

ZEFFLE GH-701

Hydrophilic additive for self-cleaning coatings

Fluorinated additive agent, lower water contact angle, self-cleaning effect under rain exposure

Characteristics

Additive for solventborne coatings

Reduces water contact angle to allow wetting which removes dirt over time

Maintains aesthetics over years of lifetime

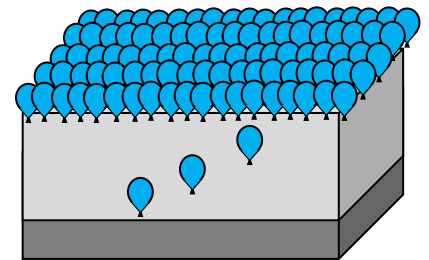
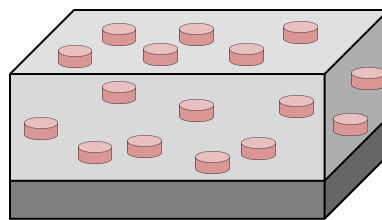
Blooms to the surface

Excellent weather resistance

Applications can be performed by various methods, including spraying, brushing, roller painting and roll to roll processes

Real World Performance:

5 years of exposure in Yodogowa, Japan

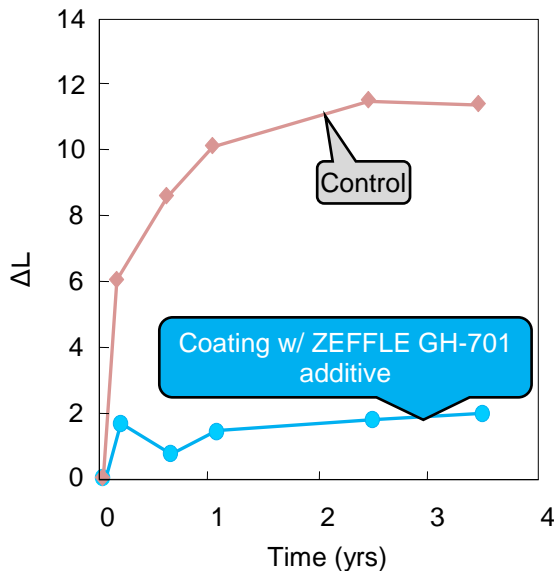


Conventional hydrophilic additive



ZEFFLE GH-701 blooming hydrophilic additive

ΔL Retention over time



Properties*	Value
Usage Level (Clear Coats)	1-5% wt
Usage Level (Pigmented Coating)	2-3% wt
Gardner Color Number	< 1
Specific Gravity	1.34-1.42
Resin Solids (wt%)	100%
Refractive Index (25°C)	1.370-1.387

*Typical properties are not suitable for specification purposes.

Self-Cleaning Starting Point Formulations:

Polyester Resin Paint Formulation:

Ingredient	Function	Mass %
Desmophen T1665S/NIB	Resin	43.08
Cymel 303	Crosslinking	6.98
Catalyst 602	Catalyst	0.22
Solvesso 100	Pigment	33.18
Cyclohexanone	Solvent	16.54
Total		100

Additive:

Ingredient	Function	Mass %
10% wt ZEFFLE GH-701 (in n-butyl acetate)	Hydrophilicity	2.8
Butanol	Solvent	5
Total		107.8

Fluoropolymer Resin Paint Formulation:

Ingredient	Function	Mass %
ZEFFLE GK-870	Resin	43.08
Cymel 303	Crosslinking	6.98
Catalyst 602	Catalyst	0.22
Solvesso 100	Pigment	33.18
Cyclohexanone	Solvent	16.54
Total		100

Additive:

Ingredient	Function	Mass %
10% wt ZEFFLE GH-701 (in n-butyl acetate)	Hydrophilicity	5.6
Triethyl Orthoformate	Solvent	5
Total		110.6

General Formulation Guidelines:

ZEFFLE GH-701 has a pot-life after mixing paint

- Varies by formulation
- Solvents (up to 5 wt% of paint) increase the pot-life
 - Triethyl Orthoformate
 - Butanol

ZEFFLE GH-701 reacts with water and humidity

- Avoid exposure to the atmosphere before formulating

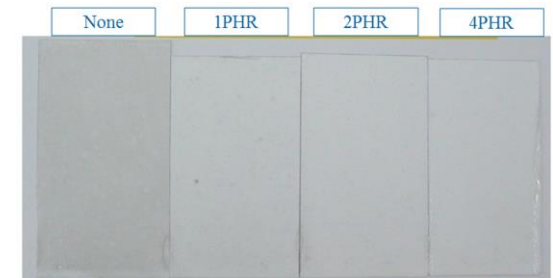
ZEFFLE GH-701 reacts with OH groups in resin

- Add to formulation right before coating

Solvent dilution before adding improves compatibility

Must be initially exposed to water before contact angle is reduced. 24 hours of immersion is recommended in lab scale testing if outdoor exposure is not viable.

Addition Level against Base Resin (PHR)*



27 months exposure
Polyester resin for clear coat PCM

*Per Hundred Resin