Technical Evaluation Report
TER 1506-01
BASF HP+™ Wall XR Series – Limit States

BASF Corporation

Product:
BASF HP+™ Wall XR Series utilizing WALLTITE® v.3 and WALLTITE® CM01 SPF in combination with Neopor® FPIS and horizontal girts

Issue Date:
October 21, 2015

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December 30, 2019

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January 1, 2021
COMPANY
INFORMATION:

BASF Corporation
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Florham Park, NJ 07932-1089
973-245-6000
basf.com

DIVISION: 06 00 00 - WOOD, PLASTICS AND COMPOSITES
SECTION: 06 12 00 - Structural Panels
SECTION: 06 12 19 - Shear Wall Panels
SECTION: 06 16 00 - Sheathing
DIVISION: 07 00 00 - THERMAL AND MOISTURE PROTECTION
SECTION: 07 21 00 - Thermal Insulation
SECTION: 07 25 00 - Water-Resistive Barriers/Weather Barriers

1 PRODUCT EVALUATED

1.1 BASF HP+™ Wall XR Series utilizing WALLTITE® v.3 and WALLTITE® CM01 SPF in combination with Neopor® FPIS and horizontal girts

1.1.1 WALLTITE® CM01 SPF may be used in lieu of WALLTITE® v.3 SPF wherever WALLTITE® v.3 SPF is specified throughout this TER.

1.1.2 Horizontal girts shall be 50 mm x 50 mm (2" x 2") and may be replaced with hat channels or timber girts where applicable.

2 APPLICABLE CODES AND STANDARDS

2.1 Codes
2.1.1 NBC—10, 15: National Building Code of Canada

2.2 Standards and Referenced Documents

2.2.2 ASTM C578: Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation

1 Building codes require data from valid certification, evaluation, and qualification reports be obtained from accredited third-party organizations. An accredited certifying organization (a type of accredited third-party organization) is a certification body that performs “certification of a product, process, or system.” An accredited third-party organization is accomplished via accreditation using ISO/IEC 17065 evaluation procedures meeting code requirements of independence, accredited testing, and professional personnel. DrJ is an ISO/IEC 17065 ANSI-Accredited Product Certification Body – Accreditation #1131.

Through ANSI accreditation, DrJ certification can be used to obtain product approval in any country that is an IAF MLA Signatory, such as Canada, and covered by an IAF MLA Evaluation per the Purpose of the MLA – “certified once, accepted everywhere.” Manufacturers can go to jurisdictions in any IAF MLA Signatory Country and have their products readily approved by authorities having jurisdiction using DrJ’s ANSI accreditation. For more information about DrJ’s accreditation, refer to this letter from the Standards Council of Canada (SCC).

For more information on any of these topics or our mission, product evaluation policies, product approval process, and engineering law, see drjcertification.org.

2 Unless otherwise noted, all references in this TER are from the 2015 version of the NBC. This alternative solution is also approved for use with the 2010 NBC and the standards referenced therein (e.g., CAN/CSA, CAN/ULC). Where this TER is not approved, the AHJ shall respond in writing stating the reasons this TER was not approved. For any variations in provincial, territorial, and local codes, see Section 8.

3 All terms defined in the applicable building codes are italicized.
2.2.3 ASTM D1622: Standard Test Method for Apparent Density of Rigid Cellular Plastics
2.2.4 ASTM D1623: Standard Test Method for Tensile and Tensile Adhesion Properties of Rigid Cellular Plastics
2.2.5 ASTM D2126: Standard Test Method for Response of Rigid Cellular Plastics to Thermal and Humid Aging
2.2.6 ASTM D2842: Standard Test Method for Water Absorption of Rigid Cellular Plastics
2.2.7 ASTM D6226: Standard Test Method for Open Cell Content of Rigid Cellular Plastics
2.2.8 ASTM E2126: Standard Test Methods for Cyclic (Reversed) Load Test for Shear Resistance of Vertical Elements of the Lateral Force Resisting Systems for Buildings
2.2.9 ASTM E2178: Standard Test Method for Air Permeance of Building Materials
2.2.10 ASTM E283: Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen
2.2.11 ASTM E330: Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference
2.2.12 ASTM E564: Standard Practice for Static Load Test for Shear Resistance of Framed Walls for Buildings
2.2.13 ASTM E72: Standard Test Methods of Conducting Strength Tests of Panels for Building Construction
2.2.15 CAN/ULC-S102.2: Test for Surface Burning Characteristics of Flooring, Floor Coverings, and Miscellaneous Materials and Assemblies
2.2.16 CAN/ULC-S701: Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering
2.2.18 CSA O86: Engineering Design in Wood
2.2.19 CWC: Engineering Guide for Wood Frame Construction
2.2.20 NFPA 286: Standard Methods of Fire Test for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth

