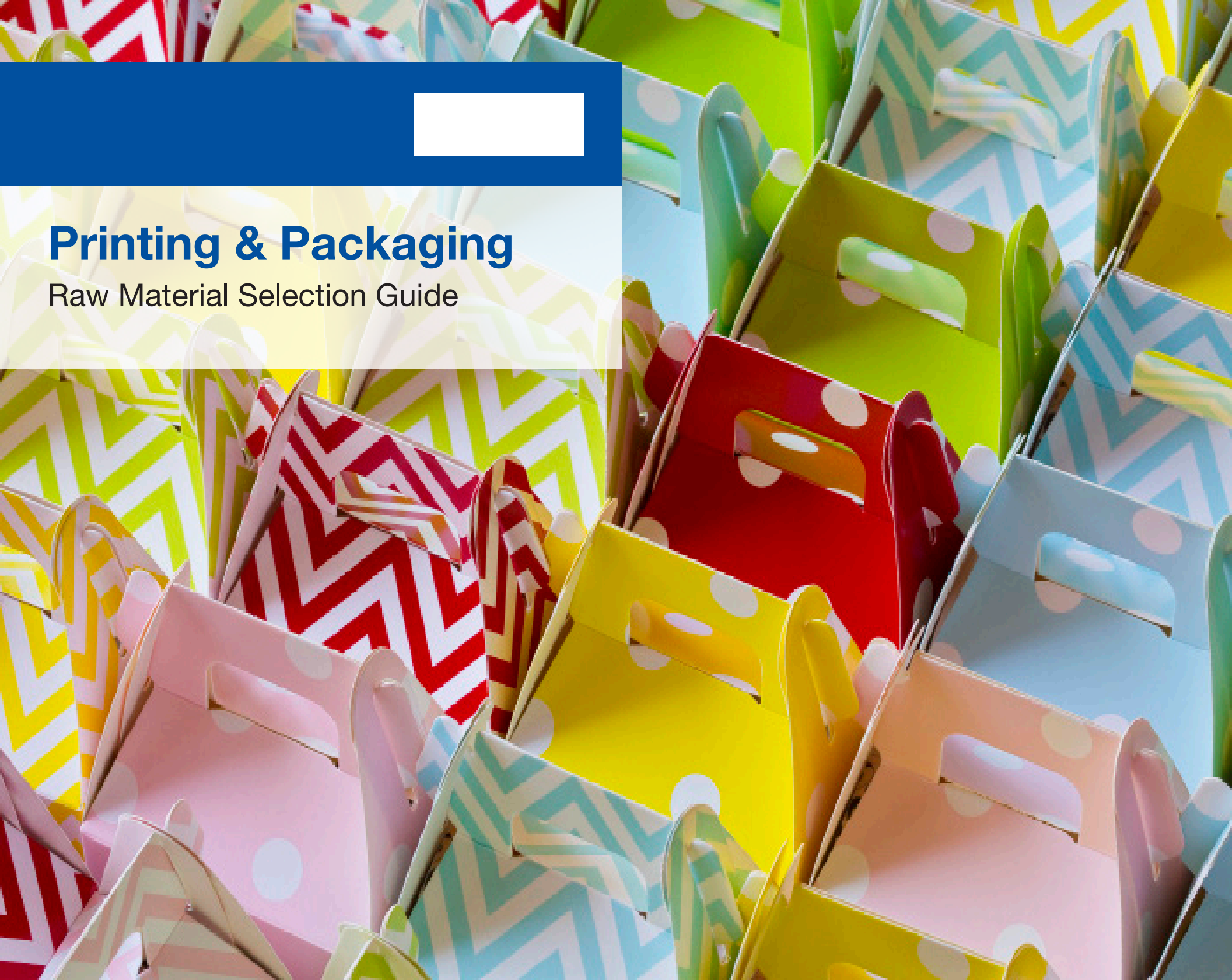
Printing & Packaging

Raw Material Selection Guide



Supporting the conversion to sustainable solutions

Sustainability is a guiding principle in how we approach innovation. One of our key contributions is the conversion from solvent-based to water-based printing and converting processes. This shift enables significant environmental benefits while maintaining high performance and cost competitiveness.

In the printing and packaging industry, we've identified the reduction of emissions and continuous improvements in health and safety in use as critical drivers for developing more sustainable inks. These insights shape our product development and help us align with the evolving expectations of our customers and regulatory landscapes.

To ensure our solutions deliver meaningful impact, we apply our Sustainable Solution Steering method. This appraoch evaluates the entire value chain from cradle to grave, while considering industry- and region-specific views in our markets. By identifying key sustainability drivers, we systematically review the performance of our resins and additives in their specific applications. This allows us to assess and enhance the sustainability profile of each product with precision and relevance.

We create chemistry that makes performance love sustainable solutions.

Our commitment to sustainability is reflected across our technologies, including those featured in our BRC portfolio, which you'll find detailed later in this brochure. These solutions are designed to support your goals without compromising on quality or efficiency.

Let's take a look at your specific requirements and explore out how we can further improve your sustainability profile**.**

Learn more about BASF's commitment to driving sustainable solutions at: www.basf.com/sustainability

At BASF, we create chemistry

About the Dispersions & Resins Division

The Dispersions & Resins business of BASF develops, produces, and markets a range of high-quality resins, additives, colorants, and polymer dispersions worldwide. These raw materials are used in formulations for coatings and paints, printing and packaging products, construction coatings, adhesives, cellulosics and composites, and paper manufacturing. With a comprehensive product portfolio and extensive knowledge of the industries we serve, our customers benefit from innovative and sustainable solutions to help them advance their formulations through chemistry. For further information about the Dispersions & Resins business in North America, please visit **http://www.basf.us/dpsolutions.**

Creating chemistry for the printing and packaging industries

At BASF, we create chemistry that helps the printing and packaging industries meet specific needs for ecologically friendly solutions without sacrificing functionality and performance.

We offer a comprehensive portfolio of resins, performance and formulation additives for specific printing and packaging applications. In addition, we have the best team in the industry to help you solve your most difficult technical challenges.

Service capabilities

Our expert teams, serving the needs of our customers in North America, offer expertise in chemistry, applications, and formulations. We can help you with:

- Formulation support
- Global research and development
- Regulatory support
- Product stewardship
- Global sourcing capabilities

Broad technology portfolio

BASF provides virtually every ingredient you need, including:

- Acrylic resins, resin solutions, RC emulsions, and colloids
- Energy-curing oligomers and reactive diluents
- UV absorbers and light stabilizers
- Wax emulsions, dispersing agents, rheology modifiers, wetting and surface modifying agents, and defoamers
- Antioxidants

Unique performance attributes

Whatever you are trying to achieve technically, BASF can work with you to develop innovative solutions for your customers that address a multitude of performance attributes, including:

- Consistent product quality
- Printability and resolubility
- Clarity and gloss
- Color strength and stability
- Low VOC and low HAPS
- Resistance and adhesion
- FDA and Global food contact compliance

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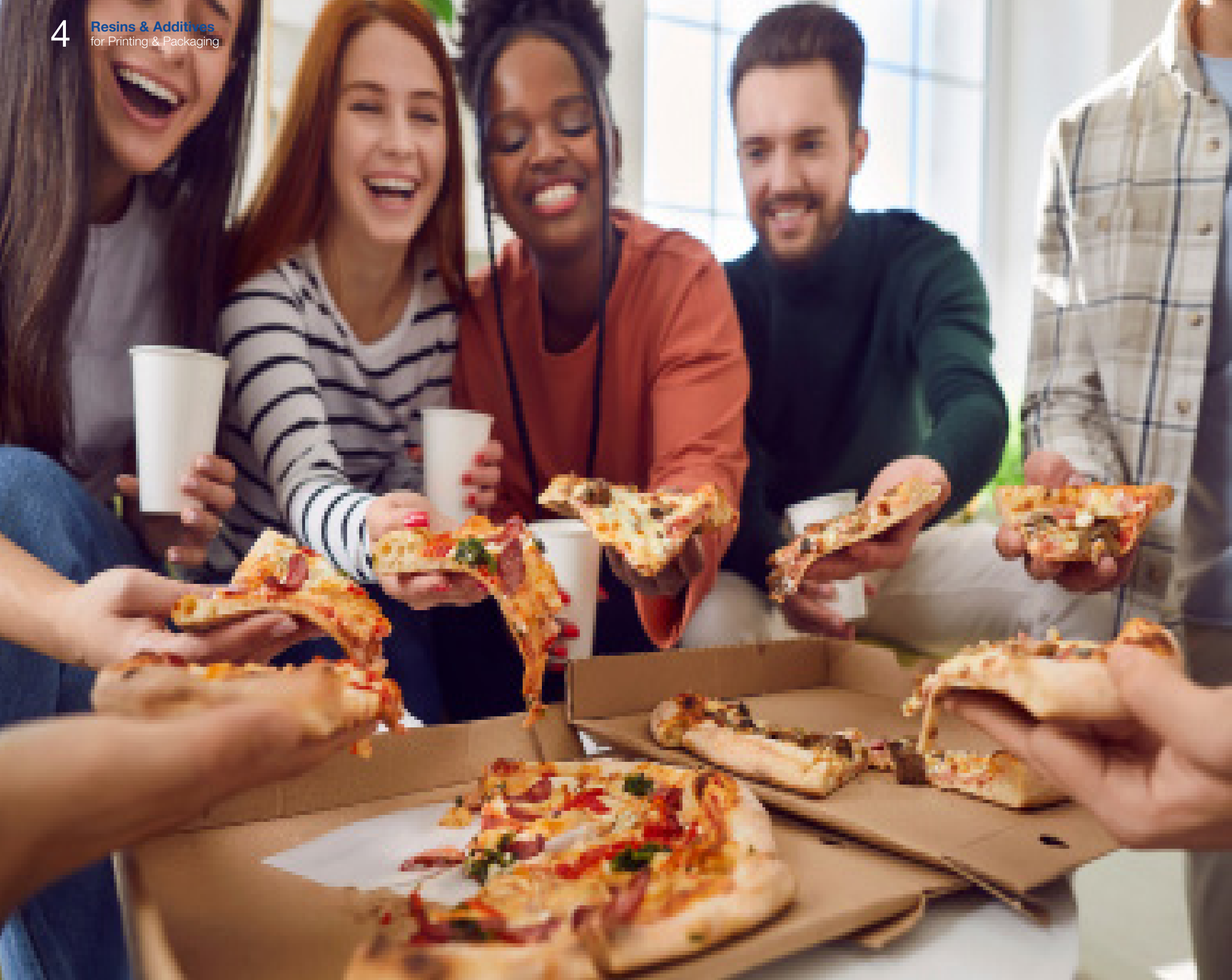


The best choice for printing and packaging applications

Packaging printing
Our portfolio enables you to increase the effectiveness and structural qualities of your packaging. We understand the performance and sustainability challenges you face, such as cost savings, product quality and consistency, resistance and resolubility, grinding efficiency and color strength, low VOC and food contact compliance.

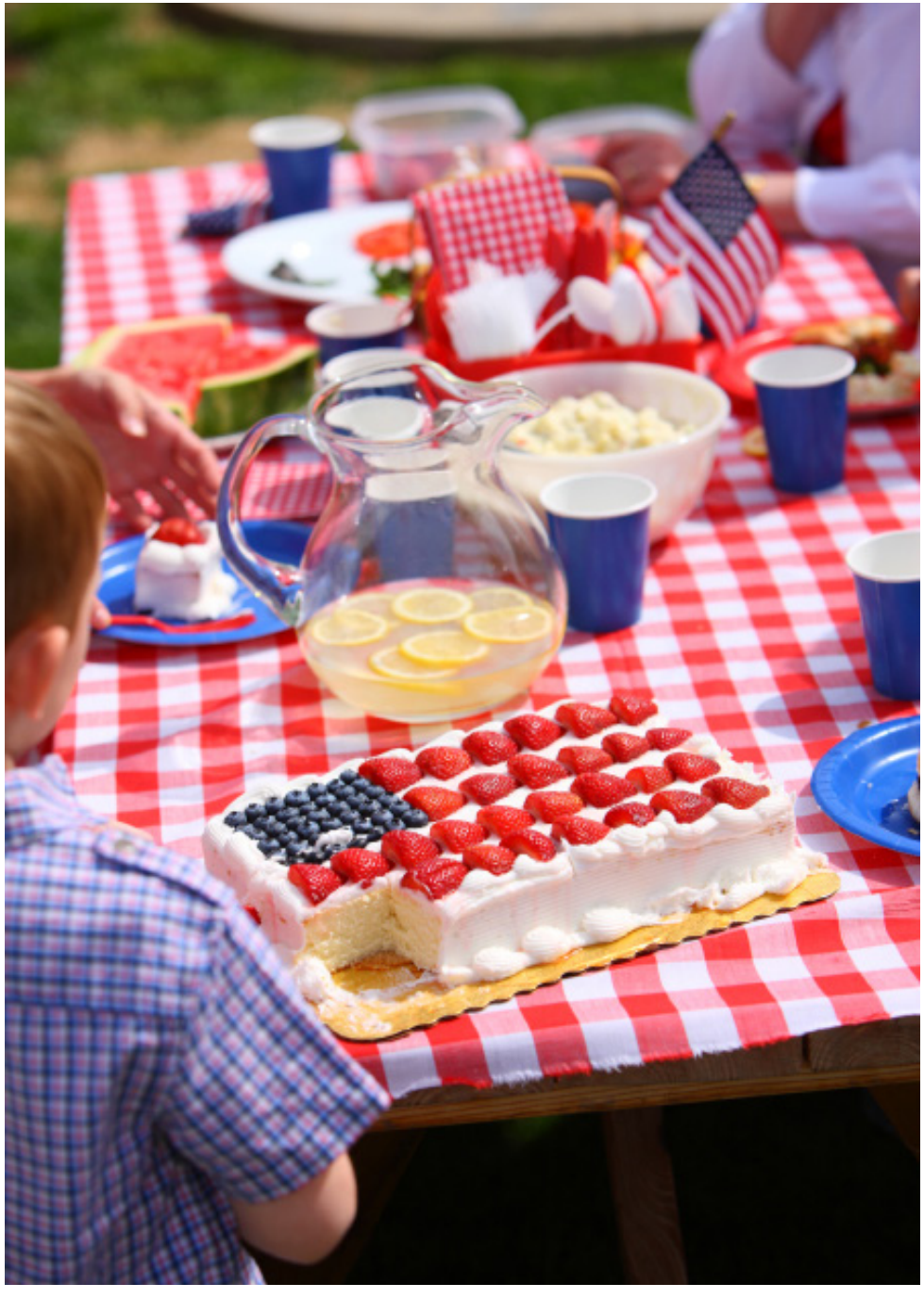
Packaging inks
For eco-efficient flexible packaging, we have developed a full range of water-based and energy-curable solutions suitable for both surface and reverse printing on different film substrates. Our resins enable efficient printing on corrugated board, reducing the amount of binder and thus cost-in-use. For paper and paperboard, our portfolio provides products for flexographic, gravure and digital applications.

