

We will start soon...

To make this call most efficient for everybody, we have **muted** your phones.

For questions, kindly use the **chat function**.

Should you have trouble hearing us, kindly choose “**use computer for audio**”. Should there still be issues, kindly try **reconnecting** to the webinar.

The **presentation** will be **shared** with all participants after the webinar.

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Your **hosts** for this call

Efka® PB 2014

A sustainable defoamer for solvent-based industrial and wood coatings



Lars Hoffmann
Presenter



Andrea Schamp/
Kerstin Schurig
Chat

We will use Mentimeter during the presentation

Use the Following Code: 3011 9594

What is Mentimeter?

- Interactive and easy tool for feedback/interaction
- Anonymous participation
- Real-time aggregated responses

How to access

Please use your smartphone or laptop
(best with google chrome)

Go to www.menti.com





Lars Hoffmann

**Technical Sales
Formulation Additives
EMEA region**



We create chemistry

Efka[®] PB 2014

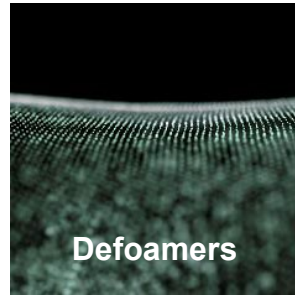
**A sustainable defoamer for
solvent-based industrial and
wood coatings**

Ludwigshafen, March 10th, 2021

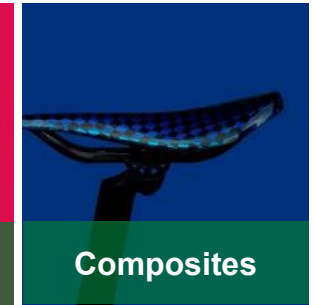
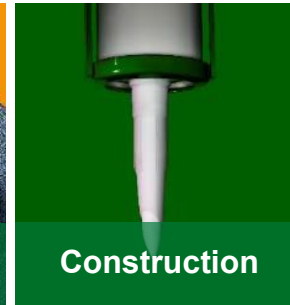
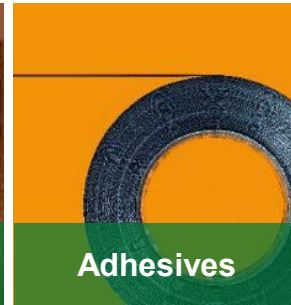
Agenda

1. Introduction
2. Market trends of solvent based coatings
3. Classification and labeling of organic solvents
4. Performance and sustainability benefits
5. 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

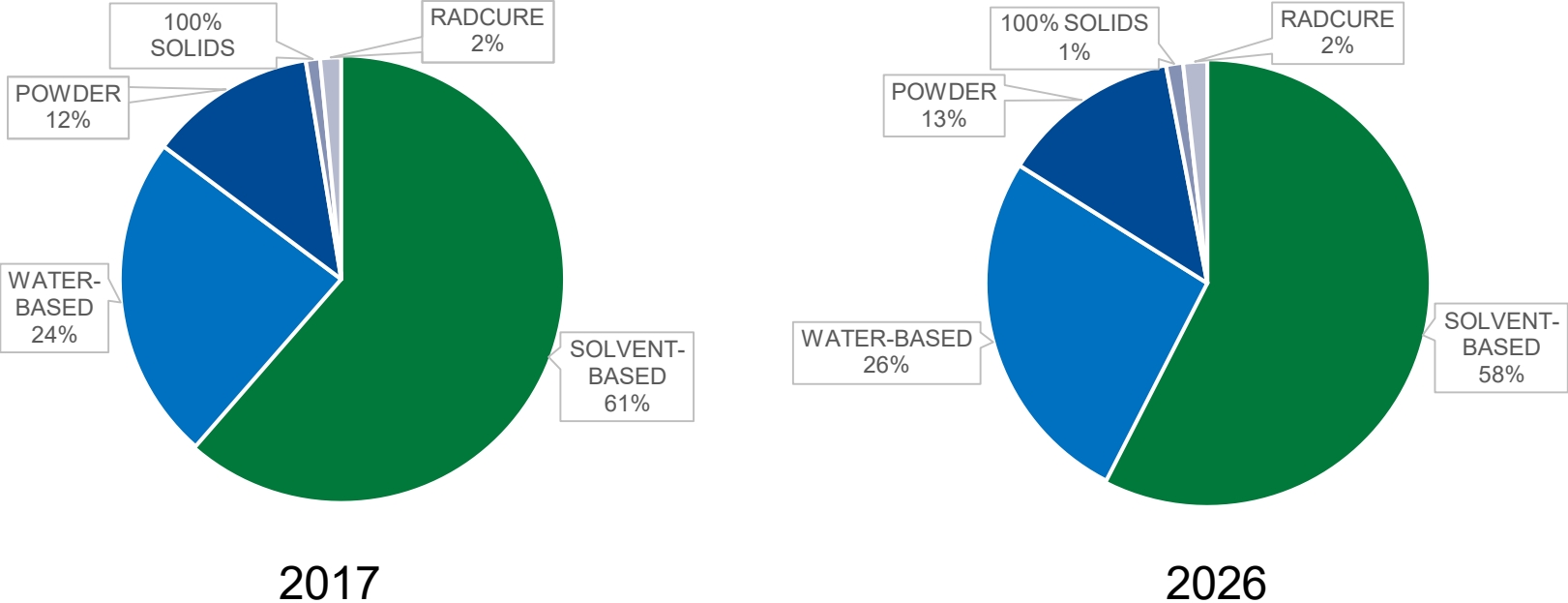
Water-based brands	Application	Solvent-based* brands
Dispex [®] / Dispex [®] Ultra	DISPERSING AGENTS	Efka [®]
Foamaster [®] / FoamStar [®]	DEFOAMERS	Efka [®]
Rheovis [®] (organic) / Attagel [®] (clays)	RHEOLOGY MODIFIERS	Efka [®]
Hydropalat [®]	WETTING AGENTS	Efka [®]
Loxanol [®]	FILM-FORMING AGENTS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