3 PERFORMANCE EVALUATION

3.1 BASF HP+™ Wall XR Series was evaluated to determine:

3.1.1 Structural performance under lateral load conditions in accordance with:

3.1.1.1 NBC Division B Subsection 9.23.13 Bracing to Resist Lateral Loads Due to Wind and Earthquake
3.1.1.2 NBC Section 4.1 Structural Loads and Procedures and the Engineering Guide for Wood Frame Construction

3.1.2 Structural performance under uplift and gravity loads for use with single top plates in accordance with NBC Division B Article 9.23.11.3.

3.1.3 Structural performance under transverse load conditions for use to resist factored external wind loads in accordance with NBC Division B Subsection 9.23.13.

3.1.4 Continuous insulated sheathing requirements complying with the provisions NBC Division B Part 5 and Subsection 9.25.2.

3.1.5 Performance for use as a component of the air barrier in accordance with NBC Division B Section 5.4 and Subsection 9.25.3.

3.1.6 Flame-spread rating and smoke developed classification complying with the provisions of NBC Division B Subsection 3.1.12.

3.2 Performance of HP+™ Wall XR Series or any of its component materials for use as a water-resistant barrier (WRB) assembly or WRB material is outside the scope of this evaluation.
3.3 Performance of HP+™ Wall XR Series or any of its component materials as used in the normal construction process is outside the scope of this TER.

3.3.1 This includes storage, weather conditions, durability considerations, handling, installing, restraining, and bracing of HP+™ Wall XR Series through the shipping, storing, and construction means and methods process.

3.4 Use of HP+™ Wall XR Series in a portal frame is outside the scope of this evaluation.

3.5 Any code compliance issues not specifically addressed in this section are outside the scope of this TER.

3.6 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 BASF HP+™ Wall XR Series is a proprietary wall system consisting of WALLTITE® v.3 Spray Polyurethane Foam (SPF) combined with Neopor® Foam Plastic Insulating Sheathing (FPIS), and horizontal Z-bar girts (or hat channel furring also called Omega bar) installed on wood studs.

4.2 The BASF HP+™ Wall XR Series described in this TER contains a combination of the following materials:

4.2.1 WALLTITE® v.3 SPF – 64 mm (2.5") or 76 mm (3")

4.2.2 Neopor® FPIS – minimum thickness: 25.4 mm (1") or 50 mm (2")

4.2.2.1 Field: fastened with minimum #7 screw with plastic cap 300 mm (12") o.c. into horizontal Z-bar girts

4.2.2.2 Top/Bottom: fastened with minimum 3.3 mm (0.131") x 89 mm (3.5") nail 150 mm (6") o.c.

4.2.3 Horizontal Z-bar girts – 50 mm x 50 mm (2" x 2"), galvanized 60, 20 gauge, at 600 mm (24") o.c.

4.2.3.1 Fastened to framing with one of the following:

4.2.3.1.1 Minimum 3.3 mm (0.131") x 63 mm (2.5") ring shank nail

4.2.3.1.2 Minimum No. 8 – 4.2 mm dia. (0.164") x 50 mm (2") wood screw

4.2.3.2 Two fasteners per stud

4.2.4 As an alternate to Section 4.2.3, hat channel furring (also called Omega bar) up to 50 mm (2") in depth, galvanized 60, 20 gauge, at 600 mm (24") o.c.

4.2.4.1 Each side of channel fastened to framing with one of the following:

4.2.4.1.1 Minimum 3.3 mm (0.131") x 63 mm (2.5") ring shank nail.

4.2.4.1.2 Minimum No. 8, 1.6 mm (0.164") x 50 mm (2") wood screw.

4.2.4.2 Two fasteners per stud

4.2.5 As an alternate to Section 4.2.3, rough wood or sawn wood studs measuring 44.5 mm x 95.3 mm (1.75" x 3.75"), rough cut or sawn wood timber girts measuring 44.5 mm x 95.3 mm (1.75" x 3.75") at 600 mm (24") o.c. may be fastened horizontally to studs with two 7.9 mm x 82.6 mm (0.131" x 3.25") nails at each stud intersection. Total thickness of the stud and girt is 140 mm (5.5").

