DIAMON-FUSION INTERNATIONAL

INDEPENDENT TESTING REPORT

9361 IRVINE BOULEVARD
IRVINE, CA 92618

UV RADIATION EXPOSURE TEST

2.1 OVERVIEW

Diamon-Fusion International contracted an independent testing laboratory, Architectural Testing, Inc., in August 2011 to evaluate its protective glass coatings and those of a competitive product, Rain-X®, for contact angle in accordance with ASTM C 813 – *Standard Test Method for Hydrophobic Contamination on Glass By Contact Angle Measurement* after exposure to ultraviolet radiation.

2.2 METRIC DEFINITION

The key metric utilized to measure the performance of the samples during these tests is "contact angle", defined as the angle at which a liquid/vapor interface meets the solid surface and can be represented, as illustrated in Figure 1, as the angle α between the normal vector of a sphere (water droplet) at a point where a plane is tangent to it and the normal vector of the plane.

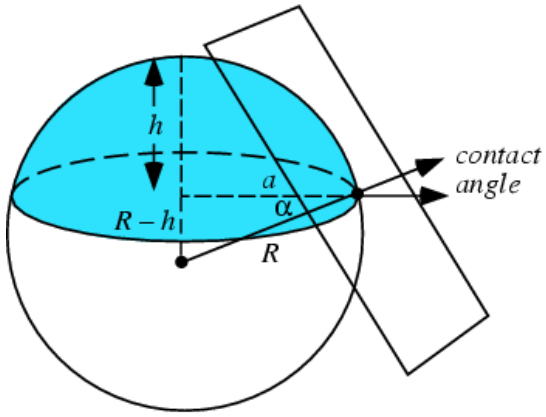

Figure 1: Contact Angle Definition

As the contact angle of a surface increases, the more hydrophobic (or water repellant) that surface becomes. For example, water perfectly sheeting on glass would have a 0^{o} contact angle while a perfect water droplet sphere on a surface would have an 180^{o} contact angle so that the water would literally roll off the surface and create "zero wettability".

2.2 TEST METHODS

Architectural Testing received DFI's coating product in liquid form and Rain-X® was purchased through normal commercial means for testing purposes. The coatings were then applied by Architectural Testing on three (3) clean annealed glass samples for each product that measured nominally 2" x 6 ½" x 1/8" thick.

All six samples were initially measured for contact angle per ASTM C 831 and subsequently exposed to ultraviolet light radiation from a Xenon Arc lamp source within an ATLAS Ci5000 Test machine. The exposure consisted of 102 minutes of continuous light at 63° C (145° F) followed y a combination of light and surface water spray for a period of 18 minutes. This two hour cycle was repeated until the completion of the required number of light hours occurred and then contact angle were measured again.

For contact angle measurement per ASTM C 831, a precisely measured amount of distilled water (0.04ml) was placed on the test surface and the profile of the drop/surface interface was viewed under magnification. A rotating angular scale within the objective of the measuring device was lined up with the advancing angle of the drop and compared to the surface. The resulting angle was then identified on both the left and right sides and recorded.

All preparation and evaluation of the coatings and glass panels were at lab ambient conditions of 70 +/- 2°F and 50 +/- 5% RH. Each test was conducted on three replicate samples to verify the repeatability of findings. No cleaning process was utilized on the glass throughout testing.

2.3 RESULTS

Samples treated with DFI's coating product demonstrated almost no degradation in contact angle after 384 hours of exposure to UV radiation (roughly equivalent to 2-3 years of normal outdoor exposure) whereas the Rain-X® samples lost over half of its initial contact angle during that same period:

	Initial	384 Hours
DFI Coating Product	105°	102°
Rain-X®	105°	54°