



CERTIFICATION



Approved. Sealed. Code Compliant.

Technical Evaluation Report

TER 1504-04

ECOMAXci® Ply

Rmax

Product:

Rmax ECOMAXci Ply

Issue Date:

December 16, 2015

Revision Date:

December 30, 2019

Subject to Renewal:

January 1, 2021



COMPANY
INFORMATION:

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DIVISION: 06 00 00 - WOOD, PLASTICS AND COMPOSITES

SECTION: 06 16 00 - Sheathing

SECTION: 06 16 13 - Insulated Sheathing

DIVISION: 07 00 00 - THERMAL AND MOISTURE PROTECTION

SECTION: 07 20 00 - Thermal Protection

SECTION: 07 21 00 - Thermal Insulation

SECTION: 07 27 00 - Air Barriers

1 PRODUCT EVALUATED¹

1.1 Rmax ECOMAXci Ply

2 APPLICABLE CODES AND STANDARDS^{2,3}

2.1 Codes

2.1.1 *IBC—12, 15, 18: International Building Code®*

2.1.2 *IRC—12, 15, 18: International Residential Code®*

2.2 Standards and Referenced Documents

2.2.1 *AISI S100: North American Specification for the Design of Cold-formed Steel Structural Members*

2.2.2 *ANSI/AWC NDS: National Design Specification (NDS) for Wood Construction*

2.2.3 *ASTM C1289: Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board*

¹ Building codes require data from valid [research reports](#) be obtained from [approved sources](#). Agencies who are accredited through ISO/IEC 17065 have met the [code requirements](#) for approval by the [building official](#). DrJ is an ISO/IEC 17065 ANSI-Accredited Product Certification Body – Accreditation #1131.

Through ANSI accreditation and the [IAF MLA](#), DrJ certification can be used to obtain product approval in any [jurisdiction](#) or country that has [IAF MLA Members & Signatories](#) to meet the Purpose of the MLA – “certified once, accepted everywhere.”

Building official approval of a licensed [registered design professional](#) (RDP) is performed by verifying the RDP and/or their business entity complies with all professional engineering laws of the relevant [jurisdiction](#). Therefore, the work of licensed RDPs is accepted by [building officials](#), except when plan (i.e. peer) review finds an error with respect to a specific section of the code. Where this TER is not approved, the [building official](#) responds in writing stating the reasons for [disapproval](#).

For more information on any of these topics or our mission, product evaluation policies, product approval process, and engineering law, visit drjcertification.org or call us at 608-310-6748.

² Unless otherwise noted, all references in this TER are from the 2018 version of the codes and the standards referenced therein (e.g., *ASCE 7*, *NDS*, *ASTM*). This material, design, or method of construction also complies with the 2000-2015 versions of the referenced codes and the standards referenced therein.

³ All terms defined in the applicable building codes are italicized.

- 2.2.4 *ASTM E1354: Standard Test Method for Heat and Visible Smoke Release Rates for Materials and Products Using an Oxygen Consumption Calorimeter*
- 2.2.5 *ASTM E136: Standard Test Methods for Behavior of Materials in a Vertical Tube Furnace*
- 2.2.6 *ASTM E2178: Standard Test Method for Air Permeance of Building Materials*
- 2.2.7 *ASTM E84: Standard Test Method for Surface Burning Characteristics of Building Materials*
- 2.2.8 *DOC PS 2: Performance Standard for Wood-based Structural-use Panels*
- 2.2.9 *NFPA 285: Standard Fire Test Method for the Evaluation of Fire Propagation Characteristics of Exterior Nonload-bearing Wall Assemblies Containing Combustible Components*

3 PERFORMANCE EVALUATION

- 3.1 Rmax ECOMAXci Ply was evaluated to determine the following uses in Type I-IV construction:
 - 3.1.1 Foam plastic insulation performance in accordance with IBC Section 2603
 - 3.1.2 Performance for use as an air barrier in accordance with IECC Section C402
 - 3.1.3 Flame spread and smoke-developed index ratings in accordance with IBC Section 2603.5.4
 - 3.1.4 Vertical and lateral fire propagation in accordance with IBC Section 2603.5.5
 - 3.1.5 Connection to light-frame cold-formed steel framing to support cladding weight in accordance with IBC Section 1609.1.1
- 3.2 ECOMAXci Ply is not designed as a structural bracing material. Adequate building bracing shall be provided through other means and methods.
- 3.3 Design of cladding fastening to ECOMAXci Ply is outside the scope of this TER.
- 3.4 Any code compliance issues not specifically addressed in this section are outside the scope of this TER.
- 3.5 Any engineering evaluation conducted for this TER was performed on the dates provided in this TER and within DrJ's professional scope of work.

4 PRODUCT DESCRIPTION AND MATERIALS

- 4.1 The product evaluated in this TER is shown in Figure 1.



FIGURE 1. ECOMAXCI PLY

- 4.2 ECOMAXci Ply is a composite product whose core consists of Rmax rigid, closed-cell polyisocyanurate (Polyiso) foamed plastic insulation board with inorganic, polymer coated glass fiber mat facers. This insulation board is bonded to fire-retardant treated (FRT) plywood with liquid adhesive.
 - 4.2.1 Rmax Polyiso foam insulation conforms to *ASTM C1289* in accordance with IBC Section 2603.
 - 4.2.2 The FRT plywood is manufactured in accordance with *DOC PS 2* and treated for compliance with IBC Section 2303.2.