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

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Automotive & Industrial Coatings Market Technologies in EMEA 2017 - 2026



Source: KNG 2017

There will also be a market for solvent-based coatings in the future

Mentimeter

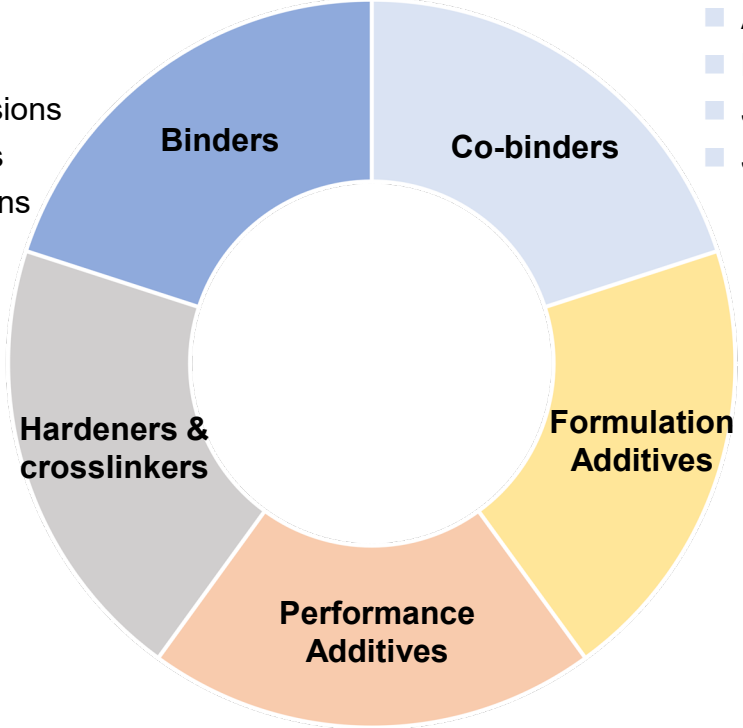
- How do you see the share of solvent-based applications in industrial and wood-coatings in future?
 - ▶ Higher than today
 - ▶ Same as today
 - ▶ Lower than today
- Please go to www.menti.com and use the code **3011 9594** to make your vote!

BASF unique portfolio offering for Coatings

Formulation component variety meets market needs

- Joncryl® Polyols
- Sovermol® Bio-based Polyols
- Laroflex® PVC Resin
- Joncryl® & Luhydran® & Basonol® AC acrylic Dispersions
- Joncryl® U & Basonol® PU Polyurethane Dispersions
- Acronal® Pro – acrylic corrosion protective Dispersions
- Laromer® UV Resins

- Basonat® HDI-based Polyisocyanates
- Luwipal® melamine-formaldehyde Resins
- Plastopal® urea-formaldehyde Resins



- Basonol® HPE Hyperbranched polyols
- Acronal® L&F & Lutonal® plastizisers
- Laropal® grinding Resin
- Joncryl® & Luhydran® & Basonol® AC – acrylic Dispersions
- Joncryl® U & Basonol® PU – Polyurethane Dispersions

- Efka® non-aqueous additives
- Dispex® & Dispex Ultra® Dispersing Agents
- Foamaster® & Foamstar® aqueous Defoamer agents
- Hydropalat® aqueous additives
- Rheovis® aqueous rheology modifiers

- Tinuvin® Light stabilizers
- Irganox® & Irgafos® Antioxidants
- Basionics® Kat 1 Catalyst