Functional packaging coatings
Part of our product portfolio is water-based binders, which add functionality to your packaging. From aqueous acrylic binders for the formulation of heat seal lacquers with low to high activation temperatures, to pre-metalization primers for vacuum-metallized paper substrates, we offer numerous solutions.

Overprint varnishes
Are you looking to formulate a clear varnish for a matte, satin or glossy finish? Our water-based styrene acrylic binders provide maximum formulation flexibility. Our energy-curable solutions show excellent gloss and scuff resistance on absorbing and non-absorbing substrates.

Industrial printing
When it comes to decorative laminates, wallpapers or floor decors, our resins and additives complement your needs, with high molecular weight dispersing agents that improve the tinctorial strength and ink viscosity. Defoamers, slip and surface additives optimize finishing effects and applicability. To round off our solution package, we offer a range of water-based, solvent-based, and UV resins, reactive diluents, and light stabilizers.

Digital printing
Raw materials for drop-on-demand inkjet are available for both radiation-curing and water-based digital printing technologies. Our Laromer monomers and oligomers support radiation-curable digital inks for graphic arts and labels, while our low-viscosity, high-solids resins and additives enable resolubility, adhesion, and stable pigment dispersion in water-based systems. These water-based technologies form the core of our Digital Printing Solutions (DPS) portfolio, designed to meet the evolving demands of digital printing with a focus on sustainability and performance.



Water-based resins

With our Joncryl range, we offer high-performance resins that enable flexible packaging printers and converters to switch from solvent-based to water-based technologies. Stricter regulations are a key issue in the industry, and we make sure that it is incorporated into our new product development process, e.g., compliance with food contact legislation.

Flexible printing inks without performance trade-off

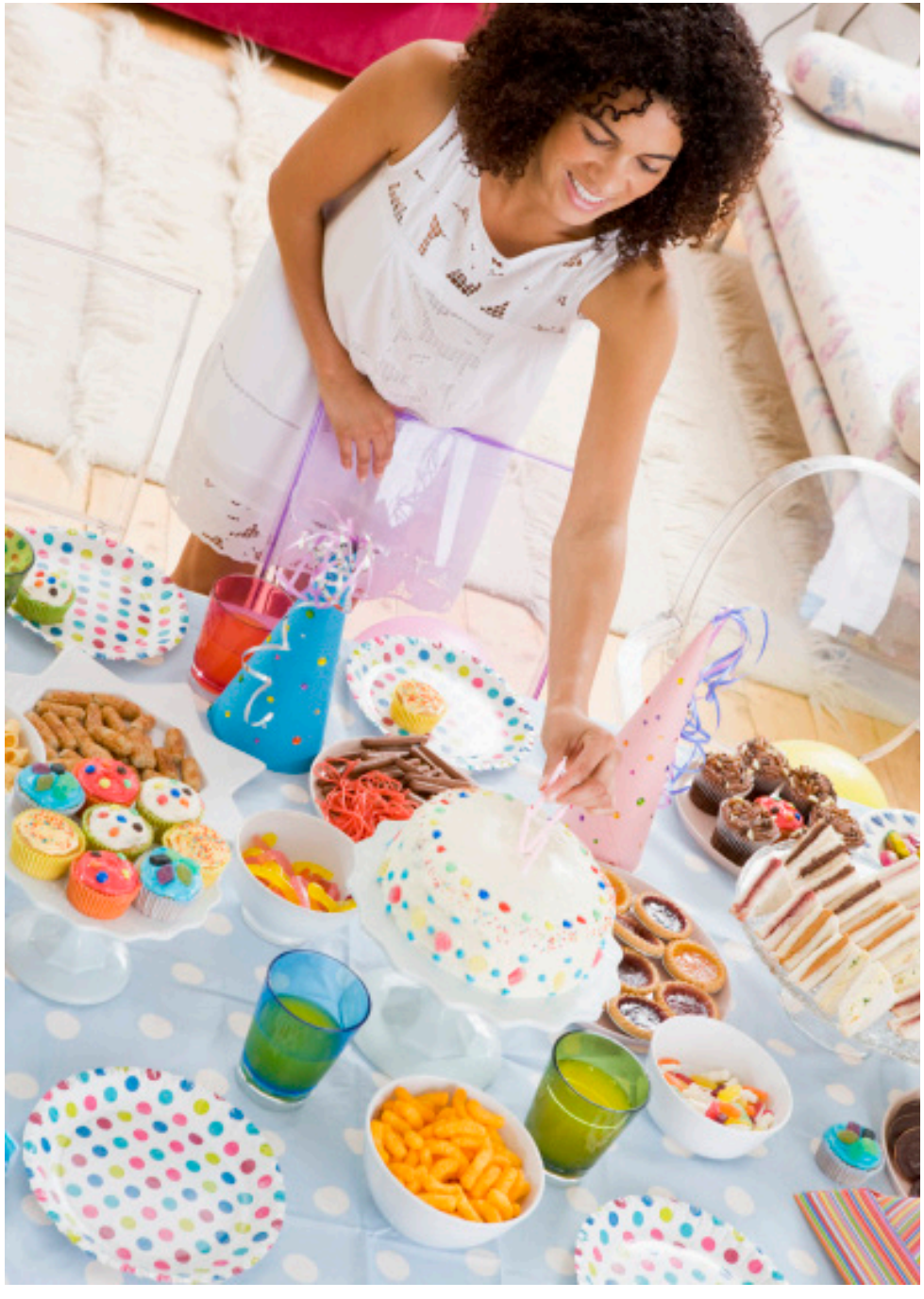
The Joncryl FLX portfolio is known in the industry as the reference in resins for water-based film printing inks. The portfolio provides substrate wetting, adhesion, and chemical resistance properties along with good printability and resolubility for surface-print inks on a broad range of substrates. The Joncryl FLX product line also offers excellent adhesion and lamination bond strength for lamination ink applications. Joncryl FLX products are not only cost-effective and eco-efficient, they also represent our commitment to support printers and converters with sustainable solutions – without compromising on performance.

Strong inks for a more colorful world

Joncryl HPD (High Performance Dispersion) series of resins and resin solutions offers excellent color development, ink stability, processing efficiencies, and improved cost-in-use. Joncryl HPD resins and resin solutions provide strong, high-performance, viscosity-stable inks that meet the needs of high-quality imaging.

pH stability without sacrificing resistance properties

The Joncryl LMV series of low-maintenance vehicles provides the printing industry a complete selection of resin solutions and emulsions that can reduce waste and downtime due to anilox plugging and ink build-up on printing plates. Joncryl LMV 7000 series pH-stable polymers, when used to make low VOC inks for paper, film, and foil inks, demonstrate a balance of clean printing, resolubility, and excellent pH stability without sacrificing resistance properties.



Joncryl acrylic resins

BASF's Joncryl acrylic resins meet the most stringent formulation requirements of ink and overprint varnish manufacturers: high molecular weight resins for high pigment load, high solids dispersions used in quality inks for film, foil, and paper applications; general purpose, mid-range molecular weight resins for gloss, resolubility, and drying speed modification; and low molecular weight resins used in high-gloss overprint varnishes and label inks.

Product	Appearance	Non Volatile (%)	Total VOC (% wt)	Molecular Weight (Mw)	Acid No. (NV)	Density @ 25°C (g/cm^3)	Softening Point (°C)	Tg (°C)	Description and Applications
Joncryl 67	clear	98.6	1.4	13,000	213	1.14	143	73	High molecular weight acrylic resin for high-quality pigment dispersions. It can also be used for water-soluble pigment chips where maximum color development and transparency are essential.
Joncryl 611	clear	99.8	0.2	8,100	53	1.12	112	50	Mid-range molecular weight, film-forming, solvent-soluble acrylic resin capable of maintaining high solids at low viscosity in solvent-based formulations.
Joncryl 678	clear	98.7	1.3	8,600	215	1.16	165	109	General purpose, mid-range molecular weight acrylic resin for water-based inks, pigment dispersions, and overprint varnishes that promotes gloss, holdout, and resolubility.
Joncryl 680	clear	99.3	0.7	4,500	215	1.15	127	67	Low molecular weight acrylic resin for high solids, low viscosity solutions to enhance gloss, resolubility, and transfer in printing ink formulations.
Joncryl 682	yellow	99.5	0.5	1,700	238	1.16	105	56	Very low molecular weight acrylic resin for high solids overprint varnishes with high gloss and excellent holdout.
Joncryl 683	clear	98.0	2.0	8,000	165	1.13	81	75	Low acid value acrylic resin that imparts resolubility and gloss in alkaline-resistant inks and overprint varnishes.
Joncryl 690	clear	98.5	1.5	16,500	240	1.07	155	102	High molecular weight, high acid value acrylic resin that optimizes the gloss and transparency of organic pigment dispersions.
Joncryl 693	clear	99.1	0.7	6,000	205	1.16	140	84	Cost-effective, mid-range molecular weight acrylic resin that offers superior value when used as a component in overprint varnishes or as an ink-extender resin.
Joncryl ECO 675	clear	99.5	0.5	5,700	222	1.16	141	103	General purpose, glycol ether-free[a], low VOC, mid-range molecular weight acrylic resin that enhances gloss, holdout, and resolubility in low odor inks and overprint varnishes for food packaging applications.
Joncryl ECO 684	slightly yellow	99.5	0.5	1,850	243	1.16	122	88	Low molecular weight, glycol ether-free[a] acrylic resin that provides high solids overprint varnishes with excellent gloss and holdout for food packaging applications.
Joncryl HPD 671	clear	99.4	0.4	17,250	214	1.14	173	128	Cost-effective, high molecular weight acrylic resin for high-quality pigment dispersions with very good viscosity stability.
Joncryl HPD 696	clear	98.9	1.1	16,000	220	1.16	155	88	High molecular weight acrylic resin that improves color development and gloss of pigment dispersions without compromising ink stability.

[a] The glycol ether level averages less than 0.002 wt%.

Joncryl acrylic resin solutions

Resin solutions based on Joncryl SGO resin technology are a convenient and cost-effective manufacturing alternative to Joncryl solid resins. The Joncryl HPD line of resin solutions allows ink manufacturers to make pigment dispersions that reduce milling time, are higher in pigment loading and color development, are viscosity stable and compatible in most water-based ink systems.

