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Contact us!



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<sup>1</sup> Please see the "Guidance on Use of Covestro Products in a Medical Application" document.  
Edition: 2023

# INSQIN<sup>®</sup>: Make every drop count

Pushing boundaries in digital textile printing  
#INSQIN<sup>®</sup> Technology #FuturePrinting





## Let's go digital together!

As of today, almost 90% of printed textiles are manufactured by using an analogue screen printing technology. However, an increasing trend towards extraordinary short time-to-market, individualization and sustainability drives the revolution of the textile industry. An intensified usage of digital application technologies is observed in the global market. Digital textile printing with pigment inks enables a shift of value adding finishing steps closer to the customer allowing for shorter times to market, a cost-efficient production of single digit lot sizes enabling mass-customization and a reduction of waste material up to 85% in comparison to screen printing resulting in more sustainable production of printed textiles.

## INSQIN®: One solution, infinite inspiration

Inspiration is the magic that creates innovative ideas that change the game. We want to inspire you! This is why Covestro has introduced INSQIN® waterborne polyurethanes (PUs) and isocyanates as a new generation of material solutions for textile performance prints to serve multiple industries – from fashion, over sports & leisure, home textiles to automotive just to name a few. With this, we tackle challenges associated with the technology shift from analogue to digital printing. Our ink-jetable binders enable you to resolve the trade-off between fastness properties and pleasant haptics. These unique product features empower performance even in the thinnest layer, enable better sustainability and create inspiration for material applications.

The Covestro global textile team maintains proximity and accessibility in the industry throughout the supply chain in order to lead joint development projects and recommend new materials. Our network, consisting of 30 production sites, 8 world-scale plants and 3 innovation hubs across Europe, Asia and the U.S., ensures stable supply with high quality products, technologies and services around the world.



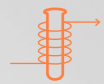
## **INSQIN<sup>®</sup>: Our contribution to a sustainable world**

INSQIN<sup>®</sup>, produced at state-of-art facilities with low VOC impact on the environment, delivers consistent qualities sought by ink manufacturers, OEMs of different industries and consumers. The technology offers stable jetting with extended open times, enhanced wash and rub fastness and abrasion resistance while maintaining pleasant haptics.

Our material solutions are the answer to society's growing interest in circular economy. The waterborne PU synthetics, brought by our INSQIN<sup>®</sup> technology, are safer, cleaner, have a lower carbon footprint and enable the acceleration of sustainable technologies such as digital textile printing.

# Material solutions for the entire process chain

Our INSQIN® toolbox includes material solutions for multiple process steps in direct-to-garment, direct-to-film and roll-to-roll processes:



