

LENSOMETRY WORKSHOP

Sandra Fortenberry, O.D.
Tami Hagemeyer, A.B.O.C.

TERMINOLOGY

Lensometer – instrument designed to measure the prescription of an optical lens.

Mires – lines, thick and thin used as measurement images.

Power Drum or Power Wheel – dial used to determine lens power.

Platform- stage the frame rests on when lenses are being neutralized
Instrument consists of an ocular for viewing the mires, a flat stage or table for supporting the spectacle frame, a power dial, and an axis wheel.

Sphere – lens with optical power being the same in all meridians (conveyed in diopters).

Cylinder – lens that has different refractive/optical power in each meridian. It is used to correct astigmatism.

Axis – meridian of cylinder with the minimum power perpendicular to maximum power meridian. Expressed in degrees.

Prism - a transparent, wedge shaped material with two flat surfaces inclined at a given angle that connect at a point called the apex. The two connected surfaces are resting on the base of the prism. Prisms are used to help the eyes to work together by bending or refracting light.

Lensometer Functions

The function of a Lensometer is to determine the characteristics of a lens, including:

1. Power
2. Optical Center location
3. Major Reference Point location
4. Prism power/direction
5. Cylinder axis orientation

The Lensometer is also used to place marks on a lens to ensure proper placement of the lens during the fabrication process.

NEUTRALIZING THE LENSES

1. Mount the eyewear on the lensometer's platform. The lenses should sit uniformly, and level on the lensometer platform, with the viewing lens centered on the eyewear's optical center. Use the lens brace to ensure stability.
2. When we establish the spherical power of the lens. Turn the power drum until the thin mires are both parallel and in focus. Read the measurement on the power drum to get the spherical value for the lens.
3. Measure the cylinder power of the lens. Simultaneously turn the power drum and the axis wheel to focus the thin mires, and then turn the power drum to bring the wide mires vertical to the thin mires into focus. Subtract the current power on the power drum from the spherical power reading (found in step 2). The difference is the cylinder power of the lens.
4. The axis is the number on the axis dial when spherical power is measured.

Multifocal neutralization

The eyewear is centered on the platform, neutralize for sphere, cylinder and axis (as in 1-4). Move the eyewear to the center of the bifocal segment.

Center the viewing lens of the lensometer on the bifocal portion of the lens. Adjust the focus knob once again to bring the thin mires into focus and subtract the current reading from the previous reading, (if the power is minus), or add (if the power is plus).

A trifocal is measured the same; the mid section will not have to be neutralized.

When neutralizing a progressive lens, we place the fitting cross on the center of the lensometer's viewing lens for distance prescription, and proceed as in 1, -4. To measure for the near add power, move the eyewear up on the lensometer platform, and over (nasal). Focus the thin mires, and subtract the power found on the power wheel, (if sphere power is minus), or add power (if sphere power is plus).

PRISMS

1. Dot the lens at the patient's center pupil.
2. Mount the eyewear on the platform of the lensometer. Line the dot (the patient's center pupil) in the center of the lensometer's viewing lens.
3. Focus the thin mires, as in neutralizing the lens spherical power. If the lens has prism we see the mires are not in the center of the lens.
4. Notice the rings that are numbered, each ring represents a degree of prism, the direction of the prism is the direction the mires are when focused, up, down,

TRANSPOSITION

We sometimes find that prescriptions come to us with plus cylinder, we, however are more familiar with neutralizing lenses in minus cylinder form. To convert the lens prescription to a minus cylinder form is called transposition. Transposition can also be used to transpose minus cylinder into plus cylinder.

1. Algebraically subtract the cylinder from the sphere power; this will be the sphere power of the lens.
2. Change the power sign of the cylinder (the power will remain the same)
3. Add 90 degrees to the axis