

TECHNOLOGIES

LABORATORY TEST REPORT

Report for: Curacreto, SA de CV Av. 1 de Mayo #8A Mexico City, Mexico 11870

Attention: Jorge A. Robles Ramos

Product Name:	Technoply SBS BFG 300 S	Manufacturer:	Curacreto, SA de CV
Date Received:	Aug. 23, 2017	Sampling:	Curacreto, SA de CV, Mexico City, Mexico
PRI-CMT Project No.:	CURA-001-02-03	Test Dates:	Aug. 25 – Dec. 13, 2017

Purpose: Evaluate the named product for compliance with ASTM D 6163-00^{c1}: Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Material Using Glass Fiber Reinforcements and Florida Building Code Test Protocols for High-Velocity Hurricane Zones, Test Application Standard (TAS) No. 110-2000 Testing Requirements for Physical Properties of Roof Membranes, Insulation, Coatings, and Other Roofing Components.

- **Test Methods:** Testing was completed in compliance with ASTM D 6163-00^{ε1}: Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Material Using Glass Fiber Reinforcements. Test methods assigned or referenced include ASTM D 146: Standard test Methods for Sampling and testing Bitumen-Saturated Felts and Woven Fabrics for Roofing and Waterproofing; ASTM D 1204: Standard Test Method for Linear Dimensional Changes of Nonrigid Thermoplastic Sheeting or Film at Elevated Temperature; ASTM D 4073: Standard Test Method for Tensile-Tear Strength of Bituminous Roofing Membranes; ASTM D 4977: Standard Test Method for Granule Adhesion to Mineral Surfaced Roofing by Abrasion; ASTM D 5147: Standard Test Methods for Sampling and Testing Modified Bituminous Sheet Materials: ASTM D 5636: Standard Test Method for Low Temperature Unrolling of Felt or Sheet Roofing and Waterproofing Materials; and ASTM D 5869: Standard Practice for Dark Oven Heat Exposure of Roofing and Waterproofing Materials.
- Sampling: Product samples were provided by Curacreto, SA de CV from Mexico City, Mexico.

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Results:

Duonortu					Desulte				Requirement
Property	Test Method				Results				Type I, Grade S
Physical Properties – Before Heat Cond	itioning								
Peak Load, (lbf/in-width) 1" x 6" specimens; Cond. 2h @ -0.4±3.6°F;	ASTM D 5147	~	N	ę	4	ъ	Avg.	St. Dev.	
Test @ -0.4±3.6°F; Rate = 0.08in/min ±3%	MD	134	157	169	191	180	166	22	≥ 70
	CMD	70	70	74	70	75	72	3	≥ 70
Elongation, (%) 1" x 6" specimens; Cond. 2h @ -0.4±3.6°F; Test @ -0.4±3.6°F; Rate = 0.08in/min ±3%	ASTM D 5147	-	Ν	e	4	ъ	Avg.	St. Dev.	
	MD	5	5	5	6	5	5	0	≥ 1
	CMD	5	4	5	4	5	5	0	≥ 1
Peak Load, (lbf/in-width) 1" x 6" specimens; Cond. 2h @ 73.4±3.6°F;	ASTM D 5147	-	Ν	m	4	ъ	Avg.	St. Dev.	
Test @ 73.4±3.6°F; Rate = 2.0in/min ±3%	MD	90	76	107	84	85	88	11	≥ 30
	CMD	32	29	27	31	34	31	3	≥ 30
Elongation, (%) 1" x 6" specimens; Cond, 2h @ 73.4±3.6°F:	ASTM D 5147	F	7	£	4	ى	Avg.	St. Dev.	
Test @ 73.4±3.6°F; Rate = 2.0in/min ±3%	MD	16	5	12	8	9	10	4	≥2
	CMD	4	4	4	4	5	4	0	≥ 2
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CURA-001-02-03

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Curacreto, SA de CV ASTM D 6163 for **Technoply SBS BFG 300 S** Page 3 of 8

	T				Results							
Property	Test Method				Results				Type I, Grade S			
Ultimate Elongation, (%) 1" x 6" specimens; Cond. 2h @ 73.4±3.6°F;	ASTM D 5147	-	2	£	4	ъ	Avg.	St. Dev.				
Test @ 73.4±3.6°F; Rate = 2.0in/min ±3%	MD	39	60	53	54	62	54	9	≥ 3			
	CMD	103	77	133	107	108	106	20	≥ 3			
Tear Strength, (lbf) 3" x 8" specimens with assigned notch; Cond. 4h @ 73.4±3.6°F & 50±5%RH; Test @ 73.4±3.6°F: Rate = 2 0in/min ±3%	ASTM D 5147	۲	2	£	4	5	Avg.	St. Dev.				
Test @ 73.4±3.6°F; Rate = 2.0in/min ±3%	MD	148	218	184	145	185	176	30	≥ 35			
	CMD	81	77	81	94	80	82	7	≥ 35			
Low Temperature Flexibility, (Pass/Fail) 1" x 6" specimens; Cond. 2h @ 0°F; Test weathering side away from mandrel;	ASTM D 5147	~	7	с	4	ъ			Pass = "none of the specimens show cracking"			
Test 180±5° over 1" ø in 2±1s @ 0°F;	MD	Pass	Pass	Pass	Pass	Pass			Pass @ 0°F			
visual hispection in nexed position	CMD	Pass	Pass	Pass	Pass	Pass			Pass @ 0°F			
Dimensional Stability, (%) 10" x 10" specimens; Cond. 40h @ 73.4±3.6°F & 50±5%RH;	ASTM D 1204/ ASTM D 5147	←	2	£	4	2	Avg.	St. Dev.				
Test 24h±15min @ 176±3.6°F	MD	0.0	0.0	0.0	0.0	0.0	0.0	0.0	≤ 0.5			
	CMD	0.0	0.0	0.0	0.0	0.0	0.0	0.0	≤ 0.5			
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Property	Tast Mathod				Posulte				Requirement
Froperty	rest method				Results				Type I, Grade S
Compound Stability, <i>[Pass/Fail]</i> 2.0±0.05" x 3.0±0.05" specimens; Cond. 4h @ 73.4±3.6°F & 50±5%RH;	ASTM D 5147	-	2	ę	4	ъ			Pass = no failures showing signs of flowing, dripping, or drop formation
Test 2h,15min±5min @ 215±5°F	MD	Pass	Pass	Pass	Pass	Pass			Pass
	CMD	Pass	Pass	Pass	Pass	Pass			Pass
Granule Embedment (g) Grade G products only; 2" x 9" specimens; Cond. 30min @ 73.4±3.6°F;	ASTM D 4977/ ASTM D 5147	۲	2	Avg.					
l est 50 complete cycles		NA	NA	NA					NA
Physical Properties – After Heat Conditioning									
Heat Conditioning Exposure: 90±0.25d @ 158±5°F	ASTM D 5869/ ASTM D 5147								
Peak Load, (lbf/in-width) 1" x 6" specimens; Cond. 2h @ -0.4±3.6°F;	ASTM D 5147	~	7	e	4	ъ	Avg.	St. Dev.	
Test @ -0.4±3.6°F; Rate = 0.08in/min ±3%	MD	206	187	208	200	202	201	8	≥ 70
	CMD	89	71	71	74	70	75	8	≥ 70
Elongation, (%) 1" x 6" specimens; Cond. 2h @ -0.4±3.6°F:	ASTM D 5147	~	2	ę	4	ъ	Avg.	St. Dev.	
Test @ -0.4±3.6°F; Rate = 0.08in/min ±3%	MD	6	9	7	5	6	6	2	≥ 1
	CMD	5	4	4	5	4	4	0	≥ 1
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Curacreto, SA de CV ASTM D 6163 for **Technoply SBS BFG 300 S** Page 5 of 8

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Property	lest Method				Results				Type I, Grade S
Peak Load, (lbf/in-width) 1" x 6" specimens; Cond. 2h @ 73.4±3.6°F; Tost @ 72.4:2 6°F;	ASTM D 5147	-	N	m	4	ъ	Avg.	St. Dev.	
Test @ 73.4 ± 3.0 F, Rate = 2.000/0000 ± 3.0	MD	147	166	162	160	161	159	7	≥ 30
	CMD	50	48	46	57	56	57	11	≥ 30
Elongation, (%) 1" x 6" specimens; Cond. 2h @ 73.4±3.6°F; Test @ 73.4±3.6°F; Rate = 2.0in/min ±3%	ASTM D 5147	.	7	ę	4	ъ	Avg.	St. Dev.	
	MD	7	8	8	7	8	8	1	≥ 2
	CMD	4	3	5	4	4	4	1	≥ 2
Ultimate Elongation, (%) 1" x 6" specimens; Cond. 2h @ 73.4±3.6°F;	ASTM D 5147	F	Ν	m	4	ъ	Avg.	St. Dev.	
Test @ 73.4±3.6°F; Rate = 2.0in/min ±3%	MD	30	31	26	31	20	28	5	≥ 3
	CMD	41	32	31	29	40	35	5	≥ 3
Low Temperature Flexibility, [Pass/Fail] 1" x 6" specimens; Cond. 2h @ 0°F; Test weathering side away from mandrel;	ASTM D 5147	Ł	7	ĸ	4	ъ			Pass = "none of the specimens show cracking"
Test 180±5° over 1" ø in 2±1s @ 0°F;	MD	Pass	Pass	Pass	Pass	Pass			Pass @ 0°F
Visual Inspection in "flexed" position	CMD	Pass	Pass	Pass	Pass	Pass			Pass @ 0°F
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CURA-001-02-03

