

SPECTROPHOTOMETER

SE 6000



**NIPPON
DENSHOKU**
Advanced Technology In Color and Brightness.

All-in-one type color meter,

enabling both of reflectance and transmittance measurements by one unit.

Using this model, you can make color measurements of various shaped samples like solid, liquid, powder, pellet and film.

Measurement is possible at **10nm interval** in the range of 380nm to 780nm.



OPTION

- ◆ APHA (Harzen number) and Gardner color can be measured.
- ◆ An optical fiber can be connected, and when doing so, it is most appropriate to measure such samples as dental maerial, skin, and the ones with difficult sampling or complicated shapes.
- ◆ Windows-based color management software (called ColorMate 5) can be used. Using it, you can view on the screen of your personal computer chromaticity coordinate graph, transition graph and a list of data, etc.



ISO 9001 certificate: Obtained in 2000

SE 6000

▼ Reflectance measurement

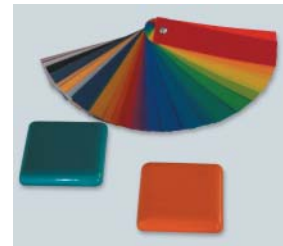
▼ Transmittance measurement



Measurement of liquid samples in square cells



Measurement of transparent samples by setting on a sample clamp



Measurement by setting color samples on a measuring stage



Measurement of powder and paste in round cells



Measurement of small samples by changing sample stages for different measuring diameters

Features

- Both of reflectance and transmittance measurements are possible by this one unit. Its is in fact all-in-one type measuring instrument enabling color measurements of various shaped samples such as solid, liquid, powder, pellet and film, etc.
- Measurement is possible at 10nm interval in the range of 380nm to 780nm.
- Measurement of metamerism can be optionally selected from the cases of using a standard light source or a target light source.
- Munsell color system (HVC) can be selected from one of the C/2° and D65/2° conditions.
- Measuring diameter for reflectance can be selected from 6mmφ, 10mmφ or 30mmφ, with a possibility to measure even small samples. (The diameter as small as 3mm is also available on your special order, which will be most appropriate for measurement of tablet pharmaceuticals.)
- On a large bright and easy-to-read screen, measurement values, spectroscopic curve, color deviation criterion chart, and transition chart are displayed.
- Color data management is available on your personal computer using the RS-232C interface.
- It is an all-in-one type color meter comprising measuring unit, optical unit and printer.
- This model is equipped with a foot switch as one of the standard accessories, which allows you to make measurements even while you are holding a sample by both hands.

OPTION

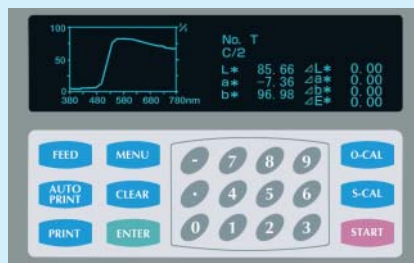
- APHA(Harzen number) and Gardner color can be measured.
- An optical fiber can be connected, and when doing so, it is most appropriate to measure such samples as dental material, skin, and the ones with difficult sampling or complicated shapes.
- Windows-based color management software(called ColorMate 5) can be used. Using it, you can view on the screen of your personal computer chromaticity coordinate graph, transition graph and a list of data, etc.



Large bright and easy-to-read screen



Display of measurement values



Display of spectroscopic curve



Display of color deviation criterion chart

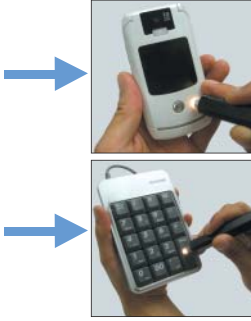
Examples of applications for different industries

- **Food industry**
Color difference control for tomato juice, orange juice, mayonnaise, ketchup, miso, coffee, and ham
- **Fishing industry**
Control for fish freshness and minced fish color
- **Cosmetics industry**
Color check for foundation, lipstick, etc. and for demonstration use at shops
- **Dentistry**
Color check for teeth, gums, and dental material
- **School and hospital**
Educational use for housekeeping class, color control at cooking, and color check of skin
- **Pharmaceutical industry**
Color shading control for tablets, granules, and powdered pharmaceuticals
- **Paper manufacturing industry**
Color management for paper and pulp
- **Household and electric appliance industry**
Color shading control for refrigerators, washing machines, cleaners, etc., and color check of TV sets, and LCD panels
- **Automobile and motorcycle industries**
Color management for automobile and motorcycle painting
- **Metal industry**
Color control for printing on aluminum and metal, and for general color printing
- **Dyeing and apparel industries**
Color shading control for dyed or sewn fabric
- **Paint and ink industries**
Color difference control for inks and pigments
- **Printing industry**
Density analysis and color management for printed matter
- **Resin and plastics industries**
Color management for pellets, resin sheets, moldings, and films
- **Petrochemical industry**
Color check for petroleum
- **Agriculture and livestock industry**
Color management for meat and processed products

