



AFCONA Additives Product List



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**AFCONA Additives
Version 9
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Additives For Coatings Or New Applications



AFCONA Malaysia



AFCONA China



AFCONA Holland



AFCONA USA

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Additives for solvent-based systems

1000 Series – Universal resins for pigment concentrates

Product Name	Properties
AFCONA-1101	Universal dispersing resin for pigment concentrates. Must be combined with a High-Molecular-Weight Dispersant from the AFCONA-4000 series or with AFCONA-5280. Compatible with most of the resin systems such as polyurethane, alkyd melamine, acrylic melamine, polyester melamine (butylated and HMMM grade), acid curing, etc.
AFCONA-1102	Cheaper version of AFCONA-1101. Gives stronger viscosity reduction in pigment concentrates and has better compatibility, especially in TPA and epoxy systems. Both contain primary OH-groups which may react in PU and baking paints. Therefore it will not act as a hard resin or plasticizer.



2000 Series – Non-silicone-based defoamers and deaerators

Product Name	Properties
AFCONA-2018/E	AFCONA-2018/E has very good compatibility and is extremely suitable for clear and high-gloss coatings. It is suitable for solvent-based wood finishes like: NC, Acid Curing and PU (except the acrylic based).
AFCONA-LE1042	AFCONA-LE1042 is a very strong defoamer. It may cause some haziness in clear systems. It is widely used in NC and AC lacquer wood finishes especially applied by curtain coater. It is also suitable for cold cured epoxy as well as UPE's like: SMC, BMC and gel coats.
AFCONA-2021	Moderate performance, good balance between defoaming and compatibility. Mainly recommended for wood coatings and high polar systems. Not suitable for acrylic based systems.
AFCONA-2024	A very strong defoamer and deaerator with better compatibility than AFCONA-2020 in PU, Epoxy and NC.
AFCONA-2050	A very strong defoamer and deaerator. Economical replacement for AFCONA-2020.
AFCONA-2270	Recommended for brush, conventional and airless spray applications. Very suitable for pigmented and matted UV coatings, epoxies, polyurethanes and baking paints.
AFCONA-2290	Non-silicone defoaming substance where it is designed for solvent containing and solvent-free systems of Epoxy, Polyurethane, UPE and UV coating. It has very good performance in defoaming and anti-foam.
AFCONA-2720/E	Mainly used in UPE's, epoxies, polyester baking systems and UV coatings. Also suitable for coil and can coatings.
AFCONA-2725/E	Very strong defoamer and deaerator. Suitable for high solid and high viscosity systems such as UPE, PU, Epoxy and PMMA flooring.
AFCONA-2754/E	Anti-foam and deaeration agent for solvent containing and solvent-free systems of Epoxy, Polyurethane, coil coatings and wood coatings.

General indicator on recommendation

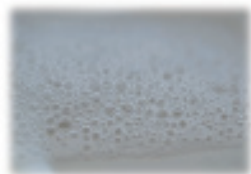
- Highly recommended
- Recommended
- Can be used

						Solvent-based System															1000 Series Product Name		
						Universal Pigment Concentrate	UV Curing System	Chlorinated Rubber	Coil and Can Coating	Thermoplastic Acrylic (TPA)	CAB Polyester/Polyacrylic	Epoxy - Solventless	Epoxy - Solvent-based	Unsaturated Polyester	2K PU (Acrylic OH Functional Solventless)	2K PU (Acrylic Polyol OH Functional)	2K PU (Alkyd/PE OH Functional)	Alkyd NC/Alkyd Amino(AC)	Auto OEM (PE or Acrylic/Melamine)	Inds. Baking Paint (Al or Ac/Melamine)		Air-drying Alkyd (medium and long oil)	
General indicator on recommendation																							
Chemical	Active Ingredient	Dosage		Solvent	Flash Point																		
Modified Polyacrylic with OH Group	59~63%	Inorganic pigment	Organic pigment	Butyl Acetate /MPA	24℃																	●	AFCONA-1101
Modified Polyacrylic with OH Group	59~61%	Inorganic pigment	Organic pigment	Butyl Acetate /MPA	24℃																	●	AFCONA-1102

General indicator on recommendation

- Highly recommended
- Recommended
- Can be used

<div>General indicator on recommendation</div> <div><div></div> - Highly recommended</div> <div><div></div> - Recommended</div> <div><div></div> - Can be used</div>				Solvent-based System															2000 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)	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	
Chemical	Dosage (Based on total formulation)	Solvent	Flash Point																
Defoaming Polymer	0.1~ 1.0%	Xylene	25℃															AFCONA-2018/E	
Modified Polyvinyl Polymer	0.1~ 0.7%	SBP Spirit 140/165	30℃															AFCONA-LE1042	
Defoaming Polymer	0.1~ 1.0%	Xylene	44℃															AFCONA-2021	
Defoaming Polymer	0.1~ 1.0%	SBP Spirit/MPA	25℃															AFCONA-2024	
Defoaming Polymer	0.1~ 1.0%	SBP Spirit/MPA	25℃															AFCONA-2050	
Defoaming Polymer	0.1~ 0.5%	—	> 100℃															AFCONA-2270	
Defoaming Polymer	0.5~ 1.5%	—	> 100℃															AFCONA-2290	
Defoaming Polymer	0.2~ 1.0%	Alkylbenzene/ SBP Spirit	42℃															AFCONA-2720/E	
Defoaming Polymer	0.5~ 1.5%	SBP Spirit	> 100℃															AFCONA-2725/E	
Defoaming Polymer	0.1~ 1.0%	SBP Spirit	> 100℃															AFCONA-2754/E	



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

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

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

The good transparency performance of AFCONA-2050 only applicable to acrylate resin. However acrylate resin varies from each formulation.

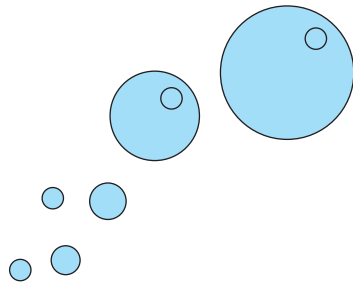
For those very high polar acrylate resin, slight haziness may occur.

For other resin systems. slight to medium haziness may occur.

Selection of a Defoamer

Testing in Skandex (Quick Test)

