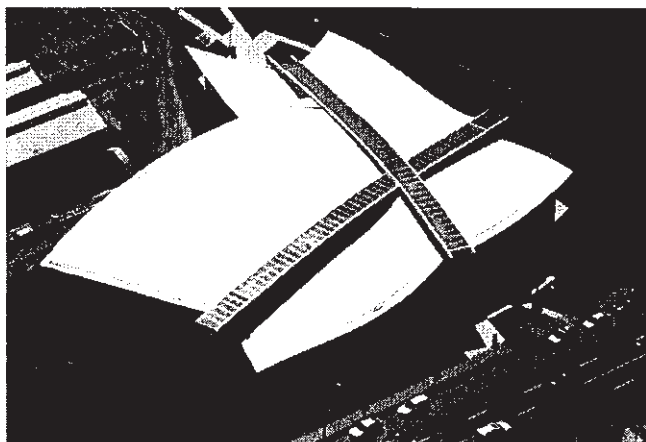


Sure-Weld® TPO

Reinforced Membrane



Overview

Carlisle's Sure-Weld TPO reinforced membrane is a premium, heat-weldable, single-ply thermoplastic polyolefin (TPO) sheet designed for new roof construction and re-roofing applications. Sure-Weld High Slope (HS) membrane is formulated with additional flame retardant for higher-slope fire code approvals. Sure-Weld EXTRA is 80 mils thick for significantly higher strength and weatherability.

Sure-Weld TPO membranes use advanced polymerization technology that combines the flexibility of ethylene-propylene (EP) rubber with the heat weldability of polypropylene. All Sure-Weld TPO membranes include OctaGuard XT™, an industry-leading, state-of-the-art weathering package. OctaGuard XT technology enables Sure-Weld TPO to withstand the extreme weatherability testing that is intended to simulate exposure to severe climates.

Physical properties of the membrane are enhanced by a strong polyester fabric that is encapsulated between the TPO-based top and bottom plies. The combination of the fabric and TPO plies provides high breaking and tearing strength, as well as excellent puncture resistance. The relatively smooth surface of the membrane produces a total surface fusion weld that results in a consistent, watertight, monolithic roof assembly. The membrane is environmentally friendly and safe to install.

Carlisle's Sure-Weld TPO reinforced membrane is available with APEEL™ Protective Film, saving time and labor by eliminating the need for roof cleaning upon project completion. Carlisle's innovative APEEL Protective Film can be left in place for up to 90 days without affecting the integrity of the film, guarding the TPO membrane's surface from scuffs and dirt accumulation during installation. Durable and easy to remove, APEEL Protective Film improves aesthetics and long-term reflectivity and is ideal for re-roofing, re-cover, and new construction projects.

Carlisle's standard and HS TPO membranes are available in highly reflective white, tan, and gray, in both 45-mil and 60-mil thicknesses. 80-mil Sure-Weld EXTRA (including HS) is also offered in white, gray, and tan colors. Sixteen special colors are also available (see Carlisle's TPO Color Palette brochure). Carlisle's TPO is offered in 4-, and 6-ft perimeter sheets and 8-, 10-, and 12-ft field sheets.

Carlisle's tan and white TPO membranes are ENERGY STAR®-qualified and California Title 24 compliant and can contribute toward LEED® (Leadership in Energy and Environmental Design) credits.

Features and Benefits

- » Outstanding puncture resistance
- » Chlorine-free with no halogenated flame retardants
- » Plasticizer-free; does not contain liquid or polymeric plasticizers
- » Excellent resistance to impact and low temperatures
- » Excellent chemical resistance to acids, bases and restaurant exhaust emissions
- » UL 2218 Class 4 hail rating
- » Exceptional resistance to heat, solar UV, ozone and oxidation
- » Manufactured using a hot-melt extrusion process for complete scrim encapsulation
- » 100% recyclable (see Carlisle's Recyclability Statement)
- » Enhanced with the OctaGuard XT weathering package
- » APEEL Protective Film guards the TPO membrane's surface from scuffs and dirt accumulation during installation, improving the roof system's appearance and long-term performance
- » APEEL Protective Film can be left in place for up to 90 days without degrading due to its excellent heat- and UV-resistance



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Installation

1. Sure-Weld TPO roofing systems are quick to install, as minimal labor and few components are required. TPO systems are installed using an Automatic Heat Welder, making sheet welding fast, clean, consistent, and easy to learn, while reducing strain on the roofing technician.
2. APEEL Protective Film should be removed from within areas that are to be heat-welded together. In areas that do not require heat-welding, the APEEL Protective Film can be left in place for up to 90 days. When the installation of the entire TPO roofing system is complete, remove and discard the APEEL Protective Film.
3. **The Carlisle Mechanically Fastened Roof System** installation starts by fastening the insulation with a minimum of 4 fasteners per 4' by 8' board. The membrane is mechanically fastened to the deck using HP-X™ Fasteners and Piranha Plates™ or HP-XTRA Fasteners and Piranha XTRA Plates. Adjoining sheets of membrane are overlapped over the fasteners and plates and joined together with a minimum 1½"-wide (4 cm) hot-air weld.

Thickness
Used /

Typical Properties and Characteristics

Physical Property	ASTM D6878 Requirement	45-mil	60-mil	80-mil EXTRA
Tolerance on Nominal Thickness, % ASTM D751 test method	+15, -10	± 10	± 10	± 10
Thickness Over Scrim, in. (mm) ASTM D7635 optical method, average of 3 areas	0.015 min (0.380)	0.018 typical (0.457)	0.024 typical (0.610)	0.034 typical (0.864)
Breaking Strength, lbf (kN) ASTM D751 grab	220 (976 N) min	225 (1.0) min 320 (1.4) typical	250 (1.1) min 360 (1.6) typical	350 (1.6) min 425 (1.9) typical
Elongation Break of Reinforcement, % ASTM D751 grab method	15 min	15 min 25 typical	15 min 25 typical	15 min 25 typical
Tearing Strength, lbf (N) ASTM D751 proc. B 8 in. x 8 in.	55 (245) min	55 (245) min 130 (578) typical	55 (245) min 130 (578) typical	55 (245) min 130 (578) typical
Brittleness Point, °F (°C) ASTM D2137	-40 (-40) max	-40 (-40) max -50 (-46) typical	-40 (-40) max -50 (-46) typical	-40 (-40) max -50 (-46) typical
Linear Dimensional Change, % ASTM D1204, 6 hours at 158°F	± 1 max	± 1 max -0.2 typical	± 1 max -0.2 typical	± 1 max -0.2 typical
Ozone Resistance, no cracks 7X ASTM D1149, 100 pphm, 168 hrs	PASS	PASS	PASS	PASS
Water Absorption Resistance, mass % ASTM D471 top surface only 166 hours at 158°F water	± 3.0 max	± 3.0 max 0.90 typical	± 3.0 max 0.90 typical	± 3.0 max 0.90 typical
Factory Seam Strength, lbf/in (kN/m) ASTM D751 grab method	66 (290) min	66 (290) min	66 (290) min	66 (290) min
Field Seam Strength, lbf/in (kN/m) ASTM D1876 tested in peel	No requirement	25 (4.4) min 50 (8.8) typical	25 (4.4) min 60 (10.5) typical	40 (7.0) min 70 (12.3) typical
Water Vapor Permeance, perms ASTM E96 proc. B	No requirement	0.10 max 0.05 typical	0.10 max 0.05 typical	0.10 max 0.05 typical
Puncture Resistance, lbf (kN) FTM 101C, method 2031 (see supplemental section)	No requirement	250 (1.1) min 325 (1.4) typical	300 (1.3) min 350 (1.6) typical	400 (1.8) min 450 (2.0) typical
Properties After Heat Aging ASTM D573, 5376 hours @ 240°F Breaking strength Elongation Reinf. Tearing Strength Weight Change, %	198 (881) 90% min 13.5 (90%) min 33 (60%) min ± 1.0 max	205 (912) min 13.5 min 33 min 1.0 max	225 (1000) min 13.5 min 33 min 1.0 max	315 (1400) min 13.5 min 33 min 1.0 max
Typical Weights lb/ft² (kg/m²)		0.23 (1.1)	0.29 (1.4)	0.40 (2.0)

Typical properties and characteristics are based on samples tested and are not guaranteed for all samples of this product. This data and information is intended as a guide and does not reflect the specification range for any particular property of this product.

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4. **The Carlisle Fully Adhered Roofing System** installation begins by fastening the insulation at the required density necessary to meet the appropriate warranty or wind load requirement. The substrate and membrane are then coated with an appropriate Sure-Weld TPO bonding adhesive and the membrane is rolled into place.

Review Carlisle specifications and details for complete installation information.

Precautions

- » Sunglasses that filter out ultraviolet light are strongly recommended, as tan and white surfaces are highly reflective. Roofing technicians should dress appropriately and wear sunscreen.
- » Surfaces may become slippery due to frost and ice buildup. Exercise caution during cold conditions to prevent falls.
- » Care must be exercised when working close to a roof edge when the surrounding area is snow-covered, as the roof edge may not be clearly visible.
- » Use proper stacking procedures to ensure sufficient stability of the rolls.
- » Exercise caution when walking on wet membrane. Membranes may be slippery when wet.
- » Store membrane in the original undisturbed plastic wrap in a cool, shaded area and cover with light-colored, breathable, waterproof tarpaulins. Membrane that has been exposed to the weather must be prepared with Weathered Membrane Cleaner prior to hot-air welding.
- » Take care not to stand or place heavy objects on the edge of folded-over membrane, as this could cause a hard crease in the membrane.
- » Maximum sustained temperature not to exceed 160°F (71°C) for TPO membrane.
- » Do not use razor blades or other sharp tools to cut the APEEL Protective Film while it is still adhered to the TPO membrane as damage to the underlying membrane may occur. Pull the protective film away from the membrane prior to cutting.
- » Remove APEEL Protective Film by pulling towards the center of the roof. Do not remove the film by pulling towards the roof edge.

EXTREME Testing for Severe Climates

ASTM Standard D6878 is the material specification for Thermoplastic Polyolefin-Based Sheet Roofing. It covers material property requirements for TPO roof sheeting and includes initial and aged properties after heat and xenon-arc exposure. As stated in the scope of the standard, "the tests and property limits used to characterize the sheet are values intended to ensure minimum quality for the intended purpose." Carlisle's goal is to

produce TPO that delivers maximum performance for the intended purpose of roofing membranes. Maximum performance requires the membrane to far exceed the requirements of ASTM D6878. For severe climates like Miami, FL and Phoenix, AZ, EXTREME testing is required.

Heat Aging accelerates the oxidation rate that roughly doubles for each 18°F (10°C) increase in roof membrane temperature. Oxidation (reaction with oxygen) is one of the primary chemical degradation mechanisms of roofing materials.

Carlisle Testing – Heat Aging

	ASTM Requirement	Sure-Weld Requirement
ASTM TEST 240°F	32 weeks*	52 weeks
Carlisle EXTREME Test 275°F	N/A	13 weeks

*Comparable to 1,024 weeks (20 years) at 185°F for 6 hours/day.

- » Test specimen is a 1" by 4" piece of 45-mil membrane unbacked, placed in circulating hot-air oven.
- » Criterion – no visible cracks after bending aged test specimen around 0.25"-diameter mandrel.

Xenon-arc exposes the membrane samples to the combined effect of UV, visible and infrared radiation as well as ozone, heat and water spray to greatly accelerate the effects of outdoor weathering. The radiation dose is measured in kilojoules per square meter (kJ/m²) at 340 nm machine UV wavelength. The irradiance power of the xenon-arc lamp is measured in watts per square meter (W/m²).

Carlisle Testing – Xenon-Arc

	Sure-Weld Results			
ASTM TEST	ASTM D6878 Requirement	45-mil	60-mil	80-mil
kJ/m ² at 340 nm	10,080	17,640	20,160	27,720

- » Test specimen is a 2.75" by 5.5" piece of membrane, unbacked, weathering side facing arc lamp.
- » Criterion – no visible cracks when viewed under 10x magnification while wrapped around 3"-diameter mandrel.

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Environmental Cycling subjects the membrane to repeated cycles of heat aging, hot-water immersion, and xenon-arc exposure.

- » ASTM requirement – none
- » Carlisle EXTREME test*:
 - 10 days heat aging at 240°F (116°C) followed by
 - 5 days water immersion at 158°F (70°C) followed by
 - 5,040 kJ/m² (2000 hours at 0.70 W/m² irradiance) xenon-arc exposure

*Test specimen is 2.75" by 5.5" piece of membrane with edges sealed.

*Criterion – after 3 complete cycles, test specimens shall remain flexible and not have any cracking under 10x magnification while wrapped around a 3"-diameter mandrel.

Supplemental Approvals, Statements and Characteristics:

1. Sure-Weld TPO meets or exceeds the requirements of ASTM D6878 Standard Specification for Thermoplastic Polyolefin-Based Sheet Roofing.
2. Radiative Properties for ENERGY STAR, Cool Roof Rating Council (CRRC) and LEED.
3. Sure-Weld TPO membranes conform to requirements of the US E.P.A. Toxic Leachate Test (40 CFR part 136) performed by an independent analytical laboratory.
4. Sure-Weld TPO was tested for dynamic puncture resistance per ASTM D5635-04 using the most recently modified impact head. 45-mil was watertight after an impact energy of 12.5 J (9.2 ft-lbf) and 60-mil was watertight after 22.5 J (16.6 ft-lbf). 80-mil EXTRA was watertight after an impact energy of 30.0 J (22.1 ft-lbf).

Radiative Properties for ENERGY STAR*, and LEED

	Test Method	White TPO	Tan TPO	Gray TPO
ENERGY STAR – Initial solar reflectance	Solar Spectrum Reflectometer	0.79	0.71	N/A
ENERGY STAR – Initial solar reflectance after 3 years	Solar Spectrum Reflectometer (uncleaned)	0.70	0.64	N/A
CRRC – Initial solar reflectance	ASTM C1549	0.79	0.71	0.46
CRRC – Solar reflectance after 3 years	ASTM C1549 (uncleaned)	0.70	0.64	0.43
CRRC – Initial thermal emittance	ASTM C1371	0.90	0.86	0.89
CRRC – Thermal emittance after 3 years	ASTM C1371 (uncleaned)	0.86	0.87	0.88
LEED – Thermal emittance	PASS	0.90	0.86	0.85
SRI (Solar Reflectance Index)		99	86	53

Solar Reflectance Index (SRI) is calculated per ASTM E1980. The SRI is a measure of the roof's ability to reject solar heat, as shown by a small temperature rise. It is defined so that a standard black (reflectance 0.05, emittance 0.90) is 0 and a standard white (reflectance 0.80, emittance 0.90) is 100. Materials with the highest SRI values are the coolest choices for roofing. Due to the way SRI is defined, particularly hot materials can even take slightly negative values and particularly cool materials can even exceed 100.

LEED Information

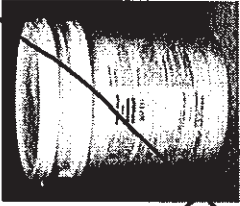
Pre-consumer Recycled Content	10%
Post-consumer Recycled Content	0%
Manufacturing Location	Senatobia, MS Tooele, UT
Solar Reflectance Index (SRI)	99 (white) 86 (tan)



Sure-Weld™ Bonding Adhesive

is a high strength solvent-based contact adhesive that allows bonding of Sure-Weld membrane to various porous and non-porous substrates.

Typical Properties and Characteristics	
Base	Synthetic Rubber
Color	Yellow
Flash Point	20.3°
Flash Point	42 F (107° C) Closed Cup
VOC	689 Grams/liter
Average Brookfield Viscosity	2500 Centipoise
Average Net Weight	7.1 lbs./gal (3.2 kg)
Packaging	5 gallon pails
Shelf Life	1 Year



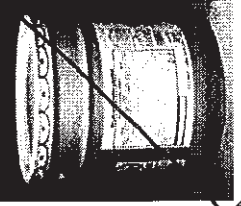
Aqua Base 120

Aqua Base 120 is a unique, semi-pressure sensitive water-based bonding adhesive for Flex-BACK® and TPO membranes offering superior peel strengths without V.O.C.'s or strong odors.

Aqua Base is installed via roller or spray application for a wet lay-in of Flex-BACK® membranes. Aqua Base 120 can also be utilized as a contact adhesive for TPO membranes. Finished coverage rate is 120 sq. ft. per gallon and it is packaged in 5 gallon pails.

