Floor Plan
Hall 1.1, Zone 7

BYK LIVE:
3 Dec 2018 / 13:35 – 14:15
Session 2 / Paper 5
Indispensable Surface Additives
Effect VS Chemistry
Dr. Majdi Al-Masri, BYK
Leiping Fan, BYK

BYK
Booth #D01-10
Pioneering Solutions

As the technological leader in water-based additives, BYK offers a diverse range of cross-sector possibilities for almost all coating applications. You will have seen the results of our specialty chemicals both in premium technology products such as tablet displays or high-tech cars, and in everyday items such as parquet flooring, washing machines or wall paints – they are everywhere.

BYK additives are world-class in water-based formulations. We can even provide high-performance aqueous additive solutions for challenging protective & marine coatings.
BYK Additives
World-class in
Water-based
Formulations
The world is changing rapidly. This is particularly evident on the coatings market, with the switch from solvent-borne to water-based coatings as a result of the long-term trend towards more environmentally friendly products.

As one of the leading additive suppliers with the **widest range of water-based additives throughout the industry**, we have been conducting the appropriate research and development for decades. To date, more than **40% of our additives** are already being recommended for water-based coatings and printing inks.

And we’re continuously expanding the range with new additives, as BYK is a **leader in innovation**. Excellent, differentiated additive solutions are developed based on new raw materials, using state-of-the-art technologies and while observing both global and local regulations. In this process, **more than 50 % of our research and development activities** are aimed at additives which help to formulate **environmentally friendly products**.
# Additives for aqueous systems

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Defoamers

BYK-1640

Mineral oil-based defoamers are widely used, mainly in applications in which price is a key criteria. Negative side effects such as separation tendency, odor, environmental aspects and the often lacking approvals for direct food contact mean that the market is looking for affordable alternatives. BYK-1640 is the alternative providing versatility and excellent cost/performance ratio. The additive is mineral oil- and silicone-free, free of odor and easy to incorporate. BYK-1640 is emission-free and suitable for direct food contact.

Benefits

• Versatile defoamer with excellent cost/performance ratio
• Mineral oil- and silicone-free, odorless
• Especially recommended for water-borne interior and exterior emulsion paints (PVC range 30-85)
• Easy to incorporate
• No negative influence on color-acceptance
• Emission-free and suitable for direct food contact
Defoamers

BYK-1781

Silicone Defoamer for Aqueous Systems to Eliminate Micro-foam Caused by Application Method
A well balanced-defoamer, the interaction of compatibility and efficiency guarantees for an easy application and a high quality of the final coating. The new BYK-1781 occupies all these features. The balanced silicone/polyether ratio leads to an excellent compatibility in a variety of aqueous coating systems e.g. pure acrylics, UV-systems and 2-pack PU-systems without a negative impact on clarity, haze and cratering. In addition the high efficiency of BYK-1781 makes it extremely suitable for difficult application methods like HVLP, Airless and Airmix to eliminate the occurring micro-foam in the coating film. The additive can be used in clear coats as well as pigmented systems and is solvent-free.

Benefits

- Excellent defoaming in several systems
  - Pure acrylics
  - Aqueous UV systems
  - Water-borne 2-pack PU systems
- High transparency and clarity in clear coats
- No or low influence on haze and cratering
- Excellent for various applications
  - HVLP
  - Airless
  - Airmix
Defoamers

BYK-1786

Silicone-containing Defoamer for Aqueous Systems to Remove Microfoam Generated During Application

Benefits

• High defoaming efficiency with broad system compatibility (clear, matt, pigmented)
  ○ 1-pack acrylics
  ○ 1-pack PUDs
  ○ 2-pack PU
  ○ Water-borne UV systems
• Especially suitable for aqueous systems applied by Airless/Airmix
• No or low influence on haze and cratering
• VOC-free
• APEO-free
A well balanced-defoamer, the interaction of compatibility and efficiency is the guarantor for an easy application and a high quality of the final coating. BYK-1786 shows excellent performance when it comes to difficult application methods such as HVLP, Airless and Airmix to eliminate the micro-foam that occurs in the coating film. The balanced silicone/polyether ratio leads to a perfect compatibility in a variety of aqueous coating systems e.g. pure acrylcs, UV systems and 2-pack PU systems without a negative impact on clarity, haze and cratering.
Defoamers

BYK-1788

VOC-free and Silicone-free Polymer Defoamer for Solvent-borne, High-solid and Solvent-free Systems. Particularly Suitable for 100 % UV Systems