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

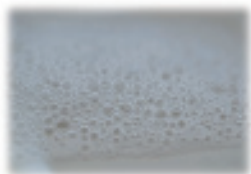


Defoaming performance



Influence on levelling performance





Additives for solvent-based systems

3000 Series – Organically modified polysiloxane based slip and levelling agents

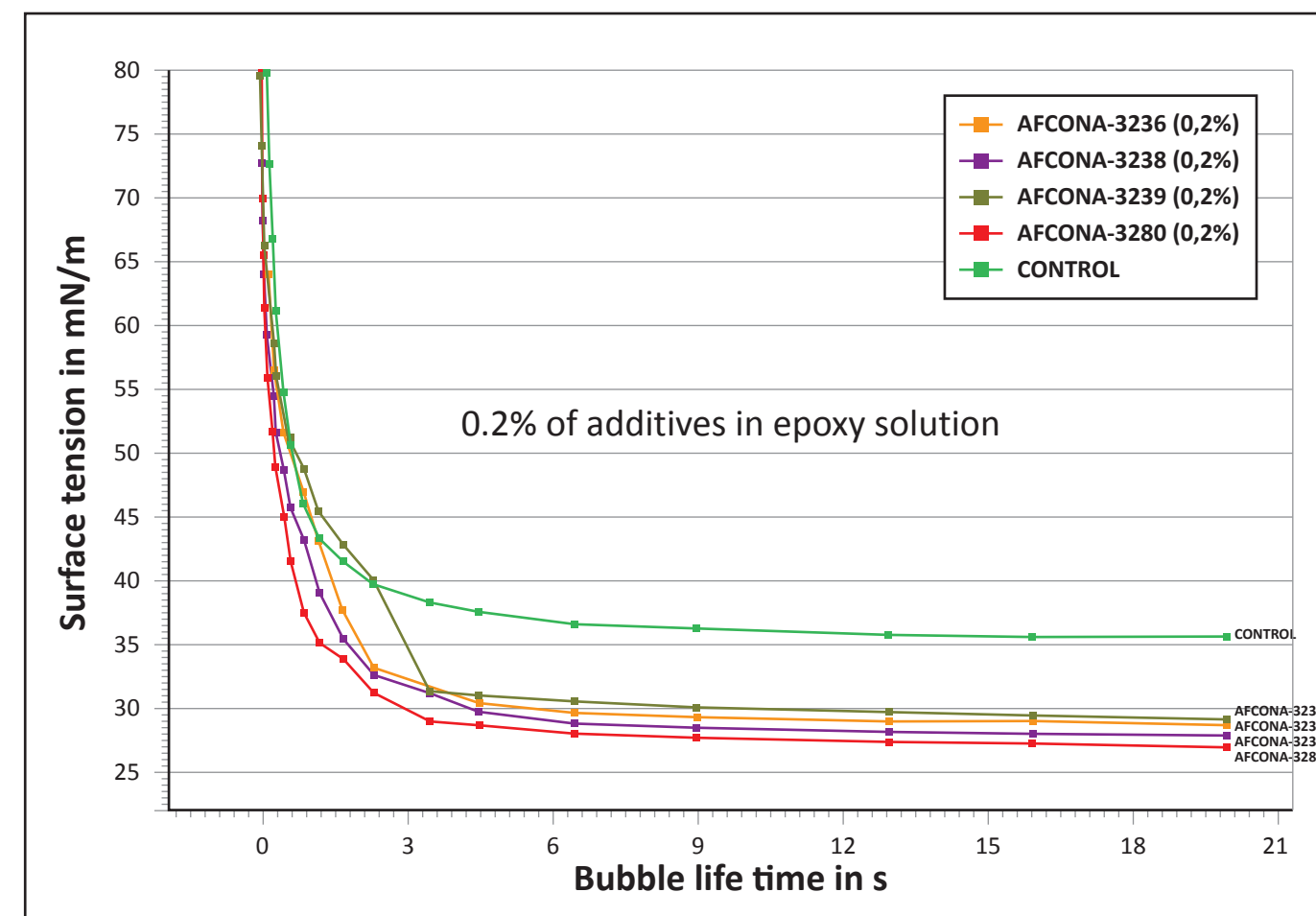
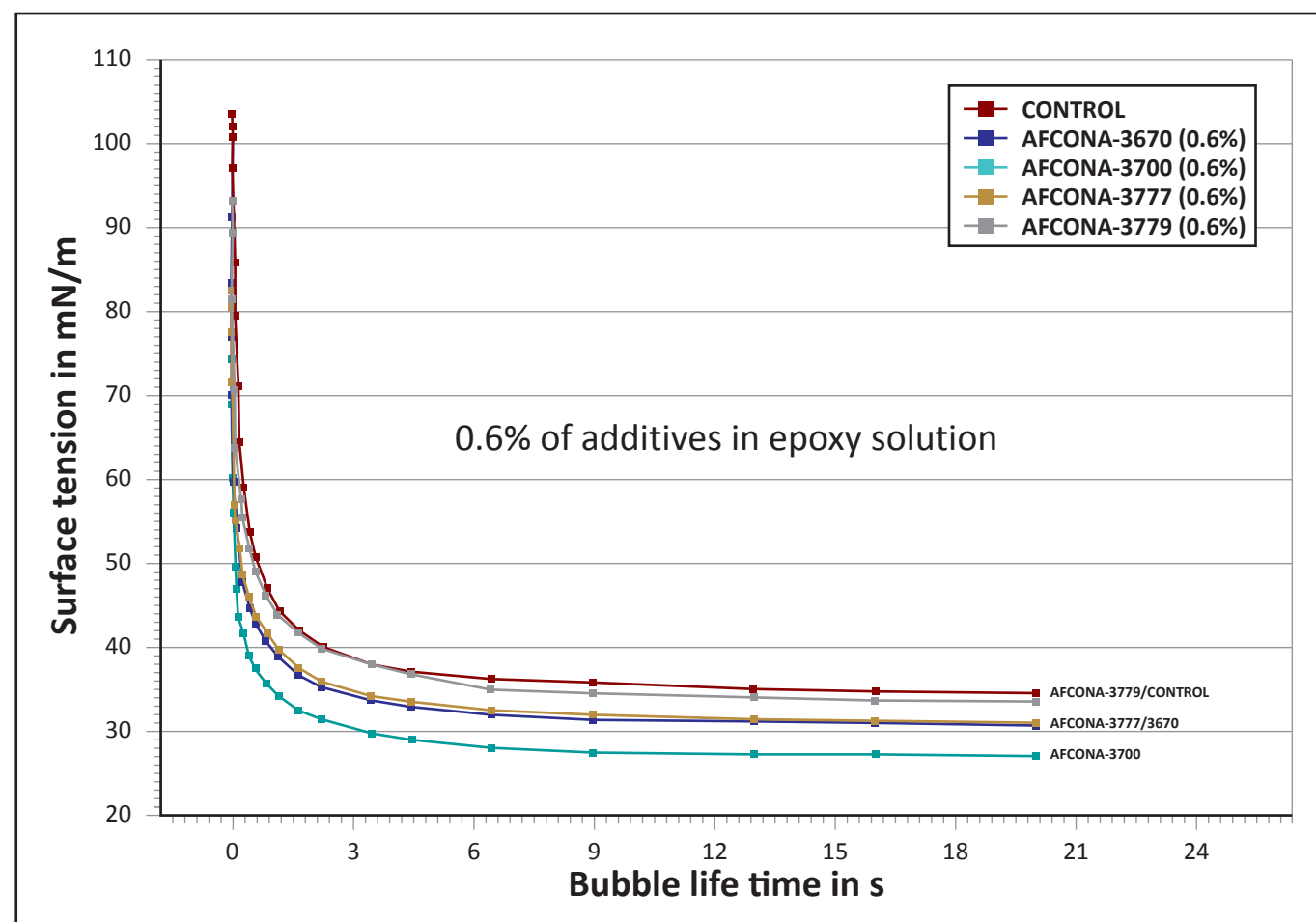
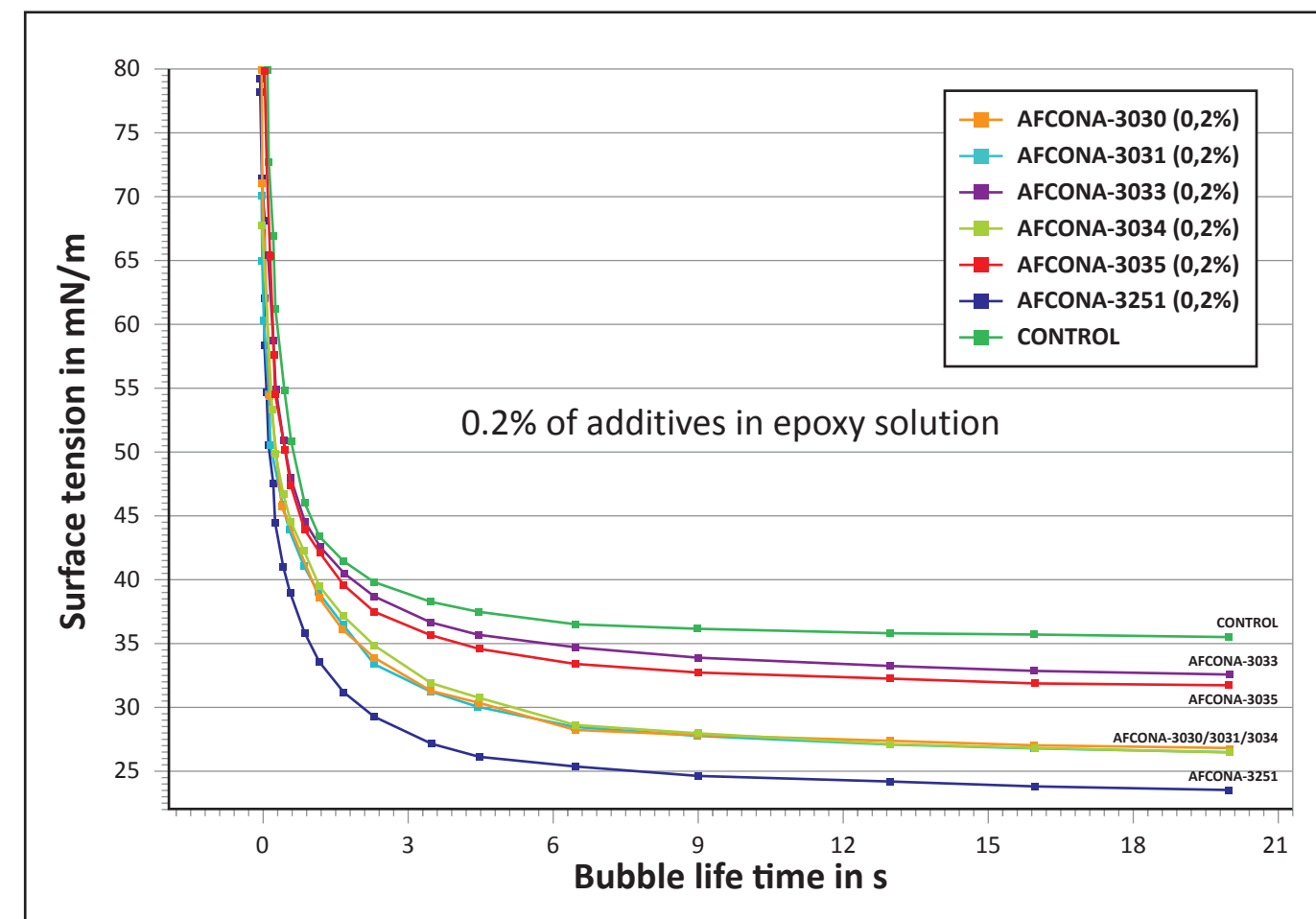
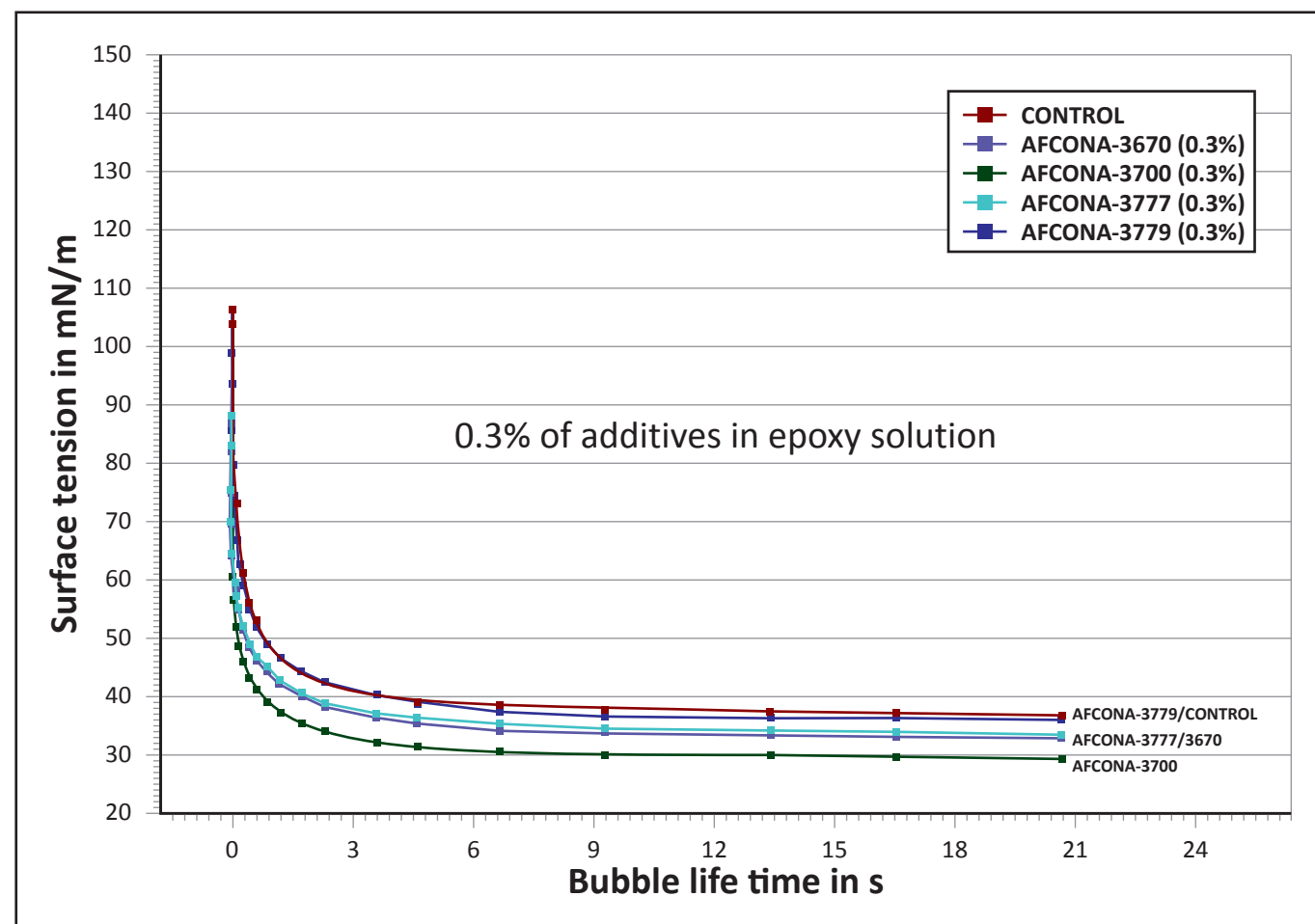
Product Name	Properties
AFCONA-3030*	Universal slip and levelling agent for all solvent-based and water-based systems. Very effective in preventing Bénard cells and good anti-crater properties in PU. Provides moderate slip.
AFCONA-3031/E	Suitable for solvent-based coatings. Has high, oily-feeling slip 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.

