Principles of contact lens Fitting

by Eric Webb

2001

Twenty Most Frequently Asked Questions About RGPs?

1. What is the most wettable and durable lens material?
A mid-range Dk material is a good choice for an average daily wear lens.
It will provide good wettability and stability. (Examples include: *Boston ES and Fluroperm 30*)

2. When would you consider using a higher Dk lens material?
For high plus prescriptions, children and extended wear.
(Approved for EW: *Fluroperm 60, 90 & 151, Paraperm EW, Paragon HDS and Boston Equalens*)

3. How do you chose the diameter of a lens?
Usually based on the base curve selected, with the steeper the curve the smaller the diameter.

4. When do you lenticulate?
Minus lenticular designs are best for ALL Plus and low Minus lenses in order to thicken the edge for better upper lid support.
Plus lenticular designs are used to thin the edges of high Minus lens (-3.00 suggested -5.00 automatic).

5. What is the difference between back torics and bitorics and how can I tell the difference on an existing lens? (If your K's equal your spectacle cylinder use a Back Toric)
Back toric design- the difference in the 2 base curves generates ALL the cylinder, the front is spherical.
Bitoric design- front and back curves generate cylinder, which combined give you the overall toricity.
(The only way to know which is which is to do the math. Convert the base curve to diopters and subtract to get the difference or amount of cylinder. Multiply by the index of refraction which is 1.50 for the plastic of the contact lens. If this figure is equal to the amount of cylinder read by the lensometer, then the lens is a Back Toric, if not, it is a Bitoric. The lensometer will read cylinder on both)

6. How much corneal cylinder do we need before we should consider a toric design?
A Back toric or Bitoric design is considered with 2.50 D or more.

7. When do you consider and RGP front toric or soft toric design?
When the corneal cylinder will not support a back toric, but there is sufficient residual cylinder which is usually ATR. (Ex. Ks = 44.50 Refraction = -3.00 -1.00 x 090)

8. How much change in lens parameter will make a difference in the way a lens fits?
Generally it is adviseable when reordering a lens to alter a parameter enough to effect a change.

Base Curve:	0.25 diopter or 0.05 mm (More realistically 0.50 D or 0.1 mm)
Diameter:	0.20 mm - 0.30.. (0.3mm change equals ½ diopter Base Curve change)
Peripheral Curves:	0.50mm
Optic Zone:	0.20 mm
Power:	+/- 0.25

9. What is *panofocal* and how does it work?
It is an aspheric polish on the front surface which when added along with the spherical equivalent of the over refraction will improve VA by half a line to a line. It works by decreasing spherical aberration to allow better tolerance of residual cylinder.

10. What types of presbyopic designs tend to be most successful?
Aspheric progressive bifocals tend to be most successful
(Ex. *Boston Multivision* and the *Lifestyle Multifocal*). Always use warranties when fitting.

11. Is it advisable to fit Keratoconus with empirical values?
Sometimes early on you can use K readings and refraction, but in most cases it is difficult to fit empirically. The best way to fit is to use corneal topography and a fitting set.

12. What type of designs are most successful on post surgical patients?

Aspheric designs are typically most successful for post penetrating keratoplasty, using large diameter 9.6 - 10.0 designs. Torics are sometimes used in these situations. If the central K readings are not too Flat then aspheric designs can be used in post refractive surgery cases as well (i.e. RK, PRK and LASIK) but these cases may require reverse geometry designs. Post traumatic cases may also benefit from aspherics.

13. Can we use the central K readings when fitting post RK patients?

As in any post refractive case, the central K readings are flatter than the peripheral K's. Therefore you are actually fitting the peripheral cornea and vaulting the central cornea. Although central K readings are valuable, it is not advisable to fit this way. If pre-surgical data is unknown use topography and/or a fitting set. If you fit use soft contact lenses you will get neo. NO Soft Contact Lenses!

14. What is the best way to identify the left from the right lens?

A standard ink dot, a drill hole with an ink mark or two different colored lenses.

15. What RGP materials come is special colors?

Boston IV and *Equalens* - Electric Blue
Fluroperm 30 - Majestic Blue
TransAire - Dark Blue, Forest Green, Yellow, Violet and Dark Red (Good for patients with poor tear chemistry)
* Most colors are used for handling tints.

16. How do we prepare an RGP lens for dispensing?

A lens should be cleaned and soaked overnight.

17. Do RGP lenses need to be enzymed?

Do as needed based on the patient. If they are a heavy protein depositor then do it weekly.

18. If I need a UV filter do I need to specify it?

Boston materials will have one unless you specify otherwise and *Paragon* will upon request.

19. On average, how many RGP patients should I be seeing?

The industry standard for an office seeing a hundred patients per week is 3 - 5 new RGP fits per week.

