For the most current product information, go to www.green-guard.com.

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INSTL-HW
1. General
GreenGuard Housewraps are polyolefin housewraps intended to perform as secondary weather barriers (weather-resistant barriers) in residential applications when installed in accordance with the guidelines provided in this manual. They are intended to reduce the risk of air and bulk water infiltration when installed under exterior coverings such as brick, stucco, clay tile, etc and various siding materials like wood, vinyl, fiber cement, etc.

GreenGuard Housewraps are available as cross-woven housewraps (Value Wrap, Classic Wrap, and RainDrop™) and as a nonwoven housewrap (Ultra Wrap). The GreenGuard Housewraps conform with the intent of the following building codes and industry standards:

- **International Residential Code - Weather-resistant Sheathing Paper**
  Section R703.2, Table R703.4 as an alternate to No. 15 asphalt-saturated felt building paper complying with ASTM D 226, Type I.

- **International Building Code - Weather-resistant Barrier**
  Sections 1404.2 and 1403.2 as an alternate to No. 15 asphalt-saturated felt building paper complying with ASTM D 226, Type I.

- **International One- and Two-Family Dwelling Code - Weather-resistant Sheathing Paper**
  Section 703.2 and Table 703.4 as an alternate to asphalt-saturated felt building paper weighing not less than 14 pounds per 100 square feet.

- **BOCA National Building Code - Weather-resistant Barrier**
  Section 1404.1 as an alternate to No. 15 asphalt-saturated felt building paper complying with ASTM D 226, Type I.

- **ICBO Uniform Building Code - Weather-resistant Barrier**
  Section 1404.1 as an alternate to No. 15 asphalt-saturated felt building paper complying with ASTM D 226, Type I.

- **SBCCI Standard Building Code - Moisture Protection Barrier**
  Sections 1404.2 and 1403.2 as an alternate to No. 15 asphalt-saturated felt building paper complying with ASTM D 226, Type I.

- **ASTM E 1677, Type I (Specification for Air Retarder Materials or Systems)**

- **HUD/FHA UU-B-790A (Equivalent to Grade D Building Paper)**

2. Description
This manual provides guidelines for installing GreenGuard Housewraps in residential applications as a secondary weather barrier (weather-resistant barrier). These guidelines are not intended to address all possible combinations of construction materials that may be used in a wall system. For this reason, the installation information provided in this manual is intended only as a guide and is for the convenience of builders, specifiers and other interested parties. The following are general descriptions of the GreenGuard Housewraps:

- **GreenGuard Value Wrap** consists of a coated, cross-woven polyolefin scrim with micro-perforations which allow for moisture vapor transmission. Value Wrap is white with dark green print.

- **GreenGuard Classic Wrap** consists of a coated, cross-woven polyolefin scrim with micro-perforations which allow for moisture vapor transmission. Classic Wrap is green with dark green print.

- **GreenGuard RainDrop™** consists of a coated, cross-woven polyolefin scrim that is manufactured with inherent properties that allow for moisture vapor transmission. RainDrop is green with black strands in the cross direction and has dark green print.

- **GreenGuard Ultra Wrap** consists of a nonwoven, reinforced polyolefin sheet that is manufactured with inherent properties that allow for moisture vapor transmission. Ultra Wrap is tan with green strands and has dark green print.

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3. Usage and Limitations
GreenGuard Housewraps are intended to perform as secondary weather barriers (weather-resistive barriers) in residential applications when installed in accordance with the guidelines provided in this manual. The following conditions apply to the use of GreenGuard Housewraps:

- GreenGuard Value Wrap and Classic Wrap housewraps installed with the print side facing outward may not be exposed to sunlight for more than 12 months.
- GreenGuard Ultra Wrap and RainDrop™ housewraps installed with the print side facing outward may not be exposed to sunlight for more than 4 months.
- GreenGuard RainDrop must be installed with the black strands in the vertical position on the exterior wall.
- GreenGuard Housewraps are not intended to be used as roofing paper.
- GreenGuard Housewraps are not intended to be used as a vapor retarder.
- GreenGuard Housewraps will ignite if exposed to fire of sufficient heat and intensity. Protect housewraps from exposure to open flame or other ignition sources during shipping, storage and installation.
- Some building code jurisdictions require the use of two layers of Grade D building paper over wood sheathing when a cementitious covering (conventional stucco) is used. As an alternative, one layer of Grade D building paper can be used in conjunction with one layer of foam plastic insulation. Check with a local building code official to verify requirements.