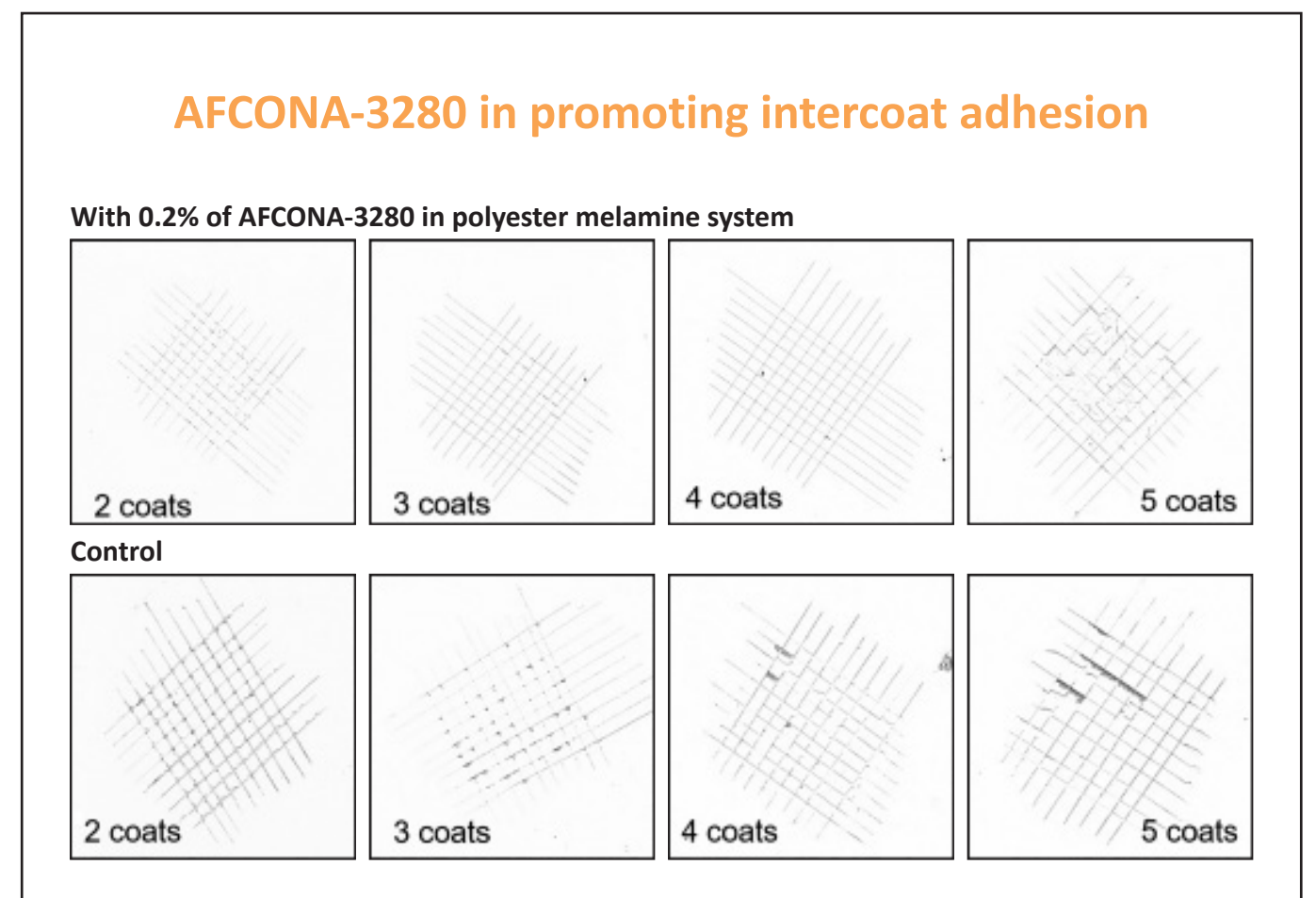
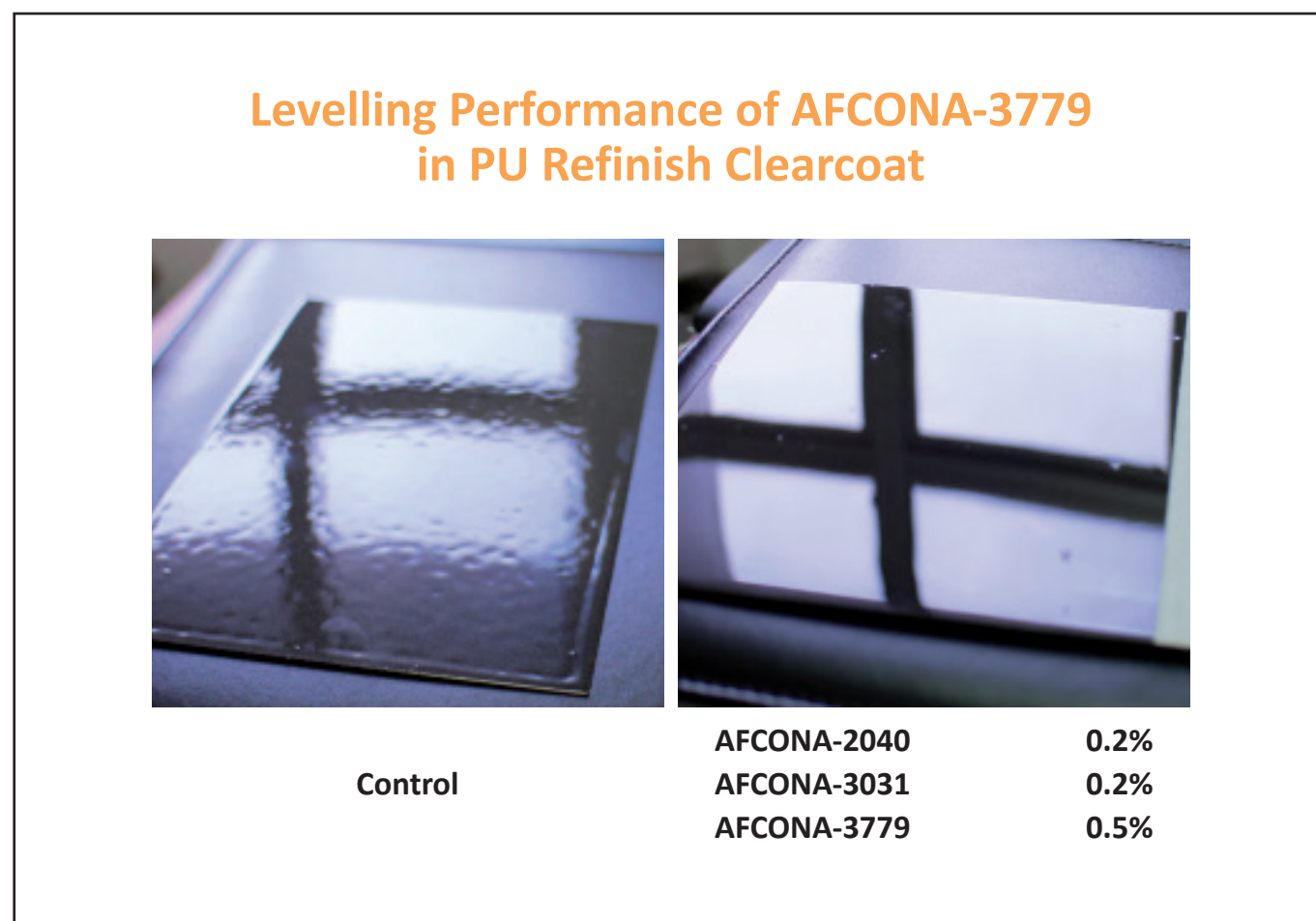
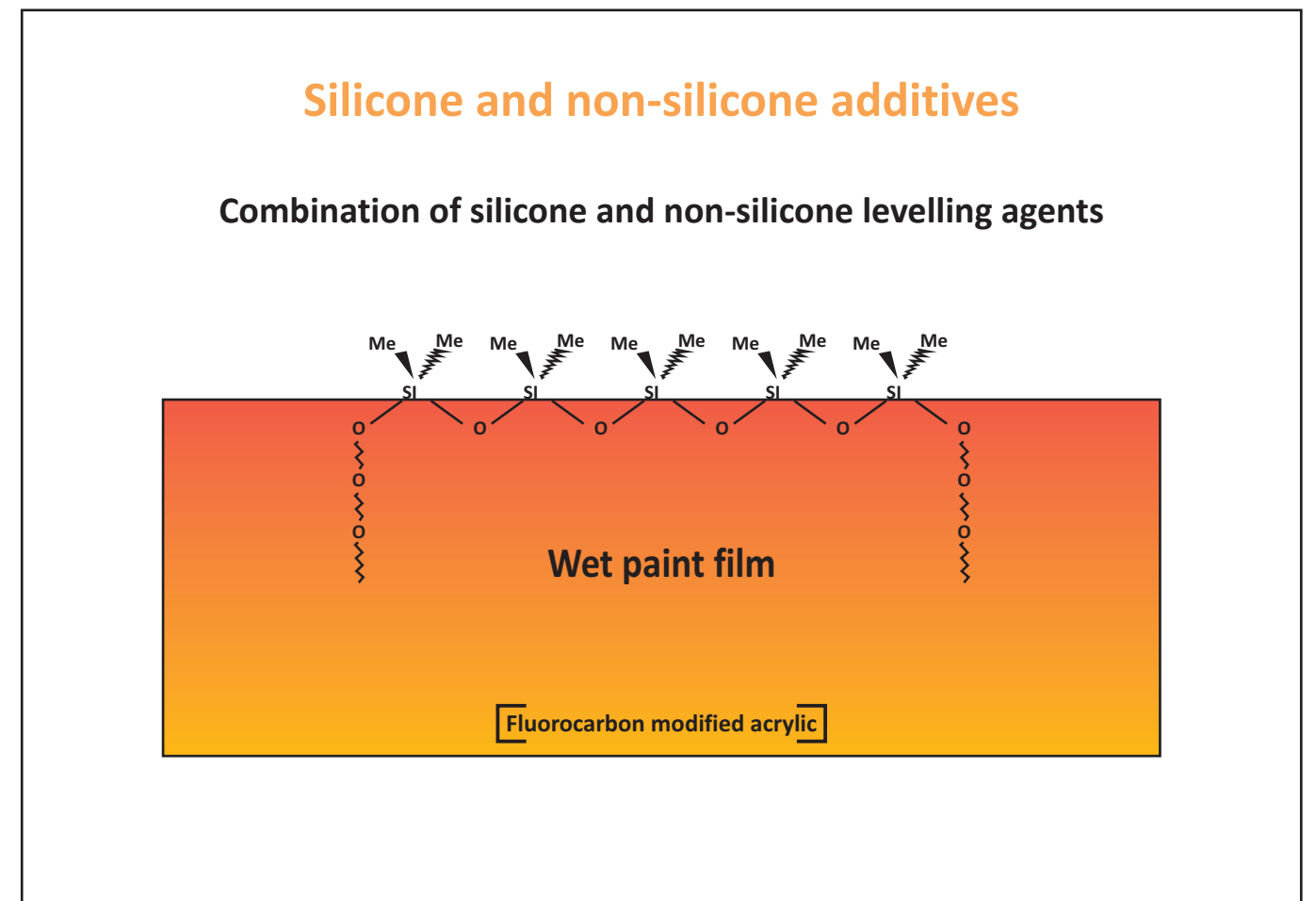
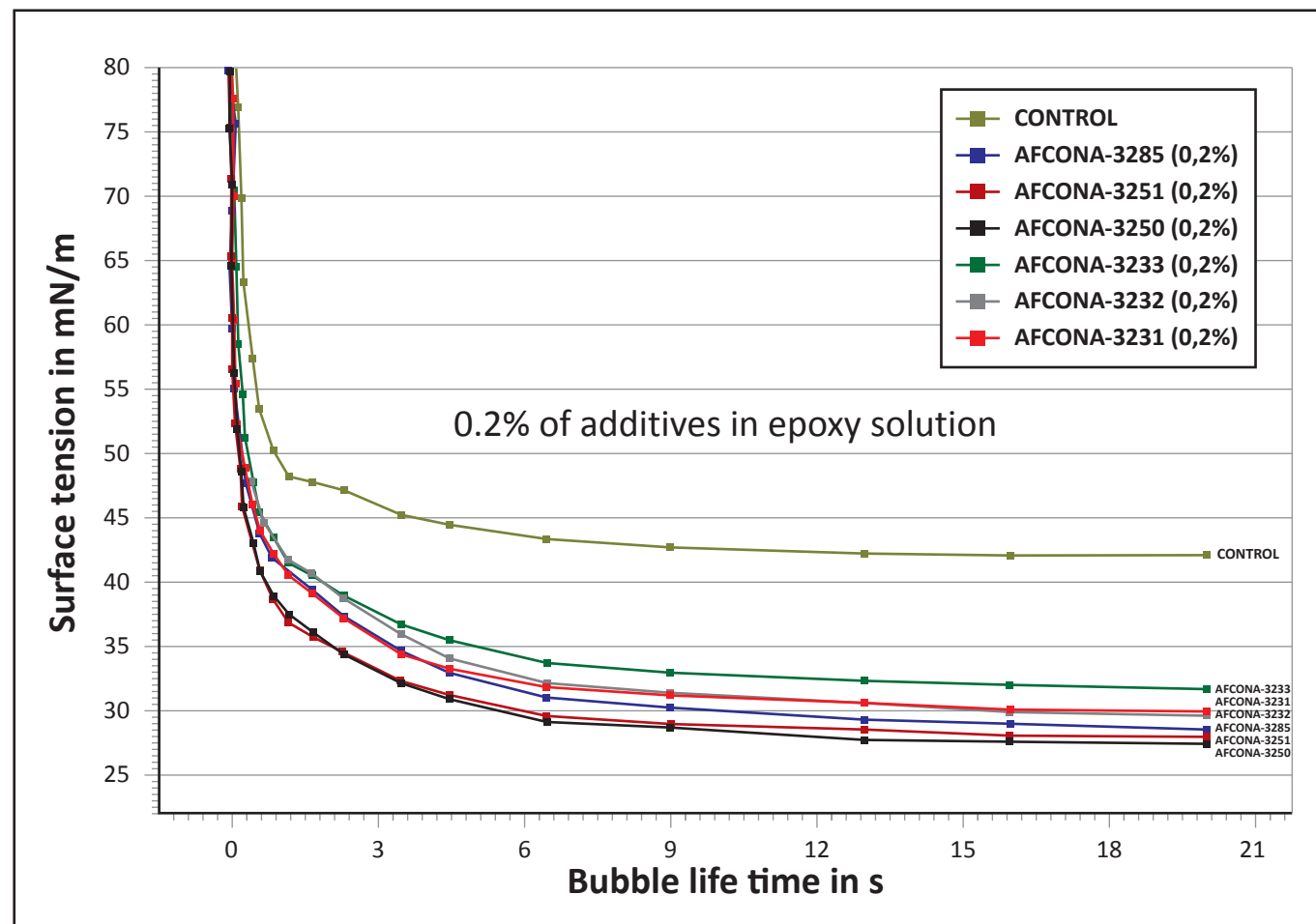
* Suitable for solvent-based and water-based coatings.