PRI-CMT Accreditations: AAMA; IAS; Miami-Dade; Florida; Los Angeles; CRRC; UL

Broparty	Tost Mathad	od Besults						Requirement		
Property	Test Method				Results				Type I, Grade S	
Physical Properties – Other										
Unrolling, <i>[Pass/Fail]</i> 10±1/8" x 18±1/8" specimens; Cond. 24h @ 73.4±3.6°F & 50±5%RH; Test Cond. 2h @ <i>Temp</i> ±1°F; Test unroll in 4-6s;	ASTM D 5636/ ASTM D 5147	Ļ	2	e	4				Pass = "finished product shall not crack nor be so sticky as to cause tearing or other material damage upon being unrolled at any temperature between 40 and 140°F"	
Visual Inspection in "unrolled" position		Pass	Pass	Pass	Pass				Pass	
Dimensions and Masses	Dimensions and Masses									
Thickness, (mils) 27-1/2" x manufacture width; 5 measurement points	ASTM D 5147	~	7	ę	4	£	Avg.	St. Dev.		
		122	120	124	119	121	121	2	≥ 80	
Net Mass, (lb/100ft ²) 1 specimen; manufacture roll	ASTM D 228									
			-	-	72		-	-	≥ 45	
Bottom Coating Thickness, (mils) Heat Welding Application Products; 6" x manufacture width; 5 measurement points	ASTM D 5147	~	7	ĸ	4	ى	Avg.	St. Dev.		
		N/A	N/A	N/A	N/A	N/A	N/A	N/A	Not Required	

Notes: 1) N/A indicates Not Applicable; NT indicates Not Tested; As Agreed: as agreed by buyer and seller

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Curacreto, SA de CV ASTM D 6163 for **Technoply SBS BFG 300 S** Page 7 of 8

Statement of Compliance:

The product tested has demonstrated compliance with the physical property requirements of ASTM D 6163-00^{ε1}: *Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Material Using Glass Fiber* Reinforcements, Type I and Florida Building Code Test Protocols for High-Velocity Hurricane Zones, Test Application Standard (TAS) No. 110-2000 *Testing Requirements for Physical Properties of Roof Membranes, Insulation, Coatings, and Other Roofing Components.* The laboratory test results presented in this report are representative of the material supplied.



Report Issue History:

Issue #DatePagesRevision Description (if applicable)Original12/27/20177NA

CURA-001-02-03

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Curacreto, SA de CV ASTM D 6163 for **Technoply SBS BFG 300 S** Page 8 of 8

END OF REPORT

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CONSTRUCTION MATERIALS

TECHNOLOGIES

LABORATORY TEST REPORT

Report for: Curacreto, SA de CV Av. 1 de Mayo #8A Mexico City, Mexico 11870

Attention: Jorge A. Robles Ramos

Product Name:	Technoply SBS BP 300 S	Manufacturer:	Curacreto, SA de CV
Date Received:	Sep. 14, 2017	Sampling:	Curacreto, SA de CV, Mexico City, Mexico
PRI-CMT Project No.:	CURA-004-02-03	Test Dates:	Sep. 21, 2017 – Jan. 4, 2018

Purpose: Evaluate the named products for compliance with ASTM D 6164: Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Material Using Polyester Reinforcements as required by the Florida Building Code Test Protocols for High-Velocity Hurricane Zones, Test Application Standard (TAS) No. 110-2000 Testing Requirements for Physical Properties of Roof Membranes, Insulation, Coatings, and Other Roofing Components.

Test Methods: Testing was completed in compliance with ASTM D 6164-05^{£1} and ASTM D 6164/D 6164M-11: Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Material Using Polyester Reinforcements. Test methods assigned or referenced include ASTM D 146: Standard test Methods for Sampling and testing Bitumen-Saturated Felts and Woven Fabrics for Roofing and Waterproofing; ASTM D 1204: Standard Test Method for Linear Dimensional Changes of Nonrigid Thermoplastic Sheeting or Film at Elevated Temperature; ASTM D 4073: Standard Test Method for Tensile-Tear Strength of Bituminous Roofing Membranes; ASTM D 4977: Standard Test Method for Granule Adhesion to Mineral Surfaced Roofing by Abrasion; ASTM D 5147: Standard Test Methods for Sampling and Testing Modified Bituminous Sheet Materials; ASTM D 5636: Standard Test Method for Low Temperature Unrolling of Felt or Sheet Roofing and Waterproofing Materials; and ASTM D 5869: Standard Practice for Dark Oven Heat Exposure of Roofing and Waterproofing Materials.

Sampling: Product samples were provided by Curacreto, SA de CV from Mexico City, Mexico

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Results:

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Property	Test Method				Results				Type I, Grade S
Physical Properties – Before Heat Cond	itioning								
Peak Load, (lbf/in-width) 1" x 6" specimens; Cond. 2h @ -0.4±3.6°F;	ASTM D 5147	-	7	ĸ	4	ى ب	Avg.	St. Dev.	
Test @ -0.4±3.6°F; Rate = 0.08in/min ±3%	MD	106	98	106	114	104	106	6	≥ 70
	CMD	104	86	94	106	101	98	8	≥ 70
Elongation, (%) 1" x 6" specimens; Cond. 2h @ -0.4±3.6°F; Test @ -0.4±3.6°F; Rate = 0.08in/min ±3%	ASTM D 5147	L.	2	e	4	ъ	Avg.	St. Dev.	
	MD	48	36	42	47	42	43	5	≥ 20
	CMD	46	35	37	41	43	41	5	≥ 20
Peak Load, (lbf/in-width) 1" x 6" specimens; Cond. 2h @ 73.4±3.6°F;	ASTM D 5147	~	2	m	4	ъ	Avg.	St. Dev.	
Test @ 73.4±3.6°F; Rate = 2.0in/min ±3%	MD	88	79	86	90	86	86	4	≥ 50
	CMD	65	69	63	65	73	67	4	≥ 50
Elongation, (%) 1" x 6" specimens; Cond. 2h @ 73.4±3.6°F; Test @ 73.4±3.6°F; Rate = 2.0in/min ±3%	ASTM D 5147	-	N	m	4	ъ	Avg.	St. Dev.	
	MD	59	51	54	55	47	53	5	≥ 35
	CMD	54	60	57	66	63	60	5	≥ 35
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CURA-004-02-03

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Curacreto, SA de CV ASTM D 6164 for **Technoply SBS BP 300 S** Page 3 of 8

Descosto					Desults				Requirement
Property	lest Method				Results				Type I, Grade S
Ultimate Elongation, (%) 1" x 6" specimens; Cond. 2h @ 73.4±3.6°F;	ASTM D 5147	-	7	ę	4	5	Avg.	St. Dev.	
Test @ 73.4±3.6°F; Rate = 2.0in/min ±3%	MD	98	76	71	77	73	79	11	≥ 38
	CMD	78	96	95	89	82	88	8	≥ 38
Tear Strength, (lbf) 3" x 8" specimens with assigned notch; Cond. 4h @ 73.4±3.6°F & 50±5%RH;	ASTM D 5147	٢	7	m	4	2	Avg.	St. Dev.	
Test @ 73.4±3.6°F; Rate = 2.0in/min ±3%	MD	112	97	105	99	98	102	6	≥ 55
	CMD	139	141	134	136	131	136	4	≥ 55
Low Temperature Flexibility, (Pass/Fail) 1" x 6" specimens; Cond. 2h @ 0°F; Test weathering side away from mandrel;	ASTM D 5147	-	0	ę	4	S			Pass = "none of the specimens show cracking"
Test 180±5° over 1" ø in 2±1s @ 0°F;	MD	Pass	Pass	Pass	Pass	Pass			Pass @ 0°F
visual inspection in nexed position	CMD	Pass	Pass	Pass	Pass	Pass			Pass @ 0°F
Dimensional Stability, (%) 10" x 10" specimens; Cond 40h @ 73 4+3 6°E & 50+5%RH	ASTM D 1204/ ASTM D 5147	-	0	ę	4	2	Avg.	St. Dev.	
Test 24h±15min @ 176±3.6°F	MD	0.2	0.0	0.1	0.1	0.1	0.1	0.1	≤ 1
	CMD	0.2	0.1	0.2	0.2	0.1	0.1	0.1	≤ 1
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PRI-CMT Accreditations: AAMA; IAS; Miami-Dade; Florida; Los Angeles; CRRC; UL

