



Underwood – Roof Installation

Cedar Shake Roof Areas

Install the following Underlayments beneath shakes:

- Titanium ice and water shield at the following locations
 - o To minimum of 2' beyond exterior walls of house
 - o (2) rows at all valleys
 - o Up intersecting dormer walls
 - o Around chimneys
- Install titanium synthetic underlayment under remaining roof surfaces
- Cedar breather laid beneath all areas to receive cedar shakes
- Lay 36" row of 30# asphalt felt at roof eaves
- Lay 18" row of 30# asphalt felt after each successive course of cedar shakes

Install the following 16 oz. copper flashings in conjunction with cedar shakes:

- 1.5" Copper Drip edge at all eaves and rake edges (See attached)
- 12" x 8" step flashing at all sidewall locations with each row of shakes (See attached)
- 4" x 4" apron flashings at intersecting headwall locations (See attached)
- 18" trough style copper valley flashings (See attached)
- 4" x 4" transition flashings at all pitch change locations (See attached)

Install CCA Treated Cedar Shakes: (See attached)

- Starter Row - Lay 18" CCA treated cedar shingles at eave edges (Extend 1.5" beyond eave edge and 1" beyond rake edges (See attached)
- Lay #1 - 24" x ½" CCA treated hand-split shakes over entire roof surface (10" exposure)
 - o Secured with ½" crown x 2" Stainless Steel Staples
- Place mitred hip shingles at all hip locations
- Install Shinglevent II – 9" ridgevent with mitred ridge shingles over shinglevent
- Shingles cut to valleys, headwalls, and ridges as required

Copper Roofing (16 oz copper)

Install the following Underlayments beneath copper roofing:

- Titanium ice and water shield beneath all copper roof areas

Install the following 16 oz. copper flashings in conjunction with copper roof areas:

- 1.5" Copper Drip edge at all eaves and rake edges (See attached)
- Copper 4" x 4" wall flashings at side and headwall locations
- Copper 4" x 4" transition flashings between copper and cedar roofing
- Pan valley flashings between copper and cedar roofing

Install 16 oz. Copper Roofing as follows:

- **Barrel roof locations**
 - o Install double lock standing seam (1" rib with 15" pan) secured with clips and screws
 - Double curved roof to utilize batten panels
 - o Hem panels to perimeter edges
- **Straight roof areas**
 - o Install 1" standing seam (1" rib with 15" pan) secured with clips and screws
- **Bell shaped dome**
 - o Install horizontal seam roof
 - o Install hip cap at all hips
 - o Place ball and spire at peak (6" Ball with 36" Spire)
- **Window wells**
 - o Install flat lock copper panels
 - o Place transition flashings over cedar roof areas
 - o Flash up side walls and below windows
 - o Place 1.5" copper drip edge at rake edges and tie in cedar roof
- **Cupolas**
 - o Install 20oz copper bell shaped cupola 85" square x 46" tall (**Large Cupola**)
 - Alluminum tube frame
 - Plywood
 - Ice and water shield
 - Copper clad fascia
 - Place ball and spire at peak (6" Ball with 36" Spire)
 - o Install 20 oz copper bell shaped cupola 40" square x 24" tall (**Garage Cupola**)
 - Alluminum tube frame
 - Plywood
 - Ice and water shield
 - Copper clad fascia
 - Place ball and spire at peak (4" Ball with 28" Spire)

Low Slope Roof

- Place $\frac{3}{8}$ " Polystyrene insulation over roof deck area
 - Secure with Durolast plates and screws
- Install 50 Mil Durolast Membrane over all of low slope area and carry to a point up a minimum of 24" up steep slope areas
 - Fasten membrane to roof deck with Durolast Plates and Screws per manufacturer specifications
 - - Heat weld all seams to min. 1.5" solid weld
 - - Terminate at eave edge with copper drip edge

Storage & Installation Instructions

Titanium PSU30 is an air, vapor, and secondary water barrier and therefore must be installed above a properly ventilated space(s). Follow ALL building codes applicable to your geographical region and structure type as it is considered a vapor barrier.

STORAGE:

1. PSU30 should be stored at room temperature, upright in the original cardboard packaging in a dry properly ventilated area. Keep clear from open flames, sparks, harmful substances and shelter from the elements.
2. Only rolls destined for same-day use should be removed from its storage area.
3. For best results store in temperatures between 40°F (4.4°C) and 90°F (32°C). If room temperature storage is not available, it is recommended to heat material to a minimum temperature of 40°F (4.4°C) prior to application.

USE:

PSU30 must be covered by primary roofing within 180 days of application. PSU30 is designed for use under; Asphalt Shingles, Synthetic Shingles, Metal Roofing, Tiles, Slate, and Cedar Shakes.

DECK PREPARATION:

1. Protrusions from the deck area must be removed and decks shall have no voids, damaged or unsupported areas. Deck surface should be free of debris, dry and moisture free.
2. PSU30 may be applied directly to a plywood, OSB, concrete or masonry roof surface and should be fully covered for attaching possible or within 180 days. Priming is not required for attaching to wood surfaces when the temperature is above 40°F. Concrete and masonry decks should be primed with a solvent or a water based primer that meets ASTM D41 for asphalt based self-adhesive membranes.
3. For re-roofing projects replace any water damaged sheathing and sweep roof deck thoroughly removing any debris such as dust, dirt and loose nails. Do not install over old roof covering.
4. Use of calcium or salt for ice and snow removal is not recommended.

APPLICATION:

1. For best results PSU30 should be installed on a dry deck when the air, membrane, and substrate temperature is over 40°F (4.4°C).
2. For cold weather applications below 40°F (4.4°C) a primer should be used and the laps blind nailed. Blind nail with 3/8" head roofing nails of 1" or longer in the 3" overlap area marked with a "+," symbol.
3. For steep slope applications (6:12 or greater) or when installing at temperatures greater than 100°F (38°C) it is recommended to blind nail the overlap area as instructed above for cold weather applications.
4. PSU30 is to be laid out horizontally (parallel) to the eave with the printed side up, using 3" horizontal laps and 6" vertical laps.
5. For vertical installation PSU30 should be anchored with 3/8" head roofing nails along the upper most edge 3 inches down with 6 equally spaced nails across the 36" width. Ensure roofing nails are perpendicular to the roof deck so that the head lays flat and seals well to the top surface of the PSU30. Vertical overlaps to be 6" and 3" for horizontal laps if required.
6. Always work from the low point to the high point of the roof. Apply the membrane in valleys before the membrane is applied to the eaves.

DISTRIBUTED BY:



7. Cut the membrane into manageable lengths. Peel back 1-2 feet of release liner, align the membrane, and continue to peel the release liner from the membrane. Hand press or walk on, then follow with a 40 lb or heavier pressure roller to smooth and secure the membrane, especially at the overlap layers. If a roller is not available or considered safe, walk on all laps, and as much of the field area as possible to push the adhesive into the pours of the roof deck and overlap.
8. For eave installation PSU30 should be applied over the metal drip edge at the eave. Do not fold PSU30 over the roof edge unless the edge is subsequently covered over by a drip edge or other flashing material. It is recommended that PSU30 extend from the eave up the roof to a point 24" (minimum) beyond the exterior wall. This should be above the maximum ice dam buildup line in most areas. Consult your local building code for specific requirements.
9. For valleys and ridge applications, center the sheet over the valley or ridge, drape, and hand press in place before removing the backside release liner. Note: It is very important PSU30 stay in contact with the roof deck into and out of the valley area. PSU30 should never be suspended or bridge a valley. It is recommended to follow up with a pressure roller or by walking on the surface. Give special attention to ALL perimeter edge areas.
10. Repair holes, fish mouths, tears, and any other penetration damage to the membrane with a round patch of membrane extending passed the damaged area by 6" in all directions. If fasteners are removed leaving holes in the membrane or other penetrations are accidentally produced, they must also be patched.
11. Do not install fasteners through membrane over any unsupported areas of the structural deck, such as over joints between adjacent structural panels.
12. For high elevation, high wind or wind driven rain it is recommended to cover the entire roof deck with PSU30.