4.2.6 As an alternate to Section 4.2.3, nominal 2x4 studs (1.5" x 3.5"), rough cut or sawn wood timber girts measuring a full 51 mm x 102 mm (2" x 4") at 600 mm (24") o.c. may be fastened horizontally to studs with two 3.3 mm x 82.5 mm (0.131" x 3.25") nails at each stud intersection. Total thickness of the stud and girt is 140 mm (5.5").

4.2.7 As an alternate to Section 4.2.3, 2x4 (1.5" x 3.5") finished timber girts may be installed horizontally at 600 mm (24") o.c. with 12.7 mm (½") plywood strips (minimum 3.5" wide).

4.2.7.1 Fastened to framing with two 3.3 mm x 82.5 mm (0.131" x 3.25") nails at each stud intersection.

4.2.8 2x Wood Framing

4.2.8.1 2x4 studs – stud grade SPF or greater

4.2.8.2 Each stud fastened to top and bottom plates with three (3) 3.3 mm (0.131") x 82.5 mm (3.25") nails.

4.2.8.3 2x6 top (single or double) and bottom plates – #2 SPF or greater
5 APPLICATIONS

5.1 BASF HP+™ Wall XR Series are used in buildings constructed in accordance with NBC Division B Section 9.23 for wood frame construction. BASF HP+™ Wall XR Series is used to provide:

5.1.1 Lateral load resistance (wind and seismic) for braced HP+™ Wall XR Series panels used in wood frame construction

5.1.2 Transverse load resistance for braced HP+™ Wall XR Series panels used in wood frame construction

5.1.3 Resistance to uplift and gravity loads in single top plate applications for HP+™ Wall XR Series assemblies used in wood frame construction in accordance with NBC Division B Article 9.23.11.3

5.2 BASF HP+™ Wall XR Series is used to provide thermal resistance in the exterior wall component of the building thermal envelope in accordance with NBC Division B Subsections 5.3.1 and 9.25.2.

5.3 BASF HP+™ Wall XR Series may be used in buildings designed in accordance with NBC Division B Section 4.1 Structural Loads and Procedures or the Engineering Guide for Wood Frame Construction.

5.4 Structural Applications

5.4.1 Except as otherwise described in this TER, BASF HP+™ Wall XR Series shall be installed in accordance with the applicable building codes listed in Section 2 using the provisions set forth therein for the design and installation of wood structural panels (WSP) and this TER.

5.4.2 BASF HP+™ Wall XR Series are permitted to be designed in accordance with NBC Division B Part 9 Articles 9.23.13.1, 9.23.13.2, and 9.23.13.3 for the design of lateral-load-resisting systems using the methods and conditions set forth therein for equivalence to the sheathing requirements in Tables 9.23.17.2(1) and 9.23.13.6 as follows:

5.4.2.1 For framing 400 mm (16") o.c. equivalent to 12.5 mm (0.5") sheathing fastened at a minimum of 150 mm (6") o. c. at edges and 300 mm (12") along intermediate supports using a 3.7 mm (0.145") diameter fastener having a penetration of at least 41 mm (1.6"), except as specifically allowed in this TER

5.4.2.2 For framing 600 mm (24") o.c. equivalent to 12.5 mm (0.5") sheathing fastened at a minimum of 150 mm (6") o. c. at edges and 300 mm (12") along intermediate supports using a 3.3 mm (0.131") diameter fastener having a penetration of at least 38 mm (1.5"), except as specifically allowed in this TER

5.4.3 BASF HP+™ Wall XR Series are permitted to be designed in accordance with Engineering Guide for Wood Frame Construction Section 10 for the design of lateral-load-resisting systems using the methods and conditions set forth therein for equivalence to Table 10.2.10A or CSA O86 Table 9.5.1A as follows:

5.4.3.1 For framing 400 mm (16") o.c. equivalent to 12.5 mm (0.5") sheathing fastened at a minimum of 150 mm (6") o. c. at edges and 300 mm (12") along intermediate supports using a 3.7 mm (0.145") diameter fastener having a penetration of at least 41 mm (1.6"), except as specifically allowed in this TER

5.4.3.2 For framing 600 mm (24") o.c. equivalent to 12.5 mm (0.5") sheathing fastened at a minimum of 150 mm (6") o. c. at edges and 300 mm (12") along intermediate supports using a 3.3 mm (0.131") diameter fastener having a penetration of at least 38 mm (1.5"), except as specifically allowed in this TER

5.4.4 Anchorage for in-plane shear shall be provided to transfer the induced shear force into and out of each shear wall in accordance with NBC Division B Subsection 9.23.6.

5.4.4.1 For buildings with two (2) or more floors supported by frame walls that are in areas where the seismic spectral response acceleration is equal to or greater than 0.70 but not greater than 1.2 or where the 1-in-50 hourly wind pressure is equal to or greater than 0.80 kPa (16.7 psf) but not greater than 1.20 kPa (25 psf), two anchor bolts per braced wall panel are required.

5.4.4.1.1 Anchor bolts shall have a diameter not less than 15.9 mm (0.625"), be located within 0.5 m (19.75") of the end of the foundation, and be spaced not more than 2.4 m (8") o.c.

5.4.4.1.2 Anchor bolts shall have a diameter not be less than 12.7 mm (0.5"), be located within 0.5 m (19.75") of the end of the foundation, and be spaced not more than 1.7 m (6") o.c.

5.4.4.2 Where the seismic spectral response acceleration, Sa(0.2), is greater than 1.2 or the 1 in 50 hourly wind pressure is equal to or greater than 1.2 kPa (25 psf), anchorage shall be designed according to Part 4.
5.4.5 The maximum aspect ratio for full height BASF HP+™ Wall XR Series braced wall segments shall be 4:1.
5.4.6 The minimum full height panel width shall be 600 mm (24"). Panels may be installed vertically or horizontally.
5.4.7 Neopor® panel top and bottom edges shall be supported with a minimum 38 mm (1.5") framing member.
5.4.8 Installation is permitted for single top plate or double top plate applications in accordance with NBC Division B Article 9.23.11.3 where concentrated loads from ceilings, floors, and roofs are not more than 50 mm (2") to one side of the studs.
5.4.9 Where the application exceeds the limitations set forth herein, design shall be permitted in accordance with accepted engineering procedures, experience, and technical judgment.

5.5 Acceptable Solutions in Accordance with NBC Division B Part 9 Bracing Applications

5.5.1 BASF HP+™ Wall XR Series may be used to brace walls of buildings as an equivalent to OSB, O-2 Grade in NBC Division B Table 9.23.17.2A Wall Sheathing Thickness and Specifications as referenced in 9.23.13.1 as follows:

5.5.1.1 Supports 400 mm (16") o.c. – 6.0 mm (0.24") minimum sheathing thickness.
5.5.1.2 Supports 600 mm (24") o.c. – 7.5 mm (0.3") minimum sheathing thickness.

5.5.2 Where a building, or portion thereof, does not comply with one or more of the bracing requirements within the acceptable solutions of NBC Part 9, those portions shall be designed and constructed in accordance NBC Division B Part 4 Structural Loads and Procedures or the Engineering Guide for Wood Frame Construction in accordance with NBC Division B Sentences 9.23.13.1(b)(ii & iii) as one of the following:

5.5.2.1 As an equivalent to OSB, O-1 or O-2 Grades in NBC Division B Table 9.23.13.6: supports 400 mm (16") o.c. – 9.5 mm (0.375") minimum sheathing thickness with fasteners spaced 150 mm (6") o. c. at edges & 150 mm (12") o.c. in field using a 3.7 mm (0.145") diameter fastener having a penetration of at least 41 mm (1.6").

