# Is a drainable wrap enough? Weather-resistive barriers and gaps

November 30, 2017

## Rainscreens

Specifying a ventilated rainscreen wall offers a means to keep the air space, increase the wall's performance, and shrink the overall assembly's dimensions. Unlike a vented cavity wall, ventilated rainscreen walls are designed to reduce the amount of moisture entering the building. These wall systems are designed to defend against moisture, not simply react to it.

Installing a polymeric-engineered rainscreen behind the cladding allows for proper draining and drying within the wall system.

The key to ventilated rainscreen wall systems is pressure moderation. If air pressure on the wall's inside is as close to equal with the air pressure on the outside of the wall, then the driving force pulling moisture through the cracks is greatly reduced in most claddings.

For this to work, these wall systems must be designed with an 'intake' and an 'exhaust.' One must allow air into the cavity mindfully. For example, we all know a 50-mm (2-in.) air space is twice as wide as a 25-mm (1-in.) air space. Therefore, twice as much air needs to enter the 50-mm air space when compared to the 25-mm space. This means it will take longer to neutralize the air space of a 50-mm cavity than a 25-mm cavity. The faster air pressure is neutralized the quicker it can combat moisture intrusion. Air should be allowed into the wall system by placing vents strategically at the wall's base and top. It is also recommended to have these vents at the bottom and top of every floor level, especially when the wall has been properly designed for fire blocking. This intake allows air to move in a convective-like fashion and exit through the top of the wall at the 'exhaust' locations. This circular movement continuously ventilates the wall by removing and not allowing a buildup of excessive moisture. For proper ventilation, the air space is recommended to be a minimum of 3 mm (0.11 in.).

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Forensic experts agree the key component to a successfully designed ventilated wall system is an air gap. So what is a sufficient air gap? Are two layers of Grade D paper enough? Is a drainable house wrap enough, or should an engineered polymeric drainage and ventilation mat, often referred to as a rainscreen, be used? Again, a few questions about building code, size of the gap, type of veneer being installed, and compatibility need to be asked.

10 *National Building Code of Canada (NBC)*:

> …exterior walls exposed to precipitation shall be protected against precipitation ingress by an exterior cladding assembly consisting of a first plane of protection and a second plane of protection incorporating a capillary break…
>
> …a cladding assembly is deemed to have a capillary break between the cladding and the backing assembly where…there is a drained and vented air space not less than 10 mm deep (0.40 in.) 9.5 mm ($^3$/8 in.) behind the cladding, over the full height and width of the wall…

An engineered polymeric drainage and ventilation mat is installed here with the filter fabric facing out as intended. The filter fabric acts as a mortar deflection blocking mortar from clogging the channel, while also not allowing the product to stretch and lose its intended air gap during construction.

The building code calls for a 10-mm (0.4-in.) air space, but what type of cladding is being used? If the cladding is absorptive, is it a masonry cladding? The drainage mat should have a filter fabric bonded to one side. In masonry walls, this allows the air space to remain clear of debris as well as provides a path for proper drainage and ventilation. The absence of a filter fabric allows excess mortar to clog the gap, which in turn creates a path for moisture to enter the inner wall system.

Building codes in the United States typically call for two layers of Grade D paper. Framers install the first layer when the walls are sheathed to protect the framing from wind-driven rain until the veneer is installed. The installer of the veneer typically installs the second layer of WRB. This additional layer is considered sacrificial for shedding liquid water away from the substrate. The second layer also creates a drainage space between the two. Another use for the sacrificial layer is to keep the first layer of Grade D paper dry during the scratch coat installation, which means moisture is not intended to penetrate the sacrificial layer.

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Drainable house wraps are the newest advancements in WRBs. These products either come with a crinkled design, or a 1-mm (0.04-in.) plastic bead to help create a gap for drainage. The drainage ability of these products far exceeds the typical house wraps that have been used for decades. This brings us to the question, "Is a drainable house wrap enough?"

#DRAINABLE WRAP #NATIONAL #RAINSCREENS #WALL SYSTEMS #WEATHER-RESISTIVE BARRIERS

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