



Make every drop count.

Resin-based digital printing solutions from Covestro.



A fresh digital printing approach from Covestro

To drive the future of print & packaging, Covestro offers a comprehensive range of digital printing solutions. We are leveraging multiple resin technologies and using a total-system approach that covers resins for primers, inkjet inks, and overprint varnishes. If you're looking for a fresh digital printing approach, we've got the solution for you.

Time for a better printing future

In our competitive and unpredictable world, companies are looking for innovative ways to engage with customers while being able to respond rapidly to market changes. To this end, brand owners are developing more impactful print & packaging products through versioning and personalization, while demanding shorter lead times to reduce time-to-market. In addition, to address rapid demand fluctuations and improve the sustainability of print & packaging, there is a growing need for cost-effective small-lot production to avoid over-production and waste in the supply chain. This drives the need for printers and packaging converters to produce more quickly, flexibly, and efficiently. Alongside this, they must also keep up with evolving needs around regulatory compliance and sustainability.

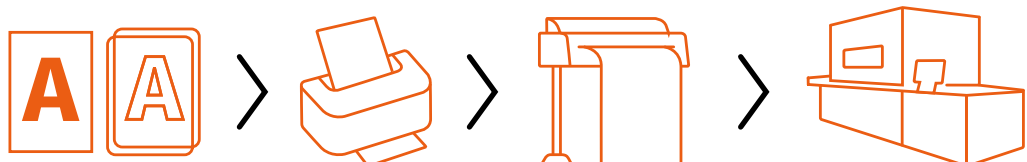
An increasingly effective method to address these demands is digital printing. Digital printing processes work by generating printed images directly in response to a digital file, with no need for the printing plates, screens, or impression cylinders required by analog printing. By eliminating these, digital printing enables cost-effective short print runs – even down to runs of one – and quicker turnaround.

With the ability to produce many design variations, digital printing can deliver greater on-the-shelf impact with consumers.

Inkjet printing, in particular, is a fast-growing method of digital printing – with significant developments in printheads, inks, and finishing systems. Inkjet inks can be formulated from low-VOC technologies – such as aqueous and 100%-radiation-curable – and can be formulated to meet ever-higher safety and sustainability standards and regulations, particularly in the food packaging industry.

With these developments boosting the cost-performance of inkjet printing over more traditional methods, this technology looks set to grow and grow. Of course, these advantages cannot be achieved without high-quality resin solutions – especially as product and print process requirements rapidly evolve. Alongside the pigment dispersion, the resin is one of the ink's core ingredients – as important as hemoglobin is to blood. When it comes to digital printing ink, it's what makes every drop count.

The road to digital printing



Analog printing

- Print plate/cylinder
- High productivity
- Mature/Low cost

Multi-pass printing

- Digital image directly printed
- Low speed/productivity
- Low ink consumption

Single-pass system solution

- Digital image directly printed
- High speed/productivity
- High ink consumption

Covestro: a customer-focused, global approach

At Covestro, our aim is to make the world a better place. To this end, we use our science-based capabilities to deliver solutions that meet our customers' needs and drive sustainable living standards across a range of markets.

In particular, we have a long history in analog printing technology – we've been producing print resins for over 30 years. During this time, we've developed waterborne, solventborne, and energy-cured resins for print & packaging applications ranging from paper coatings to bottle labeling. And, for the past decade, we have taken this rich heritage and know-how in resins for print & packaging and applied them to inkjet printing.

Proven performance

Covestro's inkjet ink products have proven performance in a wide range of applications. Many have long been used by our customers with strong feedback and sales – for example, multiple leading original equipment manufacturers (OEMs) use our resins in their commercialized digital presses. Additionally, we've been extensively recognized for our waterborne resins that enhance the print receptivity of energy-cured and solventborne inks.



This experience, including our regulatory know-how, means we understand the needs of the inkjet market when it comes to resins – from jettability to food and regulatory compliance – and we work ahead of the curve of these demands.

Count on us

With our global presence, manufacturing, R&D, and regulatory expertise, we're well-placed to develop innovative solutions for the latest digital printing techniques. Indeed, we work with our customers – both OEMs and ink manufacturers – on many of these solutions. We can help you to select the right resin products for your application, as well as providing regulatory support on issues such as food contact and GMP manufacturing.

Now, we're bringing together our extensive printing experience to create a comprehensive portfolio of resins for inkjet printing applications – offering a brand-new product range for waterborne inkjet systems alongside our existing portfolio for energy-cured systems. By bringing this portfolio together for you, we are confident we'll help you accelerate your product development timelines and take your printing products to the next level.



Our portfolio. Your solutions.

Meeting tough demands

Digital printing resins must enable reliable printing, adhere well to the substrate, and provide good physical resistance against blocking and abrasion. What's more, they must work across the relevant substrate range for the target application. In addition, resins for food packaging applications are required to meet increasingly strict national and regional food contact compliance regulations. For textile applications, other standards such as Oeko-Tex and the Global Organic Textile Standard (GOTS) are relevant.

From print reliability to food contact compliance, our portfolio meets all these basic requirements. Balancing drying time with resolubility, cost with efficiency, these resins have proven performance on a broad variety of substrates. So, whether it's for textile or corrugated board, we've got a digital printing solution for you – and we'll work together to find the right one.

