ADDAPT
Chemicals BV

for tomorrow's
Technology

Printing Process Additives

"Choices made easy"

for tomorrow's
World

Contents

ADDAPT Chemicals BV offer a unique and versatile portfolio of (mostly sustainable) additives for printing processes.

1. Additives for Flexo Graphic and Rotogravure Inks

There is an increasing demand for the development and use of environmentally friendlier raw materials and products due to legislation and, ever so important: customer demand.

“Flexo printing” refers to a relief printing process that uses flexible plates made from rubber or polymer materials. These plates are wrapped around rotating cylinders on the printing press. The image areas on the plate are raised, while the non-image areas are recessed. The ink is transferred to the printing plates via an anilox roll or sleeve and transfers the image onto the substrate as it passes through the rolls, creating a printed impression. Flexo inks are typically composed of water-based, solvent-based or energy-curable (EB/LED-UV/UV) systems.

Rotogravure printing is a system of printing from recessed areas that have been etched or inscribed below the surface of a printing plate or printing cylinder. The surface of a rotogravure cylinder consists of many recessed cells. During the printing operation, these pick up the ink directly from an ink fountain and, after the surface has been wiped clean by a doctor blade, the residual ink in the cells is transferred to the substrate to provide the printed image. Rotogravure inks are quite similar to flexographic inks in that they are solvent, water and energy-curable type, but they are characterised by lower viscosity and lower solids content than the flexo inks. The wide selection of resins and pigments that are permissible when formulating rotogravure inks result in an almost endless number of possible ink compositions.

The growing tendency for solvent-free (VOC-free) inks, result more and more in water-based ink formulations but also energy curable systems (EB/LED-UV/UV) find more and more inroads in ink formulation.

Ink additives play a crucial role in flexo graphic and rotogravure inks and, nowadays, especially in water-based and energy-curable systems.

2. Additives for Fountain Solutions

In offset printing, various additives are added to the fountain solution to make printing easier and to increase the quality of the printed products. So far, these additives have either been added by the printer itself or sold in the form of concentrates. These concentrates usually contain a buffer, humectants, film formers, preservatives, some also softeners and wetting agents and possibly alcohols such as ethanol or isopropanol.

All fountain solution concentrates contain considerable amounts of water and often require an antifoam or defoamer, corrosion inhibitors and wetting agents.

3. Additives for Energy-Curable Inks (EB, LED-UV, UV)

Energy-curable inks, which harden after irradiation with immediate drying, represent a specific but ever so important niche in the ink industry also because of ecological – solvent emission free application.

These inks are often the preferred choice due to their ability to adhere to a large number of different substrates like metal, paper and certain “plastics”, quick drying times, high gloss, and excellent print quality with high quality colour development. They are also known to impart good chemical and wear resistance.

The main driving force behind their popularity is the use in the fast-growing market of flexible packaging materials, triggered by increasing demand from the beverage, cosmetic food, feed and pharmaceutical industries.

Additives like adhesion promoters, functional monomers, pigment dispersants and often deaerators or defoamers are proven formulation aids.

4. Additives for Overprint Varnishes (OPV)

An overprint varnish (OPV) is applied to a printed piece as a coating for protecting images on a substrate. Overprint varnishing is typically performed – either on-press or as part of the finishing processes – for aesthetic purposes or to protect the printed image from moisture, abrasion, or other sources of damage.

Due to environmental considerations and legislations, emphasis is on either water-based overprint varnish, energy-curable systems, or combinations thereof. OPV’s are clear coatings applied over printed materials to enhance the durability, appearance, and protection of the print. They are environmentally friendly alternatives to solvent-based varnishes and are known for their low odour, low VOC content, and quick drying times. These varnishes can be applied in gloss, satin, or matte finishes and provide excellent resistance against scuffing, water, and chemicals.

A wide variety of additives is in use to formulate OPV’s; covered by the printing process additives depicted in section 6.

5. Additives for Inkjet Application

The vast majority of commercial inkjet inks are water-based although for some difficult substrates, solvent-based inks are still required.

Surface tension is the driving force behind inkjet printing. The static surface tension value of ink is mainly dictated by the substrate wetting behaviour and typically set between 25 – 40 mN/m for Drop on Demand (“DOD”) fluids by adding special wetting agents e.g. BioWet™.