- 4.2.3 The rigid insulation portion of ECOMAXci Ply is available in the following thicknesses: 0.75" (19 mm) through 4.5" (114 mm).
- 4.2.4 The FRT plywood portion is available in $\frac{5}{8}$ " (0.625") and $\frac{3}{4}$ " (0.75") thicknesses.
- 4.2.5 Standard product width: 48" (1219 mm)
- 4.2.6 Standard product length: 96" (2438 mm)

5 APPLICATIONS

5.1 ECOMAXci Ply is a composite insulation panel for use in the following applications:

- 5.1.1 Exterior walls of buildings of any height and of Type I-IV construction in accordance with IBC Section 2603.5
- 5.1.2 Continuous insulation on buildings constructed in accordance with the *IBC* for light-frame cold-formed steel construction or metal buildings
- 5.1.3 Continuous insulation providing a nail base for cladding materials used in light-frame cold-formed steel construction or metal buildings

5.2 The Environmental Product Declaration (EPD) for ECOMAXci is available at polyiso.org.

5.3 Thermal Insulation

5.3.1 ECOMAXci Ply is intended to be used as exterior continuous insulation under any type of permitted cladding.

5.4 Air Barrier

5.4.1 ECOMAXci Ply meets the requirements of IECC Section C402 for use as a component of the air barrier (Table 1) when installed in accordance with the manufacturer's installation instructions and this TER and with all seams, including the top and bottom edges, sealed.

TABLE 1. AIR BARRIER PROPERTIES

Product	Air Permeance [L/(s*m ²)]
ECOMAXci Ply	< 0.02
1. Tested in accordance with <i>ASTM E2178</i>	

5.4.2 The air permeance of an air barrier material is defined by the *IECC* and the Air Barrier Association of America (ABAA) as being no greater than 0.02 liter per second per square meter [L/(s*m²)] at 75 Pa pressure difference when tested in accordance with *ASTM E2178*.

5.5 Fire Safety

5.5.1 Surface Burn Characteristics:

5.5.1.1 The components of ECOMAXci Ply have the flame spread and smoke developed characteristics shown in Table 2.

TABLE 2. SURFACE BURN CHARACTERISTICS

Product	Flame Spread	Smoke Developed
ECOMAXci Ply Polyiso Core ¹ <1"	≤ 40	≤ 250
ECOMAXci Ply Polyiso Core ¹ ≥1"	≤ 25	≤ 160
FRT Plywood	≤ 25	≤ 450
1. Tested in accordance with <i>ASTM E84</i>		
2. Flame spread and smoke developed numbers are shown for comparison purposes only and are not intended to represent the performance of ECOMAXci Ply and related components under actual fire conditions.		

5.5.2 Thermal Barrier (IRC and IBC Buildings):

- 5.5.2.1 Except as noted in Section 5.5.2.2, ECOMAXci Ply panels up to 4.5" (114 mm) in foam thickness may be installed within the building envelope (including, but not limited to, attics, crawlspaces, and wall assemblies) of all building types when separated from the interior with a thermal barrier. The thermal barrier shall consist of a minimum ½" gypsum wallboard or an approved equivalent in accordance with IBC Section 2603.4 and IRC Section R316.4⁴.
- 5.5.2.2 The thermal barrier required by Section 5.4.2.1 is not required in the following applications:
 - 5.5.2.2.1 ECOMAXci Ply is covered by a minimum 1" thickness of concrete or masonry on each face of the sheathing in accordance with IBC Section 2603.4.1 and IRC Section 316.5.1.
 - 5.5.2.2.2 Walk-in coolers in accordance with IBC Section 2603.4.1.3
 - 5.5.2.2.3 Attic, crawlspace, or other uninhabitable space applications in accordance with IBC Section 2603.4.1.6 and IRC Section R316.5.3 and Section R316.5.4.
 - 5.5.2.2.4 Where an ignition barrier is permitted in lieu of a thermal barrier, such as attic, crawlspace, or other uninhabitable space applications, ECOMAXci Ply may be installed on walls only up to 4.5" in thickness of the rigid insulation portion, without a thermal barrier or ignition barrier in accordance with IBC Section 2603.4.1.6 and IRC Section R316.5.3 and Section R316.5.4.
 - 5.5.2.2.5 For thicknesses greater than 4.5" in thickness of the rigid insulation portion, an ignition barrier is required.

5.5.3 Vertical and Lateral Fire Propagation:

- 5.5.3.1 ECOMAXci Ply has been tested to assess its performance with regard to vertical and lateral fire propagation in accordance with *NFPA 285* and IBC Section 2603.5.5.
- 5.5.3.2 Engineering analysis has also been conducted to assess substitution of other products within the approved wall assemblies.
- 5.5.3.3 The wall assemblies listed in Table 3 are approved for use in Type I-IV, light-frame cold-formed steel construction or metal buildings.

TABLE 3. APPROVED NFPA 285 WALL ASSEMBLIES¹

Wall Component	Materials
Base Wall System Use either 1, 2, 3 or 4	Cast Concrete Walls <ol style="list-style-type: none"> 1. CMU Concrete Walls 2. 20 GC (min.) 3½" (min.) steel studs spaced 24" OC (max.) <ol style="list-style-type: none"> a. ½" (min.) type X Gypsum Wallboard Interior 3. Where allowed in Types I, II, III or IV construction, FRTW (Fire-retardant-treated wood) studs complying with <i>IBC Section 2303.2</i>, min. nominal 2x4 dimension, spaced 24" OC (max.) <ol style="list-style-type: none"> a. ½" type X Gypsum Wallboard Interior b. Bracing as required by code
Fire-Stopping in Stud Cavity at Floor Lines As an option, use 2 with Fire Retardant Treated Wood (FRTW) framing	<ol style="list-style-type: none"> 1. 4 pcf mineral fiber insulation installed with z-clips 2. FRTW fire blocking at floor line in accordance with applicable code requirements

⁴ 2015 *IRC* also allows for 23/32" wood structural panel.

