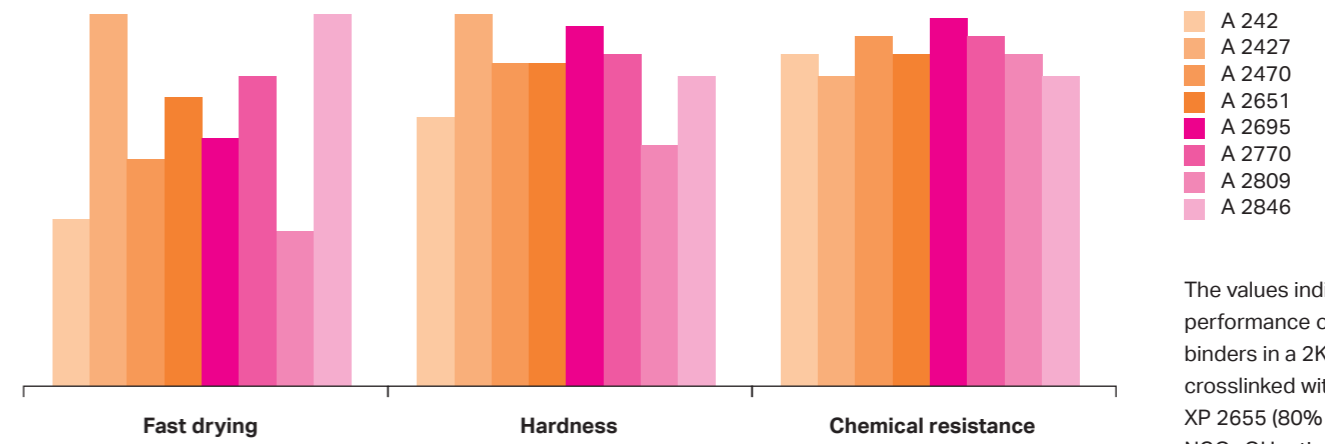


**Bayhydrol® A:**

# Aqueous acrylic polyol dispersions for waterborne 2K PUR systems

Our Bayhydrol® A dispersions are OH-group-containing resins tailor-made to be combined with our Bayhydur® range of water-dispersible polyisocyanates. The resulting waterborne 2K polyurethane coatings combine extremely

high chemical and mechanical resistance with versatile use and application. Possible applications include clear and pigmented furniture coatings, interior and exterior joinery, and hardwood floor coatings.



The values indicate the performance of these binders in a 2K formulation crosslinked with Bayhydur® XP 2655 (80% in MPA); NCO : OH ratio 1.5.

	SOLID CONTENT [%]		OH CONTENT [% ON SOLID CONTENT]		VISC. AT 23°C APPROX. [mPa · s]	PROPERTIES AND APPLICATION	PARQUET		
		CO-SOLVENT [%]					FURNITURE		EXTERIOR
<b>Bayhydrol® A 242</b>	42	0	4.0	200	Topcoats and stain-blocking primers.	●		○	
<b>Bayhydrol® A 2427</b>	42	0	2.0	80	Very fast drying/curing, especially suitable for pigmented coatings.	●			
<b>Bayhydrol® A 2470</b>	45	8.0% SN/PnB	3.9	2,000	Hard and flexible, excellent solvent resistance.	●			
<b>Bayhydrol® A 2651</b>	41	3.4% PnB	3.0	100	Good overall properties, good wetting, fast drying/curing.	●	○	○	
<b>Bayhydrol® A 2695</b>	41	7.2% PnB	5.0	2,500	Hard and flexible, highest chemical resistance.	●			
<b>Bayhydrol® A 2770</b>	45	3.6% PnB	3.9	1,000	Low-VOC version of Bayhydrol® A 2470, faster drying.	●			
<b>Bayhydrol® A 2809</b>	48	2.0% PnB	3.3	2,000	High body build-up.	●			
<b>Bayhydrol® A 2846</b>	40	0	1.5	50	Self-x-linking PAC for 1K and 2K application.	●	○	○	

