

LAUDO TÉCNICO	Data: 21/11/2023	Película: Window Blue 75%
Elaborado por: Vittor Andrade Revisado por: Thaynnara Siqueira Aprovado por: Hernane Fernandes	Lote: WB754212204	

Introdução

O presente relatório tem por objetivo apresentar o resultado dos testes feitos com as películas Bluetech Window Films®, bem como a análise e efetiva comprovação de suas características, sendo exemplos de avaliação o haze (embaçamento), percentual de luz visível transmitida, retenção de raios e infravermelhos ultravioleta, durabilidade, resistência (impactos mecânicos), entre outros.

Normas técnicas

Todos os testes conduzidos pelo Departamento de Auditoria e Qualidade da Bluetech Window Films® são orientados segundo normas técnicas estabelecidas pela American Society for Testing and Materials (ASTM), Normas Nacionais da República Popular da China (GB) e pela The industry standard of the People's Republic of China (JGJ) seguindo rigorosos padrões de qualidade, a fim de constatar os atributos físicos de todas as películas comercializadas pela marca. Desta forma, as normas utilizadas nas aferições das amostras são:

- TH-100: Norma ASTM D1003;
- CS-700: Norma ASTM D1003/D1044;
- GlasSpec-2500: Norma térmica JGJ/T151 e Norma ótica GB/T2680;
- Q-SUN XE-1: Norma ASTM D3424 - 01.

Maquinário

Para avaliação detalhada das películas, o laboratório de controle e qualidade da Bluetech Window Films® conta com os seguintes equipamentos:

- CHN Spec modelo TH-100;
- CHN Spec modelo CS-700;
- GlasSpec-2500;
- Microscópio - Trinocular ótica finita acromático 1600x Mod. NO216T4 com Monitor. Lentes Plan 10/0.25, 4/0.10, 40/0.65, 100/1.25.
- Q-SUN modelo XE-1.

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HAZE E TONALIDADE

Default 1024.st5

corp: BLUETECH

Department: AUDITORIA E QUALIDADE tester:VITTOR A.

	<u>Standard</u>	<u>Light</u>	<u>Standard</u>	<u>Haze</u>	<u>Total Tran</u>	<u>DT</u>	<u>DHaze</u>	<u>400nm</u>	<u>420nm</u>	<u>410nm</u>	<u>430nm</u>
■	Target	D65	ASTM	0.00	100.00	-	-	0.00	0.00	0.00	0.00
	<u>Sample</u>	<u>Light</u>	<u>Standard</u>	<u>Haze</u>	<u>Total Tran</u>	<u>DT</u>	<u>DHaze</u>	<u>400nm</u>	<u>420nm</u>	<u>410nm</u>	<u>430nm</u>
WB	B754212204 - M1	D65	ASTM	0.64	75.57	-24.43	0.64	0.00	0.00	0.00	0.00
WB	B754212204 - M1	D65	ASTM	0.52	75.44	-24.56	0.52	0.00	0.00	0.00	0.00
WB	B754212204 - M1	D65	ASTM	0.47	75.39	-24.61	0.47	0.00	0.00	0.00	0.00
WB	B754212204 - M1	D65	ASTM	0.39	75.46	-24.54	0.39	0.00	0.00	0.00	0.00
WB	B754212204 - M1	D65	ASTM	0.73	75.46	-24.54	0.73	0.00	0.00	0.00	0.00

Multiple test report

Company name: BLUETECH

Department: AUDITORIA E QUALIDADE

SMP name:

test Title: HAZE E TONALIDADE

light /angle: D65/2°

Name	Test Mode	Haze	Total Tran	DT	DHaze	400nm	420nm	410nm	430nm
Target	ASTM	0.01	100.00	-	-	98.46	99.91	100.12	100.24
WB754212 204 - M1	ASTM	0.58	75.13	-24.87	0.56	60.30	72.40	68.15	73.71
WB754212 204 - M1	ASTM	0.64	75.04	-24.96	0.63	59.49	72.34	70.04	73.67
WB754212 204 - M1	ASTM	0.59	75.01	-24.99	0.58	60.71	72.56	68.54	73.66
WB754212 204 - M1	ASTM	0.85	74.81	-25.19	0.83	59.37	72.67	67.51	73.42
WB754212 204 - M1	ASTM	0.59	75.04	-24.96	0.57	59.37	72.64	68.60	73.57
Remark:									

Tester:

check:VITTOR A.