Humectants are extremely important in inkjet printing. Without humectants the ink would dry or clog, since most modern-day inkjet nozzles are about 10-20 microns.

The most widely used pigments for inkjet printing are cyan (C), magenta (M) and yellow (Y). Together with a black pigment (K) makes a 4-colourset: CMYK. The pigment particle size suitable for inkjet is preferably between 0.01 and 1 micron. Existing tendency in inkjet printing for particle sizes between 0.01 and 0.025 can cause lower colour saturation and vibrancy. Increasing jetting particle sizes up to 500 nm (0.5 micron) brings multiple benefits.

Use of the “one for all” universal pigment dispersant: ADDISP™ ECO, allows particle sizes of ~500 nm using dissolver only reduces the need for highly refined and costly processing like milling.

The somewhat larger particle sizes, for example, make jetting of direct metal printing often in combination with adhesion promoters like PolySurF™ and VeoPox™ possible.

6. Printing Process Additives Portfolio

Antifoam/Defoamers/Deaerators

Foam can be generated at any step during the manufacture and application of inks. During production, foam and entrained air result in processing and packaging inefficiencies and ultimately poor product quality. During application, foam can diminish final print quality, hindering ink transfer to the substrate and contributing to surface defects.

To effectively control foam and its detrimental effects, antifoams/defoamers/deaerators are an important part of any ink formulation. ADDAPT Chemicals is a leading industry provider of defoamers. For more than 20 years, our team has formulated a diverse product line for inks and graphic arts. Our ink and printing products include (vegetable) oil-based & synthetic non-silicones, silicone and siloxane defoamers.

		Water-based	Solvent-based	UV-system
Foamstop™ 150N	Completely water soluble. Designed for lacquers and fountain solutions.	●		
Foamstop™ 400F	Highly effective universal foam control agent for water-based and solvent-based systems.	●	●	○
Foamstop™ 400N	Highly effective, complete water-soluble foam control agent. Designed for lacquers and fountain solutions.	●		
Foamstop™ 666V	100% solubility in water; no turbidity or haze of the liquid phase in clear systems. Wide pH range (2 to 12).	●		
Foamstop™ SX 47	Highly effective siloxane foam control agent for all types of aqueous and non-aqueous systems and pigment concentrates. Very rapid “killing effect”.	●	●	○
Foamstop™ SX 67*	Highly effective siloxane foam control agent for all types of aqueous and non-aqueous systems. Very rapid “killing effect”.	●	●	●
Foamstop™ VF 10N*	Recommended for the use in pigmented (flexo-) printing inks as well as clear lacquers (OPV). - MOSH / MOAH free – silicone/siloxane free.	●	○	○
Foamstop™ VF 35N*	Recommended for the use in pigmented (flexo-) printing inks as well as clear lacquers (OPV). - MOSH / MOAH free – silicone/siloxane free	●	●	○
Foamstop™ VF 41N*	Multi-purpose, VOC and silicone/siloxane free. Designed for grinding pigments and thick film. Excellent defoamer/deaerator for haze-free clear lacquers (OPV)	●	●	●
* VOC and APEO-free		● highly recommended ○ partially recommended		

Antistatic Agents

Polymer materials can have drawbacks associated with excessive build-up of static electricity leading to print failure (film defects), dust attraction and in extreme cases causing an explosion. Various methods of reducing the electrostatic phenomenon are used, the most common and cost effective being the addition of antistatic agents to the resin matrix.

Another option is the incorporation of an antistatic moiety into the resin matrix. Antistatic agents available in this portfolio:

PEX™ 080B	Liquid mono- and di-phosphate ester of 2-ethylhexanol.
PEX™ 136	Liquid mono- and di-phosphate ester of C13/6 EO alcohol.
PolySurF™ HP	Effective antistatic phosphate ester having a polymerisable methacrylic moiety for incorporation into a resin matrix via UV/EB or thermal radical polymerisation.

Coalescing Agents

OPV formulators often use very hard polymers, which requires a coalescing agent/solvent or a polymeric, non-migratory system. The use of coalescing agents enables film formation (lowering of MFFT) and gloss improvement at normal operating temperatures.