● = recommended  
○ = suitable

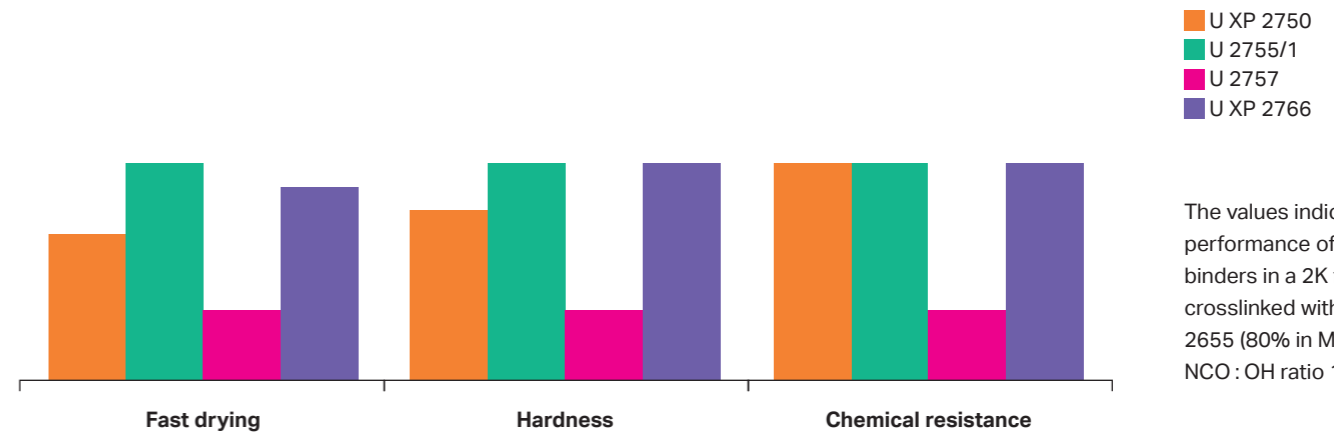


**Bayhydrol® U:**

# Aqueous polyurethane polyol dispersions

Our new generation of solvent-free OH-functional polyurethane dispersions is further improving the performance of waterborne environmentally friendly 2K polyurethane coatings. Coating films made with the new Bayhydrol® U dispersions display a wide spectrum of properties, ranging

from hard through to flexible or even a pleasant velvety soft feel, and thus provide a toolbox for the formulation of almost every specific coating. Final coatings with very low VOC content are possible, depending on the Bayhydrol® grade chosen and application requirements.



The values indicate the performance of these binders in a 2K formulation crosslinked with Bayhydrol® 2655 (80% in MPA); NCO : OH ratio 1.5.

	SOLID CONTENT [%]	CO-SOLVENT CONTENT [%]	OH CONTENT [% ON SOLID CONTENT]	VISC. AT 23°C APPROX. [mPa · s]	PROPERTIES AND APPLICATION	PARQUET	
						FURNITURE	
<b>Bayhydrol® U XP 2750</b>	41	0	3.6	< 1,000	Excellent scratch and mark resistance, self-healing properties.	●	
<b>Bayhydrol® U 2755/1</b>	35	0	3.0	< 1,000	Very fast drying, high hardness and chemical resistance, excellent appearance on wood.	●	●
<b>Bayhydrol® U 2757</b>	52	0	1.8	< 1,500	Very elastic, especially recommended to achieve natural and soft-feel effects on wood.	●	●
<b>Bayhydrol® U XP 2766</b>	37	0	4.0	< 1,000	Very high gloss, especially in pigmented coatings, fast drying.	●	○

