

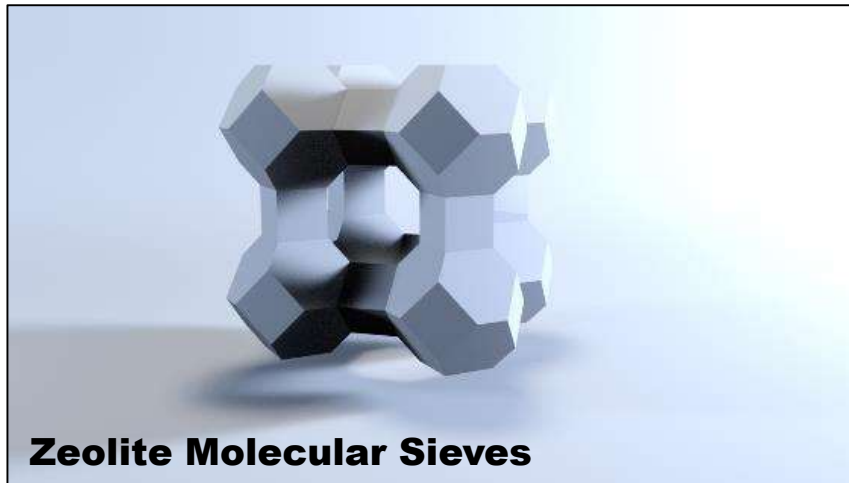
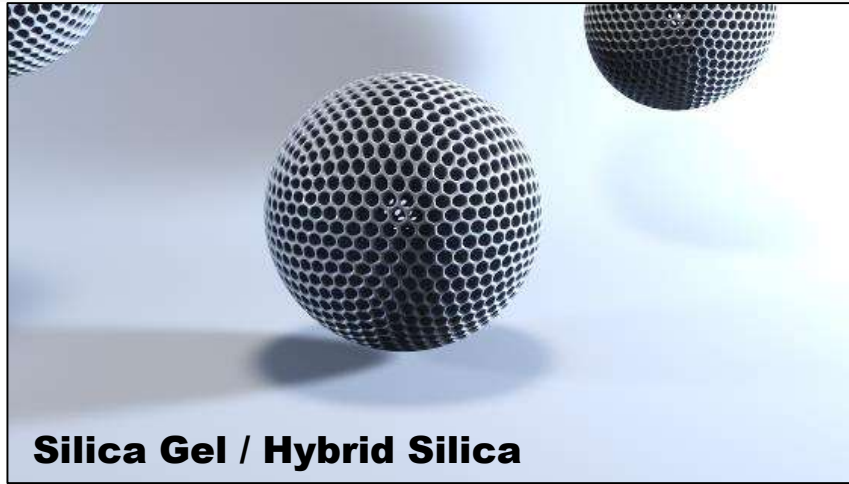


## **Next-Generation Matting Agents for Highly Durable Waterborne Coatings**

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Lead Technical Service Manager, Americas

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Talent | Technology | Trust™



