



## Corrosion Inhibitors

### Polyester Coil Coatings

[Application Bulletin No. 9810]

#### NEW ED-PLUS™ PIGMENTS MATCH CHROMATE PERFORMANCE IN POLYESTER COIL COATINGS

*ED-Plus pigments also outperform competitive nontoxic inhibitors in 1,000 hr salt-spray tests*

Moly-White Pigments Group has introduced a new series of products, MOLY-WHITE ED-Plus, to our line of molybdate corrosion inhibitors. The ED-Plus products were developed based on the modification of our proven molybdate and phospho-molybdate pigment technology. These new products are characterized by a significantly finer and narrow particle size distribution. ED-Plus products allow for improved ease of dispersion plus improved corrosion resistance in key applications including thin film (coil) coatings and high gloss systems.

Recent testing of MOLY-WHITE 101(ED-Plus), a zinc molybdate inhibitor, and MOLY-WHITE 212(ED-Plus), a calcium zinc molybdate inhibitor, in a polyester coil coating showed that these new products provide performance comparable or exceeding that of strontium chromate. Performance comparisons were made based on 1000 hr salt-spray testing (ASTM B117) conducted over phosphated cold rolled steel at a dry-film-thickness of 0.6 mils.

The formula used in this testing is shown in Table 1 (shown containing MOLY-WHITE 101(ED-Plus)). All corrosion inhibitors were incorporated at an equal weight loading (0.6 lbs./gal.) with slight adjustments being made in the titanium dioxide levels as needed to maintain equal PVC and volume solids. Coatings were applied by drawdown to phosphated cold rolled steel and baked to a PMT of 430F (221 C).

Photographs of the test panels after 1000 hr salt-spray testing are shown in Figure 1. It can be seen that both MOLY-WHITE 101(ED-Plus) and MOLY-WHITE 212(ED-Plus) provided performance that was comparable to strontium chromate in this system. Additionally, a dramatic improvement in performance was observed with the ED-Plus pigments versus competitive nontoxic inhibitors (strontium zinc phosphosilicate (SZP-391), aluminum triphosphate (K-White 105), and a molybdate modified zinc phosphate (J0806)) as well as the standard MOLY-WHITE 101 and MOLY-WHITE 212 pigment products.



**Moly-White™ Pigments Group**

**Technical Service:** 601 Canal Road, Cleveland, OH 44113 USA; Ph#: (216) 566-1294,  
Fax#: (216) 566-3837, E-mail: [chsimpson@moly-white.com](mailto:chsimpson@moly-white.com)

**Customer Service:** Post Office Box 1028, Coffeyville, KS 67337 USA; Ph#: (620) 251-0072,  
Fax#: (620) 251-7276, E-mail: [lkbriggs@moly-white.com](mailto:lkbriggs@moly-white.com)

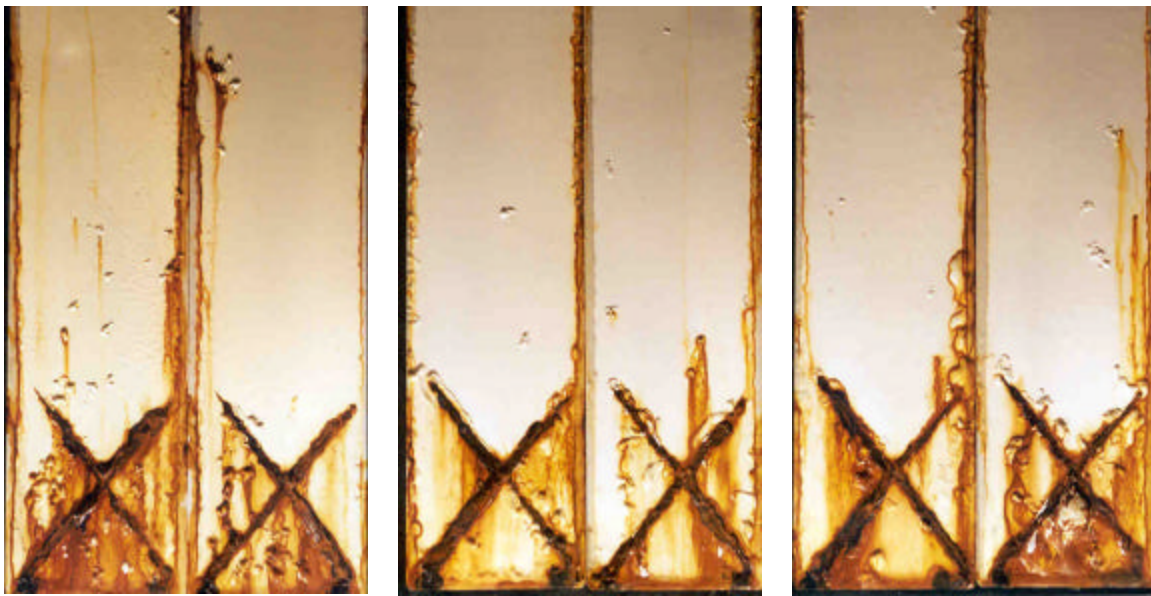
[www.moly-white.com](http://www.moly-white.com)

**Table 1 Experimental Polyester Coil Coating with MOLY-WHITE 101(ED-Plus)**

<u>material</u>	<u>lbs.</u>	<u>gal.</u>
Polymac 935 (1)	216.0	24.36
Cymel 303 (2)	60.0	6.04
High Flash Naptha	40.0	5.52
RCL 535 (3)	270.0	7.72
MOLY-WHITE 101(ED-Plus) (4) HSD 15 min.	60.0	1.44
Polymac 935 (1)	308.0	34.76
Cycat 4040 (2)	5.2	0.64
BYK 370 (5)	20.0	2.60
High Flash Naptha	40.0	5.52

Formulation Constants:      Volume Solids (%):      57.3  
    PVC (%):                              18.0  
    Bake Schedule:                      2 minutes at 500 F (260 C)  
       PMT 430 F (221 C)  
    Substrate:                              Bonderite (phosphated cold rolled steel)  
    DFT:                                        0.6 mils (approx. 15 microns)

Material Sources: (1) McWhorter, (2) Cytec, (3) Millenium, (4) Moly-White Pigments, (5) BYK-Chemie



Strontium Chromate

MOLY-WHITE 101(ED-Plus)

MOLY-WHITE 212(ED-Plus)

**Figure 1 1000 hr Salt-Spray Panels** (substrate: bonderite, dft: 0.6 mils, inhibitor loadings: 0.6lbs/gal)



J0806



K-White 105



SZP-391



Moly-White 101



Moly-White 212

**Figure 1 (cont.)**

These results show that MOLY-WHITE ED-Plus products provide a basis for the development of high performance, chromate-free coil coatings. ED-Plus products also allow for improved ease of dispersion, and improved performance in other critical thin film applications. ED-Plus versions of MOLY-WHITE MZAP and ZNP are also now available. Please contact the MOLY-WHITE Technical Service Department for more information.

All information is believed reliable; however, all recommendations are made without guarantee, since the conditions of use are beyond our control. All products are sold without warranty, expressed or implied, and on the condition that purchasers shall make their own tests to determine the suitability of such products for their purposes and that all risks are assumed by the user. Statements contained herein shall not be construed to be a recommendation to infringe any patent.



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