Data:

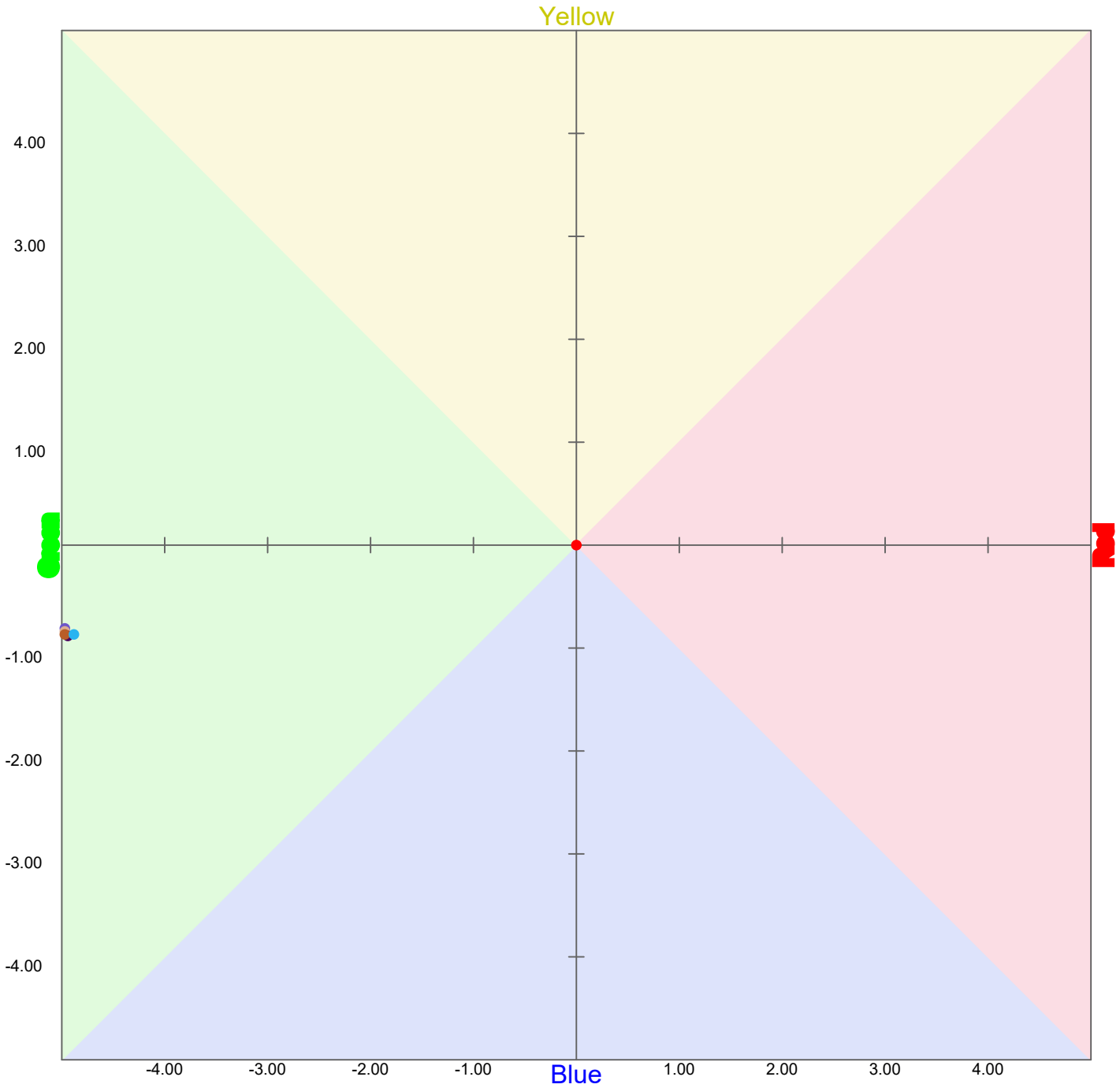
HAZE E TONALIDADE

Default 1024.st5

corp: BLUETECH

Department: AUDITORIA E QUALIDADE

tester: VITTOR A.