Wall Component	Materials
<p>Cavity Insulation Use either 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14 or 15</p> <p>Note: Items 5-15 are SPF Foam Type</p> <p>EZ FLO may be used inside the box headers and jamb studs for <i>NFPA 285</i> assemblies requiring SPF in stud cavities</p>	<ol style="list-style-type: none"> 1. None 2. Any noncombustible insulation per <i>ASTM E136</i> 3. Any Mineral Fiber (board type Class A, faced or un-faced meeting <i>ASTM E84</i>) 4. Any Fiberglass (batt type Class A, faced or un-faced meeting <i>ASTM E84</i>) 5. 5½" (max.) Icynene LD-C-50 spray foam in 6" deep studs (max.). Use with 5/8" exterior sheathing 6. 5½" (max.) Icynene MD-C-200 2 pcf spray foam in 6" deep studs (max.) full fill without an air gap. Use with 5/8" exterior sheathing 7. 5½" (max.) Icynene MD-R-210 2 pcf spray foam in 6" deep studs (max.) full fill without an air gap. Use with 5/8" exterior sheathing 8. SWD Urethane QS 112 2 pcf spray foam in 6" deep studs (max.) partial fill with a maximum 2½" air gap or full fill. Use with 5/8" exterior sheathing 9. Gaco Western 183M (3½" max.). Use with 5/8" exterior sheathing 10. Gaco Western F1850 (3½" max.). Use with 5/8" exterior sheathing 11. Demilec SEALECTION 500 (35/8" max.). Use with 5/8" exterior sheathing 12. Demilec HeatLok Soy 200 Plus (3.4" max.). Use with 5/8" exterior sheathing 13. Bayer Bayseal (3" max.) Use with 5/8" exterior sheathing 14. Lapolla FoamLok FL 2000 (3" max.) Use with 5/8" exterior sheathing 15. BASF SprayTite 81206 or WallTite (US & US-N) (35/8" max.). Use with 5/8" exterior sheathing
<p>Exterior Sheathing- Use either 1 or 2</p> <p>Note – Exterior FRTW sheathing or gypsum board is optional for Base Walls 1 and 2. When SPF is used, 5/8" exterior gypsum sheathing must be used</p>	<ol style="list-style-type: none"> 1. ½" thick or thicker, exterior type gypsum board sheathing 2. ½" (min.) FRTW structural panels complying with <i>IBC</i> Section 2303.2 and installed in accordance with code allowances for Types I, II, III or IV construction

Wall Component	Materials
<p>Weather-Resistive Barrier Installed over Exterior Sheathing</p> <p>Use either option 1 or 2 installed per the manufacturer's installation instructions</p> <p>Note: Sopraseal Xpress G may replace exterior sheathing, Item 1 above but WRB over Sopraseal Xpress G may not be used since it already incorporates a pre-installed WRB.</p>	<ol style="list-style-type: none"> 1. None 2. Any WRB tested in accordance with <i>ASTM E1354</i> (at a minimum of 20 kW/m² heat flux) and shown by analysis to be less flammable (improved T_{ign}, Pk. HRR) than the tested WRB. The following WRB products are allowed: <ol style="list-style-type: none"> a. BASF Enershield HP or I b. Carlisle (CCW) Fire Resist 705FR-A, Barritech NP or Barritech VP c. Dorken Systems Inc. Delta-Fassade S d. Dorken Systems Inc. Delta-Vent S/Plus or Delta-Vent SA e. Dorken Systems Inc. Foxx/Plus or Maxx/Plus f. Dow Corning DOWSIL DefendAir 200 g. Dow Chemical WeatherMate™ or WeatherMate™ Plus h. Dryvit Backstop NT i. Dupont Tyvek® (Various per ESR 2375) j. Grace PAB (AWM, NPL 10, VPL, VPL 50, VPL LT or VPS) k. Henry Air Bloc (17, 21 FR, 31 MR, 32 MR and 33 MR) l. Henry BlueSkin SA, EnviroCap, FoilSkin, MetalClad or VP160 m. Kingspan Green Guard®Max Building Wrap n. Pecora XL-PermULTRA VP (10 mil DFT) o. Prosoco R-Guard (Cat 5, MVP [NLA], Spray Wrap [NLA], or VB) p. Prosoco Spraywrap MVP q. Siga Majvest 500 SA r. Sika SikaGard 530 or Sika Gard 535 s. Soprema 1100T or Sopraseal Xpress G t. Soprema Stick VP, Soprasolin HD or LM 204 VP u. Vaproshield Revealshield SA v. Vaproshield Wrapshield SA w. WR Meadows Air-Shield (LMP Black, LMP Gray, LSR or TMP)
<p>Exterior Insulation</p> <p>May be installed with the FRT plywood on exterior side provided ECOMAXci Ply is installed over exterior sheathing. Alternately, the ECOMAXci Ply may be installed with the FRT plywood facing the interior and installed direct to studs without the additional exterior sheathing layer</p>	<ol style="list-style-type: none"> 1. RMAX ECOMAXci Ply, 4½" (max.) foam with 5/8" (min.) FRT plywood. Installed in accordance with applicable code requirements. Must be applied perpendicular to studs with joints staggered. Fasteners used for securing panels must penetrate through the foam plastic into FRTW studs or steel framing. The system must be designed to handle the cladding load and wind load per the applicable code. 2. 4½" (max. consisting of a single panel or multiple thinner panels) Rmax Durasheath 3. 4½" (max. consisting of a single panel or multiple thinner panels) Rmax Thermasheath 4. ECOMAXci PLY – 4½" (max.) foam thickness, 5/8" (min.) FRT plywood thickness. <p>Note: FRT plywood may be applied in the field or factory applied. Adhesive must not be full coverage.</p>

