

LAUDO TÉCNICO	Data: 23/11/2023	Película: Profissional Grafite 20%
Elaborado por: Vittor Andrade Revisado por: Thaynnara Siqueira Aprovado por: Hernane Fernandes	Lote: HB203702204	

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:

- ❶ TH-100: Norma ASTM D1003;
- ❷ CS-700: Norma ASTM D1003/D1044;
- ❸ GlasSpec-2500: Norma térmica JGJ/T151 e Norma ótica GB/T2680;
- ❹ 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:

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

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Multiple test report

Company name: BLUETECH

Department: CONTROLE E QUALIDADE

SMP name:

test Title: TESTE HAZE E TONAL.

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
HB203702204	ASTM	0.78	21.82	-78.18	0.78	0.00	0.00	0.00	0.00
HB203702204	ASTM	0.78	21.75	-78.25	0.78	0.00	0.00	0.00	0.00
HB203702204	ASTM	0.73	21.91	-78.09	0.73	0.00	0.00	0.00	0.00
HB203702204	ASTM	0.96	21.72	-78.28	0.96	0.00	0.00	0.00	0.00
HB203702204	ASTM	0.82	21.82	-78.18	0.82	0.00	0.00	0.00	0.00
Remark:									

Tester:







check:VITTOR A.

Data:

TESTE HAZE E TONAL.
Default 1024.st5

corp: BLUETECH

Department: CONTROLE 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>
	HB203702204	D65	ASTM	0.78	21.82	-78.18	0.78	0.00	0.00	0.00	0.00
	HB203702204	D65	ASTM	0.78	21.75	-78.25	0.78	0.00	0.00	0.00	0.00
	HB203702204	D65	ASTM	0.73	21.91	-78.09	0.73	0.00	0.00	0.00	0.00
	HB203702204	D65	ASTM	0.96	21.72	-78.28	0.96	0.00	0.00	0.00	0.00
	HB203702204	D65	ASTM	0.82	21.82	-78.18	0.82	0.00	0.00	0.00	0.00

Multiple test report

Company name: BLUETECH

Department: CONTROLE E QUALIDADE

SMP name:

test Title: TESTE HAZE E TONAL.

light /angle: D65/2°

Name	Test Mode	Haze	Total Tran	DT	DHaze	400nm	420nm	410nm	430nm
Target	ASTM	0.00	99.73	-	-	101.41	98.87	97.27	100.19
HB203702204	ASTM	0.59	22.33	-77.40	0.59	38.05	29.89	33.87	26.29
HB203702204	ASTM	0.75	22.33	-77.40	0.75	37.42	29.73	33.35	26.11
HB203702204	ASTM	0.68	22.38	-77.35	0.68	37.18	30.17	33.60	26.39
HB203702204	ASTM	0.88	22.30	-77.43	0.88	37.10	29.90	33.84	26.37
HB203702204	ASTM	0.57	22.34	-77.39	0.57	37.88	30.37	33.86	26.07
Remark:									

