

LAUDO TÉCNICO	Data: 27/11/2023	Película: Segurança PS4 20%
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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

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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>
■	42001051203 - M1	D65	ASTM	2.81	19.17	-80.83	2.81	0.00	0.00	0.00	0.00
■	42001051203 - M1	D65	ASTM	2.79	19.31	-80.69	2.79	0.00	0.00	0.00	0.00
■	42001051203 - M1	D65	ASTM	2.82	19.42	-80.58	2.82	0.00	0.00	0.00	0.00
■	42001051203 - M1	D65	ASTM	3.03	19.43	-80.57	3.03	0.00	0.00	0.00	0.00
■	42001051203 - M1	D65	ASTM	2.77	19.46	-80.54	2.77	0.00	0.00	0.00	0.00

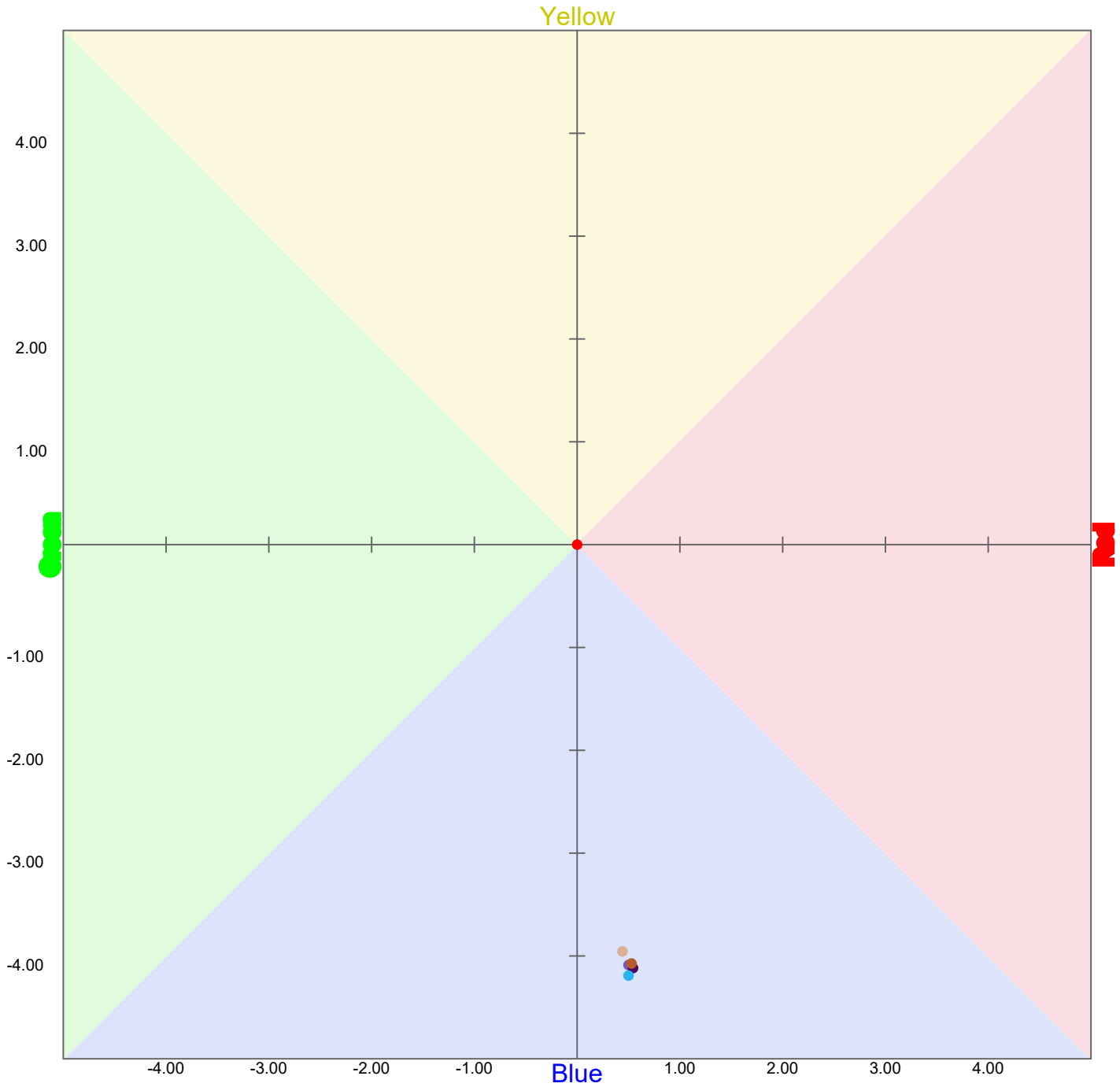
HAZE E TONALIDADE

Default 1024.st5

corp: BLUETECH

Department: AUDITORIA E QUALIDADE

tester: VITTOR A.

