

We will start soon...

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Your **hosts** for this call

Formulation Additives
for Composites and
Gel-Coats



Anne Curinier
Presenter



Andrea Schamp/
Kerstin Schurig
Chat



Anne Curinier

**Technical Sales
Performance Additives
EMEA region**



Formulation Additives for Composites and Gel-Coats

Ludwigshafen – June, 24th, 2020

Agenda

1. Introduction

2. Formulation Additives for composites & gel coats

- Air release agents
- Surface modifiers
- Dispersing & wetting agents
 - For fillers loadings
 - For pigments dispersions
- Anti-separation agents

3. Summary

Our comprehensive portfolio enables solutions for various industries



..... BASF is the premiere provider of **Performance & Formulation Additives**
for the paints and coatings industry



Strong brands to empower your business

Water-based brands	Application	Solvent-based* brands
Dispex® / Dispex® Ultra	DISPERSING AGENTS	Efka®
Foamaster® / FoamStar®	DEFOAMERS	Efka®
Rheovis® (organic) / Attagel® (clays)	RHEOLOGY MODIFIERS	Efka®
Hydropalat®	WETTING AGENTS	Efka®
Loxanol®	FILM-FORMING AGENTS	Efka®
Tinuvin®	LIGHT STABILIZERS	Tinuvin®
Irganox®	ANTIOXIDANTS	Irganox® / Irgafos® / Irgastab®

*Efka® includes also High Solids and 100% Solid Systems

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2. Formulation Additives for composites & gel coats

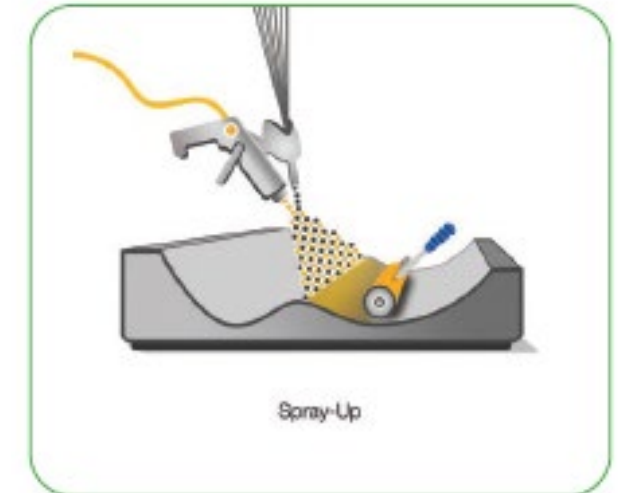
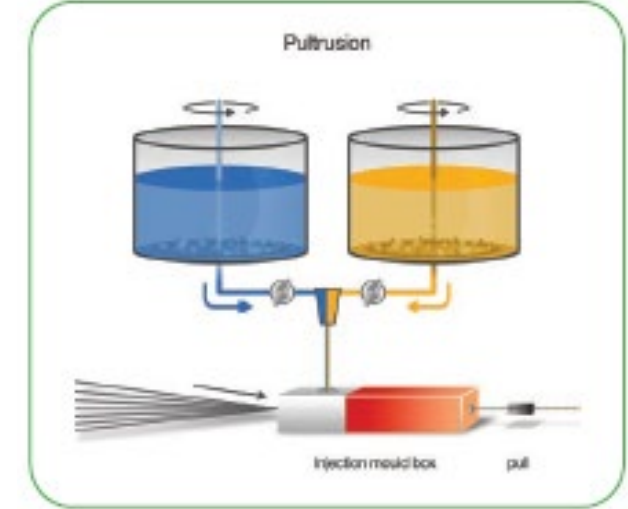
- Air release agents
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3. Summary

Scope

Our portfolio accompanies formulators of thermoset systems, based on different matrix' resins (UPE, epoxies, vinyl esters ..) as used in a number of processes to deliver finished parts

- ✓ Continuous processes (e.g. **pultrusion**)
- ✓ Injection processes (e.g. **Bulk Moulding Compounds**
thermoplastic injection is excluded)
- ✓ Compression processes (e.g. **Sheet Moulding Compounds**)
- ✓ Manual processes

