

ASTM C 1601 Field Test on Split Face Block at a school in Colorado

A school district in Colorado contracted an independent consulting engineering firm to conduct side-by-side testing, using procedure ASTM C 1601, to evaluate the relative performance of three water repellents that were applied to the block walls prior to the testing. The following is a summary of the results of that testing.

The test areas were constructed of single-wythe, split-face hollow concrete block in running bond. Only reinforced cells, typically at 32 inches-on-center, were grouted.

The purpose of the testing was to evaluate the effectiveness of three different types of clear, penetrating water repellents in limiting moisture penetration into and through the exterior masonry walls.

The products evaluated were:

- Professional Water Sealant, PWS-15, applied at 48.5 sf/gallon
- Hydrozo Clear Double 7 VOC, applied at 30 sf/gallon
- BASF Enviroseal PBT, applied at 30 sf/gallon

The Test:

The ASTM C 1601 test protocol describes a test where water is intended to sheet down the exterior surface of the wall while a positive air pressure (simulating wind-driven rain) is maintained. The test was intended to simulate a very severe storm with sustained winds of 60 mph over a 4 hour period. The test water flow rate used by the consultant was 0.68 gal/min, and the test pressure used was 10 psf (1.9 inches of water). These are the flow and pressure values prescribed by the laboratory version of the ASTM C 1601 test (ASTM E 514). The conditions represented by this test are extreme and are unlikely to occur under normal conditions. The methodology has been established to provide a consistent baseline for system performance comparison of different testing agencies.

The Results:

- Professional Water Sealant, PWS-15, applied at 48.5 sq. ft./gallon absorbed 2.0 liters/hr
- Hydrozo Clear Double 7 VOC, applied at 30 sq. ft./gallon absorbed 8.5 liters/hr
- BASF Enviroseal PBT, applied at 30 sq. ft./gallon absorbed 10.2 liters/hr

The ASTM C 1601 test does not include a pass/fail criterion or other standardized interpretation of results. An acceptable maximum level of infiltration through the wall has been considered to be between 2-4 liters per hour.

The lowest moisture infiltration measured during these tests was the wall with Professional Water Sealant, PWS-15 at 2.0 l/hr. The highest moisture infiltration rate, 10.2 l/hr, was the area where BASF Enviroseal product was applied.

Conclusions:

Professional Water Sealant performed 4 times better than Hydrozo Clear Double 7 VOC at almost twice the coverage rate; and 5 times better than BASF Enviroseal PBT at almost twice the coverage rate. Professional Water Sealant lasts 4-5 times longer than silane and siloxane water repellents. Professional Products of Kansas offers a 10-year materials warranty on vertical surfaces.