Product	Appearance	Non Volatile (%)	Total VOC (% wt)	Molecular Weight (Mw)	Viscosity @ 25°C (cps)	pH	Acid No. (NV)	Density @ 25°C (g/cm^3)	Tg (°C)	Description and Applications
Joncryl 50	clear amber	50.0	0.2	1,700	5,000	8.4	238	1.11	56	Low VOC solution of Joncryl 682 for high solids overprint varnishes that require high gloss and excellent holdout.
Joncryl 59	clear	32.0	0.4	8,600	1,500	8.6	215	1.07	109	Low viscosity version of Joncryl 60 offering good gloss, holdout, and clarity in pigment dispersions, inks, and overprint varnishes.
Joncryl 60	yellow	34.0	0.5	8,500	5,500	8.5	215	1.07	109	Low VOC solution of Joncryl 678 in water and ammonia for good gloss, holdout, and clarity in pigment dispersions, inks, and overprint varnishes.
Joncryl 61	yellow	35.5	5.7	8,500	3,500	8.3	215	1.06	109	Solution of Joncryl 678 for gloss, holdout, and resolubility in inks and overprint varnishes.
Joncryl 62	clear	30.5	1.4	13,000	4,500	8.3	213	1.06	73	Solution of Joncryl 67 for high pigment loading with either dry pigment or press cake in inks and overprint varnishes.
Joncryl 63	clear	30.5	0.5	13,000	5,000	8.5	213	1.07	73	Low VOC solution of Joncryl 67 for high-quality dispersions and printing inks.
Joncryl ECO 75	clear yellow	33.5	0.2	5,700	2,000	8.5	222	1.07	103	General purpose, glycol ether-free[a], mid-range molecular weight acrylic resin solution for pigment dispersion, low odor ink, and overprint varnish applications.
Joncryl HPD 71	clear	27.5	0.2	17,250	4,000	8.5	214	1.05	128	Solution of Joncryl HPD 671 for cost-effective, heat-resistant, high-quality pigment dispersions with very good viscosity stability.
Joncryl HPD 96	clear	34.0	0.6	16,000	5,000	8.5	220	1.10	88	Solution of a high molecular weight acrylic resin that improves color development and gloss of pigment dispersions without compromising ink stability.
Joncryl HPD 96 MEA	yellow - amber	39.0	8.6	16,000	5,000	8.6	220	1.10	86	Solution of a high molecular weight acrylic resin in water and mono-ethanol amine that improves the color development and gloss of pigment dispersions with excellent rheology, flow, and stability.
Joncryl HPD 196	clear	36.0	0.4	9,200	3,800	8.6	200	1.08	92	Solution of a mid-range molecular weight acrylic resin for dispersing organic pigments at high concentrations without compromising stability.
Joncryl HPD 196 MEA	yellow - amber	41.5	7.8	9,200	3,500	8.5	200	1.08	92	Solution of a mid-range molecular weight acrylic resin for dispersing organic pigments at high concentrations without compromising stability.
Joncryl HPD 296	yellow	36.3	0.4	11,500	600	8.1	141	1.03	15	High-performance resin solution that improves the viscosity and shock stability of highly pigmented dispersions.
Joncryl HPD 396	clear	31.5	0.2	10,000	500	8.5	185	1.07	91	High performance resin solution for pigment concentrates with low viscosity and high shock stability. Outstanding performance with difficult to disperse pigments. Improves milling speed.
Joncryl HPD 496-A	clear	34.5	0.2	5,500	500	8.5	178	1.07	58	Premium resin solution for high pigment load color concentrates for highest color development, best rheology and shock resistance. Excellent rheology at high pigment concentration.
Joncryl LMV 7025	clear	31.0	0.4	12,500	1,200	7.3	235	1.06	97	Low-maintenance, pH-stable, low VOC solution that modifies the resolubility and drying speed of Joncryl LMV-based inks.
Joncryl LMV 7085	clear	34.5	0.4	12,500	2,000	7.2	215	1.07	77	Low-maintenance, pH-stable, low VOC solution that optimizes organic pigment dispersions in Joncryl LMV-based inks, producing lower amounts of foam during pigment grinding.

[a] The glycol ether level averages less than 0.002 wt%.

Joncryl emulsions

Joncryl emulsions allow inks and overprint varnishes to meet the demanding shear stress encountered in high-speed flexographic and gravure printing. Rheology Controlled (RC) Emulsions provide wetting and adhesion as well as gloss and clarity to inks and overprint varnishes on a wide variety of substrates. The versatile Joncryl LMV line provides resolubility, pH stability, and improved pressroom efficiency through savings in ink additives and a reduction in ink waste. The products listed below are arranged in order from the lowest to the highest glass transition temperature (Tg).

Product	Appearance	Non Volatile (%)	Total VOC (% wt)	Viscosity @ 25°C (cps)	pH	Acid No. (NV)	Density @ 25°C (g/cm^3)	Tg (°C)	MFFT (°C)	Freeze-thaw Stable	Description and Applications
Joncryl 1695	translucent	39.2	0.3	700	8.1	120	1.03	- 50	< 5	yes	Soft film-forming acrylic emulsion with no added zinc or other metallic crosslinkers for use in high heat-resistant inks and overprint varnishes.
Joncryl HRC 1661	semi-translucent	47.0	0.3	500	8.3	54	1.02	- 42	< 0	no	High-performance, film-forming acrylic emulsion that provides rub and water resistance in overprint varnishes.
Joncryl ECO 2124	translucent	47.3	0.1	1,000	7.9	65	1.04	- 35	< 0	yes	Soft film-forming, glycol ether-free[a], low VOC acrylic emulsion with good adhesion and flexibility for food packaging applications.
Joncryl 80	semi-translucent	48.0	0.7	550	7.8	50	1.05	- 30	< 7	yes	General purpose acrylic emulsion for water-based flexo and gravure inks with good adhesion to flexible films and foils.
Joncryl 624	translucent	48.0	1.1	900	8.2	50	1.05	- 30	< 7	yes	General purpose, soft film-forming acrylic emulsion for water-based flexo and gravure inks on flexible films and foils.
Joncryl LMV 7034	translucent	47.8	0.7	800	7.6	52	1.05	- 30	< 0	yes	Film-forming, low-maintenance, pH-stable acrylic emulsion that provides adhesion and water-resistant characteristics in inks for utility bag and other surface-print film and foil applications.
Joncryl 1685-A	semi-translucent	43.5	< 1.1	350	9.5	89	1.07	- 20	< -5	yes	Acrylic emulsion which provides heat resistance to waterborne inks and overprint varnishes. Provides outstanding adhesion to films and foils.
Joncryl 585	translucent	44.0	2.0	300	9.1	30	1.07	- 20	< 7	yes	Heat-resistant, film-forming acrylic emulsion that exhibits high gloss and adhesion to treated flexible films and foils in inks and overprint varnishes.
Joncryl 2640	semi-translucent	49.0	0.4	500	8.2	52	1.02	- 18	< 5	no	Soft film-forming acrylic emulsion that provides early water resistance, gloss, and adhesion in inks for treated polyolefin film applications.
Joncryl 74-A	translucent	48.5	1.0	700	8.2	50	1.03	- 16	< 5	yes	Soft film-forming acrylic emulsion that provides excellent rub, water, and grease resistance to inks, overprint varnishes, and functional packaging coatings.
Joncryl 82	translucent	39.7	0.01	400	3.0	59	1.03	- 10	< 0	no	Film-forming acrylic emulsion, that when neutralized, forms a tough water- and oil-resistant film with excellent adhesion to a wide variety of paper and polyolefin substrates.
Joncryl 2646	semi-translucent	48.5	0.3	500	8.4	45	1.03	- 9	< 5	no	Cost-effective, film-forming acrylic emulsion that provides gloss, water resistance, and adhesion in inks on HDPE.

Joncryl emulsions (cont.)

Product	Appearance	Non Volatile (%)	Total VOC (% wt)	Viscosity @ 25°C (cps)	pH	Acid No. (NV)	Density @ 25°C (g/cm^3)	Tg (°C)	MFFT (°C)	Freeze-thaw Stable	Description and Applications
Joncryl LMV 7031	semi-translucent	47.5	0.6	1,500	7.5	57	1.04	- 9	- 1	yes	Film-forming, low-maintenance, pH-stable acrylic emulsion that provides good water resistance and adhesion in flexo and gravure inks.
Joncryl 1670	translucent	47.0	0.1	2,000	7.6	57	1.05	- 4	< 5	yes	Soft film-forming acrylic emulsion that provides excellent rub, water, and grease resistance in inks and overprint varnishes.
Joncryl 98	semi-translucent	47.0	0.9	500	8.4	35	1.05	1	5	no	Acrylic emulsion that minimizes blushing or whitening in overprint varnish formulations when subjected to hot water vapor.
Joncryl 2660	semi-translucent	49.0	0.9	1,100	8.6	45	1.04	13	< 5	no	Film-forming acrylic emulsion that exhibits superior gloss, transparency, and printability in inks on HDPE and aluminum foil.
Joncryl 8383-A	translucent	40.0	< 0.1	95	8.2	25	1.03	14	16	no	Water based acrylic self-crosslinking emulsion for use as receptive primer on flexible films and paper.
Joncryl 2664	translucent	43.5	13.8	550	9.3	170	1.03	16	< 5	yes	Film-forming acrylic emulsion for high-strength inks used in fine-line anilox printing.
Joncryl 77	translucent	46.0	1.0	500	8.3	55	1.05	21	20	yes	Hard film-forming acrylic emulsion that provides gloss, transparency, and block, rub, and water resistance to inks and overprint varnishes.
Joncryl ECO 2177	translucent	46.0	< 0.1	500	8.2	55	1.05	21	11	yes	Hard film-forming, glycol ether-free[a], ultra low VOC acrylic emulsion providing rub and block resistance and adhesion in inks and overprint varnishes for food packaging applications.
Joncryl 2110	translucent	49	<0.5	1200	9.0	65	1.05	22	< 5	yes	Hard film-forming, low VOC acrylic emulsion that provides high gloss and clarity, good transfer and printability in flexographic and gravure high-strength inks for fine-line anilox printing on multiple types of substrate.
Joncryl 660 DPM	translucent	33.0	4.0	400	8.5	203	1.08	27	< 0	yes	Hard film-forming acrylic emulsion that resists hot scuffing during corrugation of pre-printed linerboard.
Joncryl LMV 7040	semi-translucent	45.5	0.3	750	7.3	115	1.06	28	< 0	yes	Hard film-forming, low-maintenance, pH-stable acrylic emulsion that provides film integrity, adhesion, and rub resistance in inks for paper, paperboard, and primed foil.
Joncryl 1616	translucent	42.5	1.2	800	8.5	140	1.05	40	15	yes	High-gloss, hard film-forming acrylic emulsion that, when used as a letdown vehicle in inks for paper and paperboard applications, offers excellent transfer and printability with low-foaming in flexo and gravure inks and overprint varnishes.
Joncryl 2178-A	translucent	44.0	0.06	800	8.5	66	1.04	42	< 0	yes	Hard film-forming, low VOC acrylic emulsion with excellent wet and dry block resistance for food packaging applications.
Joncryl 537	translucent	45.7	0.8	150	9.0	40	1.05	44	42	yes	Non-film-forming acrylic emulsion that can be coalesced to form an alkali- and detergent-resistant film for inks, overprint varnishes, and functional packaging coatings.
Joncryl 1681	opaque	45.0	0.1	385	7.5	29	1.03	56	42	no	Hard, non-film forming acrylic emulsion which enables matte finishes and reduction of matting agents with rub and block resistance in inks and overprint varnishes.

Joncryl emulsions (cont.)

Product	Appearance	Non Volatile (%)	Total VOC (% wt)	Viscosity @ 25°C (cps)	pH	Acid No. (NV)	Density @ 25°C (g/cm^3)	Tg (°C)	MFFT (°C)	Freeze-thaw Stable	Description and Applications
Joncryl 538-A	translucent	45.0	1.0	200	9.3	53	1.04	64	65	yes	Non-film-forming acrylic emulsion that can be coalesced to form an alcohol- and chemical-resistant film for inks, overprint varnishes, and functional packaging coatings; can also resist plasticizer migration.
Joncryl 2153	semi-translucent	49.0	0.8	700	8.4	50	1.05	75	60	yes	Hard, non-film-forming acrylic emulsion that provides excellent stability and drying speed in inks and overprint varnishes on paper and paperboard.
Joncryl 2350	semi-translucent	47.0	< 0.1	1,200	8.4	77	1.05	75	70	yes	Non-film-forming acrylic emulsion that provides viscosity-stable printing inks with excellent gloss and holdout.
Joncryl 89	opaque	48.0	0.8	500	8.3	50	1.05	98	> 80	yes	General purpose, non-film-forming acrylic emulsion that provides gloss and clarity, block resistance, and fast drying properties to overprint varnishes.
Joncryl 2121	opaque	51.0	< 1.0	750	8.0	42	1.03	98	> 80	yes	Fast-drying, high solids, non-film-forming acrylic emulsion that provides viscosity stability, rub resistance and printability in flexographic and gravure inks for paper and paperboard applications.
Joncryl ECO 2189	opaque	48.0	< 0.1	600	8.3	50	1.05	98	> 80	yes	Hard, non-film-forming, glycol ether-free[a], ultra low VOC acrylic emulsion providing fast drying, gloss, and holdout in inks and overprint varnishes on paper and paperboard for food packaging applications.
Joncryl LMV 7050	semi-translucent	47.5	< 0.2	950	7.3	85	1.06	98	80	yes	Non-film-forming, low-maintenance, pH-stable acrylic emulsion that provides fast drying and excellent resolubility in inks for paper and paperboard.
Joncryl LMV 7051	opaque	44.5	0.3	450	7.5	115	1.04	98	56	yes	Non-film-forming, low-maintenance, pH-stable acrylic emulsion that provides high gloss and holdout in inks for paper and paperboard.
Joncryl 90-A	semi-translucent	44.0	0.8	250	8.3	76	1.05	100	84	yes	Non film-forming acrylic emulsion for high gloss , clarity, and zinc stability as an overprint varnish.
Joncryl 633	opaque	37.0	< 0.1	600	7.2	60	1.05	104	> 50	yes	Opaque acrylic emulsion that may enable the reduction of TiO_2 needed in inks for corrugated board and other natural kraft substrates.
Joncryl 631	opaque	50.0	< 0.1	2,500	7.9	25	1.05	105	> 60	no	Opaque acrylic emulsion that provides hiding power and enhances brightly colored inks on natural kraft substrates.
Joncryl 1655	semi-translucent	47.5	0.5	480	8.1	50	1.05	108	> 80	yes	Sodium neutralized, non-film-forming acrylic emulsion for inks and overprint varnishes that require no ammonia odor and exceptional flexo and gravure stability on the press.
Joncryl 541	opaque	45.0	< 0.5	100	8.0		1.04	N/A	20	yes	Self-crosslinking styrene acrylic emulsion designed for surface print applications on film and foil with excellent resoubility and resistance properties.
Joncryl HR 1620	translucent	40.0	< 0.4	100	9.6	120	1.04	N/A	< 10	yes	Film-forming acrylic emulsion for maximum heat release and water resistance in inks and overprint varnishes.

