

Strodex™ TH-100 surfactant

**A multifunctional surfactant for waterborne architectural
paints and coatings**



ASHLAND

With good chemistry great things happen.™



Formulation excellence using Strodex TH-100 multifunctional surfactant

Ashland Specialty Ingredients introduces Strodex TH-100, a low-foaming multifunctional surfactant. Strodex TH-100 multifunctional surfactant is low in volatile organic compounds (VOC) and contains no alkylphenol ethoxylates (APEOs). The unique characteristics of this product provide multiple functionalities to formulators in a single additive that can replace a wide range of non-ionic surfactants and sodium or potassium polyphosphates in many coatings formulations.

Strodex TH-100 multifunctional surfactant improves the performance of a wide range of water-based low to high PVC architectural paints and coatings, formulated with popular latex binders. Strodex TH-100 multifunctional surfactant will improve latex and paint stability color acceptance, and scrub resistance. It is also very effective for improving freeze-thaw stability. In addition, it can decrease pigment dispersion time by up to 30 percent.

The performance of Strodex TH-100 multifunctional surfactant is complemented by formulating it with Aquaflo™ nonionic synthetic associative thickeners to optimize paint rheology and by using Drewplus™ foam control agents.

Improving latex and paint stability

Divalent cations such as calcium and zinc often are the cause for destabilization of latex emulsions and coatings formulations, limiting the use of fillers such as calcium carbonate and functional pigments like zinc oxide. Zinc oxide is useful in the formulation of mildew resistant exterior white paints and interior paints for high moisture areas, tannin-blocking wood

Key features and benefits of Strodex TH-100 multifunctional surfactant:

- Enhances wetting and dispersion of pigments and fillers
- Stabilizes latex emulsions and paint formulations
- Supports substrate wetting
- Allows effective reduction of glycol solvents and provides freeze-thaw stability
- Alkyl phenol ethoxylate (APEO)-free
- Low VOC
- Low foaming

primers and efflorescence resistant primers. Higher-HLB nonionic surfactants, both those containing APEO and those that are APEO free, are currently used for stabilization. However, these surfactants are not effective in many cases, resulting in gelation of the latex, severe paint syneresis, and a decrease in scrub resistance. Strodex TH-100 multifunctional surfactant has proven to be an effective agent for stabilizing latex emulsions in the presence of divalent cations.

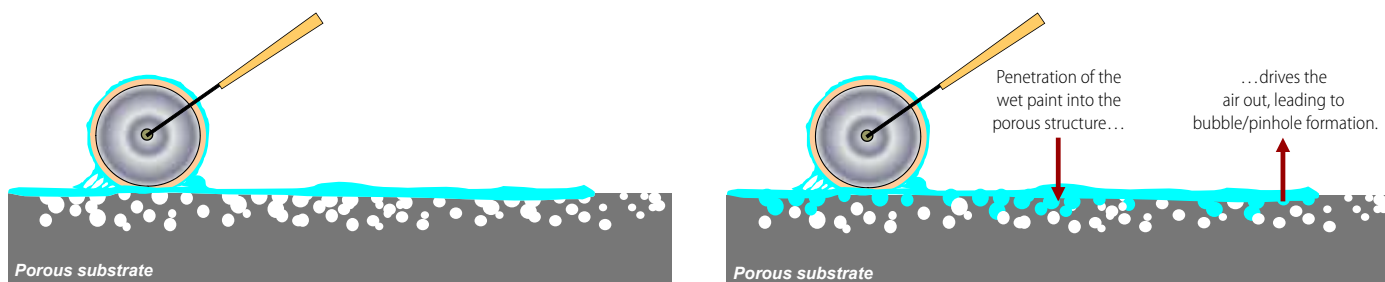
Reformulation of decorative paints: optimizing the use of opaque polymers

Opaque polymers are widely used to reduce the amount of TiO_2 in paints. Instability limits the use of opaque polymers in some formulations. Strodex TH-100 multifunctional surfactant improves paint stability and maintains gloss in paints using opaque polymer.