High Purity



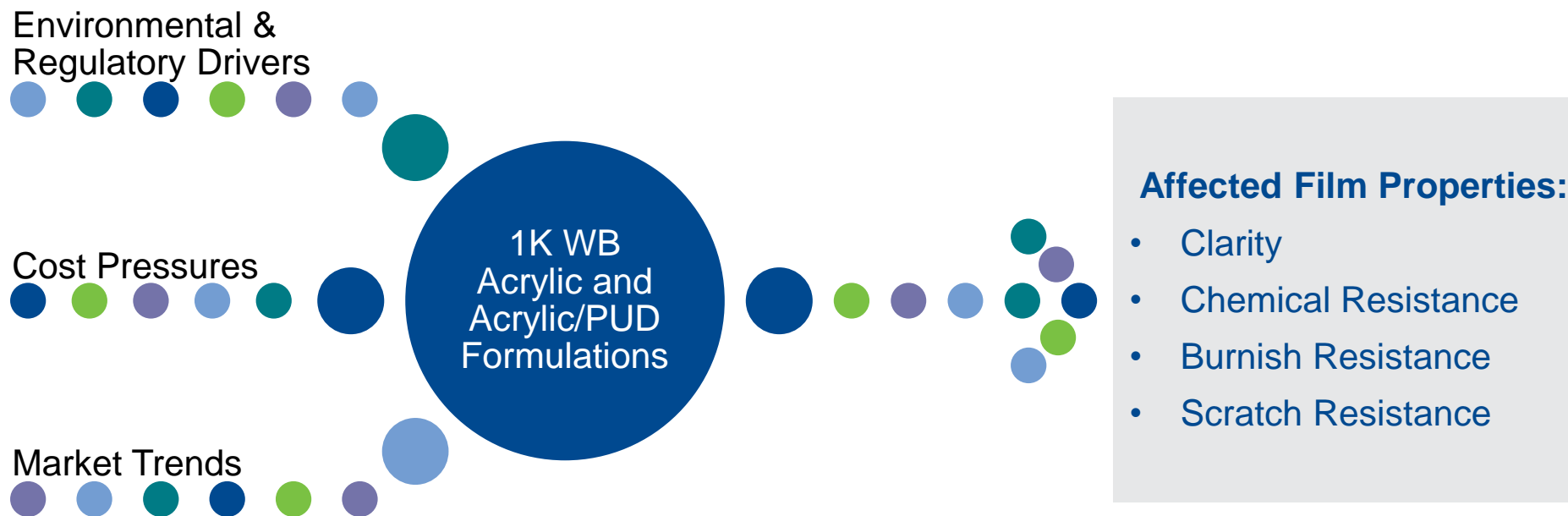
Quality Consistency



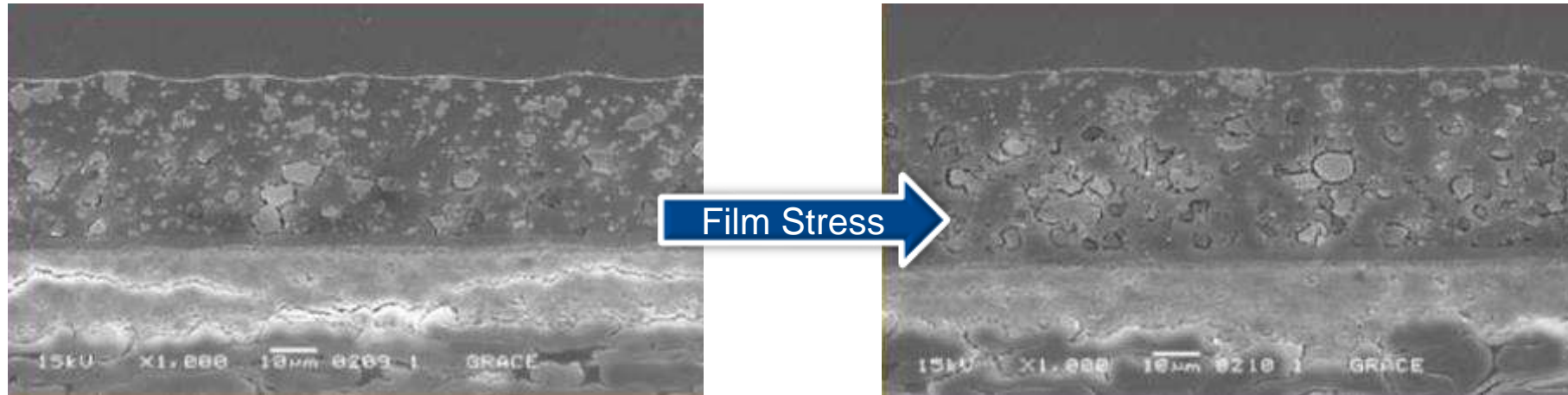
No Crystalline Silica  
Non-toxic



Highly Transparent

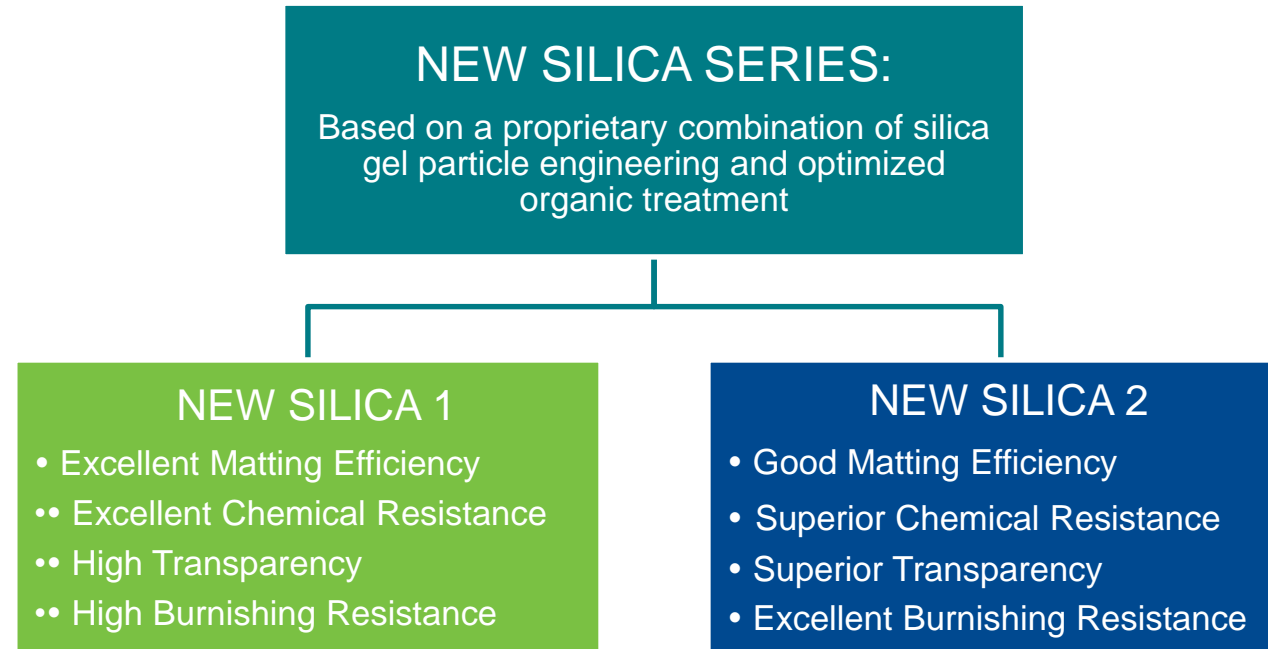


**Initial Focus of Development:**  
Matting Agents for Waterborne Industrial Wood Coatings  
with Improved Film Properties



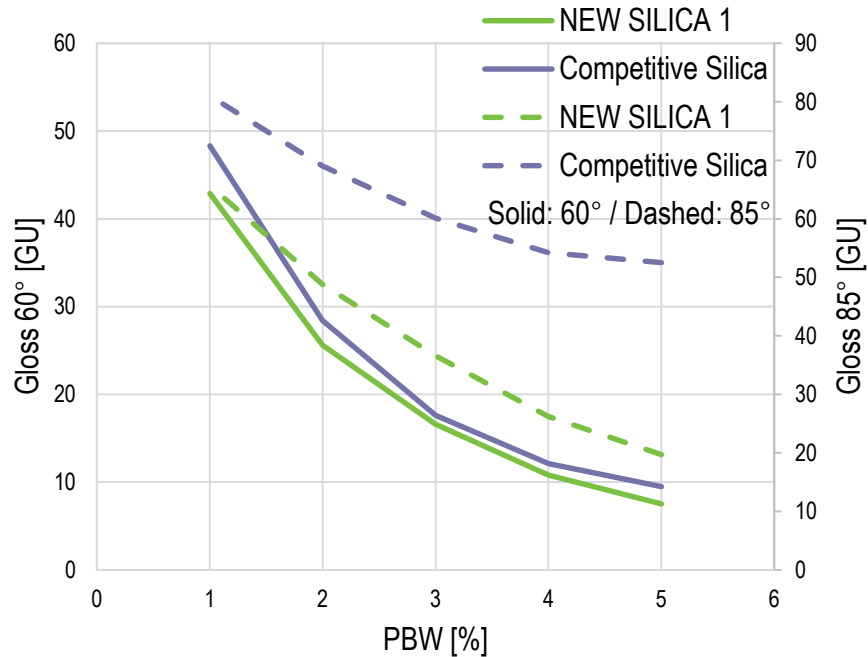
- Non-film forming materials typically deteriorate film integrity