A broad range of technologies for every need

Waterborne, energy-cured, and solventborne systems can all be used for inkjet applications, depending on the application. Moreover, the functional requirements of the printed image vary from application to application. For this reason, inkjet ink formulators at both OEMs and ink manufacturers need access to a range of different chemistries to formulate their inks and coatings. The choice of resin technology can make a huge difference to both press reliability and the final print quality – and, because it's often chosen early in the ink development process, it's important to choose the right one.

For instance, thanks to their high line speeds and food contact compliance potential, waterborne resins are particularly ideal for food packaging. Energy-cured (UV/LED/EB) inkjet resins, on the other hand, offer faster curing and are particularly suitable for label and wide-format scanning applications. That's why this portfolio includes both waterborne and energy-cured technology. And, if you are interested in solventborne products, you can also contact us to find out more.

Which resin technology is right for me?

Inkjet ink technology comparison

Single-pass inkjet ink technology comparison

	Energy-cured	Waterborne
Print reliability	●●	●●
Drying / cure speed	●●	●
Line speed	●	●●
Substrate performance	●●	●●
Food contact compliance potential	●	●●
Press complexity	Medium	High
Ink deposits	Very high	Low
Consumables and energy costs	●	●●
Environmental considerations	●●	●●

● Second best option ●● Preferred / best option

Market segment overview pigmented inkjet inks

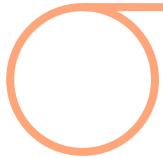
Packaging	Corrugated	●●●	●●●
	Folding Carton	●●	●●●
	Flexible films	●	●●●
	Label	●●●	●
Graphics	Wide-format scanning	●●●	●●
	Commercial print	●	●●●
Textile	RtR & DtG	●	●●●
Décor	Flooring & wall covering	●●●	●●●

● Less preferred technology ●● Secondary technology ●●● Leading technology

A 'total system' approach for waterborne inkjet

When it comes to printing, waterborne systems need more than just the inkjet ink itself: to ensure drop fixation, good resistance properties, and adhesion to the substrate, they typically require a primer. What's more, they may also need a coating to protect the ink and add extra resistance. Because we understand how these different components interact, we have a 'total system' approach for our waterborne inkjet portfolio – offering resins for primers, inkjet inks, and overprint varnishes (OPVs).

C M Y K



Priming unit

Digital or analog

Function of primer:

- Drop fixation
- Absorbing water
- Resistance properties
- Adhesion to substrate

Printing unit

Digital

Function of the ink:

- Color
- Print Definition
- Chemical and physical resistances
- Adhesion to primer/ substrate

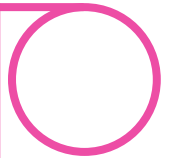
Coating unit

Digital or analog

Function of the coating:

- Protection of the ink
- Appearance/effects
- Chemical and physical resistances

(alternative is lamination offline)



Drying and curing mechanism

Covestro focus on integrated approach

Waterborne resins

Inkjet technology is moving into numerous different application areas and waterborne primers, inks and coatings are preferred for many end uses. The diversity of applications results in a large variety of requirements. Covestro can address these requirements with a broad range of inkjet resin technologies, with a number of them tailored for inkjet applications.

With their low VOC profile, thin dry layers, higher line speed potential, strong substrate performance, and adhesion-enhancing properties, waterborne technologies – inks, coatings, and consequently, waterborne resins – are the primary choice for many digital printing applications, from flexible films to textiles.

Waterborne acrylics

Our waterborne acrylic resins continue to evolve in terms of their inks and coatings performance. A major reason behind this is the fact that our technical team has unique control over particle size, morphology, functionality, chemical composition, and molecular weight – which, in turn, gives our customers huge flexibility and versatility in developing inkjet inks, primers and coatings. Our acrylic emulsion resins selected for inkjet applications all meet the high inkjet standards of particle size control and filtration, and provide excellent resolubility and open time.

Waterborne urethanes

Covestro's waterborne urethane resins provide a combination of toughness, flexibility, and adhesion performance, which is an ideal combination for packaging, decorative, and textile printing applications. Our waterborne urethane resins offer a broad platform of technologies like alkyd urethanes, self-crosslinking urethanes, and haptic-effect coating urethanes – unlocking a world of tactile opportunities and experiences. For example, through **Skins®** – our family of haptic-effect resins used in overprint varnishes.

Waterborne urethane acrylics

Our waterborne urethane acrylic resins combine some of the strong mechanical properties of urethanes with the high resistance levels of acrylics, offering the best of both worlds for inkjet applications.

Waterborne UV resins

For inkjet ink applications, acryloyl functional polyurethanes are a very promising technology as they can offer an excellent balance between resolubility in the printhead and an excellent substrate performance after cure. In addition, this technology makes it possible to achieve "100% UV" performance without the use of low-molecular-weight monomers, which is a tremendous advantage for food packaging applications. Covestro has invested in this technology and that has resulted in an innovative product that provides all these major benefits combined with excellent hydrolytic stability, assuring a long ink shelf-life.

