We will start soon…

To make this call most efficient for everybody, we have **muted** your phones.

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The **presentation** will be **shared** with all participants after the webinar.

Your **hosts** for this call

Formulation Additives for digital printing

Peter Bene
Presenter

Andrea Schamp/
Kerstin Schurig
Chat

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Formulation Additives for digital printing

for wb and UV systems

Ludwigshafen, 01.03.2021

Peter Bene

Technical Sales
Formulation Additives
EMEA

Agenda

1. Introduction
2. BASF portfolio overview for ink-jet inks
   - for water-based systems
   - for UV-based systems
3. Portfolio of UV monomers and oligomers
4. Portfolio of water-based resins
5. Summary

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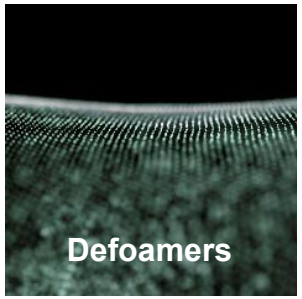
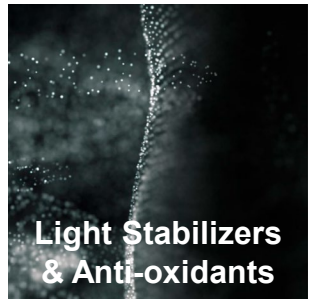
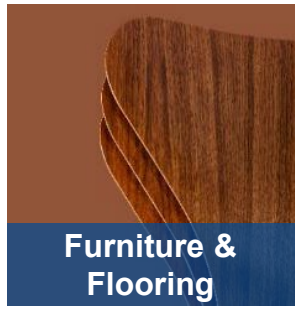
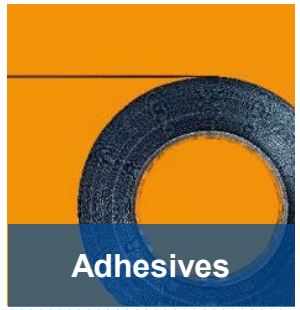
Our comprehensive portfolio enables solutions for various industries

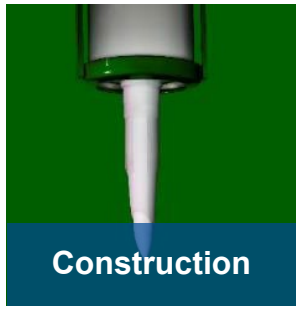


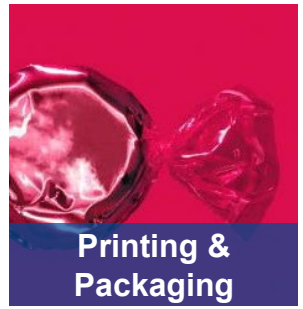


BASF is the premiere provider of **Performance & Formulation Additives** for the paints and coatings industry









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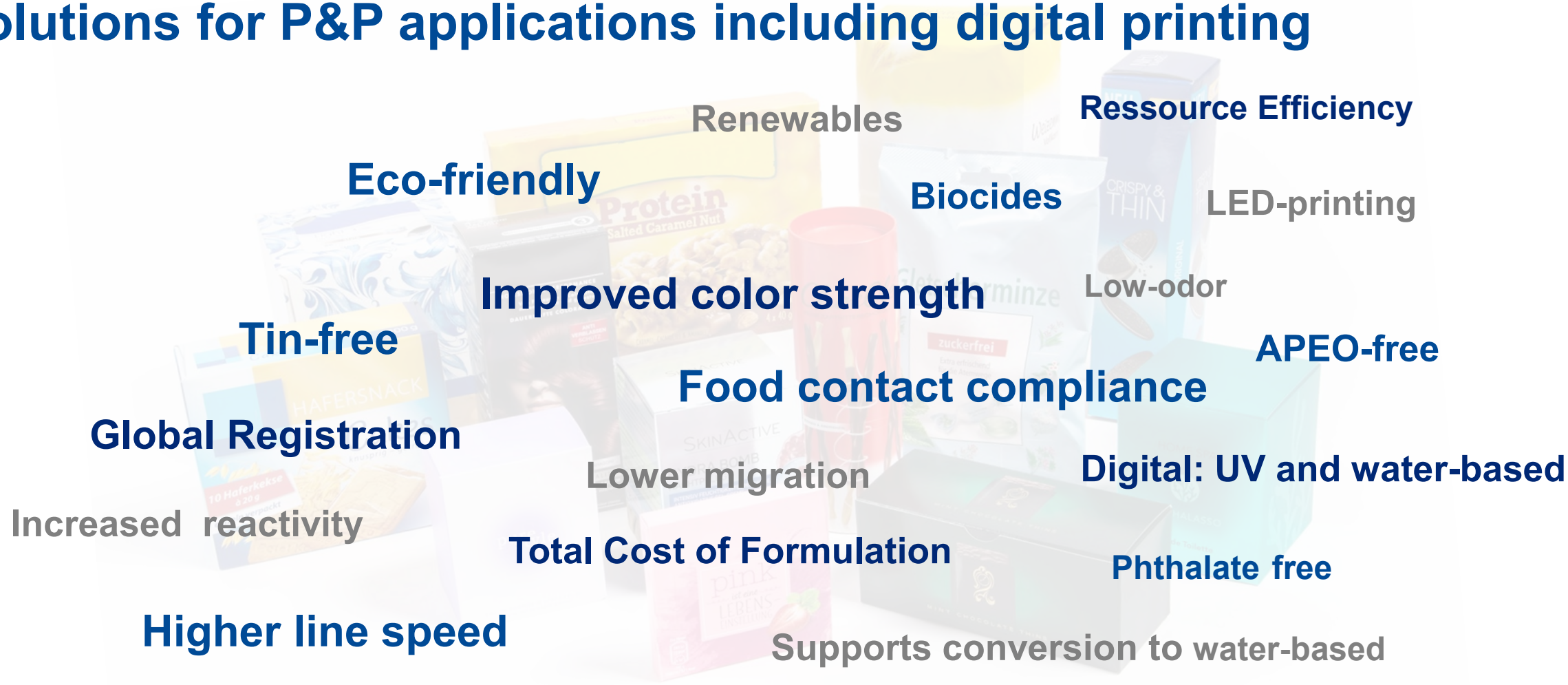
We make today's challenges tomorrow's solutions for P&P applications including digital printing



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Agenda

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ED2 Formulation Additives – Focus products for ink-jet inks

	Defoamer	Wetting agents & Surface modifier	Dispersing agents		Rheology modifiers	Others
			High MW	Low MW		
Water-based	**FoamStar®** SI 2240 SI 2292	**Hydropalat®** WE 3120 WE 3130 WE 3197 WE 3220/3221 WE 3650 WE 3694	**Dispex®** AA 4040 AA 4135 AA 4145 **Dispex®Ultra** PX 4290 PX 4575 PX 4585 PX S576	**Dispex®Ultra** FA 4437 FA 4488	**Rheovis®** AS 1125 AS 1130 HS 1212 HS 1303 EB PE 1330 PU 1191 PU 1331	**Humectants:** **BP <250°C** Solvenon DPM, DPNB Diethylenglycol **BP>250°C** Triethyleneglycol N(2-Hydroxyethyl)-ethylene urea Hydroxyethyl-ethylene-urea Glycerol Loxanol® PL 5814 Loxanol® PL 5824 **Other:** Loxanol® MI 6730
Solvent-based		**Efka®** FL 3277 FL 3740 FL 3750 SL 3200 SL 3259 **Hydropalat®** WE 3220	**Efka®** PX 4320 PX 4330 PX 4701 PX 4733 PX 4780	**Efka®** FA 4609 FA 4611 FA 4620		
UV-based	**Efka®** PB 2770 SI 2721	**Efka®** FL 3277 FL 3750 SL 3200 SL 3259 **Hydropalat®** WE 3220	**Efka®** PX 4701 PX 4703 PX 4733 PX 4780	**Efka®** FA 4611 FA 4620		**Irgastab®** UV 22

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Dispersing agents for water-based systems

In water-based ink-jet inks mainly high molecular weight dispersants based on CFRP (Controlled Free Radical Polymerisation) or advanced polymer technology are used.

Following products are recommended for such ink systems to improve viscosity/rheology, long term stability and to increase gloss and color strength of the dedicated systems:

- **Dispex® Ultra PX 4290** – general workhorse; suitable for a very broad range of organic and inorganic pigments; food contact compliance
- **Dispex® Ultra PX 4585** – also suitable for a broad range of organic pigments incl. carbon blacks; food contact compliance
- **Dispex® Ultra PX 4575** – benchmark performance for inorganics like TiO_2 and fillers, but also for other inorganic and organic pigments; suitable for a broad range of industrial applications, where NO food contact is required.

