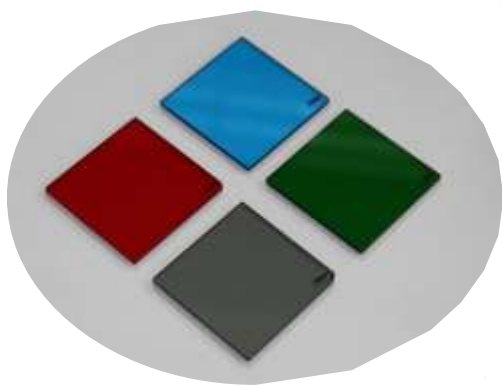


Contrast Tester CT-1 series



Measurement outline

Measure the contrast of a color filter for resist ink

Memorize two status of luminance; calibration luminance (basic luminance 0.1cd/m^2 without inserting sample) and parallel luminance (parallel position of two polarizers= maximum luminance) with a polarizer and a rotation stage, measure penetrate luminance at inserting a sample.

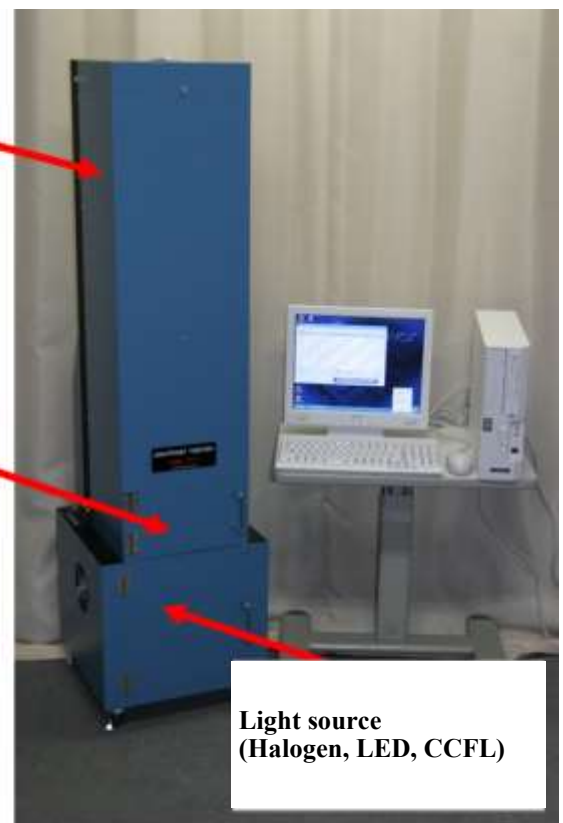
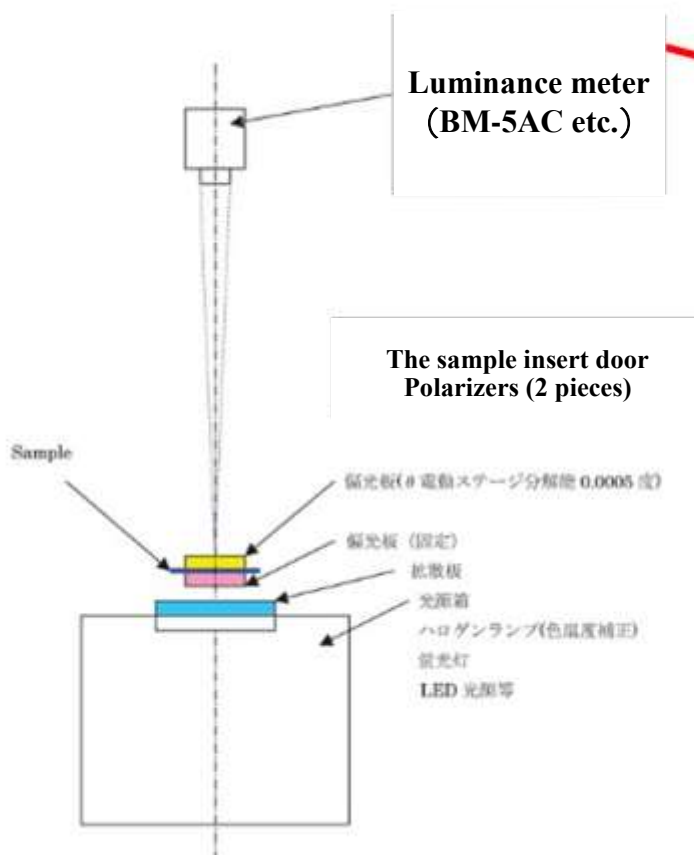
It can save measuring data with using the designated PC software.

