10 FLASHING

ESSENTIAL KNOWLEDGE

Fenestration is often blamed for water infiltration into the building envelope because these openings interrupt the path of water traveling within the building envelope (exterior waterproofing). A building must either provide a continuous impenetrable barrier or deliberately direct the flow of water with a series of lapped materials, such as flashing. Flashing is one of the longest lasting components of a building system. However, the proper installation of these materials requires experience and is time consuming. New fenestration products with integral nailing fins and the use of new exterior air/moisture barrier materials, caulks, and sealants have required reconsideration of the methods and materials used to join these products (see Section 11 and *The Rehab Guide: Exterior Walls* for further information).

Flashing must be durable, weather resistant, able to accommodate movement, and compatible with adjacent materials. The traditional overlapping assembly composed of multiple layers of flashing adjusts to movement like the scales of a fish and provides repetitive layers of resistant materials while covering the fasteners with each lap. Overlapping the material below prevents water from migrating in opposition to the forces of gravity when an unequal pressure condition exists, as in high wind storms. The longer the lap the greater the force required to draw the water upward.

Non-corrosive metals such as copper, aluminum, and lead are popular flashing materials because of their durability, malleability, and impervious nature. The proper flashing system varies among window and door types, as does the method of providing an air/moisture barrier. The introduction of integral nailing flanges and large sheets of air-permeable moisture barriers has changed the common methods of providing a water barrier (Fig. 1).

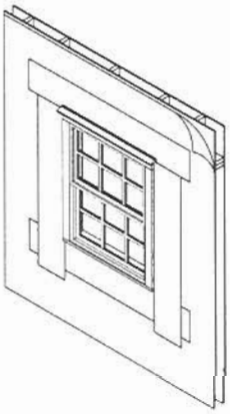

FIGURE 1 FLASHING OF INTEGRAL NAIL FLANGE WINDOW UNIT

Exterior doors have progressed similarly to windows and are now available pre-hung with casings and integral nailing fins. The traditional wood sill is a thicker profile that requires the sub flooring and/or framing to be notched to provide a level entrance and flashing to protect the framing. A soldered metal door sill pan is installed below the sill to provide a protective barrier for the framing. Most doors are now produced with either extruded metal or polycarbonate sills that resist weather and have a low profile that can be attached flush to the sub flooring and thus do not require flashing.

Repair of existing windows and doors often presents the opportunity to examine and repair existing flashing. The removal of a window or door may result in the penetration of the moisture barrier, which can be repaired with additional flashing or sealant dependent on the size of the cut-out. Compatibility of materials should be considered when combining new materials, caulking, or sealants and window units, which may produce an adverse chemical or electrolysis reaction. Materials that are separated may still create an electrolytic reaction if water is capable of bridging these two incompatible materials.

Flashing can be classified into three primary groups: sheet metal, vinyl products, and membrane/tape. Roofing underlayment, roll roofing materials, and tape products are examples of membranes. Conventional sheet metal materials include aluminum, copper, zinc, and galvanized steel, among others. Vinyl products, relatively new, are preformed in shapes suitable for particular applications. Sheet metal and vinyl flashing are appropriate for traditional assemblies of lapped materials. New continuous drainage barriers employ self-adhering membrane and tape materials to work in conjunction with doors and windows with integral nailing fins.

TECHNIQUES, MATERIALS, TOOLS

1. INSTALL SHEET METAL FLASHING.

Sheet metal flashing has proven to be one of the most durable building materials, typically capable of outlasting most other components of the envelope. The common materials, in order of durability from the most to least, are as follows: stainless steel, lead, terne coated copper, copper, galvalume, and galvanized steel. These materials are commonly available in either sheet or preformed profiles. It is important to note, however, that special consideration must be given to the selection of materials and sealants in relation to each other so as to prevent either adverse electrolytic or chemical reactions.

ADVANTAGES: The variety of sheet metal materials, able to accommodate most field conditions, provides a wide choice of finish appearance, durability, and costs. The installation of these materials is widely practiced and typically requires only a moderate level of skill.