Property	Test Method				Results				Requirement Type I, Grade S
Compound Stability, <i>[Pass/Fail]</i> 2.0±0.05" x 3.0±0.05" specimens; Cond. 4h @ 73.4±3.6°F & 50±5%RH;	ASTM D 5147	-	Ν	ĸ	4	ъ			Pass = no failures showing signs of flowing, dripping, or drop formation
Test 2h,15min±5min @ 215±5°F	MD	Pass	Pass	Pass	Pass	Pass			Pass
	CMD	Pass	Pass	Pass	Pass	Pass			Pass
Granule Embedment (g) Grade G products only; 2" x 9" specimens; Cond. 30min @ 73.4±3.6°F;	ASTM D 4977/ ASTM D 5147	F	7	Avg.					
Test 50 complete cycles		N/A	N/A	N/A					≤ 2
Physical Properties – After Heat Conditioning									
Heat Conditioning Exposure: 90±0.25d @ 158±5°F	ASTM D 5869/ ASTM D 5147								
Peak Load, (lbf/in-width) 1" x 6" specimens; Cond. 2h @ -0.4±3.6°F;	ASTM D 5147	-	7	ę	4	2	Avg.	St. Dev.	
Test @ -0.4±3.6°F; Rate = 0.08in/min ±3%	MD	107	96	100	100	101	101	4	≥ 70
	CMD	63	76	84	76	75	75	8	≥ 70
Elongation, (%) 1" x 6" specimens; Cond. 2h @ -0.4±3.6°F; Test @ -0.4±3.6°F; Rate = 0.08in/min ±3%	ASTM D 5147	-	N	m	4	ъ	Avg.	St. Dev.	
	MD	36	33	36	32	36	35	2	≥ 20
	CMD	24	33	35	27	37	31	6	≥ 20
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CURA-004-02-03

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Curacreto, SA de CV ASTM D 6164 for **Technoply SBS BP 300 S** Page 5 of 8

Property	Test Method				Results				Requirement Type I, Grade S
Peak Load, (lbf/in-width) 1" x 6" specimens; Cond. 2h @ 73.4±3.6°F; Toot. @ 73.4±2.6°F;	ASTM D 5147	~	N	m	4	Q	Avg.	St. Dev.	
Test $@ 73.4\pm3.0$ F, Rate = 2.0m/mm ± 3.6	MD	87	88	89	89	94	89	3	≥ 50
	CMD	61	62	60	59	66	62	3	≥ 50
Elongation, (%) 1" x 6" specimens; Cond. 2h @ 73.4±3.6°F; Test @ 73.4±3.6°F; Rate = 2.0in/min ±3%	ASTM D 5147	-	N	m	4	S	Avg.	St. Dev.	
	MD	49	48	48	50	58	51	4	≥ 35
	CMD	55	48	52	42	65	52	8	≥ 35
Ultimate Elongation, (%) 1" x 6" specimens; Cond. 2h @ 73.4±3.6°F;	ASTM D 5147	-	Ν	ę	4	5	Avg.	St. Dev.	
Test @ 73.4±3.6°F; Rate = 2.0in/min ±3%	MD	54	51	51	53	60	54	3	≥ 38
	CMD	59	51	56	48	74	58	10	≥ 38
Low Temperature Flexibility, <i>[Pass/Fail]</i> 1" x 6" specimens; Cond. 2h @ 0°F; Test weathering side away from mandrel:	ASTM D 5147	-	N	ę	4	S			Pass = "none of the specimens show cracking"
Test 180±5° over 1" ø in 2±1s @ 0°F;	MD	Pass	Pass	Pass	Pass	Pass			Pass @ 0°F
Visual Inspection in "flexed" position	CMD	Pass	Pass	Pass	Pass	Pass			Pass @ 0°F
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CURA-004-02-03

PRI-CMT Accreditations: AAMA; IAS; Miami-Dade; Florida; Los Angeles; CRRC; UL

Dronorty	Toot Mothed	Posulte						Requirement		
Property	Test Method		Results							
Physical Properties – Other										
Unrolling, <i>[Pass/Fail]</i> 10±1/8" x 18±1/8" specimens; Cond. 24h @ 73.4±3.6°F & 50±5%RH; Test Cond. 2h @ <i>Temp</i> ±1°F; Test unroll in 4-6s;	ASTM D 5636/ ASTM D 5147	-	N	ю	4				Pass = "finished product shall not crack nor be so sticky as to cause tearing or other material damage upon being unrolled at any temperature between 40 and 140°F"	
Visual Inspection in "unrolled" position		Pass	Pass	Pass	Pass				Pass	
Dimensions and Masses	Dimensions and Masses									
Thickness, (mils) 27-1/2" x manufacture width; 5 measurement points	ASTM D 5147	~	N	m	4	ъ	Avg.	St. Dev.		
		136	129	133	137	136	134	4	≥ 85	
Net Mass, (lb/100ft²) 1 specimen; manufacture roll	ASTM D 228									
					69				≥ 54	
Bottom Coating Thickness, (mils) Heat Welding Application Products; 6" x manufacture width; 5 measurement points	ASTM D 5147	~	7	е	4	ى	Avg.	St. Dev.		
		69	63	60	69	65	65	4	≥ 40	

Notes: 1) N/A indicates Not Applicable; NT indicates Not Tested; As Agreed: as agreed by buyer and seller

CURA-004-02-03

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Curacreto, SA de CV ASTM D 6164 for **Technoply SBS BP 300 S** Page 7 of 8

Statement of Compliance:

The products tested have demonstrated compliance with the physical property requirements of ASTM D 6164-05^{c1} and ASTM D 6164/D 6164/D 11: *Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Material Using Polyester Reinforcements,* Type I and Florida Building Code Test Protocols for High-Velocity Hurricane Zones, Test Application Standard (TAS) No. 110-2000 *Testing Requirements for Physical Properties of Roof Membranes, Insulation, Coatings, and Other Roofing Components.* The laboratory test results presented in this report are representative of the material supplied.



Report Issue History:

Issue #DatePagesRevision Description (if applicable)Original01/09/20187N/A

END OF REPORT

CURA-004-02-03

PRI-CMT Accreditations: AAMA; IAS; Miami-Dade; Florida; Los Angeles; CRRC; UL

Curacreto, SA de CV ASTM D 6164 for **Technoply SBS BP 300 S** Page 8 of 8

CURA-004-02-03

PRI-CMT Accreditations: AAMA; IAS; Miami-Dade; Florida; Los Angeles; CRRC; UL

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CONSTRUCTION MATERIALS

TECHNOLOGIES

LABORATORY TEST REPORT

Report for: Curacreto, SA de CV Av. 1 de Mayo #8A Mexico City, Mexico 11870

Attention: Jorge A. Robles Ramos

Product Name:	Technoply SBS FR SP 400 G	Manufacturer	: Curacreto, SA de CV
Date Received:	Sep. 14, 2017	Sampling:	Curacreto, SA de CV, Mexico City, Mexico
PRI-CMT Project No.:	CURA-004-02-06	Test Dates:	Oct. 11, 2017 – Feb. 1, 2018

Purpose: Evaluate the named products for compliance with ASTM D 6164: Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Material Using Polyester Reinforcements and ASTM D 5147 Section 13: Accelerated Weathering as required by the Florida Building Code Test Protocols for High-Velocity Hurricane Zones, Test Application Standard (TAS) No. 110-2000 Testing Requirements for Physical Properties of Roof Membranes, Insulation, Coatings, and Other Roofing Components.

Test Methods: Testing was completed in compliance with ASTM D 6164-05^{£1} and ASTM D 6164/D 6164M-11: Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Material Using Polyester Reinforcements. Test methods assigned or referenced include ASTM D 146: Standard test Methods for Sampling and testing Bitumen-Saturated Felts and Woven Fabrics for Roofing and Waterproofing; ASTM D 1204: Standard Test Method for Linear Dimensional Changes of Nonrigid Thermoplastic Sheeting or Film at Elevated Temperature; ASTM D 4073: Standard Test Method for Tensile-Tear Strength of Bituminous Roofing Membranes; ASTM D 4977: Standard Test Method for Granule Adhesion to Mineral Surfaced Roofing by Abrasion: ASTM D 5147: Standard Test Methods for Sampling and Testing Modified Bituminous Sheet Materials; ASTM D 5636: Standard Test Method for Low Temperature Unrolling of Felt or Sheet Roofing and Waterproofing Materials; and ASTM D 5869: Standard Practice for Dark Oven Heat Exposure of Roofing and Waterproofing Materials.

Sampling: Product samples were provided by Curacreto, SA de CV from Mexico City, Mexico.

<u>CURA-004-02-06</u> PRI-CMT Accreditations: AAMA; IAS; Miami-Dade; Florida; Los Angeles; CRRC; UL The test results, opinions, or interpretations are based on the material supplied by the client. This report is for the exclusive use of stated client. No reproduction or facsimile in any form can be made without the client's permission. This report shall not be reproduced except in full without the written approval of this laboratory. PRI Construction Materials Technologies LLC assumes no responsibility nor makes a performance or warranty statement for this material or products and processes containing this material in connection with this report.