- Applied stress results in degradation of visual properties
- The organic:inorganic interface is the defect site

## Initial Offerings from a Platform of Products

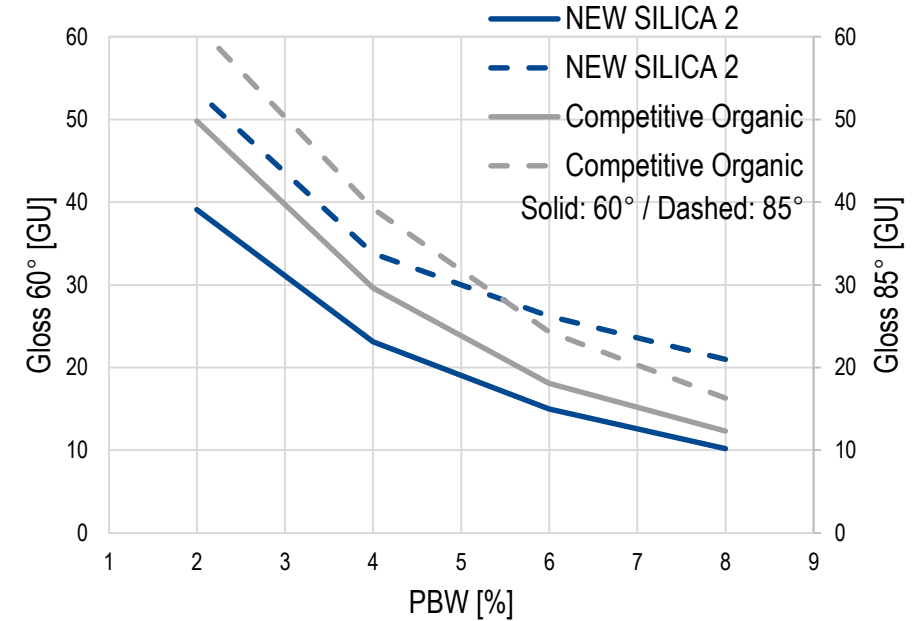


Matting Agent	Chemistry	Modification	d <sub>50</sub> (µm)
NEW SILICA 1	Silica gel	Organic	7.0
NEW SILICA 2	Silica gel	Organic	7.0
Competitor Silica	Thermal Silica (based on fumed silica)	-	9.5
Competitor Organic	Micronized wax	-	8.0