PRECAUTIONS:

1. PSU30 is not designed for indefinite outdoor exposure. Final roofing should be installed within 180 days of installation.
2. Depending on roof pitch and surface conditions, blocking maybe required to support roofing materials placed on the roof. Remember to seal the fastener holes that secured the blocking after they have been removed.
3. Protect completed roof areas to avoid damage during roof installation and material transportation by installing protective boardwalks to enable passage of people, equipment and products.
4. Be careful not to load too much material on the roof deck in one area. Disburse the weight over structural supports where possible.

CAUTION - READ GOOD SAFETY PRACTICES BELOW

As with any roofing product, always follow safe roofing codes & practices (OSHA) and always use and wear fall protection devices when working on roofs. Release liners are slippery and should be removed from work area immediately after application. Use caution when walking or standing on Titanium PSU30 as slip resistance may vary with surface conditions, weather, footwear and roof pitch. Failure to use proper safety gear and footwear can result in serious injury.

TITANIUM® PSU 30

SYNTHETIC ROOFING UNDERLAYMENT

Premium Self Adhered Underlayment for Protection from Wind Driven Rain, Water, Snow and Ice Dams

For use under all:

Metal, Tile, Slate, Shake & Shingle Roofing

SUPERIOR WALKABILITY!

SUREFOOT®

Patented Sure-Foot modular walking surface

TITANIUM®
LIMITED
LIFETIME*
WARRANTY

Over
25 Million
Squares Sold!

Roofers
rely on it.™

*See www.HierWrap.com/TitiumWarranty for complete coverage and restrictions.

INSTALLATION INSTRUCTIONS

Titanium® UDL30 is an air, water and vapor barrier (06 perms) and therefore should be installed above a properly ventilated space(s). It is recommended to follow all building codes applicable to your geographical region and structure type.

DECK PREP: All protrusions from the deck area must be removed and ensure the deck has no voids, damaged or unsupported areas. Deck surface should be free of debris, dry and moisture free.

USE: UDL30 must be covered by primary roofing within 180 days of application. UDL30 is designed for use under all primary roofing types including: Asphalt Shingles, Synthetic Shingles, Metal roofing, Tiles, Slate, and Cedar Shakes.

APPLICATION: For slopes 4:12 and higher UDL30 is to be laid out horizontally (parallel) to the eave with the printed side up. Horizontal laps should be 4" and vertical laps should be 6" and anchored approximately 1" in from the edge. For low slope applications (less than 4:12) it is recommended to overlap 50% plus 1", for complete definition of low slope and guidelines consult authorities having jurisdiction. UDL30 product is not recommended for slopes less than 2:12. The use of a roofing hammer, hatchet hammer, pneumatic air or gas driven fastener tools is acceptable. The use of a straight edge cutting knife is recommended.

FASTENERS: For same day coverage with primary roofing UDL30 can be anchored with corrosion resistant 3/8" head x 1" leg roofing nails (ring shank preferred, smooth leg acceptable). The use of every other anchoring location printed on the product is also acceptable. **DO NOT USE STAPLES:** The use of staples to penetrate UDL30 will void warranty.

ANCHORING: All anchoring nails must be flush, 90 degrees to the roof deck, and tight with the underlayment surface and the structural roof deck. Where seams and joints require sealant or adhesive use a low solvent plastic roofing cement meeting ASTM D-4586 Type 1, or Federal Spec SS-153 Type 1 such as Karnak, Henry, DAP, MB, Geocel or equivalent. Acceptable alternatives are butyl/ rubber, urethane, and EPPM based caulk or tape sealant.

EXTENDED EXPOSURE: If Titanium UDL30 product will be exposed longer than 1 day but less than 5 days then it is recommended to anchor using corrosion resistant 3/8" head x 1" leg roofing nails (ring shank preferred). Use of every other anchoring point in the field is acceptable. For exposure more than 5 days and up to 180 days UDL30 Product must be anchored with 1" plastic or metal cap smooth or ring shank roofing nails. Miami-Dade approved tin tags and nails or metal caps are also acceptable, and it is recommended for best performance to use with the rough edge facing up. For extended exposure it is always recommended to anchor on every printed position on the face. Note: UDL30 is not designed for indefinite outdoor exposure. For extended exposure conditions where driving rain or strong winds are expected it is recommended to take additional precautions such as doubling the lap widths. Alternately or in addition to a compatible sealant could be used between the laps or a peel and stick tape could be applied to the overlaps.

CAUTION - READ GOOD SAFETY PRACTICES BELOW

Good safety practices should be followed on steep slope roofs, such as use of tie-offs, toe boards, ladders and/or safety ropes and personal body harnesses. Follow OSHA guidelines. Slip resistance may vary with surface conditions from debris that accumulates, weather, footwear and roof pitch. Failure to use proper safety gear can result in serious injury. Depending on roof pitch and surface conditions, blocking may be required to support materials on the roof and is good safety practice. Remember to seal the fastener holes that secured the blocking after they have been removed.

DISTRIBUTED BY:



TITANIUM® UDL VS. ROOFING FELT

TITANIUM® (Green icons) vs. **FELT** (Red icons)

LifeTime Warranty
Inert to mold growth
High resistance to wind
Does not absorb water & wrinkle
Does not dry out and degrade
Does not leach oil
* Class A fire rating
Meets class 4 hail rating
Supports building green

DESCRIPTION	UDL30	15 lb FELT	30 lb FELT
Width	48"	36"	36"
Length per roll	250 ft.	144 ft.	72 ft.
Rolls per 1000 sq. ft.	1 roll	3 rolls	5 rolls
Rolls required per 5000 square ft. roof	5 rolls (200 lbs)	12 rolls (420 lbs)	24 rolls (744 lbs)

NOTES

- Over 1,000,000 homes are protected under LifeTime
- Titanium does not break down, dry out and degrade like felt
- Synthetic material avoids potential chemical incompatibility between primary roofing and petroleum impregnated felt
- Storm protection - stronger waterproof membrane acts as a secondary layer of protection
- Reduces liability - safer slip resistant walking surface

UDL30, 30 lb and 15 lb Felt are trademarks of Interwrap. Titanium is a registered trademark of Interwrap. © 2014 Interwrap. All rights reserved. See www.interwrap.com for complete coverage and restrictions.



For more information about InterWrap's recycling programs go to: www.interwrap.com/recycle



TITANIUM® UDL 30

SYNTHETIC ROOFING UNDERLAYMENT

FOR USE UNDER: METAL, TILE, SLATE, SHAKE & SHINGLE ROOFING

SUPERIOR WALKABILITY!

SUREFOOT®

Patented Sure-Foot nodular walking surface

TITANIUM®
LIMITED
WARRANTY

LIFETIME

Over 25 Million Squares Sold!