Benefits

- Outstanding defoaming in various systems
  - High-solid
  - Solvent-borne
  - Solvent-free
- Especially suitable for 100 % UV systems
- Broad compatibility
- No negative impact on gloss or transparency
- Especially recommended for non-pigmented systems
- Effective – even at a low dosage
- VOC-free, solvent-free, silicone-free
The well-balanced interaction of effectiveness and compatibility makes the new additive BYK-1788 particularly suitable for non-pigmented systems. BYK-1788 is silicone- and VOC-free and does not introduce any solvents to the formulation. However, in solvent-borne coating systems and those with high solids, BYK-1788 demonstrates its full spectrum of performance.
Defoamers

BYK-1796

Highly Effective Air Release Agent for Solvent-free and Solvent-borne Systems

In many areas, high-solid or 100% systems make a valuable contribution to reducing or avoiding solvent emissions. BYK therefore focuses its activities on this forward-looking, environmentally friendly technology, thereby offering competent solutions for complex system requirements.

BYK-1796 – Excellent Defoaming in Solvent-free Epoxy Floor Coatings

Test system: 2K epoxy resin (highly filled with quartz sand), based on EPON 828/D.E.R 354 and Aradur 43-1 BD
One challenge comes in releasing all of the air from a system. Trapped air not only alters a system’s optical properties, but also adversely affects its mechanical values. Among other things, this results from a high filling level and the absence of solvents. This often results in a higher processing viscosity, but prevents rapid air release from the system. The air introduced through raw materials and the processing methods used also play a major role. One such example comes in the form of PU or EP floor coatings.

BYK-1796 is a newly developed air release agent that guarantees fast and efficient elimination of trapped air without altering optical and mechanical properties. The high efficiency of the additive and a good price-performance-ratio make it the number one choice for solvent-free systems. BYK-1796 is also recommended for solvent-based systems, e.g. protective coatings, where it also offers a full range of services.

**Benefits**

- Excellent defoamer and air release agent
- Effective during both manufacturing and application of the coating
- Particularly suitable for solvent-borne and solvent-free applications, such as epoxy and polyurethane systems
- Very effective in various applications, particularly suitable for high-viscosity systems and for high layer thicknesses
Defoamers

BYK-1799

VOC-free Silicone-containing Defoamer for Solvent-borne, High-solid and Solvent-free Systems. Particularly Suitable for 100 % UV Systems

The main fields of application are UV wood and furniture coatings, and UV printing inks. However, it also perfectly defoams solvent-borne and high solid systems.

Benefits

• Excellent, spontaneous defoaming, even under critical application conditions such as roller application
• Ideal for 100 % UV systems, solvent-borne, high-solid and solvent-free systems based on epoxy and polyurethane resins
• Prevents macro- and microfoam
• Particularly suitable for highly matted and pigmented systems and also for clear coats
• Effective at a very low dosage
• VOC-free, solvent-free
Excellent Defoaming following Roller Application of a Wood Coating

0.05 % BYK-1799
Surface Additives

**BYK-325 N**

γ-Butyrolactone-free Surface Additive for Solvent-borne Coatings

Since many years BYK-325 is a well-established additive in the coatings market. The additive is used in solvent-borne systems, providing good leveling with a slight reduction of surface tension and a moderate surface slip. The recoatability of the coating is excellent. But BYK-325 contains γ-Butyrolactone, which acts as a prodrug or drug so the export is controlled, partially restricted or even forbidden.

BYK has developed a new version, BYK-325 N, which is γ-Butyrolactone free. The additive has the same active substance, so that the performance is identical. Furthermore the solvent exchange results in less labelling.
Benefits

- Good leveling
- Slight reduction of surface tension
- Moderate surface slip
- Good recoatability
Surface Additives

**BYK-326**

High-solid, Moderately Active Surface Additive for Improving the Leveling of Solvent-borne, Solvent-free and Aqueous Systems

**Benefits**

- Exceptional properties in various coating systems
  - Aqueous
  - Solvent-borne
  - Solvent-free
- Good compatibility with clear coatings; no haze or turbidity, neither in the liquid or dry coating
- Reduces risk of haze and foam stabilization
- High solids – no hazardous substance labeling required
- Cold stable down to -18 °C
The new BYK-326 displays this balanced profile and completes the BYK range with regard to universal application in all systems. It has medium polarity and displays moderate activity in reducing surface tension, which produces excellent leveling results.
Surface Additives

BYK-3455

Fluorine-free Silicone Additive to Improve Substrate Wetting and Leveling in Water-borne Systems and Solvent-free UV Coatings
A drawback of modern formulations is that the water component, due to a dramatically reduced amount of co-solvents, causes a much higher surface tension.

Hence, substrate wetting becomes more difficult. Without using environmentally critical fluorosurfactants or additive combinations with different profiles (i.e. utilize a mix of surfactants, silicones, acrylates or alcohol alkoxylates) BYK-3455 shows a strong reduction of dynamic and static surface tension and therefore an excellent substrate wetting. Additionally, due to the high mobility of the additive to the surface BYK-3455 gives an extra positive effect on leveling.