## Matting Efficiency Comparison

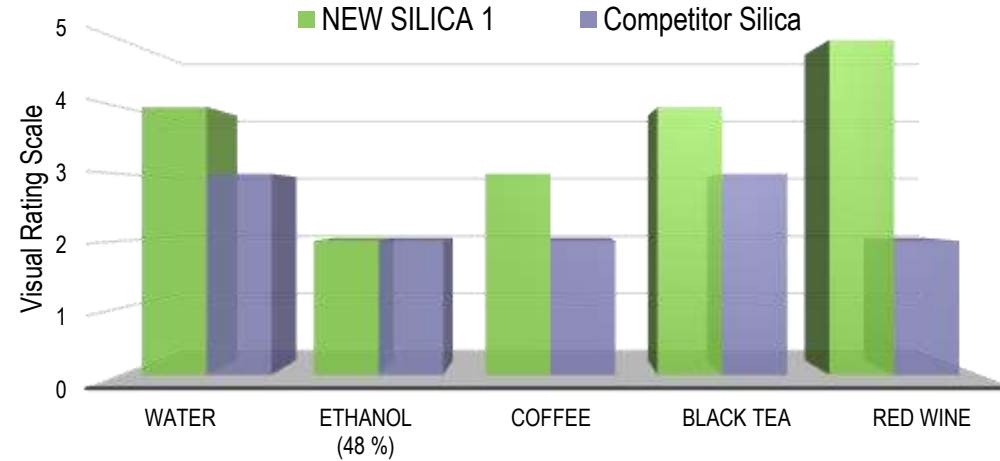


Relative to the competitive silica, NEW SILICA 1 shows comparable matting efficiency at 60° and a significant reduction at 85°



Relative to the competitive organic, NEW SILICA 2 shows slightly improved matting efficiency at 60° and comparable results at 85°

## Chemical resistance on wooden substrates (walnut / maple)



Testing stains include: Vinegar, Na<sub>2</sub>CO<sub>3</sub>, Ethanol (96%), Water, Ethanol (48%), Coffee, Black Tea, Ketchup, Mustard, and Red Wine

### Improvement observed in resistance against:



Water



Coffee

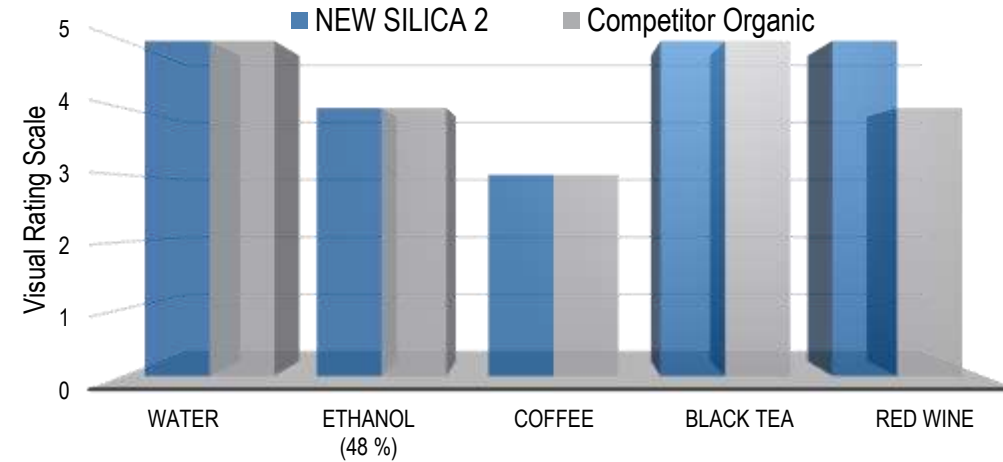


Black Tea



Red wine

## Chemical resistance on wooden substrates (walnut / maple)



Testing stains include: Vinegar, Na<sub>2</sub>CO<sub>3</sub>, Ethanol (96%), Water, Ethanol (48%), Coffee, Black Tea, Ketchup, Mustard, and Red Wine