Roofers rely on it.™

*See www.interwrap.com/LifetimeWarranty for complete coverage and restrictions

Titanium® UD.L30 is a highly engineered, mechanically attached, coated woven synthetic roofing underlayment designed for sloped roofs. UD.L30 represents the future in felt replacement technology, and used in conjunction with Titanium PSU30 self-adhered underlayment, offers the sloped roofing industry a truly revolutionary system of safety, security and simplicity.

UD.L30's advanced polymers combine to deliver a unique gray synthetic roofing underlayment that can be used under all types of primary roofing materials to replace #30 felt. Gray technology provides for a cooler working surface during installations and up to a 6 month UV exposure. Unlike smooth surfaced underlayments, UD.L30 possesses a revolutionary patented slip resistant Sure-Foot® nodular walking surface technology that allows for easier steep slope walkability, even in wet conditions.

Gain an edge in productivity and profits: UD.L30's light weight, 48" width and 250 ft run length allows for fewer laps, cuts and easier roll handling compared to felt. This means you can do more jobs in less time, use less labor, and inventory fewer rolls.

UD.L30 is 100% synthetic, therefore totally unaffected by water, which means it is 100% inert to mold, lays flat and will not wrinkle. Stay on track, take on more jobs and sleep assured that your UD.L30 projects will remain intact and dried-in. Unlike felts, UD.L30 does not dry out, leach oils in the heat, nor does it become stiff, difficult to roll or crack in the cold.

UD.L30 is 20 times stronger than #30 felt, gone are the days of blow-offs and call backs! Exceptional tear strength and up to 6 months exposure time allows your job to stay on track through all kinds of wind and weather. Less material damage and waste during installation and fewer post-install repairs result in significant savings in time and money. UD.L30 will continue to protect your high cost, long life rated, primary roofing long after oil saturated felt products have turned to dust!



Turn your next roofing job into a . . .

MASSIVE BILLBOARD!

Inquire today about Dual Logo printing on Titanium UD.L30 Synthetic Underlayment.

- Up to 6 months UV exposure rating
- Meets and exceeds ASTM D2267 Types I & II
- ICC E5 Approved
- Class A Fire ASTM E108
- CAN/CSA A220.1
- Meets Class 4 Hail Rating
- Florida Building Code Approved
- Texas Department of Insurance
- 6 times lighter and 20 times stronger than #30 felt
- Contributes to LEED® points, 100% Recyclable
- All temperature performance -40°F to 240°F
- Synthetic construction inert to mold growth
- Cool gray surface, doesn't expand or contract
- Dual logo custom printing available



TITANIUM UD.L30 ROLL SPECS

LENGTH PER ROLL: 250' / 76.2 m
 WIDTH PER ROLL: 48" / 122 cm
 WEIGHT PER ROLL: 40 lbs / 18.2 kg
 ROLL SIZE: 10 sq / 93 m²
 ROLLS PER PALLET: 30
 PALLET WEIGHT: 1,250 lbs / 567 kg

TITANIUM UD.L30 TECHNICAL DATA

TEST & STANDARD	TITANIUM UD.L30 TYPICAL VALUE	ASTM #30 FELT TYPICAL VALUE
Class A Fire ASTM E108	Pass	N/A
Nail Penetration ASTM D1970	Pass	N/A
Permeability ASTM E96	0.6 perms	1.75 perms
Water Impenetrance ASTM D9869	MD 54 lbs (20.9 kg) / CD 40 lbs (18.2 kg)	MD 10 lbs (4.5 kg) / CD 2 lbs (0.9 kg)
Tear Strength ASTM D3553	MD 143 lbs (65.9 kg) / CD 100 lbs (45.4 kg)	MD 10 lbs (4.5 kg) / CD 3 lbs (1.4 kg)
Burden Strength ASTM D151	250 psf (12.0 kPa)	66 psf (3.2 kPa)
Burst Strength ASTM F797	MD 138% CD 18%	MD 28% CD 2%
Elongation ASTM D5561	40 lbs (1.82 kg)	27 lbs (1.25 kg)
Minimum Thickness ASTM D1777	25 mils (0.63 mm)	60 mils (1.5 mm)

InterWrap® Roofing Products Division

Charleston, SC • Vancouver, BC • Mission, BC • Montréal, QC
www.interwrap.com/titanium
 Toll Free: 888 713 7663 | Tel: 778 945 2888
 E-mail: info@interwrap.com

Titanium brand products are manufactured in accordance with national standards which allow for consistent variations in weights and dimensions. Test data is based on an average of several production runs and should not be considered for interpreted as maximum or minimum values. Values are typical and not limiting specifications. All values in US units.
 © 2015 InterWrap Inc. All rights reserved. IUDL30 12Aug142015



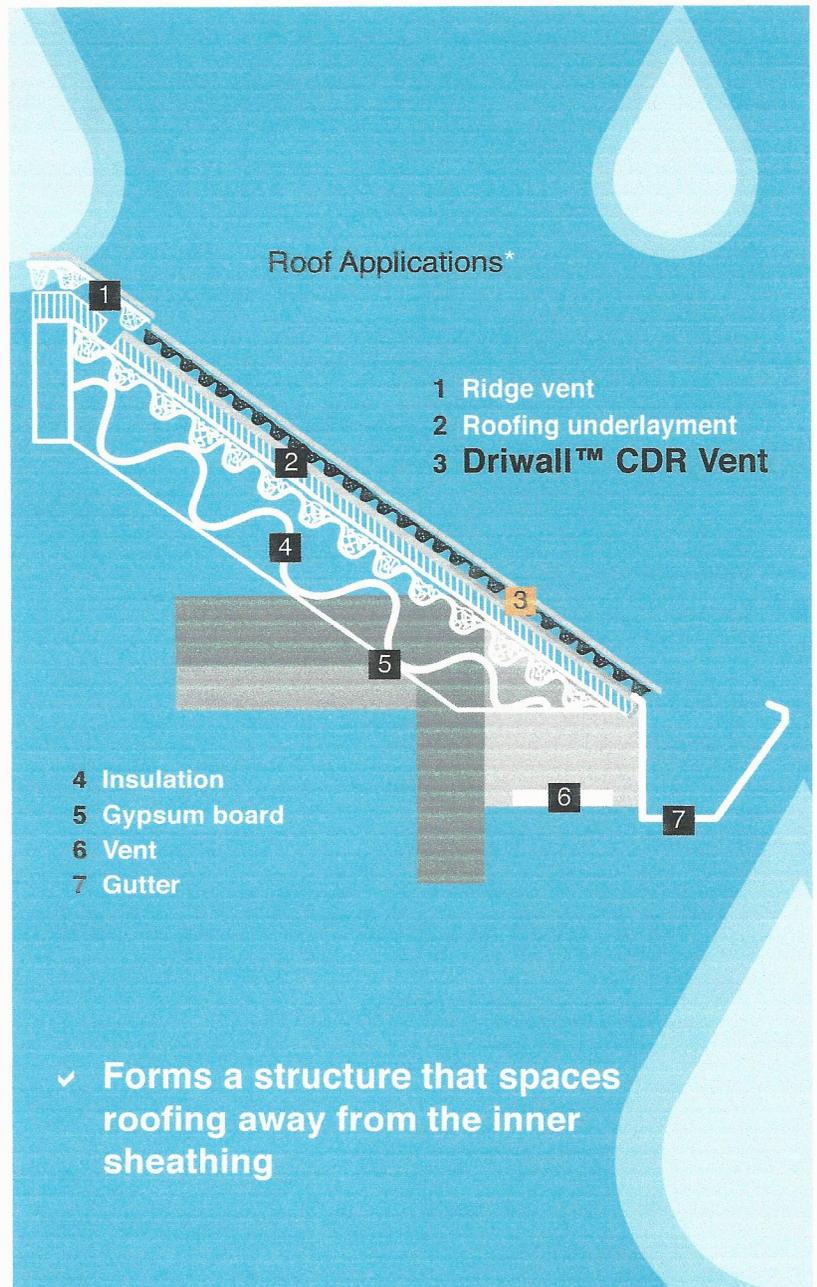
weaving a better world™



Driwall™ CDR Vent
Complete Drained Roof

Driwall™ CDR Vent is a 0.30-inch-thick drainage and ventilation mat. It is designed to eliminate moisture and moisture vapor in roofing and siding applications.