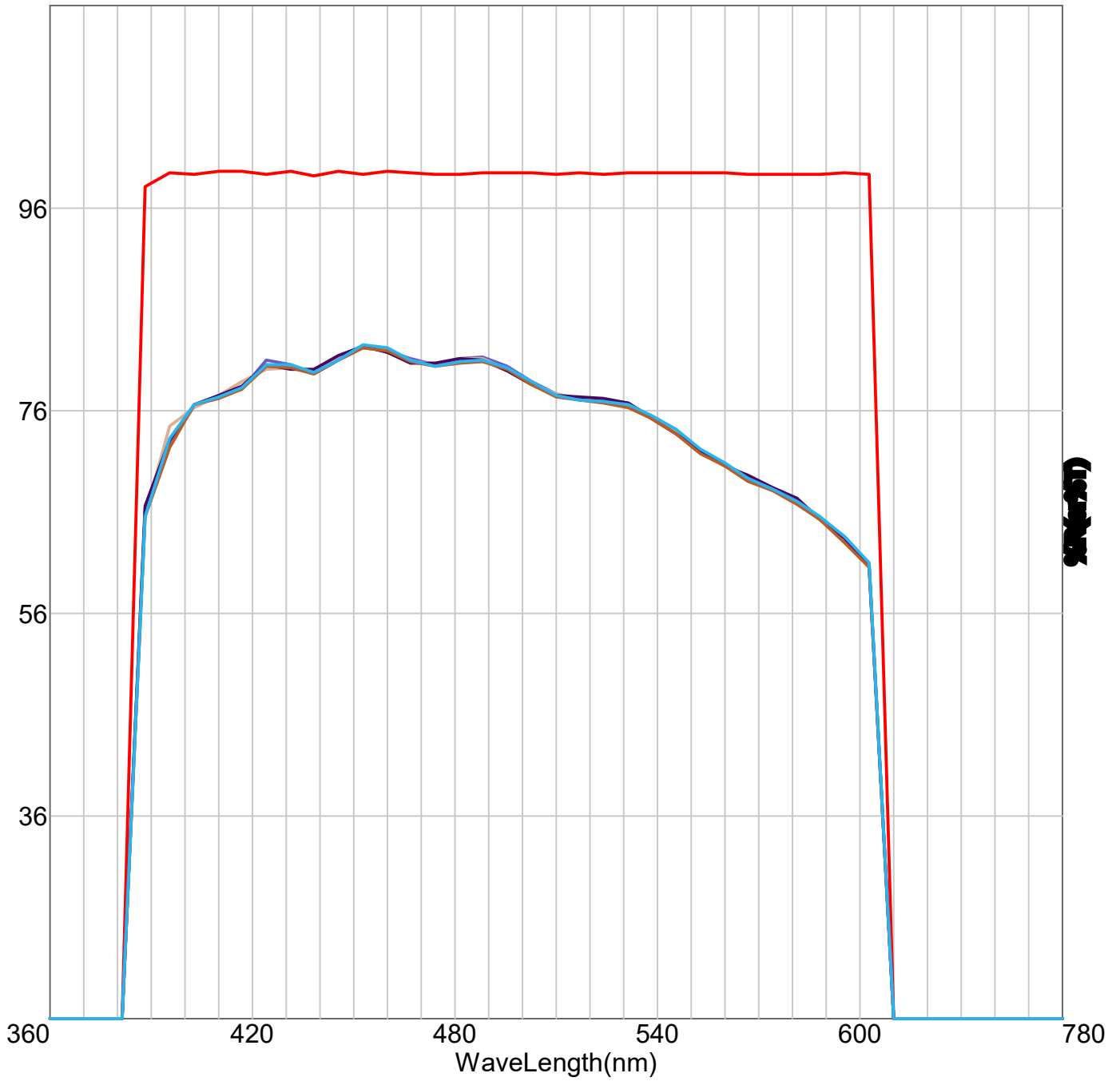


HAZE E TONALIDADE

Default 1024.st5

corp: BLUETECH

Department: AUDITORIA E QUALIDADE tester:VITTOR A.