**Primer\* to enhance image quality and fastness properties**



**Binder with pleasant haptics creating excellent bond between pigments and textile substrates**



**Crosslinker to increase fastness properties**

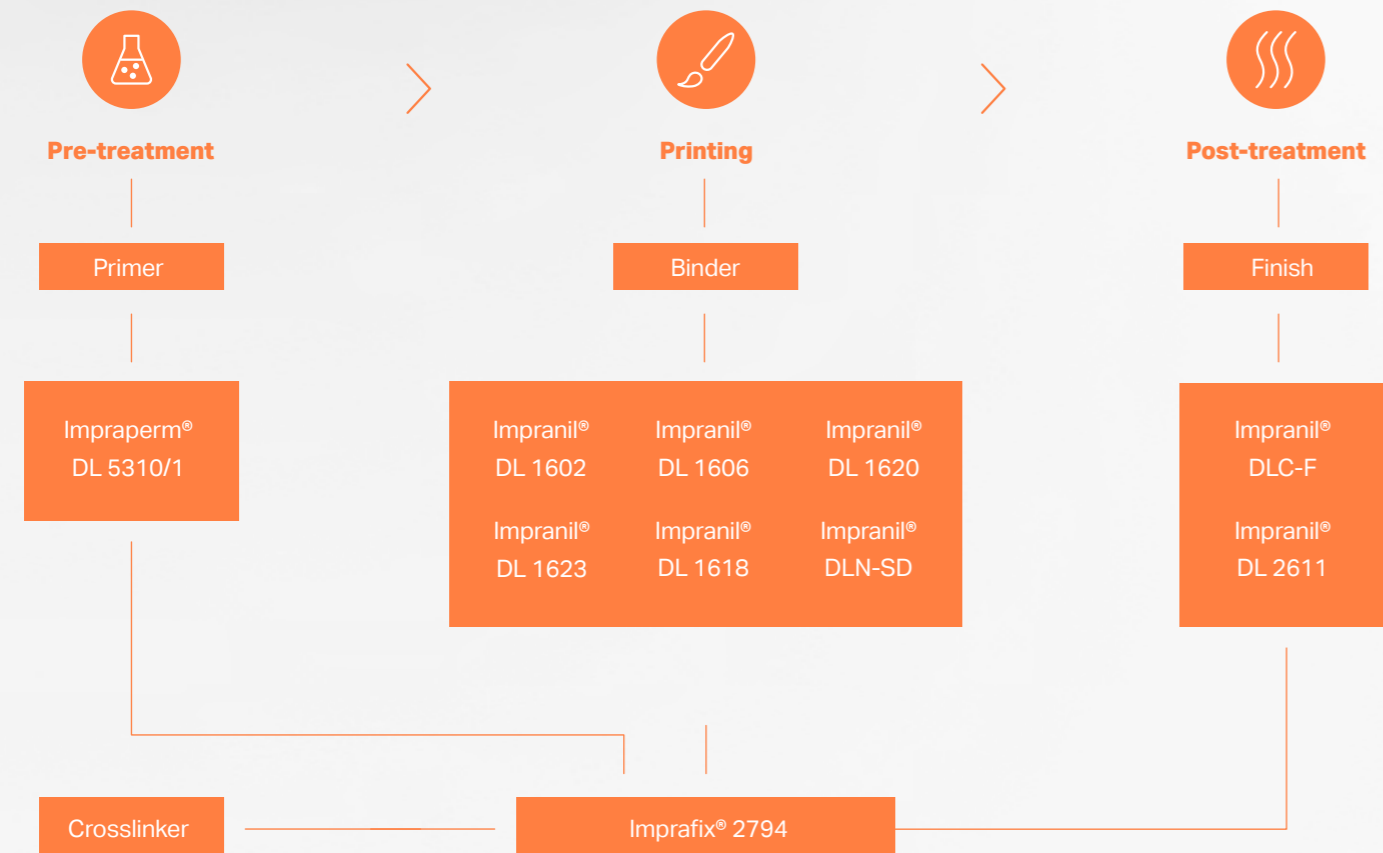


**Finishing solutions for additional functional finishing**

\*Analogue application recommended

## Beyond now: Digital application of durable textile prints

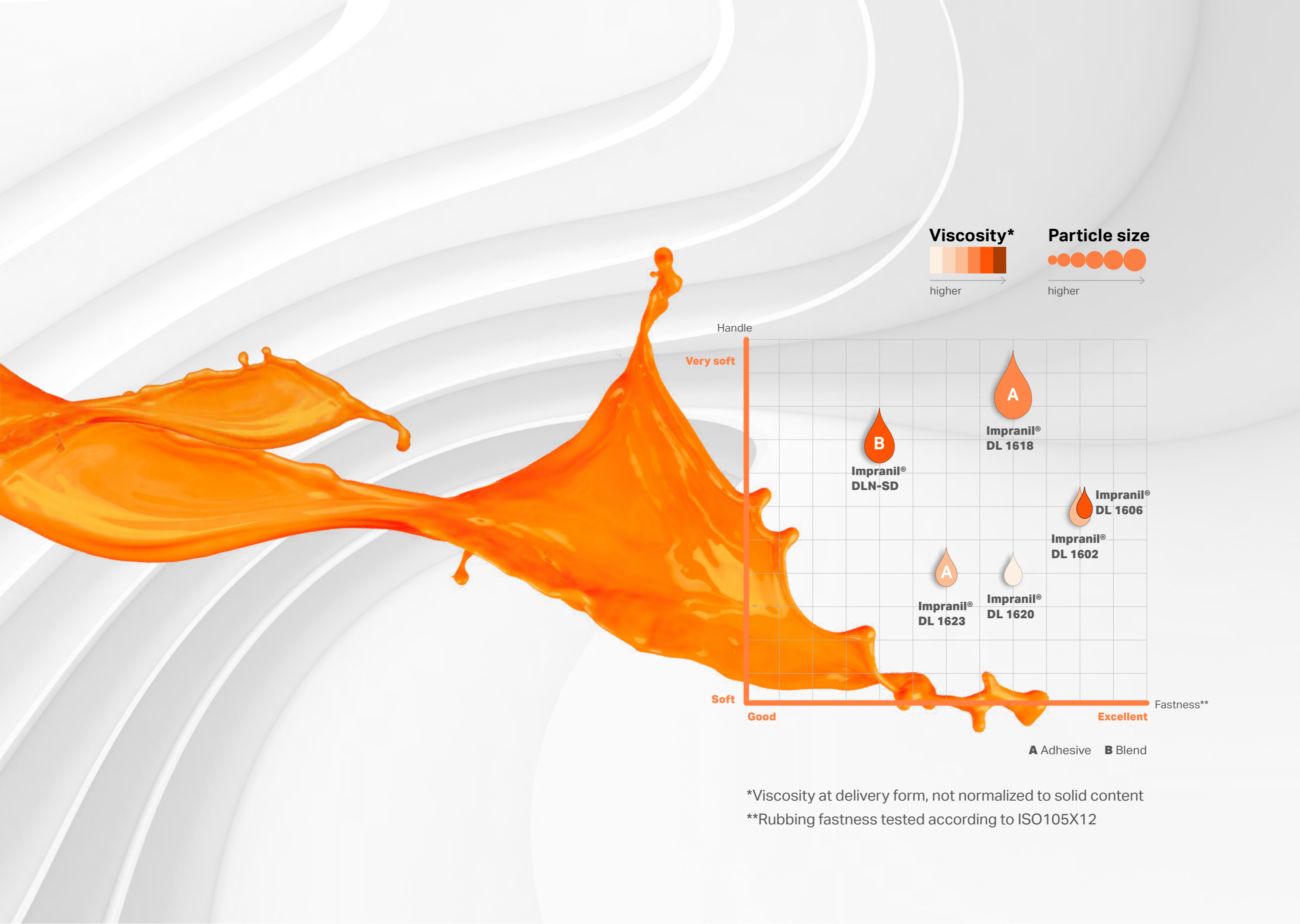
We are innovative by tradition, and continue to put forward ground-breaking innovations, trendsetting products and pioneering application methods in new dimensions. With our technology, you can get ahead of the trend towards digitally printed textiles to create the next generation of decorative and functional textiles and being sustainable at the same time.