The product is produced from an extruded polymer matrix of tangled monofilaments, which are heat-welded at the junctions to form a structure that spaces roofing and siding away from the inner sheathing. Driwall™ CDR Vent is useful in cedar shingle/shake roofing and siding in which a clean airspace is desired for ventilation and drainage.



Benefits

- ✓ Drainage of excess moisture and ventilation in one product
- ✓ Lightweight and easy to handle
- ✓ Simple installation with mechanical staple hammer
- ✓ Polymer core resistant to most known corrosive chemicals, including solvents
- ✓ Wide rolls for fewer seams
- ✓ Core ABSORBS and RELEASES NO MOISTURE



*Photo:
Driwall™ CDR Vent
over the roofing underlayment*

*CDR Vent is not recommended under asphalt or fiberglass shingles





Driwall™ CDR Vent

Product	Thickness	Length	Area
Driwall CDR Vent	0.30 in./7.6 mm	60 ft.	240 sq. ft.

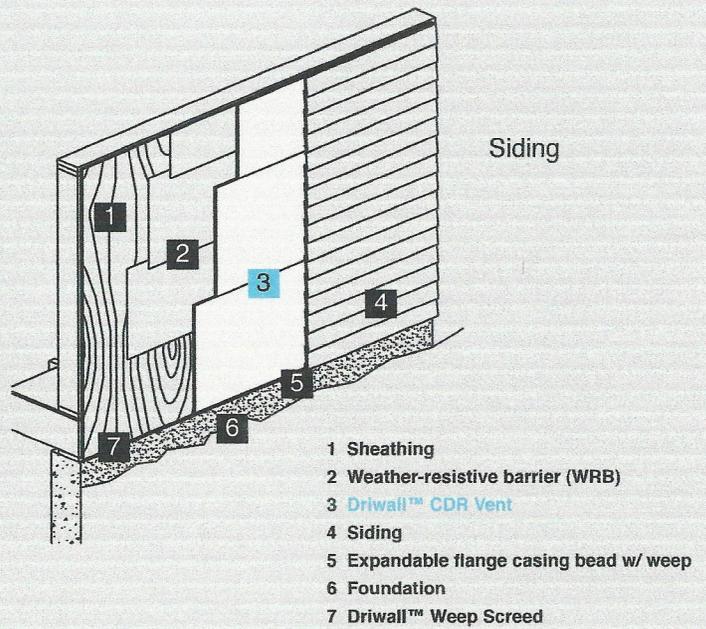
(100% post-consumer polymer)

For a complete list of all our products, please contact KBP, or visit our website at www.KeeneBuilding.com

Applications

- ✓ Roofing applications including cedar shingles and shakes
- ✓ Zinc roofing applications
- ✓ Siding applications
- ✓ Other roofing applications*

* For more information on roofing applications, please contact our office at 877-514-5336



P.O. Box 241353

Mayfield Heights, OH 44124

Info@KeeneBuilding.com

www.KeeneBuilding.com

877 | 514 | 5336

P 440 605 | 1020

F 440 605 | 1120

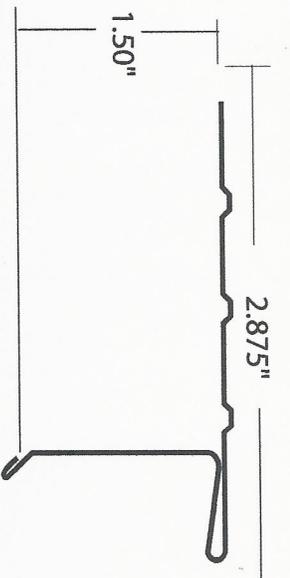
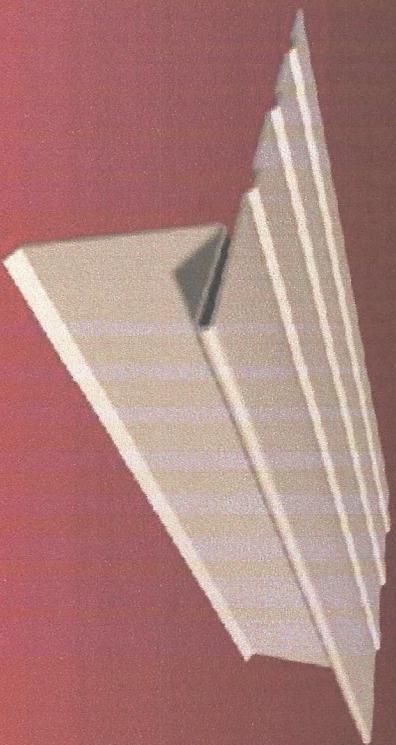
DE-5 1-1/2" Copper Drip-Edge

DE-5 Copper

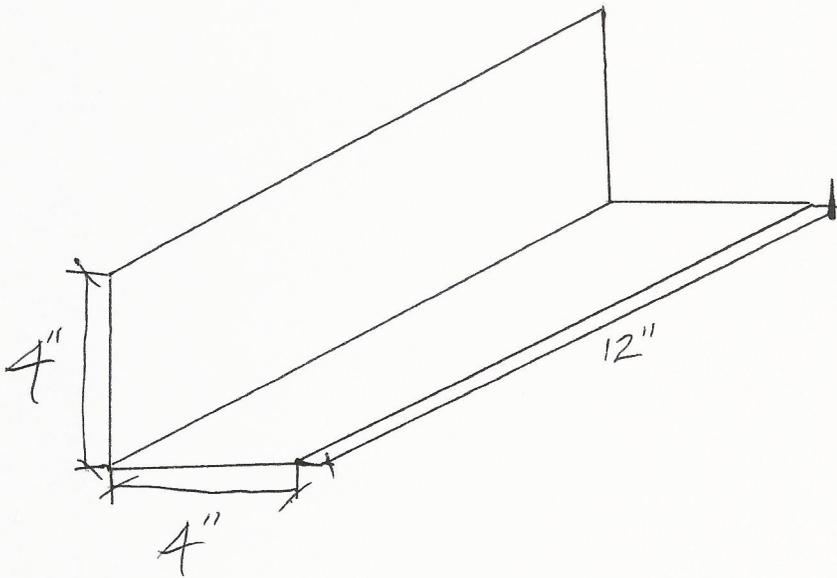
Gauge: 16oz. (.0217")

Packaging: 25 pcs/ carton
Length: 10'

