

Gemmological refractometer

RF.6381



Introduction

With your purchase of a Euromex hand refractometer you have chosen for a quality product. The Euromex hand refractometers are developed for use in laboratories and in the food industry

The maintenance requirement is limited when using the refractometer in a decent manner

This manual describes the construction of the refractometer, how to use the refractometer and maintenance of the refractometer

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General safety instructions

- This product is a high quality optical instrument. Delicate handling is required
- Impacts, even small ones, can affect the precision of the device
- Keep the device and its optics clean for maximum performance
- Precautions should be taken with the samples; substances under observation may be a risk to the health of humans and other living organisms or the environment

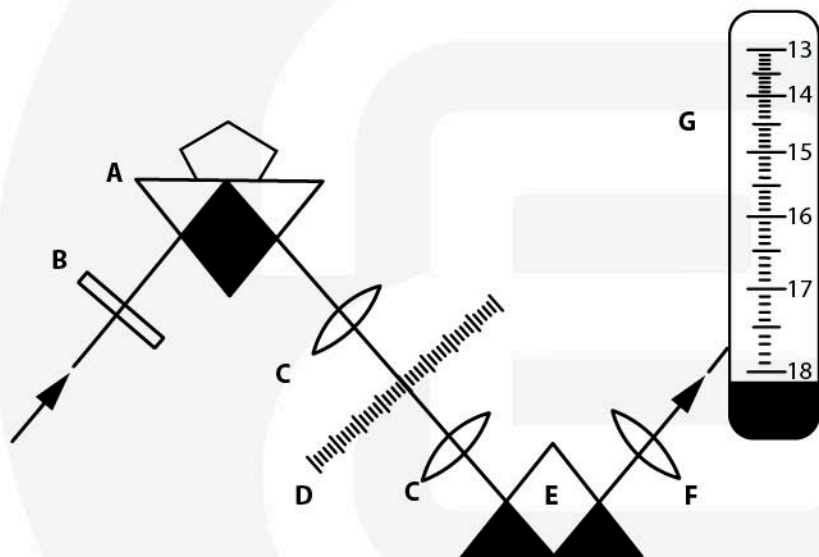
Construction of the RF.6381

The names of the parts are listed below and are indicated in the picture on page 2:

A	Cover lid	C	Eyepiece
B	Prism surface	D	Attachable polarizing filter in metal mount

Optical design of the refractometer

A	Prism	E	Reflection mirror
B	D-Line (Fraunhofer line) filter	F	Eyepiece
C	Relay lens	G	Field of view
D	Refractive index scale		



Specifications of the refractometer RF.6381

Measuring range: 1.30 – 1.81 R.I. (Refractive Index), accuracy 0.01

Filter: Built-in 590 nm.

Accessories: Detachable polarization filter for eyepiece

Preparing the refractometer for use

Remove the packaging and put the refractometer on a flat surface. Sit comfortably down behind the refractometer and take a relaxed position while looking through the eyepiece

Working with the refractometer



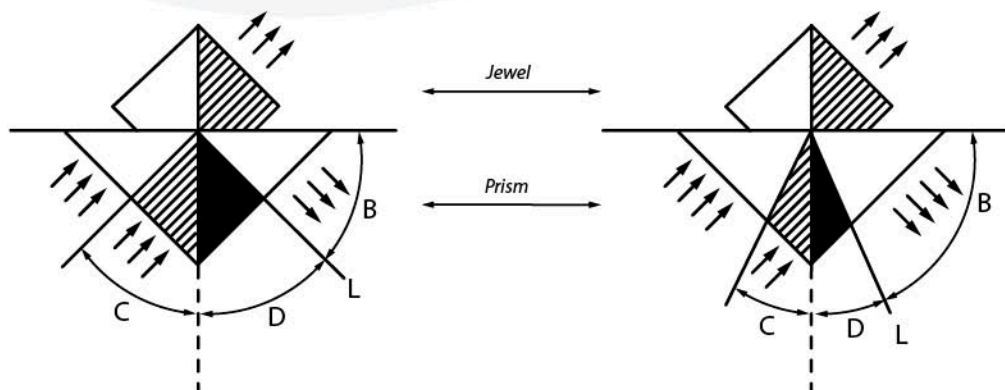
Caution! Always use immersion fluid between the gem and the prism and never touch the prism with a tool or forceps

The prism used in the refractometer must have a higher refractive index as the index of the jewels to be measured. Accordingly, this prism is made of lead glass including large quantity of lead oxide. This makes the prism soft and corrodible