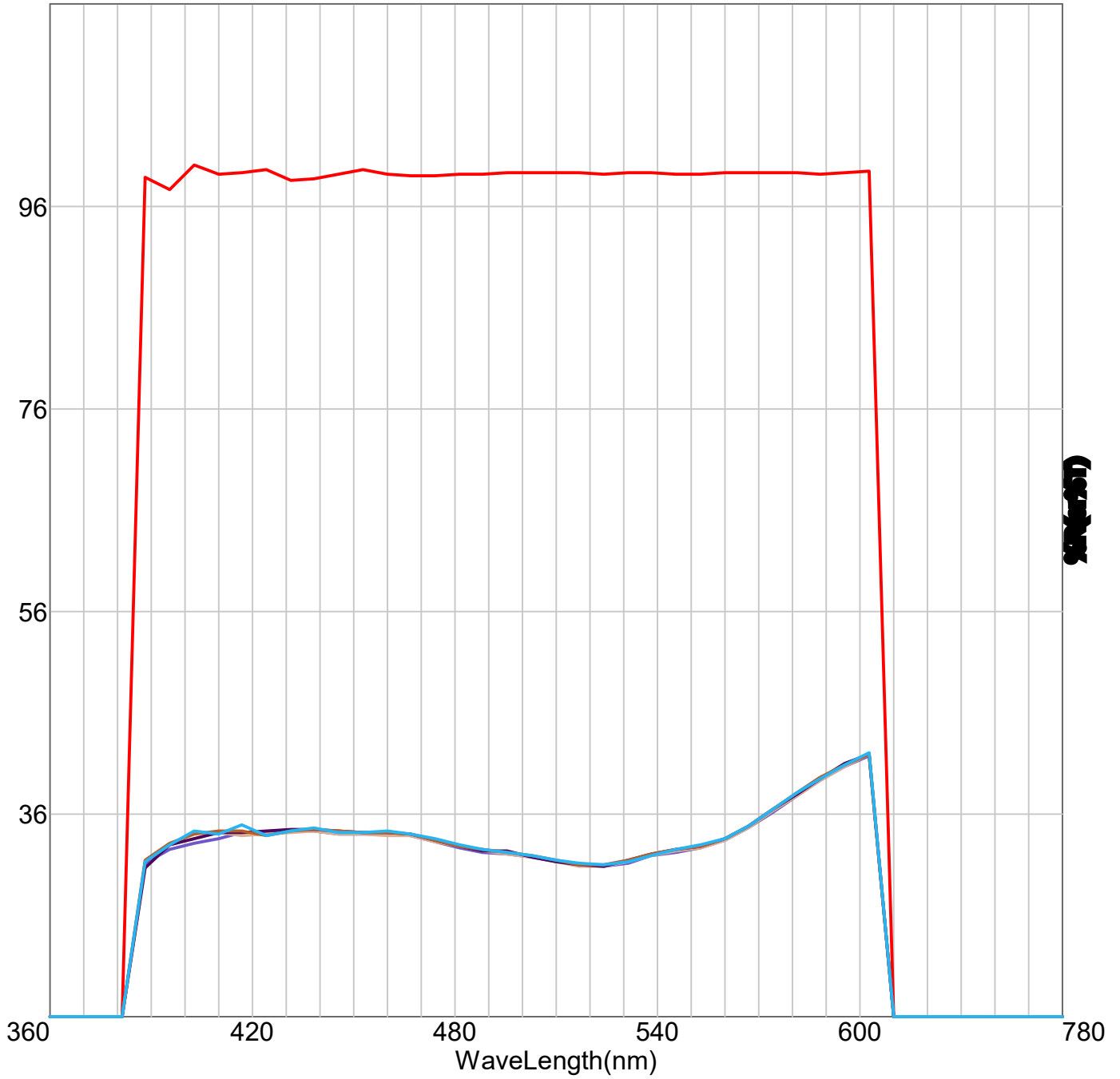


HAZE E TONALIDADE

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corp: BLUETECH

Department: AUDITORIA E QUALIDADE tester:VITTOR A.



