Novel Solutions for sustainable and durable Coating Systems

Webinar - Raw materials, finished products and coatings for the Construction and Building sectors

20th January 2022 | Jonas Berg

EVONIK
Leading Beyond Chemistry

Novel Solutions for Sustainable and Durable Coating Systems

Improving mechanical resistance of interior wall paints

SPHERILEX®

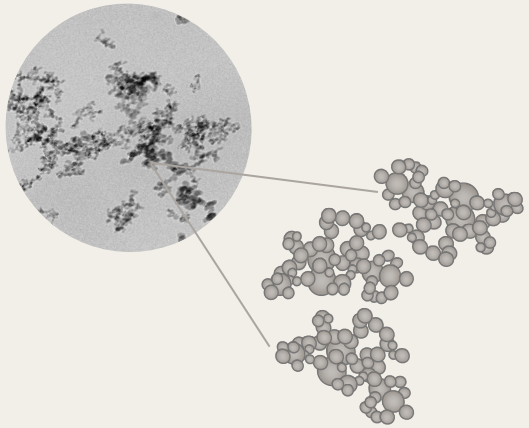
Defoamer concentrate based on renewable raw materials

TEGO® Foamex 18

EVONIK
Leading Beyond Chemistry

SPHERILEX®: A new Highlight in the World of Silica

AEROSIL®

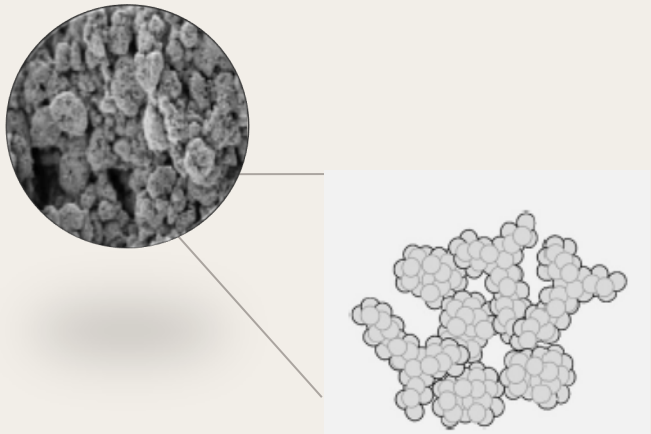


Key Driver: Aggregate Structure

Entirely open structure with a high level of surface functionality

- Thickening

ACEMATT®

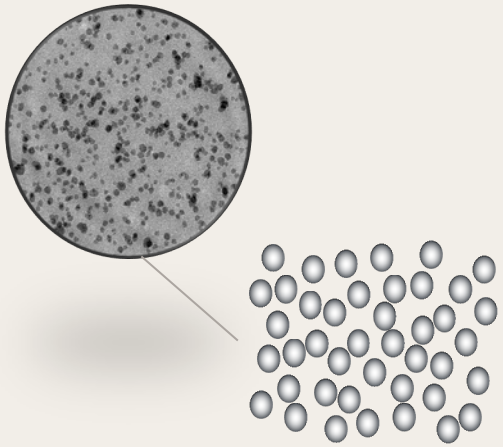


Key Driver: Surface Modification

Porous structure of interconnecting conduits

- Matting

TEGO® Nanoresins

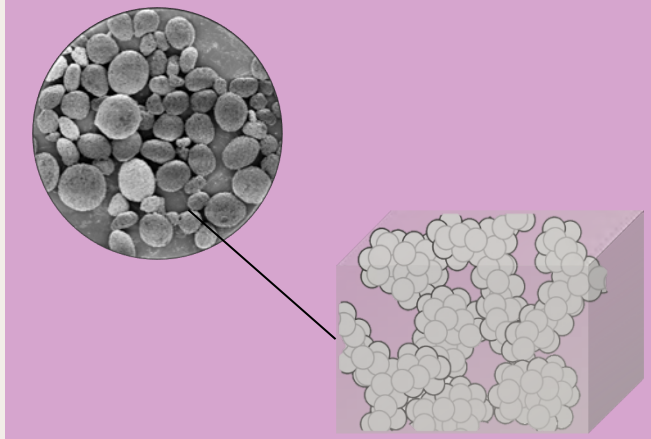


Key Driver: Surface Modification

Colloidal silica nano particles in different solvents