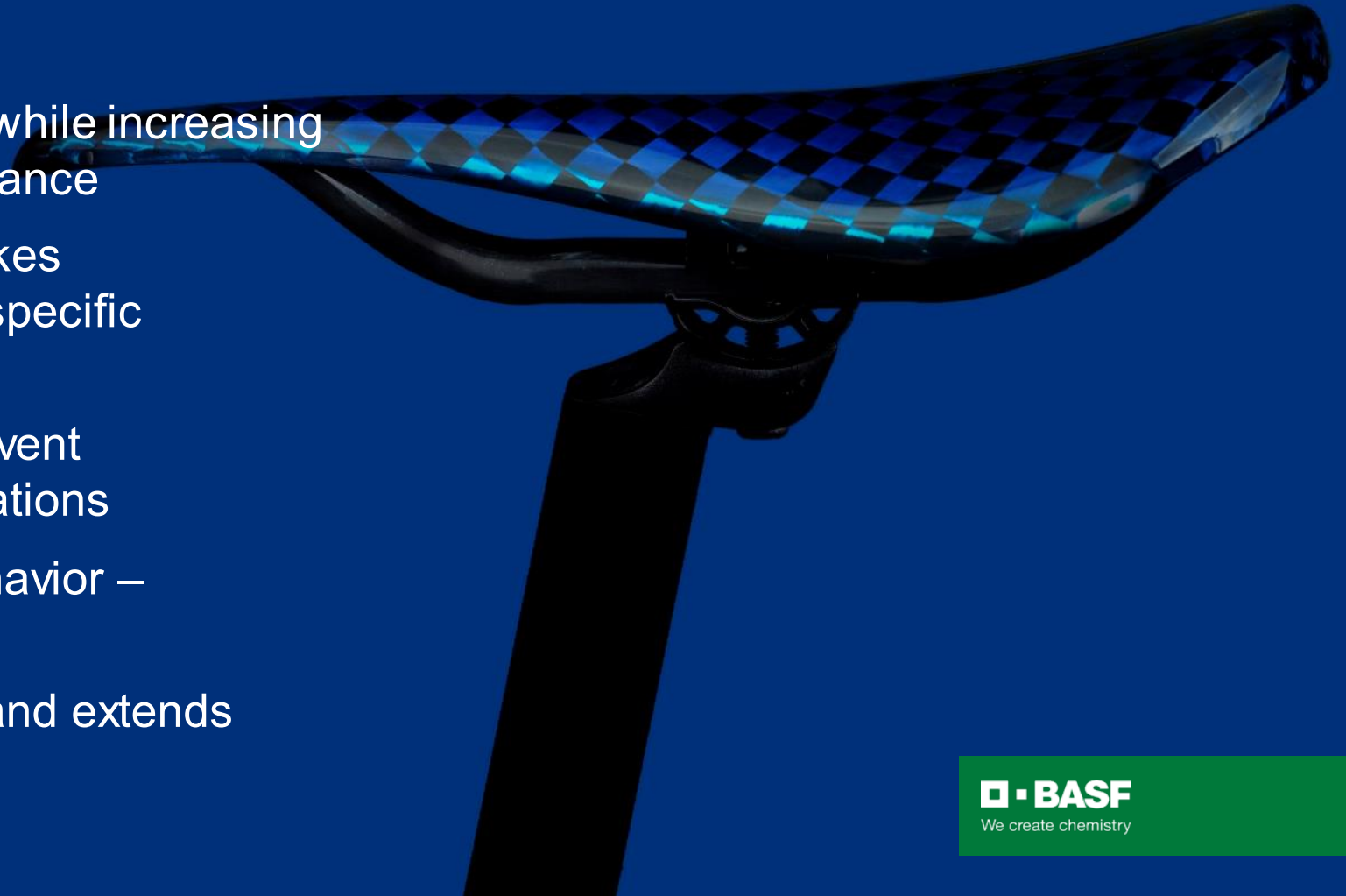


COMPOSITES

Lighter, stronger, better

Buildings, Boats, Automobiles and more

- Reduce weight of composite parts while increasing their rigidity, resilience and performance
- Optimize matrix properties and makes reinforcements more adaptable to specific applications
- Stabilize pigments and fillers to prevent sedimentation in composite formulations
- Improve flow, slip and rheology behavior — contributes to proper fiber wetting
- Enhance quality of laminate finish and extends durability of composite material