Existing portfolio



Sustainability demands in general industry coatings

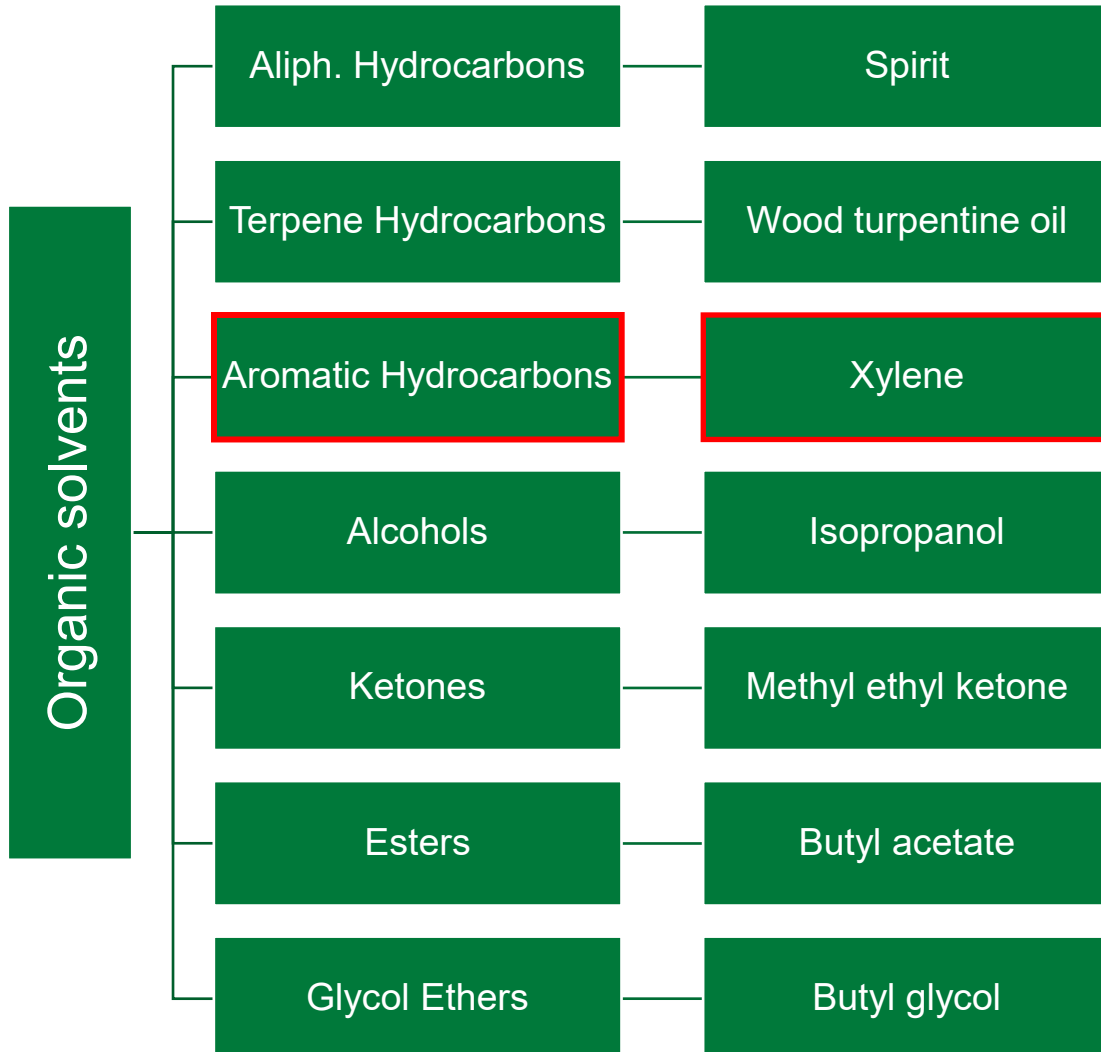
- With our formulation additives, a wide array of industrial coatings can be optimized for lower emissions, faster production, reduced consumption of raw materials and a longer lifespan







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Typical solvent classes used for paints and coatings

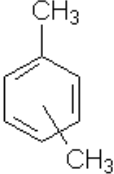
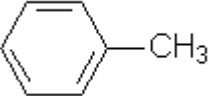
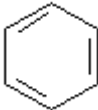
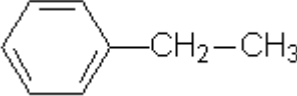
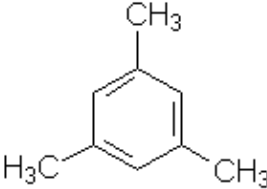







- Hydrocarbons are widely used as solvents in paints and coatings because of technical and economical reasons
- Aromatic and aliphatic solvents have different hazard potential
- Labeling and classification depend on concentration and the composition
- Solvents like naphtha contain aliphatic and aromatic hydrocarbons with distinct composition
- Most aromatic solvents have restrictive labeling

			
GHS08 Serious Health Hazards	GHS07 Health Hazard	GHS09 Hazardous to the Environment	GHS02 Flammable



- Specific aromatic solvents are suspected of being carcinogenic and mutagenic.

Classification of Aromatic hydrocarbons

Xylene, mixture of isomers	Toluene	Benzene	Ethylbenzene	Mesitylene
				
CAS No: 1330-20-7	CAS No: 108-88-3	CAS No: 71-43-2	CAS No: 100-41-4	CAS No: 108-67-8
				
