# Technical Information Sheet

## I.S.O. Spray™ R Adhesive

| Item Description | Item Number |
|---|---|
| Part A: 15-gallon (56.8 L) contained in 15-gallon (56.8 L) HDPE Keg | W56RACR15A |
| Part B: 15-gallon (56.8 L) contained in 15-gallon (56.8 L) HDPE Keg | W56RACR15B |
| Part A: 50-gallon (189.3 L) contained in 55-gallon (208.2 L) Drum | W56RACR55A |
| Part B: 50-gallon (189.3 L) contained in 55-gallon (208.2 L) Drum | W56RACR55B |
| Part A: 5-gallon (18.9 L) bag in box | W56RACR05A |
| Part B: 5-gallon (18.9 L) bag in box | W56RACR05B |

## Description

Elevate I.S.O. Spray R Adhesive is a two-component, LVOC, low rise polyurethane adhesive engineered to:

- Anchor acceptable roof insulation to acceptable substrates.
- Adhere multiple layers of insulation.
- Adhere fleece backed Elevate PVC XR, PVC KEE XR, PVC KEE XRT and UltraPly™ TPO XR membranes to acceptable substrates.

Elevate I.S.O. Spray R Adhesive is mixed and dispensed by high or low-pressure pump/proportioning units capable of mix/meter/dispensing two-component polyurethanes in full spray application and/or continuous bead extrusion. Elevate I.S.O. Spray R Adhesive may also be applied in a spatter-spray application using specialized equipment. See notes below for application requirements.

## Dispensing Equipment

1. High Pressure mix/meter/dispense units shall include heated hoses, and the capabilities to dispense mixed I.S.O. Spray R adhesive in spray and/or bead application.
2. Dispense Elevate I.S.O. Spray R Adhesive with pre-heater and hose temperature set between 90 °F and 120 °F (32 °C – 49 °C).
3. Pump pressure for spray application should be approximately 80 PSI, adjusted as required to maintain full mixing and uniform spray fan.
4. Pump pressure for bead extrusion should be 50 – 60 PSI, adjusted as required to maintain full mixing and uniform continuous bead extrusion.

**High Pressure Dispense Equipment**

| Name | Dispense Form | Container | Comment |
|---|---|---|---|
| Graco Predator™ Proportioner* | Spray or Bead | 55-gallon Drum 15-gallon Keg | **Spray dispensing:** Spray tips may be necessary and sold separately from equipment manufacturer **Bead dispensing:** Static mixers necessary- sold separately: ▪ Millennium PG-1 Pump Grade Adhesive Mix Tips ▪ Static Mixers by others: 36 element X ½" (13 mm) I.D. X 16½" (419 mm) long |
| Graco E-10 Reactor* | | | |
| AST Adhesive System Technology PCH GMP-075* | | | |
| AST Adhesive System Technology PCH GMP-500* | | | |

*Drum heaters & heated hoses available & recommended to maintain ISO Spray R between 60 °F and 80 °F (16 °C and 27 °C) during dispensing. Store and dispense ISO Spray R between 60 °F and 80 °F (16 °C and 27 °C).

| Low Pressure Dispense Equipment | | | |
|---|---|---|---|
| Name | Dispense Form | Container | Comment |
| Millennium Cyclone 1 Low Pressure Pump Cart** | Bead | 5-gallon Bag-in-Box<br>15-gallon Keg | Static Mixers require:<br>▪ 5 Static Mixers included with each 5-gallon set of Parts A & B<br>▪ Purchase Static Mixers (sold separately) for bead dispensing 15 Gallon Kegs |
| Millennium Cyclone 5/15 Low Pressure Pump Cart** | | | |
| Millennium Cyclone 5/15 VS Plus | Spray or Bead | 5-gallon Bag-in-Box<br>15-gallon Drum | Accessories Sold Separately |
| | Spatter-Spray* | 5-gallon Bag-in-Box<br>15-gallon Drum | Accessories Sold Separately<br>Millennium Adhesive Manifold and Mixer Applicator<br>*Spatter-Spray application only approved with Millennium Cyclone 5/15 VS Plus dispensing equipment and appropriate hose/tip combinations. |
| **Drum heaters recommended when dispensing ISO Spray R below 40 °F (4 °C).<br>Store and dispense ISO Spray R between 60 °F and 80 °F (16 °C and 27 °C). | | | |

| Static Mixers for Bead Application |
|---|
| Millennium PG-1 Pump Grade Adhesive Mix Tips |
| Other static mixers for two component adhesives can work:<br>½" (13 mm) inside diameter X 16 ½" (419 mm) long with 36 static mixing elements |