- Scratch resistance

SPHERILEX®

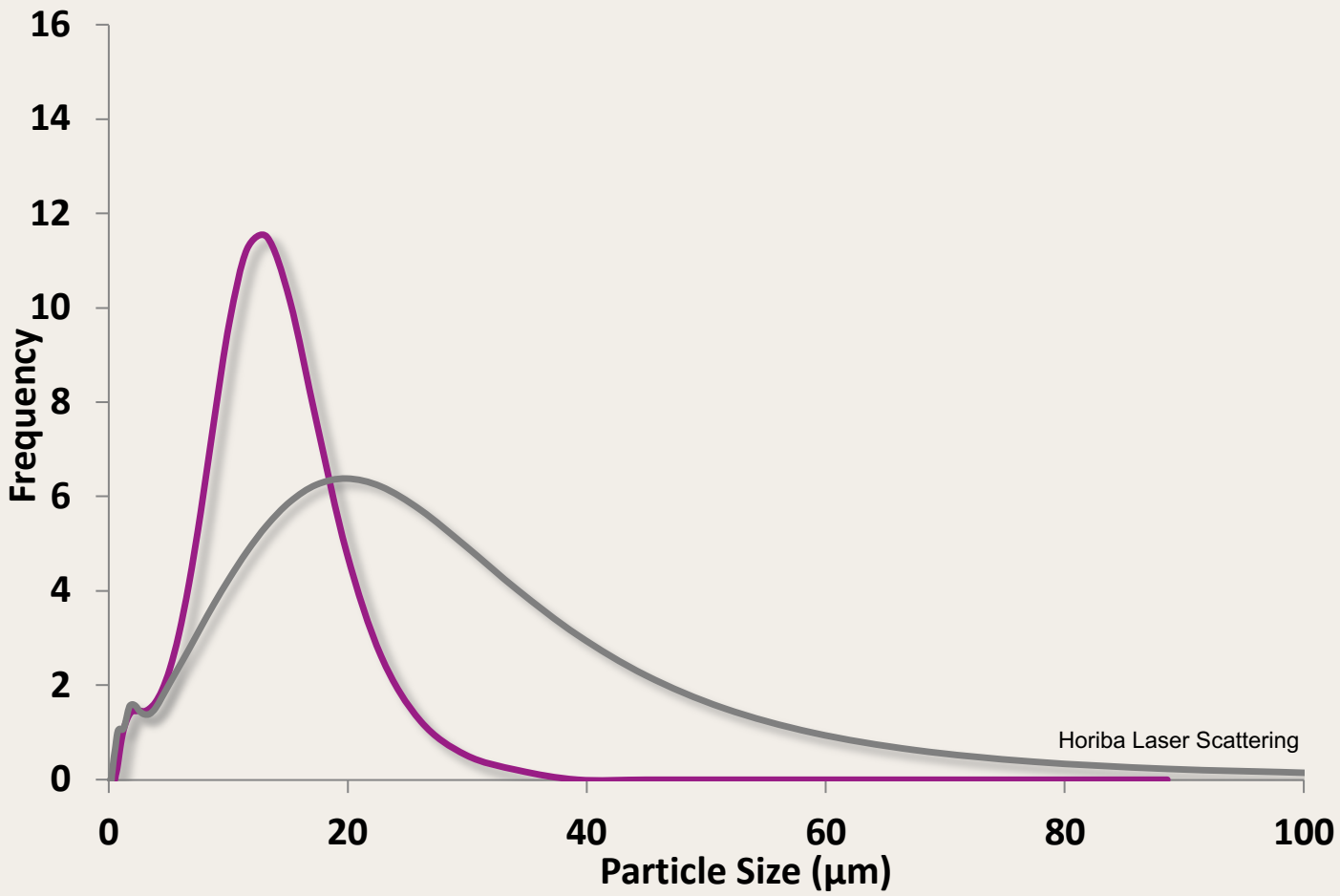


Key Driver: Particle Morphology

Spherical particle shape

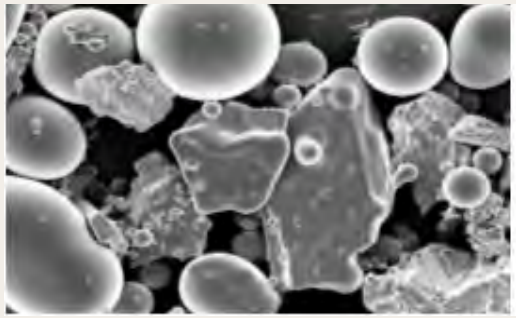
- Burnish Resistance

Unique Particle Size Distribution of SPHERILEX® versus other Products



Comparison of spherical products 10 µm particle size

SPHERILEX®

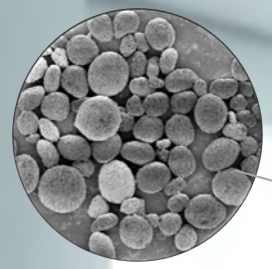


Ceramic

Three Grades of SPHERILEX® Silica

Property	SPHERILEX® DP-0111 Typical Values	SPHERILEX® DP-0112 Typical Values	SPHERILEX® DP-0115 Typical Values
Chemistry	Silicon Dioxide	Silicon Dioxide	Silicon Dioxide
Morphology	Spherical	Spherical	Spherical
Moisture (%)	< 5	< 5	< 7
5% pH	7-8	7-8	7-8
Sodium sulfate (%)	< 1.0	< 1.0	< 1.0
BET SA (m^2/g)	< 10	< 15	< 15
Oil absorption (cc/100g)	30-50	40-60	30-50
Median particle size (µm)	4-7	9-11	11 - 14

SPHERILEX®



New Silica Particle Morphology

- Spherical particle shape
- Narrow particle size distribution
- Low Oil absorption

