

FleeceBACK[®]
Roofing Systems



Carlisle's Most Durable Roofing System

Experience the **Carlisle Difference**



In the 1960s, Carlisle SynTec Systems pioneered the single-ply roofing industry with the introduction of its Sure-Seal® EPDM membrane. Since that time, the name Carlisle has been synonymous with high-quality, innovative commercial roofing materials. Since its inception as a company, Carlisle has been dedicated to providing construction professionals with the best products, services, and warranty programs on the market. Carlisle has been recognized as the trusted provider of the most dependable and longest-lasting single-ply roof systems on the market. Today, Carlisle's product offering has expanded to include Sure-Weld® TPO, Sure-Flex™ PVC, and FleeceBACK® membranes, as well as a full line of complementing accessories. And while the company's primary focus is on producing innovative and leading-edge, commercial, low-slope roofing membranes and accessories, Carlisle also provides insulation, metal roofing, coatings, skylights, pavers, and edge metal. Carlisle also makes its own primers, membrane cleaners, and adhesives including industry leading Flexible FAST® adhesive.

Carlisle's signature products have been installed on a wide range of buildings around the world, including schools, hospitals, government facilities, warehouses, retail, and cold-storage facilities. With billions of square feet of roofing materials sold and installed, Carlisle continues to lead the industry by providing its valued customers with innovative products, services, and warranty options. Whatever your roofing needs, Carlisle has a system – and an answer – for you.



Why FleeceBACK?

Durability | Puncture Resistance | Long-Term Performance

Carlisle's FleeceBACK systems are preferred for new construction and re-roofing projects, and are particularly well-suited for critical facilities that require superior protection against severe weather, as well as Roof Garden and solar applications. Composed of Carlisle's EPDM, TPO, PVC, or KEE HP membranes adhered with a strong 55-mil fleece, FleeceBACK systems provide long-term protection against high winds, hail, and punctures. FleeceBACK membranes are installed using Flexible FAST Adhesive for a VOC-free, quiet, low-odor, non-penetrating application and a roof system that offers superior durability, wind uplift, and hail resistance. FleeceBACK membranes are lightweight generally weighing less than half a pound per square foot, compared to an average of 2 pounds per square foot for asphaltic-based systems. Carlisle's FleeceBACK membranes pass FM's Severe Hail rating when adhered directly to concrete and achieve a UL 2218 Class 4 rating. FleeceBACK membranes provide uplift pressures ranging from 90-945 psf, depending on the substrate. As a result of this extraordinary wind uplift performance, the FleeceBACK/Flexible FAST Adhesive System offers an industry-leading wind performance.

FleeceBACK EPDM

FleeceBACK EPDM Roofing Systems

FleeceBACK EPDM membranes are manufactured using patented hot-melt adhesive technology to bond the fleece to the EPDM and feature 3" or 6" Factory-Applied Tape™ for consistent, high-quality seams.

Membrane Options

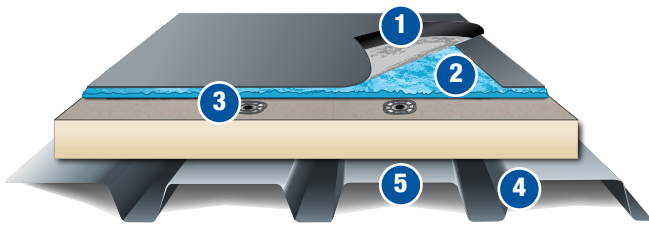
Colors:	Black, white
Thicknesses:	Black EPDM + Fleece: 100, 115, and 145 mils White EPDM + Fleece: 115 and 145 mils
Standard Widths:	5' and 10'
Standard Lengths:	40', 50', and 100'





Typical Application

1. FleeceBACK EPDM Membrane with Factory Applied Tape (FAT)
2. Flexible FAST Adhesive
3. Carlisle Fasteners and Plates
4. 2" SecurShield™ Polyiso Insulation
5. Steel Deck