Specifications	
Illumination and light receiving conditions	Reflectance : n-45° post-spectroscopy method Transmittance : n-n post-spectroscopy method Both based on JIS Z-8722
Measuring Wavelength	380nm~780nm, at 10nm interval
Measuring method	Double beam, post-spectroscopy total wavelength simultaneous compensation method
Measuring area	Reflectance : 6mmφ, 10mmφ, and 30mmφ (Small diameter is available in option.) Transmittance : 30mmφ
Light source	Halogen lamp, 12V 50W
Light receiving element	Silicon photocell quick response type
Measuring accuracy	Repeatability using a standard white plate: · ΔE* - Standard deviation within 0.02 · Spectral reflectance - Standard deviation within 0.20 At the conditions of 30 measurements at intervals of 10 seconds, 30 minutes after turning on the power
Light source	C, D65, A, F6, F8, F10
Field items	2° and 10°
Display	Number of dots : 256×64 dots Display area : 166.25mm×41.45mm
Display items	L*a*b*, ΔL*a*b*, ΔE*, Lab, ΔLab, ΔE, XYZ, Yxy, YI(E313), YI(D1925), W(CIE), W(Lab), WB, HVC, L*C*h*, ΔL*C*h*, ΔE94, ΔECMC(1:1), ΔECMC(2:1), LCh, ΔLCh, OD, Metamerism, spectral reflectance, spectroscopic curve, color deviation criterion chart. Option (APHA and GARDNER) Any of the above color systems can be arbitrarily selected to display on the screen.
Printer	Thermal line dot printing system, thermal printer
Print items	Sample No., light source/field of view, data/time, L*a*b*, ΔL*a*b*, ΔE*, Lab, ΔLab, ΔE, XYZ, Yxy, YI(E313), YI(D1925), W(CIE), W(Lab), WB, HVC, L*C*h*, ΔL*C*h*, ΔE94, ΔECMC(1:1), ΔECMC(2:1), LCh, ΔLCh, OD, Metamerism, spectral reflectance, spectroscopic curve, color deviation criterion chart. Option (APHA and GARDNER) Any of the above items can be arbitrarily selected for printing.
External output	RS-232C
Averaging	Max. 99times
Reference value	Max. 20 pieces of reference data can be registered
Power supply	100 to 240 VAC, 50/60Hz
Environment for use	15 to 40°C, 30 to 80%R.H., No condensation
Power consumption	140VA
Dimensions & weight	425W×415D×189H mm, 13kg
Related standards	JIS Z-8722, ASTM E 308, ASTM E 313, etc.
Option	Color management software for Windows, optical fiber, various attachments and cells for exclusive use

※Specifications are subject to change without notice due to technical improvement.

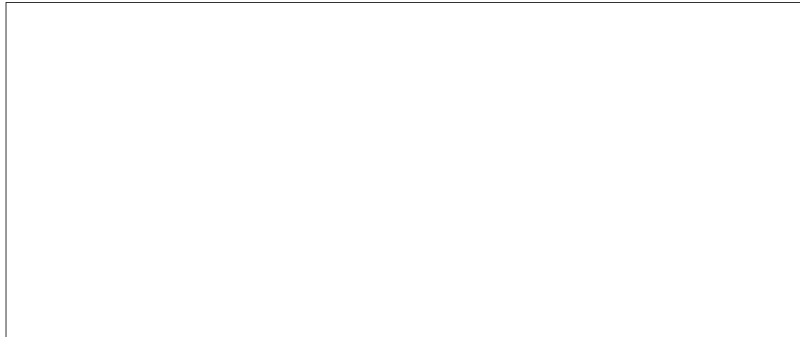
OPTION Optical fiber, Model OF



By applying a pen type head to your samples, it will become possible to measure even the ones with complicated shapes, measurement of which has been difficult before.

- **Specifications**

Measuring diameter	Select one of 3mmφ, 4mmφ, and 6mmφ
Light receiving system	Select one of the following 4 systems: 0° illumination/diffused light reception, diffused illumination/0° light reception, 0-45°, or 45-0°
- **Suitable for such measurements as for :**
 - ◇Printed matter
 - ◇Large samples
 - ◇Convexo-concave samples
 - ◇Dental material and skin
 - ◇Automobile components
 - ◇Cosmetics
 - ◇Craftwork and timber
 - ◇Petals and leaves
 - ◇Fruits
 - ◇Beans
 - ◇Electronic components



Ⓢ NIPPON DENSHOKU INDUSTRIES CO., LTD.

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