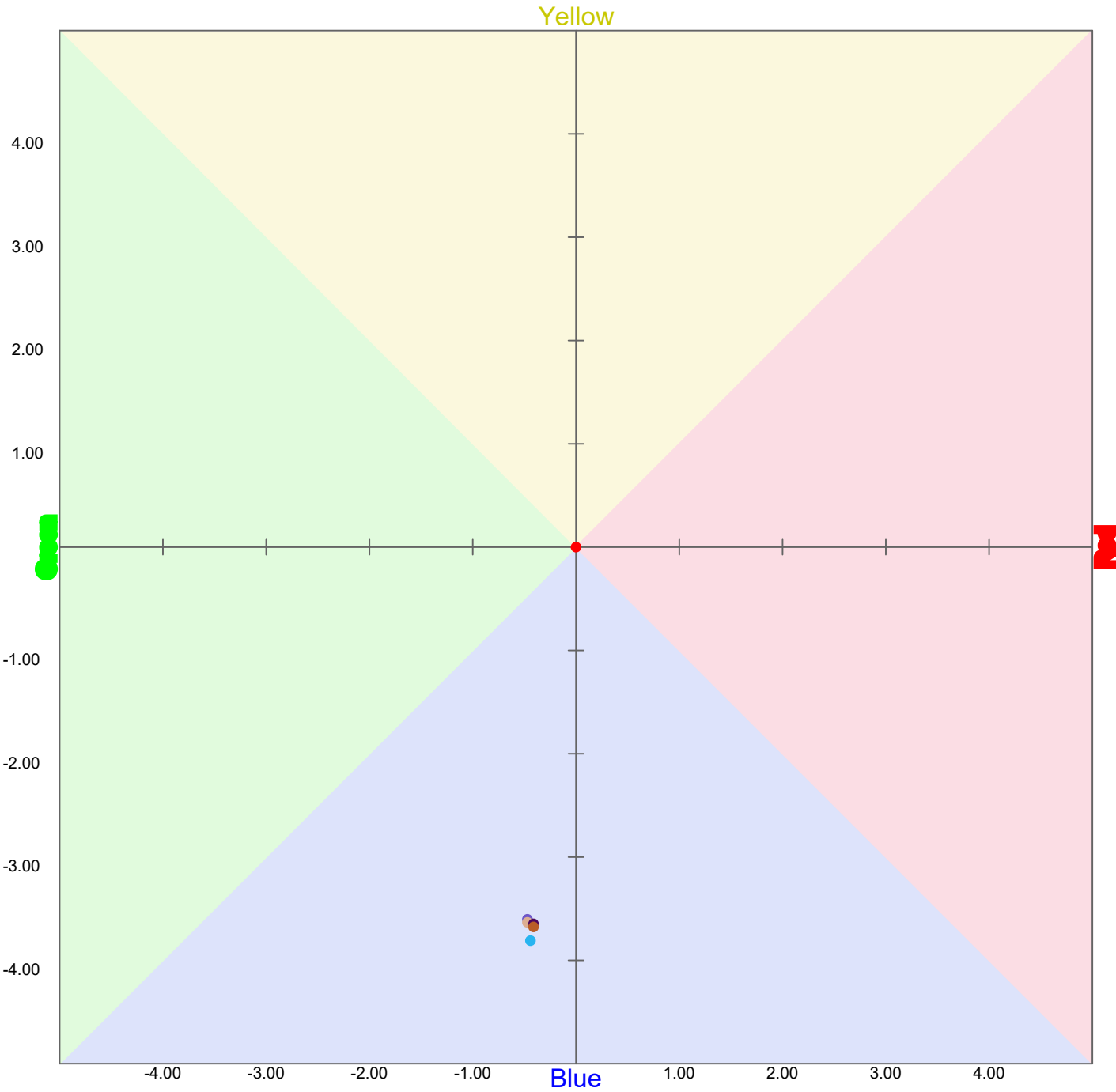
Tester:

check:VITTOR A.

Data:

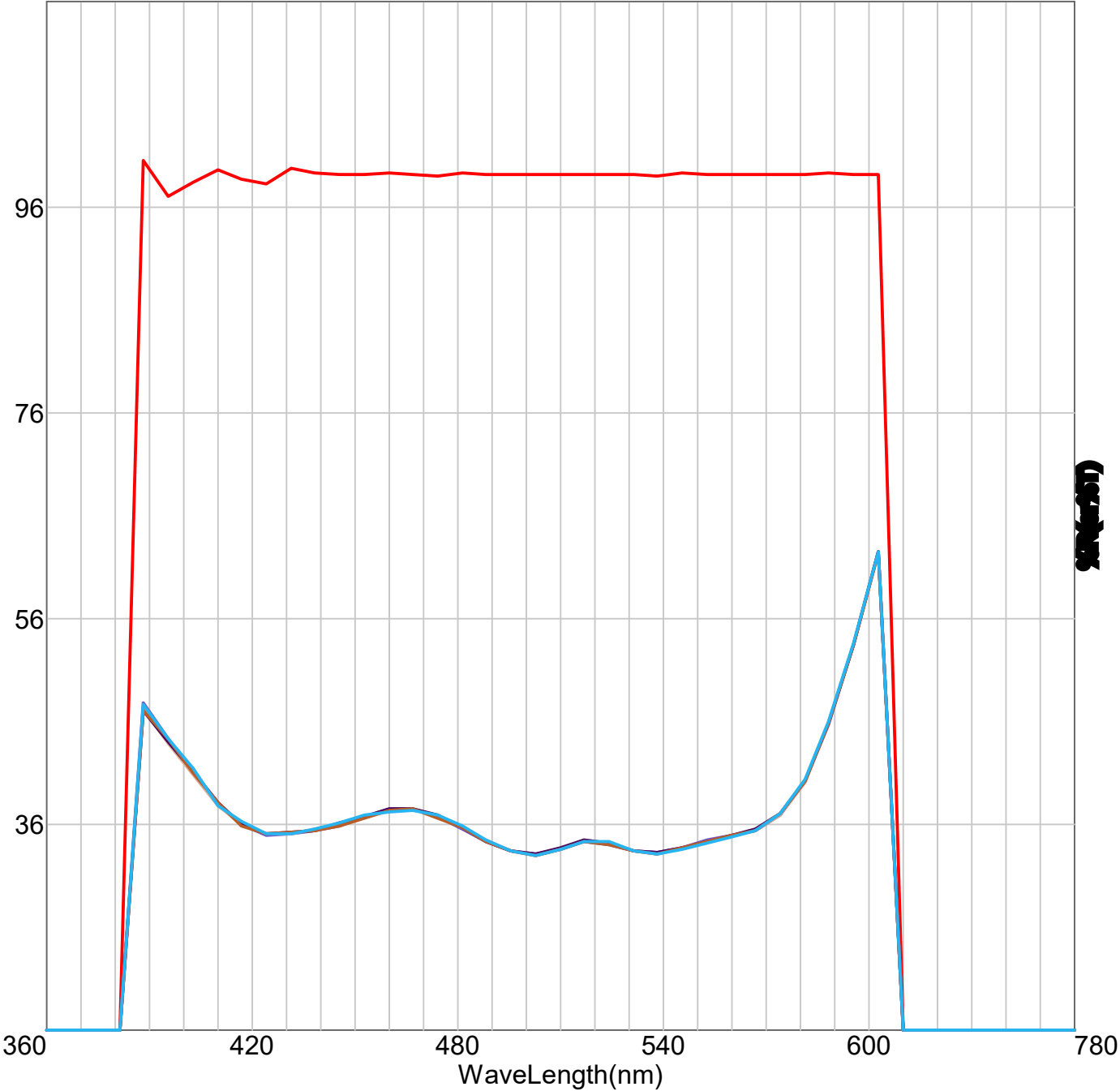
corp: BLUETECH

Department: CONTROLE E QUALIDADE tester:VITTOR A.



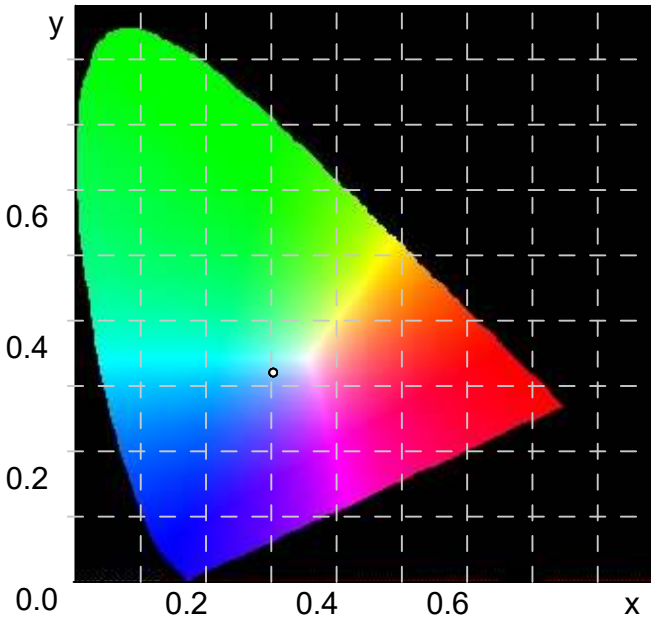
corp: BLUETECH

Department: CONTROLE E QUALIDADE tester:VITTOR A.



corp: BLUETECH

Department: CONTROLE E QUALIDADE tester:VITTOR A.