FLEECEBACK EPDM BENEFITS

- » Fleece reinforcement creates a thick, durable sheet
- » Excellent resistance to punctures and tears
- » Better puncture resistance than Modified Bitumen
- » Weighs 75% less than Modified Bitumen
- » 67% fewer seams than Modified Bitumen with 10' sheets
- » Passes UL-2218 Class 4 hail resistance test
- » Passes FM Severe Hail test
- » Quiet, low-odor installation; ideal for re-roofing occupied buildings

FACTORY-APPLIED TAPE BENEFITS

- » Seam tape is bonded to FleeceBACK membrane in a factory-controlled setting
- » Improves reliability and consistency of seams
- » Enhances seaming productivity by 75%

FleeceBACK TPO

FleeceBACK® TPO Roofing Systems

FleeceBACK TPO membranes are manufactured using a hot-melt extrusion process for complete scrim encapsulation, are chlorine- and plasticizer-free, and provide excellent long-term reflectivity. Carlisle's FleeceBACK TPO contains the OctaGuard XT™ weathering package, which provides excellent resistance to UV and extreme temperatures.

APEEL™ Protective Film application guards the TPO membrane's surface from scuffs and dirt accumulation during installation, improving the roof system's appearance and long-term performance.

Membrane Options Available with APEEL Protective Film

Colors: White, Gray, Tan
(Special Colors*: Medium Bronze, Rock Brown, Terra Cotta, Slate Gray, Patina Green)

Thicknesses: TPO + Fleece:
100, 115, and 135 mils

Standard Widths: 6' and 12'

Standard Lengths: 50' and 100' (100- and 115-mil)
75' (135-mil)

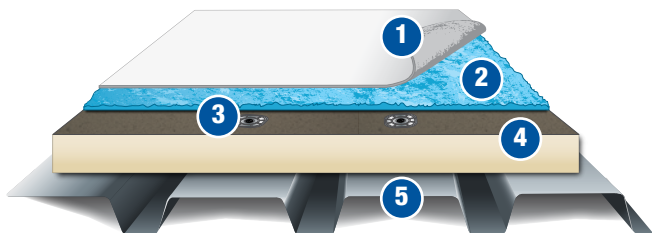
*Special Colors available in limited thicknesses and sizes.
Contact a Carlisle Representative for more details.





Typical Application

1. FleeceBACK TPO Membrane
2. Flexible FAST Adhesive
3. Carlisle Fasteners and Plates
4. 2" InsulBase® Polyiso Insulation
5. Steel Deck



FLEECEBACK TPO BENEFITS

- » Fleece reinforcement creates a thick, durable sheet
- » Excellent puncture resistance and breaking strength
- » Better puncture resistance than Modified Bitumen
- » Weighs 75% less than Modified Bitumen
- » 75% fewer seams than Modified Bitumen with 12'-wide sheets
- » Passes FM Severe Hail test
- » Cool Roof Rating Council (CRR) approved
- » Resists biological growth
- » Quiet, low-odor installation; ideal for re-roofing occupied buildings

HEAT-WELDABLE SEAMS

- » Robotic welding ensures consistency and reliability
- » Peel strengths exceed 50 pounds per inch

FleeceBACK PVC & KEE HP

FleeceBACK[®] PVC Roofing Systems

FleeceBACK[®] KEE HP Roofing Systems

FleeceBACK PVC and KEE HP are manufactured using a hot-melt extrusion process for complete scrim encapsulation and provide excellent reflectivity and resistance to chemicals, acids, bases, restaurant oils, and greases.

