



Dow Corning[®] 52 Additive

The Additive Way to Improve The Slip
and Surface Damage Protection for
Water-Borne Coatings

Hungarocoat, 26.11. 2014

DOW CORNING

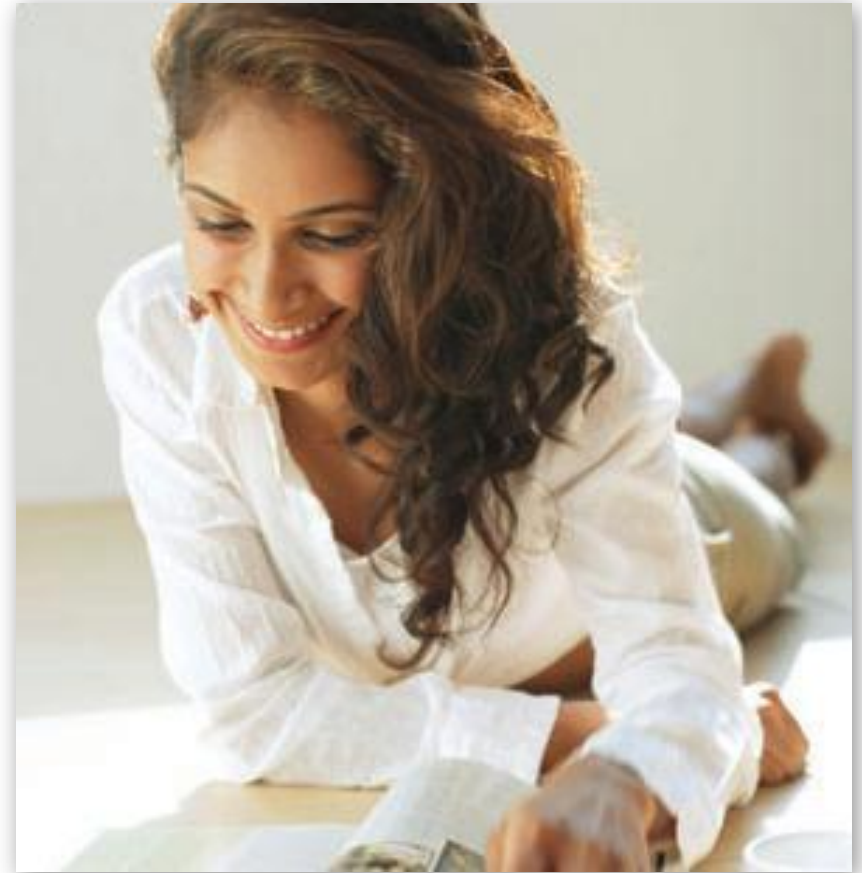
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Power Up Your Formulations



- Introduction
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Applications/Systems



