

MOCK-UPS: CONSTRUCTION'S CRASH TEST DUMMY

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That was cool - the Crash Test Dummies have done their job again! Through testing and validation, the automotive industry found a way to ensure safe performance for their deliverable (for all auto manufacturers) to owners (us). Yet when we approached the subject of performance mock-ups (testing and validation) within the building community, people seemed shocked at the suggestion. After all, it might cost something to ensure the building enclosure is built right the first time – heaven forbid!

Now, consider this: building enclosures today potentially utilize hundreds of products from multiple manufacturers, if not thousands. These products contain an unknown number of different chemical compositions, will be installed by a group of individuals with a known labor shortage, and will be managed and/or commissioned by companies and individuals with varying levels of building science knowledge. Add in the fact that very few architectural schools teach building physics to students to understand heat, air, and moisture transfer, and it is no wonder insurance claims and litigation from moisture and water issues in construction is a billion-dollar industry annually.

Question: How many architectural firms have chemists, research and development labs, or full-scale testing facilities?

Answer: Very few, but the industry is asking the architect to provide product choices in specifications, to design correctly, and to detail projects, all of this with the full knowledge that no single person or firm could understand all of the technologies available for all six sides of the enclosure.

How can the Owner be assured his building is being properly built? Use the building industry's "Crash Test Dummy" – the Performance Mock-up.

The performance mock-up is used to validate the design, product selection, and proper installation of materials before the installation of final materials on the building. Would you build a car in your backyard for your 16-year-old to drive on the expressway at 70 MPH? If you answered no, why would you expect a unique combination of design, materials, and installers to successfully provide an Owner with a leak-free building on their first try? Remember, every structure is UNIQUE. Even if you design and select the exact same materials for two identical buildings, there is no feasible way they could be built in the same weather conditions with the same labor force. It is impossible!

The performance mock-up can be built and tested in various configurations and at different cost levels. The most crucial part is that they are tested - for water leakage, air leakage, thermal concerns, and durability. Big hint here - make sure people installing the mock-up are also working on the project. What good does it do the project if the knowledge gained by the mock-up is not available for the actual construction of the project? Let's build it right on the building the first time and aim to get the lawyers, litigation, and enclosure failures out of construction.

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This is the first in a four-part series on performance mock-ups. Stay tuned for more information.

- Part 2 - Types of Mock-ups
- Part 3 - Testing of Performance Mock-ups
- Part 4 - Project Specific Education from Mock-up Lessons Learned