5.5.2.2 As an equivalent to OSB, O-1 or O-2 Grades in NBC Division B Table 9.23.13.6: supports 600 mm (24") o.c. – 12.5 mm (0.5") minimum sheathing thickness with fasteners spaced 150 mm (6") o. c. at edges & 300 mm (12") o.c. in field using a 3.3 mm (0.131") diameter fastener having a penetration of at least 38 mm (1.5")

5.5.2.3 Using the design values given in Table 1.
### Table 1. Specified Shear Design Values (Limit States Design) for BASF HP+™ Wall XR Series – Wind or Seismic\(^{1,2,3,6}\)

<table>
<thead>
<tr>
<th>Wall Assembly</th>
<th>Type of Girt</th>
<th>Max. Stud Spacing, mm (in)</th>
<th>Interior Gypsum Wallboard Minimum Thickness, mm (in)</th>
<th>Maximum Gypsum Board Fastener Spacing (edge:field), mm (in)</th>
<th>Specified Shear Strength, kN/m (plf)</th>
<th>Ductility Factor, Rd(^{4,5})</th>
<th>Overstrength Factor, Ro</th>
</tr>
</thead>
<tbody>
<tr>
<td>BASF 50 mm (2&quot;) Neopor® + 75 mm (3&quot;) SPF</td>
<td>400 (16)</td>
<td>None</td>
<td>N/A</td>
<td>6.7 (460)</td>
<td>2.0</td>
<td>1.7</td>
<td></td>
</tr>
<tr>
<td>BASF 50 mm (2&quot;) Neopor® + 63.5 mm (2.5&quot;) SPF</td>
<td>400 (16)</td>
<td>12.7 (0.5)</td>
<td>300/300 (12/12)</td>
<td>6.9 (470)</td>
<td>3.0</td>
<td>1.7</td>
<td></td>
</tr>
<tr>
<td>BASF 50 mm (2&quot;) Neopor® + 75 mm (3&quot;) SPF</td>
<td>400 (16)</td>
<td>12.7 (0.5)</td>
<td>300/300 (12/12)</td>
<td>7.0 (480)</td>
<td>3.0</td>
<td>1.7</td>
<td></td>
</tr>
<tr>
<td>BASF 50 mm (2&quot;) Neopor® + 63.5 mm (2.5&quot;) SPF</td>
<td>400 (16)</td>
<td>12.7 (0.5)</td>
<td>300/300 (12/12)</td>
<td>6.3 (430)</td>
<td>3.0</td>
<td>1.7</td>
<td></td>
</tr>
<tr>
<td>BASF 50 mm (2&quot;) Neopor® + 75 mm (3&quot;) SPF</td>
<td>400 (16)</td>
<td>12.7 (0.5)</td>
<td>300/300 (12/12)</td>
<td>6.2 (425)</td>
<td>3.0</td>
<td>1.7</td>
<td></td>
</tr>
<tr>
<td>BASF 29 mm (1.125&quot;) Neopor® + 63.5 mm (2.5&quot;) SPF</td>
<td>400 (16)</td>
<td>None</td>
<td>N/A</td>
<td>5.7 (390)</td>
<td>2.0</td>
<td>1.7</td>
<td></td>
</tr>
<tr>
<td>BASF 50 mm (2&quot;) Neopor® + 63.5 mm (2.5&quot;) SPF</td>
<td>600 (24)</td>
<td>None</td>
<td>N/A</td>
<td>6.68 (420)</td>
<td>1.5</td>
<td>1.7</td>
<td></td>
</tr>
<tr>
<td>BASF 25.4 mm (1&quot;) Neopor® + 63.5 mm (2.5&quot;) SPF</td>
<td>400 (16)</td>
<td>12.7 (0.5)</td>
<td>300/300 (12/12)</td>
<td>6.6 (450)</td>
<td>2.5</td>
<td>1.7</td>
<td></td>
</tr>
<tr>
<td>BASF 50 mm (2&quot;) Neopor® + 63.5 mm (2.5&quot;) SPF</td>
<td>600 (24)</td>
<td>12.7 (0.5)</td>
<td>300/300 (12/12)</td>
<td>6.6 (450)</td>
<td>2.5</td>
<td>1.7</td>
<td></td>
</tr>
<tr>
<td>BASF 50 mm (2&quot;) Neopor® + 50 mm (2&quot;) SPF</td>
<td>400 (16)</td>
<td>None</td>
<td>N/A</td>
<td>6.67 (410)</td>
<td>2.5</td>
<td>1.7</td>
<td></td>
</tr>
<tr>
<td>BASF 50 mm (2&quot;) Neopor® + 50 mm (2&quot;) SPF</td>
<td>400 (16)</td>
<td>None</td>
<td>N/A</td>
<td>6.88 (420)</td>
<td>1.5</td>
<td>1.7</td>
<td></td>
</tr>
</tbody>
</table>