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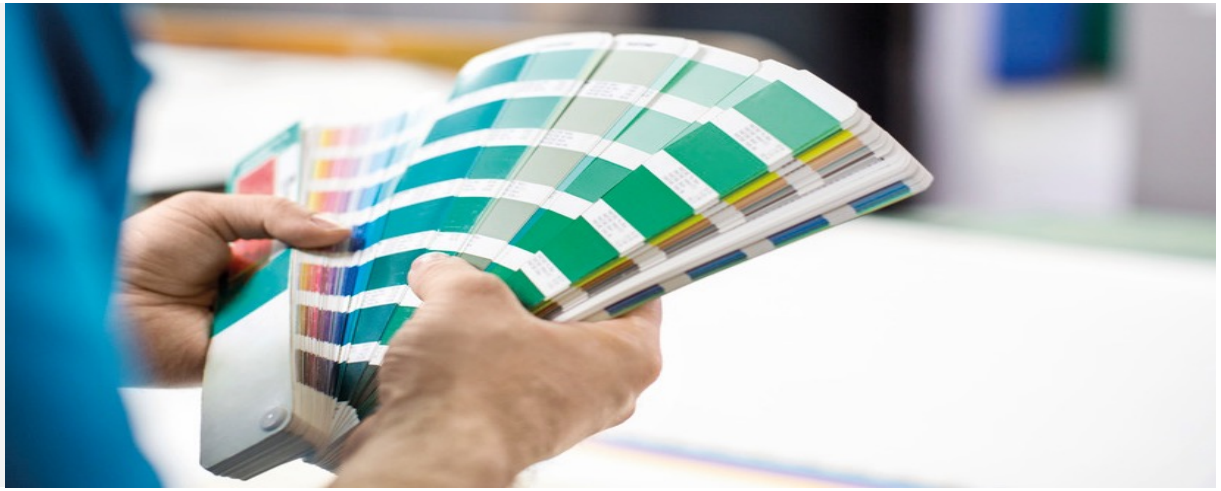
Dispex® Ultra PX 4290 for P&P applications

High molecular weight dispersing agent for organic (and inorganic) pigments in aqueous coating systems, printing inks and adhesives



Application:

Dispex Ultra® PX 4290 is a dispersing agent of organic (and inorganic) pigments in aqueous coating systems, printing inks and adhesives. Due to the excellent stabilizing characteristics high levels of gloss, outstanding color strength and excellent viscosity reduction can be achieved – combined with excellent long-term stability. This allows also higher pigment loadings while excellent flow characteristics are maintained.

Sustainability highlights:

- Label-free
- Food Contact Compliance
- Suitable for a broad range of applications

Performance highlights:

- Designed to stabilize (inorganic and) organic pigments in aqueous formulations e.g. ink-jet inks or resin free pigment concentrates for wb Flexo
- In addition, it also achieves excellent results as Co-dispersant in resin-based pigment concentrates
- Outstanding color strength
- Improved gloss
- Anti-flooding behavior
- Excellent flocculation stability
- Solvent-free

Characteristic Values:

	Dispex® Ultra PX 4290
Appearance	Clear, yellowish liquid
Solvent	water
Density	~ 1.06 g/cm^3
Active content	~ 40%

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Dispersing agents for water-based

Performance tests –

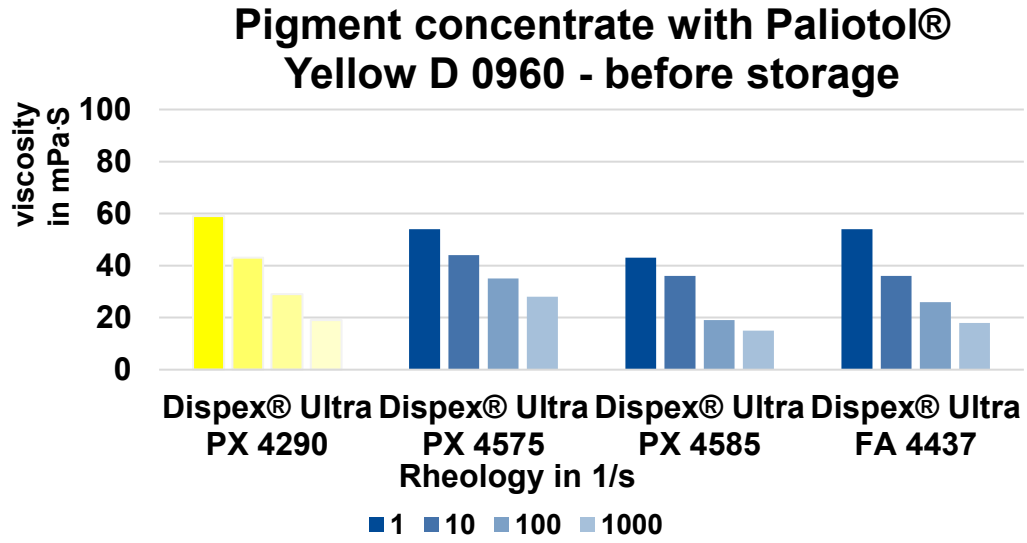
Formulation based on PY 138

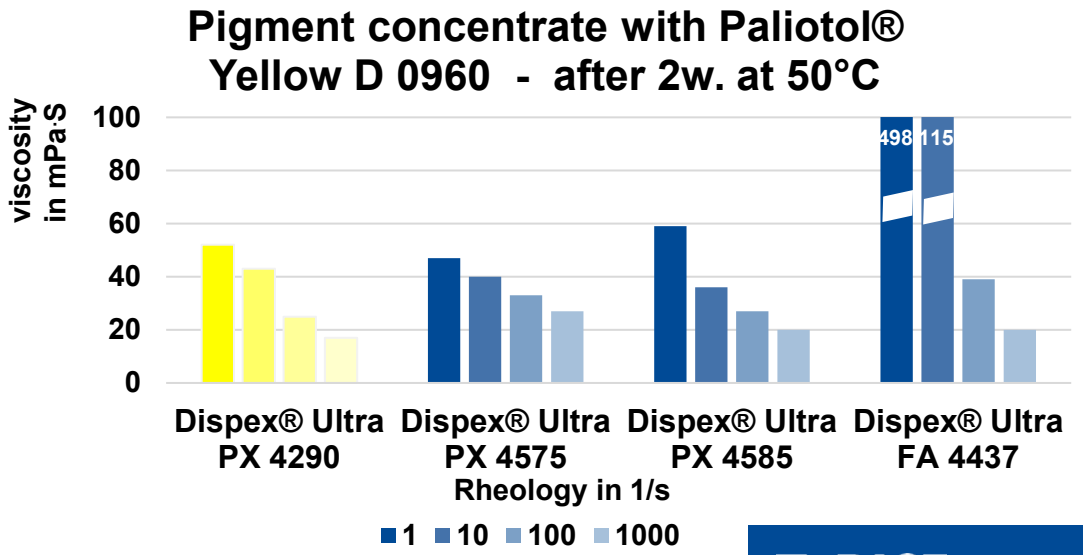
Formulation pigment concentrate				
Paliotol® Yellow D 0960	30	30	30	30
Dispex® Ultra PX 4290	32.1			
Dispex® Ultra PX 4575		32.1		
Dispex® Ultra PX 4585			25.7	
Dispex® Ultra FA 4437				12.9
FoamStar® SI 2240	1	1	1	1
Demineralized water	36.9	36.9	43.3	56.1

DaoP: 43%

	Dispex® Ultra PX 4290	Dispex® Ultra PX 4575	Dispex® Ultra PX 4585	Dispex® Ultra FA 4437
Particle size				
D50 (nm)	202	234	209	443
Stability				
After 2w. 50°C	4-5	4	4-5	4

*5 – no settlement/phase separation
1 – strong settlement/phase separation





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Dispersing agents for water-based