General indicator on recommendation

- Highly recommended
- Recommended
- Can be used

Chemical	Dosage	Active Ingredient	Solvent	Flash Point	Solvent-based System																3000 Series Product Name	
	(Based on total formulation)				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 (Alkyd/PE OH Functional)	2K PU (Acrylic 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		
Modified Polyether Polysiloxane	0.1~1.0%	50~54%	Isobutanol	27℃																		AFCONA-3030*
Modified Polyether Polysiloxane	0.1~1.0%	50~54%	Alkylbenzene	40℃																		AFCONA-3031/E
Modified Polyether Polysiloxane	0.1~1.0% (0.2~0.5%)	14~16%	Butyl Acetate	24℃																		AFCONA-3033
Fluoro Modified Polysiloxane	0.05~0.5% (0.05~0.2%)	50~54%	Methoxy-propanol	32℃																		AFCONA-3034*
Modified Polyether Polysiloxane	0.1~0.5%	50~54%	DPM	75℃																		AFCONA-3035E*
Blend of high boiling point solvents with silicone	3~5%	100%	High boiling point solvents	42℃																		AFCONA-3037/E
Modified Polyether Polysiloxane	0.1~1.0%	>93%	Ethylene glycol monobutyl ether	32℃																		AFCONA-3085
Modified Polyether Polysiloxane	0.05~0.5%	>96%	—	>100℃																		AFCONA-3230
Modified Polyether Polysiloxane	0.05~0.5%	>95%	—	>100℃																		AFCONA-3231
Modified Polyether Polysiloxane	0.05~0.5%	>96%	—	>100℃																		AFCONA-3232
Modified Polyalkyl Polysiloxane	0.05~0.5%	>96%	—	>100℃																		AFCONA-3233
Modified Polyalkyl Polysiloxane	0.05~0.5%	>96%	—	>100℃																		AFCONA-3236
Modified Polyalkyl Polysiloxane	0.05~0.5%	>92%	—	>100℃																		AFCONA-3238
Modified Polyether Polysiloxane	0.05~0.5%	>96%	—	>100℃																		AFCONA-3239
Modified Polyether Polysiloxane	0.05~0.5%	>92%	—	>100℃																		AFCONA-3250
Modified Polyether Polysiloxane	0.05~0.5%	>95%	—	>100℃																		AFCONA-3251
Special Modified Polysiloxane	0.05~0.5%	>96%	—	>100℃																		AFCONA-3280
Modified Polyether Polysiloxane	0.1~1.0%	>96%	—	>100℃																		AFCONA-3285
Methylacrylate Modified Polysiloxane	0.1~1.0%	>95%	—	>100℃																		AFCONA-3835







Additives for solvent-based systems

3000 Series – Non-silicone-based levelling agents

Product Name	Properties
AFCONA-3038/E	More polar combination of high boiling point solvents than AFCONA-3037/E. Promotes flow and prevents solvent boiling problems that lead to pin holes.
AFCONA-3277	100% version of AFCONA-3777.
AFCONA-3670	Improved version of AFCONA-3777. Based on the same chemistry but with better anti-crater performances. Suitable for all solvent-based systems.
AFCONA-3700	High-fluorocarbon-content polyacrylic with very strong surface tension reduction. Excellent tool for anti-crater, substrate wetting and promotion of vertical flow. Suitable for all solvent-based systems, especially car refinsh, plastic paint and industrial coating.
AFCONA-3730	High-Molecular-Weight polyester. Very good compatibility and levelling performance. Suitable for coil coatings, can coatings, PU's, epoxies and other solvent-based coatings.
AFCONA-3750	52% solid version of AFCONA-3700 for better handling at low temperatures.
AFCONA-3755	Pure polyacrylic levelling agent. Designed for applications where levelling and defoaming are both important, such as coil and can coatings. Can also be used in other foam-sensitive systems.
AFCONA-3758	In today's coating world polymers containing fluorocarbon are nearly banned in all coatings related to electronic applications. Mainly developed to replace fluorocarbon-modified levelling agents giving the same levelling and anti-crater performances.
AFCONA-3770	Fluorocarbon-modified polyacrylic for solvent-based systems. Very fast initial levelling, anti-crater performance and defoaming properties. Very suitable for coil coatings and UV coatings and other applications that need fast levelling. Causes in-can haziness in clear coatings.
AFCONA-3772*	Fluorocarbon-modified polyacrylic for solvent-based systems. Becomes water-soluble after neutralization with a suitable amine. Considered a polar polymer with very good compatibility in all resin systems. Stronger anti-crater properties than AFCONA-3730. Less in levelling performance.
AFCONA-3775	Same category product as AFCONA-3770, but with stronger defoaming performance. Less in anti-crater properties.
AFCONA-3777	First-generation fluorocarbon-modified polyacrylic. Suitable for all solvent-based systems to improve levelling, anti-crater performance and substrate wetting. When special results are needed, products from the newly-developed generation will perform better.
AFCONA-3778	Pure polyacrylic levelling agent. Improves levelling and has defoaming properties. Can cause in-can haziness in some systems.
AFCONA-3779	Pure polyacrylic levelling agent. Well known for flow and levelling performance. Also acts as defoamer in most coating systems.

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

General indicator on recommendation

- Highly recommended
- Recommended
- Can be used

General indicator on recommendation ● - Highly recommended ● - Recommended ● - Can be used					Solvent-based System														3000 Series Product Name		
					Universal Pigment Concentrate	UV Curing System	Chlorinated Rubber	Coil and Can Coating	Thermoplastic Acrylic (TPA)	CAB Polyester/ Polyacrylic	Epoxy - Solventless	Epoxy - Solvent-based	Unsaturated Polyester	2K PU (Acrylic OH Functional solvents)	2K PU (Acrylic Polyol OH Functional)	2K PU (Alkyd/PE OH Functional)	Alkyd NC/Alkyd Amino(AC)	Auto OEM (PE or Acrylic/Melamine)		Inds. Baking Paint (Al or Ac/Melamine)	Air-drying Alkyd (medium and long oil)
Chemical	Dosage (Based on total formulation)	Active Ingredient	Solvent	Flash Point																	
Blend of high boiling point solvents	2~5%	50~54%	High boiling point solvents	43℃	●	●	●	●	●	●	●	●	●	●	●	●	●	●	AFCONA-3038/E		
Fluorocarbon Modified Polymer	0.2~1.0%	>96%	—	>100℃	●	●	●	●	●	●	●	●	●	●	●	●	●	●	AFCONA-3277		
Fluorocarbon Modified Polyacrylate	0.3~2.0%	69~71%	Xylene/MPA/ Butyl Acetate	25℃	●	●	●	●	●	●	●	●	●	●	●	●	●	●	AFCONA-3670		
Polymeric Fluorocarbon	0.05~1.0%	>96%	—	301℃	●	●	●	●	●	●	●	●	●	●	●	●	●	●	AFCONA-3700		
Pure Polyester Polymer	0.3~2.0%	64~66%	Alkylbenzene/ Butylcellosolve/ Xylene	45℃	●	●	●	●	●	●	●	●	●	●	●	●	●	●	AFCONA-3730		
Polymeric Fluorocarbon	0.1~1.0%	50~53%	MPA	42℃	●	●	●	●	●	●	●	●	●	●	●	●	●	●	AFCONA-3750		
Polyacrylic Polymer	0.5~2.0	51~54%	Xylene/DIBK	25℃	●	●	●	●	●	●	●	●	●	●	●	●	●	●	AFCONA-3755		
Polyacrylic Polymer	0.1~1.0%	50~52%	MPA	42℃	●	●	●	●	●	●	●	●	●	●	●	●	●	●	AFCONA-3758		
Fluorocarbon Modified Polyacrylate	0.5~2.0%	69~71%	MPA	42℃	●	●	●	●	●	●	●	●	●	●	●	●	●	●	AFCONA-3770		
Fluorocarbon Modified Polyacrylate	0.3~2.0%	59~61%	Sec. Butanol	24℃	●	●	●	●	●	●	●	●	●	●	●	●	●	●	AFCONA-3772*		
Special Acrylic Polymer with good defoaming	0.5~2.0%	69~73%	Xylene/DIBK	25℃	●	●	●	●	●	●	●	●	●	●	●	●	●	●	AFCONA-3775		
Fluorocarbon Modified Polyacrylate	0.3~2.0%	69~71%	Xylene	25℃	●	●	●	●	●	●	●	●	●	●	●	●	●	●	AFCONA-3777		
Pure Polyacrylic Polymer	0.3~2.0%	69~72%	Xylene	25℃	●	●	●	●	●	●	●	●	●	●	●	●	●	●	AFCONA-3778		
Pure Polyacrylic Polymer	0.3~2.0%	50~52%	Xylene/ Isobutanol/ TGME	25℃	●	●	●	●	●	●	●	●	●	●	●	●	●	●	AFCONA-3779		



Additives for solvent-based systems

4000 Series – High-Molecular-Weight Dispersing agents – First generation polyurethane types

Product Name	Properties
AFCONA-4009*	Mainly used in preparation of pigment concentrates due to good compatibility and price advantage. Can also be used as a dispersant for normal grinding, especially for inorganic pigments.
AFCONA-4010*	Good dispersant for inorganic pigments, especially TiO2 and matting agents. Widely used as a dispersant for inorganic pigment for pigment concentrate preparations.
AFCONA-4011*	Improved version of AFCONA-4010. Better balance between price and performance. Principally developed for stabilizing inorganic pigments such as TiO2, iron oxides and matting agents. Can be used in almost all solvent-based coating systems.
AFCONA-4015*	Co-grinding aid for solvent-based systems. Needs a strong solvent such as MEK or MIBK in mill base for optimal performance.
AFCONA-4017*	Polymeric dispersant mainly developed for co-grinding processes for coil and can coatings, baking polyesters and acrylic, epoxy and polyurethane systems. Among all the best co-grinding agent.
AFCONA-4046*	Universal and efficient dispersant for all pigments, including organic and carbon black. Good pigment deflocculation strength. Improves dry film glosses and prevents floating and flooding.
AFCONA-4047*	Better performing dispersant with higher molecular weight than AFCONA-4046, especially for carbon black and difficult to disperse organic pigments. Recommended for high quality paints such as OEM, refinish and industrial coatings.
AFCONA-4050*	More economical dispersant than AFCONA-4046. Very good to disperse all kinds of pigments. Recommended for PU, baking paint, epoxy, etc.
AFCONA-4060	Medium to low polar dispersant. Suitable for coil and can coatings and polyester resin systems.
AFCONA-4070*	Improved version of AFCONA-4060 with much better pigment stability and viscosity reduction properties. Gives very high Jetness to carbon black dispersions. May crystallize at temperatures below 15 °C.
AFCONA-4080*	Very High-Molecular-Weight Dispersant with very good pigment stability performance. Especially for organic reds and other difficult to disperse pigments. Recommended for epoxies, coil coatings, fluorocarbon coatings and other high quality paints.
AFCONA-LE1069	More economical version of AFCONA-4046. Can be used as a universal dispersant for all kind of pigments. Also suitable for pigment concentrates.