Agenda

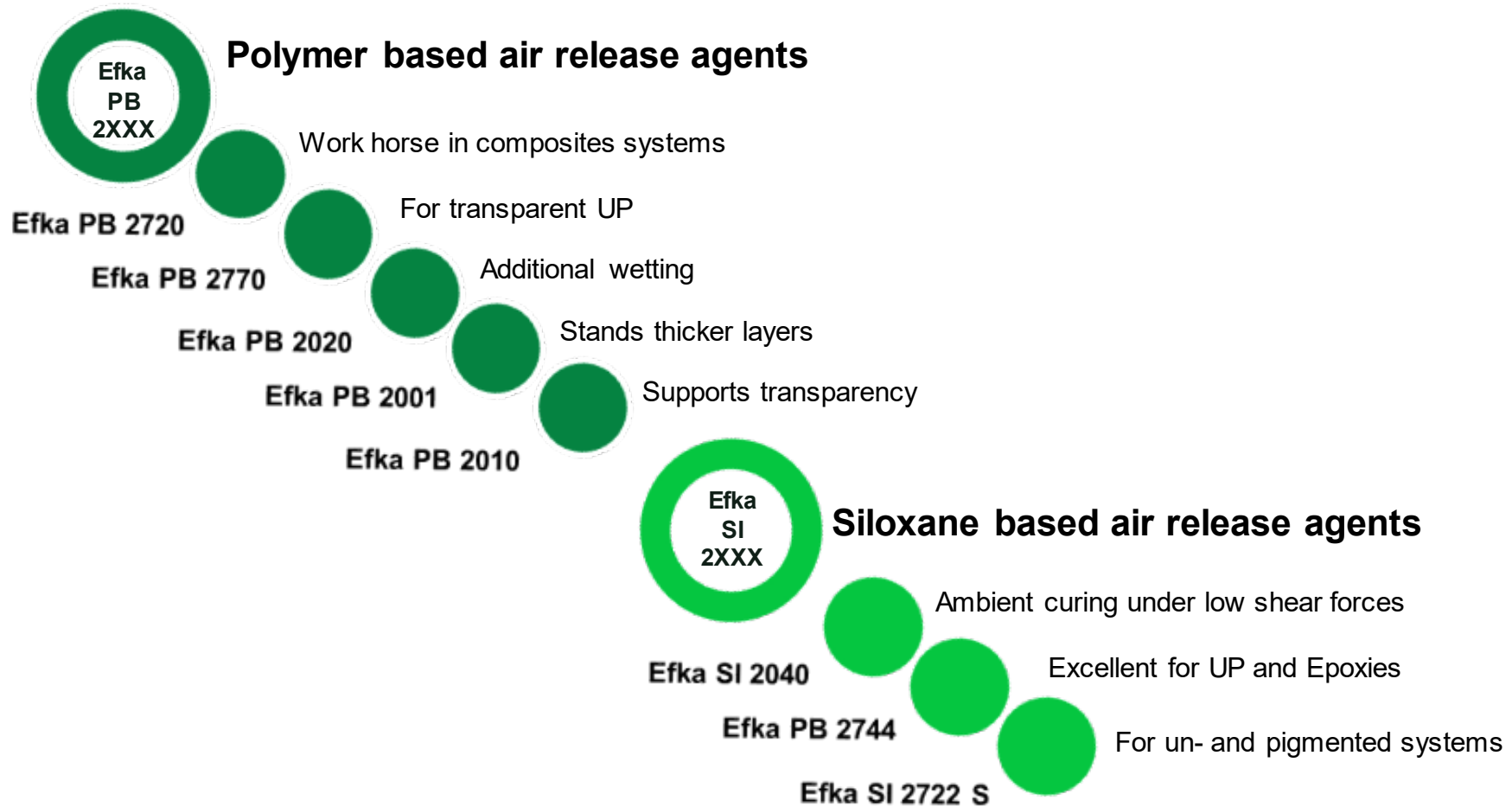
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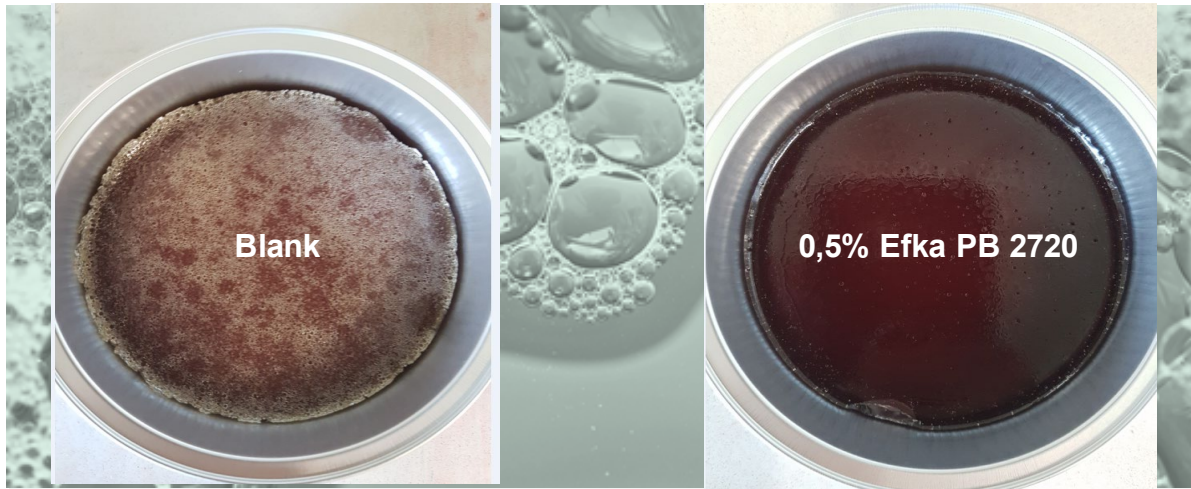
3. Summary