Performance tests –

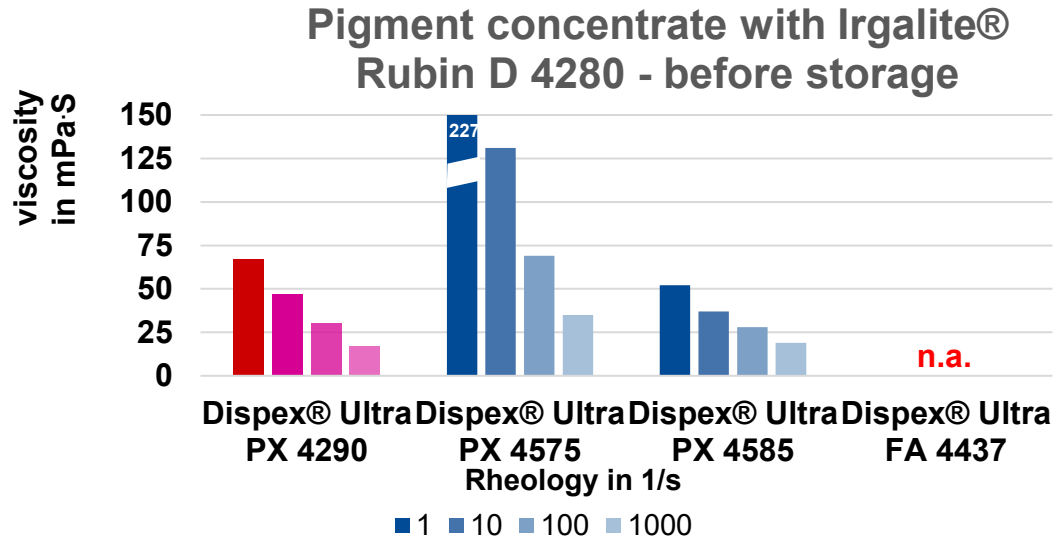
Formulation based on PR 57:1

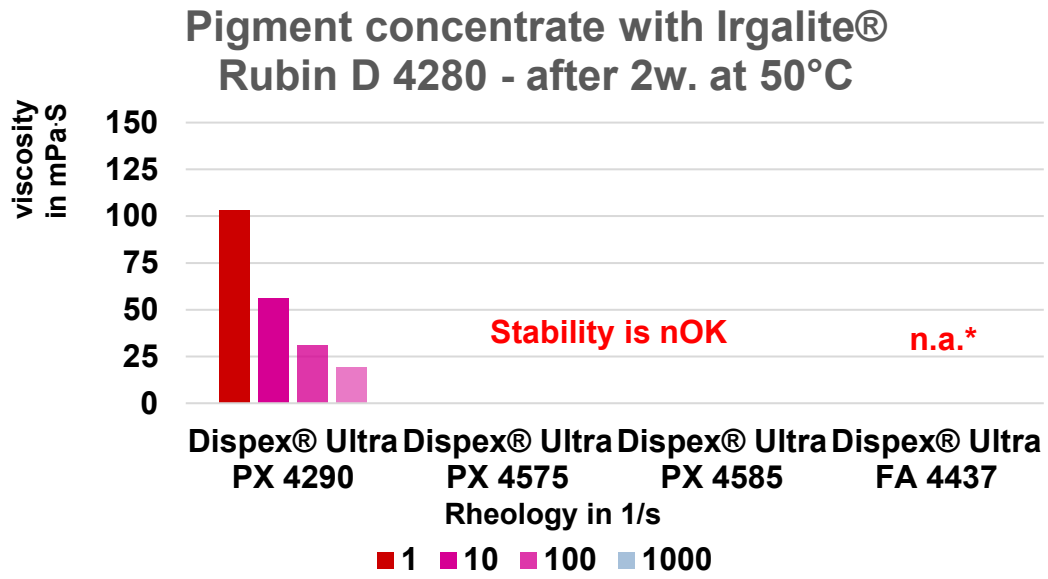
Formulation pigment concentrate	
Irgalite® Rubin D 4280	25
Dispex® Ultra PX 4290	26.8
FoamStar® SI 2240	1
Demineralized water	47.2

DaoP: 43%

	Dispex® Ultra PX 4290	Dispex® Ultra PX 4575	Dispex® Ultra PX 4585	Dispex® Ultra FA 4437
Particle size				
D50 (nm)	183	188	190	216
Stability				
After 2w. 50°C	5	3	2	2

*5 – no settlement/phase separation
1 – strong settlement/phase separation





*Strong increase of viscosity after storage

Summary dispersing agents water-based for organic pigments

		Dispex® Ultra PX 4290	Dispex® Ultra PX 4575	Dispex® Ultra PX 4585	Dispex® Ultra FA 4437
	PY 74	5	4-5	5	5
Paliotol® Yellow D 0960	PY 138	5	4-5	5	3-4
Paliotol® Yellow D 1080 J	PY 138	5	5	5	5
Paliotol® Yellow D 1085 J	PY 150	5	1	1	1
	PY 155	5	3	3	4-5
Iraglite® Orange D 2980	PO 34	5	4-5	3-4	4-5
Irgalite® Rubine D 4280	PR 57:1	5	2	2	2
Cinquasia® Magenta D 4550	PR 122	5	2-3	2	3
Cinquasia® Magenta D 4500 J	n.a.	5	2	2	4
Cinquasia® Magenta D 4570	DDP red	5	4-5	3	2
Irgazin® Red L 3630	PR 254	5	1	5	4
Irgazin® Red D 3656 HD	PR 254	5	4-5	5	4
Irgazin® Red L 3670 HD	PR 254	5	4-5	5	4-5
Cinquasia® Red L 4100 HD	PV 19	5	4-5	5	4
Cromophthal® violett D 5800	PV 23	5	4-5	5	4-5
Heliogen® Blue S 7320	PB 15:3	5	5	3	4-5
Heliogen® Blue D 7086	PB 15:3	5	4-5	3	5
Heliogen® Blue D 7115 F	PB 15:4	5	2	3	2-3
Heliogen® Blue D 7490	PB 16	5	1-2	2	1-2
Heliogen® Green D 8730	PG 7	5	2	2	3

5; 4-5	very good
4	acceptable
3-4 and below	not acceptable

*full presentation available on request.

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Wetting agents and surface modifiers for water-based systems

In water-based systems following chemistries are of interest:

- Short chain silicone surfactants with moderate reduction of surface tension, support droplet-formation; rather low foaming; no slip
  - **Hydropalat® WE 3220**
  - **Hydropalat® WE 3221**
- Fatty alcohol ethoxylates/alkoxylates, good wetting properties
  - **Hydropalat® WE 3120** (water-soluble)
  - **Hydropalat® WE 3130**
  - **Hydropalat® WE 3197** (water-soluble)
  - **Hydropalat® WE 3694** (very low foaming)
- Modified ethoxylates, good substrate wetting
  - **Hydropalat® WE 3650** (very low foaming)

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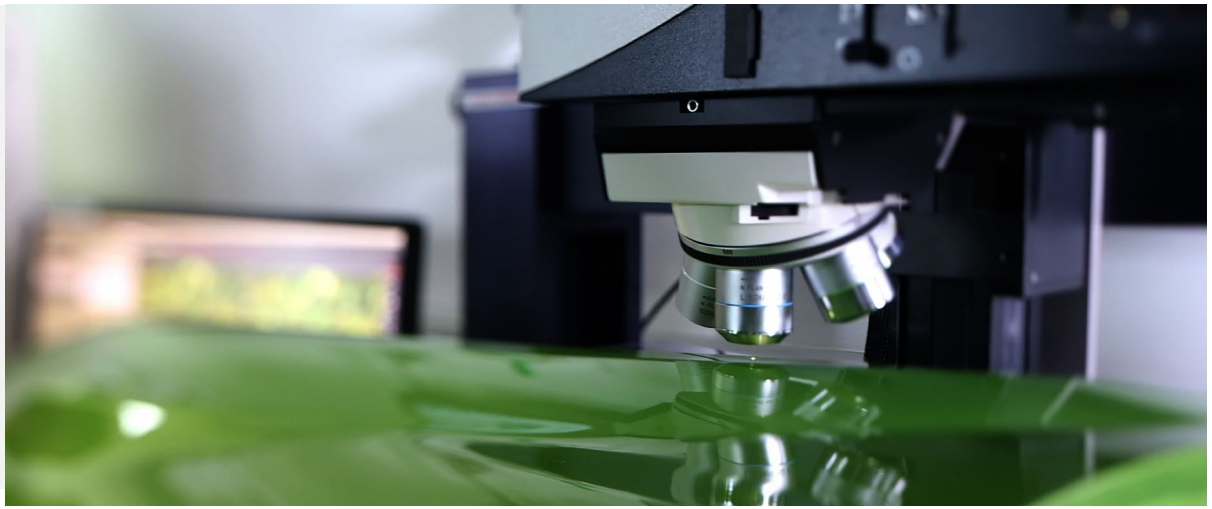
Hydropalat® WE 3220 / 3221

Silicone surfactants for water-based coatings with excellent substrate wetting



Application:

Hydropalat® WE 3220 / WE 3221 show strong reduction of surface tension in water-based systems and are highly suited to improve substrate wetting and to prevent surface defects. They are recommended as anti-crater additives with good recoatibility. Based on short organically modified polysiloxanes, Hydropalat® WE 3220 / WE 3221 do not increase surface slip.

