

# Flexible FAST™ Adhesive



## Overview

Carlisle pioneered and patented the VOC-free, energy-absorbing, impact-resistant Flexible FAST Adhesive for use with FleeceBACK® membranes and to secure insulation boards to the deck for a totally non-penetrating system application. This industry-leading breakthrough in urethane adhesive technology offers built-in elongation and energy-absorbing properties that work in conjunction with the FleeceBACK membrane to enhance puncture and hail resistance. Flexible FAST Adhesive is applied in full spray, splatter, or extrusions to deliver the two components onto the substrate. Parts A & B are mixed in the spray gun and applied to the roof. A catalytic reaction takes place, causing the Flexible FAST Adhesive to expand and foam. FleeceBACK membrane is then laid into the foamed adhesive after developing “string/body” and rolled with a 150-lb. segmented roller to ensure the fibers of the fleece are embedded into the adhesive. Within 20 minutes, Flexible FAST Adhesive cures to form a tenacious bond between the substrate and the FleeceBACK membrane.

## Features and Benefits

### » Added Puncture Resistance

In side-by-side dynamic puncture tests, Flexible FAST Adhesive increased puncture resistance between 33–50% compared to traditional competitive 2-component low-rise adhesives. The energy absorbing nature of the Flexible FAST foam makes this an ideal product for use in Roof Garden, Plaza Paver and Solar Panel applications in conjunction with FleeceBACK membrane.

### » FM approved

### » Energy Efficient and Environmentally Sound

Each layer of Flexible FAST Adhesive expands to 1/16"–1/8"-thick and provides an additional R-value of 0.20 to 0.50 per layer. The NRCA estimates that up to 10% of R-value can be lost due to joints in the insulation. The expanding nature of Flexible FAST adhesive helps to seal insulation joints, when Flexible FAST Adhesive is specified for insulation attachment in place of mechanical fasteners, the 3–8% loss in R-value can be eliminated. Water is used as the blowing agent in Flexible FAST Adhesive, making it VOC compliant and not labeled as a flammable product.

### » Superior Wind Uplift

Superior wind uplift resistance is delivered with uplift pressures ranging from 90–945 psf depending on the substrate. Due to its superior wind uplift performance, the FleeceBACK/Flexible FAST Adhesive System can qualify for upgraded wind speed warranties of 80–120 mph with design enhancements. **Contact Carlisle SynTec Systems for design enhancement requirements.**

### » Expedient Installations without Interruption

Due to the low noise and low odor associated with the system, the FleeceBACK/Flexible FAST assembly is an excellent choice for re-roofing occupied buildings, as there is minimal disruption. Because of these benefits, schools, universities and hospitals are some of the biggest users of the FleeceBACK/Flexible FAST assembly. The speed of application with Flexible FAST Adhesive affords project completion in a timely manner. Flexible FAST offers a significant reduction in free MDI: from 32% to 23% compared to traditional urethane adhesives.

### » System Warranties

A full range of system warranties are available including 10-, 15-, 20-, and 30-year terms, which are No Dollar Limit, transferable and not voided for ponded water. In summary, the combination of 50 years of single-ply experience, fleece backing reinforcement, and Carlisle's impact-resistant adhesive technology results in an extremely tough and durable roofing composite system with superior wind uplift performance that can be applied with minimal business disruption and no deck penetrations.

## Productivity Boosting Features and Benefits:

- » Reduces membrane application time up to 93% when compared to traditional installations using bonding adhesives on non-FleeceBACK systems
- » Eliminates the need to pre-drill into concrete and gypsum decks
- » 15- and 50-gallon drums reduce empty adhesive container stoppage time by 67%-90% when compared to Bag-in-a-Box



# Flexible FAST Adhesive

## Application

- The surface to which adhesive is to be applied shall be dry and free of fins, protrusions, sharp edges, loose and foreign materials, oil and grease. Depressions greater than ¼" (6 mm) shall be filled with Flexible FAST Adhesive or other approved patching material. All sharp projections shall be removed. **Previously unweathered asphalt must be primed with CAV-GRIP™ III.**
- Seal gaps between the wall/penetration and concrete deck with Carlisle 725TR, Flashing Foam, or other suitable material, to avoid condensation issues and positive pressure from air infiltration.**
- For reroofing sprayed-in-place (SPF) urethane roofs, all wet areas must be removed. The surface must then be scarified or perforated, depending on the coating, before applying Flexible FAST Adhesive.
- Apply Flexible FAST Adhesive when the substrate and ambient temperatures are 25°F (-4°C) or above when spraying or extruding with heated or non-heated equipment. Dispense the adhesive between 300-800 psi depending on the equipment used. Consult with your local FleeceBACK Specialist for more details.
- Set pre-heater and hose temperature to 120°F (49°C). Temperature settings will vary with conditions.