Improve your burnish resistance

EVONIK
Leading Beyond Chemistry

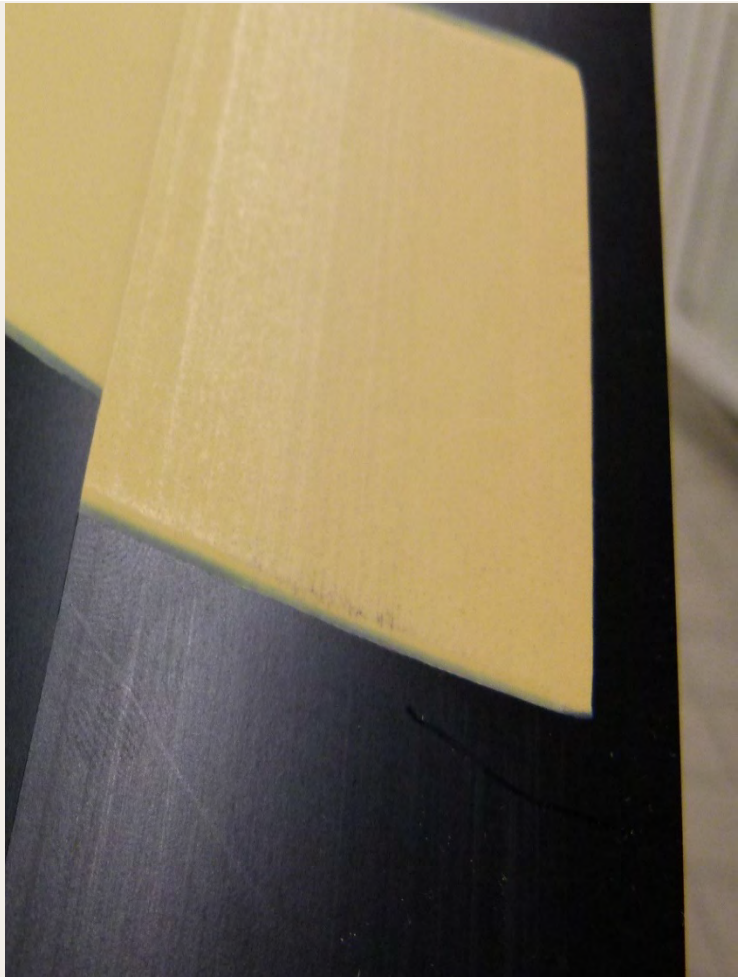
Burnish Resistance – Definition and Testing

What is burnish resistance?

Burnish resistance is the coatings' ability to maintain its visual appearance after being rubbed by soft types of objects like leather, sponges, cloth or human hands

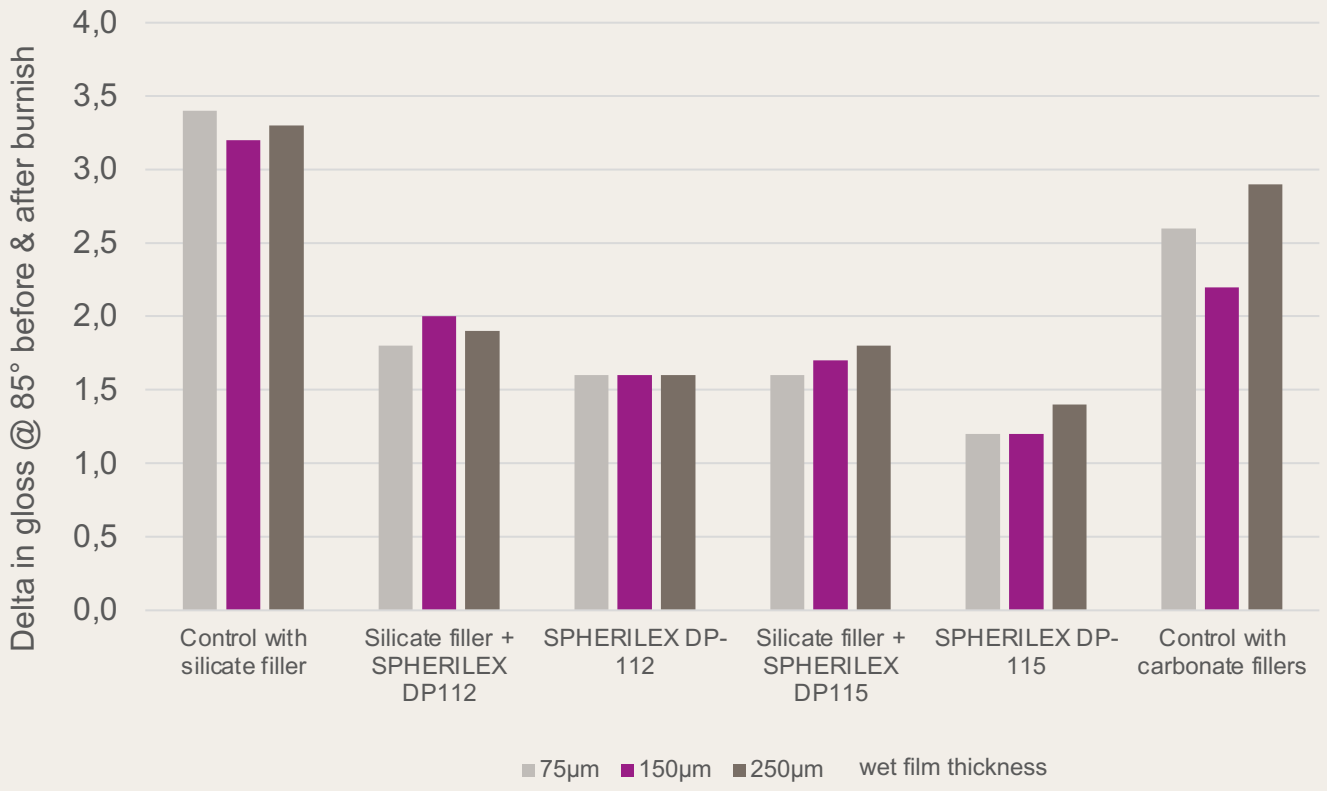
Burnish test methods include:

ASTM D6736 (Cheesecloth)
Master Painters' Institute (MPI) Standard 44 (Synthetic leather chamois)
CRGI Wet Method (Nylon bristle brush)
CRGI Dry Method (Cheesecloth)
Evonik internal test methods



Improvement of Burnish Resistance in Architectural Coatings

SPHERILEX® improves burnish resistance compared to standard filler packages

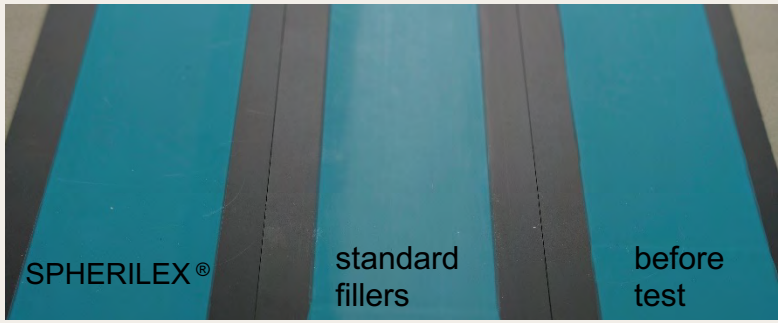


Evonik standard test method for burnish resistance

Application of 300µm on black Leneta cards

The samples dried at room temperature.

Burnish resistance was checked with Regmed RAS-21, 50 and 100 cycles, test weight 1800 g, and with 4 layers cheesecloth.