<p>H226: Flammable liquid and vapour. H304: May be fatal if swallowed and enters airways. H312+H332: Harmful in contact with skin or if inhaled. H315: Causes skin irritation. H319: Causes serious eye irritation. H335: May cause respiratory irritation. H373: May cause damage to organs through prolonged or repeated exposure.</p>	<p>H225: Highly flammable liquid and vapour. H304: May be fatal if swallowed and enters airways. H315: Causes skin irritation. H336: May cause drowsiness or dizziness. H361d: Suspected of damaging the unborn child. H373: May cause damage to organs through prolonged or repeated exposure. H412: Harmful to aquatic life with long lasting effects.</p>	<p>H225: Highly flammable liquid and vapour. H304: May be fatal if swallowed and enters airways. H315: Causes skin irritation. H319: Causes serious eye irritation. H340: May cause genetic defects. H350: May cause cancer. H372: Causes damage to organs through prolonged or repeated exposure. H412: Harmful to aquatic life with long lasting effects.</p>	<p>H225: Highly flammable liquid and vapour. H304: May be fatal if swallowed and enters airways. H332: Harmful if inhaled. H373: May cause damage to organs through prolonged or repeated exposure.</p>	<p>H226: Flammable liquid and vapour. H304: May be fatal if swallowed and enters airways. H315: Causes skin irritation. H319: Causes serious eye irritation. H335: May cause respiratory irritation. H411: Toxic to aquatic life with long lasting effects.</p>

- Xylene is till now excepted as aromatic solvent in various applications.
- Other derivates of Benzene appear as impurities in solvent mixtures

Classification of Hydrocarbon mixtures

Naphtha; Low boiling point naphtha	Petroleum spirit, containing aromatic compounds
Mixture of aliphatic and aromatic hydrocarbons	Mixture of aliphatic and aromatic hydrocarbons
CAS No: 8030-30-6	
	
<p>H225: Highly flammable liquid and vapour. H304: May be fatal if swallowed and enters airways. H315: Causes skin irritation. H336: May cause drowsiness or dizziness. H340: May cause genetic defects. H350: May cause cancer. H361: Suspected of damaging fertility or the unborn child. H411: Toxic to aquatic life with long lasting effects.</p>	<p>H226: Flammable liquid and vapour. H304: May be fatal if swallowed and enters airways. H336: May cause drowsiness or dizziness. H411: Toxic to aquatic life with long lasting effects.</p>

- Labeling of hydrocarbon solvents mixtures highly affected by the composition
- Impurities with aromatic solvents have a significant impact on classification
- Mixtures of solvents used for the manufacturing of coatings as well as a component in raw material e.g. additives and resins.

The use of aromatic solvents should be avoided to fulfil health protection and environmental aspects !

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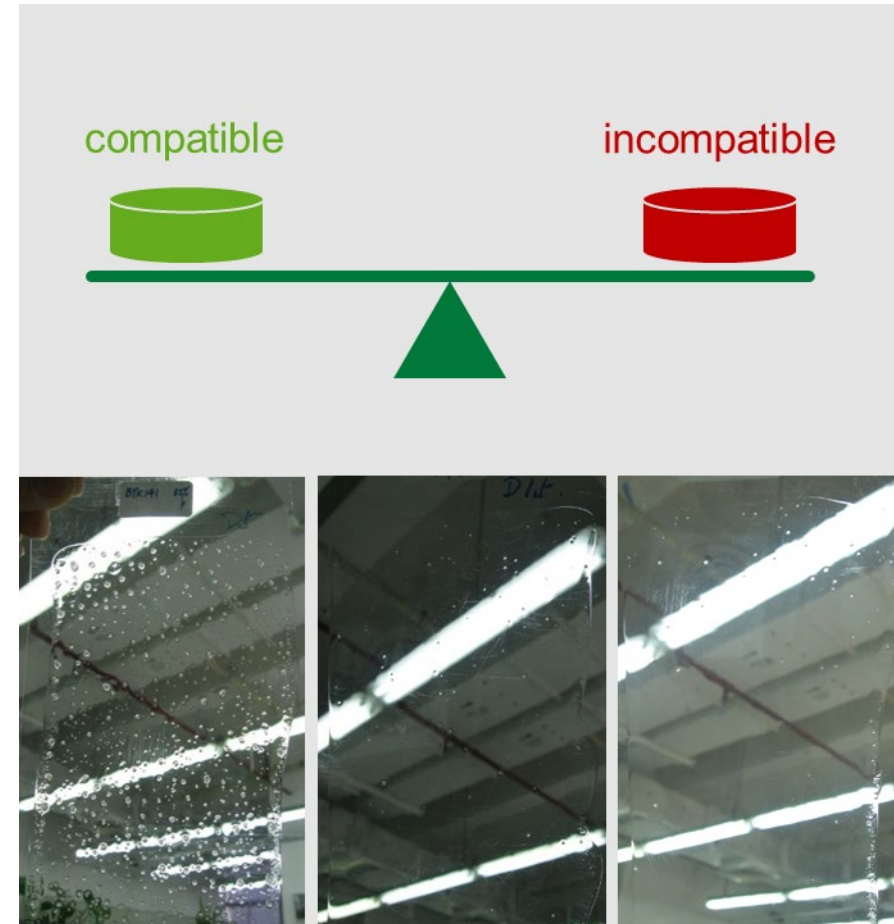
Focus products for Industrial Coatings

Dispersing Agents	High Molecular Weight	Efka®	PU 4063	PX 4310	PX 4330	PX 4350	PX 4701	PX 4753	PX 4780
	Low Molecular Weight	Efka®	PA 4600	FA 4601	FA 4609	FA 4611	FA 4620		
Defoamers		Efka®	PB 2001	PB 2010	PB 2020	PB 2014	PB 2744		
			SI 2008	SI 2035	SI 2040	SI 2723			
Rheology Modifiers		Efka®	RM 1463	RM 1469	RM 1506				
Wetting Agents and surface modifiers		Efka®	FL 3741	FL 3777					
		Efka®	SL 3030	SL 3258	SL 3288	SL 3299			
Light Stabilizers	UVA	Tinuvin®	384-2	400	928				
	HALS	Tinuvin®	123	152	292	5100			
	DW								
	Blend	Tinuvin®	5050	5060	5151				


How to make the perfect defoamer?