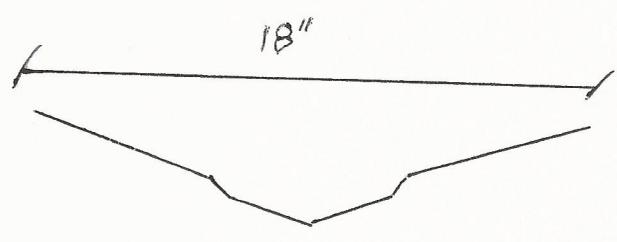
Manufactured in accordance with
ASTM B370



phone: 586-465-7650 fax: 586-465-4730
www.calbermetals.com

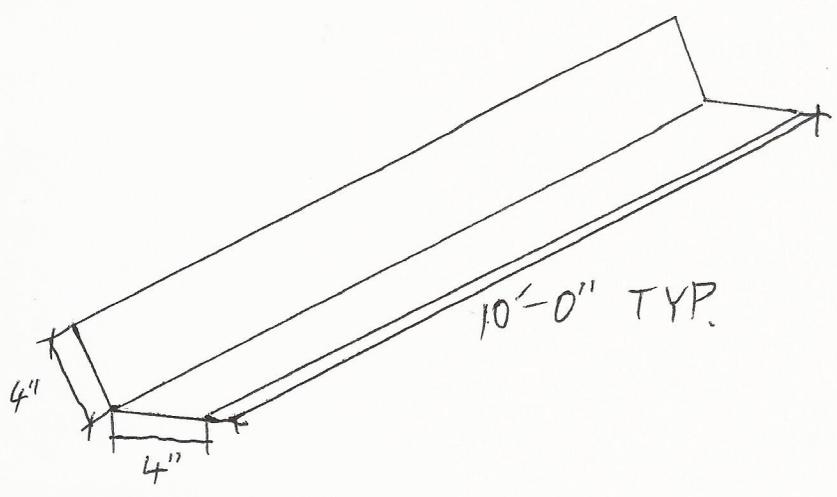


16 oz. COPPER STEP FLASHING



10' LENGTH

16 oz. COPPER TROUGH STYLE VALLEY



16 oz. COPPER HEADWALL

Certi-label Shakes

A solid deck is recommended in seismic activity, hurricane and tornado regions and in areas where wind-driven snow is encountered. Roofing felt system interlay between the shake courses is required whether the sheathing is spaced or solid. The felt interlay acts as a baffle that prevents wind-driven snow or other foreign material from entering the attic cavity during extreme weather conditions. The felt interlays also increase the roof's insulation value. The felt interlay system forces water to the surface.

If spaced sheathing is used in shake application, the sheathing is usually 1 x 6 boards spaced on centers equal to the weather exposure, (Table 4, Page 20) at which the shakes are to be laid - *but never more than 7 1/2" for 18" shakes and 10" for 24" shakes on roof installations.* When 1 x 4 spaced sheathing is installed at 10" on center, additional 1 x 4 boards must be installed (i.e. maximum allowable spacing is approximately 3 1/2" measured from edge to edge between the sheathing boards). Please note that the only solid sheet sheathing tested with Certi-label™ shakes & shingles is plywood. Check with your local building official for plywood thickness/dimensions.

Special care should be taken when installing the felt interlays over spaced sheathing to ensure that an effective baffle is formed (Figure 1). The felt should be applied over the top portion of the shakes and extend on to the spaced sheathing so that the bottom edge of the felt is positioned at a distance above the butt equal to twice the weather exposure.

Certi-label Shake Application

Shakes, like shingles, are normally applied in straight, single courses. The following application details (Figure 4) must be observed.

1. The starter course may be one or two layers of cedar shingles or shakes overlaid with the desired shake. A 15" shake is made expressly for starter and finish courses.
2. Butts of first course shakes should project 1 1/2" beyond the fascia and approximately 1" over the gable or rake end.
3. The CSSB recommends using an 18" wide strip of No. 30 ASTM D226 Type II or No. 30 ASTM D4869 Type IV roofing felt laid over the top portion of shakes and extending on to the sheathing. (Check with your local building official for exact specifications in

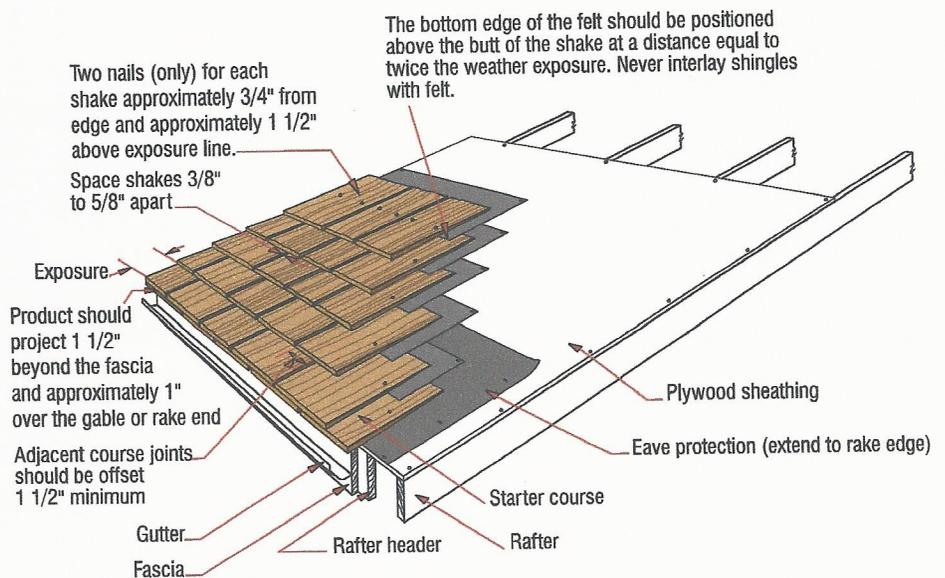


Figure 4: Certi-label Shake Application

your area). The bottom edge of the felt should be positioned above the butt of the shake at a distance equal to twice the weather exposure. For example, 24" shakes, felt extends up 14" onto the sheathing forcing water to the surface.

4. Spacing between adjacent shakes should be a minimum of 3/8" and a maximum of 5/8".
5. Shakes shall be laid with a side lap of not less than 1 1/2" between joints in adjacent courses.

