



6.2. Gradal[®] RD

Product Specifications

Material

- CR39 hard resin
- $n_d=1.499$
- Abbe 58
- Specific Gravity 1.32 g/cm^3
- >93% UV-A and 100% UV-B Protection

Technical Processing Notes

- Please see detailed description on the following pages. Zeiss recommends a minimum center thickness of 1.8 mm. Gradal[®] RD lenses of this minimum thickness fulfill the FDA standards of impact resistance.
- After blocking wait 15 minutes to allow lenses to cool before generating.
- Zeiss recommends deblocking by cold knock off or block ejector, not by hot water.

Hard Coating

Zeiss Gradal[®] RD semi-finished lens blanks feature a factory applied, scratch resistant hard coating.

Delivery Range

- Sph +6.00D to -6.00D
- Cyl up to -4.00D (total combined power not to exceed -6.00D)
- Adds 0.50D to 2.50D (equals ordered Adds 1.00D to 3.00D)
- Prism up to 3.00D in addition to equithin

Lens Data Chart

Base Curve	Actual/Useable Diameter [mm]	Decentr. [mm]	True Curve [1.53]	CX Radius [mm]	Back Curve [1.53]	Center Thickness [mm]	Edge Thickness [mm]
4.30	72/77 round	2.5	4.83	109.73	4.0	10.0	9.3
5.10	72/77 round	2.5	5.69	93.15	4.0	11.0	9.0
5.70	72/77 round	2.5	6.35	83.46	4.0	12.5	10.3
6.60	72/77 round	2.5	7.21	73.51	4.0	14.0	9.8
7.10	72/77 round	2.5	7.17	73.92	4.0	14.0	9.8



Zeiss Gradal[®] lenses are designed to work perfectly with a thickness reducing prism. To achieve the thinnest and lightest lenses possible, Zeiss recommends a base down (270°) prism in the following graduation depending on the power of the addition.

Addition [D]	0.75 1.00	1.25	1.50 1.75	2.00	2.25 2.50
Prism [D]	0.50	0.75	1.00	1.25	1.50

Introduction

Gradal[®] RD is the first real progressive lens that was specifically designed for indoor and computer use.

Apart from a restructuring of the progressive surface, the distance refraction value is increased by 0.50D internally at the lab after receipt of the order while reducing the add power by 0.50D, thus widening the viewing area. Therefore, the reading power remains unchanged.

The 0.50D increase in the distance power means that the reading power would also change by +0.50D if the ordered addition were to be retained. As this is not intended, a semi-finished lens with a 0.50D lower addition must be used in the production of the lens.

The retail customer should be informed about both of these facts.

It is important to note, however, that the Gradal[®] RD is ordered and fitted the same as Gradal[®] Top. The optician enters the normal distance refraction and addition on the order exactly as if ordering Gradal[®] Top lenses. The necessary changes described above take place in the lab. For fitting, distance centration using the fitting cross is recommended, again, exactly as for Gradal[®] Top. This makes handling of Gradal[®] RD lenses extremely easy for your customers.

Please note that due to the Gradal[®] RD lens concept with a distance portion located 10 mm above the fitting cross, measurement values can vary considerably from the ordered prescription already in the distance portion - even after taking the 0.50D indoor correction into consideration. However, the patient will always experience the 0.50D while wearing his glasses. Please refer to page 2 in General Information for details on the Zeiss Measurement Value System.

Lens Thickness Compensation

When surfacing Gradal[®] RD lenses on aluminum blocks with Center Thickness (CT) type generators, a thickness variation occurs due to the change in curve from center to edge.



Due to this, Zeiss recommends removing 0.5 mm more when generating the lens. This change has to be made directly at the generator, not while keying the job in at order entry.