Air release agents for gelcoats and composites



Efka® PB 2720

Solution of deaerating substances, silicone-free



Application:

Efka® PB 2720 finds use in many processes, including casting.

Efka® PB 2720 is of standard use in UPE systems including gel-coats.

Efka® PB 2720 is a cost effective air release agent.

Performance highlights:

- Silicone-free air release agent, supports de-aeration during application of compounds or laminates
- Broadest UPE systems compatibility
- Suited for filled/reinforced thermoset systems such as UPE
- Synergistic effect with Efka FA 4644 / 4647

Characteristic Values:

Appearance	colorless, clear to slightly hazy liquid
Density at 20°C	~ 0.84 g/cm ³
Solvent	alkyl benzene/industrial spirit (boiling range 140–165°C)

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3. Summary

Surface modifiers for gelcoats and composites

Supports air release



Silicone free non-modified polyacrylates

- Efka FL 3750 (100%)
- Efka FL 3740 EH (100% active)
- Efka FL 3741 (100% active)
- Efka FL 3778 (70% active)

Silicone free fluorocarbon-modified polyacrylate

- Efka FL 3277 (100% active)

Organically modified polysiloxane

- Efka SL 3236 (100% Active)
- Efka SL 3035 (52% Active)
- Efka SL 3030 (15% Active)

Providing slip

Providing levelling

Additional wetting

Efka® FL 3277

Surface modifiers - Fluorocarbon modified polyacrylate



Application:

Efka® FL 3277 is a surface modifier suited for BMC & gel-coats UPE. Efka® FL 3277 gives excellent levelling performance in solvent-free epoxies & polyurethane thick systems.

Performance highlights:

- Fluorocarbon modified polyacrylate
- Stronger anti-cratering effect
- Provides additional substrate wetting

Characteristic Values:

Appearance	slightly hazy, lightly colored liquid
Active ingredients	~ 98.5 %
Flash point	85 °C (185 °F)
	~ 1.470
Color	= < 2