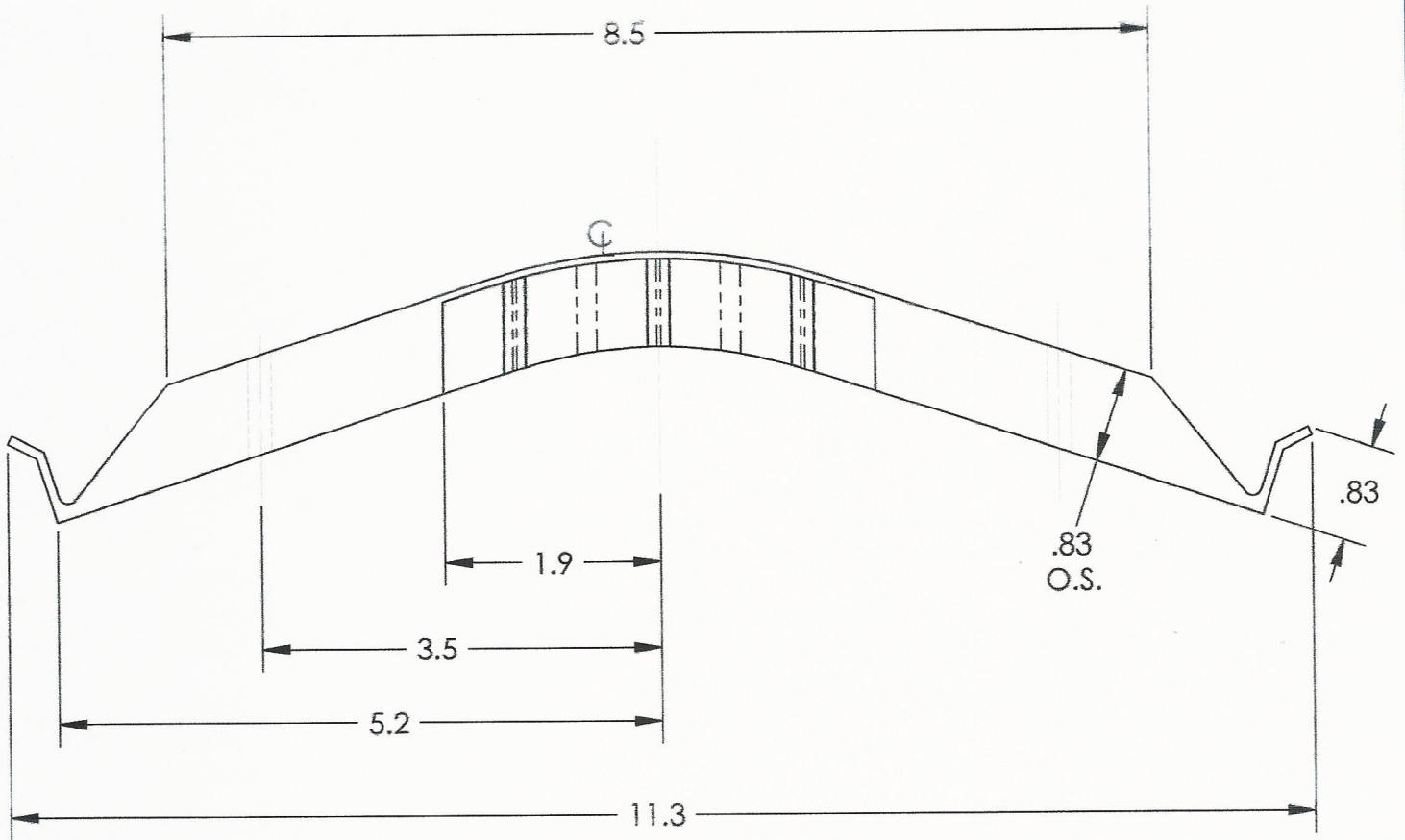
6. Straight-split shakes should be laid with the froe-end (the end from which the shake has been split and which is smoother) towards the ridge.

Notes: See page 19 for high humidity areas.

Currently the only acceptable solid sheathing product tested for use with Certi-label shakes is plywood.



Architect: Shana Dana Wharton Photo: Robert Benson



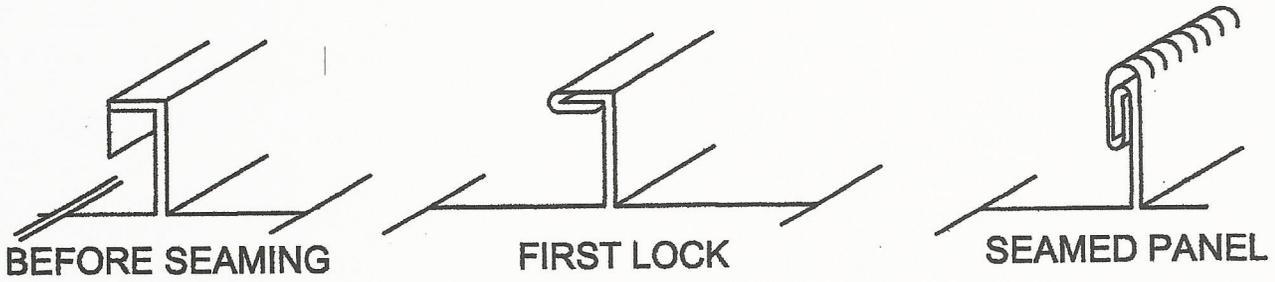
NOTES:

1. ATTACH WITH NAILS OF SUFFICIENT LENGTH TO FULLY PENETRATE ROOF DECK
2. PROVIDES 16 SQ. IN. NFA PER LINEAR FT.
3. 3/12 TO 12/12 ROOF PITCH
4. INTEGRAL ENDPLUG AND WEATHER FILTER
5. AVAILABLE IN 4 FT. LENGTHS
6. MATERIAL: POLYPROPYLENE

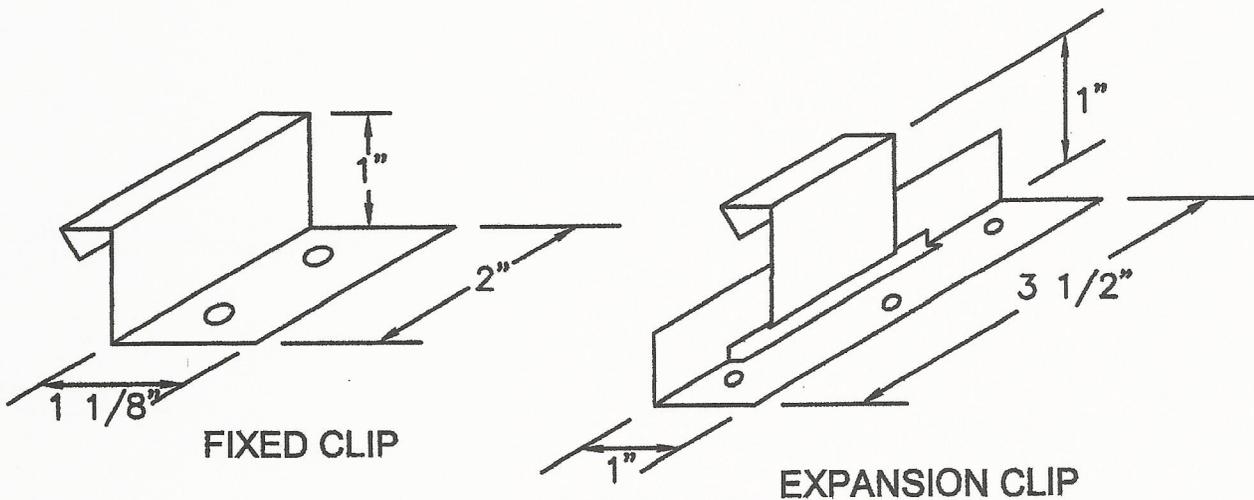
 DALLAS, TEXAS	
DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED DO NOT SCALE DRAWING	DESCRIPTION: SHINGLE VENT II - 9" - CHARCOAL
DRAWING NUMBER: C-SHFV9CC	
PREP: A. Lindahl DATE: 5-28-2010	
 THIRD ANGLE PROJECTION	MODEL NUMBER: SHFV9CC