● = recommended  
○ = suitable





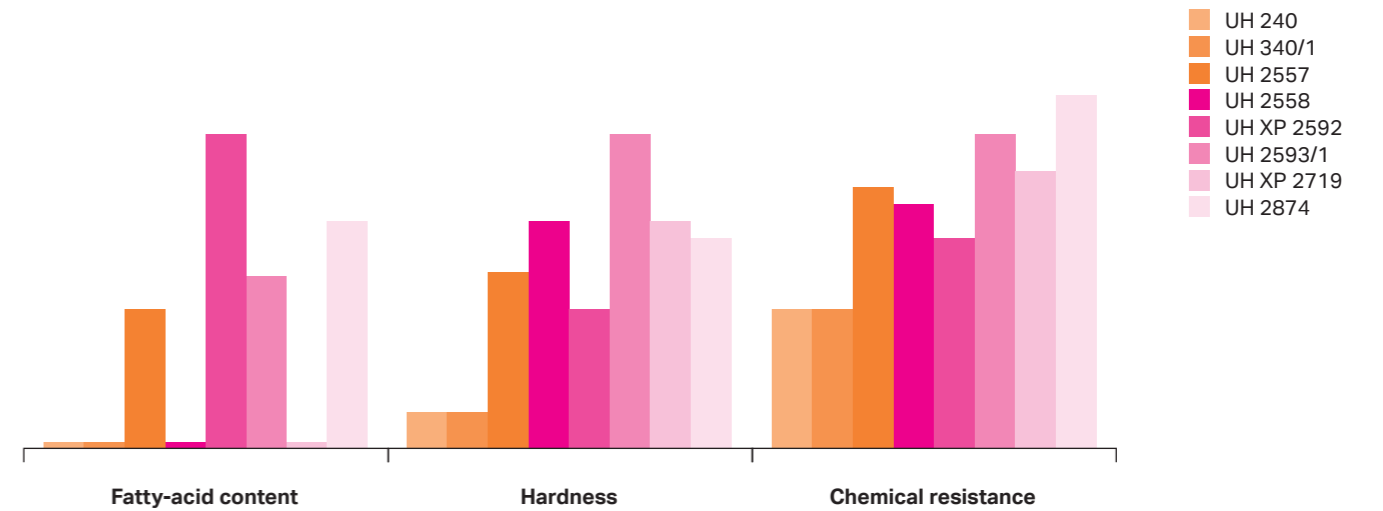
**Bayhydrol® UH:**

# Aqueous high molecular weight polyurethane dispersions

Polyurethane dispersions have been in use for years and they are nowadays one of the leading technologies for parquet coatings. The clear advantages include outstanding mechanical properties, mild odor, ease of application and rapid curing.

The choice of the right Bayhydrol® UH grade allows the formulation of coatings with the necessary hardness, elasticity, abrasion resistance, black heel mark resistance and chemical resistance.

Introducing fatty acids into the chain increases the crosslinking, resulting in greater chemical and black heel mark resistance. Film properties can be enhanced by adding a polyisocyanate to produce a high-quality 2K coating. We offer these hydrophilic polyisocyanates under the brand name Bayhydur®.



TYPE	CO-SOLVENT CONTENT [%]	SOLID CONTENT [%]	VISC. AT 23°C APPROX. [mPa · s]	MFFT [°C]	PROPERTIES AND APPLICATION	APPLICATION			
						FURNITURE	PARQUET	EXTERIOR	
Bayhydrol® UH 240	Aliphatic PUD	40	0	75	0	Highly elastic, for flexibilization of hard PAC and PU dispersions.	●	●	
Bayhydrol® UH 340/1	Aliphatic PUD	40	0	50	0	Highly elastic, for flexibilization of hard PAC and PU dispersions.	●	●	
Bayhydrol® UH 2557	Fatty acid-modified aliphatic PUD	35	0	100	38	Good black heel mark resistance (BHMR), abrasion-resistant, flexible.	○	●	
Bayhydrol® UH 2558	Aliphatic PUD	37	0	100	24	Hard, abrasion-resistant; especially suitable for 2K.	○	●	
Bayhydrol® UH 2593/1	Fatty acid-modified aliphatic PUD	35	0	100	60	Good black heel mark resistance (BHMR), high hardness, strong drying.	●	●	
Bayhydrol® UH XP 2719	Aliphatic PUD	40	0	100	20	Fast blocking resistance development and high abrasion resistance.	●	●	
Bayhydrol® UH XP 2592	Aliphatic urethane-modified alkyd dispersion	45	0	300	< 20	Oxidatively drying, excellent weathering resistance on wood.			●
Bayhydrol® UH 2874	Fatty acid-modified aliphatic PUD	40	0	300	40	Excellent chemical resistance and black heel mark resistance (BHMR), strong physical drying.	●	●	

