

6 Sphere and cylindrical lens vertex power measurement with digital lensmeter

6.1 Introduction

Currently we use so called digital or automated lensmeters for measuring vertex power of spectacle lens. Devices contain the same mechanical parts like the previous ones (light source, collimator, lens holder etc.) but also digital display (LCD) which can show us all important parameters of the measured lens.

The spectacle lens measuring in digital lensmeter is very rapid and automatic. We can control the instrument's function with buttons below display. Here we can change measuring with plus to minus cylinder, define rounding or switch on automatic measuring of the progressive lenses.



Picture 6.1: Digital automated lensmeter (Benes et al. 2010).

The most modern instruments contain so called Shack-Hartmann sensor which enables to measure high order aberration. This aberration can be generated by progressive spectacle lenses. Further we can show graphically on instrument's display increasing of the lens' addition. Some digital lensmeters are able to measure lens absorption and transmission.

6.2 Goals

- Measure and write down vertex power value of cylindrical lens on digital lensmeter.
- Measure and write down vertex power value of spherical lens on digital lensmeter.

6.3 Equipment

Digital automated lensmeter, sphere and cylindrical spectacle lens

6.4 Methods

Measure and write down vertex power value of cylindrical lens on digital lensmeter.

At first familiarize yourself with the device. Find the switch on button and rest place for the lens. Try to use marking device. In software menu meet the basic setting. It is usually rounding of measuring 0.25 D, changing the cylindrical value (plus/minus). Further place the spherical lens into instrument and use the lens holders. Finally, you can read vertex power values from to instrument's display.

Measure and write down vertex power value of spherical lens on digital lensmeter.

Be sure that all values on instrument's display are cleared. Put the cylindrical lens in the instrument's rest place. On instrument's display you can read spherocylindrical notation of lens' vertex power. This notation converts to cylindrical-cylindrical notation.

6.5 Results

Measure and write down vertex power value of spherical lens on digital lensmeter.

$S_s =$

Measure and write down vertex power value of cylindrical lens on digital lensmeter.

x sph comb. -y cyl ax. z deg.

x sph comb. +y cyl ax. z deg.

$S_1 =$

$ax_1 =$

$S_2 =$

$ax_2 =$

6.6 Discussion

Measuring with digital lensmeter is very rapid and exact. It is important to have proper measuring conditions. Spectacle lens should be placed into instrument with concave surface down. If we measure all spectacles it is important to place these spectacles in lensmeter with lower part down. Both spectacle eyes should be rested on the instrument's rest place.



Picture 6.2: Right spectacles' position in the lensmeter (Benes et al. 2010).

6.7 Conclusion, notes, comments

How can we determine prismatic in the lensmeter?

Is it important to measure lens' vertex power with 0.01 D? Why?