

LAUDO TÉCNICO	Data: 21/11/2023	Película: Window Blue 20%
Elaborado por: Vittor Andrade Revisado por: Thaynnara Siqueira Aprovado por: Hernane Fernandes	Lote: WB204212204	

Introdução

O presente relatório tem por objetivo apresentar o resultado dos testes feitos com as películas Bluetechnology 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 Bluetechnology 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 Bluetechnology 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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Multiple test report

Company name: BLUETECH

Department: AUDITORIA E QUALIDADE

SMP name:

test Title: HAZE E TONALIDADE

Light: D65

Name	Test Mode	Haze	Total Tran	DT	DHaze	400nm	420nm	410nm	430nm
Target	ASTM	0.00	100.00	-	-	0.00	0.00	0.00	0.00
WB204212 204 - M1	ASTM	2.13	16.57	-83.43	2.13	0.00	0.00	0.00	0.00
WB204212 204 - M1	ASTM	2.37	16.52	-83.48	2.37	0.00	0.00	0.00	0.00
WB204212 204 - M1	ASTM	2.19	16.57	-83.43	2.19	0.00	0.00	0.00	0.00
WB204212 204 - M1	ASTM	2.12	16.62	-83.38	2.12	0.00	0.00	0.00	0.00
WB204212 204 - M1	ASTM	2.60	16.53	-83.47	2.60	0.00	0.00	0.00	0.00
Remark:									

Tester:

check:VITTOR A.

Data:

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	B204212204 - M1	D65	ASTM	2.13	16.57	-83.43	2.13	0.00	0.00	0.00	0.00
WB	B204212204 - M1	D65	ASTM	2.37	16.52	-83.48	2.37	0.00	0.00	0.00	0.00
WB	B204212204 - M1	D65	ASTM	2.19	16.57	-83.43	2.19	0.00	0.00	0.00	0.00
WB	B204212204 - M1	D65	ASTM	2.12	16.62	-83.38	2.12	0.00	0.00	0.00	0.00
WB	B204212204 - M1	D65	ASTM	2.60	16.53	-83.47	2.60	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	0.00	99.79	-	-	98.03	98.11	100.95	100.30
WB204212 204 - M1	ASTM	2.27	16.48	-83.31	2.27	13.34	15.24	14.40	16.39
WB204212 204 - M1	ASTM	2.22	16.49	-83.30	2.22	13.36	15.31	14.77	16.07
WB204212 204 - M1	ASTM	2.41	16.46	-83.34	2.41	13.55	15.24	14.30	15.53
WB204212 204 - M1	ASTM	2.30	16.43	-83.36	2.30	12.56	15.64	14.71	15.89
WB204212 204 - M1	ASTM	2.19	16.43	-83.36	2.19	12.47	15.26	15.00	15.83
Remark:									

Tester:

check:VITTOR A.

Data:

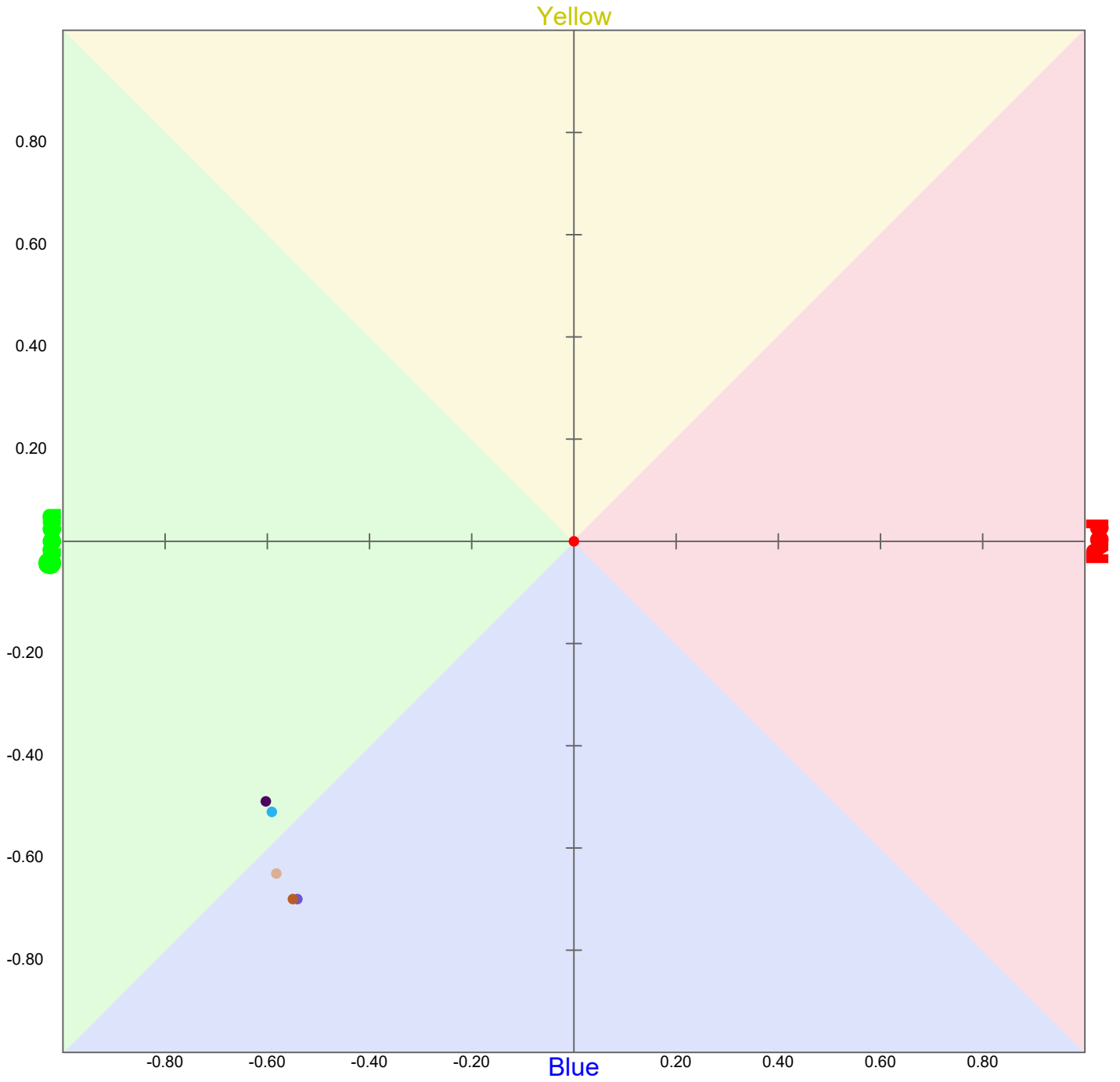
HAZE E TONALIDADE

Default 1024.st5

corp: BLUETECH

Department: AUDITORIA E QUALIDADE

tester: VITTOR A.