EVONIK
Leading Beyond Chemistry

Formulation Advice for Achieving the Best Performance

Dosage:
1 - 10%

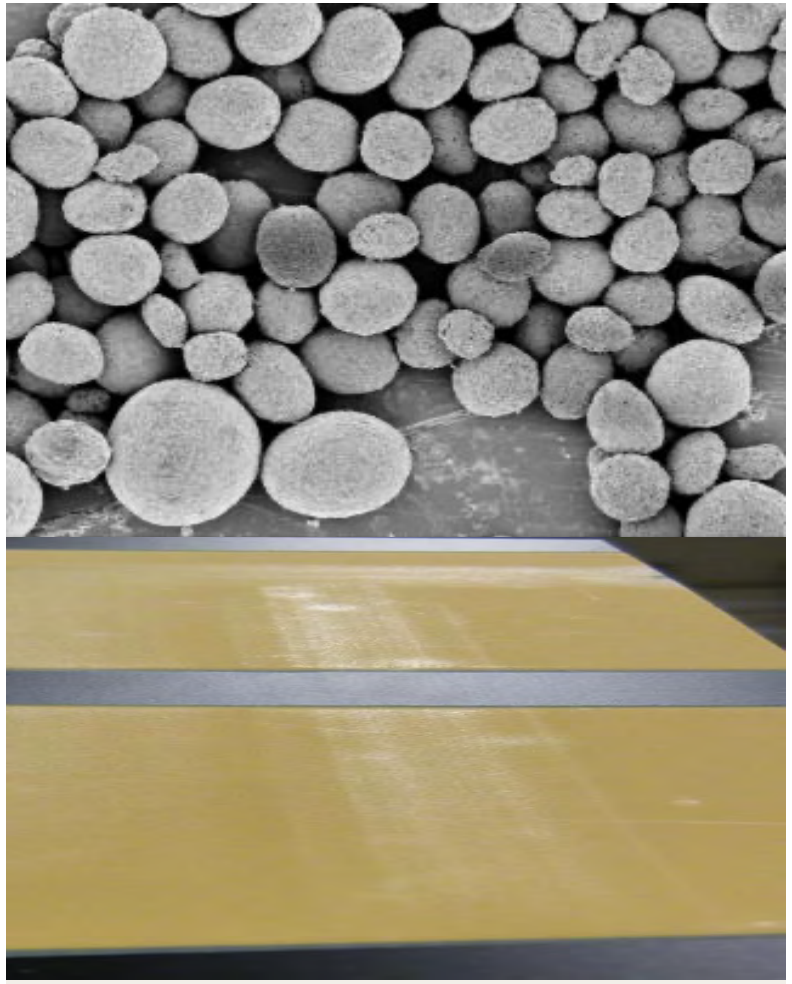
Use SPHERILEX® in the mill base

Coarser particles – more efficient

Smaller particles more compatible

Pseudoplastic rheology is beneficial

Combination of particle sizes



TEGO® Foamex 18

A Member of the 2-digit Architectural Defoamer range

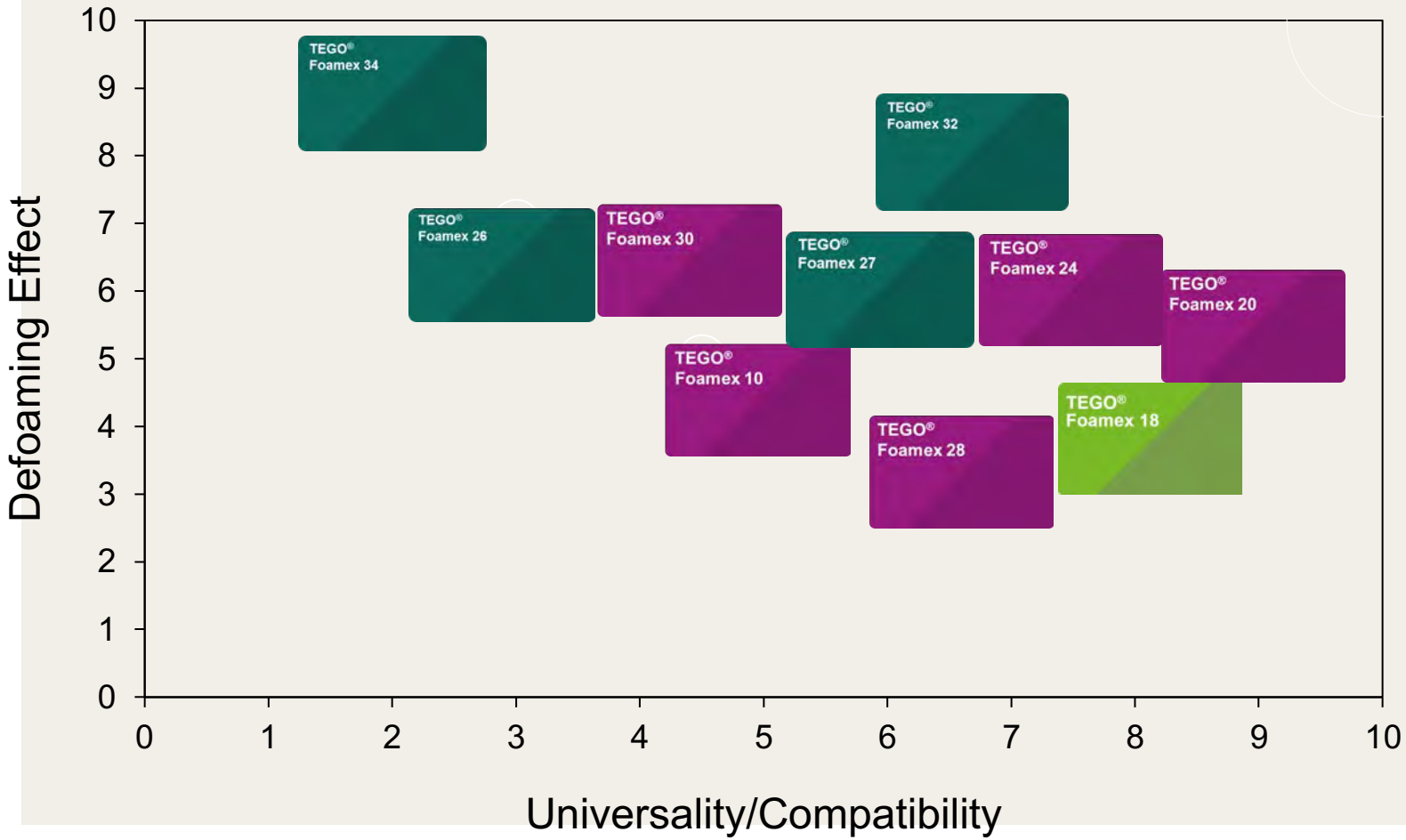
EVONIK
Leading Beyond Chemistry

Foam – The Troublemaker

Impacts

- Disrupted production process and increased production time
  - Less efficient milling process
  - Longer filling times
- Negative affected paint transfer and disturbed application
  - Longer application time
  - Inhomogeneous surface appearance
- Substantial quality loss and surface defects
  - Reduction of gloss
  - Craters or bubbles on the surface
  - Loss of protection

Dedicated Portfolio to cover major needs in Architectural Paints



Selection of

- strong defoamer for more efficient processing
- more universal/compatible for sensitive systems