**Benefits**

**In water-borne coatings:**
- Improved substrate wetting, flow and leveling
- Strong reduction of static and dynamic surface tension
- Better pore wetting of wood substrates
- No influence on intercoat adhesion
- Reduced picture framing / fish eyes
- No increase in slip

**In solvent-free UV coatings:**
- Improved substrate wetting, flow and leveling
- No foam stabilization
Surface Additives

**BYK-3456**

Fluorine-free, Silicone-containing Additive to Improve Substrate Wetting and Leveling in Aqueous Systems and Solvent-free UV Coatings

Efficient substrate wetting and outstanding leveling are not guaranteed in every system nor are they easy to achieve. A particular challenge is posed by aqueous systems owing to the high surface tension of the medium, and UV systems, which

- Excellent substrate wetting even on porous substrates, e.g. wood
- Improved substrate wetting combined with good leveling properties
- Reduction in the dynamic surface tension
- Hydrolytic stability at low and high pH values
- Eliminates craters, fish eyes and picture framing
- High compatibility with many resins
are critical based on their rapid curing and high application speeds. It is for these specific systems that BYK has developed a new additive. BYK-3456 is a fluorine-free silicone additive that greatly reduces the dynamic and static surface tension. Even rough and porous substrates (e.g. wood) are wetted perfectly. As BYK-3456 is active both at the interface to the substrate and at the surface, the additive simultaneously improves substrate wetting and leveling. In contrast with many other additives, however, BYK-3456 does not stabilize foam. And there is no negative impact on the recoatability of the system. The additive is compatible with a multitude of resins and stable to hydrolysis across a broad pH range.

**BYK-3456 – Mode of Action Compared with Standard Additives**

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Surface Additives

**BYK-3560**

Macromer Technology Based Additive for Increasing the Surface Energy of Cured Coatings

**Benefits**

- Increases the surface energy of cured coatings overall, especially the polarity
  → Improvement in the adhesion of subsequent layers such as paints, lamination foils, adhesives, printing inks etc.
- Improved wetting of the cured coating by the subsequent layer
  → Very good leveling of subsequent layers
- Improves the leveling of the system in which it is being used
- Does not influence the surface tension of the liquid coating
- Retains the high transparency of clear coats
- Silicone- and fluorine-free
- 100 % active substance and easily incorporated
Systems

- Aqueous
- Solvent-borne
- UV curable
- High solid

Applications

- Automotive coatings
- Industrial coatings
- Wood and furniture coatings
- Can coatings
- Coil coatings
Surface Additives

BYK-3565

Macromer Technology Based Surface Additive to Increase Surface Energy, and with Anti-cratering Properties

Benefits

- Increases the surface energy of the cured coating layer
- Improves wetting and adhesion of the subsequent coating
- Guarantees excellent leveling
- Anti-cratering effect (primarily in aqueous systems)
The new BYK-3565 is the logical further development of BYK’s macromer-modified acrylate additives and can meet complex requirements such as providing excellent leveling, substrate wetting and even anti-cratering properties. Its special modification enables BYK-3565 to orientate itself to the surface of the coating. Recoatability and the adhesion of subsequent coatings are improved at the same time. It is recommended for use in aqueous, solvent-borne and 100 % systems.
Surface Additives

BYK-3760

Highly Effective Silicone Additive for Aqueous, Solvent-borne, and UV-curing Systems

BYK-3760 is a unique, highly active polyether-modified polysiloxane which reduces the surface tension significantly. As a result of its low tendency to stabilize foam, BYK-3760 can also be used in applications that involve high shear forces. The additive remains fully effective, even at a very low dosage and can be used in a wide variety of resin systems. This new additive runs through an additional process to nearly remove cyclic silicone compounds (D4-D6 cycles). It complies with the latest food contact and environmental regulations: EU Ecolabel, Nordic Swan and Blue Angel. BYK-3760 has 100% active substance and is recommended for general industrial, wood and furniture, can, architectural, and protective coatings as well as printing inks.

Benefits

- Extremely strong reduction in surface tension
  → Excellent anti-cratering properties
  → Improved substrate wetting
  → High surface slip – low COF values
  → Good scratch resistance
BYK-3760 – Very Low Foam Stabilization

Notes: BYK-3760 has an emulsifying effect in water (highly compatible). It is also highly effective in aqueous systems with a low proportion of co-solvents. Test system and method: 30 ml water and 0.5 ml BYK-3760 is mixed in a cylinder and shaken manually. The foam formation or stabilization is evaluated.

