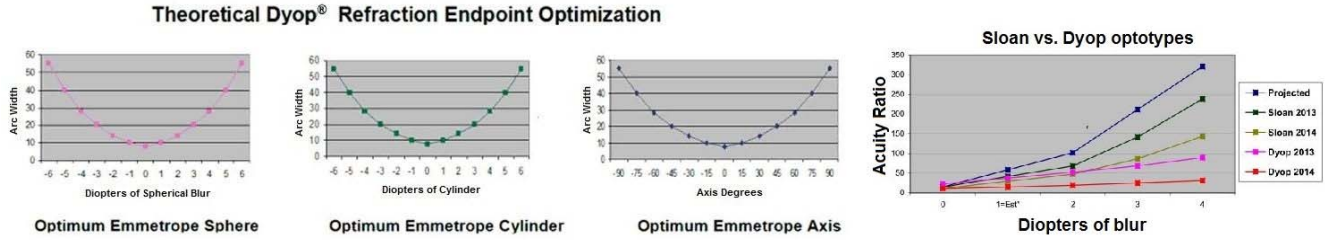
Dyop® Refraction Procedure

1. A Dyop® is a rotating segmented optotype which uses a strobic stimulus of the photoreceptors to determine visual acuity. The **Visual Acuity Endpoint** is the smallest diameter Dyop® arc width detected as rotating. The Dyop® Visual Acuity Endpoint indicates the Minimum AREA of Resolution (MAR). A Dyop® whose gap/segments only "**twinkle**" is **NOT** "rotating."

2. Before using the Dyop® test, be sure that the test is properly calibrated in the Setup as to the monitor size and the patient viewing distance. Exit the Setup screen to access the test. Use the Mouse Scroll Wheel, or the Dyop® IR controller, or the Keyboard Up/Down Arrows to adjust the Dyop® diameter sizes.

3. Displayed In the **lower left corner** of the screen will be the **Dyop® arc width diameter (arc min)** with the corresponding **Sloan**, **logMar**, **Decimal**, or **Metric** value displayed in the **upper left corner** of the screen. The acuity endpoint may be recorded as the Dyop® arc width or the comparable Snellen/Sloan ratio, the logMar value, the Decimal value, or the Metric ratio.

4. Because of the smaller Dyop visual stimulus area, and the rotational strobic stimulus, an increase in the Dyop® angular arc width has an almost linear relationship to an increase in diopters of blur, both for myopia (minus sphere) and hyperopia (plus sphere). As the "optimum" value for sphere, cylinder, and axis is achieved, the Dyop® arc width diameter where rotation can be detected will become minimized.



5. For a refraction using a Dyop®, reduce the **INITIAL Dyop® arc width with unaided vision** in each eye to the smallest Dyop® diameter where rotation can be detected. A rotating Dyop® with an angular width of 8 arc minutes is approximately equivalent to Snellen 20/20, or Metric 6/6. **Subtract 8** from that minimum **unaided INITIAL Dyop® arc width value** to have a **Dyop® Plano Comparison Value**. Divide the **Dyop® Plano Comparison Value** by **6** to get the initial +/-spherical lens diopter setting, which will be a (+) for a hyperope and (-) for a myope. For example, an **unaided INITIAL Dyop® arc width** of 14 arc minutes will be one diopter with the **Dyop® Plano Comparison Value** of **6** (14 – 8 = 6; **6/6 = 1** diopter)**.** An **unaided INITIAL Dyop® arc width** of 20 arc minutes will be two diopters (20 – 8 = 12; **12/6 = 2** diopters), 26 arc minutes will be three diopters (26 – 8 = 18; **18/6 = 3** diopters), and 32 arc minutes will be four (32 – 8 = 24; **24/6 = 4** diopters) of either a plus (+) or minus (-) spherical lens. Use the appropriate (-) or (+) lens to then further reduce the Dyop® diameter to the minimum arc width where rotation can still be detected. For a myope, a minus (-) initial spherical lens will make the Dyop® clearer and a plus (+) initial spherical lens will make the Dyop® even blurrier. For a hyperope, a plus (+) initial spherical lens will make the Dyop® clearer and a minus (-) initial spherical lens will make the Dyop® even blurrier..

6. To determine the axis, rotate a -0.50 diopter cylinder lens to determine the maximum Dyop® clarity which will be the axis setting. Once the axis is determined, further reduce the Dyop® diameter to the minimum arc width where rotation can still be detected. With the now smaller Dyop® diameter, use sphere increments of (-) 0.25 or (+) 0.25 diopters to determine if the Dyop® becomes clearer and the Dyop® diameter can be further reduced. If the Dyop® becomes blurrier, reverse the (+/-) selection.

7. Repeat the addition of cylinder increments of (-) 0.25 diopters or (+) 0.25 diopters to determine if the Dyop® becomes blurrier or clearer and the Dyop® diameter can again be further reduced. Once the cylinder is optimized, repeat the process again with sphere increments of (-) 0.25 diopters or (+) 0.25 diopters to determine the optimum setting for the minimum Dyop® diameter where the Dyop® diameter can no longer be reduced. You may also use the (+/-) sphere changes and alternating the Dyop® rotation location and rotation reversal options to check for false positives.

8. The refraction endpoint is the setting for sphere, cylinder, and axis for the minimum Dyop® diameter where Dyop® rotation can be detected. The **Best Visual Acuity** may be recorded as the (minimum) **Dyop® arc width** or the **Snellen ratio** or the **Metric ratio**. Repeat the process for each eye and binocularly.