Compatibility vs. incompatibility in paints and coatings

- Defoamer actives need to be incompatible and form droplets
- If defoamer actives become too incompatible in paints and coatings, surface defects might arise:
 - ▶ turbidity, haze
 - ▶ uneven surfaces
 - ▶ or even craters



Exemplary products with unfavorable labeling

Name	GHS labeling	Hazard Statement
Standard silicone-free defoamer for solvent based and solvent-free systems like Efka® PB 2020		<p>H226 Flammable liquid and vapour. H304 May be fatal if swallowed and enters airways. H336 May cause drowsiness or dizziness. H372 Causes damage to organs (Central nervous system) through prolonged or repeated exposure. H411 Toxic to aquatic life with long lasting effects</p>

- H304 is associated with Aspiration hazard and is relevant for preparations containing more than 10% of solvent naphtha (which are classified with H304) and where the Kinematic Viscosity is $\leq 20,5$ cSt at 40°C

Efka[®] PB 2014 – Toxicological and performance benefits

Classification benefits

- Low content of aromatic components
- Reduced labeling



- Moderate hazard classification
H226, H336, H412

Performance benefits

- Performance equals to Efka[®] PB 2020
- Highly efficient defoamer for solvent-borne coatings (pigmented and non pigmented systems)
- Excellent resin compatibility especially nitrocellulose, 2pack polyurethane and 2pack epoxy systems
- No negative effect on intercoat adhesion

Efka® PB 2014

Highly effective, sustainable, silicone-free defoamer for solvent-based and solvent-free systems



Application:

Efka® PB 2014 is a sustainable version of Efka® PB 2020, which also can accelerate defoaming in solvent-based coatings. It therefore eliminates foaming and blistering, regardless of whether the air bubbles are caused by the substrate, e.g., wood or paper or as a result of pumping, rolling, flooding or airless spraying.

Sustainability highlights:

- Low content of aromatic components
- Reduced labeling
- Moderate hazard classification
H226, H336, H412

Performance highlights:

- Performance equal to Efka® PB 2020
- Highly efficient defoamer for solvent-borne coatings (pigmented and non pigmented systems)
- Excellent resin compatibility especially nitrocellulose, 2pack polyurethane and 2pack epoxy systems
- No negative effect on intercoat adhesion

Characteristic Values:

Refractive index	~ 1.435
Density at 20°C	~ 0.81 g/cm ³
Flash point	26°C

Test formulation

Fast drying 2pack PU polyester clear wood coating

Pos.	Raw material	Discription	Weight [g]	Supplier
1	Eterkyd 3106-B-70	Short soya alkyd resin for high gloss, matt topcoat and primer for wood, fast drying, high hardness, low viscosity	74.00	(1)
2	Methoxy propyl acetate	Solvent	1.00	
3	Butyl acetate	Solvent	24.50	
4	Efka® SL 3030	Slip and leveling agent, organically modified polysiloxane	0.20	(2)
5	DBTL, 1% in Butyl acetate	Catalyst	0.10	
Add defoamer at high shear forces to ensure proper incorporation and compatibility				
6	Defoamer (variable)		0.20	
Total			100.00	
7	Basonat® HB175	Polyisocyanate based on biuret-modified hexamethylene diisocyanate (HDI)	23.5	(2)



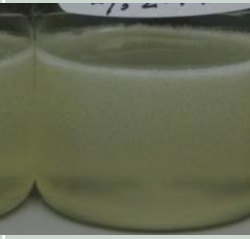


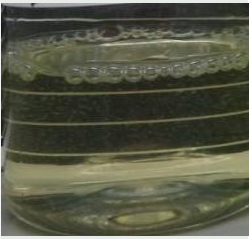
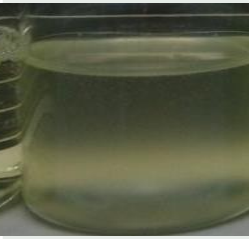
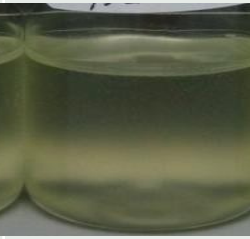
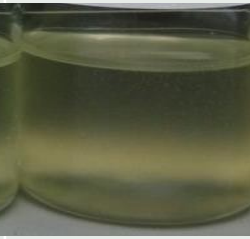
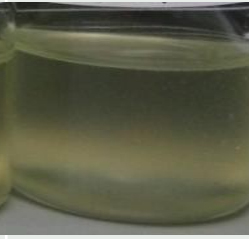
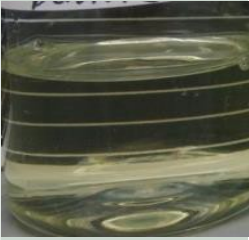
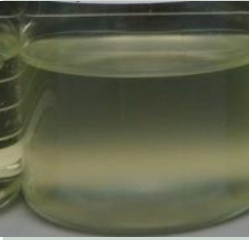
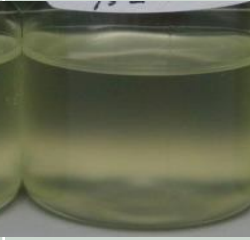

