



# Quality Standards: Rhino Decal UV Resistance & Adhesion

At Rhino we understand the importance of providing high quality products that withstand the rigors of outdoor exposure in harsh environments for long periods of time. In order to meet this challenge, we hold ourselves to stringent standards to ensure performance in both testing-environments as well as in the real world out on the right-of-way.

## UV Stable Inks + Lamination:

Rhino vinyl decals are printed with UV stable inks and laminated to drastically reduce fading, and provide superior chemical resistance. Our automated laminating machine allows for laminating and close tolerance cutting of digital and screen printed substrates.

## Corona Treatment:

All plastics have a surface energy that causes them to be non-receptive to bonding with printed inks and adhesives. We Corona treat all plastic products before decal installation to equalize the surface energy of the substrate making it receptive to permanent bonding.

## Quality Testing

### In House Testing:

We have our own Weatherometer (Q-Sun Xe-1 testing chamber) which is used to test the performance of our products in "extreme" weather conditions and allows for accelerated aging. By using this technique we can observe the physical effects of sunlight, heat, and weather on the surface of our products. This test allows us to see the estimated equivalent of years of exposure in only a few months. Our test criteria are based on ASTM G53.

### Independent Laboratory Testing:

To validate our internal testing we have an independent laboratory perform the same Weatherometer testing procedure. (ASTM G53)

See attached: *Decal COMTECT Testing PRINT.pdf*

### Adhesion Testing:

We use DYNE TEST™ Marker Pens to test a substrate's ability to anchor inks, coatings, or adhesives. (Pen fluids specified in ASTM D2578) PosiTest adhesion testers are used to conduct pull tests. A plug is glued to the surface of an installed decal. After a minimum 48 hours of curing time the plug is pulled away from the marker where adhesion strength is digitally measured in PSI.

### Real World Validation:

- Rhino Decals have been in use since 1998
- In the past 10 years over 2,000,000 Rhino Decals have been factory installed on our products, or purchased and used by customers from around the world

### 10 Year Warranty:

Almost 20 years of real world experience combined with stringent quality control system and Weatherometer testing gives us the confidence to offer a 10 year warranty. The warranty states Rhino Decals will not fade significantly or become brittle for a minimum of 10 years when properly installed and used within the service, range and purpose for which intended.



Properly installed decals are placed on the product at an environmental temperature range of 50° - 95°F following adhesive manufacturer specifications.



Photo taken 4/2018 • TriView install date 5/2007



June 8 1998

Scott Landes  
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**WEATHEROMETER TESTING.**

We have completed 2000 hours of exposure on the Rhino C Series Decal samples. The exposure test followed ASTM G53 (Standard practice for light and water exposure of nonmetallic material.) The cycle of exposure of the specimens was 4 hours of UV light at 60 deg. C. followed by 4 hours of condensation at 50 deg. C. in a qpanel Accelerated Weathering Tester with UVA-340 lamps as the light source. The lamps are rotated every 400 hours to maintain an even light distribution over the specimens. The test was conducted from 3-2-98 through 5-26-98 at Winona State University, COMTEC testing lab.

**Rhino C Series Decals**

We tested the following colored decals: White, orange, teal, green, black, red, purple, and blue. None of the colors exhibited any fading. All the decals remained aggressively bonded to the test board with no signs of bubbling or edge curl.

COMTEC

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