CARLISLE'S SURE-SEAL

Sure-Seal®/Sure-White® EPDM Roofing Systems

August 2007

Products

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This Section does not include information on the FleeceBACK®, Hot Mopped or Sure-Weld® Membrane and Accessories.
Such information can be found in the respective specification for each system.

CARLISLE
Carlisle SynTec

Sure-Seal®/Sure-White® EPDM Roofing Systems

August 2007

Products

This section lists and describes products manufactured or marketed by Carlisle. Refer to the "Design Criteria" and/or respective "Application" sections in this manual for their use and applicability.

The components of Carlisle's Roofing Systems are to be products of Carlisle or accepted by Carlisle as compatible. The installation, performance or integrity of products by others, **when selected by the specifier and accepted as compatible by Carlisle**, is not the responsibility of Carlisle and is expressly disclaimed by the Carlisle Warranty.

Consult the Carlisle Technical Data Bulletins for the shelf life limitation, coverage rates and application procedures of each product. Refer to the manufacturer's Material Safety Data Sheets for applicable precautions and warnings prior to the use of any product.

A. SURE-SEAL/SURE-WHITE EPDM MEMBRANES

1. Cured non-reinforced or reinforced EPDM (Ethylene, Propylene, Diene Terpolymer) compounded elastomer.

   Non-Reinforced EPDM membrane is available in **Sure-Seal (black)** or **Sure-White (white-on-black)**. Sure-White membrane must be installed with the white surface facing up. **Reinforced EPDM is available in Sure-Seal (black) only.**

2. **Pre-KLEENED™ Sure-Seal (black) EPDM Membrane** (mica dust has been removed during manufacturing) is available for sheets maximum 10' wide. Refer to applicable "Application" sections for installation procedures.

Note: Factory-Applied TAPE™ (3" or 6" wide) is available for 60-mil and 45-mil thick non-reinforced EPDM in membrane sheets up to 25' wide. 10' wide reinforced EPDM is also available with Factory-Applied TAPE.

3. Membrane is available in various sizes as outlined below.

   a. **Non-Reinforced EPDM Membrane**

      Sure-Seal (black) 45 or 60-mil thick non-reinforced EPDM membrane - maximum 50' wide, maximum 100' long (additional lengths available dependent on membrane thickness and width). Conforms to ASTM D4637, Type I (non-reinforced).

      Sure-White (white-on-black) 60-mil thick non-reinforced EPDM membrane - maximum 10' wide, maximum 100' long, which meets ASTM D4637, Type I.

   b. **Reinforced EPDM Membrane (Sure-Seal, black only)**

      Sure-Seal (black) 45 and 60-mil thick reinforced EPDM membrane - 4-1/2', 8' or 10' wide, maximum 100' long, reinforced membrane (10' wide 45-mil thick membrane is also available in lengths of 200') with polyester fabric. Conforms to ASTM D4637, Type II (reinforced).

      Sure-Seal (black) Sure-Tough™ Reinforced EPDM membrane - approximately 75-mil thick, 10' wide by 100' long membrane offering enhanced puncture, tear and wind uplift resistance. Reinforced with polyester fabric, which meets ASTM D-4637, Type II.

Refer to the physical properties listed on the following pages.

SURE-SEAL (Black)
45 and 60-MIL THICK NON-REINFORCED EPDM MEMBRANE
STANDARD AND FIRE RETARDANT (FR)

45-mil thick black non-reinforced EPDM membrane is used for:

1. Sure-Seal Design "B" Loose Laid Ballasted Roofing Systems
2. Sure-Seal Design "C" Loose Laid Protected Roofing Systems

60-mil thick black non-reinforced FR (Fire Retardant) EPDM membrane is used primarily for the Sure-Seal Adhered Roofing System. This membrane can also be used for the Sure-Seal Design "B" and Design "C" Roofing Systems.

Note: Although 60-mil thick Non-Reinforced EPDM is recommended for Adhered Roofing Systems, 45-mil thick FR Non-Reinforced EPDM may be utilized, **if specified**.

Physical Property	Test Method	ASTM SPEC.(Pass)	Typical	
			45-mil Standard	60-mil FR
Tolerance on Nominal Thickness, %	ASTM D 412	±10	±10	±10
Tensile Strength, min, psi (MPa)	ASTM D 412	1305 (9)	1550 (10.7)	1550 (10.7)
Elongation, Ultimate, min, %	ASTM D 412	300	480	480
Tear Resistance, min, lbf/in (kN/m)	ASTM D 624 (Die C)	150 (26.3)	200 (35.0)	200 (35.0)
Factory Seam Strength, min.	Modified ASTM D 816	Membrane Rupture	Membrane Rupture	Membrane Rupture
Resistance to Heat Aging*	ASTM D 573			
Properties after 4 weeks @ 240°F (116°C)				
Tensile Strength, min, psi (MPa)	ASTM D 412	1205 (8.3)	1500 (10.3)	1500 (10.3)
Elongation, Ultimate, min, %	ASTM D 412	200	225	225
Tear Resistance, min, lbf/in (kN/m)	ASTM D 624	125 (21.9)	215 (37.6)	215 (37.6)
Linear Dimensional Change, max, %	ASTM D 1204	±1.0	-0.4	-0.4
Ozone Resistance* Condition after exposure to 100 pphm Ozone in air for 168 hours @ 104°F (40°C) Specimen is at 50% strain	ASTM D 1149	No Cracks	No Cracks	No Cracks
Brittleness Temp., max, deg. F (deg. C)*	ASTM D 746	-49 (-45)	-67 (-55)	-67 (-55)
Resistance to Water Absorption* After 7 days immersion @ 158°F (70°C) Change in mass, max, %	ASTM D 471	+8.0, -2.0	+2.0	+2.0
Water Vapor Permeance* max, perm	ASTM E 96 (Proc. B or BW)	0.1	.05	.05
Resistance to Outdoor (Ultraviolet) Weathering* Xenon-Arc, 7560 kJ/m^2 total radiant exposure at .70 W/m^2 irradiance, 176°F (80º C) black panel temp.	ASTM D 4637 Conditions	No Cracks No Crazing	No Cracks No Crazing	No Cracks No Crazing

* Not a Quality Control Test due to the time required for the test or the complexity of the test. However, all tests are run on a statistical basis to ensure overall long-term performance of the sheeting.

