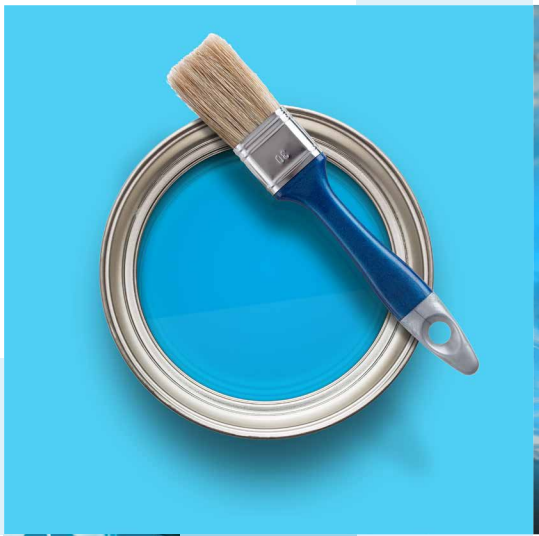
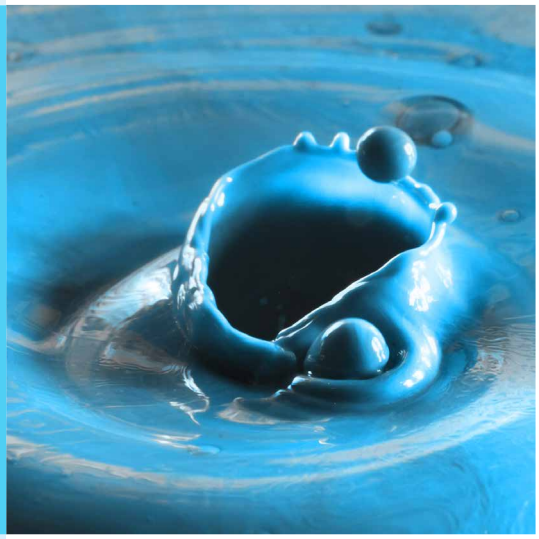
CLARIANT

Dispersant for waterborne pigment concentrates **DISPERSOGEN® PLF 100**





what is precious to you?

An easier way to make **STABLE FORMULATIONS**

Pigment pastes can be a real pain to make. But not with Dispersogen® PLF 100 – because it's different.

One issue formulators often run into when preparing pigment concentrates is the foam formation that occurs when they grind pigments to break them up into smaller aggregates. Other problems can arise during dispersion and storage. Here, unwanted viscosity increases can make further dilution necessary, or sedimentation and syneresis can spoil the consistency of the paste.

These issues can make it hard to formulate pigment concentrates that fully satisfy paint manufacturers. They often stand in the way of giving pastes the color-strength they need to efficiently tint paints at small concentrations.

Dispersogen® PLF 100 offers a reliable solution to these challenges. In our tests, paints formulated with the additive clearly exhibited lower foaming during grinding and smaller viscosity changes during storage than paints prepared with the market alternatives. Due to its strong dispersion power, Dispersogen® PLF 100 also imparted excellent color strength.

The polymeric dispersing agent for waterborne pigment preparations is broadly applicable and can not only be used with organic pigments but also with selected inorganic ones and carbon blacks. Additional benefits include low microfoaming during paint application, reduced blocking and low leaching.

Another point to look out for when formulating pigment pastes: The resulting paints should comply with current regulations, trends and eco-label requirements.

	DISPERSOGEN® PLF 100	Alternative 1	Alternative 2
Low foaming	●	●	●
Storage stability	●	●	●
Color strength	●	●	●
Organic pigments	●	●	●
Inorganic pigments	●	●	●
Low leaching	●	●	●
Reduced blocking	●	●	●

● excellent ● good ● medium

Functional groups for wetting and solubility – **PLUS FUTURE-PROOF SUSTAINABILITY**

PRODUCT PROFILE*

Active substance content	approx. 100%
Appearance at 25 °C	yellowish, highly viscous
Density at 50 °C (DIN 15212-1)	about 1,08 g/cm³
Viscosity at 50 °C	about 2760 mPa•s
Pour point (ISO 3016)	approx. 6 °C
Solubility at 20 °C	soluble in water
pH value, 10m-% in water	4.5–5.0

Product properties that facilitate formulation

Dispersogen® PLF 100 is a comb polymer with pigment-affine groups that promote pigment wetting. Other functional groups attached to the polymer enhance its solubility in water.