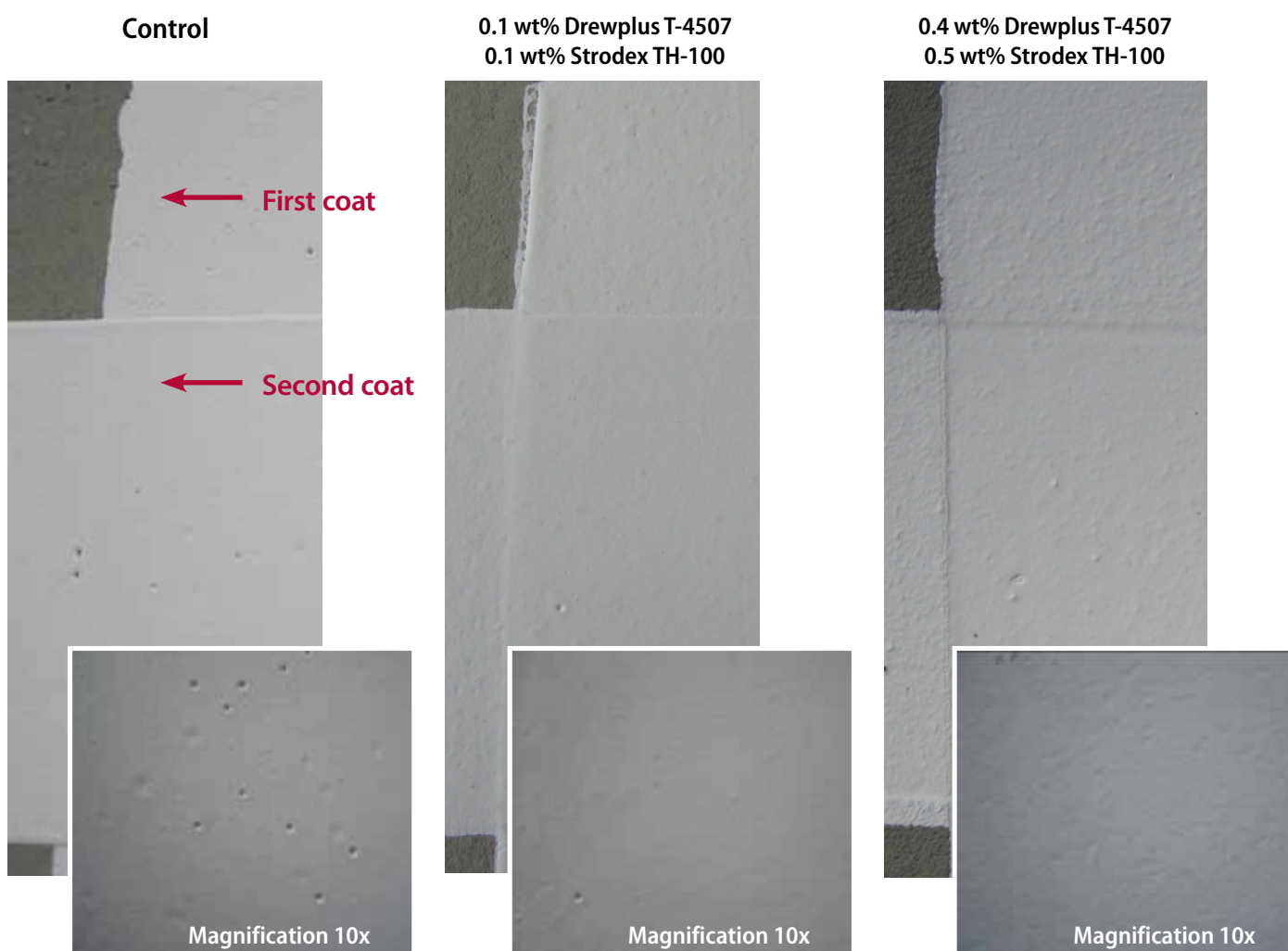
Single-surfactant formulating strategies using Strodex TH-100 multifunctional surfactant