Sustainability highlights:

- Food Contact Compliances: Swiss Ordinance SR 817.023.21

Performance highlights:

- Silicone surfactants based on organo modified silicones
- Excellent substrate wetting
- Strong reduction of surface tension
- No increase of surface slip
- Anti-cratering
- Good surface leveling

Characteristic Values:

Appearance	Clear colorless, low-viscosity liquid
Density at 20°C	~ 1,04 g/cm^3 / ~ 1,00 g/cm^3
Active matter	~ 100% / ~ 52%
Color (Gardner)	max. 2

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Humectants for water-based systems

lower boiling point (<250°C)

- **Solvenon® DPM –** Dipropylene glycol monomethyl ether
- **Solvenon® DPNB –** Dipropylene glycol monobutyl ether
- **Diethylene glycol etc.**

higher boiling point (>250°C)

- **Triethylene glycol**
- **N(2-Hydroxyethyl)-2-pyrrolidone**
- **Hydroxyethyl-ethylene urea**
- **Glycerol**
- **Solvenon® TPNB –** Tripropylene glycol monobutyl ether
- **Loxanol® PL 5814 –** Polyethylene glycol 400
- **Loxanol® PL 5824 –** Polypropylene glycol 400
- **Other higher MW PEG or PPGs are also available**

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Agenda

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Efka® PB 2770

Silicone-free, 100% defoamer for radiation curing systems

Application:

Efka® PB 2770 is a new, silicone-free, 100% active defoamer for radiation curing systems offering excellent foam-breakdown and outstanding compatibility.
Efka® PB 2770 is an excellent deaerator and defoamer for universal use in clear and pigmented UV curable formulations, composites, gel coats, cast resins and adhesives, but also printing inks (incl. UV ink-jet)

Sustainability highlights:

- Silicone-free
- 100% active

Performance highlights:

- Silicone-free, polymer-based defoamer
- Outstanding compatibility in various systems
- Excellent recoatability
- Suitable for typical F&F applications like roller or curtain coater but also for printing inks (incl. ink-jet)

Characteristic Values:

Appearance	Clear yellowish liquid
Density at 20°C	~ 0.96 g/cm^3
Viscosity	~ 1,800 mPa·s

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Dispersing agents for UV-based systems

Also for UV applications – here in particular UV Ink-jet – products based on CFRP or advanced polymer technology are highly recommended.

- **Efka® PX 4701** – general workhorse; suitable for a very broad range of organic pigments; food contact compliant
- **Efka® PX 4733** – suitable for a broad range of pigments including PBl 15:4 certain food contact compliant.
- **Efka® PX 4703** – suitable for a very broad range of organic pigments incl. carbon black; food contact compliant
- **Efka® PX 4780** – excellent viscosity reduction; outstanding in carbon black NO food contact compliance -> suitable only in industrial applications

---

For inorganic pigments like TiO_2 and fillers:

- **Efka® FA 4611**– acidic polyether, excellent stabilization of pigment with improved opacity and reduced viscosity of pigment concentrate.

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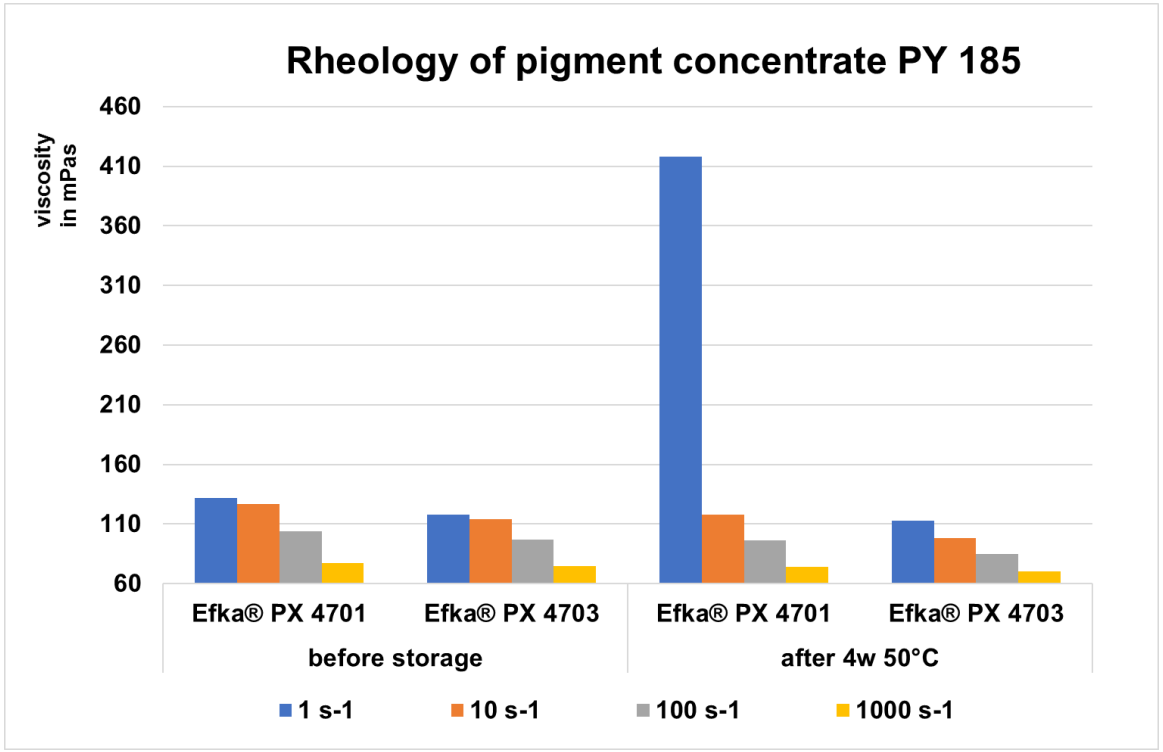
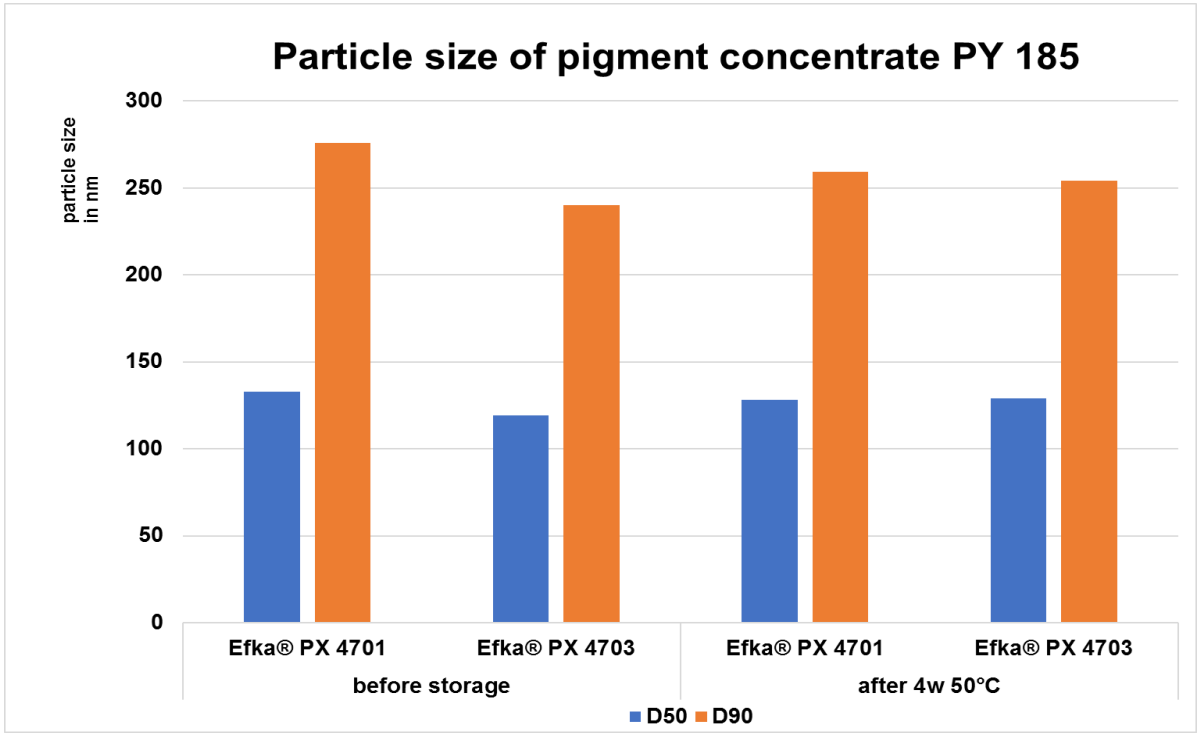
Dispersing agents UV for organic pigments – Efka PX 4701/PX 4703
pigment concentrate PY 185