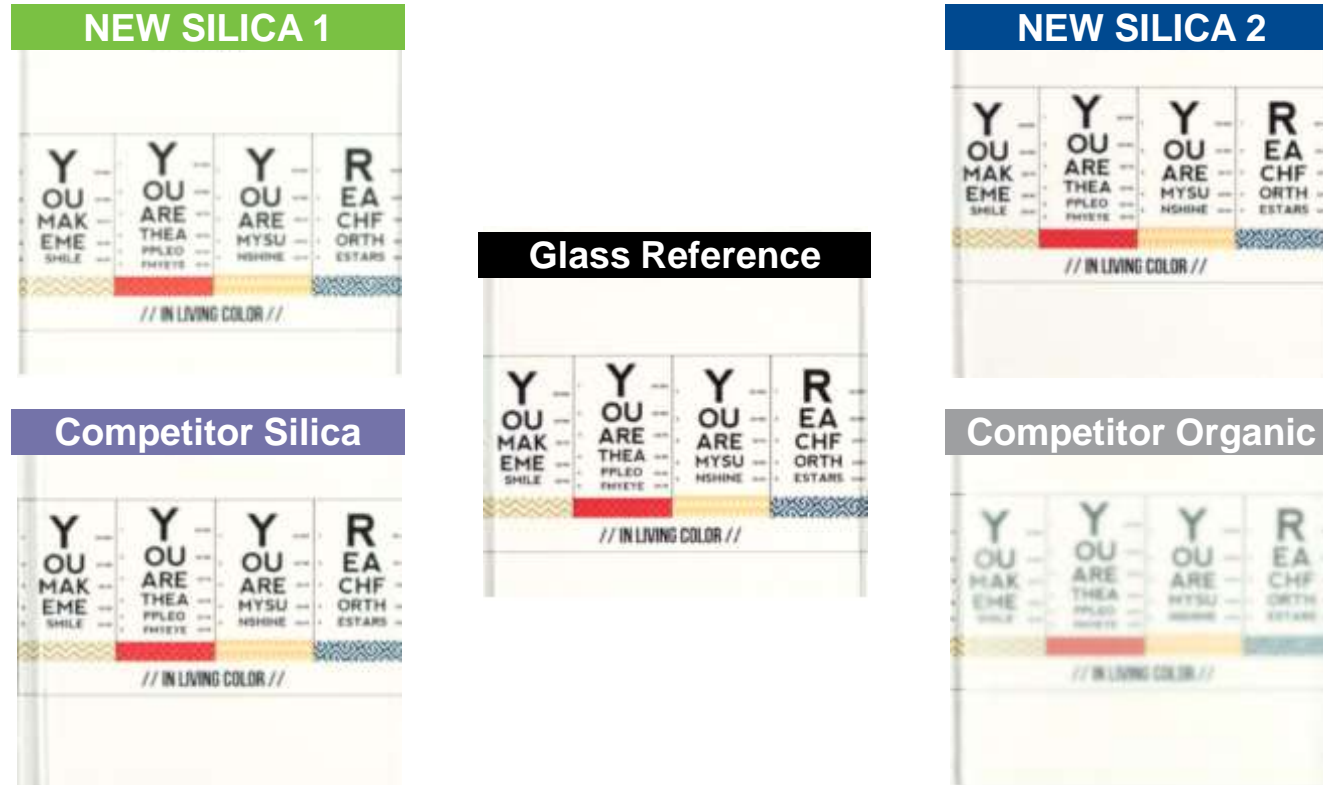
Improvement observed in resistance against:



Red Wine



## Visual Clarity Evaluation



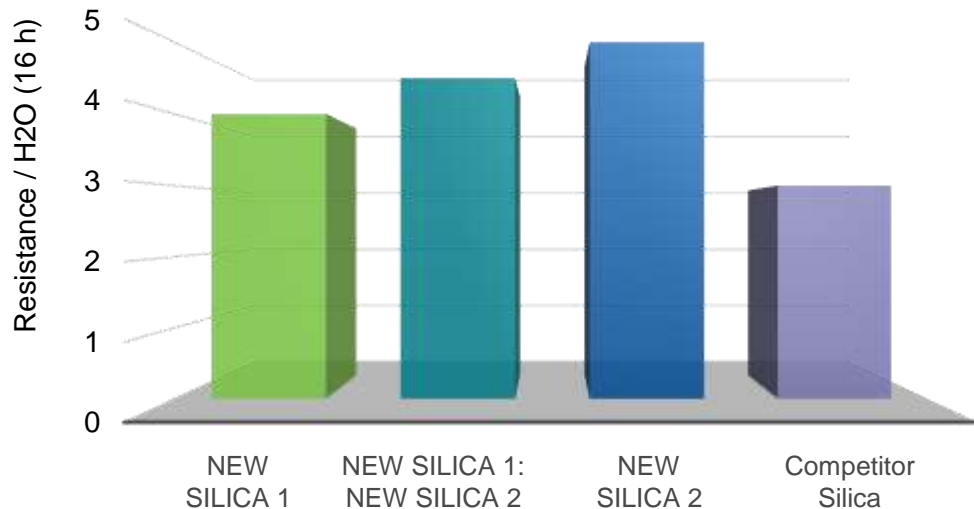
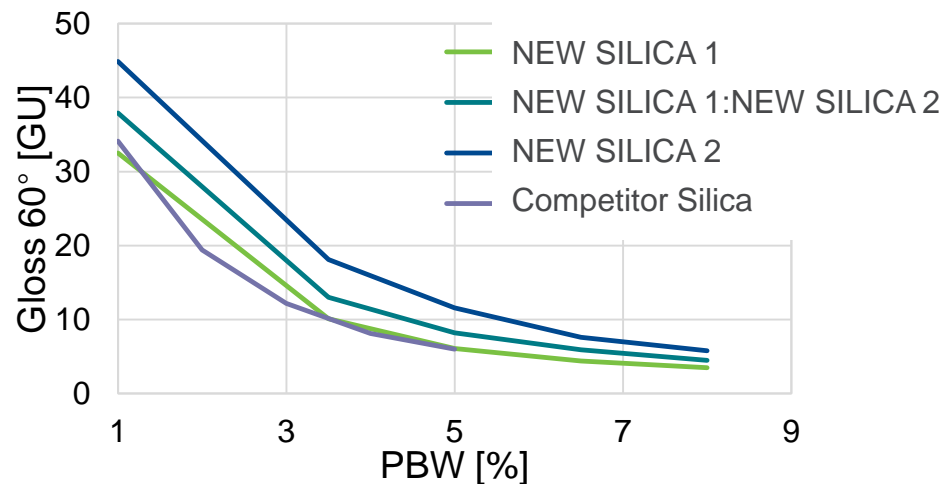
**NEW SILICA 1 is comparable in visual clarity to competitive silica offering, while NEW SILICA 2 excels relative to micronized wax offering**

