



CONSTRUCTION MATERIALS

TECHNOLOGIES

LABORATORY TEST RESULTS

Report for: Gardner Gibson
4146 E. 7th Avenue
Tampa, FL 33605

Attention: Matt Mullins

Product Name(s): FT ³ Tile Underlayment	Manufacturer: Gardner Gibson
PRI-CMT Project No.: GGI-196-02-01	Source: See Sampling Section
Date Received: See Sampling Section	Dates Tested: April 17, 2017 – Mar. 9, 2018

Subject: Determine the physical properties of Gardner Gibson's FT³ Tile Underlayment for compliance with 2017 Florida Building Code Test Protocols for High-Velocity Hurricane Zones **TAS 103: TEST PROCEDURE FOR SELF-ADHERED UNDERLAYMENTS FOR USE IN DISCONTINUOUS ROOF SYSTEMS.**

Testing for Extended Exposure for 180d was conducted in accordance with TAS 103-95: *Test Procedure for Self-Adhered Underlayments for Use in Discontinuous Roof Systems* for properties prescribed in TAS 110 – 2000: *Testing Requirements for Physical Properties of Roof Membranes, Insulation, Coatings, and other Roofing Components.*

Test Methods: Testing was completed as described in TAS 103-95: *Test Procedure for Self-Adhered Underlayments for Use in Discontinuous Roof Systems*. Test methods assigned or referenced include TAS 124: *Test Procedure for Field Uplift Testing of Existing Membrane Roof Systems*, ICBO-ES AC08: *Acceptance Criteria for Concrete Tile Underlayment on Spaced Sheathing* (historical standard); ICC-ES AC48: *Acceptance Criteria for Roof Underlayment for Use in Severe Climate Areas*; ASTM C 794: *Standard Test Method for Adhesion-in-Peel of Elastomeric Joint Sealants*; ASTM D 570: *Standard Test Method for Water Absorption of Plastics*; ASTM D 1970: *Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection*; ASTM D 2523: *Standard Test Method for Testing Load-Strain Properties of Roofing Membranes*; ASTM D 4073: *Standard Test Method for Tensile-Tear Strength of Bituminous Roofing Membranes*; ASTM D 4798: *Standard Practice for Accelerated Weathering Test Conditions and Procedures for Bituminous Materials (Xenon-Arc Method)*; ASTM D 5147: *Standard Test Methods for Sampling and Testing Modified Bituminous Sheet Material*; ASTM E 96: *Water Vapor Transmission of Materials.*

Sampling: The following materials were received by PRI.

