CALIBRATION & REPAIR SERVICES

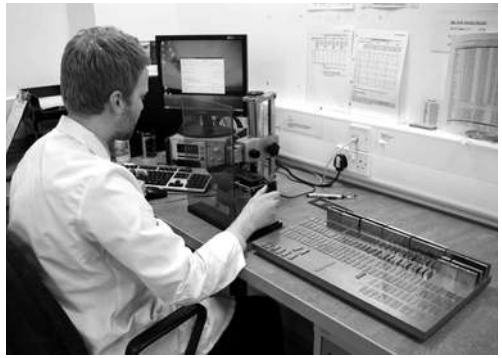
Purpose-built laboratory and workshop providing UKAS accredited calibration services.

UKAS CALIBRATION
0244

- Temperature controlled to 20°C +/- ½° to ensure accuracy of calibration.
- Fully upgraded equipment and software for accurate, traceable measurement and calibration.
- Conformance to International Standard BS EN ISO/IEC 17025: 2005.
- Cost-effective, customer focused service delivery.

UKAS Accredited Calibration Services at Wigston, Leicester, LE18 2FS.



AVAILABLE FROM YOUR DISTRIBUTOR

OXFORD PRECISION Leicester, England, LE18 2FS.

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OXFORD PRECISION

Portable Optical Refractometer

- Improved eyepiece and focus adjuster
- Improved calibration mechanism with covered screw
- Improved textured rubber sleeve on barrel
- Relocated cover plate hinge for easier cleaning

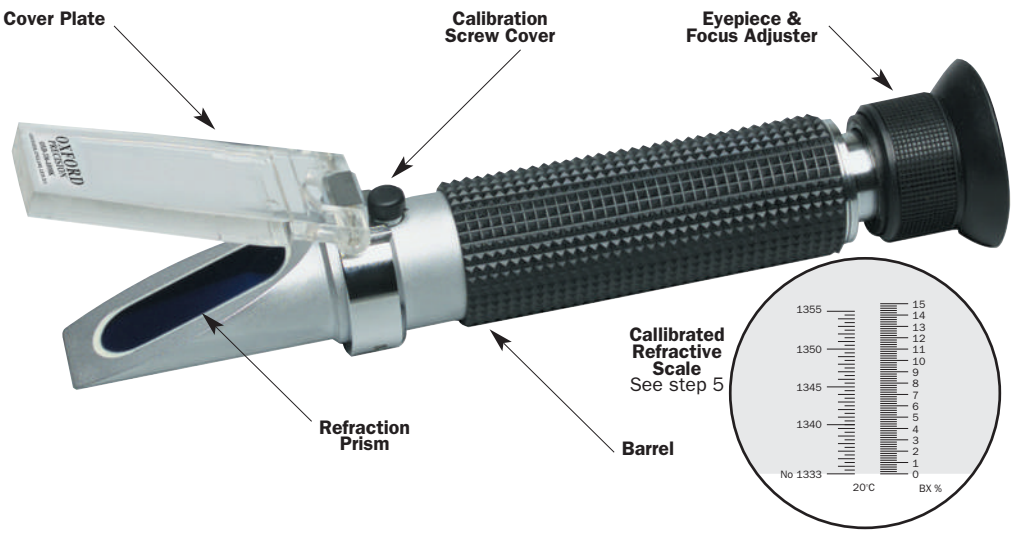


OXD-336-1010K

OPERATOR'S MANUAL

OXFORD Portable Optical Refractometer

An optical instrument which uses the variation in refractive index of fluids at different concentrations to measure dilution ratios.



Instructions

Readings will vary according to Temperature. It is recommended that the Refractometer should be calibrated before every use.

Calibration

Use a "standard" of known value, on the refractive index. Distilled water being zero, is recommended.

1. Open cover plate, and ensure both prism, and inner face of cover plate are clean. Use a soft, clean and lint free cloth.
2. Place a drop of distilled water onto the centre of the prism and close the cover.
3. The sample will spread over the surface of the prism and become a thin film.
4. With a light source (daylight is preferable) above the prism cover, look through the eyepiece. Focus is adjusted by means of rotating the adjuster. The line of measurement is the boundary line between the blue and white zones.
5. Using the small screwdriver provided adjust the calibration screw until the boundary line is exactly at zero on the scale.