## FleeceBACK Installation

### Slide-in Method:

- Unroll FleeceBACK sheet and position. Fold the sheet back in half lengthwise (end-to-end).
- Spray-apply, splatter, or extrude Flexible FAST Adhesive to the substrate.
  - For full spray applications, spray adhesive at 1-gallon per square to obtain full coverage (approximately ¼ to ½ thick after foaming). Ensure membrane end laps are protected from adhesive.
  - For splatter applications, spray adhesive at ½ gallon per square to obtain 50% coverage (approximately ¼ to ½ thick after foaming). Ensure membrane end laps are protected from adhesive.
  - For extruded applications, apply at 4", 6", or 12" on center with a minimum ½" bead. Ensure membrane end laps are protected from adhesive.
- Once "string time" occurs, gradually feed FleeceBACK sheet into Flexible FAST Adhesive, checking for "string/body" every few feet. Stop feeding FleeceBACK sheet into adhesive when applicator reaches adhesive that has NOT developed "string/body". Immediately begin to roll membrane width-wise with a 150-lb. segmented weighted roller. Repeat process until FleeceBACK sheet is fully installed.

### Roll-in (Mod Bit) Method:

- Keeping the FleeceBACK sheet on the core, position roll of FleeceBACK membrane at the designated starting point.

- Spray-apply, splatter, or extrude Flexible FAST Adhesive to the substrate.
  - For full spray applications, spray adhesive at 1-gallon per square to obtain full coverage (approximately ¼ to ½ thick after foaming). Ensure membrane end laps are protected from adhesive.
  - For splatter applications, spray adhesive at ½ gallon per square to obtain 50% coverage (approximately ¼ to ½ thick after foaming). Ensure membrane end laps are protected from adhesive.
  - For extruded applications, apply at 4", 6", or 12" on center with a minimum ½" bead. Ensure membrane end laps are protected from adhesive.
- Once "string time" occurs, gradually roll FleeceBACK membrane into Flexible FAST Adhesive, checking for "string/body" every few feet. Stop rolling FleeceBACK into adhesive when applicator reaches adhesive that has NOT developed "string/body". Immediately begin to roll membrane width-wise with a 150-lb. segmented weighted roller. Repeat process until FleeceBACK sheet is fully installed.

## Insulation Attachment

- Apply Flexible FAST Adhesive to the substrate achieving a light-blue-colored foam.
  - For full spray applications, spray adhesive at 1-gallon per square to obtain full coverage (approximately ¼ to ½ thick after foaming). Ensure membrane end laps are protected from adhesive.
  - For splatter applications, spray adhesive at ½ gallon per square to obtain 50% coverage (approximately ¼ to ½ thick after foaming). Ensure membrane end laps are protected from adhesive.
  - For extruded applications, apply at 4", 6", or 12" on center with a minimum ½" bead. Ensure membrane end laps are protected from adhesive.

Bead spacing parameters for 5, 10, 15, or 20-year 55-mph warranties: (Contact Carlisle Project Review for bead spacing on higher mph warranties and 30-year warranty projects).

Building Height	Bead Spacing (Perimeter)	Bead Spacing (Field)
0' – 25'	6" o.c. (4' perimeter)	12" o.c.
26' – 50'	6" o.c. (8' perimeter)	12" o.c.
51' – 75'	6" o.c. (12' perimeter)	12" o.c.
76' – 100'	6" o.c. (16' perimeter)	12" o.c.
101' or greater	6" o.c. (24' perimeter)	12" o.c.

- Factory Mutual bead spacing guidelines in the perimeter and corner may differ from the table above. Beads at 12" o.c. are not acceptable at perimeters and corners.
- Allow Flexible FAST Adhesive to rise and develop "string/body" (approx. 1½ – 2 min.). String time will vary based on environmental

# Flexible FAST Adhesive

conditions like temperature and humidity. Do not allow the adhesive to over-cure prior to setting insulation boards.