SURE-WHITE (White-on-Black)
60-MIL THICK NON-REINFORCED EPDM MEMBRANE

The membrane is used for Sure-White Adhered Roofing Systems.

Physical Property	Test Method	ASTM SPEC.(Pass)	Typical
Tolerance on Nominal Thickness, %	ASTM D 412	±10	±10
Tensile Strength, min, psi (MPa)	ASTM D 412	1305 (9)	1685 (11.6)
Elongation, Ultimate, min, %	ASTM D 412	300	480
Tear Resistance, min, lbf/in (kN/m)	ASTM D 624 (Die C)	150 (26.3)	200 (35.0)
Factory Seam Strength, min.	Modified ASTM D 816	Membrane Rupture	Membrane Rupture
Resistance to Heat Aging*	ASTM D 573		
Properties after 1 week @ 240°F (116°C)			
Tensile Strength, min, psi (MPa)	ASTM D 412	1205 (8.3)	1550 (10.7)
Elongation, Ultimate, min, %	ASTM D 412	200	250
Tear Resistance, min, lbf/in (kN/m)	ASTM D 624	125 (21.9)	185 (32.4)
Linear Dimensional Change, max, %	ASTM D 1204	±1.0	-0.5
Ozone Resistance* Condition after exposure to 100 pphm Ozone in air for 168 hours @ 104°F (40°C) Specimen is at 50% strain	ASTM D 1149	No Cracks	No Cracks
Brittleness Temp., max, deg. F (deg. C)*	ASTM D 746	-49 (-45)	-67 (-55)
Resistance to Water Absorption* After 7 days immersion @ 158°F (70°C) Change in mass, max, %	ASTM D 471	+8.0, -2.0	+3.6
Water Vapor Permeance* max., perms	ASTM E 96 (Proc. B)	0.1	.05
Resistance to Outdoor (Ultraviolet) Weathering* Xenon-Arc, 7560 kJ/m^2 total radiant exposure at .70 W/m^2 irradiance, 176°F (80°C) black panel temperature	ASTM D 4637 Conditions	No Cracks No Crazing	No Cracks No Crazing
* Not a Quality Control Test due to the time required for the test or the complexity of the test. However, all tests are run on a statistical basis to ensure overall long-term performance of the sheeting.			

SURE-SEAL (Black)
45 and 60-MIL THICK REINFORCED EPDM MEMBRANE
STANDARD AND FIRE RETARDANT (FR)

The membrane is used for:

1. Sure-Seal Adhered Roofing Systems
2. Sure-Seal Mechanically Fastened Roofing Systems
3. Sure-Seal Metal Retrofit Roofing Systems
4. Sure-Seal Design "B" Ballasted and Design "C" Roofing Systems

Physical Property	Test Method	ASTM SPEC.(Pass)	Typical
Tolerance on Nominal Thickness, %	ASTM D 751	±10	±10
Thickness Over Scrim, min, in. (mm)	ASTM D 4637 Annex	.015 (.381)	.045"-.016 (.406) .060"-.020 (.508)
Breaking Strength, min, lbf (N)	ASTM D 751 Grab Method	90 (400)	180 (800)
Elongation, Ultimate, min, %	ASTM D 751 Grab Method	250 **	480 **
Tear Strength, min, lbf (N)	ASTM D 751 B Tongue Tear	10 (45)	30 (132)
Brittleness Temp., max, deg. F (deg. C) *	ASTM D 2137	-49 (-45)	-60 (-51)
Resistance to Heat Aging * Properties after 4 weeks @ 240°F Breaking Strength, min, lbf (N) Elongation, Ultimate, min, % Linear Dimensional Change, max, %	ASTM D 573 ASTM D 751 ASTM D 751 ASTM D 1204	 80 (355) 200 ** ±1.0	 200 (890) 250 ** -0.7
Ozone Resistance* Condition after exposure to 100 pphm Ozone in air for 168 hours @ 104° F Specimen wrapped around 3" mandrel	ASTM D 1149	No Cracks	No Cracks
Resistance to Water Absorption* After 7 days immersion @ 158°F (70°C) Change in mass, max, %	ASTM D 471	+8.0, -2.0 **	+2.0 **
Resistance to Outdoor (Ultraviolet) Weathering* Xenon-Arc, 7560 kJ/m^2 total radiant exposure at .70 W/m^2 irradiance, 176°F (80°C) black panel temperature	ASTM D 4637 Conditions	No Cracks No Crazing	No Cracks No Crazing

* Not a Quality Control Test due to the time required for the test or the complexity of the test. However, all tests are run on a statistical basis to ensure overall long-term performance of the sheeting.

** Specimens to be prepared from coating rubber compound, vulcanized in a similar method to the reinforced product.

SURE-SEAL (Black)
SURE-TOUGH™ REINFORCED EPDM MEMBRANE

This membrane is approximately 75-mil thick with enhanced reinforcement which maximizes puncture and tear resistance. The material can be used for:

1. Sure-Seal Adhered Roofing Systems
2. Sure-Seal Mechanically Fastened Roofing Systems
3. Sure-Seal Metal Retrofit Roofing Systems
4. Sure-Seal Design "B" Loose Laid Ballasted Roofing Systems