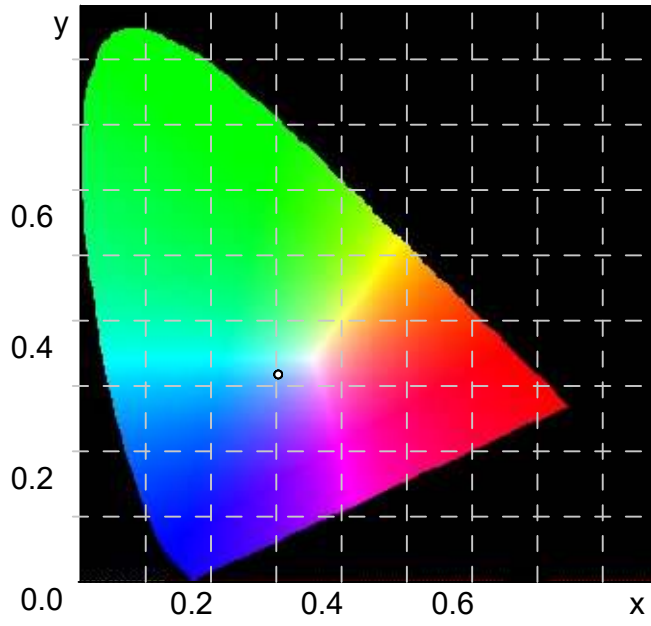
HAZE E TONALIDADE

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corp: BLUETECH

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HAZE E TONALIDADE

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corp: BLUETECH

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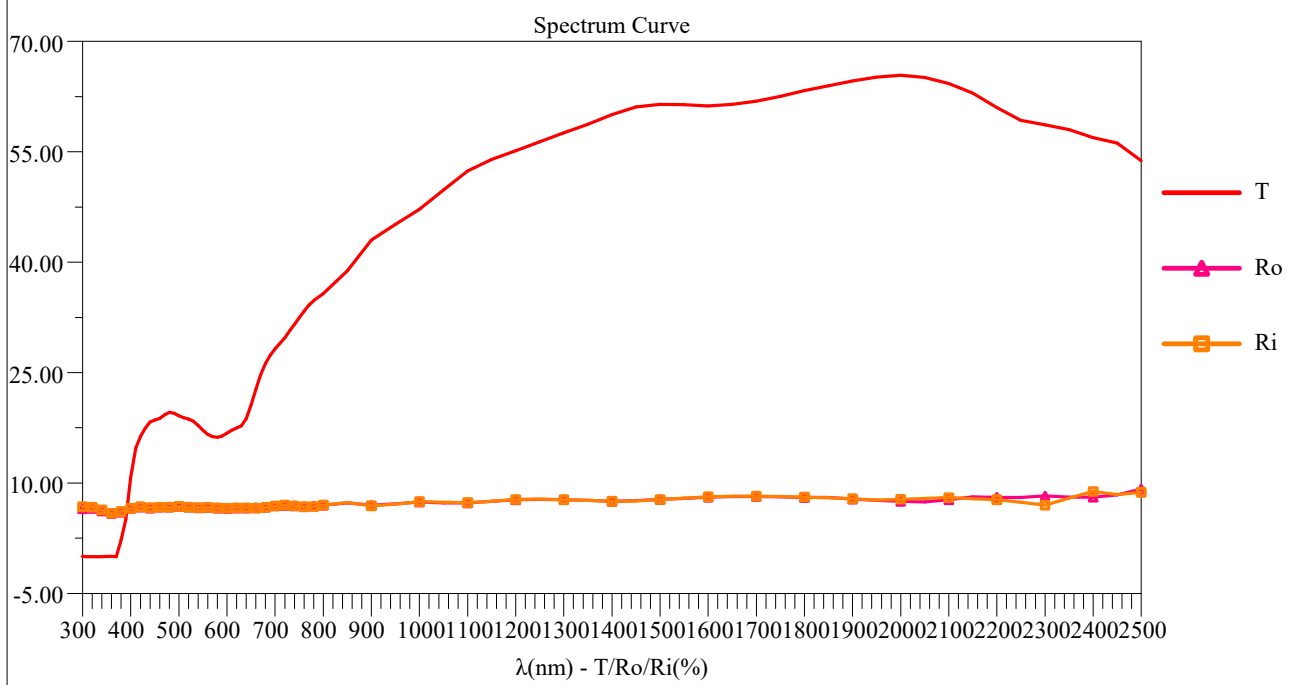
	<u>Standard</u>	<u>Light</u>	<u>Standard</u>	<u>Haze</u>	<u>Total Tran</u>	<u>DT</u>	<u>DHaze</u>	<u>400nm</u>	<u>420nm</u>	<u>410nm</u>	<u>430nm</u>
■	Target	D65/2°	ASTM	0.00	99.78	-	-	99.42	100.73	97.96	99.96
	<u>Sample</u>	<u>Light</u>	<u>Standard</u>	<u>Haze</u>	<u>Total Tran</u>	<u>DT</u>	<u>DHaze</u>	<u>400nm</u>	<u>420nm</u>	<u>410nm</u>	<u>430nm</u>
■	42001051203 - M1D65/2°		ASTM	2.99	19.44	-80.34	2.99	18.09	20.38	19.74	21.01
■	42001051203 - M1D65/2°		ASTM	3.18	19.48	-80.30	3.18	17.57	21.01	20.29	21.01
■	42001051203 - M1D65/2°		ASTM	2.91	19.64	-80.15	2.91	17.54	21.02	20.33	21.01
■	42001051203 - M1D65/2°		ASTM	3.08	19.64	-80.15	3.08	18.52	21.59	20.49	21.01
■	42001051203 - M1D65/2°		ASTM	3.03	19.70	-80.09	3.03	18.19	21.98	20.28	21.01

