



# euromex RF.6381 Science Dealing Gemological Refractometer User Manual

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Gemmological refractometer  
RF.6381

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**RF.6381 Science Dealing Gemological Refractometer**



user manual

## Introduction

With your purchase of a Euromex hand refractometer, you have chosen 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.



## 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

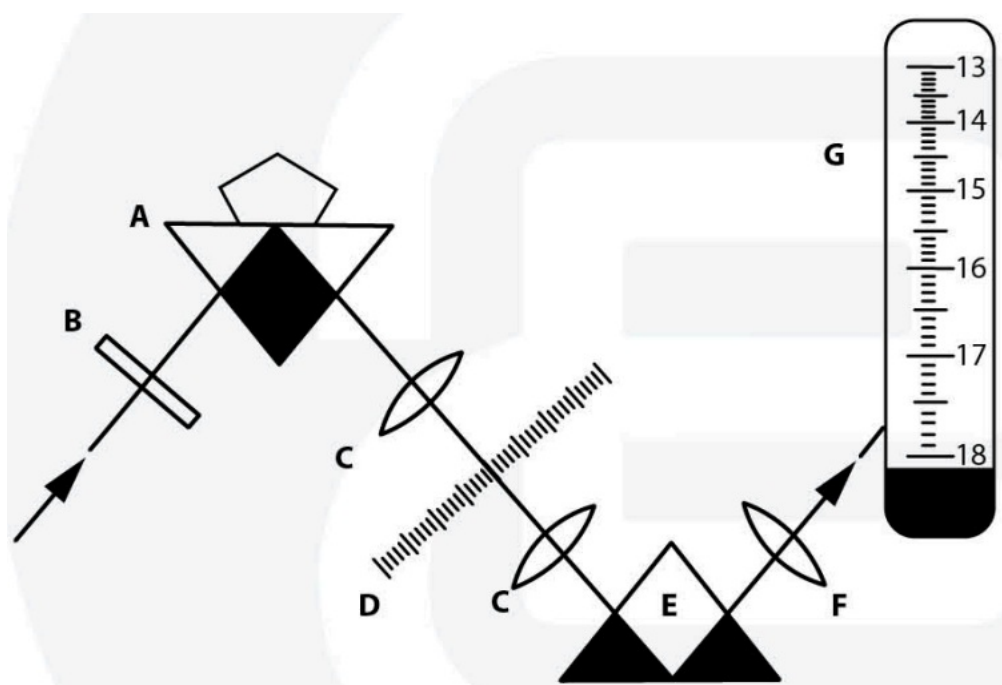
## Construction of the RF.6381

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

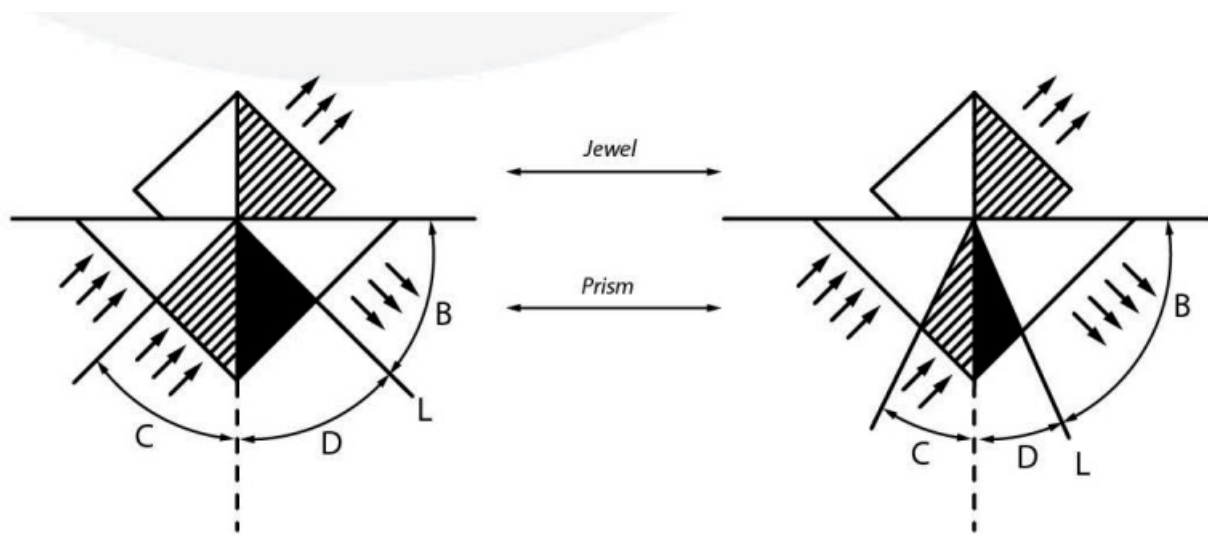
**⚠ Caution!** Always use immersion fluid between the gem and the prism and never touch the prism with a tool or forceps