Physical Property	Test Method	ASTM SPEC.(Pass)	Typical
Tolerance on Nominal Thickness, %	ASTM D 751	±10	±10
Thickness Over Scrim, min, in. (mm)	ASTM D 4637 Annex	.015 (.381)	.020 (0.508)
Color	N/A	N/A	Gray/Black
Breaking Strength, min, lbf (N)	ASTM D 412 Grab Method	90 (400)	230 (1023)
Elongation, Ultimate, min, %	ASTM D 751 Grab Method	250 **	500 **
Tear Strength, min, lbf (N)	ASTM D 751 B Tongue Tear	10 (45)	70 (311)
Brittleness Temp., max, deg. F (deg. C) *	ASTM D 2137	-49 (-45)	-60 (-51)
Resistance to Heat Aging *	ASTM D 573		
Properties after 4 weeks @ 240°F			
Breaking Strength, min, lbf (N)	ASTM D 751	80 (355)	250 (1112)
Elongation, Ultimate, min, %	ASTM D 751	200 **	250 **
Linear Dimensional Change, max, %	ASTM D 1204	±1.0	-0.7
Ozone Resistance* Condition after exposure to 100 pphm Ozone in air for 168 hours @ 104° F Specimen wrapped around 3" mandrel	ASTM D 1149	No Cracks	No Cracks
Resistance to Water Absorption* After 7 days immersion @ 158°F (70°C) Change in mass, max, %	ASTM D 471	+8.0, -2.0 **	+2.0 **
Hydrostatic Resistance, (min) psi (MPa)	ASTM D 751	380 (2.6)	440 (3.0)
Static Puncture Resistance, lbf (N)	FTM 2031	N/A	>250 (1112)
Resistance to Outdoor (Ultraviolet) Weathering* Xenon-Arc, 7560 kJ/m^2 total radiant exposure at .70 W/m^2 irradiance, 176°F (80°C) black panel temperature	ASTM D 4637 Conditions	No Cracks No Crazing	No Cracks No Crazing

* Not a Quality Control Test due to the time required for the test or the complexity of the test. However, all tests are run on a statistical basis to ensure overall long-term performance of the sheeting.

** Specimens to be prepared from coating rubber compound, vulcanized in a similar method to the reinforced product.

B. FLASHING ACCESSORIES

1. **Sure-Seal (black)/Sure-White (white) Pressure-Sensitive Pipe Seals** with Factory-Applied TAPE on the deck flange are available for use with Sure-Seal/Sure-White Roofing Systems**:**

   a. Sure-Seal Pressure-Sensitive Pipe Seals are available in sizes: 1/2" to 3", 4" to 6" and 1" to 6".

   b. Sure-White Pressure-Sensitive Pipe Seals are available in one size: 1" to 6".

2. **Sure-Seal Pourable Sealer Pocket**: A pre-fabricated Pourable Sealer Pocket which consists of a 2" wide plastic support strip with Factory-Applied, adhesive backed uncured Elastoform Flashing; available in 4" 6" and 8" diameters. Available in black only.

3. **Sure-Seal Inside/Outside Corner:** A 7" by 9" precut 60-mil thick (black) Elastoform Flashing with a 35-mil Factory-Applied TAPE. Available in black only.

4. **Sure-Seal/Sure-White Pressure-Sensitive Curb Flashing** – A 20" wide by 50' long Sure-Seal or Sure-White cured 60-mil thick EPDM membrane with 5" wide Factory-Applied TAPE along one edge to be used to flash curbs/skylights, etc.

5. **Sure-Seal Pressure-Sensitive Overlayment Strip:** A nominal 40-mil black, **semi-cured** EPDM membrane laminated to a nominal 35-mil cured, Factory-Applied TAPE. Available in 6", 9" and 12" widths and 100' long rolls used to flash gravel stops, metal edgings and Seam Fastening Plates used for additional membrane securement.

6. **Sure-Seal/Sure-White Pressure-Sensitive Cured Cover Strip:** a 6", 9" and 12" wide by 100' long Sure-Seal or Sure-White 60-mil cured EPDM membrane laminated to a nominal 35-mil cured Factory-Applied TAPE. The Cured Cover Strip is ideal for stripping in seams, flash gravel stops, metal edging and Carlisle Seam Fastening Plates.

7. **Sure-Seal Pressure-Sensitive "T" Joint Covers:** A factory cut 6" x 6" uncured 60-mil thick EPDM flashing (with rounded corners) laminated to a nominal 35-mil Factory-Applied TAPE, used to overlay field splice intersections and to cover field splices at angle changes.

8. **Sure-White Pressure-Sensitive Corner/T-Joint Cover:** A 7" by 9" precut 60-mil thick (white) Elastoform Flashing with a 35-mil Factory-Applied TAPE; used for inside and outside corners, to overlay field splice intersections, and to cover field splices at angle changes.

9. **Sure-Seal/Sure-White Uncured EPDM Elastoform Flashing®:** An easily formed, 60-mil thick Sure-Seal or Sure-White uncured EPDM membrane. Sure-Seal Uncured Elastoform Flashing is available in widths of 12" and 18" and lengths of 100'. Sure-White Uncured Elastoform Flashing is available in 12" width only.

   Sure-Seal uncured flashing is to be used in conjunction with Sure-Seal (black) Roofing Systems and the Sure-White uncured flashing is to be used in conjunction with Sure-White (white-on-black) Roofing Systems. Sure-Seal/Sure-White uncured Elastoform Flashing is used mainly to flash inside and outside corners, pipes, scuppers and field fabricated pourable sealer pockets when the use of Carlisle pre-fabricated flashing accessories is not feasible.

10. **Sure-Seal/Sure-White Pressure-Sensitive Elastoform® Flashing:** A 9" or 12" wide by 50' long, 60-mil thick Sure-Seal or Sure-White **uncured** EPDM Flashing laminated to a 35-mil Factory-Applied TAPE used in conjunction with Sure-Seal Primer as an option to Sure-Seal Elastoform Flashing.

C. CLEANERS, PRIMERS, ADHESIVES AND SEALANTS

Refer to Technical Data Bulletins for material coverage rates and proper usage. Prior to the use of any of the products listed below, consult the Material Safety Data Sheets for applicable cautions and warnings.

1. **Carlisle Weathered Membrane Cleaner:** A clear, solvent-based cleaner used to loosen and remove dirt and other contaminants from the surface of exposed EPDM membrane (for repairs, etc.) prior to applying Sure-Seal Splice Cleaner or Primer. Weathered Membrane Cleaner can also be used in lieu of splice cleaner when applying Splicing Cement. Available in 5-gallon pails.

2. **Sure-Seal SecurTAPE™:** A 3" or 6" wide (used for Mechanically Fastened Roofing Systems and 20-year Warranty Systems) by 100' long splice tape used for splicing adjoining sections of EPDM membrane. Complies with the South Coast Air Quality Management District Rule 1168.

