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# Polyurethanes for Textile Coatings

Impranil® Impraperm® Imprafix®





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Impranil® Impraperm® Imprafix®



Covestro is one of the world's leading suppliers of premium polymers. Our materials and application solutions are found in nearly every area of modern life. Our desire for innovation and sustainability drive the continuous development of our products, processes and facilities.

Covestro's core business is divided into three segments that produce and continuously advance raw materials for polyurethanes and their derivatives, the premium plastic polycarbonate as well as coatings, adhesives and other specialties. With several thousand different products in their portfolios, our segments work hand in hand to push boundaries for our customers' success.

We are focused on developing sustainable solutions to the greatest challenges of our age: climate change, resource depletion, urban expansion, population growth and the resulting increase in awareness of environmental issues. Covestro is meeting this demand by developing long-lasting, light, environmentally friendly and cost-effective materials which will benefit our customers, partners and the public.

We make the world a brighter place.

# Committed to sustainable coated textiles

## Our expertise in textile coatings

As the inventor of polyurethane chemistry and with more than 80 years of experience in research and innovation, Covestro (formerly known as Bayer MaterialScience) helps our industry partners to set themselves apart from the competition.

The global textile coatings team is dedicated to address the ever-growing requirements from global markets for functional and less environmentally impactful textile materials.

We offer a broad range of high-quality water based polyurethane (PU) coating materials tailor-made for various textile applications. We also develop new bio-based and bio-degradable PU dispersions that lead the trend.

We continuously invest in product and application development such as textile coatings, textile printing and PU synthetics. Our team offers new textile material development services to integrate value chain players in a collaborative union and brings values to our partners.

Covestro has been a Bluesign® systems partner since 2014, which signifies our continuous goal of increasing the range of certified substances that customers in the textile industry can use to achieve production operations that are compatible with both people and environment.

bluesign®

SYSTEM  
PARTNER



## Textile coating and printing: PU brings magic to materials

Polyurethane (PU) coating and printing technologies play an essential role in transforming many of the fabrics that we use every single day. Applied in layers, multi-talented PU offers a pleasing touch and outstanding functionalities including improved waterproof performance, breathability and durability, allowing consumers to enjoy enhanced performance from their textile products including auto interiors, clothing, shoes and furniture.

Our innovations not only fulfill a functional and decorative role in a diverse range of applications, but are also more responsible. Our products are manufactured using production processes that are state-of-the-art with respect to the impact on people and the environment. Sustainable coating materials are increasingly demanded in the market, so our coatings offer your business a real benefit.

Covestro's eco-friendly material option is waterborne PU, also known as polyurethane dispersion (PUD). This solution is capturing a lot of industry attention due to its unique capacity to combine high performance with high flexibility.

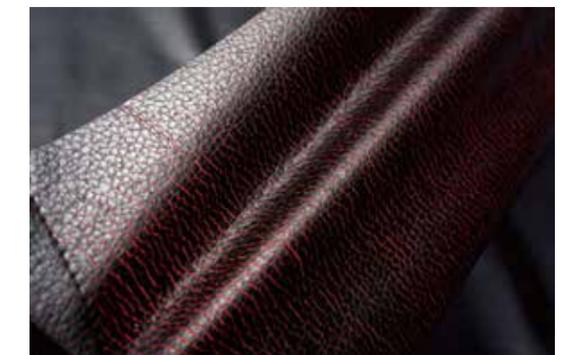
The high-tech waterborne PU technology for textile coatings and printing is essential to enabling eco-friendly PU coated fabrics. They can be manufactured entirely without solvents and with higher resource efficiency, making an important contribution to industry sustainability as a whole.

## PU synthetics: soft yet highly durable

PU is the technology inside synthetic materials of the highest quality: soft and natural-feeling yet exceptionally durable. PU is also often used to provide a suitable finish to PVC synthetic materials. Waterborne PU dispersions from Covestro enable manufacturers to produce PU synthetic materials using a more environmentally compatible process than the traditional solvent borne process, while still retaining the combination of touch and durability for which PU synthetics are renowned.

Traditionally, there are two key processes used in the manufacture of PU synthetics: the coagulation or wet process and the transfer coating or dry process. The coagulation process yields a base that mimics a genuine leather look and feel. The transfer coating process is used to produce a skin layer that provides color, texture and resistance properties. Traditionally, solvent borne PU resins are used for both processes.