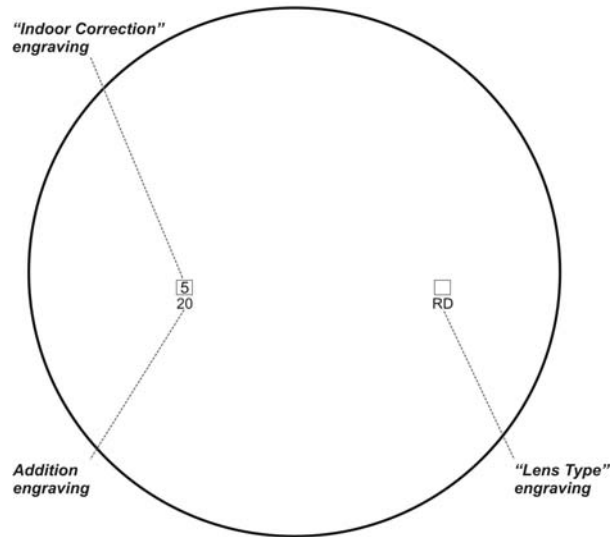


Permanent Engravings

In Gradal® RD, the position of the progressive surface is marked by two small squares. The abbreviation for the lens type (RD) is engraved beneath the nasal square. The engraving indicating the addition of the semi-finished lens used is found beneath the temple square. International standards require that the actual rise in power in the progression zone be engraved.

However, in order to inform the customer that the addition is 0.50D less than ordered a "5" has also been engraved in the square above the addition figure. The optician can determine the ordered addition by adding these two figures together.

	Nasal Engraving	Temple Engraving
Gradal® RD	 RD	 05-25



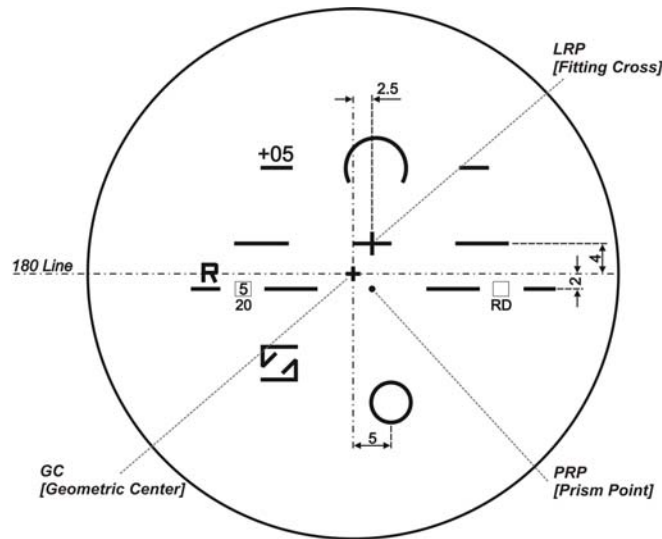
Addition ordered: 2.50D
 Addition delivered and engraved: 2.00D



Markings and Dimensions of the Semi-Finished Lens

Gradal[®] RD features a round lens blank. Please see graphic below for the unique Gradal[®] RD semi-finished lens markings. For processing purposes, the blank is marked with a cross at the geometric center.

Please note that Zeiss Gradal[®] RD lenses, if they are not to be cribbed at the generator, should be blocked on the geometric center to avoid producing unwanted prism during the fining operation.





