SOLUTION DESCRIPTION

The Rmax answer for commercial exterior walls, ECOMAXci Wall Solution, includes our tested, thermally efficient continuous insulation (c.i.) board, along with Rmax branded tape and flashing and the choice of fiber glass, stone/mineral wool or no cavity fill. This solution has been tested in multiple NFPA 285 assemblies and is approved for use in exterior walls of buildings of any height, as described within this document.

Backed by over 30 years of Rmax experience and knowledge, the ECOMAXci Wall Solution provides a ready-made answer to fire, air and water, in addition to thermal efficiency for exterior commercial wall designs.

SOLUTION BENEFITS

• Engineered to optimize performance
• Tested as an assembly
• Meets current building codes with respect to c.i., fire, air and water
• Meets NFPA 285 fire performance criteria
• Exterior gypsum not required
• Fire-stopping at header openings not required
• Meets ABAA criteria for an Air Barrier Assembly
• Meets ICC-ES Acceptance Criteria for WRB
• Flexibility in cavity insulation
• Eliminates secondary barriers
• Faster dry-in time
• Reduces energy costs, as well as material and labor costs
• Covered by the ECOMAXci Wall Solution limited warranties
KEY COMPONENTS

The ECOMAXci Wall Solution is a tested solution utilizing ECOMAXci, R-SEAL 3000 and R-SEAL 6000. Rmax has engineered this solution to optimize compatibility of components and their performance in assembly tests. All testing is component specific and substitutions are not allowed. A brief description of these components is listed below. However, more detailed information and requirements can be found in the corresponding component data sheets and installation instructions.

**ECOMAXci**

ECOMAXci is an energy-efficient thermal insulation board composed of a closed-cell POLYISO foam core with heavy duty 10mil interior and 12mil exterior glass fiber reinforced aluminum foil facers. It utilizes a CFC, HCFC and HFC free blowing agent that has zero Ozone Depletion Potential (ODP) and negligible Global Warming Potential (GWP). Availability includes a wide range of thicknesses supplied in four foot wide panels with a standard length of twelve feet to minimize the number of joints and cut down on the amount of required tape. This component provides continuous insulation eliminating thermal bridging through the studs.

**R-SEAL 3000**

R-SEAL 3000 is a nominal 2mil high-strength, dead soft aluminum foil coated with cold weather solvent acrylic pressure sensitive adhesive. It comes in four inch wide rolls with 150 linear feet per roll. This component seals insulation joints to make the air and water barrier continuous across the framing.

**R-SEAL 6000**

R-SEAL 6000 is a self-sealing nominal 35mil black woven polyethylene membrane with a butyl rubber adhesive. It comes in nine or twelve inch wide rolls with 50 linear feet per roll. This component provides flashing to bridge the insulation around doors, windows, service openings and penetrations to complete the air and water barrier for the entire wall assembly.

COMPLIANCES/TESTING

**Continuous Insulation Code References**

- International Building Code (IBC)
- International Energy Conservation Code (IECC)
- International Green Construction Code (IGCC)
- ASHRAE 90.1
- ASHRAE 189

**Fire Performance**

- ASTM E84 Class A
- NFPA 285
- 1, 2, 3 or 4 hour Fire Rated Assemblies as shown in the UL Fire Resistance Directory.

**Air Barrier**

- ASTM E2357
- CAN/ULC-S742 (A1)

**Water-Resistive Barrier**

- AATCC Test Method 127
- ASTM E331
ASSEMBLY PERFORMANCE IN DEPTH

CONTINUOUS INSULATION

Heat transfer takes the path of least resistance. Therefore, it is critical that the insulation covers the entire building envelope to avoid thermal bridging, i.e., continuous insulation. ASHRAE defines continuous insulation (c.i.) as “insulation that is continuous across all structural members without thermal bridges other than fasteners and service openings.” Thermal bridging occurs when two dissimilar materials exist in the same plane. For example, in the case of cavity insulation between the studs of a wall, the heat transfers more readily through the studs than the cavity insulation. Therefore, the cavity insulation is not as effective as expected. This is grossly exaggerated in the case of steel studs, where steel has such a low resistivity (approximately R0.003). The graphic below was derived from Table A9.2B of ASHRAE Standard 90.1-2007 which shows the effective R-value of cavity insulation in a steel stud application versus its claimed value. It clearly shows that the effective R-value of the cavity insulation is dramatically lower than expected due to the thermal bridging of the steel studs. Since continuous insulation is “continuous” and does not have interruption from framing, the effective value equals the rated value.