Open the cover of the instrument and softly wipe off the prism with a lenspaper. Put a drop of the immersion fluid onto the surface of the prism. After having cleaned the gem you want to be measured, carefully place it into the drop of immersion fluid

Direct the filter window on the back of the instrument towards a light source and look through the eyepiece. You will see the borderline between bright- and darkfield in the field of view. At this point the refractive index can be observed

If the measured jewel has a mono-refractive index, you see a spectrum as borderline, but if the jewel has double-refractive index you will see two spectrums on the borderline in the field of view



C Critical angle of refraction between prism and jewel

B Brightfield by reflection

D Darkfield by refraction

L Borderline divide brightfield and darkfield which appears in the field of view through the eyepiece

Maintenance and cleaning

The instrument can be cleaned with a soft cloth. The optical parts like prism and polarizer/analyser can be cleaned with special lens papers



Caution:

Cleaning cloths containing plastic fibres can damage the prism!

Refractive index table for jewels

Name of jewel	REFRACTIVE INDEX		
	Double index	Mono index	Double index
Almandite		1.800 (± 0.030)	
Amblygonite	1.612		1.636
Anatase	2.493		2.554
Andradite G		1.875 (± 0.020)	
Andalusite	1.634 (± 0.006)		1.643 (± 0.004)
Apatite	1.642 (+0.003 / -0.012)		1.646 (+0.005 / -0.014)
Augelite	1.574		1.588
Azinite	1.678		1.688
Azurite	1.730 (± 0.010)		1.840 (± 0.010)
Benitoite	1.757		1.804
Beryl	1.577 (± 0.016)		1.583 (± 0.017)
Brasiliannite	1.602		1.621
Cassiterite	1.997		2.093
Chrysoberyl	1.746 (± 0.004)		1.755 (± 0.005)
Corundum	1.762 (± 0.007)		1.770 (± 0.008)
Dambrite	1.630 (± 0.003)		1.636 (± 0.003)
Datolite	1.626		1.670
Diamond		2.417	
Diopside	1.675 (+0.027 / -0.010)		1.701 (+0.029 / -0.007)
Dioptase	1.655 (± 0.011)		1.708 (± 0.012)
Dumortierite	1.678		1.689
Ekanite		1.597	
Enstatite	1.658 (± 0.005)		1.668 (± 0.005)
Epidote	1.729 (+0.006 / -0.015)		1.768 (+0.012 / -0.035)
Euclase	1.654 (± 0.004)		1.674 (± 0.004)
Gahnite		1.800	
Gahnspinel		1.760 (± 0.020)	
Grossularite		1.735 (± 0.015)	
Idocrase	1.713 (± 0.012)		1.718 (± 0.014)
Jedite	1.654		1.667

Name of jewel	REFRACTIVE INDEX		
	Double index	Mono index	Double index
Jet		1.660 (±0.020)	
Kyanite	1.716 (±0.004)		1.731 (±0.004)
Lazu-lite	1.612		1.643
Marcasite	1.660		1.910
Nephrite	1.606		1.632
Odontolite	1.600 (±0.030)		1.620 (±0.020)
Painite	1.787		1.816
Peridot	1.654 (±0.020)		1.690 (±0.020)
Phenakite	1.654 (+0.017 / -0.003)		1.670 (+0.026 / 0.004)
Prehnite	1.615		1.646
Pyrope		1.746 (+0.010 / -0.026)	
Rhodelite		1.760 (±0.010)	
Rhodizite		1.690	
Rhodnite	1.730		1.740
Rhodochrosite	1.597		1.817
Scheelite	1.918		1.934
Sillimantite	1.659		1.680
Sinhalite	1.668 (±0.003)		1.707 (±0.003)
Smithsonite	1.621		1.849
Spessartite		1.810 (±0.010)	
Sphalerite		2.370	
Spinel		1.718 (+0.044 / -0.006)	
Spodumene	1.660 (±0.005)		1.676
Staurolite	1.735		1.746
Stibiotantalite	2.380		2.450
Taaffeite	1.719		1.723
Titanite	1.900 (±0.018)		2.034 (±0.020)
Topaz	1.619 (±0.010)		1.627 (±0.010)
Tourmaline	1.624 (±0.005)		1.644 (±0.006)
Turquoise	1.610		1.650
Verdite		1.580	
Willemite	1.690		1.720
Zincite	2.013		2.029
Ziosite	1.700		1.706
Zircon (H)	1.927		1.984
Zircon (L)	1.810 (±0.020)		1.815 (±0.020)
Zircon (M)	1.875 (±0.045)		1.905 (±0.075)



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