Formulation pigment concentrate PY 185		
Paliotol® Yellow D 1155	20	20
Laromer® DPGDA	73.1	73.1
Efka® PX 4701	6.5	
Efka® PX 4703		6.5
Irgastab® UV 22	0.4	0.4





	before storage	after 4w. 50°C	before storage	after 4w. 50°C
	w. Efka® PX 4701		w. Efka® PX 4703	
Newtonian flow	122	123	118	115
Thixotropy	102	101	101	101
Stability of PC*		5		5

*5- very good, no settlement or phase separation
1- strong settlement or phase separation

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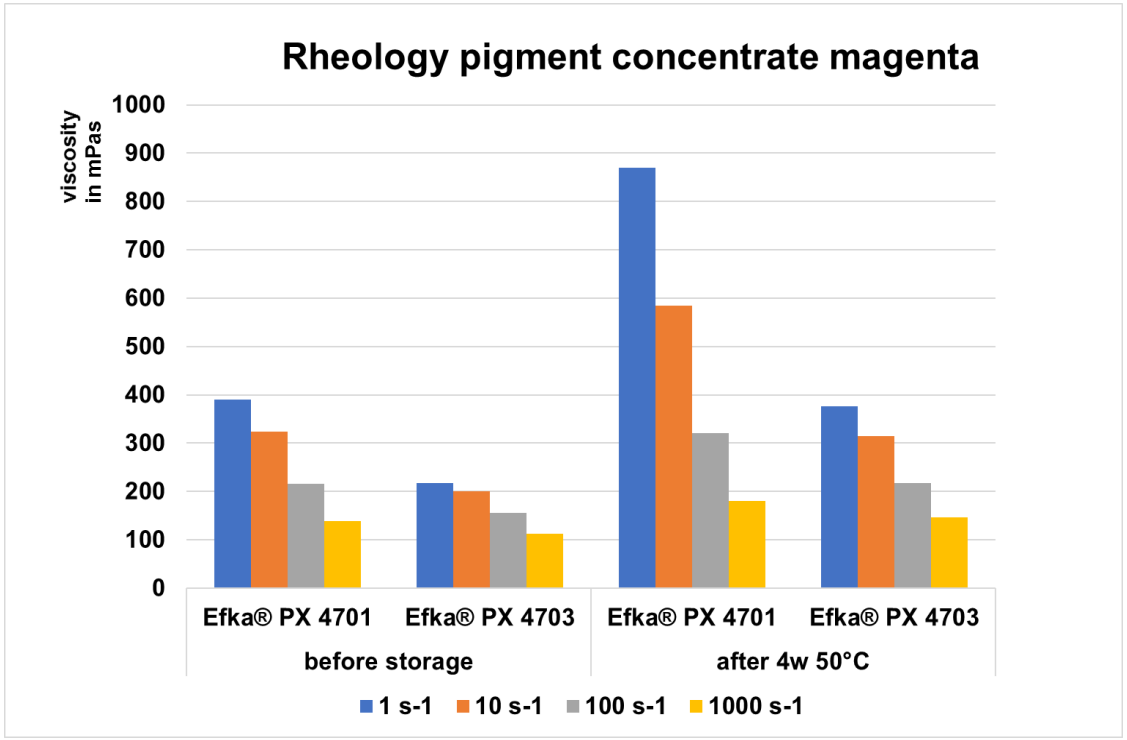
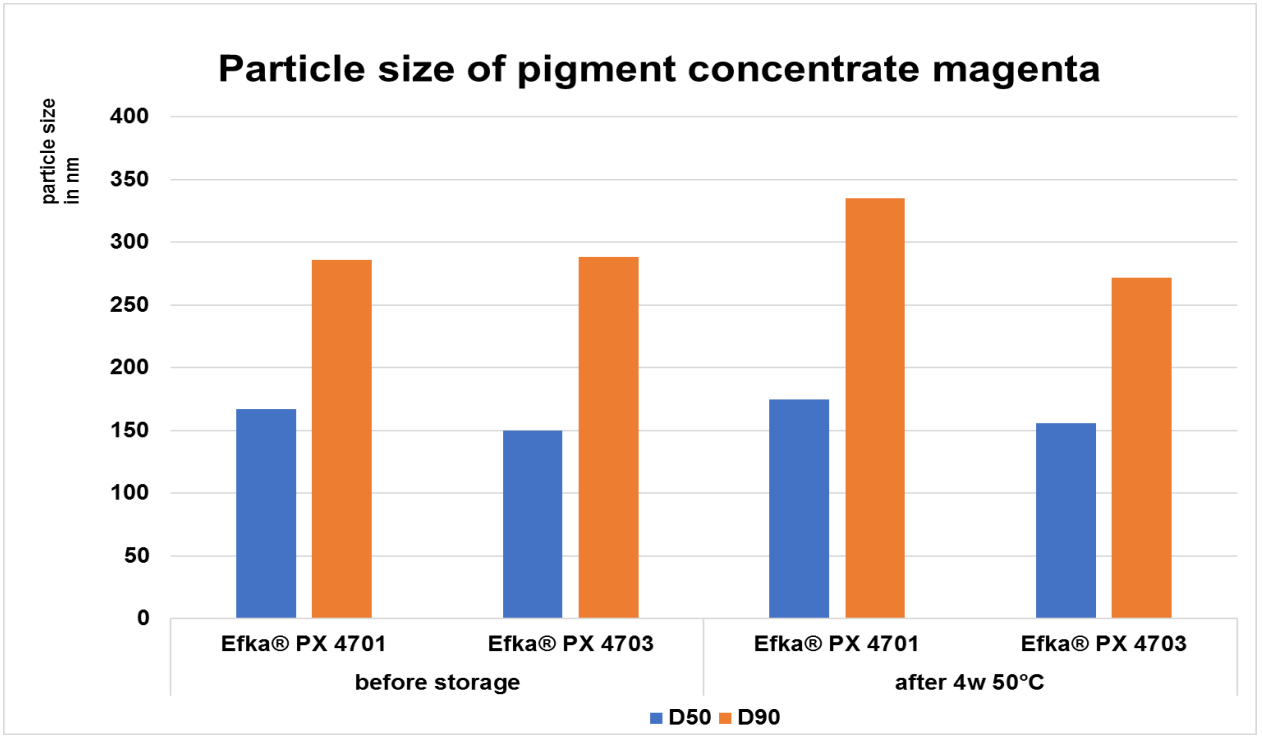
Dispersing agents UV for organic pigments – Efka PX 4701/PX 4703

pigment concentrate magenta

Formulation pigment concentrate magenta		
Cinquasia® Magenta D 4545 J	20	20
Laromer® DPGDA	71.2	71.2
Efka® PX 4701	8.4	
Efka® PX 4703		8.4
Irgastab® UV 22	0.4	0.4





	before storage	after 4w. 50°C	before storage	after 4w. 50°C
	w. Efka® PX 4701		w. Efka® PX 4703	
Newtonian flow	150	182	128	144
Thixotropy	104	117	102	108
Stability of PC*		5		5

*5- very good, no settlement or phase separation
1- strong settlement or phase separation