Membrane Options

Colors: White, Gray, Tan, Light Gray, and Slate Gray

Thicknesses: PVC + Fleece: 115 and 135 mils

KEE HP + Fleece: 105, 115, and 135 mils

Standard Widths: 10' (105-mils), 5' and 10' (115- and 135-mils)

Standard Lengths: 100' (115-mil) and 75' (135-mil)





Typical Application

1. FleeceBACK KEE HP Membrane

2. Flexible FAST Adhesive

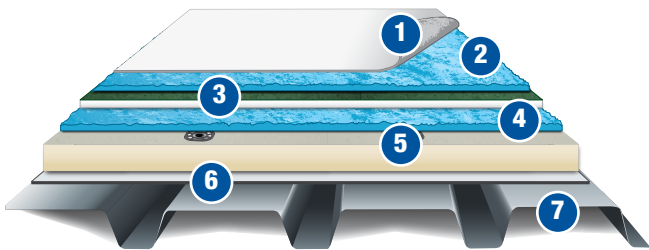
3. Cover Board

4. Flexible FAST Adhesive

5. 2" SecurShield Polyiso

6. VapAir Seal™ MD

7. Steel Deck



FLEECEBACK PVC AND KEE HP BENEFITS

- » External fleece reinforcement creates a very thick, durable sheet
- » Excellent puncture resistance and breaking strength
- » 67% fewer seams than Modified Bitumen with 10'-wide sheet
- » Passes FM Severe Hail test
- » Fiberglass reinforcing scrim provides exceptional dimensional stability
- » Highly resistant to chemicals, acids, bases, restaurant oils, fats, and greases
- » Cool Roof Rating Council (CRRC) approved
- » KEE HP resists biological growth
- » Quiet, low-odor installation; ideal for re-roofing occupied buildings

HEAT-WELDABLE SEAMS

- » Robotic welding ensures consistency and reliability

Flexible FAST Adhesive



Fleece reinforcement creates a thick, durable sheet and increased protection



Industry-leading wind performance with uplift pressures from 90 – 945 psf (depending on substrate)



Quiet, low-odor installation – ideal for re-roofing occupied buildings



FleeceBACK membrane with Flexible FAST adhesive weighs 75% less with up to 75% fewer seams than modified bitumen



When adhered directly to concrete, all FleeceBACK membranes pass FM's Severe Hail Test and achieve a UL 2218 class 4 rating, FM Severe Hail. FM Very Severe Hail (VSH) ratings are available for some FleeceBACK assemblies.



FleeceBACK TPO, PVC, or KEE HP membranes are Cool Roof Rating Council (CRRC) certified. The combination of FleeceBACK membranes with Flexible FAST Adhesive increases energy savings by eliminating thermal bridging of mechanical fasteners and insulation joints, providing additional R-value. Flexible FAST Adhesive is HFC free, providing a green alternative, offering low GWP and ZERO ODPs (Ozone Depleting Particles).

REDUCE OR ELIMINATE THERMAL BRIDGING

The National Roofing Contractors' Association estimates that 3 – 8% of R-value is lost due to fasteners and plates, and up to 10% is lost due to insulation joints. Using standard or Flexible FAST Adhesive for insulation attachment eliminates thermal bridging of mechanical fasteners and helps seal insulation joints. In addition, standard and Flexible FAST Adhesives provide an additional R-value of 0.2 to 0.5 per layer.



Using Flexible FAST eliminates thermal bridging caused by fasteners and helps to seal insulation joints.

Impact-resistant Flexible FAST Adhesive forms a tenacious interlocking bond with the fibers of the fleece and increases resistance to hail and punctures.

Flexible FAST Adhesive is a VOC-free, energy-absorbing, impact-resistant adhesive used to adhere FleeceBACK membranes insulation boards for a quiet, low-odor, non-penetrating system application. Flexible FAST offers built-in elongation and energy-absorbing properties that work in conjunction with FleeceBACK membranes to enhance resistance to hail and punctures.

FleeceBACK and Flexible FAST provide increased protection compared to non-FleeceBACK systems.