3. **Sure-White SecurTAPE:** A 3" wide by 100' long, cream colored splice tape used with Sure-White Systems. Complies with the South Coast Air Quality Management District Rule 1168.

4. **Sure-Seal HP-250 Primer:** A solvent-based primer used to prepare the surface of EPDM membrane for application of Splice Tape or Pressure-Sensitive products. This Primer can also be used in conjunction with EP-95 Splicing Cement in lieu of Splice Cleaner.

5. **Sure-Seal LV-600 Primer:** A low VOC (volatile organic compound) primer (less than 250 grams/liter) for use with Splice Tape or Pressure-Sensitive products. Complies with the South Coast Air Quality Management District Rule 1168.

6. **Splicing Cement:** A high-strength, butyl-based contact cement which is used for splicing adjoining sections of EPDM membrane (cured or uncured).

   a. Sure-Seal EP-95 Splicing Cement: Black splicing cement for use with Sure-Seal (black) Roofing Systems.

   b. Sure-White Splicing Cement: White splicing cement used with Sure-White (white-on-black) Adhered Roofing Systems.

7. **In-Seam Sealant 1124:** A one-part, gun-consistency sealant applied in adhesive splices between **cured** Sure-Seal/Sure-White EPDM membrane sections.

8. **Lap Sealant:** A black, heavy-bodied material (trowel or gun-consistency) used to seal the exposed edges of a membrane splice. A pre-formed Lap Sealant tool is included in each carton of Lap Sealant.

   a. Sure-Seal Lap Sealant: Black sealant for use with Sure-Seal (black) Roofing Systems.

   b. Sure-White Lap Sealant: White sealant for use with Sure-White (white-on-black) Roofing Systems.

9. **90-8-30A Bonding Adhesive:** A high-strength, yellow colored, synthetic rubber adhesive used for bonding Sure-Seal/Sure-White EPDM membranes to various surfaces.

10. **Aqua Base 120 Bonding Adhesive** (for use in areas where volatile organic compound, VOC, regulations are in effect): A semi pressure-sensitive water based adhesive; used as a 2-sided contact adhesive for bonding Sure-Seal/Sure-White EPDM membrane to various surfaces. Complies with the South Coast Air Quality Management District Rule 1168.

11. **Water Cut-Off Mastic:** A one-component, low viscosity, self wetting, Butyl blend mastic used as a sealing agent between the EPDM membrane or Elastoform Flashing and applicable substrates.

12. **Pourable Sealer**: A black, two-component, solvent-free, polyurethane based product used for tie-ins and as a sealant around hard-to-flash membrane penetrating objects such as clusters of pipes and for a daily seal when the completion of flashings and terminations cannot be completed by the end of each work day.

13. **Sure-Seal One-Part Pourable Sealer:** A black, one-component, moisture curing, elastomeric polyether sealant used for attaching lightning rod bases and ground cable clips to the membrane surface and as a sealant around hard-to-flash penetrations such as clusters of pipes.

14. **PT-304 Sealant:** A one-part urethane, non-sagging sealant designed for sealing expansion joints, control joints and counterflashings. Available in white only.

D. EPICHLOROHYDRIN (ECO/CO) MEMBRANE AND RELATED PRODUCTS

1. Cured, non-reinforced (black), 60-mil thick ECO/CO compounded Hydrin® epichlorohydrin elastomer which conforms to minimum physical properties as listed below. The membrane is available in maximum 10' widths and 50' lengths.

   The membrane is especially designed to resist hydrocarbons, solvents, grease and oil, and is promoted for use as a **protective overlayment on EPDM roofing systems with a minimum slope of 1/4" in 12"**. Carlisle must be

contacted regarding application requirements when ECO/CO membrane is to be specified.

SURE-SEAL (Black)
60-MIL THICK EPICHLOROHYDRIN (ECO/CO) MEMBRANE

Physical Property	Test Method	SPEC.(Pass)	Typical
Tolerance on Nominal Thickness, %	ASTM D 412	±10	±10
Tensile Strength, min, psi (MPa)	ASTM D 412	1305 (9.0)	1550 (10.7)
Elongation, Ultimate, min, %	ASTM D 412	200	250
Tear Resistance, min, lbf/in (kN/m)	ASTM D 624 (Die C)	150 (26.3)	225 (39.4)
Resistance to Heat Aging* Properties after 168 hours @ 240°F (116°C) Tensile Strength, min, psi (MPa) Elongation, Ultimate, min, %	 ASTM D 412 ASTM D 412	 1305 (9.0) 150	 1500 (10.3) 182
Ozone Resistance* Condition after exposure to 100 pphm Ozone in air for 168 hours @ 104°F (40°C) Specimen is at 50% strain	ASTM D 1149	No Cracks	No Cracks
Brittleness Temp., max, deg. F (deg. C)*	ASTM D 746	-20 (-29)	-20 (-29)
Water Vapor Permeability* max, perms (.060" thickness)	ASTM E 96 (Proc. B)	0.10	.042
Oil Absorption * Change in mass, max, % after 7 days immersion in Diesel fuel #2 at 158°F (70°C)	ASTM D 471	+15	+15
* Not a Quality Control Test due to the time required for the test or the complexity of the test. However, all tests are run on a statistical basis to ensure overall long-term performance of the sheeting.			

2. **Carlisle Weathered Membrane Cleaner:** A solvent-based cleaner that provides the clean surface necessary for applying P-30 Splicing Cement and ECH-1 Lap Sealant.

3. **P-30 Splicing Cement**: A high-strength, solvent-based contact cement which is used for splicing adjoining sections of ECO/CO membrane.

4. **In-Seam Sealant 1124**: A one-part, gun-consistency sealant applied in the splice area between ECO/CO membrane sections.

5. **ECH-1 Lap Sealant**: A heavy bodied material (trowel or gun consistency) used to seal the exposed edges of ECO/CO membrane splices.