● = recommended  
○ = suitable

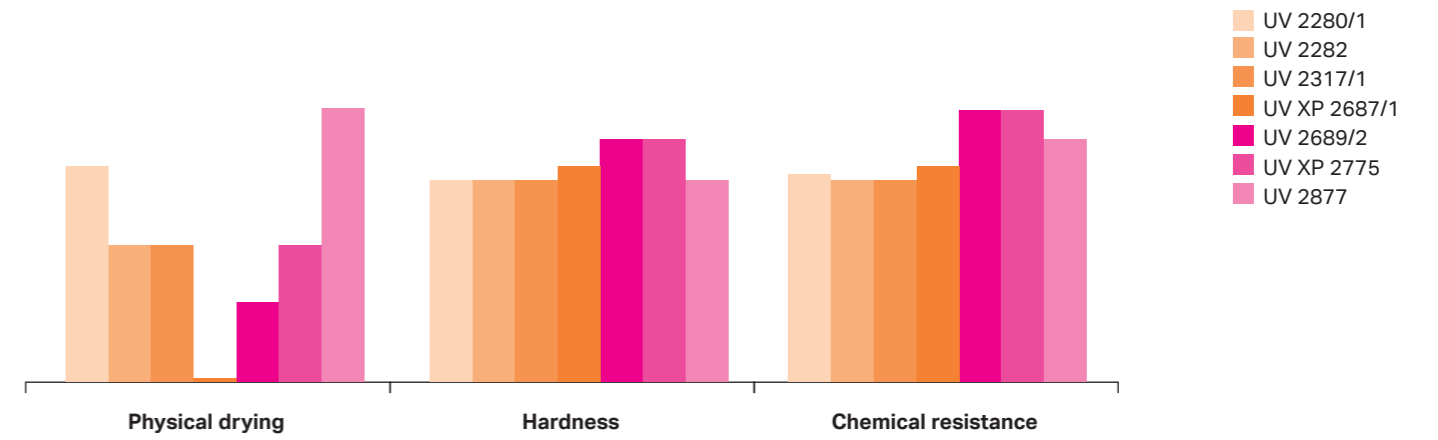


**Bayhydrol® UV:**

# Waterborne radiation curing resins

The most promising technology amongst the various environment-friendly wood coating systems are UV-curing polyurethane dispersions. UV waterborne technology is the fastest curing waterborne coating technology, that has a high

crosslink density, and offers close to 0% VOC and overspray recycling. Advantages that make this technology particularly suitable when higher productivity is required.



	TYPE	SOLID CONTENT [%]		VISC. AT 23°C APPROX. [mPa · s]		pH	PROPERTIES AND APPLICATION	FURNITURE		EXTERIOR	
			CO-SOLVENT CONTENT [%]		MFFT [°C]			PARQUET			
<b>Bayhydrol® UV 2282</b>	PU dispersion	39	0	160	0	7.8	Good grain wetting, physical drying for all-around use (multi-coat). Does not contain intentionally added organotin compounds.	●	○		
<b>Bayhydrol® UV 2317/1</b>	PU dispersion	37	0	100	0	7.5	High wet film transparency, good grain wetting, physical drying. Does not contain intentionally added organotin compounds.	●	○		
<b>Bayhydrol® UV 2280/1</b>	PU dispersion	39	0	60	25	7.5	Outstanding physical drying, good standard product for pigmented coatings. Does not contain intentionally added organotin compounds.	●	○		
<b>Bayhydrol® UV XP 2687/1</b>	PU emulsion	49	0	< 500	0	8.0	Good grain wetting, high solids, good adhesion; especially as a primer on wood. Does not contain intentionally added organotin compounds.	●	●		
<b>Bayhydrol® UV 2689/2</b>	PU dispersion	42	0	100	0	7.8	Highest crosslink density, low physical drying, high scratch and chemical resistance. Especially for clear coats, deep matt & high-gloss coatings. Does not contain intentionally added organotin compounds.	●			
<b>Bayhydrol® UV XP 2775</b>	PU dispersion	40	0	< 300	0	8.0	Excellent chemical and stain resistance, in pigmented white topcoats or matt clear coats. Does not contain intentionally added organotin compounds.	●			
<b>Bayhydrol® eco UV 2877</b>	PU dispersion	39	0	< 500	40	8.0	Bio-based content approx. 38%. <sup>1</sup> Self-crosslinking UV-curable polyurethane dispersion. Fast water release, high chemical resistance and shadow curing. Does not contain intentionally added organotin compounds.	●	○		

● = recommended  
○ = suitable

<sup>1</sup>Based on results of <sup>14</sup>C/total C according to ASTM D 6866.