TESTE HAZE E TONAL.
Default 1024.st5

corp: BLUETECH

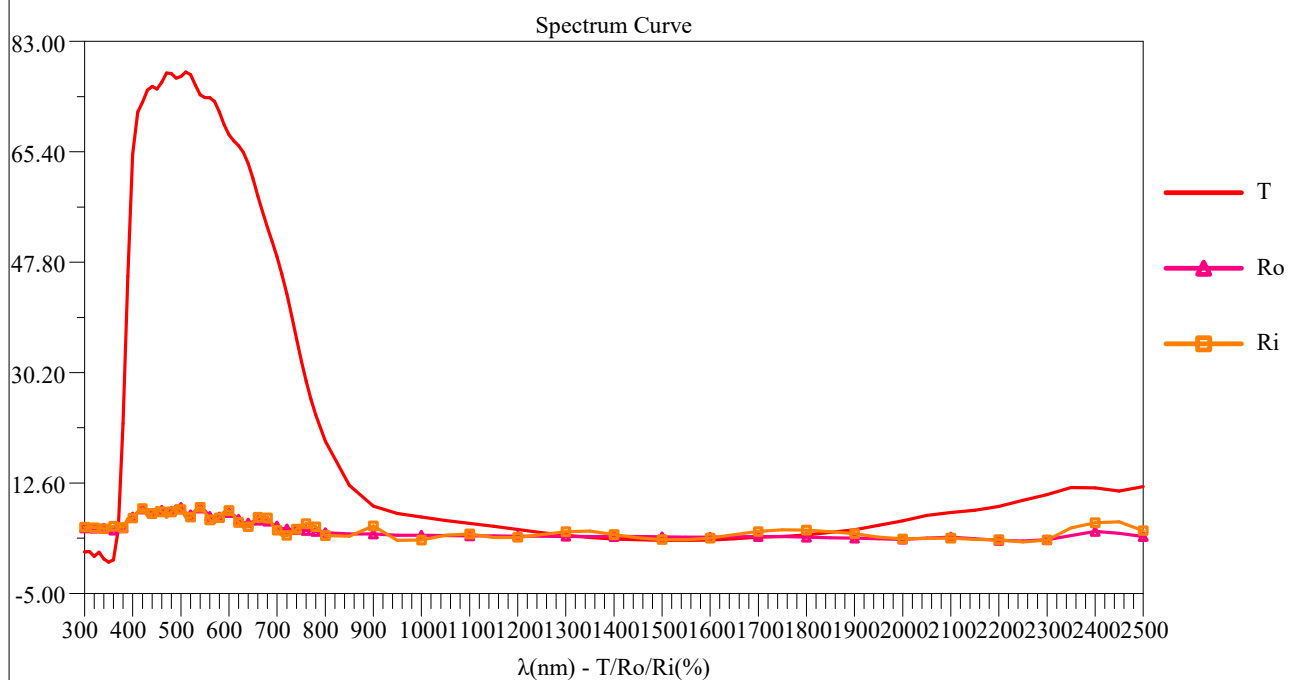
Department: CONTROLE E QUALIDADE tester:VITTOR A.

	<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	99.73	-	-	101.41	98.87	97.27	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>
■	HB203702204	D65/2°	ASTM	0.59	22.33	-77.40	0.59	38.05	29.89	33.87	26.00
■	HB203702204	D65/2°	ASTM	0.75	22.33	-77.40	0.75	37.42	29.73	33.35	26.00
■	HB203702204	D65/2°	ASTM	0.68	22.38	-77.35	0.68	37.18	30.17	33.60	26.00
■	HB203702204	D65/2°	ASTM	0.88	22.30	-77.43	0.88	37.10	29.90	33.84	26.00
■	HB203702204	D65/2°	ASTM	0.57	22.34	-77.39	0.57	37.88	30.37	33.86	26.00

GlasSpec2500 Optical and Thermal Parameters Measuring Instrument Test Report

Instrument: GlasSpec2500 Thermal standard: JGJ/T 151 Date: 2023-08-31 Test No.: _____
 CIE: D65/2° Optical standard: GB/T 2680 Time: 15:43:44 Environment: _____
 Structure: 0.0(1#Low-E, 0.880)

No.	Content	Results
1	UV transmittance τ_{uv}	0.038
2	Visible light transmittance τ_v	0.731
3	Visible light reflectance ρ_v	0.077
4	Inside visible light reflectance $\rho_{v,i}$	0.075
5	Solar direct transmittance τ_e	0.383
6	Solar direct reflectance ρ_e	0.058
7	Inside solar direct reflectance $\rho_{e,i}$	0.058
8	Solar direct absorptance a_e	0.559
9	Solar infrared direct transmittance τ_{IR}	0.084
10	Solar infrared direct reflectance ρ_{IR}	0.042
11	Total solar energy transmittance g	0.524
12	Shading coefficient SC	0.602
13	Total solar infrared heat transmittance g_{IR}	0.306
14	Visible light to total solar energy transmittance LSG	1.39
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_{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: 0.540
	Solar direct reflectance	pe: 0.000
	Solar direct absorptance	ae: 0.460

VIS	Visible light transmittance	tv: 0.208
	Visible light reflectance	pv: 0.000

NIR	Solar infrared direct transmittance	tIR: 0.851
	Solar infrared direct reflectance	pIR: 0.000