Joncryl Resins for Direct Food Contact

Joncryl Direct Food Contact Resins provide safe, versatile solutions for food packaging inks, coatings, and varnishes. With broad FDA compliance and proprietary Food Contact Notifications, they simplify formulation while meeting strict safety standards. Ideal for paperboard and flexible film applications, Joncryl DFC resins offer excellent gloss, adhesion, and resolubility. Their low VOC profiles and options for moisture resistance, heat-sealability, and recyclability support both performance and sustainability goals.

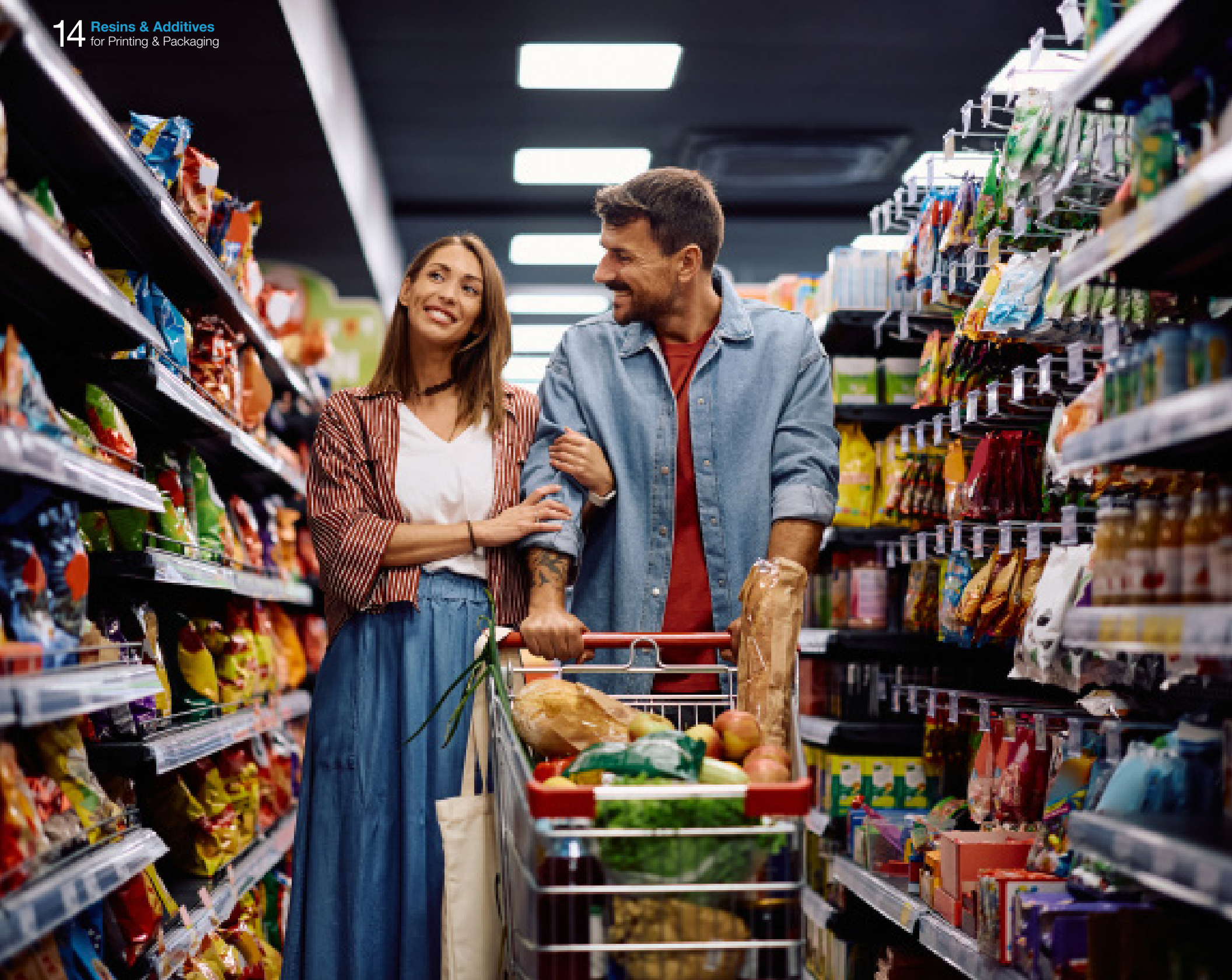
Product	Appearance	Non Volatile (%)	Total VOC (% wt)	Viscosity @ 25°C (cps)	pH	Acid No. (NV)	Density @ 25°C (g/cm^3)	Tg (°C)	MFFT (°C)	Freeze-thaw Stable	Description and Applications
Joncryl DFC 3025	clear liquid	35.4	< 0.2	5,500	9.0	220	1.07	95		yes	Direct food contact compliant, medium molecular weight resin solution for printing ink, overprint varnish, and functional packaging coating applications.
Joncryl DFC 3030	translucent	47.4	< 0.1	1,150	7.9	64	1.04	- 27	< 5	yes	Soft film-forming acrylic emulsion that provides flexibility and water resistance in inks, overprint varnishes, and functional packaging coatings for food contact applications.
Joncryl DFC 3040	semi-translucent	46.0	<0.1	500	8.2	55	1.04	21	11	yes	Hard film-forming acrylic emulsion that provides rub and block resistance in inks, overprint varnishes, and functional packaging coatings for food contact applications.
Joncryl DFC 3050	opaque	48.2	< 0.05	850	8.3	49	1.04	99	> 80	yes	Non-film-forming acrylic emulsion that provides fast dry and block resistance in inks, overprint varnishes, and functional packaging coatings for food contact applications.

[a] The glycol ether level averages less than 0.002 wt%.

Joncryl colloidal emulsions

Joncryl colloidal emulsions' low cost-in-use makes them an excellent choice as a letdown resin for corrugated inks. They can also be used as a dispersion resin for carbon black, which makes it possible to manufacture a black corrugated ink using only one polymer. From low-cost brown box printing to medium-quality brand colors, Joncryl colloidal emulsions meet the formulator's need for balance of print properties and economy.

Product	Appearance	Non Volatile (%)	Total VOC (% wt)	Molecular Weight (Mw)	Viscosity @ 25°C (cps)	pH	Acid No. (NV)	Density @ 25°C (g/cm^3)	Tg (°C)	MFFT (°C)	Freeze-thaw Stable	Description and Applications
Joncryl 143	opaque	39.5	< 0.005	48,000	25	6.0	130	1.05	10	< 7	no	General purpose, acrylic colloidal emulsion designed as a sole vehicle for carbon black inks; also recommended as a letdown vehicle for organic pigment dispersions.
Joncryl 646	opaque	40.0	< 0.005	100,000	45	6.0	128	1.07	30	< 7	no	High molecular weight, cost-effective acrylic colloidal emulsion that maintains ink viscosity with a minimal amount of polymer in inks for corrugated board.
Joncryl 652-A	opaque	50.0	< 0.001	19,900	100	2.5	136	1.10	105	< 5	yes	Colloidal emulsion that, when used as a modifying binder in water-based inks and overprint varnish applications, improves gloss, hardness, and heat resistance.
Joncryl 659-A	white emulsion	44.0	< 0.3	80,000	< 100	2.1	150	1.03	93	85	no	Colloidal emulsion for use in inks for pre-print and post-print corrugated board and kraft paper with hot mar resistance and excellent printability at low polymer solids for low cost-in-use.
Joncryl LMV 7014	opaque	34.0	< 0.1	45,000	< 100	4.0	201	1.08	50	< 5	yes	Low-maintenance vehicle, pH-stable, acrylic colloidal emulsion that provides excellent resolubility and good ink transfer in cost-effective, carbon black corrugated inks when used as a sole vehicle; also recommended as a letdown vehicle for organic pigment dispersions.



Joncryl FLX

Joncryl FLX is a resin series that was developed for surface print and lamination ink applications within the flexible packaging market. Inks based on the Joncryl FLX series are a cost-effective alternative to solvent-based inks and eliminate your customer's need to worry about U.S. EPA VOC restrictions and European VOC legislation.

Product	Appearance	Non Volatile (%)	Total VOC (% wt)	Viscosity @ 25°C (cps)	pH	Acid No. (NV)	Density @ 25°C (g/cm^3)	MFFT (°C)	Freeze-thaw Stable	Description and Applications
Self-crosslinking acrylic emulsions										
Joncryl FLX 5000-A	translucent emulsion	42.0	< 0.5	1,000	8.8	90.0	1.05	< 5	no	Self-crosslinking acrylic emulsion that has excellent balance of resistance and resolubility for surface printing applications, such as bread bags, frozen food bags, and heavy-duty bags.
Joncryl FLX 5060	white emulsion	43.0		150	9.3	14	1.04	< 5	no	Self-crosslinking acrylic emulsion with excellent balance of resistance and resolubility for surface printing, especially on PE/PP films. Grease resistance, alcohol and solvent resistance, and heat seal resistance are featured properties.
Polyurethane dispersions										
Joncryl FLX 5200	white emulsion	40.0	< 1.0	70	8.0	0.0	1.05	< 5	no	Polyurethane dispersion vehicle that provides water-based lamination inks with high bond strength and very good resolubility.
Joncryl FLX 5201	translucent emulsion	40.0	< 1.0	100	8.5	0.0	1.05	< 5	no	Polyurethane dispersion vehicle that provides water-based lamination inks with high bond strength and very good resolubility.
Acrylic-PUD hybrid										
Joncryl FLX 5220	translucent emulsion	43.0	0.2	200	8.0	13.6	1.05	< 5	no	Acrylic-PUD hybrid specially designed for enhanced print performance in water-based lamination inks for medium- to heavy-duty applications, including retort packaging.

Specialty Resins for Printing & Packaging

Our Joncryl specialty resins portfolio includes four distinct product lines developed to meet the evolving needs of the printing and packaging industry. BRC (Bio-Renewable Content) and DPS (Digital Printing Solutions) support the shift toward renewable raw materials and enable high-quality results in digital workflows. Joncryl HPB (High Performance Barrier) offers barrier coating solutions for paper and board, while Joncryl HSL (Heat Seal Lacquer) provides heat seal lacquer technologies for flexible and rigid packaging. Together, these product lines help formulators meet performance demands and stay ahead of market trends.

Advancing Bio-Based Performance

Joncryl BRC resins are designed to help formulators respond to growing market demand for more sustainable packaging solutions. By incorporating bio-based content and contributing to lower VOC formulations, the portfolio supports efforts to reduce environmental impact while maintaining performance across a variety of printing substrates. This approach reflects BASF's commitment to advancing sustainability through purposeful innovation in the printing and packaging industry.

Reliable and high-performance barrier solutions

The Joncryl HPB product line delivers high-performance barrier coatings that enhance durability and functionality in paper and board packaging. These water-based emulsions resist liquids, moisture vapor, oil, and grease, and offer heat sealability with low VOC content. They support a wide range of food and non-food applications and are compatible with various application methods including rod coaters, gravure, and flexo.

Versatile and efficient heat seal lacquers

The Joncryl HSL product line offers a versatile range of heat seal lacquers designed for secure sealing and smooth peeling across various applications. It enables effective heat sealability between different substrates such as filmic and paper under diverse sealing conditions, all without surface tack. This performance makes Joncryl HSL suitable for demanding packaging needs, supporting both functional integrity and user-friendly opening experiences.

Joncryl Resins with Bio-Renewable Content

BASF's Joncryl BRC series delivers innovative bio-based resin solutions for printing and packaging applications. Designed with renewable feedstock, biopolymers, and bio-oligomers, these resins replace traditional raw materials while maintaining high performance. They offer excellent transfer and color strength with outstanding resolubility on press, making them ideal for flexographic and gravure printing.

Product	Bio-Renewable Content (% solids)	Tg [°C] or MFFT	Solids (%)	pH	Description and Applications
Joncryl BRC 662	52	100	43	2.5	Collodial emulsion partly based on renewable raw materials for use in pre- and post-print corrugated inks and kraft paper applications.
Joncryl BRC 6824	50	-31	47	7.9	Film-forming emulsion partly based on renewable raw materials for use in water-based inks on paper substrates.
Joncryl BRC 6890	50	105	45.5	8.3	Emulsion partly based on renewable raw materials for use in water-based inks and overprint varnishes.
Joncryl BRC 6896	64		40	8.5	High performance dispersion resin solution for pigment dispersions to be used in water-based inks.