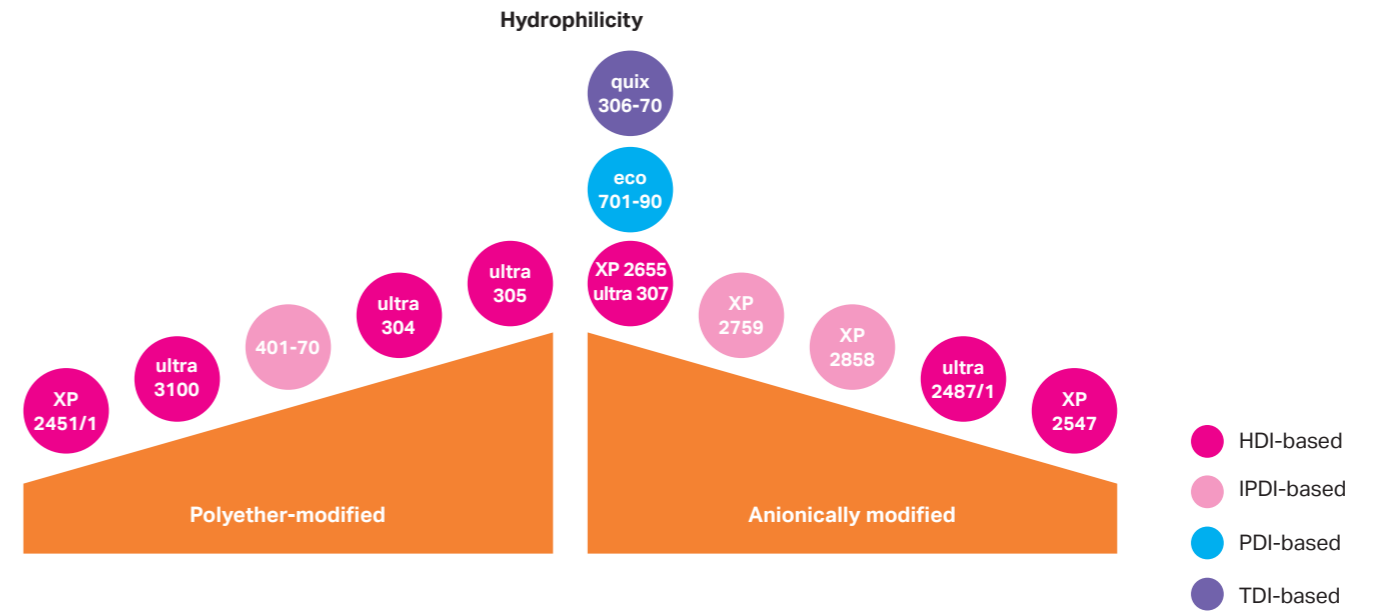


**Bayhydur®:**

# Hydrophilic polyisocyanates for 2K waterborne polyurethane systems

The key to the waterborne 2K PU systems for wood application is the use of hydrophilic polyisocyanates, which have to be completely homogenized into the aqueous phase. In 1994, Covestro offered the first of these products under the trade name Bayhydur®. These hardeners do not contain surfactants and are specially designed for combination with our Bayhydrol® types, and

meet the most important needs of today's market. By choosing the right type of Bayhydur®, it is possible to adjust the performance of the coating system to meet your specific requirements. With the introduction of the Bayhydur® ultra grades, with 0.1% monomeric content, Covestro is setting a new standard with improved working hygiene.



	TYPE	SUPPLY FORM	NCO CONTENT [% ON SUPPLY FORM]		PROPERTIES AND APPLICATION	PARQUET	
				VISC. AT 23°C APPROX. [mPa · s]		FURNITURE	
Bayhydur® ultra 3100	HDI-based	100%	17.4	2,800	Versatile and economic.	○	●
Bayhydur® 401-70	IPDI-based	70% MPA/X	9.4	600	Fast-drying combination partner for HDI types.	●	
Bayhydur® ultra 305	HDI-based	100%	16.2	6,500	Easy mixing and high gloss; especially suitable for trade application, also for mixing by hand.	○	●
Bayhydur® XP 2451/1	HDI-based	100%	20.3	900	Very high chemical resistance.	○	○
Bayhydur® ultra 2487/1	HDI-based	100%	20.6	5,400	Very high chemical resistance.	●	
Bayhydur® XP 2547	HDI-based	100%	22.5	650	Water-dispersible polyisocyanate, low viscosity, high chemical resistance.	●	
Bayhydur® XP 2655	HDI-based	100%	20.8	3,500	Very high chemical resistance, high gloss and easy incorporation.	●	
Bayhydur® ultra 2700	HDI-based	65% DPGDME	10.6	77	Bayhydur® ultra 305, diluted in DPGDME as ready-to-use supply form.	○	●
Bayhydur® XP 2759	IPDI-based	70% MPA	11.0	6,500	Fast drying and high chemical resistance. Combination partner for HDI types.	●	●
Bayhydur® 2858 XP	HDI-/IPDI-based	70% in PGDA	13.7	500	Universal ready-to-use hardener for parquet, joinery & furniture.	●	●
Bayhydur® eco 701-90	PDI-based	90% in PGDA	18.0	5,000	Bio-based content approx. 61% <sup>1</sup> in supply form (66% in solids). Very high chemical resistance and easy incorporation.	●	●
Bayhydur® quix 306-70	HDI-/TDI-based	70% MPA	13.4	200	Fastest drying and high chemical resistance.	●	○
Bayhydur® ultra 307	HDI-based	100%	20.3	6,000	Very high chemical resistance, high gloss and easy incorporation with low monomer content.	●	

● = recommended  
○ = suitable

<sup>1</sup> Based on results of <sup>14</sup>C/total C according to ASTM D 6866.



