



## **AFCONA Additives Product List**



**Where technology and  
quality meet perfection**

**AFCONA Additives  
Version 9  
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[www.afcona.com.my](http://www.afcona.com.my)

**Additives For Coatings Or New Applications**

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**AFCONA Malaysia**



**AFCONA China**



**AFCONA Holland**



**AFCONA USA**

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## Additives for solvent-based systems

### 2000 Series – Silicone-based defoamers and deaerators

Product Name	Properties
AFCONA-2022	Very strong defoamer and deaerator. Suitable for all solvent-based systems, especially PU and Baking paints. Also suitable for curtain coating applications.
AFCONA-2023/E	Moderate defoamer, well balanced between defoaming and compatibility. Suitable for PU systems that are used in refinish, wood and industrial paints. Furthermore good for NC and AC wood coatings, air-drying long oil and medium oil alkyds.
AFCONA-2025	Moderate defoamer, well balanced between defoaming and compatibility. Very wide application from low to high polar systems. Mainly for physical drying systems and air-drying alkyds.
AFCONA-2027	Developed for low and high polar printing ink applications such as offset, gravure, flexo and UV.
AFCONA-2028	For all solvent-based applications especially curtain coating. Works as post-add additive to break the foam created during processing. Add slowly while stirring.
AFCONA-2035	Universal defoamer for all systems from low to high polar, especially air-drying alkyds, physical drying systems, wood coatings, auto refinishes and general industrials. Moderate defoamer, well balanced between defoaming and compatibility.
AFCONA-2038/E	The most compatible defoamer in AFCONA range. Recommended for clear coats. Best performance in PU, Epoxy, UV and UPE systems. Widely used in refinish topcoats clear, UV systems and wood coatings.
AFCONA-2040/E	Same group as AFCONA-2035, with additional levelling properties. Recommended to test next to AFCONA-2035 because of different performances.
AFCONA-2045	Very compatible defoamer with good defoaming effect. Particularly suitable for medium to high polar systems such as PU, Epoxy, TPA and UPE. Outstanding performance in PU systems.
AFCONA-2048	Particularly suited for high gloss solvent-based wood finishes. Good compatibility. No unacceptable haze. Extremely suitable for brush applications where quick solvents evaporate and rapid defoaming is required.
AFCONA-2051	Strong defoamer for solvent-based applications. Specially developed for clear top coat applications.
AFCONA-2721	Defoamer dissolved in a reactive solvent (HEA). Recommended for UV coatings.
AFCONA-2722/E	Very strong defoamer and deaerator. Suitable for high solid & high viscosity systems, such as PU and Epoxy floorings. 45% of the raw material origin from renewable sources.
AFCONA-2723	Improved version of AFCONA-2720 for UPE systems. Better transparency and defoaming properties. Also suitable in PU and Epoxy floorings.
AFCONA-2724E	Anti-foam and deaeration agent for solvent containing and solvent-free systems such as Epoxy, Polyurethane, coil and wood coatings. Best transparency in flooring systems.
AFCONA-2726/E	Very strong defoamer for high solid and high viscosity systems such as PU and Epoxy flooring. Additionally good levelling properties.
AFCONA-2727/E	Stronger defoamer with easier incorporation than AFCONA-2726. Very good performance for Epoxy and PU, especially in the solventless types.
AFCONA-2763/E	Very strong defoamer with reasonably good compatibility and clarity in high-gloss UV systems, epoxies, polyurethanes, baking paints and other high viscosity systems.
AFCONA-2790	Strong defoamer and deaerator for solvent containing and solvent-free systems. Can quickly remove tiny bubbles in system, as well as quickly breaking foam on surface.
AFCONA-LE1057	Solvent-free and labeling-free defoamer for solvent-free epoxies. The combination of silicone and non-silicone polymers allows to act as anti-foam and deaeration additive.

General indicator on recommendation

- - Highly recommended
- ◐ - Recommended
- ◑ - Can be used

Chemical	Dosage (Based on total formulation)	Solvent	Flash Point	Solvent-based System											2000 Series Product Name			
				Air-drying Alkyd (medium and long oil)	Inds. Baking Paint (A or Ac/Melamine)	Auto OEM (PE or Acrylic/Melamine)	Alkyd NC/Alkyd Aminol(Ac)	2K PU (Acrylic OH Functional)	2K PU (Acrylic OH Functional)	Unsaturated Polyester	Epoxy - Solvent-based	Epoxy - Solventless	CAB Polyester/PolyAcrylic	Thermoplastic Acrylic (TPA)		Coil and Can Coating	Chlorinated Rubber	UV Curing System
Modified Polysiloxane	0.1~1.0%	Xy/MPA/BAC/EAc	19 °C	◐	●	●	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	AFCONA-2022
Modified Polysiloxane	0.1~0.5% (0.2~0.4%)	MPA/Alkylbenzene	42 °C	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	AFCONA-2023/E
Fluorocarbon Modified Polysiloxane	0.1~1.0% (0.2~0.4%)	Cyclohexanone	42 °C	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	AFCONA-2025
Fluorocarbon Modified Polysiloxane	0.1~1.0% (0.2~0.4%)	Ethyl Acetate	-1 °C	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	AFCONA-2027
Modified Polysiloxane	0.1~1.0% (0.2~0.4%)	Xy/MPA/BAC/EAc	22 °C	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	AFCONA-2028
Fluorocarbon Modified Polysiloxane	0.1~1.0% (0.2~0.4%)	DIBK	49 °C	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	AFCONA-2035
Modified Polysiloxane	0.1~1.0% (0.2~0.4%)	Alkylbenzene/MPA/Xylene	25 °C	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	AFCONA-2038/E
Fluorocarbon Modified Polysiloxane	0.1~1.0%	DIBK/SBP Spirit	49 °C	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	AFCONA-2040/E
Modified Polysiloxane	0.1~0.7%	Xylene/Butylacetate	27 °C	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	AFCONA-2045
Fluorocarbon Modified Polysiloxane	0.1~0.5%	Cyclohexanone	42 °C	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	AFCONA-2048
Modified Polysiloxane	0.2~0.5%	DIBK/MPA	42 °C	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	AFCONA-2051
Modified Polysiloxane	0.1~1.0% (0.2~0.5%)	2-ethylhexyl acrylate/DIBK	46 °C	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	AFCONA-2721
Modified Polysiloxane	0.5~1.5%	Alkylbenzene/MPA/Pine Oil	42 °C	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	AFCONA-2722/E
Modified Polysiloxane	0.1~0.5%	SBP Spirit	77 °C	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	AFCONA-2723
Modified Polysiloxane	0.1~1.0%	MPA/Alkyl benzene/DIBK/MIBK/SBP Spirit	14 °C	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	AFCONA-2724E
Modified Polysiloxane	0.5~1.5%	SBP Spirit	>100 °C	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	AFCONA-2726/E
Modified Polysiloxane	0.5~1.5%	SBP Spirit	>100 °C	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	AFCONA-2727/E
Fluorocarbon Modified Polysiloxane	0.1~1.0%	DIBK/MIBK/SBP Spirit	43 °C	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	AFCONA-2763/E
Modified Polysiloxane with hydrophobic silica	0.3~1.0%	-	>100 °C	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	AFCONA-2790
Defoaming polymers containing silicone	1.0~2.0%	-	>100 °C	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	◐	AFCONA-LE1057

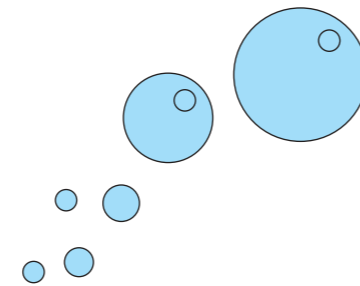
## 2000 Series – Defoamer

Properties	Defoamers	Remark	
Easy incorporation	AFCONA-2038/E AFCONA-2724E AFCONA-2050 AFCONA-2018/E	AFCONA-2024 AFCONA-2051 AFCONA-2023/E	AFCONA-2038/E is most easily incorporated, followed by grades ranging sequence.
Medium incorporation (Need medium speed/shear force to incorporate. For the incorporation fluorocarbon containing grades, in-can transparency is much better than others.)	AFCONA-2035 AFCONA-2040/E AFCONA-2721 AFCONA-2045 AFCONA-2028 AFCONA-2021	AFCONA-2025 AFCONA-2027 AFCONA-2763/E AFCONA-2754/E AFCONA-2723	AFCONA-2035 is most easily incorporated, followed by grades ranging sequence.
Delicate incorporation (Need high speed/shear force to incorporate. Normally gives in-can haziness.)	AFCONA-2720/E AFCONA-2022 AFCONA-2726/E AFCONA-LE1042 AFCONA-2280	AFCONA-2722/E AFCONA-2725/E AFCONA-2727/E AFCONA-2290 AFCONA-2270	AFCONA-2720/E is most easily incorporated, followed by grades ranging sequence.

## Selection of a Defoamer

### Testing in Skandex (Quick Test)

- 1) Mix the different defoamers into the clear binder individually.
- 2) Shake for 3 minutes.
- 3) Observe the following phenomena below:
  - a. The foam level immediately from skandex; the less foam sample represents better **anti-foam**.
  - b. Observe the movement of the foam from bottom to top; faster movement represents better **deaeration**.
  - c. Observe the foam breaking speed; faster foam breaking represents better **defoaming**.

