

Carlisle's PVC Very Severe Hail (VSH) Approved Systems

As the industry leader in warranted commercial roofing systems, Carlisle SynTec Systems takes pride in its tradition of providing unique solutions for rooftop challenges. Carlisle offers a variety of roofing membranes including PVC, which is renowned for its resistance to chemicals, grease, fire and punctures making it an ideal choice for a wide variety of buildings. Carlisle continues to shape the evolution of the commercial roofing industry by offering world-class PVC system solutions that are Very Severe Hail (VSH) approved.

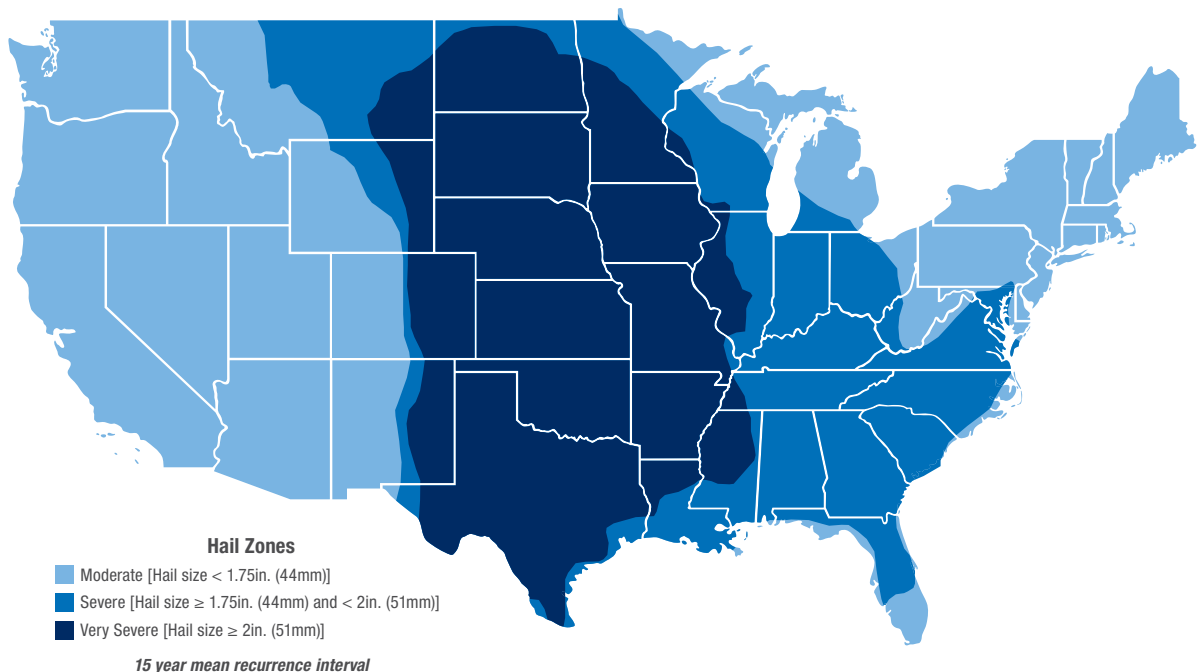
SEVERE HAIL (SH) VS. VERY SEVERE HAIL (VSH)

Historically, the Factory Mutual (FM) Severe Hail (SH) designation has been the most stringent hail approval in roofing. The test consists of a 2-inch steel ball dropped almost 18 feet, with virtually any rigid insulation board with a single-ply membrane resulting in an approval. In 2017, Factory Mutual introduced the Very Severe Hail (VSH) approval, consisting of a 2-inch diameter ice ball shot out of a pressurized air cannon. The ice ball impacts the membrane and substrate at approximately 110 miles per hour, resulting in four times the energy impact as SH testing.

Hail Rating	Impact Medium	Method	Impact Energy
SH Severe Hail	2"-Diameter Steel Ball	17' 9½" Height Gravity Drop	14 ft-lb (19 J)
VSH Very Severe Hail	2"-Diameter Ice Ball	160 Feet/Second Shot Velocity	58 ft-lb (79 J)

FACTORY MUTUAL'S HAIL ZONE MAP

VSH requirements now include parts of 19 states as designated by Factory Mutual. VSH requirements can also appear in specifications outside of these states.