## Method of Application – Insulation Attachment

1. Install only as much roof insulation as can be covered and made watertight during the workday.
2. Ambient and substrate temperature to receive I.S.O. Spray R Adhesive shall exceed 25 °F (-4 °C); and clean, smooth, dry, free of sharp edges, loose and foreign materials, oil, grease, and other contaminates.
3. When dispensing ISO Spray R from:
   a. High pressure equipment with heated hoses and drum heaters, the ambient and substrate temperatures to receive I.S.O. Spray R adhesive shall exceed 25 °F (-4 °C); and clean, smooth, dry, free of sharp edges, loose and foreign materials, oil, grease, and other contaminates.
   b. Low pressure equipment, the ambient and substrate temperature to receive I.S.O. Spray R Adhesive shall exceed 25 °F (-4 °C); and clean, smooth, dry, free of sharp edges, loose and foreign materials, oil, grease, and other contaminates. When dispensing below 40 °F (4 °C), drum heaters are recommended to keep ISO Spray R between 60 °F and 80 °F (16 °C and 27 °C).
4. Allow I.S.O. Spray R Adhesive to rise (within 1–2 minutes) before setting the insulation boards (max. size: 4' x 4' [1.2 m x 1.2 m]) after dispensing the I.S.O. Spray R Adhesive.
5. If I.S.O. Spray R Adhesive does not rise after dispensing- STOP. Troubleshooting is required to determine why the mixed adhesive is not rising. Conduct mix ratio test to ensure ISO Spray R is dispensed at 1:1 ratio of Part A: Part B.
6. Immediately after setting the insulation board, weight each board, using full pails of Bonding Adhesive or other available source of weight that will not damage the roof insulation. This ensures full contact and adhesion during set-up time. Set-up time will vary depending on ambient conditions.
7. Performance of I.S.O. Spray R Adhesive should be periodically monitored during the workday to verify that sufficient rise, adhesion, and full bonding is occurring.

8. Portable wind screens may be used to contain and limit airborne I.S.O. Spray R Adhesive overspray.
9. Do not attempt to apply I.S.O. Spray R Adhesive during unfavorable conditions.

## Method of Application – Elevate PVC XR or UltraPly TPO XR Membrane

1. Install only as much XR Membrane as can be completed and made watertight during the workday.
2. When dispensing ISO Spray R from:
   a. High pressure equipment with heated hoses and drum heaters, the ambient and substrate temperatures to receive I.S.O. Spray R adhesive shall exceed 25 °F (-4 °C); and clean, smooth, dry, free of sharp edges, loose and foreign materials, oil, grease, and other contaminates.
   b. Low pressure equipment, the ambient and substrate temperature to receive I.S.O. Spray R Adhesive shall exceed 25 °F (-4 °C); and clean, smooth, dry, free of sharp edges, loose and foreign materials, oil, grease, and other contaminates. When dispensing below 40 °F (4 °C), drum heaters are recommended to keep ISO Spray R between 60 °F and 80 °F (16 °C and 27 °C).
3. Starting at the highest roof elevation, unroll and position Elevate PVC XR or UltraPly TPO XR Membrane. Position membrane panels so the laps will be fabricated in “shingle fashion”, and not “buck” water.
4. Allow the XR Membrane to relax in its final intended position for 30 minutes (minimum).
5. Fold the properly positioned membrane panels back to expose the substrate to receive I.S.O. Spray R Adhesive. Take care not to move, or otherwise disturb, the XR Membrane from its final intended position during folding.
6. Dispense I.S.O. Spray R Adhesive on the substrate as follows:
   a. Spray Application: Full spray coverage ⅛" to ¼" thick (3.2 to 6.4 mm).
   b. Bead Application: ½" to ¾" or ¾" to 1" wide continuous beads 4", 6" or 12" on center (13 to 19 mm wide; 102, 152 or 305 mm on center continuous beads).