E. FASTENING COMPONENTS

1. **Sure-Seal Pressure-Sensitive RUSS™** (Reinforced Universal Securement Strip): A 6" or 9" wide, nominal 45-mil thick clean, cured reinforced EPDM black membrane with 3" wide Factory-Applied TAPE laminated along one edge for the 6" wide RUSS and along both edges for the 9" wide RUSS.

   a. **6" wide Pressure-Sensitive RUSS** is used horizontally or vertically at the base of walls, curbs, etc., in conjunction with 2" diameter Fastening Plates below the EPDM deck membrane for additional membrane securement (Polymer Seam Plates are required for Mechanically Fastened Roofing Systems over steel decks).

   b. **9" wide Pressure-Sensitive RUSS** is utilized for perimeter membrane securement on Sure-Seal Mechanically Fastened Roofing Systems and primary securement on Metal Retrofit Roofing Systems. Packaged in rolls 100' long.

2. **Sure-White Pressure-Sensitive RUSS** (Reinforced Universal Securement Strip): A 6" wide, nominal 45-mil thick clean, cured, white reinforced EPDM membrane with 3" wide Factory-Applied TAPE laminated along one edge. Used on Sure-White Adhered Roofing Systems.

3. **RUSS**: A standard 6" wide, 100' long, strip of Sure-Seal (black) reinforced EPDM membrane. Used for

membrane securement on Adhered and Ballasted Roofing Systems for maximum 10-year warranty projects (not for use on Mechanically Fastened Systems regardless of warranty length).

9" wide standard RUSS is utilized in conjunction with gravel stops and metal edgings to allow continuation of cured EPDM deck membrane as flashing.

4. **HP Polymer Seam Plate**: A 2" diameter plastic barbed fastening plate used with Carlisle HP Fasteners for membrane and Pressure-Sensitive RUSS securement for Mechanically Fastened Roofing Systems over steel roof decks. (Available pre-assembled.)

5. **Seam Fastening Plate**: A 2" diameter metal fastening plate used for membrane and RUSS attachment on Mechanically Fastened Roofing Systems over wood or structural concrete decks. Seam Fastening Plates are also used in conjunction with RUSS or EPDM membrane for additional membrane securement on Adhered or Ballasted Roofing Systems. This plate may be used for insulation attachment on Mechanically Fastened Roofing Systems.

6. **Insulation Fastening Plate**: A nominal 3" diameter FM approved metal plate used for insulation attachment in conjunction with Sure-Seal Fasteners.

7. **Polymer Batten Bar**: A 1" wide by 1/20" thick polymer bar which is pre-punched 6" o. c. packaged in 250' long coils used for membrane securement on Mechanically Fastened Roofing Systems.

8. **Sure-Seal Sure-Tite (ST) Fastening Bar**: A 1" x .040" x 10' long gavalume-coated steel fastening bar used primarily for membrane securement in conjunction with Sure-Tite Fasteners on Mechanically Fastened Roofing Systems.

9. **Sure-Seal Fasteners**

   All Sure-Seal Fasteners listed below can be used with Sure-Seal or Sure-White Roofing Systems. Refer to the applicable specification for specific requirements.

   a. **HP Fastener**: A threaded, black epoxy electro-deposition coated (E-Coat) fastener for use with steel, wood plank, minimum 15/32" thick plywood or minimum 7/16" thick oriented strand board.

   b. **InsulFast Fasteners**: A threaded, Phillips head fastener used with 3" diameter Carlisle Insulation Plates. Used for insulation attachment into steel or wood decks.

   c. **Pre-Assembled ASAP Fasteners**: Carlisle's InsulFast Fastener and pre-assembled 3" diameter Plastic Insulation Plate used for insulation attachment on Adhered and Mechanically Fastened Roofing Systems. Installed using Olympic Fastening Tools.

   d. **Sure-Tite Fasteners**: A nominal 33-mil diameter fastener incorporating an oversized #3 Phillips head used for membrane securement or Mechanically Fastened Roofing Systems in conjunction with Sure-Tite (ST) Fastening Bars.

   e. **CD-10 Concrete Fastener**: A hammer-driven, non-threaded, black epoxy electro-deposition coated (E-Coat) fastener for use with structural concrete decks rated 3,000 psi or greater.

   f. **HD 14-10 Concrete Fastener**: A #14 threaded fastener used for minimum 3,000 psi concrete decks.

   g. **HP-NTB Fastener**: A non-penetrating, plastic fastener and corresponding plate used with lightweight deck substrates such as cementitious wood fiber and gypsum.

   h. **Lite-Deck Fastener**: An oversized diameter metal fastener and associated 3" diameter Lite-Deck metal plate for use on Adhered Roofing Systems to attach insulation to dense gypsum decks.

   i. **HP-X Fasteners:** A heavy-duty #15 threaded fastener with a Phillips head for use primarily on Adhered assemblies where increased pullout resistance is necessary. Used for steel and wood decks.

   j. **HP Purlin Fastener**: A hex-head, threaded, self-drilling, black epoxy electro-deposition coated (E-Coat) fastener used for membrane/RUSS securement into structural purlins (12-18 gauge) in conjunction with Sure-Seal and Sure-Weld Metal Retrofit Roofing Systems.

k. **HP Term Bar Nail-In**: A 1-1/4" long expansion anchor with threaded drive pin used for fastening Sure-Seal Termination Bar or Seam Fastening Plates to concrete, brick or block walls. The fastener is set by hammering the drive pin into place.