Puncture Resistance
33-50%



Hail Resistance
33-66%

Flexible FAST vs. Competitor's 2-Component Urethane Adhesive

	Temp Window	Elongation	Window of Workability
Flexible FAST	25 – 120°F	150%	3:30
Competitor A	40 – 90°F	5.7%	2:00
Competitor B	40 – 90°F	3.2%	1:30



INDUSTRY- LEADING WARRANTY COVERAGE

As a division of Carlisle Construction Materials, Carlisle SynTec has a large warranty reserve, ensuring that your investment is backed by proven financial stability. Carlisle offers industry leading warranty coverage on all of our roof systems, giving you the peace of mind of knowing that your rooftop will perform for the long haul. Carlisle's FleeceBACK systems are backed by transferrable warranties that provide unparalleled coverage of leaks, high wind speeds, hail, and accidental punctures.

SATISFIED BUILDING OWNERS

Schools – Thomas Jefferson, Benjamin Franklin Early Ed, Liberty H.S., Mark Twain Jr. & Sr. High

Universities – Univ. of Pennsylvania, Princeton, Yale, Temple, Vanderbilt, Swarthmore, Dickinson, BYU, Kent State

Govt. Buildings – U.S. Army, Navy, Air Force, FAA, FDA, DOJ, U.S. Post Office

Hospitals – Good Samaritan Hospital, Methodist Hospital, Missouri Baptist Med. Ctr., S. Nassua Community Hospital, VA Medical Center, Yale New Haven Hospital, HCA

Industry – Boeing, Dupont, Howard Hughes Corp., Newport News, Wyeth, Merck, Glaxo, State Farm, Bank One, NBC, Verizon, Union Carbide, U-Haul, Amana

EXTENSIVE APPLICATOR NETWORK

Carlisle has a nationwide network of approved applicators who have completed rigorous technical and hands-on training and have the product knowledge and real-world experience to install your FleeceBACK roofing system so that it thrives for years to come.

FLEECEBACK SPECIALIST

Carlisle offers a group of dedicated FleeceBACK Specialists to assist with technical, sales, and equipment support. Carlisle's FleeceBACK specialists have completed rigorous technical training with 2-component urethane adhesives, adhesive equipment, and FleeceBACK systems. Their expertise allows them to provide assistance with jobsite application and training to ensure that your roof is installed to the highest quality standards.

DESIGN FLEXIBILITY

Carlisle's technical and design services staff will assist you with your FleeceBACK roof design, product selection, and jobsite application. Since Carlisle manufactures a wide variety of roofing membranes, our systems provide the utmost flexibility for your rooftop, and our experts can assist you through the process of designing a FleeceBACK roofing system that will enable your building to perform to its optimal capacity.

TECHNICAL SERVICES

With decades of combined experience, Carlisle's technical services staff can provide the expertise you need, assisting with jobsite application and inspecting the rooftop to ensure that it is installed to the highest quality standards.