Dow Corning[®] 52 Additive

Novel Si technology to
deliver high molecular
weight silicone

Waterborne Wood Coatings

Waterborne Inks

Waterborne Interior Coatings

Waterborne Exterior Coatings

Waterborne OPVs

**Compatible with waterborne acrylic, alkyd, polyester, epoxy, polyurethane,
and vinyl resin-based coatings**

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Enhanced Benefits



Dow Corning[®] **52 Additive**

Enhanced formulations
at low addition levels

0.1-0.5 wt%

Slip Customization

Scratch Resistance

Abrasion Resistance

Sandability

Anti-blocking

Recoatibility

Easy Incorporation

No Impact on Water Resistance

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Formulation Options



**Dow Corning®
52 Additive**
Used alone

All benefits with
low addition levels

**Dow Corning®
52 Additive**
Used with waxes
(Paraffin, HDPE, PE wax emulsions)

Increase slip and abrasion
of your current formulation
with low addition levels

Enhanced formulations with cost-in-use savings

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Typical Properties

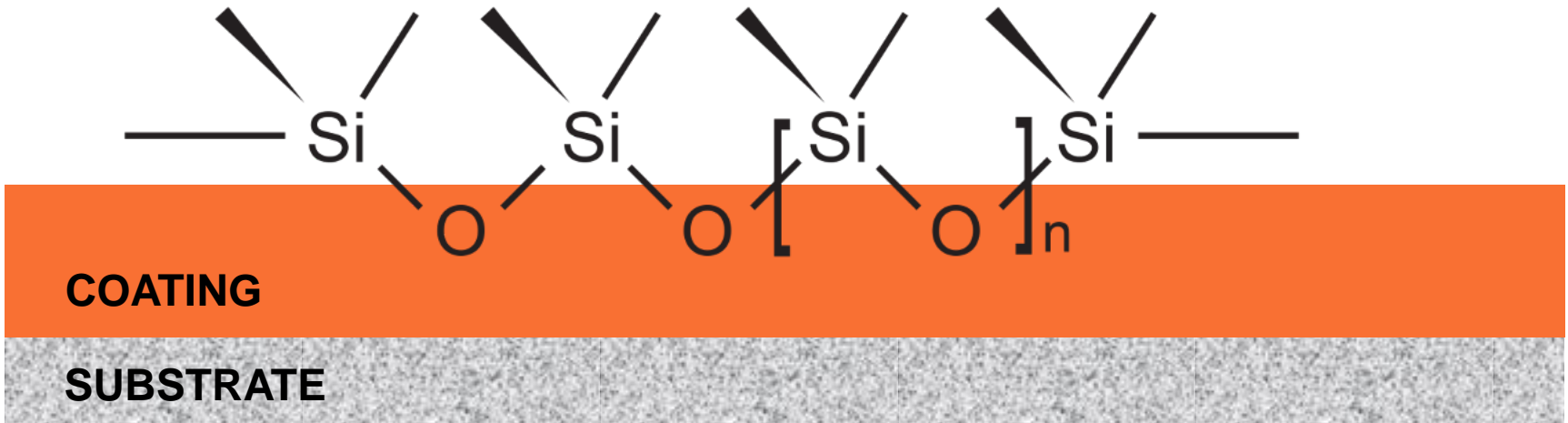


Property	<i>Dow Corning</i> [®] 52 Additive
Description	Ultra-high molecular weight silicone dispersion in water
Reactive group	OH-functional, silanol
Appearance	Smooth, milky white liquid
Nonvolatile content	62-67%
Viscosity at 25°C (77°F)	3,000-5,000 cP
Regulatory Information	Please see Appendix

How Silicones Work



Silicones orient to the air/polymer interface to form a very thin lubricating layer on the coating surface, which reduces the coefficient of friction



The Physics of Slip



DEFINITION

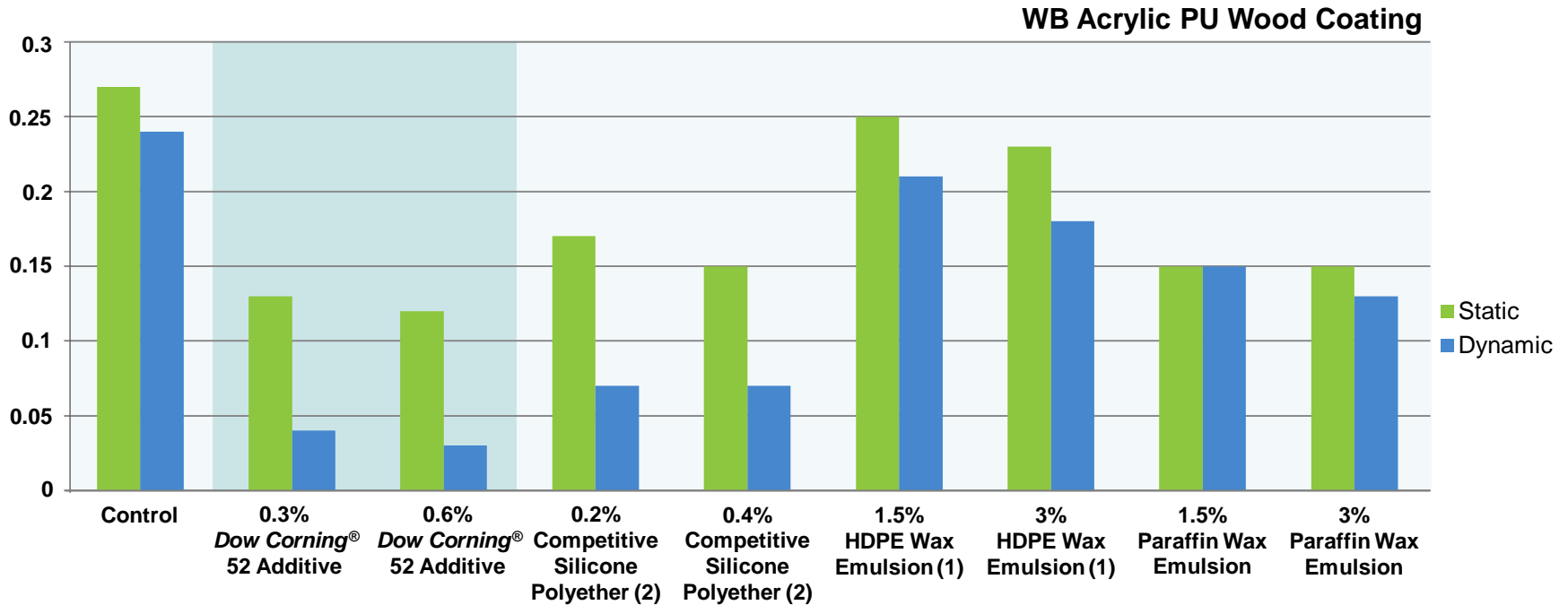
- Lubrication at the surface of the dry coating film
- Slip is quantified by measuring the coefficient of friction as both static and dynamic values
 - Static CoF is the force required to start the movement of an object not in motion
 - Dynamic CoF is the force during movement for objects in motion
 - CoF is mainly reduced by lubrication with surface-active additives