Agenda

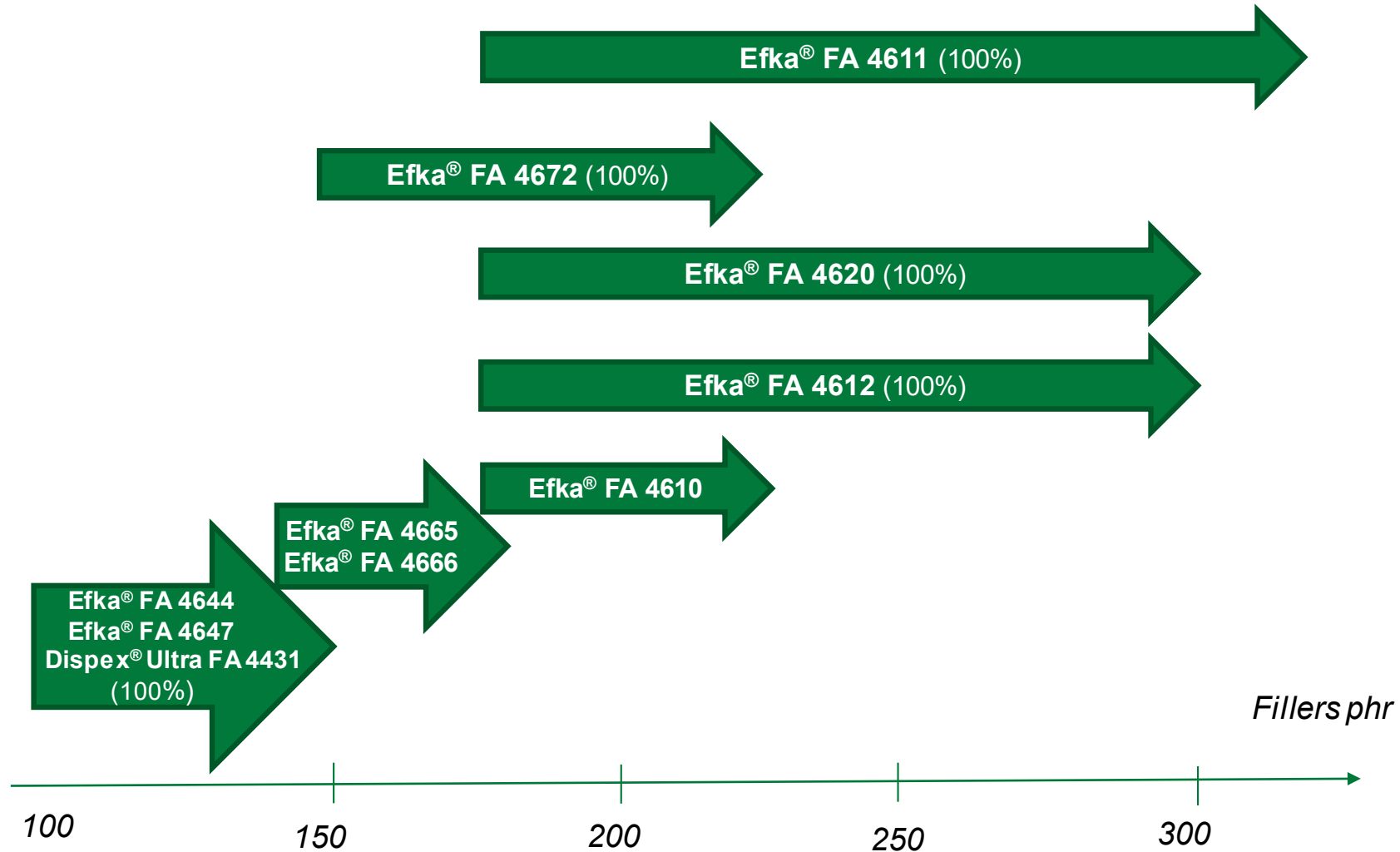
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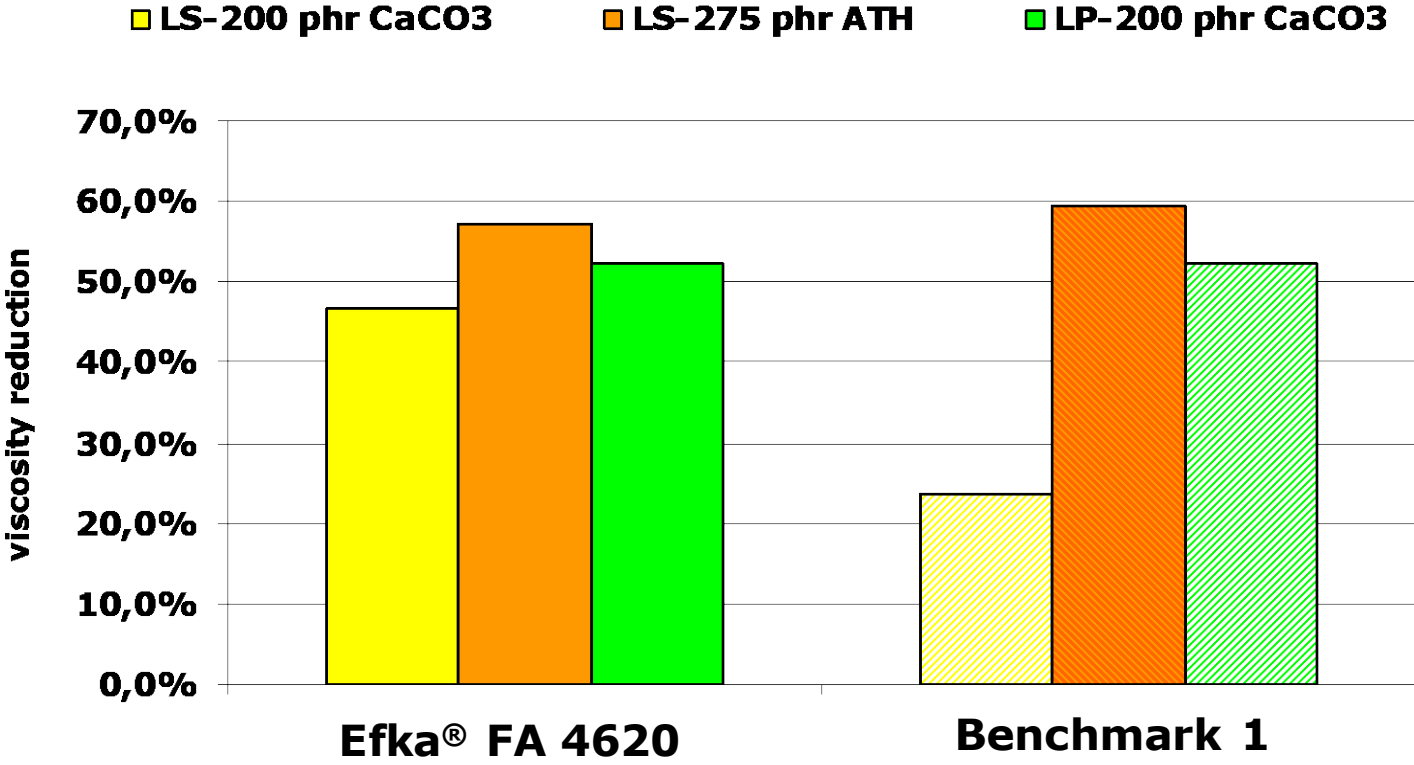
3. Summary