      NOTE: Bead spacing will be modified (requiring closer bead spacing) at building corners and perimeter, depending on wind zone.
   c. Do not apply I.S.O. Spray R Adhesive directly to the Elevate PVC XR or UltraPly TPO XR Membrane. Keep lap areas of XR Membrane clean and free of I.S.O. Spray R Adhesive. Remove any I.S.O. Spray R Adhesive from lap area before completing the seam.
7. Allow I.S.O. Spray R Adhesive to rise (within 1 to 2 minutes) before mating the XR Membrane. DO NOT allow adhesive to skim over.
8. If I.S.O. Spray R Adhesive does not rise after dispensing- STOP. Troubleshooting is required to determine why the mixed adhesive is not rising. Conduct mix ratio test to ensure ISO Spray R is dispensed at 1:1 ratio of Part A: Part B.
9. Use a weighted roller (such as linoleum roller) to roll the freshly mated XR Membrane to ensure proper adhesion.
10. Performance of I.S.O. Spray R Adhesive should be periodically monitored during the workday to verify that sufficient rise, adhesion, and full bonding is occurring.
11. Portable wind screens may be used to contain and limit airborne I.S.O. Spray R Adhesive overspray.
12. Do not attempt to apply I.S.O. Spray R Adhesive during unfavorable conditions.

## Spatter-Spray Method of Application - Millennium Cyclone 5/15 VS Plus –

## Appropriate Fleece Backed Membrane

1. See previous Method of Application – Elevate PVC XR, PVC KEE XR, PVC KEE XRT or UltraPly TPO XR Membrane steps for membrane preparation and consult adhesive machine setup and application requirements for specific setup requirements.
2. Once the adhesive containers are attached to the machine and hoses are secured properly switch machine to Hi-Spatter Application Mode and turn pump on.
3. Using a container purge the system to ensure no air remains in the lines then close hose valves to the off position.
4. Attach mixer, spatter-spray trip and air line. The air line to spatter-spray tip is required to achieve the proper application.
5. Dispense I.S.O. Spray R Adhesive on the substrate as follows:
    a. Do not apply I.S.O. Spray R Adhesive directly to the Elevate PVC XR or UltraPly TPO XR Membrane. Keep lap areas of XR Membrane clean and free of I.S.O. Spray R Adhesive. Remove any I.S.O. Spray R Adhesive from lap area before completing the seam.
    b. Spatter-Spray Application: While moving in a uniform motion spray adhesive in a speed that will achieve a coverage rate of 0.55 – 0.75 Gal/Sq.
6. Allow I.S.O. Spray R Adhesive to rise (within 1 to 2 minutes) before mating the XR Membrane. DO NOT allow adhesive to skim over.
7. If I.S.O. Spray R Adhesive does not rise after dispensing - STOP. Troubleshooting is required to determine why the mixed adhesive is not rising. Conduct a mix ratio test to ensure ISO Spray R is dispensed at 1:1 ratio of Part A: Part B.
8. Use a weighted roller (such as linoleum roller) to roll the freshly mated XR Membrane to ensure proper adhesion.
9. The performance of I.S.O. Spray R Adhesive should be periodically monitored during the workday to verify that sufficient rise, adhesion, and full bonding is occurring.
10. Portable wind screens may be used to contain and limit airborne I.S.O. Spray R Adhesive overspray.
11. Do not attempt to apply I.S.O. Spray R Adhesive during unfavorable conditions.

## Storage

- Do not allow I.S.O. Spray R Adhesive to freeze.
- Store in original, unopened containers between 60 °F and 80 °F (16 °C and 27 °C).
- Keep bungs on drums tightly closed during storage.
- Do not store in direct sunlight.
- Do not expose to moisture.
- For optimum results, rotate stock to ensure stored material will not exceed the shelf life.

## Shelf Life

- Shelf life of eighteen (18) months can be expected when stored in original, unopened containers at temperatures between 60 °F and 80 °F (16 °C and 27 °C) and kept out of sunlight and protected from rain and moisture.
- All containers indicate the date of manufacture.