The prism used in the refractometer must have a higher refractive index than the index of the jewels to be measured. Accordingly, this prism is made of lead glass including a 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 lens paper. 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 the 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 a 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 Bright field by reflection

D Dark field by refraction

L Borderline divide brightfield and dark field 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/analyzer can be cleaned with special lens papers

**⚠ Caution:** Cleaning cloths containing plastic fibers can damage the prism!

### Refractive index table for jewels

| Name of jewel | REFRACTIVE INDEX |            |              |
|---------------|------------------|------------|--------------|
|               | Double index     | Mono index | Double index |
|               |                  |            |              |

|               |                         |                       |                         |
|---------------|-------------------------|-----------------------|-------------------------|
| Almandite     |                         | 1.800 ( $\pm 0.030$ ) |                         |
| Amblygonite   | 1.612                   |                       | 1.636                   |
| Anatase       | 2.493                   |                       | 2.554                   |
| Andradite G   |                         | 1.875 ( $\pm 0.020$ ) |                         |
| Andalusite    | 1.634( $\pm 0.006$ )    |                       | 1.643 ( $\pm 0.004$ )   |
| 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 ( $\pm 0.010$ )   |                       | 1.840 (10.010)          |
| Benitoite     | 1.757                   |                       | 1.804                   |
| Beryl         | 1.577 ( $\pm 0.016$ )   |                       | 1.583 ( $\pm 0.017$ )   |
| Brasillannite | 1.602                   |                       | 1.621                   |
| Cassiterite   | 1.997                   |                       | 2.093                   |
| Chrysoberyl   | 1.746 ( $\pm 0.004$ )   |                       | 1.755 (0.005)           |

|              |                         |                       |                         |
|--------------|-------------------------|-----------------------|-------------------------|
| Corundum     | 1.762 ( $\pm 0.007$ )   |                       | 1.770( $\times 0.008$ ) |
| Dambrlre     | 1.630( $\times 0.003$ ) |                       | 1.636 ( $\pm 0.003$ )   |
| Datollte     | 1.626                   |                       | 1.670                   |
| Diamond      |                         | 2.417                 |                         |
| Diopside     | 1.675 (+0.027 / -0.010) |                       | 1.701 (+0.029 / -0.007) |
| Diopase      | 1.655 ( $\pm 0.011$ )   |                       | 1.708 ( $\pm 0.012$ )   |
| Dumortierite | 1.678                   |                       | 1.689                   |
| Ekanite      |                         | 1.59/                 |                         |
| Enstatite    | 1.658 ( $\pm 0.005$ )   |                       | 1.668 ( $\pm 0.005$ )   |
| Epidote      | 1.729 (+0.006 / -0.015) |                       | 1.768 (+0.012 / -0.035) |
| Euclase      | 1.654( $\times 0.004$ ) |                       | 1.674( $\pm 0.004$ )    |
| Gahnite      |                         | 1.800                 |                         |
| Gahnospinel  |                         | 1.760 (10.020)        |                         |
| Grossularite |                         | 1.735 ( $\pm 0.015$ ) |                         |