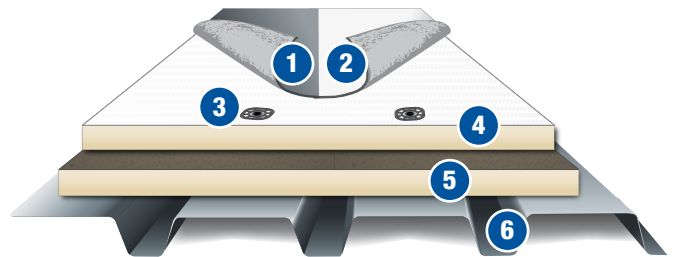
RapidLock (RL™) Roofing Systems

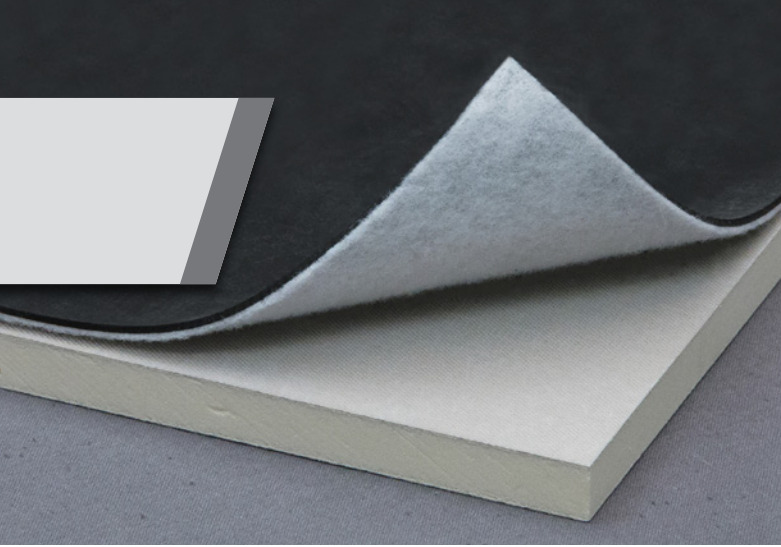
RapidLock TECHNOLOGY

Carlisle's RapidLock (RL) Roofing System is a revolutionary membrane attachment method that provides a fully adhered system without the use of adhesives. The RL system utilizes VELCRO® Brand Securable Solutions along with FleeceBACK RL EPDM, FleeceBACK RL TPO, or FleeceBACK RL PVC to achieve performance on par with traditional fully adhered single-ply systems. Underlayment options include InsulBase RL, SecurShield RL Polyiso, or SecurShield HD RL Polyiso. The RL system is VOC- and odor-free, has no application temperature restrictions, and provides significant labor savings thanks to the simplicity of the system and ease of installation.

Typical Application

1. FleeceBACK RL EPDM Membrane with RapidLock Technology
2. FleeceBACK RL TPO or FleeceBACK RL PVC Membrane with RapidLock Technology
3. Insulation Fasteners and Plates
4. InsulBase RL or SecurShield RL Polyiso with RapidLock Technology
5. InsulBase or SecurShield Polyiso
6. Steel Deck





FLEECEBACK RAPIDLOCK (RL) EPDM

- » RL fleece is specifically designed to work with RL insulation facer
- » Superior wind uplift performance and ratings (up to FM 1-225)
- » Fleece reinforcement adds toughness, durability, and enhanced resistance to hail and punctures
- » Factory-Applied Tape™ provides consistent seam quality and enhances productivity
- » FleeceBACK RapidLock EPDM comes in colors black or white

FLEECEBACK RAPIDLOCK (RL) TPO

- » RL fleece is specifically designed to work with RL insulation facer
- » Superior wind uplift performance and ratings (up to FM 1-225)
- » Fleece reinforcement adds toughness, durability, and enhanced resistance to hail and punctures
- » Wide window of weldability
- » FleeceBACK RapidLock TPO comes in colors white, gray and tan

FLEECEBACK RAPIDLOCK (RL) PVC

- » RL fleece is specifically designed to work with RL insulation facer
- » Superior wind uplift performance and ratings (up to FM 1-225)
- » Fleece reinforcement adds toughness durability, and enhanced resistance to hail and punctures
- » Enhanced chemical resistance
- » FleeceBACK RapidLock PVC comes in colors white, gray, light gray, slate gray and tan

RAPIDLOCK (RL) POLYISO INSULATION/COVER BOARDS

- » RL facer specifically designed to work with RL membranes
- » Standard compressive strength Polyiso insulation and high-density insulating cover boards available
- » Contains 0% ozone-depleting components and no CFCs
- » Approved for direct application to steel decks

SYSTEM CODES

- » UL Standard 790; Class A Roofing Systems
- » FM uplift values of up to 225psf can be achieved
- » For code specifics, refer to Carlisle's FleeceBACK Code Approval Guide

RAPIDLOCK FEATURES AND BENEFITS

- » No application temperature restrictions
- » VOC- and odor-free
- » Adhesive-less system saves time and labor
- » Integrated with an adhered slip sheet for ease of installation
- » RL fleece is specifically designed to work with RL Insulation facer
- » Superior Wind uplift performance and ratings (up to FM 1-225), comparable to traditional fully adhered single-ply systems
- » Fleece reinforcement adds toughness, durability, and enhanced resistance to hail and punctures