Joncryl Resins for High Performance Barrier Coatings

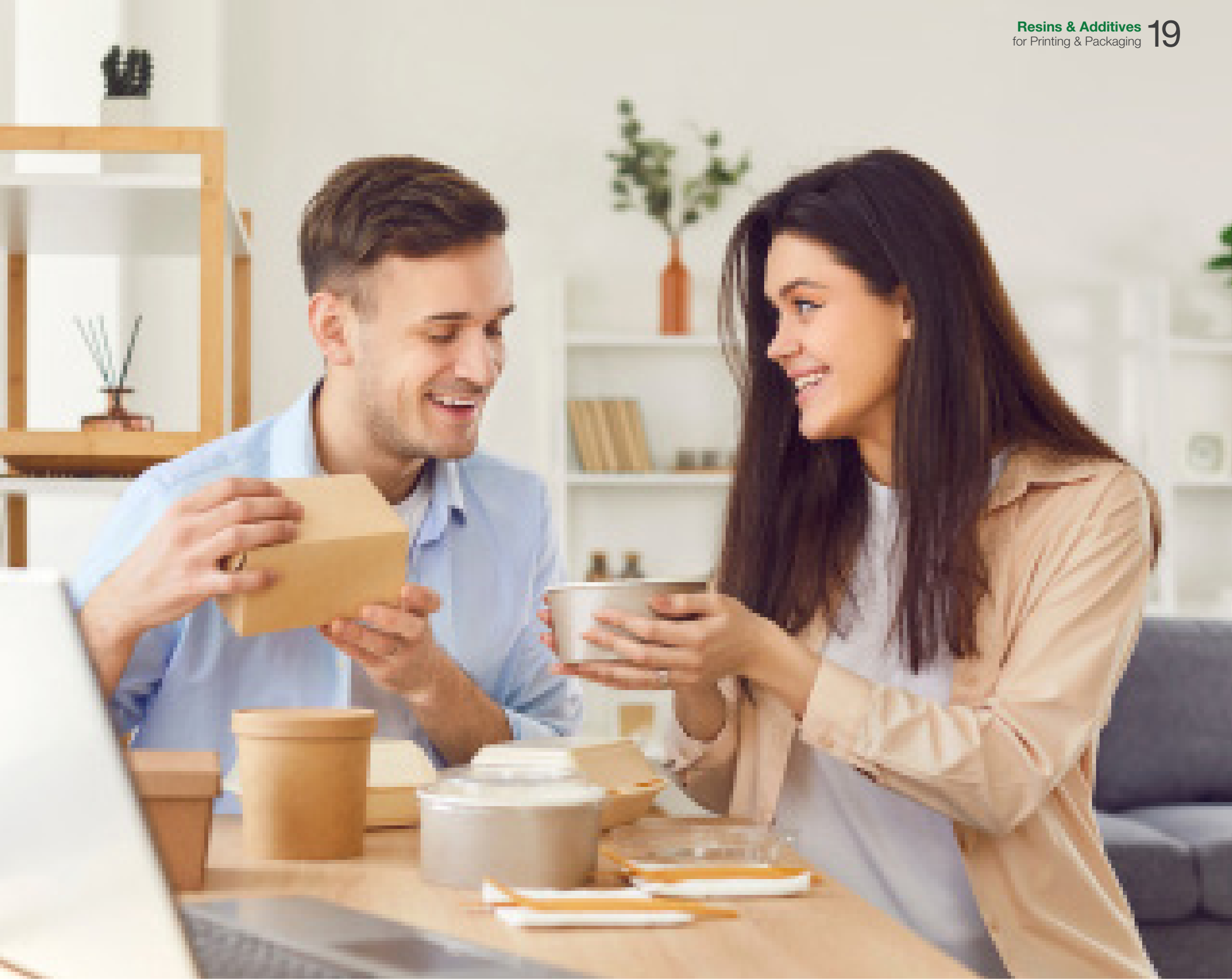
Joncryl HPB resins are water-based acrylic emulsions that deliver excellent liquids, moisture vapor, oil and grease resistance, making them ideal for replacing polyethylene or wax coatings. Joncryl HPB resins are heat sealable, repulpable, and food contact compliant, supporting sustainable mono-material packaging for cups, trays, cartons, and food pouches.

Product	Appearance	Non Volatile (%)	Viscosity @ 25°C (cps)	pH	Acid Number (mg KOH/g)	Density @ 25°C (g/cm^3)	Tg (°C)	MFFT (°C)	Freeze-thaw Stable	Description and Applications
Joncryl HPB 1631-A	semi-translucent	39.0	1250	9.0	50	1.02	< 5	< 5	no	A glycol ether-free styrene acrylic emulsion offering low-VOC moisture resistance for paper and board.
Joncryl HPB 1702	opaque	49.0	125	7.7	32	1.04	< 5	< 5	no	An acrylic emulsion designed for grease-resistant food packaging applications.
Joncryl HPB 4012	opaque	41.0	1250	8.0	36	1.06	< 5	< 5	yes	A styrene acrylic dispersion that delivers water resistance and heat sealability for coated paper applications.

Joncryl Resins for Heat Seal Lacquers

Joncryl HSL resins are water-based acrylic copolymer emulsions developed for heat seal lacquers in flexible and rigid packaging. Joncryl HSL resins offer low activation temperatures, adhesion to aluminum foil, plastic films, and paper. These resins are ideal for pharmaceutical blister packs, dairy lidding, and PET tray sealing, providing a solvent-free solution with excellent seal integrity and efficient processing.

Product	Appearance	Non Volatile (%)	Total VOC (% wt)	Viscosity @ 25°C (cps)	pH	Acid No. (NV)	Density @ 25°C (g/cm^3)	Tg (°C)	MFFT (°C)	Freeze-thaw Stable	Description and Applications
Joncryl HSL 750	opaque	50.0	0.2	< 100	5.5	52	1.05	4	< 5	no	Film forming, self-thickening, acrylic emulsion for heat seal coatings on paper and paperboard.
Joncryl HSL 9010	translucent	45.0	< 0.1	70	7.3	60	1.03	-10	< 5	no	Acrylic copolymer emulsion for cardboard blister packs and flexible packaging.
Joncryl HSL 9011	opaque	44.7	< 0.1	500	9.0	35	1.05	-30	< 5	no	Acrylic copolymer emulsion with low activation temperature for cardboard blister packs and flexible packaging.
Joncryl HSL 9012	translucent	39.0	< 0.1	500	8.0	35	1.04	0	< 5	no	Acrylic copolymer emulsion for pharmaceutical blister lidding foil sealed against PVC, PVDC-coated PVC and PET.

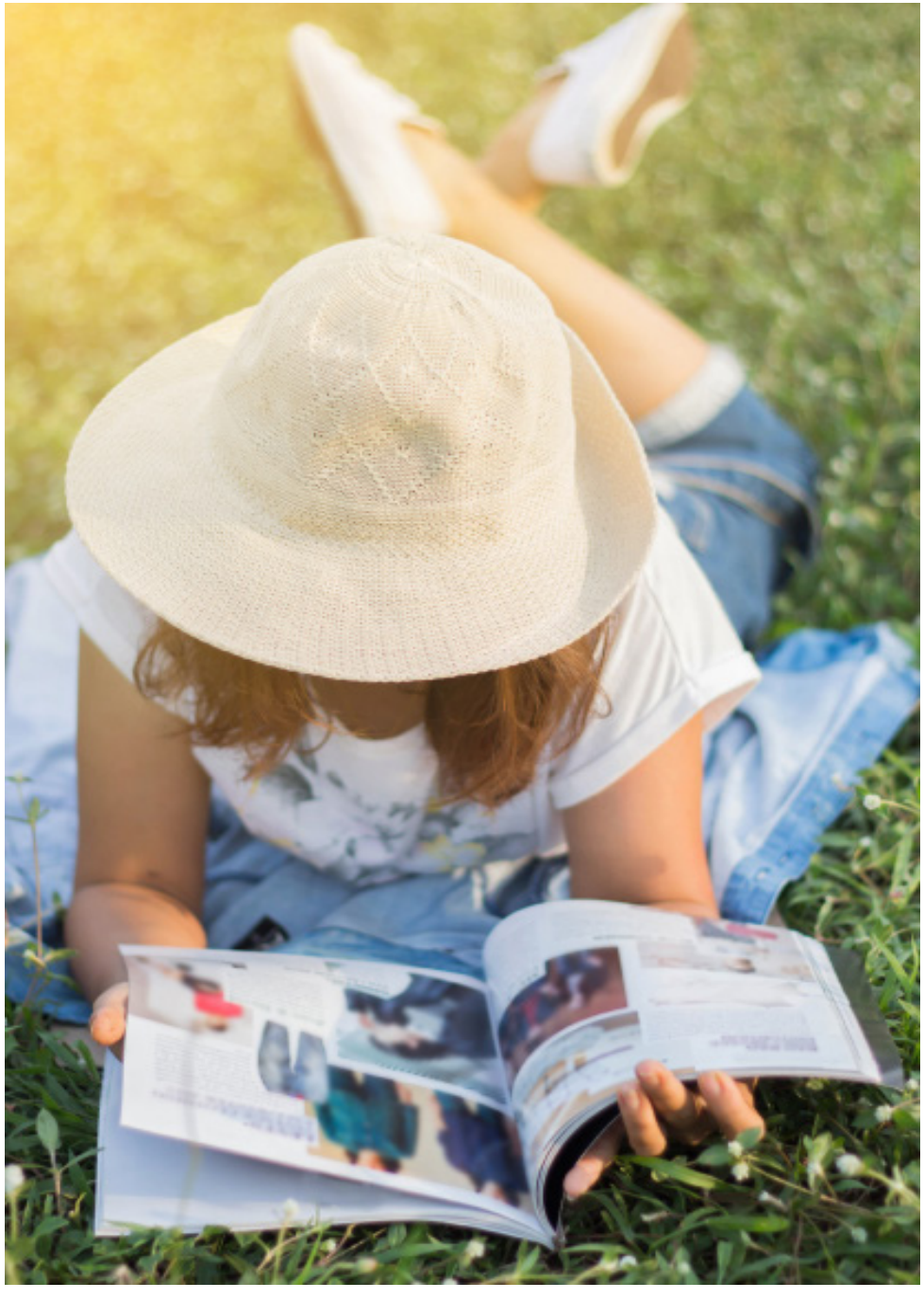


Energy-curable systems

We are continuously expanding our Laromer portfolio for the fast-growing UV and electron beam (EB) curable ink and overprint varnish market. The technology offers significant advantages, such as instant curing for increased productivity or high performance in resistance properties and gloss, to name just a few. Our energy-curable Laromer portfolio meets the demand of increasingly stringent legislative requirements and helps to continue the conversion to more sustainable solutions.

Driving Sustainable Innovation

As sustainability becomes a central focus in the printing and packaging industry, Laromer resins provide a forward-looking solution. Their energy-curable properties enable instant curing, reducing energy consumption and enhancing production efficiency. With near-zero VOC emissions and compatibility with recyclable substrates, our Laromer products support converters and brand owners in minimizing environmental impact while maintaining high performance. Additionally, certain Laromer resins are LED-curable, offering faster processing and lower energy usage compared to conventional curing systems. Whether used in inks or overprint varnishes, these resins contribute to a more responsible packaging lifecycle, advancing circularity and compliance with evolving environmental standards.



Laromer oligomers

BASF offers oligomers for energy-curing inks and overprint varnishes. Cured inks and overprint varnishes formulated with Laromer oligomers provide performance attributes, such as good adhesion, good pigment wetting, high reactivity, good resistance to chemicals, and fast cure rate.

Product	Diluent (content)	Functionality	Viscosity (cPs)	Hydroxyl Value (approx. mg KOH/g)	Hardness	Elasticity	Reactivity	Chemical Resistance	Adhesion			Key Properties
									Plastic	Paper	Metal	
Epoxy acrylate												
Laromer EA 8765 R		2.0	600 - 1,200	330	■	■■■	■■■	■		✓	✓	Flexible, highly reactive, partially water soluble, BPA Free.
Laromer EA 9082 ECO	TPGDA (30%)	2.0	6,000 - 9,000		■■■■	■■	■■	■■■■		✓		Outstanding chemical reistance, high hardness and reactivity, bio content 16%.
Laromer EA 9124	HDDA (20%)	2.0	7,000 - 15,000		■■■■	■	■■■	■■■■	✓	✓	✓	Excellent reactivity, high abraison and chemical resistance, good adhesion to plastic/metal.
Laromer EA 9138	TPGDA (25%)	2.0	10,000 - 20,000		■■■	■■	■■	■■■■		✓	✓	Excellent reactivity, resistant to chemicals and hardness.
Laromer EA 9143 ECO	GPTA (25%)	2.3	35,000 - 55,000		■■■■	■■	■■■	■■■■		✓	✓	Good chemical resistance, excellent hardness.
Laromer EA 9145	DPGDA (30%)	2.0	4,000 - 7,000		■■■■	■■	■■	■■■■		✓	✓	Fast cure, excellent chemical resistance.
Laromer LR 8986 ECO		2.4	3,000 - 6,000	170	■■■■	■■■	■■	■■■■	✓	✓	✓	Low viscosity, good chemical resistance, high hardness.
Laromer LR 9019		2.4	15,000 - 25,000	175	■■■	■■■	■■■■	■■■■		✓	✓	Highly reactive, good chemical resistance, UV LED curing.
Laromer LR 9023	DPGDA (15%)	2.3	2,000 - 5,000	150	■■■	■■	■■■	■■■■		✓	✓	Diluted version of LR 9019.
Polyester acrylate												
Laromer PE 44 F		1.9	2,000 - 5,000	80	■	■■■	■■	■■■	✓	✓		Low viscosity resin with low odor and good balance of properties.
Laromer PE 55 F		2.6	25,000 - 45,000	70	■■	■■■	■■■	■■■	✓		✓	Workhorse resin with high toughness and abrasion resistance, good adhesion and chemical resistance.
Laromer PE 56 F		2.8	20,000 - 40,000	70	■■	■■■	■■■	■■■	✓	✓	✓	Better compatibility with reactive diluents compared to PE 55 F.
Laromer PE 8800		2.6	4,000 - 8,000	80	■■■■	■■	■■	■■■■	✓	✓	✓	Low viscosity resin with excellent hardness and chemical resistance. Low odor.
Laromer PE 8981		2.9	4,000 - 14,000	80	■	■■■	■■■■	■■■	✓			Excellent reactivity and flexibility. Good for sandability.
Laromer PE 9004		2.5	20,000 - 50,000		■■	■■■	■■■	■■■	✓	✓	✓	Excellent flexibility and chemical resistance. Good adhesion.
Laromer PE 9074		3.2	7,000 - 13,000		■■	■■■	■■■	■■■	✓	✓	✓	Excellent flexibility and abrasion resistance. Good chemical resistance.
Laromer PE 9079		3.3	2,000 - 4,000 @ 60°C	50	■■	■■■	■■■	■■■	✓	✓	✓	Higher viscosity version of PE 9074.

