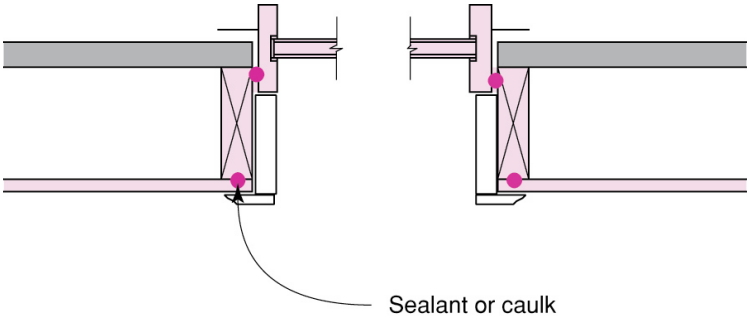
BSC Information Sheet 406

Air Sealing Windows

for All Climates

Location of Air Seal Relative to Window Frame



- Air seal toward the interior edge of the window frame permits drainage of leakage through the window frame
- The diagram above depicts an interior air barrier. Note that the air barrier would also transition to the rough opening framing with cavity air seal or exterior air barrier approaches

Air Sealing Windows

Windows are elements of the building enclosure system that perform many building enclosure functions. One of the building enclosure functions that windows must fulfill is that of an air barrier. As a component of the air barrier system, the connection between windows and other air barrier components is critical to the overall air barrier performance. The air barrier connection between windows and other components must be made in a way that does not compromise other building enclosure functions. Also, the window is the sole air barrier at its opening, unlike walls (which have some redundancy of layers, in terms of airtightness).

While this Information Sheet specifically addresses windows, it may also be applied to doors and other pre-assembled elements installed in building enclosures that also perform an air barrier function.

Location

The air seal between the window unit and the rough opening should be toward the interior edge of the window unit frame. There are two reasons for this. First, at this location, the seal is less likely to interfere with drainage (remember the other building enclosure functions). This is especially important at the sill where the pan flashing must be able to drain to the exterior. The second benefit of sealing toward the interior of the unit is that the remaining gap toward the exterior would be pressure equalized with the exterior. There is then no air pressure difference to drive moisture into the joint (note that water may still be driven into the joint by other forces).

Materials

The window unit should be sealed to the rough opening (or material lining the rough opening) with an air impermeable material. Chinking the gap between window units and rough opening with fibrous insulation does not provide an air barrier connection.

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Materials used to seal the window in the rough opening should be permanently flexible so as to maintain the seal as components move due to thermal expansion and changes in humidity. Finally, the material used to make the seal must not cause the window framing to bow or bend. If foams are used, it must be a low, or no expansion foam and the application should be tested before being applied to the whole building. Caulking may be a suitable air sealing material if gaps are _" or less. Backer rod and sealant may be suitable if the gap between the window unit and framing is of relatively uniform width.

Suggestions for Further Research:

"Understanding Air Barriers", Building Science Digest-104, www.buildingscience.com.

"READ THIS: Before You Design, Build, or Renovate," Building Science Primer-040, www.buildingscience.com.

"Drainage, Holes and Moderation", Building Science Insight 004, www.buildingscience.com.

Lstiburek, Joseph W.; *Builder's Guide Series*, Building Science Press, 2006.