## Improvement in Burnish Resistance



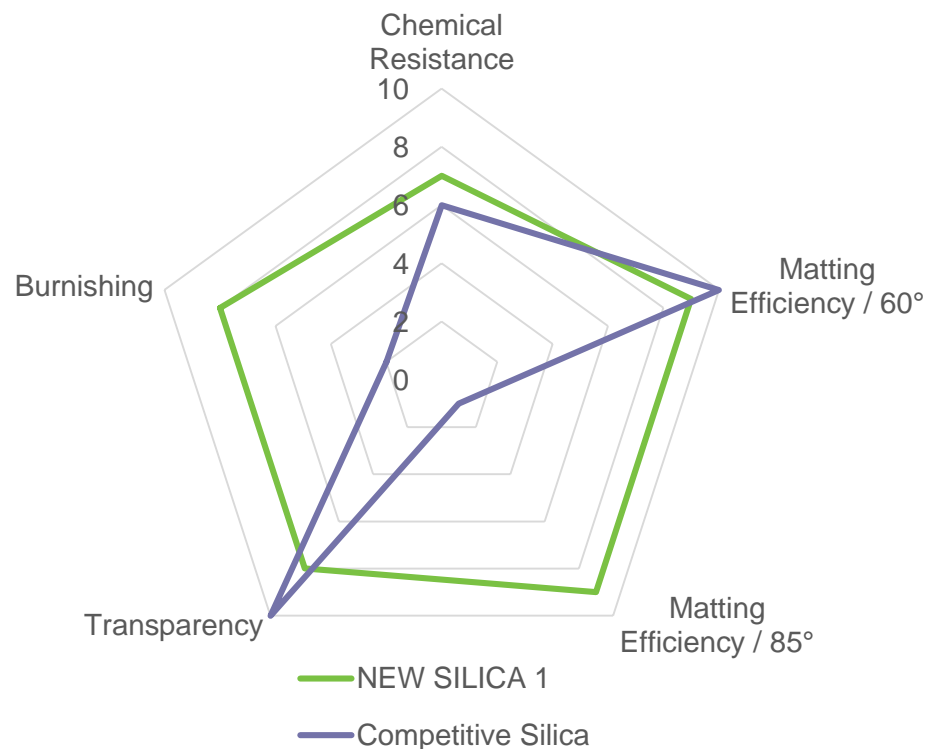
The NEW SILICA products demonstrate improved burnish resistance as well as enhanced scratch resistance relative to competitive offerings