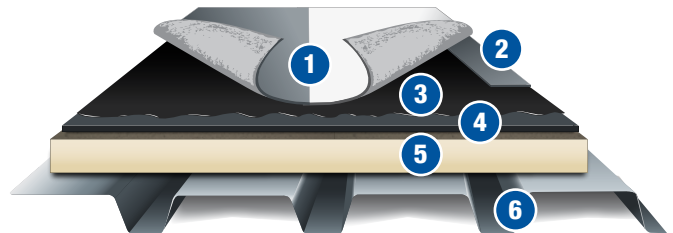
FleeceBACK AFX Multi-Ply Roofing Systems

FleeceBACK® AFX Roofing Systems

Carlisle's FleeceBACK AFX multi-ply roofing system uses highly puncture-resistant FleeceBACK AFX EPDM or FleeceBACK AFX TPO membranes adhered with Carlisle's Cold Applied or Hot Mopped adhesive. The system is ideal for recovering existing asphalt-based roofing systems, as the FleeceBACK AFX EPDM or FleeceBACK AFX TPO membranes can be adhered directly to primed or power-washed smooth or granular surface BUR or SBS modified bitumen systems. FleeceBACK AFX EPDM and FleeceBACK AFX TPO membranes can be used in conjunction with Carlisle's Modified Base Sheets for a multiple-ply, redundant system. FleeceBACK AFX EPDM and FleeceBACK AFX TPO are also approved for use in mechanically fastened systems.

Typical Application

1. FleeceBACK AFX EPDM or FleeceBACK AFX TPO
2. 3" or 6" Factory-Applied Tape on EPDM or Selvege Edge for TPO
3. Carlisle's Cold Applied or Hot Adhesive
4. Existing Smooth or Mineral-Surfaced Built-up or Modified Bitumen System or new Carlisle Modified Base Sheet
5. Existing or new Carlisle Insulation
6. Metal Deck



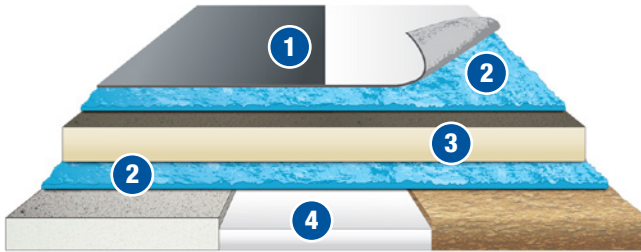
AFX MULTI-PLY FEATURES AND BENEFITS

- » Compatible with Hot-Mopped and Cold-Applied Adhesive
- » Fast and quiet; less disruptive installation
- » Low-VOC Cold Applied adhesive
- » No dangerous torches or open flames
- » Added redundancy
- » Up to 75% fewer seams than Modified Bitumen
- » Improved resistance to ponding water



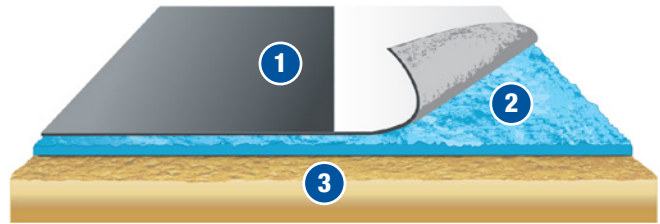
TYPICAL FLEECEBACK ASSEMBLIES

Insulated Assembly



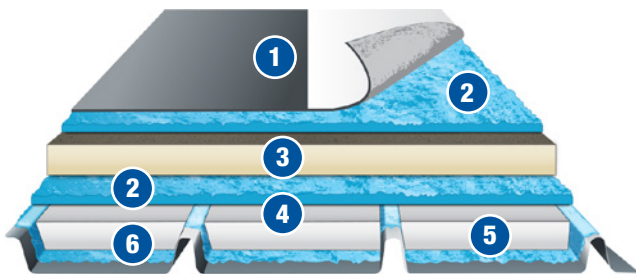
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|---------------------------|--|
| 1. FleeceBACK Membrane | 4. Structural Concrete, or
Gypsum Deck, or Tectum
Deck |
| 2. Flexible FAST Adhesive | |
| 3. Carlisle Insulation | |