While continuous insulation is the most efficient way to insulate and reduce thermal bridging, it will be increasingly necessary to meet energy code requirements throughout all climate zones.

FIRE RESISTANCE

According to the IBC, exterior walls of buildings of Type I, II, III or IV construction of any height, containing foam plastic insulation, require additional fire testing. Per Section 2603.5.5, “The wall assembly shall be tested in accordance with and comply with the acceptance criteria of NFPA 285.” NFPA 285 is an assembly test, not a material test. Approval is dependent on all components of the assembly.

NFPA 285 provides a method of determining the flammability characteristics of exterior, non-load-bearing wall assemblies, which contain combustible components. The test method is intended to simulate the “full-scale” fire performance of the wall assembly being evaluated. The basic test apparatus consists of a section mock-up of a multi-story building. It is designed to be two rooms, one above the other; the lower of which contains a window opening. Two burners are used to conduct the test; one inside the lower test room and one on the exterior side of the window opening. The primary performance characteristics evaluated in this test are the capability of the test wall assembly to resist the following:

- Flame propagation over the exterior face of the system
- Vertical flame spread within the combustible core components from one story to the next
- Vertical flame spread over the interior (room side surface of the panels from one story to the next)

These characteristics are assessed through visual observations and temperature data obtained during the test by over 65 thermocouples located throughout the wall assembly. The Rmax ECOMAXci Wall Solution passed NFPA 285 fire testing. All aspects, including components and installation, must be followed during construction. Final analyses and third party listings can be provided for specific instructions in addition to this document.

AIR BARRIER ASSEMBLY

An air barrier assembly is a collection of air barrier materials and accessories gathered together to control air infiltration and exfiltration through the building envelope by forming a continuous barrier. An air barrier material, such as POLYISO foam sheathing, serves to provide the principal plane of air tightness for the building envelope. Air barrier accessories, such as tapes, transition membranes and sealants, serve to connect and seal the primary air barrier material to complete the air barrier assembly. According to ABAA, “The performance of an air barrier assembly is of far greater importance than the air permeance of the material. When materials and accessories are installed proficiently, the benefits of the assembly have positive benefits for the entire life cycle of the building. The testing of an air barrier assembly for air leakage is completed in accordance with ASTM E2357, Standard Test Method for Determining Air Leakage of Air Barrier Assemblies.”

Specific requirements for air barrier materials and assemblies are located in Chapter 4 of the IECC (Commercial Provisions), Section 5 of ASHRAE 90.1 and Section 7 of ASHRAE 189.1. While these requirements are relatively new to building codes, awareness of the importance of such criteria and building performance is elevated within the code arena and continues to be on the forefront.

The ECOMAXci Wall Solution has been tested in accordance with ASTM E2357 and resulted in a value that was well below the maximum allowable air leakage rate of 0.2 L/(s.m²) that defines an air barrier assembly.

WATER RESISTIVE-BARRIER

A water-resistive barrier consists of materials designed to work together to shield the building interior from rain penetration and water leakage through the exterior cladding. According to the ABAA, “A properly installed water resistive barrier (which includes proper flashing over doors and windows, continuity at seams, and sealing around penetrations) will improve the overall moisture efficiency and performance of the home or building’s wall system... Water will be channeled down the outside surface of the water resistive barrier, thus reducing the potential for condensation build-up in the wall assembly which reduces the likelihood of moisture problems, rot and degradation.”