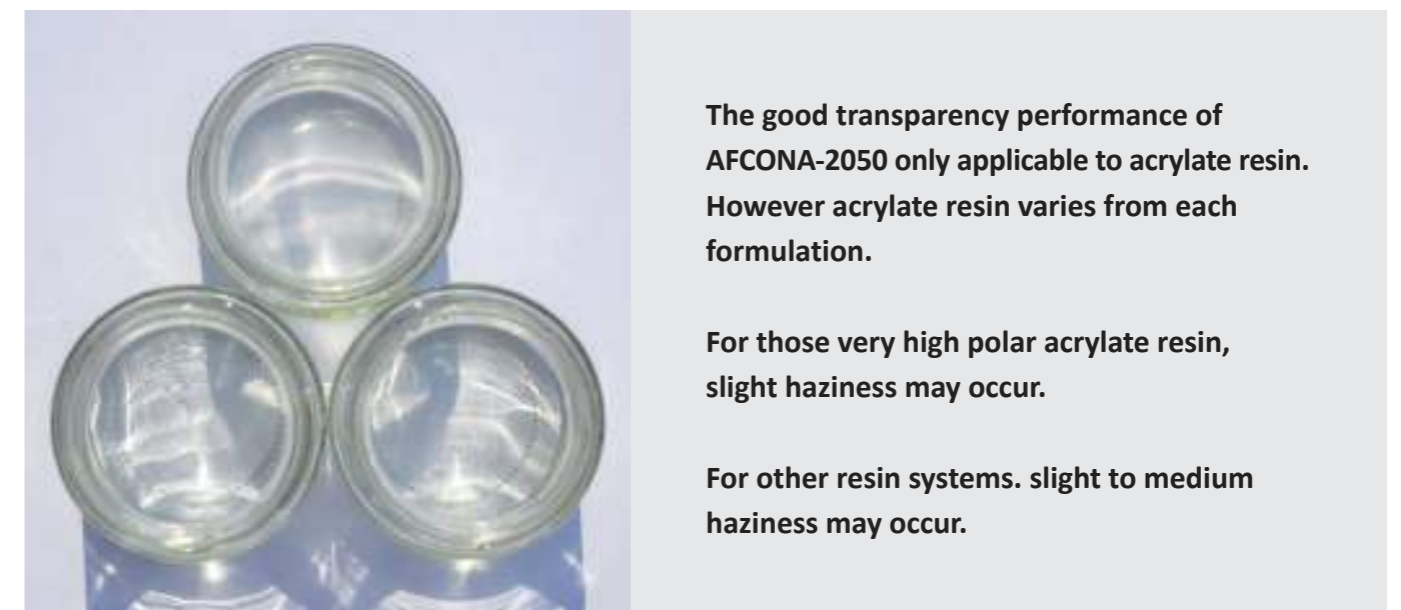


## Comparison test between AFCONA-2020 and AFCONA-2050 in PU acrylate with OH value at 2.5%

### In-can clarity. Side view



### In-can clarity. Top view



### Defoaming performance



### Influence on levelling performance







## Additives for solvent-based systems

### 3000 Series – Organically modified polysiloxane based slip and levelling agents

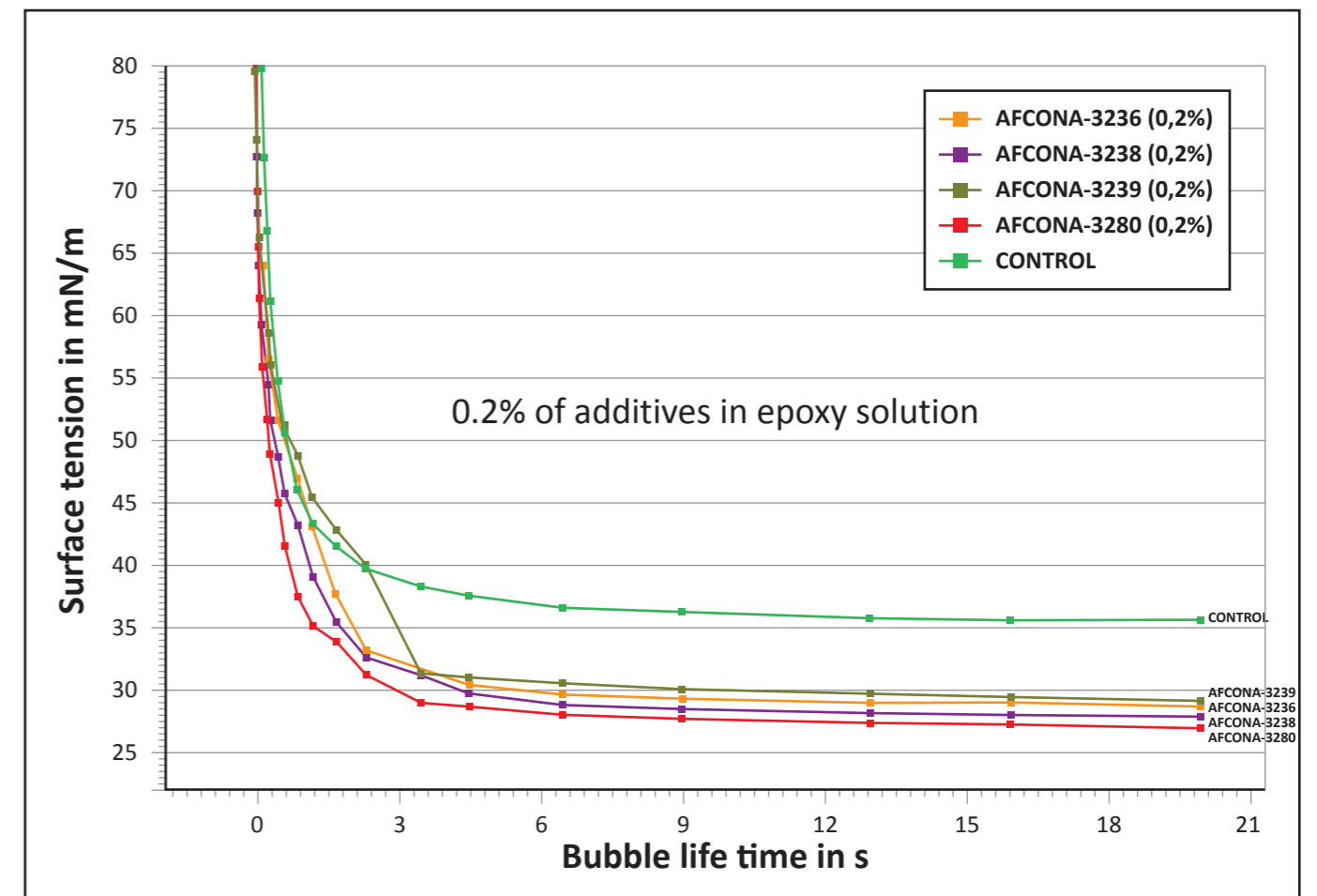
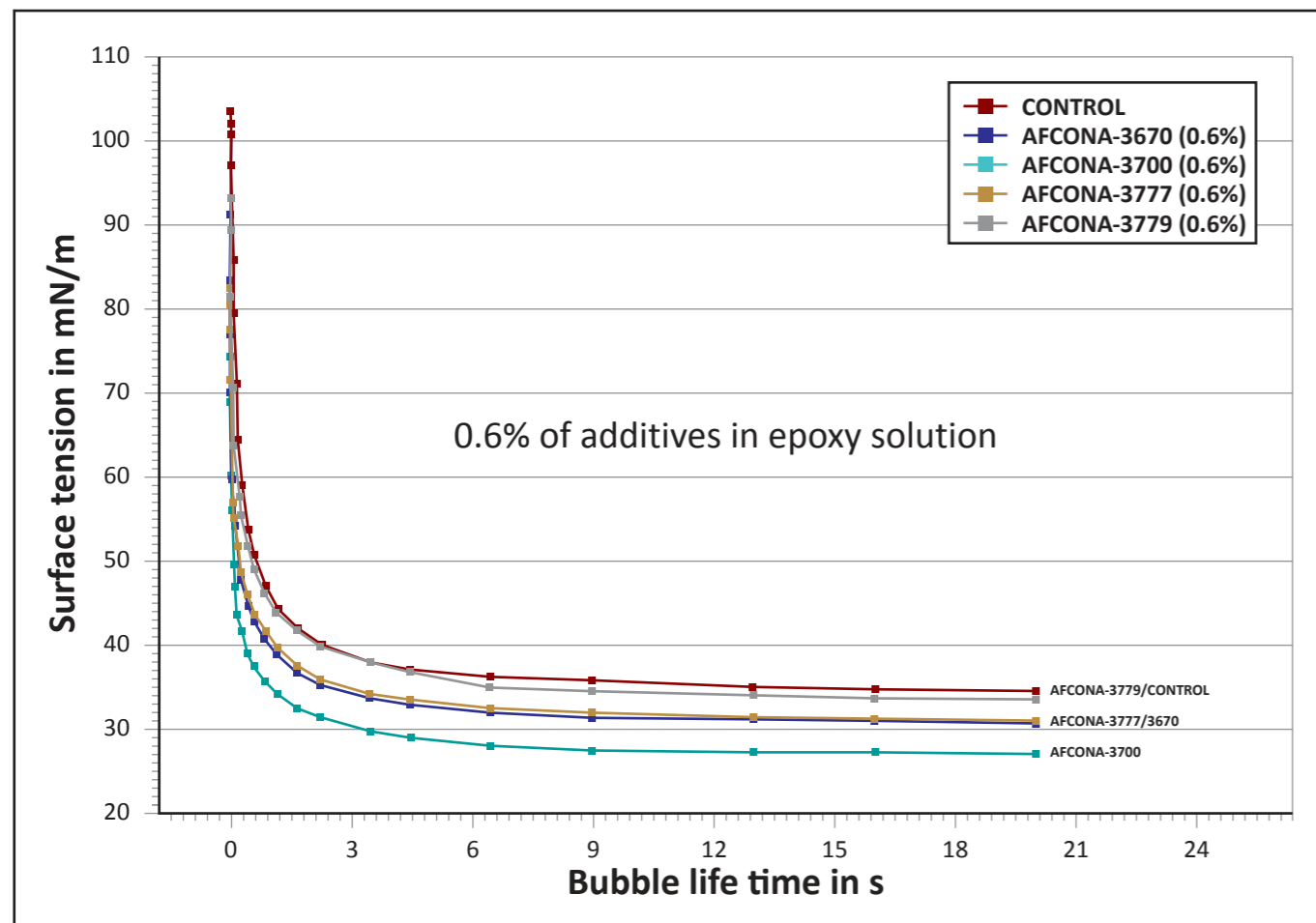
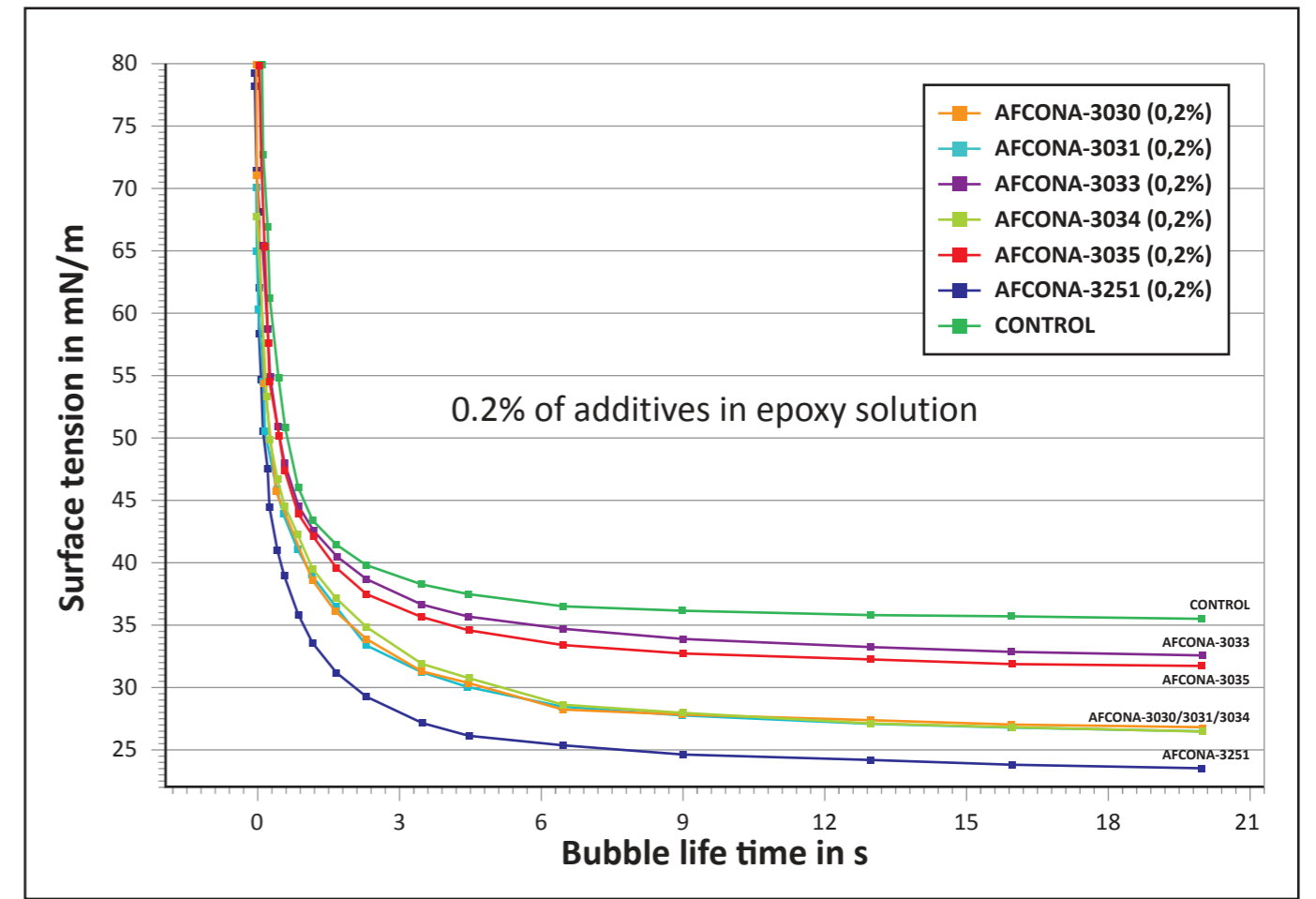
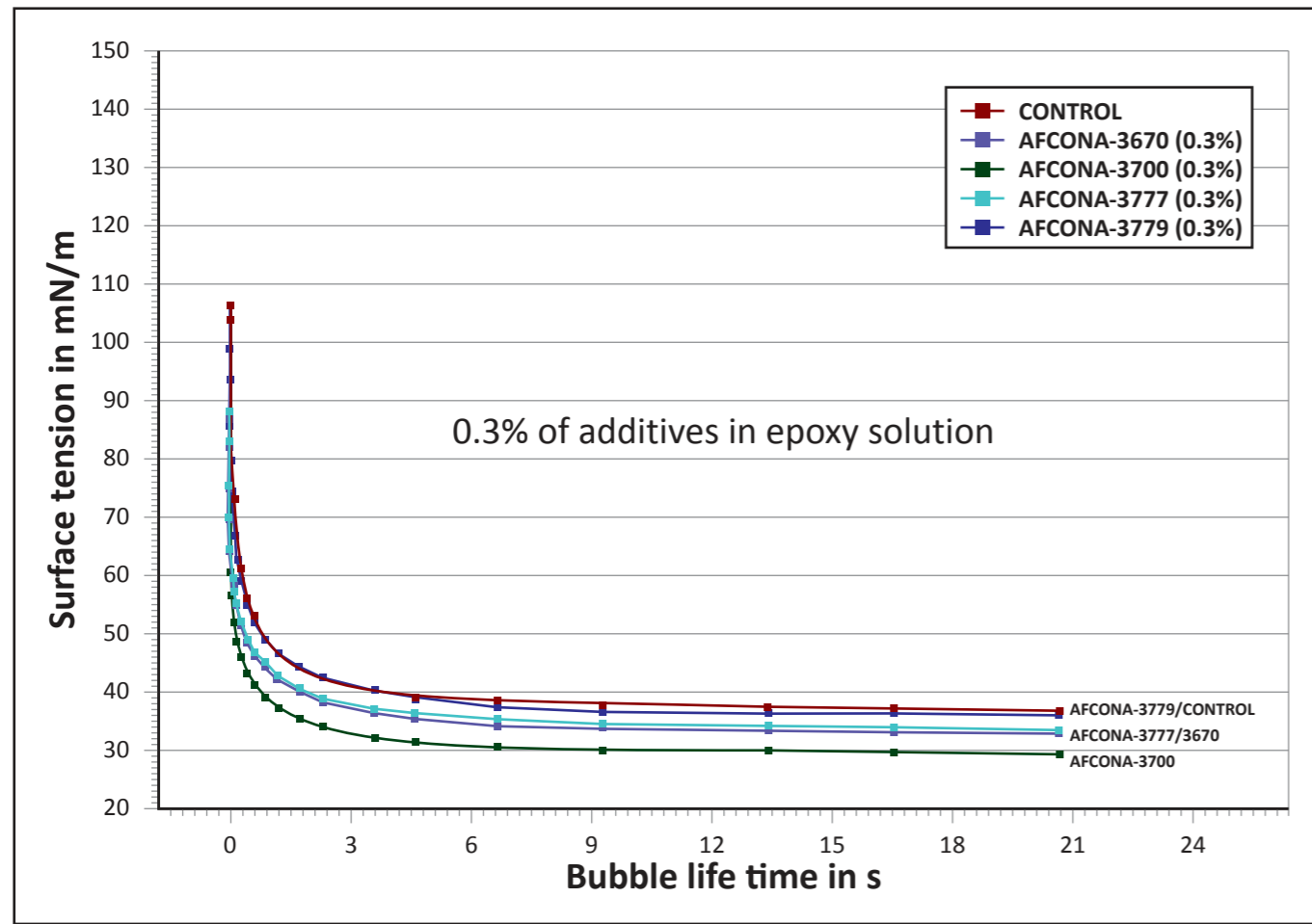
Product Name	Properties
AFCONA-3030*	Universal slip and levelling agent for all solvent-based and water-based systems. Very effective in preventing Bénard cells and good anti-crater properties in PU. Provides moderate slip.
AFCONA-3031/E	Suitable for solvent-based coatings. Has high, oily-feeling slip performance. Oily effect enhances build up appearance. Good for metal coatings, refinish and baking paints. Low inner bubble sensitivity in PU coatings.
AFCONA-3033	High dry-feeling slip performance. Very good compatibility in all solvent-based systems. Very suitable for clear coatings. Mainly recommended for wood and plastic coatings and physical drying systems.
AFCONA-3034*	Fluorocarbon modified polysiloxane with strong surface tension reduction properties, excellent anti-crater properties, substrate wetting and improved vertical levelling.
AFCONA-3035E*	Specifically developed for UPE systems. Improves levelling and promotes a smoother surface to the coatings. Furthermore suitable for UV coatings.
AFCONA-3037/E	Combination of high boiling point solvents. Contains a small amount of very compatible polysiloxane. Promotes flow of the system and prevents solvent boiling problems that lead to pin holes.
AFCONA-3085	Polysiloxane-based polymer with di-hydroxyl functional groups at both ends. Can be cross-linked in polyurethane systems as well as in baking paints. Very high slip and levelling performance.
AFCONA-3230	One of the highest slip performances of AFCONA silicone-based levelling agents. Low foam stabilizing effect, very good compatibility and no influence on in-can transparency. Suitable for Polyurethane coatings where high slip is needed.
AFCONA-3231*	Supplied as 100% active additive. Strong slip combined with wet feel. For UV, metal coatings and baking paints. Also for refinish as it enhances the build up appearance.
AFCONA-3232	100% active version of AFCONA-3033.
AFCONA-3233*	Supplied as 100% active additive. Universal slip and levelling agent for all solvent-based systems. Anti-cratering, slip, and no Bénard cells.
AFCONA-3236	Slip, levelling, and defoaming. For foam sensitive systems (PU, epoxy, coil coating). Slight in-can haziness in clears vs AFCONA-3238 and AFCONA-3239. High-temperature resistance (280°C).
AFCONA-3238	Better defoaming in medium to high polar systems. Moderate slip, levelling and serious in-can haziness. For foam sensitive systems (PU, epoxy, wood coatings). Often selected for defoaming properties.
AFCONA-3239	Defoaming > AFCONA-3236, < AFCONA-3238 in medium to high polar systems. For foam sensitive systems (PU, epoxy). Improves matting in UV coatings.
AFCONA-3250	Same family as AFCONA-3230, but overall more compatible.
AFCONA-3251	Improved version of AFCONA-3250, better levelling and anti-crater performances in PU and UV coatings.
AFCONA-3280	Short-chain polysiloxane, will not influence intercoat adhesion. For baking paints based on alkyd-melamine, oil-free polyesters and thermoset acrylics. Improves hot water soak.
AFCONA-3285	Polysiloxane polymer terminated with di-hydroxyl functional groups at both ends, enabling AFCONA-3285 to cross-link in polyurethane systems as well as in baking paints. Very high slip and levelling performance. 100% version of AFCONA-3085.
AFCONA-3835	Reactive polysiloxane with methacrylate functionality, crosslinks into UV/EB systems. For coatings with permanent slip, anti-blocking and anti-scratch performance.

