

The Science of a Mortar Bond at the Flashing Course

The excerpts below are from BIA tech notes 7, 21 and 28;

*The flashing also serves as a **bond break** between the brick and the concrete foundation. This permits differential movement between the materials and reduces the likelihood of cracking. In construction without basements, **the flashing may also serve as a termite shield**.*

*Place through-wall flashing in the mortar joint immediately beneath the coping and firmly attach the coping to the wall below with **mechanical anchors***

*Since flashing is a bond break, **the tensile strength of the wall at that location is assumed to be zero**. The shear stress will also be reduced. The structural design of the building should address these issues appropriately.*

Bond Breaks

*When a different material, such as concrete masonry or precast, is incorporated into a brick wall, differential movement between the two materials is likely to occur. In such cases, a bond break should separate it from the surrounding brickwork. This break allows for movement between the two materials and diminishes horizontal or vertical cracking. **A bond break is achieved by installing a layer of No. 15 asphalt or flashing between the other material and the mortar joint surrounding it.***

We are often asked which of our flashing membranes offers the best mortar bond and our answer is **“None of them”**. These questions typically surface when our customers are securing coping stones to a parapet, running a flashing membrane all the way through a single wythe wall or placing flashing under a precast sill. We must assume that the mortar bond is zero and that these structural elements are being held in place vertically by gravity and horizontally by some other means. The coping stones and sills are pinned and bolted and the single wythe walls are supported by rebar.

Industry literature has long claimed that asphalt coatings, fiberglass cloth and craft papers will “enhance the bond in the mortar joint”. We decided to send brick couplets to the New Hampshire Test Laboratory in an attempt to attach a number to the adjective “enhance”.

Test results per ASTM C952 performed by the NH Materials Laboratory, Inc.:

<u>Flashing type</u>	<u>Bond Strength</u>	<u>% Reduction</u>
No flashing-----	526#-----	0 (baseline)
PVC-----	73#-----	84
Rubberized Asphalt-----	184#-----	65
Copper + craft paper-----	95#-----	82
Copper + asphalt-----	109#-----	79
Copper + fiberglass-----	131#-----	75
Copper only-----	62#-----	89
Stainless Steel only-----	59#-----	89 (OVER)

The table above summarizes the results we received and shows why our literature no longer speaks about enhanced mortar bond for any flashing membrane. The decrease in the mortar bond with all of the various membranes tested ranged from 89% for stainless Steel and copper drip edges to 75% for the Copper Fabric and 65% for the rubberized asphalt membrane. The result on the rubberized asphalt has to be re-evaluated in light of the fact that it must sit on top of a drip edge and therefore would revert to the bond associated with stainless steel and copper edges. At the end of the day, rough textured surfaces do enhance the bond in the mortar joint, but not enough to brag about and certainly not enough to rely on to hold a coping stone or sill in place.

Once we establish that the wall is not going anywhere because it is pinned in place, the question turns to the real issue. How do I mend the holes in the flashing that I just created with the pins and rebar? This question forces us to look for flashing materials that give us the greatest number of options for sealant compatibility. The membranes that utilize asphalt are going to restrict us to asphaltic mastic to seal the wounds in our flashing. Moving away from these choices to non-asphaltic membranes gives you access to silicones, urethanes, butyls and a host of EPDM and olefin tapes that have vastly improved elasticity and life expectancy over mastics. So if you must make a hole in the flashing, make sure that your flashing material is compatible with as many different sealant types as possible. York's Multi-Flash™ 500 and Flash-Vent™ products were engineered with just this in mind. These two products offer access to an almost limitless array of sealants. They have become “the solution providers” of our product line for all of the tough details and interface issues and the products of choice for standard installations.

For specs & downloadable details go to www.yorkmfg.com