**St:** 25.4 mm = 1 in, 1 kN/m = 737.6 lb/ft

1. BASF HP+™ Wall XR Series fastening per Section 4.2
2. Interior gypsum wallboard attached to framing with minimum 2.14 mm (0.086") nail or #6 Type W screw fasteners. Minimum penetration of nails or screws into framing is 19 mm (¾"). Fastener spacing shall be as required above. Note: NBC Table 9.23.13.6 requires 15.9 mm thick gypsum with framing 600 mm o.c.
3. Building Height Limitations:
   a. \( d \leq S_d(0.2) < 0.2 \) – No Limit
   b. \( 0.2 \leq S_d(0.2) < 0.35 \) – No Limit
   c. \( S_d(0.2) \geq 0.35 \) – 20 m (65.6 ft)
   d. \( S_d(1.0) \geq 0.3 \) – 20 m (65.6 ft)
4. Response modification coefficient, \( R_d \), for use throughout the NBC
5. For combinations of different types of SFRS acting in the same direction in the same storey, \( R_d R_o \) shall be taken as the lowest value of \( R_d R_o \) corresponding to these systems. See NBC Division B Article 4.1.8.9.
6. Heights are maximum height limits above grade, as defined in NBC Division B Table 4.1.8.9

### 5.6 Axial Loading

5.6.1 BASF HP+™ Wall XR Series will perform the same as prescriptive wall assemblies.

5.6.2 Designs shall have a load path capable of transferring loads from their point of origin to their final point of resistance in accordance with NBC Division C Sentence 2.2.4.3(1).
5.7 Transverse Wind Loading

5.7.1 BASF HP+™ Wall XR Series installed over exterior framing spaced a maximum of 600 mm (24") o.c. without an interior covering can resist specified wind loads as shown in Table 2. Hourly wind pressures (1/50) to be resisted are found in NBC Division B, Appendix C, Table C-2, for selected locations.

<table>
<thead>
<tr>
<th>Table 2. TRANSVERSE (OUT-OF-PLANE) WIND LOAD RESISTANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wall Assembly</td>
</tr>
<tr>
<td>--------------------------------------------------------</td>
</tr>
<tr>
<td>BASF HP+™ Wall XR Series with 38 mm (1½&quot;) SPF + 33 mm (1⅛&quot;) Neopor®</td>
</tr>
<tr>
<td>--------------------------------------------------------</td>
</tr>
</tbody>
</table>

1. Neopor® attached to Z-bar girt 12" o.c. and to top and bottom plates with 3.3 mm (0.131") x 89 mm (3.5") nail 150 mm (6") o.c. The attachment of the sheathing to the framing is primarily through the adhesion of the SPF to the framing and Neopor® sheathing.

2. Hourly Wind Pressure (1/50) for selected locations can be located in NBC Division B, Appendix C, Table C-2.

5.8 Thermal Resistance

5.8.1 BASF HP+™ Wall XR Series meets the continuous insulated sheathing requirements complying with the provisions of NBC Division B Subsection 9.36.2.5.

5.8.2 BASF HP+™ Wall XR Series components have the thermal resistance as shown on Table 3.

<table>
<thead>
<tr>
<th>Table 3. THERMAL RESISTANCE PROPERTIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product</td>
</tr>
<tr>
<td>----------------------------------------</td>
</tr>
<tr>
<td>Neopor®</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>WALLTITE® v.3</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

5.9 Air Barrier

5.9.1 BASF HP+™ Wall XR Series components have the air permeance performance material properties shown in Table 4 in accordance with NBC Division B Article 5.4.1.2 and Subsection 9.25.3.