Measuring procedures

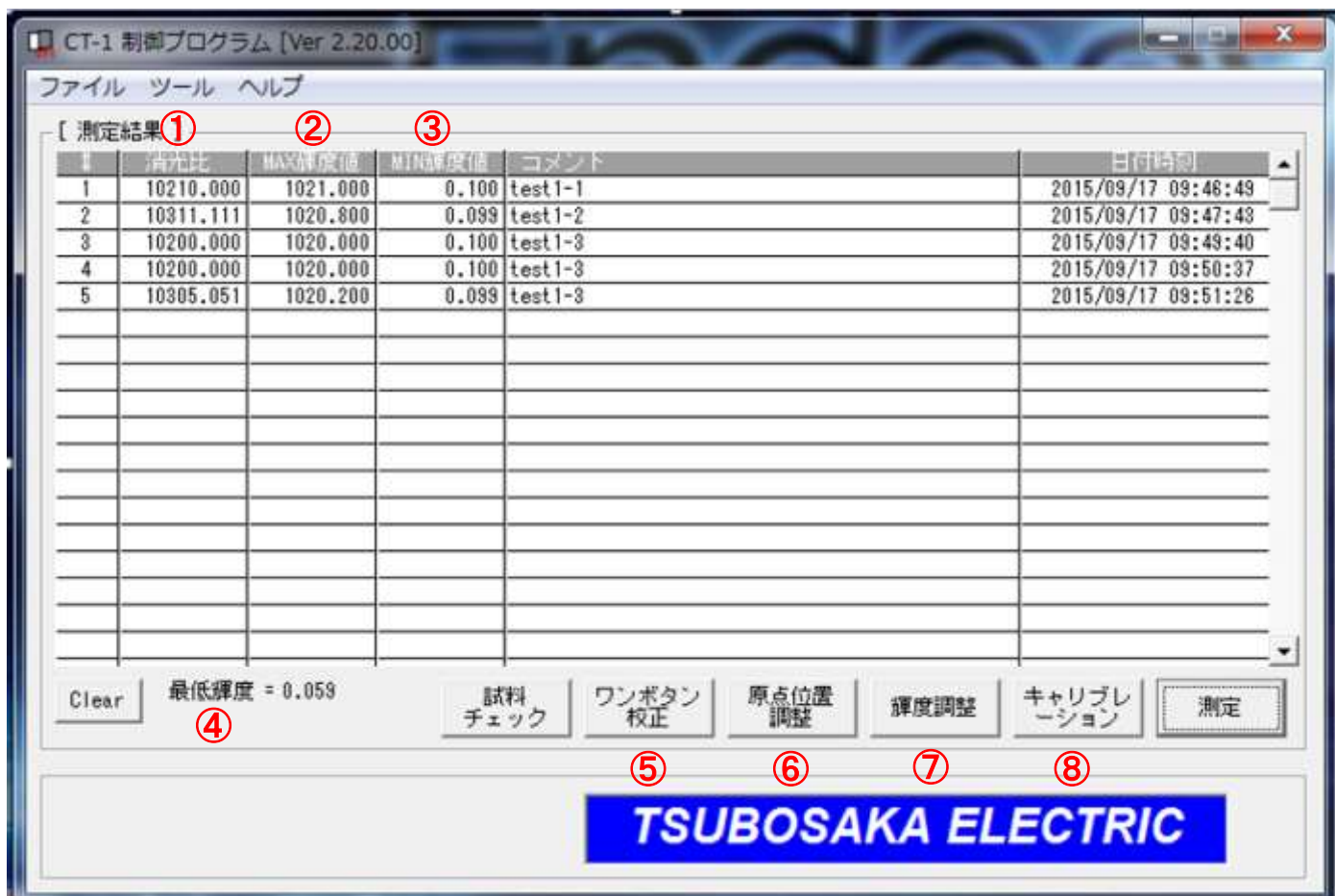
- ① Calibrate the device
- ② Set a sample on the device
- ③ Measure parallel luminance "MAX"
- ④ Measure calibration luminance "MIN"
- ④ Calculate contrast "MAX : MIN"