Primers in waterborne inkjet systems

Our waterborne primer resins deliver the all-important drop fixation, water-absorbency, resistance, and adhesion needed in waterborne printing systems. Including resins for both analog and digital applications, they can support you in making a smooth transition toward digital printing:

	DESCRIPTION	APPEARANCE
Binders for analog applied primers		
NeoRez® R-9340	A flexible nonionic stabilized polyurethane dispersion with a broad adhesion window that can be formulated into inkjet primers for absorbent and non-absorbent substrates. The binder can be combined with cationic resins, multi-valent metal salts and acidic materials and can also be loaded with high levels of inorganic fillers.	Light tan translucent liquid
NeoCryl® XK-30	A low-pH acrylic dispersion that has a cationic character during the drying phase. Upon drying, the formic acid that provides a low pH evaporates and a neutral dry film is obtained. By formulating the product with a non-volatile acid or cationic materials, a permanent cationic character can be created, which is ideal for inkjet primers.	Milky white liquid

	DESCRIPTION	APPEARANCE
Binders for digital and analog applied primers		
NeoCryl® D-2201	A medium-MFFT self-crosslinking acrylic dispersion that can be used in jettable primers for both absorbent and non-absorbent substrates. The product provides a broad formulation latitude combined with excellent hardness, adhesion window and film formation.	Milky white liquid
NeoCryl® D-2202	A flexible, film-forming, low-MFFT self-crosslinking acrylic dispersion with very good adhesion properties. In jettable primer applications, the resin is mainly targeted for flexible packaging.	Yellowish translucent liquid

	SOLIDS %	VISCOSITY mPas	pH	MFFT °C	DENSITY kg/L	ACID VALUE mg KOH/g DRY RESIN
	39–41	100–1,500	6.5–7.5	<5	1.09	0
	41.5–43.5	max 100	3.8–4.3	30	1.05	0

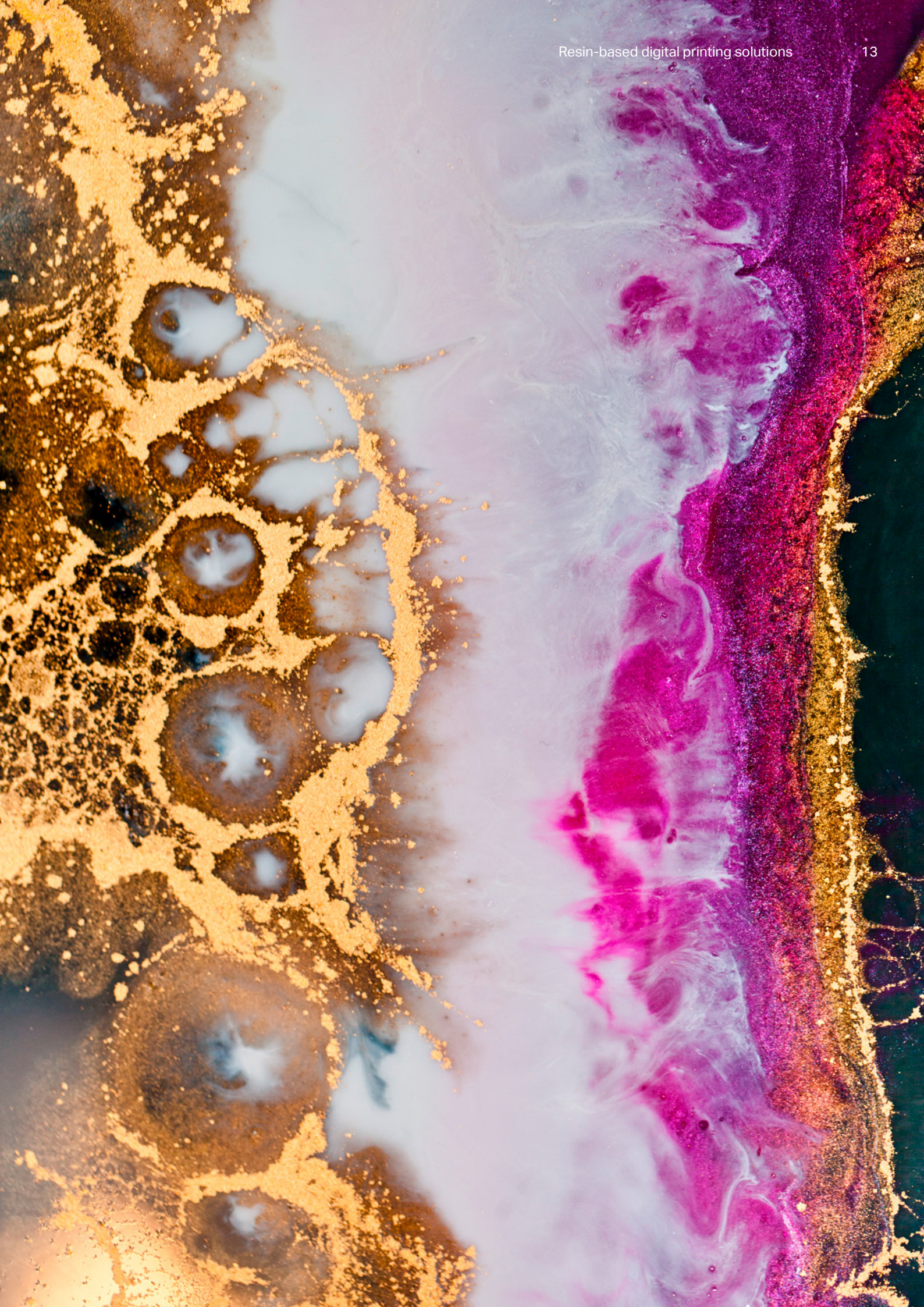
	SOLIDS %	VISCOSITY mPas	pH	MFFT °C	DENSITY kg/L	ACID VALUE mg KOH/g DRY RESIN
	44–46	40–100	7.8–8.2	29	1.05	49
	43–45	25–175	7.3–7.9	7	1.05	28