- Extremely low foam stabilization → Significantly better than standard additives
- Extensive compatibility in a wide variety of systems → Universal
- 100 % solid content → Complies with the strict ecolabel requirements; labeling-free
Surface Additives

BYK-3931 P

A Highly Efficient Synergist for Powder Coatings

In certain applications where the formulator has used lower cost resins to reduce the raw material cost of his formulation various quality problems can occur due to the resulting inconsistent batch qualities such as:

- Poor leveling
- Surface craters
- Orange peel

BYK-3931 P works as a synergist improving the robustness of the powder coating against craters. The additive should be used in combination with the standard leveling additive.

Benefits

- High mobility and rapid surface orientation
- Strong interfacial activity
- Works in combination with the currently used leveling additive
- No need for complete reformulation
Wax Additives

CERAFLOUR 961

Highly Effective Wax Additives for Improved Outgassing of Powder Coatings on Porous Substrate
CERAFLOUR additives are special modified waxes. CERAFLOUR 961 is particularly recommended for powder coating applications on porous substrates. The additive is an excellent degassing additives, which also ensure a smooth and uniform surface without any defects.

**Benefits**

- Prevents
  - Trapped air
  - Craters
  - Pinholes
- Improved scratch resistance
- Smooth and uniform surface without any defects
- Ideal level of viscosity
Can coatings form a protective film on metallic substrates for food packaging. On the one hand, they prevent the corrosion of the metal, and on the other hand, they protect the food contained inside the can. Many foodstuffs sold in metallic packaging contain, for example, acids, fats or salts. These food components can corrode the metal, thereby causing metal compounds to be released into the foodstuff.
The processing of the metal is particularly challenging, as it will be formed after it has been coated. Therefore, an optimum balance between the flexibility and the hardness of the coating is essential. AQUACER 1540 is a wax emulsion based on carnauba wax, and has been specially developed for can coatings with low film thickness. The additive provides low COF values, an excellent scratch resistance, and has no negative effect on the gloss, even in the case of thin layers. AQUACER 1540 fulfills food contact legal status requirements, and can be used both for internal and external coatings.

Benefits

- Low COF values
- Improves the scratch resistance of the coating
- No influence on turbidity, haze or gloss
- Particularly suitable for low film thicknesses
- For internal and external coatings
- Food contact legal status

Applications

For aqueous can coatings and aqueous systems with a low proportion of co-solvent.
Wax Additives

CERACOL 605

Wax Additive to Improve the Surface Properties of Solvent-borne and Aqueous Coating Formulations with a High Proportion of Organic Co-solvent, Especially Can Coatings

Can coatings form a protective film on metallic substrates for food packaging. On the one hand, they prevent the corrosion of the metal, and on the other hand, they protect the food contained inside the can. Many foodstuffs sold in metallic packaging contain, for example, acids, fats or salts. These food components can corrode the metal, thereby causing metal compounds to be released into the foodstuff.

The processing of the metal is particularly challenging, as it will be formed after it has been coated. Therefore, an optimum balance between the flexibility and the hardness of the coating is essential. CERACOL 605 is a very fine wax dispersion based on carnauba wax, and has been specially developed for can coatings with low film thickness. CERACOL 605 contains
butylglycol, and is ideal for solvent-borne and aqueous systems with a high proportion of co-solvent. The additive provides low COF values, an excellent scratch resistance and good optical properties, even in the case of thin layers. CERACOL 605 fulfills food contact legal status requirements, and can be used both for internal and external coatings.

**Benefits**

- Very fine wax dispersion for low film thicknesses
- Low COF values
- Improves the scratch resistance of the coating
- Minor influence on turbidity, haze or gloss
- For internal and external coatings
- Food contact legal status

**Applications**

For solvent-borne and aqueous systems with a high proportion of co-solvent, especially can coating systems
Wax Additives

CERATIX 8561
CERATIX 8563
CERATIX 8566
NMP-free Wax Additives for Excellent Effect Pigment Orientation in Solvent-borne Coatings
Adhesion Promoter

BYK-4513

Adhesion Promoter for Aqueous 2K Epoxy Systems

Benefits

• Improves adhesion of 2K epoxy systems to metal substrates
• Increases wet adhesion and corrosion resistance
• Can be used in the curing agent and in the binder
• Good compatibility; no negative effect on the pot life or drying
• Silane-free and thus excellent storage stability compared to silane-containing adhesion promoters
• Positive effect on the flexibility of the coatings
Significant Improvement in Coating Adhesion with BYK-4513

Control

![Control](image)

Directly after salt spray test | After 24 h regeneration time

2 % BYK-4513

![2 % BYK-4513](image)

Directly after salt spray test | After 24 h regeneration time

Test system and method: aqueous 2K epoxy resin system (dispersion); 240 h neutral salt spray test (ISO 9227), drying: 45 minutes at 80 °C + 16 h at room temperature, dry coat thickness: 35 μm; Cross-cut test (ISO 2409), once immediately after the salt spray test and once after 24 h regeneration time
Wetting & Dispersing Additives

