DESIGN ADVISORY

IECC Air Barrier Requirements
DA-2017-01
April 20, 2017

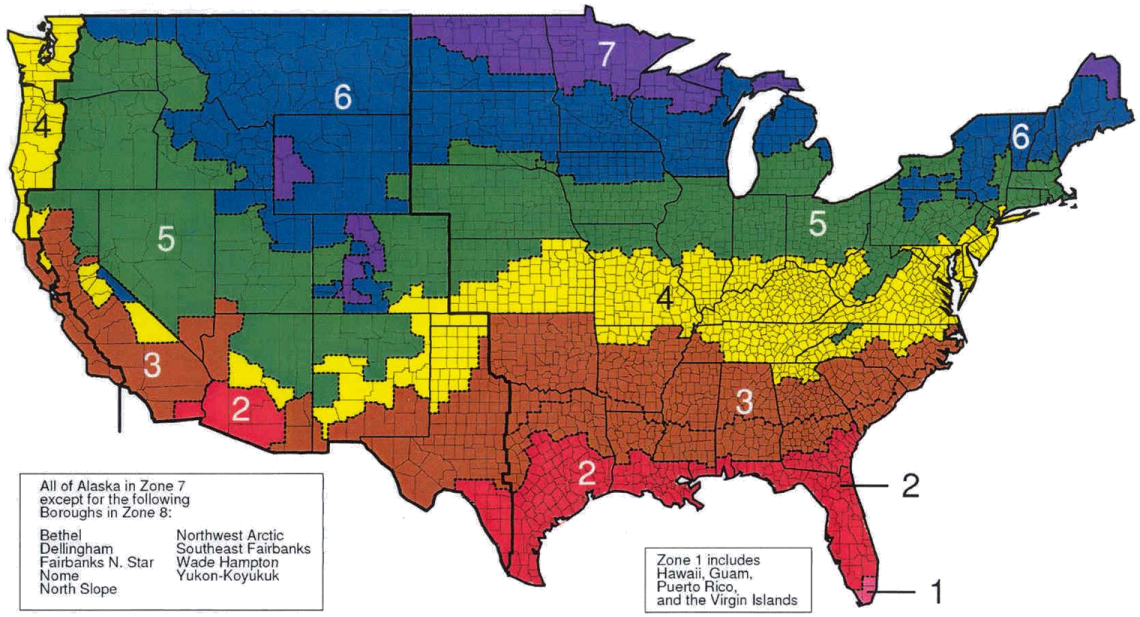
To: Carlisle SynTec Systems' Manufacturer's Representatives, Distributors, and Authorized Applicators

Subject: 2015 International Energy Conservation Code (IECC) Air Barrier Requirements

With the publication of the 2015 International Energy Conservation Code (IECC), there have been some small changes to the air barrier requirement for commercial construction projects.

Carlisle's August 2014 Code Advisory discussed the options for compliance with the 2012 IECC air barrier requirement. With each new edition of the code, items are modified or re-worded for clarity. In the 2015 IECC, the air barrier section has again been modified and moved to Section C402.5.

- The exception has been changed from ASHRAE zones 4–8 to ALL United States climate zones except for zone 2B, which is made up of small parts of California and Texas and a significant portion of Arizona.



- Clarifications have been made regarding what is to be considered an air barrier penetration and how to address it.
- The option for compliance using a whole-building air leakage test has been removed.

The significance of these changes will vary based on geographical area. There are two compliance paths, one for materials and one for assemblies.

The two options listed below qualify as acceptable systems; however, in mechanically fastened systems, it is strongly recommended, due to concerns over air intrusion, to use an additional air barrier in conjunction with the roofing membrane. Carlisle offers a variety of air barriers suitable for this application, including

VapAir Seal™ 725TR Air and Vapor Barrier, VapAir Seal MD, and SureMB 120TG Base (which meets the minimum air leakage requirement with only one fastener per square foot).

In November 2016, ASHRAE and the NRCA argued for the removal of the words "fully adhered" preceding "single-ply membranes" from the 2018 IECC code. In the final voting results, published in December 2016, it was deemed to leave the comply list as-is and to maintain the wording "fully adhered single-ply membranes."

The reasoning for not including mechanically fastened roof membranes as a compliant option was centered around energy savings, considering air intrusion and positive building pressure. Air intrusion into the roof assembly by conditioned air from below can be drawn into a mechanically fastened assembly by the 'fluttering' or 'pumping' of the roofing systems. This conditioned air underneath the membrane can be warmed (in the summer) or cooled (in the winter), and can result in moisture being deposited into the roof system if moisture-laden air reaches the dew point at the surface of the membrane. In this case, installing an additional air barrier at deck level will prevent conditioned air (whether warm or cool) from moving into the roof assembly.

Material Option – Combats air leakage. This option is a list of building materials, including several roofing systems and many exterior building products, which are deemed to qualify as air barriers. While fully adhered single-ply membranes are on this list, mechanically fastened single-ply membranes are not. The option continues to list an ASTM E2178 test with which the material must comply; all of Carlisle's membranes have passed this test, whether they are adhered or mechanically fastened.

Assembly Option – Combats air intrusion. This option outlines a minimum air leakage of 0.04 cfm/ft^2 at a pressure differential of 0.3 inches of water gauge when tested in accordance with ASTM E2357, ASTM E1677, or ASTM E283. (Note: None of these ASTM numbers relate to roofing products.)

The 2015 IECC is still in the process of being adopted by various state and local municipalities; widespread adoption will likely take another year. It is a good idea to call your local code official to verify if this air barrier requirement has been adopted in your area, particularly if you are unsure whether your jurisdiction has adopted ASHRAE 90.1 or IECC requirements. Keep in mind that ASHRAE 90.1-2010 was the first energy code that required an air barrier in commercial construction and is a popular alternative to the IECC.

Visit the Carlisle website for more information about air barriers, including product data sheets, options for sealing penetrations, code approvals, and fire testing information. If you have any questions about these code changes, please contact Carlisle's Design Services department.

Sincerely,

Craig A. Tyler
Architect, Design Services
cc: Job File