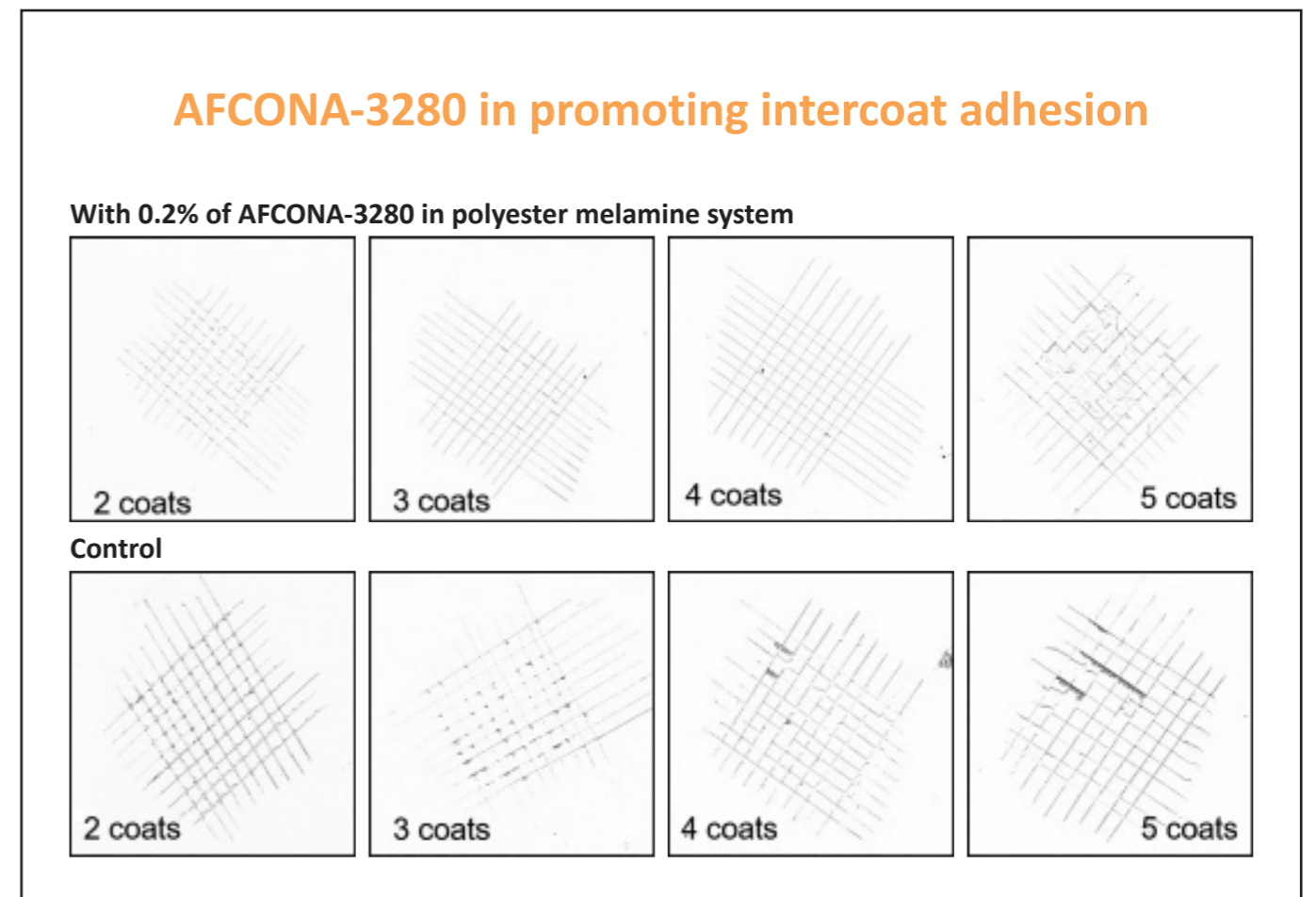
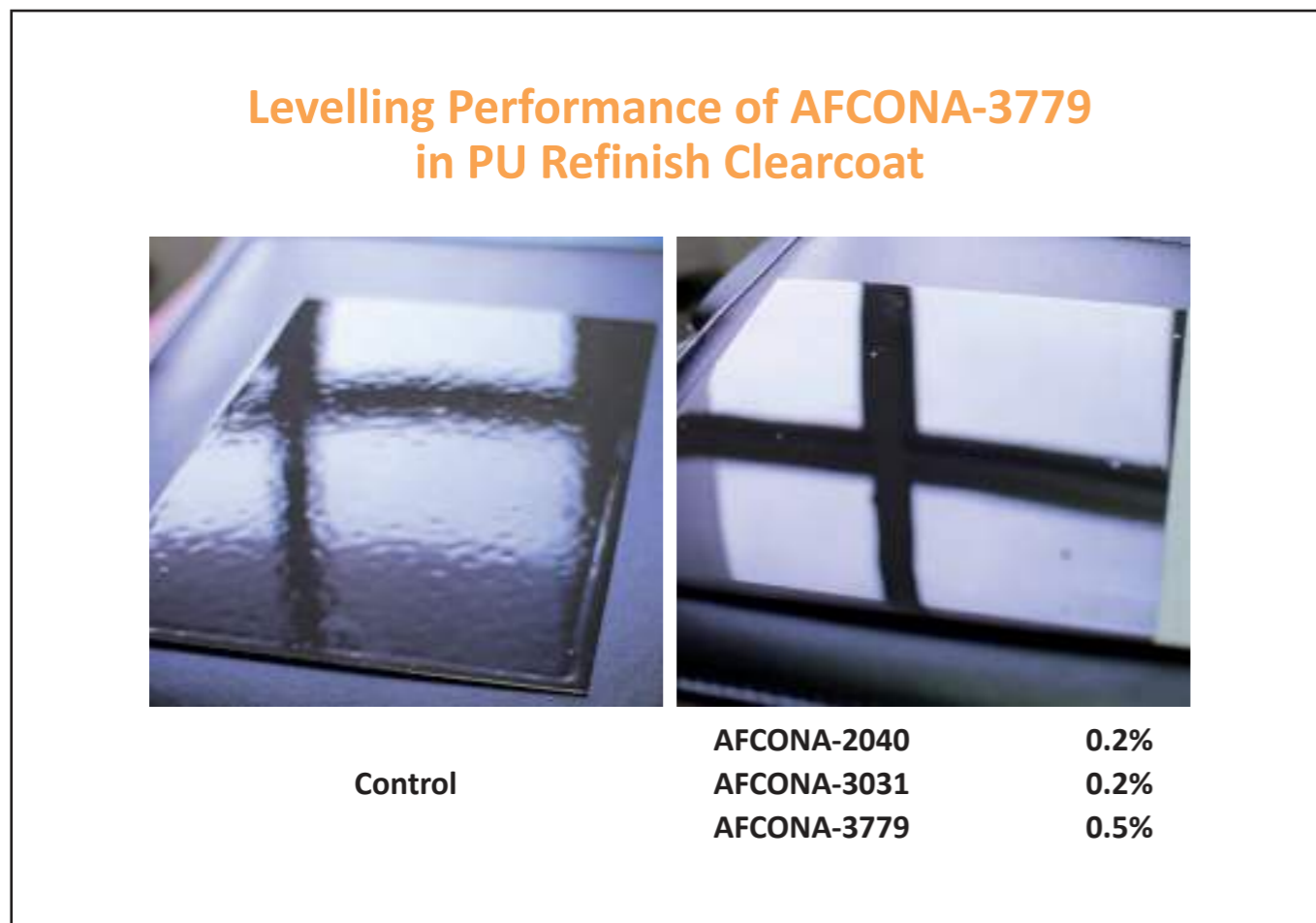
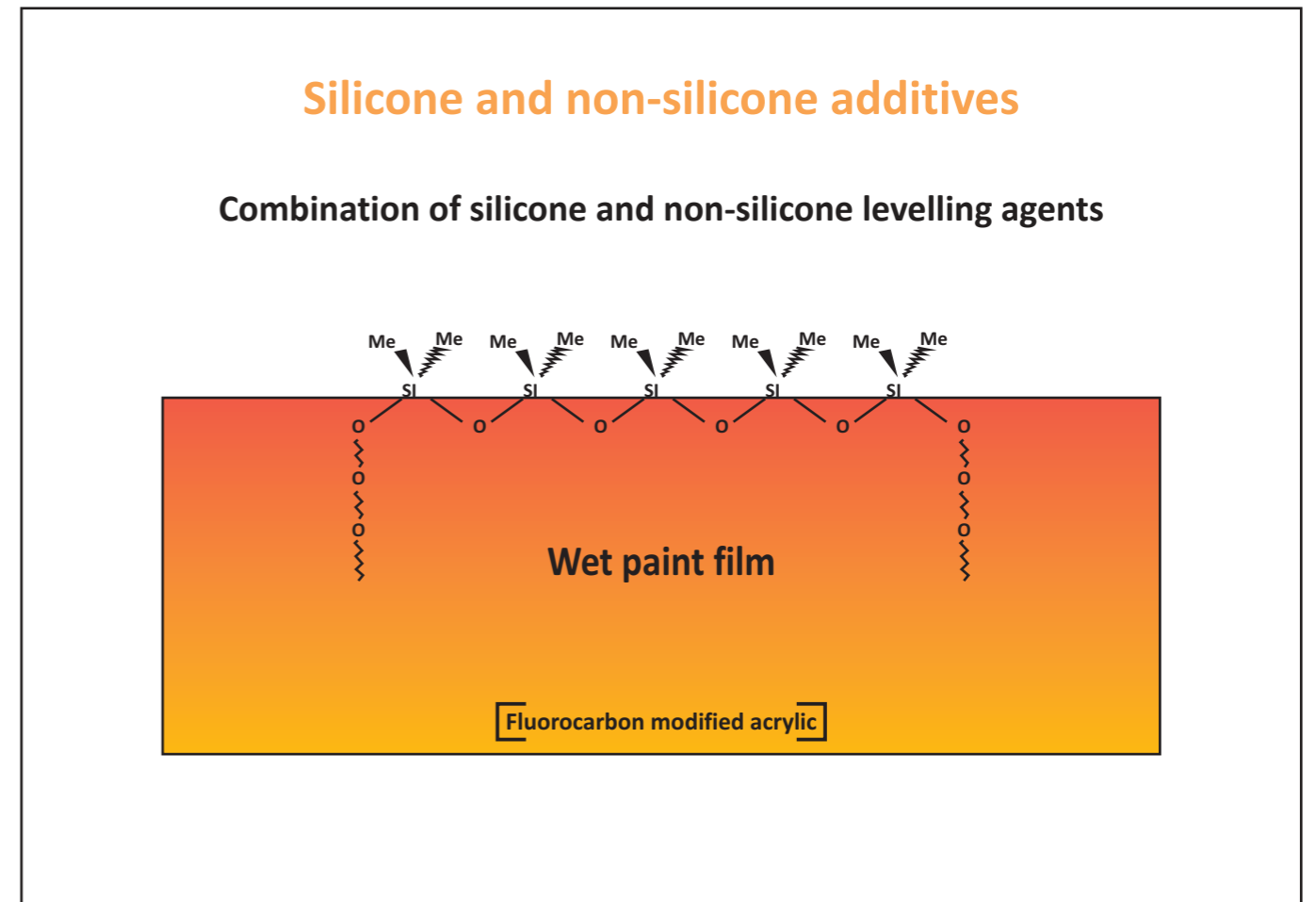
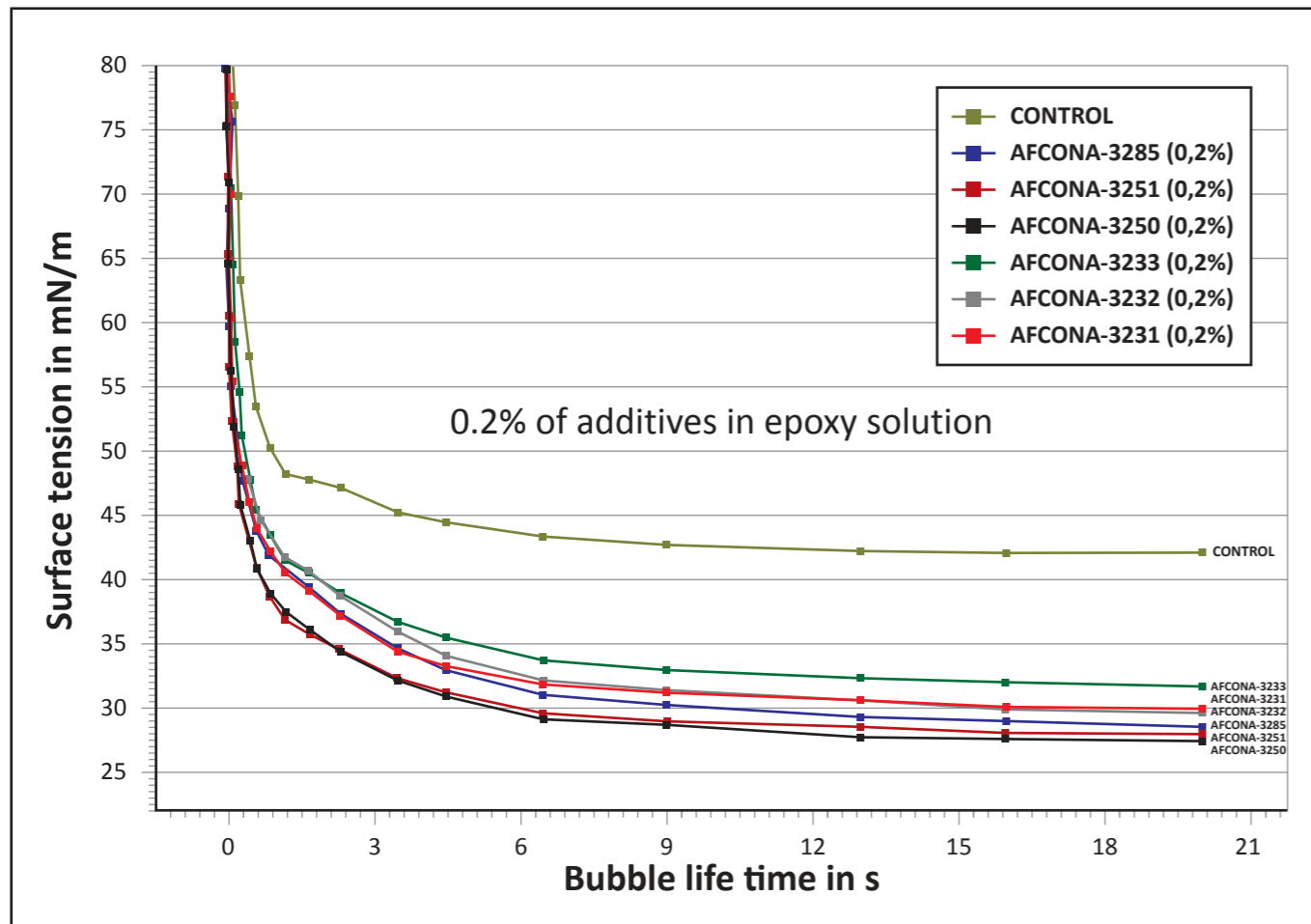
\* Suitable for solvent-based and water-based coatings.