PANEL SEAM PROFILE

BARREL ROOFS

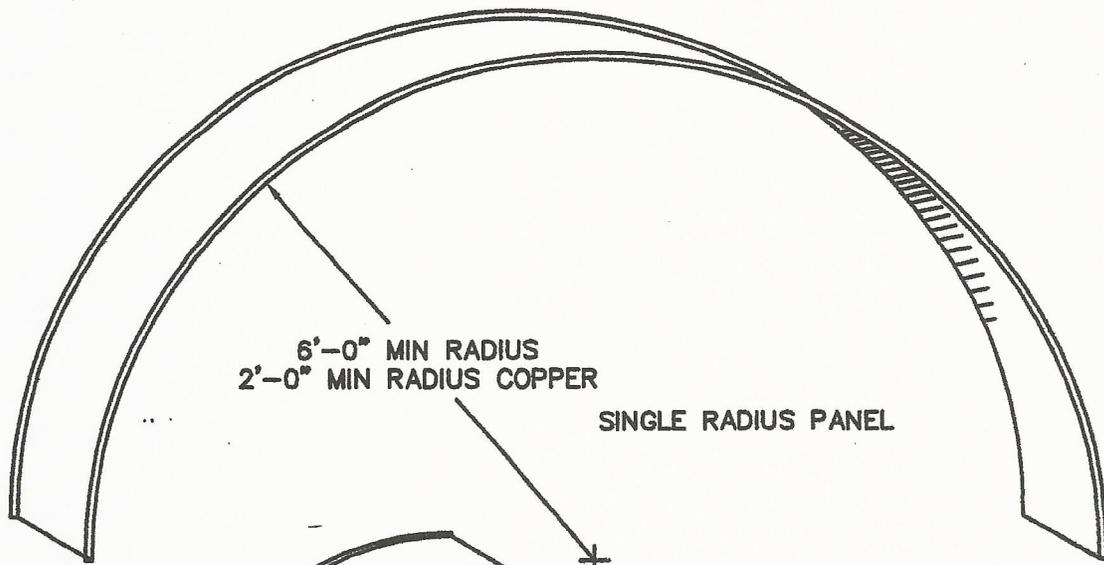


STANDING SEAM ROOF PANELS ARE AVAILABLE IN WIDTHS FROM 12" - 21"
PANELS MAY BE ANY LENGTH. WE RECOMMEND COPPER PANELS BE NOT MORE
THAN 30 FEET LONG. RECOMMENDED LENGTH OF OTHER PANELS IS 40 FOOT MAX.
WIDER PANEL WIDTHS ARE MORE ECONOMICAL, BUT WILL ALSO DISPLAY
A HIGHER DEGREE OF OIL CANNING.

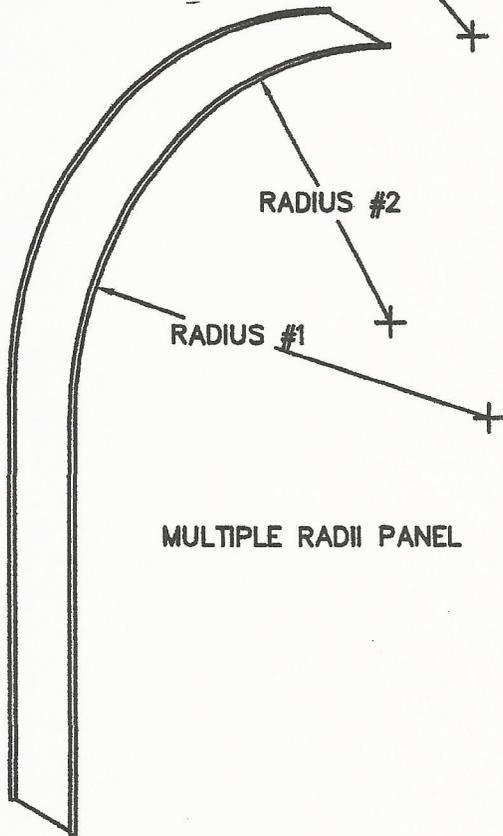


AVAILABLE IN 1" HIGH STANDING SEAM
TYPICAL CLIP SPACING IS 18" ON CENTER. HIGH WIND ZONES
OR EAVE AND CORNER CONDITIONS MAY VARY. CALL FOR SPECIFIC DETAILS
CLIPS ARE AVAILABLE IN COPPER, STAINLESS STEEL OR GALVANIZED STEEL

CURVED PANELS



SINGLE RADIUS PANEL



MULTIPLE RADII PANEL

USE SINGLE (OR SIMPLE) RADIUS PANELS FOR BARREL VAULT ROOFS. MULTIPLE RADII PANELS ARE USED FOR ELLIPTICAL SHAPED ROOFS. COPPERCRAFT ROOF PANELS ALLOW THE DESIGNER TO CREATE THE ULTIMATE IN ROOF SYSTEMS

AVAILABLE MATERIALS:

COPPER

ZINC/ TIN COATED COPPER

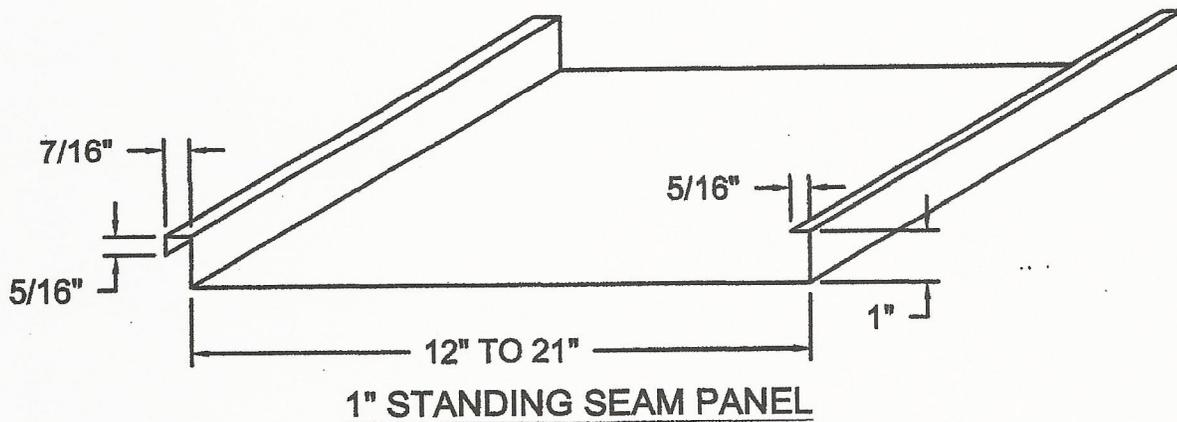
PREWEATHERED ZINC

PAINT GRIP STEEL

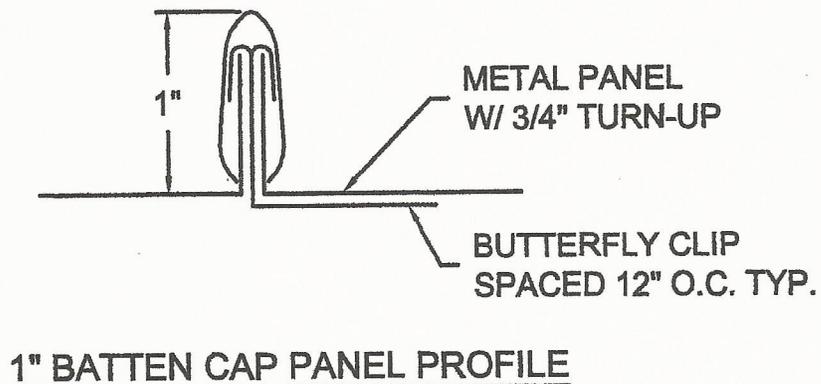
9-05

COPPER CRAFT
BY **FABRAL** A EURAMAX COMPANY

STANDING SEAM PANELS



STANDARD WIDTHS: 12", 15", 18" & 21" IN COPPER



AVAILABLE MATERIALS

COPPER ZINC/ TIN COATED COPPER PREWEATHERED ZINC PATINA COPPER
PREFINISHED ALUMINUM/ STEEL PAINT GRIP STEEL

COPPER CRAFT
BY **FABRAL** A EURAMAX COMPANY

9-02



BELL TOWER ROOF





BARREL ROOF / WINDOW WELL EXAMPLES

DURO-LAST® 50-MIL MEMBRANE

Advantages:

Duro-Last® 50-Mil (DL50) membrane is an excellent choice for projects requiring a long lasting, energy efficient roofing membrane. The membrane is available in prefabricated sections or as roll goods. A complete line of custom prefabricated accessories is available for the DL50 membrane.

