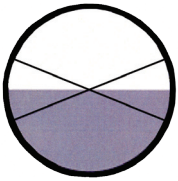
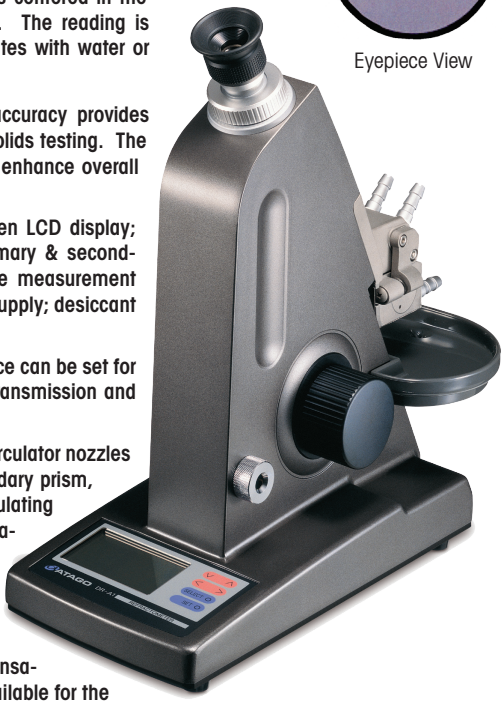
ABBE REFRACTOMETERS

MODEL DR-A1

The Model DR-A1, with its digital display, provides the user with a precision instrument for the Brix and Refractive Index (nD) analysis of liquids, glass, plastic, & film.



Eyepiece View



Easy to Use. Operation consists of placing a sample on the prism. While looking through the eyepiece, the control knob is turned until the shadowline is centered in the crosshairs (see image "Eyepiece View"). The reading is shown on the large LCD display. Calibrates with water or the included 1.5163 nD glass standard.

Digital Accuracy. High resolution and accuracy provides substantial precision for both liquid and solids testing. The digital display and simple operation both enhance overall precision - no analog scales to read.

Professional Features. Large, menu-driven LCD display; Refractive Index (nD) & Brix scales; primary & secondary prisms; color compensator dial; large measurement dial; focusable eyepiece; external power supply; desiccant case; drain nozzle.

LED Light Source. Long-life LED light source can be set for upper and lower settings enabling both transmission and reflection measurement modes.

Prism Temperature Control. Featuring 2 circulator nozzles for the primary prism and 2 for the secondary prism, Model DR-A1 can be connected to a circulating bath to accurately regulate prism temperature. The prism temperature is displayed on the LCD display. The effective temperature range is 5-50°C.

Automatic Temperature Compensation. Features Automatic Temperature Compensation with 20°C as the reference point. Available for the Brix scale only. The effective compensation range is 5-50°C.

Glass, Plastic, & Film Testing. Transparent or translucent glass and plastic samples can be measured with the use of the included bromonaphthalene contact liquid and the lighting adapter. Transparent or translucent film samples can be measured with the use of the included bromonaphthalene contact liquid and the optional film measurement set (cat. no. RE-1581).
Note: The refractive index (nD) of the sample must be lower than that of the contact liquid. The included bromonaphthalene contact liquid has a refractive index (nD) value of 1.6300.

Double Refraction (Birefringence) Testing. With the optional polarizing eyepiece (cat. no. RE-1145), Model DR-A1 can test samples exhibiting double refraction. For example, a piece of film with this characteristic would have a machining direction (Y axis), a right-angle to machining direction (X axis), and a thickness direction (Z axis) - the refractive index must be measured for each axis.

DR-A1 SPECIFICATIONS

Measuring System:	Optical Refraction Critical Angle Detection	
Measuring Range:	Refractive Index (nD):	1.3000 - 1.7100
	Brix:	0.0 - 95.0%
Resolution:	Refractive Index (nD):	0.0001
	Brix:	0.1%
Accuracy:	Refractive Index (nD):	±0.0002
	Brix:	±0.1%
Temperature Compensation:	5-50°C (Brix Scales Only)	
Ambient Temperature:	5-35°C	
Measuring Temperature:	5.0 - 50.0°C	
Sample Quantity:	>0.1ml	
Relative Humidity:	<90%	
Altitude:	<5000m Above Sea Level	
Calibration Liquid/Medium:	Distilled Water Glass Standard, 1.5163 nD (w/Bromonaphthalene Contact Liquid)	
Display:	LCD	
Measuring Light Source:	LED	
Prism:	Optical Glass	
Prism Housing:	SUS316 Stainless Steel	
Circulator Nozzles:	2 for Primary Prism 2 for Secondary Prism	
Desiccant Case:	Tablets w/Color Indicator	
Input Voltage:	100 to 240V AC, 50/60 Hz	
Output Voltage:	5V DC, 6A	
Power Consumption:	10V A	
Dimensions:	29 (L) x 13 (W) x 31 (H) cm	
Weight:	6.0 kg	
Supplied With:	Power Supply, Power Cord, Glass Standard (1.5163 nD), Contact Liquid Bromonaphthlanene (4ml bottle), Allen Wrench), Lighting Adaptor for Solid Samples, Tubing Band, Instruction Manual.	

