

# mold™

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**& MOISTURE MANAGEMENT MAGAZINE**  
The Magazine for Moisture Prevention and Remediation

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# Controlling Moisture in Wall Assemblies

## A Guide to Selecting the Right Product

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**M**oisture management systems can be a potent weapon against mold and mildew buildup behind residential sidewalls. Persuading clients to invest in such protection requires a thorough understanding of the performance characteristics of each product type—and the climate in which it will be used.

Increasingly, architects and high-end builders view moisture management solutions—such as water-resistive barriers, housewraps and rainscreen systems—not merely as “nice-to-have” extras, but as essential elements of well-protected residential wall systems. Building professionals are specifying such products to protect residential wall assemblies from the potential effects of mold

damage, especially in areas that experience heavy, wind-driven rain or high temperatures and humidity.

Even in climates with average or little rainfall, architects and builders who wish to optimize wall drying and drainage are turning to moisture management systems as insurance against callbacks, remediation and/or litigation. They also can help builders comply with growing rules for using water-resistive barriers behind certain facades.

Despite their obvious benefits, however, architects may still find it challenging to convince their clients that building envelope products are worth the added investment. In fact, many architects and builders may be confused themselves by the bewildering array of moisture management systems available, and unsure as to when and where to use each solution. To compound the problem, the building industry uses terms like rainscreen and house-

wrap interchangeably, when they play distinctly different roles. And, at present, there are few standards-based methods to help professionals evaluate these products.

A recent study commissioned by our company Benjamin Obdyke Inc., found that the most important drivers in selecting the right moisture management system are the amounts of rainfall and wind-driven rain where the home will be built, as well as the choice of siding, because each type of cladding responds differently to moisture.

### Water-Resistive Barriers

Water-resistive barriers are part of an exterior wall system, designed to prevent air and water from entering the stud wall cavity from the outside. They perform like a shell for buildings—liquid water that has penetrated the exterior finish does not pass through, yet water vapor from the interior can escape so that the framing and wall cavity can dry. There are three basic types:

- **Building Paper:** a paper sheet or felt material coated or impregnated with asphalt to increase its strength and water resistance; primarily used as a drainage barrier.
- **Housewraps:** engineered plastic sheet membranes designed to resist the movement of water on the outside, but also allow water vapor to pass through the building envelope.
- **Drainable Housewraps:** also engineered plastic membranes, these products offer the features of housewraps or building papers but also include a drainage system to promote bulk water through channels engineered into the sheet. They are designed to maintain a more constant drain rate than basic water-resistive barriers.



Several factors can determine the choice of wall assembly system for keeping water out of a residential project, including the project's location and the cladding material used.

## Rainscreens

The laws of physics state that moisture will always seek a drier plane. Thus, even with a drainable housewrap, water may still seep through crevices in exterior cladding into interior assemblies, especially in regions prone to heavy rainfall, high temperatures and humidity—and even in climates that receive low or average rainfall.

A rainscreen wall system creates a pressure-equalized air space immediately behind cladding, in conjunction with a water-resistive barrier. The ¼- to ¾-inch air space helps

neutralize the forces that draw water into the assembly. Any water that does enter the wall is allowed to enter and exit through an opening at the bottom of the wall. Rainscreens also provide ventilation drying of any residual moisture from the back side of the cladding.

There are two ways to construct a rainscreen system airspace—nailing wood furring strips over wall studs after applying a building paper or housewrap or using “void space” products that feature a three-dimensional plastic matrix to create a vented continuous rainscreen. Architects

and builders can choose from a plastic matrix applied directly over a water-resistive barrier or bonded products that combine the plastic matrix with a water-resistive barrier.

## Selecting the Right Product for the Job

Product performance, however, is only one variable in selecting the right moisture management system. According to building experts, rain is the single most important factor to control in promoting sidewall

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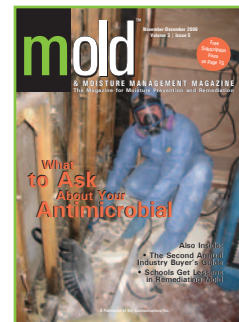
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durability. As a result, the main rule of thumb in choosing a product is to first determine the amount of rain control needed.

For extremely wet and/or humid climates, coastal areas and hilltop exposures receiving high (40 to 60 inches annually) or extreme (60 inches or more annually) rainfall, a rainscreen assembly is generally the best solution. Building experts advise using a rainscreen system for areas that experience high winds in addition to rain, as wind-driven rain frequently manages to penetrate small openings in cladding.

In climates that experience moderate rainfall (20 to 40 inches annually), protection against rain penetration should include a drainable housewrap. And in areas of low rainfall (less than 20 inches annually), a housewrap or building

paper should offer sufficient water resistance.

### Cladding Choice is a Factor, Too

In selecting a moisture management solution, architects and builders also must consider the cladding choice. Some exterior claddings are more moisture absorbent than others, and therefore could benefit from drainable housewraps or rainscreen systems.

As the state of building science progresses, more standards will be developed to assist professionals in the decision-making process. But in the meantime, armed with the knowledge of the roles and performance characteristics of rainscreen systems and the distinct types of water-resistive barriers, architects and home builders are in a better position to make the right choice. m

## Guidelines For Best Building Practices

Siding Material	Building Envelope Protection Option	Reason
Wood cladding	Rainscreen system	All woods are highly susceptible to moisture penetration and absorption and require air space protection.
Stucco or stone masonry	Rainscreen system or drainable housewrap	Porous stucco and stone absorbs water and therefore benefit from air space protection. Drainable housewrap may suffice in certain dry climates, but not all enhanced housewraps optimize drying; over time, small cracks will appear in stucco, requiring water drainage behind cladding.
Cement fiber	Rainscreen system or drainable housewrap	Less susceptible to moisture infiltration and absorption than wood, but can trap water like stucco (see Stucco above).
Vinyl siding	Housewrap or building paper	Non-absorbent, does not trap water, low potential for rot. Good-performing building paper or housewrap is recommended to optimize long-term performance.
Brick	Rainscreen system automatically created	Nature of brick construction creates sufficient moisture protection and air movement; however, water seepage is possible if air cavity is not continuously maintained.

Source: Benjamin Obdyke

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