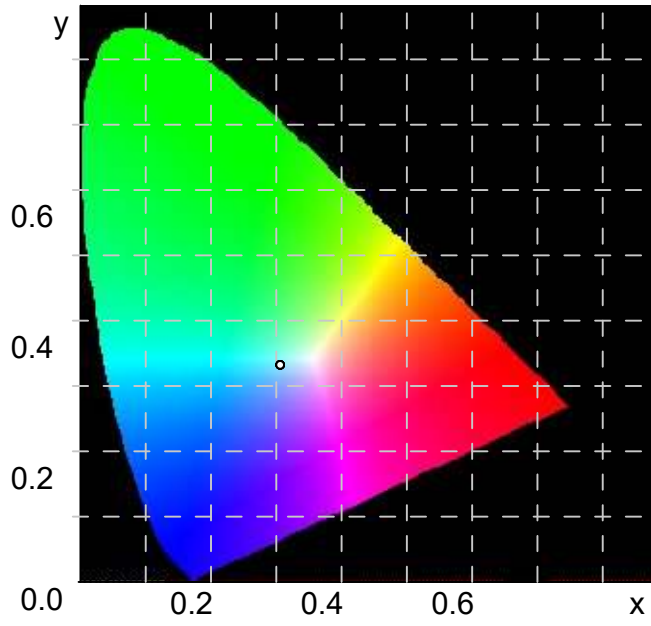
HAZE E TONALIDADE

Default 1024.st5

corp: BLUETECH

Department: AUDITORIA E QUALIDADE

tester: VITTOR A.



HAZE E TONALIDADEDefault 1024.st5

corp: BLUETECH

Department: AUDITORIA E QUALIDADE tester:VITTOR A.

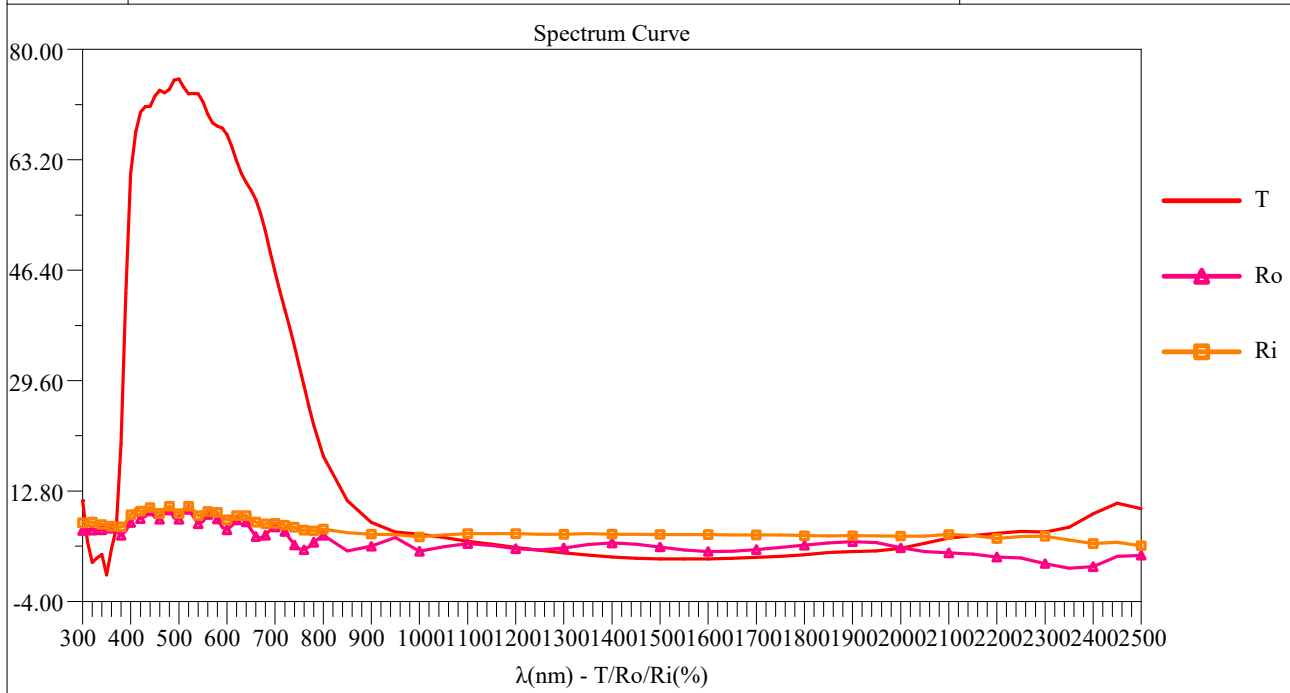
<u>Standard</u>	<u>Light</u>	<u>Standard</u>	<u>Haze</u>	<u>Total Tran</u>	<u>DT</u>	<u>DHaze</u>	<u>400nm</u>	<u>420nm</u>	<u>410nm</u>	<u>430nm</u>
■ Target	D65/2°	ASTM	0.01	100.00	-	-	98.46	99.91	100.12	100.12
<u>Sample</u>	<u>Light</u>	<u>Standard</u>	<u>Haze</u>	<u>Total Tran</u>	<u>DT</u>	<u>DHaze</u>	<u>400nm</u>	<u>420nm</u>	<u>410nm</u>	<u>430nm</u>
WB754212204 - M1 D65/2°		ASTM	0.58	75.13	-24.87	0.56	60.30	72.40	68.15	73.15
WB754212204 - M1 D65/2°		ASTM	0.64	75.04	-24.96	0.63	59.49	72.34	70.04	73.15
WB754212204 - M1 D65/2°		ASTM	0.59	75.01	-24.99	0.58	60.71	72.56	68.54	73.15
WB754212204 - M1 D65/2°		ASTM	0.85	74.81	-25.19	0.83	59.37	72.67	67.51	73.15
WB754212204 - M1 D65/2°		ASTM	0.59	75.04	-24.96	0.57	59.37	72.64	68.60	73.15

