Corrosion Inhibitors

Styrene Acrylic Latex Primers

[Application Bulletin No. 9970]

MOLY-WHITE MZAP PROVIDES SUPERIOR COST-EFFECTIVE PERFORMANCE IN STYRENE ACRYLIC LATEX PRIMERS

Moly-White MZAP outperforms competitive inhibitors in 850 hr salt-spray and 1,008 hr cyclic salt-spray/UV exposure tests in Reichhold Arolon 847 formulation

Recent testing of MOLY-WHITE MZAP, a calcium zinc phospho-molybdate corrosion inhibitor, demonstrated the excellent, cost-effective performance of this inhibitive pigment in styrene acrylic latex primer formulations. Coatings prepared using MOLY-WHITE MZAP were found to offer superior salt-spray and cyclic salt-spray/UV exposure results versus a variety of competitive inhibitors, all currently promoted for latex coating applications.

Testing was conducted in a model formulation based on Reichhold's Arolon 847 styrene acrylic latex resin. The formula for the MOLY-WHITE MZAP containing system is shown in Table 1. All corrosion inhibitors were evaluated at an equal weight loading of 0.5 lbs/gal, with slight adjustments made in the extender levels (Atomite) as needed to maintain constant PVC and volume solids. All coatings were applied to mild cold-rolled steel test panels at a dry film thickness of 2.2 mils. Panels were allowed to cure for 1-week under ambient conditions before starting exposure tests.

Photographs of the test panels are presented in Figure 1. In salt-spray (ASTM B117), the MOLY-WHITE MZAP based formulation can be seen to provide superior corrosion resistant performance.

Oven stability testing (4 weeks @ 120 F) of these formulations showed that the stability of MOLY-WHITE MZAP was comparable to the competitive inhibitors, but some optimization of formulation stability might be desirable (e.g., the MZAP formulation exhibited a 14 KU increase after 4 weeks @ 120 F).

MOLY-WHITE MZAP is also a highly versatile corrosion inhibitor, offering excellent performance in other waterbased systems and a wide range of solvent based formulations.

Moly White™ Pigments Group

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Table 1 Styrene Acrylic Latex Primer with MOLY-WHITE MZAP

material	lbs.	gal.
grind		
Methyl Carbitol (1)	20.6	2.44
water	62.0	7.44
Tamol 731 (2)	10.3	1.12
ammonia	2.1	0.28
Triton CF-10	0.2	1.65
Patcote 841M (3)	4.1	0.56
R1299 RIO (4)	51.6	1.21
Atomite (5)	142.2	6.32
MOLY-WHITE MZAP (6)	50.0	2.00
HSD 5-10 minutes		
letdown		
water	20.6	2.48
Arolon 847 (7)	585.6	66.55
ammonia	2.3	0.30
butoxyethanol	46.5	6.19
10% sodium nitrite	13.9	1.58
RM 825 thickener (2)	8.9	0.99
water	8.4	1.01

Formulation Constants:

VOC (g/l):	134
Vol. Solids (%):	35.4
PVC (%):	26.9
pH:	8.9
Viscosity (KU):	76 (initial)

Material Sources: (1) Union Carbide, (2) Rohm&Haas, (3) Patco, (4) Harcross , (5) ECC, (6) Moly-White Pigments, (7) Reichhold

Table 2 Corrosion Inhibitors Evaluated

Product Name	Composition
MOLY-WHITE MZAP	calcium zinc phosphomolybdate
Mineral Pigments J0852	zinc phosphate
Halox SZP-391	strontium zinc phosphosilicate
Heucophos ZMP	molybdate modified zinc phosphate
ZMP/SZP-391*	1:1 mix of ZMP and SZP-391

*inhibitor system referenced in starting formulation used for this study

The accompanying results show that MOLY-WHITE MZAP provides an excellent, cost-effective route to the development of high performance, corrosion resistant latex primers. MOLY-WHITE MZAP is also highly effective in other waterbased systems and a variety of solventborne formulations. For more information, please contact the MOLY-WHITE Technical Service Department at 1-216-566-1294.

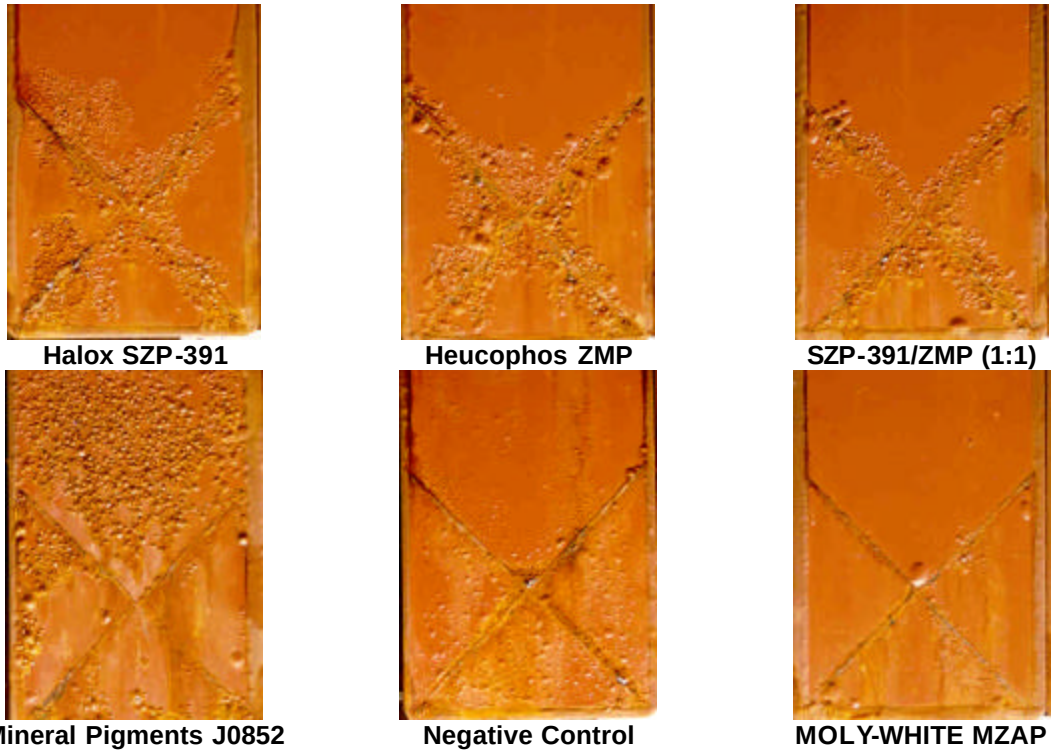

Figure 1 **Appearance of Panels After Testing** (substrate: mild cold rolled steel, dft: 2.2 mils, inhibitor loadings: 0.5 lbs/gal)

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