DISADVANTAGES: Careful selection of flashing material and fabrication methods is necessary to avoid staining, electrolysis, or corrosion. Some materials such as stainless steel and galvanized steel are difficult to work with on site. The costs of these materials vary dramatically but are in relation to their anticipated lifespan.

2. INSTALL VINYL (PVC) FLASHING.

Vinyl flashing is a relatively new material that is substituted for conventional preformed sheet metal products. Being materially consistent with vinyl products for windows and doors, as well as with siding products, allows for compatability.

ADVANTAGES: Vinyl flashing provides for a simple, inexpensive means of flashing. The material is flexible and easily cut to conform with irregular shapes. The plastic material is not subject to galvanic action with other flashing or fasteners.

DISADVANTAGES: The variety of profiles is currently limited. Vinyl lacks tensile strength and may become brittle during cold weather. Like vinyl siding the material is subject to UV degradation and chemical incompatibility.

3. INSTALL SELF-ADHERING MEMBRANE OR TAPE FLASHING.

The increasing popularity of integral nailing fins and housewrap products has led to a variety of new methods for installing window and door units. While the methods of installation are beyond the scope of this guide, new materials, such as self-adhering tape and membranes, are commonly employed as a means of joining materials as a continuous barrier or a replacement for conventional spline and sill materials. The popularity of housewrap products is primarily attributable to the fact that they may be applied in large sheets or continuous rolls, minimizing the number of seams and reducing air infiltration. The benefits associated with reduced air infiltration may also be improved with foam gasket materials that are attached to the nailing fin either on the job site or by the manufacturer. Materials are typically available from the

producers of roofing materials and housewrap products.

ADVANTAGES: The materials are easy to work with even for inexperienced users. Manufacturers claim that the membrane products self seal around penetrations of nails and fasteners. The cost relative to other products is moderate.

DISADVANTAGES: These materials are relatively new and reliant on the adhesive bond between a wide variety of materials. Common methods of installation with these materials provide little to no redundancy for failure. Some materials when exposed to ultraviolet light, sealant materials, and excessive heat may degrade.

FURTHER READING

Door and Window Installation-Builder's Series, Canada Mortgage and Housing Corporation, 1995.

Graphic Guide to Frame Construction, Rob Thallon, Newtown, CT: The Taunton Press, 1991.

"Details That Keep Walls Tight," Paul Fisette, Building Materials and Wood Technology, University of Massachusetts at Amherst, www.umass.edu/bmatwt/walls.html.

"Flashing Details", *Remodeling*, p.46, Mid-February 1997.

"How to Avoid Common Flashing Errors," James R. Larson, *Fine Homebuilding*, April/May 1998.

"Window Nail Flange Air Sealing Gasket," *Energy Design Update*, September 1996, p. 11.

PRODUCT INFORMATION

AFCO Products Inc., 44 Park Street, Somerville, MA 02143; 617-623-7700 (copper, aluminum, vinyl).

Benjamin Obdyke Inc., 65 Steamboat Drive, Warminster, PA 18974; 800-523-5261 (Gap Wrap wall seam tape).

Bethlehem Steel Corporation, Bethlehem, PA 18016; 800-352-5700.

Heckman Industries, 405 Spruce Street, Mill Valley, CA 94941; 800-841-0066 (Deck Seal, self-adhesive aluminum flashing).

Owens Corning, 1 Owens Corning Parkway, Toledo OH 43659; www.owenscorning.com.

Polytite, 324 Rindge Avenue, Cambridge, MA 02140; 800-776-0930; www.polytite.com.

Protecto Wrap Company, 2255 South Delaware, Denver, CO 80223; 800-759-9727.

Specialty Steel Industry of North America, 3050 K St., N.W., Washington, DC 20007; 800-982-0355; www.ssina.com.

Tamlyn and Sons, 10406 Cash Road, Stafford, TX 77477; 800-334-1676; www.tamlyn.com.

Tyvek HomeWrap, DuPont Fibers, P.O. Box 80705, Wilmington, DE 19880-0705; 800-448-9835.

W.R. Grace & Co., 62 Whittemore Ave., Cambridge, MA 02140; 800-558-7066; www.gcp-grace.com (Perm-A-Barrier wall seam tape).