

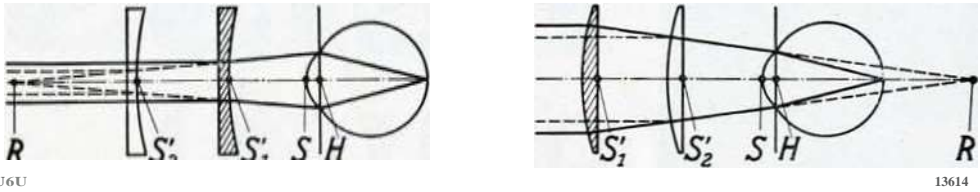
# ZEISS OPTICAL SLIDE RULE

divided by Prof. Rochat

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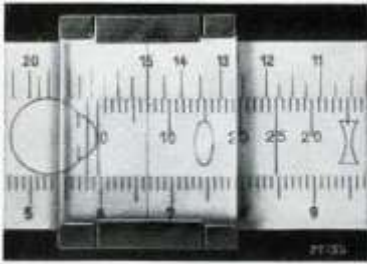
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Correcting spectacle lenses with refraction values  $s:R$  and  $SR$  at distances  $SS_1$  and  $SS_2$  from the corneal vertex  $S$ . focal intercepts of the spectacle lenses  $SfR$  and  $SR$ . Principal point refraction of the ametropic eye  $R$ .

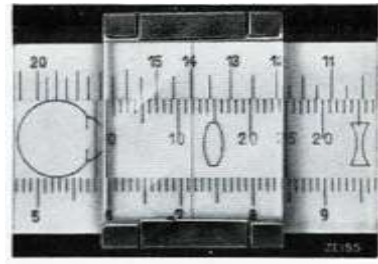
frequently a lens in the trial frame has a distance from the corneal vertex which differs from that which it is intended to occupy in the spectacle frame in which it is to be fitted. Where lenses are of a power exceeding 6 D. it will not be admissible simply to mount in the wearer's spectacle frame a lens of the same power as that in the trial frame. The first thing necessary is to ascertain the vertex refraction corresponding to the modified vertex distance. This may be computed or looked up in the table of correction values. The correction can be made, however, more quickly and with greater certainty with the aid of the **Optical Slide Rule**.

This slide rule is made of white celluloid and, like an ordinary slide rule, consists of a fixed part, a movable slide, and a cursor. The fixed portion has inscribed on it on the top surface a scale of principal point refraction values or vertex refraction values respectively from 5 to 30 D., while the movable slide bears the line corresponding to the plane of the principal point of the eye and a scale of vertex distances of the lens from the corneal vertex for long-sighted, and for near-sighted eyes. The fixed dioptré scale and the movable vertex distance scale in conjunction with the cursor line serve for ascertaining the vertex refraction values for different vertex distances and also the principal point refraction (axial refraction) of the eye from the given vertex refraction and the vertex distance. Opposite the dioptré scale the optical slide rule bears the corresponding scale of focal intercepts and focal lengths respectively. With the aid of the cursor line one is enabled to read off immediately the reciprocal value corresponding to each linear value, and conversely. The slide rule is likewise available for use as a depth-gauge for measuring the depth of the vertex of spectacle lenses.

## Finding the Vertex Refraction Value for different Vertex Distances.



I. Given a lens  $+15 D.$  at  $7 mm.$  vertex distance. Required: the vertex refraction value for  $12 mm.$  distance.



I. Set the cursor line to  $15 D.$  and move the slide so that the vertex distance  $7 mm.$  comes under the cursor line.

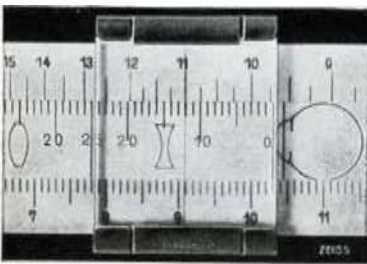
2. Set the cursor line to  $12 mm.$  vertex distance and read off the required vertex refraction value:  $+14 D.$

II. Given a lens of  $-11.5 D.$  with  $16 mm.$  vertex distance. Required: the vertex refraction value for  $12 mm.$  distance.