Waterborne inkjet ink resins

Available in a range of polymer technologies, our waterborne inkjet ink resins deliver the stable jetting, fast drying, and low viscosity that all inkjet inks need. And, to prevent the early drying in the printhead that is a well-known issue in waterborne inkjet inks, they offer a careful balance between drying time and resolubility. What's more, these resins have all been successfully formulated into inkjet inks and tested for compatibility with leading inkjet pigment dispersions.

Inkjet ink resin portfolio – Resins by application	CORRUGATED		FOLDING CARTON		FLEXIBLE FILMS		LABELS		WIDE-FORMAT SCANNING		COMMERCIAL PRINT		TEXTILE RTR & DTG		FLOORING & WALL PAPER	
	Packaging								Graphics				Textile		Décor	
	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●
NeoCryl® D-2101	●●●●●	●●●●●	●●●	●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●	●●●●●	●●●●●			
NeoRad™ D-2102 XP	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●	●●	●●●●●	●●●●●			
NeoCryl® D-2103 XP	●●●●●	●●●	●●●	●●	●●	●●	●●	●●	●●	●●●●	●	●●	●●			
NeoCryl® D-2104	●●●●●	●●●●●	●●●	●●	●●	●●	●●	●●	●●	●●●●	●●	●●	●●			
Decovery® D-2105	●●●●	●●●	●●●	●	●	●	●●●●●	●	●	●●●●●	●	●●	●●			
NeoCryl® D-2201	●●●●	●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●	●●	●●	●●	●●●●	●●●●			
NeoCryl® D-2202	●●	●●	●●●●●	●●●●●	●●	●●	●●	●●	●●	●●	●●	●●	●●			
NeoCryl® D-2203	●●	●●	●●●●●	●●●●	●●	●●	●●	●●	●●	●●	●●	●●	●●			
NeoCryl® D-2204	●●●	●●●	●●●●●	●●●●●	●●●●	●●●	●●	●●	●●	●●	●	●●●●	●●●●			
NeoCryl® D-2301	●	●●	●●●●	●	●●●●	●	●●●●	●	●	●	●●●●●	●●	●●			

Inkjet ink resin portfolio – Resin performance on substrate	ADHESION WINDOW		COHESIVE STRENGTH (LAMINATES)		THERMAL RESISTANCE		ANTI-BLOCKING		CHEMICAL RESISTANCE		SWISS ORDINANCE COMPLIANCE*		REACH		TSCA	
	Registration status								REACH		TSCA					
	●●●●	●●●	●●●●	●●●●	●●●●	●●●●	●●●●	●●●●	●●●●	●●●●	●●●●	●●●●	●●●●	●●●●	●●●●	●●●●
NeoCryl® D-2101	●●●●	●●●	●●●●	●●●●	●●●●	●●●●	●●●●	●●●●	●●●●	●●●●	✓	✓	✓	✓	✓	
NeoRad™ D-2102 XP	●●●●	●●●	●●●	●●●●	●●●●	●●●●	●●●●	●●●●	●●●●	●●●●	✓	✓	⌚	✓	✓	
NeoCryl® D-2103 XP	●●●●	●	●●●●	●●●●	●●	●●	●●	●●	●●	●●	✓	✓	✓	✓	✓	
NeoCryl® D-2104	●●●●	●●	●●	●●	●●	●●	●●	●●	●●	●●	✓	✓	✓	✓	✓	
Decovery® D-2105	●●●	●●	●	●●	●	●●	●	●	●	●	✓	✓	✓	✓	✓	
NeoCryl® D-2201	●●●●●	●●●	●●●●	●●●●	●●●●	●●●●	●●●●	●●●●	●●●●	●●●●	✓	✓	✓	✓	✓	
NeoCryl® D-2202	●●●●●	●●●	●●●	●●●	●●●	●●●	●●●	●●●	●●●	●●●	✓	✓	✓	✓	✓	
NeoCryl® D-2203	●●●●●	●●●●●	●●●	●●	●●	●●	●●	●●	●●	●●	✓	✓	✓	✓	✓	
NeoCryl® D-2204	●●●●●	●●●	●●●●	●●●●	●●●●	●●●●	●●●●	●●●●	●●●●	●●●●	✓	✓	✓	✓	✓	
NeoCryl® D-2301	●●●●●	●●●●●	●●	●	●	●	●	●	●	●	✓	✓	✓	✓	✓	