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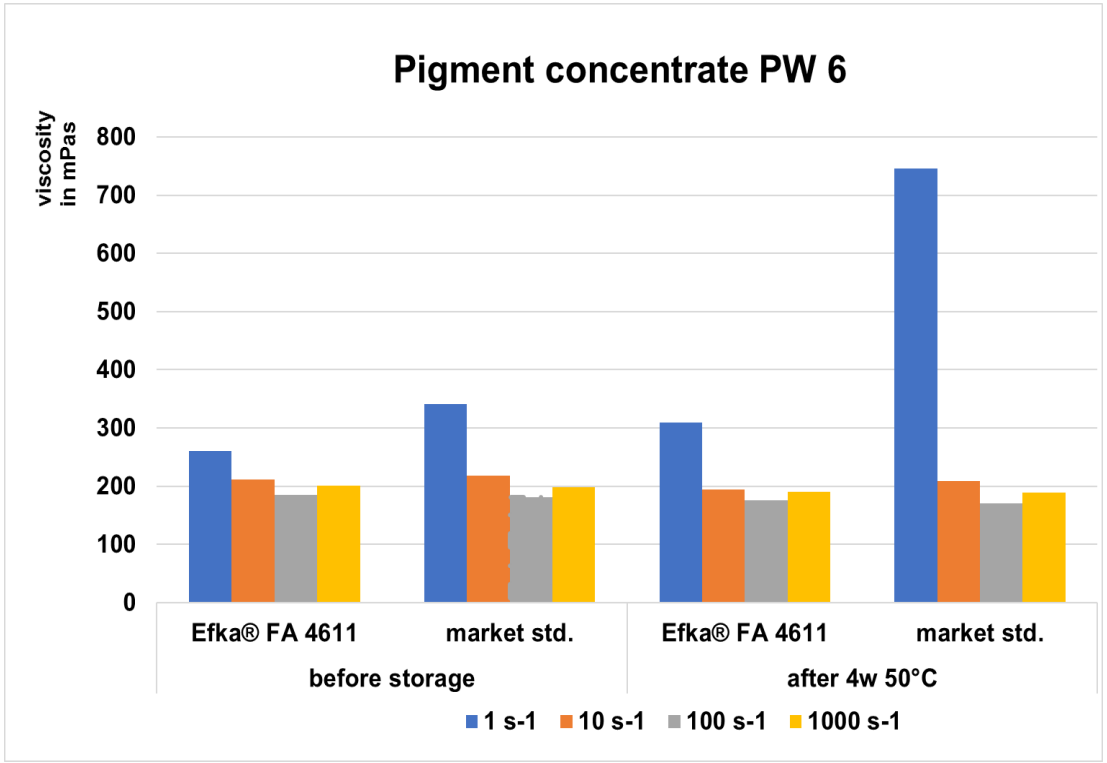
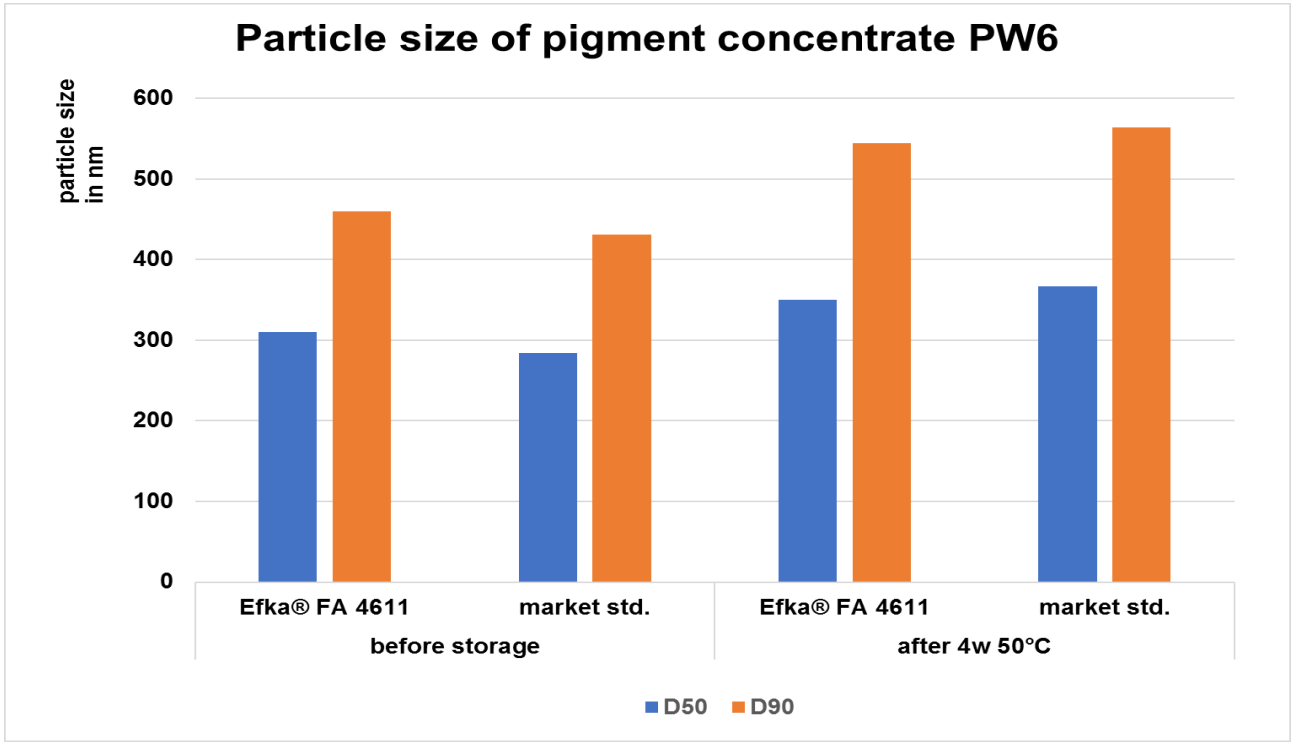
Dispersing agent UV: for TiO_2 and fillers – Efka® FA 4611

Formulation pigment concentrate PW6		
Kemira® RDI-S	70	70
Laromer® DPGDA	24.5	25.5
Efka® FA 4611	5	
Market standard		5
Irgastab® UV 22	0.5	0.5





	before storage	after 4w. 50°C	before storage	after 4w. 50°C
	w. Efka® FA 4611		w. market std.	
Newtonian flow	114	111	120	122
Thixotropy	102	102	102	102
Stability of PC*		4-5		4

5- very good, no settlement or phase separation
1- strong settlement or phase separation

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Wetting agents and surface modifiers for UV systems

In UV-based systems following chemistries are in use:

- Short chain silicone surfactants with moderate reduction of surface tension, good for droplet-formation; no slip, good overcoatability

  Hydropalat® WE 3220

- Organo-modified silicones; perform a strong slip, but also excellent reduction of the surface tension

  Efka® SL 3259

  Efka® SL 3230

- Fluoro-modified acrylates; moderate substrate wetting; no slip, good over-coatability

  Efka® FL 3277

  Efka® FL 3600

- Acrylate; modified substrate wetting; no slip, good overcoatability

  Efka® FL 3750

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UV Monomers and Oligomers

	Product	Description
Monomers, Reactive Diluents	Laromer POEA	imparts adhesion and flexibility, high cutting power
	Laromer LR 8887	flexibility, adhesion on metal and plastics, low odor
	Laromer TBCH	imparts flexibility and adhesion
	Iso-decylacrylate	imparts flexibility and adhesion („swelling“); good substrate wetting
	Laurylacrylate	very low viscosity, high flexibility; renewable content
	Ethyldiglycol acrylate	flexibility, adhesion on plastic
	Dihydroxycyclopenta dienyl acrylate	imparts hardness, hydrophobic
	N-Vinylcaprolactam	high reactivity and cutting power, water soluble, gives adhesion and hardness
	Laromer HDDA	adhesion on plastic („swelling“)
	Laromer DPGDA	high hardness, high chemical and abrasion resistance, excellent cutting power
	Laromer TPGDA	high reactivity, high cutting power
	DVE-2	high cutting power, both for radical and cationic UV-curing systems
	DVE-3	
	Laromer TMPTA	high hardness, high chemical and abrasion resistance, high reactivity
	Laromer GPTA	high reactivity, flexibility and hardness; renewable content

	Product	Description
Monomers, Reactive Diluents	Laromer LR 8863	excellent cutting power, adhesion on plastic, flexibility, high reactivity
	Laromer PO 33 F	good flow and substrate wetting properties, good pigment wetting
	Laromer PO 8996	amine modified polyether acrylate, provding excellent reactivity and film-forming properties, good solvent resistance and low yellowing
	Laromer PPTTA	tetrafunctional monomer – excellent reactivity and film-forming properties, good flexibility
	most recent monomers	
	VMOX	Excellent alternative to NVC with improved labeling and comparable performance, low viscosity
	IPGA *(R&D product ; not yet commercially available)*	IPGA (Isopropylidene Glycerol Acrylate) still on R&D level - commercialisation is aimed for end of 2021 low viscosity , high reactivity , good adhesion on plastic and improved labeling; renewable content
Oligomers	Laromer PO 8997	amine modified polyether acrylate with excellent reactivity and film-forming properties, good adhesion on plastic.
	Laromer PO 94 F	amine modified polyether acrylate, providing excellent reactivity and film-forming properties, good solvent resistance.
In-can Stabilizers	Irgastab UV 22	14% active matter in GPTA, effectively inhibiting premature thermal polymerisation of UV-inks and ink-jet inks and providing longer shelf life

For further information please contact Edouard Loisel

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Agenda

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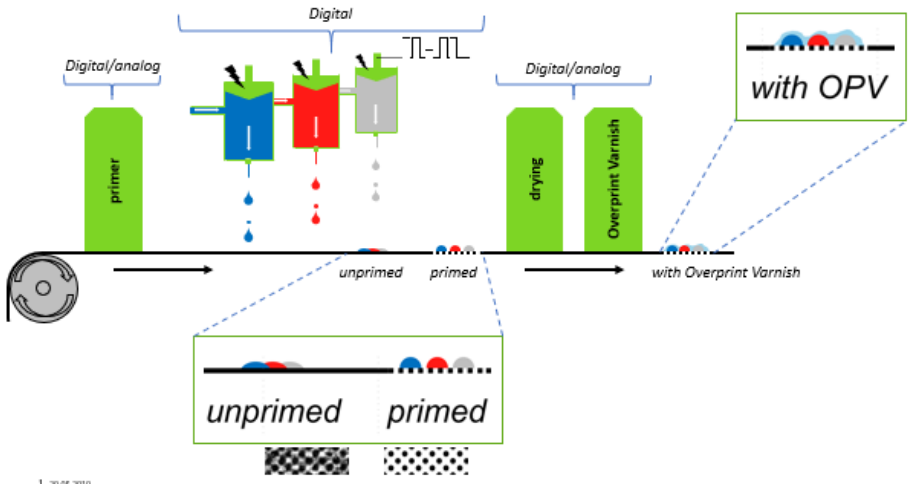
Portfolio water-based resins for ink-jet applications

Resins for water-based digital printing inks

The Joncryl® DPS range is developed to produce printing inks which are digitally applied. Several properties are important for these kind of inks like particle size distribution, viscosity stability and salt compatibility. With this range of resins, you will be able to formulate a wide range of printing inks and OPV's for absorbent and non-absorbent substrates.