DISPERBYK-190

VOC and Solvent-free Wetting and Dispersing Additive for Aqueous Coating Systems, Printing Inks and Adhesives. Suitable for all Pigments

Over the last decades the trend to water-based systems is at a continuous rise. BYK has recognized this trend early and developed DISPERBYK-190 in the early 90ies. This additive was definitely a milestone. DISPERBYK-190 has an extremely wide range of applications and is suitable for all different kinds of pigments. Due to its excellent wetting and dispersing quality, it produces a high level of gloss and transparency in conjunction with low viscosity, thereby enabling a better flow behavior and increased pigmentation. DISPERBYK-190 is particularly suitable for producing binder-free pigment concentrates. This impressive product profile has established it as an industry standard worldwide.
Benefits

• Excellent pigment deflocculation
• Higher pigment load
• Improved color strength
• High levels of gloss and transparency
• Strong viscosity reduction

Applications

• Printing Inks
• Architectural coatings
• Wood and furniture coatings
• Automotive coatings
• Can coatings
• Protective coatings
• Leather finishes
• Adhesives
• Binder-free pigment concentrates
Wetting & Dispersing Additives

**DISPERBYK-199**

Polymeric Deflocculating Wetting and Dispersing Additive

**DISPERBYK-199 for Aqueous Systems**

**DISPERBYK-199 – Excellent Color Acceptance in a High Gloss Pure Acrylic Top Coat**
**DISPERBYK-199** is a cost-effective wetting and dispersing additive for various waterborne coatings, decorative as well as industrial, both for resin-free slurry grinds or in combination with a grinding resin. DISPERBYK-199 is a copolymer based on modified acrylate chemistry and it stabilizes inorganic and organic pigments through its anchoring groups and electrosteric working mechanism.

**Benefits**

- Cost-effective alternative to commonly used dispersants (e.g. Na\(^+\) and NH\(_4^+\) salted polyacrylic acids) and high molecular weight wetting and dispersing additives in aqueous systems
- VOC < 1500 ppm
- APEO- and amine-free
- Excellent stabilization of organic and inorganic pigments
- High color strength
- Broad compatibility
Wetting & Dispersing Additives

DISPERBYK-2013

100 % Solvent-free Wetting and Dispersing Additive for Solvent-borne, Solvent-free and Aqueous Coatings, Printing Inks and UV Systems
Benefits

- Its **excellent deflocculation and stabilization** of especially
  - Organic pigments (phthalo blue, organic red and yellow pigments)
  - Carbon blacks
  - Inorganic pigments, transparent iron oxide red and transparent iron oxide yellow pigments
- **DISPERBYK-2013** leads to properties such as:
  - **Effective viscosity reduction with minimized thixotropic flow behavior**
    - Allows a higher pigment load in the mill base
  - **Excellent storage stability** of the formulated coating systems
  - **Significantly improved optical properties** such as
    - Higher color strength and transparency
    - Increased gloss and minimized haze

Applications

- Industrial coatings
- Coil coatings
- Wood and furniture coatings
- Marine and protective coatings
- Automotive coatings
- Floor coatings
- Can coatings
- Printing inks
DISPERBYK-2055 is a high molecular-weight wetting and dispersing additive that covers a very broad application spectrum. It enables the production of high-quality pigment concentrates that can be used to cover almost the entire polarity range of let-down binders – from long oil alkyds through to aqueous binder systems.

DISPERBYK-2055 is also extremely well suited to co-grinds, i.e. where pigment blends are used during the grinding phase. As DISPERBYK-2055 deflocculates and stabilizes both inorganic and organic pigments, and also provides outstanding results with fillers and matting agents, such co-grinds now only require one wetting and dispersing additive. The smart selection of specific raw materials and a highly efficient production process have led to the development of a product that is not only of high quality but also exhibits an outstanding price-performance ratio.

DISPERBYK-2055 is suited for industrial, automotive, coil, protective, and wood and furniture coatings.
Benefits

- 100% solids
- Very broad compatibility of non-polar solvent-borne systems through to aqueous formulations
- Stabilizes TiO₂, (transparent) inorganic and organic pigments, carbon blacks, effect pigments, fillers, and matting agents
- For coatings (single grinds and co-grinds) and pigment concentrates
- Very good price-performance ratio
Wetting and Dispersing Additives

DISPERBYK-2080
DISPERBYK-2081

Wetting and Dispersing Additives for Aqueous Systems without Negative Impact on Water Sensitivity, Stain and Corrosion Resistance

Benefits

• DISPERBYK-2080 and DISPERBYK-2081 preserve the
  o Water resistance
  o Corrosion resistance
  o Stain resistance
  o Early water resistance
  of aqueous systems

• Show positive effects on
  o Gloss retention
  o Improved adhesion

• Good wetting and dispersing properties with excellent viscosity reduction for TiO₂, inorganic, partly organic and anticorrosive pigments as well as fillers
To overcome the difference in surface tension between pigments and water, dispersing additives for water-borne systems need a certain hydrophilicity which can be achieved through ionic or hydrophilic structures. As these components remain in the cured coating, they bear the risk of increasing the coating’s hydrophilicity negatively influencing characteristics such as water, stain, and corrosion resistance.