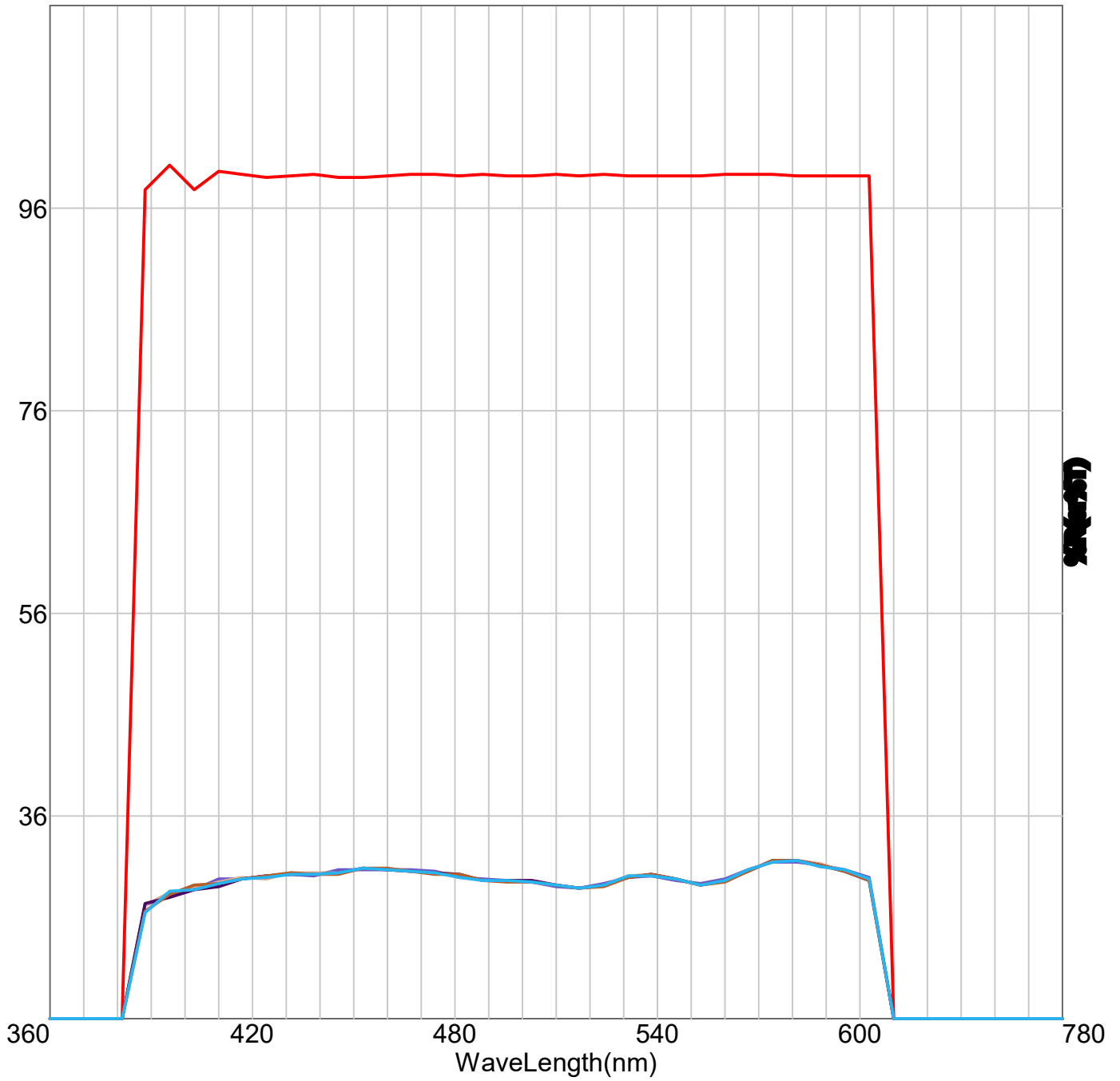


HAZE E TONALIDADE

Default 1024.st5

corp: BLUETECH

Department: AUDITORIA E QUALIDADE tester:VITTOR A.



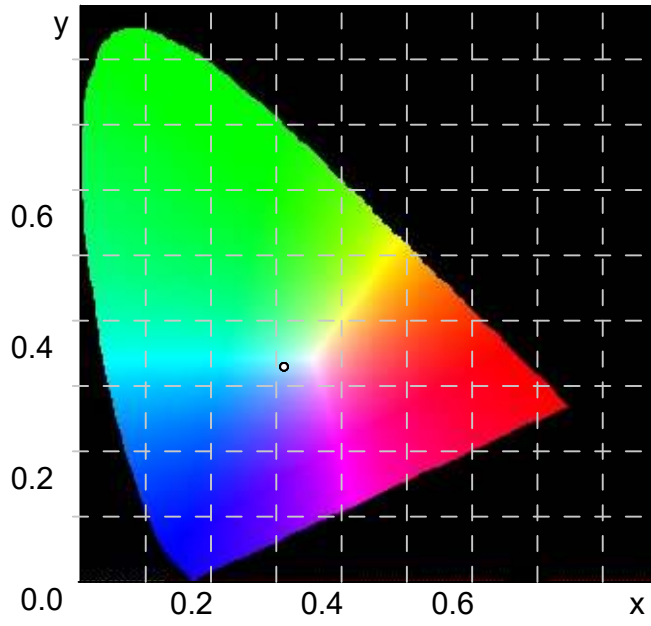
HAZE E TONALIDADE

Default 1024.st5

corp: BLUETECH

Department: AUDITORIA E QUALIDADE

tester: VITTOR A.



HAZE E TONALIDADE

Default 1024.st5

corp: BLUETECH

Department: AUDITORIA E QUALIDADE tester:VITTOR A.