Results:

Property	Test Method				Results				Requirement
									Type I, Grade G
Physical Properties – Before Heat Cond	itioning		1	-	1	1	1	1	I
Peak Load, (lbf/in-width) 1" x 6" specimens; Cond. 2h @ -0.4±3.6°F;	ASTM D 5147	۲	7	ę	4	ъ	Avg.	St. Dev.	
Test @ -0.4±3.6°F; Rate = 0.08in/min ±3%	MD	114	102	101	113	113	109	7	≥ 70
	CMD	77	75	79	92	84	81	7	≥ 70
Elongation, (%) 1" x 6" specimens; Cond. 2h @ -0.4±3.6°F; Test @ -0.4±3.6°F; Rate = 0.08in/min ±3%	ASTM D 5147	-	Ν	ę	4	ъ	Avg.	St. Dev.	
	MD	40	35	39	46	43	41	4	≥ 20
	CMD	21	26	26	38	32	29	7	≥ 20
Peak Load, (lbf/in-width) 1" x 6" specimens; Cond. 2h @ 73.4±3.6°F;	ASTM D 5147	-	N	e	4	2	Avg.	St. Dev.	
Test @ 73.4±3.6°F; Rate = 2.0in/min ±3%	MD	85	92	92	79	81	86	6	≥ 50
	CMD	60	61	56	56	62	59	3	≥ 50
Elongation, (%) 1" x 6" specimens; Cond. 2h @ 73.4±3.6°F; Test @ 73.4±3.6°F; Rate = 2.0in/min ±3%	ASTM D 5147	L	7	e	4	ъ	Avg.	St. Dev.	
	MD	53	50	63	56	47	54	6	≥ 35
	CMD	54	58	51	58	57	56	3	≥ 35
Continued on next page DBI CMT Accorditations: Adds: LAS: Mierri Dads: Flatida: Las Acceles: ODDO: LU									

Curacreto, SA de CV ASTM D 6164 and ASTM D 5147 for Technoply SBS FR SP 400 G Page 3 of 9

Property	Test Method				Results				Requirement Type I, Grade G
Ultimate Elongation, (%) 1" x 6" specimens; Cond. 2h @ 73.4±3.6°F;	ASTM D 5147	-	2	с	4	5	Avg.	St. Dev.	
Test @ 73.4±3.6°F; Rate = 2.0in/min ±3%	MD	81	85	95	83	75	84	7	≥ 38
	CMD	78	82	71	77	83	78	5	≥ 38
Tear Strength, (lbf) 3" x 8" specimens with assigned notch; Cond. 4h @ 73.4±3.6°F & 50±5%RH;	ASTM D 5147	~	7	ю	4	5	Avg.	St. Dev.	
Test @ 73.4±3.6°F; Rate = 2.0in/min ±3%	MD	111	118	108	98	95	106	10	≥ 55
	CMD	121	144	125	145	130	133	11	≥ 55
Low Temperature Flexibility, (Pass/Fail) 1" x 6" specimens; Cond. 2h @ 0°F; Test weathering side away from mandrel:	ASTM D 5147	-	7	ю	4	5			Pass = "none of the specimens show cracking"
Test 180±5° over 1" ø in 2±1s @ 0°F;	MD	Pass	Pass	Pass	Pass	Pass			Pass @ 0°F
visual inspection in flexed position	CMD	Pass	Pass	Pass	Pass	Pass			Pass @ 0°F
Dimensional Stability, (%) 10" x 10" specimens; Cond. 40h @ 73.4±3.6°F & 50±5%RH;	ASTM D 1204/ ASTM D 5147	~	2	ю	4	5	Avg.	St. Dev.	
Test 24h±15min @ 176±3.6°F	MD	0.1	0.1	0.0	0.0	0.1	0.1	0.1	≤ 1
	CMD	0.1	0.1	0.0	0.0	0.0	0.0	0.0	≤ 1
Continued on next page									

Property	Test Method	Results							Requirement
Compound Stability, <i>[Pass/Fail]</i> 2.0±0.05" x 3.0±0.05" specimens; Cond. 4h @ 73.4±3.6°F & 50±5%RH;	ASTM D 5147	۲	7	ę	4	ى ك			Pass = no failures showing signs of flowing, dripping, or drop formation
Test 2h,15min±5min @ 215±5°F	MD	Pass	Pass	Pass	Pass	Pass			Pass
	CMD	Pass	Pass	Pass	Pass	Pass			Pass
Granule Embedment (g) Grade G products only; 2" x 9" specimens; Cond. 30min @ 73.4±3.6°F;	ASTM D 4977/ ASTM D 5147	Ţ	7	Avg.					
Test 50 complete cycles		1	1	1					≤ 2
Physical Properties – After Heat Conditioning									
Heat Conditioning Exposure: 90±0.25d @ 158±5°F	ASTM D 5869/ ASTM D 5147								
Peak Load, (lbf/in-width) 1" x 6" specimens; Cond. 2h @ -0.4±3.6°F;	ASTM D 5147	-	7	e	4	Ð	Avg.	St. Dev.	
Test @ -0.4±3.6°F; Rate = 0.08in/min ±3%	MD	91	102	94	96	107	98	6	≥ 70
	CMD	67	69	67	73	74	70	4	≥ 70
Elongation, (%) 1" x 6" specimens; Cond. 2h @ -0.4±3.6°F;	ASTM D 5147	Ţ	7	m	4	Q	Avg.	St. Dev.	
Test @ -0.4±3.6°F; Rate = 0.08in/min ±3%	MD	29	31	31	21	34	29	5	≥ 20
	CMD	22	24	30	28	21	25	4	≥ 20
Continued on next page			PRI-	CMT Accred	litations: AAI	MA: IAS: Mia	mi-Dade: Fl	orida: Los A	ngeles: CRRC: UI

Curacreto, SA de CV ASTM D 6164 and ASTM D 5147 for **Technoply SBS FR SP 400 G** Page 5 of 9

Property	Test Method				Results				Requirement Type I, Grade G
Peak Load, (lbf/in-width) 1" x 6" specimens; Cond. 2h @ 73.4±3.6°F; Toot @ 73.4±3.6°F;	ASTM D 5147	-	N	ю	4	S	Avg.	St. Dev.	
Test @ 73.4 ± 3.0 F, Rate = 2.011/1111 $\pm 3\%$	MD	90	92	96	90	97	93	3	≥ 50
	CMD	68	63	62	60	60	63	3	≥ 50
Elongation, (%) 1" x 6" specimens; Cond. 2h @ 73.4±3.6°F;	ASTM D 5147	-	N	с	4	2	Avg.	St. Dev.	
Test @ 73.4±3.6°F; Rate = 2.0in/min ±3%	MD	40	40	54	47	50	46	6	≥ 35
	CMD	53	42	51	49	33	46	8	≥ 35
Ultimate Elongation, (%) 1" x 6" specimens; Cond. 2h @ 73.4±3.6°F;	ASTM D 5147	-	N	с	4	2	Avg.	St. Dev.	
Test @ 73.4±3.6°F; Rate = 2.0in/min ±3%	MD	48	46	59	55	53	52	5	≥ 38
	CMD	56	47	56	55	41	51	7	≥ 38
Low Temperature Flexibility, [Pass/Fail] 1" x 6" specimens; Cond. 2h @ 0°F; Test weathering side away from mandrel;	ASTM D 5147	L	Ν	с	4	2			Pass = "none of the specimens show cracking"
Test 180±5° over 1" ø in 2±1s @ 0°F;	MD	Pass	Pass	Pass	Pass	Pass			Pass @ 0°F
Visual Inspection in "flexed" position	CMD	Pass	Pass	Pass	Pass	Pass			Pass @ 0°F
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CURA-004-02-06

PRI-CMT Accreditations: AAMA; IAS; Miami-Dade; Florida; Los Angeles; CRRC; UL

Dronosty	Toot Mothed				Deculte				Requirement
Property	rest Method	Results							Type I, Grade G
Physical Properties – Other									
Unrolling, <i>[Pass/Fail]</i> 10±1/8" x 18±1/8" specimens; Cond. 24h @ 73.4±3.6°F & 50±5%RH; Test Cond. 2h @ <i>Temp</i> ±1°F;	ASTM D 5636/ ASTM D 5147	٢	2	ç	4				Pass = "finished product shall not crack nor be so sticky as to cause tearing or other material damage upon being unrolled at any temperature between 40 and 140°F"
Test unroll in 4-6s; Visual Inspection in "unrolled" position	<i>Temp</i> =40°F	Pass	Pass	Pass	Pass				Pass
	<i>Temp</i> =140°F	Pass	Pass	Pass	Pass				Pass
Dimensions and Masses									
Thickness, (mils) 27-1/2" x manufacture width; 5 measurement points	ASTM D 5147	-	7	e	4	ъ	Avg.	St. Dev.	
		179	181	180	172	170	176	5	≥ 130
let Mass, (lb/100ft²) 1 specimen; manufacture roll	ASTM D 228								
			90						
Bottom Coating Thickness, (mils) Heat Welding Application Products; 6" x manufacture width;	ASTM D 5147	F	Ν	e	4	ъ	Avg.	St. Dev.	
o measurement points		85	75	89	71	75	79	8	≥ 40
Continued on next page									