Typical Properties and Characteristics	
Base	Acrylic
Color	White (translucent when dry)
Solids	45%
Flash Point	None
Average Brookfield Viscosity	16,000 Centipoise
Average Net Weight	8.8 lbs./gal
Packaging	5 Gallon Pail
Shelf Life	1 Year
VOC	7 grams per liter less water

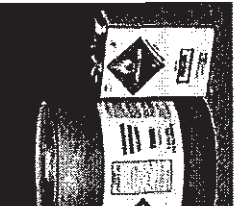
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Low VOC Bonding Adhesive

is a high strength solvent-based contact adhesive that allows bonding of Sure-Weld membrane to various porous and non-porous substrates. It is specially formulated using a blend of VOC exempt and non-exempt solvents to be in compliance with the state of California Clean Air Act of 1988 (updated in 1997) and is further regulated by California's Air Quality Control Districts listing VOC grams per liter limitations.

Typical Properties and Characteristics	
Base	Synthetic Rubber
Color	Yellow
Average Solids	20.3%
VOC	250 Grams/liter
Flash Point	0° F (-17° C) Closed Cup
Average Brookfield Viscosity	3500 Centipoise
Average Net Weight	9.4 lbs./gal (4.3 kg)
Packaging	5 gallon pail
Shelf Life	1 Year



Weathered Membrane Cleaner

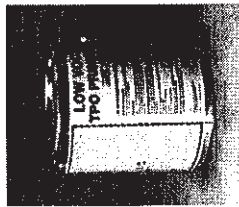
is used to clean in-service Sure-Weld membrane prior to the welding process. It helps to loosen and remove dirt and other contaminants from the surface of the Sure-Weld membranes and leaves a suitable surface for welding or the subsequent application of TPO Primer.

Typical Properties and Characteristics	
Color	Clear
Solids	0%
Flash Point	65° F (18° C)
Boiling Point	280-291° F (122-144° C)
Packaging	5 (18.9 liter) gallon closed top pail
VOC	755 grams/liter



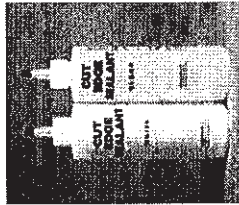
CARLISLE'S ADHESIVES & SEALANTS

Low-VOC TPO Primer
is a low solids, clear (translucent color) solvent-based splice primer used to prepare TPO membrane for improved adhesion to pressure sensitive TPO products.



Typical Properties and Characteristics	
Color	Translucent
Appearance	Smooth, no lumps
Solids	10-12%
Average Net Weight	10.4 lbs./gallon (4.72 kg/callon)
VOC Content	250 grams/liter maximum
Packaging	6-1 gallon cans/carton
Shelf Life	1 year, unopened container

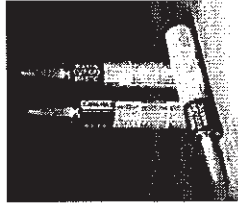
Cut-Edge Sealant
is a free flowing polymeric material designed for sealing cut edges (exposed fabric) of sure-weil reinforced membrane.



Typical Properties and Characteristics	
Bag	Synthetic Rubber
Color	Clear - 14%
Average Solids	White - 25%
Flash Point	Clear - 39° F (4° C)
	White - 31° F (-1° C)
Average Brookfield Viscosity	Clear - 3000 Centipoise
	White - 200 Centipoise
VOC	Clear - 7.4 lbs./gal (3.3 kg)
	White - 7.8 lbs./gal (3.5 kg)
Average Net Weight	8 - 16oz. Bottles/carton (3.8L)
Packaging	1 year
Shelf Life	

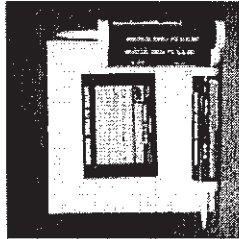
Sure-Seal® Water Cut-Off Mastix

is a one-component, low viscosity, self-wetting butyl blend mastic used with roofing and waterproofing systems. It is primarily used when membrane is being terminated using a compression-type seal.

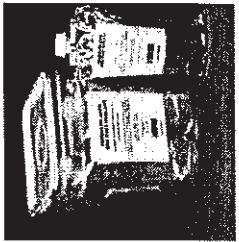


Typical Properties and Characteristics	
Color	Gray
Solids	80%
Flash Point	40° F (4° C) Closed Cup
Service Temp.	-40° F to 200° F (-40° C to 33° C)
Specific Gravity	1.29
Cold Weather Flex	Excellent
Average Brookfield Viscosity	1,300,000 cps
Packaging	10 lbs./carton, 5 gallon pails
VOC	250 grams/liter
Clean Up	Weathered Membrane Cleaner
Average Net Weight/Gallon	10.7 lbs. (4.9 kg/callon)
Shelf Life	1 year, unopened container

Universal Single-Ply Sealant
is 100% solids, solvent-free, one-part polyether sealant that provides a weather tight seal to a variety of building substrates.



Typical Properties and Characteristics	
Color	White
Viscosity	850,000 cps
Tack Free Time	35 minutes depending on temperature
Cure Time	3-7 days depending on temperature
Flow, Sag or Slump	None (1/4" Bead)
Sealing	None
Joint Resistance	Good
UV Resistance	Excellent
Cured Hardness (Shore A)	17-23
Shear Strength	150 PSI
Weight per Carton	26 lbs
Packaging	24 Cartons, 10.1 Fl. Oz. each
Shelf Life	12 months, unopened container @ 90° F



Thermoplastic One Part Sealant
is a single component, moisture-curing elastomeric polyether sealant that is compatible with Carlisle's Thermoplastic membranes. The material is designed to provide a flexible, durable and long lasting seal around hard-to-flash penetrations in Thermoplastic Roofing Systems. The product can also be used for attaching lightning rod bases and ground cable clips to the membrane surface. Thermoplastic One Part Pourable Sealer provides rapid skin time when exposed to atmospheric moisture forming a waterproof rubber surface in less than one (1) hour. Moisture curing continues, until a two (2) - inch deep solid rubber seal encases the penetration. Complete cure time will vary depending on relative humidity and temperature.

The sealant's one-part, pourable consistency allows for quick pocket filling without mixing. Carlisle's TPO Primer must be applied to all surfaces, including membrane, flashings and penetrations that will be in contact with the Thermoplastic One Part Pourable Sealant. Unused sealant remaining in a pouch will remain useable up to 30 days if pouch is resealed with original cap.

Typical Properties and Characteristics	
Specific Gravity	1.4 (11.6 lbs./gallon)
Viscosity (Brookfield RTV, #9)	Soft loading 20,000 - 50,000
Color	White
Odor	Mild ester smell (min) when wet. Exceeds when dry.
Elongation @ Break, % ASTM D-412	450
Tack Free Time ASTM C-661	25 - 35
Hardness (Shore A) ASTM C-673	Less than 1 hour
Low Temperature Flex PASS	-20° F
Shrinkage (14 day cure)	No measurable shrinkage
Service Temperature ASTM D453	-40° F to 200° F
Long term weatherability ASTM G53	No crazing or cracking
• 98 cycles @ 12 hours/cycle	
• Condensate exposure - 4 hrs @ 50° C	
• UV exposure - 3 hrs @ 125° C	
Packaging	40.5 gallon pails/buckets per bucket
Weight Per Carton	20 lbs./bucket
Shelf Life (unopened container)	12 months

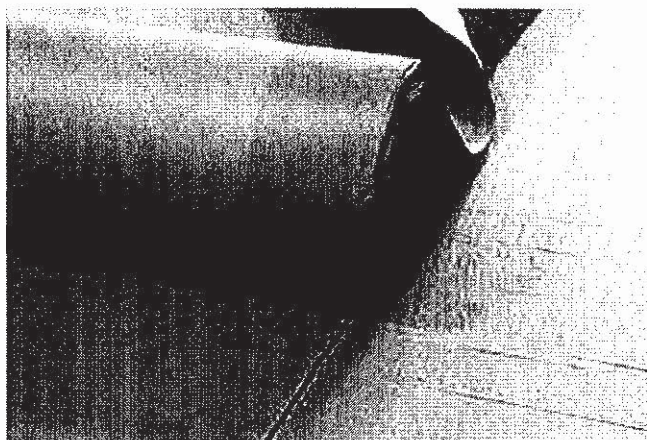
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VapAir Seal™ 725TR

Air and Vapor Barrier/Temporary Roof



Overview

Carlisle's VapAir Seal™ 725TR Air and Vapor Barrier/Temporary Roof is a 40-mil composite consisting of 35 mils of self-adhering rubberized asphalt laminated to a 5-mil woven polypropylene film. A siliconized one-piece release liner prevents the material from bonding to itself in the roll and is easily removed for installation. VapAir Seal 725TR is available in a 244-square-foot roll with dimensions of 39" x 75'. The factory-controlled thickness of the membrane ensures uniform barrier properties on the job; the woven polypropylene film increases strength and has a non-skid surface suitable for the bonding of subsequent layers. Approved Carlisle adhesives for attaching insulation to VapAir Seal 725TR are:

- » Flexible FAST™ Adhesive
- » FAST™ Adhesive
- » OlyBond 500™
- » One Step Insulation Adhesive

VapAir Seal 725TR can be used on concrete, plywood, exterior gypsum, DensDeck® Prime, SECUROCK® or other approved substrates in conjunction with Carlisle SynTec roofing systems. Gypsum decks may require additional securement with mechanical fasteners. Use of CAV-GRIP™, CCW-702 or CCW-702LV is required on all substrates. VapAir Seal 725TR may be installed directly over a nailed Carlisle Modified Base Sheet when primed with CAV-GRIP.

VapAir Seal 725TR must be covered with roofing membrane within 120 days. T-joints must be sealed with an internal bead of Carlisle Lap Sealant. Carlisle does not accept responsibility for the watertight integrity of the VapAir Seal 725TR related to workmanship issues or physical damage.

For unusual situations, contact the Project Review and Warranty Services Department prior to specifying this material.

Installation

Surface Preparation: The concrete surface shall be completely dry; dryness shall be determined by a qualified owner's representative. The surface shall have a smooth finish and be free of voids, spalled areas, sharp protrusions, loose aggregate, laitance and form-release agents. Some curing compounds may interfere with proper adhesion, so an adhesion test is recommended. In the event of rain, concrete must be allowed to dry before the application of primer. **Artificial drying methods such as torches are not acceptable.**

Adhesive: Surfaces to receive VapAir Seal 725TR must be clean and dry. Use of CAV-GRIP, CCW-702 or CCW-702LV is required on all substrates. Approved Carlisle adhesives for attaching insulation to VapAir Seal 725TR are: Flexible FAST Adhesive, FAST Adhesive, OlyBond 500, and One Step Adhesive.

Application: VapAir Seal 725TR material must be stored and kept above 60°F prior to installation. Apply VapAir Seal 725TR from low to high points in a shingle fashion so that the laps will shed water. Overlap all edges by at least 2". End laps should be staggered. Position the membrane carefully to avoid fish-mouths and wrinkles. **Roll the VapAir Seal 725TR membrane immediately after installation with a 100-150-pound roller wrapped in a resilient material.** When the VapAir Seal 725TR is applied to a vertical surface, hand-rolling with a 2" hand roller is required. Vertical surfaces must be prepared in the same fashion as horizontal surfaces.

Note: For applications below 40°F – all materials must be kept above 60°F prior to installation and CAV-GRIP Primer must be used.

Seaming: Apply a 2"-long bead of lap sealant internally along any T-joints or step-offs. Use a hand roller or stand-up seam roller to mate the entire seam together, ensuring the seam's leading edge is rolled properly. Be sure to pay particular attention to the T-joints and step-offs. If seam surface is contaminated, clean and prime with CCW-702, CCW-702LV or CAV-GRIP.

Review Carlisle specifications and details for complete installation information.

VapAir Seal 725TR

Air and Vapor Barrier/Temporary Roof

Precautions

- » Use proper stacking procedures to ensure sufficient stability of the materials.
- » Exercise caution when walking on wet membrane. Membranes are slippery when wet.
- » VapAir Seal 725TR must be dry prior to installation of subsequent layers.
- » VapAir Seal 725TR should be installed using CAV-GRIP Adhesive when temperatures are below 25°F.
- » Avoid moving or stacking heavy loads on the installed membrane, particularly in hot weather. This could thin out the self-adhering barrier layer.
- » Refer to applicable Material Safety Data Sheets before using any Carlisle products.
- » Do not apply CAV-GRIP, CCW-702 or membrane to damp or contaminated surfaces.
- » Do not apply CAV-GRIP, CCW-702 or membrane to frozen substrates.
- » Do not allow VapAir Seal 725TR to be exposed for more than 120 days.
- » Failure to allow CCW-702 and CCW-702LV to flash off completely will result in blisters and unadhered areas.

Typical Properties and Characteristics

Physical Property	Test Method	Typical
Thickness	ASTM D1970	40 mils
Tensile Strength	ASTM D412	250 psi
Elongation	ASTM D412	250%
Peel Adhesion	ASTM D903	5 lbs/in
Puncture Resistance	ASTM E154	60 lbs
Permeability	ASTM D1970*	0.05 perms
Air Permeance	ASTM E2178	0.000 L*m² @ 75 Pa

Typical properties and characteristics are based on samples tested and are not guaranteed for all samples of this product. This data and information is intended as a guide and does not reflect the specification range for any particular property of this product.

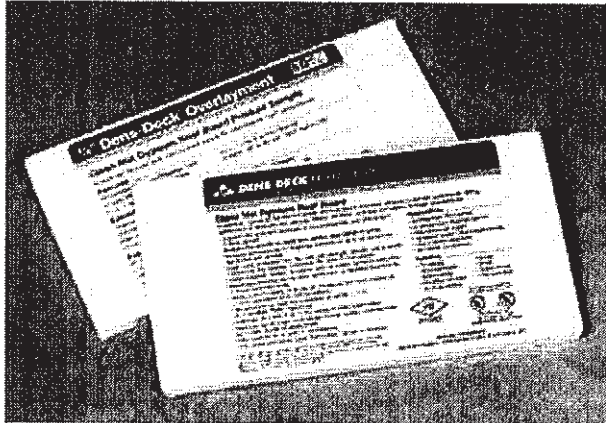
*D1970 is tested to E96 standards for permeability.

LEED® Information

Pre-consumer Recycled Content	0%
Post-consumer Recycled Content	0%
Manufacturing Location	Terrell, TX
VOC Content	0 g/L
Solar Reflectance Index	N/A

DENSDECK PRIME™/DENSDECK® COVER BOARD

DISTRIBUTED BY CARLISLE



Overview

DensDeck and DensDeck Prime are exceptional fire barriers, thermal barriers and cover boards used in various commercial roofing systems. The patented design employs glass mat facers on the top and bottom. They are embedded into a gypsum core to provide excellent fire resistance, moisture resistance and wind uplift properties. They have also been shown to withstand deterioration, warping and jobsite damage.

These products are FM Approved and the only 1/2" gypsum product to meet the calorimeter requirements for conventionally insulated decks. Tested in accordance with ASTM E84, its surface burning characteristics are Flame Spread-0 and Smoke Developed-0. DensDeck or DensDeck Prime (5/8" thick) can replace any generic Type X gypsum board in any roof assembly in the UL Fire Resistance Directory under the prefix "P".

Intended Uses

DensDeck Prime is typically used in fully adhered EPDM and TPO applications as an overlayment board in lieu of high-density wood fiberboard over insulations such as extruded polystyrene or EPS. It is compatible with solvent based bonding adhesives and over polyisocyanurate insulation when additional compressive strength is desired. Additionally, DensDeck Prime is used as a base layer for Carlisle's 725TR Air and Vapor Retarder, in conjunction with CCW 702-LV Primer or Cav-Grip, on applications where Carlisle FAST™ Adhesive is used to attach insulation and a vapor retarder is specified. It is also compatible with hot asphalt and can be used as a membrane underlayment on the Hot Mopped Roofing System or as a parapet wall substrate for all systems.

DensDeck is used primarily in mechanically fastened roofing applications as an overlayment board in lieu of high density wood fiberboard over insulations such as extruded polystyrene or EPS. DensDeck can also be used over polyisocyanurate insulation when additional compressive strength is desired for roofs subjected to increased foot traffic or for increased resistance to hail damage. It is also heavily used in wood deck constructions to achieve UL/FM Approvals fire ratings. DensDeck reduces the growth of mold and mildew per ASTM D 3273.

Features and Benefits

- Superior UL code ratings available for high slopes and wood decks
- Cover board improves resistance to foot traffic and hail damage
- Reduced fastening densities provide labor savings
- Superior FM Approvals wind uplift ratings

Installation

DensDeck or DensDeck Prime may be fastened in accordance with an approved fastening pattern (see reverse) or secured with FAST Adhesive or mopped with Type III or IV Asphalt.

Edge joints should be located on and parallel to deck ribs. End joints of adjacent lengths should be staggered.

