Air Control

It is a building enclosure best practice and energy code requirement to provide an air control layer. The previous chapters in this guide discuss the air control layer (see Control Layer Summary on page 21) and specific air barrier systems (see Table 6-2) commonly used with masonry wall systems. As demonstrated in Fig. 3-8 on page 19, the air control layer has relationships with all of the building enclosure loads listed, including heat flow, making it a critical component of the building enclosure. Unintentional air flow across the enclosure can be defined as air leakage and is specifically addressed by the governing energy codes in the state of Colorado and southern Wyoming. Maximum air leakage targets are typically prescribed in local energy codes as maximum allowable flow rates at a specified pressure differential across the building enclosure.

Code Air Leakage Requirements

The governing energy codes within the state of Colorado and southern Wyoming require a continuous air barrier system throughout the building’s thermal envelope that is continuously sealed and supported by the structure (e.g., fastened or adhered). The 2015 IECC defines the building thermal envelope as “the basement walls, exterior walls, floor, roof, and any other building elements that enclose conditioned space or provide a boundary between conditioned space and exempt or unconditioned space.”

<table>
<thead>
<tr>
<th>Energy Code</th>
<th>Seals required at openings, penetrations, and joints?</th>
<th>Maximum air leakage rate requirement for fenestration assemblies?</th>
<th>Maximum air permeability requirement for materials?</th>
<th>Maximum air leakage requirement for assemblies?</th>
<th>Maximum whole-building air leakage requirement?</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003/2009 IECC</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>2012 IECC</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
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<tr>
<td>2015/2018 IECC</td>
<td>Yes, if not pursuing the whole-building air leakage test compliance option.</td>
<td>Yes, if not pursuing the whole-building air leakage test compliance option.</td>
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</tbody>
</table>

A continuous air barrier must comply with one of the following options:

1. The air permeability of materials shall not exceed 0.004 cfm/ft² under a pressure differential of 0.3 inch water gauge when tested in accordance with ASTM E 2178.
2. The average air leakage of assemblies of materials and components shall not exceed 0.04 cfm/ft² under a pressure differential of 0.3 inch water gauge when tested in accordance with ASTM E 2357, ASTM E 1677, or ASTM E 283.
3. The air leakage rate of the completed building shall not exceed 0.4 cfm/ft² under a pressure differential of 0.3 inch water gauge when tested in compliance with ASTM E 779 or (an equivalent method approved by the code official).

The air barrier must comply with one of the following options if not pursuing the whole-building air leakage test compliance option:

1. The air permeability of materials shall not exceed 0.004 cfm/ft² under a pressure differential of 0.3 inch water gauge when tested in accordance with ASTM E 2178.
2. The average air leakage of assemblies of materials and components shall not exceed 0.04 cfm/ft² under a pressure differential of 0.3 inch water gauge when tested in accordance with ASTM E 2357, ASTM E 1677, or ASTM E 283.

Compliance may be demonstrated by performing a whole-building air leakage test in compliance with ASTM E 779 or (an equivalent method approved by the code official) with a final result that does not exceed 0.40 cfm/ft² at 0.3 inch water gauge in lieu of the prescriptive requirements for seals, materials, and assemblies.

*Local amendments in the cities of Fort Collins and Boulder include mandatory whole-building air leakage testing.