Chapter 14 of the IBC requires that exterior walls shall provide a weather-resistant envelope and shall be designed and built in such a manner as to impede the accumulation of water within the assembly by providing a water-resistant barrier behind the exterior cladding. ICC Evaluation Services developed Acceptance Criteria for Foam Plastic Sheathing Panels Used as Water-Resistant Barriers (AC71) to establish test requirements since the codes do not provide them. AC71 requires that foam plastic panels and ancillary materials, such as tapes and flashings, be tested per ASTM E331 and AATCC Test Method 127.

The ECOMAXci Wall Solution serves as a Water-Resistive Barrier and has been tested per the guidelines set forth in the ICC-ES AC71.
ECOMAXci Wall Solution

NFPA 285: ASSEMBLY OPTIONS
The approval of NFPA 285 assemblies with ECOMAXci Wall Solution allows for ultimate efficiency through multiple design options, ease of construction, a better building envelope and reduced energy usage. With a direct impact on the savings throughout the life of the building, ECOMAXci Wall Solution is the superior choice for commercial buildings. The various component options throughout the wall system are outlined below. NOTE: For specific details, requirements and limitations of each component, refer to Rmax NFPA 285 Assembly Guide and DrJ Technical Evaluation Report, TER 1212-03. For more information on these assemblies, contact Rmax Technical at (800) 527-0890.

BASE WALL
• Concrete or concrete masonry wall
• Steel studs with interior gypsum wallboard

FLOOR LINE FIRE-STOPPING
• Mineral fiber insulation

CAVITY INSULATION
• None
• Mineral fiber or fiberglass (faced or unfaced)
• Any non-combustible insulation

EXTERIOR SHEATHING
• None
• Exterior gypsum sheathing

WRB OVER SHEATHING*

EXTERIOR INSULATION
• Rmax ECOMAXci

WRB OVER INSULATION*

EXTERIOR CLADDING OPTIONS
1. Brick
2. Stucco
3. Limestone
4. Natural Stone Veneer
5. Cast Artificial Stone Veneer
6. Terracotta Cladding
7. Any NFPA 285 MCM (aluminum, steel, copper, zinc)
8. Metal panel, uninsulated
9. Fiber-cement siding, uninsulated
10. Stone/Aluminum honeycomb composite
11. Autoclaved-aerated-concrete (AAC)
12. Thin Set Brick

FLASHING
• Rmax R-SEAL 6000; any asphalt, acrylic or butyl based

WRB OPTIONS
None
BASF Enershield®-HP or Enershield®-I
Carlisle Barritech™ NP, Barritech™ VP or Fire Resist 705FR-A
Dow WEATHERMATE™ or WEATHERMATE™ Plus
Dupont Tyvek®
Henry Air-Bloc® 17, Air-Bloc® 21FR, Air-Bloc® 31MR, Air-Bloc® 32MR, Air-Bloc® 33MR, EnviroCap, FOILSKIN® or Metal Clad
Pacliv GreenGuard® MAX™ Building Wrap
Prosoco R-Guard® Blueskin® SA, Blueskin®VP™ 160, R-Guard® Cat 5®, R-Guard® VB, or R-Guard® Spray Wrap MVP
Soprema Sopraseal Stick VP, Soprema Sopraseal Stick 1100T or Sopraseal Xpress G
VaproShield RevealShield SA™ or WrapShield SA®

Refer to TER 1212-03 for specified location or veneer.

*NOTE: For approved use of WRB with specified location or veneer, as well as approvals with the use of fire retardant treated wood (FRTW) studs and/or sheathing, refer to TER 1212-03.

DISCLAIMERS: For warranties, limitations and conditions refer to Rmax Sales Policy and applicable warranties. All documents are located at www.rmax.com. For technical and sales support, email rmax@rmax.com or call (800) 527-0890. It is the responsibility of the project architect, engineer, general contractor and/ or building owner to determine the suitability of this solution and the information contained within this document as it pertains to local Building Code requirements. In order for the ECOMAXci Wall Solution to perform as intended, the installation of all components is paramount. The details outlined in this document, as well as in the ECOMAXci Wall Solution Installation Instructions, must be followed for the performance claims within this document to be valid.