## Precautions

- Refer to Safety Data Sheets (SDS) for additional safety information.
- Personnel sensitive or allergic to isocyanate or polyurethane should not work with, or handle, I.S.O. Spray R Adhesive.
- Review method of application with dispensing equipment supplier before use.
- Review dispensing equipment prior to use. Ensure that all equipment is in good working order: generator, air compressor, mix/meter/dispense proportioning unit, transfer pumps, drum heaters, heated hoses, spray gun, bead extruder & static mixers.
- Inspect all Personal Protection Equipment (respirator & cartridges, gloves, safety glasses, protective suits), and insure all are in good working order before handling and dispensing I.S.O. Spray R.
- Ensure dispensing unit is grounded per equipment manufacturer's requirements to prevent static electricity build up and discharge.
- Avoid contact with eyes and skin. Use gloves and safety glasses with side shields when handling or dispensing I.S.O. Spray R Adhesive. Wash all exposed areas thoroughly after handling.
- Avoid breathing vapors. Wear respirators, long sleeved shirts, and long pants when handling and dispensing I.S.O. Spray R Adhesive. Protective suits are recommended.
- Agitate Elevate I.S.O. Spray R Adhesive Part A and Part B on drum roller before use (recommended).
- Protect all areas vulnerable to overspray of the I.S.O. Spray R Adhesive. This includes but is not limited to: vehicles parked adjacent to the building receiving the I.S.O. Spray R Adhesive, air intakes/exhausts on the building, roof-mounted HVAC units, roof drains, access hatches and windows/skylights accessible to the roof, and any other item or personnel which may be downwind from spraying the I.S.O. Spray R Adhesive. There will be days that the wind conditions, as well as temperature conditions, prevent the use of I.S.O. Spray R Adhesive. Do not attempt to spray I.S.O. Spray R Adhesive when the wind speed exceeds 15 mph (24 km/h). This can be estimated by observing a flag. When a flag is windblown to the extent that it flies approximately "straight out", the wind is too extreme to use I.S.O. Spray R Adhesive on that workday. Portable wind screens may be used to contain and limit airborne I.S.O. Spray R Adhesive overspray.
- When used for insulation attachment, it is imperative that freshly installed insulation is continuously weighted until such time as the I.S.O. Spray R Adhesive sets up and the board is held securely in place by the adhesive.
- Freshly installed Elevate PVC and UltraPly TPO XR Membranes shall be rolled immediately after mating to ensure proper adhesion.
- Use caution when removing drum bungs as contents may develop pressure during storage. Loosen bungs ¾" (19 mm) and allow gas to escape before completely removing bungs.
- Do not burn or torch-cut empty drums. Empty Part B component drums can be reconditioned at drum re-conditioners. Empty Part A (or B) component drums should be disposed of in accordance with local, state, and federal regulations.
- Do not expose empty Part A component drums to moisture or attempt to clean/flush drums with water.
- If the I.S.O. Spray R Adhesive does not rise after dispensing- STOP. Troubleshooting is required to determine why the mixed adhesive is not rising. Conduct mix ratio test to ensure ISO Spray R is dispensed at 1:1 ratio of Part A: Part B.
- Replace static mixers when pauses in bead dispensing exceed 1 minute. Extended pauses in bead dispensing allow ISO Spray R to cure within the static mixer, jeopardizing the proper mix ratio of 1:1 Part A: Part B.

## Coverage Rate

### Spray Application

- Full spray coverage to ⅛" to ¼" thick (3.2 to 6.4 mm) on granule or smooth substrates: 90 to 100 ft²/gallon* (2.21 m²/L to 2.45 m²/L)**
- Full spray coverage to ⅛" to ¼" thick (3.2 to 6.4 mm) over gravel surface BUR: 50 ft²/gallon* (1.23 m²/L)**

### Bead Application

| I.S.O. Spray R Bead Spacing in Continuous beads ½" - ¾" (13 mm – 19 mm) Wide | Coverage (English Units) | Coverage (Metric Units) |
|---|---|---|
| 12" (0.305 m) on center | 250 to 300 ft²/gallon* | 4.909 to 7.363 m²/L** |
| 9" (0.229 m) on center | 187 to 225 ft²/gallon* | 4.590 to 5.522 m²/L** |
| 6" (0.152 m) on center | 125 to 150 ft²/gallon* | 3.068 to 3.681 m²/L** |
| 4" (0.102 m) on center | 83 to 100 ft²/gallon* | 2.037 to 2.454 m²/L** |
| 3" (0.076 m) on center | 62 to 75 ft²/gallon* | 1.522 to 1.841 m²/L** |
| *1 Gallon mixed I.S.O. Spray R = ½ gallon Part A I.S.O. Spray R + ½ gallon Part B I.S.O. Spray R<br>**1 Liter mixed I.S.O. Spray R = ½ Liter Part A I.S.O. Spray R + ½ Liter Part B I.S.O. Spray R | | |

### Spatter-Spray Application

- Spatter-Spray coverage on granule or smooth substrates: 0.55 – 0.75 Gal/Sq (182 – 133 ft²/Gal)
  NOTE: Application rates may need to be adjusted based on field conditions including granular or porous surfaces.