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

General indicator on recommendation

- Highly recommended
- Recommended
- Can be used

General indicator on recommendation <div><div></div> - Highly recommended</div> <div><div></div> - Recommended</div> <div><div></div> - Can be used</div>										Solvent-based System															4000 Series Product Name
										UV Curing System	Chlorinated Rubber	Coil and Can Coating	Thermoplastic Acrylic (TPA)	CAB Polyester/Polyacrylic	Epoxy - Solventless	Epoxy - Solvent-based	Unsaturated Polyester	2K PU (Acrylic Polyol OH Functional)	2K PU (Alkyd/PE OH Functional)	2K PU (Acrylic OH Functional Solventless)	Alkyd NC/Alkyd Amino(AC)	Auto OEM (PE or Acrylic/Melamine)	Inds. Baking Paint (Al or Ac/Melamine)	Air-drying Alkyd (medium and long oil)	
Chemical	Active Ingredient	TiO2 (Other Inorganic Pigment)	Organic Pigment	Carbon Black	Acid value mgKOH/g	Amine value mgKOH/g	Solvent	Flash Point																	
Modified Polyurethane Polymer	58~61%	2~3% (2~5%)	20~40%	20~50%	10~17	8~15	BAC/MPA/Sec-BA	19°C																	AFCONA-4009*
Modified Polyurethane Polymer	50~54%	2~4% (5~10%)	20~40%	30~60%	8~18	6~16	BAC/MPA/Alk-Bz/Sec-BA	24°C																	AFCONA-4010*
Modified Polyurethane Polymer	50~54%	2~4% (5~10%)	20~40%	30~60%	8~18	6~16	BAC/MPA/Alk-Bz/Sec-BA	24°C																	AFCONA-4011*
Modified Polyurethane Polymer	34~36%	6~8% (5~10%)	20~40%	30~60%	35~50	9~18	Xy/Alk-Bz/DIBK/MEK	24°C																	AFCONA-4015*
Modified Polyurethane Polymer	28~32%	6~8% (5~10%)	20~40%	30~60%	25~45	3~12	BAC/MPA/Sec-BA/Alk-Bz/DIBK	24°C																	AFCONA-4017*
Modified Polyurethane Polymer	39~41%	2~3% (2~4%)	20~40%	20~60%		10~25	BAC/MPA/Sec-BA	24°C																	AFCONA-4046*
Modified Polyurethane Polymer	34~36%	2~3% (2~4%)	20~40%	20~60%		10~20	BAC/MPA/Sec-BA	24°C																	AFCONA-4047*
Modified Polyurethane Polymer	43~47%	2~3% (2~4%)	20~40%	20~60%		10~25	BAC/MPA/Sec-BA	24°C																	AFCONA-4050*
Modified Polyurethane Polymer	29~31%	2~3% (2~4%)	20~40%	20~60%		6~16	BAC/MPA/Xy/Sec-BA	24°C																	AFCONA-4060
Modified Polyurethane Polymer	29~31%	2~3% (2~4%)	20~40%	20~60%		6~16	BAC/MPA/Xy/Sec-BA	24°C																	AFCONA-4070*
Modified Polyurethane Polymer	29~31%	2~3% (2~4%)	20~40%	20~60%		6~16	BAC/MPA/Sec-BA	47°C																	AFCONA-4080*
Special Modified Polyurethane Polymer	39~41%	2~3% (2~4%)	20~40%	20~60%		3~10	BAC/MPA/Alkyl-benzene	44°C																	AFCONA-LE1069



Additives for solvent-based systems

4000 Series – High-Molecular-Weight Dispersing agents – New-generation polyurethane types

Product Name	Properties
AFCONA-4063*	Effective polymeric dispersant for stabilizing inorganic and organic pigments as well as carbon blacks. Very good stability performance, through effective steric hindrance on all types of pigments, especially in organic red, yellow and violet.
AFCONA-4067*	BTX-free version of AFCONA-4063. Very effective in stabilizing inorganic and organic pigments and carbon black. Especially effective for organic red, yellow and violet due to the three-dimensional steric hindrance network. Very good viscosity reduction and improvement of colour strength.
AFCONA-4071*	Improved version of AFCONA-4070, better in overall performances. Supplied in higher solid, 45%. Recommended for refinishes, can coatings, dispersion of transparent iron oxides and other industrial coatings and pigment concentrates.
AFCONA-4200*	Polyurethane dispersant supplied in 100% active form. Recommended for solvent-free systems, where conventional wetting and dispersing agents can not perform with organic pigments and carbon blacks. Extremely good compatibility with thermoplastic acrylic, NC and CAB. Very interesting for ink dispersions because of the free solvent choice.
AFCONA-4201*	Same structure as AFCONA-4200. However, the polymer chain is longer, providing better steric hindrance. Performs stronger in pigment stability, colour and gloss developments.
AFCONA-4202*	Very compatible polymeric dispersant. Compatible with most of the resin systems on the market, ranging from Alkyd to NC, CAB, Epoxy and Thermoplastic Acrylic. Therefore highly recommended for solvent-based Resin Minimal Pigment Concentrates. Good viscosity reduction and easy incorporation, especially in NC systems.

4000 Series – High-Molecular-Weight agents – New polyester types

AFCONA-4203*	Result of an innovative concept of polyester dispersants, designed by AFCONA. Based on the latest structure of steric hindrance and new designed anchoring groups. Excellent wetting and dispersing performance to inorganic and organic pigments and carbon black. Can also reduce the viscosity of high pigment content paste. Good stability of concentrates for long time storage.
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4000 Series – High-Molecular-Weight Dispersing agents – Polyacrylate types

AFCONA-4400*	Suitable for nearly all solvent-based systems. Should be avoided in epoxy because of the high amine value. Very good pigment stability with organic pigments, less with inorganic pigments. Less viscosity reduction compared to polyurethane dispersants.
AFCONA-4401*	Higher solid version of AFCONA-4400 with lower molecular weight. Better compatibility. Less viscosity reduction compared to polyurethane dispersants. Suitable for most solvent-based systems.
AFCONA-4403*	More compatible version of AFCONA-4401. Special modification gives lower surface tension on polymer and allows dispersant to penetrate more easily to the surface of the pigment. Therefore, better wetting and faster grinding. Pigment concentrates based on AFCONA-4403 give easier incorporation, especially in NC.
AFCONA-4474*	Very strong dispersant especially for TiO2 dispersion in oil-free polyester/melamine systems. Use of TiO2 dispersions in coil and can coating applications will increase whiteness as well as hiding power of coating. Reduces the viscosity of the system, therefore higher pigment loading can be achieved. Very suitable for UPE & Epoxy systems due to the acid functional pigment affinity group. Common dispersants mostly contain amine values which could affect the self- and pot-life.
AFCONA-4531**	Polymeric dispersant for stabilizing inorganic and organic pigments in water- and solvent-based systems. In solvent-based systems, a polar polymer with very good compatibility to difficult polar systems such as NC, wash primer etc. Pigment paste based on AFCONA-4531 giving very easy incorporation. Must be neutralized for water-based applications.
AFCONA-4570**	For water and solvent -based universal decorative pigment concentrates. Especially for those used in high solid aromatic-free long oil alkyds. Also effective as an additive to improve colour acceptance of commercial colourants.

4000 Series – High-Molecular-Weight Dispersing agents -
Based on Controlled Free Radical Polymerisation

AFCONA-4701*	Innovative dispersant based on Controlled Radical Polymerisation (CRP). Recommended for all kind of pigments, including difficult organic pigments and High Channel Carbon Blacks. Recommended for coating systems that need the highest requirements such as automotive OEM and refinish, coil and industrial stoving systems.
AFCONA-4720*/**	Solvent-free innovative dispersant based on Controlled Radical Polymerisation (CRP). Suitable to disperse and stabilize all kinds of pigments, including difficult organic pigments and HCC Carbon blacks. Very compatible in most water- and solvent-based resin systems.

* 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

										Solvent-based System														4000 Series Product Name
										Universal Pigment Concentrate	UV Curing System	Chlorinated Rubber	Coil and Can Coating	Thermoplastic Acrylic (TPA)	CAB Polyester/Polyacrylic	Epoxy - Solventless	Epoxy - Solvent-based	Unsaturated Polyester	2K PU (Acrylic Polyol OH Functional)	2K PU (Alkyd/PE OH Functional)	2K PU (Acrylic OH Functional Solventless)	Alkyd NC/Alkyd Amino(AC)	Auto OEM (PE or Acrylic/Melamine)	
General indicator on recommendation																								

Modified Polyester Polymer	≥95%	2~3% (5~10%)	20~40%	30~80%	2~6	8~12	-	>100°C		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	AFCONA-4203*
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Modified Polyacrylate Polymer	39~42%	2~3% (2~4%)	20~40%	20~60%		40~55	BAC/Sec-Butanol	24°C		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	AFCONA-4400*
Modified Polyacrylate Polymer	50~54%	2~3% (2~4%)	20~40%	20~60%		45~60	BAC/MPA Sec-BA	24°C			•	•	•	•	•	•	•	•	•	•	•	•	•	•	AFCONA-4401*
Modified Polyacrylate Polymer	54~56%	2~3% (2~4%)	20~40%	20~60%		34~44	BAC/ MPA /Sec. BA /Xylene	24°C	•	•	•	•	•	•	•	•	•	•	•	•	•		•	•	AFCONA-4403*
Modified Polyacrylate Polymer	50~52%	2~3% (2~4%)	20~40%	20~60%	7~14		MPA/BAC	27°C		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	AFCONA-4474*
Modified Polyacrylate Polymer	49~51%	2~3% (2~4%)	20~40%	20~60%	30~40	20~30	Methoxy-propanol	32°C		•	•	•	•	•	•	•	•	•	•	•	•		•	•	AFCONA-4531**
Modified Polyacrylate Polymer	58~60%	2~3% (2~4%)	20~40%	20~60%		40~50	TPM	116°C	•			•	•	•	•	•									AFCONA-4570**

CRP Polyacrylate Polymer	48~52%	2~3% (2~4%)	20~40%	20~60%		15~25	MPA	44°C	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	AFCONA-4701*
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 solid to solid (%)	Based on surface area (m ² /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 N2 absorption.		
DBP (DiButyl Phthalate) value - Measurement of surface area of carbon black by using dibutyl phthalate.		

Polyurethane-based Dispersant

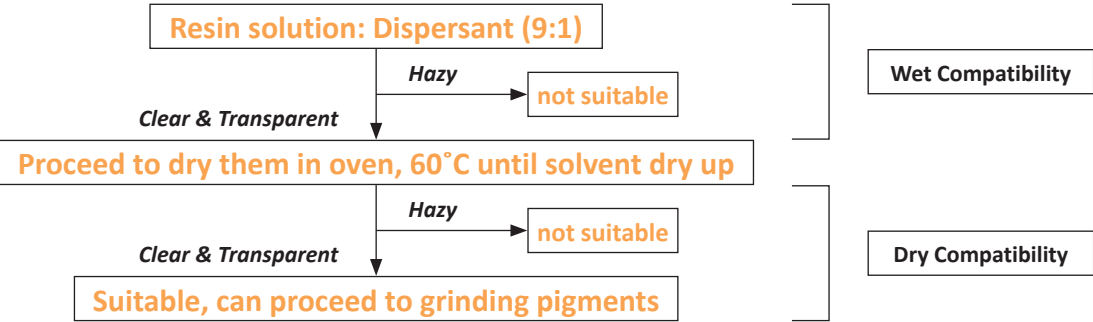
AFCONA-4009	AFCONA-4067	
AFCONA-4010	AFCONA-4071	
AFCONA-4011	AFCONA-4080	
AFCONA-4015	AFCONA-LE1069	
AFCONA-4017	AFCONA-4200	
AFCONA-4046	AFCONA-4201	Only for co-grinding
AFCONA-4047	AFCONA-4530	Best for inorganic pigments
AFCONA-4050	AFCONA-5585	For all solvent-based systems
AFCONA-4060	AFCONA-5586	For water-based systems
AFCONA-4063		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:

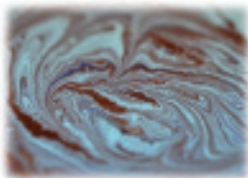
Compatibility with resin systems

Compatibility can split to wet compatibility and dry compatibility



Polyacrylate-based Dispersant

AFCONA-4400	AFCONA-4570	
AFCONA-4401	AFCONA-4595	
AFCONA-4474	AFCONA-4597	
AFCONA-4531	AFCONA-4599	
AFCONA-4550	AFCONA-4700	For all solvent-based systems
AFCONA-4560	AFCONA-4701	For water-based systems
AFCONA-4565	AFCONA-4720	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