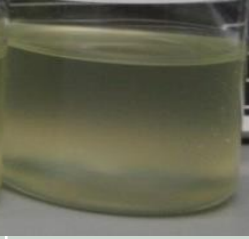
(1) Eternal Materials Co.,Ltd.

(2) BASF SE

Test Methods

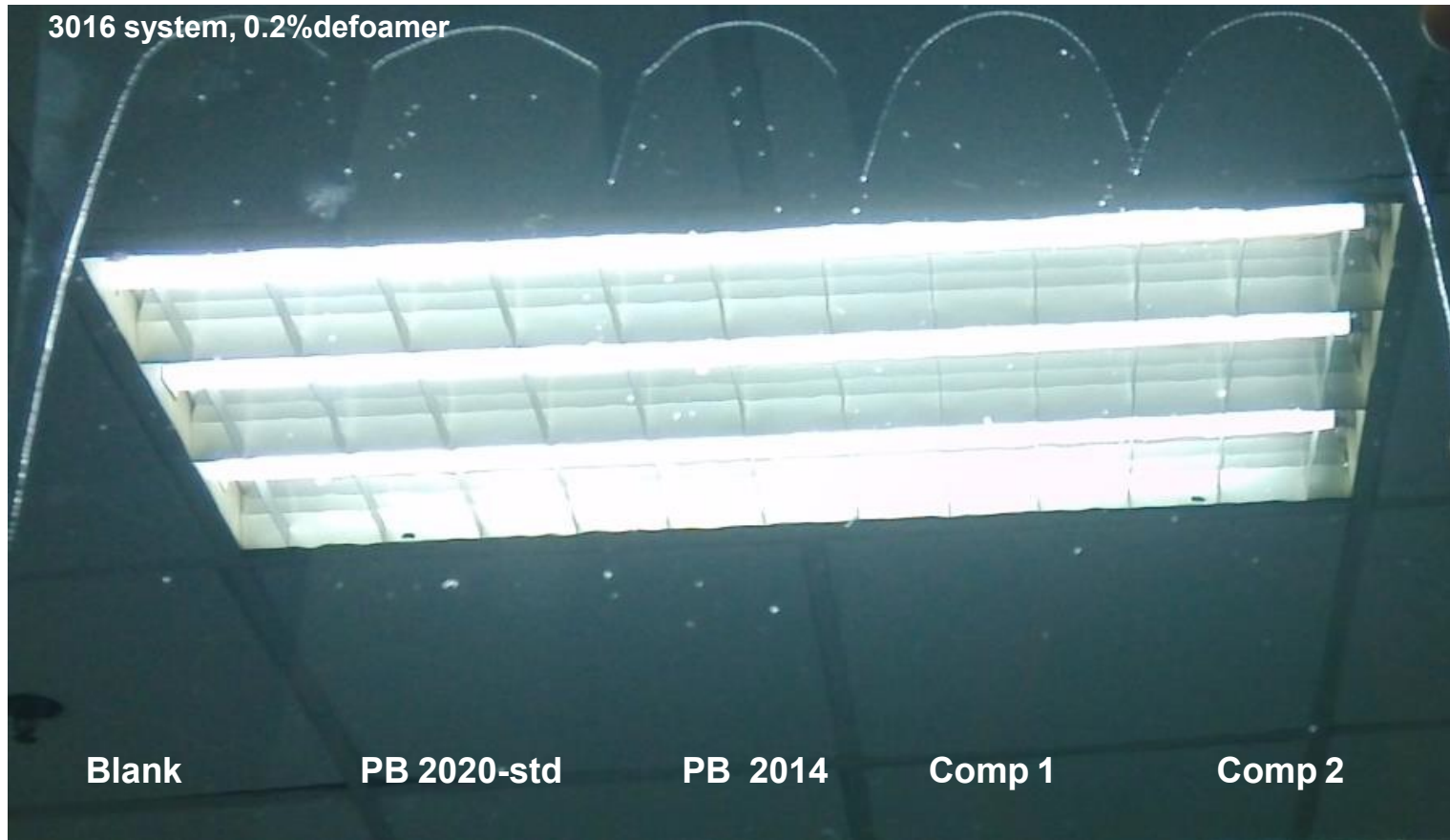
Test	Method
Defoaming and long-term efficiency after 2 weeks at 50°C	Add 0.2% of each defoamer and hardener into the formulation. Stir all samples incl. the reference w/o defoamer for 3 minutes @ 3000 RPM to evoke foam formation. Record foam development directly after stirring, 20 and 60 minutes.
Compatibility after 2 weeks at 50°C	Apply (foam-free) formulations with 150µm wire bar coater on polyester foil. Take pictures for appearance assessment (clarity, haze).