Waterborne inkjet ink resins

DESCRIPTION

APPEARANCE

	DESCRIPTION	APPEARANCE
NeoCryl® D-2101	A high-MFFT/non-film forming styrene acrylic dispersion designed for inkjet ink applications in commercial and packaging printing on absorbent substrates. The product provides excellent latency, has a very broad compatibility profile, and is a robust product to use in aqueous inkjet ink formulations for paper applications.	Milky white liquid
NeoRad™ D-2102	A waterbased acryloyl functional/energy-curable PUD dispersion with high double bond functionality. Due to its excellent resolubility, the product can be formulated into inkjet inks with very low humectant levels and still provide excellent latency. The product can be used on absorbing and non-absorbing substrates in packaging and other applications.	Bluish liquid
NeoCryl® D-2103 XP	A highly resoluble self-crosslinking alkali-solubilized acrylic polymer designed for inkjet printing applications focused on paper and board substrates.	Bluish, slightly hazy
NeoCryl® D-2104	A low-MFFT, flexible styrene acrylic dispersion with an excellent balance between resolubility and drying speed targeted for inkjet inks for paper substrates with demanding resistance properties. The product has a broad compatibility window.	White translucent liquid
Decovery® D-2105	An alkali-soluble acrylic dispersion supplied in dispersion form at low pH. The resin can be solubilized by neutralization with a range of neutralization agents. The main application for this product is in printing on absorbent substrates, such as paper and corrugated board. Decovery® D-2105 contains 32% 14C biobased content in solids.	White translucent liquid
NeoCryl® D-2201	A medium-MFFT self-crosslinking acrylic dispersion for inkjet inks for both absorbent and non-absorbent substrates. The product provides a broad ink formulation latitude combined with excellent hardness, adhesion window and film formation.	Milky white liquid
NeoCryl® D-2202	A film-forming, low-MFFT, self-crosslinking acrylic dispersion combining excellent resolubility with very good adhesion properties. The product is mainly targeted for inkjet inks for flexible packaging.	Yellowish translucent liquid
NeoPac™ D-2203	A film-forming hybrid urethane acrylic dispersion with excellent resolubility/latency combined with excellent adhesion properties to packaging films. The product also provides excellent bond strengths in flexible packaging laminates.	Yellowish translucent liquid
NeoCryl® D-2204	A medium-MFFT self-crosslinking acrylic dispersion with a broad formulation latitude. The binder is mainly targeted for aqueous ink applications for flexible packaging but can also be used where good chemical resistances are required on other substrates.	Hazy, yellowish liquid
NeoRez® D-2301	An aliphatic urethane dispersion designed for inkjet printing applications. The highly flexible polyurethane provides excellent adhesion to a variety of substrates used in flexible packaging and textile printing applications.	Bluish, hazy liquid

	SOLIDS %	VISCOSITY mPas	pH	PARTICLE SIZE nm	MFFT °C	DENSITY kg/L	MOLECULAR WEIGHT kD	ACID VALUE mg KOH/g DRY RESIN
	41–43	10–100	7–8	100	55	1.03	> 100	33
	37–38	40	7–8	55	< 5	1.04	20	8
	28.5–30.5	max 350	7.5–8.1	n.a.	< 0	1.06	15–20	63
	39–41	50–500	8–8.5	120	10	1.06	> 100	66
	39–41	10–25	5–6	n.a.	0	1.06	30	71
	44–46	40–100	7.8–8.2	95	29	1.05	> 100	49
	43–45	25–175	7.3–7.9	60	7	1.05	bimodal	28
	38–40	75–350	7.5–8.5	60	< 0	1.02	> 100	4
	39–41	max 150	8.3–8.9	60	33	1.05	bimodal	12
	32–34	max 200	7–9	60	< 5	1.02	45	n.a.

Resins for overprint varnishes (OPVs)

When it comes to adding a coating to board, paper, or film packaging, our waterborne resins offer all the adhesion, anti-blocking, and physical and chemical resistance you need – as well as improving the final product's 'look and feel'. In particular, our **Skins® OPV resins** can deliver aesthetic and haptic effects that really make packaged products stand out. And, to give you greater flexibility, our overprint varnishes are available for both analog and digital applications.

DESCRIPTION

Binders from the Skins® portfolio for analog applied overprint varnishes

APPEARANCE

	DESCRIPTION	APPEARANCE
NeoRez® R-1021	An aliphatic waterborne urethane dispersion that adds a smooth, silky feel and matt coating to print. It can be used on a wide range of papers, boards and plastics including food packaging.	Milky white liquid
NeoRez® R-1030	A specialty aliphatic polyurethane dispersion with large particle size which adds a matt, soft, rubbery coating to print. The soft rubbery textures make text and graphics on packaging more visible on the shelf.	Milky white liquid

DESCRIPTION

Binders for digital and analog applied overprint varnishes

APPEARANCE

	DESCRIPTION	APPEARANCE
NeoCryl® D-2101	A high-MFFT/non-film-forming styrene acrylic dispersion with a very broad compatibility profile and excellent latency. A robust product to use in aqueous overprint varnish formulations for paper and board applications. Once the film is properly formed, the product provides a very resistant coating.	Milky white liquid
NeoRad™ D-2102 XP	A waterbased acryloyl functional/energy-curable polyurethane dispersion with high double bond functionality. The product provides both excellent resolubility and very good resistance properties after UV/LED/EB curing. A product highly suitable to formulate OPVs for paper and film substrates.	Bluish liquid
NeoCryl® D-2201	A medium-MFFT self-crosslinking acrylic dispersion that can be used in jettable overprint varnishes for both absorbent and non-absorbent substrates. The product provides a broad ink formulation latitude combined with excellent hardness, adhesion window and film formation.	Milky white liquid
NeoCryl® D-2202	A low-MFFT self-crosslinking acrylic dispersion with very good adhesion properties. The resin has excellent resolubility and can be used for jettable overprint varnishes for flexible packaging applications.	Yellowish translucent liquid