100% Product/Concentrate

100% Product/Renewable Concentrate

Emulsion/Dispersion

EVONIK Leading Beyond Chemistry

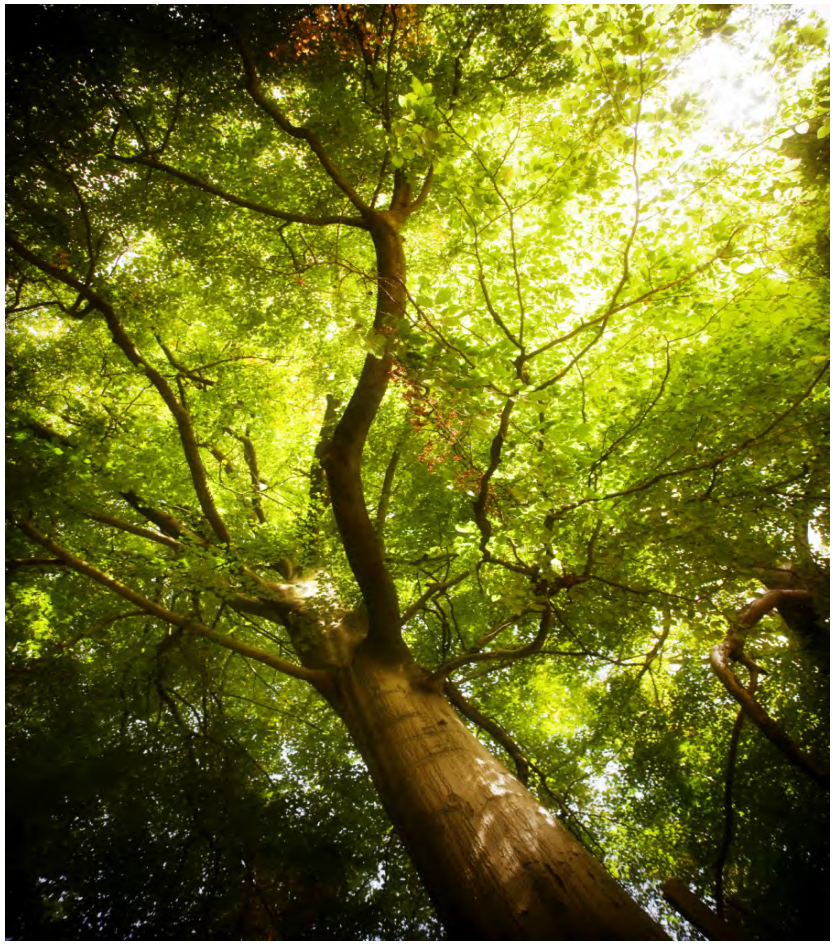
Market Trends Architectural – Ecolabel & Regulatory Guidance

- Ecolabel became a basic requirement in the industry
  - final products must comply with certain regulations, demand on data and analytics constantly increases
- The knowledge of regulatory trends is of key importance in our product development
- Our products can be used in compliance with the current regulatory requirements
- Coating Additives have an expert group for Regulatory Guidance in each region

EVONIK
Leading Beyond Chemistry

Market Trends Architectural – Biobased Raw Materials

- Increasing demand of biobased products globally, the market is still small but growing strongly
- Systems for assessment of product portfolio sustainability are established with clear criteria which result in attractive profiles for bio-based products
- 100% active products get more attractive since no biocide is needed for in can preservation



TEGO® Foamex 18 – Defoamer with three Advantages

Regulations

- Suitable for biobased paints
- Meets all relevant ecolabel requirements
- Global Listing

Renewable

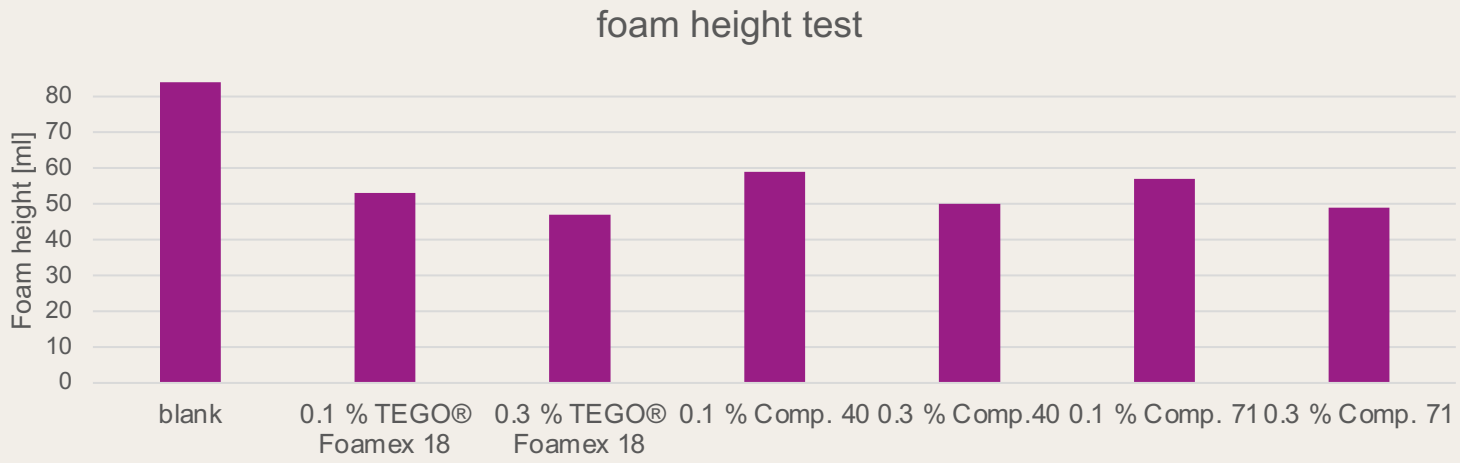
- ~ 97% components derived from plants
- 100% defoamer concentrate (solvent free)
- free of mineral oil