## LEED® Information

Post-Consumer Recycled Content: 0%

Post Industrial Recycled Content: 0%

Manufacturing Location: Chagrin Falls, OH

NOTE: LEED® is a registered trademark of the U.S. Green Building Council


| Typical Properties | |
|---|---|
| Properties | Typical Performance |
| Component Composition | Part A: Isocyanate<br>Part B: Polyol |
| Color | Part A: Light Brown<br>Part B: Colorless with slight haze<br>After Part A & Part B mixed: Off-White |
| Mix Ratio of Part A: Part B | 1:1 by Volume |
| Viscosity at 77 °F (25 °C) | Part A: 100 to 400 cps using RVT #2 spindle at 20 RPM<br>Part B: 250 to 550 cps using RVT #2 spindle at 20 RPM |
| V.O.C. Content | When Part A and Part B mixed: 32 grams/Liter |
| Weight per gallon | Part A: 10.18 lb/gallon<br>Part B: 8.17 lb/gallon |
| NOTE: DensDeck® is a registered trademark of Georgia Pacific.; Predator™ is a registered trademark of Graco Inc. | |

| Acceptable Substrates | | | |
|---|---|---|---|
| Substrate | Insulation Attachment | XR Membrane Attachment | NOTE |
| Structural Concrete (New) | Yes | Yes | Newly poured decks must be sufficiently cured to allow adhesion to the substrate surface. Cure times vary. A roof consultant, structural engineer, or concrete industry professional may be contacted to perform moisture tests if readiness of concrete is in question. |
| Structural Concrete (Existing) | Yes | Yes | Positive adhesion test required. |
| Steel | Yes | No | New steel decks may require cleaning to remove processing oils. |
| Gypsum Decks | Yes | Yes | Positive adhesion test required. |
| Cementitious Woodfiber | Yes | Yes | |
| Smooth or Granule Surfaced Modified Bitumen Roofs | Yes | Yes | |
| Plywood and OSB | Yes | Yes | |
| SBS Base Sheets | Yes | Yes | |
| Lightweight Concrete* | Yes | Yes | Acceptable lightweight concrete substrates include cellular or air-entrained concrete. *Lightweight concrete substrates with aggregate (such as perlite or vermiculite) are not acceptable substrates. |
| *Lightweight concrete substrates with aggregate (such as perlite or vermiculite) are not acceptable substrates. | No | No | |
| Existing Asphalt Smooth Surface Built up Roofing | Yes | Yes | Existing substrates containing residual asphalt must be cleaned and scraped as smooth as possible. Positive adhesion test required. |
| Coal Tar Pitch | Yes | No | Positive adhesion test required |
| ISO 95+™ GL / ISOGARD™ GL, ISOGARD HD, RESISTA™ / ISOGARD CG, Structodek® HD, DensDeck® Prime, Securock®, Expanded Polystyrene (EPS), Extruded Polystyrene (XPS), Polyiso Insulation, WoodFiber | Yes | Yes<br>EPS & XPS: NO | Extruded Polystyrene (XPS) and Expanded Polystyrene (EPS) are not acceptable immediate substrates to receive adhered TPO XR membrane. |
| Existing Single-Ply Roofs, Fiberglass Insulation, Perlite Insulation | No | No | These substrates are not acceptable as an immediate substrate for this product. |
| NOTE: Building Codes may not allow specific applications listed above. Confirm that proposed application and assemblies comply with the applicable Building Code requirements before proceeding. | | | |

## Product Packaging

| Packaging | Contents per Container | Containers per Pallet |
|---|---|---|
| Part A in 15-gallon (56.8 L) Keg | 15-gallon (56.8 L) 155 lb (70.3 kg) per keg | 8 Kegs per Pallet<br>4 Kegs Part A & 4 Kegs Part B |
| Part B in 15-gallon (56.8 L) Keg | 15-gallon (56.8 L) 132 lb (59.9 kg) per keg | |
| Part A: 55-gallon (208.2 L) Drum | 50-gallon (189.3 L) 553 lb (251.4 kg) per drum | 4 Drums per Pallet<br>2 Drums Part A & 2 Drums Part B |
| Part B: 55-gallon (208.2 L) Drum | 50-gallon (189.3 L) 453 lb (205.9 kg) per drum | |
| Part A: 5-gallon (18.9 L) Bag-in-box | 5-gallon (18.9 L) 52 lb (23.6 kg) per box | 36 Bag-in-Boxes/Pallet<br>18 Boxes Part A & 18 Boxes Part B<br>Each Part A & B set contains:<br>5 Static Mixers |
| Part B: 5-gallon (18.9 L) Bag-in-box | 5-gallon (18.9 L) 42 lb (19.1 kg) per box | |

Please contact Holcim Technical Services at 800-428-4511 for further information.