General indicator on recommendation <div><div></div> - Highly recommended</div> <div><div></div> - Recommended</div> <div><div></div> - Can be used</div>									Solvent-based System															5000 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)	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
Chemical	Active Ingredient	TiO2 (Other Inorganic Pigment)	Organic Pigment	Carbon Black	Acid value mgKOH/g	Amine value mgKOH/g	Solvent	Flash Point																		
Fatty Acid Modified Polyamide	68~72%	0.2~2.0%	2.0~5.0%		130~150	<5	Xylene	30℃																		AFCONA-5009*/E
Solution of an acidic polyester phosphorus	50~54%	1.0~4.0% (5~10%)			65~85		Xylene/ Sec. Butanol	25℃																		AFCONA-5010*
Polymer of carboxylic acid and polyamide	50~54%	0.5~5.0%	20~50%	25~40%		185~215	Alkyl-benzene /MPA	45℃																		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℃																		AFCONA-5044*
HMW carboxylic acid salts	50~54%	0.2~2.0%			50~60	45~60	Alkyl-benzene	42℃																		AFCONA-5054/E*
HMW unsaturated carboxylic acid with polysiloxane	50~54%	0.5~2.5%			80~150		Alkyl-benzene /DIBK	40℃																		AFCONA-5065/E*
HMW unsaturated carboxylic acid	50~54%	0.5~2.5%			120~180		Alkyl-benzene /DIBK	40℃																		AFCONA-5066/E*
Alkylol ammonium salt of a HMW carboxylic acid	50~54%	0.5~2.0%			90~110	95~130	Water	>100℃																		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℃																		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 ₂ O ₃)			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

Solvent-based System													6000 Series Product Name
Chemical	Active Ingredient	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)	
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:

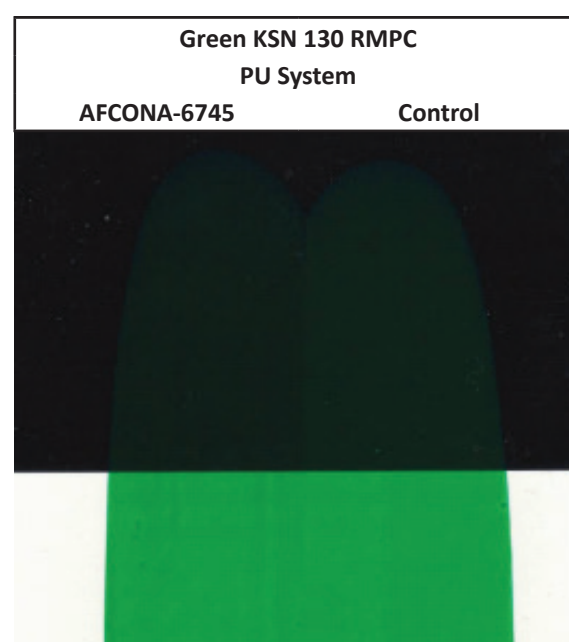
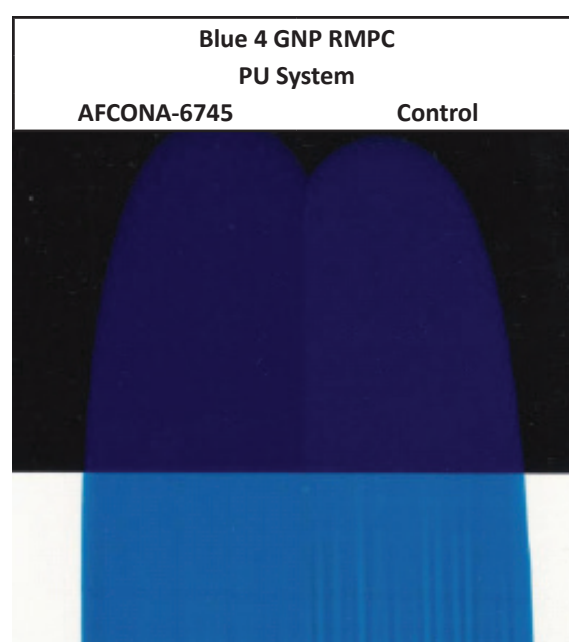
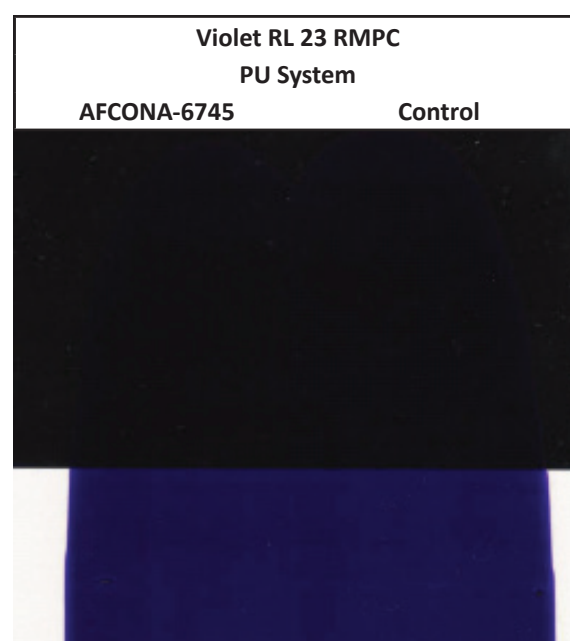
Metallic Base Paint	4
Pigment Paste	1



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

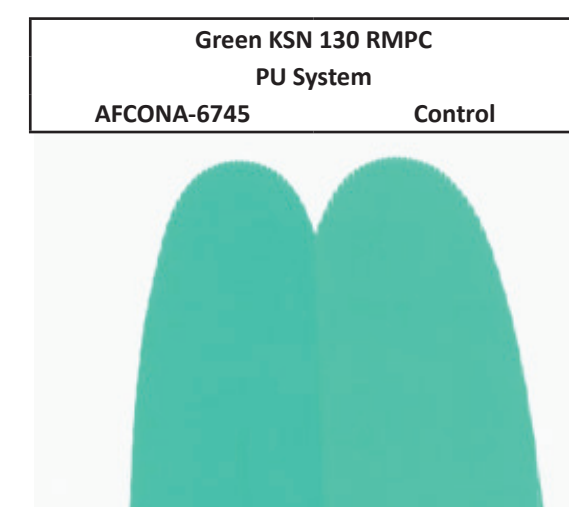
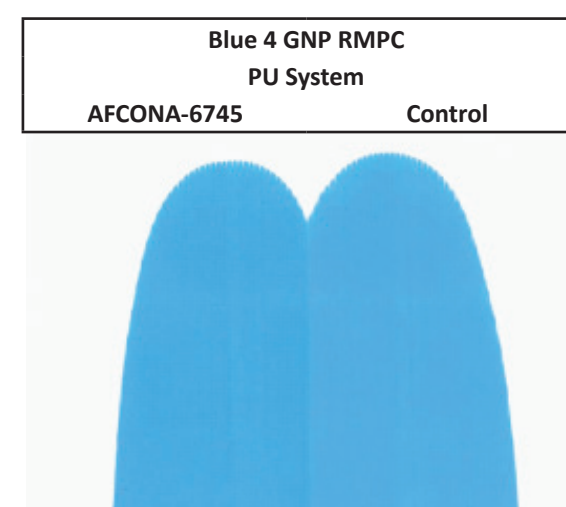
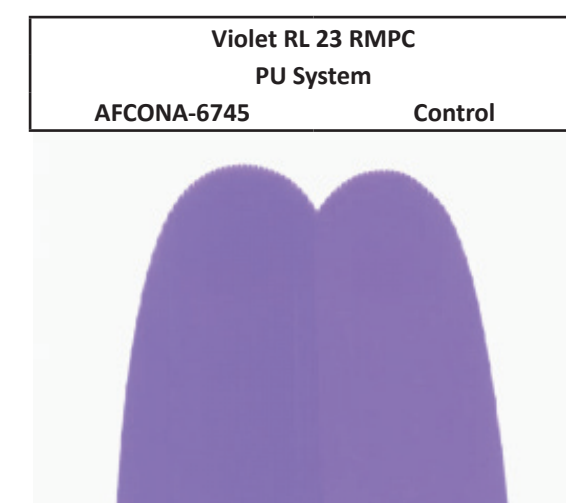


Physical test of pigment concentrate

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

Resin: Polyacrylate with OH value at 3.5%					Ratio: 3% paste in white paint				
PB 15:3					FW 200				
4071					6226				
	L	A	B	ΔE		L	A	B	ΔE
6226	69.1	-21.9	-32.0	-	6226	62.9	-5.0	-0.7	-
4071	-1.0	-0.9	-1.6	2.1	4071	-0.6	+0.2	+0.6	0.9
PG 7					PR 254				
4071					6226				
	L	A	B	ΔE		L	A	B	ΔE
6226	78.5	-28.2	-1.3	-	6226	68.0	+37.0	+4.8	-
4071	-0.4	-1.3	-0.5	1.4	4071	+0.3	-0.3	-0.1	0.4
MA 100					PV 23				
4071					6226				
	L	A	B	ΔE		L	A	B	ΔE
6226	51.4	-4.8	-2.6	-	6226	62.2	+8.7	-30.1	-
4071	+0.5	+0.1	+0.6	0.8	4071	-2.6	+1.7	-2.6	4.1

Remark: Almost all organic pigments paste with AFCONA-4071 gives better colour strength.

Resin: Epoxy Solvent free					Ratio: 3% paste in white paint				
PB 15:3					FW 200				
4071					6226				
	L	A	B	ΔE		L	A	B	ΔE
6226	65.8	-21.9	-32.4	-	6226	57.9	-4.4	+0.7	-
4071	-0.7	-0.3	-0.9	1.2	4071	-0.8	-0.2	+0.1	0.8
PG 7					PR 254				
4071					6226				
	L	A	B	ΔE		L	A	B	ΔE
6226	74.7	-40.3	-1.0	-	6226	66.6	+34.9	+5.4	-
4071	-0.6	-1.0	-0.2	1.2	4071	+0.2	-0.6	-0.4	0.7
MA 100					PV 23				
4071					6226				
	L	A	B	ΔE		L	A	B	ΔE
6226	46.9	-4.3	-1.3	-	6226	58.3	+8.6	-35.6	-
4071	+0.8	+0.1	+0.2	0.8	4071	-0.1	-0.3	-0.4	0.5

Remark: Almost all organic pigments paste with AFCONA-4071 gives better colour strength.

Resin: Polyacrylate with OH value at 3.5%					Ratio: 3%					Resin: Epoxy Resin free					Ratio: 3% paste in white paint				
Iron Oxide Red					Iron Oxide Yellow					Iron Oxide Red					Iron Oxide Yellow				
4071					6226					4071					6226				
	L	A	B	ΔE		L	A	B	ΔE		L	A	B	ΔE		L	A	B	ΔE
6226	67.0	-21.9	+17.6	-	6226	86.3	-0.0	+30.0	-	6226	67.0	-21.9	+17.6	-	6226	86.3	-0.0	+30.0	-
4071	+0.9	-0.8	-0.3	1.2	4071	+0.3	-0.2	-0.5	0.6	4071	+0.9	-0.8	-0.3	1.2	4071	+0.3	-0.2	-0.5	0.6

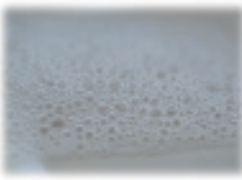
Remark: For iron oxide pigments, better stabilized pigment gives lower colour strength because it gives cleaner and not dirty colour tone.



Additives for water-based systems

1000 Series – Universal resins for pigment concentrates

Product Name	Properties
ACONA-1501	Recommended to combine with High-Molecular-Weight Dispersing agents such as AFCONA-4560, AFCONA-4570 or AFCONA-6226 for preparation of water-based pigment concentrates. Complete water-solubility is reached by adding 8% AMP95.