1. Shall be installed with ends and edges butted tightly
2. Where installed over combustible wood decks or insulations, all joints should be staggered
3. In accordance with approved shop drawings, FM Approved fasteners shall be installed with plates through the roof board, flush with the surface
4. When attaching Carlisle 725TR Air and Vapor Retarder, use only DensDeck Prime in conjunction with CCW-702, 702-LV or Cav-Grip Primers.

Precautions

1. Panels must be kept dry before, during and after installation. Apply only as much roof board as can be covered by the roof membrane system in the same day
2. When applying solvent-based adhesives or primers, allow sufficient time for the solvent to flash off to avoid damage to polystyrene roofing components
3. 1/4" thick DensDeck is not recommended for vertical parapet applications
4. DensDeck or DensDeck Prime is not permitted as the membrane underlayment for ballasted roofing systems

Technical Data

- Manufactured to conform to ASTM C 1177
- Tested in accordance with ASTM E-84 or CAN/ULC-S102. Non-combustible when tested in accordance with ASTM E 136
- DensDeck Prime: UL Classified when tested in accordance with ASTM E 119

Investing in Roofing Solutions for Over 45 Years

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

CARLISLE
Carlisle SynTec

DENSDECK PRIME™/DENSDECK® COVER BOARD

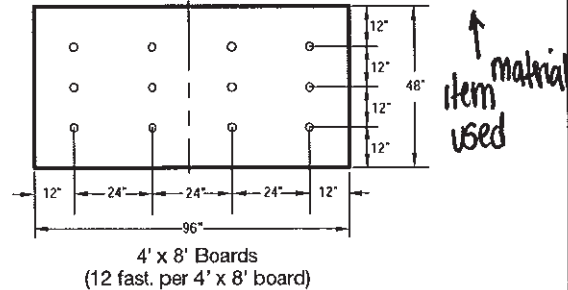
DISTRIBUTED BY CARLISLE

DensDeck Prime Cover Board
fastening criteria to conform with FM
Approvals ratings on Carlisle SynTec
Fully Adhered Roofing Systems⁽¹⁾⁽²⁾⁽³⁾

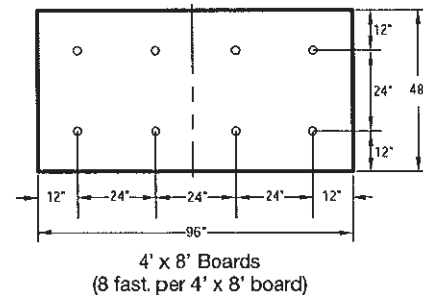
Notes:

1. For wind uplift/FM Approvals compliance where DensDeck Prime Cover Board is mechanically attached to metal decks. These products shall be installed to the specifics of the FM Approvals design assembly.
2. Contact Carlisle for fastening density requirements for other FM Approvals ratings available.
3. Metal insulation fastening plates must be used with their corresponding FM Approvals-approved fastener.
4. Refer to FM Approvals Property Loss Product Data Sheet 1-29 for perimeter and corner enhancements.

FM Approvals 1-90 1/4" or 1/2" DensDeck Prime Cover Board



FM Approvals 1-90 5/8" DensDeck Prime Cover Board



DensDeck Prime/DensDeck

Typical Properties and Characteristics	ASTM (method)	DensDeck Prime or DensDeck		
Thickness, nominal inches		1/4"	1/2"	5/8"
Width, standard		4'	4'	4'
Length, standard		8' ±1/4"	8' ±1/4"	8' ±1/4"
Weight, lbs/sq. nominal		1.1	1.95	2.5
Surfacing		Glass Mat*	Glass Mat*	Glass Mat*
Flexural Strength, Parallel, lbs. min.	C 473 E 1177 minimums	40	80	100
Flexural Strength, Perpendicular, lbs. min.	C 473 E 1177 minimums	50	100	140
Flute Spacing	E 661 (400 lb. conc. load)	2-5/8"	5"	8"
Permeance Perms	C 335 (dry cup method)	50	35	32
R-Value	C 518 (heat flow meter)	.28	.56	.67
Coefficient of Thermal Expansion in/ in/ °F		8.5 x 10 ⁻⁶	8.5 x 10 ⁻⁶	8.5 x 10 ⁻⁶
Linear Variation with Change in Moisture in / in / % / RH		6.25 x 10 ⁻⁶	6.25 x 10 ⁻⁶	6.25 x 10 ⁻⁶
Absorption, % max.	C 473	10.0	10.0	10.0
Compression, psi		500	500	500
Surface Water Absorption, grams	C 473	2.5	2.5	2.5
Flame Spread - Smoke Developed	D 84	0	0	0
Fire Classification		UL Class A ULC S-102 UL 1256 ULC S-126 UL 790	FM Approvals Class 1 UL Class A ULC S-102 UL 1256 ULC S-126 UL 790	FM Approvals Class 1 UL Classified "P" Assemblies ULC S-101

* DensDeck Prime incorporates a glass mat/primed surface.

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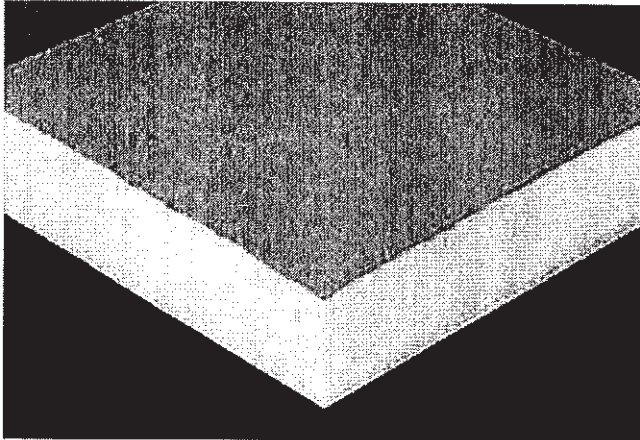
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HP-H POLYISO

Insulation



Overview

HP-H is a rigid-roof insulation panel composed of a closed-cell polyisocyanurate foam core bonded on each side to fiber-reinforced paper facers.

Features and Benefits

- » HP-H polyiso insulation provides the highest R-value per inch of commercially available insulation products
- » Environmentally friendly construction with 0% ozone-depleting components and CFC free
- » Approved for direct application to steel decks

Panel Characteristics

- » Available in 4' x 4' (1220 mm x 1220 mm) and 4' x 8' (1220 mm x 2440 mm) panels in thickness of 1" (25 mm) to 4.5" (115 mm)
- » Available in two grades of compressive strengths per ASTM C1289-11, Type II, Class 1, Grade 2 (20 psi), Grade 3 (25 psi)

Applications

- » Constructions requiring FM Class 1 and UL Class A ratings
- » Single-Ply Roof Systems (Ballasted, Mechanically Attached, Fully Adhered)

HP-H Polyiso Thermal Values

Thickness (inches)	Thickness (MM)	LTTR R-value**	Flute Spanability
1.00	25	5.7	2 5/8"
1.50	38	8.6	4 1/8"
1.75	44	10.0	4 3/8"
1.80	46	10.3	4 3/8"
2.00	51	11.4	4 3/8"
2.50	64	14.4	4 3/8"
2.60	66	15.0	4 3/8"
3.00	76	17.4	4 3/8"
3.50	89	20.5	4 3/8"
3.80	97	22.3	4 3/8"
4.00	102	23.6	4 3/8"
4.30	109	25.5	4 3/8"
4.50	114	26.8	4 3/8"

↑ Material Item Used

**Long-Term Thermal Resistance Values are based on ASTM C1289-11 effective January 1, 2014, predicting product R-value after five years, which is equivalent to a time-weighted thermal design R-value for 15 years.

Installation

Ballasted Single-Ply Systems

Each HP-H panel is loosely laid on the roof deck. Butt edges and stagger joints of adjacent panels. Install the roof membrane according to Carlisle's specifications.

Mechanically Attached Single-Ply Systems

Each HP-H panel must be secured to the roof deck with fasteners and plates (appropriate to the deck type). Butt edges and stagger joints of adjacent panels. Install the roof membrane according to Carlisle's specifications.

Fully Adhered Single-Ply Systems

Each HP-H panel must be secured to the roof deck with fasteners and plates (appropriate to deck type). Butt edges and stagger joints of adjacent panels. Install the roof membrane according to Carlisle's specifications.

HP-H 4' x 8' panels can be secured to the roof deck with Carlisle's FAST® Adhesive, either full coverage or bead spacing of no less than 6" on center.

HP-H 4' x 4' panels may be adhered to prepared concrete deck with a full mopping of Type III or IV asphalt.

Review Carlisle specifications and details for complete installation information.

HP-H POLYISO

Insulation

HP-H Codes and Compliances

- » ASTM C1289-11, Type II, Class 1, Grade 2 (20 psi), Grade 3 (25 psi)
- » International Building Code (IBC) Section 2603

NOTE: Please be aware the Federal Specification HH-I-1972/GEN has been replaced.

Underwriters Laboratories, Inc.

- » Component of Class A Roof Systems (UL 790)
- » Hourly Rated P series roof assemblies (UL 263) P 225, 230, 259, 302, 303, 508, 510, 514, 519, 701, 710, 713, 717, 718, 719, 720, 722, 723, 727, 728, 729, 730, 732, 734, 735, 739, 741, 742, 743, 819, 824, 827, 828
- » Insulated metal deck assemblies - (UL 1256) nos. 120, 123, 292
- » HP-H classified by ULC
- » R18846

Factory Mutual Research

- » FM Class 1 approval for steel roof-deck constructions, (FM 4450)
- » FM 4470
(Subject to the conditions of approval described in Roofnav.com)
- » FLORIDA BUILDING CODE APPROVAL FL#1296
- » MIAMI-DADE COUNTY, FLORIDA NOA NO: 04-1018.01

Precautions

Insulation must be protected from open flame and kept dry at all times. Install only as much insulation as can be covered the same day by completed roof-covering material. Protect installed product from excessive foot traffic. Carlisle will not be responsible for specific building and roof design by others, for deficiencies in construction or workmanship, for dangerous conditions on the job site or for improper storage and handling. Technical specifications shown in this literature are intended to be used as general guidelines only and are subject to change without notice. Call Carlisle for more specific details, or refer to PIMA Technical Bulletin No. 109: Storage & Handling Recommendations for Polyiso Roof Insulation.

Typical Properties and Characteristics

Physical Property	Test Method	Value
Compressive Strength	ASTM D1621 ASTM 1289	20 psi* minimum (138 kPa, Grade 2)
Dimensional Stability	ASTM D2126	2% linear change (7 days)
Moisture Vapor Transmission	ASTM E96 12.10	<1 perm (57.5 ng/(Pa•s•m ²))
Water Absorption	ASTM C209	<1% volume
Service Temperature		-100°F to 250°F (-73°C to 122°C)

Typical properties and characteristics are based on samples tested and are not guaranteed for all samples of this product. This data and information is intended as a guide and does not reflect the specification range for any particular property of this product.

* Polyiso Foam Core only

Other Polyiso Products by Carlisle

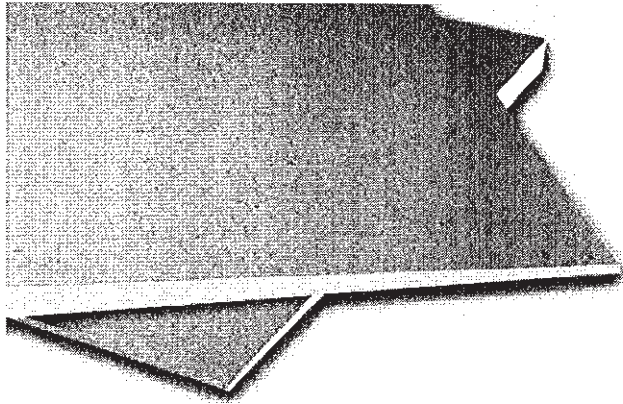
- » Tapered HP-H – Polyiso bonded to fiber-reinforced paper facers
- » Flat and Tapered SecurShield – Polyiso bonded to coated glass facers
- » SecurShield CD – 1" Class A Polyiso on a combustible deck
- » HP-NB – Polyiso bonded to Oriented Strand Board
- » HP-F – Polyiso bonded to foil
- » SecurShield HD Composite
- » SecurShield HD – ½" Polyiso coverboard, 100 psi
- » SecurShield HD Plus – ½" Polyiso coverboard, 100 psi – FM 1-90 with reduced fastening



Foamed plastic as roof deck construction material with resistance to an internal fire exposure only for use in construction no.(s) 120 and 123. See UL Directory of Products Certified for Canada and UL Roofing Materials and Systems Directory. 990L.



HP-H Tapered Polyiso



Overview

HP-H Tapered is a sloped rigid roof insulation panel composed of a closed cell polyisocyanurate foam core bonded during the manufacturing process to fiber reinforced paper facers. Tapered systems are designed to promote positive drainage and prevent ponding water. Contact Carlisle's Tapered Systems Group for design assistance.

Features and Benefits

- » HP-H tapered polyiso insulation provides the highest R-value per inch of commercially available insulation products.
- » Environmentally friendly construction with 0% ozone depleting components and CFC free.
- » Approved for direct application to steel decks.

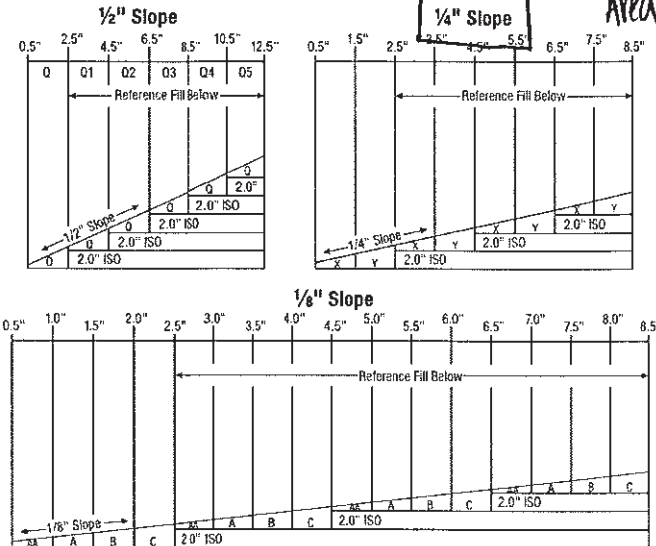
Panel Characteristics

- » Available in 4' x 4' (1220 mm x 1220 mm) in thickness of 1/2" (12 mm) minimum to 4.5" (115 mm) maximum in a single layer
- » Available slopes are 1/16" (2 mm), 1/8" (3 mm), 3/16" (5 mm), 1/4" (6 mm), 3/8" (10 mm) and 1/2" (12 mm) per foot
- » Available in two grades of compressive strengths per ASTM C1289-06a, Type II, Class 1, Grade 2 (20 psi), Grade 3 (25 psi)

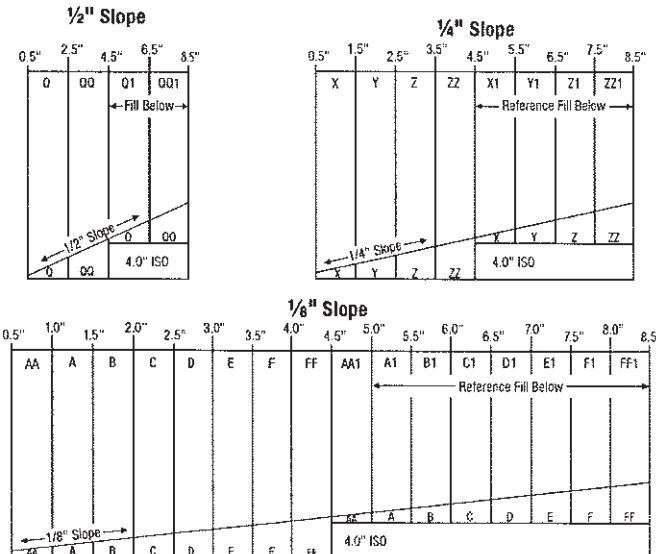
Applications

- » Constructions requiring FM Class 1 and UL Class A ratings
- » Single-Ply Roof Systems (Ballasted, Mechanically Attached, Fully Adhered)

Standard Panel Profiles



Extended Panel Profiles



Installation

BALLASTED SINGLE-PLY SYSTEMS

Each HP-H Tapered panel is loosely laid on the roof deck. Butt edges and stagger joints of adjacent panels. Install the roof membrane according to Carlisle's specifications.

HP-H Tapered Polyiso

MECHANICALLY ATTACHED & FULLY ADHERED SINGLE-PLY SYSTEMS

Each HP-H Tapered panel must be secured to the roof deck with fasteners and plates (appropriate to deck type). Butt edges and stagger joints of adjacent panels. Install the roof membrane according to Carlisle's specifications.