	SOLIDS %	VISCOSITY mPas	pH	PARTICLE SIZE nm	MFFT °C	DENSITY kg/L
	31-33	700-1,800	7.0-8.6	> 1,000	< 0	1.05
	31-33	300-1,000	7.0-8.5	> 1,000	< 0	1.05

	SOLIDS %	VISCOSITY mPas	pH	PARTICLE SIZE nm	MFFT °C	DENSITY kg/L
	41-43	10-100	7-8	100	55	1.03
	37-38	20-100	7-8	55	< 5	1.04
	44-46	40-100	7.8-8.2	95	29	1.05
	43-45	25-175	7.3-7.9	60	7	1.05

Energy curable portfolio

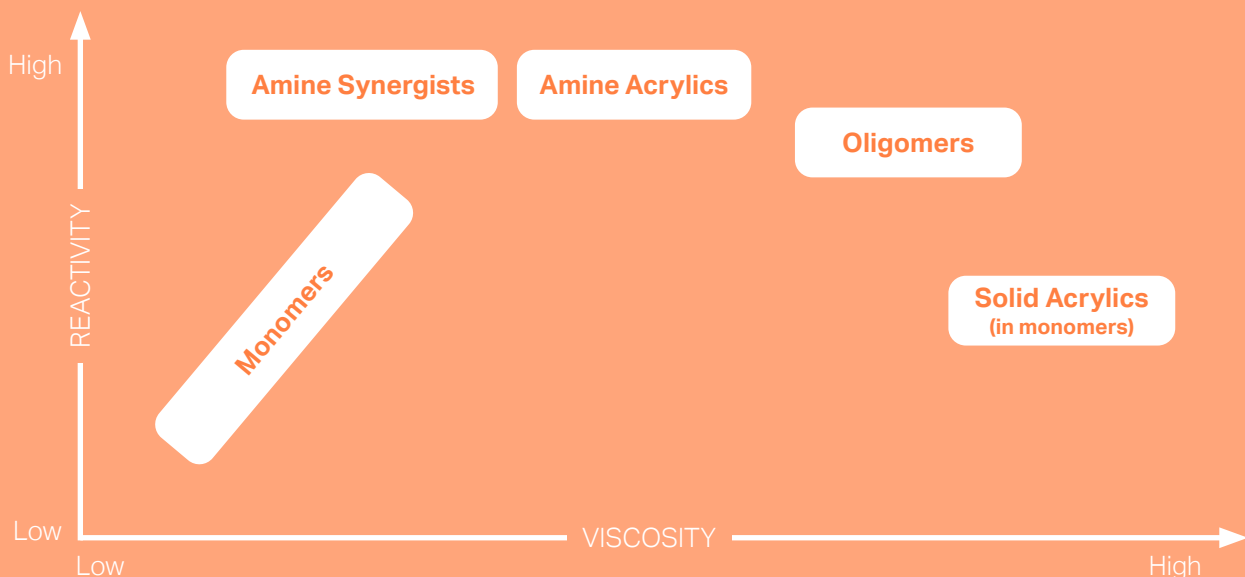
Offering fast curing, high durability, and print reliability, energy-curable (UV, LED and EB) inkjet inks are a popular choice for applications on absorbing and non-absorbing substrates.

One of the key benefits of energy-curing technology is that it offers an optimal balance between print reliability (excellent resolubility and open time as long as the ink is not cured) and durability of the cured film (excellent resistance properties after very fast cure). This is a clear benefit over most waterborne systems, where achieving this balance is more complex.

Unlike water- or solvent-based systems, energy-curable inkjet ink systems are 100% solid systems and are cured with radiation. Hence the film thickness of energy-curable inkjet inks is higher than that of water- or solvent-based inkjet inks. Typical film thicknesses of 5–40 μm are realistic for energy-curabale inkjet inks while waterborne inks are more in the range of 1–5 μm .

The major challenge of inkjet inks is that the inks need to be very low in viscosity to provide good drop generation in the printhead. This requirement, in combination with cure speed/reactivity, is an important factor in selecting the right ingredients for the ink. Low viscosity of pigment dispersion with particles of sub-micron (ca. 100nm) size requires the use of special pigment grades with specific primary particle size, and the use of dispersants matched to the pigment.