2000 Series – Silicone-based defoamers and deaerators

Product Name	Properties
AFCONA-2502	Defoamer based on a modified polysiloxane with fine silica. Very high resistance to shear forces and temperatures. Suitable for pigment concentrates, coatings, printing inks and other highly filled and high solid systems.
AFCONA-2503	Defoamer for water-based applications, mainly for the preparation of pigment concentrates. Less tendency to form craters than AFCONA-2502. Also improves levelling.
AFCONA-2505	Strong defoamer for water-based applications. Effective in coating systems ranging from PU dispersions for industrial to acrylic based decorative paints. Also suitable for pigment concentrates and inks for high speed flexo-printing process.
AFCONA-2507	Organically modified polysiloxane with hydrophobic silica, designed for all water based coatings to give excellent performance in defoaming and anti-foaming Suitable to eliminate process foams in PUD and polyacrylic emulsion resins system. Gives good shear force resistance. Suitable for pigment concentrate preparation and defoamer for printing ink systems.
AFCONA-2508	Organically modified polysiloxane which designed to give good defoamer, anti-foam in all water based coatings. It has excellent performance against micro foam. It is very suitable in compressed air spray as well as airless spray.
AFCONA-2524/E	Specifically developed for PU dispersions. Good defoaming as well as levelling and anti-crater action. Based on modified polysiloxane and very easy to incorporate, even in low-shear conditions. Biocide free.
AFCONA-LE1080	VOC-free version of AFCONA-2524/E. Biocide free.
AFCONA-2530	Strong defoamer for water-based applications. Particularly suitable for clear top coat applications. Easy incorporation.
AFCONA-LE1081	VOC-free version of AFCONA-2530.
AFCONA-2590	Good defoamer for all kinds of water-based coatings. Especially developed for airless spray application where it works well against micro foam. More compatible compared to AFCONA-2592.
AFCONA-2592	Strong defoamer for all kind of water-based coatings. Especially developed for airless spray application where it works very well against micro foam.

2000 Series – Non-silicone-based defoamers and deaerators

AFCONA-2270	Defoamer for water-based-systems. Due to very high shear force resistance very suitable for production of pigment concentrates.
AFCONA-2583	Non-silicone defoamer with synthetic silica which gives good defoaming and deaeration performance in all water-based coatings

General indicator on recommendation

- Highly recommended
- Recommended
- Can be used

Chemical	Active Ingredient	Dosage			Acid value mgKOH/g	Amine value mgKOH/g	Flash Point	Water-based System										1000 Series Product Name
		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 and solvent-based	
Modified fatty acid Polymer	>96%	4-5 times of solid dispersant	3-5 times of solid dispersant	3-5 times of solid dispersant	34-45	–	>100°C	●	●	●							●	AFCONA-1501

General indicator on recommendation

- Highly recommended
- Recommended
- Can be used

General indicator on recommendation ● - Highly recommended ● - Recommended □ - Can be used					Water-based System										2000 Series Product Name	
					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
Chemical	Active Ingredient	Dosage (Based on total formulation)	Solvent	Flash Point												
Polysiloxane containing defoamer	82%	0.1~ 0.5%	Hydrocarbon Solvent	117℃		●	●			●			●	●	●	AFCONA-2502
Polysiloxane containing defoamer	>96%	0.05~ 1.0%	—	>100℃	●	●	●	●	●	●	●	●	●	●	●	AFCONA-2503
Organically modified Polysiloxane	>96%	0.05~ 1.0%	—	>100℃	●	●	●	●	●	●	●	●	●	●	●	AFCONA-2505
Organically modified Polysiloxane with hydrophobic silica	>96%	0.05~ 1.0%	—	>100℃	●	●	●	●	●	●	●	●	●	●	●	AFCONA-2507
Polysiloxane containing defoamer	>95%	0.05~ 1.0%	—	>100℃	●	●	●	●	●	●	●	●	●	●	●	AFCONA-2508
Polysiloxane containing defoamer	15%	0.1~ 2.0%	Water/Hydro-carbon solvent	117℃	●	●	●	●	●	●	●	●	●	●	●	AFCONA-2524/E
Polysiloxane containing defoamer	15%	0.1~ 2.0%	Water	>100℃	●	●	●	●	●	●	●	●	●	●	●	AFCONA-LE1080
Solution of a silicone modified polymer	85%	0.2~ 1.0%	DPM	75℃	●	●	●	●	●	●	●	●	●	●	●	AFCONA-2530
Defoaming polymers containing silicone	100%	0.2~ 1.0%	—	>100 ℃	●	●	●	●	●	●	●	●	●	●	●	AFCONA-LE1081
Polysiloxane containing defoamer	33%	0.1~ 1.0%	Water	>100℃	●	●	●	●	●	●	●	●	●	●	●	AFCONA-2590
Polysiloxane containing defoamer	29%	0.1~ 1.0%	Water	>100℃	●	●	●	●	●	●	●	●	●	●	●	AFCONA-2592

Modified Polymer	>96%	0.1~ 0.7%		–	–	●	●	●	●	●	●	●	●	●	●	AFCONA-2270
Modified Polymer with synthetic silica	<95%	0.2~ 1%		–	–	●	●	●	●	●	●	●	●	●	●	AFCONA-2583



Additives for water-based systems

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

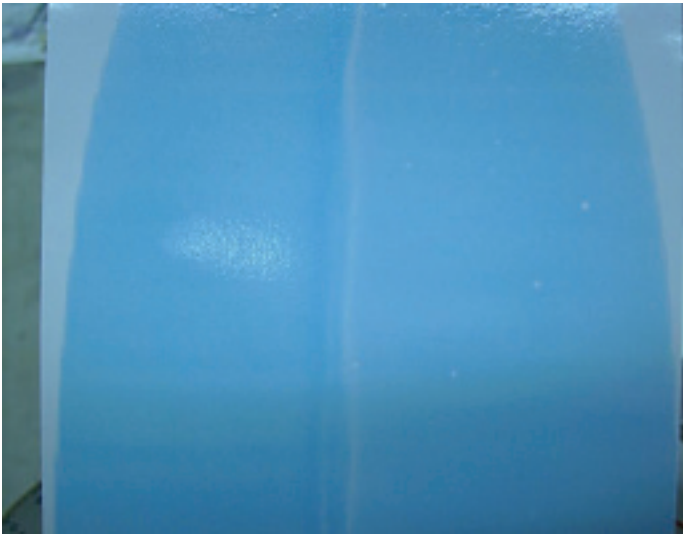
Product Name	Properties
AFCONA-3035E*	Normally used in solvent-based systems, but also effective as a levelling and anti-crater agent in water-based applications.
AFCONA-3522	Emulsion of non-polar polysiloxane in water. Gives water resistance and slip performance. No foam-stabilizing effect. High dosages 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

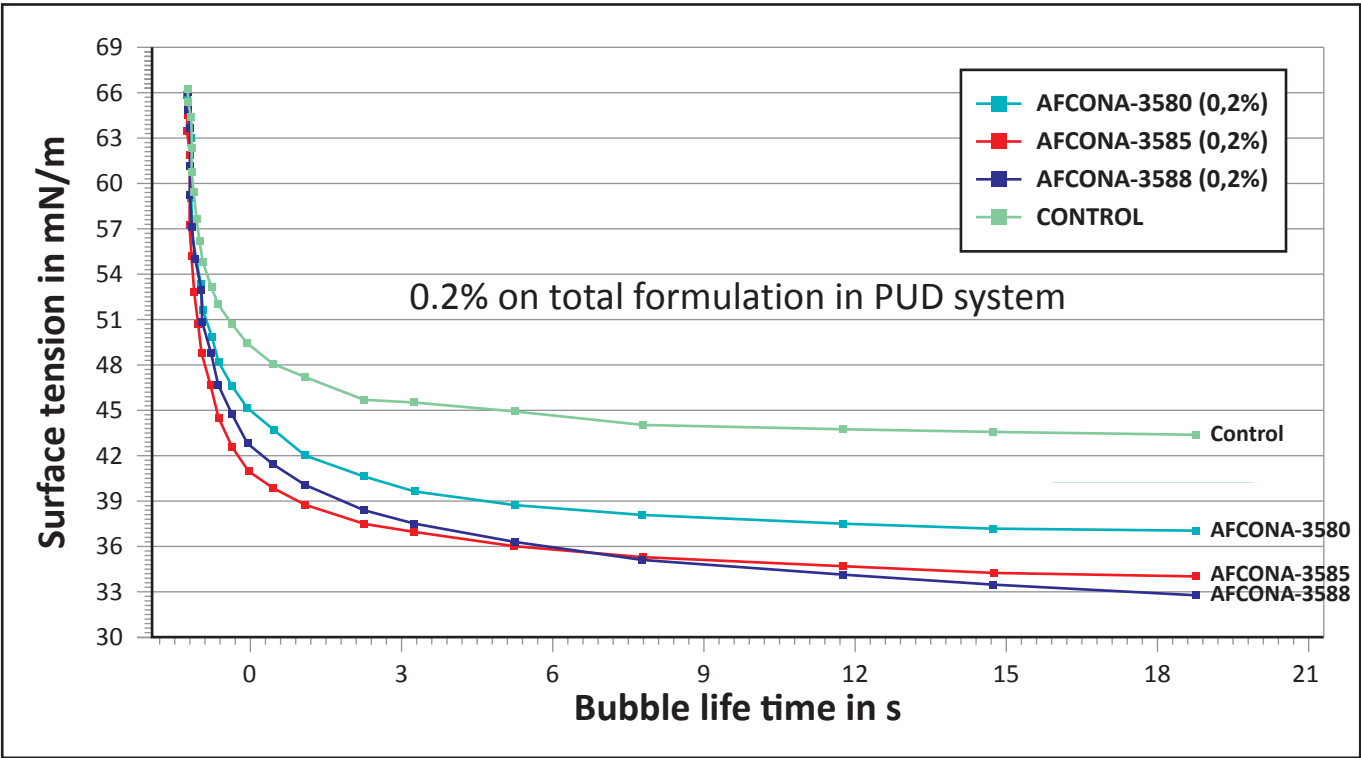
Zero test

General indicator on recommendation

- Highly recommended
- Recommended
- Can be used

<div>General indicator on recommendation</div> <div><div></div> - Highly recommended</div> <div><div></div> - Recommended</div> <div><div></div> - Can be used</div>					Water-based System										additives
					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	
Chemical	Active Ingredient	Dosage (Based on total formulation)	Solvent	Flash Point											3000 Series Product Name
Organically modified polyether polysiloxane	50~54%	0.1~ 0.5%	DPM	75℃											AFCONA-3035E*
Modified polysiloxane emulsion (APE free)	34~36%	0.1~ 1.0%	Water	>100℃											AFCONA-3522
Modified anionic poly-dimethylsiloxane emulsion	58~62%	0.1~ 1.0%	Water	>100℃											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℃											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℃											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

									Water-based System										4000 Series Product Name
Chemical	Active Ingredient	TiO2 (Other Inorganic Pigment)	Organic pigment	Carbon Black	Acid value mgKOH/g	Amine value mgKOH/g	Solvent	Flash Point	Alkyd Emulsion	Alkyd Water-reducible Emulsion	Acrylic Copolymer	Polyurethane 2 Component	Polyurethane Dispersion (PUD)	Epoxy 2 Component	Polyester/Melamine	UV Curing System	Printing Ink Systems	Pigment paste water-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 (m²/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
BET (Brunauer, Emmet and Teller) value - Measurement of surface area pigment by using N2 absorption		
DBP (DiButyl Phthalate) value - Measurement of surface area of carbon black by using DiButyl Phthalate		