■■■■ superior ■■■ excellent ■■ very good ■ good

Laromer oligomers (cont.)

Product	Diluent (content)	Functionality	Viscosity (cPs)	Hydroxyl Value (approx. mg KOH/g)	Hardness	Elasticity	Reactivity	Chemical Resistance	Adhesion			Key Properties
									Plastic	Paper	Metal	
Urethane acrylate												
Laromer UA 19 T E	TPGDA (35%)	2.9	14,000 - 32,000	10	■■	■■■	■	■		✓	✓	Highly elastic, low yellowing, good adhesion, flexibilizer.
Laromer UA 8987 E	HDDA (30%)	4.6	4,000 - 6,000	11	■■■	■■	■■	■■■		✓	✓	Excellent weatherability, chemical, scratch resistant.
Laromer UA 9047 E	n-butyl acetate (20%)	3.5	2,000 - 7,000	10	■■■	■■	■	■■■■			✓	Scratch resistant, tack-free before UV, weathering resistance, functionality.
Laromer UA 9048	DPGDA (25%)	7.5	10,000 - 20,000		■■■■	■	■■■	■■■■			✓	Scratch and abrasion resistant, high functionality, chemical resistance.
Laromer UA 9072 E	TBCH (30%)	2.9	2,000 - 15,000 @ 60°C	6	■	■■■■	■	■■	✓	✓	✓	Highly elastic, tear resistant, low yellowing, excellent adhesion.
Laromer UA 9073 *		2.0	2,000 - 15,000 @ 60°C		■■	■■■	■■	■■	✓	✓	✓	Highly elastic, abrasion resistance, good adhesion.
Laromer UA 9089 E		2.0	10,000 - 30,000	3	■■	■■■	■■	■■	✓	✓	✓	High elasticity, excellent adhesion to PVC,weathering resistance, and low yellowing.
Laromer UA 9181 *	DPGDA (40%)	2.0	1,000 - 2,500		■	■■■	■■	■■	✓	✓	✓	Good adhesion to plastic, good toughness.
Laromer UA 9186 E	CTFA (30%)	2.8	15,000 - 25,000		■	■■■■	■■■	■■	✓	✓	✓	Very elastic, low yellowing, good adhesion, medium reactivity.
Polyether acrylate												
Laromer PO 33 F		3.0	70 - 130	30	■■■	■	■	■■■	✓	✓	✓	Good hardness, solvent resistance, good cure speed.
Laromer PO 8967		2.3	120 - 190	50	■■■	■■	■■	■■■	✓	✓	✓	Balanced property profile, low viscosity with good chemical resistance and medium reactivity and elasticity.
Laromer PO 8982		2.7	150 - 300	70	■■■	■■	■■	■■		✓		Partially water-soluble, spray viscosity adjustable.
Polyether acrylate (amine-modified, free of monomers)												
Laromer PO 77 F		2.5	1,000 - 3,000	120	■	■■■	■■■	■■■	✓	✓	✓	Very highly reactive, versatile resin, good sanding properties.
Laromer PO 84 F		2.6	400 - 700	55	■■	■■	■■■	■■■	✓	✓	✓	Good pigment wetting, film formation.
Laromer PO 94 F		2.6	300 - 600	55	■■	■■■	■■■■	■■■■	✓	✓	✓	High reactivity with very good chemical resistance.
Laromer PO 8996		2.6	50 - 90	30	■■	■■	■■■	■■■	✓	✓	✓	High reactivity, very low in color and viscosity.
Laromer PO 8997		2.6	300 - 500		■■	■■	■■■■	■■■	✓	✓	✓	Highly reactive, very good in color.
Laromer PO 9067		2.6	400 - 700		■■	■■	■■■	■■■	✓	✓	✓	Outstanding reactivity, excellent film forming, high solvent resistance.

■■■■ superior ■■■ excellent ■■ very good ■ good

* Indicates aromatic resin

Laromer oligomers (cont.)

Product	Diluent (content)	Functionality	Viscosity (cPs)	Hydroxyl Value (approx. mg KOH/g)	Hardness	Elasticity	Reactivity	Chemical Resistance	Adhesion			Key Properties
									Plastic	Paper	Metal	
Water-based												
Laromer PE 22 Aqua	Water (50%)	3.6	150 - 500		■■	■■	■■	■■■■	✓		✓	Polyester acrylate resin with good chemical resistance, physical drying properties, hardness, and low yellowing.
Laromer PE 55 Aqua	Water (50%)	2.2	250 - 650		■■	■■■	■■■	■■■	✓	✓		Polyester acrylate resin that is hard, resistant to chemicals, and offers good sanding properties.
Laromer UA 8983 Aqua	Water (60%)	1.6	50 - 300		■■	■■■■	■■	■■	✓	✓		Aromatic urethane acrylate dispersion with dry-to-touch pre-cure, excellent elasticity, and good chemical resistance.
Laromer UA 9005 ECO	Water (60%)	5.2	20 - 250		■■■■	■■	■■	■■■■	✓	✓		Excellent hardness, scratch and chemical resistance, great physical drying.
Laromer UA 9059 Aqua	Water (30%)	2.0	6,000 - 11,000		■	■■■■	■■	■	✓	✓		Aliphatic urethane acrylate resin that is very flexible and delivers excellent 'coin-test' results.
Laromer UA 9095 Aqua	Water (60%)	3.8	50 - 500		■■■	■■	■■	■■■■	✓	✓		Urethane acrylate dispersion with high grain enhancement, good hardness and chemical resistance, and low yellowing.
Laromer UA 9135 Aqua	Water (60%)	3.9	10 - 600		■■■■	■■	■■	■■■■	✓	✓		Great coffee rsistance, viscosity stability, weatherability.
Special energy-curable												
Laromer PO 9026		1.5	600 - 1,500		■■■■	■	■■	■■■	✓			Nano-modified polyether acrylate containing 50% non-crystalline nano-silica and offering very high scratch resistance.
Laromer PR 9013		1.5	45,000 - 70,000	25	■■■	■	■	■■	✓		✓	Modified polyether acrylate resin with excellent pigment wetting, low shrinkage, high flexibility, and good adhesion to plastic.
Laromer PR 9052	TMPTA (60%)	3.7	4,000 - 8,000		■■■	■	■■	■■■				Polyester resin with high hardness and scratch resistance, delivering the best Taber abrasion results when combined with aluminum oxide.
Laromer UP 35 D	DPGDA (45%)	3.5	3,000 - 6,000		■■	■■■	■■	■■■	✓			Unsaturated polyester resin with low yellowing, good chemical resistance, and excellent sanding properties.
Laromer UP 9096	GPTA (60%)	4.8	5,000 - 10,000		■■	■■	■■	■■■	✓			Hard and scratch-resistant, good leveling, high gloss.
Laromer UP 9118	DPGDA/ TMPTA (42%)	4.5	26,000-31,000	7	■■■	■	■■■	■■■	✓			Unsaturated polyester resin that is hard, offers good chemical resistance, and is easy to matte.
Laromer UP 9178	DPGDA (24%)	3.0	20,000 - 35,000		■■	■■■	■■	■■■	✓			Good sanding propoerties, ecellent cost performance ratio, good leveling and adhesion.
Laromer PA 9083		1.0	1,250 - 3,500						✓		✓	Adhesion promoter for metal and plastic, when used as a modifying resin to a formulation.
Dual cure												
Laromer PR 9000		2 + 2 NCO	1,000 - 1,400		■■	■	■	■■	✓		✓	A low viscosity dual-cure resin featuring both NCO and UV reactive groups that enhances adhesion and shadow cure areas. It offers an improvement to scratch and chemical resistance and exterior durability.

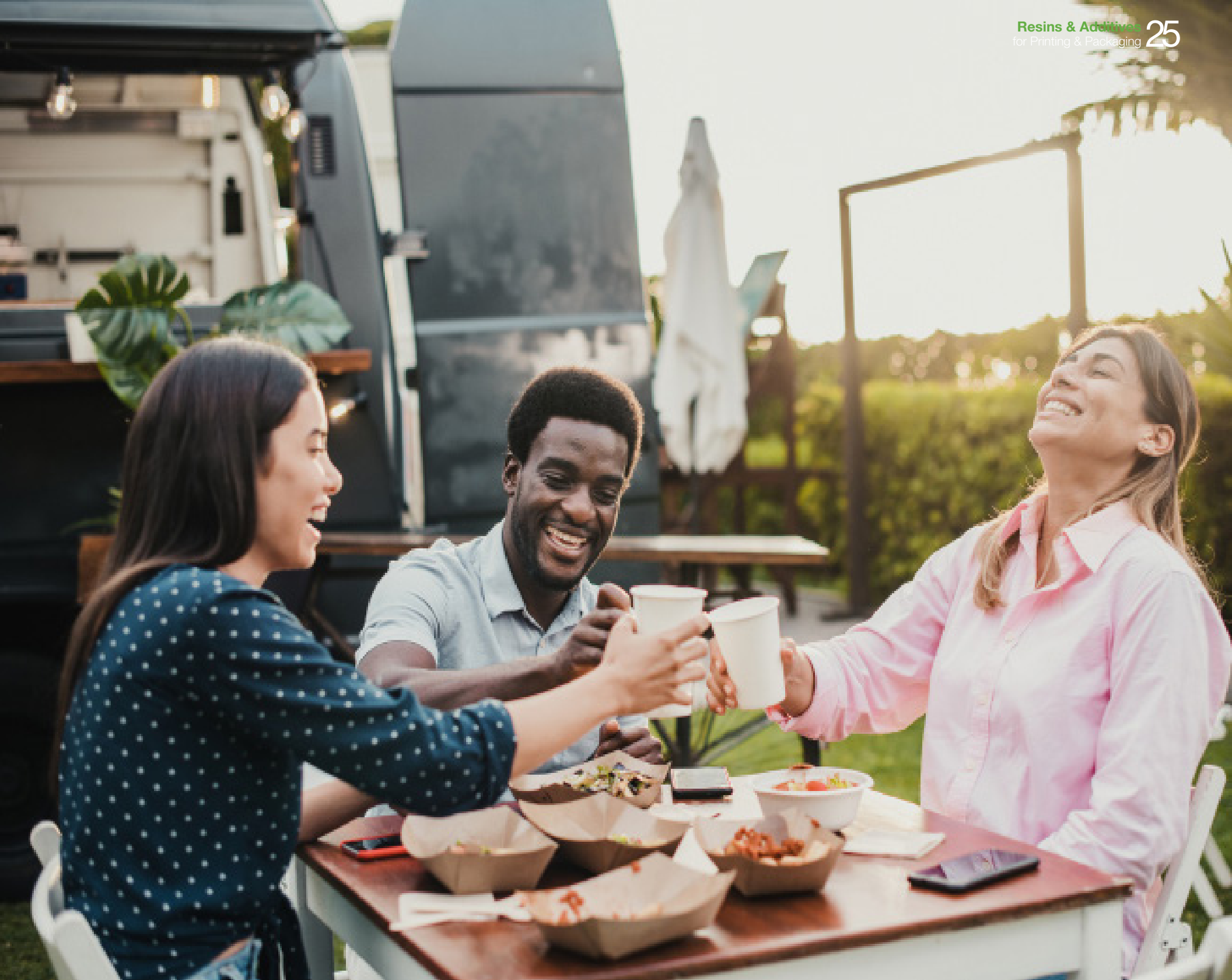
■■■■ superior ■■■ excellent ■■ very good ■ good

Laromer reactive diluents

The polymerizable groups of BASF's Laromer monomers allow them to be used as a crosslinking component in energy-curable inks and overprint varnishes, where they act as reactive diluents. Cured inks and overprint varnishes formulated with Laromer reactive diluents provide performance attributes, such as good adhesion and film hardness, very good reactivity, fast cure rate, low shrinkage, and good flexibility.