F. INSULATION/UNDERLAYMENT

SURE-SEAL INSULATIONS

Brand Name	Board Size	Thickness		R-Value @40° F (5° C)	Minimum Compressive Strength (1)	Minimum Density
		Inch	cm			
Sure-Seal EPS (Expanded Polystyrene) Tapered and higher density boards are available upon request	4' x 4' (1.2 m x 1.2 m) or 4' x 8' (1.2 m x 2.4 m)	1" 1-1/2" 2" 3" 4" 5"	2.5 3.8 5 7.6 10.1 12.7	4.17 6.25 8.33 12.50 16.67 20.83	10 psi (.7 kg/cm^2)	0.9 pcf (14.42 kg/cu m)
HP Recovery Board (High density wood fiber with asphalt coated facer)	4' x 4' (1.2 m x 1.2 m) or 4' x 8' (1.2 m x 2.4 m)	1/2" 1"	1.3 2.5	1.23 2.46	32 psi (2.25 kg/cm^2)	15.5 pcf (248 kg/cu m)
Sure-Seal EPS Composite Board (Expanded Polystyrene/wood fiber composite with asphalt coated facer) Higher density boards are available upon request.	4' x 4' (1.2 m x 1.2 m)	1-1/2" 2" 2-1/2" 3" 4" 5-1/2"	3.8 5 6.4 7.6 10.1 14	5.40 7.48 9.56 11.67 15.75 22.06	See individual board physical properties.	See individual board physical properties.
Polyisocyanurate HP-H (3) (Polyisocyanurate with a medium glass facer) **SecurShield™ Polyiso** (3) (Polyisocyanurate with a coated glass fiber mat) Tapered boards are available upon request.	4' x 8' (1.2 m x 2.4 m)	1" 1-1/2" 2" 2-1/2" 3" 3-1/2" 4"	2.5 3.8 5 6.4 7.6 8.9 10.1	6.00 9.00 12.10 15.30 18.50 21.7 25.00	20 psi (2) (1.13 kg/cm^2)	2 pcf (24 kg/cu m)

Notes:
(1) Compressive strength at 10% deformation.
(2) Also available up to 25 psi.
(3) R-Value based on 15 year time-weighted average Long-Term Thermal Resistance (LTTR), following ASTM C1289-05a and CAN/ULC-S770, which has been adopted by PIMA (Polyisocyanurate Insulation Manufacturer's Association) as of Jan. 1, 2003.

Dens-Deck and Dens-Deck Prime Glass Mat Gypsum Boards (Supplied by Carlisle)			
Properties	**DensDeck or DensDeck Prime ***		
Thickness, nominal inches	5/16"	1/2"	5/8"
Width, standard	4'		
Length standard	8' ± 1/4"		
Weight, lbs/ sq. ft. nominal	1/4" thick – 1.1	1/2" thick – 1. 95	5/8" thick – 2.5
Surfacing	Glass Mat *		
Flexural Strength, Parallel, lbs. Min (4)	1/4" thick – 40	1/2" thick – 80 (5)	5/8" thick – 100 (5)
Flexural Strength, Perpendicular, lbs. Min (4)	1/4" thick – 50	1/2" thick – 100 (5)	5/8" thick – 140 (5)
Flute Spanability (1)	1/4" thick – 2-5/8"	1/2" thick – 5"	5/8" thick – 8"
Permeance Perms (2)	1/4" thick – 50	1/2" thick – 35	5/8" thick – 32
R-Value (3)	1/4" thick – .28	1/2" thick – .56	5/8" thick – .67
Coeffficient of thermal Expansion Inches/inch/° F	8.5 x 10 –6		
Linear Variation with Change in Moisture in/in/%RH	6.25 x 10 –6		
Absorption, % max. (4)	10.0		
Compression, psi	500		
Surface Water Absorption grams (4)	2.5		
Flame spread – Smoke Developed (ASTM D 84)	0		
Fire Classification	1/4" and 1/2" thick ** - UL Class A, ULC S-102, UL 1256, ULC S-126, UL 790 5/8" thick ** - UL Classified "P" Assemblies, ULC S-101		
* DensDeck Prime incorporates a glass mat/primed surface. ** 1/2" and 5/8" thick meet FMRC Class 1	Notes: (1) Tested in accordance with ASTM E 661 (400 lb. Conc. Load). (2) Tested in accordance with ASTM C 335 (dry cup method). (3) Tested in accordance with ASTM C 518 (heat flow meter). (4) Tested in accordance with ASTM C 473 (5) ASTM E 1177 minimums.		

FOAMULAR® INSULATIONS (supplied by Carlisle)						
Brand Name	**Board Size**	**Thickness**		**R-Value @ 40° F (5° C)**	**Minimum Compressive Strength (1)**	**Minimum Density (2)**
		Inch	**cm**			
Thermapink 18 (Extruded Polystyrene)	2' x 8' (.61 m x 2.4 m) or 4' x 8' (1.2 m x 2.4 m)	1" 1-1/2" 2" 2-1/2" 3"	2.5 3.8 5 6.4 7.6	5.00 7.50 10.00 12.50 15.00	18 psi (1.05 kg/cm^2)	1.35 pcf (22 kg/cu m)
Thermapink 25 (Extruded Polystyrene) Tapered boards are available upon special request	2' x 8' (.61 m x 2.4 m) or 4' x 8' (1.2 m x 2.4 m)	3/4" 1" 1-1/2" 2" 2-1/2" 3" 3-1/2" 4"	1.9 2.5 3.8 5 6.4 7.6 8.9 10.1	3.75 5.00 7.50 10.00 12.50 15.00 17.50 (3) 20.00 (3)	25 psi (1.76 kg/cm^2)	1.6 pcf (26 kg/cu m)
Durapink (Extruded Polystyrene)	4' x 8' (1.2 m x 2.4 m)	1/2"	1.3	2.50	18 psi (1.27 kg/cm^2)	1.6 pcf (26 kg/cu m)
		3/4" 1"	1.9 2.5	3.75 5.00	25 psi 1.76 kg/cm^2)	
Foamular 404 (Extruded Polystyrene with drainage channels) For use above the membrane on Design "C" Loose Laid Protected Roofing Systems.	2' x 8' (.61 m x 2.4 m)	1-1/2" 2" 3"	3.8 5 7.6	7.50 10.00 15.00	40 psi (2.81 kg/cm^2)	1.8 pcf (29 kg/cu m)
Foamular 400 (Extruded Polystyrene) For use primarily with waterproofing installations.	2' x 8' (.61 m x 2.4 m)	1" 1-1/2" 2" 2-1/2" 3" 3-1/2" 4"	2.5 3.8 5 6.4 7.6 8.9 10	5.00 7.50 10.00 12.50 15.00 17.50 20.00	40 psi (2.81 kg/cm^2)	1.8 pcf (29 kg/cu m)
Foamular 600 (Extruded Polystyrene) For use primarily with waterproofing installations.	2' x 8' (.61 m x 2.4 m)	1-1/2" 2" 2-1/2" 3"	3.8 5 6.4 7.6	7.50 10.00 12.50 15.00	60 psi (4.22 kg/cm^2)	2.2 pcf (35 kg/cu m)

Notes:
(1) Value at yield or 5% deformation (10% for Thermapink 18 and 25), whichever occurs first.
(2) The densities listed are minimum in accordance with ASTM C 578-87A (the minimum density listed for Durapink 1/2" Board is based on ASTM C303).
(3) Thickness available in 2' x 8' only.

