



Performance Testing of WK-8552 WR Primer and WX-8000xx Enamel

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Project reference: P-299 **Book reference:** CB-14620

Product reference: WK-8551 (made from WX-8000xx base), WK-8552, WB-8100

Background: WX-8000xx is a clear water-reduced alkyd enamel designed to be tinted opaque and applied to primed metal substrates – specifically doors designed for interior and exterior exposure. WK-8552 is a black tinted version of water-reduced alkyd metal primer.

A standard testing procedure for steel door paint is available from the Steel Door Institute as *Test Procedure and Acceptance Criteria for — Factory Applied Finish Coatings for Steel Doors and Frames (ANSI/SDI A250.3-2007)*. Steel doors are commonly constructed in combination with fiberglass and other composite parts as moldings and trim; a subset of this testing is relevant for these materials.

Objective: Conduct testing and evaluate performance in accordance with ANSI/SDI A250.3-2007.

Experimental approach:

- Summarize required testing
- Apply primer (WK-8552) and topcoat (WK-8551) and let dry 10 days
- Conduct testing according to ANSI/SDI A250.3-2007

Tests and Acceptance Criteria for ANSI/SDI A250.3-2007

Test	Method	Requirement
Salt spray (120 hour)	ASTM B117-03	Uncoated: ≥ 6 rust grade, Scribe: $< 1/8$ " undercut
Condensation testing	ASTM D4585-99	≥ 8 blisters, "few" #6 blisters
Accelerated weathering (300 hour)	ASTM D154-04	No mechanical damage, "few" #6 blisters, $\leq 50\%$ gloss decrease, $\leq 10\%$ color change
Impact (Gardner: 20 in-lb)	ASTM D2794-93(2004)	No coating removal
Film adhesion	ASTM D3359-02	$\geq 3B$
Abrasion (CS-10)	ASTM D4060-01	Wear index: ≤ 100



Sample Preparation

Panel ID	Primer (WK-8552)	Enamel (WK-8551)
Panel 1 (steel) CB-14620-1	Spray 3-4 wet mils on clean cold rolled steel Dry 60 minutes Sand 180 grit paper	Spray 3-4 wet mils on panel Dry 10 days
Panel 2 (steel) CB-14620-2	Spray 3-4 wet mils on clean cold rolled steel Dry 60 minutes No sanding primer	Spray 3-4 wet mils on panel Dry 10 days
Fiberglass trim & Composite wood	Lightly sand substrate with 180 grit Spray 3-4 wet mils Dry 60 minutes No sanding primer	Spray 3-4 wet mils on panel Dry 10 days

Abrasion Sample Preparation

Substrate	Enamel (WB-8100)*
Preprimed steel	Spray 3-4 wet mils on panels Dry >10 days

*WB-8100 is the white pigmented version of WX-8000xx. This data is from a previous experiment (P-139).

Results / Discussion: The coating system passed all of the SDI criteria tested on the steel panels. The condensation test was not performed in this case. The condensation test has been performed in the past using this enamel on preprimed steel with passing results.

Steel Panel Test Results

Test	Method	Result	Pass / Fail
Salt spray (120 hour)	ASTM B117-03	Panel 1: <20 #8 blister Panel 1: No creep at scribe Panel 2: 60% #8 blister Panel 2: No creep at scribe	Pass
Condensation testing	ASTM D4585-99	Not tested	NA
Accelerated weathering (300 hour)	ASTM D154-04	DE CIELAB: 0.07 (black paint**) Gloss change (60°): 16% change Initial gloss: 8.0; final gloss: 6.7 No mechanical damage or blisters	Pass
Impact (Gardner: 20 in-lb)	ASTM D2794- 93(2004)	No coating removal	Pass
Film adhesion	ASTM D3359-02	Panel 1: 5B Panel 2: 5B	Pass
Abrasion (CS-10)	ASTM D4060-01	68 (1000 cycles)	Pass

**White-tinted versions of this enamel show DE CIELAB values between 0.55 and 0.87, and equivalent gloss change.



The adhesion and accelerated weathering performance of the coating system on samples of fiberglass trim and on composite wood passed the acceptance criteria of the SDI test for the same coating system on steel (the SDI test does not actually address the issue of non-steel substrates). No additional testing was performed with these substrates.