Wall Component	Materials
<p>Weather-Resistive Barrier Installed over Exterior Insulation or FRTW</p> <p>Use any of items 1 (a-pp)</p> <p>Note: Items b-d are not traditional WRB products, but are insulation panel joint tapes. The insulation panel joints shall be staggered. These tapes are listed to allow use with all claddings.</p>	<ul style="list-style-type: none"> a. For use with all cladding options b. None c. 6" (max.) Venture Tape CW over insulation joints d. 6" (max.) RMAX R-SEAL 3000, R-SEAL 6000 or R-SEAL 2000 LF over insulation joints e. 6" (max.) asphalt or butyl based tape or liquid flashing over insulation joints f. Kingspan Green Guard®Max Building Wrap g. Dupont Tyvek® (Various per ESR 2375) h. Dow Chemical WeatherMate™ or WeatherMate™Plus i. Henry FoilSkin or MetalClad j. Prosoco Spraywrap MVP k. Soprema Soprasolin HD l. Carlisle (CCW) Fire Resist 705FR-A m. Grace PAB AWM n. For use with cladding options 1-6 (heavy masonry) o. Henry Air Bloc 31MR p. Henry Envirocap q. Henry Air Bloc 33MR r. Henry Air Bloc 21 FR s. Henry Air Bloc 17 t. Henry Blueskin VP 160 u. Soprema Stick VP v. Carlisle (CCW) Fire Resist Barritech NP w. Carlisle (CCW) Fire Resist Barritech VP x. Prosoco R-Guard Spray Wrap (NLA) y. Prosoco R-Guard MVP (NLA) z. Prosoco R-Guard VB aa. Prosoco R-Guard Cat 5 bb. Vaproshield Revealshield SA cc. Vaproshield Wrapshield SA dd. Pecora XL-PermULTRA VP (10 mil DFT) ee. W.R. Grace PAB VPL ff. W.R. Grace PAB VPL LT gg. W.R. Grace PAB VPS hh. Dryvit Backstop NT ii. WR Meadows Air-Shield LMP (Gray) jj. WR Meadows Air-Shield LMP (Black) kk. WR Meadows Air-Shield TMP ll. WR Meadows Air-Shield LSR mm. Siga Majvest 500 SA nn. Sika SikaGard 535 oo. Dow Corning DOWSIL DefendAir 200 pp. Dorken Systems Inc. Delta-Vent S/Plus qq. Dorken Systems Inc. Delta-Fassade S rr. Dorken Systems Inc. Foxx/Plus or Maxx/Plus

Wall Component	Materials
Exterior Cladding Use either 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13 or 14	<ol style="list-style-type: none"> 1. Brick – Nominal 4" thick clay brick or veneer with maximum 2" air gap behind the brick. Brick Ties/Anchors 24" OC (max.) 2. Stucco – Minimum ¾" thick, exterior cement plaster and lath. A secondary WRB shall be installed between the exterior insulation and the lath to provide a bond break. The secondary WRB shall not be full-coverage asphalt or butyl-based self-adhered membranes 3. Limestone – Minimum 2" thick using any standard installation technique 4. Natural Stone Veneer – Minimum 2" thick using any standard installation technique 5. Cast Artificial Stone – Minimum 1½" thick complying with ICC-ES AC 51 using any standard installation technique 6. Terracotta cladding – Minimum 1¼" thick using any standard installation technique 7. Uninsulated fiber-cement panel siding using any standard installation technique 8. Any MCM or ACM (aluminum, steel copper, zinc) (w/ 2½" max air gap) that has successfully passed <i>NFPA 285</i> using any standard installation technique 9. Uninsulated sheet metal building panels including aluminum, steel or copper using any standard installation technique 10. Stone/ Aluminum honeycomb composite building panels that have passed <i>NFPA 285</i> or equivalent such as Stone Panels Inc., Stone Lite Panel System 11. Autoclaved Aerated Concrete (AAC) panels that have successfully passed <i>NFPA 285</i> using any standard installation technique 12. Thin set brick such as Glen Gery ThinTech Elite 13. Natural Stone Veneer – minimum 1¼ inch (adhered with mortar or concrete/cement based adhesive). 14. FunderMax M.Look using the manufacturer standard installation technique. The air gap between cladding and insulation or WRB must not exceed 1 ½ inches.
<ol style="list-style-type: none"> 1. All WRBs shall be installed at recommended application rates and per the manufacturer's installation instructions. 2. Window headers for all wall assemblies shall incorporate minimum 20 ga steel flashing to cover air gaps between the exterior sheathing or exterior insulation and the exterior veneer. All fenestrations and penetrations shall be flashed in accordance with the applicable code using asphalt, acrylic, or butyl-based flashing tape or liquid flashing, R-SEAL 6000, or R-SEAL 2000 LF up to 12" maximum width. 	

5.6 Fastener Attachments for ECOMAXci Ply to Support Cladding Weight

- 5.6.1 The fasteners attaching the ECOMAXci Ply sheathing to the wall framing shall have a maximum spacing as shown in Table 4 and Table 5.
- 5.6.2 Minimum allowable penetration into wall framing is the steel thickness plus three threads plus the tip.
- 5.6.3 Fasteners with properties equal to or greater than the following shall be permitted:
 - 5.6.3.1 #8 screw: 0.164" shank diameter, 0.3125" head diameter
 - 5.6.3.2 #10 screw: 0.190" shank diameter, 0.3400" head diameter
 - 5.6.3.3 #12 screw: 0.216" shank diameter, 0.3400" head diameter
 - 5.6.3.4 Rmax Nail Board Fastener SIPLD: 0.189" shank diameter, 0.625" head diameter
 - 5.6.3.5 Rmax Nail Board Fastener SIPHD: 0.213" shank diameter, 0.625" head diameter
 - 5.6.3.6 TruFast SIPLD: 0.189" shank diameter, 0.625" head diameter
 - 5.6.3.7 FastenMaster HeadLOK: 0.260" shank diameter, 0.465" head diameter
- 5.6.4 Fasteners shall be coated to protect against fire-retardant treated wood per [IBC Section 2304.10.5](#).
- 5.6.5 Where the application exceeds the limitations set forth herein, design shall be permitted in accordance with accepted engineering procedures, experience, and technical judgment.