## The Added Benefit of Blending

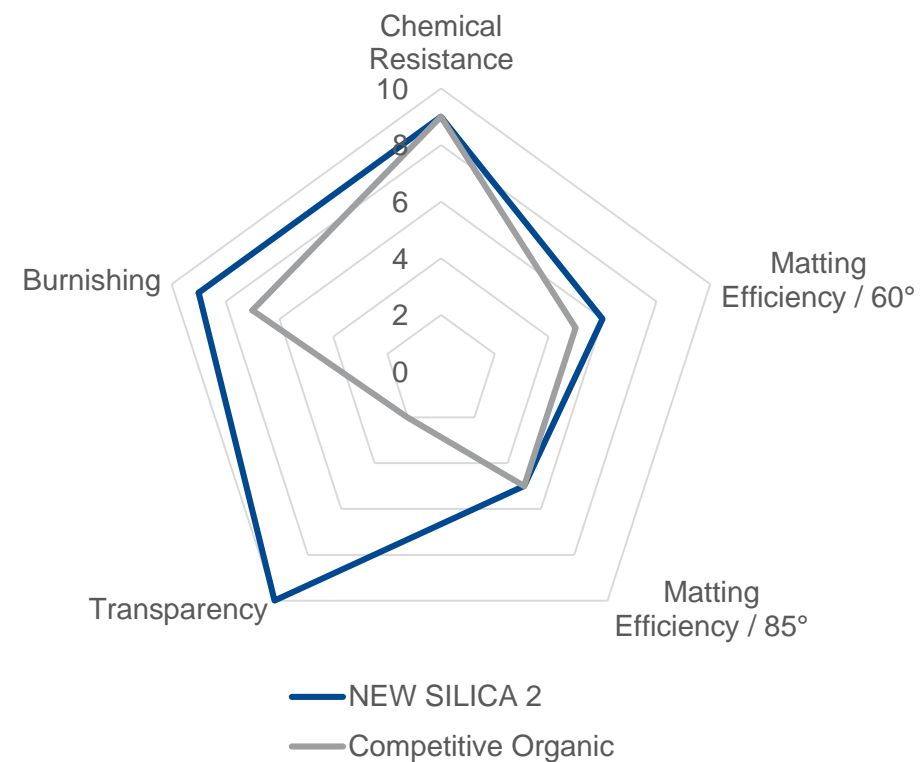


Blending provides flexibility to the formulator to dial in the desired balance of properties

	Matting	Chemical Resistance	Transparency
NEW SILICA 1	● Best	◐ Good	◑ Good
NEW SILICA 2	◐ Good	★	★
NEW SILICA 1:NEW SILICA 2	◑ Good	◐ Good	● Best
Competitor Silica	● Best	◐ Good	◑ Good



NEW SILICA 1 offers a stronger balance of performance relative to an industry standard silica

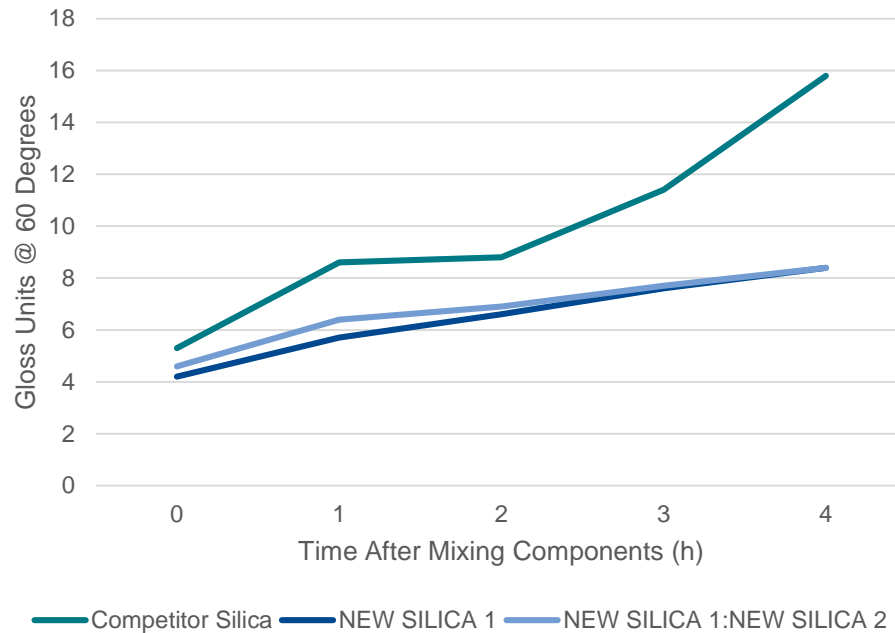


NEW SILICA 2 provides enhanced transparency and burnish resistance relative to micronized wax additive