**Desmophen®:**

# Polyester polyols for 2K polyurethane coatings

Due to their enormous versatility, raw materials for polyurethane coatings have gained the highest shares in world's markets for wood and furniture coatings. The tremendous variability in resins

structures leads to a high versatility in properties. The many requirements resulting from specific demands of different kinds of wooden substrates can be satisfied by using tailor-made PU coatings.



	TYPE	SUPPLY FORM	OH CONTENT [% ON SUPPLY FORM]	VISCOSITY AT 23°C [mPa · s]	PROPERTIES AND APPLICATION	PARQUET		
						FURNITURE	EXTERIOR	
<b>Desmophen® 651 MPA/X</b>	Branched polyester	67% MPA/X	5.5	25,000	For colorfast and chemically resistant coatings and isolation primers on exotic wood.	○	●	●
<b>Desmophen® 651 MPA</b>		65% MPA	5.5	14,500		○	●	●
<b>Desmophen® 800</b>		100%	8.6	850 (70% in MPA)	High chemical resistance, impact resistance, toughness and abrasion resistance.	○	●	
<b>Desmophen® 800 BA</b>		80% BA	6.9	3,500		○	●	
<b>Desmophen® 800 MPA</b>		85% MPA	7.5	11,000		○	●	
<b>Desmophen® 1100</b>		Slightly branched polyester	100%	6.5	400 (70% in MPA)	Highly flexible, good compatibility with other Desmophen® grades.	○	●
<b>Desmophen® 1200</b>	100%		5.0	300 (70% in MPA)	○		●	
<b>Desmophen® 1700</b>	Linear polyester	100%	1.3	17,500	Flexibilizing resin to improve toughness, durability and abrasion resistance in coatings.	○	●	
<b>Desmophen® 1300 X</b>	Fatty acid-modified branched polyester	75% X	3.2	3,450	For clear and pigmented primers, fillers and topcoats.	●		
<b>Desmophen® 1300 BA</b>		75% BA	3.2	1,000		●		
<b>Desmophen® 1300 PR</b>		75% X	3.1	7,250		●		
<b>Desmophen® PL 300</b>		60% X	2.7	5,350	Hard, highly reactive and long pot life.	●		
<b>Desmophen® PL 800</b>		70% X	2.5	1,500	Good pigment wetting, flexible, high yellowing resistance, low application viscosity.	●		
<b>Desmophen® PL 817</b>		75% X/MEK	3.3	10,000	Highly reactive; used in combination with highly condensed types in sealers to increase solid content.	●		
<b>Desmophen® 881 X</b>		75% X	3.2	12,500	Good pigment wetting, low yellowing; for clear and pigmented glossy coatings.	●		

● = recommended  
○ = suitable

**Desmophen® NH:**

# Polyaspartic ester polyols for 2K polyaspartic coatings

The European VOC legislation is leading to an increased demand for coatings with a reduced content of organic solvents. Very high solids (VHS) coatings offer a variety of possible application fields with still optimal durability, optical and mechanical properties as well as application robustness. Our Desmophen® NH polyaspartic

ester range offers the possibility to formulate 2K polyaspartic systems with very high solids content and that are very fast drying. The use of low viscosity HDI isocyanurates like Desmodur® N 3390 or Desmodur® N 3900 is highly recommended as partners to produce very high solid 2K-polyurea coatings.



	TYPE	SUPPLY FORM	VISCOSITY AT 23°C [mPa · s]	EQUIVALENT WEIGHT	PROPERTIES AND APPLICATION	FURNITURE
<b>Desmophen® NH 1420</b>	Aminofunctional resin	100%	1,450	276	Very high solids 2K PUR and solvent-free fast-drying coatings.	○
<b>Desmophen® NH 1520</b>	Aminofunctional resin	100%	1,400	290	Very high solids 2K PUR and solvent-free coatings.	○
<b>Desmophen® NH 1521</b>	Aminofunctional resin	90% BA	160	326	90% solid version of Desmophen® NH 1520.	○
<b>Desmophen® NH 2850 XP</b>	Aminofunctional resin	100%	100	295	Very high solids 2K PUR and solvent-free coatings with higher impact resistance.	○
<b>Desmophen® NH 1422</b>	Aminofunctional resin	100%	1,450	276	Version of Desmophen® NH 1420 with extended pot life.	○