Category	Product	Resin Type	Backbone	Solid content DIN EN ISO 3251 [%]	pH DIN ISO 976 [-]	Tensile strength DIN EN 53504 [MPa]	Elongation DIN EN 5350 [%]	Modulus DIN EN 53504 [MPa]	Tg [°C]	Typical viscosity <sup>1</sup> DIN EN ISO 2555 23°C, 30rpm); <sup>2</sup> DIN EN ISO 3219/A.3 (23 °C, 40 1/s) [mPas]	Typical mean particle size [nm]	Value proposition
Primer	Impraperm® DL 5310/1	Nonionic aliphatic	PC/PET	30	6 - 8	5	460	2,5	-	< 1000 <sup>2</sup>	<100	Good adhesion Soft handle Good transparency in supply form
Binder	Impranil® DL 1602	Anionic Aliphatic	PC	35	6 - 9	50	600	3,8	-32	< 1000 <sup>1</sup>	<85	Excellent filterability* and good jetting performance Excellent resolubility and long open times Good transparency in supply form Excellent crocking fastness
Binder	Impranil® DL 1606	Anionic Aliphatic	PC	35 - 37	6 - 9	49	580	3,8	-32	< 1000 <sup>1</sup>	<85	Anti-sagging properties Applicable for all colors including white Excellent filterability* and good jetting performance Excellent resolubility and long open times Good transparency in supply form Excellent crocking fastness
Binder	Impranil® DL 1620	Anionic Aliphatic	PES/PC	35	7 - 9	18	450	6	-45	< 100 <sup>2</sup>	<100	Excellent filterability* and good jetting performance Good transparency in supply form
Binder	Impranil® DL 1623	Aliphatic	PET	33	7 - 9	27	480	6,4	-	< 200 <sup>2</sup>	<100	Excellent adhesion with different textile substrates Excellent filterability* and good jetting performance Good transparency in supply form
Binder	Impranil® DL 1618	Anionic Aliphatic	PES	50	7 - 9	9	1160	1	-4	< 250 <sup>1</sup>	<300	Excellent adhesion with different textile substrates Especially suitable for white ink layer
Binder	Impranil® DLN-SD	Anionic Aliphatic	PES	40	5 - 8	35	950	1,7	-40	< 500 <sup>1</sup>	<250	Soft and dry hand Especially suitable to be used in compounds
Finish	Impranil® DLC-F	Anionic Aliphatic	PC	40	6 - 9	50	360	6	-33	< 2000 <sup>1</sup>	<160	Excellent hydrolysis resistance Excellent chemical resistance Very good resistance to salty water Very good abrasion and scratch resistance Very dry handle
Finish	Impranil® DL 2611	Anionic Aliphatic	PES	40	5 - 9	40	130	18	-33	< 1000 <sup>1</sup>	<200	Can provide gloss effect Good hydrolysis and abrasion resistance Dry handle
Crosslinker	Imprafix® 2794	Aliphatic	-	38	6 - 9	-	-	-	-	< 100 <sup>2</sup>	<100	Improved reactivity and thermostability Substantial improvement of resistance such as washing, scratch and hydrolysis Absence of pot-life reduces waste and increases flexibility Suitable in combination with primer, binder and finish

Note: Typical values do not indicate any specification and may differ from COA of individual batches