ADDAPTOL™ DB	Biodegradable, label-free, non-VOC with high thermal, hydrolytic and pH-stability. Compared with 2,2,4-trimethylpentanediol mono-isobutyrate, ADDAPTOL™ DB shows the following improved characteristics in waterborne coatings: ● Low odour ● Low dosage ● Improved water resistance ● Lowering of MFFT ● Extended open time ● Better scrub resistance due to more complete coalescence of hard polymers, less affinity to water than other coalescing agents In solvent-borne systems, ADDAPTOL™ DB has the following advantages: ● Excellent tail solvent. ● Improved levelling and pinhole resistance.
BioWet™ PC	Non-SVOC polymeric coalescent for use as a processing aid in waterborne systems to improve the film forming properties.

Corrosion Inhibitors

The low pH of fountain solutions (4.5 – 5.5) may cause severe corrosion processes at exposure to (different types of) metal parts of the printing press. The Anticor™ products are excellent corrosion inhibitors for multi-metal applications.

		Active content (%)
Anticor™ A40	Label-free, biobased and biodegradable corrosion inhibitor. Outstanding rust prevention of ferrous substrates in acidic systems.	~84%
Anticor™ AMC 2330	Readily biodegradable and emulsifiable anti-corrosion additive for aqueous systems. It protects copper, aluminium as well as magnesium, and combinations thereof.	~94%
Anticor™ F1026	Multifunctional corrosion inhibitor suitable for the protection of aluminium, copper but also iron substrates. It is soluble in alcohols and emulsifiable in water.	~100%
Anticor™ L295	Label-free and readily biodegradable water-soluble multi-metal anti-corrosion additive.	~56%
Anticor™ AM 4501	Anti-corrosion additive for aqueous systems. Very effective ferrous corrosion inhibitor, but also protects surfaces of aluminium as well as magnesium and/or combinations of these metals when exposed to aqueous media.	~87%

Functional Monomers for UV Inks – Adhesion Promoters

There is an increasing demand for the development and use of environmentally friendlier raw materials and products due to legislation and, ever so important: customer demand. The composition and use of solvent-based products such as paint, adhesives and printing inks have already changed dramatically but need further changes in coming years. The demand for new, environmentally friendlier systems is therefore stronger than ever, not only based on ecological reasons but also due to increasing quality demand.

One such approach is a printing mechanism based on curing coatings with UV/LED light or electron beam (EB). These coatings are both ecological and emission-free. With PolySurF™ phosphated group of additives, adhesion to metal, metal oxides, glass, certain thermoplastics and ceramics is strongly improved.

The PolySurF™ range is polymerisable via UV and radical initiators and after polymerisation, non-migratory. The phosphate group also imparts a certain degree of flame-retardant properties.

		~P-content (%)
PolySurF™ HP	Proprietary mixture of acrylated mono-and di-phosphate ester. Co-polymerisable stabiliser: the reactive group is methacrylate.	12.0
PolySurF™ HPm	As PolySurF™ HP with high(er) mono-phosphate ester content.	14.0
PolySurF™ HEOP	Proprietary mixture of acrylated mono-and di-phosphate ester. Co-polymerisable stabiliser: the reactive group is methacrylate with additional EO-spacers for increased compatibility with polar systems.	8.5
PolySurF™ HPH	Proprietary mixture of acrylated mono-and di-phosphate ester. The reactive group is methacrylate. Hydrophilic modified with a long EO-chain. Hydrophilic, co-polymerisable, non-migratory plasticiser.	4.2
PolySurF™ HPL	Proprietary mixture of acrylated mono-and di-phosphate ester. The reactive acrylate group is methacrylate. Hydrophobic modified with long aliphatic chain, non-migratory plasticiser.	7.1
PolySurF™ ACE	Solvent-free additive, imparts acid resistance, high gloss, excellent pigment wetting, water repellence, film appearance, UV stability and improved adhesion to certain thermoplastics. It contains an active acrylate group.	0

Adhesion Promoters

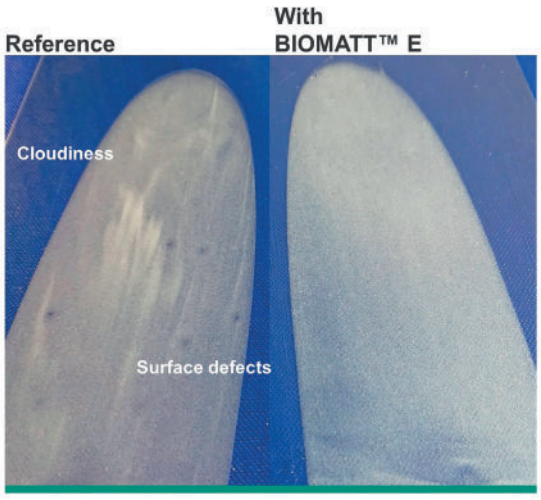
Printing on “difficult’ substrates like direct metal printing and glass printing, often requires special adhesion promoters to overcome the surface tension/surface energy differences.