|          |                       |  |                       |
|----------|-----------------------|--|-----------------------|
| Idocrase | 1.713 ( $\pm 0.012$ ) |  | 1.718 ( $\pm 0.014$ ) |
| Mate     | 1.654                 |  | 1.667                 |

| Name of jewel | REFRACTIVE INDEX         |                       |                        |
|---------------|--------------------------|-----------------------|------------------------|
|               | Double index             | Mono index            | Double index           |
| Jet           |                          | 1.660 ( $\pm 0.020$ ) |                        |
| Kyanite       | 1.716 ( $\pm 0.004$ )    |                       | 1.731 ( $\pm 0.004$ )  |
| Lazu-lite     | 1.612                    |                       | 1.643                  |
| Marcasite     | 1.660                    |                       | 1.910                  |
| Nephrite      | 1.606                    |                       | 1.632                  |
| Odontolite    | 1.600 ( $\pm 0.030$ )    |                       | 1.620 ( $\pm 0.020$ )  |
| Painite       | 1.787                    |                       | 1.816                  |
| Peridot       | 1.654 ( $\pm 0.020$ )    |                       | 1.690 ( $\pm 0.020$ )  |
| Phenakite     | 1.654 (+0.017 / -0.0403) |                       | 1.670 (+0.026 / 0.004) |
| Prehnite      | 1.615                    |                       | 1.646                  |
| Pyrope        |                          | 1.746 (+0.010/-0.026) |                        |
| Rhodelite     |                          | 1.760 ( $\pm 0.010$ ) |                        |

|                 |                       |                         |                       |
|-----------------|-----------------------|-------------------------|-----------------------|
| 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 ( $\pm 0.003$ ) |                         | 1.707 ( $\pm 0.003$ ) |
| Smithsonite     | 1.621                 |                         | 1.849                 |
| Spessartite     |                       | 1.810 (*two)            |                       |
| Sphalerite      |                       | 2.370                   |                       |
| Spinel          |                       | 1.718 (+0.044 / -0.006) |                       |
| Spodumene       | 1.660 ( $\pm 0.005$ ) |                         | 1.676                 |
| Staurolite      | 1.735                 |                         | 1.746                 |
| Stibiotantalite | 2.380                 |                         | 2.450                 |
| Taaffeite       | 1.719                 |                         | 1.723                 |
| Titanite        | 1.900 (10.018)        |                         | 2.034 (10.020)        |
| Topaz           | 1.619 ( $\pm 0.010$ ) |                         | 1.627 ( $\pm 0.010$ ) |
| Tourmaline      | 1.624 ( $\pm 0.005$ ) |                         | 1.644 ( $\pm 0.006$ ) |




|            |                |       |                |
|------------|----------------|-------|----------------|
| Turquoise  | 1.610          |       | 1.650          |
| Verdite    |                | 1.580 |                |
| Willemite  | 1.690          |       | 1.720          |
| Zincite    | 2.013          |       | 2.029          |
| Zoisite    | 1.700          |       | 1.706          |
| Zircon (H) | 1.927          |       | 1.884          |
| Zircon (L) | 1.810 (±0.020) |       | 1.815 (±0.020) |
| Zircon (M) | 1.875 (±0.045) |       | 1.905 (±0.075) |

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All information may be changed without prior notice v.124281



## Documents / Resources

|  |   |
|--|---|
|  <p>Gemmological refractometer<br/>RF.6381</p> <p>euromex user manual</p> | <p><a href="#">euromex RF.6381 Science Dealing Gemmological Refractometer</a> [pdf] User Manual<br/> RF.6381, Science Dealing Gemmological Refractometer, Gemmological Refractometer, Science Dealing Refractometer, Refractometer, RF.6381</p> |
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