Droporty	Test Mathed				Desults				Requirement
Property	Test Method		Type I, Grade G						
Physical Properties – After Accelerated	Weathering								
Xenon Arc Weathering Exposure: 83±0.35d @ Cycle A	ASTM D 4798/ ASTM D 5147				_				
Peak Load, (lbf/in-width) 1" x 6" specimens; Cond. 2h @ -0.4±3.6°F;	ASTM D 5147	-	Ν	£	4	2	Avg.	St. Dev.	
Test @ -0.4±3.6°F; Rate = 0.08in/min ±3%	MD	105	91	87	102	86	94	9	≥ 70
	CMD	81	71	61	73	91	75	11	≥ 70
Elongation, (%) 1" x 6" specimens; Cond. 2h @ -0.4±3.6°F;	ASTM D 5147	-	N	S	4	2	Avg.	St. Dev.	
Test @ -0.4±3.6°F; Rate = 0.08in/min ±3%	MD	35	29	24	33	22	29	6	≥ 20
	CMD	40	31	22	33	42	34	8	≥ 20
Peak Load, (lbf/in-width) 1" x 6" specimens; Cond. 2h @ 73.4±3.6°F;	ASTM D 5147	-	N	3	4	S	Avg.	St. Dev.	
Test @ 73.4±3.6°F; Rate = 2.0in/min ±3%	MD	102	94	93	95	94	96	4	≥ 50
	CMD	66	72	67	55	65	65	6	≥ 50
Elongation, (%) 1" x 6" specimens; Cond. 2h @ 73.4±3.6°F;	ASTM D 5147	~	N	с	4	2	Avg.	St. Dev.	
Test @ 73.4±3.6°F; Rate = 2.0in/min ±3%	MD	54	57	51	51	67	56	7	≥ 35
	CMD	59	63	56	37	52	53	10	≥ 35
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CURA-004-02-06

PRI-CMT Accreditations: AAMA; IAS; Miami-Dade; Florida; Los Angeles; CRRC; UL

Curacreto, SA de CV ASTM D 6164 and ASTM D 5147 for **Technoply SBS FR SP 400 G** Page 8 of 9

Property	Test Method		Results						
Ultimate Elongation, (%) 1" x 6" specimens; Cond. 2h @ 73.4±3.6°F; Test @ 73.4±3.6°F; Rate = 2.0in/min ±3%	ASTM D 5147	Ţ	7	ю	4	Q	Avg.	St. Dev.	
	MD	58	59	53	54	74	60	9	≥ 38
	CMD	63	66	61	46	57	58	8	≥ 38
Low Temperature Flexibility, <i>[Pass/Fail]</i> 1" x 6" specimens; Cond. 2h @ 0°F; Test weathering side away from mandrel; Test 180±5° over 1" ø in 2±1s @ 0°F; Visuel kapagetian in "floyed" position	ASTM D 5147	-	2	3	4	5			Pass = "none of the specimens show cracking"
	MD	Pass	Pass	Pass	Pass	Pass			Pass @ 0°F
	CMD	Pass	Pass	Pass	Pass	Pass			Pass @ 0°F

Notes: 1) N/A indicates Not Applicable; NT indicates Not Tested; As Agreed: as agreed by buyer and seller

CURA-004-02-06

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Curacreto, SA de CV ASTM D 6164 and ASTM D 5147 for Technoply SBS FR SP 400 G Page 9 of 9

Statement of Compliance:

The products tested have demonstrated compliance with the physical property requirements of ASTM D 6164-05^{c1} and ASTM D 6164/D 6164/D 11: *Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Material Using Polyester Reinforcements,* Type I and Florida Building Code Test Protocols for High-Velocity Hurricane Zones, Test Application Standard (TAS) No. 110-2000 *Testing Requirements for Physical Properties of Roof Membranes, Insulation, Coatings, and Other Roofing Components.* The laboratory test results presented in this report are representative of the material supplied.



Report Issue History:

Issue #	Date	Pages	Revision Description (if applicable)	
Original	02/05/2018	9	N/A	

END OF REPORT

CURA-004-02-06

PRI-CMT Accreditations: AAMA; IAS; Miami-Dade; Florida; Los Angeles; CRRC; UL



CONSTRUCTION MATERIALS

TECHNOLOGIES

LABORATORY TEST REPORT

Report for: Curacreto, SA de CV Av. 1 de Mayo #8A Mexico City, Mexico 11870

Attention: Jorge A. Robles Ramos

Product Name:	Technoply SBS SP 400 G	Manufacturer:	Curacreto, SA de CV
Date Received:	Nov. 8, 2017	Sampling:	Curacreto, SA de CV, Mexico City, Mexico
PRI-CMT Project No.:	CURA-004-02-08	Test Dates:	Dec. 21, 2017 – Apr. 20, 2018

Purpose:Evaluate the named products for compliance with ASTM D 6164: Standard
Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet
Material Using Polyester Reinforcements and ASTM D 5147 Section 13:
Accelerated Weathering as required by the Florida Building Code Test Protocols
for High-Velocity Hurricane Zones, Test Application Standard (TAS) No. 110-2000
Testing Requirements for Physical Properties of Roof Membranes, Insulation,
Coatings, and Other Roofing Components.

Test Methods:Testing was completed in compliance with ASTM D 6164-05^{£1} and ASTM D 6164/D
6164M-11: Standard Specification for Styrene Butadiene Styrene (SBS) Modified
Bituminous Sheet Material Using Polyester Reinforcements. Test methods assigned
or referenced include ASTM D 146: Standard test Methods for Sampling and testing
Bitumen-Saturated Felts and Woven Fabrics for Roofing and Waterproofing; ASTM
D 1204: Standard Test Method for Linear Dimensional Changes of Nonrigid
Thermoplastic Sheeting or Film at Elevated Temperature; ASTM D 4073: Standard
Test Method for Tensile-Tear Strength of Bituminous Roofing Membranes; ASTM D
4977: Standard Test Method for Granule Adhesion to Mineral Surfaced Roofing by
Abrasion; ASTM D 5147: Standard Test Methods for Sampling and Testing Modified
Bituminous Sheet Materials; ASTM D 5636: Standard Test Method for Low
Temperature Unrolling of Felt or Sheet Roofing and Waterproofing Materials; and
ASTM D 5869: Standard Practice for Dark Oven Heat Exposure of Roofing and
Waterproofing Materials.

Sampling:

Product samples were provided by Curacreto, SA de CV from Mexico City, Mexico.

CURA-004-02-08

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Results:

Description	To a block of				Desults				Requirement
Property	lest Niethod				Results				Type I, Grade G
Physical Properties – Before Heat Conditionin	g								
Peak Load, (lbf/in-width) 1" x 6" specimens; Cond. 2h @ -0.4±3.6°F;	ASTM D 5147	1	2	£	4	ß	Avg.	St. Dev.	
Test @ -0.4±3.6°F; Rate = 0.08in/min ±3%	MD	97	104	120	132	117	114	14	≥ 70
	CMD	79	73	77	85	69	77	6	≥ 70
Elongation, (%) 1″ x 6″ specimens; Cond. 2h @ -0.4±3.6°F; Test @ -0.4±3.6°F; Rate = 0.08in/min ±3%	ASTM D 5147	Т	7	ĸ	4	ъ	Avg.	St. Dev.	
	MD	37	41	46	52	42	44	6	≥ 20
	CMD	34	25	22	35	13	26	9	≥ 20
Peak Load, (lbf/in-width) 1" x 6" specimens; Cond. 2h @ 73.4±3.6°F;	ASTM D 5147	1	2	æ	4	Ŀ	Avg.	St. Dev.	
Test @ 73.4±3.6°F; Rate = 2.0in/min ±3%	MD	91	87	89	86	83	89	3	≥ 50
	CMD	66	64	75	63	62	66	5	≥ 50
Elongation, (%) 1" x 6" specimens; Cond. 2h @ 73.4±3.6°F; Test @ 73.4±3.6°F; Rate = 2.0in/min ±3%	ASTM D 5147	1	2	œ	4	ъ	Avg.	St. Dev.	
	MD	48	54	58	51	58	54	4	≥ 35
	CMD	58	54	62	57	61	58	3	≥ 35
Continued on next page									

CURA-004-02-08

Curacreto, SA de CV ASTM D 6164 and ASTM D 5147 for **Technoply SBS SP 400 G** Page 3 of 9