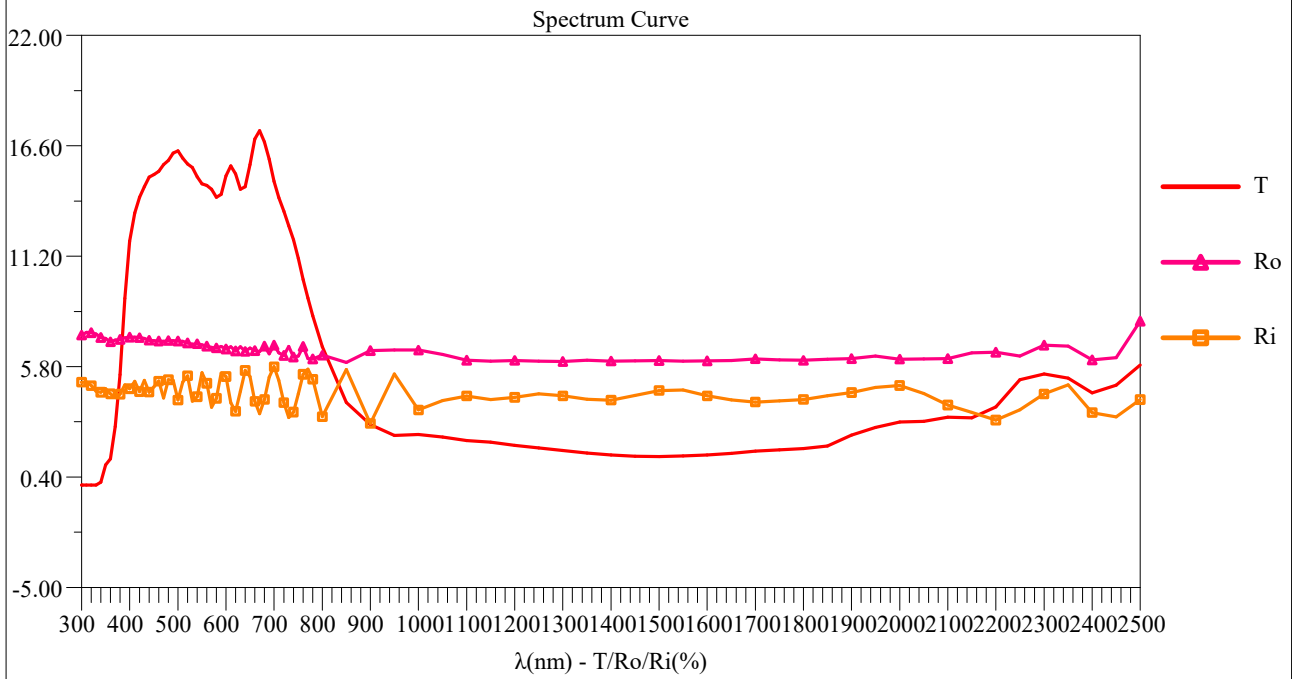
	<u>Standard</u>	<u>Light</u>	<u>Standard</u>	<u>Haze</u>	<u>Total Tran</u>	<u>DT</u>	<u>DHaze</u>	<u>400nm</u>	<u>420nm</u>	<u>410nm</u>	<u>430nm</u>
■	Target	D65/2°	ASTM	0.00	99.79	-	-	98.03	98.11	100.95	100.00
	<u>Sample</u>	<u>Light</u>	<u>Standard</u>	<u>Haze</u>	<u>Total Tran</u>	<u>DT</u>	<u>DHaze</u>	<u>400nm</u>	<u>420nm</u>	<u>410nm</u>	<u>430nm</u>
WB	B204212204 - M1 D65/2°		ASTM	2.27	16.48	-83.31	2.27	13.34	15.24	14.40	16.00
WB	B204212204 - M1 D65/2°		ASTM	2.22	16.49	-83.30	2.22	13.36	15.31	14.77	16.00
WB	B204212204 - M1 D65/2°		ASTM	2.41	16.46	-83.34	2.41	13.55	15.24	14.30	15.00
WB	B204212204 - M1 D65/2°		ASTM	2.30	16.43	-83.36	2.30	12.56	15.64	14.71	15.00
WB	B204212204 - M1 D65/2°		ASTM	2.19	16.43	-83.36	2.19	12.47	15.26	15.00	15.00

GlasSpec2500 Optical and Thermal Parameters Measuring Instrument Test Report

Instrument: GlasSpec2500 Thermal standard: JGJ/T 151 Date: 2023-08-08 Test No.: _____
 CIE: D65/2° Optical standard: GB/T 2680 Time: 16:15:05 Environment: _____

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

No.	Content	Results
1	UV transmittance τ_{uv}	0.016
2	Visible light transmittance τ_v	0.151
3	Visible light reflectance ρ_v	0.068
4	Inside visible light reflectance $\rho_{v,i}$	0.047
5	Solar direct transmittance τ_e	0.092
6	Solar direct reflectance ρ_e	0.066
7	Inside solar direct reflectance $\rho_{e,i}$	0.045
8	Solar direct absorptance a_e	0.842
9	Solar infrared direct transmittance τ_{IR}	0.030
10	Solar infrared direct reflectance ρ_{IR}	0.062
11	Total solar energy transmittance g	0.306
12	Shading coefficient SC	0.352
13	Total solar infrared heat transmittance g_{IR}	0.261
14	Visible light to total solar energy transmittance LSG	0.49
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: _____