TEST METHOD

- Coefficient of friction – the force required to pull a sled of specified weight along the surface of the coating
- Slip angle – the lower the steepness of the incline, the more slippery the surface



Static & Dynamic CoF: WB Wood Coating

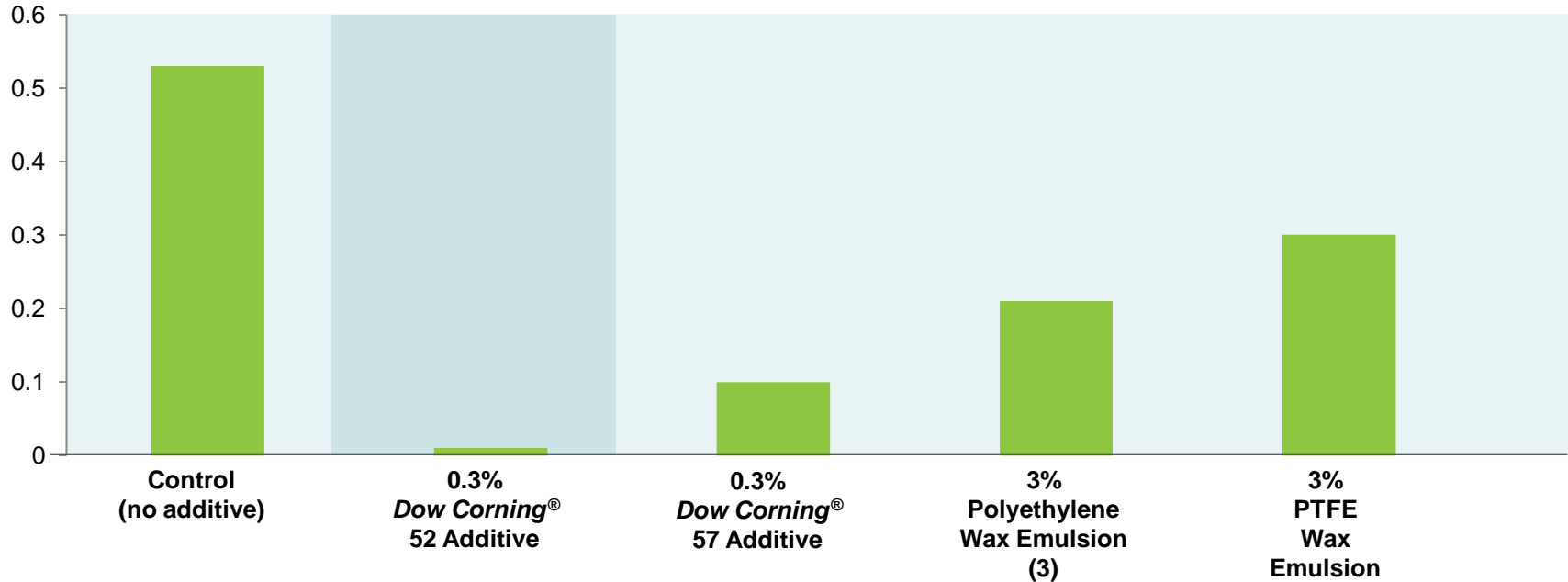


***Dow Corning® 52 Additive* has the lowest coefficient of friction values versus competitive silicone polyethers and the wax emulsions**



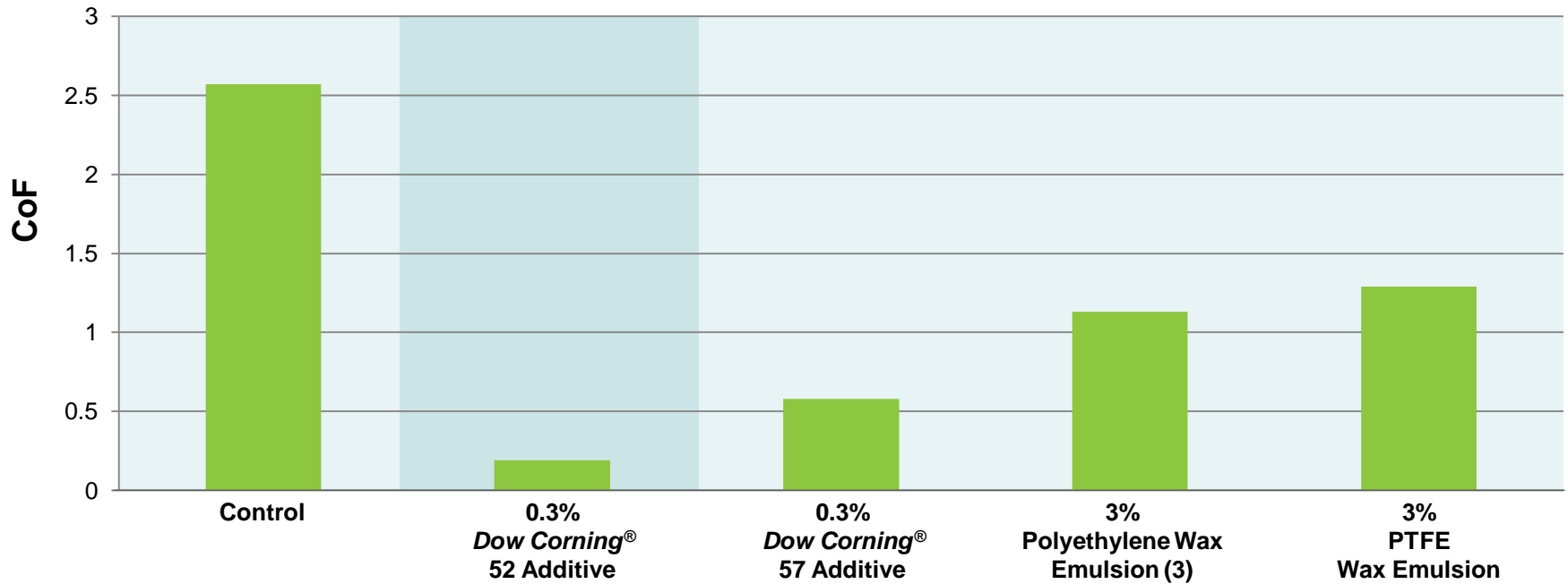
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Dynamic CoF: WB Acrylic Urethane Paint



Dow Corning[®] 52 Additive at 0.3 weight % is 1/10 the level of the wax used. Waxes fail to achieve the very low CoF.

Dynamic CoF: WB Acrylate OPV



Dow Corning[®] 52 Additive provides a greater reduction in the dynamic CoF at lower use levels compared to organic and fluorinated waxes.