The water and corrosion resistance is of special importance to anticorrosive primers and DTM (direct to metal) coatings whereas wood coatings need excellent water and stain resistance. These systems are mainly pigmented with titanium dioxides and other inorganic pigments, fillers and anticorrosive pigments.

DISPERBYK-2080 and DISPERBYK-2081 are new tailor-made wetting and dispersing additives based on novel chemical structures, which combine good viscosity reduction and deflocculation of inorganic pigments with the least negative influence on water, stain, and corrosion resistance as possible.
Wetting & Dispersing Additives

**DISPERBYK-2158**
**DISPERBYK-2159**

Wetting and Dispersing Additives for Excellent Dispersion and Stabilization of Silica-based Matting Agents to Produce Deep-matt UV-curing and Conventional Solvent-borne Coatings
DISPERBYK-2158 and DISPERBYK-2159

For some time, there has been a trend towards deep-matt solvent-free UV-curing coatings in the wood and furniture coatings industry, and these represent a particular challenge – from careful raw material selection to perfectly tailored application and curing equipment. In addition to specialist matting binders or matting agents, it is common to use treated or untreated silica-based matting agents when gloss needs to be reduced. However, due to the absence of volatile solvents, minimum film shrinkage and the fast curing speed of solvent-free UV-curing coatings, high quantities of silica are required, which causes a significant increase in viscosity – an undesirable effect.

To both satisfy the technical requirements and achieve an optimum application viscosity, BYK has developed the new additives DISPERBYK-2158 and DISPERBYK-2159. Their special structural design enables perfect interaction both with treated and untreated silica-based matting agents to achieve consistently deep-matt coatings with optimum viscosity profiles.
Perfectly Tailored for Highest Affinity to Silica-based Matting Agents

Benefits

- Excellent dispersion and stabilization of treated or untreated silica-based matting agents
- Excellent viscosity reduction with minimal thixotropic flow properties (Newtonian flow behavior)
- Possible to add large quantities of matting agents
  → Perfectly suited to producing deep-matt coatings with a good processing viscosity
- Significantly improved matting of solvent-free and solvent-borne UV-curing coatings and conventional solvent-borne systems
- Extremely good compatibility with all common oligomers and monomers
Wetting & Dispersing Additives

**DISPERBYK-2205**

Solid Wetting and Dispersing Additive for Organic and Inorganic Pigments in a Multitude of Solvent-borne Applications and UV Printing Inks

DISPERBYK-2205 has an optimum molecular weight to be highly compatible with a multitude of different systems and to result in excellent pigment stabilization and low viscosities. In addition, its reduced amine value and therefore virtually neutral character enable it to be used in acid-catalyzed systems. Coatings that are manufactured with DISPERBYK-2205 are characterized by high gloss and low haze. In printing ink applications it can also be used for medium-polarity systems and even UV systems.
Benefits

• Stabilizes a multitude of organic and inorganic pigments
• Suitable for all low to medium-polarity systems
• In pigment concentrates:
  o Low millbase viscosity
  o High pigment load possible
  o Generates Newtonian flow behavior
  o Improves color strength
• In co-grinds:
  o Reduces flooding/floating
  o Significantly increases the in-can storage stability
Rheology Additives

OPTIFLO-H 3300 VF

VOC-free Associative Thickener (HEUR) for Aqueous Systems to Generate a Slightly Pseudoplastic Flow Behavior
OPTIFLO-H 3300 VF increases the viscosity in the medium shear range with an extremely low impact in the high shear range. It optimizes storage stability and provides an excellent balance between flow properties and the sagging tendency. The additive is liquid and therefore easy to handle. It is not necessary to specifically adjust the pH value or control the temperature during incorporation. When combined with rheology additives which are effective in the high shear range, such as the OPTIFLO-L/T series, it enables an optimum processability.