Product	Source	Date
FT ³ Tile Underlayment	Springville, AL	April 6, 2017

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FBC (HVHZ) TAS 103

Property	Test Method	Result								Requirement
Thickness, mils	TAS 103	#1	#2	#3	#4	#5	Avg	StdDev	60 min (for Average)	
		70	65	65	63	59	64	4		
Wind Uplift, [Pass/Fail]	TAS 124 TAS 103	Pass							No deflection or significant blistering	
Dimensional Stability @ 180°F for 6h, [Pass/Fail]	TAS 103	Pass							No tearing or shrinking of lap	
Tear Resistance, lbf	ASTM D 4073 TAS 103									
MD (as received)		90							≥ 20	
CMD (as received)		75							≥ 20	
Breaking Strength @ 77°F, lbf/in	ASTM D 2523 TAS 103									
MD (as received)		77							20 min	
CMD (as received)		57							20 min	
MD (after heat aging)		81							≥ 40 (85% 'as received')	
CMD (after heat aging)		52							≥ 34 (85% 'as received')	
MD (after QUV exposure)		76							≥ 40 (85% 'as received')	
CMD (after QUV exposure)		58							≥ 34 (85% 'as received')	
MD (after accelerated aging)		82							≥ 40 (85% 'as received')	
CMD (after accelerated aging)		52							≥ 34 (85% 'as received')	
Elongation (as received) @ 77°F, %	ASTM D 2523 TAS 103									
MD (as received)		51							25 min	
CMD (as received)		62							25 min	
MD (after heat aging)		49							(85% 'as received')	
CMD (after heat aging)		56							(85% 'as received')	
MD (after QUV exposure)		43							(85% 'as received')	
CMD (after QUV exposure)		55							(85% 'as received')	
MD (after accelerated aging)		47							(85% 'as received')	
CMD (after accelerated aging)		56							(85% 'as received')	
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Property	Test Method	Result	Requirement
Water Absorption, %	ASTM D 570 TAS 103		
Conditioned, 73.4±3.6°F for 72h		1.1	3.0 max
Low Temperature Flexibility @ -10°F, [Pass/Fail]	ASTM D 1970 TAS 103		
MD (as received)		Pass	No cracking
CMD (as received)		Pass	No cracking
Ultraviolet Resistance 200h ultraviolet (10h/d for 20d) Lamp: Ultra-Vitalux 300W 220V, [Pass/Fail]	ICC-ES AC 48 TAS 103	Pass	No visible peeling, chipping, cracking, flaking, pitting, or other damage under 5X magnification.
Cyclic Elongation 100 cycles @ -20°F, [Pass/Fail]	ICC-ES AC 48 TAS 103		
As Received		Pass	No cracking
Water Vapor Transmission, g/m ² /24h	E 96 (Water Method)		
As received		0.3	1.0 max
Compound Stability @ 220°F, [Pass/Fail]	ASTM D 5147 TAS 103		
As received		Pass	No dripping or drop formation
Puncture Resistance, [Pass/Fail]	ICBO-ES AC 08 TAS 103		
Ultraviolet exposed, 200h		Pass	No sign of puncture
Slippage Resistance @ 165°F for 72h, [Pass/Fail]	Modified TAS 103 (see notes) ¹		
2":12" Slope		Pass	No tears or slippage
6":12" Slope		Pass	No tears or slippage
Crack Cycling @ 180±5°F & 55±5% RH for 7d, [Pass/Fail]	ICC-ES AC 48 TAS 103		
As received		Pass	No cracking
Peel Adhesion on 15/32" plywood, lbf/ft	ASTM D 1970 TAS 103		
Conditioned, 75±2°F for 4h		74	6.5 min
After ultraviolet exposure, 200h		83	(75% 'conditioned')
After accelerated aging, 25 cycles		63	(75% 'conditioned')
Granule Adhesion, g	ASTM D 5147	N/A	0.75 max
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Property	Test Method	Result	Requirement
Heat Aging 7d @ 149±5°F; [Pass/Fail]	TAS 103	Pass	No visible peeling, chipping, cracking, flaking, pitting, or other damage under 5X magnification.
QUV Exposure 460h continuous; [Pass/Fail]	TAS 103	Pass	No visible peeling, chipping, cracking, flaking, pitting, or other damage under 5X magnification.
Accelerated Aging 25 cycles; [Pass/Fail]	ICC-ES AC 48 TAS 103	Pass	No visible peeling, chipping, cracking, flaking, pitting, or other damage under 5X magnification.
Self Sealability ¹ , [Pass/Fail] 5 in. WC hydrostatic head for 72 hrs; 40±5°F	ASTM D 1970	Pass	No water penetration or leakage.

Note(s): 1) N/A = "Not Applicable"

FBC (HVHZ) TAS 110: Extended Exposure Limitation – 180d (1,000h)