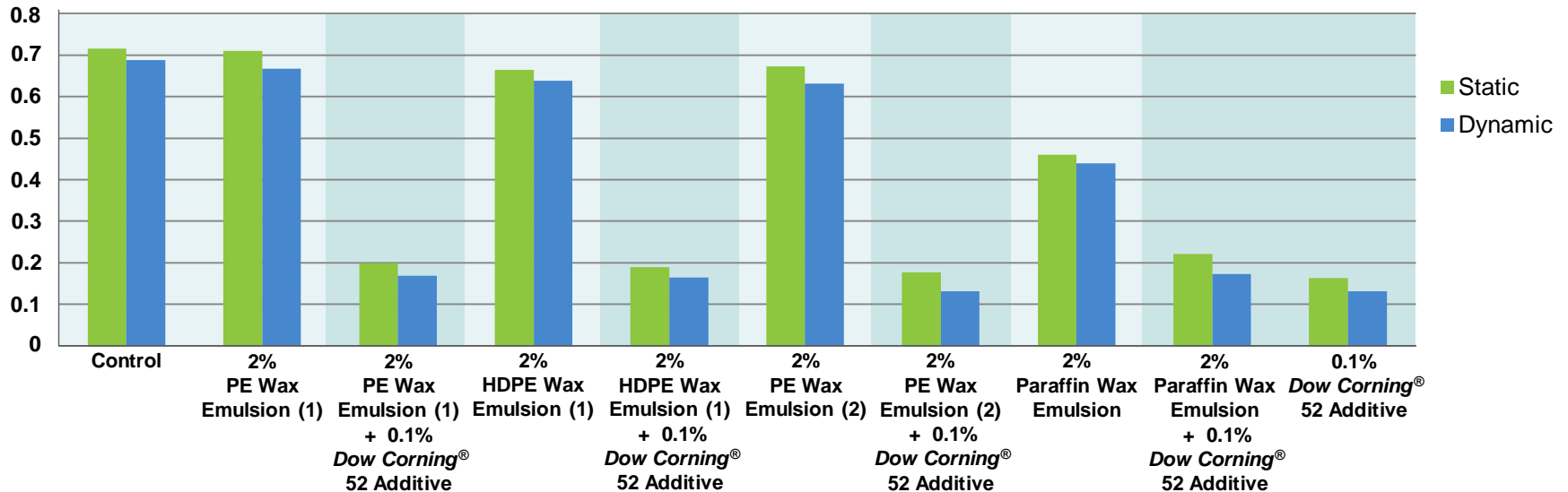


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CoF: *Dow Corning*[®] 52 Additive in Combination with Wax Emulsions



WB Acrylic Wood Coating



In all cases, *Dow Corning*[®] 52 Additive when used with wax emulsions showed a significant improvement in slip over the samples containing only the wax emulsion.