Benefits

- Viscosity increase in the medium shear range
- Positive Impact on:
  - Flow properties
  - Sagging
  - Storage stability
- Easy-to-use

Applications

- Architectural coatings
- Wood and furniture coatings
Rheology Additives

OPTIFLO-H 7625 VF

VOC-, APEO- and Tin-free Associative Thickeners (HEUR) for Aqueous Systems to Generate Highly Pseudoplastic Flow Behavior

Substantial Increase in Viscosity in the Low Shear Range

Test system: Pure acrylic
Dosage: 0.15 % active substance based on the total formulation
Test method: Plate/cone viscometer
Benefits

Product Performance
- Substantial increase in viscosity in the low shear range
- Offers highly pseudoplastic flow behavior
- Improves anti-sagging and anti-settling properties
- Easy to incorporate

Environmental Properties
- SVOC-free (<1.5 g/L)
- VOC-free (< 1500 ppm)
- APEO-free
- Tin-free
- Propylene glycol-free
Rheology Additives

**OPTIFLO-L 1400**

VOC-free Associative Thickener (HEUR) for Aqueous Systems to Generate a Newtonian Flow Behavior

**Benefits**

- High shear rate viscosity with negligible influence on low and mid-shear viscosity
- Enhanced roller spatter resistance and brushability
- Excellent syneresis resistance
- Well balanced flow and leveling properties
- No negative influence on gloss
- VOC-free
Applications

- Architectural coatings
- Wood and furniture coatings
- Paper coatings
**Rheology Additives**

**OPTIFLO-M 2600 VF**

VOC-free Associative Thickener (HEUR) for Aqueous Systems to Generate a Newtonian Flow Behavior

OPTIFLO-M 2600 VF significantly increases the viscosity in the medium shear range. Using the additive reduces spattering during application and greater layer thicknesses can be achieved which also have good leveling. The additive is liquid and therefore easy to handle. It is not necessary to adjust the pH value or control the temperature during incorporation. OPTIFLO-M 2600 VF is used in various aqueous systems that are based on acrylate, styrene acrylate, polyvinyl acetate binders as well as in PU and alkyd emulsions and epoxy dispersions.

**Benefits**

- Viscosity increase in the medium shear range
- Reduced spattering
- Good leveling
Applications

- Architectural coatings
- Wood and furniture coatings
- Leather coatings
- Protective coatings
Rheology Additives

**OPTIFLO-T 1000**

VOC-free Associative Thickener (HEUR) for Aqueous Systems to Generate a Newtonian Flow Behavior
OPTIFLO-T 1000 increases the viscosity in the high shear range with an extremely low impact in the low shear range. It improves processability and leveling. It reduces spattering during application. In addition, greater layer thicknesses can be achieved along with an excellent balance between the flow properties and leveling. The additive is liquid and therefore easy to handle. It is not necessary to adjust the pH value or control the temperature during incorporation.

Benefits

• Viscosity increase in the high shear range
• Better processability
• Reduced spattering
• Excellent balance between flow and leveling

Applications

• Architectural coatings
• Wood and furniture coatings
• Paper coatings
• Adhesives & Sealants
Rheology Additives

OPTIFLO-T 1010

Liquid VOC-free Rheology Control Additive to Adjust High Shear Viscosity in Water-borne Coatings

Benefits

• Newtonian flow behavior
• High shear rate viscosity with negligible influence on low- and mid-shear viscosity
• Improvement of roller spatter resistance
• Excellent syneresis resistance
• Provides excellent brushability with improved leveling
• No negative influence on gloss
• Excellent color acceptance and rub-out stability
Beside the well-known OPTIFLO-T 1000 and OPTIFLO-L 1400 there is a new addition to BYK’s product portfolio, OPTIFLO-T 1010. Modern coating systems and their resins require specific, tailor-made additives that provide the optimum performance but at the same time an environmentally sound solution. OPTIFLO-T 1010 provides enhanced syneresis, spatter resistance and shows a significant improvement in brushability while being free from VOCs, APEOs and tin.

OPTIFLO-T 1010 – Benefits Compared to Other OPTIFLO Additives
BYK Instruments
The Objective Eye for Paint QC Solutions

The world is in a continuous change. The trends of ‘globalization and standardization’ within a more and more ‘digital world’ not only change our consumer behavior, but also your requirements of testing solutions.
Global Communication
- Global specifications are prerequisite for seamless communication and ask for digital standard distribution.
- Excellent technical performance in compliance with international standards is a must requirement.

Standardized QC Management System
- Standardized QC procedures and QC reports need to be easy to set-up globally.
- Routine QC checks and documentation are the key to product and process optimization.

Increase Efficiency
- Innovative technologies are needed to guarantee objective and reliable measurement data.

Figures and Facts Instead of Feelings!