General indicator on recommendation

- - Highly recommended
- - Recommended
- - Can be used

Chemical	Dosage (Based on total formulation)	Active Ingredient	Solvent	Flash Point	Solvent-based System											3000 Series Product Name		
					Air-drying Alkyd (medium and long oil)	Inds. Baking Paint (Al or Ac/Melamine)	Auto OEM (PE or Acrylic/Melamine)	Alkyd NC/Alkyd Amino(AC)	ZK PU (Alkyd/PE OH Functional)	ZK PU (Acrylic OH Functional Solventless)	Unsaturated Polyester	Epoxy - Solvent-based	Epoxy - Solventless	CAB Polyester/Polyacrylic	Thermoplastic Acrylic (TPA)		Coil and Can Coating	Chlorinated Rubber
Modified Polyether Polysiloxane	0.1~1.0%	50~54%	Isobutanol	27°C	●	●	●	●	●	●	●	●	●	●	●	●	●	AFCONA-3030*
Modified Polyether Polysiloxane	0.1~1.0%	50~54%	Alkylbenzene	40°C	●	●	●	●	●	●	●	●	●	●	●	●	●	AFCONA-3031/E
Modified Polyether Polysiloxane	0.1~1.0% (0.2~0.5%)	14~16%	Butyl Acetate	24°C	●	●	●	●	●	●	●	●	●	●	●	●	●	AFCONA-3033
Fluoro Modified Polysiloxane	0.05~0.5% (0.05~0.2%)	50~54%	Methoxy-propanol	32°C	●	●	●	●	●	●	●	●	●	●	●	●	●	AFCONA-3034*
Modified Polyether Polysiloxane	0.1~0.5%	50~54%	DPM	75°C	●	●	●	●	●	●	●	●	●	●	●	●	●	AFCONA-3035E*
Blend of high boiling point solvents with silicone	3~5%	100%	High boiling point solvents	42°C	●	●	●	●	●	●	●	●	●	●	●	●	●	AFCONA-3037/E
Modified Polyether Polysiloxane	0.1~1.0%	>93%	Ethylene glycol monobutyl ether	32°C	●	●	●	●	●	●	●	●	●	●	●	●	●	AFCONA-3085
Modified Polyether Polysiloxane	0.05~0.5%	>96%	-	>100°C	●	●	●	●	●	●	●	●	●	●	●	●	●	AFCONA-3230
Modified Polyether Polysiloxane	0.05~0.5%	>95%	-	>100°C	●	●	●	●	●	●	●	●	●	●	●	●	●	AFCONA-3231
Modified Polyether Polysiloxane	0.05~0.5%	>96%	-	>100°C	●	●	●	●	●	●	●	●	●	●	●	●	●	AFCONA-3232
Modified Polyalkyl Polysiloxane	0.05~0.5%	>96%	-	>100°C	●	●	●	●	●	●	●	●	●	●	●	●	●	AFCONA-3233
Modified Polyalkyl Polysiloxane	0.05~0.5%	>96%	-	>100°C	●	●	●	●	●	●	●	●	●	●	●	●	●	AFCONA-3236
Modified Polyalkyl Polysiloxane	0.05~0.5%	>92%	-	>100°C	●	●	●	●	●	●	●	●	●	●	●	●	●	AFCONA-3238
Modified Polyether Polysiloxane	0.05~0.5%	>96%	-	>100°C	●	●	●	●	●	●	●	●	●	●	●	●	●	AFCONA-3239
Modified Polyether Polysiloxane	0.05~0.5%	>92%	-	>100°C	●	●	●	●	●	●	●	●	●	●	●	●	●	AFCONA-3250
Modified Polyether Polysiloxane	0.05~0.5%	>95%	-	>100°C	●	●	●	●	●	●	●	●	●	●	●	●	●	AFCONA-3251
Special Modified Polysiloxane	0.05~0.5%	>96%	-	>100°C	●	●	●	●	●	●	●	●	●	●	●	●	●	AFCONA-3280
Modified Polyether Polysiloxane	0.1~1.0%	>96%	-	>100°C	●	●	●	●	●	●	●	●	●	●	●	●	●	AFCONA-3285
Methacrylate Modified Polysiloxane	0.1~1.0%	>95%	-	>100°C	●	●	●	●	●	●	●	●	●	●	●	●	●	AFCONA-3835















Recommended dosage of high molecular weight dispersant on several common pigments, fillers and matting agents.		
Pigment type	Based on solid to solid (%)	Based on surface area (m <sup>2</sup> /g)
Titanium Dioxide	2-3%	10% on oil absorption
Iron Oxide Pigments	3-4%	10% on oil absorption
Chrome Oxide Pigments	2-4%	10% on oil absorption
Fillers (Clay, CC powder, Kaolin, Barium Sulphate)	1-2%	10% on oil absorption
Matting agents	2 -3%	10% on oil absorption
Phthalocyanine pigments	15-25%	15-25% on BET value
Organic Red	15-25%	15-25% on BET value
Organic Yellow	15-25%	15-25% on BET value
Organic Violet	15-30%	15-25% on BET value
Regular Carbon Black	20%	20% on BET value
High Channel Carbon Black	30-50%	30-50% on BET value

BET (Brunauer, Emmett and Teller) value - Measurement of surface area of pigment by using N<sub>2</sub> absorption.

DBP (DiButyl Phthalate) value - Measurement of surface area of carbon black by using dibutyl phthalate.

## Polyurethane-based Dispersant

<p><b>AFCONA-4009</b></p> <p><b>AFCONA-4010</b></p> <p><b>AFCONA-4011</b></p> <p><b>AFCONA-4015</b></p> <p><b>AFCONA-4017</b></p> <p><b>AFCONA-4046</b></p> <p><b>AFCONA-4047</b></p> <p><b>AFCONA-4050</b></p> <p><b>AFCONA-4060</b></p> <p><b>AFCONA-4063</b></p>	<p><b>AFCONA-4067</b></p> <p><b>AFCONA-4071</b></p> <p><b>AFCONA-4080</b></p> <p><b>AFCONA-LE1069</b></p> <p><b>AFCONA-4200</b></p> <p><b>AFCONA-4201</b></p> <p><b>AFCONA-4530</b></p> <p><b>AFCONA-5585</b></p> <p><b>AFCONA-5586</b></p>
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- Only for co-grinding
- Best for inorganic pigments
- For all solvent-based systems
- For water-based systems
- With excellent anti-settling

## Dispersing concept

In order for a dispersing and wetting agent to function in particular systems, they must be complied to certain basic rules:

**Compatibility with resin systems**

Compatibility can split to wet compatibility and dry compatibility

## Polyacrylate-based Dispersant

<p><b>AFCONA-4400</b></p> <p><b>AFCONA-4401</b></p> <p><b>AFCONA-4474</b></p> <p><b>AFCONA-4531</b></p> <p><b>AFCONA-4550</b></p> <p><b>AFCONA-4560</b></p> <p><b>AFCONA-4565</b></p>	<p><b>AFCONA-4570</b></p> <p><b>AFCONA-4595</b></p> <p><b>AFCONA-4597</b></p> <p><b>AFCONA-4599</b></p> <p><b>AFCONA-4700</b></p> <p><b>AFCONA-4701</b></p> <p><b>AFCONA-4720</b></p>
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- For all solvent-based systems
- For water-based systems
- CRP technology dispersant



## Additives for solvent-based systems

### 5000 Series – Conventional wetting and dispersing agents

Product Name	Properties
AFCONA-5009/E*	Economical wetting and dispersing agent for pigment dispersions. Designed to replace old-fashioned products such as AFCONA-5044, AFCONA-5054 and AFCONA-5207. Stabilizes pigments through electrically charged repulsion forces. Very effective in bentonite gel preparation. 63% of the raw material origin from renewable sources.
AFCONA-5010*	Special dispersant for pure white paints. Very good viscosity reduction. Suitable for most of the solvent-based systems. Not suitable for air-drying alkyd systems.
AFCONA-5030*	Amine rich dispersing agent for carbon blacks and organic pigments. Particularly suited for artificial leather, PU, Alkyd, Polyamide and printing ink systems.
AFCONA-5044*	Universal dispersant for all solvent-based systems. Can be used to prepare bentonite gels. 29% of the raw material origin from renewable sources.
AFCONA-5054/E*	Higher polarity than AFCONA-5044. Used in low to medium polar systems. Can cause yellowing in NC. Mostly recommended for bentonite gel preparations. 28% of the raw material origin from renewable sources.
AFCONA-5065/E*	Effective co-grinding agent, containing polysiloxane. Can be used as a post-additive to correct floating and flooding problems. Can give foam-stabilizing effect due to the silicone modification. 34% of the raw material origin from renewable sources.
AFCONA-5066/E*	Silicone-free version of AFCONA-5065/E. No foam-stabilizing effect. Stronger in anti-settling properties. 37% of the raw material origin from renewable sources.
AFCONA-5071**	Very good anti-settling effect. Recommended for water and solvent-based systems. Extremely suitable for wash primers. 21% of the raw material origin from renewable sources.
AFCONA-5207*	Specially designed for all kind of pigments in air-drying alkyds. 80% of the raw material origin from renewable sources.
AFCONA-5209*	Economical solvent-free dispersing agent for pigment dispersions. Designed to replace old-fashioned products such as AFCONA-5044, AFCONA-5054 and AFCONA-5207. Stabilizes the pigments through electrically charged repulsion forces. Very effective in bentonite gel preparation. 90% of the raw material origin from renewable sources.
AFCONA-5210**	100% active version of AFCONA-5010.
AFCONA-5244*	100% active version of AFCONA-5044. 57% of the raw material origin from renewable sources.
AFCONA-5251*	Mainly developed for dispersing and stabilizing transparent iron oxide pigments. May also be used as a dispersant for other inorganic pigments and extenders, where it reduces the viscosity in the dispersion. Very useful in high filled systems.
AFCONA-5280**	Improved version of AFCONA-5207. Also for other resins systems. Dispersant with performance in between High-Molecular-Weight Dispersants and conventional dispersing agents. Therefore suitable to replace High-Molecular-Weight Dispersants for economical reasons.
AFCONA-5285**	Good viscosity-depressing wetting agent for primers and highly loaded extender systems.
AFCONA-5290E**	Suitable for all solvent-based systems ranging from low polar to high polar, including air dry alkyd. Very high pigment stability, good viscosity reduction and high colour strength. Supplied in 100% active ingredients. Excellent dispersant for Polyurethane, epoxy and UV coating. 10% of the raw material origin from renewable sources.

\* These products will become slightly hazy at temperatures below 5°C. This will not influence the quality.  
 \*\* Suitable for Water- and Solvent-based coatings.

