

Outdoor Flooring System™

PT01-GratedeX®: UNDERLAYMENT PANEL

PROPERTIES:

Dimensions	48"x48"x1" (16 square feet)
Weight	44 lbs (2.75 lbs/sq ²); with adhesive (3.5 lbs./sq ²)
Material	FRP-fiber reinforced plastic
Color	dark gray/brown
Surface	smooth on top and bottom sides
Weatherability	moisture/temperature resistant, does not support bacteria or mold growth
Durability	moderate corrosion resistance including seawater
Fire Rating	ASTM-E84; Class 1, flame spread rating of 25 or less
Cutting Tool	cut with segmented diamond blade
Cut Down Size	saw blade width cutting channels at 16" and 24" O.C. with double bar
Spans/Layout	16" or 24" O.C.; actual 48" panel-to-panel
Penetrations	cut panel bars for post or other without reducing product strength

<u>LOAD CONDITION</u> ⁶	<u>(W)16" O.C. SUPPORT x 4'L</u> ¹			<u>(W) 24" O.C. SUPPORT x 4'L</u> ¹		
Weight Applied (lbs total)	<u>0</u>	<u>0</u>	<u>800</u>	<u>0</u>	<u>400</u>	<u>800</u>
Point Load ³ Deflection ²	0	0	1/32"	0	1/32"	1/16"
Weight Applied (lbs/ft of L/total wght)	<u>0</u>	<u>0</u>	<u>200/800</u>	<u>0</u>	<u>100/400</u>	<u>200/800</u>
Line Load ⁴ Deflection ²	0	0	1/32"	0	1/32"	1/16"
Weight Applied (lbs/sq ² /total wght)	<u>0</u>	<u>0</u>	<u>150/800</u>	<u>0</u>	<u>0</u>	<u>100/800</u>
Uniform Load ⁵ Deflection ²	0	0	1/64"	0	0	1/32"
Ultimate Capacity (psf)	2800			1780		

1. Support: Supports are joist framing members in parallel.
2. Deflection: The amount of sag from the horizontal plane when loaded.
3. Point Load Deflection: The 4'L x (W)" O.C. is supported along two opposite edges while a single load is placed in the center of the panel.
4. Line Load Deflection: The 4'L x (W)" O.C. is supported along two opposite while a single load is placed along a line through the center of the panel in parallel with the supports.
5. Uniform Load Deflection: The 4'L x (W)" O.C. is supported along two opposite while a single load is placed uniformly over the panel surface.
6. The loaded condition is the GratedeX® underlayment panel only and does not consider the added value of gauged stone or tile bonded to the GratedeX® panel.

<u>ASTM E72-98: RACKING LOAD</u> ²	<u>JOIST</u>	<u>MAX LOAD</u> ³	<u>DEFLECTION</u> ³	<u>SHEAR</u> ⁴
Test Conditions	24" O.C.	6282 lbs	1.47"	170 lbs/sq'
Extrapolated Conditions	16" O.C.	6282 lbs	1.47"	200 lbs/sq'

1. Description: An 8'x12' deck was constructed with 2x6 joists spaced 24" O.C. and with 2x6 perimeter framing. GratedeX® panels were glued edge-to-edge and fastened to the joist with Bite-Tite® fasteners and screws at 24" O.C. along each panel edge and in the field.
2. Test Model: ASTM E72-98, "Standard Test Methods of Conducting Strength Tests of Panels for Building Construction; Section 14, Racking Load."
3. Loading Results: The panel exhibited linearly elastic deformation under loading and reaching the maximum load that the hydraulic ram could deliver to the assembly; 6282 lbs with 1.47" deflection. Upon load release, the frame rebounded to a permanent set of only 0.30". There was no visible damage to the panel, framing, or to the Bite-Tite® connectors. The distributed load to the panel base was 523.5 pounds per foot, *as much as five times the design load* on a typical residential deck.
4. Shear Values: Recommended allowable shear is based on a factor of safety FS = 3.

PT08-PierdeX®: UNDERLAYMENT PANEL

PROPERTIES:

Dimensions	32"x32"x1.25" (actual 31 5/8"x31 5/8") (7 square feet)
Weight	31 lbs (4.43 lbs/sq'); with adhesive (5.29 lbs./sq')
Material	FRP-fiber reinforced plastic
Color	brown/black
Surface	smooth on top and bottom sides
Weatherability	moisture/temperature resistant, does not support bacteria or mold growth
Durability	moderate corrosion resistance including seawater
Fire Rating	ASTM-E84; Class 1, flame spread rating of 25 or less
Cutting Tool	cut with segmented diamond blade
Cut Down Size	none
Spans/Layout	32" O.C.; actual 31 3/4" O.C. (includes 1/8" spacing between panels)
Penetrations	cut panel bars for post or other without reducing product strength