GlasSpec2500 Optical and Thermal Parameters Measuring Instrument Test Report

Instrument: GlasSpec2500 Thermal standard: JGJ/T 151 Date: 2023-08-10 Test No.: _____
 CIE: D65/2° Optical standard: GB/T 2680 Time: 15:28:06 Environment: _____

Structure: 0.0(1#Low-E, 0.880)

No.	Content	Results
1	UV transmittance τ_{uv}	0.052
2	Visible light transmittance τ_v	0.702
3	Visible light reflectance ρ_v	0.086
4	Inside visible light reflectance $\rho_{v,i}$	0.094
5	Solar direct transmittance τ_e	0.364
6	Solar direct reflectance ρ_e	0.062
7	Inside solar direct reflectance $\rho_{e,i}$	0.078
8	Solar direct absorptance a_e	0.573
9	Solar infrared direct transmittance τ_{IR}	0.072
10	Solar infrared direct reflectance ρ_{IR}	0.043
11	Total solar energy transmittance g	0.509
12	Shading coefficient SC	0.585
13	Total solar infrared heat transmittance g_{IR}	0.298
14	Visible light to total solar energy transmittance LSG	1.38
15	Thermal transmittance $K(W/(m^2 \cdot K))$	5.39



Notes:

1. K is calculated according to the winter condition of JGJ/T 151
2. g/g_{IR} is calculated according to the summer condition of JGJ/T 151
3. The optical parameters are calculated according to standard GB/T 2680, $SC = g/0.87$
4. The spectral curve is plotted at spectral intervals in standard GB/T 2680

Tester: _____

Verification: _____

>> WB754212204 - M2 - P9 [Total]

>> T-R-A Graph at AM1.5

Solar	Solar direct transmittance te: 0.364
	Solar direct reflectance pe: 0.062
	Solar direct absorptance ae: 0.573
VIS	Visible light transmittance tv: 0.702
	Visible light reflectance pv: 0.086
NIR	Solar infrared direct transmittance tIR: 0.072
	Solar infrared direct reflectance pIR: 0.043
Thermal	Total solar energy transmittance g: 0.509
	Shading coefficient SC: 0.585
	Total solar infrared heat transmittance gIR: 0.298
	Light to solar gain LSG: 1.38
	Thermal transmittance $W/(m^2 \cdot K)$ K: 5.39

