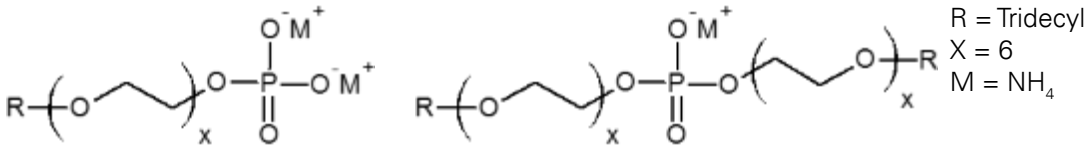
POLYSTEP® P-12A

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 mechanical stability
- ✓ Alkyl phenol ethoxylate (APE) free
- ✓ Improves color acceptance
- ✓ Improves washability
- ✓ Improves RT[1] block resistance

Latex Performance

Polymer	52BA/46MMA/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 = Methyl Methacrylate MAA = Methacrylic Acid

POLYSTEP P-12A is comparable to a nonyl phenol (POE-6) phosphate ester (NP-6PE) as the sole primary emulsifier in an acrylic polymer (Tg = 2°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.

[1]RT = Room temperature

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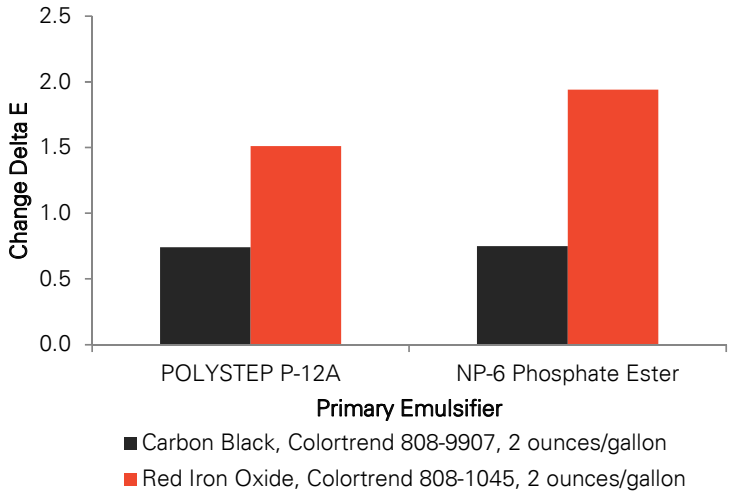
The coatings containing **POLYSTEP P-12A** and NP-6PE do not contain any additional wetting agents added to the paint formulation. The examples that follow show how the choice of surfactant in the latex impacted coating applications.

Color Acceptance

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

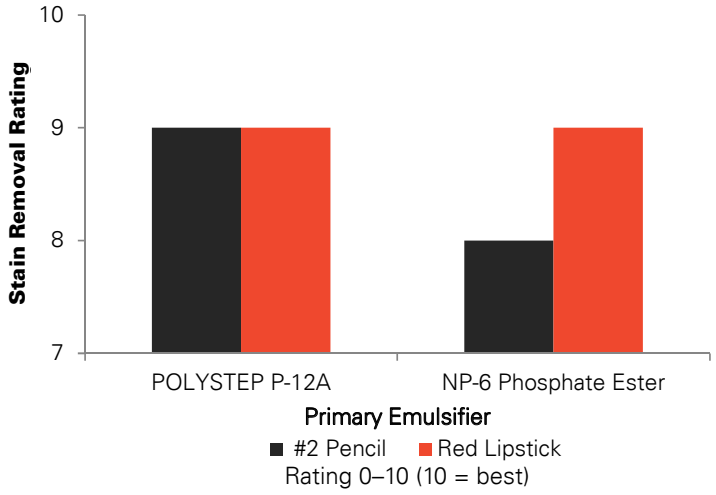
<50 g/L VOC, PVC = 29.8%, Volume Solids = 33.7%



Washability

POLYSTEP P-12A improved #2 pencil stain removal compared to NP-6PE and provided comparable red lipstick removal.

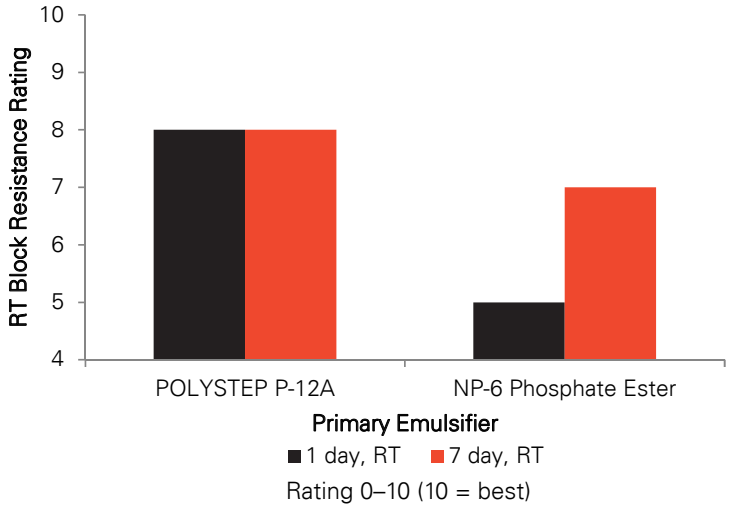
ASTM D4828
<50 g/L VOC, PVC = 29.8%, Volume Solids = 33.7%



Block Resistance

POLYSTEP P-12A improved 1-day and 7-day RT block resistance compared to NP-6PE.

ASTM D4946
<50 g/L VOC, PVC = 29.8%, Volume Solids = 33.7%



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