Reroofing SPF Assembly



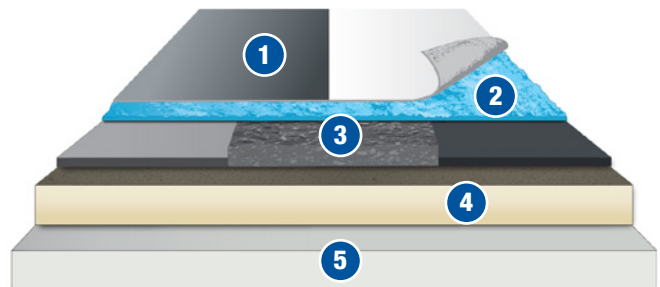
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| 1. FleeceBACK Membrane | 3. Existing Acrylic SPF or
Scarified SPF |
| 2. Flexible FAST Adhesive | |

Reroofing Standing Seam Metal Assembly



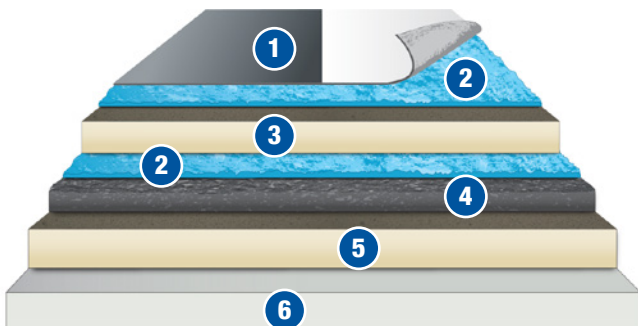
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|---------------------------|-----------------------------|
| 1. FleeceBACK Membrane | 4. Flute Fill Insulation |
| 2. Flexible FAST Adhesive | 5. Standing Seam Metal Deck |
| 3. Carlisle Insulation | |

Reroofing Mod Bit, Smooth BUR or Aged Single Ply Assembly



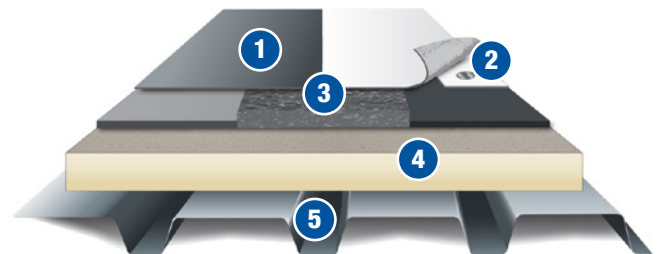
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|---|------------------------|
| 1. FleeceBACK Membrane | 4. Existing Insulation |
| 2. Flexible FAST Adhesive | 5. Roof Deck |
| 3. Existing Single-Ply, or Smooth/Mineral Surface BUR, or
Modified Bitumen | |

Reroofing Gravel BUR Assembly



- | | |
|---------------------------|------------------------|
| 1. FleeceBACK Membrane | 4. Existing Gravel BUR |
| 2. Flexible FAST Adhesive | 5. Existing Insulation |
| 3. Carlisle Insulation | 6. Roof Deck |

Mechanically Fastened Recovery System



- | | |
|---|------------------------|
| 1. FleeceBACK Membrane | 4. Existing Insulation |
| 2. Fasteners and Plates | 5. Existing Metal Deck |
| 3. Existing Single-Ply, or Smooth/Mineral Surface BUR, or
Modified Bitumen | |

EXPERIENCE THE CARLISLE DIFFERENCE



800-479-6832 | P.O. Box 7000 | Carlisle, PA 17013 | Fax: 717-245-7053 | www.carlisesyntec.com

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