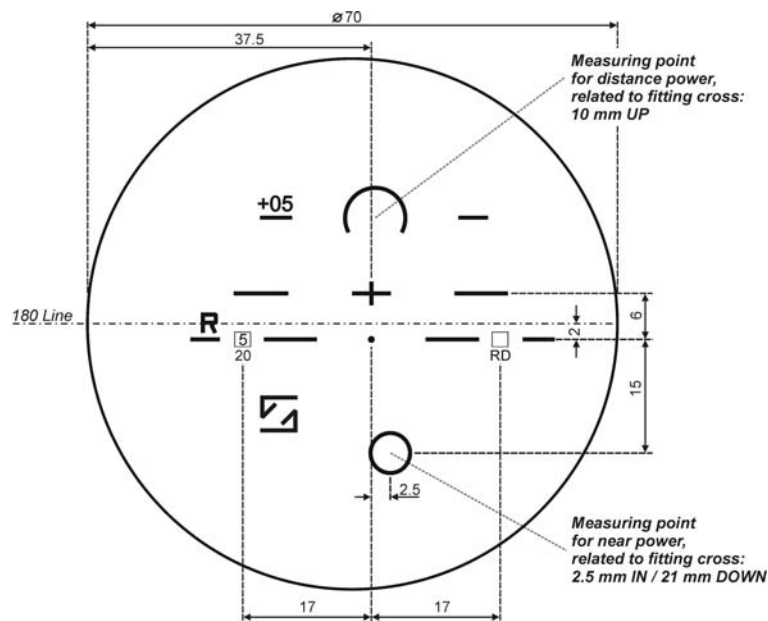
Markings and Dimensions of the Finished Lens

The Gradal® RD finished lens markings are considerably different from the ones used for Gradal® Top. Firstly, the figure +0.5 indicates the value by which the distance power measured will be greater than the ordered power.

The position of the distance fitting cross corresponds to Gradal® Top (6.0 mm up from the prism measuring point). The position of the prism measuring point related to the geometric center also corresponds to Gradal® Top (2.5 mm in and 2.0 mm down).

Due to the considerably longer progression zone of Gradal® RD, the measuring circles for near and distance are further apart than the ones of Gradal® Top. The inset of the distance measuring circle from geometric center has been increased to 3.0 mm. The inset of the near measuring circle from the fitting cross remains unchanged at 2.5 mm.

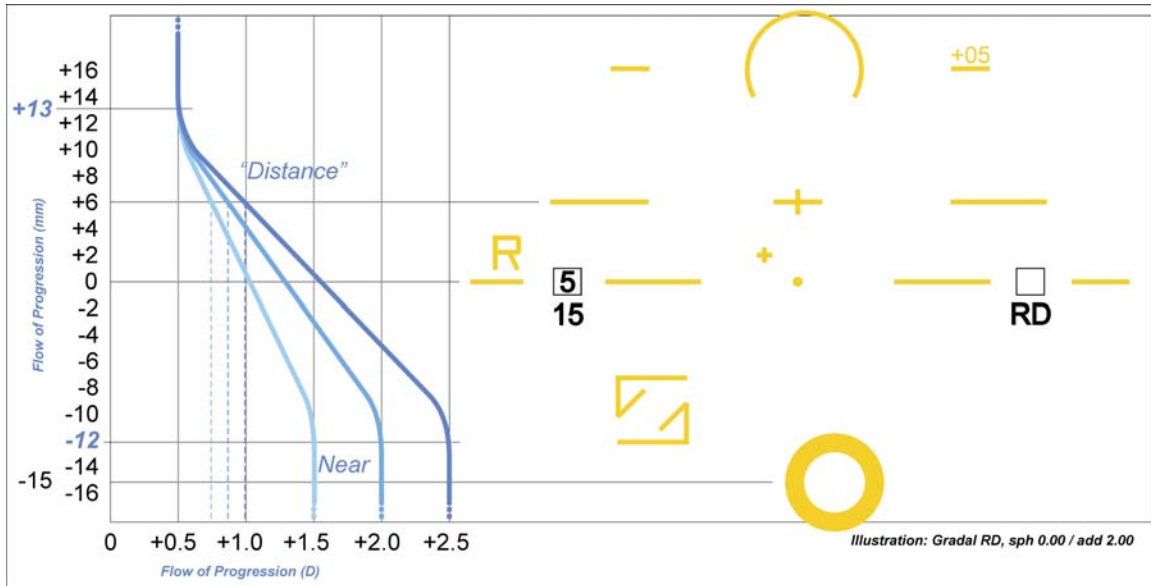
The markings are to be placed by the Zeiss partner lab using the Zeiss Gradal® RD verification labels (Item #0000139.90510). Gradal® Top or Gradal® Brevity verification labels cannot be used for Gradal® RD lenses.