Defoaming and clarity in a liquid 2K PU system

Mixing time	Blank	Efka® PB 2020	Efka® PB 2014	Comp.1	Comp. 2
Initial					
20 minutes					
60 minutes					


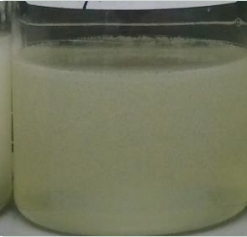
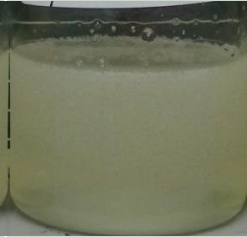

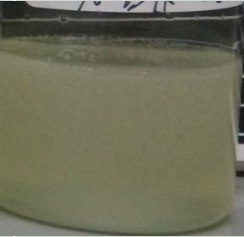

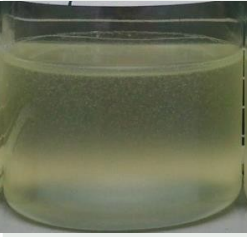
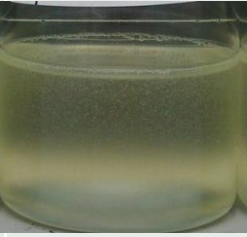
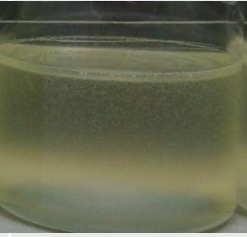
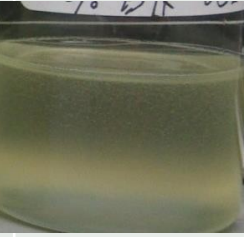

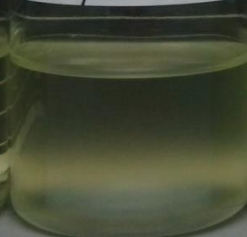
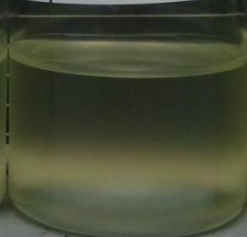
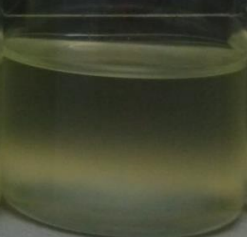
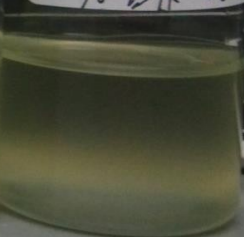
Efka® PB 2014 shows similar defoaming efficiency and compatibility in 2K PU system.

Compatibility & Clarity in dry films



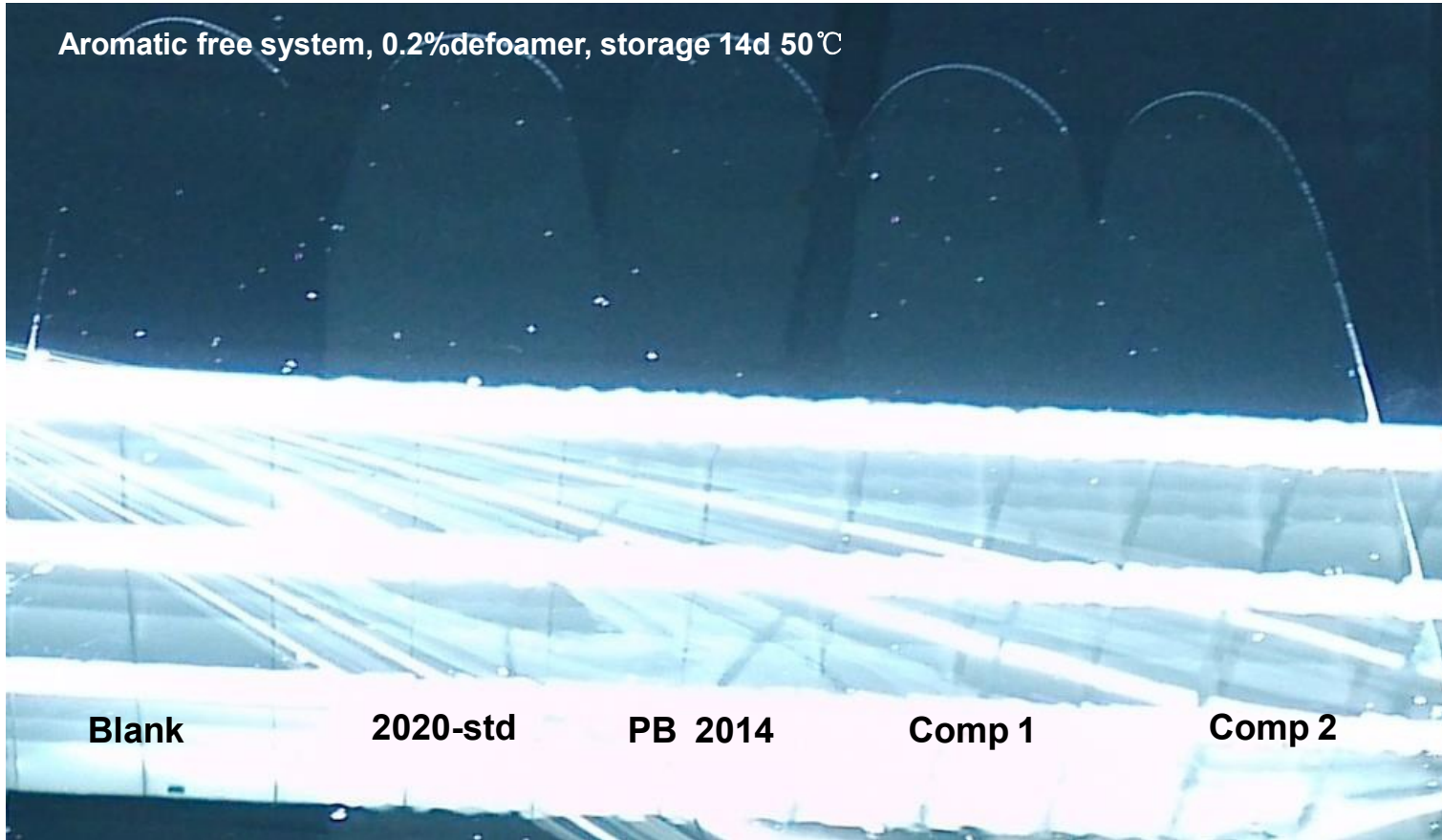
Efka® PB 2014 has slightly better clarity.