- Recommended starting point dosage levels: 0.1 – 0.5 wt% based on total formulation weight.
- Remove all surfactants from the existing paint formulation and replace these with an equal weight of Strodex TH-100 multifunctional surfactant. Dose Strodex TH-100 multifunctional surfactant in the dispersion stage. Subsequently reduce the amount needed by 25 percent and 50 percent to obtain the best cost and performance for the final paint formulation. **Do not remove the main dispersing agent from the paint formulation.**
- Remove any co-dispersants, such as sodium or potassium triphosphate, as these may have a detrimental effect on the coating performance.
- If required, move part of the dosage of Strodex TH-100 multifunctional surfactant to the let-down stage.

Problem description: Improving coating performance if applied on a porous concrete substrate



Phenomena may also occur upon application of a second coat on the first dry layer.



Improvement of a PVC 70 styrene-acrylic latex wall paint. Application on a porous concrete substrate.

The control paint contains both a defoaming agent and a conventional surfactant. The appearance of both the first and second coats of paint is affected severe blisters and pinholes caused by air released from the porous substrate. This problem cannot be solved by adding a foam control agent only. The use of Strodex TH-100 multifunctional surfactant enhances the wetting of the substrate and supports the quick release of air; combined with the use of a boosted foam control agent such as Drewplus T-4507 foam control agent, it will effectively improve coating performance.

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Material	wt%
Water	16.87
Natrosol™ 250 HBR HEC	0.24
pHLEX™ 110 neutralizing agent	0.10
Dispersing agent	0.44
Drewplus™ L-475 foam control agent	0.59
Strodex™ TH-100 multifunctional surfactant	0.56
TiO ₂	17.61
CaCO ₃	3.98
Sodium alumino silicate opacifier	1.76
Disperse for 10-15 minutes then let down with:	
Drewplus W-4502 foam control agent	0.31
Strodex TH-100 multifunctional surfactant	0.16
Acrylic emulsion (49% by wt solids)	38.57
Opacifying binder dispersion (30% by wt solids)	11.58
Dibenzoate ester	2.23
Biocide 1	0.17
Biocide 2	0.22
Aquaflow™ NHS-300 NSAT (as-is)	1.22
Aquaflow™ XLS-500 NSAT (as-is)	0.33
Water	3.06
Total	100.00

43-PVC, low-odor, exterior paint based on an acrylic emulsion.

Formulation showing an optimal combination of additives including Strodex TH-100 multifunctional surfactant as the single added surfactant.

Paint properties

Stormer, KU	103
ICI, Pa-s	1.6
Weight solids, %	45.7
PVC	43
Hiding	97.7
Gloss (60° /85°)	13/40
Abrasive scrub (First Cut/Cut through)	630/789

71-PVC, low-odor, Interior paint based on an acrylic emulsion.

Formulation showing an optimal combination of additives including Strodex TH-100 multifunctional surfactant as the single added surfactant.

Paint properties

Stormer, KU	113
ICI, Pa-s	2.1
Weight solids, %	50.9
PVC	71
Hiding	98
Gloss (60° /85°)	3/9
Abrasive scrub (First Cut/Cut through)	354/428

Material	wt%
Water	16.81
Natrosol™ 250 HBR HEC	0.29
pHLEX™ 110 neutralizing agent	0.09
Dispersing agent	0.77
Drewplus™ L-475 foam control agent	0.53
Strodex™ TH-100 multifunctional surfactant	0.50
TiO ₂	15.20
CaCO ₃	10.30
Sodium alumino silicate opacifier	2.17
Calcine clay	10.51
Disperse for 10-15 minutes then let down with:	
Drewplus W-4502 foam control agent	0.28
Strodex TH-100 multifunctional surfactant	0.15
Acrylic emulsion (49% by wt solids)	18.15
Opacifying binder dispersion (30% by wt solids)	12.85
Dibenzoate ester	1.27
Biocide 1	0.15
Biocide 2	0.20
Aquaflow™ NHS-300 NSAT (as-is)	1.01
Aquaflow™ XLS-500 NSAT (as-is)	0.44
Water	8.33
Total	100.00