

IMPROVING BUILDING VALUE THROUGH FAÇADE WEATHERPROOFING

1.0 Intro



1.1 Improving building value by sealing façade connections

A - The Building Enclosure - Weatherproofing

In our introduction we have briefly analyzed the importance of a building's façade and its impact on a building's global performance and final value.

A building's façade is the filter between the climate outside and the conditioned space inside and as such it has to address / control multiple loads and functions. Focusing only on climate related loadings, a building, and its enclosure, experience different conditions or microclimates, depending on the project's location, landscape, adjacent buildings, façade and roof configuration, among others. This microclimate has to be taken into consideration when designing a façade solution.

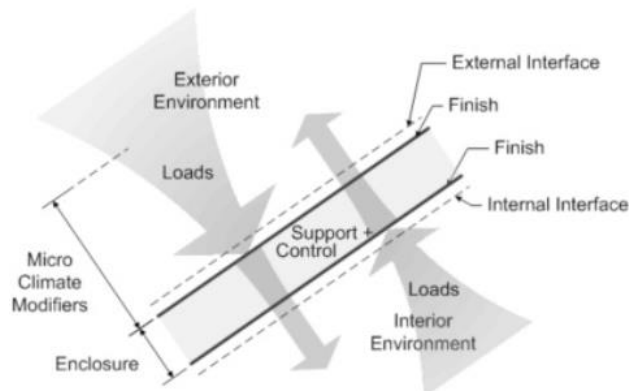


Fig. 1 Building enclosure and its functions (1)

The performance of a façade should be analyzed taking into consideration how it behaves in relation to the different loadings generated by the exterior environment, the interior environment, and the building enclosure itself.

There is a complete list of [climate related loadings](#) (2) that a façade needs to address, such as:

- Solar light
- Heat
- Water
- Air
- Moisture

In this Ebook we will focus on façade weatherproofing but more in particular on the control of water, air and moisture, ensuring watertightness, airtightness and moisture management in facades.

B - Controlling water, vapour and moisture on facades

- Controlling water ensuring watertightness

Protection against water penetration is, since the very beginning, a major function of a building's envelope. However, water leakages remain one of the most common building pathologies, and are definitely, one of those that most deeply affect the performance of our buildings and their value. Water leakages can almost instantaneously cause deterioration of the most common construction materials, uncomfortable indoor environment, and in worst cases, affect a building's structural stability by, for example, causing corrosion on metal structures.

- Controlling air and moisture ensuring airtightness and moisture management

With major efforts made initially in Europe and North America, [airtightness](#) (3) has now globally become a standard requirement for a building's envelope, with major efforts made recently by Australia and Canada, among other countries. It is essential to work towards energy consumption efficiency (energy consumption reductions reached through airtightness can reach up to 40%), maximizing thermal and acoustic insulation, and eliminating the risk of [mold](#) (4) and other building pathologies associated with [moisture](#) (5).

Moisture management is strictly associated with airtightness, and every building airtightness analysis has to consider facade moisture management, assuring that the designed solution eliminates the risk of condensations and allows the evaporation of internal existing or generated moisture.



Effisus Ecofacade Envelope - Air tightness and water vapor management facade integrated system.

Effisus Ecofacade – Facade waterproofing solution.



(1) http://buildingscience.com/documents/digests/bsd-018-the-building-enclosure_revised
(2) http://buildingscience.com/documents/digests/bsd-018-the-building-enclosure_revised- Please check fig. 1, 2 and 3
(3) <http://rdh.com/wp-content/uploads/2014/04/Air-Leakage-Control-in-Multi-Unit-Residential-Buildings.pdf>
(4) <https://www.wbdg.org/resources/moisturedynamics.php>
(5) <https://www.wbdg.org/resources/moisturemanagement.php>

C - Façade connections - The most common leakage paths

The number one rule to ensure a building's enclosure watertightness and airtightness, is to ensure the continuity of the water and air control layer.

However, a building's enclosure and in this case, specifically facades, are a combination of planar components, and each of these components is a three-dimensional, multi-layer ensemble that extends from the inside to the outside.

While it may be easier to define the watertight and airtight solutions for these planer components, usually the bigger challenges arise at the connection areas of these planar components, or at points where these planar components need to be perforated or penetrated by the passage, or fixation, of singular construction elements.

These interfacing areas are the most common façade water and air leakage paths. Compromising the quality of a sealing solution for these areas means compromising the façade's complete watertightness and airtightness.

D - Sealing Façade Connections

Sealing façade interfaces such as the connections between, windows or doors, and the cladding wall, is usually a challenge.

These are areas where the convergence of very different materials, with very different properties and behaviors, happens, such as metal and concrete, or steel and plaster. These are also the areas where the larger facade movements have to be absorbed and where the selected construction materials are under bigger stresses or loads.

Meanwhile, these are areas that are not so expressive, volume wise, on a façade's complete packaging, and many times, properly designing the solution for these connections is not faced as a priority.



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- (1) http://buildingscience.com/documents/digests/bsd-018-the-building-enclosure_revised
- (2) http://buildingscience.com/documents/digests/bsd-018-the-building-enclosure_revised - Please check fig. 1, 2 and 3
- (3) <http://rdh.com/wp-content/uploads/2014/04/Air-Leakage-Control-in-Multi-Unit-Residential-Buildings.pdf>
- (4) <https://www.wbdg.org/resources/moisturedynamics.php>
- (5) <https://www.wbdg.org/resources/moisturemanagement.php>