Defoaming performance after storage (2 weeks at 50°C)

Mixing time	Blank	Efka® PB 2020	Efka® PB 2014	Comp.1	Comp. 2
Initial					
20 minutes					
60 minutes					

Efka® PB 2014 has comparable performance to controls in the formulation.

Compatibility and clarity after storage (2 weeks at 50°C)



Efka® PB 2014 has slightly better clarity after storage at 50°C.

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Summary: Efka® PB 2014

- Efka® PB 2014 is a sustainable version of Efka® PB 2020 with improved hazard labeling which allows for a simple one-to-one replacement.
- Efka® PB 2014 is free of silicones* and is suitable for use in 2-K PU, NC- alkyds, air drying and baking enamels, acid curing systems and cold-cured epoxies
- Efka® PB 2014 is suitable for use in automotive coatings and industrial coatings, especially furniture and floor coatings

* No intentional silicone added



Solution Finder Tool for Formulation Additives

BASF
We create chemistry

Formulation
Additives



The **Solution Finder Tool** offers you the best additive solution for your formulation needs across all industries (www.basf.com/solution-finder)

Features & Benefits

- Formulation Additives guide for Paints and Coatings, Adhesives and Construction*
- Understand the benefits of our products (Dispersing Agents, Defoamers, Rheology Modifiers, Wetting Agents and Surface Modifiers, and Film-Forming Agents) by application, and with technical information
- Order samples or email us for detailed consultations
- Available on BASF web, Apple Store and Google Play Store**

*The product list and sample ordering for adhesives and construction are only applicable in Europe. It also comprises recommendations for Performance Additives

**To use this tool on your Windows device, please visit our website for details

Scan QR
code for
details



Lab Assistant for Architectural Coatings

Lab Assistant is a web-based application that makes it easier for you to find BASF dispersions and additives for Architectural Coatings in Europe (www.lab-assistant.basf.com)

Features & Benefits

- Get product recommendations and formulation ideas according to the final properties of the paint, technical data, complete recipes and ingredient calculator
- Access formulation expertise to gain new insights and ideas
- All relevant data (e.g. MSDS, TDS, Reach, sustainability aspects, brochures, value cards, etc) available in one location
- Compare products or formulations
- Individualize your own account and share content with your colleagues
- Order samples or get in touch with our experts
- Runs on your PC / laptop / tablet / smartphone

Scan QR
code for
details



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email: formulation-additives-europe@basf.com

There is more to come...

Next series of Webinars starting Apr 14th

Tin-free catalysis for moisture curing systems: **Apr 14 & 15**

Formulation Additives for exterior coatings: **Apr 21 & 22**

Addressing upcoming regulations on Tinuvin® 326 with alternative UV-Absorbers: **Apr 28 & 29**

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Or visit us on our Website at:

<http://www.basf.com/additives>



We create chemistry

Disclaimer

■ Safety

When handling the mentioned products, please comply with the advice and information given in the safety data sheets and observe protective and workplace hygiene measures adequate for handling chemicals.

■ Note

The data contained in this publication are based on our current knowledge and experience. In view of the many factors that may affect processing and application of our products, these data do not relieve processors from carrying out their own investigations and tests; neither do these data imply any guarantee of certain properties, nor the suitability of the product for a specific purpose. Any descriptions, drawings, photographs, data, proportions, weights, etc. given herein may change without prior information and do not constitute the agreed contractual quality of the product. The agreed contractual quality of the product results exclusively from the statements made in the product specification. It is the responsibility of the recipient of our product to ensure that any proprietary rights and existing laws and legislation are observed.