Duran anti-					Desults				Requirement
Property	Test Method				Results				Type I, Grade G
Ultimate Elongation, (%) 1″ x 6″ specimens; Cond. 2h @ 73.4±3.6°F;	ASTM D 5147	1	2	m	4	Ŀ	Avg.	St. Dev.	
Test @ 73.4±3.6°F; Rate = 2.0in/min ±3%	MD	141	89	311	339	90	194	122	≥ 38
	CMD	81	78	85	79	83	81	3	≥ 38
Tear Strength, (lbf) 3″ x 8″ specimens with assigned notch; Cond. 4h @ 73.4±3.6°F & 50±55%RH; Test @ 73.4±3.6°F; Rate = 2.0in/min ±3%	ASTM D 5147	Ч	2	m	4	Ŀ	Avg.	St. Dev.	
	MD	90	109	98	94	101	98	7	≥ 55
	CMD	120	128	133	115	122	124	7	≥ 55
Low Temperature Flexibility, (Pass/Fail) 1" x 6" specimens; Cond. 2h @ 0°F; Test weathering side away from mandrel;	ASTM D 5147	1	2	£	4	Ŀ			Pass = "none of the specimens show cracking"
Test 180±5° over 1″ ø in 2±1s @ 0°F;	MD	Pass	Pass	Pass	Pass	Pass			Pass @ 0°F
Visual Inspection in "flexed" position	CMD	Pass	Pass	Pass	Pass	Pass			Pass @ 0°F
Dimensional Stability, (%) 10" x 10" specimens; Cond. 40h @ 73.4±3.6°F & 50±5%RH;	ASTM D 1204/ ASTM D 5147	1	2	£	4	Ŀ	Avg.	St. Dev.	
Test 24h±15min @ 176±3.6°F	MD	0.1	0.0	0.0	0.1	0.0	0.0	0.0	≤1
	CMD	0.0	0.0	0.0	0.0	0.0	0.0	0.0	≤ 1
Continued on next page									

CURA-004-02-08

Curacreto, SA de CV ASTM D 6164 and ASTM D 5147 for **Technoply SBS SP 400 G** Page 4 of 9

Duran anti-					Deculto				Requirement	
Property	lest Method				Results				Type I, Grade G	
Compound Stability, <i>[Pass/Fail]</i> 2.0±0.05" x 3.0±0.05" specimens; Cond. 4h @ 73.4±3.6°F & 50±5%RH;	ASTM D 5147	1	2	ĸ	4	Ŀ			Pass = no failures showing signs of flowing, dripping, or drop formation	
Test 2h,15min±5min @ 215±5°F	MD	Pass	Pass	Pass	Pass	Pass			Pass	
	CMD	Pass	Pass	Pass	Pass	Pass			Pass	
Granule Embedment (g) Grade G products only; 2" x 9" specimens; Cond. 30min @ 73.4±3.6°F;	ASTM D 4977/ ASTM D 5147	1	2	Avg.						
Test 50 complete cycles		2.6	1.2	1.9				≤ 2		
Physical Properties – After Heat Conditioning										
Heat Conditioning Exposure: 90±0.25d @ 158±5°F	ASTM D 5869/ ASTM D 5147									
Peak Load, (lbf/in-width) 1" x 6" specimens; Cond. 2h @ -0.4±3.6°F;	ASTM D 5147	7	2	æ	4	ß	Avg.	St. Dev.		
Test @ -0.4±3.6°F; Rate = 0.08in/min ±3%	MD	95	110	96	110	118	106	10	≥ 70	
	CMD	75	79	74	86	75	78	5	≥ 70	
Elongation, (%) 1" x 6" specimens; Cond 2h @ -0 4+3 6°E:	ASTM D 5147	1	2	æ	4	ß	Avg.	St. Dev.		
Test @ -0.4±3.6°F; Rate = 0.08in/min ±3%	MD	23	36	15	26	35	27	9	≥ 20	
	CMD	24	29	38	39	36	33	7	≥ 20	
Continued on next page										

CURA-004-02-08

Curacreto, SA de CV ASTM D 6164 and ASTM D 5147 for **Technoply SBS SP 400 G** Page 5 of 9

Duou o du	Test Mathed	Doculto						Requirement	
Property	Test Method				Results				Type I, Grade G
Peak Load, (lbf/in-width) 1" x 6" specimens; Cond. 2h @ 73.4±3.6°F;	ASTM D 5147	T	2	œ	4	£	Avg.	St. Dev.	
Test @ 73.4 ± 3.6 F; Rate = 2.01n/min $\pm3\%$	MD	102	85	95	92	97	94	7	≥ 50
	CMD	80	70	72	65	68	71	6	≥ 50
Elongation, (%) 1″ x 6″ specimens; Cond. 2h @ 73.4±3.6°F; Test @ 73.4±3.6°F; Rate = 2.0in/min ±3%	ASTM D 5147	1	2	æ	4	ß	Avg.	St. Dev.	
	MD	59	44	52	49	54	51	6	≥ 35
	CMD	60	45	56	51	50	52	6	≥ 35
Ultimate Elongation, (%) 1" x 6" specimens;	ASTM D 5147	Ţ	7	m	4	ъ	Avg.	St. Dev.	
Test @ 73.4±3.6°F; Rate = 2.0in/min ±3%	MD	62	49	53	51	56	54	5	≥ 38
	CMD	64	50	66	54	53	57	7	≥ 38
Low Temperature Flexibility, [Pass/Fail] 1" x 6" specimens; Cond. 2h @ 0°F; Test weathering side away from mandrel:	ASTM D 5147	1	2	ĸ	4	ъ			Pass = "none of the specimens show cracking"
Test 180±5° over 1″ ø in 2±1s @ 0°F;	MD	Pass	Pass	Pass	Pass	Pass			Pass @ 0°F
Visual Inspection in "flexed" position	CMD	Pass	Pass	Pass	Pass	Pass			Pass @ 0°F
Continued on next page									

CURA-004-02-08

Curacreto, SA de CV ASTM D 6164 and ASTM D 5147 for **Technoply SBS SP 400 G** Page 6 of 9

Duo u outo		Posults						Requirement	
Ргорегту	Test Method				Results				Type I, Grade G
Physical Properties – Other									
Unrolling, <i>[Pass/Fail]</i> 10±1/8" x 18±1/8" specimens; Cond. 24h @ 73.4±3.6°F & 50±5%RH; Test Cond. 2h @ <i>Temp</i> ±1°F;	ASTM D 5636/ ASTM D 5147	1	2	ĸ	4				Pass = "finished product shall not crack nor be so sticky as to cause tearing or other material damage upon being unrolled at any temperature between 40 and 140°F"
Test unroll in 4-6s;	<i>Temp</i> =40°F	Pass	Pass	Pass	Pass				Pass
	<i>Temp</i> =140°F	Pass	Pass	Pass	Pass				Pass
Dimensions and Masses									
Thickness, (mils) 27-1/2" x manufacture width; 5 measurement points	ASTM D 5147	1	2	ĸ	4	Ŀ	Avg.	St. Dev.	
		174	172	171	171	171	172	2	≥ 130
Net Mass, (lb/100ft ²) 1 specimen; manufacture roll	ASTM D 228								
					89				≥ 75
Bottom Coating Thickness, (mils) Heat Welding Application Products; 6" x manufacture width;	ASTM D 5147	1	2	m	4	ъ	Avg.	St. Dev.	
5 measurement points		89	78	87	82	78	83	5	≥ 40
Continued on next page									

CURA-004-02-08

Curacreto, SA de CV ASTM D 6164 and ASTM D 5147 for **Technoply SBS SP 400 G** Page 7 of 9

Duos o du	Test Mathed			Requirement						
Ргорегту	lest Niethod		incourto							
Physical Properties – After Accelerated Weath	nering									
Xenon Arc Weathering Exposure: 83±0.35d @ Cycle A	ASTM D 4798/ ASTM D 5147									
Peak Load, (lbf/in-width) 1" x 6" specimens; Cond. 2h @ -0.4±3.6°F;	ASTM D 5147	Ч	2	m	4	Ŀ	Avg.	St. Dev.		
Test @ -0.4±3.6°F; Rate = 0.08in/min ±3%	MD	94	100	110	113	91	102	10	≥ 70	
	CMD	78	70	72	73	86	76	6	≥ 70	
Elongation, (%) 1" x 6" specimens; Cond. 2h @ -0.4±3.6°F;	ASTM D 5147	Ч	7	m	4	Ŀ	Avg.	St. Dev.		
Test @ -0.4±3.6°F; Rate = 0.08in/min ±3%	MD	35	35	43	43	27	36	7	≥ 20	
	CMD	35	32	44	33	45	38	6	≥ 20	
Peak Load, (lbf/in-width) 1" x 6" specimens; Cond. 2h @ 73.4±3.6°F;	ASTM D 5147	Ч	2	£	4	5	Avg.	St. Dev.		
Test @ 73.4±3.6°F; Rate = 2.0in/min ±3%	MD	94	90	101	92	86	93	6	≥ 50	
	CMD	72	70	65	68	63	68	4	≥ 50	
Elongation, (%) 1″ x 6″ specimens; Cond. 2h @ 73.4±3.6°F; Test @ 73.4±3.6°F; Rate = 2.0in/min ±3%	ASTM D 5147	H	2	m	4	Ŀ	Avg.	St. Dev.		
	MD	55	56	62	52	53	56	4	≥ 35	
	CMD	63	62	51	55	46	55	7	≥ 35	
Continued on next page										

CURA-004-02-08

Curacreto, SA de CV ASTM D 6164 and ASTM D 5147 for **Technoply SBS SP 400 G** Page 8 of 9