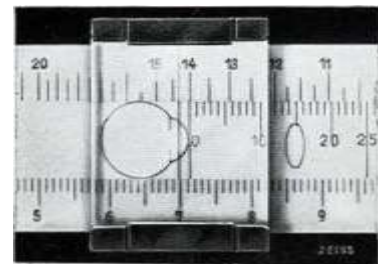
III. Given a lens  $+12 D.$  at  $12 mm.$  vertex distance. Required: the axial refraction.

1. Set the cursor line to  $11.5 D.$  and move the slide so that the vertex distance  $16 mm.$  comes under the cursor line.

1. Set the cursor line to  $12 D.$  and the slide so that the vertex distance  $12 mm.$  comes under the cursor line.



2. Set the cursor line to  $12 mm.$  vertex distance and read off the required vertex refraction value:  $-11 D.$



2. Set the cursor line to the principal plane of the long-sighted eye (inner line) and read off the axial refraction:  $+14.3 D.$

IV. Given an astigmatic lens  $-16.5 - 20 D.$  at  $16 mm.$  vertex distance. Required: the vertex refraction value for  $12 mm.$  distance.

I. Set the cursor line to  $16.5 D.$  and the slide so that  $16 mm.$  vertex distance comes under the cursor line.

2. Set the cursor to  $12 mm.$  vertex distance and read off vertex refraction value for the first principal section:  $-15.5 D.$

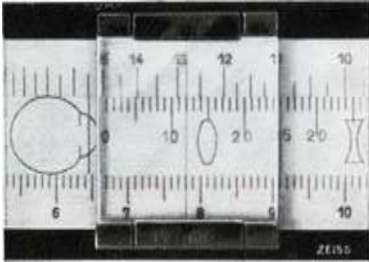
3. Set the cursor line to  $20 D.$  and the slide so that  $16 mm.$  vertex distance comes under the cursor line.

4. Set the cursor line to  $12 mm.$  and read off the vertex refraction value for the second principal section:  $-18.5 D.$

For  $12 mm.$  vertex distance the required astigmatic lens will be  $-15.5 - 18.5 D.$

V. Given a lens  $+13.5$  D. at  $8$  mm. vertex distance. Required: a lens for  $12$  mm. distance.

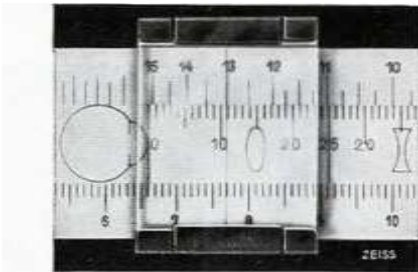
1. Set the cursor line to  $13.5$  D. and the slide so that vertex distance  $8$  mm. comes under the cursor line.



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2. Set the cursor line to  $12$  mm. vertex distance and read off the vertex refraction value:  $+12.8$  D.

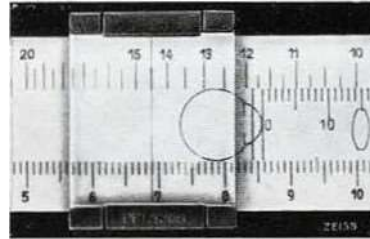
$+13$  D. to be prescribed in place of  $+12.8$  D.  
What is the required vertex distance



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3. Set the cursor line to  $13$  D. and read off the vertex distance under the cursor;  $11$  mm.

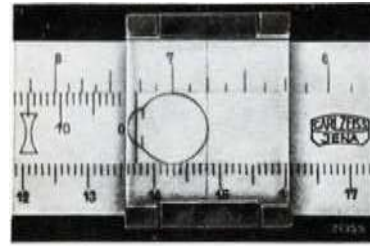
VI. Required: focal intercept of spectacle lens of  $14.5$  D. vertex refraction.



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- Set the cursor line to  $14.5$  D. and on the millimetre scale: below read off the focal intercept:  $69$  mm.

VII. Required: power of lens  $148$  mm. focal length.



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- Set the cursor line to  $148$  mm. and on the dioptré scale above read off the power:  $6.75$  D.

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VIII. When measuring the depth of the vertex the contact edge of the slide rule should rest with both sides upon the edges of the lens and the point of the taper end of the slide should be in contact with the inside lens vertex. Read off with the aid of the vernier: e. g.  $6.6$  mm. The zero line of the vernier is situated between  $6$  and  $7$  on the upper scale. The sixth vernier line (signifying  $6.6$ ) coincides with a line on the upper scale.