#### General indicator on recommendation

- - Highly recommended
- - Recommended
- - Can be used

Chemical	Active Ingredient	Solvent-based System										5000 Series Product Name															
		Dosage (Based on solid pigment weight)																									
		TiO2 (Other Inorganic Pigment)	Organic Pigment	Carbon Black	Acid value mgKOH/g	Amine value mgKOH/g	Solvent	Flash Point	Air-drying Alkyd (medium and long oil)	Inds. Baking Paint (Al or Ac/Melamine)	Auto OEM (PE or Acrylic/Melamine)		Alkyd NC/Alkyd Amino(AC)	2K PU (Acrylic OH Functional Solventless)	2K PU (Alkyd/PE OH Functional)	2K PU (Acrylic Polyol OH Functional)	Unsaturated Polyester	Epoxy - Solvent-based	Epoxy - Solventless	CAB Polyester/Polyacrylic	Thermoplastic Acrylic (TPA)	Coil and Can Coating	Chlorinated Rubber	UV Curing System	Universal Pigment Concentrate		
Fatty Acid Modified Polyamide	68~72%	0.2~2.0%	2.0~5.0%		130~150	<5	Xylene	30°C	•			•	•														AFCONA-5009*/E
Solution of an acidic polyester phosphorus	50~54%	1.0~4.0% (5~10%)			65~85		Xylene/Sec. Butanol	25°C		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	AFCONA-5010*
Polymer of carboxylic acid and polyamide	50~54%	0.5~5.0%	20~50%	25~40%		185~215	Alkyl-benzene /MPA	45°C	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	AFCONA-5030*	
Unsaturated polyamide and acid ester salts	50~54%	0.2~2.0%	2.0~5.0%		25~45	5~15	Xylene/n-Butanol /MPG	25°C	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	AFCONA-5044*	
HMW carboxylic acid salts	50~54%	0.2~2.0%			50~60	45~60	Alkyl-benzene	42°C	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	AFCONA-5054/E*	
HMW unsaturated carboxylic acid with polysiloxane	50~54%	0.5~2.5%			80~150		Alkyl-benzene /DIBK	40°C	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	AFCONA-5065/E*	
HMW unsaturated carboxylic acid	50~54%	0.5~2.5%			120~180		Alkyl-benzene /DIBK	40°C	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	AFCONA-5066/E*	
Alkylol ammonium salt of a HMW carboxylic acid	50~54%	0.5~2.0%			90~110	95~130	Water	>100°C	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	AFCONA-5071**	
OH-functional unsaturated modified carboxylic acid	>96%	0.5~1.5% (3~5%)	10~20%			50~70			•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	AFCONA-5207*	
Fatty Acid Modified Polyamide	>96%	0.2~2.0%	2.0~5.0%		180~220	<5			•			•	•													AFCONA-5209*	
Acidic polyester phosphorus	>96%	1~4% (3~10%)			120~140			>100°C		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	AFCONA-5210**
Unsaturated polyamide and acid ester salts	>96%	0.1~1.0%	1.0~2.0%		50~70	10~30			•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	AFCONA-5244*	
HMW carboxylic acid polymer	>98%	2~4% (10~20% trans. Fe <sub>2</sub> O <sub>3</sub> )			105~115				•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	AFCONA-5251*	
Cationic/anionic co-polymer with pigment affinity groups	>96%	0.5~1.5% (3~5%)	10~30%		25~40	20~35			•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	AFCONA-5280**	
Anionic co-polymer with acidic groups	>95%	0.5~1.5% (3~5%)	10~30%		100~105				•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	AFCONA-5285**	
Polymer with pigment affinity groups	>96%	2~3% (2~4%)	20~40%	20~60%	5~15	4~12			•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	AFCONA-5290E**	



## Additives for solvent-based systems

### 6000 Series – Miscellaneous products

Product Name	Properties
AFCONA-6220*	Fatty acid modified emulsifier. Recommended to improve colour acceptance of colourants in base paints. The use in coloured NC can improve gloss. 50% of the raw material origin from renewable sources.
AFCONA-6225*	Better pigment stability than AFCONA-6220. Suitable as colour acceptance additive, as well as effective dispersant for all kind of pigments for water-based and solvent-based systems. Can be used to formulate water-based resin-free pigment concentrates for universal colourants.
AFCONA-6226*	Improved version of AFCONA-6225. Exhibits more hydrophilic behaviour than AFCONA-6225. Therefore giving better colour strength, viscosity reduction, pigment stability and colour acceptance in water-based and solvent-based paints.
AFCONA-6230*	Suitable for most water- and solvent-based systems. Effective viscosity reduction agent for all highly filled systems with inorganic pigments and extenders.
AFCONA-LE1048	Anti-gelling agent for air-drying alkyd and baking paints. In air-drying alkyd paints, the oxime forms a protective layer on top of the paint to reduce the oxidation caused by oxygen. In Stoving paints, it helps to block the reactive group of the melamine and will be released for further curing of the paint film when the temperature reaches 80-100 °C.
AFCONA-LE1082	Xylene-free version of AFCONA-LE1048.
AFCONA-6745	Synergist agent for phthalocyanine pigments, carbon blacks and violet pigments. Must be used in combination with AFCONA-4000 series dispersant. Improves gloss, viscosity depression and pigment stability.
AFCONA-6755*	Water-based version of AFCONA-6745. In systems that contain high amounts of alcohol or ketone solvent, AFCONA-6755 is the better choice.
AFCONA-6788	Compatible polymer for pigment concentrates. Provides pigment concentrates with an easier incorporation into the base paints. May even occur with hand stirring. Combination with AFCONA-4071 results in pigment paste with an easy incorporation without seeding.

\* Suitable for Water- and Solvent-based coatings.

#### Auto Refinish Pigment paste formulations

Raw materials	PB 15:3		PR 122		PG 7		PR 101		Monarch 1400		PR 179	
Laropal A81 60%	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00
AFCONA-4701	-	6.00	-	4.90	-	6.00	-	9.00	-	5.75	-	7.20
PU dispersant (45% solid)	6.67	-	5.44	-	6.67	-	10.00	-	6.39	-	8.00	-
Xylene	20.47	20.80	22.38	22.65	20.47	20.80	17.30	17.80	23.93	24.25	20.00	20.40
Butyl acetate	20.46	20.80	22.38	22.65	20.46	20.80	17.20	17.70	23.93	24.25	20.00	20.40
Pigments	12.00	12.00	9.80	9.80	12.00	12.00	15.00	15.00	5.75	5.75	12.00	12.00
AFCONA-6745	0.40	0.40	-	-	0.40	0.40	-	-	-	-	-	-
Cab-O-Sil M5	-	-	-	-	-	-	0.50	0.50	-	-	-	-
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
% of dispersants on pigment	25	25	25	25	25	25	30	30	50	50	30	30

#### General indicator on recommendation

- - Highly recommended
- - Recommended
- ◻ - Can be used

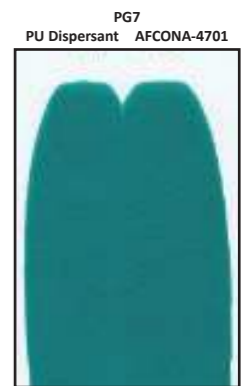
Chemical	Active Ingredient	Dosage (Based on solid pigment weight)										Solvent-based System										6000 Series Product Name					
		TiO2 (Other Inorganic Pigment)	Organic Pigment	Carbon Black	Acid value mgKOH/g	Amine value mgKOH/g	Solvent	Flash Point	Air-drying Alkyd (medium and long oil)	Inds. Baking Paint (Al or Ac/Melamine)	Auto OEM (PE or Acrylic/Melamine)	Alkyd NC/Alkyd Amino(Ac)	2K PU (Acrylic OH Functional Solventless)	2K PU (Alkyd/PE OH Functional)	2K PU (Acrylic Polyol OH Functional)	Unsaturated Polyester	Epoxy - Solvent-based	Epoxy - Solventless	CAB Polyester/Polyacrylic	Thermoplastic Acrylic (TPA)	Coil and Can Coating		Chlorinated Rubber	UV Curing System	Universal Pigment Concentrate		
Fatty Acid Modified Polyester	>96%	5~10%	10~20%		10~30	15~35																					AFCONA-6220*
Fatty Acid Modified Polyester	>96%	5~10%	10~20%		44~48	30~42																					AFCONA-6225*
Fatty Acid Modified Polyester	>96%	5~10%	10~20%		25~35	18~28																					AFCONA-6226*
Aliphatic polyether with acidic groups	>95%	1~3%	5~7%		100~105																						AFCONA-6230*
Based on oxime and phosphorus ester salt									IBA/Xylene/water	24°C																	AFCONA-LE1048
Based on ketoxime and phosphorus ester salt									IBA/BAC/water	24°C																	AFCONA-LE1082
Synergist agent	>98%		3~5%	5~%																							AFCONA-6745
Synergist agent	>98%		3~5%	5~%																							AFCONA-6755*
Modified Polyacrylic Polymer	>96%																										AFCONA-6788

#### Metallic Basecoat

Raw materials	
Acrylic Resin (50%)	25.00
Touch OTAL 2006	15.00
Aluminium Paste	7.00
Xylene	10.00
Butyl acetate	9.00
PMA	5.00
CAB 381-0.5% (20% in BA)	29.00
Total	100.00

Mixing ratio between metallic base paint and pigment paste:

Metallic Base Paint	4
Pigment Paste	1

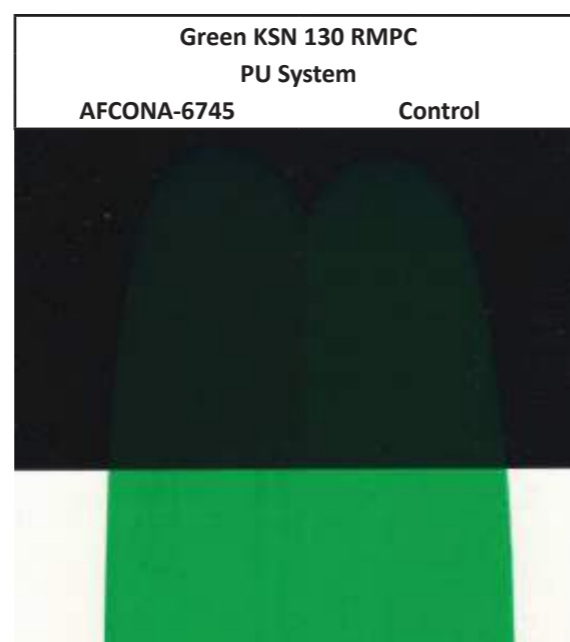
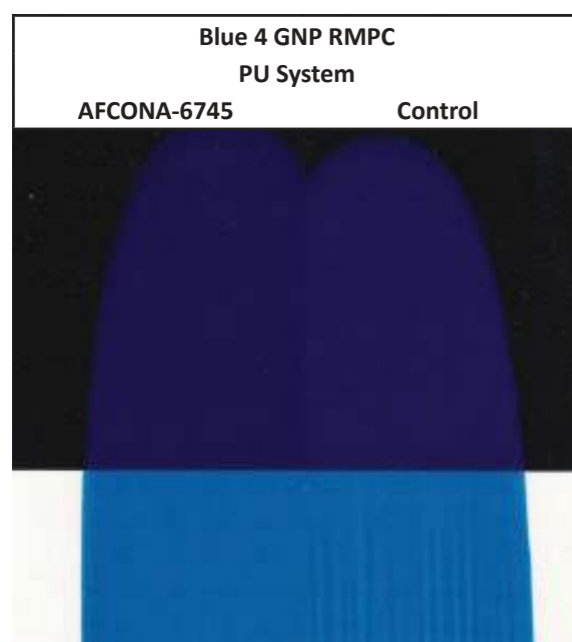




## Performance test of synergist agent AFCONA-6745 in black, violet, blue and green pigment

### Test Formulations

Raw material	Black FW 200		Violet RL 23		Blue 4 GNP		Green KSN 130	
	Control	AFCONA-6745	Control	AFCONA-6745	Control	AFCONA-6745	Control	AFCONA-6745
AFCONA-1102	30	30	30	30	30	30	30	30
PMA	25	24.75	26.6	26.35	22.5	22.25	19.4	19.15
Xylene	25	24.75	26.6	26.35	22.5	22.25	19.4	19.15
AFCONA-4071	8	8	6.8	6.8	9	9	11.2	11.2
Pigment	12	12	10	10	16	16	20	20
AFCONA-6745	-	0.5	-	0,5	-	0.5	-	0.5
Total	100	100	100	100	100	100	100	100

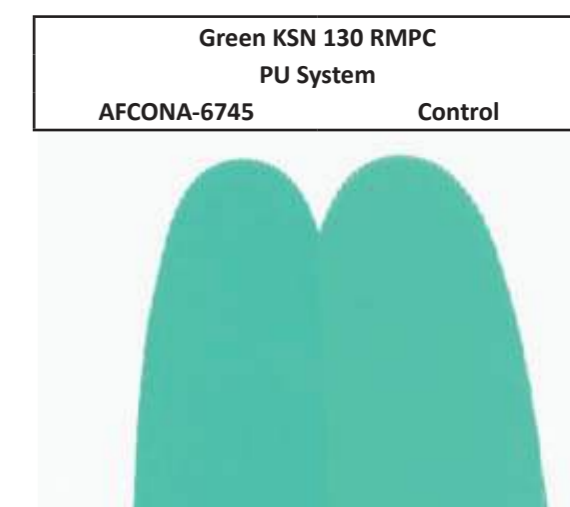
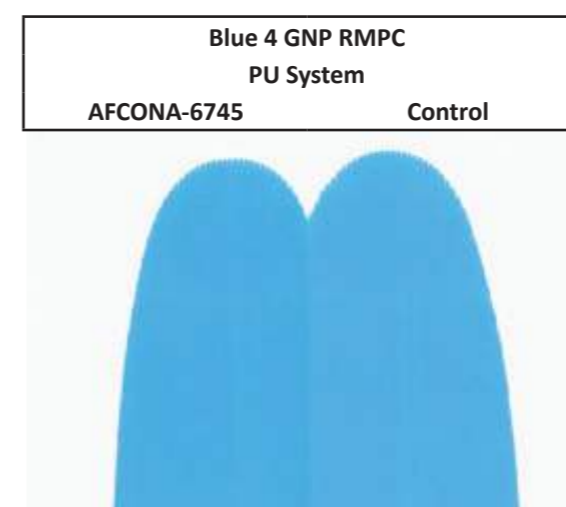
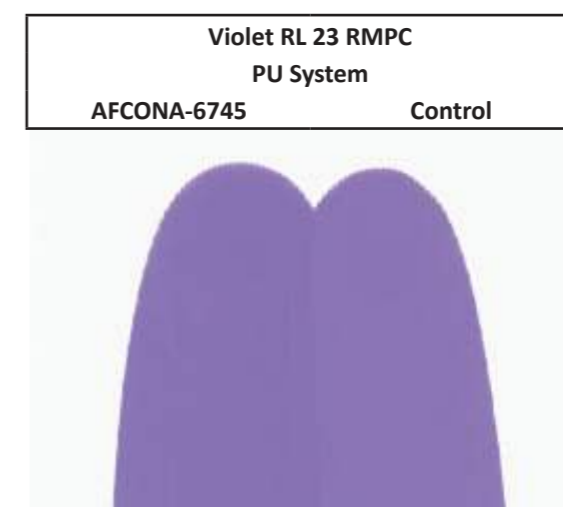


