August 19, 2014

TECHNICAL BULLETIN

TARGET MARKET ROOFING

Sarnafil BUILDING TRUST

Subject: IECC Air Barrier Requirements - 2012

The IBC enacted a significant change from the 2009 to the 2012 International Energy Conservation Code (IECC) requiring that the building envelope be designed to limit air leakage through the building's thermal envelope. The intent of the IECC code change is to make commercial (non-residential) buildings more energy efficient by minimizing hot air from infiltrating into the building during the cooling seasons and cold air during the heating season. To meet this mandatory code requirement, the thermal envelope of the building shall comply with code Sections C402.4.1 through C402.4.8, which basically states there will be a continuous air barrier provided throughout the building thermal envelope. The exception to the mandatory continuous air barrier requirement is those buildings located in climate zones 1, 2 and 3.

The IECC has set parameters for the maximum allowable air leakage for buildings and allows three methods to determine compliance with stated maximum air permeability or leakage of the air barrier.

Materials (Section C402.4.1.2.1) – air permeability no greater than 0.004 cfm/ft^2 (0.02L/s m^2) when tested to ASTM E2178.
The code recognizes fifteen materials as meeting the code requirements, as long as all joints are sealed and the materials are installed as air barriers in accordance with the manufacturer's instructions. This pre-approved list includes materials such as built up roofs, modified bituminous roof membrane and fully adhered single ply roof membrane. Mechanically attached roof systems are not included on the pre-approved material list.

Assemblies (Section C402.4.1.2.2) – assemblies of materials and components with an average air leakage not to exceed 0.014 cfm/ft^2 (0.2 L/s m^2) as tested to ASTM E 2357, ASTM E 1677 or ASTM E 283. At this time these assembly tests are only for wall constructions.

Building Test (Section C402.4.1.2.3) – the completed building shall be tested with the air leakage of the building envelope not exceeding 0.4 cfm/ft^2 (2.0 L/s m^2), tested to ASTM E779, which is a full building pressure test.

As the 2012 IECC is written, our adhered single ply systems meet the air barrier requirement based on the pre-approved list noted in the code

To validate all of our membranes as well as our barrier sheets, we did third party independent material testing with our Sarnafil G410, Sarnafil S327, Sikaplan, Sarnavap - 10 and Sarnavap SA in accordance with ASTM E2178 to prove these materials all meet or exceed the air barrier requirements of Section C402.4.1.2.1 of IECC 2012. With the testing of the roof membranes, we used the thinnest offering for each so as to represent what may be considered the "most critical" version of the product for this test procedure. The values in the following table show all these materials are all well below the requirements for an air barrier material as required by the code.

Material	Flow Rate		Air Permeance
	cfm / ft^2	L /s m^2	L / (Pa m^2 s)
Sarnafil G410	<0.00006	<0.0003	<0.000012
Sarnafil S327	<0.00010	<0.0005	<0.000020
Sikaplan	<0.00004	<0.0002	<0.000008
Sarnavap - 10	<0.00004	<0.0002	<0.000008
Sarnavap SA	<0.00006	<0.0003	<0.000012

Based on the test data, these materials meet the requirement of Section C402.4.1.2.1 that allows for air infiltration to be ≤ 0.004 cfm/ft^2 (0.02L/s m^2) when tested to ASTM E2178 as long as all the seams or joints of our materials are sealed, these materials meet the IECC building code requirements for air barriers.

We believe the listed materials in the above table meet the requirements of the 2012 IECC, as the test report provided by an ICC certified laboratory states, it is still the local building code official that makes the ultimate and final decision for code compliance.

The 2012 IECC is slowly being reviewed and adopted by state and/or local code jurisdictions. The following chart will provide a general understanding of adoption of the IECC as well as other ICC codes as of July, 2014. The link to stay current regarding state code adoption is: **www.iccsafe.org/gr/Documents/stateadoptions.pdf**

As stated above, the 2012 IECC requires a continuous air barrier for the entire building envelope. The transitions to dissimilar products, such as a roof to wall air barrier tie-in will be critical. Not only must the tie-in be sealed, as required by the code, there is the issue of compatibility between the various products. Please review our Technical Bulletins dated 3/28/2014 for Sika Wall Air Barrier to Roof Tie-in Details and Bulletin 02-12, date 5/23/2012, which addresses Sarnafil membranes in contact with self-adhered barrier sheets.

With a re-roof or recover application, it may be impossible to meet the IECC code requirements, as there most likely will not be a wall air barrier in place. There are a few states that have recognized this issue, such as IL, NC, and SC, and do not require compliance with the 2012 air barrier requirements. Other states are realizing the potential issues of providing a continuous building envelope air barrier with recover or reroof applications and are considering similar exemptions. It is believed that the 2015 IECC will exempt reroof and recover applications from the air barrier requirements.

The following web sites may be useful to keep current with each states adoption of the entire IECC or portions of the code.

http://www.energycodes.gov/adoption/states

http://www.nrca.net/roofing/Energy-codes-256

International Codes-Adoption by State (July 2014)

ICC makes every effort to provide current, accurate code adoption information. Not all jurisdictions notify ICC of code adoptions.
To obtain more detailed information on amendments and changes to adopted codes, please contact the jurisdiction. To submit code adoption information: www.iccsafe.org/adoptions

X = Effective Statewide A = Adopted, but may not yet be effective L = Adopted by Local Governments S = Statewide adoptions with limitations **XL = Adopted by the State for Local Adoption**

12= 2012 Edition 09 = 2009 Edition 06 = 2006 Edition 04 = 2004 Edition 03 = 2003 Edition 00 = 2000 Edition

* The title of the 2000 and 2003 IUWIC Code was changed to IWUIC in the 2006 version.