Thermal	Total solar energy transmittance	g: 0.656
	Shading coefficient	SC: 0.754
	Total solar infrared heat transmittance	gIR: 0.888

	Light to solar gain	LSG: 0.32
	Thermal transmittance	K: 5.39 W/(m²·K)

>> Measurement control information

Normal

T: 0.0445 R: 0.0231

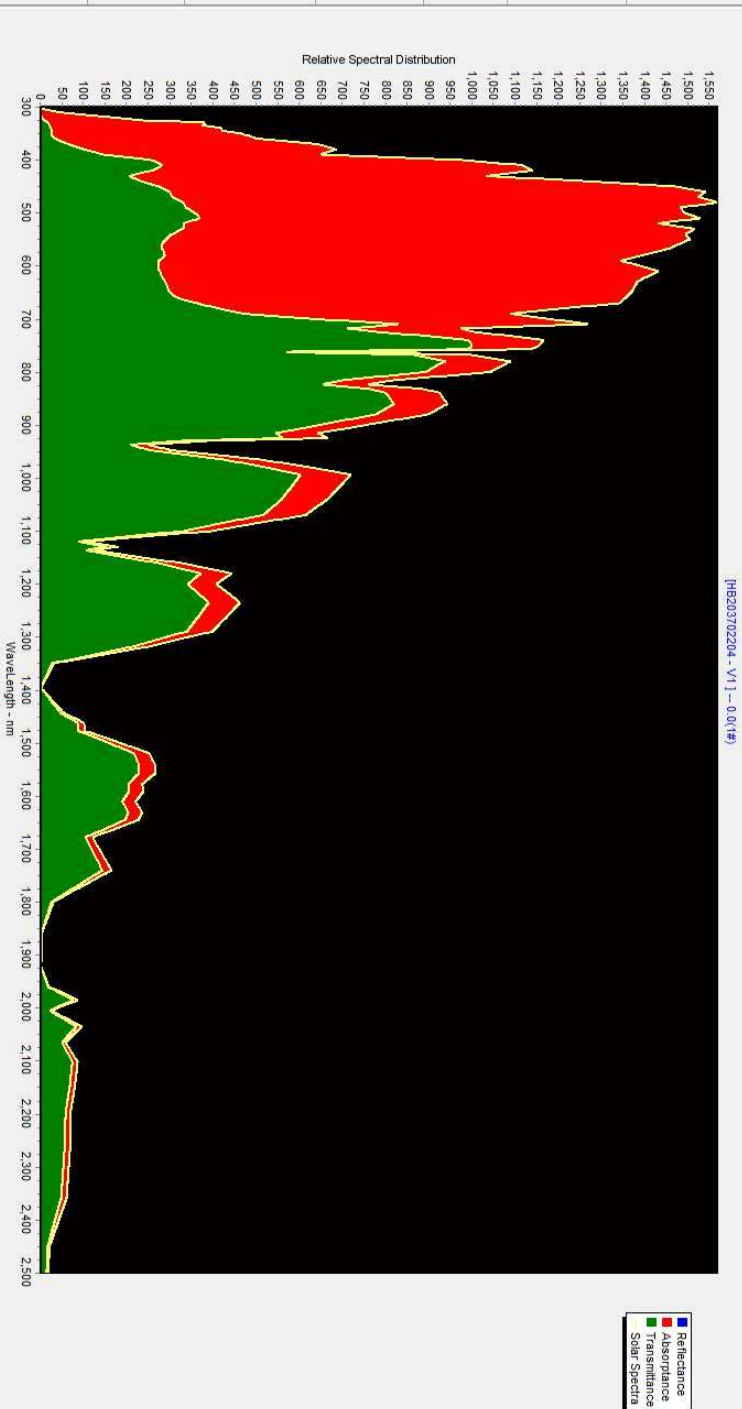
D65/2° Batch: BLUETECH

T-R-A Graph at AM1.5

Status: Normal

Outdoor Indoor

0 Internal Link



>> Glass Structure File:[HB203702204 - V1] Structure:0.0(1#) Current Data: Total

JG/T 151
GB/T 2680

Name: Automatic

WB754212204 - V1

Wizard

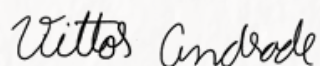
HB203702204 - SAMPLE - LENTE PLAN 10/0.25



HB203702204 - SAMPLE - LENTE PLAN 4/0.10



Assinatura do responsável



Vittor Andrade
Auditor de Qualidade