Water-based digital printing



	Products*	Description	Application/Properties
Primer	Joncryl® DPS 3611	Acrylic resin for digital primer for absorbing substrates	• Low dot gain behavior • Increased color density • Improved sharpness
Ink & Overprint Varnish	Joncryl® DPS 3771	High Tg resin for digital inks and OPV for all substrates	• High chemical resistance • Good printability • Excellent viscosity stability
	Joncryl® DPS 3772	Low Tg resin for digital ink and OPV for all substrates	• High chemical resistance • Good printability • Excellent viscosity stability
	Joncryl® DPS 3773	Solid grade resin for digital inks and OPV for absorbing substrates	• Excellent printability • Good color strength development • Good resolubility
	Joncryl® DPS 3791	Polyurethane dispersion for all substrates	• Specifically for continuous inkjet • High salt compatibility • Excellent lamination properties
Pigment grinding	Joncryl® HPD range	Joncryl® HPD acrylic resins and resin solutions help to formulate strong, high performance, viscosity-stable inks that meet the needs of high-quality imaging. Used in color concentrates, they provide the ideal combination of increased color strength with excellent flow properties, while maintaining good shock and storage stability.	

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Agenda

1. Introduction
2. BASF portfolio overview for ink-jet inks
   - for water-based systems
   - for UV-based systems
3. Portfolio of UV monomers and oligomers
4. Portfolio of water-based resins
5. Summary

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Important topics to remember

- **BASF offers a full range of Formulation Additives** (Defoamers – Dispersing Agents – Wetting agents and Surface modifiers – Rheology modifiers and Humectants)
- **Food contact compliance** – availability of a broad range of listed products (see Food Contact Brochure)
- **Sustainability** – sustainability **quick guide** and related brochure, overview of additives with certain **renewable** content
- **Digitalisation** – following the market trend towards ink-jet printing we developed a selected portfolio of additives (see **overview on page 8** or PDF version of **Brochure for digital solutions**)
- In addition, BASF can offer a dedicated range of **monomers, oligomers** and **in-can stabilizer** for the UV ink-jet market.
- BASF also developed a dedicated selection of **Joncryl DPS dispersions** for **water-based ink-jet** systems including **primers, grind resin, let-down vehicles and overprint varnishes.**

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Solution Finder Tool for Formulation Additives

The **Solution Finder Tool** offers you the best additive solution for your formulation needs across all industries *(www.basf.com/solution-finder)*

Features & Benefits

- Formulation Additives guide for Paints and Coatings, Adhesives and Construction*
- Understand the benefits of our products (Dispersing Agents, Defoamers, Rheology Modifiers, Wetting Agents and Surface Modifiers, and Film-Forming Agents) by application, and with technical information
- Order samples or email us for detailed consultations
- Available on BASF web, Apple Store and Google Play Store**

*The product list and sample ordering for adhesives and construction are only applicable in Europe. It also comprises recommendations for Performance Additives
**To use this tool on your Windows device, please visit our website for details

Scan QR code for details

Lab Assistant for Architectural Coatings

Lab Assistant is a web-based application that makes it easier for you to find BASF dispersions and additives for Architectural Coatings in Europe (*www.lab-assistant.basf.com*)

Features & Benefits

- Get product recommendations and formulation ideas according to the final properties of the paint, technical data, complete recipes and ingredient calculator
- Access formulation expertise to gain new insights and ideas
- All relevant data (e.g. MSDS, TDS, Reach, sustainability aspects, brochures, value cards, etc) available in one location
- Compare products or formulations
- Individualize your own account and share content with your colleagues
- Order samples or get in touch with our experts
- Runs on your PC / laptop / tablet / smartphone

Scan QR code for details

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There is more to come…

Next series of Webinars starting Jan 20th

Label-free light stabilizers: **Feb 24 & 25**

Further digitalization in printing & packaging applications: **March 3 & 4**

Sustainable defoamer for solvent-based industrial and wood coatings: **March 10 & 11**

Don’t want to miss the **next webinars**? Register for our **newsletters** at:
https://paints-coatings.basf.com/global/en/newsletter-coatings/subscribe.html or https://packaging-print.basf.com/global/en/newsletter-printing-packaging/subscribe.html

Or visit us on our Website at:
http://www.basf.com/additives

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Disclaimer

Safety

When handling the mentioned products, please comply with the advice and information given in the safety data sheets and observe protective and workplace hygiene measures adequate for handling chemicals.

Note

The data contained in this publication are based on our current knowledge and experience. In view of the many factors that may affect processing and application of our products, these data do not relieve processors from carrying out their own investigations and tests; neither do these data imply any guarantee of certain properties, nor the suitability of the product for a specific purpose. Any descriptions, drawings, photographs, data, proportions, weights, etc. given herein may change without prior information and do not constitute the agreed contractual quality of the product. The agreed contractual quality of the product results exclusively from the statements made in the product specification. It is the responsibility of the recipient of our product to ensure that any proprietary rights and existing laws and legislation are observed.

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FoamStar® SI 2240

Highly-efficient defoamer with broad food contact compliance for water-based systems

Application:

FoamStar® SI 2240 has global country registrations and an extended food contact compliance which qualifies the product for the printing inks and adhesives market. Due to its excellent shear stability it is also suitable for (binder containing) pigment concentrates and shows beneficial properties in the let-down phase.

FoamStar® SI 2240 is a silicone based defoamer compound with a broad compatibility in various binder systems the product imparts spontaneous defoaming effect and excellent long term efficiency. Due to its chemical composition, it has minimum effect on gloss in various application areas, such as architectural and industrial coatings, but also for printing inks.

Performance highlights:

- Broad food contact compliance
- Excellent long-term persistency
- Broad compatibility with different binder systems
- Excellent defoaming efficiency also under high shear conditions

Sustainability highlights:

- APEO-free
- Low odour

Characteristic Values:

	FoamStar® SI 2240
Appearance	Colorless to slightly yellowish, clear to slightly hazy liquid
Density at 20°C	~ 1,00 g/cm^3
Viscosity	~ 175 mPa.s
Refractive index at 20°C	> 90 ºC
Active content	100%

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Dispex® Ultra PX 4585

VOC-free, dispersing agent for wb systems with benchmark performance with carbon blacks and organic pigments

Application:

Dispex® Ultra PX 4585 sets new standards in achieving highest jetness for carbon blacks and in stabilizing many difficult to disperse organic pigments. This dispersing agent is based on a unique technology which enables precise design of polymer structure, Controlled Free Radical Polymerization technology (CFRP)

Performance highlights:

- Excellent jetness for carbon black pigments
- Benchmark performance for carbon black and organic pigments
- Strong viscosity reduction in high pigment concentration in grinding stage
- Improved pigment affinity and stability
- Particularly recommended where high transparency is required
- Broad compatibility in water-borne systems

Characteristic Values:

	Dispex® Ultra PX 4585
Appearance	Clear, slightly yellowish liquid
Color	<=9
Solids	~ 50%
Amine number	~ 20 mg KOH
VOC	< 0.1 acc. to EU 2004/42 (b.p. > 250°C)

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Dispex® Ultra PX 4575

VOC-free, dispersing agent for wb systems with benchmark performance with inorganic pigments

Application:

Dispex® Ultra PX 4575 is also based on the Controlled Free Radical Polymerization technology (CFRP) and thus specifically designed for optimum performance in inorganic pigments, however it also shows excellent performance with organic pigments. Although recommended for colorants, Dispex® Ultra PX 4575 is also well suited for direct grinds. Beside architectural and industrial paints also well suited for ink-jet application.