LCD Display View

RE-1310 Model DR-A1 Refractometer $6,615.00

Optional Items

RE-1581 Film Measurement Set ..... POR

RE-1145 Polarizing Eyepiece ..... POR

DR-M SERIES

The Model DR-M Series Abbe Refractometers, featuring multiple wavelengths and automatic Abbe Number measurement are the first instruments of their kind for the high-level Refractive Index analysis of liquids, glass, plastic, & film.

Easy to Use. Operation consists of placing a sample on the prism; inserting an interference filter in the light source; while looking through the eyepiece, the control knob is turned until the shadowline is centered in the crosshairs (see Eyepiece View); the reading is shown on the large LCD display. Units calibrate with water (Model DR-M2) or the included glass standard.

Professional Features. Large, menu-driven LCD display; primary & secondary prisms; color compensator dial; large measurement dial; focusable eyepiece; desiccant case; drain nozzle.

Multiple Wavelengths. Measures at 589nm (vD) or 546nm (vE) with the two included interference filters. Capable of measuring in the range of 450-1100nm with the use of optional interference filters. For testing above 680nm, the optional infrared Viewer is required. External halogen light source features digital readout, variable intensity, and adjustable positoning of the light guide.

Abbe Number Measurement. Automatic; digital readout of Abbe Number (vD & vE) in 4 easy steps. For vD, the included 589nm interference filter and the optional 486nm & 656nm interference filters are used. For vE, the included 546nm interference and the optional 480nm & 644nm interference filters are used.

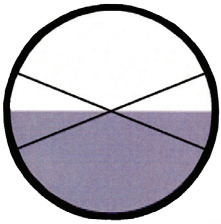
Digital Accuracy. High resolution and accuracy provides substantial precision for both liquid and solids testing. The digital display and simple operation both enhance overall precision - no analog scales to read.

Prism Temperature Control. Featuring 2 circulator nozzles for the primary prism and 2 for the secondary prism, The DR-M Series models can be connected to a circulating bath to accurately regulate prism temperature. The prism temperature is displayed on the LCD display. The effective temperature range is 5-50°C.

Glass, Plastic, & Film Testing. Transparent or translucent glass and plastic samples can be measured with the use of the included contact liquid. Transparent or translucent film samples can be measured with the use of the included contact liquid and lighting glass.
Note: The refractive index (nD) of the sample must be lower than that of the contact liquid. The included bromonapthalene contact liquid has a refractive index (nD) value of 1.6300; the included methylene iodide solution (Model DR-M4 only) has a refractive index (nD) value of 1.7400.

Double Refraction (Birefringence) Testing. With the optional polarizing eyepiece, the DR-M Series models can test samples exhibiting double refraction.

Display


Cross hairs in eyepiece view

OPTICAL INSTRUMENTS

DR-M2, DR-M4

Refractive index or Abbe number (νd or νe) can be measured at different wavelengths ranging from 450 to 1,100nm. (For measurement at wavelengths ranging from 681 to 1,100nm, the optional Near Infrared Ray Viewer is required.)
The DR-M2, DR-M4 display measurement result of refractive index or Abbe number digitally on the LCD. Measurement can be achieved by matching the boundary line with the intersection point of the cross hairs. These refractometers are connectable with a digital printer (optional).

SPECIFICATIONS - DR-M2, DR-M4

Measurement range:

DR-M2

Wavelength	450nm:	Refractive index 1.3277 to 1.7379
Wavelength	589nm:	Refractive index 1.3000 to 1.7100
Wavelength	680nm:	Refractive index 1.2912 to 1.7011
Wavelength	1,100nm:	Refractive index 1.2746 to 1.6843

DR-M4

Wavelength	450nm:	Refractive index 1.5164 to 1.9164
Wavelength	589nm:	Refractive index 1.4700 to 1.8700
Wavelength	680nm:	Refractive index 1.4558 to 1.8557
Wavelength	1,100nm:	Refractive index 1.4304 to 1.8303

Minimum indication: 0.0001 in refractive index
0.1 in Abbe number

Measurement accuracy: ±0.0002 in refractive index (with the attached test piece at 589nm)

Wavelength range: From 450 to 1,100nm (with interference filters)
(For measurement at wavelengths ranging from 681 to 1,100nm, the Near Infrared Ray Viewer (optional) is required)

Measurement temperature range: 5 to 50°C

Output terminal: For printer (optional)

Power supply: AC100 to 240V 50/60Hz

Dimensions and weight: Refractometer 13 x 29 x 31cm, 6.0 kg
Light source unit 15 x 33 x 11cm, 3.0 kg

Optional accessory: Near Infrared Ray Viewer

RE-1410	DR-M2, Refractive index, 1.3000-1.7100 450nm-680nm (681nm-1100nm option)Refractometer	$15,750.00
RE-1414	DR-M4, Refractive Index, 1.4700-1.8700 450nm-680nm (681nm-1100nm option) Refractometer	15,750.00
RE-9119	Near Infrared Ray Viewer (Optional Accessory)	POR

DR-M2/1550, DR-M4/1550

Refractive index or Abbe number (νd or νe) can be measured at different wavelengths ranging from 450 to 1,550nm. These refractometers digitally display measurement result of refractive index or Abbe number on the LCD. Measurement can be achieved by matching the boundary line with the intersection point of the cross hairs. They are connectable with a digital printer (optional).

