

Select from
**three different
 operations**
 using just one device!



- Three different operation methods can be selected from one device. Expand your capability by being able to measure a variety of samples!
- Both color and density can be measured using just one device. Can be used for a wide-range of activities from offset printing to color management.
- This compact device can display the spectral reflection rate, polarized color criteria chart, and various color systems.

Quick
 Spectrophotometer
NF 333

Patent Pending
 Condensing
 method
0/45°



Pen type



Stapler type



Mouse type



LED type

**Clearly displays the numerical value for
 minute color differences.**

Select from three different



Pen type

Features a movable optical sensor that is optimal for measuring in recessed and confined areas.



Stapler type

Allows the target position to be confirmed making is optimal for partial measurement of printed matter, etc.



Mouse type

The optical sensor and body are combined into one unit to allow measurements to be taken with just one hand on flat and vertical surfaces.

Quick

Spectrophotometer

NF 333

(with Color Management Software)

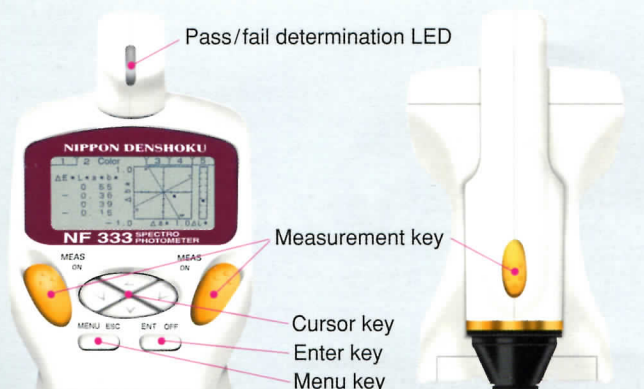
LED type

Clearly displays the numerical value for minute color differences.



* This unit is traced by the National Institute of Standards and Technology (NIST) in U. S. A.

Can be easily operated with either the right or left hand, and measurement keys are also positioned near the two sensor areas on the body.



Measurement keys	Used to turn on the power and to take measurements.
Menu key	Used to turn menus on or off.
Enter key	Used to select menu items and turn the power off.
Cursor key	Used to change the screens and move the cursor.
Pass/fail determination LED	<p>Green light: Within the tolerance range of the set reference color (good)</p> <p>Red light : Outside the tolerance range of the set reference color (no good)</p>

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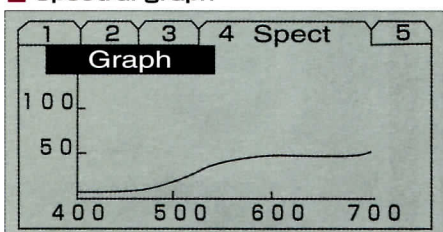
Patent Pending