Sustainability highlights:

- Label-free
- Suitable for a broad range of applications

Performance highlights:

- Benchmark performance for inorganic pigments like TiO2, other inorganic pigments and fillers.
- Very good performance also with a lot of organic pigments.
- Strong viscosity reduction in high pigment concentration in grinding stage
- Broad compatibility in water-borne systems

Characteristic Values:

	Dispex® Ultra PX 4575
Appearance	Clear, slightly yellowish liquid
Color	<=9
Solids	~ 40%
Density	~ 1,080g/cm³
VOC	< 0.1 acc. to EU 2004/42 (b.p. > 250°C)

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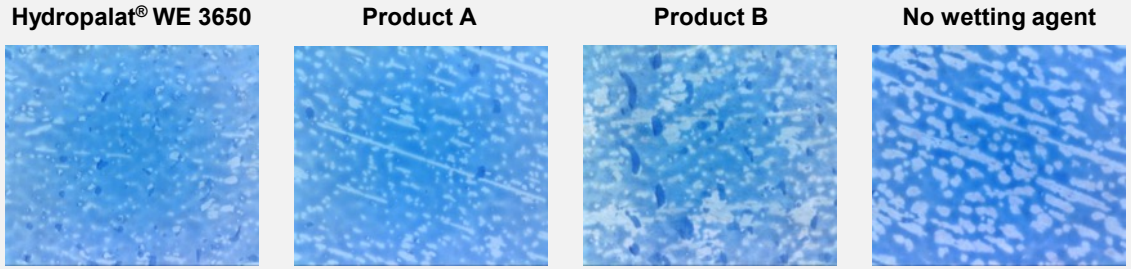
Hydropalat® WE 3650

Solvent-free, highly effective, low foaming, substrate wetting agent for water-based printing inks and coatings

Print trials of a water-based printing ink for flexible packaging at 100 m/min in flexo mode on PE-film:



Application:

Hydropalat® WE 3650 is a 100% active new wetting agent (modified alkoxylate) that offers excellent dynamic surface tension reduction in combination with low foam stabilization. Hydropalat® WE 3650 is recommended for waterbased formulations for OPV's (flexo, screen and offset applied), corrugated packaging (flexo applied), industrial printing (wall paper, flooring) and flexible packaging (wide web flexo) but as well for water-based ink-jet inks.

Performance highlights:

- Excellent substrate wetting, even under high speed application
- Low foaming
- 100% active, liquid product form
- Replaces multiple dynamic wetting agents

Sustainability highlights:

- Food Contact Compliances: Swiss Ordinance SR 817.023.21
- Solvent-free
- APEO-free
- Low Odor

Characteristic Values:

	Hydropalat® WE 3650
Appearance	Clear, colorless to slightly yellow liquid
Density	~ 0.97 g/cm^3
Color Gardner	<= 1
Active content	~ 100%

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Loxanol® MI 6730

Primer for ink-jet inks especially on porous substrates and adhesion promoter in multilayer packaging films

Application:

Loxanol® MI 6730 is an aqueous solution of a cationic polymer based on polyethylene imine. It is a very effective adhesion promoter in multilayer packaging films manufactured by coating, lamination, extrusion coating or co-extrusion - when used as a primer.

Formulated as primer it also can provide wb. ink-jet inks a fast fixation on the substrate due to its cationic nature. This fixation avoids spreading of the ink into the porous substrate and therefore improves color strength.

Performance highlights:

- Provides excellent adhesion of acrylic coatings to OPP
- Provides dissipation of static charge resulting in low ash pick up
- Provides adhesion to UV inks on difficult substrates
- Allowing lower temperature upon sealing

Performance highlights:

- L. MI 6730 can also act as a primer for wb ink-jet inks for porous substrates

Characteristic Values:

	Loxanol® MI 6730
Average molar mass	~ 750,000g/mol
Density	~ 1.09 g/cm^3
Viscosity	25,000 mPas
Solids	~ 50%

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Efka® PX 4701 and 4733

High-molecular-weight dispersing agents for high-performance inkjet and flexographic ink systems – for organic pigments as well as for carbon black.

Application:

Efka® PX 4701/4733 are 100% active dispersing agents based on our advanced polymer technology. They are especially recommended tor high-performance systems such as ink-jet inks, UV-curable and solvent-based flexographic inks.
Efka® PX 4701 is especially suitable tor carbon blacks and can be used with resin-free pigment concentrates (RFPC) in UV-curable and solvent-based systems.
Efka® PX 4733 is recommended tor mild solvent ink-jet systems as well as for UV-Flexo and Offset inks.

Performance highlights:

- Strong viscosity reduction
- Excellent storage stability
- Broad compatibility towards different ink systems and pigments
- Improves color strength of organic pigments
- Excellent in stabilizing organic pigments in low viscosity systems
- Both products are suitable tor various UV applications, but also tor solvent-based and 100% systems in industrial and automotive coatings

Characteristic Values:

	Efka® PX 4701	Efka® PX 4733
Appearance	Amber to brownish liquid	Amber high viscous liquid
Amine value	~ 40mg KOH/g	~ 25mg KOH/g
Active ingredients	~ 100 %	~ 100%

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Efka® PX 4703 for P&P applications

Solvent-free dispersing agent for organic pigments and carbon black in UV-printing inks (incl. Ink-jet, Flexo, Screen and Offset)

Application:

Efka® PX 4703 is a solvent-free dispersing agent, which shows excellent stabilization of a broad range of organic pigments and carbon black
With Efka® PX 4703 a strong reduction of mill-base viscosity and an improved rheological behavior can be achieved in various UV-ink applications (incl ink-jet and flexo).

Performance highlights:

- Solvent-free product, suitable for high solid and 100% solvent free solids
- Strong reduction of mill-base viscosity
- Improved rheological behavior
- High pigment and filler loading
- Broad pigment compatibility
- Suitable for high gloss systems

Characteristic Values:

	Efka® PX 4703
Appearance	brown, high viscous liquid
Solids	>99 %
Amin Value	~ 46 mg KOH/g

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Efka® FA 4611 for P&P applications

Solvent-free dispersing agent for inorganic pigments in 100% systems, solvent-based coatings and UV-based printing inks

Application:

Efka® FA 4611 is a solvent-free dispersing agent (acidic polyether) which shows excellent stabilization of inorganic pigments and fillers, in particular Titanium Dioxide. With Efka® FA 4611 high pigment and filler loadings, strong reduction of mill-base viscosity and an improved rheological behaviour can be achieved in 100% system like UV.

Performance highlights:

- Solvent-free product, suitable for high solid and 100% systems (e.g UV systems)
- Strong reduction of mill-base viscosity
- Improved rheological behavior
- High pigment and filler loading
- Broad compatibility in a wide range of resin systems
- Suitable for high gloss systems
- Increased hiding power

Characteristic Values:

	Efka® FA 4611
Appearance	Clear, colorless to yellow liquid
Refractive index	1.4635 – 1.4735
Solids	90 -100 %
Acid value	~ 129 mg KOH
Density	~ 1.16 g/cm^3

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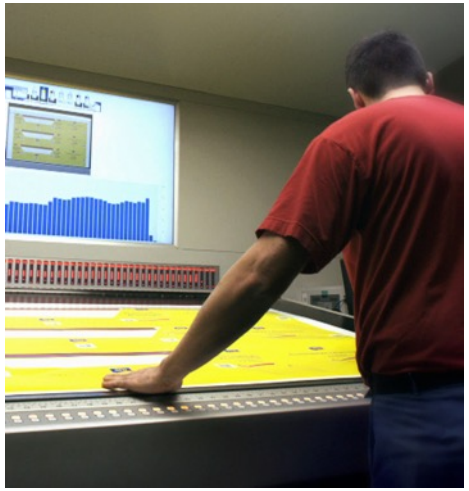
Efka® SL 3259

Slip and levelling aid for UV-based coatings and printing inks



Application:

Efka® SL 3259 is a solvent-free, organo modified polysiloxane for use in printing inks, coatings and paints. Efka® SL 3259 is well suited for UV-curable formulations as well as solvent- and water-based applications

Performance highlights:

- Highly effective slip agent
- Very strong reduction of surface tension
- Enhanced anti-blocking
- Prevents cratering
- Suitable also for solvent- and water-based systems

Characteristic Values:

	Efka® SL 3259
Appearance	Clear to slightly hazy colorless liquid
Density	~ 1,00 g/cm^3
Brookfield viscosity at 23ºC	~ 175 mPa.s
Flash point	> 90 ºC

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