

IMPROVING BUILDING VALUE THROUGH ENVELOPE WEATHERPROOFING



Intro – Building Envelope – Watertightness, air sealing, moisture management and air quality

While energy efficiency is mentioned as a top priority when considering design envelope, the primary function of the building envelope is to protect occupants and provide basic shelter. To optimize energy efficiency, while assuring security, protection from the weather and fire, privacy, comfort, aesthetics, ventilation and views to the outdoor, is the key challenge for any building envelope design.

While in our previous eBook we focused on façades' connections, in this new eBook we will be focusing on how to ensure watertightness, airtightness and moisture management in the entire facade, detailing its benefits for the building envelope and building value.

▪ 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, leading to an uncomfortable indoor environment, and in worst cases, damaging a building's structural stability by, for example, causing corrosion of metal structures. It is mandatory to achieve a continuous watertight layer along the entire façade, in order to achieve proper building watertightness standards.

▪ Airtightness and moisture management

Normal air movement, in and out of buildings – infiltration and exfiltration – is known as air leakage. Air leakage largely compromises the thermal and acoustic insulation's effectiveness, decreases comfort, while also increasing the risk of mould and other building pathologies associated with moisture, appearing in any building. In addition, air leakages in a typical building, are approximately accountable for 25 to 40 percent of the energy used, for heating and cooling.

Natural weather conditions, such as wind and temperatures differences, can increase air leakage probabilities. Heating and cooling systems can also increase air leakage, by creating pressure differences between the inside and the outside of a building.

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.

Airtightness of a building envelope is one of the most critical features of any energy efficient building. It is important to note that a continuous airtight layer has to be guaranteed along the entire façade, in order to achieve proper airtightness. Continuity is in fact the key.

▪ **Air quality**

Watertightness and airtightness protect a building’s façade internal layers from corrosion and deterioration, maximize energy efficiency, reduce the risk of condensations and consequentially, the development of mould and fungi, which have a major impact on indoor air quality and human health. It is important to remember that when considering building airtightness, we can forget the importance of building ventilation. While building airtightness has major advantages for energy efficiency, we can not forget, especially with our buildings becoming more airtight, that it is crucial that ventilation by natural and mechanical means is assured, in order to maintain the necessary ventilation levels for indoor air quality.

Vapour Flow in Cold Climates

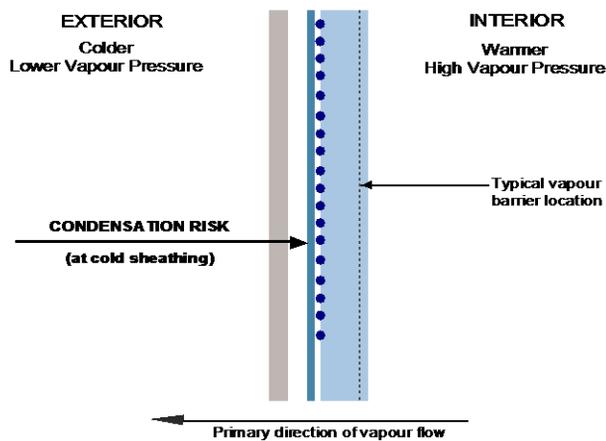


Figure 1 – Vapour flow in cold climates



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

Effisus Ecofacade – Facade waterproofing solution.