\*Filterability evaluated with internal test method (5 µm and 1.2 µm PP membrane filter)



Viscosity\*

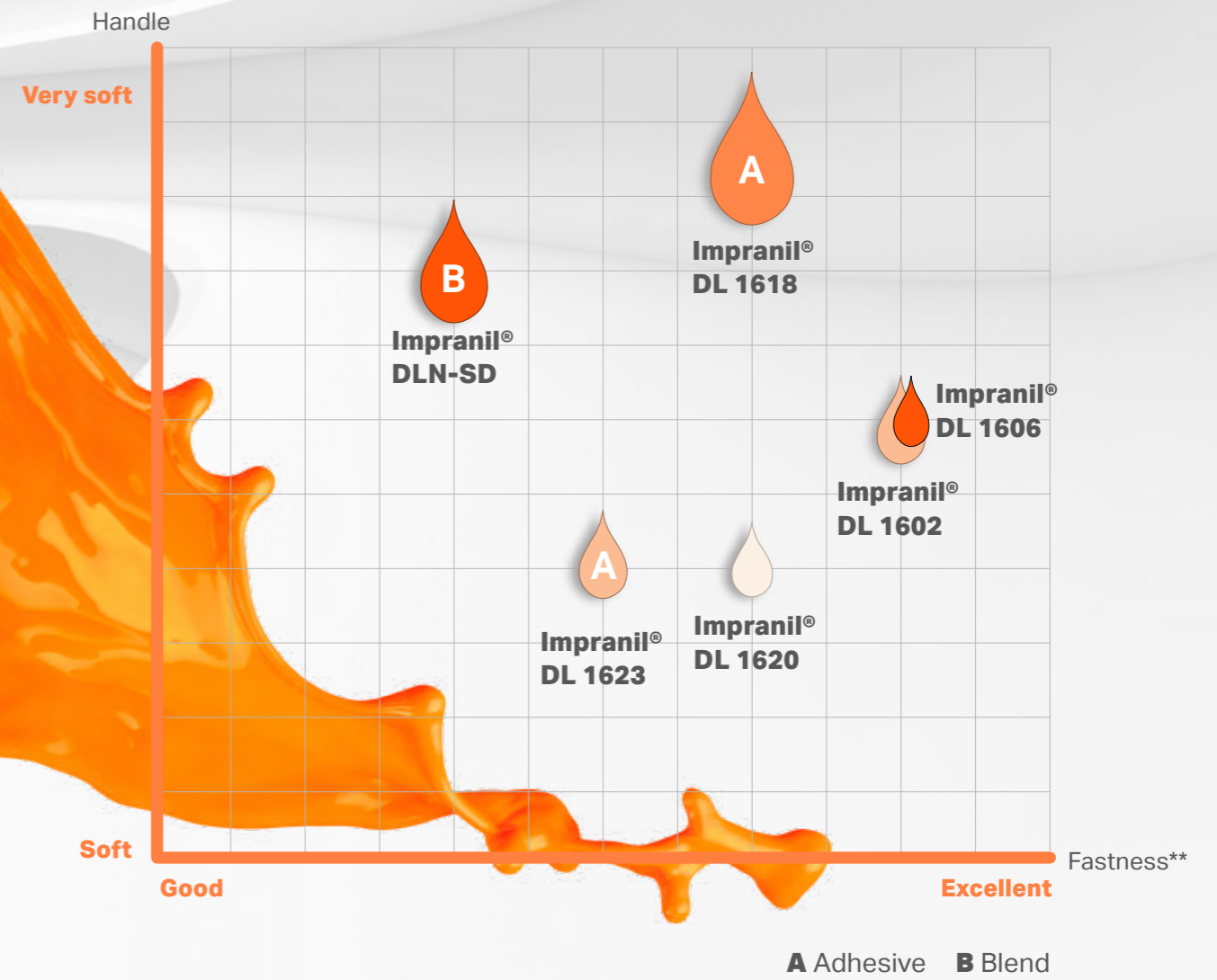


higher →

Particle size



higher →



\*Viscosity at delivery form, not normalized to solid content

\*\*Rubbing fastness tested according to ISO105X12

# Every drop an opportunity - not only in textiles

Not only the textile industry but the entire coatings and adhesives world is changing leveraging on the shift from analogue to digital application technologies. Therefore, we share our knowledge and expertise on digital printing solutions within Covestro. Aiming to unlock the potential of digital printing, we offer a versatile portfolio of inkjettable material solutions suitable for footwear, automotive, food packaging, sports and leisure. Are you interested to learn more about our waterborne, solventborne, UV and bio-based pre-treatment, binder and post-treatment solutions to digitally print on metal, plastic, paper or board? Scan me!



## Mobility



## Printing & Packaging



## Sports & Leisure