For fully adhered single-ply, HP-H Tapered 4' x 8' panels can be secured to the roof deck with Carlisle's FAST® Adhesive, either full coverage or bead spacing of no less than 6" on center.

Review Carlisle specifications and details for complete installation information.

HP-H Tapered Codes and Compliances

- » ASTM C1289-06, Type II, Class 1, Grade 2 (20 psi), Grade 3 (25 psi)
- » International Building Code (IBC) Section 2603

NOTE: Please be aware the Federal Specification HH-I-1972/GEN has been replaced.

Underwriters Laboratories, Inc.

- » Component of Class A Roof Systems (UL 790)
- » Hourly Rated P series roof assemblies (UL 263) P 225, 230, 259, 302, 303, 508, 510, 514, 519, 701, 710, 713, 717, 718, 719, 720, 722, 723, 727, 728, 729, 730, 732, 734, 735, 739, 741, 742, 743, 819, 824, 827, 828
- » Insulated metal deck assemblies - (UL 1256) nos. 120, 123, 292
- » HP-H Tapered classified by ULC

Factory Mutual Research

- » FM Class 1 approval for steel roof-deck constructions, (FM 4450)
- » FM 4470
(Subject to the conditions of approval described in Roofnav.com)
- » FLORIDA BUILDING CODE APPROVAL FL#1296
- » MIAMI-DADE COUNTY, FLORIDA NOA NO: 04-1018.01

Precautions

Insulation must be protected from open flame and kept dry at all times. Install only as much insulation as can be covered the same day by completed roof covering material. Protect installed product from excessive foot traffic. Carlisle will not be responsible for specific building and roof design by others, for deficiencies in construction or workmanship, for dangerous conditions on the job site or for improper storage and handling.

Technical specifications shown in this literature are intended to be used as general guidelines only and are subject to change without notice. Call Carlisle for more specific details, or refer to PIMA Technical Bulletin No. 109: Storage & Handling Recommendations for Polyiso Roof Insulation.

Typical Properties and Characteristics

Physical Property	Test Method	Value
Compressive Strength	ASTM D1621 ASTM 1289-05a	20 psi* minimum (138 kPa, Grade 2)
Dimensional Stability	ASTM D2126	2% linear change (7 days)
Moisture Vapor Transmission	ASTM E96 12.10	<1 perm (57.5 ng/(Pa•s•m²))
Water Absorption	ASTM C209	<1% volume
Service Temperature		-100°F to 250°F (-73°C to 122°C)

Typical properties and characteristics are based on samples tested and are not guaranteed for all samples of this product. This data and information is intended as a guide and does not reflect the specification range for any particular property of this product.

Other Polyiso Products by Carlisle

- » Flat and Tapered SecurShield™ – Polyiso bonded to coated glass facers
- » Flat Polyiso bonded to fiber-reinforced paper facers
- » HP-F – Polyiso bonded to foil
- » HP-NB – Polyiso bonded to Oriented Strand Board
- » SecurShield HD – ½" Polyiso coverboard, 100 PSI
- » SecurShield HD Composite – Polyiso bonded on-line to ½" SecurShield HD Coverboard
- » SecurShield HD Plus – ½" Polyiso coverboard, 100 PSI – FM 1-90 with reduced fastening
- » SecurShield CD – 1" Class A Polyiso on a combustible deck



Foamed plastic as roof deck construction material with resistance to an internal fire exposure only for use in construction no.(s) 120 and 123. See UL Directory of Products Certified for Canada and UL Roofing Materials and Systems Directory. 99DL.



FAST™ Dual Cartridge Adhesive



Overview

Carlisle FAST Adhesive Dual Cartridge is a VOC-free construction grade, two-component, polyurethane adhesive. The low-rise, expanding characteristics are designed to bond Carlisle's FleeceBACK® membrane and insulations to a variety of substrates. Carlisle FAST Adhesive Dual Cartridge is compatible with: wood fiberboard, polyisocyanurate insulation, EPS, extruded polystyrene, DensDeck®, Securock® and OSB. Compatible deck types include concrete, cellular lightweight concrete, gypsum, cementitious wood fiber, wood and painted or galvanized steel. Carlisle FAST Adhesive Dual Cartridge is also compatible with the following roofing substrates: smooth BUR (previously exposed), mineral cap sheet, smooth (previously exposed) or granulated SBS Mod-Bit and Carlisle's 725TR Vapor Barrier. Previously unexposed asphalt must be primed with CAV-GRIP™ or 702 Primer. Carlisle FAST Adhesive Dual Cartridge is applied in beads or ribbons 4", 6" or 12" o.c. depending on the wind zone, building height and code requirements to produce a strong adhesive bond between the FleeceBACK membrane, insulation and the substrate. Factory Mutual approval over a variety of deck types and substrates has been achieved.

Coverage Rate

FleeceBACK or insulation attachment to: Lightweight concrete, concrete, wood, steel, smooth (previously exposed) BUR, Mod-Bit, mineral cap, or multiple layers of insulation. Rough, uneven or porous surfaces will require more adhesive than the rates below.

Per carton - 4 cartridge sets
600 sq.ft. - 12" o.c.
300 sq.ft. - 6" o.c.
200 sq.ft. - 4" o.c.

Application

1. The surface to which the adhesive is to be applied shall be smooth, dry, free of fins, sharp edges, loose and foreign materials, oil and grease and standing water. All sharp projections and loose material shall be removed by sweeping, blowing or vacuum cleaning. Previously unexposed asphalt must be primed with CAV-GRIP or 702 Primer.
2. Seal gaps between the wall/penetration and concrete deck with Carlisle 725TR or other suitable material to avoid condensation issues and positive pressure issues from air infiltration.
3. Proper adhesion of existing roof coatings to their substrate must be verified prior to bonding to these materials.
4. Fibrous cement decks must be investigated for their ability to retain liquid adhesive. (Some types of fibrous cement decks may allow liquid adhesive to flow through the deck).
5. Apply Carlisle FAST Adhesive Dual Cartridge when the substrate and ambient temperature is 50°F (10°C) and above.
6. Apply Carlisle FAST Adhesive Dual Cartridge IC (winter grade) when the substrate and ambient temperature is 25°-50°F (-4°-10°C).

Insulation Attachment

1. Apply a ½" to ¾"-wide bead of Carlisle FAST Adhesive Dual Cartridge using a portable 1:1 applicator (oversized, dual-cartridge caulking gun)* with beads spaced as outlined on the following chart for 5-, 10-, or 15-year or 55-mph warranties (20 yr or 72-mph warranties require 6" o.c. in the field):

Building Height	Bead Spacing (Perimeter)	Bead Spacing (Field)
0-25'	6" o.c. - 4' perimeter	12" o.c.
25-50'	6" o.c. - 8' perimeter	12" o.c.
50-75'	6" o.c. - 12' perimeter	12" o.c.
75-100'	6" o.c. - 16' perimeter	12" o.c.
100' or greater	Contact Carlisle for bead spacing requirements.	

2. When following Factory Mutual guidelines, bead spacing in the perimeter and corner areas may differ from the table above. Beads at 12" o.c. are not acceptable at perimeters or corners.
3. Place 4' x 4' maximum insulation boards into Carlisle FAST Adhesive Dual Cartridge after allowing it to rise ½" and develop string/body (approx. 1 min. at room temperature) but before the adhesive reaches a "tack-free" state.

FAST Dual Cartridge Adhesive

- Designate one person to walk and roll boards into place using a 150 lb. weighted roller adding constant weight or slitting boards where necessary until adhesive sets-up.

FleeceBACK Attachment

- Unroll FleeceBACK sheet and position. Fold sheets in half width-wise.
- Apply FAST Adhesive Dual Cartridge to the substrate at 4", 6" or 12" on center (depending on building height, wind-speed warranty, warranty length and Factory Mutual guidelines).
- Allow adhesive to rise and develop string/body (approx. 1.5 – 2 minutes), then roll FleeceBACK membrane into FAST Adhesive. The time it takes for the adhesive to develop string will vary based on environmental conditions (temperature and humidity).
- Roll membrane with a roller (not to exceed 150 lbs.) to insure fleece embedment. If adhesive contaminates the splice area immediately remove with splice cleaner or splice primer.

Precautions

- Review the applicable Material 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 if concentrations of MDI exceed the TLV or are unknown. Proper safety training is essential for all persons involved in the installation process. If 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 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 sleeves and pants. Wash thoroughly after handling. In case of contact with skin, thoroughly wash affected area with soap and water or corn oil.

NOTE: Nitrile gloves are required when handling Part A directly.

- Jobsite storage temperatures in excess of 90°F (32°C) may affect product shelf life and lead to leakage around the bottom seal. Should the components be stored at temperatures lower than 55°F (13°C), restore to room temperature prior to use. Do not allow Carlisle FAST Adhesive Dual Cartridge to freeze.
- High slope applications require beads to be applied to the back of the insulation board on a flat surface.
- REMOVE THE NOZZLE IMMEDIATELY from a partially used cartridge when stopping or pausing for more than 30–60 seconds. Wipe opening with a clean rag and reinstall plastic stopper. When ready to restart application of adhesive, ensure opening in each side is clear and install new nozzle.
- KEEP OUT OF THE REACH OF CHILDREN.

WARNING (CAUTION): Failure to remove nozzle from partially used cartridge will cause increased internal pressure upon reuse, with possible rupture of the cartridge and result in personal injury.

FAST Dual Cartridge Adhesive

Typical Properties and Characteristics**

Property	Part A (1) Polymeric Isocyanate	Part B (2) Polyols, Surfactants & Catalysts
Viscosity (CPS @ 25°C)	250 cps 10.25 lbs/gal	250 cps 8.75 lbs/gal
Avg. Net Weight Packaging	0.2 gal (0.75 L) per cartridge	0.2 gal (0.75 L) per cartridge
Mixing Ratio by Volume	1:1 Part A to Part B	1:1 Part A to Part B
Shelf Life	1 year	1 year
VOC Content	0 g/L	0 g/L
Manufacturing Location	Carlisle, PA	Carlisle, PA
Pre/Post-consumer Recycled Content	0%	0%

* The portable 1:1 applicator is a hand operated, lightweight, portable unit that consists of an oversized, dual-cartridge caulking gun used to transfer the 2-component Carlisle FAST Adhesive Dual Cartridge from the plastic cartridges to the substrate. From the applicator, the adhesive flows through a disposable static mixing nozzle and onto the substrate. Since the adhesive reaction occurs in the nozzle, clean up and maintenance is fast and easy. Each carton includes 4 cartridge sets and 6 static mixing tubes.

** Typical properties and characteristics are based on samples tested and are not guaranteed for all samples of this product. This data and information is intended as a guide and does not reflect the specification or specification range for any particular property of this product.

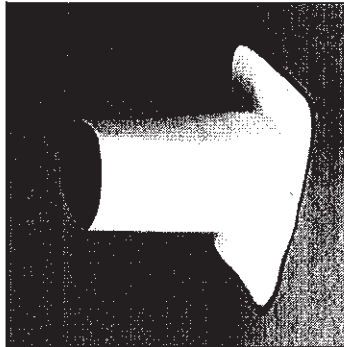


CERTIFICADO DE FABRICACIÓN ACCESORIOS

Una guía de referencia lista para ordenar a los Accesorios TP0 para su siguiente trabajo.

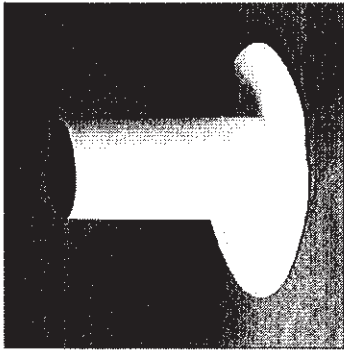


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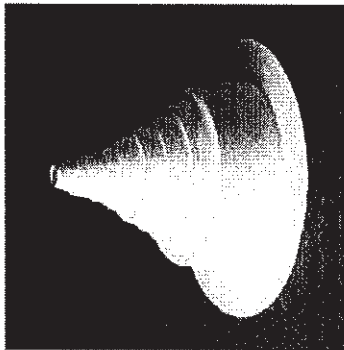
Recubrimientos de TP0 para tubos

cuadrados:
Se fabrican con una membrana reforzada de TP0 de 60 milipulgadas y están diseñados para sellar tubos cuadrados de metal. En estas piezas se incorpora una lengüeta dividida y superpuesta para poder abrir las tapajuntas y sellarlos para reducir una penetración cuadrada ostruida. Se encuentran disponibles en cuatro tamaños: 3 x 4 x 4, 5 x 5 x 6 x 6 pulgadas (7,6 x 7,6; 10,2 x 10,2; 13 x 13 y 15,2 x 15,2 cm), respectivamente. También se encuentran disponibles otros tamaños y colores a través de pedido especial.
Paquetes de 8 unidades por caja.



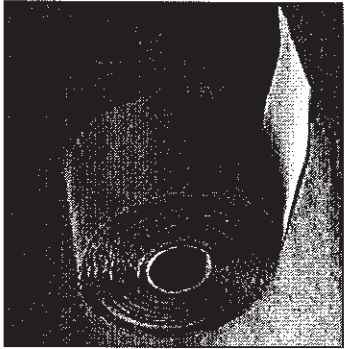
Sellos de TP0 para tuberías divididas:

Son tapajuntas de membrana reforzada de TP0 de 60 milipulgadas para sellar tuberías obstruidas, que evita la instalación de un sello moldeado para tuberías. Los tamaños estándar son: 1, 2, 3, 4, 5 y 6 pulgadas (2,5; 5,1; 7,6; 10,2; 13 y 15,2 cm) de diámetro, respectivamente. También se encuentran disponibles otros tamaños y colores a través de pedido especial.
Paquetes de 8 unidades por caja.



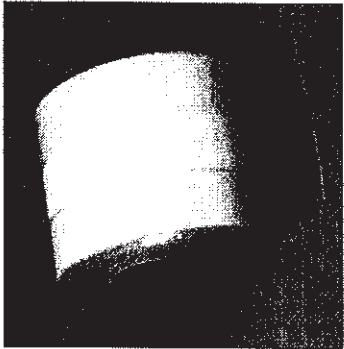
Sellos moldeados de TP0 para tuberías:

Son tapajuntas preformadas, moldeadas por inyección, para tuberías de 1/4 a 8 pulgadas (2 a 20,3 cm) de diámetro. Incluye aros de sujeción de acero inoxidable.
Paquetes de 8 unidades por caja.



Listón tapajuntas de TP0, sensible a la presión:

Es un TP0 no reforzado laminado en una cinta sensible a la presión utilizada para instalar bandas impermeabilizadas en rebordes planos de metal, tales como las canalizaciones para la bajada de agua.
Paquetes de 2 rollos por caja.



Cinta RUSS de TP0, sensible a la presión:

Se encuentra disponible en dos tipos. La cinta RUSS de 10 pulgadas (25,4 cm) (que se muestra) se utiliza en lugar de láminas de ancho estrecho para asegurar la membrana en el perímetro del techo. La cinta RUSS de 6 pulgadas (15,2 cm) se utiliza para asegurar la membrana en la base de paredes verticales sin tener que penetrar la lámina.
Paquetes de 2 rollos de 6 pulgadas x 100 pies (15,2 cm x 30,5 m) y de 1 rollo de 10 pulgadas x 100 pies (25,4 cm x 30,5 m).



Esquinas interiores de TP0 1 y

esquinas exteriores de TP0 2:
Son premoldeadas y se utilizan para sellar esquinas interiores y exteriores que tienen varios detalles.
Paquetes de 12 unidades por bolsa.

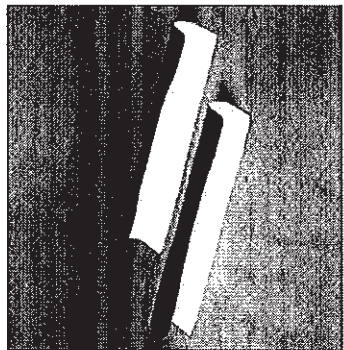
Recubrimiento para juntas en T de TP0 3:

Son tapajuntas no reforzadas y perforadas previamente que se utilizan para sellar intersecciones en membranas de TP0 de 60 y 80 milipulgadas.
Se encuentran disponibles en un tamaño de 4,5 pulgadas (11,4 cm) de diámetro.
Paquetes de 100 unidades por caja.