Fiberglass & Composite Wood Test Results

Test	Method	Result	Pass / Fail
Accelerated weathering (300 hour)	ASTM D154-04	DE CIELAB: 0.07 (black paint**) Gloss change (60°): 16% change Initial gloss: 8.0; final gloss: 6.7 No mechanical damage or blisters	Pass
Film adhesion	ASTM D3359-02	Fiberglass trim: 5B Composite wood: 5B	Pass

This subset of testing on non-steel substrates was selected based on two assumptions. First, the salt spray and impact tests are not relevant to these substrates since these materials do not corrode and the specified impact test is designed for metal substrates. Second, abrasion is a surface property and is not likely affected by substrate changes. With those exclusions, film adhesion and accelerated weathering are the remaining properties to be tested.

Conclusion: The WX-8000xx enamel / WK-8552 primer coating system is suitable for use on properly prepared cold rolled steel doors with accompanying fiberglass and composite moldings. These results are relevant for the specific materials tested. Results may differ on different substrates, so the performance of the entire coated part should be tested each time a different substrate or coating process is introduced.



Appendix A: Test specimen photos

Salt Spray Panels – steel



CB-14620-1

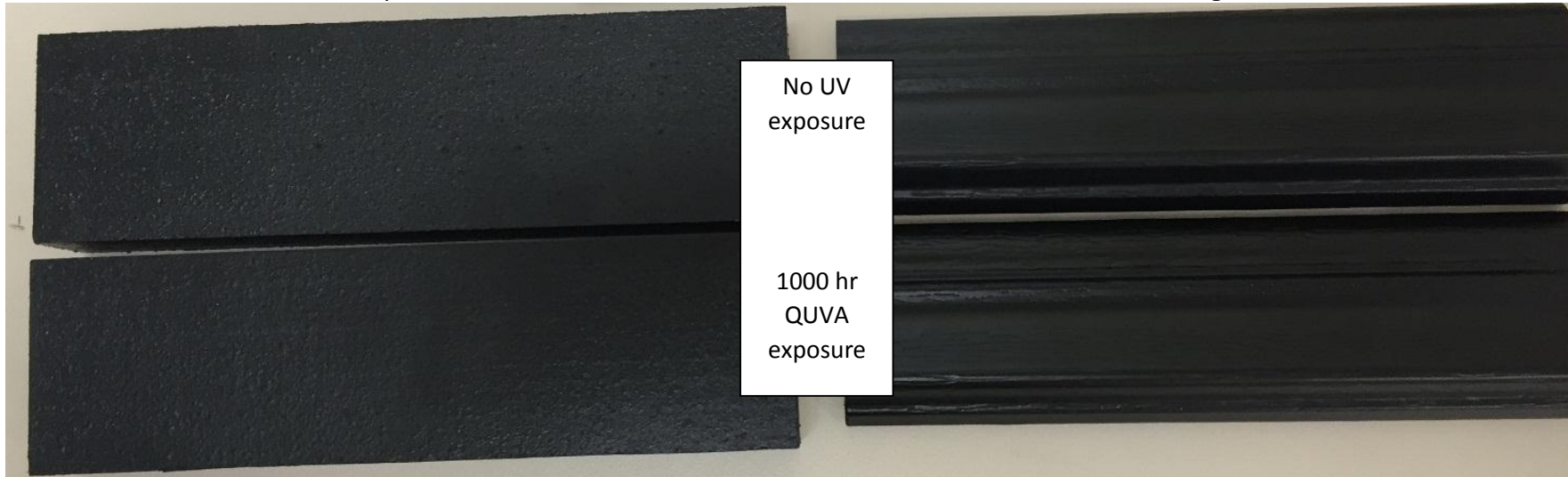
CB-14620-2



Accelerated Weathering Test Parts

Composite wood

Fiberglass trim





Impact and Crosshatch Adhesion – steel