THE OBJECTIVE EYE
spectro2guide

Raise Your Expectations
Touch the Color

Benefits

- Color, gloss and new fluorescence measurement in one instrument
- Balanced and upfront design with large 3.5” color touchscreen
- Docking station with built-in standard for automatic calibration and charging
- Live preview of measurement spot with zoom function
- Smart high tech LEDs with peak performance for digital standards
- Data analysis out-of-the-box with WiFi or USB connection
#touchthecolor
www.touchthecolor.com
BYK-mac i
The NEW Standard for Multi-angle Color and Effect Measurement

Benefits

• Excellent correlation to visual perception: 6-angle color measurement and sparkle/graininess analysis
• Quantification of fluorescence with new parameter IntEmission
• Innovative LED technology guarantees excellent inter-instrument agreement allowing digital standard distribution
• 10-year warranty on LED light sources
• Color display for ease of use at production line
micro-gloss XS

The Perfect Fit for Small Parts
Benefits

• Small port – 2 x 4 mm
  The gloss of small and large parts will finally fit together

• Unsurpassed performance
  Best in temperature control – reliable and stable results from 10...40 °C
smart-chart Software
The Solution to Set-up a Global QC Management System
Benefits

- Works with micro-gloss, spectro2guide, BYK-mac, wave-scan and cloud-runner
- Powerful standard management with digital standard distribution
- Predefined customer specific color and appearance scales of all auto OEMs
- Re-calculation of measurement results in any color systems
- Standardized QC reports – trend graphs – SPC box plots
byko-spectra *pro*

See Things the Right Way

Benefits

- Light booth with highest MLvis class A for daylight simulation of CIE D65 and D75: Combination of filtered halogen lamps with LEDs
- Eight certified light sources: D65, D75, A, HZ, CWF, TL84, U30 and UV
- Simultaneous visualization of color temperature and light intensity in lux ensures 100% controlled illumination
- Auto Sequence Mode for standardized and efficient color evaluation
- Available as luminaire. Mount on the ceiling or a wall and appraise conveniently large products
Testing Physical Properties from Wet to Dry

Cross-Cut Adhesion

Applicators

Pendulum Hardness

Film Thickness
Drawdown Test Charts

Flow and Dip Cups
BYK by Numbers

About 1,000 Samples a Day

More than 35 Laboratories Across the Globe

1 Specialized End-Uses
About 2,250 Employees Around the World

9 Percent Average Increase in Sales per Year

More than 145 Years of Expertise
What do we mean by... Innovation?

Continually offering the most modern and advanced additives. To do this we invest about eight percent of our annual turnover in research and development – three times more than most in the sector. Research & development and application technology staff make up 22 % of our workforce.
What do we mean by... Expertise?

We host more than 40 customer seminars annually, sharing valuable know-how and insights into product solutions and application techniques.

www.byk.com
What do we mean by... Closeness?

Our global footprint and end use structure enable us to deliver regional solutions to our customers with specialized industry and application focus.
Welcome to the interactive world of BYK additives. This multimedia has been designed to support your work, offering interactive graphs of the chemical processes.
Welcome to the Interactive World of BYK Additives.

Our multimedia brochures support your work with interactive graphics, fascinating animations, and videos to illustrate chemical processes.

ebooks.byk.com
Museum of the Western Han Dynasty Mausoleum of the Nanyue King
Yuexiu Park
Baiyun Mountain
Highlights in Guangzhou

Time to Explore the City

Canton Tower
Canton Tower

The Canton Tower is a 600 meter high TV and observation tower in Guangzhou. Its extraordinary architecture consists of a hyperboloid structure of two transposed ellipses.

The tower offers a Sky Drop and a ride on its roof. The spherical glass cars drive on an elliptic route that runs beyond the edge of the tower. Both attractions guarantee an impressive view of the city.

Museum of the Western Han Dynasty
Mausoleum of the Nanyue King

The Museum of the Mausoleum of the Nanyue King of the early western Han dynasty exhibits discoveries from the tomb of the Nanyue king Zhao Mo as well as other archeological discoveries.
Yuexiu Park

With a size of 9 hectare, the Yuexiu Park, sitting at the bottom of the Yuexiu Mountain, is the biggest urban green space in China. The park consists of seven hills and three artificial lakes — about 83% of its area is covered with plants. The natural and artificial landscape invites to visiting, leisure and relaxation.

Baiyun Mountain

The Baiyun Mountains is a mountain range north of Guangzhou. The name “white clouds” derives from the spectacular view of its peak that is shrouded in mist during late spring or after a rain.
#CHINACOAT2018

## Publishing Information

**ShowNews #CHINACOAT2018 – A publication of BYK Additives & Instruments.**

Publisher: BYK-Chemie GmbH, Marketing & Sales Services, Abelstr. 45, 46483 Wesel, Germany

Editor-in-chief: Sven Kremser

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Pictures: Neue Zeiten, Getty Images, fotolia
Layout: heureka GmbH, Essen
Printed by: Shanghai Kexin Printing Co., Ltd., formulated with additives from BYK

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This issue replaces all previous versions – Printed in China

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11/2018