CT-1 Measuring method



PC software



No.	Item	Content
①	Extinction ratio	Contrast value (MAX luminance : MIN luminance)
②	MAX luminance	Luminance at parallel position of polarizers = luminance value at high luminance
③	MIN luminance	Calibration luminance = Set luminance as 0.1cd/m ² without inserting a sample
④	Lowest luminance	Luminance at crossing polarizers
⑤	One-button calibration	Operate ⑥～⑧ at once before measuring
⑥	Adjust starting position	Find the crossing point of polarizers to measure the lowest luminance
⑦	Adjust luminance	Adjust luminance with checking a value of luminance meter; Some models have automatic luminance adjustment function
⑧	Calibration	Find the position of two polarizers to reach 0.1cd/m ²

It can measure and save a measuring value with using the designated PC software

Control the measuring device with PC software

It can also display chromaticity coordinate and spectrum except contrast value depending on a luminance meter.

Measuring value can be saved as CSV.

※Regarding calibration luminance

Recommend 0.1cd/m², but it can change to an arbitrary number.

Light source



Select LED lamp or Halogen lamp
It can purchase only light source after purchasing the device

①LED lamp model

Luminance: 1000~4000[cd/m²]

- It can change luminance widely
- Luminance feedback function
Automatically monitor and adjust luminance with the internal light sensor
- Automize luminance adjustment
Automatic luminance adjustment with a communication to a luminance meter of contrast tester

②Halogen lamp model

Luminance can change to 500~1000[cd/m²]

③CCFL lamp (F10 light)

※EOS at the end of 2019.

Differences of luminance meters

Some differences on the right side are between color luminance meter:BM-5AC and spectral luminance meter: SR-UL2

Recommend spectral luminance meter for more accurate measurement.

Item/Device	BM-5AC	SR-UL2
Measuring method	Tristimulus values	Spectra measurement
Measuring accuracy	Good	Much Better (More accurate)
Measuring speed	Fast	Normal

Spectra measurement makes more accurate measurement for sample with strong peak features.

Standard and Light models



Standard

Standard model

Select a luminance meter from BM-5AC, SR-UL2 or CS-2000A

For customers who want to measure chromaticity and spectrum

Light

Reasonable model

Luminance meter is LS-150

For customers who want to measure contrast values

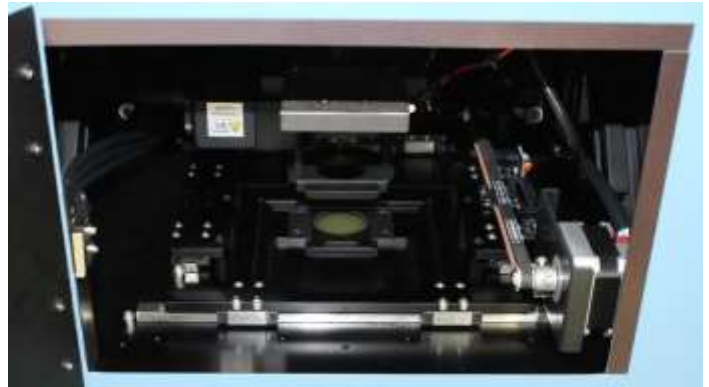
Performance/Features Common specifications with other grades	Content	Light
Display a measuring contrast value	Display both values at penetrating with low luminance and high luminance	
Save a measuring value (CSV)	It can save measuring data like contrast values as CSV	
One-button calibration	One-button calibration until starting measurement	
Sample tray (200mmx200mm)	Inner 200 square mm can decrease in size with an adapter (Option)	
Measuring point	Center one point to the tray	
Designated PC software	Corresponding to Windows 10	
Polarizer	Slide type One set is standard equipment	
Light source	One type from halogen, CCFL or LED is standard equipment	