## Physical test of pigment concentrate

Raw material	Black FW 200		Violet RL 23		Blue 4 GNP		Green KSN 130	
	Control	AFCONA-6745	Control	AFCONA-6745	Control	AFCONA-6745	Control	AFCONA-6745
Fineness	30	30	30	30	30	30	30	30
Viscosity / CPS (Spin=34; 0.3 rpm)	25	24.75	26.6	26.35	22.5	22.25	19.4	19.15

## Properties test of pigment concentrate in PU system

Properties test		Full shade	Tint Strength	Pour out	
				Degree of flocculation	Transparency
Black FW 200	Control	4	4	5	5
	AFCONA-6745	5	5	5	5
Violet RL 23	Control	5-	4	5	5
	AFCONA-6745	5	5	5	5-
Blue 4GNP	Control	4	4	5	5
	AFCONA-6745	5	5	5	4
Green KSN 130	Control	4	4	5	5
	AFCONA-6745	5	5	5	4



## Suggesting formulation based on AFCONA-4071 and Laropal A81

### Pigment paste for high quality paint

Dispersant: AFCONA-4071  
Resin: Laropal A81

Items	FW-200	MA100 (or special black 100)	Blue PB 15:3	Green PG 7	Red 254 PR254	Violet RL special PV23	Bayferrox 110	Bayferrox 3920
Laropal A81 (60% in PMA)	30.00	30.00	25.00	25.00	25.00	30.00	10.00	10.00
AFCONA-4071	12.00	12.00	9.00	9.00	12.00	7.00	4.50	4.00
AFCONA-6745	0.00	0.00	1.00	1.00	0.00	2.00	0.00	0.00
Pigment	10.00	20.00	20.00	20.00	20.00	10.00	65.00	55.00
Blanc Fix Micro	0.00	0.00	0.00	0.00	0.00	1.00	5.00	5.00
Touch Anset 3300	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00
Solvesso 100	24.00	19.00	23.00	23.00	22.00	25.00	7.50	12.50
PMA	24.00	19.00	22.00	22.00	21.00	25.00	7.00	12.50
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
% Dispersant	54.00	27.00	20.25	20.25	27.00	31.50	3.12	3.27

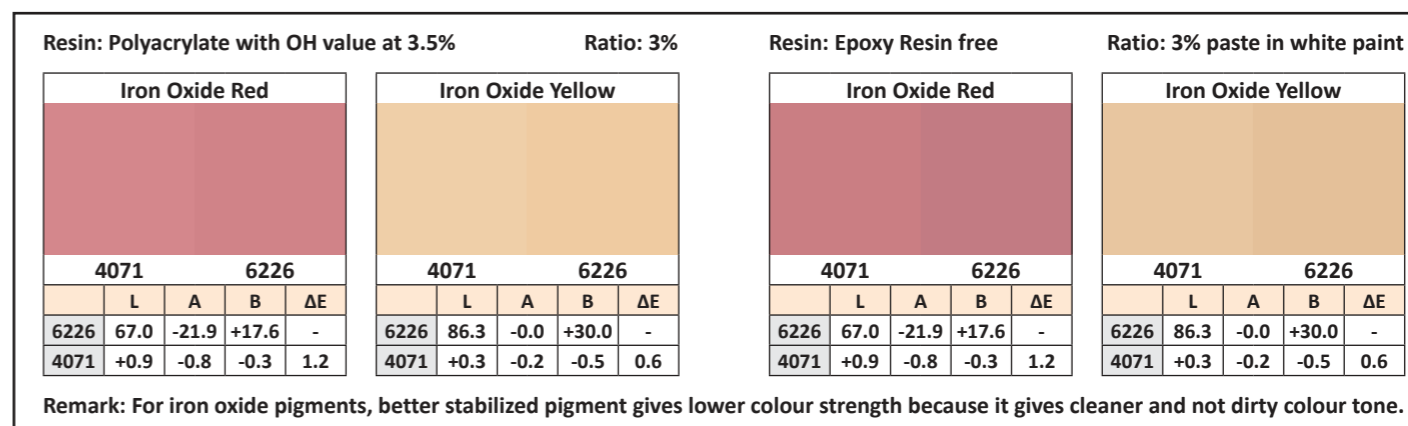
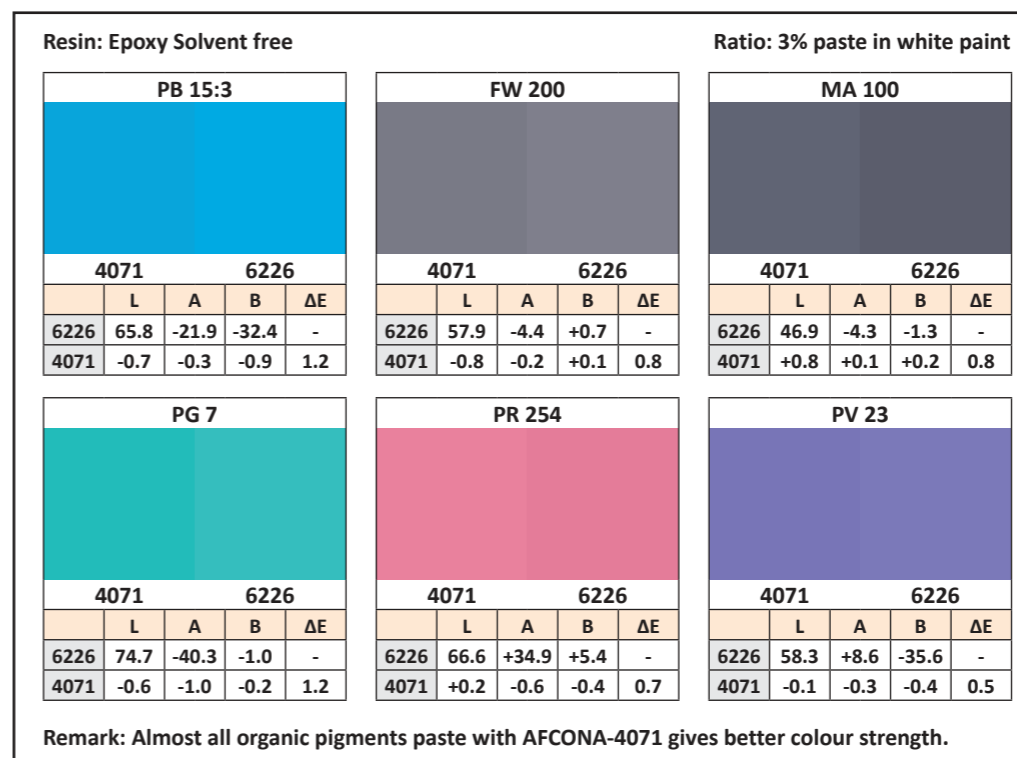
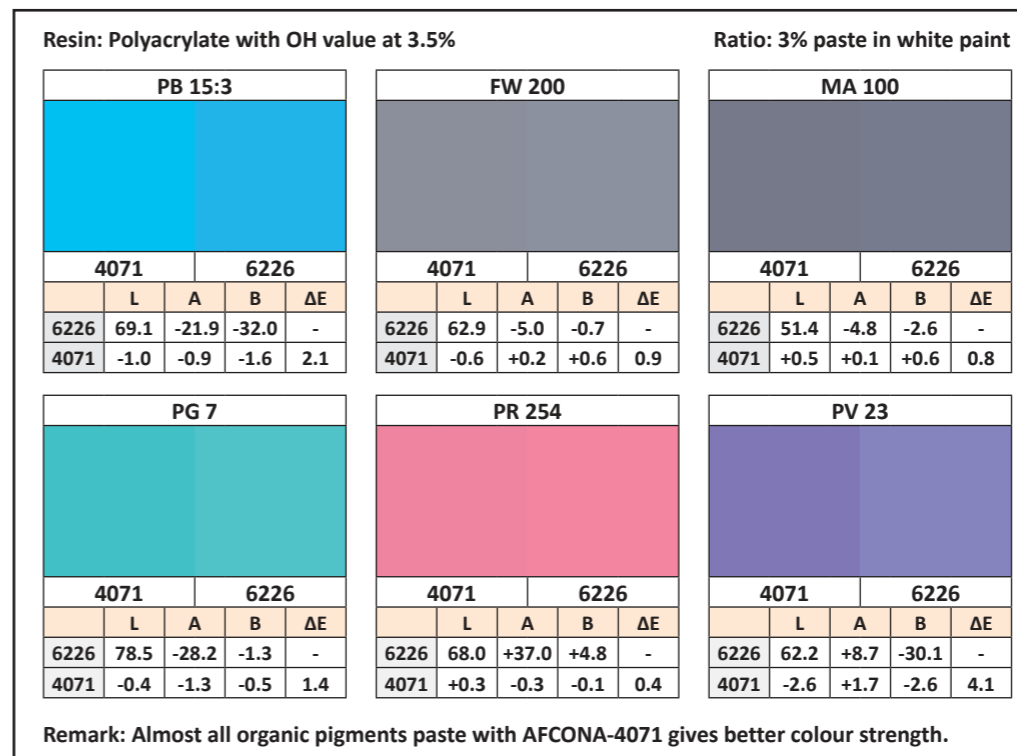
## Suggesting formulation based on AFCONA-6226 and Laropal A81

### Pigment paste for economy reason

Dispersant: AFCONA-6226  
Resin: Laropal A81

Items	FW-200	MA100 (or special black 100)	Blue PB 15:3	Green PG 7	Red 254 PR254	Violet RL special PV23	Bayferrox 110	Bayferrox 3920
Laropal A81 (60% in PMA)	30.00	30.00	25.00	25.00	25.00	30.00	10.00	10.00
AFCONA-6226	5.00	6.00	5.00	5.00	5.00	3.00	2.50	2.00
AFCONA-6745	0.00	0.00	1.00	1.00	0.00	2.00	0.00	0.00
Pigment	10.00	20.00	20.00	20.00	20.00	10.00	65.00	55.00
Blanc Fixe Micro	0.00	0.00	0.00	0.00	0.00	1.00	5.00	5.00
Touch Anset 3300	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00
Solvesso 100	28.00	22.00	25.00	25.00	21.00	27.00	8.50	13.50
PMA	27.00	22.00	24.00	24.00	25.00	27.00	8.00	13.50
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
% Dispersant	50.00	30.00	25.00	25.00	25.00	30.00	3.85	3.64

## Tinting Comparison









## Additives for water-based systems

### 3000 Series – Organically modified polysiloxane-based slip and levelling agents

Product Name	Properties
AFCONA-3035E*	Normally used in solvent-based systems, but also effective as a levelling and anti-crater agent in water-based applications.
AFCONA-3522	Emulsion of non-polar polysiloxane in water. Gives water resistance and slip performance. No foam-stabilizing effect. High dosages provide water-repellent effect. Biocide free.
AFCONA-3571	Modified anionic polydimethyl siloxane emulsion. Enhances surface properties like: slip, soft feel and anti tackiness in water-based applications.
AFCONA-3580	Short-chain polysiloxane with no influence on intercoat adhesion in multi-coat systems. Very strong anti-crater performance. Must be used in combination with a suitable defoamer. Recommended for electro deposition coatings and all other water-based systems.
AFCONA-3581E	50% solution of AFCONA-3580 in DPM.
AFCONA-3585	Very strong surface tension reduction and good compatibility properties. Very fast substrate wetting and anti-crater effect in all water-based systems.
AFCONA-3587	Levelling agent for aqueous coating systems with excellent substrate wetting and anti-crater properties. No influence on intercoat adhesion. Free of cyclosiloxanes (D4, D5 and D6).
AFCONA-3588	Levelling agent for aqueous coatings systems with excellent substrate wetting and anti-crater properties. No influence on intercoat adhesion.
AFCONA-3593	Special designed polyether modified polysiloxane. Can quickly reduce surface tension to improve substrate wetting and has excellent anti-crater properties.

### 3000 Series – Non-silicone-based levelling agents

AFCONA-3500	Fluorocarbon-modified polyacrylic for water-based systems. Stronger in levelling and anti-crater performance than AFCONA-3570. Only recommended for systems with a pH higher than 8.
AFCONA-3570	Fluorocarbon-modified polyacrylic for water-based systems. Very good in levelling and anti-crater performance. Only recommended for systems with a pH higher than 8.
AFCONA-3772*	Fluorocarbon-modified polyacrylic. Becomes water-soluble after neutralization with a suitable amine. Without neutralization, very suitable in solvent-based high-gloss clear coatings.

\* Suitable for Water- and Solvent-based coatings.