Jurisdiction	IBC	IRC	IFC	IMC	IPC	IPSDC	IFGC	IgCC	IECC	IPMC	IEBC	ISPSC	ICCPC	IWUIC	IZC	ICC 700
Alabama	S09, L	L	S09, L	S09, L	S09, L	L	S09, L		L	L	L		L		L	
Alaska	X09	L06	X09	X09			X09		L06							
Arizona	S09, L	S09, L	S06, L	S09, L	S09, L	L	S09, L	L	S09, L	L	L	L	L	L	L	L
Arkansas	X12	X12	X12	X09	X06	L	X06		X09	L	L					
California	X12	X12	X12							L	X12	L		L		
Colorado	S12, L	S12, L	S12, L	S12, L	X12, L	L	X12, L	L	S12, L	L	S12,L	L12	L	S12,L	L	L
Connecticut	X03	X09	X03	X03	X03				X09	L	X03					
Delaware	L12	L12	L12	L12	S12		L12		S12	L	L					
District of Columbia	X12	X12	X12	X12	X12		X12	X12	X12	X12	X12	X12				
Florida	X09	X09		X09	X09		X09	X	X09	L09	X09					
Georgia	X12	X12	X12	X12	X12		X12		X09	L06	L06	L12				L08
Hawaii	X06	X06, L06							X06							
Idaho	X12	X09	X09	X09			X09		X09		X12					L
Illinois	S09, L	L	S09, L	S09, L	L	L	S09, L		X12	S09, L	S09, L	L12	L	L	L	
Indiana	X06	X03	X06	X06	X06		X06									
Iowa	S09, L	S09, L	X09	S09, L	L	L	L		X12	L	S09, L				L	
Kansas	L	L	S06, L	L	L	L	L		S09, L	L	L					
Kentucky	X12	X12	X12	X12					X09	L						
Louisiana	X12	X12	L	X12			X12		X09,L	L	X12					
Maine	X09	X09							X09		X09					
Maryland	X12	X12		X12	L12	L	L	X	X12	X12	X09					
Massachusetts	X09	X09		X09					X12		X09					
Michigan	X09	X09	L	X12	X12	L	X09		X09	L	X09		L			
Minnesota	X06	X06	X06	X00			X06			L						
Mississippi	S12, L	S12, L	S12, L	S12, L	S12, L	L	S12, L		L	L	S12, L		L			
Missouri	S12,L	S00, L	L	S12, L	S12,L	L	S00		S12	L	L		L	L	L	
Montana	X09	X06	L	X09			X09		X09		X09					
Nebraska	S09, L	S09, L	L	L	L	L	L		S09, L	L	S09, L			L	L	
Nevada	S12, L	S12, L	S12, L	L	L	L	L		S12, L	L	L		L	X09, L		
New Hampshire	X09	X09	L	X09	X09			L	X09	L	X09					
New Jersey	X09	X09	X06	X09			X09		X09	L						
New Mexico	X09	X09	X03	L	L		L		X09	L	X09		L	L		
New York	X06	X06	X06	X06	X06		X06		X09	X06	X06					
North Carolina	X09	X09	X09	X09	X09		X09	X	X09							
North Dakota	S12, L	S12, L	L	S12, L			S12, L		S12, L	L	L					
Ohio	X09	A09	X09	X09	X09		X09		X09	L					L	
Oklahoma	S09, X	S09, X	S09, X	S09, X	S09, X	L	S09, X		S03, L	S06, L	S09, X		S06, L	L	L	
Oregon	X09	X09	X12	X09			X09	X	X09							
Pennsylvania	X09	X09	X09	X09	X09		X09		X09	L	X09		X09	X09		
Rhode Island	X12	X12		X12	X12		X12	X12	X12	X12						
South Carolina	X12	X12	X12	X12	X12		X12		X09	L12	L12	L12	L12			
South Dakota	S12, L	L	S09, L	S09, L		L	L		L	L12	L		L	L		
Tennessee	S06, L	X09	S06, L	L	L		L		X06	L	L	L12	L		L	
Texas	X06	X00	L06	L06	L06	L	L06		X09	L	L06	L12	L	L	L	
Utah	X12	X12	X12	X12	X12		X12		X12					X06		
Vermont	X12	L			X12				X09							
Virginia	X12	X12	X12	X12	X12		X12		X12	X12	X12	X12				
Washington	X12	X12	X12, L	X12	L12		X12, L	L	X12, L12	L	X12, L		L	L09		
West Virginia	X12	X09		X12	X12		X12		X09	X12	X12					
Wisconsin	X09		L	X09			X09		X09		X09					
Wyoming	X12, L	L12	X12, L	X12, L	L12	L12	X12, L		L12	S12	S12, L	L12	L12	L12	L12	
U.S.Territories	**IBC**	**IRC**	**IFC**	**IMC**	**IPC**	**IPSDC**	**IFGC**	**IgCC**	**IECC**	**IPMC**	**IEBC**	**ISPSC**	**ICCPC**	**IUWIC**	**IZC**	**ICC 700**
Guam	X09	X09	X09	X09	X09	X09	X09				X09					
Northern Marianas Islands	X09															
Puerto Rico	X09	X09	X09	X09	X09	X09	X09		X09		X09					
U.S. Virgin Islands	X12	X12	X12	X12					X12							