Wetting & dispersing agents for inorganics in gelcoats and composites



Low molecular weight dispersants - Indicative ranking in UPE systems

Wetting & dispersing agents for inorganics in gelcoats and composites



Efka® FA 4620 - ex: towards CaCO₃ / ATH in SMC compound

Viscosity reduction of different SMC formulations

Efka® FA 4620

Solvent-free wetting agent for inorganic powders in 100% systems, non aqueous compounds



Application:

Efka® FA 4620 is an acidic polyester wetting & dispersing agent.

Efka® FA 4620 finds use in compounds & gel-coats and fits well in most UPE based systems for example for SMC, gel-coats formulations.

Not designed for Co-accelerated systems.

Sustainability highlights:

- Free of solvents

Performance highlights:

- Wetting & dispersing agent for fillers like CaCO₃, ATH
- Improves wetting and incorporation of fillers
- Reduces viscosity of compounds or allows higher filler loading
- Contributes to a more suited rheology to the related processes
- Supports hiding power of TiO₂

Characteristic Values:

Appearance	Clear brownish liquid
Gardner colour	< / = 8
Solids	~100%
Acid value	~ 290 mg KOH
Density	~ 1.25 g/cm ³

Wetting & dispersing agents for organics

High molecular weight dispersants in composites & gelcoats

High molecular weight dispersing agents are especially suited for coloured organic pigments thus of special interest for pigment pastes in particular or for gel-coats.