Covestro has developed a comprehensive range of waterborne PU dispersions that enable coagulation and coating processes to be carried out without using solvents, providing PU synthetics and synthetic bases with the same performance as solvent borne PU. It also enhances the designability of the finished products, thereby offering more diverse and appealing outlook. In addition, when using waterborne PU dispersions, depending on the combination of processes used, energy consumption can be reduced by at least 50 percent and water consumption by up to 95 percent compared with solvent borne PU used in traditional processes.



# INSQIN®: Enabling a new era of material

INSQIN® waterborne PU technology enables an entirely new level of material sustainability for textiles. By enabling waterborne material manufacturing processes, INSQIN® brings increased workplace hygiene, eliminates risks of environmental pollution and drastically reduces the consumption of water and energy.

INSQIN® also enables totally new possibilities in performance, design, comfort and even the manufacturing of textile-based articles. By offering these aspects as well as game-changing sustainability, we help our customers address not only their sustainability commitments, but their product and manufacturing innovation goals.

For manufacturers our state-of-the-art pilot coating facilities allow much of the material development to happen with a minimal stoppage in production.

We also work directly with brand owners to realize the maximum innovative potential of our technology by developing materials in parallel with their product development, enabling inspiration to develop new technologies and promoting the supply chain transparency sought by the industry.



## Impranil® polyurethane dispersions for textile applications

Product	Category	Resin Type	Polyol Type	Non-Volatile Content [%]	Hydrolytic Stability* (Weeks) (DIN EN 12280-3)	Light- fastness	100% Modulus [MPa]	Tensile Strength [MPa]	Elongation at Break [%]	Melting Range [°C]
Impranil® CGL 105	Dispersion	Aliphatic	Polyester	51	1	7	1.2	10.0	1000	200-220
Impranil® DAA	Dispersion	Aromatic	Polyether	40	3	3	0.5	1.0	>2000	140-160
Impranil® DAH	Dispersion	Aromatic	Polyether	35	4	4	1	10.0	750	150-170
Impranil® DL 519	Dispersion	Aliphatic	Polyester	40	1	7	7	40.0	550	180-200
Impranil® DL 1016	Dispersion	Aliphatic	Polyester	50	4	7	2.4	30.0	750	170-180
Impranil® DL 1068	Dispersion	Aliphatic	Polyether	50	>10	7	1.5	21.0	1050	210-230
Impranil® DL 1069	Dispersion	Aliphatic	Polyether	50	1	7	1.6	20.0	1000	220-240
Impranil® DL 1116	Dispersion	Aliphatic	Polyester	60	2	7	1.4	25.0	1000	210-220
Impranil® DL 1380	Dispersion	Aliphatic	Polyester	60	1	7	1.2	25.0	1200	210-220
Impranil® DL 1537	Dispersion	Aliphatic	Polyester	60	2	7	2	15.0	850	200-210
Impranil® DL 1554	Dispersion	Aliphatic	Polyester	60	2	7	3	26.0	750	200-220
Impranil® DL 2077	Dispersion	Aliphatic	Polycarbonate	35	>10	7	20-25	25-30	150-200	220-230
Impranil® DL 2611	Dispersion	Aliphatic	Polyester	40	3	7	18	40.0	130	200-220
Impranil® DL 2772	Dispersion	Aliphatic	Polyester	40	1	7	2.5	40.0	800	175-200
Impranil® DL 3040	Dispersion	Aliphatic	Polyester	40	1	7	5	40.0	800	175-200
Impranil® DLC-F	Dispersion	Aliphatic	Polycarbonate	40	>10	7	6	50.0	360	215-225
Impranil® DLC-T	Dispersion	Aliphatic	Polycarbonate/Polyester	35	>5	7	5.5	6.0	500	150-160
Impranil® DLH	Dispersion	Aliphatic	Polyester	40	3	7	4.2	50	850	165-175
Impranil® DLI	Dispersion	Aliphatic	Polyester	50	3	7	2	37.0	950	175-200
Impranil® DLN-SD	Dispersion	Aliphatic	Polyester	40	1	7	1.7	35.0	950	175-200
Impranil® DLN-W50	Dispersion	Aliphatic	Polyester	50	1	7	1.7	35.0	950	175-200
Impranil® DLP	Dispersion	Aliphatic	Polyester	50	2	7	0.9	10.0	1100	200-220
Impranil® DLP-R	Dispersion	Aliphatic	Polyester	50	2	7	0.9	10.0	1100	200-220
Impranil® DLS	Dispersion	Aliphatic	Polyester	50	2	7	2.5	30.0	850	170-180
Impranil® DLU	Dispersion	Aliphatic	Polycarbonate/Polyether	60	>10	7	2	30.0	700	200-230
Impranil® DLV/1	Dispersion	Aliphatic	Polycarbonate/Polyether	40	>10	7	1.7	25.0	750	200-220
Impranil® eco-DL 519	Dispersion	Aliphatic	Bio-based Polyester	40	1	7	9	40.0	450	180-200
Impranil® eco-DLS	Dispersion	Aliphatic	Bio-based Polyester	50	1	7	2.5	30.0	800	170-180

\*Based on crosslinked dry film.