Additional item from CT-1-L	Content	Standard
Chromaticity x, y measurement	Measure and indicate the chromaticity coordinate	
Spectra measurement	Only for selecting SR-UL2, CS-2000A as a luminance meter	

Pro CT-1-P



Professional



Automatic multiple points measuring for one sample

Measure multiple points as moving a sample with the X-Y electro motor stage

Can specify measuring points and measuring length

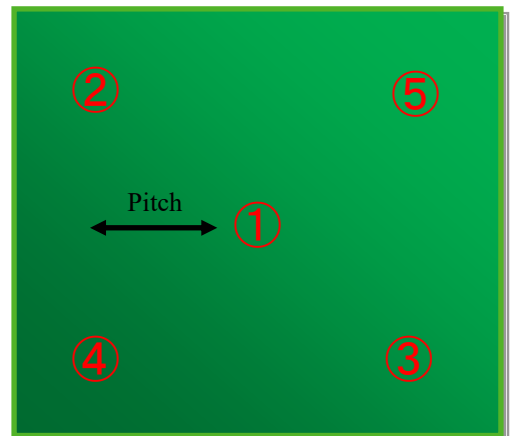
Measuring points : Center 1, 2, 3, 5, 9, 25 points

Measuring length : 2~30[mm] (by 2mm)

※Input a length from the center

Measuring stroke : Maximum 60[mm]

Most suitable for measuring uniformity of spin coating and improving accuracy of sample repeats

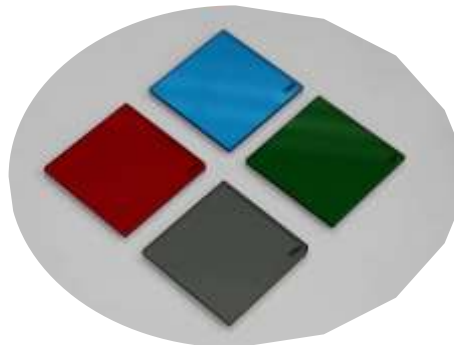


Additional item from Standard	Content
Without a tray Sample size 100x100mm	Sample tray is not used for moving xy stage It can measure 100 square mm sample
Automatic measuring multiple points	Automatic measuring maximum 25 points for a sample (Uniformity of spin coating can measure)
Adjusting temperature mechanism	Monitor temperature in the device, activate a heater at low temperature Stabilize measuring values out of guarantee temperature
Clean air mechanism	Equip the air clean filter to make inside of the device a simple clean room Prevent dust

Always stable measurement for clean air mechanism and adjusting temperature mechanism

Reduce dust for equipping the clean air mechanism

Improve accuracy of measuring repeats for reducing effects from surround temperature with equipping the adjusting temperature mechanism



Reduce heat effects to glass samples

High stability of luminance meter and light source for stable temperature

Auto sampler CT-1ATS-25



Equipped auto carrier device of glass sample model

Set samples, push a measuring start button to measure multiple samples automatically



Watch how to use device on Youtube

TSUBOSAKA Auto sampler demo

Search

Set samples, push a measuring button to measure as the set number

Any who should not have to be in front of the tester.