* The properties are for guidance only and do not represent product specifications. Tolerances can be found in the product specification sheet. For further information on product properties, toxicological, ecological and safety data, please refer to the safety data sheet.

REGULATORY INFORMATION

- **No structural units of concern**
- **APEO/NPEO-free**
- **Low VOC (< 1% in ISO 11890-2)**
- **Free of organic solvents**

Regulations are getting stricter – and products must keep up

Some of the most commonly used dispersing agents on the market use bisphenol A, alkylphenol, or tristyryl phenyl moieties to promote pigment affinity. Since these moieties can be released during biodegradation, however, their potential effects on aquatic organisms are under intense scrutiny.

By design, Dispersogen® PLF 100 is free of such moieties.

SUSTAINABILITY PROFILE

Consumers want reassurance, eco-labels provide it

Dispersogen® PLF 100 complies with the criteria of these well-known and widely respected European eco-labels:

European Ecoflower

German Blue Angel

Scandinavian Nordic Swan

Additional benefits with **TESTED RELIABILITY**

BROAD APPLICABILITY

		DISPERSOGEN® PLF 100		ALTERNATIVE 1		ALTERNATIVE 2	
		Color strength	Storage stability	Color strength	Storage stability	Color strength	Storage stability
Organic	**Hansa Brilliant Yellow 2GX70S** Pigment Yellow 74	●	●	●	●	●	●
	Novoperm Yellow HR 03 Pigment Yellow 83	●	●	●	●	●	●
	Permanent Red FGR Pigment Red 112	●	●	●	●	●	●
	Hostaperm® Pink ED-W Pigment Red 122	●	●	●	●	●	●
	Hostaperm® Blue B2G EDS Pigment Blue 15:3	●	●	●	●	●	●
	Hostaperm® Violet RL 02 Pigment Violet 23	●	●	●	●	●	●
	Hostaperm® Green GNX Pigment Green 7	●	●	●	●	●	●
Inorganic	**Bayferrox 130 M** Pigment Red 101	●	●	●	●	●	●
Carbon Black	**Printex 300** (Orion Engineered Carbons) Pigment Black 7	●	●	●	●	●	●

● excellent ● good ● medium

LOW FOAMING WHEN PAINT IS APPLIED

To test for behavior during paint application, we added Dispersogen® PLF 100 and two alternatives to a low PVC acrylic lacquer. Alternative 1 created copious microfoam, alternative 2 caused both micro- and macrofoaming. Our product, by contrast, created a surface that was smooth, tack-free (no blocking) and free of leaching.

DISPERSOGEN® PLF 100 Alternative 1 Alternative 2

BETTER HANDLING

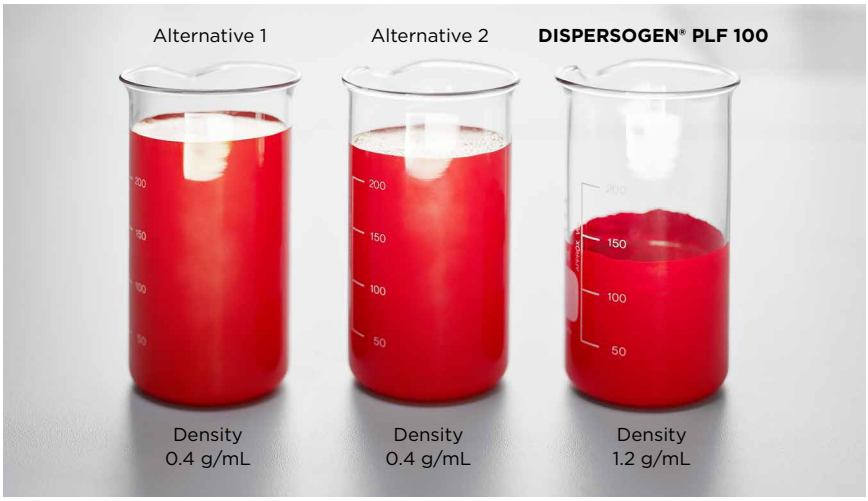
REDUCED BLOCKING	When applied in a finished paint, the new polymer exhibits reduced tack and good compatibility.
LOW LEACHING	Low leaching in exterior paints
HANDLING	Due to 100% active content of the dispersing agent, less water is introduced into the formulation. Flowable and pumpable at room temperature.