TABLE 4. ECOMAXCI PLY WITH 5/8" OR 3/4" FIRE TREATED PLYWOOD – VERTICAL STUDS 16" O.C.

Framing Member	Screw Fastener Type and Min. Size ²	Max. Distance from Face of Framing to Underside of Fastener Head (in)	Max. Vertical Fastener Spacing ¹ (in)					
			Cladding Weight (psf)					
			5	10	15	20	25	30
20 ga. structural (33 mil)	Rmax Nail Board Fastener SIPLD	1.50	24	16	12	8	8	6
		1.75	24	16	8	8	6	4
		2.30	24	12	8	6	4	4
		2.75	24	12	8	6	4	4
		3.25	16	8	6	4	-	-
		3.75	12	6	4	-	-	-
		4.25	8	4	-	-	-	-
	Rmax Nail Board Fastener SIPHD	1.50	24	16	12	8	8	6
		1.75	24	16	12	8	6	6
		2.30	24	16	8	8	6	4
		2.75	24	12	8	6	4	4
		3.25	16	8	6	4	4	-
		3.75	16	8	6	4	-	-
		4.25	12	6	4	-	-	-
	HeadLOK	1.50	24	24	16	12	8	8
		1.75	24	24	16	12	8	8
		2.30	24	16	12	8	8	6
		2.75	24	16	12	8	8	6
		3.25	24	16	12	8	6	6
		3.75	24	16	8	8	6	4
		4.25	24	12	8	6	4	4
		4.75	16	8	6	4	4	-
		5.25	16	8	6	4	-	-
	#12 common	1.50	24	16	12	8	8	6
		1.75	24	16	12	8	8	6
		2.30	24	16	12	8	6	6
		2.75	24	16	8	8	6	4
		3.25	24	12	8	6	4	4
		3.75	24	12	8	6	4	4
		4.25	16	8	6	4	-	-
	#10 common or TruFast SIPLD	1.50	24	16	12	8	8	6
		1.75	24	16	12	8	8	6
		2.30	24	16	8	8	6	4
		2.75	24	12	8	6	4	4
		3.25	24	12	8	6	4	4
			3.75	16	8	6	4	-

Framing Member	Screw Fastener Type and Min. Size ²	Max. Distance from Face of Framing to Underside of Fastener Head (in)	Max. Vertical Fastener Spacing ¹ (in)					
			Cladding Weight (psf)					
			5	10	15	20	25	30
20 ga. structural (33 mil)	TruFast SIPLD	4.25	12	6	4	-	-	-
		4.75	8	4	-	-	-	-
	#8 common	1.50	24	16	12	8	6	6
		1.75	24	16	8	8	6	4
		2.30	24	12	8	6	4	4
		2.75	24	12	8	6	4	4
		3.25	16	8	6	4	-	-
18 ga. structural (43 mil)	Rmax Nail Board Fastener SIPLD	1.50	24	24	16	12	8	8
		1.75	24	24	16	12	8	8
		2.30	24	16	12	8	8	6
		2.75	24	16	8	8	6	4
		3.25	24	12	8	6	4	4
		3.75	16	8	6	4	-	-
		4.25	8	4	-	-	-	-
	Rmax Nail Board Fastener SIPHD	1.50	24	24	16	16	12	8
		1.75	24	24	16	12	8	8
		2.30	24	24	16	12	8	8
		2.75	24	16	12	8	8	6
		3.25	24	16	8	8	6	4
		3.75	24	12	8	6	4	4
		4.25	16	8	6	4	-	-
		4.75	12	6	4	-	-	-
	HeadLOK	1.50	24	24	24	16	12	12
		1.75	24	24	24	16	12	12
		2.30	24	24	16	16	12	8
		2.75	24	24	16	12	12	8
		3.25	24	24	16	12	8	8
		3.75	24	16	12	8	8	6
		4.25	24	16	12	8	8	6
		4.75	24	16	8	8	6	4
		5.25	24	12	8	6	4	4
	#12 common	1.50	24	24	16	12	8	8
		1.75	24	24	16	12	8	8
		2.30	24	16	12	8	8	6
		2.75	24	16	12	8	8	6
3.25		24	16	12	8	6	6	
3.75		24	12	8	6	4	4	
4.25		16	8	6	4	4	-	