Good efficiency to do other tasks during measurement

Maximum samples : 25

Measuring time of a sample : About one and a half min; 1.5min (with BM-5AC)

Automatic measuring time : About half an hour; 30min

Specifications (Light & Standard)

Spec/Model	CT-1-LL3	CT-1-STB1	CT-1-STS1	CT-1-STC1
Grade	Light	Standard		
Luminance meter	LS-150	BM-5AC	SR-UL2	CS-2000A
Measuring item	Contrast value	Contrast value Chromaticity(x, y) or (Y, x ,y)	Contrast value Chromaticity (x, y) or (Y, x, y) Spectrum	
Tray size	Inner size 200 square mm			
PC software	Attachment for Light	Attachment for Standard		
Save data	Save as CSV			
Measuring points	Center one point			
Heater	None	None (Option)		
Clean air mechanism	None	None (Option)		
Compositions	Measuring main device: 1 Light source: 1 Tray: 1 Polarizers: 1set ※PC is separately sold			
Dimension	Main device: 420 x 1650 x 420			
Weight	50	60		

- ※ 1 Cannot select others without LS-150 as Light
- ※ 2 Cannot select LS-150 as Standard
- ※ 3 Dimension and weight might be different from an actual product

Light source specifications

Spec/Model	CT-LE10U	CT-H55U
Lamp	White LED	Halogen
Luminance [cd/m ²]	1000 ~ 4000	500 / 1000
Correlated color temperature [K]	6500 +/- 600	5500 +/- 400
Life span [h]	10000	1000
Luminance feedback	With	Without
Automatic adjustment luminance	With	Without

- ※ 1 Switch luminance of halogen with an attached light aperture

Specifications (Professional & ATS)

Spec/Model	CT-1-PB1	CT-1-PS1	CT-1-PC1	CT-1ATS-25
Grade	Professional			ATS
Luminance meter	BM-5AC	SR-UL2	CS-2000A	Selectable
Measuring item	Contrast value Chromaticity (x, y) or (Y, x, y)	Contrast value Chromaticity (x, y) or (Y, x, y) Spectrum		Depends on luminance meter
Tray size	Without a tray, Sample 100 square mm			Inner size 100 square mm
PC software	Attachment for Professional			Attachment for ATS
Save data	Save data as CSV			
Measuring points	Center one point, otherwise including surround 2, 3, 5, 9, 25			One
Heater	Standard equipment			None
Clean air mechanism	Standard equipment			None
Composition	Measuring main device: 1 Adjusting temperature unit:1 Light source: 1 Tray: 1 Polarizers: 1set ※PC is separately sold			Measuring main device: 1 Light source: 1 Tray: 1 Polarizers: 1set ※PC is separately sold
Dimension (W x H x D [mm])	Main device: 420 x 1650 x 420 Adjusting temperature unit: 190 x 210 x 280			1000 x 1820 x 900
Weight [kg]	Main device: 70 Adjusting temperature unit: 3			120

※ 1 Consult us about details of T-1ATS-25

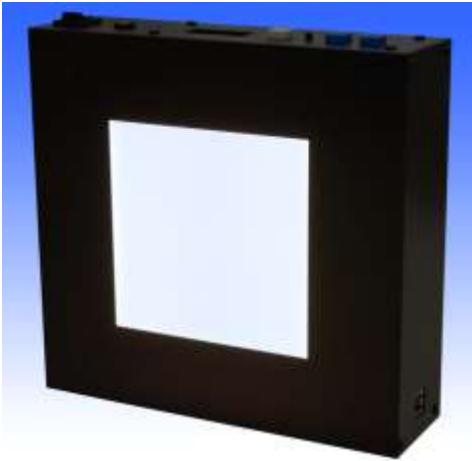
Options/Maintenance parts

Item	Detail
PC	Desktop / Laptop
PC rack & chair	Corresponding to clean room
Adjusting temperature mechanism & Clean air	Can add to only Standard (Only at manufacturing)
Spare polarizers	Slide type, top/bottom 1set
Spare sample tray	200 square mm for Light and Standard
Sample tray adapter	Corresponding to 50 / 75 / 100 / 150 square mm except Pro model
Clean set of polarizers	Solvent・Microfiber cloth・groves