Outstrips the alternatives in **ENHANCING PERFORMANCE**

PERFORMANCE-BOOSTING EFFECTS

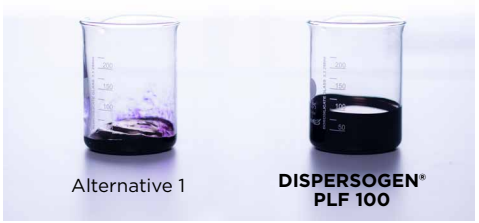
Low foaming

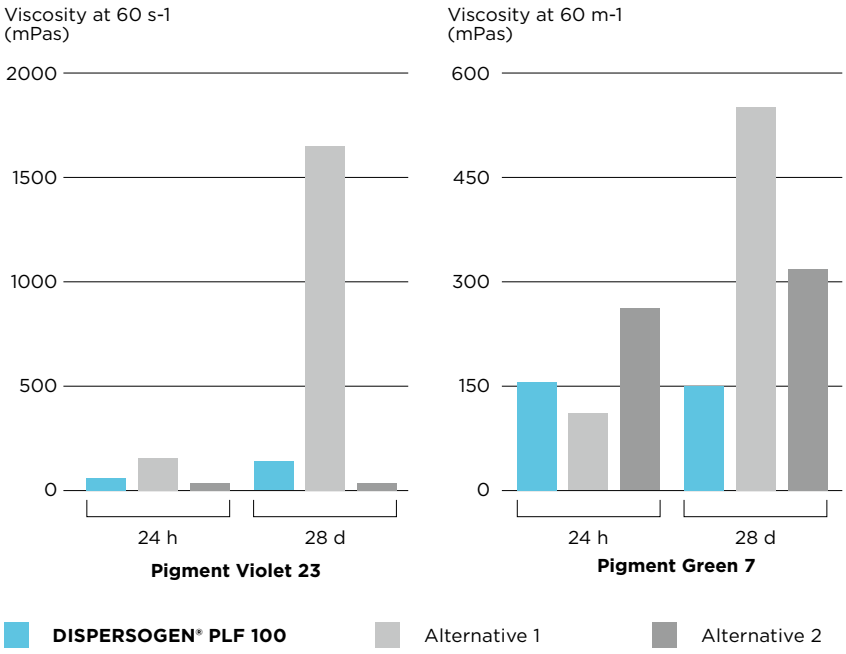
Even when adding defoamers, formulators have to contend with a strong foaming tendency in pigments such as the naphthol pigment Red 112. With Dispersogen® PLF 100, the density of the formulation stays well above 1 g/mL, meaning no or little air has been introduced, while the alternatives fail to prevent significant foaming and expansion.



Storage stability

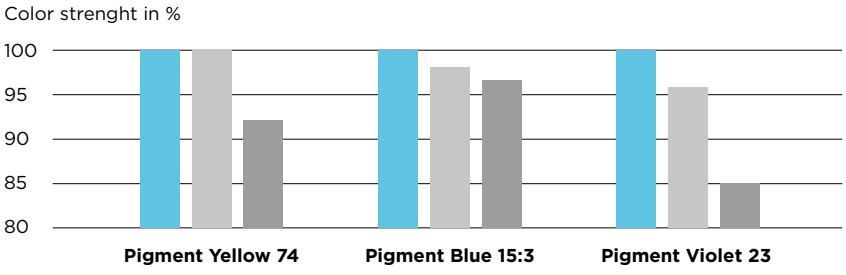
We simulated a 2-year storage with two particularly demanding pigments, Pigments Violet 23 and Green 7, by storing the pastes made with them for 28 days at 50 °C. Again, Dispersogen® PLF 100 delivered a superior overall performance, while also preserving the initial color strength of the pastes.