UNDERSTANDING VSH APPROVED SYSTEMS

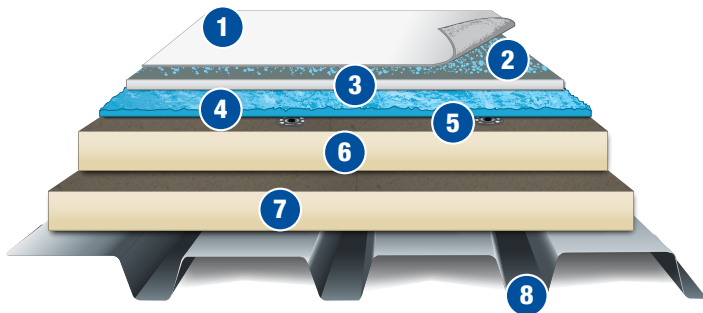
Cover boards are an essential part of a VSH single-ply system. Carlisle's commitment to innovation has allowed common rooftop cover boards such as gypsum to gain approval under these extreme testing standards. EcoStorm VSH™ offers a solution sourced from post-industrial and post-consumer waste streams with a compressive strength of nearly 4,000 psi. DensDeck® StormX™ is reinforced gypsum panels that are extremely durable.

Cover board attachment is a critical step in any VSH approved system. See the chart and schematics below for clarification.

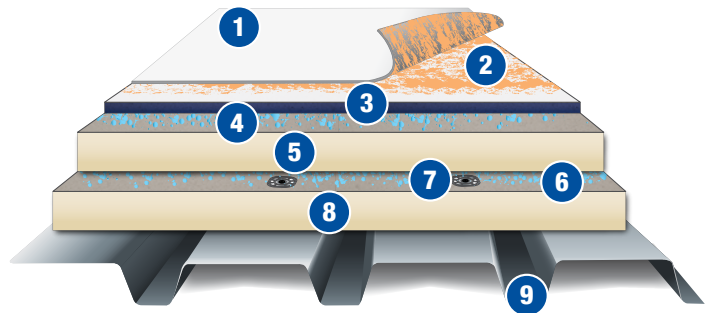
VSH Approvals		60-mil and 80-mil Sure-Flex	
Membrane Attachment	Hydrobond Water Based PVC bonding adhesive for Sure-Flex PVC, Cav-Grip PVC Adhesive for Sure-Flex PVC (CG), Low VOC PVC Bonding Adhesive for Sure-Flex PVC		
Cover Board	EcoStorm VSH	DensDeck StormX	
Cover Board Attachment	Flexible FAST™		Flexible FAST
VSH Approvals		115-mil and 135-mil Sure-Flex FleeceBACK	135-mil Sure-Flex KEE HP FleeceBACK
Membrane Attachment	Flexible FAST Rig Splatter, Flexible FAST Dual Tank Splatter or HydroBond Water Based PVC Bonding Adhesive		Flexible FAST Rig Splatter or Flexible FAST Dual Tank Splatter
Cover Board	EcoStorm VSH	DensDeck StormX	DensDeck StormX
Cover Board Attachment	Flexible FAST	Flexible FAST	Flexible FAST
VSH Approvals		60-mil and 80-mil Sure-Flex KEE HP	
Membrane Attachment	Low VOC PVC Bonding Adhesive for Sure-Flex KEE HP membranes (LV)		
Cover Board	EcoStorm VSH	DensDeck StormX	
Cover Board Attachment	Flexible FAST	Flexible FAST	

Scan here for our full listing of VSH approvals.

SURE-FLEX® FLEECEBACK® PVC



SURE-FLEX PVC



- 1 Sure-Flex FleeceBACK 115- or 135-mils
- 2 Flexible FAST Rig Splatter
- 3 DensDeck StormX
- 4 Flexible FAST
- 5 Approved Plates and Fasteners
- 6 2.6" InsulBase
- 7 2.6" InsulBase
- 8 Steel Deck

- 1 Sure-Flex PVC 60- or 80-mil
- 2 CAV-GRIP® PVC Adhesive
- 3 EcoStorm VSH
- 4 Flexible FAST Rig Splatter
- 5 2.6" InsulBase
- 6 Flexible FAST Rig Splatter
- 7 Approved Plates and Fasteners
- 8 2.6" InsulBase
- 9 Steel Deck