Contrast tester Q&A

Question	Answer
What kinds of documentations are attached to a contrast tester ?	<ul style="list-style-type: none"> ▪ Exam result ▪ User's manual <p>This model is not subject to calibration, so traceability document is only certificate of luminance meter.</p>
How can we do everyday maintenance?	<p>Dusts on polarizers prevents a certain measurement. Check polarizers not to stick dust or dirt to them, often clean them</p>
How often should we calibrate or over-haul them?	<p>We recommend calibration of luminance meter once a year. Regarding overhaul of the device, we recommend it once every three years, otherwise once every five years. We need to keep the device for overhaul.</p>
What are differences between previous model and updated new model?	<ul style="list-style-type: none"> ▪ Polarizers are only slide type. ▪ Standard model has successor specifications. ▪ It can communicate to LED light source (Automatic communication via PC software to adjust luminance) ▪ Improve the speed to finish one-button calibration of the model with SR-UL2. ▪ Add multiple points measurement and adjust temperature mechanism. ▪ Corresponding to Windows10.
What are common parts to use from the previous model?	<ul style="list-style-type: none"> ▪ It can use light source (luminance auto adjustment is not available) ▪ It can use slide type polarizers ▪ It can use 200 square mm sample tray (except Pro model)
What is the recommend environment?	<p>Recommend the environment in a clean room with stable temperature/ humidity.</p> <ul style="list-style-type: none"> ▪ Temperature: 20~30 ±2 [°C] ▪ Humidity: less than 85 [%] without dew condensation ▪ Clean room: Class 10000 (class 7) more <p>It should be the same environment for storage.</p>

Related products



Surface light source Ex)VLB-10FBW2-CRI

As backlight for measuring transparency of a sample or as the standard light source for luminance meter

- Switchable two color temperatures
- Always stable luminance for luminance feedback
- Can switch luminance register settings
- Corresponding to low luminance
- High color rendering LED Ra97



Irradiating illumination Ex)SOL-100AZ

Suitable for a color inspection of paintings (coatings)

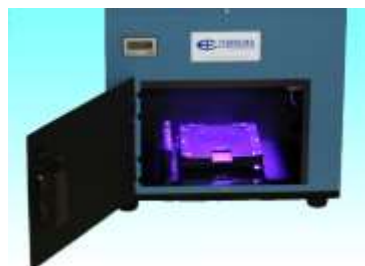
- Irradiating illumination LED Ra97
similar spectra to sunlight
- Adjustable color temperatures
- High illuminance Max1,200lx 1m ahead



UV curing device Ex)UVL-2

For UV curing of a sample

- Basic exposure
- Customize to special requires; a size, a use



Our specialty is the standard light source, light measuring device, optical measuring device.

Consult us about your customization require, we apply for special requirement.

Start sales of clean set for polarizers



Tools for clean of polarizers

Contents

- Solvent
- Microfiber cloth
- Groves

Prepare the below solvents; 1:1

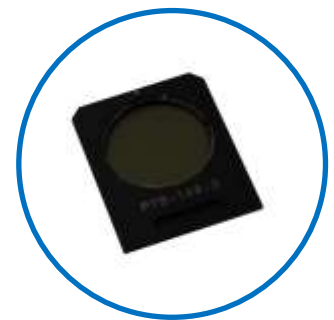
- Methanol
- Diethyl ether

Start sales of polarizers as lot unit

To reduce optical performance comparisons which happen to production of lot unit of polarizing glass

- **Procure lot units for each customer**
- **Unify all lot units at purchase**
- **Arrange chromaticity coordinate with an actual measuring value of our master machine**

These optional supports are available.



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