Descente		Doculto							Requirement
Property	Test Method		Type I, Grade G						
Ultimate Elongation, (%) 1" x 6" specimens; Cond. 2h @ 73.4±3.6°F; Test @ 73.4±3.6°F; Rate = 2.0in/min ±3%	ASTM D 5147	Ţ	2	£	4	Ŀ	Avg.	St. Dev.	
	MD	58	61	81	58	55	63	11	≥ 38
	CMD	66	66	54	59	49	59	8	≥ 38
Low Temperature Flexibility, [Pass/Fail] 1" x 6" specimens; Cond. 2h @ 0°F; Test weathering side away from mandrel; Test 180±5° over 1" ø in 2±1s @ 0°F; Visual Inspection in "flexed" position	ASTM D 5147	Ч	2	ß	4	ß			Pass = "none of the specimens show cracking"
	MD	Pass	Pass	Pass	Pass	Pass			Pass @ 0°F
	CMD	Pass	Pass	Pass	Pass	Pass			Pass @ 0°F

Notes: 1) N/A indicates Not Applicable; NT indicates Not Tested; As Agreed: as agreed by buyer and seller

CURA-004-02-08

Curacreto, SA de CV ASTM D 6164 and ASTM D 5147 for **Technoply SBS SP 400 G** Page 9 of 9

Statement of Compliance:

The products tested have demonstrated compliance with the physical property requirements of ASTM D 6164-05^{£1} and ASTM D 6164/D 6164M-11: *Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Material Using Polyester Reinforcements,* Type I and Florida Building Code Test Protocols for High-Velocity Hurricane Zones, Test Application Standard (TAS) No. 110-2000 *Testing Requirements for Physical Properties of Roof Membranes, Insulation, Coatings, and Other Roofing Components.* The laboratory test results presented in this report are representative of the material supplied.



Report Issue History:

lssue #	Date	Pages	Revision Description (if applicable)
Original	04/27/2018	9	N/A

END OF REPORT

CURA-004-02-08



CONSTRUCTION MATERIALS

TECHNOLOGIES

LABORATORY TEST REPORT

Report for: Curacreto, SA de CV Av. 1 de Mayo #8A Mexico City, Mexico 11870

Attention: Jorge A. Robles Ramos

Product Name:	Technoply SBS SP 400 Aluminum Flake	Manufacturer:	Curacreto, SA de CV
Date Received:	Jan. 3, 2018	Sampling:	Curacreto, SA de CV, Mexico City, Mexico
PRI-CMT Project No.:	CURA-006-02-01	Test Dates:	Jan. 3, 2017 – Apr. 25, 2018

Purpose:Evaluate the named products for compliance with ASTM D 6164: Standard
Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet
Material Using Polyester Reinforcements and ASTM D 5147 Section 13:
Accelerated Weathering as required by the Florida Building Code Test Protocols
for High-Velocity Hurricane Zones, Test Application Standard (TAS) No. 110-2000
Testing Requirements for Physical Properties of Roof Membranes, Insulation,
Coatings, and Other Roofing Components.

Test Methods:Testing was completed in compliance with ASTM D 6164-05^{ε1} and ASTM D 6164/D
6164M-11: Standard Specification for Styrene Butadiene Styrene (SBS) Modified
Bituminous Sheet Material Using Polyester Reinforcements. Test methods assigned
or referenced include ASTM D 146: Standard test Methods for Sampling and testing
Bitumen-Saturated Felts and Woven Fabrics for Roofing and Waterproofing; ASTM
D 1204: Standard Test Method for Linear Dimensional Changes of Nonrigid
Thermoplastic Sheeting or Film at Elevated Temperature; ASTM D 4073: Standard
Test Method for Tensile-Tear Strength of Bituminous Roofing Membranes; ASTM D
4977: Standard Test Method for Granule Adhesion to Mineral Surfaced Roofing by
Abrasion; ASTM D 5147: Standard Test Methods for Sampling and Testing Modified
Bituminous Sheet Materials; ASTM D 5636: Standard Test Method for Low
Temperature Unrolling of Felt or Sheet Roofing and Waterproofing Materials; and
ASTM D 5869: Standard Practice for Dark Oven Heat Exposure of Roofing and
Waterproofing Materials.

Sampling:

Product samples were provided by Curacreto, SA de CV from Mexico City, Mexico.

CURA-006-02-01

The test results, opinions, or interpretations are based on the material supplied by the client. This report is for the exclusive use of stated client. No reproduction or facsimile in any form can be made without the client's permission. This report shall not be reproduced except in full without the written approval of this laboratory. PRI Construction Materials Technologies LLC assumes no responsibility nor makes a performance or warranty statement for this material or products and processes containing this material in connection with this report.

Results:

Description	To a block of				Desults				Requirement
Property	lest Niethod				Results				Type I, Grade G
Physical Properties – Before Heat Conditionin	g								
Peak Load, (lbf/in-width) 1" x 6" specimens; Cond. 2h @ -0.4±3.6°F;	ASTM D 5147	1	2	£	4	ß	Avg.	St. Dev.	
Test @ -0.4±3.6°F; Rate = 0.08in/min ±3%	MD	111	120	109	114	110	113	4	≥ 70
	CMD	79	83	86	94	98	88	8	≥ 70
Elongation, (%) 1" x 6" specimens; Cond. 2h @ -0.4±3.6°F; Test @ -0.4±3.6°F; Rate = 0.08in/min ±3%	ASTM D 5147	1	2	œ	4	ъ	Avg.	St. Dev.	
	MD	44	41	38	40	37	40	3	≥ 20
	CMD	24	34	43	44	55	40	12	≥ 20
Peak Load, (lbf/in-width) 1" x 6" specimens; Cond. 2h @ 73.4±3.6°F;	ASTM D 5147	1	2	œ	4	ß	Avg.	St. Dev.	
Test @ 73.4±3.6°F; Rate = 2.0in/min ±3%	MD	70	81	77	91	78	80	8	≥ 50
	CMD	54	61	54	63	66	60	5	≥ 50
Elongation, (%) 1″ x 6″ specimens; Cond. 2h @ 73.4±3.6°F; Test @ 73.4±3.6°F; Rate = 2.0in/min ±3%	ASTM D 5147	1	2	œ	4	ъ	Avg.	St. Dev.	
	MD	48	68	63	70	59	62	9	≥ 35
	CMD	48	60	49	70	76	61	13	≥ 35
Continued on next page									

CURA-006-02-01

Curacreto, SA de CV ASTM D 6164 and ASTM D 5147 for **Technoply SBS SP 400 Aluminum Flake** Page 3 of 9

2	Test Markhaul				Describe				Requirement
Property	Test Method				Results				Type I, Grade G
Ultimate Elongation, (%) 1″ x 6″ specimens; Cond. 2h @ 73.4±3.6°F;	ASTM D 5147	1	2	S	4	Ŀ	Avg.	St. Dev.	
Test @ 73.4±3.6°F; Rate = 2.0in/min ±3%	MD	152	378	181	107	441	252	148	≥ 38
	CMD	182	132	152	155	172	159	20	≥ 38
Tear Strength, (lbf) 3″ x 8″ specimens with assigned notch; Cond. 4h @ 73.4±3.6°F & 50±5%RH; Test @ 73.4±3.6°F; Rate = 2.0in/min ±3%	ASTM D 5147	1	2	£	4	Ŀ	Avg.	St. Dev.	
	MD	106	101	104	93	103	101	5	≥ 55
	CMD	126	135	128	127	130	129	4	≥ 55
Low Temperature Flexibility, (Pass/Fail) 1" x 6" specimens; Cond. 2h @ 0°F; Test weathering side away from mandrel;	ASTM D 5147	1	2	£	4	Ŀ			Pass = "none of the specimens show cracking"
Test 180±5° over 1″ ø in 2±1s @ 0°F;	MD	Pass	Pass	Pass	Pass	Pass			Pass @ 0°F
Visual Inspection in "flexed" position	CMD	Pass	Pass	Pass	Pass	Pass			Pass @ 0°F
Dimensional Stability, (%) 10" x 10" specimens; Cond. 40h @ 73.4±3.6°F & 50±5%RH;	ASTM D 1204/ ASTM D 5147	1	2	£	4	Ŀ	Avg.	St. Dev.	
Test 24h±15min @ 176±3.6°F	MD	0.0	0.0	0.0	0.0	0.1	0.0	0.0	≤1
	CMD	0.0	0.0	0.1	0.1	0.1	0.1	0.0	≤ 1
Continued on next page									

CURA-006-02-01

Curacreto, SA de CV ASTM D 6164 and ASTM D 5147 for **Technoply SBS SP 400 Aluminum Flake** Page 4 of 9