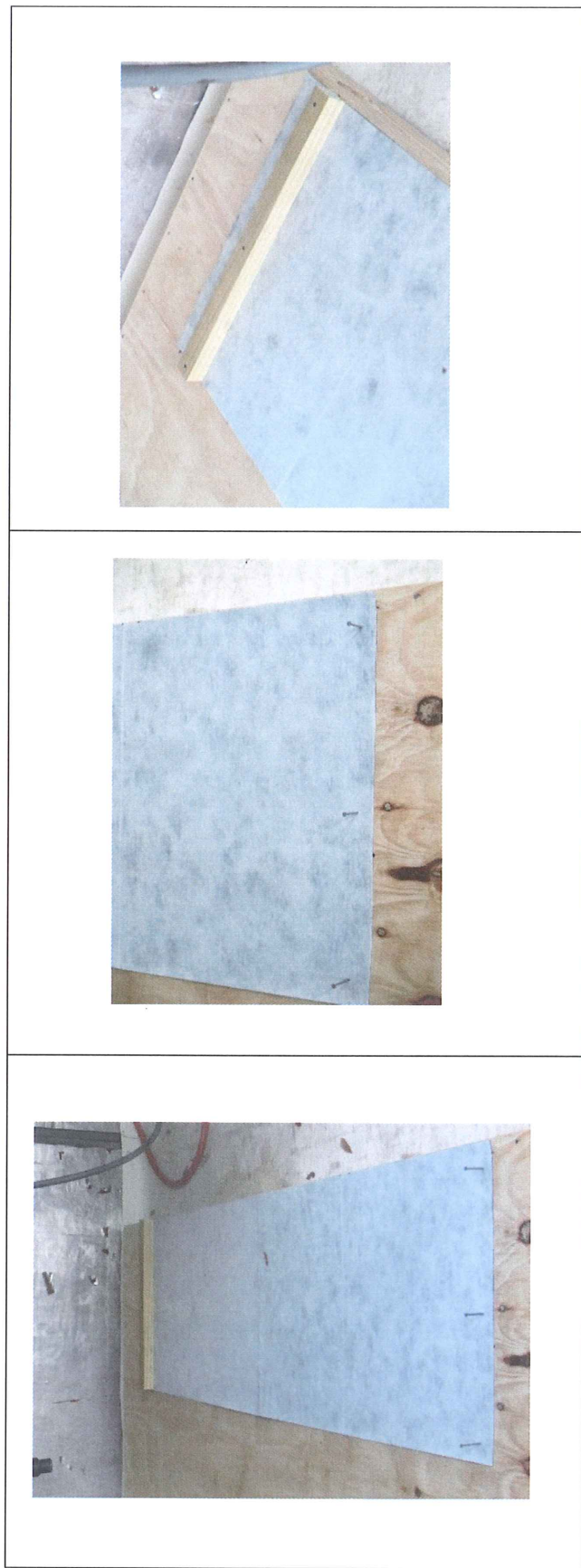
Property	Test Method	Result	Requirement
Tear Resistance, lbf	ASTM D 4073 TAS 103		
MD (after accelerated weathering)		62	≥ 20
CMD (after accelerated weathering)		51	≥ 20
Breaking Strength @ 77°F, lbf/in	ASTM D 2523 / TAS 103		
MD (after accelerated weathering)		35	20 min
CMD (after accelerated weathering)		25	20 min
Elongation (as received) @ 77°F, %	ASTM D 2523 / TAS 103		
MD (after accelerated weathering)		26	25 min
CMD (after accelerated weathering)		33	25 min
Low Temperature Flexibility @ -20°F, [Pass/Fail]	ASTM D 1970 / TAS 103		
MD (after accelerated weathering)		Pass	No cracking
CMD (after accelerated weathering)		Pass	No cracking
Peel Adhesion on 15/32" plywood, lbf/ft	ASTM D 1970 TAS 103		
After accelerated weathering		71	6.5 min
Accelerated Weathering 1,000h of Cycle A; [Pass/Fail]	ASTM D 4798	Pass	No visible peeling, chipping, cracking, flaking, pitting, or other damage under 5X magnification.

Note(s): None.

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Dimensional Stability – Before Conditioning



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Dimensional Stability – After Conditioning (6h @ 180°F)