LOAD CONDITION ⁶

32" x 32" CORNER SUPPORT ¹

Weight Applied (lbs total)	<u>0</u>	<u>0</u>	<u>400</u>
Point Load ³ Deflection ²	0	0	3/64"
Weight Applied (lbs/ft of L/total wght)	<u>75/200</u>	<u>150/400</u>	
Line Load ⁴ Deflection ²	1/32"	1/16"	
Weight Applied (lbs/sq'/total wght)	<u>50/350</u>	<u>100/700</u>	
Uniform Load ⁵ Deflection ²	1/32"	5/64"	
Ultimate Capacity (psf)	3200		

1. Support: Supports are 6" Ped-Tite™ connectors with 4" ABS pipe at four corners.
2. Deflection: The amount of sag from the horizontal plane when loaded.
3. Point Load Deflection: The 32" square panel is supported at the four corners while a single load is placed in the center of the panel.
4. Line Load Deflection: The 32" square panel is supported at the four corners while a single load is placed along a line through the center of the panel in parallel with the supports.
5. Uniform Load Deflection: The 32" square panel is supported at the four corners while a single load is placed uniformly over the panel surface.
6. The loaded condition is the GratedeX® underlayment panel only and does not consider the added value of gauged stone or tile bonded to the GratedeX® panel.

PT04-Hold-Tite® TR: TROWELABLE ADHESIVE

PROPERTIES:

Material	thick flexible elastomeric for exterior all weather use
Packaging: TA	20 oz sausage; 4/ GratedeX® panel, 2/ PierdeX™ panel
Color	black
Trowel Size	3/16" v-notch
Tack Free	< 60 min @ 70°F/50% RH
Skin Time	< 30 min @ 70°F/50% RH
Sag	None
Tensile Strength	225 psi
Lap Shear	275 psi
Elongation	275%
High Temp Resistance	up to 400°F for short periods
Low Temp Flex	properties retained to -75°F
UV Rating	after 200 hrs no change
Weatherability	moisture/temperature resistant
Contaminant	does not support bacteria or mold growth
Corrosive Properties	none
Staining	none
Set Step 1	place directly into position ± 1/8"; don't slide
Set Step 2	light pressure to fix placement
Clean Up	cure and rub loose or mineral spirits
Storage Temp	at or below 80°F
Usage Temp	> 32°F, optimum 55-80°F for best workability colder temps slows curing; thickens product making dispensing difficult warmer speeds curing; thins product making it more fluid

<u>PEEL TEST</u> ^{1,2}	<u>TEST FAILURE LOAD</u> ⁴	<u>MAX FAILURE LOAD</u> ⁵
Hold-Tite® CS (contact adhesive sheet)	58 lbs	522 lbs
Hold-Tite® TA/PV (trowelable adhesive)	322 lbs	2898 lbs

1. Description: Forces applied to the stone/tile edge to peel it off of the GratedeX® underlayment in the manner of peeling an orange peel.
2. Test Model: 3" square GratedeX® underlayment with a gauged stone sample bonded to the surface with a ¼" overhanging stone lip.
3. Peel Method Used: GratedeX® underlayment samples were fixtured and a 3"x1/4" finger-like plate lifted vertically one overhanging edge of the bonded stone/tile to a point of separation.
4. Separation Values: Total pounds of force applied to the 3" square sample to separate the stone from the GratedeX® underlayment.
5. Separation Values Extrapolated: If the samples were enlarged to 16"x16" and the same force mechanism was applied along a ¼"x16" edge, this would be a conservative estimated load required to cause separation.
6. Failure values in no way reflect on any failure of the GratedeX® underlayment panel.

<u>WEATHER TEST</u> ¹	<u>BOND FAILURE</u> ²
Hold-Tite® CS (contact adhesive sheet)	None
Hold-Tite® TA (trowelable adhesive)	None

1. Laboratory Thermal Shock performed on Hold-Tite® CS and Hold-Tite® TA with 500 cycles of extreme temperature changes between -20°F and +130°F with 25 minute dwells at each temperature.
2. Samples examined after weather test showed no signs of bond failure nor did they show any lose of strength when compared to un-weathered samples later compared in a peel test.

PT03-Hold-Tite® CS: CONTACT SHEET ADHESIVE

PROPERTIES:

Dimensions	15 3/4"x15 3/4"x1/16"
Material	double sided flexible adhesive sheet for exterior all weather use
Packaging	5/bag; 2 bags/GratedeX® panel, 1 bag/PierdeX™ panel
Color	black
Weatherability	moisture/temperature resistant
Contaminant	does not support bacteria or mold growth
Placement	permanent bond; no removal after contact

PT06-Ped-Tite®: PEDESTAL CONNECTORS

PROPERTIES:

Dimensions	6" dia.x7/8" H
Material	ABS
Packaging	4/bag; 2 bag/GratedeX® panel (pad install), 1 bag/PierdeX™ panel
Color	black
Bottom Surface	smooth; add protection layer as required over waterproofing
Pad Clearance	1/2" between bottom of panel and bearing surface
Min. Pipe Height	5/8" pipe when attached to top and bottom Ped-Tite™
Min. Pedestal Height	1 1/4" with min. between bottom of panel and bearing surface
Calculate Pipe Length	overall height between bearing surface and bottom of panel – 5/8"
Pedestal Pipe	4" ABS SCH40 DWV (not included) cut to length; 4 1/2" OD, 4" ID
Gluing	glue ABS pipe to Ped-Tite™; ABS pipe glue, Hold-Tite® TA, Weld-Tite®
Adjusting	heights over 8" can use ABS threaded male and female coupling
Pedestal Placement	max. 24" O.C. GratedeX® panel, max. 32" O.C. PierdeX® panel
Pedestal Attachment	Ped-Tite™ may be loose or glued to surface
Fire Rating	ASTM-E84; Class 1, flame spread rating of 25 or less; pipe and connector

Website Reference: <http://www.charlottepipe.com/Default.aspx?Page=ABSPVCDWV&type=ABSPVCDWV> - Fire

PT02-Bite-Tite®: FASTENER & SCREW

PROPERTIES:

Dimensions: Bite-Tite®	1 1/2"x1 1/2"
Material: Bite-Tite®	16 ga 304 Stainless Steel
Dimensions: Screw	3"
Material: Screw	305 Stainless Steel
Packaging	12/bag-1 bag/GratedeX® panel

PT07-Weld-Tite®: ADHESIVE FOR GratedeX® UNDERLAYMENT PANEL

PROPERTIES:

Material	2-part adhesive
Packaging	10 oz cartridge; internal 2-part with mix tip; 1/6 GratedeX® panels
Color	neutral
Bond Performance	panel stock failure
Strength (PSI); Shear	3000-3500
Strength (PSI); Tensile	3000-3500
Work Time	10-18 min
Handling Strength	20-35min
Operating Temp (cured)	-67°F-250°F
Storage Temp	55-75°F ; do not freeze; shelf life can be extended with refrigeration
Usage Temp	65-80°F < 65°F; slows curing; thickens product making dispensing difficult > 80°F; speeds curing; thins product making the product runny

<u>LOAD TEST</u> ¹	<u>TEST FAILURE LOAD</u> ⁵	<u>MAX FAILURE LOAD</u> ⁶
3-Point ³	602 lbs	200 lbs/sq"
Shear ⁴	897 lbs	299 lbs/sq"

1. Description: Forces applied to break the bond between two joining edges of the GratedeX® outdoor flooring system.
2. Test Model: Two 3" square GratedeX® underlayment samples glued edge-to-edge with the Weld-Tite® adhesive applied in a 1/8" bead and achieving full cure.
3. Test Method Used 3-Point: The joined GratedeX® underlayment samples were placed in their flat horizontal plane on supporting edges while a line load, 1"x3" was applied directly along the glued joint to a point of separation.
4. Test Method Used Shear: The joined GratedeX® underlayment samples were placed standing on the 1" panel edge with one panel fully supported while a vertical line load, 1"x3", was applied to the other panel attempting to slide one panel past the other to a point of separation.
5. Separation Values: Total pounds of force applied to the 1"x3" area to break the bond between the two GratedeX® underlayment pieces.
6. Separation Values Extrapolated: If the Test Failure load were expressed over the dimensions of the load applied, 1"x3", this would be the Per Square Inch failure load for the adhesive.
7. Failure values in no way reflect on any failure of the GratedeX® underlayment panel.

PAVER SURFACE

Material	concrete, brick, stone, other
Weight	approximately 18-20 lbs/sq'
Maximum Size	none
Minimum Size	4"
Gauge Thickness	1" to 2 1/2"±
Bottom Finish	uniformly flat all directions ± 1/16", non-shaling
Bearing	GratedeX® on 4x framing or Ped-Tite® pads PierdeX™ on Ped-Tite™ pedestals
Trim	optional; cosmetic only
Adhesive	Hold-Tite® TA edge/curb pavers only
Fabric	6 oz (medium weight) nonwoven geotextite
Placement	any orientation or pattern
Spacing	tight edge to edge
Finish	no sand or fillers required
Drainage	between paver joints and thru panel

STONE/TILE SURFACE

Material	gauged natural stone tiles, porcelain tiles or other
Weight	approximately 6-8 lbs/sq'
Maximum Size	none
Minimum Size	4"
Gauge Thickness	1/4" to 1/2"±
Bottom Finish	uniformly flat all directions ± 1/16", non-shaling
Bearing	GratedeX® on 2x framing or Ped-Tite® pads PierdeX™ on Ped-Tite™ pedestals
Trim	optional; cosmetic only
Adhesive	Hold-Tite® TA, Hold-Tite® CS
Fabric	none
Placement	any orientation or pattern
Spacing	1/16" to 1/8"
Finish	none
Drainage	between open joints and thru panel