Framing Member	Screw Fastener Type and Min. Size ²	Max. Distance from Face of Framing to Underside of Fastener Head (in)	Max. Vertical Fastener Spacing ¹ (in)						
			Cladding Weight (psf)						
			5	10	15	20	25	30	
18 ga. structural (43 mil)	#10 common or TruFast SIPLD	1.50	24	24	16	12	8	8	
		1.75	24	24	16	12	8	8	
		2.30	24	16	12	8	8	6	
		2.75	24	16	12	8	6	6	
		3.25	24	12	8	6	6	4	
	TruFast SIPLD	3.75	24	12	8	6	4	4	
		4.25	16	8	4	4	-	-	
		4.75	8	4	-	-	-	-	
	#8 common	1.50	24	16	12	8	6	6	
		1.75	24	16	8	8	6	4	
		2.30	24	12	8	6	4	4	
		2.75	24	12	8	6	4	4	
		3.25	16	8	6	4	-	-	
	16 ga. structural (54 mil)	Rmax Nail Board Fastener SIPLD	1.50	24	24	24	24	16	16
			1.75	24	24	24	16	16	12
2.30			24	24	16	16	12	8	
2.75			24	24	16	12	8	8	
3.25			24	16	12	8	8	6	
3.75			24	16	8	8	6	4	
4.25			16	8	6	4	-	-	
4.75			6	-	-	-	-	-	
Rmax Nail Board Fastener SIPHD		1.50	24	24	24	24	16	16	
		1.75	24	24	24	16	16	12	
		2.30	24	24	24	16	12	12	
		2.75	24	24	16	16	12	8	
		3.25	24	24	16	12	8	8	
		3.75	24	16	12	8	8	6	
		4.25	24	12	8	6	6	4	
		4.75	16	8	6	4	-	-	
HeadLOK		1.50	24	24	24	16	16	12	
		1.75	24	24	24	16	12	12	
		2.30	24	24	16	16	12	8	
		2.75	24	24	16	12	12	8	
		3.25	24	24	16	12	8	8	
		3.75	24	24	16	12	8	8	
		4.25	24	16	12	8	8	6	
		4.75	24	16	8	8	6	4	
5.25	24	12	8	6	4	4			

Framing Member	Screw Fastener Type and Min. Size ²	Max. Distance from Face of Framing to Underside of Fastener Head (in)	Max. Vertical Fastener Spacing ¹ (in)					
			Cladding Weight (psf)					
			5	10	15	20	25	30
16 ga. structural (54 mil)	#12 common	1.50	24	24	16	12	8	8
		1.75	24	24	16	12	8	8
		2.30	24	16	12	8	8	6
		2.75	24	16	12	8	8	6
		3.25	24	16	12	8	6	6
		3.75	24	12	8	6	4	4
		4.25	16	8	6	4	4	-
	#10 common or TruFast SIPLD	1.50	24	24	16	12	8	8
		1.75	24	24	16	12	8	8
		2.30	24	16	12	8	8	6
		2.75	24	16	12	8	6	6
		3.25	24	12	8	6	6	4
	TruFast SIPLD	3.75	24	12	8	6	4	4
		4.25	16	8	4	4	-	-
		4.75	8	4	-	-	-	-
	#8 common	1.50	24	16	12	8	6	6
		1.75	24	16	8	8	6	4
		2.30	24	12	8	6	4	4
		2.75	24	12	8	6	4	4
		3.25	16	8	6	4	-	-

 SI: 1 in = 25.4 mm, 1 psf = 0.0479 kN/m²

1. The maximum vertical fastener spacing along each stud spaced 16" o.c. to support the specified cladding weight (psf)
2. Minimum fastener penetration into stud is steel thickness plus three threads plus the tip.
3. ECOMAXci Ply is installed with foam directly to the studs.
4. Screw values determined using NDS Yield Limit Equations and TR-12 for evaluating the foam as a gap.

TABLE 5. ECOMAXCI PLY WITH 5/8" OR 3/4" FIRE TREATED PLYWOOD – VERTICAL STUDS 24" O.C.

Framing Member	Screw Fastener Type and Min. Size ²	Max. Distance from Face of Framing to Underside of Fastener Head (in)	Max. Vertical Fastener Spacing ¹ (in)					
			Cladding Weight (psf)					
			5	10	15	20	25	30
20 ga. structural (33 mil)	Rmax Nail Board Fastener SIPLD	1.50	24	12	8	6	4	4
		1.75	16	8	6	4	4	-
		2.30	16	8	6	4	-	-
		2.75	16	8	4	4	-	-
		3.25	12	6	4	-	-	-
		3.75	8	4	-	-	-	-
		4.25	4	-	-	-	-	-
	Rmax Nail Board Fastener SIPHD	1.50	24	12	8	6	4	4
		1.75	24	12	8	6	4	4
		2.30	16	8	6	4	4	-
		2.75	16	8	6	4	-	-
		3.25	12	6	4	-	-	-
		3.75	12	6	4	-	-	-
		4.25	8	4	-	-	-	-
	HeadLOK	1.50	24	16	8	8	6	4
		1.75	24	16	8	8	6	4
		2.30	24	12	8	6	6	4
		2.75	24	12	8	6	4	4
		3.25	24	12	8	6	4	4
		3.75	16	8	6	4	4	-
		4.25	16	8	6	4	-	-
		4.75	12	6	4	-	-	-
		5.25	12	6	4	-	-	-
	#12 common	1.50	24	12	8	6	6	4
		1.75	24	12	8	6	4	4
		2.30	24	12	8	6	4	4
		2.75	16	8	6	4	4	-
		3.25	16	8	6	4	-	-
		3.75	16	8	4	4	-	-
		4.25	12	6	4	-	-	-
	#10 common or TruFast SIPLD	1.50	24	12	8	6	4	4
		1.75	24	12	8	6	4	4