VeoPox™ 2	Reactive hybrid precursor for (digital) printing on metal. Fatty acid modified bisphenol A epoxy resin. It contains a reactive methacrylate group. Excellent adhesion on aluminum, stainless steel and non-ferrous substrates.
VeoPox™ 2S	As VeoPox™ 2; further modified with silane for even better adhesion.
VeoPox™ 3	Reactive hybrid precursor for (digital) printing on metal. Fatty acid-modified bisphenol F epoxy resin. It contains a reactive methacrylate group. Excellent adhesion on aluminium, stainless steel and non-ferrous substrates.
VeoPox™ 3S	As VeoPox™ 3; further modified with silane silane for even better adhesion.
BioWet™ 50L	Glass adhesion promoter and glass corrosion inhibitor for aqueous inks. It can/should be post-added.

Matting Aid

Waxes and certain silicas can be added to lower gloss. Individual particles on the surface scatter the light in different directions.

BioMatt™ E	VOC free, liquid matting aid to be used with matting agents. Recommended for various water-based applications where gloss is undesirable, but transparency a must. It greatly improves the distribution of matting agents, coating homogeneity and substrate wetting.



Optical coating properties

	Reference	BIOMATT™ E
Gloss 85°	8	4 - 5
Transp.	93.4%	95.9%

pH Stabilisers & Neutralisation Aids

Amines are used in emulsion polymerisation to provide mechanical stability of resultant dispersions and also in coatings manufacture to assist with pigment dispersion, grind stability if dispersing pigments into polymer dispersion and also pH buffering of dispersion coatings.

Ammonia is the most used amine, being low cost, but is highly odorous and has high volatility resulting in pH instability. To overcome these disadvantages formulators have looked at successfully incorporating various alkanol-amines. In addition to lower volatility and lower odour, these alkanol-amines also allow superior corrosion resistance, VOC reduction in formulation, excellent pH-buffering and very good pigment dispersion properties.
After application of the wet coating, the pH-adjusting agent must either (at least) partially evaporate from the film, which facilitates the resin binder to coalesce and improve early water resistance. Or if not evaporated, the pH-adjusting agent must become completely inert within the final coating film.

ADDSPERSE™ pH is a proprietary blend of alkanol-amines with an active content of ~68%. This is an almost colourless liquid with a low viscosity, that remains liquid at temperatures below -10°C and withstands >5 freeze/thaw cycles at -15°C. It is an excellent pH-buffer with emulsifying properties.

Additionally, ADDAPT® Chemicals BV markets CODIS™ BIO, a multifunctional neutralising agent for Ecolabel-certified paints and inks. It enhances compatibility with pigments, wetting and corrosion inhibition. It is based on renewable components, VOC-free and without hazardous labelling.