Flow of Progression

The flow of progression in Gradal® RD is considerably different from Gradal® Top. The progressive zone stretches over a length of 25 mm. In direct comparison to Gradal® Top the progressive zone starts higher and ends lower. Therefore, you'll always find a certain amount of add power in the fitting cross (in addition to the +0.50D in the measuring point for distance power). For evaluation of the approximate power you may find in the fitting cross, refer to the illustration below.



Example: Flow of progression Gradal® RD

Ordered Power	Measured Distance Power	Measured Near Power	Appr. Power in Fitting Cross
0.00D add 1.50D	Sph +0.47D cyl -0.06D	Sph +1.39D	About +0.75D
0.00D add 2.00D	Sph +0.52D cyl -0.06D	Sph +1.85D	About +0.85D
0.00D add 2.50D	Sph +0.55D cyl -0.10D	Sph +2.37D	About +1.00D

The power in the fitting cross is the prescribed distance power plus about 40% of the ordered add power.

$$\text{Power}_{\text{Fitting Cross}} = \text{Power}_{\text{Rx-Distance}} + 40\% \text{ Add}_{\text{Rx}}$$



Ordering/Data Entry/Processing/Delivery

Lab customers fit and order Gradal[®] RD exactly like Gradal[®] Top using normal Rx information as to distance and near powers, PD and seg heights.

It is very important that the lab's customer be informed and understand that Gradal[®] RD will be delivered with 0.50D increased plus power in the distance (indoor correction) and an addition with 0.50D less to retain the reading prescription. This means that if a 2.00D addition is specified on the Rx, the lens blanks must be marked and pulled as a 1.50D addition. This is a unique process.

Example 1

	Distance power	Addition	Reading power
Customer's Rx	+2.00D	+3.00D	+5.00D
Rx Lab order is written	+2.50D	+2.50D	+5.00D
Rx Lab processes Rx	+2.50D	+2.50D	+5.00D

Example 2

Customer's Rx	-2.00D	+2.00D	0.00D
Rx Lab order is written	-1.50D	+1.50D	0.00D
Rx Lab processes Rx	-1.50D	+1.50D	0.00D

Please note that the cylinder powers are not changed

When a Gradal[®] RD order is received by the Rx lab order department, the Rx order will be rewritten as explained above and used for all processing steps thereafter. The original Rx order from the customer will be sealed and attached to the back of the processing Rx order form to be returned with the completed job.

Phone orders will be changed at time of order and will be the only Rx order document returned to the customer upon completion.

Please note that the distance and addition changes on the Rx lab processing form is a manual operation and cannot be automated by the computer software system.

The order will be trayed as usual. Keying will be performed as usual per the modified Rx information, specifying Gradal[®] RD.

Please make sure that your Customer Service representatives are informed about the technical and practical aspects of Gradal[®] RD.



**Base Curve Chart
Gradal® RD**

sph/-cyl	0.00	-0.25	-0.50	-0.75	-1.00	-1.25	-1.50	-1.75	-2.00	-2.25	-2.50	-2.75	-3.00	-3.25	-3.50	-3.75	-4.00
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- Zeiss highly recommends conforming to the base curve for a specific R_x power as displayed in the Base Curve Chart for Gradal® RD lenses. Picking another base curve for a certain power will decrease the imaging performance and may impact adaptation and patient satisfaction.
- Please be also aware that the base curve and the add power determine the nasal inset of the near portion. A base curve other than recommended restricts the usability of the intermediate zone and near portion due to a mismatch of distance power, add and required inset.
- Base curve ranges are specified according to Gradal® RD indoor correction (meaning after +0.50D has been added to the ordered R_x). Example: Customer ordered sph -6.00D add 2.00D. Indoor correction: sph -5.50D add 1.50D. Base curve 4.30 is used.