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

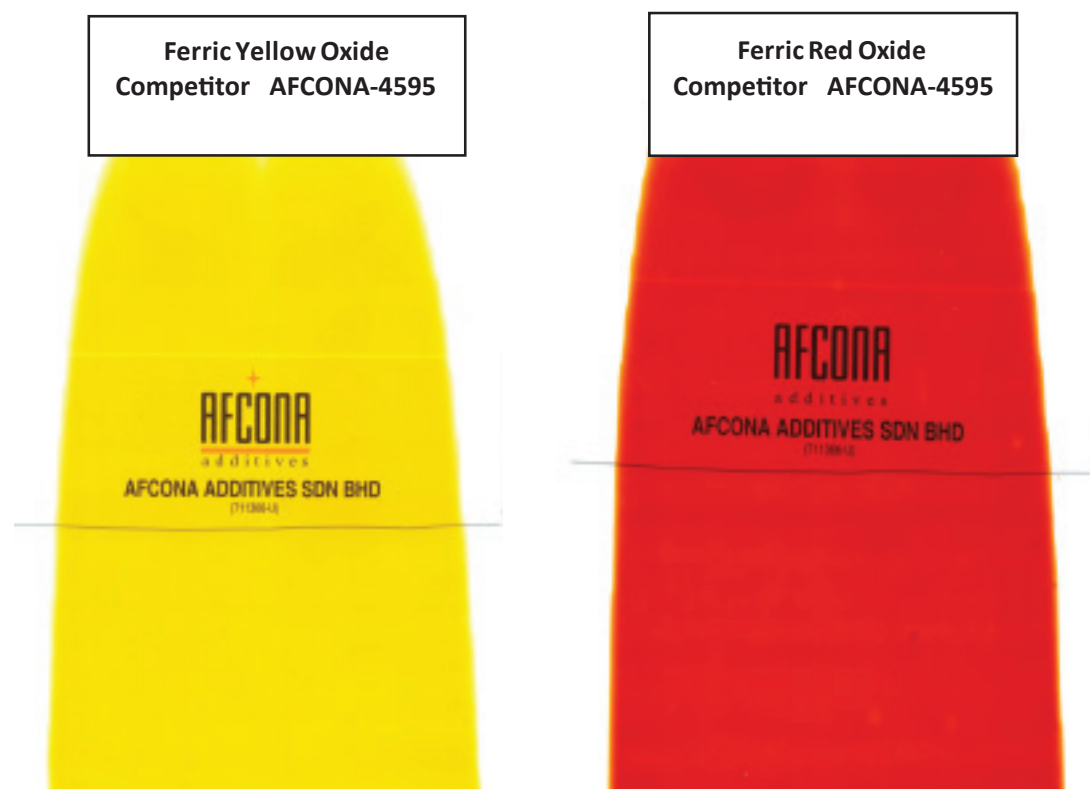
Test formulation in Resin Free Pigment Concentrate

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 AFCONA-4595	4 5	4 5
Ferric Red Oxide	Competitor AFCONA-4595	4 5	4 5

Rating: 1-Poor and 5-Excellent



Pigment	Dispersants	Fineness		Viscosity	
		Initial Sample	After Stability	Initial Sample	After Stability
Ferric Yellow Oxide	Competitor AFCONA-4595	<10 µm <10 µm	<10 µm <10 µm	3 3	3 3
Ferric Red Oxide	Competitor AFCONA-4595	<10 µm <10 µm	<10 µm <10 µm	3+ 3+	3+ 3+
Chrome Yellow P103	Competitor AFCONA-4595	<10 µm <10 µm	<10 µm <10 µm	3 3-	3 3-
Yellow Oxide P4920	Competitor AFCONA-4595	<10 µm <10 µm	<10 µm <10 µm	4 4	3+ 3+
Red Oxide P-K130	Competitor AFCONA-4595	<10 µm <10 µm	<10 µm <10 µm	4 4	4 4
Antanil Yellow 260	Competitor AFCONA-4595	<10 µm <10 µm	<10 µm <10 µm	3 3	3 3-
Hostaperm Pink E	Competitor AFCONA-4595	<10 µm <10 µm	<10 µm <10 µm	3 3	3 3
Novoperm Red F2RK	Competitor AFCONA-4595	<10 µm <10 µm	<10 µm <10 µm	3 3	3 3
Green PG7	Competitor AFCONA-4595	<10 µm <10 µm	<10 µm <10 µm	3 3	3 3
Blue PG 15:3	Competitor AFCONA-4595	<10 µm <10 µm	<10 µm <10 µm	3+ 3+	3+ 3+
Violet RL 23	Competitor AFCONA-4595	<10 µm <10 µm	<10 µm <10 µm	4 4	4 3
Sunblack X-15	Competitor AFCONA-4595	<10 µm <10 µm	<10 µm <10 µm	3 3	3 3
FW 200	Competitor AFCONA-4595	<10 µm <10 µm	<10 µm <10 µm	4 4	4 3+

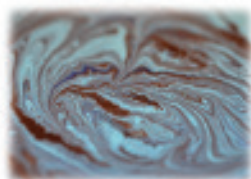
Rating: 1-High viscosity and 5-Low viscosity

Pigment	Dispersants	Rub Out Test		Tinting Strength	
		Initial Sample	After Stability	Initial Sample	After Stability
Chrome Yellow P103	Competitor AFCONA-4595	5 5	5 5	5 5	5 5
Yellow Oxide P4920	Competitor AFCONA-4595	5 5	5 5	5- 5	5 5
Red Oxide P-K130	Competitor AFCONA-4595	5 5	5 5	5 5	5- 5
Antanil Yellow 260	Competitor AFCONA-4595	5 5	5 5	5 5	5 5
Hostaperm Pink E	Competitor AFCONA-4595	5 5	5 5	5 5	5 5
Novoperm Red F2RK	Competitor AFCONA-4595	5 5	5 5	5 5	5- 5
Green PG7	Competitor AFCONA-4595	5 5	5 5	5 5-	5 5
Blue PG 15:3	Competitor AFCONA-4595	5 5	5 5	5 5	5 5
Violet RL 23	Competitor AFCONA-4595	5 5	5 5	5 4	5 5-
Sunblack X-15	Competitor AFCONA-4595	5 5	5 5	5- 5	5 5-
FW 200	Competitor AFCONA-4595	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

<div>General indicator on recommendation</div> <div><div></div> - Highly recommended</div> <div><div></div> - Recommended</div> <div><div></div> - Can be used</div>										Water-based System										additives	
										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
Chemical	Active Ingredient	Dosage			Acid value mgKOH/g	Amine value mgKOH/g	Solvent	Flash Point	5000 Series Product Name												
Alkylol ammonium salt of a HMW carboxylic acid	50~54%	TiO2 (Other Inorganic Pigment) 0.5~2%	Organic pigment 2.~5%	Carbon Black 20~60%	90~110	95~130	Water	>100°C	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	AFCONA-5071**
HMW block copolymer with pigment affinity groups	>96%	2~3% (2~4%)	20~40%	20~60%	—	17~25	—	—	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	AFCONA-5585*/**
HMW block copolymer with pigment affinity groups	>96%	2~3% (2~4%)	20~40%	20~60%	—	15~25	—	—	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	AFCONA-5586*/**

General indicator on recommendation
■ - Highly recommended
■ - Recommended
■ - Can be used

General indicator on recommendation <div><div></div> - Highly recommended</div> <div><div></div> - Recommended</div> <div><div></div> - Can be used</div>									Water-based System											6000 Series Product Name	
									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		
									Chemical	Active Ingredient	TiO2 (Other Inorganic Pigment)	Organic pigment	Carbon Black	Acid value mgKOH/g	Amine value mgKOH/g	Solvent	Flash Point				
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**

afcon additives		PRODUCT SELECTOR															
		Solvent-based application					Water-based application										
DISPERSION RELATED	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					
	Higher color strength	Inorganic pigment	5207/5209	4201/PF1611	4071+6788	5285/6226	5071/6226	5071/6226	5071/6226	5071/6226	5071/6226	5071/6226					
	Lower millbase viscosity	Organic pigment	5207/5209	4067/4201	4071+6788	4530/4595	4530/4595	4530/4595	4530/4595	4530/4595	4530/4595	4530/4595					
	Better pigment stability	Carbon Black	5207/5209	4067/4201	4071+6788	4530/4595	4530/4595	4530/4595	4530/4595	4530/4595	4530/4595	4530/4595					
	Co-grinding		5209	5066	Not applicable	4530/4570	4530/4570	4530/4570	4530/4570	4530/4570	4530/4570	4530/4570					
	Color acceptance		Not applicable	Not applicable	4570/6226	4570/6226	4570/6226	4570/6226	4570/6226	4570/6226	4570/6226	4570/6226					
SURFACE RELATED	Reduces flooding and floating		5065	5066	5065/6226	4570/6226	4570/6226	4570/6226	4570/6226	4570/6226	4570/6226	4570/6226					
	Cost effective		5209	5290/PF1611	PF1611	4570/6226	4570/6226	4570/6226	4570/6226	4570/6226	4570/6226	4570/6226					
	Improves mar resistance, increases slip		3030/3233	3251/3835	Not applicable	3522/3571	3522/3571	3522/3571	3522/3571	3522/3571	3522/3571	Not applicable					
	Anti-cratering		3030/3233	3034+/-3700	Not applicable	3570+/-3585	3570+/-3585	3570+/-3585	3570+/-3585	3570+/-3585	3570+/-3585	Not applicable					
	Improves substrate wetting		3670/3700	3670/3700	Not applicable	3500/3570	3500/3570	3500/3570	3500/3570	3500/3570	3500/3570	Not applicable					
	Reduces Bénard cells		3030/3233	3251	Not applicable	3585/3588	3585/3588	3585/3588	3585/3588	3522	3522	Not applicable					
AIR RELATED	Improves levelling		3030/3233	3250+3700	Not applicable	3233+3570	3233+3570	3570	3570+3585	3522+3570	3522+3570	Not applicable					
	Defoaming		2040/2763	2720/2763	Not applicable	2524/2530	2524/2530	2501	2524/2530	2524/2530	2524/2530	2524/2530					
	Deaeration		2040/2763	2720/2763	Not applicable	2503/2592	2592	2524/2530	2505	2503	2503/2592	2507					

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

		AIR DRY ALKYD (LONG AND MEDIUM OIL)	INDUSTRIAL BAKING PAINT ALKYD/MELAMINE ACRYLIC/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	Inorganic pigment	5207/5209	4011/5280	4071/5280	4071/5280	4011/4071	4071/5290	4011/5251	4011/5251	4011	4011/4063	4200/4201
	Lower millbase viscosity	Organic pigment	5207/5209	4063/4067	4071	4050/4071	4047/4063	4071/4201	4071/4570	4050/4063	4080	4063/4067	4201
	Better pigment stability	Carbon Black	5207/5209	4047/4067	4063	4047/4067	4047/4067	4201	4063/4570	4047/4063	4080	4063/4067	4201
	Co-grinding		5207/2509	4017/5066	5290	4017/5066	4017/5066	4017	4017	4017	4017	4017	5065
	Color acceptance		4570/6225										
	Reduces flooding and floating		6226	5066	5065/6226	5065/6226	5065	5066	5066/6226	5066/6226	5066/6226	5066	5065/6226
SURFACE RELATED	Cost effective		5209	5280/5290	4011	5209	4071/5290	4071/5290	4071/5290	4071/5290	4071/5290	4011/5280	5209
	Improves mar resistance, increases slip		3030/3233	3251/3285	3251/3285	3251/3285	3251/3285	3236/3239	3035/3251	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	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
	Reduces Bénard cells		3030/3233	3030/3233	3033/3251	3030/3251	3030/3251	3700	3035/3251	3030/3670	3700	3670	3033
	Improves levelling		3030/3233	3251/3285	3251+3670	3033+3670	3251+3670	3236+3700	3035+3670	3239+3670	3236+3670	3700	3033/3251
AIR RELATED	Defoaming		2040/2763	2021/2720	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	2722/2727	2040/2727	2045/2727	2045/2727	2038	2038/2040

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



AFCONA Additives Sdn Bhd
21, Jalan Anggerik Mokara 31/47
Kota Kemuning 40460 Shah Alam
Selangor Darul Ehsan, Malaysia
Tel.: +603-5122 2289
Fax: +603-5122 8289
Website: www.afcona.com.my
E-mail: afcona@afcona.com.my

**AFCONA (NANCHONG)
SPECIALTY POLYMERS Co., Ltd**
No.1 Zhibei Road, Hexi Town Jianling District,
Nonchong City 637939 SICHUAN, P. R. CHINA
Tel.: +86 21 63 8081 00
Website: www.afcona.com
E-mail: info@afcona.com

AFCONA Additives BV
Amperèstraat 34
1704 SN Heerhugowaard
The Netherlands
Tel.: +31 (0)72-571 15 24
Website: www.afcona.com
E-mail: info@afcona.com

AFCONA Additives USA Inc.
5685 Hudson Industrial Parkway
Hudson, Ohio 44236
USA
Tel.: +1(330) 650-0971
Fax: +1(330) 650-0954
Website: www.afcona.com
E-mail: info@afcona.com