4. Place insulation boards (maximum 4' x 4' insulation boards when adhesive is extruded at 12" o.c. or when boards exceed 4" thickness, or 4' x 8' insulation boards when adhesive is applied in full spray, 4", or 6" beads) into adhesive after allowing it to rise and develop "string/body". String time will vary based on environmental conditions like temperature and humidity. Do not allow the adhesive to over-cure prior to setting insulation boards.
5. Designate one person to walk boards into place and then roll the boards between 5–7 minutes from the initial adhesive application. Boards may be temporarily weighted or relief-cut where necessary to keep the boards in constant contact with the adhesive until the adhesive cures.
6. At the beginning of the insulation attachment process and periodically throughout the day, check the adhesion of boards to ensure a tight bond is created and maximum contact is achieved.

Review Carlisle specifications and details for complete application information.

## Precautions

- » Review the Safety Data Sheet for complete safety information prior to use.
- » The foam produced is an organic material. It must be considered as combustible and may constitute a fire hazard. The foam adhesive must not be left exposed or unprotected. Shield from heat and sparks.
- » Do not smoke during application.
- » Use with adequate ventilation. Avoid breathing vapors. Wear a NIOSH- or MSHA-approved respirator for organic vapors with prefilters and solvent-resistant cartridges or supplied airline respirators while spraying. Proper safety training is essential for all persons involved in the installation process. If vapor is inhaled, remove to fresh air and administer oxygen if breathing is difficult. Consult a physician immediately.
- » Avoid contact with eyes. Safety glasses or goggles are required.
- » If Flexible FAST adhesive is splashed in eyes, immediately flush eyes with plenty of clean water for at least 15 minutes. Contact a physician immediately.
- » Avoid contact with skin. Wear long-sleeved shirts and long pants. Wash hands thoroughly after handling. In case of contact with skin, thoroughly wash affected area with soap and water or corn oil. NOTE: Permeation-resistant gloves that meet ANSI/ISEA 105-2005 are required when handling the material or during application.
- » Jobsite storage temperatures in excess of 90°F (32°C) may affect product shelf life. When temperatures are in excess of 90°F (32°C) utilize white membrane or material to shield the drums from direct sunlight. Should the components be stored at temperatures lower than 70°F (21°C), restore to room temperature prior to use. Do not

allow Flexible FAST Adhesive to freeze (storage below 0°F (-18°C) for at least 3 days).

- » Use spray booths, windscreens and/or lower spray pressure with spatter tips when spraying.
- » Precautions must be taken to prevent Flexible FAST Adhesive vapors or overspray from entering buildings during application. All air-intake vents on roofs must be closed during application of adhesive.
- » Use desiccant dryers on Part A drums to avoid formation of crystals from exposure to moisture in the air.
- » KEEP OUT OF THE REACH OF CHILDREN.
- » Desiccant dryers should be used to prevent atmospheric moisture contamination of the remaining diisocyanate. Even a small amount of contamination by water or other foreign substance could result in excess pressure and catastrophic failure of the jug container. Do not reseal a jug if contamination is suspected. Move container to a well-ventilated area (outside) and allow to stand for at least 48 hours to allow escape of evolved carbon dioxide to avoid hazardous pressure build-up in container.

## Coverage Rates

Application rates may vary depending on ambient temperatures, surface, and substrate absorption rate.

Approximate Coverage Rate (Sq. Ft.)	50 Gallon Drums				
	Full Spray	4" o.c.	6" o.c.	12" o.c.	Splatter Value
	5,000-10,000	6,700-9,000	10,000-12,500	20,000-25,000	18,000-20,000
Approximate Coverage Rate (Sq. Ft.)	15 Gallon Drums				
	Full Spray	4" o.c.	6" o.c.	12" o.c.	Splatter Value
	1,800-3,000	2,110-2,700	3,000-3,750	6,000-7,500	5,400-6,000

LEED® Information	
Pre-consumer Recycled Content	0%
Post-consumer Recycled Content	0%
Manufacturing Location	Geismar, LA, Elwood, IL Chattanooga, TN
VOC Content	0 g/L
Solar Reflectance Index	N/A