### Crater test



0.5% AFCONA-3570

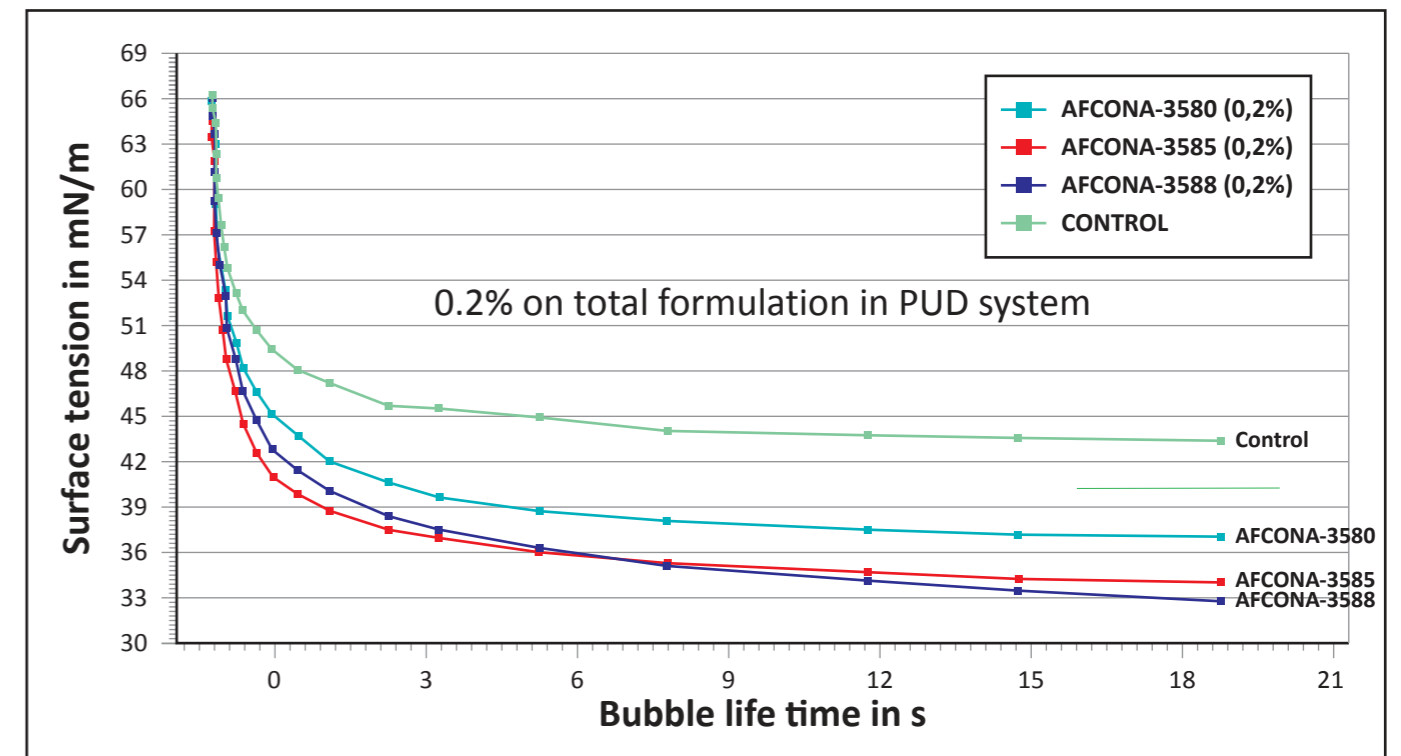
Zero test

General indicator on recommendation

- - Highly recommended
- - Recommended
- - Can be used

Chemical	Active Ingredient	Dosage (Based on total formulation)	Solvent	Flash Point	Water-based System										3000 Series Product Name		
					Alkyd Emulsion	Alkyd Water-reducible Emulsion Acrylic Copolymer	Polyurethane 2 Component	Epoxy 2 Component	Polyurethane Dispersion (PUD)	Polyester/Melamine	UV Curing System	Printing Inks Systems	Pigment paste water-based	Pigment paste water and solvent-based			
Organically modified polyether polysiloxane	50~54%	0.1~ 0.5%	DPM	75°C													AFCONA-3035E*
Modified polysiloxane emulsion (APE free)	34~36%	0.1~ 1.0%	Water	>100°C													AFCONA-3522
Modified anionic polydimethylsiloxane emulsion	58~62%	0.1~ 1.0%	Water	>100°C													AFCONA-3571
Organically modified polysiloxane for aqueous systems	>95%	0.1~ 1.0%	-	-													AFCONA-3580
Organically modified polysiloxane for aqueous systems	50~54%	0.1~ 1.0%	DPM	75°C													AFCONA-3581E
Organically modified polysiloxane for aqueous systems	>96%	0.1~ 1.0%	-	-													AFCONA-3585
Organically modified polysiloxane for aqueous systems	>95%	0.1~ 1.0%	-	-													AFCONA-3587
Organically modified polysiloxane for aqueous systems	>96%	0.1~ 1.0%	-	>100°C													AFCONA-3588
Organically modified polysiloxane for aqueous systems	>96%	0.1~ 1.0%	-	-													AFCONA-3593

Fluorocarbon modified polyacrylate	30~32%	0.5~ 1.5%	Water	-													AFCONA-3500
Fluorocarbon modified polyacrylate	59~61%	0.5~ 1.5%	Water	>110°C													AFCONA-3570
Fluorocarbon modified polyacrylate	59~61%	0.3~2.0%	Sec. Butanol	24°C													AFCONA-3772*





**Additives for water-based systems**

**4000 Series – High-Molecular-Weight Dispersing agents - Polyacrylic and polyurethane**

Product Name	Properties
AFCONA-4530*/**	Polymeric dispersant for stabilizing inorganic and organic pigments in water-based systems. Through effective steric hindrance and electrostatic repulsion an excellent stability performance in all type of pigments.
AFCONA-4531 °/*/**	Polymeric dispersant for stabilizing inorganic and organic pigments in water and solvent-based systems. In water-based systems, it should be pre-neutralized to become completely soluble in water. Not suitable for preparation of resin-free pigment concentrates.
AFCONA-4550*/**	Water-based pH-independent dispersant for all kind of pigments in industrial coatings. Can be used as effective dispersant to formulate resin-free pigment concentrates.
AFCONA-4560*/**	Water-based pH-independent dispersant for all kind of pigments in decorative and industrial coatings. Can be used as effective dispersant to formulate resin-free pigment concentrates.
AFCONA-4565*/**	pH-independent with a wide compatibility in most commonly used water-based decorative and industrial coatings. Completely water soluble, does not have to be neutralized. However neutralization will improve the viscosity reduction.
AFCONA-4570 °/*/**	Water-based pH-independent dispersant for all kind of pigments. Better in viscosity depressing and pigment stability than AFCONA-4550. Can be used as effective dispersant to formulate resin-free pigment concentrates. Furthermore, an effective additive to improve colour acceptance.
AFCONA-4590*/**	Dispersing agent for all water-based coating systems. Both decorative as well as industrial, in combination with or without a grinding resin. Can also be used in water-based resin-free pigment concentrates. These RFPC can have a universal character and can be used in both water-based and solvent-based coatings.
AFCONA-4595***	Improved version of AFCONA-4560. Better viscosity-depression on pigment dispersions, especially for Carbon blacks and transparent iron oxides. Also more effective for the production of water-based pigment concentrates.
AFCONA-4597*/**	Improved water-resistance version of AFCONA-4595. For water-based applications which need high water-resistance. Universal in use for all kind of pigments.
AFCONA-4599*/**	Special designed modified polyacrylic polymer with low influence to the water resistance of the final coating. Very good in viscosity depressing of inorganic pigment concentrates.
AFCONA-4720°/*	Solvent-free innovative dispersant based on Controlled Radical Polymerisation (CRP). Suitable to disperse and stabilize all kind of pigments, including difficult organic pigments and HCC Carbon blacks. Very compatible in most water- and solvent-based resin systems.

° Suitable for Water- and Solvent-based coatings  
 \* These products will become slightly hazy at temperatures below 5°C. This will not influence the quality.  
 \*\* Keep in a cool and dry place  
 \*\*\* Below 0 °C separation or turbidity could occur. Warm up to 20 °C and mix well.  
 "" Dosage for transparent Iron Oxide pigments.

General indicator on recommendation

- - Highly recommended
- - Recommended
- - Can be used

Chemical	Active Ingredient	Dosage				Acid value mgKOH/g	Amine value mgKOH/g	Solvent	Flash Point	Water-based System										4000 Series Product Name	
		TiO2 (Other Inorganic Pigment)	Organic pigment	Carbon Black	Alkyd Emulsion					Alkyd Water-reducible Emulsion	Acrylic Copolymer	Polyurethane 2 Component	Polyurethane Dispersion (PUD)	Epoxy 2 Component	Polyester/Melamine	UV Curing System	Printing Inks Systems	Pigment paste water-based	Pigment paste water- and solvent-based		
Modified Polyurethane Polymer	38~42%	2~3% (2~4%)	20~40%	20~60%	-	12~20	Water	>100°C	●	●	●	●	●	●	●	●	●	●	●	●	AFCONA-4530*/**
Modified Polyacrylic Polymer	48~52%	2~3% (2~4%)	20~40%	20~60%	30~40	20~30	Methoxy propanol	32°C	●	●	●	●	●	●	●	●	●	●	●	●	AFCONA-4531 °/*/**
Modified Polyacrylic Polymer	48~52%	2~3% (2~4%)	20~40%	20~60%	-	20~35	Water	>100°C	●	●	●	●	●	●	●	●	●	●	●	●	AFCONA-4550
Modified Polyacrylic Polymer	38~42%	2~3% (2~4%)	20~40%	20~60%	-	25~35	Water	>100°C	●	●	●	●	●	●	●	●	●	●	●	●	AFCONA-4560
Modified Polyacrylic Polymer	38~42%	2~3% (2~4%)	20~40%	20~60%	-	25~35	Water	>100°C	●	●	●	●	●	●	●	●	●	●	●	●	AFCONA-4565
Modified Polyacrylic Polymer	58~60%	2~3% (2~4%)	20~40%	20~60%	-	40~50	TPM	116°C	●	●	●	●	●	●	●	●	●	●	●	●	AFCONA-4570 °/*/**
Modified Polyacrylic Polymer	40~43%	2~3% (2~4%)	20~40%	20~60%	-	35~45	Water/TPM	116°C	●	●	●	●	●	●	●	●	●	●	●	●	AFCONA-4590*/**
Special Designed Block Copolymer	38~43%	4~5% (8~12%) "10~15%	12~30%	50~60%	7~15	-	Water	>100°C	●	●	●	●	●	●	●	●	●	●	●	●	AFCONA-4595***
Special Designed Block Copolymer	38~42%	4~5% (8~12%)	12~30%	50~60%	6~13	10~16	Water	>100°C	●	●	●	●	●	●	●	●	●	●	●	●	AFCONA-4597*/**
Modified Polyacrylic Polymer	39~43%	2~5% (5~10%)	20~60%	40~80%	4~10	8~14	Water	>100°C	●	●	●	●	●	●	●	●	●	●	●	●	AFCONA-4599*/**
CRP Polyacrylate Polymer	≥96%	2~3% (2~4%)	20~40%	20~60%	14~22	24~30	-	>100°C	●	●	●	●	●	●	●	●	●	●	●	●	AFCONA-4720°/*

Recommended dosage of High-Molecular-Weight Dispersant on several common pigments, fillers and matting agents		
Pigment type	Based on oil to solid (%)	Based on surface area (m <sup>2</sup> /g)
Titanium Dioxide	2 - 3%	10% on oil absorption
Iron Oxide pigments	3 - 4%	10% on oil absorption
Chrome Oxide pigments	2 - 4%	10% on oil absorption
Fillers (Clay, CC powder, Kaolin, Barium Sulphate)	1 - 2%	10% on oil absorption
Matting agents	2 - 3%	10% on oil absorption
Phthalocyanine pigments	15 - 25%	15 - 25% on BET value
Organic Red	15 - 25%	15 - 25% on BET value
Organic Yellow	15 - 25%	15 - 25% on BET value
Organic Violet	15 - 30%	15 - 30% on BET value
Regular Carbon Black	20%	20% on BET value
High Channel Carbon Black	30 - 50%	30 - 50% on BET value
<i>BET (Brunauer, Emmet and Teller) value - Measurement of surface area pigment by using N2 absorption</i>		
<i>DBP (DiButyl Phthalate) value - Measurement of surface area of carbon black by using DiButyl Phthalate</i>		

## Performance test of AFCONA-4595 against competitor's product AFCONA-4595 (40%) / Competitor (40%)

### Test formulation in Resin Free Pigment Concentrate

Raw material	Yellow Oxide P4920	Chrome Yellow P103	Red Oxide P-K130	Ferric Yellow Oxide	Ferric Red Oxide	Antanil Yellow 260	Hostaperm Pink E	Novoperm Red F2RK	Green PG7	Blue PG 15:3	Violet RL 23	Sunblack X-15	FW 200
Water	23.3	18.3	13.3	35.8	35.8	34.3	36.8	29.3	21.8	29.3	36.8	28.1	51.8
Propylene Glycol	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
AMP 95	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Dispersant	10.0	10.0	10.0	22.5	22.5	15.0	17.5	20.0	22.5	20.0	17.5	26.2	22.5
Pigment	55.0	60.0	65.0	30.0	30.0	40.0	35.0	40.0	45.0	40.0	35.0	35.0	15.0
AFCONA-2503	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
AFCONA-5071	1.0	1.0	1.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

### Transparency for transparent Iron Oxide Red and Yellow

Pigment	Dispersant	Transparency	
		Initial Sample	After Stability
Ferric Yellow Oxide	Competitor	4	4
		5	5
Ferric Red Oxide	Competitor	4	4
		5	5

Rating: 1-Poor and 5-Excellent

Pigment	Dispersants	Fineness		Viscosity	
		Initial Sample	After Stability	Initial Sample	After Stability
Ferric Yellow Oxide	Competitor	<10 µm	<10 µm	3	3
		<10 µm	<10 µm	3	3
Ferric Red Oxide	Competitor	<10 µm	<10 µm	3+	3+
		<10 µm	<10 µm	3+	3+
Chrome Yellow P103	Competitor	<10 µm	<10 µm	3	3
		<10 µm	<10 µm	3-	3-
Yellow Oxide P4920	Competitor	<10 µm	<10 µm	4	3+
		<10 µm	<10 µm	4	3+
Red Oxide P-K130	Competitor	<10 µm	<10 µm	4	4
		<10 µm	<10 µm	4	4
Antanil Yellow 260	Competitor	<10 µm	<10 µm	3	3
		<10 µm	<10 µm	3	3-
Hostaperm Pink E	Competitor	<10 µm	<10 µm	3	3
		<10 µm	<10 µm	3	3
Novoperm Red F2RK	Competitor	<10 µm	<10 µm	3	3
		<10 µm	<10 µm	3	3
Green PG7	Competitor	<10 µm	<10 µm	3	3
		<10 µm	<10 µm	3	3
Blue PG 15:3	Competitor	<10 µm	<10 µm	3+	3+
		<10 µm	<10 µm	3+	3+
Violet RL 23	Competitor	<10 µm	<10 µm	4	4
		<10 µm	<10 µm	4	3
Sunblack X-15	Competitor	<10 µm	<10 µm	3	3
		<10 µm	<10 µm	3	3
FW 200	Competitor	<10 µm	<10 µm	4	4
		<10 µm	<10 µm	4	3+