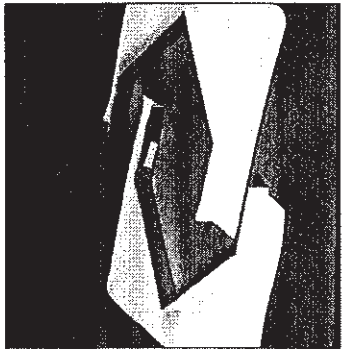
Cavidad selladora moldeada de TP0:

Son dos piezas entrelazadas de cavidades moldeadas por inyección para soldar y que se utilizan para impermeabilizar grupos de tuberías u otras penetraciones de formas particulares, tamaño aproximado: 7,5 - 10 pulgadas (19 - 25,4 cm) x 6 x 2 pulgadas (15,2 x 5,1 cm) de alto.
Paquetes de 5 unidades completas por caja.



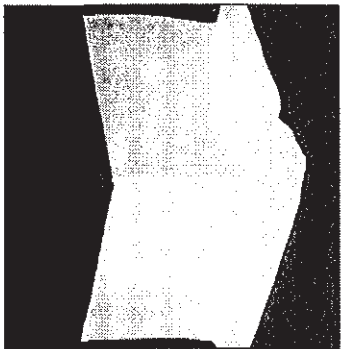
Extensiones de cavidades de TP0:

Consisten en TP0 reforzado laminado en metal revestido de TP0 y se utilizan para ampliar las longitudes de las cavidades selladoras moldeadas o prefabricadas. Tamaño: 2 x 10 pulgadas (5,1 x 25,4 cm).
Paquetes de 10 unidades por caja.



Cavidades selladoras prefabricadas:

Son membranas de TP0 laminadas en metal revestido de TP0. Esta cavidad está diseñada para impermeabilizar penetraciones de gran tamaño, tales como vigas en L y grandes grupos de penetraciones. Se encuentran disponibles en tamaños de 12 (30,5 cm). Se encuentran disponibles otros tamaños y colores a través de pedidos especiales.
Paquetes de 2 unidades por caja.



Esquinas de recubrimiento de TP0 para bordillos:

Son láminas prefabricadas de membrana reforzada de TP0 de 80 milipulgadas, diseñadas para reducir el tiempo de sellado de los bordillos. Cada esquina tiene un rebordo de base de 6 pulgadas (15,2 cm) de ancho y una altura total de 12 pulgadas (30,5 cm). Un rebordo inclinado a 45 grados. Se encuentran disponibles otros tamaños y colores a través de pedidos especiales. Además, de 7 pulgadas (17,8 cm) para bordillos de 12 pulgadas (30,5 cm), recubrimiento para bordillo de 13 pulgadas (33 cm) para bordillo de 24 pulgadas (61 cm), recubrimiento para bordillo de 19 pulgadas (48 cm) para bordillo de 36 pulgadas (91,4 cm), recubrimiento para bordillo.
Paquetes de 12 recubrimientos por caja o 3 bordillos, completos.



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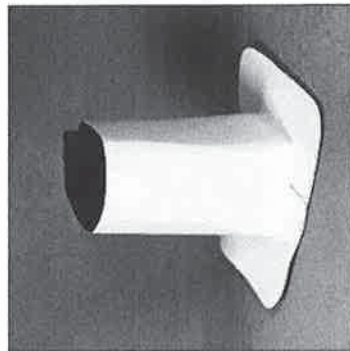
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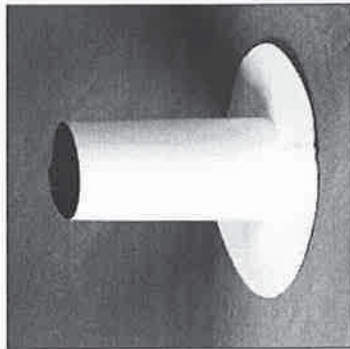
CERTIFIED FABRICATED ACCESSORIES

A ready reference guide for ordering TPO Accessories for your next job.

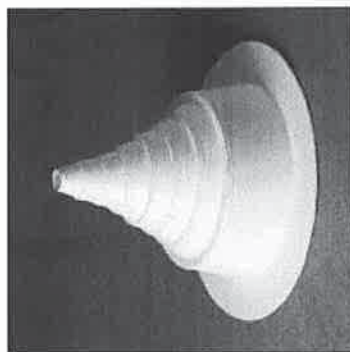
SW TPO SURE-WELD®
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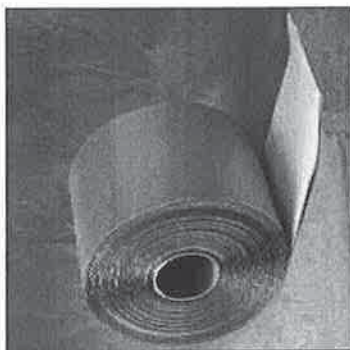
Sure-Weld Square Tubing Wraps
are fabricated using 60-mil reinforced Sure-Weld membrane and are designed to flash square metal tubing. A split and overlap tab are incorporated into these parts to allow the flashings to be opened and wrapped around a square penetration with an obstruction. Stocked in four sizes: 3" x 3", 4" x 4", 5" x 5", and 6" x 6". Other sizes and colors available through special order.
Packaged 8 per box.



Sure-Weld Split Pipe-Seals
are fabricated flashings made of 60-mil reinforced Sure-Weld membrane for flashing pipes with an obstruction that prevents the installation of a molded pipe seal. Standard sizes are 1", 2", 3", 4", 5", and 6" diameter. Other sizes and colors available through special order.
Packaged 8 per box.



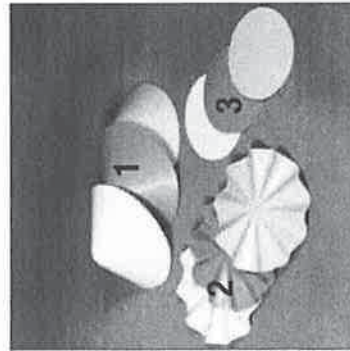
Sure-Weld Molded Pipe Seals
are injection-molded, pre-formed flashings for pipes 3/4" to 8" in diameter. Includes stainless steel clamping rings.
Packaged 8 per box.



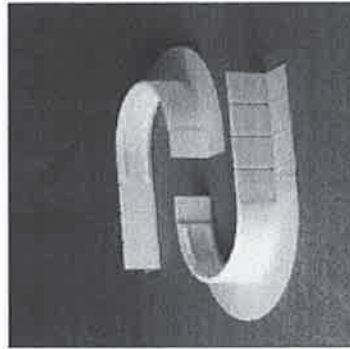
Sure-Weld Pressure-Sensitive Coverstrip
is a non-reinforced TPO laminated to a pressure-sensitive tape used for stripping in flat metal flanges such as drip edge.
Packaged 2 rolls per box.



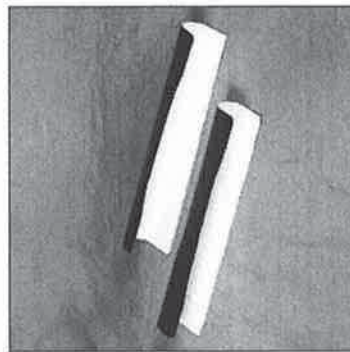
Sure-Weld Pressure-Sensitive RUSS
is available in two types. 10" RUSS (shown) is used in place of narrow width sheets to secure membrane in the perimeter of the roof. 6" RUSS is used to secure membrane at the base of vertical walls without penetrating the sheet. Packaged 2 rolls of 6" x 100' and 1 roll of 10" x 100'.



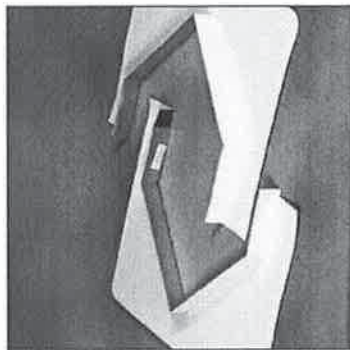
1-Sure-Weld TPO Inside Corners
2-Sure-Weld TPO Outside Corners
are pre-molded and are used for flashing inside and outside corners of a variety of details.
Packaged 12 per bag.
3-Sure-Weld TPO T-Joint Covers
are pre-punched non-reinforced flashings used to seal intersections on 60 and 80-mil TPO membranes.
Size is 4.5" in diameter.
Packaged 100 per box.



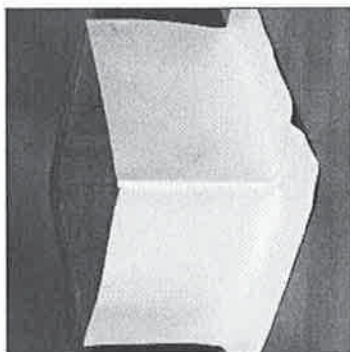
Sure-Weld Molded Sealant Pockets
are interlocking, two piece, injection molded wettable pockets and are used to waterproof pipe clusters or other odd shaped penetrations. Approximate size is 7.5"-10" x 6" x 6" high.
Packaged 5 full pockets per box.



Sure-Weld Pocket Extensions
consist of reinforced TPO laminated to TPO Coated Metal and is used to extend the lengths of the molded or the prefabricated sealant pockets. Size is 2" x 10".
Packaged 10 per box.



Pre-Fabricated Sealant Pockets
consist of TPO membrane laminated to TPO coated metal. This pocket is designed to waterproof large penetrations such as I-beams and large clusters of penetrations. 12" wide available. Other sizes and colors available through special orders.
Packaged 2 pockets per box.



Sure-Weld Curb Wrap Corners
are fabricated flashings made of 60-mil reinforced Sure-Weld membrane designed to reduce curb flashing time. Each corner has a 6" wide base flange and a 12" overall height. One curb will require 4 corners. Other sizes and colors available through special orders. Can be ordered in 1 or 2 piece wraps as well. 7" Curb Wrap for 12" Curb, 13" Curb Wrap for 24" Curb, 19" Curb Wrap for 36" Curb.
Packaged 12 wraps per box or 3 full curbs.

CARLISLE
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COMMENT: AAI INSERTED THIS SHEET IN SUBMITTAL S01.5r.
THIS SHEET (IN ENGLISH) WAS TAKEN FROM SUBMITTAL S01.3r.

CARLISLE'S FASTENING AND TERMINATION BARS

Polymer Fastening Bar

The Polymer Fastening Bar is an engineered polymer bar that's used to mechanically fasten EPDM membranes per Carlisle Specifications. The bar is packaged in a 1" x 250' coil that has pre-punched holes every 3" on center. The bar can be easily cut to any desired length. When installing, make sure that all corners of cut bar are rounded. Install the bar using HP or HP-X Fasteners.

Polymer Fastening Bar

Typical Properties and Characteristics

Material	Engineered Polymer
Dimensions	1" (25 mm) wide x 250' (76 m) long
Packaging	250 lf (76 m) per carton
Weight	10 lbs. (5 kg) carton

Metal Fastening Bar

The Metal Fastening Bar is a Galvalume™ coated metal that's used to mechanically fasten EPDM membranes per Carlisle Specifications. The bar is packaged in 1" x 10' lengths, 500 linear feet per package and has pre-punched holes every 6" on center. The bar can be easily cut to any desired length. When installing, make sure that all corners of cut bar are rounded. Install the bar using HP-X Fasteners.

Metal Fastening Bar

Typical Properties and Characteristics

Material	Galvalume Coated Metal
Dimensions	1" (102 mm) wide x 10' (3 m) long
Packaging	50 pcs; 500 lf (152 m) per carton
Weight	85 lbs. (39 kg) carton

Termination Bar

The Termination Bar is an extruded aluminum bar that's designed for securing and sealing compression type flashing terminations per Carlisle Specifications. The bar is packaged in 1" x 10' lengths, 500 linear feet per package and has pre-punched holes every 6" on center. This bar features a top edge for ease of applying Carlisle's Lap Sealant for EPDM installations or Universal Single Ply Sealant for TPO installations. The bar can be easily cut to any desired length. When installing, make sure that all corners of cut bar are rounded. Install the bar using HP-X Fasteners, or Term-Bar Nail In Fasteners.

Termination Bar

Typical Properties and Characteristics

Material	6036-T6 Extruded Aluminum
Dimensions	1" (25 mm) wide x 10' (3 m) long
Packaging	50 pcs; 500 lf (152 m) per carton
Weight	69 lbs. (31 kg) carton

Sure-Seal Ballast Retaining Bar

The Ballast Retaining Bar is an extruded aluminum bar that's designed as a ballast retaining perimeter securement system, which comes packaged in 4" x 10' lengths, 250 linear feet per package. The ballast retaining bar has pre-punched holes every 6" on center for installation, and also has pre-punched drainage holes every 4" on center.

Sure-Seal Ballast Retaining Bar

Typical Properties and Characteristics

Material	6036-T6 Extruded Aluminum
Dimensions	4" (102 mm) wide x 10' (3 m) long
Packaging	25 pcs; 250 lf (76 m) per carton
Weight	123 lbs. (56 kg) carton

Material
will be using

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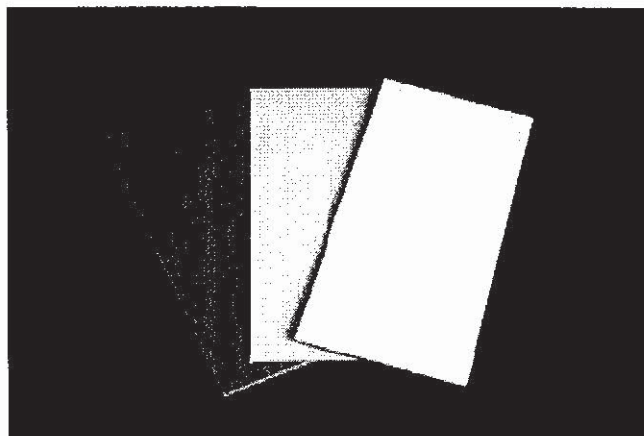
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CARLISLE
Carlisle SynTec

Sure-Weld® TPO

Coated Metal



Overview

Sure-Weld TPO Coated Metal is a 24-gauge (0.6 mm) galvanized steel sheet that is coated with a layer of .035" non-reinforced TPO flashing. TPO membrane may be welded directly to the coated metal, eliminating the need to strip in the metal with a separate piece of TPO Pressure-Sensitive Coverstrip. The sheet is cut to the appropriate width and used to fabricate metal drip edges or other roof perimeter edging profiles. The metal is available in 4' by 10' (1.2 m by 3.1 m) sheets and comes packaged 10 or 25 sheets per pallet.

Carlisle's TPO Coated Metal is part of the Certified Fabricated Accessory (CFA) program. Certified Fabricated Accessories are the only factory-fabricated TPO accessories that meet the stringent quality tolerances required to be included in a Carlisle warranted roofing system.

Features and Benefits

- » Allows direct welding of TPO membrane to the metal, eliminating the need to strip in edging with additional TPO Pressure-Sensitive Coverstrip.
- » Easy to cut and form for creating a variety of edge sizes and profiles.

Installation

1. Install TPO Coated Metal with 1/8" to 1/4" (3-6 mm) between adjoining sections.
2. Install 2"-wide (5 cm) duct tape over joints in TPO Coated Metal.
3. Heat-weld 6"-wide (15.5 cm) piece of TPO non-reinforced flashing over joint.
4. Position TPO reinforced membrane and heat-weld to the TPO Coated Metal with a minimum 1 1/2" (4 cm) weld.

Review Carlisle specifications and details for complete installation information.

Precautions

- » Store coated metal in a cool, shaded area and cover with light-colored, breathable, waterproof tarpaulins. TPO Coated Metal that has been exposed to the weather must be prepared with Weathered Membrane Cleaner prior to hot-air welding.

Typical Properties and Characteristics

Sheet Size	4' by 10' (1.2 m by 3.0 m)
Weight	1.1 lb/ft ² (5.4 kg/m ²)
Color	Gray, Tan and White
Flashing Thickness	0.035" (0.9 mm) nominal
Steel Thickness	0.024" (0.6 mm) nominal (24 gauge)
Steel Type	Hot Dipped Galvanized Steel – G90
Conforms to ASTM A653	
Packaging	10 or 25 sheets per pallet

Typical properties and characteristics are based on samples tested and are not guaranteed for all samples of this product. This data and information is intended as a guide and does not reflect the specification range for any particular property of this product.

LEED® Information

Pre-consumer Recycled Content	0%
Post-consumer Recycled Content	0%
Manufacturing Location	Franklin Park, IL
Solar Reflectance Index (SRI)	N/A

Sure-Weld[®] TPO Walkway Rolls



Overview

Carlisle's Sure-Weld Heat Weldable Walkway Roll is designed to protect the Sure-Weld TPO membrane in those areas exposed to repetitive foot traffic and other hazards. Walkways must be installed at all traffic concentration points (i.e., roof hatches, access doors, rooftop ladders, etc.) regardless of traffic frequency. Walkways must also be installed if regular maintenance (once a month or more) is necessary to service rooftop equipment.