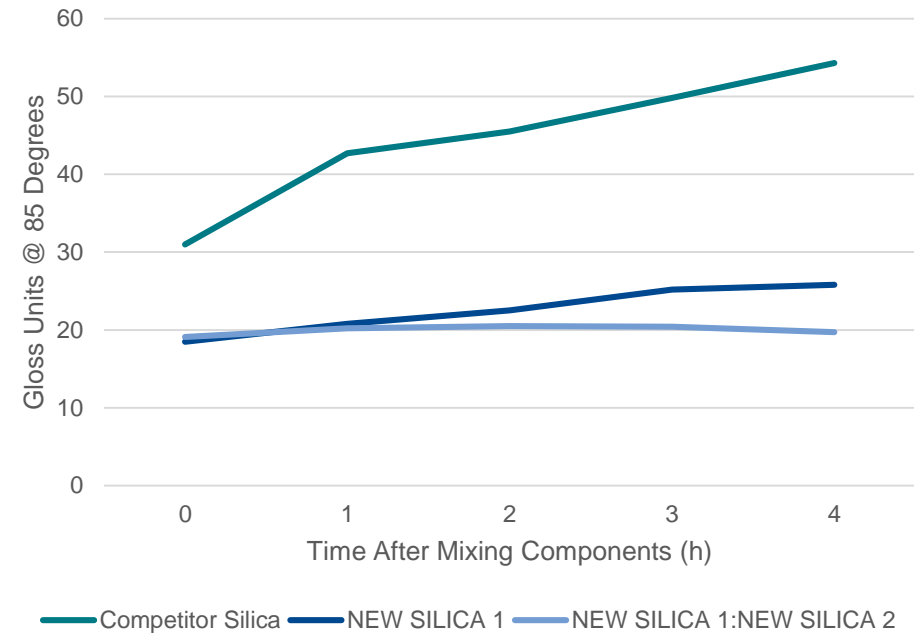
## Matting Efficiency and Gloss Stability

Matting Agent	Loading
Competitor Silica	5%
NEW SILICA 1	4%
NEW SILICA 1:NEW SILICA 2	6% (3% AQ800/3% AQ880)

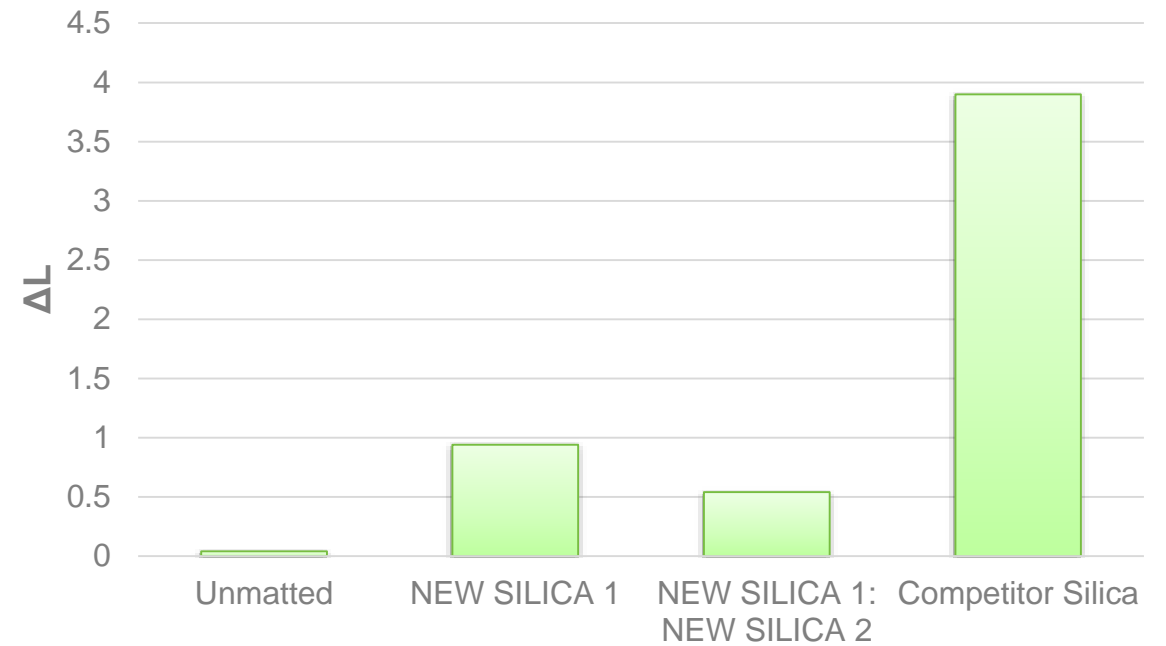
60 Degree Gloss vs. Pot Life



85 Degree Sheen vs. Pot Life



## Hot Water Resistance



## Chemical Resistance



24H H <sub>2</sub> O	
1H 96% EtOH	4H 96% EtOH
1H 5% AcOH	1H 10% Na <sub>2</sub> CO <sub>3</sub>

- Improvements in water and acetic acid for both; 4h ethanol for the blend
- Comparable clarity for all samples

## Stain Resistance



- Mustard, red wine and black tea were improved for both; coffee improved for the blend
- Mustard was improved over the unmatted control



- NEW SILICA 1 performed well as a standalone matting agent relative to the competitive grade
- Blending approach was confirmed to provide the formulator options based on desired balance of properties
- Pot life stability was improved for the NEW SILICAS
- 85° sheen was significantly lower than the competitive grade
- Hot water resistance was substantially improved
- Select chemical and stain resistance was improved
- Clarity and metal marking were comparable



**Leather Coatings**

Car seats | Furniture



**Glass Coatings**

Architectural | Consumer goods



**Digital Media**

Screen printing



**Plastic Coatings**

Consumer electronics | Automotive interior



**Thank you!**

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