Duran anti-	Test Mathad				Desults				Requirement
Property	l est iviethod				Results				Type I, Grade G
Compound Stability, <i>[Pass/Fail]</i> 2.0±0.05" x 3.0±0.05" specimens; Cond. 4h @ 73.4±3.6°F & 50±5%RH;	ASTM D 5147	1	2	ĸ	4	Ŀ			Pass = no failures showing signs of flowing, dripping, or drop formation
Test 2h,15min±5min @ 215±5°F	MD	Pass	Pass	Pass	Pass	Pass			Pass
	CMD	Pass	Pass	Pass	Pass	Pass			Pass
Granule Embedment (g) Grade G products only; 2" x 9" specimens; Cond. 30min @ 73.4±3.6°F;	ASTM D 4977/ ASTM D 5147	1	2	Avg.					
Test 50 complete cycles		0.4	0.4	0.4			≤ 2		
Physical Properties – After Heat Conditioning									
Heat Conditioning Exposure: 90±0.25d @ 158±5°F	ASTM D 5869/ ASTM D 5147								
Peak Load, (lbf/in-width) 1" x 6" specimens; Cond. 2h @ -0.4±3.6°F;	ASTM D 5147	1	2	m	4	Ŀ	Avg.	St. Dev.	
Test @ -0.4±3.6°F; Rate = 0.08in/min ±3%	MD	116	115	113	101	113	112	6	≥ 70
	CMD	79	74	76	74	78	76	3	≥ 70
Elongation, (%) 1" x 6" specimens; Cond. 2h @ -0.4±3.6°F:	ASTM D 5147	1	2	£	4	Ŀ	Avg.	St. Dev.	
Test @ -0.4±3.6°F; Rate = 0.08in/min ±3%	MD	35	34	36	24	35	33	5	≥ 20
	CMD	27	16	20	15	24	20	5	≥ 20
Continued on next page									

CURA-006-02-01

Curacreto, SA de CV ASTM D 6164 and ASTM D 5147 for **Technoply SBS SP 400 Aluminum Flake** Page 5 of 9

					D				Requirement
Property	lest Method				Results				Type I, Grade G
Peak Load, (lbf/in-width) 1" x 6" specimens; Cond. 2h @ 73.4±3.6°F; Text @ 73.4±6.6°F;	ASTM D 5147	1	2	ę	4	ъ	Avg.	St. Dev.	
Test @ $73.4\pm3.6^{+}$; Rate = 2.0in/min $\pm3\%$	MD	107	93	82	85	91	91	10	≥ 50
	CMD	77	69	69	62	74	70	6	≥ 50
Elongation, (%) 1" x 6" specimens; Cond. 2h @ 73.4±3.6°F; Test @ 73.4±3.6°F; Rate = 2.0in/min ±3%	ASTM D 5147	1	2	ę	4	ъ	Avg.	St. Dev.	
	MD	54	44	44	44	49	47	5	≥ 35
	CMD	44	53	51	40	52	48	6	≥ 35
Ultimate Elongation, (%) 1" x 6" specimens;	ASTM D 5147	1	2	m	4	ъ	Avg.	St. Dev.	
Test @ 73.4±3.6°F; Rate = 2.0in/min ±3%	MD	56	52	48	46	51	51	4	≥ 38
	CMD	48	57	54	43	55	51	6	≥ 38
Low Temperature Flexibility, [Pass/Fail] 1" x 6" specimens; Cond. 2h @ 0°F; Test weathering side away from mandrel:	ASTM D 5147	1	2	m	4	ъ			Pass = "none of the specimens show cracking"
Test 180±5° over 1″ ø in 2±1s @ 0°F;	MD	Pass	Pass	Pass	Pass	Pass			Pass @ 0°F
Visual Inspection in "flexed" position	CMD	Pass	Pass	Pass	Pass	Pass			Pass @ 0°F
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CURA-006-02-01

Curacreto, SA de CV ASTM D 6164 and ASTM D 5147 for **Technoply SBS SP 400 Aluminum Flake** Page 6 of 9

Duran autor					Deculto				Requirement
Ргорегту	Test Method				Results				Type I, Grade G
Physical Properties – Other		-							
Unrolling, <i>[Pass/Fail]</i> 10±1/8" x 18±1/8" specimens; Cond. 24h @ 73.4±3.6°F & 50±5%RH; Test Cond. 2h @ <i>Temp</i> ±1°F;	ASTM D 5636/ ASTM D 5147	T	2	£	4				Pass = "finished product shall not crack nor be so sticky as to cause tearing or other material damage upon being unrolled at any temperature between 40 and 140°F"
Test unroll in 4-6s;	<i>Temp</i> =40°F	Pass	Pass	Pass	Pass				Pass
visual inspection in unrolled position	Temp=140°F	Pass	Pass	Pass	Pass				Pass
Dimensions and Masses									
Thickness, (mils) 27-1/2" x manufacture width; 5 measurement points	ASTM D 5147	1	2	ĸ	4	ß	Avg.	St. Dev.	
		147	147	144	146	145	146	1	≥ 130
Net Mass, (lb/100ft ²) 1 specimen; manufacture roll	ASTM D 228								
		82							≥ 75
Bottom Coating Thickness, (mils) Heat Welding Application Products; 6" x manufacture width;	ASTM D 5147	1	2	m	4	ъ	Avg.	St. Dev.	
5 measurement points		49	46	47	46	49	47	2	≥ 40
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CURA-006-02-01

Curacreto, SA de CV ASTM D 6164 and ASTM D 5147 for **Technoply SBS SP 400 Aluminum Flake** Page 7 of 9

Duoseentu	Test Mathed		Requirement						
Property	Test Method		Type I, Grade G						
Physical Properties – After Accelerated Weath	ering								
Xenon Arc Weathering Exposure: 83±0.35d @ Cycle A	ASTM D 4798/ ASTM D 5147				_			_	
Peak Load, (lbf/in-width) 1" x 6" specimens; Cond. 2h @ -0.4±3.6°F;	ASTM D 5147	Ч	2	£	4	Ŀ	Avg.	St. Dev.	
Test @ -0.4±3.6°F; Rate = 0.08in/min ±3%	MD	104	113	118	105	112	111	6	≥ 70
	CMD	93	88	87	63	69	80	13	≥ 70
Elongation, (%) 1" x 6" specimens; Cond. 2h @ -0.4±3.6°F;	ASTM D 5147	Ч	2	£	4	S	Avg.	St. Dev.	
Test @ -0.4±3.6°F; Rate = 0.08in/min ±3%	MD	37	30	33	19	38	31	8	≥ 20
	CMD	39	32	35	13	21	27	14	≥ 20
Peak Load, (lbf/in-width) 1" x 6" specimens; Cond. 2h @ 73.4±3.6°F; Test @ 73.4±3.6°F; Rate = 2.0in/min ±3%	ASTM D 5147	Ч	2	£	4	5	Avg.	St. Dev.	
	MD	90	112	88	88	81	92	12	≥ 50
	CMD	66	71	76	78	66	72	5	≥ 50
Elongation, (%) 1″ x 6″ specimens; Cond. 2h @ 73.4±3.6°F;	ASTM D 5147	Ч	2	£	4	£	Avg.	St. Dev.	
Test @ 73.4±3.6°F; Rate = 2.0in/min ±3%	MD	59	66	52	56	57	58	5	≥ 35
	CMD	64	62	64	67	56	63	4	≥ 35
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CURA-006-02-01

Curacreto, SA de CV ASTM D 6164 and ASTM D 5147 for **Technoply SBS SP 400 Aluminum Flake** Page 8 of 9

Duran autor	Test Mathed		Requirement						
Property	Test Method				Results		Type I, Grade G		
Ultimate Elongation, (%) 1″ x 6″ specimens; Cond. 2h @ 73.4±3.6°F; Test @ 73.4±3.6°F; Rate = 2.0in/min ±3%	ASTM D 5147	Ţ	2	æ	4	Ŀ	Avg.	St. Dev.	
	MD	96	74	84	114	100	94	15	≥ 38
	CMD	71	73	72	76	66	72	4	≥ 38
Low Temperature Flexibility, [Pass/Fail] 1" x 6" specimens; Cond. 2h @ 0°F; Test weathering side away from mandrel; Test 180±5° over 1" ø in 2±1s @ 0°F; Visual Inspection in "flexed" position	ASTM D 5147	1	2	æ	4	Ŋ			Pass = "none of the specimens show cracking"
	MD	Pass	Pass	Pass	Pass	Pass			Pass @ 0°F
	CMD	Pass	Pass	Pass	Pass	Pass			Pass @ 0°F

Notes: 1) N/A indicates Not Applicable; NT indicates Not Tested; As Agreed: as agreed by buyer and seller

CURA-006-02-01

Curacreto, SA de CV ASTM D 6164 and ASTM D 5147 for **Technoply SBS SP 400 Aluminum Flake** Page 9 of 9

Statement of Compliance:

The products tested have demonstrated compliance with the physical property requirements of ASTM D 6164-05^{E1} and ASTM D 6164/D 6164M-11: *Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Material Using Polyester Reinforcements,* Type I and Florida Building Code Test Protocols for High-Velocity Hurricane Zones, Test Application Standard (TAS) No. 110-2000 *Testing Requirements for Physical Properties of Roof Membranes, Insulation, Coatings, and Other Roofing Components.* The laboratory test results presented in this report are representative of the material supplied.



Report Issue History:

Issue #	Date	Pages	Revision Description (if applicable)
Original	04/27/2018	9	N/A

END OF REPORT

CURA-006-02-01