4. General Installation Guidelines
4.A. Housewrap Installed Over Sheathing
(Appplies to All GreenGuard Housewraps)

1. Install housewrap over structural sheathing board, over insulation board (see Figures 1 and 2), or directly to framing members (except for RainDrop Housewrap, which must be installed over sheathing).

2. Begin by aligning the bottom edge of the roll with the base of the wall, approximately 2 feet from a corner, folding several inches of the material under itself and fastening securely to a structural sheathing through insulation board to a framing member or directly to studs.

3. Unroll the housewrap with the printed side out, wrapping the entire building, including door and window openings. Common galvanized roofing nails, plastic cap nails or staples with a minimum 1-inch crown may be used for attachment of housewrap. If smaller crown staples are used, then more fasteners must be used.

When installing housewrap over nonstructural sheathing products such as insulation board or directly to studs, fasteners must penetrate the framing member a minimum of 1/2 inch. Fasteners should be spaced every 12 inches along every other stud location and spaced 6 inches apart around the bottom of the wall and around window and door openings (see Figure 2).

4. For best results, a modified “I” pattern should be made through the housewrap at window openings. Fold excess material inside the rough opening and fasten securely through all layers to a framing member (see Figure 3). If door frames and windows are already in place when installing the housewrap, then trim as close to them as possible and tape the housewrap edges. Use Pactiv Contractor Tape or equivalent to seal housewrap seams around openings, window flanges, door jambs, sill plates, pipes, ducts, etc (“Standard Type” for Value Wrap and
GreenGuard® Housewrap Installation Guide


5. When the end of a roll is reached, fold the edge of the housewrap under itself and attach to the structural sheathing or through the nonstructural sheathing to the nearest framing member. Vertical and horizontal seams must be overlapped a minimum of 6 inches unless otherwise specified for a particular application. Upper courses of housewrap must overlap the lower courses (in water-shedding fashion). All vertical and horizontal seams must be taped using Pactiv Contractor Tape (“Standard” type or “Enhanced Adhesion” type) or an equivalent tape.

4.B. Installation of Housewrap at Window Frame Detail

Figure 4 shows an example of a window frame detail where the housewrap is installed over the sheathing and is wrapped around the window jambs to the interior of the wall. Windows should be sealed in accordance with the window manufacturer’s installation instructions.

4.C. Installation of Housewrap at Exterior Electrical Boxes

All exterior electrical boxes and other penetrations through the housewrap should be sealed to prevent air and moisture intrusion at the openings. The housewrap must be taped to the electrical box in order to provide an adequate seal (see Figure 5).

4.D. Installation of Housewrap at Wall Penetrations

When penetrations, such as those for pipes and ducts, breach the housewrap, they must be sealed to the housewrap using a sealant that is compatible with both the housewrap and the pipe or duct material (see Figure 6).

Housewrap Applied After the Window Installation - Flashing Applied Over the Face of the Mounting Flange

1. Apply the horizontal sill flashing material first, level with the top edge of the rough opening (Important: Use a clean cloth to clean all surfaces prior to applying self-adhering flashing materials). Cut the sill flashing long enough to extend an equal distance beyond the 9-inch jamb flashing, which will be applied later (see Figure A-1). Fasten the top edge of the sill flashing to the framing. Place fasteners along the edge of the rough opening where they will be covered by the mounting flange of the window later.

2. Apply a continuous bead of sealant to the back side (interior surface) of the mounting flange of the window. Sealant selection and bead design shall be in accordance with the window manufacturer's installation instructions (see Figure A-2). Immediately set the window into the opening and apply shims as required to ensure the unit is plumb, level and square. Fasten the window perimeter in accordance with the window manufacturer's installation instructions.

3. Apply a continuous bead of sealant to the exposed mounting flange (exterior surface) at the side jambs of the installed window (may not be necessary if using self-adhering type flashing). If a self-adhering flashing is used, it should be installed in accordance with the manufacturer's installation instructions. Continue the sealant bead at the jambs vertically 8-1/2 inches above the rough opening at the head of the window (to the face of the header) to allow for application of the top portion of the jamb flashing into sealant in the next step.

4. Install the jamb flashing next by pressing the flashing into the sealant beads previously applied to the exterior face of the mounting flanges (see Figure A-3). Attach the flashing into position to the rough opening framing using staples or other appropriate fasteners (self-adhering type flashings do not require mechanical attachment). Extend the bottom edge of the jamb flashing 8-1/2 inches beyond the rough opening sill, and extend the top edge 8-1/2 inches beyond the rough opening head. Do not attach the bottom of the jamb flashing until after the housewrap has been installed.

5. Apply a continuous bead of sealant to the exposed mounting flange (exterior surface) at the head of the installed window (not necessary when using self-adhering type flashing).