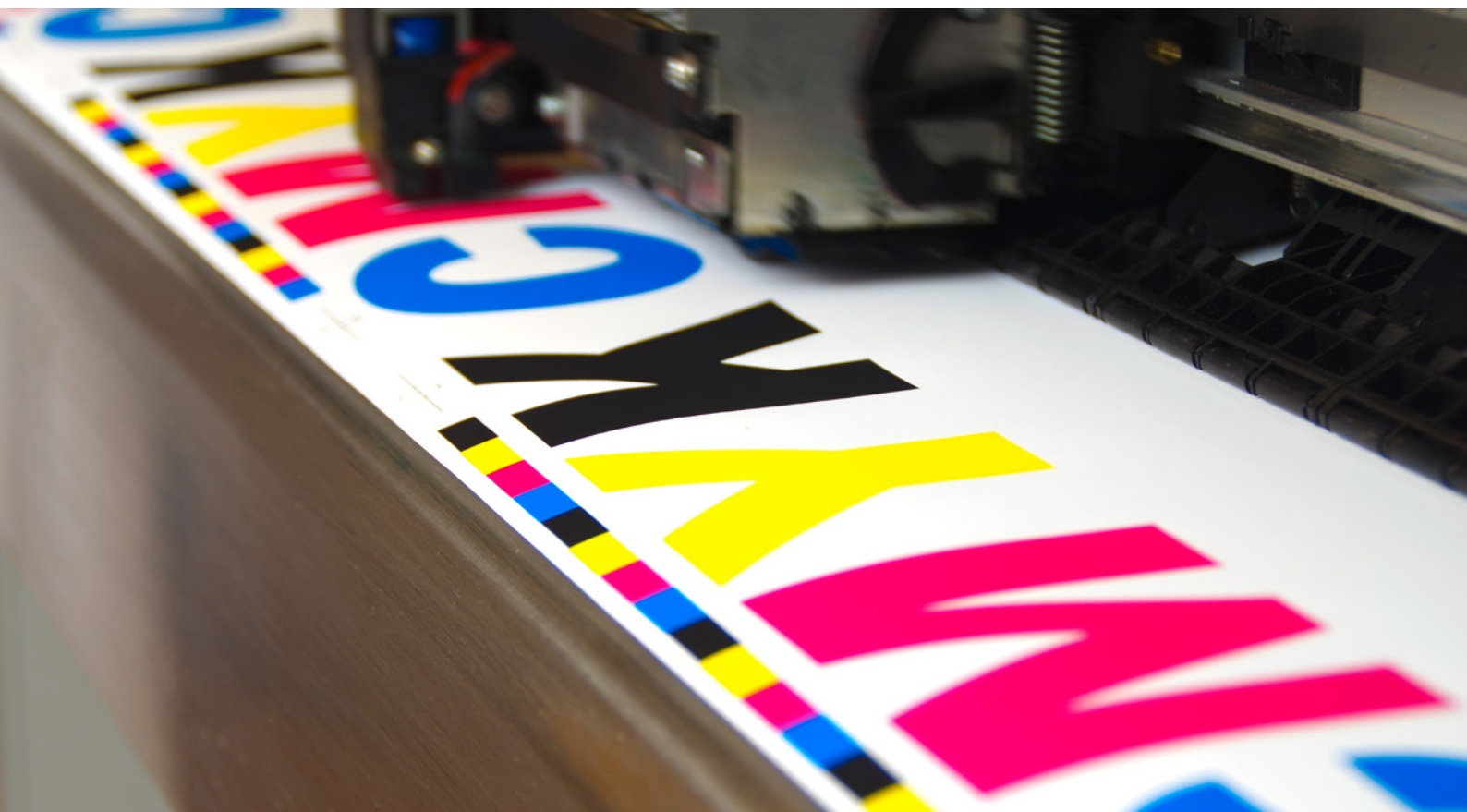
Viscosity/reactivity performance relation



Inkjet pigment dispersion needs to deliver high levels of colloidal stability during production and storage, requiring a resin and dispersing agent system with good pigment wetting properties and excellent steric stabilisation characteristics **(AgiSyn™ 008 & NeoRad™ P-50)**.

The reactivity or cure speed of the energy-curable inkjet inks depends on the binder composition, the level and quality of the photo initiator and the color type and intensity. The major component in the inks are mono- and difunctional monomers that exhibit a low viscosity. The other resin ingredients in the formulation providing additional performance requirements are pigment dispersing resins, oligomers, adhesion promoters and cure speed enhancers. Covestro offers all these materials in this portfolio.

The raw material selection in energy-curing systems is not straightforward because there are many interactions that impact the total performance and therefore a careful selection of raw materials is required. In the table on the following page, we provide you with an overview of the key performance contributors and properties of the portfolio.



Which Covestro UV inkjet resin is right for me?

Monomers	FUNCTIONALITY			VISCOSITY CONTROL	ADHESION		HARDNESS		CURE SPEED
	VISCOSITY (mPa.s @ 25°C)	ACID VALUE mg KOH/g		PIGMENT GRINDING		SOLVENT RESISTANCES			
	Physical properties			Typical properties					
AgiSyn™ 2832 <ul style="list-style-type: none"> • 2-Phenoxy ethyl acrylate • Strong dilution effect • Low shrinkage • Excellent adhesion (various plastics and metals) • High refractive index 	5–15	1	< 0.5	●●●	●●●	●●●●	●●●●	●	●
AgiSyn™ 2839* <ul style="list-style-type: none"> • Tetrahydrofurfuryl acrylate • Strong dilution effect • Good adhesion to plastics • Good outdoor resistance 	3–12	1	< 0.5	●●●●	●●●	●	●●●●	●	●●
AgiSyn™ 2852* <ul style="list-style-type: none"> • Cyclic trimethyl propane formal acrylate • Low odor • Excellent adhesion (various plastic and metals) • Good abrasion and chemical resistance 	15–20	1	< 0.5	●●	●●●	●●●	●●●●	●	●
AgiSyn™ 2870 <ul style="list-style-type: none"> • Isobornyl acrylate • High Tg though good flexibility • Excellent adhesion to a variety of substrates • Good outdoor resistance 	5–15	1	< 0.1	●●	●●●	●●●●	●●●●	●●●●	●
Agisyn™ 2880* <ul style="list-style-type: none"> • 2-(2-ethoxyethoxy)ethyl acrylate • High flexibility • Good adhesion • Strong dilution effect 	3–8	1	< 0.5	●	●●●●	●	●●●●	●●●	●●
AgiSyn™ 2896 <ul style="list-style-type: none"> • Lauryl acrylate • Low surface tension • Good adhesion 	4–10	1	< 0.5	●●●	●●●●	●●●●	●●●●	●●●	●