DOW STYROFOAM INSULATIONS (supplied by Carlisle)						
Brand Name	**Board Size**	**Thickness**		**R-Value @ 40° F (5° C)**	**Minimum Compressive Strength ***	**Minimum Density**
		Inch	**cm**			
Deckmate	2' x 8' (.61 m x 2.4 m)	2" 3"	5 7.6	10 15	18 psi (1.27 kg/cm^2)	1.35 (22 kg/cu m)
	4' x 8' (1.2 m x 2.4 m)	1" 1-1/2" 2" 2-1/2" 3"	2.5 3.8 5 6.4 7.6	5 7.5 10.0 12.5 15		
Deckmate Plus	2' x 8' (.61 m x 2.4 m)	2" 3"	5 7.6	10 15	25 psi (1.76 kg/cm^2)	1.6 (26 kg/cu m)
	4' x 8' (1.2 m x 2.4 m)	1" 1-1/2" 2"	2.5 3.8 5	5 7.5 10.0		
Recovermate	4' x 8' (1.2 m x 2.4 m)	1/2"		2.2	18 psi (1.27 kg/cm^2)	2.0 (32 kg/cu m)
Roofmate For use above the membrane on Design "C" Loose Laid Protected Roofing Systems	2' x 8' (.61 m x 2.4 m)	1" 1-1/2" 2" 2-1/2" 3" 3-1/2" 4"	2.5 3.8 5 6.4 7.6 9.9 10	5.0 7.50 10.00 12.5 15.00 17.5 20	40 psi (2.8 kg/cm^2)	1.8 (29 kg/cu m)
Plazamate For use above the membrane on Design "C" Loose Laid Protected Roofing Systems	2' x 8' (.61 m x 2.4 m)	1-1/2" 2" 3"		7.50 10.0 15.0	60 psi (4.22 kg/cm^2)	2.2 (35 kg/cu m)

G. INSULATION SECUREMENT ADHESIVE

1. **Sure-Seal FAST 100 or 100 LV Adhesive:** A spray (full coverage) or bead-applied, two-component polyurethane, construction grade, low-rise expanding foam adhesive used for attaching approved insulations to compatible roof decks (concrete, cellular lightweight insulating concrete, gypsum, cementitious wood fiber, wood or steel) or existing smooth or gravel surfaced BUR, modified bitumen or cap sheets. Coverage rates vary by deck type and are identified in the "Application" Section of the Adhered Roofing System Specification.

2. **Sure-Seal FAST Catalyst:** Added to FAST Adhesive (Part B Side) to quicken adhesive reaction time.

3. **OlyBond 500™ BA** – A two-component, polyurethane, low-rise expanding adhesive used to bond insulation to various substrates. Packaged in 5-gallon pails of Part A and Part B formulations that are applied using a mechanical dispenser system. Applied in 1/2" to 3/4" beads or ribbons at the rate of 1 gallon per 150-250 square feet for 12" o.c. bead spacing. Perimeter bead spacing patterns and acceptable insulation and deck types are listed in the applicable Technical Data Bulletin.

4. **OlyBond Spot Shot** - A two-component, polyurethane construction grade, low-rising expanding adhesive designed for bonding insulation to various substrates. Applied in 1/2" to 3/4" beads or ribbons using a portable 1:1 applicator (oversized, dual-cartridge caulking gun). Refer to the Technical Data Bulletin for bead spacing with reference to building height.

5. **VersiGrip Insulation Adhesive:** A one-component, moisture-curing, polyurethane adhesive that is applied directly from its container in 1/2" to 3/4" beads spaced a maximum of 12" on center to approved substrates at a coverage rate of 200 – 300 square feet per gallon. Perimeter bead spacing patterns and acceptable insulation and deck types are listed in the applicable Technical Data Bulletin.

H. VAPOR/AIR RETARDER

1. **Carlisle 725 Self Adhering Air and Vapor Barrier:** A 40-mil thick composite consisting of 32-mil self-adhering rubberized asphalt membrane laminated to an 8-mil spun bonded polyester fabric which has a permeability rating (ASTM E-96) of 0.05 perms and is fully compatible with urethane based insulation adhesive. Available in rolls 36" wide by 75' long (225 square feet).

2. **Carlisle CCW 702 Primer:** A single component, solvent based, high tack primer used to provide maximum adhesion between Carlisle 725 Air and Vapor Barrier and an approved substrate. Applied by spray or long nap roller with a coverage rating ranging from approximately 250 square feet per gallon on smooth finishes (i.e., concrete) to 75 square feet per gallon on porous surfaces (i.e., Dens-Deck Prime gypsum board). Available in 5-gallon containers.

I. EDGINGS AND TERMINATIONS

Products listed below can be used with any of the available Carlisle Roofing Systems. Refer to the applicable Carlisle details and installation instruction manuals for specific installation criteria.

1. **SecurEdge™ 200**: A snap-on edge system consisting of a 24 gauge galvanized metal water dam and 40, 50 or 63-mil thick aluminum Kynar 500, clear and colored anodized finish or 22 or 24 gauge steel, Kynar 500 finish. The fascia is available in a variety of colors and heights varying from 5" to 12-1/2". Custom fascias and colors are available upon request.

2. **SecurEdge™ 300**: A snap-on edge system consisting of a 24 gauge galvanized metal springclip water dam and 32, 40 or 50-mil thick aluminum Kynar 500, colored anodized finish or 24 gauge steel, Kynar 500 finish. The fascia is available in a variety of colors and heights varying from 5" to 10". Custom fascias and colors are available upon request.

3. **SecurEdge 1000:** A metal anchor bar fascia system consisting of a formed quarter hard 0.050" aluminum retainer bar, corrosion resistant fasteners and a 0.040" aluminum or 24 gauge steel snap-on fascia cover. Available in two versions, one for Fully Adhered and Mechanically Fastened Roofing Systems and one for Ballasted Roofing Systems.