Shown with Near Infrared Ray Viewer

SPECIFICATIONS - DR-M2/1550, DR-M4/1550

Measurement range:

DR-M2/1550

Wavelength	450nm:	Refractive index 1.3278 to 1.7379
Wavelength	589nm:	Refractive index 1.3000 to 1.7100
Wavelength	680nm:	Refractive index 1.2913 to 1.7011
Wavelength	1,100nm:	Refractive index 1.2746 to 1.6843
Wavelength	1,550nm:	Refractive index 1.2594 to 1.6690

DR-M4/1550

Wavelength	450nm:	Refractive index 1.5164 to 1.9164
Wavelength	589nm:	Refractive index 1.4700 to 1.8700
Wavelength	680nm:	Refractive index 1.4558 to 1.8557
Wavelength	1,100nm:	Refractive index 1.4304 to 1.8303
Wavelength	1,550nm:	Refractive index 1.4215 to 1.8214

Minimum indication: 0.0001 in refractive index
0.1 in Abbe number

Measurement accuracy: ±0.0002 in refractive index (with the attached test piece at 589nm)

Wavelength range: From 450 to 1,550nm (with interference filters)

Measurement temperature range: 5 to 50°C

Output terminal: For digital printer (optional)

Power supply: AC100 to 240V 50/60Hz

Dimensions and weight: Refractometer 13 x 29 x 31cm, 6.0kg
Power supply unit 15 x 33 x 11cm, 3.0kg

RE-1412	DR-M2/1550, Refractive index, 1.3000-1.7100 450nm-1550nm w/Infrared Viewer Refractometer	$20,845.00
RE-1415	DR-M4/1550, Refractive Index, 1.4700-1.8700 450nm-1550nm w/Infrared Viewer Refractometer	20,845.00
RE-3011	Printer for DR-M2, DR-M4, DR-M2/1550, DR-M4/1550	1,340.00

OPTICAL INSTRUMENTS

Each model refractometer comes with the following:

DR-M2 Multi-wavelength Abbe Refractometer

- DR-M2 main unit
- Light source unit
- AC power cable
- Light stand
- Light guide
- Allen wrench for detaching/attaching prism
- Test piece (nD1.516) (for practicing solid matter measurement)
- Contact liquid (monobromonaphthalene, 4 ml) (for practicing solid matter measurement)
- Lighting glass for film measurement
- Interference filter, 589 nm and 546 nm
- Tube band
- Spare bulb
- Instructions manual
- Inspection certificate
- Test report

DR-M4 Multi-wavelength Abbe Refractometer

- DR-M4 main unit
- Light source unit
- AC power cable
- Light stand
- Light guide
- Allen wrench for detaching/attaching prism
- Test piece (nD1.62) (for setting reference point)
- Contact liquid (monobromonaphthalene, 4 ml) (for setting reference point)
- Contact liquid (metlylene iodide containing sulphur solution, 4 ml) (for practicing solid matter measurement)
- Lighting glass for film measurement
- Interference filter, 589 nm and 546 nm
- Tube band
- Spare bulb
- Instructions manual
- Inspection certificate
- Test report

DR-M2/1550 Multi-wavelength Abbe Refractometer

- DR-M2/1550 main unit
- Power supply unit
- AC power cable
- Monochromatic light source device
- Near infrared ray viewer
- Mounting adapter
- Screw for mounting adapter
- Interference filter, 589 nm
- Interference filter frame for 589 nm
- Interference filter frame for registration
- Lighting glass for film measurement
- Allen wrench for detaching/attaching prism
- Test piece (nD1.516)
- Contact liquid (monobromonaphthalene, 4 ml)
- Tube band
- Instructions manual
- Inspection certificate
- Test report

DR-M4/1550 Multi-wavelength Abbe Refractometer

- DR-M4/1550 main unit
- Power supply unit
- AC power cable
- Monochromatic light source device
- Near infrared ray viewer
- Mounting adapter
- Screw for mounting adapter
- Interference filter, 589 nm
- Interference filter frame for 589 nm
- Interference filter frame for registration
- Allen wrench
- Lighting glass for film measurement
- Test piece (nD1.62)(for setting reference point)
- Contact liquid (monobromonaphthalene, 4 ml)
- Contact liquid (metlylene iodide containing sulphur solution, 4 ml)
- Tube band
- Instructions manual
- Inspection certificate
- Test report