● = recommended  
○ = suitable





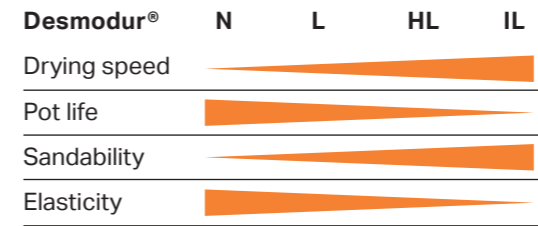
**Desmodur®:**

# Polyisocyanates for 2K polyurethane systems

A broad range of polyisocyanates with different structures and supply forms enables you to select the combination of your choice for each and every formulation in wood and furniture

coatings. With the introduction of the Desmodur® ultra grades, with 0.1% monomeric content, Covestro is setting a new standard with improved working hygiene.

**Polyisocyanate properties**



TYPE	SUPPLY FORM	VISCOSITY AT 23°C [mPa · s]	NCO CONTENT [% ON SUPPLY FORM]	PROPERTIES AND APPLICATION	PARQUET	
					FURNITURE	EXTERIOR
Desmodur® ultra UL 75 XP	75% EA	1,600	13.3	Ultra-low monomer grade of Desmodur® L 75.	●	○
Desmodur® L 75	75% EA	1,600	13.3	Tough but flexible, all-purpose hardener for polyester and fatty acid-modified polyester.	●	○
Desmodur® L 67 BA	67% BA	600	11.9		○	●
Desmodur® L 67 MPA/X	67% MPA/X	1,600	11.9		○	●
Desmodur® ultra IL EA	51% EA	700	8.0	Highly reactive hardener for polyester and fatty acid-modified polyester.	●	○
Desmodur® ultra IL BA	51% BA	2,000	8.0		●	○
Desmodur® ultra IL 1351	51% BA	1,300	8.0		●	○
Desmodur® IL 1451	51% BA	250	7.4	Highly reactive low-viscosity hardener with good compatibility for polyester and fatty acid-modified polyester.	●	○
Desmodur® HL BA	60% BA	2,200	10.5	Reactive hardener with low yellowing for polyester and fatty acid-modified polyester.	●	
Desmodur® HL EA	60% EA	1,100	10.5	Polyester.	●	
Desmodur® N 100	100%	10,000	22.0	Highly flexible hardener with resistance to yellowing for polyacrylates.	●	
Desmodur® N 75 BA	75% BA	160	16.5		●	
Desmodur® N 75 MPA	75% MPA	250	16.5		●	
Desmodur® N 75 MPA/X	75% MPA/X	250	16.5		●	
Desmodur® ultra N 3300	100%	3,000	21.8	Low viscosity, resistant to yellowing and chemicals.	●	○
Desmodur® ultra N 3390 BA	90% BA	500	19.6		●	○
Desmodur® ultra N 3600	100%	1,200	23.0	Low viscosity hardener for non-yellowing high solids and waterborne coatings.	●	○
Desmodur® N 3790 BA	90% BA	1,800	17.8	Highly functional hardener for fast-drying, chemical resistant and non-yellowing coatings.	●	○
Desmodur® N 3900	100%	730	23.5	Low viscosity hardener for non-yellowing high solids and waterborne coatings.	●	○
Desmodur® N 3580 BA	80% BA	500	15.4	Highly functional hardener for scratch-resistant and non-yellowing trimer coatings; specially recommended for self-healing coatings.	●	○
Desmodur® eco N 7300	100%	9,500	21.5	Bio-based content approx.70%. <sup>1</sup> Outstanding weather stability and gloss retention, non-yellowing.	●	○

● = recommended  
○ = suitable

<sup>1</sup> Based on results of <sup>14</sup>C/total C according to ASTM D 6866.

