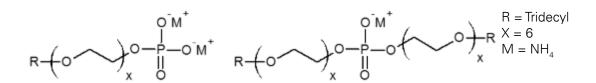


POLYSTEP® P-12A

a primary emulsifier for use in emulsion polymerization systems

POLYSTEP P-12A is a tridecyl ethoxylate phosphate ester, ammonium salt for use in emulsion polymerization. When compared to an alkyl phenol ethoxylate (APE) type phosphate ester as the primary emulsifier, **POLYSTEP P-12A** can improve performance attributes in both the emulsion polymerization process and downstream coating applications.



Key Attributes:

- ✓ Low coagulum formation in small particle latexes ✓ Improves color acceptance ✓ Improves washability ✓ Improves mechanical stability
- ✓ Alkyl phenol ethoxylate (APE) free

- ✓ Improves RT¹ block resistance

Latex Performance

Polymer	52BA/46	6MMA/2MAA
Surfactant	POLYSTEP P-12A	NP-6PE
Level BOM, %	1.5	1.5
Final PSD, nm	113	111
Ca ²⁺ Stability, g 10% CaCl ₂	8.5	8.4
Shear Stability, min	6.0	4.0
Heat Stability, 49°C for 30 days	Pass	Pass
BA = Butyl Acrylate MMA = M	ethyl Methacrylate	MAA = Methacrylic Acid

POLYSTEP P-12A is comparable to a nonvl phenol (POE-6) phosphate ester (NP-6PE) as the sole primary emulsifier in an acrylic polymer $(Tq = 2^{\circ}C)$ stabilized with MAA and no additional post-additive latex stabilizers.

POLYSTEP P-12A provided comparable results in the emulsion polymerization process and resulting latex as NP-6PE.



The coatings containing **POLYSTEP P-12A** and NP-6PE do not contain any additional wetting agents added to the paint formulation. The examples that follow show how the choice of surfactant in the latex impacted coating applications.

Color Acceptance

POLYSTEP P-12A improved performance for red iron oxide and provided equivalent performance to NP-6PE for carbon black color acceptance.

<50 g/L VOC, PVC = 29.8%, Volume Solids = 33.7%

<u>Washability</u>

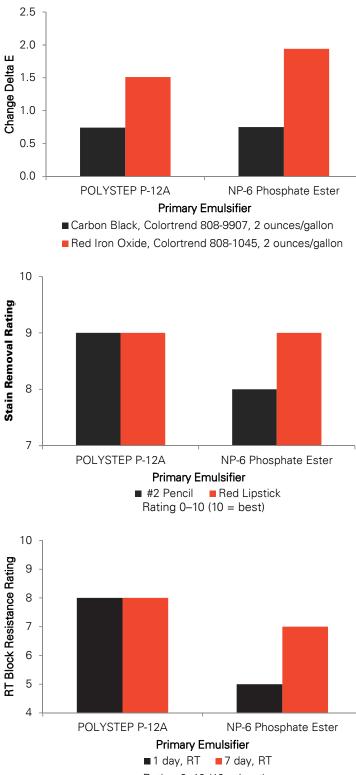
POLYSTEP P-12A improved #2 pencil

stain removal compared to NP-6PE and provided comparable red lipstick removal.

<50 g/L VOC, PVC = 29.8%, Volume Solids = 33.7%

ASTM D4828

NP-6PE.



Rating 0-10 (10 = best)

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ASTM D4946

<50 g/L VOC, PVC = 29.8%, Volume Solids = 33.7%

Block Resistance

POLYSTEP P-12A improved 1-day and

7-day RT block resistance compared to

February 2018