Condensing method
0/45°

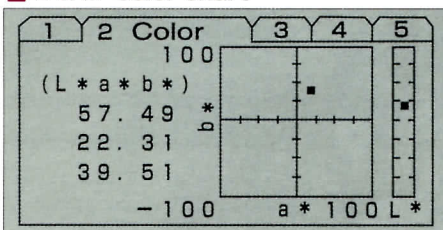
Features

- 1 Compact, lightweight, simple operation, high mobility spectrophotometer**
This small and lightweight (approx. 530g) is easily portable and convenient to use. Provides a selection of three different measurement methods and supports a wide-range of applications from outsourcing inspections to acceptance tests. Can also be powered by an AC adapter.
- 2 A spectrophotometric method is used to allow measurement under a variety of light sources. Matches the sense of vision.**
Use of a spectrophotometric method makes it possible to take measurements under a variety of light sources (A, B, C, D₅₀, D₅₅, D₆₅, D₇₅, F2, F5, F6, F7, F8, F10, F11, F12) and 2° and 10° visual angle conditions. The way color is seen under a variety of lighting conditions matches that of visual sense. Metamerism criteria are also available.
- 3 Data compensation function**
Your company's in-house reference values can be combined with the data. This function minimizes the problems that arise when switching from a spectrophotometer made by another manufacturer or the differences between devices when using multiple spectrophotometers to ensure uniform quality from development to manufacturing.
- 4 Color and density can be measured using one device**
The color and density measurement functions are contained in one device. This makes it possible to use the device for a wide-range of applications from offset printing to color R & D to quality control.
- 5 High Accuracy**
Spectrophotometric technology has made it possible to reduce sensor size, increase battery life, and resolve some conventional spectrophotometer problems, such as differences among individual devices, measurement value compatibility, and reproducibility.
- 6 2-language display function**
Operations and displays support both Japanese and English. The device is easy for foreigners to use.
- 7 Function Lock**
Applying a function lock after the items to be used are set in advance allows only measurements to be taken and the power to be turned on and off. This makes it easy for anyone to take measurements and is very convenient for preventing misoperation.
- 8 Energy conserving design**
This devices can be powered by both batteries and an AC adapter and features an auto power off function that automatically turns off the device when it has not been used for a set time (6 selectable time settings).
- 9 Graph display and output**
The screen displays spectral reflection rate and polarized color criteria charts (changeable range) and L*a*b* chromaticity coordinates (changeable range). Connecting the optional printer makes it possible to output data and (if color management software is used) a variety of graphs.
- 10 Pass / fail determination function**
The data from measured samples or existing reference values that are stored in memory can be used as reference values for comparison with measurement data to determine if the measurement data is within the tolerance range. The setting can be set to color difference (ΔE^* , ΔL^* , Δa^* , Δb^*) or density difference (ΔC , ΔM , ΔY , ΔK) and the pass / fail results are indicated using LED lights (green and red) or the screen display (OK and NG).
- 11 Saving, storing, inputting, referencing, graphically displaying, and data output of measurement data.**
The meter can save the data from 400 measurements (spectral data) in its memory, and a backup function can be used to prevent the data from being lost even when the power is turned off.
- 12 Reference value setting function**
40 pieces of data can be saved in memory as reference values. These can be input by either measurement or key entry (spectral reflection rate, XYZ).
- 13 Average value setting**
This is very convenient when measuring a sample with a broad surface area. Up to 20 points can be freely set and then the meter finds the average for the measured points, which can be used as one measurement.
- 14 Warning Displays**
Various warnings are displayed on the screen, such as when the measurement head moves away from the sample, when the meter is calibrating, when the temperature difference during measurement changed by more than 5°C, and when only a small amount of battery power remains. These warnings are useful for increasing the reliability of the data.
- 15 Data communication with printers and personal computers**
The meter can communicate with the printer (optional) or personal computer when connected to them by a RS-232C cable, and the saved data can be used by the ColorMate, color management software, to make communication with a personal computer easy.