Solar	Solar direct transmittance	te: 0.092
	Solar direct reflectance	pe: 0.066
	Solar direct absorptance	ae: 0.842
VIS	Visible light transmittance	tv: 0.151
	Visible light reflectance	pv: 0.068
NIR	Solar infrared direct transmittance	tIR: 0.030
	Solar infrared direct reflectance	pIR: 0.062
Thermal	Total solar energy transmittance	g: 0.306
	Shading coefficient	SC: 0.352
	Total solar infrared heat transmittance	gIR: 0.261
	Light to solar gain	LSG: 0.49
Thermal transmittance $W/(m^2 \cdot K)$		K: 5.39

>> Measurement control information

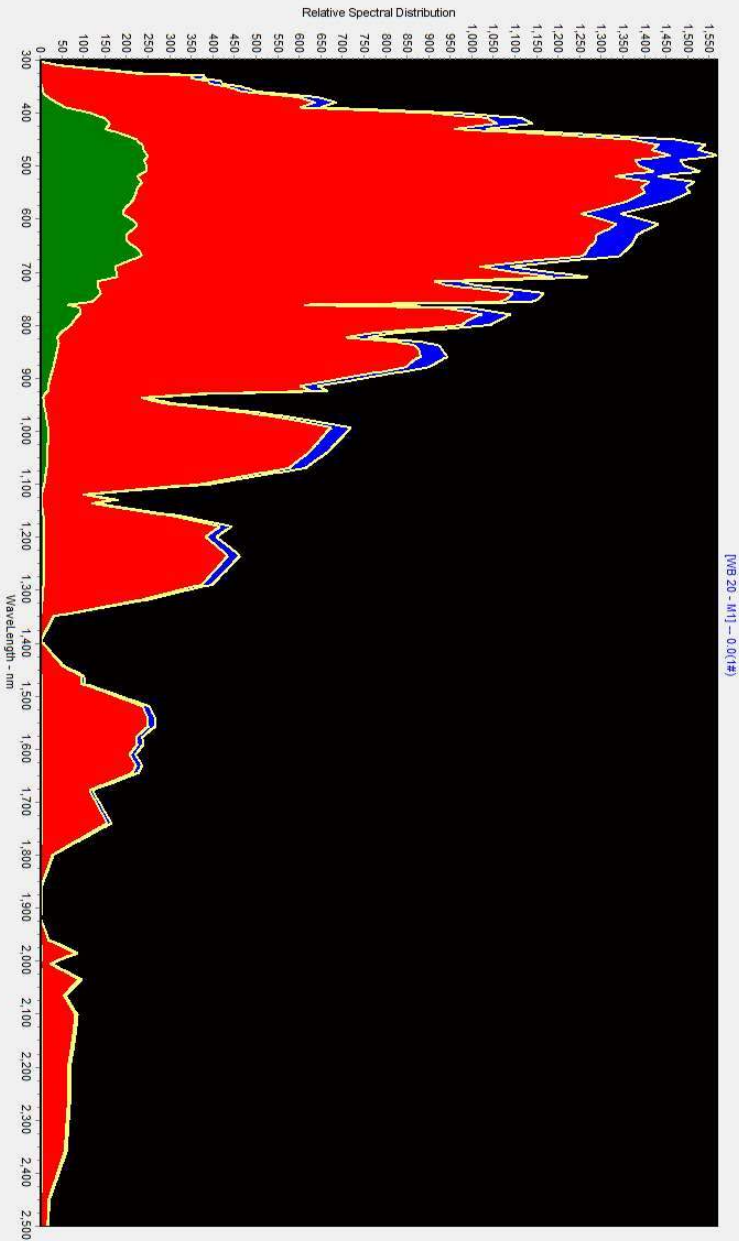
Normal	
T	R
0.03:44	0.01:22

>> Glass Structure File:[WB 20 - M1] Structure:0(1#) Current Data:Total

JGJ/T 151
GB/T 2680

Outdoor Indoor

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



Overlay Spectrum

No.	Name	T	Ro	Ri
0	Current Measuring	Red	Yellow	Blue
1	WB 35 - M1 - P4	Red	Yellow	Blue
2	WB 35 - M2	Magenta	Cyan	Black
3	WB 35 - M2 - P2	Red	Yellow	Blue
4	WB 35 - M3	Blue	Black	Black
5	WB 05 - M1	Black	Black	Black
6	WB 20 - M1	Black	Black	Black

Name: [WB 20 - M1] Automatic

Wizard

WB204212204 - SAMPLE - LENTE PLAN 10/0



WB204212204 - SAMPLE - LENTE PLAN 4/0.10



Assinatura do responsável

Vittor Andrade

Vittor Andrade
Auditor de Qualidade