## Impraperm® for waterproof and water vapor transmission (WVT) textile coatings

Product	Category	Resin Type	Polyol Type	Non-Volatile Content [%]	Solvent	Light- fastness	100% Modulus [MPa]	Tensile Strength [MPa]	Elongation at Break [%]	Melting Range [°C]
Impraperm® DL 5249	Dispersion	Aliphatic	Polyester	32	Water	7	3.2	22.0	620	240
Impraperm® DL 5310/1	Dispersion	Aliphatic	Polycarbonate/Polyether	30	Water	6-7	2.1	5.2	460	174
Impraperm® 43153 sol.	Solution	Aliphatic	Polyester	25	Toluene/Isobutanol	7	5.0	20.0	400	200

## Impranil® polyurethane solutions, high solids and granules for textile applications

Product	Category	Resin Type	Polyol Type	Non-Volatile Content [%]	Solvent	Light- fastness	100% Modulus [MPa]	Tensile Strength [MPa]	Elongation at Break [%]	Melting Range [°C]
IMPRANIL® EWN-13 sol. A	Solution	Aromatic	Polyether	35	Dimethylformamide / Toluene / Methyl ethyl ketone	5	3	15	700	150-160
IMPRANIL® C sol.	Solution	Aromatic	Polyester	30	Ethylacetate	4	4	45	400	-
IMPRANIL® ELH-A/1 sol.	Solution	Aliphatic	Polycarbonate	30	Toluene / Isopropanol / 1-Methoxypropanol-2	7	7-8	50	400	190-200
IMPRANIL® 43031 sol.	Solution	Aliphatic	Polyether	25	Toluene / Isopropanol / 1-Methoxypropanol-2	7	30	35	175	<200
IMPRANIL® 2610	Solution	Aliphatic	Polycarbonate	30	1-Methoxypropylacetate / Isopropanol-Butyrolacton / 1-Methoxypropanol-2	7	6-7	50	300	190-200
IMPRANIL® HS-62	High Solid	Aromatic	Polyether	98	1-Methoxypropylacetate-2	2	2	8	660	200-210
IMPRANIL® HS-80	High Solid	Aromatic	Polyether	90	1-Methoxypropylacetate-2	3	4.5	25	450	200-220
IMPRANIL® HS-130	High Solid	Aromatic	Polyether	100	-	2-3	10	25	400	>150
IMPRANIL® C	Granule	Aromatic	Polyester	100	-	4	4	45	400	-

## Imprafix® and other crosslinking agents / catalyst / additives

Product	Non-Volatile Content [%]	Solvent	Remarks
Imprafix® 2794	40	Water	Dimethylpyrazole (DMP) blocked aliphatic isocyanate, low deblocking temperature, for waterborne systems
Imprafix® IO 3025	100	-	Aliphatic isocyanate, for waterborne systems
Imprafix® IO 3388	45	Water	MEKO blocked aliphatic isocyanate crosslinker dispersion, for waterborne systems
Imprafix® TH sol.	75	Ethylacetate	Isocyanate crosslinking agent, aromatic, for solvent borne systems
Imprafix® TRL sol.	60	Butylacetate	Isocyanate crosslinking agent, aromatic/aliphatic, for solvent borne systems
Imprafix® SO 2582	4	Ethylacetate	Accelerator for Imprafix® TH and TRL
Imprafix® AM 2330	100	-	Crosslinking agent for Impranil® HS-series
Imprafix® HS-C	100	-	Crosslinking agent for Impranil® HS-series
Impranil® AC 2346	40	Ethylacetate	Acrylate additive for Impraperm® 43153
Desmodur® N 3900	100	-	Isocyanate crosslinking agent, aliphatic, for waterborne systems and solvent borne PU
Bayhydur® 3100	100	-	Isocyanate crosslinking agent, aliphatic, for waterborne systems
Desmoderm® Additive Z	75	1-Methoxypropylacetat-2/ Xylol 1:1	Isocyanate crosslinking agent, aliphatic, for solvent borne PU
Desmodur® DN	100	-	Isocyanate crosslinking agent, aliphatic, for waterborne systems
Bayhydur® 302	100	-	Aliphatic crosslinker for waterborne systems