The refractometer is now ready for use.

6. To measure a sample from the coolant system, take a drop from the outlet pipe of the machine. This avoids picking up any tramp oil from the surface of the coolant tank.
7. After cleaning (drying) the prism and inner face of the cover plate, place a drop from the sample onto the centre of the prism.
8. Close the lid and take a reading by looking through the eyepiece (focus as necessary by rotating the adjuster) and record the figure where the boundary line passes through the scale.
9. Clean prism and cover after use.
   The reading taken should be related to the refraction index figure given for the particular product and dilution by the manufacturer.

If this figure is not available the following is an alternative means of establishing one.

After following the calibration procedure (Steps **1** to **4**,) mix a small sample of the emulsion in a measuring cylinder, using the manufacturers recommended proportion of oil to water. This sample may then be measured following steps **7** to **9** to establish the correct scale reading for that particular product and dilution.

You can now compare, using steps **6** to **9**, a sample from the machine to determine the strength of the coolant in the system.

The higher the reading, the more concentrated the mix is. The nearer to zero the reading is, the weaker the solution.

Application

For determining the concentration of oil in water emulsions and transparent solutions, such as machine shop coolant.

Maintaining the correct mixture in coolant systems is vital to ensure optimum performance from cutting tools.

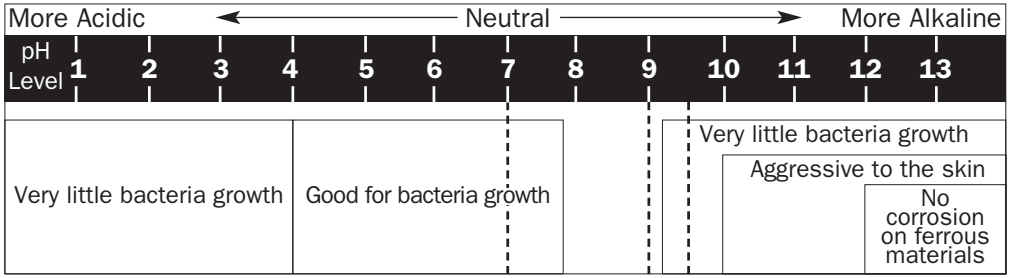
To protect the machine and work piece from corrosion and to reduce the risk of health hazards arising from incorrect concentrations of water soluble oils.

To economise the use of water base cutting fluids and grinding fluids.

Note: Dilution ratio does not necessarily give an indication of the condition of the emulsion. Bacteria and/or pH level can effect coolant performance. For further details regarding pH level please see below.

The pH Scale

pH is a measurement of the acidity or alkalinity of an aqueous fluid.
pH should be measured using pH papers, which are available from your Oxford distributor.
The end of the paper should be dipped in to the test fluid. Within a matter of seconds it will change colour. This colour can then be matched to a standard pH colour chart. Always test a sample from the outlet pipe of the machine. This avoids picking up tramp oil from the surface of the coolant tank.



Typical fresh cutting fluids are in the range pH 9 to 9.5

Each division on the scale is a factor of 10 from the next, eg. pH 9 is ten times more alkaline than pH 8.

The pH level should never be above 10 as this will cause skin irritation.

Bacteria prefer slightly acidic conditions, ie. just below pH 7 but start to be encouraged at anything below around pH 8. Bacteria can live at pH9 and as they work they excrete acid waste which reduces the pH of the emulsion, further improving their environment.

Alkaline pH's reduce corrosion of ferrous materials and above pH 12 there is no corrosion on these materials.

Cutting fluids are usually formulated to have a fresh emulsion pH in the range 9.0 - 9.5, ie. as high as possible to resist bacteria and corrosion without causing skin problems.

SPECIFICATIONS:

Range ND: 1.333 -1.356 Bx:0-15%	**Accuracy:** ± 0.0003 ± 0.2%
Eyepiece Magnification: x11	**Weight:** 0.3kg
Lattic Value: 0.0005 0.2%	**Dimensions:** (W x H x L) 38 x 38 x 185mm
Telescopic Lens Magnification: x 4	