Color strength

In our tests, Dispersogen® PLF 100 dispersed pigments from all organic classes equally well, whether it was a simple monoazo pigment (PY 74), a common phthalocyanine pigmenet (PB 15:3), or a delicate dioxazine pigment (PV 23). While alternative 1 delivered similarly consistent performance in terms of color strength, it proved inferior in our tests for storage stability.



Guide formulation
DISPERSOGEN® PLF 100

PIGMENT				
Color index	PY 74	PY 83	PG7	PR 112
Pigment tradename	Hansa Brilliant Yellow 2GX70S	Novoperm® Yellow HR 03	Hostaperm® Green GNX	Pigment Red FGR
Pigment supplier	Clariant	Clariant	Clariant	Clariant
FORMULATION				
Pigment	50.0%	35.0%	45.0%	45.0%
Dispersogen® PLF 100	**4.0%**	**7.0%**	**6.0%**	**4.0%**
Polyglykol G 500	10.0%	10.0%	10.0%	10.0%
Oleic acid				
Defoamer	0.3%	0.3%	0.3%	0.3%
Biocide	0.2%	0.2%	0.2%	0.2%
Water	35.5%	47.5%	38.5%	40.5%
Total	100.0%	100.0%	100.0%	100.0%
VISCOSITY PROFILE				
Cone-Plate viscometer[1] [mPas]	160	86	145	416
STORAGE STABILITY AND TINTING STRENGTH				
Storage stability	■■■■	■■■■	■■■■	■■■■
Tinting strength in high PVC[2] emulsion paint	■■■■	■■■□	■■■■	■■■■

[1] Cone-Plate rheometer shear rate 1/60s, 23 °C, after 7 days at 50 °C
[2] PVC: pigment volume concentration
[3] Against tristyryl phenol ethoxylate dispersing agent

Not compatible with solvent-borne alkyd lacquer

CRITERIA FOR PERFORMANCE EVALUATION

RATING	
■■■■	Outstanding performance
■■■□	Very good performance
■■□□	Good performance
■□□□	Fair performance
□□□□	Not compatible

PB 15:1	PB 15:3	PV 23	PR 122	PR 101	PBk 7
Hostaperm® Blue A4R	Hostaperm® Blue B2G-EDS	Hostaperm® Violet RL 02	Hostaperm® Pink E02	Bayferrox® 130M	Printex® 300
Clariant	Clariant	Clariant	Clariant	Lanxess	Orion
35.0%	45.0%	35.0%	30.0%	65.0%	40.0%
8.0%	**6.0%**	**7.0%**	**7.0%**	**4.0%**	**8.0%**
10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
				1.0%	
0.3%	0.3%	0.3%	0.3%	0.3%	0.3%
0.2%	0.2%	0.2%	0.2%	0.2%	0.2%
46.5%	38.5%	47.5%	52.5%	19.5%	41.5%
100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
68	181	123	71	475	372

STORAGE STABILITY	TINTING STRENGTH[3]
• Viscosity[1] remains unchanged during storage • No sedimentation/syneresis	• Highest tinting strength • No rub out
• Viscosity[1] increases about 100 to 200 mPas within 4 weeks storage • No sedimentation/syneresis	• 10–19% less tinting strength • No rub out
• Viscosity[1] increases > 200 mPas within 4 weeks but is still free flowing	• 20%–29 less tinting strength • Max slight rub out
• Viscosity[1] increases > 200 mPas within 2 weeks but is still free flowing	• >30% less tinting strength • Max. slight rub out
• Pigment paste is getting pasty/solid • Strong sedimentation/syneresis occurs during storage	• Not compatible • Strong rub out

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