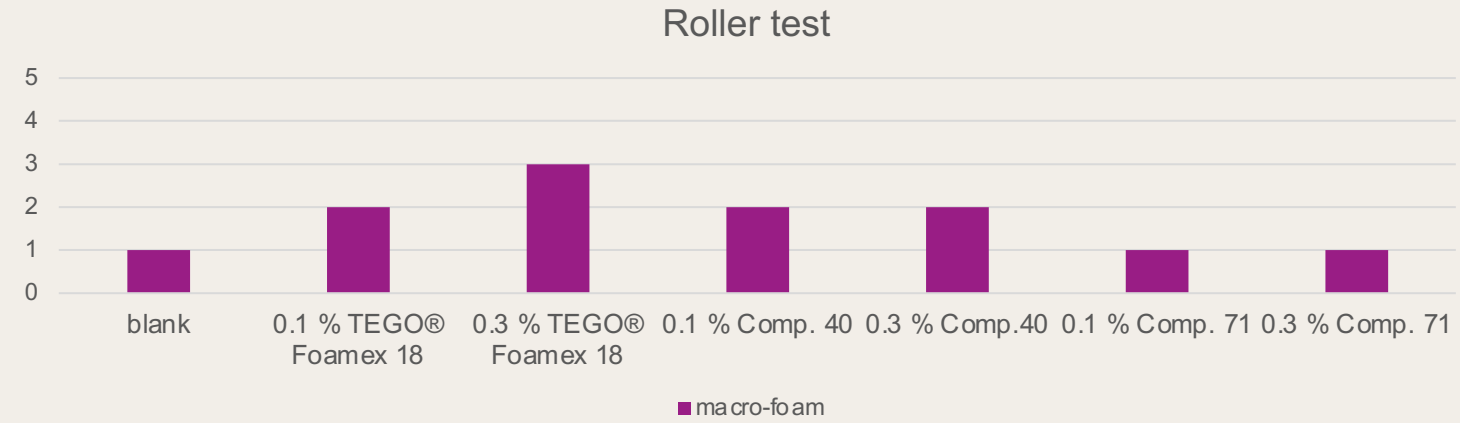
Performance

- high persistency
- excellent defoaming properties
- especially for let-down

Comparison to other Biobased Defoamers

Semi gloss emulsion paint PVC = 30% Binder: VAC – emulsion

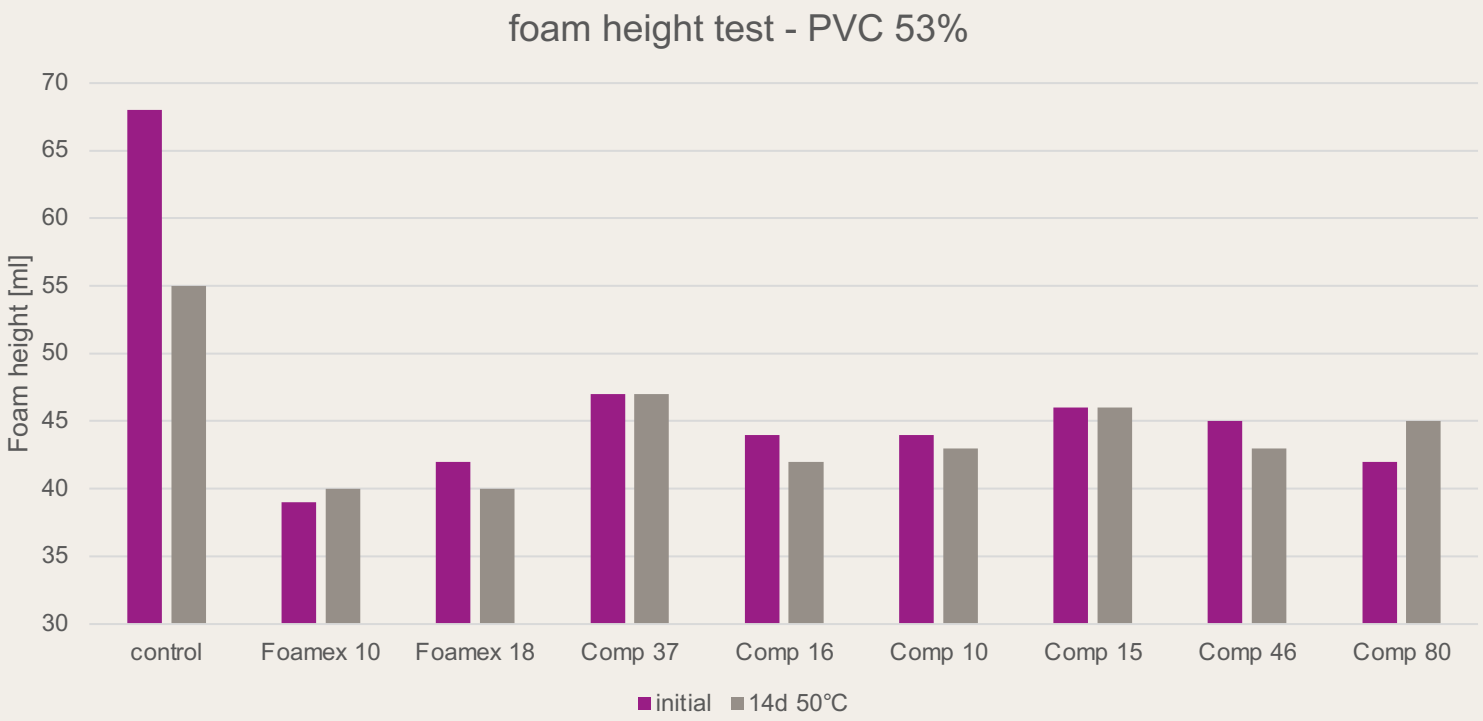




Compatibility of all tested defoamers on a similar high level

TEGO® Foamex 18 for Exterior Coatings

Emulsion Paint, 53% based on styrene acrylic binder Acronal S790

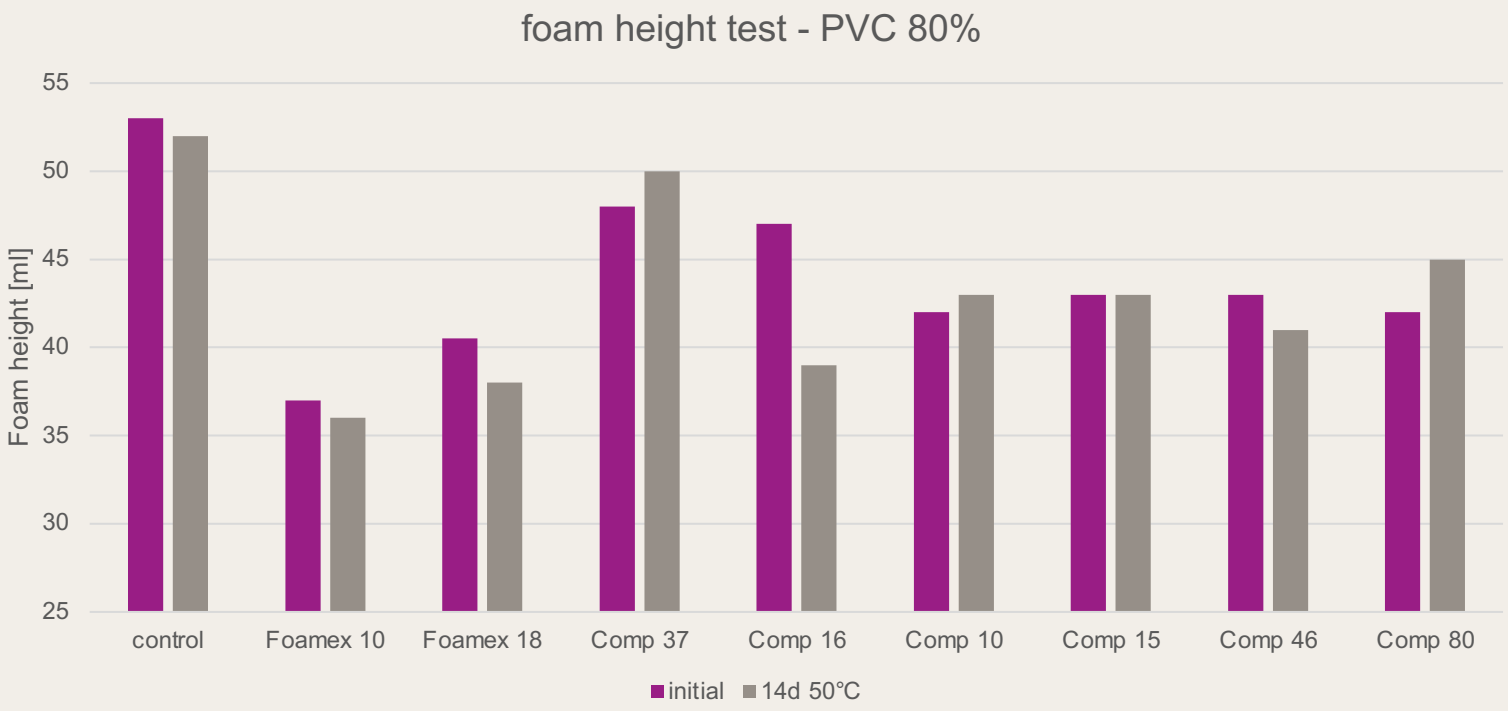


Defoamer dosage: 0.3% delivery form

EVONIK
Leading Beyond Chemistry

TEGO® Foamex 18 for Interior Wall Paints

Emulsion Paint, 80% based on Vinylacetate binder Mowilith LDM 1871



Defoamer dosage 0.3% delivery form

EVONIK
Leading Beyond Chemistry

TEGO® Foamex 18 Unique Selling Proposition

- Based on renewable raw materials
- Ecolabel compliant
- Easy to incorporate
- Free of biocides
- Free of silicone
- Free of mineral oil
- For a broad range of architectural applications
- Very universal for a broad range of PVCs

In case of questions, please contact:

Jonas Berg

jonas.berg@evonik.com

EVONIK Leading Beyond Chemistry

EVONIK

Leading Beyond Chemistry