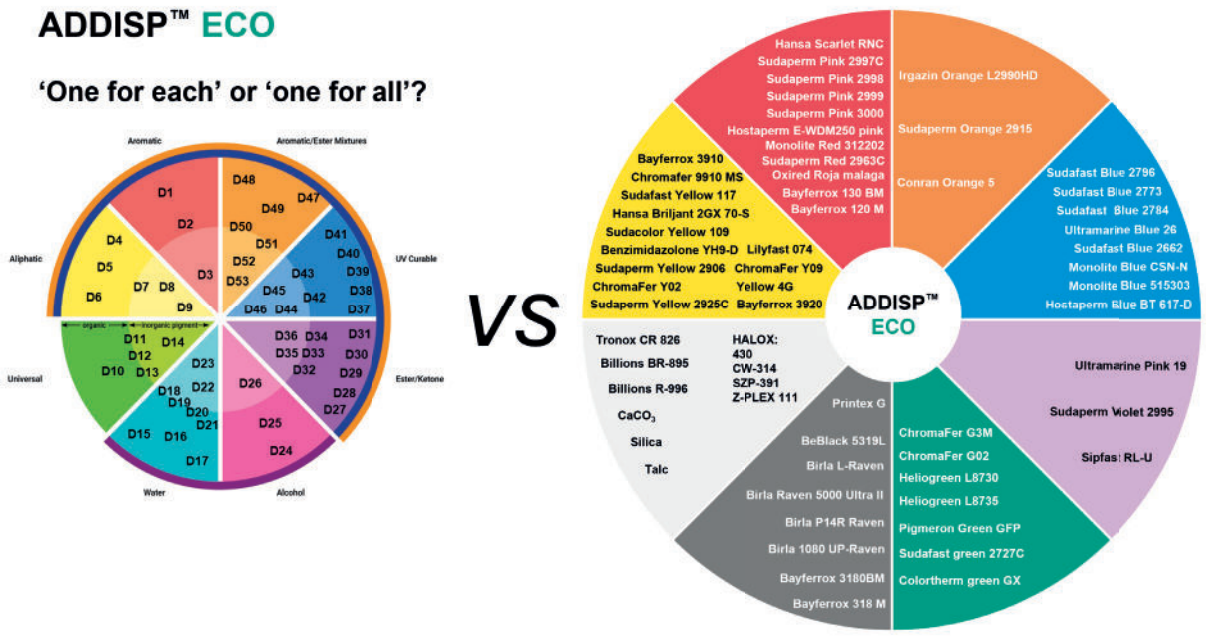
ADDSPERSE™ PH	Very effective pH control for low odour systems. It has minimal contribution to VOC. It eliminates the need for ammonia.
CODIS™ BIO	Provides very effective pH control for low odour systems. It has no contribution to VOC and contains ~34% biobased carbon.
CODIS™ 95	Highly effective neutralisation- and buffering agent for water-based systems, hereby exhibiting high gloss, good water resistance and anti-corrosion properties. Also acts as an effective co-dispersant for (mineral) pigments and fillers. Only available in EU.

Pigment Dispersing Additives

The primary focus in preparing a printing ink is on dispersing of pigment particles and re-agglomeration of the particles. Inorganic pigments are relatively easy to disperse with low force whereas organic pigments often require special grinding techniques via ball or roller mills to produce nanometer-sized particles.

The growing tendency for solvent-free (VOC-free) inks, results in more and more water-based ink formulations. Due to the high surface tension of water, pigment dispersants are often used in combination with wetting agents, sometimes also called surfactants, to lower the surface tension of the solution or the surface energy of the substrate.

		Resin based	Resin free	Inorganic	Organic	Carbon black	Water-based	Solvent-based	UV-system
ADDISP™ 600N	Polyacrylic sodium salt. Modified with phosphate for hard water resistance.	●	●	●			●		
ADDISP™ 850	Amphoteric surface-active components in water.		●	●	●	●	●		
ADDISP™ 950	High molecular weight, non-ionic copolymer with pigment-affinic groups.	○	●	○	●	●	●	●	○
ADDISP™ ECO	"One for All" dispersant. Proprietary formulation.	●	●	●	●	●	●	●	●
		● highly recommended ○ partially recommended							

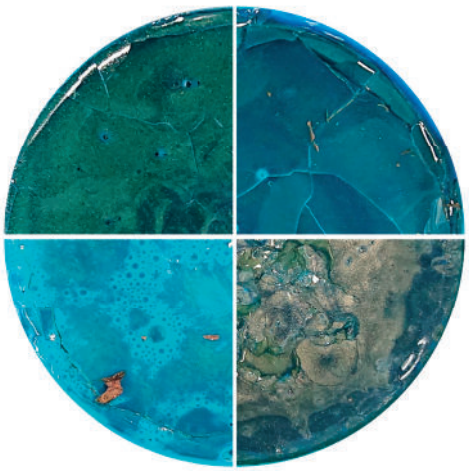


Metal pigments passivation & anticorrosion

Anticor™ CBA 63 exhibits excellent anti-corrosion and metal passivating properties for different grades of copper and bronze pigment surfaces.

Anticor™ CBA 63 exhibits excellent anti-staining and anti-corrosion properties for different grades of aluminium and zinc surfaces. It controls “pitting” and especially gassing of the metal surface.

Anticor™ CBA 63	Dispersing agent annex corrosion inhibitor for metallic pigments like copper, bronze and aluminium (CBA).



Variety of oxidation colours in metallic copper pigment concentrates after one month of storage.