GlasSpec2500 Optical and Thermal Parameters Measuring Instrument Test Report

Instrument: GlasSpec2500 Thermal standard: JGJ/T 151 Date: 2023-11-27 Test No.: _____
 CIE: D65/2° Optical standard: GB/T 2680 Time: 08:34:28 Environment: _____

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

No.	Content	Results
1	UV transmittance τ_{uv}	0.001
2	Visible light transmittance τ_v	0.176
3	Visible light reflectance ρ_v	0.067
4	Inside visible light reflectance $\rho_{v,i}$	0.067
5	Solar direct transmittance τ_e	0.325
6	Solar direct reflectance ρ_e	0.070
7	Inside solar direct reflectance $\rho_{e,i}$	0.070
8	Solar direct absorptance a_e	0.604
9	Solar infrared direct transmittance τ_{IR}	0.500
10	Solar infrared direct reflectance ρ_{IR}	0.075
11	Total solar energy transmittance g	0.478
12	Shading coefficient SC	0.550
13	Total solar infrared heat transmittance g_{IR}	0.607
14	Visible light to total solar energy transmittance LSG	0.37
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: 0.325
	Solar direct reflectance pe: 0.070
	Solar direct absorptance ae: 0.604
VIS	Visible light transmittance tv: 0.176
	Visible light reflectance pv: 0.067
NIR	Solar infrared direct transmittance tIR: 0.500
	Solar infrared direct reflectance pIR: 0.075
Thermal	Total solar energy transmittance g: 0.478
	Shading coefficient SC: 0.550
	Total solar infrared heat transmittance gIR: 0.607
	Light to solar gain LSG: 0.37
	Thermal transmittance K: 5.39 W/(m ² K)