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Abrasion Resistance



DEFINITION

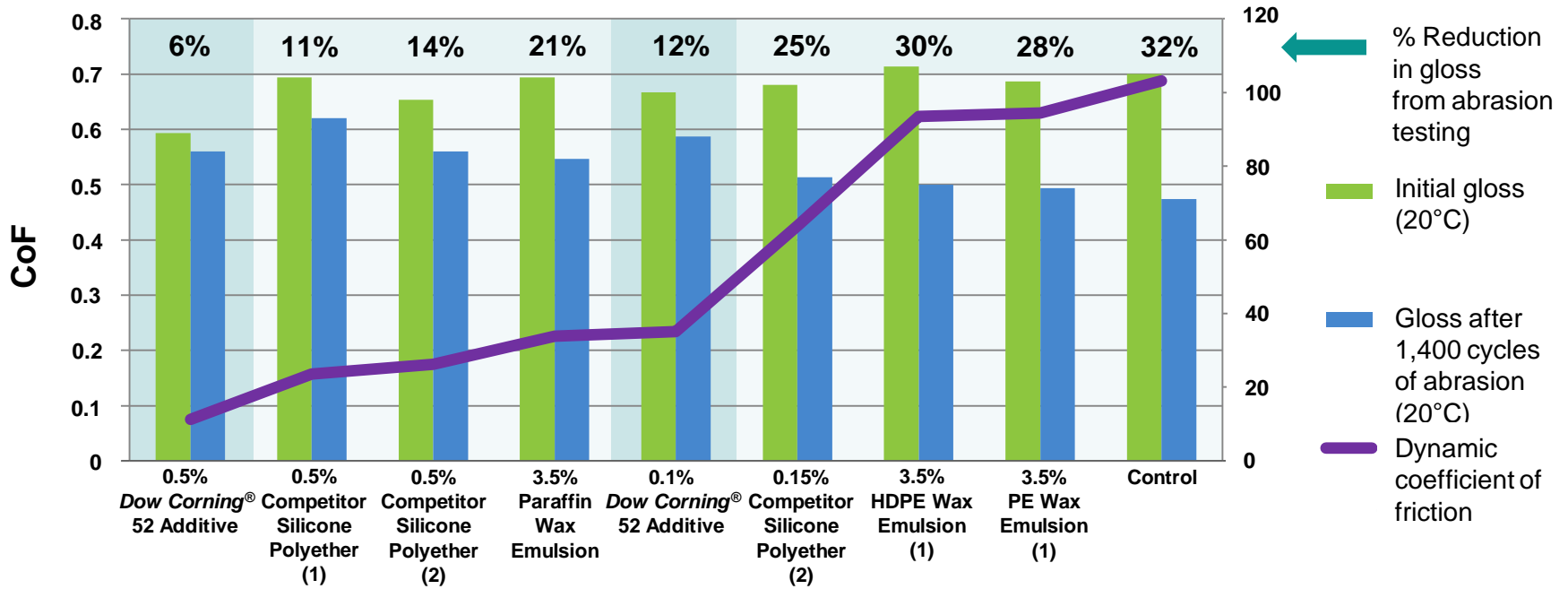
- Resistance of coating to wear by friction

TEST METHOD

Reciprocating Abrasion Testing

- Reciprocating abrasion testing – generates wear by friction on a coated panel that moves horizontally under a stationary abrasive
- Determine % reduction of gloss after abrasion testing