Copper pigment concentrate containing 2% Anticor™ CBA 63, after one month storage.

Wax Emulsions

Wax emulsions are used to improve slip, soft-feel, and enhance durability. They also provide water resistance and smoother finishes, ensuring high-quality, long-lasting prints.

		Melting point °C wax	Surfactant system*	Solid content %
WaxMul™ C325	T3-type carnauba wax emulsion. Gives abrasion resistance, scratch resistance, soft hand-feeling and improved gloss.	82 - 86	N	25 ± 1
WaxMul™ WM 35	High melting point PE-wax emulsion giving very good abrasion resistance.	138	N	35 ± 1
WaxMul™ WM 110	Balanced blend of emulsified polyethylene and paraffin waxes giving hydrophobic properties as well as a matting effect.	50 - 110	A/N	32 ± 2

*Surfactant system: N = Nonionic A/N = Anionic/Nonionic

Wetting Agents & Levelling Agents/Humectants

Wetting agents are a class of substances that lower interfacial tension of, for instance, water. The surface tension of water itself (72 mN/m) is higher than most of the substrates. Such substances or wetting agents are added, typically in small quantities, to a liquid in order to reduce its surface tension and allow surfaces to be more completely wet by the liquid.

A variety of wetting agents used in the manufacture of printing inks is sometimes called a dispersing agent. However, in this brochure, dispersing agents are used for dispersing pigments and colourants. Wetting agents are also an important ingredient of offset press fountain solutions so as to increase the solution's ability to rapidly form a thin, continuous film.

Levelling agents have little to no influence on the surface tension at the substrate-liquid interface, but instead, form a thin layer on top of the film to give a uniform surface tension at the air-liquid interface. This prevents uneven evaporation of diluents and results in a smoother surface, which improves the gloss and "slip" properties of the coating. Reducing the surface roughness also improves the scratch resistance due to a reduction in frictional resistance. In this case, the interfacial tension (dynamic surface tension) of the liquid is not changed; one cannot measure major differences with and without levelling agent.

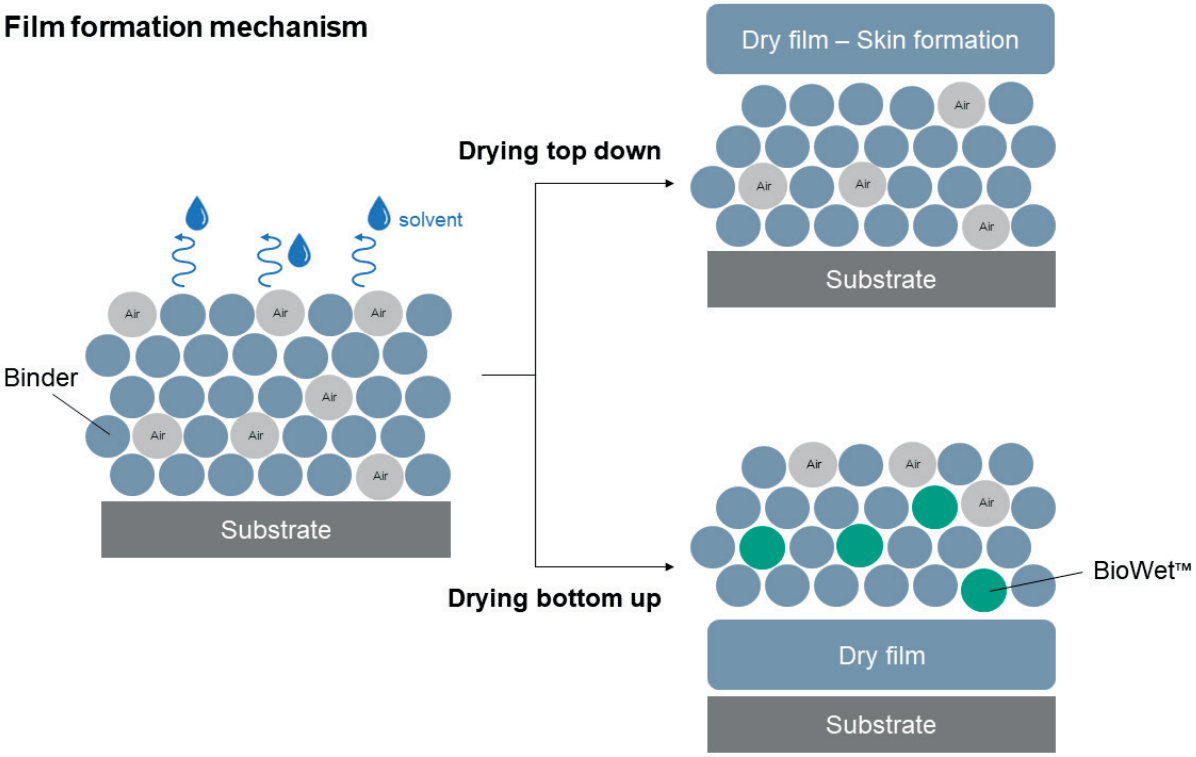
		Surface tension*	Biobased carbon content
ADDISP™ 550	Wetting agent for pigments for aqueous systems and resin-free pigment concentrates. Non-foaming in the mill base.	Static: 33.5 Dynamic: 42.8	~28%
BioFlow™ 71	Wetting agent for aqueous systems such as Flexo ink, ink, OPV, and universal pigment preparations. Prolongs open time (humectant).	Static: 27.8 Dynamic: 36.4	~32%
BioWet™ 25	Exhibits a high surface energy that leads to an excellent wetting of the high energy surfaces (glass, ceramics) without an increase of the water absorption (low COBB value). Prolongs open time (humectant).	Static: 69.8 Dynamic: 73.8	~75%
BioWet™ 50L	Exhibits excellent wetting and adhesion on high-energy surfaces (glass, ceramics). Silane containing.	Static: 70.8 Dynamic: 74.0	~80%
BioWet™ AC17	Improves pigment wetting and colour development. Shows anti-skinning properties in water-based formulations. Exhibits low dynamic and static surface tension values. Excellent "spreader".	Static: 26.6 Dynamic: 27.6	-