<table>
<thead>
<tr>
<th>Table 4. AIR BARRIER PROPERTIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product</td>
</tr>
<tr>
<td>WALLTITE® v.3</td>
</tr>
</tbody>
</table>


5.10 Surface Burn Characteristics

5.10.1 BASF HP+™ Wall XR Series panels have the flame spread characteristics shown in Table 5.

<table>
<thead>
<tr>
<th>Table 5. SURFACE BURN CHARACTERISTICS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product</td>
</tr>
<tr>
<td>WALLTITE® v.3</td>
</tr>
</tbody>
</table>

1. Tested in accordance with CAN/ULC-S102 including CAN/ULC-S127
5.11 Thermal Barrier Requirements

5.11.1 Foam plastics that form part of a wall or ceiling assembly in combustible construction shall be protected from adjacent spaces in the building, other than adjacent concealed spaces within attic or roof spaces, crawl spaces, and wall assemblies by an approved thermal barrier as required by NBC Division B Article 3.1.5.12 and 9.1.0.17.10.

6 INSTALLATION

6.1 BASF HP™ Wall XR Series shall be installed in accordance with the manufacturer’s published installation instructions and this TER. In the event of a conflict between the manufacturer’s installation instructions and this TER, the more restrictive shall govern.

6.2 A copy of the manufacturer’s published installation instructions shall be available at all times on the jobsite during installation.

6.3 Where required, gypsum wallboard shall be a minimum 12.7 mm (0.5") thickness.

6.4 Orientation

6.4.1 BASF HP™ Wall XR Series sheathing panels must be installed vertically with the length dimension of the panels parallel to the framing behind and perpendicular to the Z-bar girts or hat channel furring (also called Omega bar).

6.4.2 BASF HP™ Wall XR Series Z-bar girts or hat channel furring (also called Omega bar) must be installed over studs, with framing that has a thickness of not less than 38 mm (1.5") and spaced a maximum of 600 mm (24") o.c.

6.5 Fasteners

6.5.1 Neopor®:

6.5.1.1 #7 (0.151" dia) screws with plastic cap. Screw must be long enough to penetrate Neopor® sheathing and Z-bar girt or hat channel furring, plus three threads.

6.5.1.2 Top/Bottom (at the 2x6 plates): 3.3 mm (0.131") x 89 mm (3.5") nail and a minimum of 38 mm (1.5") penetration into framing

6.5.2 Z-bar Girt or Hat Channel Furring:

6.5.2.1 Minimum 3.3 mm (0.131") x 63 mm (2.5") ring shank nail

6.5.2.2 Minimum No. 8 (0.164" x 2") wood screw

6.5.2.3 Two (2) fasteners into each framing member

6.5.3 Rough Cut Timber:

6.5.3.1 As an alternate to Section 6.5.2, full 2" x 4" (1.75" x 3.75") rough cut timber girts at 24" o.c., fastened to framing with two (2) 0.131" x 3.25" nails at each stud intersection.

6.5.4 Finished Timber:

6.5.4.1 As an alternate to Section 6.5.2, 2" x 4" (1.5" x 3.5") timber girts installed horizontally at 24" o.c. with 1/2" plywood strips (minimum 3.5" wide), fastened to framing with two (2) 0.131" x 3.25" nails at each stud intersection.

6.5.5 Gypsum Wallboard:

6.5.5.1 Where required, gypsum wallboard shall be installed in accordance with NBC Division B Subsection 9.29.5, except No. 6 x 32 mm (1.25") Type W or S wood screw or equivalent is permitted where a fire-resistance rating is not required.

6.6 Fastener Spacing

6.6.1 BASF HP™ Wall XR Series (Neopor® sheathing):

6.6.1.1 Maximum of 150 mm (6") o.c. along the edge and 305 mm (12") o.c. in the field

6.6.2 Z-bar Girt or Hat Channel Furring (also called Omega bar):

6.6.2.1 Two fasteners into each framing member
6.6.3 Gypsum Wallboard:

6.6.3.1 For NBC Division B Part 9 applications, gypsum nail fasteners shall be spaced a minimum of 150 mm (6") o.c. on vertical wall supports and 300 mm (12") o.c. along intermediate supports.

6.6.3.2 For NBC Division B Part 9 applications, gypsum screw fasteners shall be spaced a minimum of 150 mm (6") o.c. on vertical wall supports and 300 mm (12") o.c. along intermediate supports.

6.6.3.3 For engineered design, see Table 1

6.7 Fastener Edge Distance

6.7.1 For NBC Division B Part 9 applications, fastener edge distance is a minimum of 10 mm (3/8") for both BASF HP+™ Wall XR Series and gypsum wallboard.