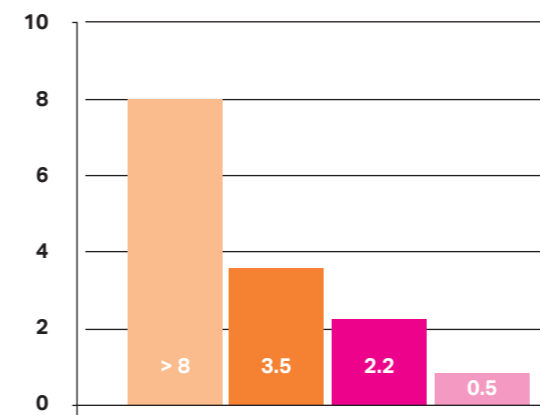
**Desmodur® E:**

# Moisture-curing polyisocyanates for 1K and 2K polyurethane systems

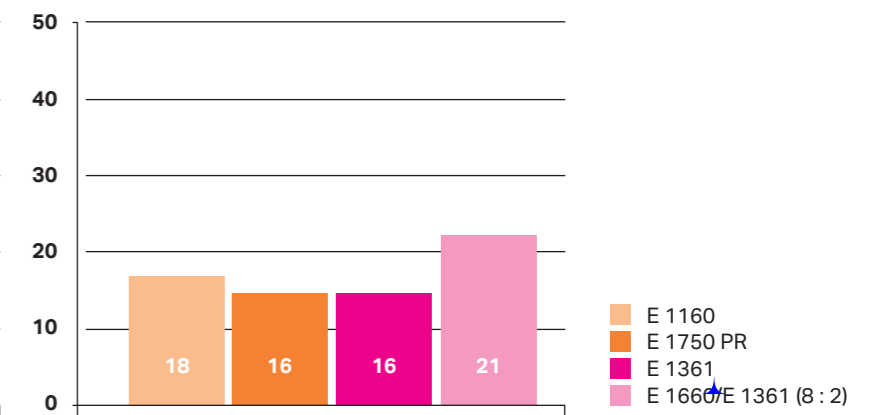
For many years, 1K polyurethane coatings based on Desmodur® E have set the industry standard. Desmodur® E types are especially suitable for use in formulating transparent wood coatings, e.g., for parquet flooring and for wall and ceiling paneling. Their outstanding resistance to wear and non-slip characteristics mean that they are the systems of choice for public buildings, dance halls and multipurpose halls. Such coatings can withstand extreme loads over long periods and

are thus highly cost-effective. Coatings based on Desmodur® E always dry in the presence of moisture. Drying time, hardness development and application properties depend to a high degree on the ambient temperature and humidity conditions. To take account of the wide variation in these conditions, we offer a range of adapted products for use in every region of the world and application requirement.

Tack-free in hours



Abrasion in mg



	TYPE	SUPPLY FORM	VISCOSITY AT 23°C [mPa · s]	OH CONTENT [% ON SUPPLY FORM]	PROPERTIES AND APPLICATION	PARQUET	
						FURNITURE	
Desmodur® E 1160 MPA/X	TDI prepolymer	60% MPA/X	550	5.4	Standard moisture-curing polyisocyanate.	○	●
Desmodur® E 1361 MPA/X	TDI prepolymer	61% MPA/X	500	6.8	Similar to Desmodur® E 1160 MPA/X but with faster drying.	○	●
Desmodur® E 1361 BA		61% BA	250	6.8		○	●
Desmodur® E 1660	TDI prepolymer	60% BA	1,600	5.3	Very hard; developed to be combined with other Desmodur® E types; very fast drying.	●	●
Desmodur® E XP 2605/1	TDI/MDI prepolymer	50% BA	175	4.3	Very fast drying for parquet and furniture.	●	●

● = recommended  
○ = suitable







# We help make wood a star.

**Key to the abbreviations  
used in the tables**

General:

HDI	Hexamethylene diisocyanate
IPDI	Isophorone diisocyanate
MDI	Diphenylmethane diisocyanate
MFFT	Minimum film formation temperature
NCO	Isocyanate
OH	Hydroxyl
PAC	Polyacrylate
PDI	Pentamethylene diisocyanate
PU	Polyurethane
PUD	Polyurethane dispersion
TDI	Toluene diisocyanate

Solvents:

BA	Butyl acetate
BG	Butyl glycol
DPGDME	Dipropylene glycol dimethyl ether
EA	Ethyl acetate
MEK	Methyl ethyl ketone
MIBK	Methyl isobutyl ketone
MPA	1-Methoxypropyl acetate-2
PGDA	Propylene glycol diacetate
PnB	Dowanol PnB
SN	Solvent naphtha 100
X	Xylene



## Fast-lane access to polyurethane innovations

At Covestro, innovation is in our DNA. Ever since Otto Bayer discovered polyurethanes in 1937, we have been driving polyurethane innovations in coatings and adhesives as well as in other application areas. As our partner, you enjoy fast-lane access to polyurethane innovations, and can help us in developing the next generation of polyurethanes to meet the industry's upcoming challenges and needs. What can we offer you?

- Powerful know-how on both established and new polyisocyanates, as well as on new polyurethane hybrid technologies.
- The prospect of new application technologies to enable efficient processes.
- More sustainable, biomass- or CO<sub>2</sub>-based materials that do not sacrifice high performance.

**Join us to shape the future!**