Carlisle Sure-Weld Walkway Rolls are part of the Certified Fabricated Accessory (CFA) program. Certified Fabricated Accessories are the only factory-fabricated TPO accessories that meet the stringent quality tolerances required to be included in a Carlisle warranted roofing system.

Features and Benefits

- » Increased slip resistance created with a diamond plate tread pattern
- » Walkway edges are trimmed in safety yellow to better define the designated traffic flow
- » The yellow edges are smooth without tread lugs for easier welding
- » Superior weathering package for long term performance
- » Stocked in white, tan and gray, special colors available (minimum quantities apply)

Installation

1. Use Weathered Membrane Cleaner to prepare the membrane to be welded to the walkway material.
2. Position the walkway material. Cut the Walkway Rolls into maximum 10' lengths and position with a minimum 1" gap between adjacent pieces to allow for water drainage. Cut the walkway so a 4" minimum gap is created over any field splices. (Since the attachment of the walkway to the membrane is permanent, this will allow access to the field seams).

3. Using an automated welder, weld all four sides of the walkway material to the membrane. (Typically the same speed and temperature settings will be used for this procedure as for welding membrane to membrane. A test weld is always recommended prior to performing welds to the installed membrane). A hand held welder may be utilized, however, productivity will be decreased.

Review Carlisle specifications and details for complete installation information.

Precautions

- » Walkway Rolls are a maintenance item and are not covered under the Carlisle membrane systems warranty.
- » This product is to be used as a walkway only and is not designed as a perimeter warning line or a substitute for ballast. Walkway rolls cannot be installed within 10' (3m) of the roof perimeter.
- » If possible, allow the walkway to relax and warm up in the sun prior to welding in place.

Typical Properties and Characteristics

Physical Property	Test Method	Typical Properties	
		Minimum	Maximum
Dimensional Conformance Thickness, in. (mm)	ASTM D412	0.160 (4.06)	0.180 (4.5)
Density, lbs./ft ³ ; (gr/cm ³)	ASTM D792	80.5 (1.29)	84.3 (1.35)
Tensile Strength, psi (MPa)	ASTM D638	600 (4.1)	
Tear Strength, lbf/in (kN/m)	ASTM D624	100 (17.5)	
Sizes	34" wide x 50' long		
Packaging	9 per skid, each roll individually bagged		
Weight (each)	97 lbs.		
Thickness	80-mil at bottom of tread, 80-mil at yellow welding edge, 170-mil overall		
Color	White, gray and tan		

Typical properties and characteristics are based on samples tested and are not guaranteed for all samples of this product. This data and information is intended as a guide and does not reflect the specification range for any particular property of this product.



Sure-Weld® TPO

Split Pipe Seals



Overview

Carlisle's Sure-Weld TPO Split Pipe Seals are prefabricated flashings made from specially designed 60-mil reinforced TPO Detail Membrane that allows for the elimination of T-Joint Covers at crossovers. Designed to fit pipes ranging from 1" (25.4 mm) to 6" (152.4 mm) in diameter, TPO Split Pipe Seals can be used to wrap round pipes with obstructions that would prevent the use of a standard pre-molded pipe seal.

TPO Split Pipe Seals are available in standard white and are packaged 8 per carton. Each carton also contains 8 universal clamping rings. Additional sizes and colors are available on a special-order basis.

Carlisle's TPO Split Pipe Seals are part of the Certified Fabricated Accessory (CFA) program. Certified Fabricated Accessories are the only factory-fabricated TPO accessories that meet the stringent quality tolerances required to be included in a Carlisle warranted roofing system.

Features and Benefits

- » Special, more flexible TPO Detail Membrane allows for the elimination of T-Joint Covers at crossovers
- » Simplifies the contractor's job when flashing a pipe with an obstruction
- » Easier to work with in colder temperatures
- » Required on 25- or 30-year warranties

Productivity Boosting Features and Benefits:

- » Up to 60% labor savings compared to traditional field fabrication
- » Quick and simple installation with no stretching required
- » Provides a consistent, finished appearance



Installation

Confirm the outside diameter of the pipe to be flashed as most pipe sizes refer to inside diameter. TPO Split Pipe Seals indicate the maximum outside diameter they will fit, not the size pipe they will fit. For example, a 2" PVC pipe has a 2 $\frac{3}{8}$ " outside diameter, therefore a 3" Split Pipe Seal is required to fit the 2" inside diameter of the pipe.

Each Split Pipe Seal can fit a pipe with an outside diameter that is 1" smaller than the Split Pipe Seal's stated size. A 3" Split Pipe Seal can fit pipes with a 2" to 3" outside diameter.

1. Wrap the TPO Split Pipe Seal around the pipe until the vertical leg is tight against the outside of the pipe.
2. Mark the pipe around the top of the TPO Split Pipe Seal.
3. Remove the TPO Split Pipe Seal from around the pipe.
4. Install Water Cut-Off Mastic below the mark indicating the top of the installed TPO Split Pipe Seal.
5. Wrap the TPO Split Pipe Seal back around the penetration until the vertical leg is tight against the outside of the pipe.
6. Tack-weld the back edge of the pipe seal's vertical leg, ensuring that good contact is maintained between the TPO Split Pipe Seal and the pipe. This process will hold the TPO Split Pipe Seal in place.
7. Heat-weld the entire width of the vertical overlap. Hand-roll against the outer surface of the pipe to create the pressure necessary to achieve an acceptable weld.
8. Heat-weld the base flange to the deck membrane and complete the horizontal overlap weld.
9. Once the flashing has completely cooled, check all splices for voids and cold welds. Make any needed repairs.

Sure-Weld TPO

Split Pipe Seals

10. Install a stainless steel universal clamping ring to provide constant compression of the sealant.
11. Apply TPO Cut-Edge Sealant to all edges of the TPO Split Pipe Seal that are located on the horizontal plane. Do not apply the sealant to vertical surfaces.

Review Carlisle specifications and details for complete installation information.

Precautions

- » Remove all lead and other flashing.
- » Temperature of pipe must not exceed 160°F (71°C).
- » Install a minimum of four fastening plates around pipe penetrations on mechanically fastened systems. Position fastening plates around the penetration so the plates are covered by the TPO Split Pipe Seal flange. A minimum 1½"-wide weld must be maintained around the outer edge of the flange beyond the plates. If fastening plates cannot be installed in a manner to allow a minimum 1½" weld, the plates must be placed outside the pipe seal flange and covered with a heat-welded reinforced TPO overlay.
- » Store pipe seals in a cool, shaded area and cover with light-colored, breathable, waterproof tarpaulins. TPO Split Pipe Seals or membrane that have been exposed to the weather prior to use must be prepared with Weathered Membrane Cleaner prior to hot-air welding.

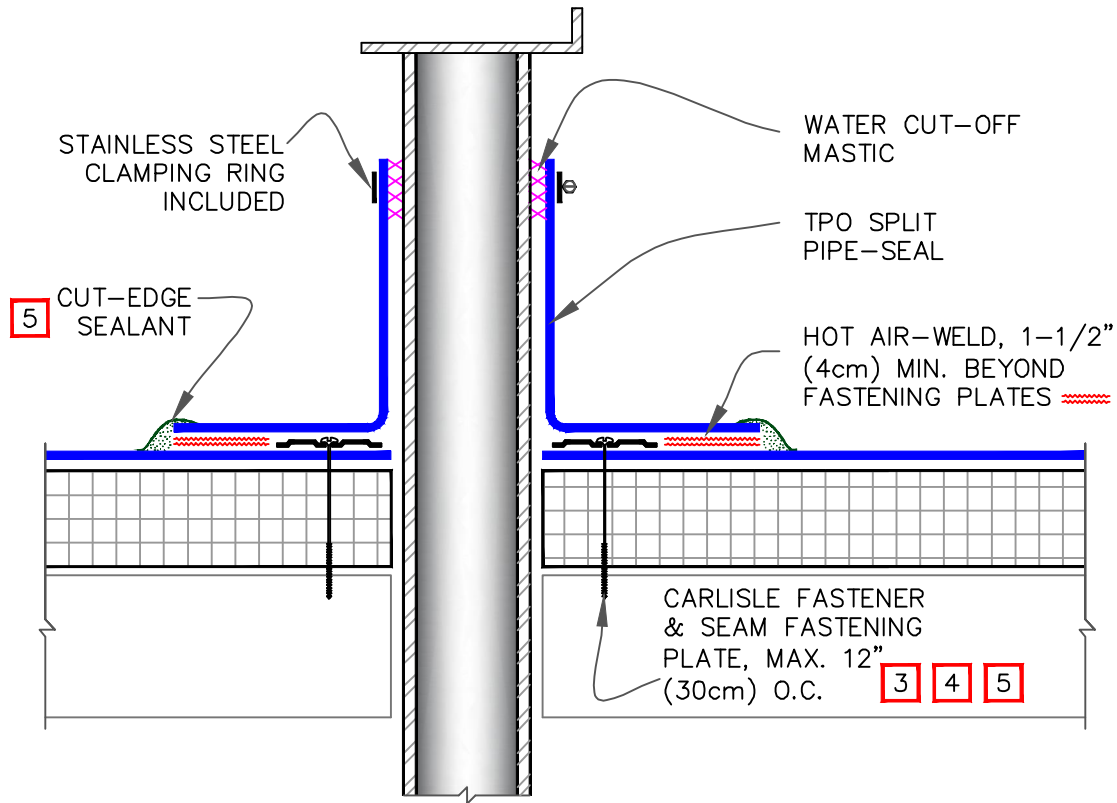
Typical Properties and Characteristics

Sizes	1", 2", 3", 4", 5", and 6" O.D. Pipe (25.4, 50.8, 76.2, 101.6, 127.0, and 152.4 mm)
Packaging	8/box
Weight (box)	1" 4 lbs (2 kg) 2" 5 lbs (2 kg) 3" 5 lbs (2 kg) 4" 6 lbs (3 kg) 5" 6 lbs (3 kg) 6" 6 lbs (3 kg)
Material	Reinforced 60-mil TPO Detail Membrane
Color	White (Gray and Tan are available via custom order)

Typical properties and characteristics are based on samples tested and are not guaranteed for all samples of this product. This data and information is intended as a guide and does not reflect the specification range for any particular property of this product.

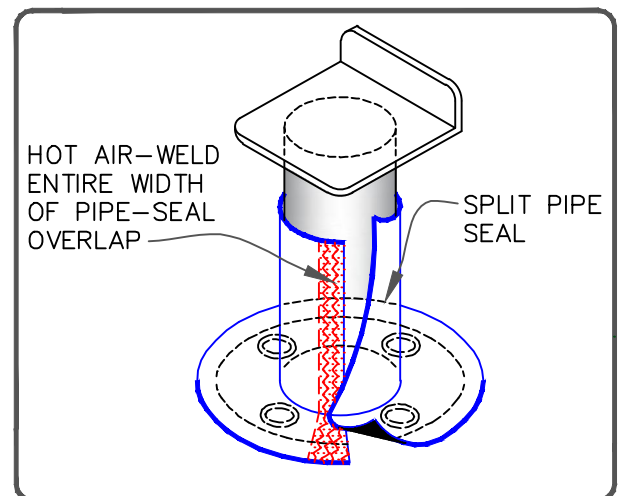
LEED® Information

Pre-consumer Recycled Content	0%
Post-consumer Recycled Content	0%
Manufacturing Location	Piedmont, SC Eugene, OR
Solar Reflectance Index (SRI)	White:99



NOTES:

1. REMOVE ALL EXISTING LEAD AND FLASHING MATERIAL BEFORE INSTALLING SPLIT PIPE FLASHING.
2. TEMPERATURE OF THE PIPE PENETRATION MUST NOT EXCEED 160°F (71°C).
3. INSTALL A MINIMUM OF 4 FASTENERS AND PLATES AROUND THE PIPE, EQUALLY SPACED. IF FASTENERS AND PLATES CANNOT BE INSTALLED AS SHOWN, THEY MAY ALSO BE POSITIONED OUTSIDE THE PIPE MAXIMUM 12" (30cm) O.C. AND FLASHED WITH TPO REINFORCED MEMBRANE/CUT-EDGE SEALANT. REFER TO [DETAIL U-8B.](#)
4. FASTENERS AND PLATES ARE NOT REQUIRED ON ADHERED SYSTEMS UNLESS PIPE DIAMETER EXCEEDS 18" (46cm).
5. APPROXIMATELY 1/8" (0.5cm) DIAMETER BEAD OF CUT-EDGE SEALANT IS REQUIRED ON CUT EDGES OF REINFORCED TPO MEMBRANE ONLY.
6. T-JOINT COVERS ARE NOT REQUIRED ON WHITE, TAN OR GRAY PREFABRICATED ACCESSORIES. FOR ALL ADDITIONAL COLORS IT IS REQUIRED TO COVER T-JOINTS.



CFA CERTIFIED PRE-FABRICATED SPLIT PIPE SEAL

MAXIMUM WARRANTY: 30 YEARS



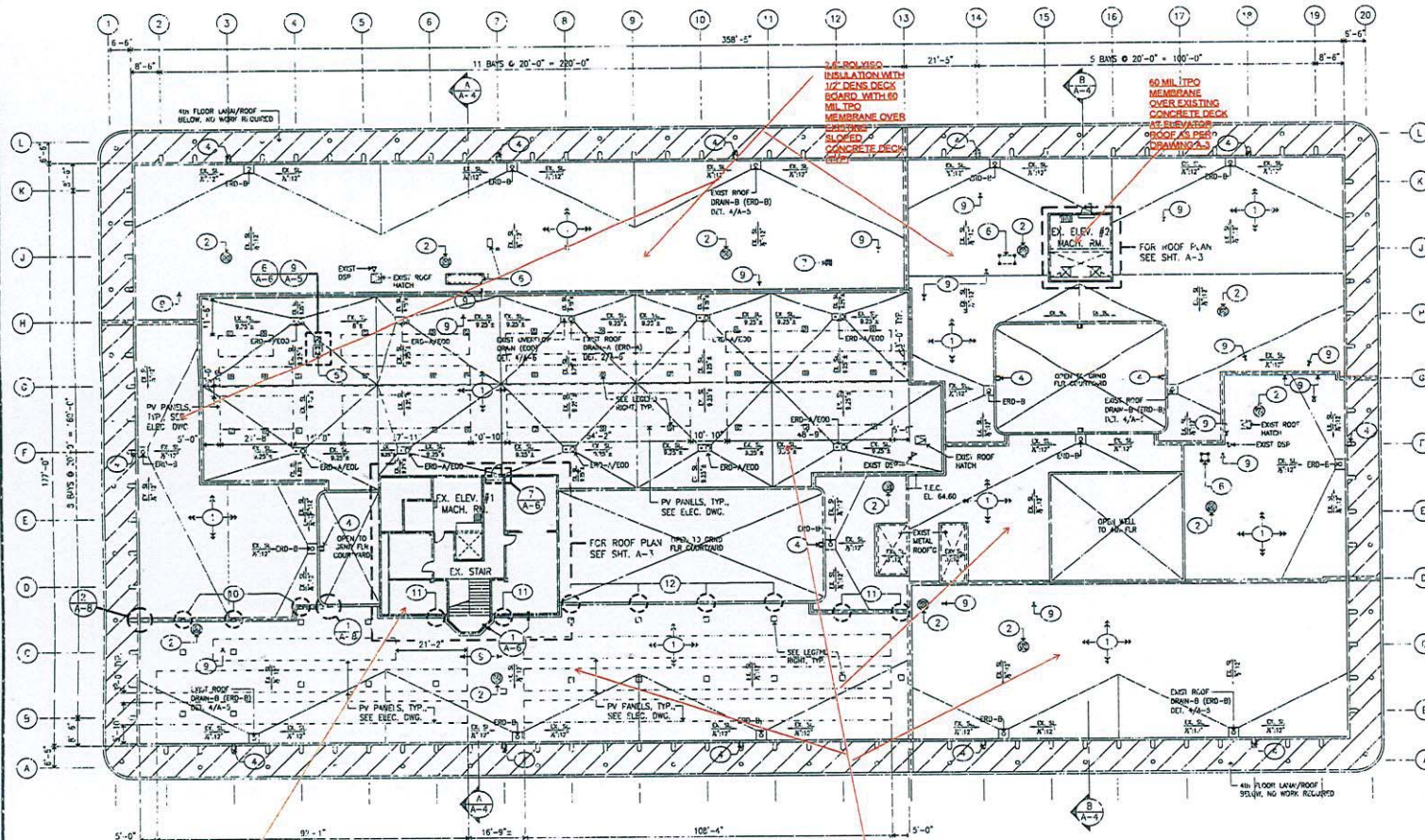
DETAIL NO.