Product	CAS Number	Functionality	Density @ 25°C (g/cm^3)	Viscosity @ 25°C (cps)	TMPTA Residual (% wt.)	Abrasion Resistance	Scratch Resistance	Adhesion	Corrosion Protection	Applications				
										Inks				Weathering
										Offset	Flexo	Screen	Inkjet	
Laromer CTFA Cyclic trimethylolpropane formal acrylate	66492-51-1	1.0	1.10	18	< 0.10			✓	✓	✓	✓	✓	✓	✓
Laromer POEA phenoxyethyl acrylate	48145-04-6	1.0	1.10	11				✓	✓	✓	✓	✓	✓	
Laromer TBCH 4-t-butylcyclohexyl acrylate	84100-23-2 .282-104-8	1.0	0.94	9				✓	✓	✓	✓	✓	✓	✓
Laromer DPGDA dipropyleneglycol diacrylate	57472-68-1	2.0	1.05	8		✓	✓	✓		✓	✓	✓	✓	✓
Laromer HDDA hexanediol diacrylate	13048-33-4	2.0	1.02	6		✓	✓	✓		✓	✓	✓	✓	✓
Laromer TPGDA tripropyleneglycol diacrylate	42978-66-5	2.0	1.04	15		✓		✓		✓	✓	✓	✓	✓
Laromer GPTA propoxylated glycerol triacrylate	52408-84-1	3.0	1.08	70 - 120			✓	✓		✓	✓	✓	✓	✓
Laromer TMPTA trimethylolpropane triacrylate	15625-89-5	3.0	1.10	130	100	✓	✓			✓	✓	✓	✓	✓
Laromer LR 8863 ethoxylated trimethylolpropane triacrylate	28961-43-5	3.0	1.10	50 - 100	< 0.55	✓	✓	✓		✓	✓	✓	✓	✓
Laromer LR 8863 NG ethoxylated trimethylolpropane triacrylate	28961-43-5	3.0	1.10	50 - 100	< 0.10	✓	✓	✓		✓	✓	✓	✓	✓

* All products registered with REACH and TSCA. All other countries, please contact your BASF representative.



Joncryl Wax Emulsions & Zinc Oxide Solutions

BASF's Joncryl Wax emulsions and Zinc Oxide solutions are used to enhance the performance of surface printing ink and overprint varnish formulations. Joncryl Wax emulsions improve rub and scuff resistance with minimal loss of gloss, while Zinc Oxide Solution #1 contributes to increased chemical and heat resistance in water-based systems.

Product	Appearance	Non Volatile (%)	Total VOC (% wt)	Wax Particle Size (µm)	Viscosity @ 25°C (cps)	pH	Density @ 25°C (g/cm^3)	Melting Point of Wax (°C)	Freeze-thaw table	Description and Applications
Joncryl Wax 4	opaque emulsion	40	< 0.005	4.00	1,000	9.0	0.94	110	no	Large particle size polyethylene wax dispersion that imparts rub and scuff resistance to water-based inks at low use levels.
Joncryl Wax 26	translucent emulsion	25	3.3	0.05	10	9.8	0.99	130	no	Small particle size polyethylene wax emulsion that improves rub resistance of water-based inks, overprint varnishes, and functional packaging coatings with no significant loss of gloss.
Joncryl Wax 30	tan emulsion	35	3.5	0.08	50	9.2	1.00	132	no	Small particle size, low VOC polyethylene wax emulsion designed to improve rub and scuff resistance in water-based inks, overprint varnishes, and functional packaging coatings without sacrificing gloss.
Joncryl Wax 120	tan emulsion	34	< 0.005	0.08	400	9.0	0.98	56	no	Small particle size, very low VOC polyethylene/paraffin wax emulsion for water shedding, heat release, and low COF in overprint varnish and functional packaging coating formulations.
Zinc Oxide Solution #1	clear, water-white solution	15	< 0.005		5	11.4	1.22		yes	Zinc ammonium carbonate solution for aqueous inks, overprint varnishes, and functional packaging coatings where improved heat resistance and film hardness are desired.

Additives

As a world leader in the global chemical industry, BASF offers a wide array of high-performance additives that support a broad spectrum of applications across many different industry sectors. These unique raw materials help enable performance-driven products meet the latest and most stringent application requirements.

Our portfolio comprises a broad technology base of dispersing agents, defoamers, wetting and flow control agents, rheology modifiers, and film-forming agents.

With global manufacturing capabilities, a strong research and development platform, full-service regional technical laboratories, pre-screening capabilities and a team of knowledgeable, experienced experts, BASF can shorten your development time to bring new formulations to market.

Tinuvin® UV absorbers and light stabilizers

UV absorbers and light stabilizers for water-based, solvent-based and energy-curable inks and overprint varnishes.

Tinopal® optical brighteners / tracers

Highly fluorescent molecules used either as an optical brightener to mask or counteract yellowness or as a tracer to provide an optical method for detecting non-pigmented coating.

Irgastab® and Lignostab® in-can stabilizers

In-can stabilizers enhance shelf-life stability during ink storage and maintain stable viscosity.

Irgastab® and Irganox® antioxidants

Antioxidants minimize discoloration and the long-term effects of oxidative degradation of the binder in inks, coatings and adhesives.

Efka®, Dispex®, Dispex® Ultra dispersing agents

Dispersing agents wet and stabilize pigments and other particles within formulations. They represent an essential component as they provide color strength, gloss, viscosity stability and prevent sedimentation of particles.

Efka® and Rheovis® rheology modifiers

Rheology modifiers make it possible to adjust the flow behavior of formulations.

Efka® and Hydropalat® wetting agents and surface modifying agents

Wetting and flow control agents provide adequate wetting properties, enhance component compatibility and surface flow.

Slip and rub control agents provide a formulation with strong slip and surface smoothness effects.

Efka® and FoamStar® defoamers

Defoamers focus on establishing a perfect balance between excellent foam suppresion, high compatibility, long-term efficiency and easy handling.

Tinuvin UV absorbers & light stabilizers

Signage, graphics, magazines and packaging are often over lacquered with a protective coating (overprint varnish) to improve durability. BASF offers a broad selection of UV absorber (UVA) additives, which can easily be incorporated into water-based, solvent-based, or energy-curable overprint varnish formulations. Due to their high photostability, broad spectral coverage and very high extinction, Tinuvin UVAs provide excellent performance by filtering harmful UV light and protecting the underlying image against fading. In addition, the varnish itself can be protected against light degradation (cracking, loss of gloss, delamination, etc.) with the addition of Tinuvin hindered amine light stabilizers (HALS) in the formulation. Alternatively, they can be added directly into the ink formulation to help protect the colorant and binder against photo-oxidation, which will also increase the lifetime of the image.

Product	Physical Form	Melting Range (°C)	Solubility/Miscibility @ 20°C (g/100g)							Applications				Description and Applications
			mineral spirit / toluene	xylene / methyl isobutyl ketone	methyl amyl ketone / methyl ethyl ketone	butyl acetate / ethyl acetate	ethyl Cellosolve* acetate / butyl Cellosolve* acetate	butyl Carbitol* / Texanol**	water	Digital Inks	Overprint Varnish	UV Curing	Adhesives	
2-(2-hydroxyphenyl)-Benzotriazole UVA (BTZ)														
Tinuvin 171	liquid		> 50 > 50	> 50 > 50	> 50 > 50	> 50 > 50		> 50 na	<0.01	✓	✓			Ideal UVA for photographic applications when initial yellowing must be kept to a minimum.
Tinuvin 928	solid	109 - 113		> 50 na	30 na	> 30 na	10 9.5		<0.01	✓	✓		✓	Premiere BTZ for photo-permanence and for its ability to provide high UV blocking power over a broad spectral range.
Tinuvin 1130	liquid		na > 50	> 50 > 50	> 50 > 50	> 50 > 50	> 50 > 50	> 50 > 50	<0.01	✓	✓		✓	Excellent spectral coverage in UVA and UVB region. Easily incorporates into water- and solvent-based inks.
2-Hydroxyphenyl-s-triazine UVA (HPT)														
Tinuvin 400	liquid		na > 50	> 50 > 50	> 50 > 50		> 50 > 50	> 50 > 50	<0.01	✓	✓	✓	✓	A general purpose, easy to incorporate UVA with high photo-permanence. It is especially useful in blocking light in the short wavelength spectral region (below 320nm) most preferred for UV curing applications.
Tinuvin 477	liquid									✓	✓	✓	✓	Designed as a red-shifted UVA. It blocks light up to 400 nm. Often used in combination with Tinuvin 400 for optical applications and in color-sensitive applications, where protecting color long term is critical.
Tinuvin 479	solid									✓	✓	✓	✓	A general purpose, easy to incorporate UVA with high photo-permanence. It is especially useful in blocking light in the short wavelength spectral region (below 320nm) most preferred for UV curing applications.

Note:
For EB cure applications, use light stabilizer packages as needed.
For UV cure applications, please contact your BASF representative to assist with light stabilizer package optimization.
*Cellosolve and Carbitol are trademarks of The Dow Chemical Company.
**Texanol is a trademark of the Eastman Chemical Company.

Tinuvin UV absorbers & light stabilizers (cont.)

Product	Physical Form	Melting Range (°C)	Solubility/Miscibility @ 20°C (g/100g)							Applications				Description and Applications
			mineral spirit / toluene	xylene / methyl isobutyl ketone	methyl amyl ketone / methyl ethyl ketone	butyl acetate / ethyl acetate	ethyl Cellosolve* acetate / butyl Cellosolve* acetate	butyl Carbitol* / Texanol**	water	Digital Inks	Overprint Varnish	UV Curing	Adhesives	
Hindered amine light stabilizers (HALS)														
Tinuvin 123	liquid		> 50 > 50	> 50 > 50	> 50 > 50	> 50 > 50			<0.01	✓	✓		✓	Low basicity amino-ether (NOR) HALS that provides protection against cracking and color change.
Tinuvin 152	solid										✓	✓		Good for UV/EB applications.
Tinuvin 249	liquid									✓	✓	✓		Low viscosity and general purpose. Ideal for polar inks, coatings and adhesives.
Tinuvin 292	liquid		> 50 > 50	> 50 > 50	> 50 > 50	> 50 > 50		> 50 > 50	<0.01	✓	✓	✓	✓	Good for a variety of applications. It also can be dispersed into water-based inks.
Tinuvin 622 SF	solid												✓	Polymeric HALS, exhibiting low migration.
Tinuvin 770 DF	solid	81 - 85				na 24			<0.01				✓	HALS with indirect food contact approval.
NEAT additive preparations for water-based applications														
Tinuvin 123-DW ECO	liquid									✓	✓		✓	Non-interacting and hydrophobic HALS for water-based formulas.
Tinuvin 400-DW ECO	liquid									✓	✓	✓	✓	Ideal for UV curing; protects against UV light with minimal yellowing.
Tinuvin 477-DW ECO	liquid									✓	✓		✓	A red-shifted HPT light absorber, which is ideal for thin water-based coatings and inks.
Tinuvin 479-DW ECO	liquid									✓	✓	✓		Very hydrophobic HPT absorber that is delivered in a water-miscible preparation. It delivers a high level of protection in the critical 300-340 nm region.
Tinuvin 5321-DW ECO	liquid										✓	✓	✓	UVA/HALS blend with strong performance and durability for exterior water-based coatings.
Tinuvin 5333-DW ECO	liquid									✓	✓	✓	✓	A blend of high-performance UVA/HALS, which resists wash-out, for high durability outdoor applications.
Tinuvin 9945-DW ECO	liquid									✓	✓	✓	✓	A BTZ light absorber, which is solvent-free, label-free; ideal for water-based formulas.

Note:
For EB cure applications, use light stabilizer packages as needed.
For UV cure applications, please contact your BASF representative to assist with light stabilizer package optimization.
*Cellosolve and Carbitol are trademarks of The Dow Chemical Company.
**Texanol is a trademark of the Eastman Chemical Company.

Tinopal optical brighteners / optical tracers

Tinopal products are highly fluorescent molecules. They are used primarily as optical brighteners to mask or counter-act yellowness (especially in white inks) and make colors brighter. UV-A (like black light, 365 nm) excitation produces strong blue light emission from them. The Tinopal products are also widely used as a “tracer” (especially in adhesives and clear coating applications), so they can provide an optical method for detecting non-pigmented coating (as in overspray or in determining the proper registration during application). The Tinopal products are generally not considered photo-permanent, so they are recommended for indoor use only or in sealers.

Product	Physical Form	Applications					Description and Applications
		Solventborne	Waterborne	Inks	OPV	Adhesives	
Tinopal NFW Liquid	liquid		✓	✓	✓	✓	Approx. 20% solution of 4,4’-bis(2-sulfostyryl)-biphenyl disodium salt.
Tinopal OB CO	solid	✓		✓	✓	✓	Non-ionic, 2,5-thiophenediyl bis(5-tert-butyl-1,3-benzoxazole).
Tinopal SFP	solid		✓	✓	✓	✓	Water-soluble stilbene-based optical brightener.

In-can stabilizers

In-can stabilizers are critical to enhance shelf-life stability during storage of an ink. They are important in maintaining stable viscosity. They are mainly used in reactive resins, such as UV/EB-curable inks, coatings and adhesives. They are especially useful in UV-curable inkjet inks and in 2K acrylic adhesives.

Product	Physical Form	Applications					Description and Applications
		Solventborne	Waterborne	Inks	OPV	Adhesives	
Irgastab UV 22	liquid solution	✓		✓	✓	✓	An aneraobic free-radical scavenger (quinone derivative) dissolved in GPTA monomer. It is used mainly for UV/EB applications.
Lignostab 1198	solid	✓	✓	✓	✓	✓	100% active. Can be used in either non-aqueous or water-based formulas. Often used synergistically with Irgastab UV 22 and with secondary antioxidants, like Irgafos 126 phosphite.