Framing Member	Screw Fastener Type and Min. Size ²	Max. Distance from Face of Framing to Underside of Fastener Head (in)	Max. Vertical Fastener Spacing ¹ (in)					
			Cladding Weight (psf)					
			5	10	15	20	25	30
		2.30	16	8	6	4	4	-
20 ga. structural (33 mil)	#10 common or TruFast SIPLD	2.75	16	8	6	4	-	-
		3.25	16	8	4	4	-	-
	TruFast SIPLD	3.75	12	6	4	-	-	-
		4.25	8	4	-	-	-	-
		4.75	4	-	-	-	-	-
	#8 common	1.50	24	12	8	6	4	4
		1.75	16	8	6	4	4	-
		2.30	16	8	6	4	-	-
		2.75	16	8	4	4	-	-
		3.25	12	6	4	-	-	-
18 ga. structural (43 mil)	Rmax Nail Board Fastener SIPLD	1.50	24	16	12	8	6	6
		1.75	24	16	8	8	6	4
		2.30	24	12	8	6	4	4
		2.75	16	8	6	4	4	-
		3.25	16	8	6	4	-	-
		3.75	12	6	4	-	-	-
		4.25	6	-	-	-	-	-
	Rmax Nail Board Fastener SIPHD	1.50	24	16	12	8	8	6
		1.75	24	16	12	8	6	6
		2.30	24	16	8	8	6	4
		2.75	24	12	8	6	4	4
		3.25	16	8	6	4	4	-
		3.75	16	8	6	4	-	-
		4.25	12	6	4	-	-	-
	HeadLOK	1.50	24	24	16	12	8	8
		1.75	24	24	16	12	8	8
		2.30	24	16	12	8	8	6
		2.75	24	16	12	8	8	6
		3.25	24	16	12	8	6	6
		3.75	24	12	8	6	6	4
		4.25	24	12	8	6	4	4
	4.75	16	8	6	4	4	-	

Framing Member	Screw Fastener Type and Min. Size ²	Max. Distance from Face of Framing to Underside of Fastener Head (in)	Max. Vertical Fastener Spacing ¹ (in)					
			Cladding Weight (psf)					
			5	10	15	20	25	30
		5.25	16	8	6	4	-	-
	#12 common	1.50	24	16	12	8	6	6
18 ga. structural (43 mil)	#12 common	1.75	24	16	12	8	6	6
		2.30	24	12	8	6	6	4
		2.75	24	12	8	6	4	4
		3.25	24	12	8	6	4	4
		3.75	16	8	6	4	-	-
		4.25	12	6	4	-	-	-
	#10 common or TruFast SIPLD	1.50	24	16	12	8	6	6
		1.75	24	16	8	8	6	4
		2.30	24	12	8	6	6	4
		2.75	24	12	8	6	4	4
		3.25	16	8	6	4	4	-
	TruFast SIPLD	3.75	16	8	4	4	-	-
		4.25	8	4	-	-	-	-
		4.75	6	-	-	-	-	-
	#8 common	1.50	24	12	8	6	4	4
		1.75	16	8	6	4	4	-
		2.30	16	8	6	4	-	-
		2.75	16	8	4	4	-	-
		3.25	12	6	4	-	-	-
	16 ga. structural (54 mil)	Rmax Nail Board Fastener SIPLD	1.50	24	24	16	16	12
1.75			24	24	16	12	8	8
2.30			24	16	12	8	8	6
2.75			24	16	12	8	6	6
3.25			24	12	8	6	6	4
3.75			16	8	6	4	4	-
4.25			12	6	4	-	-	-
4.75			4	-	-	-	-	-
Rmax Nail Board Fastener SIPHD		1.50	24	24	16	16	12	8
		1.75	24	24	16	12	8	8
		2.30	24	24	16	12	8	8
		2.75	24	16	12	8	8	6
		3.25	24	16	8	8	6	4

Framing Member	Screw Fastener Type and Min. Size ²	Max. Distance from Face of Framing to Underside of Fastener Head (in)	Max. Vertical Fastener Spacing ¹ (in)					
			Cladding Weight (psf)					
			5	10	15	20	25	30
		3.75	24	12	8	6	4	4
		4.25	16	8	6	4	4	-
		4.75	12	6	4	-	-	-
16 ga. structural (54 mil)	HeadLOK	1.50	24	24	16	12	8	8
		1.75	24	24	16	12	8	8
		2.30	24	16	12	8	8	6
		2.75	24	16	12	8	8	6
		3.25	24	16	12	8	6	6
		3.75	24	16	8	8	6	4
		4.25	24	12	8	6	4	4
		4.75	16	8	6	4	4	-
		5.25	16	8	6	4	-	-
	#12 common	1.50	24	16	12	8	6	6
		1.75	24	16	12	8	6	6
		2.30	24	12	8	6	6	4
		2.75	24	12	8	6	4	4
		3.25	24	12	8	6	4	4
		3.75	16	8	6	4	-	-
		4.25	12	6	4	-	-	-
	#10 common or TruFast SIPLD	1.50	24	16	12	8	6	6
		1.75	24	16	8	8	6	4
		2.30	24	12	8	6	6	4
		2.75	24	12	8	6	4	4
		3.25	16	8	6	4	4	-
	TruFast SIPLD	3.75	16	8	4	4	-	-
		4.25	8	4	-	-	-	-
		4.75	6	-	-	-	-	-
	#8 common	1.50	24	12	8	6	4	4
		1.75	16	8	6	4	4	-
		2.30	16	8	6	4	-	-
		2.75	16	8	4	4	-	-
		3.25	12	6	4	-	-	-

Framing Member	Screw Fastener Type and Min. Size ²	Max. Distance from Face of Framing to Underside of Fastener Head (in)	Max. Vertical Fastener Spacing ¹ (in)					
			Cladding Weight (psf)					
			5	10	15	20	25	30
SI: 1 in = 25.4 mm, 1 psf = 0.0479 kN/m ² 1. The maximum vertical fastener spacing along each stud spaced 24" o.c. to support the specified cladding weight (psf) 2. Minimum fastener penetration into stud is steel thickness plus three threads plus the tip. 3. ECOMAXci Ply is installed with foam directly to the studs. 4. Screw values determined using NDS Yield Limit Equations and TR-12 for evaluating the foam as a gap. 5. Proprietary fastener properties are per published data or testing.								

