RAINSCREEN FAÇADES

A rainscreen façade is a two-level construction system – an inner insulated wall, protected by an outer skin. This skin provides a shield against rain and moisture, and maintaining a space between the cladding and the building wall prevents water from infiltrating the building’s structure. It is a more sophisticated approach to moisture control, and one of the most effective options on the market today.

HOW A RAiNSCREEN WORKS

The key features of a rainscreen façade are:

1. An outer cladding
2. A cavity
3. An air and vapour barrier

OUTER CLADDING

This is a durable, non-porous material, designed to shed most if not all water, and bears the primary brunt of exterior weather forces.

CAVITY

The cavity is essential to the effectiveness of the rainscreen system. Providing a secondary line of defence against the elements, it serves two purposes:

1. Allows drainage of any moisture that may penetrate the outer cladding
2. Allows air circulation, evaporating moisture from the surface of the air-and-water barrier and drying the cavity

A minimum cavity depth of 25mm should be maintained to allow sufficient air movement. As a general rule of thumb, walls greater than 25m high should have a cavity depth of 1mm per meter in height. For example, a 50m wall with a continuous cavity should have a minimum depth of 50mm. The cavity may be broken and drained at individual floor levels.

AIR & VAPOUR BARRIER

This is the final layer of protection, preventing any moisture from penetrating the building walls. It may be permeable or non-permeable depending on requirements. All penetrations should be sealed.
As classified by the American Architectural Manufacturers Association, there are two basic types of rainscreen systems:

1. Drained, Back-Ventilated (AAMA 509-09)
2. Pressure Equalised (AAMA 508-07)

Also in common usage is a third type:

3. Vented Rainscreen

**DRAINED, BACK-VENTILATED**

This system is the primary scope of this document. Drained and back-ventilated have a continuous airspace, with openings at top and bottom of a wall section to encourage air movement. These systems can stop well over 90% of the water that could potentially reach the air and vapour barrier of the building. The remaining small quantity of water is then dissipated through the combined action of gravity (drainage) and air circulation (evaporation).

**PRESSURE EQUALISED**

Pressure equalised rainscreens are gaining prevalence in Europe as the optimum waterproofing solution. The system relies on a cavity pressure that matches the external air pressures. This is achieved through open joints and compartmentalising the cavity. The benefit of this system is that as air pressures are equal there is no air movement to force rainwater into the cavity. As the cavity pressures match external wind pressures however, the air and vapour barrier must be able to absorb the windloads. As such this system is mainly suitable for masonry construction.

**VENTED RAINSCREEN**

Vented systems are only open at the bottom, with the primary focus being to drain moisture. These are mainly used with face-sealed cladding systems, aiming to deal with condensation and potential long-term system failure (eg sealant deterioration). There is debate as to whether this is actually a rainscreen at all.

**BENEFITS OF RAINSCREEN FAÇADES**

1. **Superior waterproofing** – rainscreen facades protect the structure of the building from moisture, including rain and condensation, through a multi-layer barrier system, and is less dependant on sealants and site workmanship for waterproofing performance.

2. **Long-term durability** – rainscreen facades are sealant free, and hence are less subject to deterioration over time, and the maintenance cost of dealing with this.

3. **Thermal efficiency** – the rainscreen cladding helps shade the structure and dissipate heat. Rather than letting heat transfer into the structure (particularly the heat absorbed from direct sunlight), this is radiated into the cavity. The warm air moves up and out the cavity by convection, drawing in cooler air at the base and insulating the primary wall structure.