Antioxidants

Antioxidants are used as process aids and are key to minimizing discoloration and the long-term effects of oxidative degradation of the binders in inks, coatings, and adhesives. The Irganox antioxidants work to scrub away peroxy radicals and minimize the formation of hydroperoxides (which are key contributors to yellowing, etc.). Irgafos® phosphites, hydroxyl amines and thiosynergists help high-temperature performance. The Irganox and Irgafos products often work synergistically as thermal stabilizers.

Product	Physical Form	Applications					Description and Applications
		Solventborne	Waterborne	Inks	OPV	Adhesives	
Irganox 245-DW	liquid solution		✓			✓	A water-based emulsion of a sterically hindered phenolic antioxidant (40% active).
Irganox 1010	solid	✓				✓	Widely used antioxidant for adhesives and for low-migration applications.
Irganox 1010-DW ECO	liquid		✓			✓	AO for water-based systems.
Irganox 1035	solid	✓		✓	✓	✓	Contains both hindered phenol and thio synergist. Used mainly in UV/EB applications.
Irganox 1076	solid	✓		✓	✓	✓	Widely used antioxidant for resins used in inks and adhesives.
Irganox 1520 L	liquid / solid	✓	✓			✓	An efficient antioxidant for both non-aqueous and water-dispersible formulations. Used mainly in adhesives.
Irganox 1726	solid	✓				✓	An efficient antioxidant, especially for adhesives.
Irganox B 225	solid	✓				✓	A blend of Irganox 1010 (a hindered phenol, primary antioxidant) and Irgafos 168 (a phosphite, secondary antioxidant designed), which targets the termination of hydroperoxides and minimizes thermo-oxidative degradation.
Irganox PS 800	solid	✓				✓	A thiosynergist heat stabilizer. Most often used in combination with a phenolic antioxidant, such as Irganox 1035.
Irgastab FS 301	solid	✓		✓	✓	✓	Phenol-free processing stabilizer system.

Formulation additives

Dispex, Rheovis, Hydropalat, Efka, FoamStar

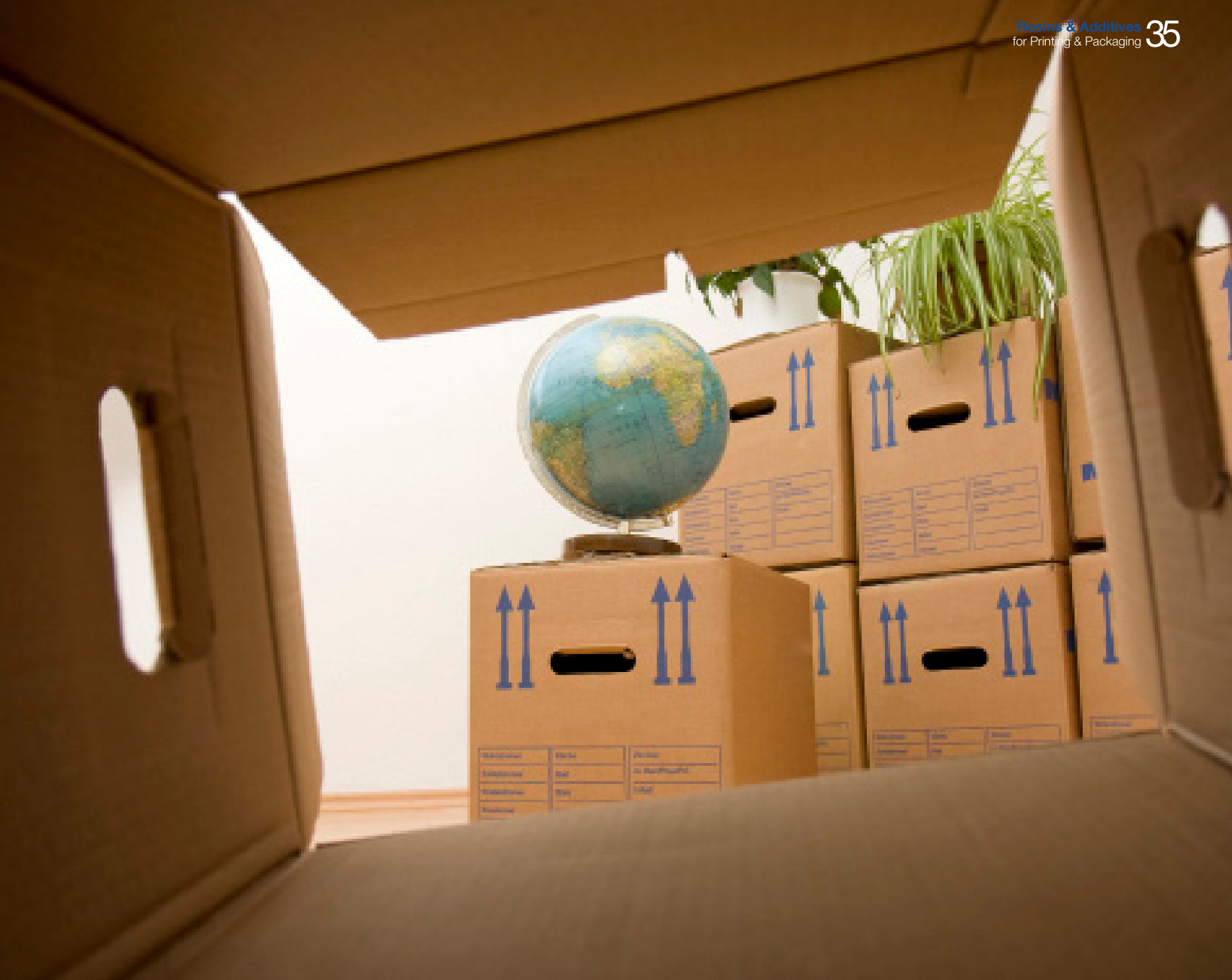
BASF is a premiere provider of formulation additives for the printing ink industry, including digital inks. These unique products enable performance-driven formulations, which meet the latest and most stringent environmental regulations. The portfolio comprises a broad technology base of dispersing agents, wetting agents and surface modifiers, defoamers, rheology modifiers, and film-forming agents. Many of our additives have been classified as fit for indirect food contact.

Product	Non Volatile (%)	Total VOC (% wt)	Acid No. (NV)	Amine #	Water-based	Solvent-based	UV Curable	Description and Applications
Dispersants								
Dispex AA 4040	43		0	0	✓			Ammonium polyacrylate polymer dispersing agent for WB UV inorganic pigments and fillers.
Dispex AA 4144	35		0	0	✓			Sodium polyacrylate, highly effective pigment dispersing aid for WB UV inorganic pigments, even at low dosages.
Dispex Ultra FA 4480	80		0	0	✓			Universal, non-ionic dispersing and wetting agent improves color development, acceptance, and gloss.
Dispex Ultra CX 4452	< 0.1		0	0	✓			Excellent for inorganic pigments and transparent iron oxides; strong viscosity reduction with low foaming during milling.
Dispex Ultra PX 4585	50		0	20	✓			Acrylic block copolymer that demonstrates high efficiency in stabilizing pigments and wide compatibility with many WB resin systems, which make it ideally suited for resin-free pigment concentrates. Benchmark dispersant for carbon blacks.
Dispex Ultra PX 4290	< 0.1		9	0	✓			Universal pigment affinity; suitable for aqueous coating systems, printing inks and adhesives; excellent stabilizing characteristics.
Dispec Ultra PX 4565	< 0.1		0	11	✓			Strong viscosity reduction during pigment griding of many organic pigments and carbon blacks; providing excellent coloristic properties.
Efka FA 4611	100	<0.1	129	0		✓	✓	Solvent-free dispersing agent, with excellent stabilization of inorganic pigments, notably TiO_2. Achieves strong reduction in mill-base viscosity, even with high pigment and filler loadings.
Efka FA 4666	52	48	140	0		✓	✓	Inorganic pigment dispersant for SB and UV inks and OPV's. In UV systems produces low and stable viscosity in low gloss formulations with high loads of silica based flatting pigments. Especially effective in low gloss applications with Laromer PO 9026.
Efka PX 4310	50	50	0	19		✓		50% active acrylic block copolymer dispersant, offering high efficiency in stabilizing pigments and wide compatibility with solvent-based resin systems. Highly suitable for carbon blacks and resin-free dispersions.
Efka PX 4701	> 97	< 3	0	40		✓	✓	100% active acrylic block copolymer dispersing agent, well-suited for high-performance pigments and resin-free pigment concentrates in UV-curable printing inks and inkjet inks offering long term storage stability.
Efka PX 4703	> 99	< 1	0	56		✓	✓	100% active acrylic block copolymer dispersing agent, suited for high-performance pigments in UV oligomer and monomer formulations that are less polar than those used with Efka PX 4701.
Efka PX 4733	> 97	< 2.5	0	25		✓	✓	100% active tin-free dispersant for UV flexo and offset systems. Specifically for phthalo blue and green pigments.

Formulation additives (cont.)

Product	Non Volatile (%)	Total VOC (% wt)	Acid No. (NV)	Amine #	Water-based	Solvent-based	UV Curable	Description and Applications
Wetting Agents								
Hydropalat SL 3683	< 0.2		0	0	✓		✓	Strong anti-blocking performance with good compatability in water-based systems; enhances scratch resistance; low cyclic silicone content.
Hydropalat WE 3220	> 99	< 1	0	0	✓		✓	Silicone surfactant, 100% active wetting agent. Strong reduction of surface tension, limited surface slip, great for over-coatability.
Hydropalat WE 3225			0	0	✓		✓	Silicone-based wetting agent, offering excellent substrate wetting and pronouced defoaming action; enhances gloss, improves flow and leveling, and accentuates wood grain in coatings.
Hydropalat WE 3229	< 2		0	0	✓		✓	Excellent wetting agent for high speed application with good deaeration and excllent anticratering performance, suitable for 100% UV systems.
Hydropalat WE 3475	75	6	0	0	✓			Sulfosuccinate wetting agent, strong reduction of dynamic surface tension, benchmark wetting agent for OPVs. To manage foam consider using with Foamstar SI 2240.
Hydropalat WE 3650	> 99	< 1	0	0	✓		✓	100% active modified alkoxylate wetting agent, excellent dynamic surface tension reduction, low foam stabilization.
Hydropalat WE 3966	100	< 1	0	0	✓			Powder form surfactant, prevents pigment shock during grind letdown, easy to blend with other powders.
Surface Slip								
Efka SL 3200	> 95	< 1	0	0	✓	✓	✓	Modified polysiloxane slip additive, 100% active. Broad FDA and Swiss compliance.
Efka SL 3257	> 99	< 1	0	0	✓	✓	✓	Modified polysiloxane slip additive, 100% active. Provides surface slip and mar resistance.
Defoamers								
FoamStar SI 2210 NC	100	1	0	0	✓			Persistent defoamer for non-pigmented and low-pigmented inks and adhesives and UV-curable systems.
FoamStar SI 2213	100	< 0.1	0	0	✓			Highly effective siloxane based defoamer with excellent compatibility. For printing inks in let down stage and OPV's. Can be used press-side due to ease of incorporation.
FoamStar SI 2240	100	< 0.1	0	0	✓			Well-suited for production of pigment concentrates due to its excellent stability under high shear conditions. Minimizes macro and micro foam from the grind process and offers concentrates with low viscosity. Extended food contact compliance and global country registrations.
Foamaster NO 2306	100	< 0.1	0	0	✓		✓	Non-mineral-oil and non-silicone based defoamer.
Foamaster NO 2331	< 0.1		0	0	✓			Native oil-based defoamer for monomer stripping in latex manufacturing and emulsion polymerization; specifically designed to have broadest food contact compliance.
Efka PB 2744	> 99	< 0.5	0	0		✓	✓	Ultra-low VOC, silicone and mineral oil free defoamer recommended for UV systems.
Efka SI 2022	< 10	> 90	0	0		✓	✓	Modified polydimethylsiloxane-based defoamer, ~10% active for UV that can tolerate some solvent. Low-shear incorporation.
Efka SI 2751	> 95		0	0		✓		Silicone defomaer for universal usage in solvent-based systems, complies with food contact regulations.
Rheology Modifiers								
Rheovis AS 1130	30	< 1	0	0	✓			Highly efficient low-shear ASE thickener, highly shear thinning. Excellent for anti-sag and anti-settle in spray and pigment slurries formulations.
Rheovis PU 1292	20		0	0	✓			High active VOC; mid to high shear thickening.
Rheovis PU 1333	< 0.1		0	0	✓			Most newtonian high-shear thickener with minimum effect on low- and mid-shear viscosity.

Notes



About BASF

BASF Corporation, headquartered in Florham Park, New Jersey, is the North American affiliate of BASF SE, Ludwigshafen, Germany. BASF has more than 15,500 employees in North America, and had sales of $18.2 billion in 2024. For more information about BASF's North American operations, visit www.basf.com.

At BASF, we create chemistry for a sustainable future. We combine economic success with environmental protection and social responsibility. The more than 111,000 employees in the BASF Group work on contributing to the success of our customers in nearly all sectors and almost every country in the world. Our portfolio is organized into five segments: Chemicals, Performance Products, Functional Materials & Solutions, Agricultural Solutions and Oil & Gas. BASF generated sales of €65.3 billion in 2024. BASF shares are traded on the stock exchanges in Frankfurt (BAS), London (BFA) and Zurich (BAS). Further information at www.basf.com.

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