Rating: 1-High viscosity and 5-Low viscosity

Pigment	Dispersants	Rub Out Test		Tinting Strength	
		Initial Sample	After Stability	Initial Sample	After Stability
Chrome Yellow P103	Competitor	5	5	5	5
		5	5	5	5
Yellow Oxide P4920	Competitor	5	5	5-	5
		5	5	5	5
Red Oxide P-K130	Competitor	5	5	5	5-
		5	5	5	5
Antanil Yellow 260	Competitor	5	5	5	5
		5	5	5	5
Hostaperm Pink E	Competitor	5	5	5	5
		5	5	5	5
Novoperm Red F2RK	Competitor	5	5	5	5-
		5	5	5	5
Green PG7	Competitor	5	5	5	5
		5	5	5-	5
Blue PG 15:3	Competitor	5	5	5	5
		5	5	5	5
Violet RL 23	Competitor	5	5	5	5
		5	5	4	5-
Sunblack X-15	Competitor	5	5	5-	5
		5	5	5	5-
FW 200	Competitor	5	5	5-	5-
		5	5	5	5

Rating: 1-Poor and 5-Excellent

### Test Panels: Rub-out test and Tinting Strength (Mixing ratio Pigment paste: White base 3:100)







## Additives for water-based systems

### 5000 Series – Conventional wetting and dispersing agents

Product Name	Properties
AFCONA-5071**	Very good anti-settling effect. Used in combination with another dispersant for better anti-settling, anti-floating and anti-flooding performances. 21% of the raw material origin from renewable sources.
AFCONA-5585*/**	High-Molecular-Weight Dispersing agent which stabilizes all kind of pigments through steric hindrance. Very suitable for the production of universal pigment concentrates for solvent-based and water-based systems.
AFCONA-5586*/**	Specially modified High-Molecular-Weight block copolymer with pigment affinic groups. Solvent-free. For universal pigment concentrates. Suitable for ECO-friendly systems.



### 6000 Series – Miscellaneous products incl. LE-Products

Product Name	Properties
AFCONA-6220**	Fatty acid modified emulsifier. Recommended to improve colour acceptance of colourants in base paints. Can be used to formulate water-based resin-free pigment concentrates with inorganic pigments. 50% of the raw material origin from renewable sources.
AFCONA-6225**	Better pigment stability performances than AFCONA-6220. Suitable to use not only as a colour acceptance additive, but also as an effective dispersant for all kind of pigments for water-based and solvent-based systems. Can be used to produce water-based Resin-Free Pigment Concentrates for universal purposes.
AFCONA-6226**	Improved version of AFCONA-6225. More hydrophilic behaviour, therefore better colour strength, viscosity reduction, pigment stability and colour acceptance for water-based and solvent-based systems. Can be used for environment-friendly systems.
AFCONA-LE 1000**	Solvent-free wetting and dispersing additive for universal colourants. Suitable for all kind of pigments. Completely water-soluble and need to be neutralized. Neutralization to pH 9 will strongly improve viscosity reduction performance. Suitable for ECO-friendly systems.
AFCONA-LE 1032**	Solvent-free wetting and dispersing additive for universal colourants. Suitable for all kind of pigments. Improved version of LE1000. Completely water-soluble, don't need to be neutralized. Suitable for ECO-friendly systems. 50% of the raw material origin from renewable sources.
AFCONA-6228	VOC free and glycol free viscosity reducer for universal colourants and colour acceptance.
AFCONA-6230**	Suitable for most water-based and solvent-based systems. Effective viscosity reduction agent for any highly filled system containing inorganic pigments and/or extenders.
AFCONA-6755**	Water-based version of AFCONA-6745. Synergist for Phthalocyanine and violet pigments. Also suitable for carbon blacks. Must be used in combination with one of the AFCONA-4000 series. Improves gloss, viscosity-depression and pigment stability.

\* These products will become slightly hazy at temperatures below 5°C. This will not influence the quality.

\*\* Suitable for Water- and Solvent-based coatings

General indicator on recommendation

- - Highly recommended
- - Recommended
- - Can be used

Chemical	Active Ingredient	Dosage				Acid value mgKOH/g	Amine value mgKOH/g	Solvent	Flash Point	Water-based System										5000 Series Product Name		
		TiO2 (Other Inorganic Pigment)	Organic pigment	Carbon Black	Polyurethane 2 Component					Polyurethane 2 Component	Epoxy 2 Component	Polyester/Melamine	UV Curing System	Printing Inks Systems	Pigment paste water-based	Pigment paste water and solvent-based						
Alkylol ammonium salt of a HMW carboxylic acid	50~54%	0.5~2%	2~5%	20~60%	90~110	95~130	Water	>100°C	●	●	●	●	●	●	●	●	●	●	●	●	●	AFCONA-5071**
HMW block copolymer with pigment affinity groups	>96%	2~3% (2~4%)	20~40%	20~60%	-	17~25	-	-	●	●	●	●	●	●	●	●	●	●	●	●	●	AFCONA-5585*/**
HMW block copolymer with pigment affinity groups	>96%	2~3% (2~4%)	20~40%	20~60%	-	15~25	-	-	●	●	●	●	●	●	●	●	●	●	●	●	●	AFCONA-5586*/**

General indicator on recommendation

- - Highly recommended
- - Recommended
- - Can be used

Chemical	Active Ingredient	Dosage				Acid value mgKOH/g	Amine value mgKOH/g	Solvent	Flash Point	Water-based System										6000 Series Product Name		
		TiO2 (Other Inorganic Pigment)	Organic pigment	Carbon Black	Polyurethane 2 Component					Polyurethane 2 Component	Epoxy 2 Component	Polyester/Melamine	UV Curing System	Printing Inks Systems	Pigment paste water-based	Pigment paste water and solvent-based						
Fatty acid modified Polyester	>96%	5~10%	10~20%	10~20%	10~30	15~35	-	-	●	●	●	●	●	●	●	●	●	●	●	●	●	AFCONA-6220**
Fatty acid modified Polyester	>96%	5~10%	10~20%	10~20%	44~48	30~42	-	-	●	●	●	●	●	●	●	●	●	●	●	●	●	AFCONA-6225**
Fatty acid modified Polyester	>96%	5~10% Colour acceptance 0.5~1.0%	10~20%	10~20%	25~35	18~28	-	-	●	●	●	●	●	●	●	●	●	●	●	●	●	AFCONA-6226**
Fatty acid modified Polyester	>96%	5~10%	10~20%	10~20%	25~35	25~35	-	-	●	●	●	●	●	●	●	●	●	●	●	●	●	AFCONA-LE 1000**
Fatty acid modified Polyester	82~86%	5~10%	10~20%	10~20%	25~35	25~35	-	-	●	●	●	●	●	●	●	●	●	●	●	●	●	AFCONA-LE 1032**
Fatty acid modified derivative	76~80%	-	-	-	-	-	water	-	●	●	●	●	●	●	●	●	●	●	●	●	●	AFCONA-6228
Aliphatic polyether with acidic groups	>95%	1~3%	5~7%	-	100~105	-	-	-	●	●	●	●	●	●	●	●	●	●	●	●	●	AFCONA-6230**
Synergist agent	>98%	-	3~5%	5%	-	-	-	-	●	●	●	●	●	●	●	●	●	●	●	●	●	AFCONA-6755**

**PRODUCT**

**SECTOR**

		Water-based application											
		Solvent-based application											
		CHLORINATED RUBBER	UV CURING SYSTEM	UNIVERSAL PIGMENT PASTE SOLVENT-BASED	ALKYD EMULSION	ALKYD WATER-REDUCIBLE	EMULSION ACRYLIC COPOLYMER	POLYURETHANE 2 COMPONENT	POLYURETHANE DISPERSION	EPOXY 2 COMPONENT	POLYESTER/MELAMINE	UV CURING SYSTEM	PIGMENT WASTE WATER-BASED
DISPERSION RELATED	Higher color strength	5207/5209	Inorganic pigment	4071+6788	5285/6226	5071/6226	5071/6226	5071/6226	5071/6226	5071/6226	5071/6226	5071/6226	5071/6226
	Lower millbase viscosity	5207/5209	Organic pigment	4071+6788	4530/4595	4530/4595	4530/4595	4530/4595	4530/4595	4530/4595	4530/4595	4530/4595	4530/4595
	Better pigment stability	5207/5209	Carbon Black	4071+6788	4530/4595	4530/4595	4530/4595	4530/4595	4530/4595	4530/4595	4530/4595	4530/4595	4530/4595
	Co-grinding	5209		Not applicable	4530/4570	4530/4570	4530/4570	4530/4570	4530/4570	4530/4570	4530/4570	4530/4570	4530/4570
	Color acceptance	Not applicable		4570/6226	4570/6226	4570/6226	4570/6226	4570/6226	4570/6226	4570/6226	4570/6226	4570/6226	4570/6226
	Reduces flooding and floating	5065		5065/6226	4570/6226	4570/6226	4570/6226	4570/6226	4570/6226	4570/6226	4570/6226	4570/6226	4570/6226
	Cost effective	5209		PF1611	4570/6226	4570/6226	4570/6226	4570/6226	4570/6226	4570/6226	4570/6226	4570/6226	4570/6226
SURFACE RELATED	Improves mar resistance, increases slip	3030/3233		Not applicable	3522/3571	3522/3571	3522/3571	3522/3571	3522/3571	3522/3571	3522/3571	3522/3571	Not applicable
	Anti-cratering	3030/3233		Not applicable	3570+/-3585	3570+/-3585	3570+/-3585	3570+/-3585	3570+/-3585	3570+/-3585	3570+/-3585	3570+/-3585	Not applicable
	Improves substrate wetting	3670/3700		Not applicable	3500/3570	3500/3570	3500/3570	3500/3570	3500/3570	3500/3570	3500/3570	3500/3570	Not applicable
	Reduces Bénard cells	3030/3233		Not applicable	3585/3588	3585/3588	3585/3588	3585/3588	3585/3588	3522	3522	3522	Not applicable
	Improves levelling	3030/3233		Not applicable	3233+3570	3233+3570	3570	3570+3585	3570+3585	3522+3570	3522+3570	3522+3570	Not applicable
	Defoaming	2040/2763		2720/2763	2524/2530	2524/2530	2501	2524/2530	2524/2530	2524/2530	2524/2530	2524/2530	2524/2530
	Deaeration	2040/2763		2720/2763	2503/2592	2592	2524/2530	2505	2503	2503/2592	2502/2592	2503	2507

Remark: / = use either one; +/- = use alone or in combination; + = use in combination

**PRODUCT**

**SECTOR**

		Solvent-based application											
		AIR DRY ALKYD (LONG AND MEDIUM OIL)	INDUSTRIAL BAKING PAINT ALKYD/MELAMINE	AUTOMOTIVE OEM POLYESTER/MELAMINE ACRYLIC/MELAMINE	ALKYD/NC ALKYD/AMINO (AC)	2K PU ALKYD/PE OH FUNCTIONAL	2K PU ALKYD OH FUNCTIONAL	2K PU ALKYD OH FUNCTIONAL SOLVENT FREE	UNSATURATED POLYESTER	EPOXY SOLVENT BASED	EPOXY SOLVENT FREE	CAB/ACRYLIC CAB/PE	ACRYLIC THERMO-PLASTIC
DISPERSION RELATED	Higher color strength	5207/5209	4011/5280	4011/5010	4071/5280	4071/5280	4011/4071	4071/5290	4011/5251	4011/5251	4011	4011/4063	4200/4201
	Lower millbase viscosity	5207/5209	4063/4067	4047/4067	4071	4050/4071	4047/4063	4071/4201	4071/4570	4050/4063	4080	4063/4067	4201
	Better pigment stability	5207/5209	4047/4067	4067/4701	4063	4047/4067	4047/4067	4201	4063/4570	4047/4063	4080	4063/4067	4201
	Co-grinding	5207/2509	4017/5066	4017/5066	5290	4017/5066	4017/5066	4017	4017	4017	4017	4017	5065
	Color acceptance	4570/6225											
	Reduces flooding and floating	6226	5066	5066	5065/6226	5065/6226	5065	5066	5066/6226	5066/6226	5066/6226	5066	5065/6226
	Cost effective	5209	5280/5290	4011	5209	5209	5209/5290	4071/5290	4071/5290	4071/5290	4071/5290	4011/5280	5209
SURFACE RELATED	Improves mar resistance, increases slip	3030/3233	3251/3285	3251/3285	3251/3285	3251/3285	3236/3239	3035/3251	3236/3239	3236/3239	3236/3239	Not applicable	3251/3285
	Anti-cratering	3030/3233	3034+/-3700	3034+/-3670	3034+/-3700	3034+/-3700	3034+/-3700	3035+/-3777	3034+/-3700	3236+/-3700	3236+/-3700	3700	3034+/-3700
	Improves substrate wetting	3670	3670/3700	3670/3700	3670/3700	3670/3700	3670/3700	3670/3700	3670/3700	3670/3700	3670/3700	3670/3700	3670/3700
	Reduces Bénard cells	3030/3233	3030/3233	3670	3033/3251	3030/3251	3700	3700	3035/3251	3030/3670	3700	3670	3033
	Improves levelling	3030/3233	3251/3285	3670/3700	3251+3670	3033+3670	3251+3670	3236+3700	3035+3670	3239+3670	3236+3670	3700	3033/3251
	Defoaming	2040/2763	2021/2720	2720/2725	2018/2020/2050	2018/2020/2050	2725/2754	2270/2290	2020/2050/2290	2722/2754/2290	2722/2754/2290	2021	2020/2021/2050
	Deaeration	2040/2763	2022	2040/2763	2038/2045	2038/2045	2038/2045	2722/2727	2040/2727	2045/2727	2045/2727	2038	2038/2040

Remark: / = use either one; +/- = use alone or in combination; + = use in combination



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**AFCONA Additives Sdn Bhd**  
21, Jalan Anggerik Mokara 31/47  
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