Description:

DL50 membrane is composed of PVC film laminated to both sides of a reinforcement fabric (weft-inserted scrim).

Duro-Last membranes must not be used with Duro-Last EV membranes.

PVC Film - Proprietary thermoplastic PVC formulation of resins, plasticizers, stabilizers, biocides, flame retardants, and U.V. absorbents. The same PVC film is used on both sides of the scrim.

- PVC film above weft-inserted scrim – 28 mil

Weft-Inserted Scrim - An 18 x 14 polyester fabric construction with weft insertion, composed of 840 x 1000 denier threads, provides superior tear and puncture resistance. The polyester thread is treated to prevent wicking.

Total Thickness – 50 mil, nominal.

Weight – 0.29 lb. per square foot.

Colors – White, tan, gray, dark gray and terra cotta.

R-Value – 0.1 ft²·°F·hr/Btu.

Available Configurations:

Prefabricated Sections – DL50 is available in prefabricated sections up to 2,000 sq. ft. with a maximum 80 ft. in either dimension.

Roll Good – Typical Dimensions

Width	Length (max.)	Roll Area	Approx. Weight	Approx. Coverage ¹
64 inches	100 ft.	533 sq. ft.	155 lb.	483 sq. ft.
48 inches	100 ft.	400 sq. ft.	116 lb.	350 sq. ft.
32 inches	100 ft.	267 sq. ft.	77 lb.	217 sq. ft.
16 inches	100 ft.	133 sq. ft.	39 lb.	83 sq. ft.

¹ Assuming 6 inch overlap.

Energy Efficiency:

White DL50 membrane is an excellent product for complying with California Title 24, LEED® and other energy efficiency programs requiring the use of a highly reflective roof membrane. It is an ENERGY STAR® qualified product.



Cool Roof Rating Council (CRRC)¹

	Solar Reflectance		Thermal Emittance		Solar Reflective Index (SRI)	
	Initial	3-yr	Initial	3-yr	Initial	3-yr
White	0.88	0.68	0.87	0.84	111	82
Tan	0.39	0.33	0.89	0.89	43	35
Gray	0.47	0.40	0.89	0.89	54	45
Dark Gray	0.26	0.25	0.88	0.89	26	25
Terra Cotta	0.26	P ²	0.89	P ²	26	P ²

¹ Duro-Last's CRRC Product ID: 0610.

² 3-year aged results pending.

LEED & LEED-EB Credits - White DL50 membrane alone can obtain 1 credit in either U.S. Green Building Council's LEED or LEED-EB programs. In combination with other design criteria the membrane may help attain other credits.

LEED Credit Category	Duro-Last Attribute
Sustainable Sites Credit 7.2 Heat Island Effect: Roof	Solar Reflective Index (SRI) SRI = 111

LEED-EB Credit Category	Duro-Last Attribute
Sustainable Sites Credit 6.2 Heat Island Effect: Roof	ENERGY STAR Qualified Thermal Emittance = 0.87

Warranty:

The following warranties are available for projects utilizing DL50 membrane. Contact Duro-Last for warranty details.

Available Warranties				
Supreme	15-YR NDL	15 + 5 Material Only ²		15 + 5 ²
Ultra	15-YR Hail ¹	15-YR Hail & High Wind ¹	15-YR High Wind ¹	20-YR High Wind ¹
Basic	15-YR NDL ¹		20-YR NDL ¹	
Residential	15-YR Material Only ¹		20-YR Material Only ¹	

¹ Excludes consequential damage coverage.

² Excludes consequential damage coverage for last 5 years.

Codes and Standards:

Underwriters Laboratories (US & Canada), FM Approvals, ICC-ES (ESR-1660), Canadian Construction Materials Centre (CCMC 13299-L), State of Florida, Miami-Dade County, Texas Department of Insurance.

Storage:

Store rolls lengthwise on pallets. Use tarps to keep rolls dry.

Membrane Attachment:

Mechanically Fastened – DL50 membrane may be mechanically attached to a variety of roof deck and wall materials. An appropriate slip sheet or cover board may be required. Refer to the Duro-Last Mechanically Fastened Systems Specification for prefabricated system requirements. If using roll goods, refer to the Roll Good Mechanically Fastened Systems Specification.

Duro-Bond® System – The Duro-Bond system (induction weld) may be used to attach DL50 membrane. Refer to the Duro-Last Duro-Bond System Specification for system requirements.

Adhered – DL50 membrane may be adhered to a variety of properly prepared roof decks, walls, cover boards and insulations. Refer to the Duro-Last Adhered Systems Specification for system requirements.

Physical Properties:

DL50 membrane has been subjected to the tests required by ASTM 4434 “Standard Specification for Poly (Vinyl Chloride) Sheet Roofing” and has been classified as a Type III, internally reinforced sheet. The results of each test as well as typical values are listed below.

Physical Property	Test Method	ASTM 4434 Requirement	Result	Typical Value
Overall Thickness	ASTM D751	≥ 0.045 in.	PASS	0.050 in. (50 mil), nominal
Thickness Over Scrim	ASTM D7635	≥ 0.016 in.	PASS	0.028 in. (28 mil)
Breaking Strength ¹	ASTM D751 Grab Method	≥ 200 lbf./in.	PASS	390 x 438 lbf./in.
Elongation ¹	ASTM D751 Grab Method	≥ 15%	PASS	31% x 31%
Seam Strength	ASTM D 751 Grab Method	≥ 328 lbf. (75% of Breaking Strength.)	PASS	417 lbf.
Tear Strength ¹	ASTM D751 Procedure B	≥ 45 lbf.	PASS	132 x 163 lbf.
Low Temp. Bend	ASTM D2136	Must pass at -40° F	PASS	PASS
Heat Aging	ASTM D3045	Conditioned for 56 days in oven maintained at 176° F.	PASS	PASS
Accelerated Aging	ASTM G154 (formerly G53)	5,000 hours total test time. Irradiance level of 0.68 W/m ² -nm. Cycle: 8 hours at 145° F, 4 hours condensation at 122° F.	PASS	PASS
Dimensional Stability ¹	ASTM D1204	Conditioned for 6 hours in oven maintained at 176° F. Allowable change: ≤ 0.5%	PASS	-0.30% x -0.45%
Water Absorption	ASTM D570	Immersed in water at 158° F for 168 hours. Allowable weight change: ≤ 3%	PASS	1.7%
Static Puncture	ASTM D5602	≥ 33 lbf.	PASS	56 lbf.
Dynamic Puncture	ASTM 5635	≥ 14.7 ft-lbf. (20 J)	PASS	≥ 14.7 ft-lbf. (20 J)

¹ Typical values are shown for both machine and cross machine directions. The machine direction results are listed first.

Additional Tests

Fungi Resistance	ASTM G-21	No sustained growth or discoloration
Moisture Vapor Transmission	ASTM E96, Proc. B, Method A	< 0.35 U.S. perms

