

Analysis and Measurement Services

We provide a wide range of analysis and measurement services, including those for physical properties in the vacuum ultraviolet range, as well as fundamental chemical analysis and optical properties assessment.

Transmittance

Characteristics

- Ability to measure a wide range of wavelengths (120 nm to 6000 nm)
- Double Beam (~ 3300 nm) Spectrophotometer optical system to reduce measurement variations using our proprietary adjustment techniques
- Nikon's precision cleaning processes eliminate the influence of organic contamination, resulting in high-accuracy transmittance measurements
- Available measurements include fixed-point absolute measurement, wavelength scanning measurement and mapping measurement

Wavelength reproducibility

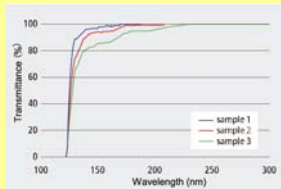
± 0.025 nm @ 190 ~ 900 nm,
 ± 0.1 nm @ 900 ~ 6000 nm

Measurement samples

Transparent glass, crystal,
resin, liquid

Measurement example

Internal transmittance chart



Sample : Calcium fluoride
Thickness: 10 mm

Transmittance map on sample



Sample : Synthetic silica glass
Measurement wavelength: 193 nm

Birefringence

Characteristics

- High-accuracy in-plane distribution of birefringence measurements
- Ability to determine the direction of the fast axis

Repeatability

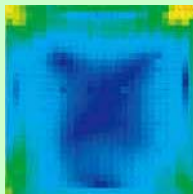
≤ 0.1 nm

Measurement samples

Transparent glass, crystal, resin

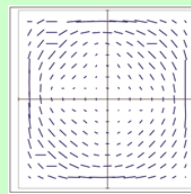
Measurement example

Birefringence map (birefringence amount)



Sample : Synthetic silica glass
Measurement wavelength: 193 nm

Birefringence map (birefringence amount and fast axis direction)



Sample : Synthetic silica glass
Measurement wavelength: 193 nm
*Line length: Birefringence amount
*Line direction: Fast axis direction

Refractive index homogeneity

Characteristics

- Measurement of large glass material of $\phi 650$ mm using our proprietary technologies is also available
- Simultaneous front and back surface measurement of refractive index homogeneity and surface shape using the FT-PSI method
- High-accuracy measurement can be achieved by optimizing the measurement surface of the sample with Nikon's precision polishing process

Repeatability

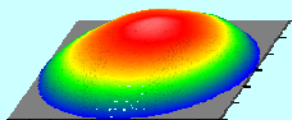
< 0.1 nm

Measurement samples

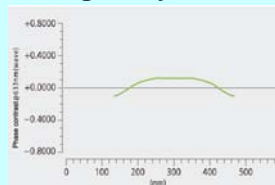
Transparent glass, crystal

Measurement example

Homogeneity (3D map)



Homogeneity (Cross-section map)



Sample : Synthetic silica glass
 $\Delta n = 1.9$ ppm (PV)
 $\phi 350$ mm example

Analysis and measurement services

Item	Wavelength range, Condition, Usage, Equipment
Refractive index	Standard wavelength: C, d, F, g
	Wavelength: 185 ~ 1013 nm
Temperature coefficients of refractive index	Wavelength: i, g, F, F', e, d, C', C, r Temperature: -70 ~ 90 °C
Refractive index homogeneity	Wavelength: 193 nm, 633 nm
Transmittance	Wavelength: 120 ~ 6000 nm
i-line solarization	Super-high-pressure mercury lamp
Laser durability	ArF excimer laser
Reflectance	Wavelength: 240 ~ 2600 nm
Birefringence	Crossed Nicols method
	Standard measurement (accuracy: 1 nm/cm)
	Precise measurement (accuracy: 0.1 nm/cm)
	Birefringence distribution (wavelength: 157 nm, 193 nm, 248 nm, 633 nm)
Photoelastic constant	Wavelength: 157 nm, 193 nm, 248 nm, 633 nm
Density	JOGIS 05
Fluorescence	Wavelength: 220 ~ 730 nm
Crystal orientation	Calcium fluoride, Quartz, Sapphire, Magnesium fluoride etc.
Internal quality	JOGIS 11, 12, 13
Raman spectroscopy	Hydrogen concentration, OH concentration, Fictive temperature (silica glass evaluation)
Focal length	Standard wavelength: C, d, e
Photomicroscopy	Light microscope (maximum 50 magnifications)
Thermal properties	Linear expansion coefficient (room temperature ~ 1500 °C)
	Transformation temperature, Yield point
	Thermogravimetric/Differential thermal analysis (room temperature ~ 1450 °C)
	DSC (room temperature ~ 1500 °C)
Mechanical properties	Young's modulus, Shear modulus, Poisson's ratio
	Knoop hardness, Vickers hardness
	Abrasion (JOGIS 10)
Chemical properties	Climate resistance, Water resistance, Acid resistance, Alkali resistance

- Samples may need to be processed depending on measurements. Please contact us to learn more about prices and lead times.
- Please also contact us about other measurement conditions and analysis of results.



NIKON CORPORATION Glass Division

10-1, Asamizodai 1-chome, Minami-ku, Sagami-hara,
 Kanagawa 252-0328 Japan
 Tel : +81-42-740-6746
 glass.sales@nikon.co.jp
<http://www.nikon.co.jp/glass/>

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