Monomers	FUNCTIONALITY			VISCOSITY CONTROL	ADHESION		HARDNESS		CURE SPEED
	VISCOSITY (mPa.s @ 25°C)	ACID VALUE mg KOH/g		PIGMENT GRINDING		SOLVENT RESISTANCES			
	Physical properties			Typical properties					
AgiSyn™ 2816 <ul style="list-style-type: none"> • 1,6- Hexanediol diacrylate • Multipurpose acrylate • Outstanding adhesion to plastics • Strong dilution effect • Good outdoor resistance 	5–10	2	< 0.1	●●●●	●●●	●●●●	●●●●	●●●	●●●
AgiSyn™ 2833* <ul style="list-style-type: none"> • Dipropylene glycol diacrylate • Good dilution effect • High T_g 	7–13	2	< 0.5	●●●	●●●●	●●●	●●●●●	●●●●	●●●

Oligomers	Physical properties			Typical properties					
	NeoRad™ P-50 <ul style="list-style-type: none"> • Low odor, low extratable and low viscous pigment grinding vehicle • Low viscosity with higher pigment content with excellent flow properties • Good adhesion to various plastics • Based on 20% renewable materials 	1,500–2,500	4	< 10	●●	●●●●●	●●●●●	●●●●●	●●●●
AgiSyn™ 720 <ul style="list-style-type: none"> • Low viscosity Polyester acrylate • Good reactivity & compatibility • High gloss 	400–1,000	4	< 20	●●	●●●●	●●●	●●●●	●●●	●●●●

Which Covestro UV inkjet resin is right for me?

	FUNCTIONALITY		VISCOSITY CONTROL	ADHESION		HARDNESS		CURE SPEED	
	VISCOSITY (mPa.s @ 25°C)	ACID VALUE mg KOH/g	PIGMENT GRINDING	SOLVENT RESISTANCES					
AgiSyn™ 002 <ul style="list-style-type: none"> Functionalized amine synergist Low viscosity High reactivity Highly efficient co-initiator (10–15% use in formulation) for surface cure 	10–30	1	< 1	●●●	●●	●●●●	●●●	●●	●●●●●
AgiSyn™ 008 <ul style="list-style-type: none"> Functionalized amine synergist High reactivity Good resistance to water Good adhesion to plastics Good pigment wetting 	800–1,500	2	< 1	●●	●●●●	●●●●	●●●●	●●●	●●●●●
AgiSyn™ 701 <ul style="list-style-type: none"> Amine-modified polyether acrylate High reactivity Good pigment wetting Low irritancy 	2,500–3,500	4	< 1	●	●●●	●●●●	●●●●	●●●●	●●●●
AgiSyn™ 703 <ul style="list-style-type: none"> Amine-modified polyether acrylate Low viscosity High reactivity High scratch resistance 	450–650	4	< 1	●●	●●●	●●●	●●●●	●●●	●●●●
NeoRad™ P-85 <ul style="list-style-type: none"> Amine-modified polyether acrylate Low viscosity High reactivity High scratch and chemical resistance 	300–700 (23°C)	6	< 10	●	●●	●●●	●●●●●	●●●●	●●●●●

	FUNCTIONALITY		VISCOSITY CONTROL	ADHESION		HARDNESS		CURE SPEED	
	VISCOSITY (mPa.s @ 25°C)	ACID VALUE mg KOH/g		PIGMENT GRINDING	SOLVENT RESISTANCES				
Solid acrylics									
NeoCryl® B-300 <ul style="list-style-type: none"> • Solid methacrylic copolymer • Low viscosity when dissolved in diluting acrylates • Excellent adhesion • Good scatch resistance 	700–1,300	0	< 1	●	●●●●	●●●●●	●●●●●	●●●●	●
NeoCryl® B-302 <ul style="list-style-type: none"> • Solid methacrylic copolymer • Low viscosity when dissolved in diluting acrylates • Excellent adhesion • High T_g 	400–800 ¹	0	< 5	●●	●●●●	●●●●	●●●●●	●●●●●	●
NeoCryl® B-890 <ul style="list-style-type: none"> • Solid methacrylic copolymer • Excellent pigment wetting properties • Good adhesion to difficult substrates • Good outdoor durable propertiers • High T_g 	1,000–1,500 ²	0	< 80	●	●●●●	●●●●	●●●●●	●●●	●

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