6. Install the head flashing by pressing the flashing into the sealant bead previously applied across the mounting flange. Extend the ends of the head flashing 10 inches beyond the rough opening, over the top of the jamb flashing (see Figure A-4). Fasten the head flashing into place along the top edge using staples or other appropriate fasteners.

7. Install the housewrap in accordance with Section 4.A over the sheathing board, beginning at the bottom of the wall and overlapping upper courses over lower courses in shingle fashion. Fasten the housewrap as described. To properly integrate the sill and jamb flashing, tuck the housewrap underneath as shown in Figure A-5. Tape all vertical and horizontal joints and around window and door openings (see Figure A-6). For optimum adhesion performance, clean the surfaces of the housewrap prior to applying the tape.
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FIGURE A-1: INSTALLATION OF SILL FLASHING

Sill Flashing
Wood Sheathing or Insulation Board
Rough Opening
Sill Flashing

FIGURE A-3: INSTALLATION OF JAMB FLASHING

Jamb Flashing
Jamb Flashing (Overlap Sill Flange)
Window Frame
Window Flange
Sill Flashing

FIGURE A-4: INSTALLATION OF HEAD FLASHING

Head Flashing
Extend Beyond Jamb Flashing
Window Frame

FIGURE A-6: TAPE AROUND WINDOW OPENING

GreenGuard Contractor Tape
Reduces Air Infiltration & Moisture Permeation at the Seams of Housewrap

FIGURE A-5: INSTALLED WINDOW WITH GREENGUARD HOUSEWRAP

GreenGuard Housewrap
GreenGuard Housewrap (Overlap Lower Layer)

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Housewrap Applied Prior to Window Installation - Flashing Applied Over the Face of the Mounting Flange.

1. At the head of the window opening, starting at the top corner of the window, measure from the corner 9 inches up and 9 inches over and mark. At a 45-degree angle, carefully cut the housewrap on a diagonal. Gently raise the top edge of the housewrap and temporarily tape the top corners (see Figure A1-1).

2. Apply the horizontal sill flashing material next, level with the top edge of the rough opening (Important: Use a clean cloth to clean all surfaces prior to applying self-adhering flashing materials). Cut the sill flashing long enough to extend an equal distance beyond the 9-inch jamb flashing, which will be applied later (see Figure A1-2). Fasten the top edge of the sill flashing to the framing. Place fasteners along the edge of the rough opening, where they will be covered by the mounting flange of the window later.

3. Apply a continuous bead of sealant to the back side (interior surface) of the mounting flange of the window. Sealant selection and bead design shall be in accordance with the window manufacturer's installation instructions (see Figure A1-3). Immediately set the window into the opening and apply shims as required to ensure the unit is plumb, level and square. Fasten the window perimeter in accordance with the window manufacturer's installation instructions.

4. Apply a continuous bead of sealant to the exposed mounting flange (exterior surface) at the side jambs of the installed window (may not be necessary if using self-adhering type flashing). If a self-adhering flashing is used, it should be installed in accordance with the manufacturer's installation instructions.

5. Continue the sealant bead at the jambs vertically 8-1/2 inches above the rough opening at the head of the window (to the face of the header) to allow for application of the top portion of the jamb flashing into sealant in the next step. For windows with mechanically joined mounting flanges, apply sealant to the full length of the joints or seams where the flanges meet.

6. Install the jamb flashing next by pressing the flashing into the sealant beads on the mounting flanges (see Figure A1-4). Attach the flashing into position on the rough opening framing using staples or other appropriate fasteners (self-adhering type flashings do not require mechanical attachment). Extend the bottom edge of the jamb flashing 8-1/2 inches beyond the rough opening sill, and extend the top edge 8-1/2 inches beyond the rough opening head, where the head flashing will be placed next.

7. Apply a continuous bead of sealant to the exposed mounting flange (exterior surface) at the head of the installed window (not necessary when using self-adhering type flashing).

8. Install the head flashing by pressing the flashing into the sealant bead previously applied across the mounting flange. Extend the ends of the head flashing 10 inches beyond the rough opening, over the top of the jamb flashing (see Figure A1-5). Apply a new piece of sheathing tape over the entire diagonal cut made in the housewrap. The tape should be compressed against the housewrap and the head flashing, which extends over the jamb (see Figure A1-6).