>> Measurement control information

Normal

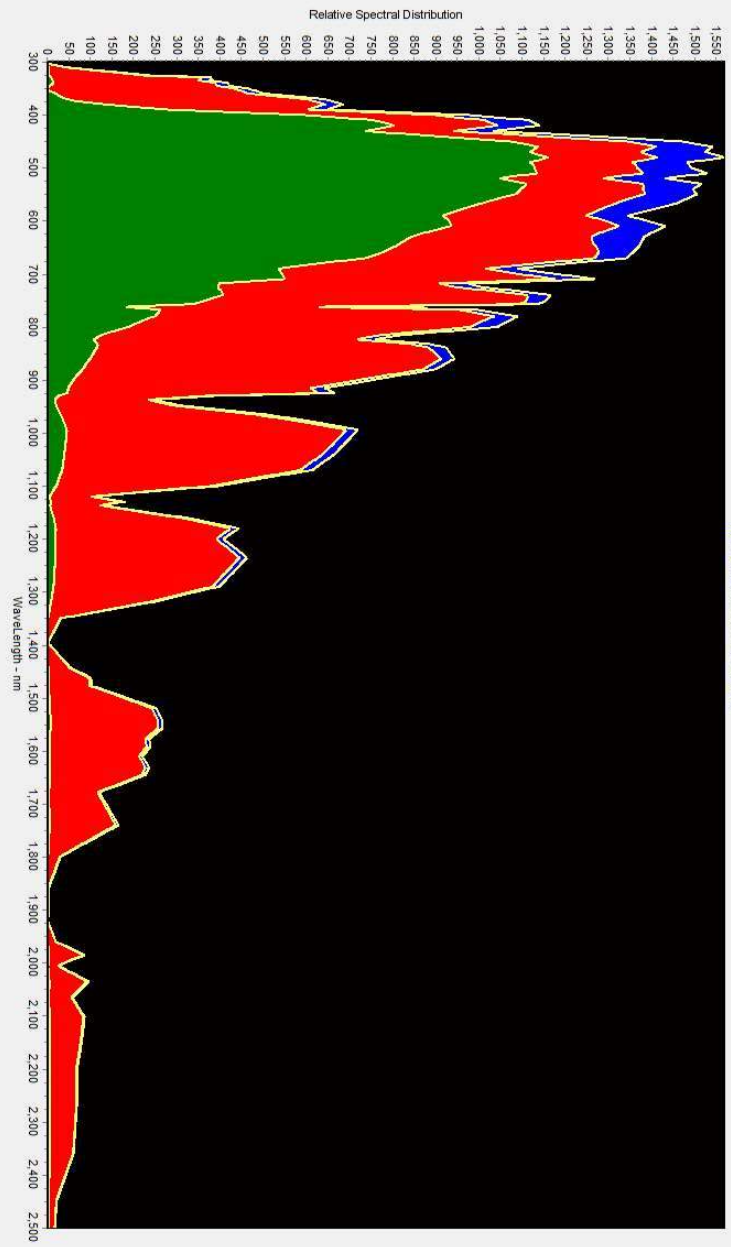
T: 0.08:43 R: 0.06:14

>> Glass Structure File: [WB754212204 - M2 - P9] Structure 0 (0) (#) Current Data: Total

IGJ/T 151
GB/T 2680

T-R-A Graph at AM1.5 Status: Normal

Outdoor Indoor



Overlay Spectrum

No.	Name	T	Ro	Ri
0	Current Measuring	Red	Yellow	Blue
1	WB754212204 - M2	Red	Yellow	Blue
2	WB754212204 - M2 - P2	Magenta	Yellow	Blue
3	WB754212204 - M2 - P3	Brown	Yellow	Blue
4	WB754212204 - M2 - P4	Dark Blue	Yellow	Blue
5	WB754212204 - M2 - P5	Olive	Yellow	Blue
6	WB754212204 - M2 - P6	Black	Yellow	Blue
7	WB754212204 - M2 - P7	Black	Yellow	Blue
8	WB754212204 - M2 - P8	Black	Yellow	Blue
9	WB754212204 - M2 - P9	Black	Yellow	Blue

Name:

Automatic

Wizard

0 Internal Link

WB754212204 - SAMPLE - LENTE PLAN 10/0.25



WB754212204 - SAMPLE - LENTE PLAN 4/0.10



Assinatura do responsável

Vittor Andrade

Vittor Andrade
Auditor de Qualidade