# Flexible FAST Adhesive

## Substrate Compatibility

Insulation/Underlayments		Roof Decks		Existing Roofing Materials	
HP Polyiso	Yes	Concrete	Yes	Smooth BUR	Yes <sup>5</sup>
HP Recovery Board	Yes	Cellular Lt.Wt. Concrete	Yes	Gravel BUR	Yes <sup>6</sup>
Expanded Polystyrene (EPS)	Yes <sup>1</sup>	NVS Lt.Wt. Concrete	Yes	Mineral Cap Sheet	Yes
Extruded Polystyrene	Yes <sup>2</sup>	Gypsum	Yes	Granular Modified-Bitumen	Yes
New Sprayed Foam	Yes	Cementitious Wood Fiber	Yes	Smooth Modified-Bitumen	Yes
Scarified SPF	Yes	Plywood/OSB	Yes	Coal Tar Pitch	Yes <sup>7</sup>
DensDeck®	Yes	Painted Steel	Yes	Aluminum-Coated BUR	Yes <sup>8</sup>
SECUROCK®	Yes	Galvanized Steel	Yes <sup>3</sup>	Acrylic-Coated SPF	Yes
Oriented Strand Board	Yes	Acoustical Steel	Yes <sup>4</sup>	Silicone-Coated SPF	Yes <sup>9</sup>
SecurShield®	Yes	Wood Plank	Yes	Aged EPDM, Hypalon®, TPO	Yes <sup>10,12</sup>
				Unweathered Asphalt	Yes/No <sup>11</sup>

- EPS insulation cannot be used directly beneath Sure-Seal® (Black) FleeceBACK membrane unless a light-colored coating is specified. Both Sure-White™ and Sure-Weld® FleeceBACK membranes may be installed directly over minimum 1.5-lb.-density EPS; however, to obtain UL & FM codes, an overlayment of HP Recovery Board, DensDeck, Securock or HP Polyiso insulation is required.
- For insulation attachment only.
- For new galvanized steel decks, power-washing is necessary to remove finishing oil residue if present.
- For acoustical steel decks, fill the flutes with fiberglass or other suitable fill insulation and tack in place with strips of duct tape 3' o.c., or other adhesive, prior to spraying the deck with Flexible FAST Adhesive.
- Existing Smooth BUR must be Type III or IV asphalt if the (Black) FleeceBACK EPDM, FleeceBACK PVC and KEE HP, or FleeceBACK TPO membrane is to be installed directly without insulation.
- A minimum ½" HP Recovery Board or insulation is required over properly prepared gravel BUR. FleeceBACK membrane cannot be installed directly over a gravel/slag surface.
- An insulation providing the necessary R-value must be specified to prevent the coal tar pitch from softening. FleeceBACK membranes cannot be installed directly to coal tar pitch.
- Any loose coatings must be removed by power-washing or by physical abrasion prior to the application of Flexible FAST Adhesive. A test installation over the aluminum-coated smooth BUR is recommended to ensure the aluminum coating is fully adhered.
- Silicone-coated substrates must be scarified (coating removed) prior to the application of Flexible FAST Adhesive.
- Power-washing aged EPDM, Hypalon, or TPO membrane is required prior to the application of Flexible FAST Adhesive.
- Requires CAV-GRIP III for all applications.
- Contact Carlisle for specific requirements on TPO recover.

## Typical Properties and Characteristics

Base	A-Side Polymeric Isocyanate	B-Side Surfactants and Catalysts
Mixing Ratios by Volume	1:1 Part A to Part B	
Viscosity (CPS @ 25C)	400	400
MDI Content	23%	
Avg. Net Weight	9.88 lbs/gal	9.23 lbs/gal
Packaging	15-gallon drum (57 L) 50-gallon drum (190 L)	15-gallon drum (57 L) 50-gallon drum (190 L)
Shelf Life	1 year	1 year
Temperature Requirements (Substrate & Ambient)		min. 25°F (Heated Equipment) min. 25°F (Unheated Equipment)

Typical R-value added for FleeceBACK membrane attachment: 0.20 to 0.50 R-value. R-value may be higher as more adhesive is used on uneven surfaces.

Physical Property	Test Method	Results
Elongation	ASTM D412	150%
Modulus at 150% Elongation	ASTM D412	20 psi
Dynamic Puncture Resistance - OSB Dynamic Puncture Resistance - HP Recovery Board Dynamic Puncture Resistance - Polyiso	ASTM D5635-04a	33% greater than standard FAST 40% greater than standard FAST 50% greater than standard FAST