4. **SecurEdge 2000:** An anchor bar roof edge fascia system consisting of heavy .100" thick extruded aluminum bar, corrosion resistant stainless steel fasteners and snap-on fascia cover used with Adhered, Mechanically Fastened and Ballasted assemblies. Refer to installation instructions for various sizes, colors and accessories.

5. **SecurEdge 3000**: A metal anchor bar fascia system consisting of a 20 gauge steel retainer bar, corrosion resistant fasteners and an aluminum or 24 gauge steel snap-on fascia cover. It is for use in Fully Adhered and Mechanically Fastened Roofing Systems only.

6. **Sure-Seal Drip Edge:** Designed for use on Adhered and Mechanically Fastened Roofing Systems. Includes a 22 gauge continuous 12' pre-punched 90-degree angle cleat and 12' long fascia sections. Incorporates concealed joint covers and strong 1-1/4" ring shank nails to provide long-term holding power. A selection of colors in 24 gauge steel, Kynar® 500 and 32-mil aluminum finish or Kynar 500 is available.

7. **SecurEdge Coping:** Incorporates an anchor cleat with pre-slotted holes, a concealed joint cover and 10'or 12' continuous sections of coping cap consisting of 40, 50, 63 or 80-mil thick Kynar 500, clear and colored anodized finish or 24 gauge steel, Kynar 500 finish. The coping cap is available in a variety of colors and widths. Custom pieces such as tees, crosses, radius copings, etc., are also available.

8. **Sure-Seal Ballast Retaining Bar:** A ballast retaining perimeter securement system comprised of a slotted (4" on center) extruded mil aluminum retention bar with an integrated compression fastening strip. 1-1/2" stainless steel fasteners with Neoprene washers are provided for stable securement.

9. **Termination Bar:** A 1" wide and 98-mil thick extruded aluminum bar pre-punched 6" on center which incorporates a sealant ledge to support Lap Sealant and provide increased stability for membrane terminations.

J. OTHER CARLISLE ACCESSORIES

1. **SecurTaper:** An ergonomic equipment innovation designed to provide a means for tape seam application that is efficiently driven, user friendly and quality enhancing.

2. **Flashing Applicator**: Similar in concept to the SecurTaper only used to apply Pressure-Sensitive Flashing.

3. **Seam Roller:** A lightweight 6" wide by 2" diameter roller and 62" long handle with a 45° bend. Allows splices to be rolled in an ergonomic stand-up position.

4. **HP Protective Mat:** A nominal 6-ounce per square yard, black, UV resistant, polypropylene fabric for use as an underlayment for crushed stone or pavers and a puncture protection mat for various Carlisle Roofing Systems. Available in rolls 15' wide by 300' long.

5. **Carlisle Rollout Membrane Underlayment**: A nominal 2.9 ounce per square foot roofing underlayment composed of recycled synthetic fibers, needle punched and coated on one side. The coating is cured to form a firm crust and is installed with the "crust" side facing upwards. Carlisle Rollout can be used as an alternative to HP Recovery Board in Carlisle's Sure-Seal Mechanically Fastened or Ballasted Systems. It is available in 6' x 60' and 12' x 60' rolls.

6. **HP Splice Wipes:** Used in conjunction with Splice Cleaners or HP-250 Primer to clean membrane prior to splicing or applying Lap Sealant.

7. **Hycron® Gloves:** A specially coated glove for protection of hands from irritations and stains during the use of Splice Cleaners, Primers, Splicing Cements and Bonding Adhesives.

8. **Lay Flat Tubing**: 2-1/2" diameter, 15' long tubing filled with dry sand, used in conjunction with Pourable Sealer to temporarily seal the edge of the membrane and to protect completed sections of the roof when nightfall or inclement weather interrupts installation.

9. **Expansion Joint Supports**: A high quality foamed EPDM expansion joint support for use with all Sure-Seal/Sure-White Roofing Systems; available in two profiles for use at expansion joints within the field of the roof and along parapet walls.

10. **Sure-Seal/Sure-White Pressure-Sensitive Walkway Pads**: Sure-Seal (black) or Sure-White (white) molded walkway pads with Factory-Applied TAPE used to provide protection for areas of EPDM membrane that are exposed to regular rooftop maintenance.

11. **Walkway Rolls**: A black, shredded, compressed rubber walkway pad available in 30" wide by 30' long rolls, approximately 5/16" in thickness.

12. **Sure-Seal Rubber Pavers**: A 2' by 2' by 2" thick rubber paver weighing approximately 24 pounds per unit, 6 pounds per square foot manufactured from recycled rubber, which provides a resilient, shock absorbing, weather resistant surface. Designed primarily for use as a walkway or on terrace areas offering a unique, environmentally sound advantage over concrete pavers. Features include freeze/thaw stability, bi-directional drainage and no breakage concerns. Available in black and terra cotta.

13. **Sure-Seal Insert Drains:** Available in Sure-Seal Insert, Vandal Resistant and Add-On Drain models; ideally suited for the reroofing market and are extremely cost effective when compared to removing and replacing existing drain bowls and associated plumbing costs. Insert Drains are designed to retrofit 3", 4", 5" or 6" drain assemblies. The Add-On model is available to connect with 4" outside diameter cast iron or PVC pipe.

14. **Olympic Pipe Support System:** A non-penetrating support system designed to carry piping, conduit, ductwork and elevated walkways across the roof or to support equipment such as air conditioners on the roof.

15. **Sure-Seal Acrylic Coating:** A water-based color coating used with EPDM membrane. Available in standard colors of white and gray.

16. **EM-8 Hypalon Color Coating:** A hypalon (rubber) based paint used for color coating the EPDM membrane. Available in white. Additional colors are available on special order.

17. **Other Accessories Available**: 6" blade heavy-duty scissors and 2" wide steel hand rollers.

This specification represents the applicable information available at the time of its publication. Owners, specifiers and Carlisle authorized roofing applicators should consult Carlisle or their Carlisle Manufacturer's Representative for any information that has subsequently been made available.

Review the appropriate Carlisle warranty for specific warranty coverage, terms, conditions and limitations.