ADDISP™ 550, BioFlow™ & BioWet™ products are silicone/siloxane, VOC-, APEO- and PFAS-free and readily biodegradable. (OECD 301). The biobased carbon content has been calculated according to EN 16640:2017.

* Surface Tension: (dynes/cm) at 0.4% actives, 25°C
Static: NEN-EN 14370 (Du Noüy)
Dynamic: ASTM D3825 (Maximum bubble pressure)

There is a thin line between the functioning of some levelling agents and humectants. Humectants slow down the drying of pigment preparations and prevent skin formation. The prolonged open time by adding a humectant, prevents surface faults and defects.

Film formation mechanism



Schematic drying mechanism of BioFlow™/BioWet™ showing humectant properties.

Swiss Ordinance

The following products are listed:

ADDAPTOL™ DB	BioWet™ PC
ADDISP™ 600N	CODIS™ 95
ADDISP™ 550	CODIS™ BIO
ADDISP™ 850	Foamstop™ SX 67
ADDISP™ 950	Foamstop™ VF 35N
ADDISP™ ECO	Foamstop™ VF 10N
Anticor™ AMC 2330	Foamstop™ VF 41N
Anticor™ AM 4501	PEX™ 080B
Anticor™ CBA 63	PEX™ 136
Anticor™ F1026	PolySurF™ HP
BioFlow™ 71	PolySurF™ HPm
BioWet™ 25	PolySurF™ HPH
BioWet™ 50L	PolySurF™ HPL
BioWet™ AC 17	WaxMul™ C325

CONTACT INFORMATION

ADDAPT Chemicals B.V.

Speltdijk 1
5704 RJ Helmond
The Netherlands

Tel.: +31 (0)492 59 75 75
E-mail: info@addapt-chem.com
http://www.addapt-chem.com

Liability

All recommendations for the use of our products, whether given by us in writing, oral, or to be implied from the results of tests carried out by us, are based on the current state of our knowledge. Under no circumstances shall Seller be liable for incidental, consequential or indirect damage for alleged negligence, breach of warranty, strict liability, tort or contract arising in connection with product(s). Seller's sole liability for any claims shall be Buyer's purchase price. Data and results are based on controlled lab work and must be confirmed by Buyer by testing for its intended conditions of use. The product(s) has/have not been tested for, and is/are therefore not recommended for, uses for which prolonged contact with mucous membranes, abraded skin or blood is intended, or for uses for which implantations within the human body is intended.

© ADDAPT Chemicals BV, 2025-03