Examples of most used dispersing agents

Polyurethane polymers:

Efka® PU 4010 / Efka® PU 4063 / Efka® PU 4047 / Efka® PU 4050

Polyacrylate polymers:

Efka® PA 4402 / Efka® PA 4401

Advanced polymers:

Efka PX 473X grades



Agenda

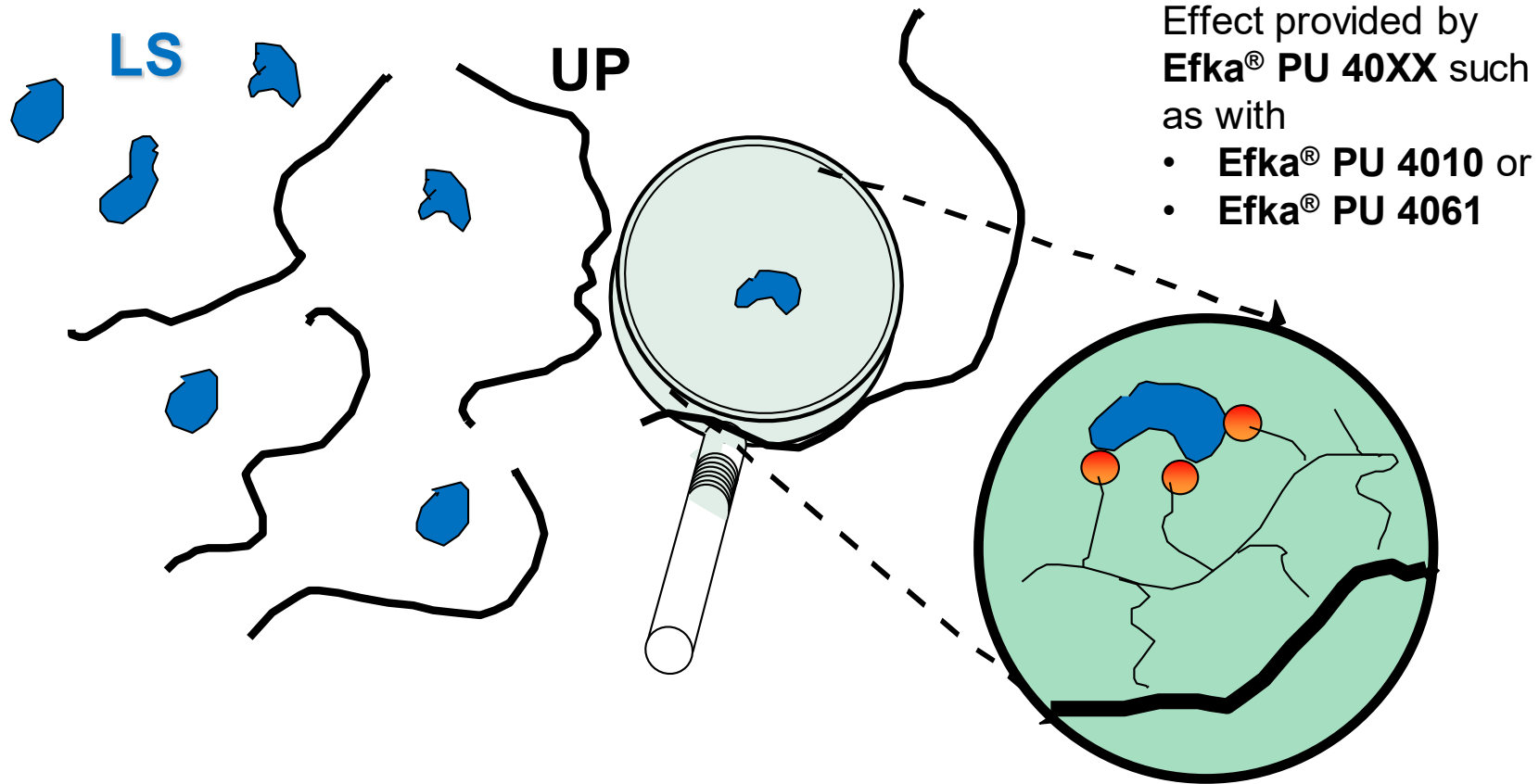
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Anti-separation agents for filled/unfilled UPE resin systems



