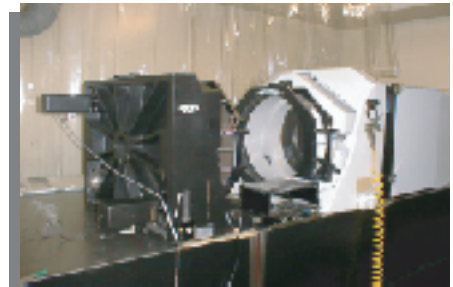


Ohara has established an independent service center to focus on materials measurement and analysis. This facility encompasses some of the world's most advanced optical metrology equipment and is capable of measuring glass, ceramics, quartz, fused silica, calcium fluoride, liquids, polymers and other materials. We would be pleased to measure your materials.

SERVICES

- **Measurement of Refractive Indices**
 - Refractive indices
 - Temperature coefficients of refractive index
 - Optical homogeneity
 - Stress birefringence/strain
- **Measurement of Spectral Transmission and Reflection**
 - Transmission at UV, visible and infrared wavelengths
 - Internal transmittance
- **Measurement of Mechanical Characteristics**
 - Knoop and Vickers hardness
 - Poisson's Ratio and Young's Modulus
 - Photoelastic constant
- **Measurement of Thermal Characteristics**
 - Linear expansion coefficient
 - Thermal conductivity
 - Strain point and annealing point
 - Softening point
- **Evaluation of Chemical Durability**
 - Evaluation of chemical durability by powder and surface methods
- **Dimensional Measurements**
 - Flatness, surface roughness, concentricity, angles, etc.
 - Analysis of composition and raw materials
 - Major and minor chemical composition elements
- **Micro Topography and Compositional Analysis**
 - Pin-point surface analysis by SEM / EPMA
 - X-Ray Fluorescence (XRF) measurement



Spectral Line Measurements and Accuracy

Spectral lines				Measuring equipment			
				Moeller Wedel			Carl Zeiss Jena
Wave-length in air (nm)	Wave-length in vacuum (nm)	Sym.	Light source	Super precision spectrometer Type1		Precision spectrometer Type 2	Refractometer Type PR-2
				Ultra precision measurement	Precision measurement	Standard measurement	Standard measurement
				Measuring accuracy (10 ⁻⁶)	Measuring accuracy (10 ⁻⁵)	Measuring accuracy (10 ⁻⁵)	Measuring accuracy (10 ⁻⁵)
2325.42	2326.05		Hg	±5	±1	x	x
2058.09	2058.65		He	±5	±1	x	x
1970.09	1970.63		Hg	±5	±1	x	x
1813.07	1813.57		Hg	±5	±1	x	x
1529.58	1530.00		Hg	±5	±1	x	x
1128.64	1128.95		Hg	±3	±1	x	x
1013.98	1014.26	t	Hg	±1	±1	±3	±5
852.110	852.344	s	Cs	±1	±1	±3	±5
780.023	780.237		Rb	±1	±1	±3	±5
706.519	706.714	r	He	±1	±1	±3	±5
656.273	656.454	C	H ₂	±1	±1	±3	±3
643.847	644.025	C'	Cd	±1	±1	±3	±3
632.82	632.99		He-Ne	±1	±1	±3	±3
587.562	587.725	d	He	±1	±1	±3	±3
546.075	546.227	e	Hg	±1	±1	±3	±3
486.133	486.269	F	H ₂	±1	±1	±3	±3
479.992	480.126	F'	Cd	±1	±1	±3	±3
435.835	435.957	g	Hg	±1	±1	±3	±3
404.656	404.770	h	Hg	±1	±1	±3	±5
388.865	388.975		He	±1	±1	±3	x
365.015	365.119	i	Hg	±1	±1	±3	x
346.620	346.719		Cd	±3	±1	x	x
340.365	340.463		Cd	±3	±1	x	x
334.148	334.244		Hg	±3	±1	x	x
326.106	326.200		Cd	±3	±1	x	x
312.566	312.657		Hg	±3	±1	x	x
296.728	296.814		Hg	±3	±1	x	x
289.360	289.444		Hg	±3	±1	x	x
253.652	253.728		Hg	±3	±1	x	x
228.802	228.872		Cd	±3	±1	x	x
226.502	226.572		Cd	±3	±1	x	x
214.438	214.506		Cd	±3	±1	x	x
213.856	213.923		Zn	±3	±1	x	x
206.200	206.266		Zn	±3	±1	x	x
202.548	202.613		Zn	±3	±1	x	x
-	194.227		Hg	±5	±1	x	x