Housewrap Applied After the Window Installation - Flashing Applied Behind the Face of the Mounting Flange

1. Apply the horizontal sill flashing material first, level with the top edge of the rough opening (Important: Use a clean cloth to clean all surfaces prior to applying self-adhering flashing materials). Cut the sill flashing long enough to extend an equal distance beyond the 9-inch jamb flashing, which will be applied later (see Figure B-1). Fasten the top edge of the sill flashing to the framing. Place fasteners along the edge of the rough opening where they will be covered by the mounting flange of the window later. Do not fasten the bottom edge or the last 9 inches of each end of the sill flashing, as the housewrap will be installed under the sill flashing in a water-shedding fashion later.

2. Apply the jamb flashing to the edge of the framing at each jamb (see Figure B-2). Place fasteners along the edge of the rough opening where they will be covered by the mounting flange of the window later. Extend the jamb flashing 8-1/2 inches beyond the rough opening dimension at the head and sill. The bottom end of the jamb flashing is to overlap the sill flashing. Do not attach the bottom of the jamb flashing until the housewrap is installed later.

3. Apply a continuous bead of sealant to the back side (interior surface) of the mounting flange of the window. Sealant selection and bead design shall be in accordance with the window manufacturer’s installation instructions (see Figure B-3). Immediately set the window into the opening and apply shims as required to ensure the unit is plumb, level and square. Fasten the window perimeter in accordance with the window manufacturer’s installation instructions.

4. Apply a continuous bead of sealant horizontally across the face of the exposed mounting flange (exterior surface) at the head of the installed window (not necessary when using self-adhering type flashing).

5. Install the head flashing by pressing the flashing into the sealant bead previously applied to the mounting flange. Extend the ends of the head flashing 10 inches beyond the rough opening, over the top of the jamb flashing (see Figure B-4). Fasten the head flashing into place along the top edge using staples or other appropriate fasteners.

6. Install the housewrap in accordance with Section 4.A over the sheathing board, beginning at the bottom of the wall and overlapping upper courses over lower courses in shingle fashion. Fasten the housewrap as described. To properly integrate the sill and jamb flashing, tuck the housewrap underneath as shown in Figure B-5. Tape all vertical and horizontal joints and around window and door openings (see Figure B-6). For optimum adhesion performance, clean the surfaces of the housewrap prior to applying the tape.
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FIGURE B-1: INSTALLATION OF SILL FLASHING

FIGURE B-2: INSTALLATION OF JAMB FLASHING

FIGURE B-3: WINDOW INSTALLATION

FIGURE B-4: INSTALLATION OF HEAD FLASHING

FIGURE B-5: INSTALLED WINDOW WITH GREENGUARD HOUSEWRAP

FIGURE B-6: TAPE AROUND WINDOW OPENING

Housewrap Applied Before the Window Installation - Flashing Applied Behind the Face of the Mounting Flange

1. At the head of the window opening, starting at the top corner of the window, measure from the corner 9 inches up and 9 inches over and mark. At a 45-degree angle, carefully cut the housewrap on a diagonal. Gently raise the top edge of the housewrap and temporarily tape the top corners (see Figure B1-1).

2. Apply the horizontal sill flashing material first, level with the top edge of the rough opening (Important: Use a clean cloth to clean all surfaces prior to applying self-adhering flashing materials). Cut the sill flashing long enough to extend an equal distance beyond the 9-inch jamb flashing, which will be applied later (see Figure B1-2). Fasten the top edge of the sill flashing to the framing. Place fasteners along the edge of the rough opening where they will be covered by the mounting flange of the window later.

3. Apply the jamb flashing to the edge of the framing at each jamb (see Figure B1-3). Place fasteners along the edge of the rough opening where they will be covered by the mounting flange of the window later. Extend the jamb flashing 8-1/2 inches beyond the rough opening dimension at the head and sill. The bottom end of the jamb flashing is to overlap the sill flashing.

4. Apply a continuous bead of sealant to the back side (interior surface) of the mounting flange of the window. Sealant selection and bead design shall be in accordance with the window manufacturer's installation instructions (see Figure B1-4). Immediately set the window into the opening and apply shims as required to ensure the unit is plumb, level and square. Fasten the window perimeter in accordance with the window manufacturer's installation instructions.

5. Apply a continuous bead of sealant horizontally across the face of the exposed mounting flange (exterior surface) at the head of the installed window (not necessary when using self-adhering flashing materials).

6. Install the head flashing by pressing the flashing into the sealant bead previously applied to the mounting flange. Extend the ends of the head flashing 10 inches beyond the rough opening, over the top of the jamb flashing (see Figure B1-5). Fasten the head flashing into place along the top edge using staples or other appropriate fasteners.

7. Apply a piece of contractor tape over the entire diagonal cut made in the housewrap. The tape should be compressed against the housewrap and the head flashing, which extends over the jamb (see Figure B1-6).