Principle of interaction between UPE resin and LS or LP additives

Anti-separation agents for filled UPE resin systems



Efka® PU 4010's contribution to provide a homogeneous compound

Effect in a filled and pigmented compound

Agenda

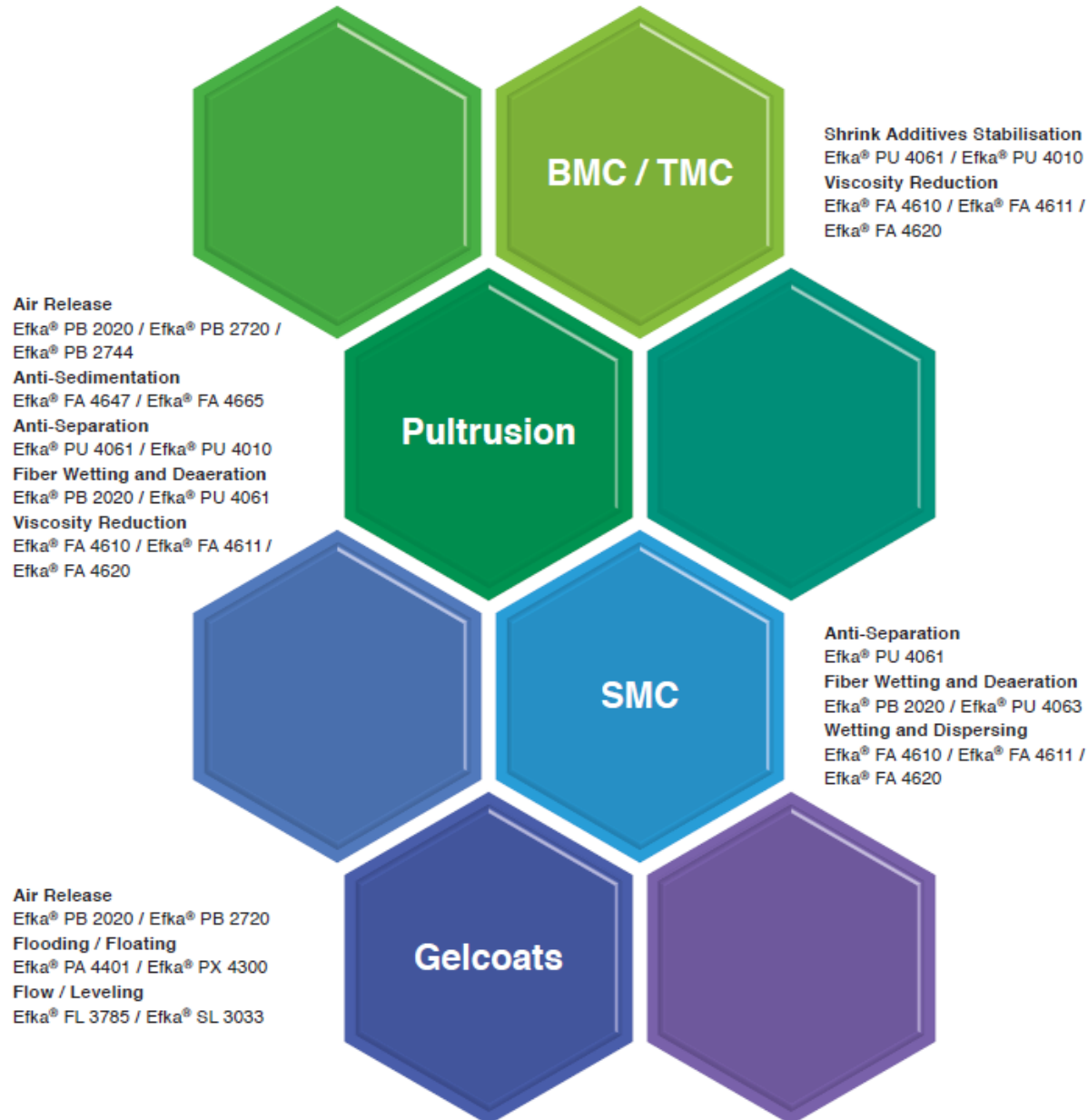
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BASF's Formulation Additives Focus Portfolio for Composites & Gelcoats



www.basf.com/additives

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We create chemistry

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