Abrasion Resistance & Slip: WB Acrylic Wood Coating

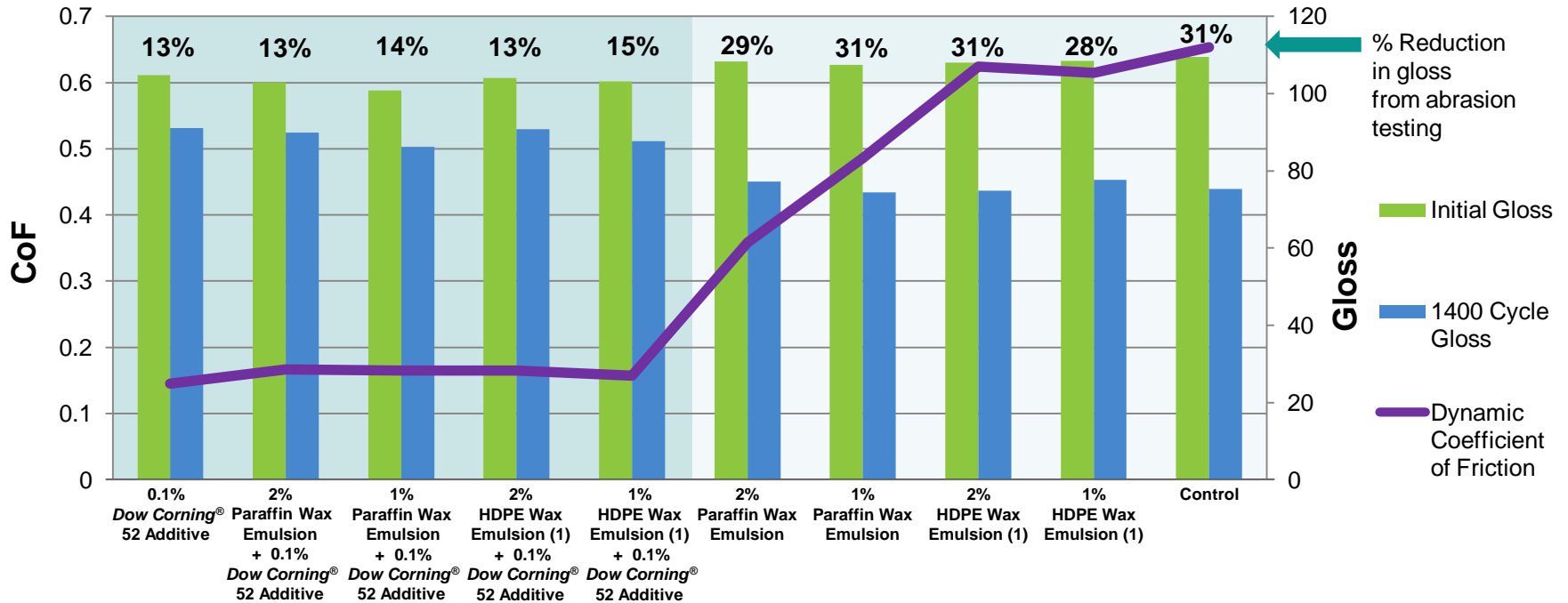


The results for *Dow Corning*® 52 Additive at 0.1 weight % are significantly better than the wax emulsions for slip and abrasion resistance.



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Cost in Use – Combination



Dow Corning® 52 Additive when used with wax emulsions at levels 1% or 2% showed a significant improvement in slip and abrasion resistance versus the samples containing only the wax emulsion at either percent levels.



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Scratch Resistance & Sandability



DEFINITION

Scratch Resistance

- The ability of a coating to resist minor damage or scratching

Sandability

- The ability of a coating to sanded without clogging the sandpaper

TEST METHOD

Scratch Resistance

- Quartant abrasion testing – generates abrasion by both reciprocating and rotary motion similar to processing conditions
- Determine the change in gloss before and after scratch testing