6.8 Neopor® Attachment with Furring Installed on the Exterior Side

6.8.1 Install the plastic cap screws in at the corners of each Neopor® panel only, then install minimum 19 mm x 63 mm (nominal 1" x 3") wood furring using a screw going through the furring strip, through the Neopor® and finally into the hat furring or Z-bar. The wood furring and its connection shall be designed to support the cladding weight and transfer any required loads to the framing members.

7 TEST ENGINEERING SUBSTANTIATING DATA

7.1 Lateral load testing in accordance with ASTM E2126 conducted by the Structural Building Components Research Institute (SBCRI)

7.2 Transverse wind load testing in accordance with ASTM E330 conducted by SBCRI

7.3 Uplift load testing in accordance with ASTM E72 conducted by SBCRI

7.4 Gravity load testing for single top plate applications in accordance with ASTM E72 conducted by SBCRI

7.5 Surface burning testing in accordance with CAN/ULC S102 conducted by Intertek

7.6 Material property testing in accordance with ASTM C578 conducted by QAI

7.7 WALLTITE® v.3 product listing per CCMC 13588-L

7.8 WALLTITE® CM01 product listing per CCMC 14100-L

7.9 Some information contained herein is the result of testing and/or data analysis by other sources which conform to NBC Volume I commentary on Conformity Assessment 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.

7.10 Where appropriate, DrJ’s analysis is based on design values that have been codified into law through codes and standards (e.g., NBC, NECB, CAN/CSA). 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, BASF HP+™ Wall XR Series complies with the applicable sections of the codes listed in Section 2 for the following applications.

8.1.1 Lateral load resistance due to wind and seismic loads carried by shear walls in accordance with Table 1.

8.1.2 Transverse wind load resistance in accordance with Table 2.

8.1.3 Thermal resistance properties in accordance with Table 3.

8.1.4 Air permeance performance in accordance with Table 4.

8.1.5 Material fire properties in accordance with Table 5.
8.2 **NBC Article 1.2.1.1. states:**

1.2.1.1. **Compliance with this Code**

1) Compliance with this Code shall be achieved by
   a) complying with the applicable acceptable solutions in Division B (see Note A-1.2.1.1.(1)(a)), or
   b) using alternative solutions that will achieve at least the minimum level of performance required by Division B in the areas defined by the objectives and functional statements attributed to the applicable acceptable solutions (see Note A-1.2.1.1.(1)(b)).

2) For the purposes of compliance with this Code as required in Clause 1.2.1.1.(1)(b), the objectives and functional statements attributed to the acceptable solutions in Division B shall be the objectives and functional statements referred to in Subsection 1.1.2. of Division B.

8.3 **NBC Division C Section 2.3 includes additional guidance for alternative solutions.**

8.4 This product has been evaluated in the context of the codes listed in Section 2 and is compliant with all known provincial, territorial, and local building codes. Where there are known variations in provincial, territorial, or local codes applicable to this evaluation, they are listed here.

8.4.1 No known variations

9 **CONDITIONS OF USE**

9.1 When BASF HP+™ Wall XR Series are not installed for use as wall bracing, as described in this TER, the walls shall be braced by other materials, in accordance with the applicable code.

9.1.1 Loads applied shall not exceed those recommended by the manufacturer as follows:

9.1.1.1 Specified shear loads do not exceed values in Table 1, as applicable.

9.1.1.2 Specified axial loads do not exceed values in Section 5.6.

9.1.1.3 Specified transverse loads do not exceed values in Table 2.

9.2 The manufacturer’s installation instructions shall be available on the jobsite for inspection.

9.3 All panel edges shall be supported by wall framing or solid blocking a minimum of 50 mm (2") nominal thickness.

9.4 Where required by the authority having jurisdiction in which the project is to be constructed, this TER and the installation instructions shall be submitted at the time of permit application.

9.5 Any generally accepted engineering calculations needed to show compliance with this TER shall be submitted to the AHJ for review and approval.

9.6 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 designer (e.g., owner).

9.7 At a minimum, this product shall be installed per Section 6 of this TER.

9.8 This product is manufactured under a third-party quality control program with quality control inspections established by the governing legislation of the adopting province or territory, as described in NBC Volume 1 commentary on Conformity Assessment.

9.9 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 AHJ for acceptance.

9.10 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 AHJ’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 basf.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.