

Manual Lensometer

Clinical

Lensometry is a procedure that measures the power of a patient's existing eye glass or contact lens, using a device called Lensometer or Focimeter. This procedure is also called neutralisation.



Procedure

Lensometer measures the three principal properties of lenses:

- Spherical and cylindrical power of lenses in diopters (the unit of measure of lens power)
- Axis, if the lenses have a cylindrical component
- Presence and direction of a prism in the lenses

Lensometers are also used to determine the location of the optical centre of a lens.

Types of Manual Lensometer

There are two types of manual lensometers

- The American crossed line target type
- European dot target type

Here we discuss American crossed line target type lensometer.

Initial steps in Lensometry

The three steps in performing lensometry are

1. Adjustment of the eyepiece (Incorrect focusing of eye piece can lead to inaccurate measurement. So the focus should be verified each time)
2. Positioning eyeglass lens on the spectacle table or platform of the lensometer
3. Measuring the sphere power, cylinder power and the axis
 - In multifocal lenses, near vision power can also be measured
 - For multifocal lenses, the distance portion is positioned and measured first.

The near vision power is the algebraic difference in dioptric power between the upper portion and the lower portion.

Adjusting Eye Piece

- The focus of the lensometer eyepiece must be verified each time
- Adjust the focusing eye piece of the lensometer so that it reads 0D on the measuring drum with the target in focus.

Mounting the Glasses

Here we see a pair of glasses mounted on the lens stage, with the right lens over the lens port, ready to be read.

- Notice that the glasses are mounted so that the temples are toward the back of the lensometer.

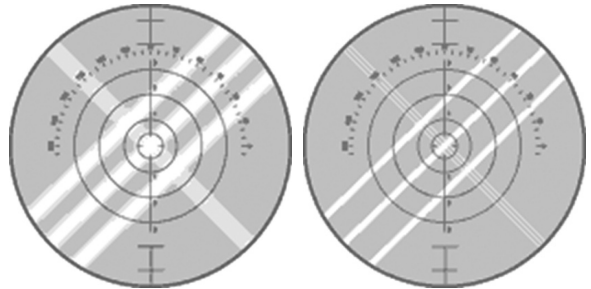


- Both right and left lenses must be touching the lens stage in order for the axis reading to be accurate.
- The lens stage moves up and down with a lever to adjust the vertical position of the lens relative to the lens port.

Neutralizing Spectacles

- Measure the right lens first. Then measure the left lens.
- Center the spectacles within the carriage of the instrument so that the target is centrally aligned within the eyepiece reticule.
- From an excess plus power direction rotate the power drum of the lensometer so that the target comes to a sharp focus in the first meridian with thin lines, simultaneously rotating the axis drum making its target lines continuous. This is the first meridian. Note the position of the power drum.
- Continue rotating the power drum until the second meridian with thick lines comes into sharp, continuous focus. This is the second meridian. Note the position of the power and axis drums.

Distinctly different foci, the lens is spherocylinder..



Unfocused image

Focused image

- If both meridians come to a sharp focus simultaneously, the lens is spherical. If there are two distinctly different foci, the lens is spherocylinder.

Neutralize Add / Bifocal Power

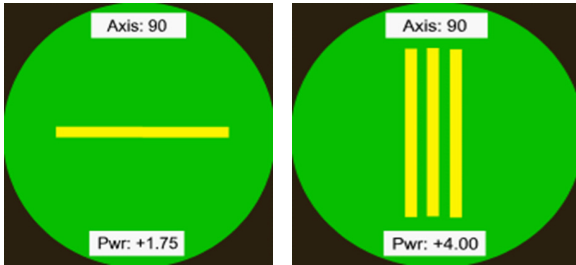
- Adjust glasses on platform by turning glasses so that temples are toward you and bottom of glasses are positioned for viewing to determine add power.
- Bifocal power is determined by rotating the power drum until the thin lines are in focus again.
- The difference between this number and sphere reading power is the amount of "add" to the lenses

Recording Prescription – Distance

- Sphere – first power drum reading with thin lines focused.
- Cylinder – second power drum reading with thick lines focused. Recorded as difference between first reading and this one. This measurement gives the POWER of the cylinder meridian.
- Axis – degree reading with thin lines focused.

Reticule - a net of fine lines in the eye piece

Example:



Ans: +1.75Ds/ +2.25D cyl x 90°

Neutralizing Prism in the Lensometer

- Position the glasses on the platform with optical centre in the middle as if reading sphere power.
- When viewing the mires, lines may be off-centre. The rings inside the lensometer are measured at 1 prism diopter.
- The number of rings from the centre of the reticule over is the amount of prism in the glasses.

Prism Direction

- This is determined by the direction of displacement of the intersection of the thin and thick lines

- If the position of the lines is toward the nose piece, it is base-in prism.
- If the position of the lines is toward the top of the lens, it is base-up prism

Check calibration of lensometer

- Rotate the diopter dial until all mires come into focus without a lens on the frame table.
- If the diopter dial reads “0” once all mires are in focus, the lensometer is properly calibrated.

Remember

- Adjust eyepiece of the lensometer before each reading.
- Carefully fine-tune the power and the axis drums.
- If the lens is multifocal, look carefully for the maximum plus power position of the lens.

- S.M.Mariammal

Refraction – Tutor, Aravind - Tirunelveli