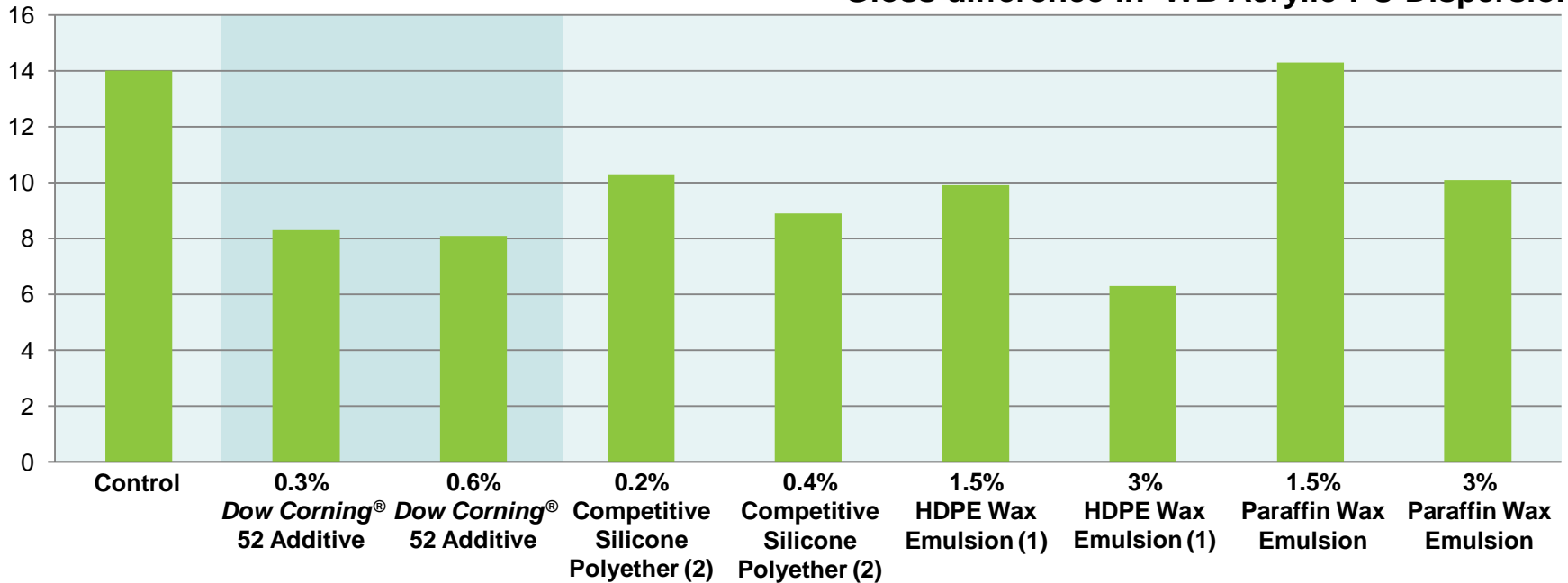
Sandability

- Ranking of the ability of the coating to powder and not clog the sandpaper

Scratch Resistance: WB Wood Coating



Gloss difference in WB Acrylic PU Dispersion



Dow Corning® 52 Additive at 0.3% and 0.6% performed well versus the competitive silicone polyether and wax emulsions.

Sandability Ranking



**Best
Sandability**
Best Ranking = 1

**Worst
Sandability**
Worst Ranking = 9

1 0.6% *Dow Corning*[®] 52 Additive

2 0.3% *Dow Corning*[®] 52 Additive

3 3% Paraffin Wax Emulsion

4 3% HDPE Wax Emulsion (1)

5 1.5% Paraffin Wax Emulsion (1)

6 0.4% Competitive Silicone Polyether (2)

7 1.5% HDPE Wax Emulsion (1)

8 0.2% Competitive Silicone Polyether (2)

9 Control

Dow Corning® 52 Additive: The Positive Effects



- Significantly improves slip, scratch and abrasion resistance, sandability, recoatability and anti-blocking without negatively impacting current properties.
- Ease of incorporation and very low addition levels differentiates formulation performance providing competitive advantages in the market.
- Use in combination with current wax additives at very low concentrations for low cost-in-use.

Target Markets



Industrial Wood



Inks and OPVs



Wood Trim



Interior and Exterior Paints

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Power Up Your Coatings



make a big splash!
WITH DOW CORNING

**Superior
Performance**

***Dow Corning*[®]
52 Additive**

**Good Cost
In Use**

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Learn More and Request a Sample



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 - Learn how to power up your coatings, view our [product guide](#)
- The advantages are in the details
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APPENDIX

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Regulatory Information



- Compliant with U.S. FDA 21 CFR 176.210 – “Defoaming agents used in the manufacture of paper and paperboard”
- Please contact your local Dow Corning Customer Center to receive the EU Food Profile.
- APEO-free
- VOC
 - Exclude value is 7 g/l (U.S.)
 - *Dow Corning*[®] 52 Additive contains about 1.9% of components considered VOC following European Council Directive 1999/13/EC and 2004/42/EC criteria*

*This assessment is based on the *theoretical* evaluation of the information provided by our suppliers and the knowledge of our materials. Since we do not specifically *analyze* our products for total VOC content, we cannot guarantee specific limits.

Competitive Materials



Material	Description
Competitor silicone polyether (1)	Polyether siloxane copolymer
Competitor silicone polyether (2)	Polyether modified polydimethylsiloxane
HDPE wax emulsion (1)	35% solids nonionic emulsion based on an oxidized HD polyethylene wax
PE wax emulsion (1)	26% solids polyethylene wax emulsion
PE wax emulsion (2)	42% solids nonionic polyethylene emulsion
Polyethylene wax emulsion (3)	27% solids nonionic polyethylene dispersion
Paraffin wax emulsion	35% solids nonionic emulsion based on a modified paraffin wax
PTFE wax emulsion	42% solids nonionic polytetrafluoroethylene dispersion

Competitive Materials: Benefits Comparison



Material	Scratch Resistance	Rub Resistance	Abrasion Resistance	Slip	Anti-blocking	Mar Resistance
<i>Dow Corning</i> ® 52 Additive	■	■	■	■	■	■
Competitor silicone polyether (1)				■		
Competitor silicone polyether (2)				■	■	
HDPE wax emulsion (1)	■	■				
PE wax emulsion (1)		■				
PE wax emulsion (2)	■			■	■	■
Polyethylene wax emulsion (3)	■		■	■	■	
Paraffin wax emulsion	■	■		■	■	
PTFE wax emulsion			■	■		

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