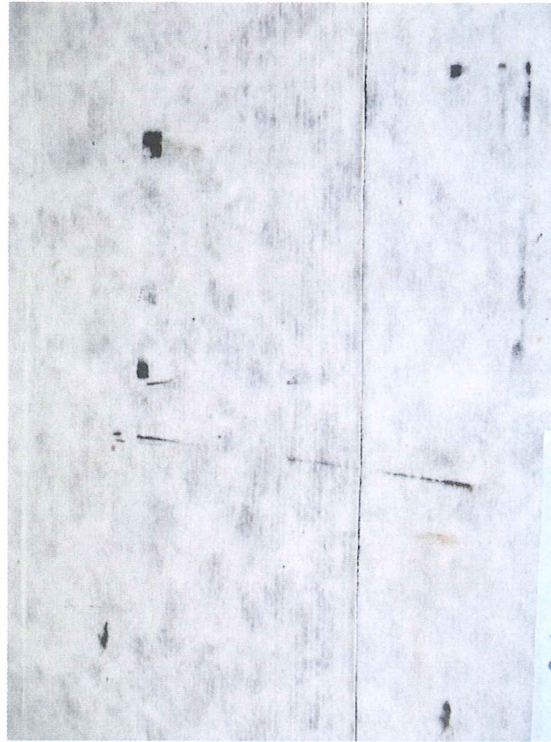


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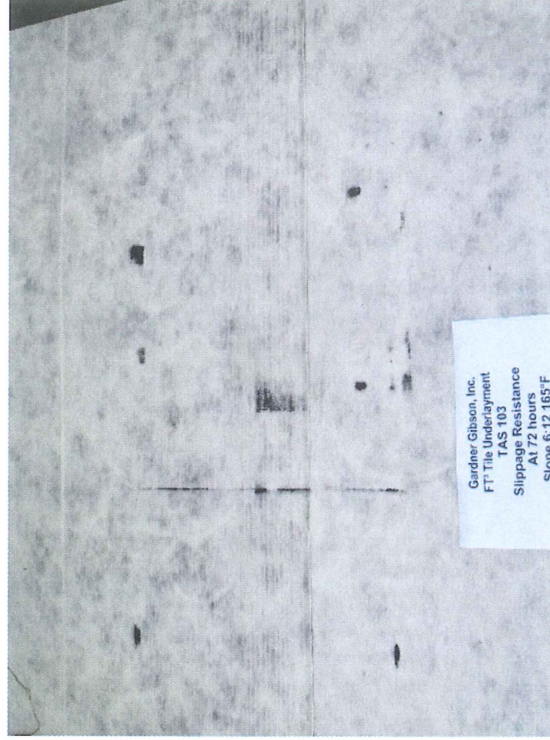
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Slippage Resistance – After Conditioning (72h @ 165°F) – without tile

2":12" Slope



6":12" Slope



Gardner Gibson, Inc.
FT³ Tile Underlayment
TAS 103
Slippage Resistance
At 72 hours
Slope 6:12 165°F

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Statement of Compliance:

The product tested complies with all of the requirements of Florida Building Code 2017 Test Protocols for High-Velocity Hurricane Zones **TAS 103-95: TEST PROCEDURE FOR SELF-ADHERED UNDERLAYMENTS FOR USE IN DISCONTINUOUS ROOF SYSTEMS.**

Exposure Limitation: The product tested complies with the extended exposure limitation of 180 days prescribed in FBC TAS 110 – 95 , whereas minimum requirements for physical properties were met through physical properties testing of samples weathered for 1,000 hours in accordance with ASTM D 4798 as outlined in ASTM D 5147 (Cycle A).

Signed: _____

Jason Simmons
Director

Signed: _____

Duc T. Nguyen
Florida Registered Professional Engineer
P.E. Number: 65034

Date: _____

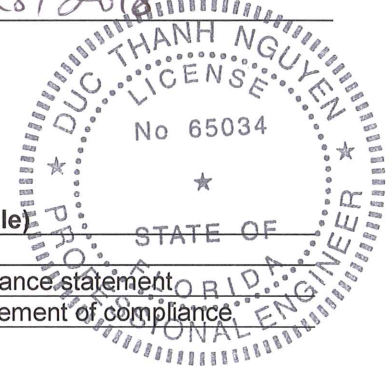
3/20/2018

Date: _____

3/28/2018

Report Issue History:

Issue #	Date	Pages	Revision Description (if applicable)
Original	07/26/2017	8	NA
Revision	08/08/2017	8	Revised thickness data and compliance statement
Revision	09/15/2017	8	Included exposure limitation in statement of compliance
Revision	03/27/2018	8	Updated tear testing to 2017 FBC



END OF REPORT

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