U-8E

U (Universal Detail)



Proposed design of base platform with roofing material installed and the concrete platform placed on top. Materials used to construct the base platform is not known.



2.5" POLYISO
INSULATION
TAPERED
INSULATION 1/4"
PER FT SLOPE
WITH 1/2" DENS
DECK BOARD
WITH 60 MIL TPO
MEMBRANE OVER
EXISTING
CONCRETE DECK
AT MACH RM
ROOF AS PER
DRAWING A-3



EXIST ROOF PLAN - REROOF
SCALE: 1/16" = 1'-0"

2.5" POLYISO
INSULATION WITH
1/2" DENS DECK
BOARD WITH 60
MIL TPO
MEMBRANE OVER
EXISTING
SLOPED
CONCRETE DECK
(TYP.)



GENERAL REROOFING NOTES:

1. ALL SURFACES TO RECEIVE NEW ELAST. SHEET ROOFING, FLASHING, SEALANT, CAULKING, ETC., SHALL BE CLEAN & FREE OF ANY DEBRIS & OR CONTAMINATES.
2. CLEAN & PREP EXIST ROOF TO 1/2\"/>

UTILITY CONDUIT/PIPING NOTES:

1. FOR EXIST UTILITY CONDUIT/PIPING ROOF PENETRATION FLASHING SEE DET. 3/A-3
2. MOUNT EXIST, NEW OR RELOCATED UTILITY PIPING/CONDUIT ONTO PRE-FAB CURB, MODIFY PIPING/CONDUIT AS REQUIRED SEE DET. 3/A-5

REROOFING NOTES:

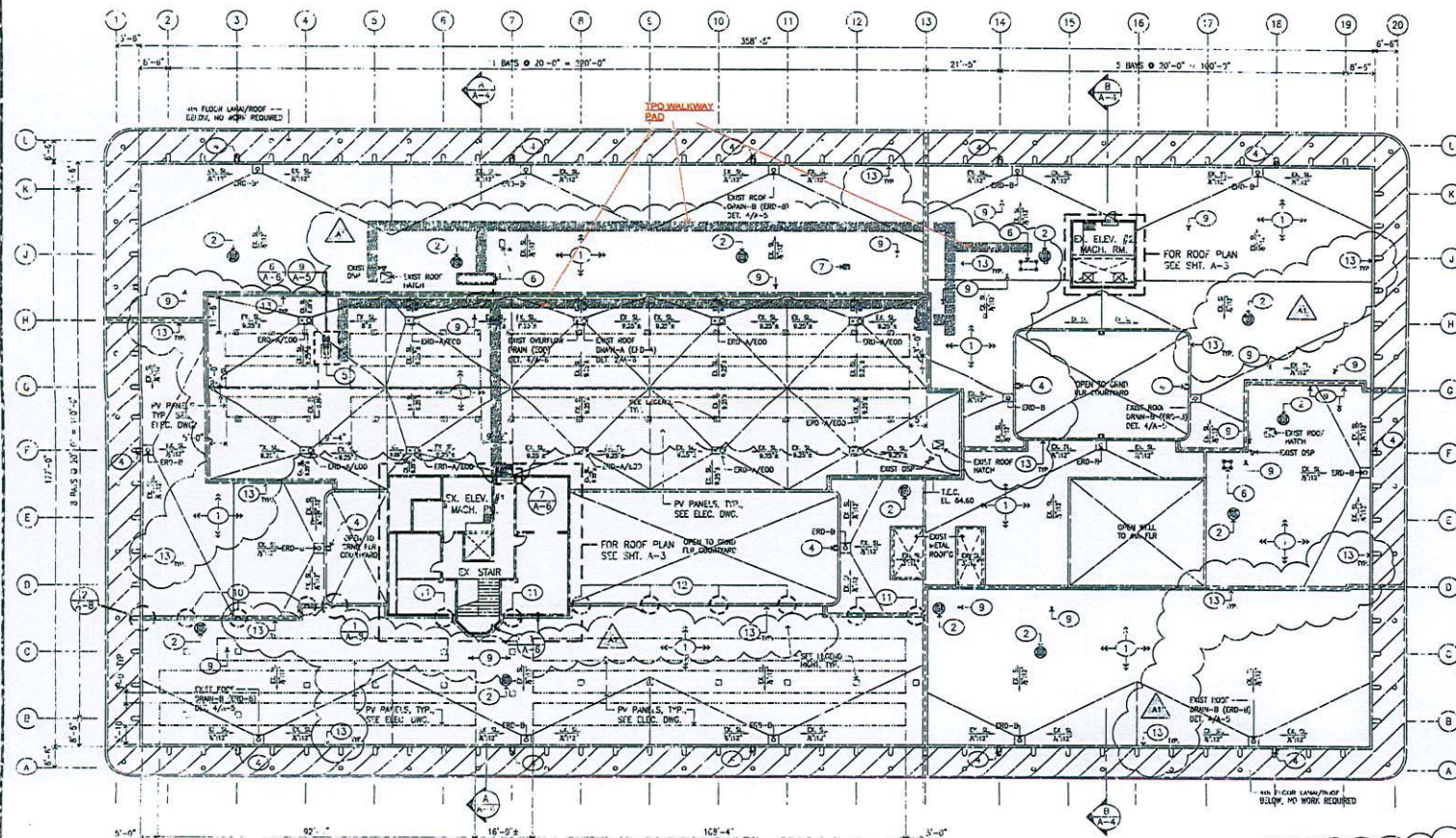
(THIS SHEET ONLY)

1. INSTALL NEW ELAST. SHEET ROOFING (ADHESIVE) ON 1/2\"/>

LEGEND:

- ELAST. SHEET ROOFING PAD FOR PV PANEL SUPPORT, HOT AIR WELD EDGES 1/4\"/>

Keelikolani Bldg Install PV
system Replace upper Roof
Torys Roofing & Waterproofing, Inc



EXIST ROOF PLAN - REROOF
SCALE: 1/16" = 1'-0"

LEGEND: TPO

- **EXIST ROOF** - ROOFING PAD FOR PV PANEL SUPPORT, HOT AIR WELD EDGES 1/2" MINIMUM TO ELAST. SHEET ROOFING. PAD SHALL EXTEND 6" (MINIMUM, ALL SIDES) BEYOND PV PANEL SUPPORT BASE. DO NOT FASTEN PV PANEL SUPPORT BASE TO ROOFING PAD. VERIFY SIZE, LOCATION & QUANTITY WITH STRUCTURAL DRAWINGS.
- **PITCH POCKET** FOR PV PANEL SUPPORT, SEE DET. 3/A-6 SIM. VERIFY SIZE, LOCATION, ORIENTATION & QUANTITY WITH STRUCTURAL DRAWINGS.
- △ **WALKWAY PADS.**

Graphic Scale in Feet: (1/16"=1'-0")

GENERAL REROOFING NOTES:

1. ALL SURFACES TO RECEIVE NEW ELAST. SHEET ROOFING, FLASHING, SEALANT, CAULKING, ETC. SHALL BE CLEAN & FREE OF ANY DEBRIS & OR CONTAMINATES.
2. ~~REMOVE & FILE EXIST ROOFING TO 4" GROUT, FLUSH TO ADJACENT SURFACES WHERE EXISTING SHEET METAL COUNTER FLASHING WAS REQUIRED TO RECEIVE NEW ELAST. SHEET COUNTER FLASHING WELD BE INSTALLED.~~
3. PATCH & REPAIR ALL DAMAGED SURFACES AS REQUIRED WITH LIKE MATERIAL, MATCH ADJACENT SURFACE.
4. ~~CLEAN, REPAIR AND/OR SEAL ALL CONCRETE WALLS, PARAPETS AND CURB GUARDS THAT ARE TO REMAIN EXPOSED AFTER THE EXISTING ROOFING MATERIAL IS REMOVED AND PREPARE SURFACE TO RECEIVE ELASTOMERIC WATERPROOF COATING.~~

UTILITY CONDUIT/PIPING NOTES:

1. PEN-ENG-UTILITY CONDUIT/PIPING ROOF PENETRATIONAL FLASHING, SEE DET. 3/A-5
2. ~~MOUNT EXIST NEW OR RELOCATED UTILITY PIPING/CONDUIT ONTO PRE-FAB CURB - MODER-DRIVE/CONDUIT AS REQUIRED SEE DET. 3/A-5~~

REROOFING NOTES:

(THIS SHEET ONLY)

1. INSTALL NEW ELAST. SHEET ROOFING (ADHERED) ON 1/2" GYPSUM BASE COVER BOARD, ADHERED OVER 2.6" RIGID INSULATION. FOR TYPICAL ELAST. SHEET COUNTER FLASHING, SEE DET. 10/A-5
2. INSTALL NEW SUPPLY/EXHAUST FAN & FLASHING ON EXIST ROOF CURB, SEE DET. 9/A-5
3. REINSTALL EXIST WATER CHILLER ON NEW EQUIPMENT SUPPORT FRAMING, SEE DETAIL 5/A-5 FOR EQUIPMENT SUPPORT FRAMING. MODIFY EXIST WATER CHILLER HEIGHT AS REQUIRED.
4. INSTALL NEW SHEET METAL OVERFLOW SCUPPER, SEE DET. 2/A-5
5. REINSTALL EXIST EXHAUST FAN ON NEW EQUIPMENT SUPPORT FRAMING, SEE STRUCTURAL DRAWINGS. MODIFY EXIST DUCT WORK AS REQUIRED.
6. INSTALL NEW PITCH POCKET AT EXIST EQUIPMENT SUPPORT FRAME, TYP. SEE DET. 3/A-6 SIM.
7. ~~INSTALL NEW SHEET METAL ROOF JACK ON EXIST ROOF CURB, SEE DET. 1/A-5~~
8. INSTALL CONTINUOUS 36" WIDE (MIN.) ELAST. SHEET WALKING PATH OVER ELAST. SHEET ROOFING. CONTINUOUS HOT AIR WELD EDGES 1/2" WIDE (MIN.) TO ROOFING.
9. EXIST VENT PIPE, SEE DETAIL 6/A-5 FOR FLASHING
10. INSTALL NEW PV PANEL SUPPORT BEAM, SEE STRUCT. DWG. FOR FLASHING SEE 3/A-8
11. INSTALL NEW PV PANEL SUPPORT BEAM, SEE STRUCT. DWG. FOR FLASHING SEE 4/A-8
12. INSTALL NEW PV PANEL SUPPORT BEAM, SEE STRUCT. DWG. FOR FLASHING SEE 5/A-8
13. ~~ELASTOMERIC WATERPROOF COATING ON ALL EXPOSED CONCRETE WALLS, PARAPETS & CURBS.~~

Keelikolani Bldg Install
Pv system and Replace
upper Roof.

Tony's Roofing & Waterproofing

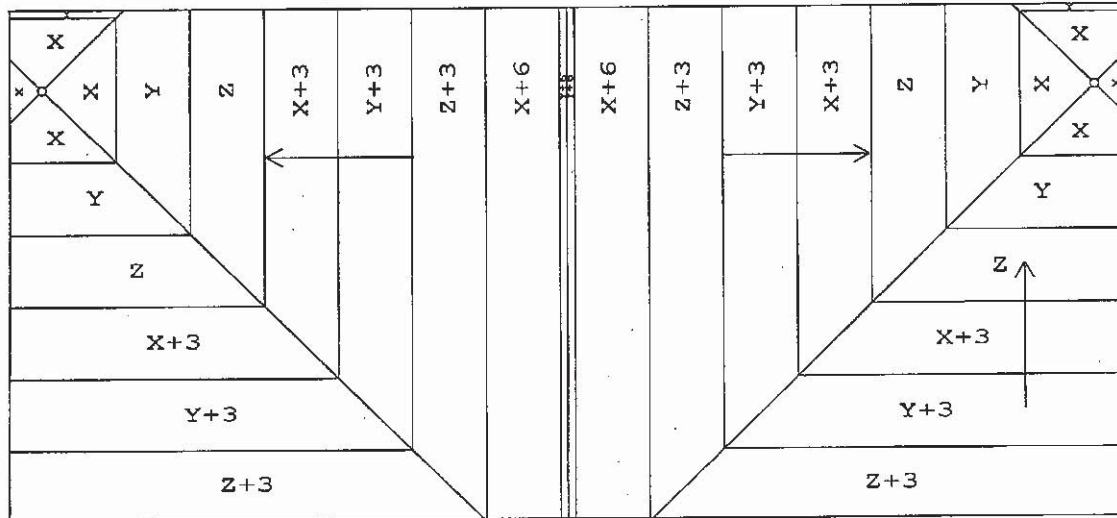
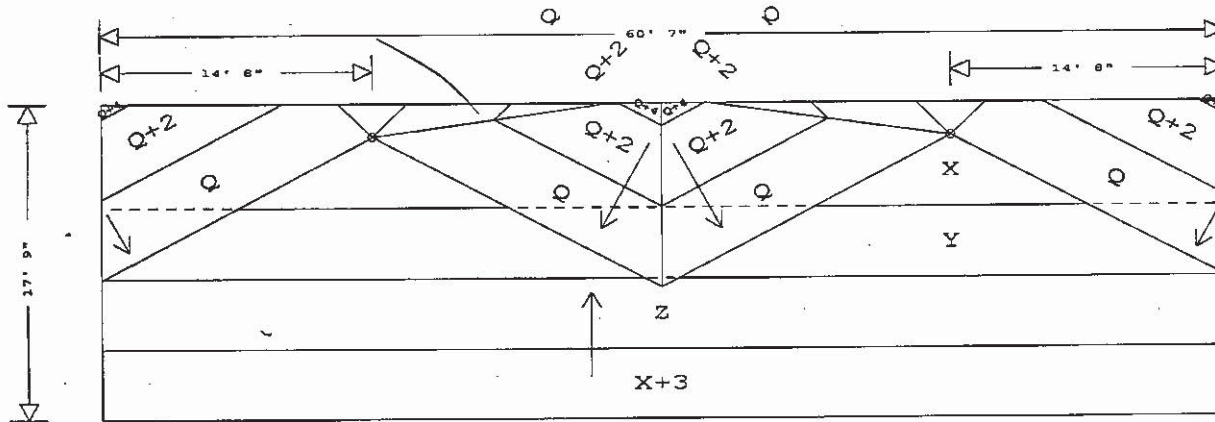
1A-2

PROJECT:
KEELIKOLANI BLDG STAIR ROOF
POLYISO SUBMITTAL LAYOUT

#1 Mechanical Room
Tapered Drawing
Insulation

SHEET A-3
GRIDLINE E

SHEET A-3
GRIDLINE D



Material: POLYISO
Tapered Slope: 1/4" per ft.
Thickness min.: 0.5" max: 7.75"
Squares Applied: 50 [28sq]
Drawn By: [CB]

HAWAII SUPPLY

Distributor of Roofing, Insulation & Waterproofing Products
www.HawaiiSupplyLLC.com

APPROVED

APPROVED AS NOTED

The contractor is responsible for correctness of all dimensions, sizes and quantities.

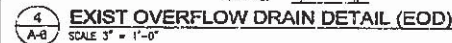
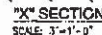
- I, the contractor, agree to the following:
1. The dimensions shown are correct.
 2. I will reuse all partial panels.
 3. I will field match ISO at any/all transitions.

Signed: _____ Date: _____

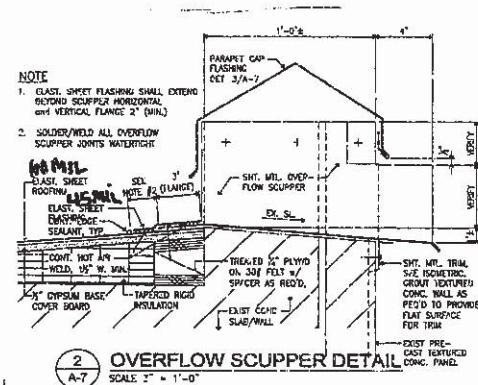
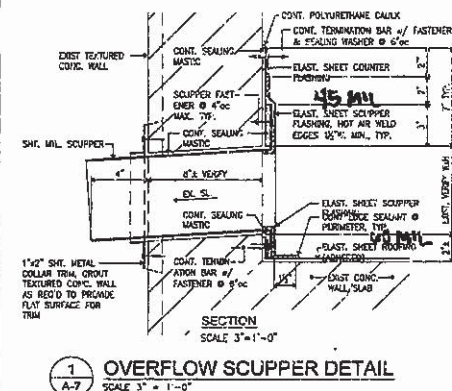
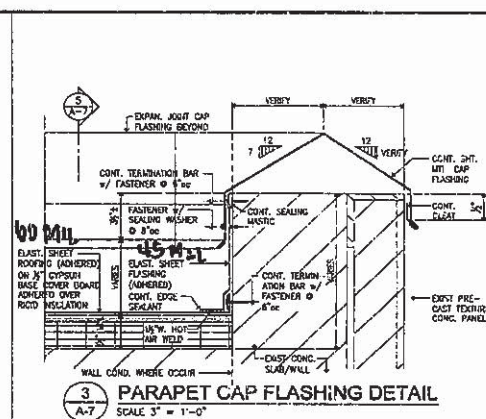


Tony's Roofing & Waterproofing, Inc.