6 INSTALLATION

- 6.1 ECOMAXci Ply shall be installed in accordance with the manufacturer's published installation instructions and this TER. In the event of any conflicts between the manufacturer's instructions and this TER, the more restrictive shall govern.
- 6.2 *Orientation*
- 6.2.1 ECOMAXci Ply may be installed vertically or horizontally over cold-formed steel studs with framing that has a nominal thickness of not less than 2" (51 mm) and spaced a maximum of 24" (610 mm) o.c.
- 6.3 *Attachment*
- 6.3.1 Fasteners shall be installed with a nominal edge distance of $\frac{3}{8}$ " (9.5 mm).
- 6.3.2 Fasteners, including nuts and washers, for fire-retardant treated wood used in exterior applications or wet or damp locations shall be of hot-dipped zinc-coated galvanized steel, stainless steel, silicon bronze, or copper in accordance with [IBC Section 2304.9.5.3](#) for fire-retardant treated wood.
- 6.3.3 Fasteners are production self-tapping sheet metal screws or equivalent spaced as indicated in Table 4 and Table 5.
- 6.3.4 Bending yield strength of commodity fasteners shall be as shown in *NDS Table 12N, Footnote 2*. Bending yield of proprietary fasteners are as published by the fastener manufacturer.

7 TEST ENGINEERING SUBSTANTIATING DATA

- 7.1 Test reports and data supporting the following material and structural properties of ECOMAXci Ply:
- 7.1.1 Air permeance in accordance with *ASTM E2178* conducted by Exova
- 7.1.2 Flame spread and smoke developed ratings in accordance with *ASTM E84* conducted by Intertek
- 7.1.3 Fire performance criteria in accordance with *NFPA 285* conducted by Intertek
- 7.2 Foam Sheathing Committee Tech Matters, Guide to Attaching Exterior Wall Coverings through Foam Sheathing to Wood or Steel Framing.
- 7.3 New York State Energy Research and Development Authority (NYSERDA), *Fastening Systems for Continuous Insulation*, Apr. 2010.
- 7.4 Some information contained herein is the result of testing and/or data analysis by other sources which conform to [IBC Section 1703](#) and relevant [professional engineering law](#). DrJ relies on accurate data from these sources to perform engineering analysis. DrJ has reviewed and found the data provided by other professional sources to be credible.

- 7.5 Where appropriate, DrJ's analysis is based on design values that have been codified into law through codes and standards (e.g., *IBC*, *IRC*, *NDS®*, and *SDPWS*). This includes review of code provisions and any related test data that aids in comparative analysis or provides support for equivalency to an intended end-use application. Where the accuracy of design values provided herein is reliant upon the published properties of commodity materials (e.g., lumber, steel, and concrete), DrJ relies upon the grade mark, stamp, and/or design values provided by raw material suppliers to be accurate and conforming to the mechanical properties defined in the relevant material standard.

8 FINDINGS

- 8.1 When used and installed in accordance with this TER and the manufacturer's installation instructions, the product(s) listed in Section 1.1 are approved for the following:
- 8.1.1 Use as a nailbase for cladding materials when installed in accordance with the manufacturer's installation instructions and this TER.
- 8.2 *IBC* Section 104.11 (*IRC* Section R104.11 and *IFC* Section 104.9 are similar) states:
- 104.11 **Alternative materials, design and methods of construction and equipment.** The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been *approved*. An alternative material, design or method of construction shall be *approved* where the *building official* finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, not less than the equivalent of that prescribed in this code...Where the alternative material, design or method of construction is not *approved*, the *building official* shall respond in writing, stating the reasons the alternative was not *approved*.
- 8.3 This product has been evaluated in the context of the codes listed in Section 2 and is compliant with all known state and local building codes. Where there are known variations in state or local codes applicable to this evaluation, they are listed here.
- 8.3.1 No known variations

9 CONDITIONS OF USE

- 9.1 Walls shall not be used to resist horizontal loads from concrete and masonry walls.
- 9.2 ECOMAXci Ply may be used as a nail base for cladding. Fastener size and spacing shall be in accordance with Table 4 and Table 5.
- 9.3 Where required by the *building official*, also known as the authority having jurisdiction (AHJ) in which the project is to be constructed, this TER and the installation instructions shall be submitted at the time of *permit* application.
- 9.4 Any generally accepted engineering calculations needed to show compliance with this TER shall be submitted to the AHJ for review and approval.
- 9.5 Design loads shall be determined in accordance with the building code adopted by the *jurisdiction* in which the project is to be constructed and/or by the Building Designer (e.g., *owner* or *registered design professional*).
- 9.6 At a minimum, this product shall be installed per Section 6 of this TER.
- 9.7 This product is manufactured under a third-party quality control program in accordance with *IBC* Section 104.4 and 110.4 and *IRC* Section R104.4 and R109.2.
- 9.8 The actual design, suitability, and use of this TER, for any particular building, is the responsibility of the *owner* or the owner's authorized agent. Therefore, the TER shall be reviewed for code compliance by the *building official* for acceptance.
- 9.9 The use of this TER is dependent on the manufacturer's in-plant QC, the ISO/IEC 17020 third-party quality assurance program and procedures, proper installation per the manufacturer's instructions, the *building official's* inspection, and any other code requirements that may apply to demonstrate and verify compliance with the applicable building code.

10 IDENTIFICATION

- 10.1 The product(s) listed in Section 1.1 are identified by a label on the board or packaging material bearing the manufacturer's name, product name, TER number, and other information to confirm code compliance.
- 10.2 Additional technical information can be found at rmax.com.

11 REVIEW SCHEDULE

- 11.1 This TER is subject to periodic review and revision. For the most recent version of this TER, visit drjcertification.org.
- 11.2 For information on the current status of this TER, contact [DrJ Certification](#).