>> Measurement control information

Normal

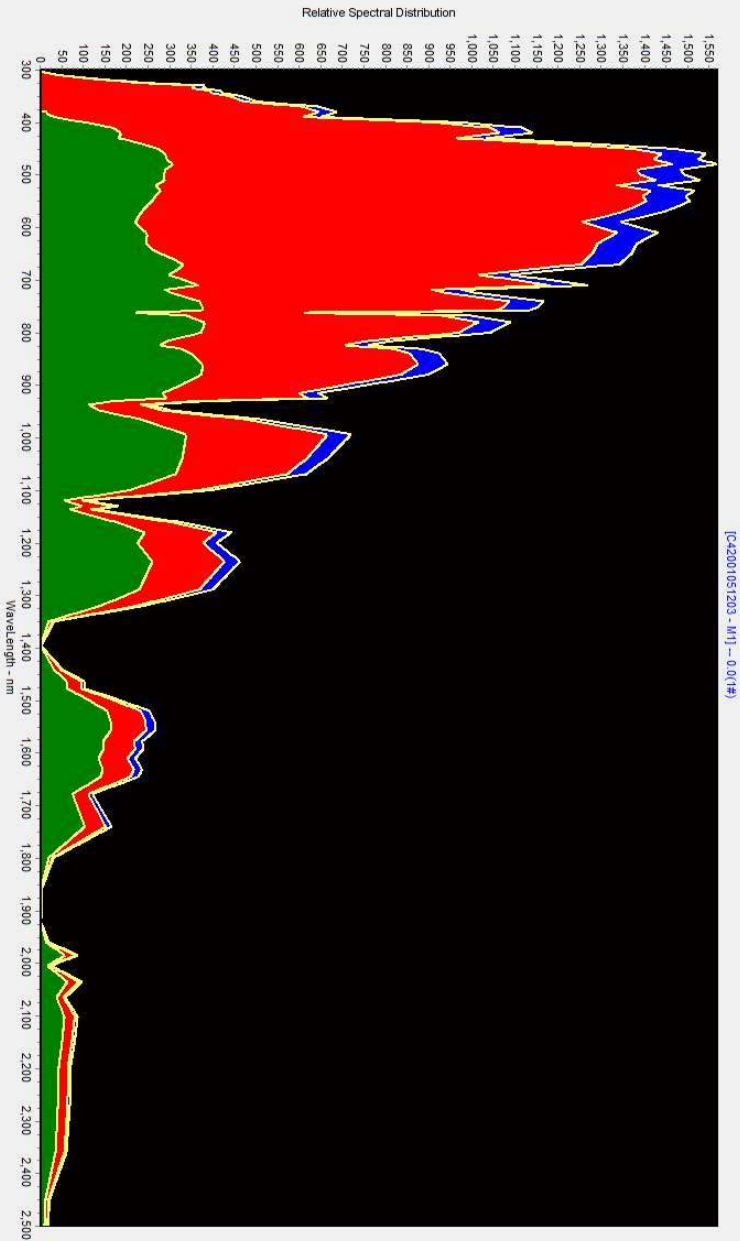
T: **0.05:55** R: **0.03:37**

>> Glass Structure File[C42001051203 - M1] Structure:0(1#) Current Data: Total

JG/T 151
GB/T 2680

Outdoor Indoor

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



[C42001051203 - M1 - 0.0(1#)]

Reflectance
Absorptance
Transmittance
Solar Spectra

Overlay Spectrum

No.	Name	T	Ro	Ri
0	Current Measuring	Red	Pink	Orange
1	C42001051203 - M1	Red	Yellow	Cyan

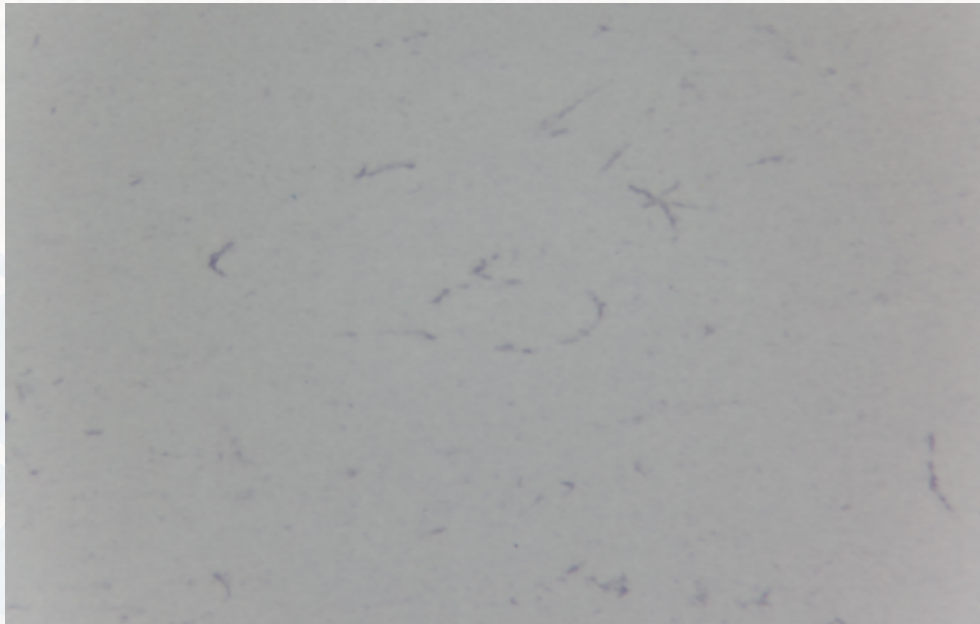
Name: Automatic

C42001051203 - M1

Wizard

0 Internal Link

C42001051203 - SAMPLE - LENTE PLAN 10/0.25



C42001051203 - SAMPLE - LENTE PLAN 4/0.10



Assinatura do responsável

Vittor Andrade

Vittor Andrade
Auditor de Qualidade