(A-5)



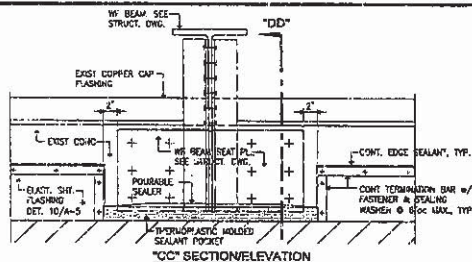
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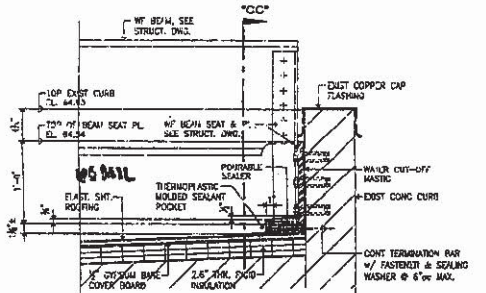
Keel Kolani Building Install
PV system and Replace upper
RMF.

Tony's Roofing & Waterproofing, Inc.

(A-7)



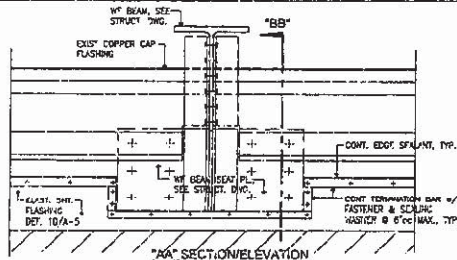
"DD" SECTION/ELEVATION



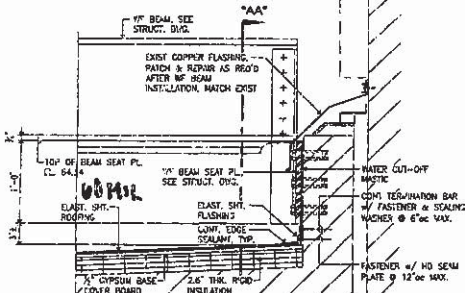
"CC" SECTION/ELEVATION

5 FLASHING DETAIL

A-B SCALE 1 1/2\"/>



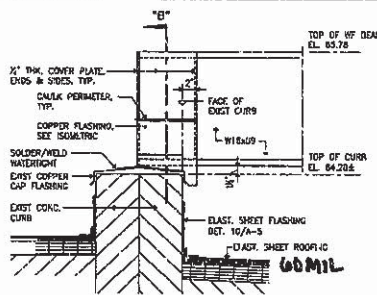
"BB" SECTION/ELEVATION



"AA" SECTION/ELEVATION

4 FLASHING DETAIL

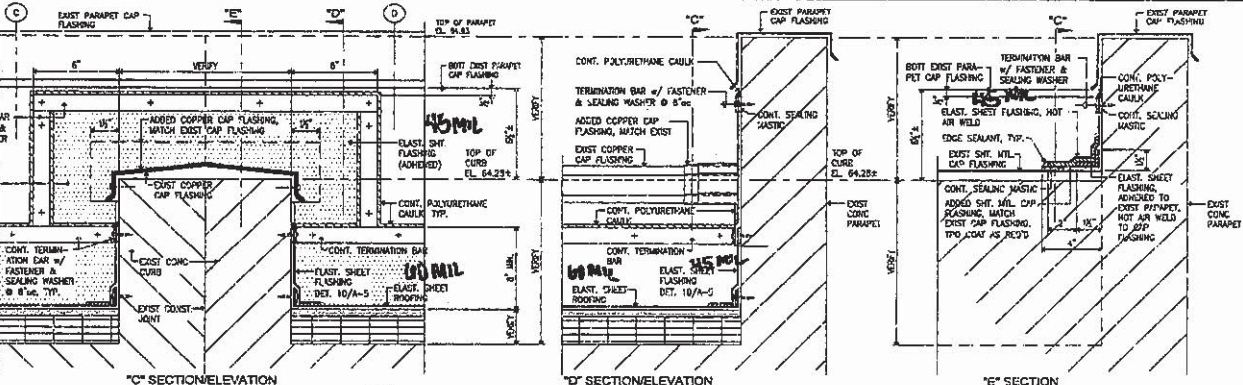
A-B SCALE 1 1/2\"/>



"B" SECTION

3 FLASHING DETAIL

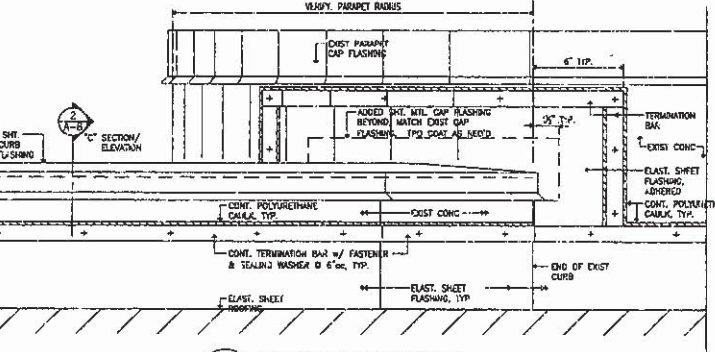
A-B SCALE 1 1/2\"/>



"C" SECTION/ELEVATION

2 FLASHING DETAIL

A-B SCALE 3\"/>



1 ELEVATION/SECTION

A-B SCALE 3\"/>

Keeli Kolani Building Install
PV System and Replace upper
Roof

Tony's Roofing's Waterproofing, Inc.
(A-8)

 **CARLISLE'S
SPEC SUPPLEMENT**

G-08-11

**Application Procedures for Carlisle 725TR Air and
Vapor Barrier**

November 2011

The information contained in this supplement serves as a criteria for Specifiers and Authorized Applicators regarding the design and installation of Carlisle Roofing Systems and related products. Additional information essential for the design and installation of the Roof Systems mentioned herein are also included in the respective Specification for each Roof System and in the Design Reference Section of the Carlisle Technical Manual. Specifiers and Authorized Applicators are advised to reference all applicable sections.

A. General

1. **Carlisle 725TR Air and Vapor Barrier** A 40-mil thick composite consisting of 35-mil self-adhering rubberized asphalt membrane laminated to an 5-mil UV resistant poly film with an anti-skid surface which is fully compatible with FAST Adhesive. 725TR can also function as a temporary roof for up to 120 days. Available in rolls 39" wide by 75' long (244 square feet).
2. **CCW Cav-Grip** - is a low VOC contact adhesive used to prime surfaces for the application of 725TR. It features a quick dry time and ease of application from the self contained pressurized cylinder. Cav-Grip is an alternate, high-strength, adhesive using a blend of VOC exempt and non-exempt solvent which complies with the State of California Clean Air Act of 1988 (updated in 1997). Coverage rate is 2,500-3,000 sq ft per cylinder.
3. **CCW 702 Primer and 702LV Primer (Low VOC)** - A single component, solvent based, high tack primer used to provide maximum adhesion between Carlisle 725TR Air and Vapor Barrier and an approved substrate. Applied by spray or long nap roller with a coverage rating ranging from approximately 300 to 350 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. CCW 702LV Primer contains less than 250g/L VOCs and meets South Coast Air Quality Management District (SCAQMD) and Leadership in Energy and Environmental Design (LEED) Requirements for Volatile Organic Compounds.

B. Approved Substrates

Carlisle 725TR Air and Vapor Barrier, in conjunction with either CCW Cav-Grip or 702 Primers, can be used over structural concrete, gypsum and wood decks. In addition, Securock/Dens-Deck Prime (typically used over steel deck construction) is a suitable substrate providing it is mechanically fastened to the deck at the minimum rate of 1 per 2 per square foot or adhered to the deck with FAST Adhesive per Carlisle Specifications.

CAUTION: Use of standard Dens-Deck is not recommended due to excessive primer absorption. When the use of standard Dens-Deck is specified, two coats of

CCW Primer will be required along with a trial test to verify adequate adhesion of the Carlisle 725TR Air and Vapor Barrier.

C. Limitations

1. Do not apply primer or vapor barrier to frozen substrates. Best results are obtained when temperatures are above 40°F (4°C).
2. Do not apply primer or vapor barrier to damp or contaminated surfaces.
3. Carlisle 725TR Air and Vapor Barrier is not recommended for use over sealants containing coal tar or polysulfides. If these materials are present, they must be removed and the surfaces thoroughly cleaned.

D. Installation

1. **Surface Preparation:** Concrete shall be in place for 7 days minimum and the substrate must be dry. The surface shall have a smooth finish and be free of voids, spalled areas, sharp protrusions, loose aggregate, laitance and form release agents. In the event of rain, concrete must be allowed to dry before primer is applied.
2. **Primer:** Surfaces to receive Carlisle 725TR Air and Vapor Barrier must be clean and dry. Prime with CCW Cav-Grip, 702 or 702LV Primer. Apply Primer by spray, brush or with a long nap roller at the applicable coverage rate noted above. At 75° F allow primer to dry 1 hour minimum. Primer has a satisfactory cure when it will not transfer when touched. Prime only areas to be waterproofed the same day. Re-prime if area becomes dirty.
3. **Application:** Apply Carlisle 725TR Air and Vapor Barrier from low to high point, in a shingle fashion, so that laps will shed water. Overlap all edges at least 2-1/2". End laps shall be staggered. Place membrane carefully so as to avoid wrinkles and fishmouths. Immediately after installation, roll with a 100-150 pound weighted steel roller.
4. **Repairs:** Following application, inspect 725TR membrane for tears, punctures, fishmouths, air bubbles and voids due to misalignment at seams. Remove damaged membrane. Prime exposed substrate and allow primer to dry. Apply a new section of Carlisle 725TR Air and Vapor Barrier to primed substrate, extending onto adhered membrane 6" on all sides. Firmly press air and vapor barrier repair section to ensure a good seal. Slit fishmouths and overlap the edges. Place a section of Carlisle 725TR over the repair and extend 6" in all directions. Firmly press repair section to ensure a good seal.
5. **Insulation and FleeceBACK Membrane Installation:** Ensure surface of Carlisle 725TR Air and Vapor Barrier is dry prior to installing insulation. Place insulation over the surface and mechanically fasten to the roof deck or adhere to the vapor barrier with FAST Adhesive in accordance with this Carlisle Specification. Complete the installation by adhering FleeceBACK membrane over the insulation.
6. **Installation at angle changes:** For FleeceBACK Systems where insulation is adhered to the vapor retarder and adhered roofing systems with vertical base wall securement and adhered insulation, one of the following options must be incorporated to ensure continuous seal is provided during climatic changes, especially in northern regions:
 - a. Option One: Mechanically secure the first course of insulation (bottom layer) with insulation fasteners and plates. A row of fasteners shall be installed within 6" of the angle change spaced 12" O.C.

- b. Option Two: In lieu of fastening, install a 3" diameter backer rod along the angle change to accommodate for movement and prevent the effect of the vapor retarder pulling away from angle change.

Note: Maintain mylar backing at the sponge tubing to prevent the 725TR from adhering to the tubing. As shown in the applicable Carlisle Detail.

- c. Option Three: In lieu of fastening and when the use of backer rod is not possible, the 725TR can be installed with a double fold, allowing extra material to accommodate for structural movement.

Note: Maintain mylar backing within the fold to allow for material expansion in the event of movement. Refer to applicable Carlisle Detail.

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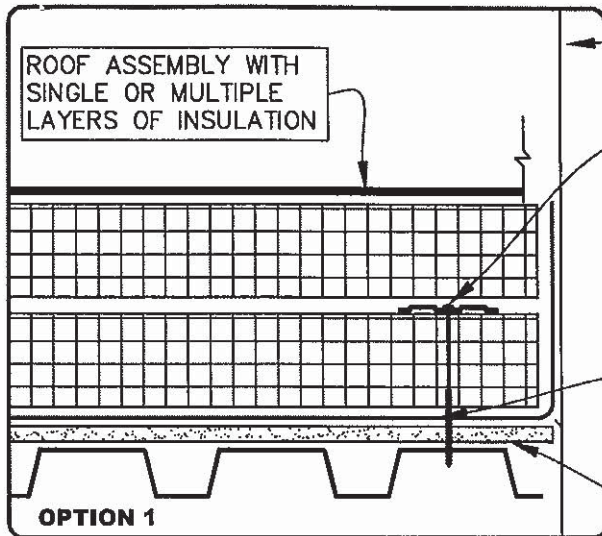
Carlisle, FleeceBACK, and FAST Adhesive are Trademarks of Carlisle Construction Materials Incorporated

Dens Deck is a Trademark of Georgia-Pacific Gypsum LLC

Securock is a Trademark of USG Corporation

This Spec Supplement 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.

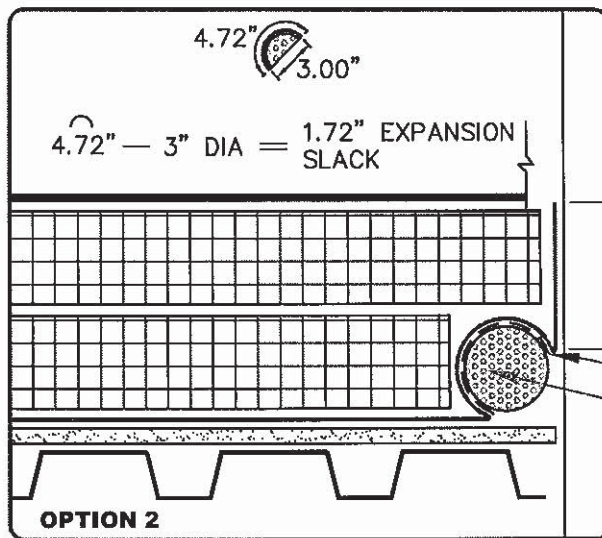


PARAPET WALL/LOW CURB

SECURE BOTTOM LAYER OF INSULATION AT 12" (305mm) O.C. PARALLEL TO WALL AT 6" (152mm) DISTANCE **NOTE:** WHEN MEMBRANE BASE SECUREMENT IS PROVIDED INTO THE DECK, INSULATION FASTENER MAY BE ELIMINATED

725TR SELF-ADHERING VAPOR RETARDER FULLY ADHERED TO PRIMED SUBSTRATE

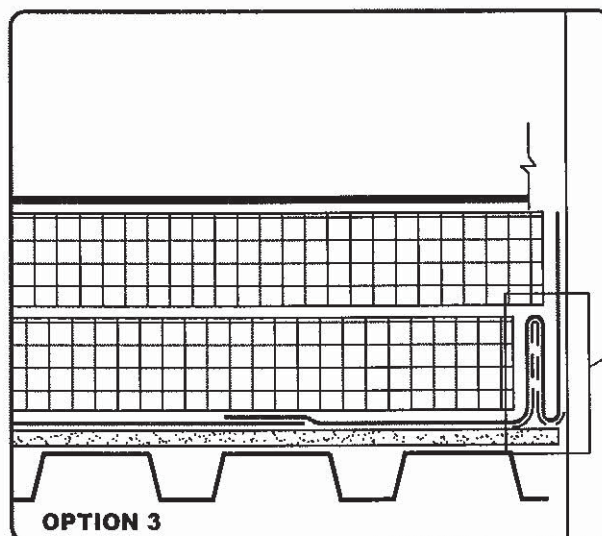
SUBSTRATE BOARD



DIMENSIONS		mm	
(A)	3"	76	MIN.

MYLAR SHEET (DASH LINE) AS BOND BREAKER

CONTINUOUS OPEN CELL POLYURETHANE FOAM BACKER ROD



CONTINUOUS STRIPPING OF SELF-ADHERING VAPOR RETARDER 725TR FULLY ADHERED TO WALL AND SUBSTRATE WITH DOUBLE FOLD CREASES MIN. 2" (51mm) HIGH, SET VERTICALLY UP AGAINST THE WALL. DO NOT ADHERE THE FOLDS TOGETHER

MYLAR SHEET (DASH LINE) AS BOND BREAKER

	MEMBRANE
	APPROVED SUBSTRATE
	SEE NOTE(S)

DECK-TO-WALL VAPOR RETARDER EXPANSION DETAIL

For additional information, refer to Specifications



DETAIL NO.

G-08