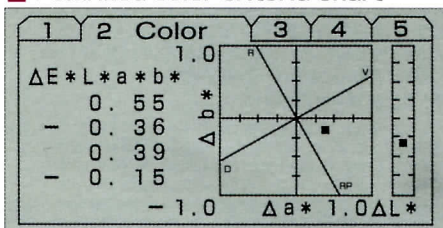
■ Spectral graph



■ L*a*b* color chart



■ Polarized color criteria chart



Specifications

Device type and model	LED type, Quick Spectrophotometer NF 333
Dimensions	Approx. 170mm L × 95mm D × 145mm H
Weight	Body: approx. 420g (including batteries), sensor, approx. 110g
Supported standards	Complies with JIS Z 8722, ISO 7724, DIN 5033, ASTM D 2244, E 308, JIS K 7654, ISO 5/4, ANSI PH 2.17, DIN 16536, etc.
Light source	Multicolored LED (10-year life)
Photoreceptor	Photo diode
Measurement wavelength range	400 nm to 700 nm
Wavelength interval	20 nm
Measurement diameters	8 mm ϕ (standard), 4mm ϕ
Meter configurations	Three different configurations (pen, mouse, stapler type) are offered.
Illumination conditions	A, B, C, D ₅₀ , D ₆₅ , D ₆₅ , D ₇₅ , F2, F5, F6, F7, F8, F10, F11, F12
Visual field angle conditions	2° and 10°
Reflection angle response	ISO status, T, E, I, DIN (wide and narrow)
Measurement range	Reflection rate: 0 to 150%, Display output resolution: 0.01%
Measuring time	Approx. 1 sec
Measurement reproducibility	$\Delta E^* = 0.02$ or less (dia. 8mm), $\Delta E^* = 0.05$ or less (dia. 4mm) (Standard color deviation based on the average when measuring the white color board 20 times.)
Measurement items	Spectral reflection rate (value and graph), polarized light criteria chart, L*a*b* chromaticity coordinates, XYZ, Yxy, L*a*b*, L*c*h*, L*u*v*, Hunter Lab, WI-Tw (CIE No. 15.2/ISO 105-J02), WI (ASTM E 313), WI (ISO 2470), W, WB, YI (ASTM E 313), YI (ASTM D 1925/JIS K 7103), Munsell value (equivalent to HV/C C/2* & D ₆₅ /2*), MI, pass/fail determination, reflection density (CMYK), ΔXYZ , ΔYxy , $\Delta L^*a^*b^*$, $\Delta L^*c^*h^*$, $\Delta L^*u^*v^*$, Hunter ΔLab , ΔWI (three kinds), ΔW , ΔWB , ΔYI (two kinds), Δ reflected density (CMYK)
Color difference formula	ΔE^*_{ab} , ΔE^*_{CMC} (coefficient random setting), ΔE^*_{94} (coefficient random setting), ΔE^*_{uv} , ΔE
Density calculation function	CMYK density, density difference
Graphic display	Spectral reflection rate (value & graph) polarized color criteria chart (changeable range)
Average measurement	Up to a maximum of 20 points can be freely set and measured.
Data compensation function	Reference values can be input from the spectral reflection rate or XYZ.
Data save quantity	400 data pieces (saved as spectral data)
Reference date quantity	40 data pieces (Can be input from measurements, spectral reflection rate, or XYZ.)
Display	128×64 dots with backlit, high-contrast black & white graphic LCD
Display area size	Approx. 55×44mm
Displayed languages	Japanese and English (interchangeable)
Operation keys	4 cursor keys, 2 function keys, 3 measurement keys
Power	Four AA batteries or AC adapter
Battery measurement life	Approx. 20,000 measurements (when the pass/fail LED and LCD backlighting are not used when battery powered)
Low battery warning	A warning is displayed on the LCD during measurement when the batteries are low.
Buzzer	Standard feature (The buzzer can be turned off.)
Warmup	Unnecessary
Auto power off	Provides 6 settings (off, 1, 5, 10, 20, 30 min) for the time after which the power is automatically turned off when the meter is not in use.
Data communication	RS-232C, maximum 38,400 bps. Data can be exchanged with a personal computer using the color management software.
Operating temperature/humidity	5 to 40°C, 20 to 80% RH (no condensation)
Temperature sensor	Built in (with function for re-calibration)
Warning message display	Displays various warnings to facilitate better data reliability.
Options	Printer, printer AC adapter, RS-232C cable (for connecting with the printer), thermal sensitive paper (10 rolls), AC adapter (100V, 120V, 220-240V), target plate (for curved surfaces) O-ring sensor (10 units), sponge ring, etc.

*These specifications may be changed without notice.

Color Management Software

For RS-232C communications

- Display of various graphs and colors by numerical values
- Data collection using statistic and management records
- Easy management using data entry and a good assortment of function
- Text output
- Copying of graphs to a printer port
- Data criteria function

Operating system: Supports Windows (95, 98, 2000)

Computer: PC AT compatible (Macintosh not supported)

Printer

OPTION



Standard accessories

- Body
- Sensor
- Reference calibration boards (white board, black board)
- Four AA batteries
- Color management software
- AC adapter
- Plate for stapler type model
- Cable for connecting the body and sensor
- Target plate
- RS-232C cable (D-sub 9pin)
- Instruction manual
- Carrying case



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