20. What is Spherical Power Effect design, when to use it and what are the benefits?

It is when the change in base curve in diopters is equal to the change in lens power in diopters.
It is used when corneal cylinder is equal to spectacle cylinder.
It is beneficial since the lens can rotate on the eye and not blur vision.
Fitting principles:
Fit the flatter meridian On-K and the steeper meridian .75D flatter than K. A 9.0 mm lens diameter is a good starting point. A larger lens requires flatter curves to avoid vaulting and a smaller lens design requires steeper curves to avoid excessive touch.
Example:
Spectacle refraction: -1.00 -3.00 x 180
Keratometry readings: 41.00 @ 180, 44.00 @ 090 (Delta K = -3.00)

Fit the 41.00 @ 180 meridian On-K and the 44.00 @ 090 meridian -.75 steeper than K or 43.25 @ 090
The -.75 in the tear lens with a -3.25 lens power will give -4.00 in the 090 meridian
The 0 diopter tear lens @ 180 with a -1.00 lens power will give -1.00 in the 180 meridian
Order:

Powers	-3.25 & -1.00 (Change in lens power of -2.25)
Base Curve	43.25 & 41.00 (Change in Base curve in diopters -2.25)

Dr. Pole's TOP TEN NO BRAINERS:

1. NEVER ask "Do we need to know this for the test?"

2. NEVER say: decrease the base curve, say STEEPEN (Ex. 8.0 to 7.8)
   increase the base curve, say FLATTEN (Ex. 7.8 to 8.0)

3. NEVER stop a PMMA wearer cold turkey, measure the lenses and put them in RGPs

4. ALWAYS lenticulate a Plus lens

5. ALWAYS measure the perimeters of a new patient's lenses

6. A single cut lens is NOT lenticulated, it has one front surface curve

7. KNOW Dk/L values: 87 is desirable for EW
   34 is the minimum for EW
   24 is the minimum for DW

8. When a patient complains that looking down is more comfortable think edge awareness/discomfort and modify the edges

9. When you want more movement/less adherence you can:
   a. Increase the thickness
   b. Increase the plus power (Less minus)
   c. Decrease the diameter
   d. Flatten the base curve

10. When you want less movement/more adherence you can:
    a. Decrease the thickness
    b. Decrease the plus power (More minus)
    c. Increase the diameter
    d. Steepen the base curve

RGP Materials

Composition	DK	Materials	Advantages	Disadvantages
Silicon/ Acrylate	Basic 12.5 - 18	1. Boston II 3. ParaPerm 02 2. SGP I 4. Optacryl 60	1. Very Stable, great for thin lens designs 2. Good when fitting a high astigmat with a spherical lens 3. Recommended for patients who were long time PMMA wearers	1. Low Oxygen transmission 2. Long term use has caused Polymegathism & Polymorphism
Silicon/ Acrylate	Medium 28 - 56	1. Boston IV 4. Transaire 2. SGP II 5. Phoenix 32 3. ParaPerm EW	1. Excellent for hyperope and special lens designs: back torics, bi-torics and especially front torics when prism is necessary 2. Higher oxygen transmission	1. Lens flexure (Can be beneficial) 2. Wettability may be a factor for dry eye patients
Fluro silicon/ Acrylate	Mid-range 26.5 - 49.8	1. FluroPerm 30 4. Fluorex 500 2. Boston RXD 5. SGP III 3. Fluorex 300	1. Higher amount of fluorine provides stability and wettability without excessive weight, which allows thinner centers	1. Flexure
Fluro silicon/ Acrylate	High 61 - 151	1. Boston Equalens 4. FluroPerm 92 2. Fluorex 700 5. FluroPerm 151 3. FluroPerm 60	1. All but Fluorex 700 are approved for 7 day extended wear 2. Excellent oxygen permeability 3. Many patients report higher comfort and wettability over group 1 & 2	1. Heavier than non-fluorinated materials, may cause them to ride low and increase 3 & 9 o'clock injection 2. Unwanted flexure can also be a problem
Fluro silicon/ Aercor	Medium 31 & 73	"Achievement" Lens 1. Boston ES (DK 31) 2. Boston 7 (DK 73)	1. Boston 7 is good for hyperopes, toric designs or when a non-flexing, stable design is needed 2. Boston ES is excellent for most patients due to its thinner design- optics, stability, durability, wetting and deposit resistance are all considered good 3. Spherical base curve with controlled edge life design minimizes mid-peripheral bearing and excessive edge stand off	1. Boston 7 can be a problem for dry eye patients

RGP McGuire "NIPPLE" Cone Diagnostic Set

Base Curve	Power	Diameter	Optic Zone	Peripheral Curves 0.3mm + 0.3mm + 0.3mm + 0.4mm = 1.3mm			
50.00	-8.00	8.6	6.0	7.25	8.25	9.75	11.75
51.00	-9.00	8.6	6.0	7.10	8.10	9.60	11.60
52.00	-10.00	8.6	6.0	7.00	8.00	9.60	11.50
53.00	-11.00	8.6	6.0	6.85	7.85	9.35	11.35
54.00	-12.00	8.6	6.0	6.75	7.75	9.25	11.25
55.00	-13.00	8.6	6.0	6.65	7.65	9.15	11.15

RGP McGuire "OVAL" Cone Diagnostic Set

Base Curve	Power	Diameter	Optic Zone	Peripheral Curves 0.3mm + 0.3mm + 0.3mm + 0.4mm = 1.3mm			
50.00	-8.00	9.1	6.5	7.25	8.25	9.75	11.75
51.00	-8.00	9.1	6.5	7.10	8.10	9.60	11.60
52.00	-10.00	9.1	6.5	7.00	8.00	9.50	11.50
53.00	-10.00	9.1	6.5	6.85	7.85	9.35	11.35
54.00	-12.00	9.1	6.5	6.75	7.75	9.25	11.25
55.00	-12.00	9.1	6.5	6.65	7.65	9.15	11.15
56.00	-14.00	9.1	6.5	6.50	7.50	9.00	11.00
57.00	-14.00	9.1	6.5	6.40	7.40	8.90	10.90
58.00	-16.00	9.1	6.5	6.30	7.30	8.80	10.80
59.00	-16.00	9.1	6.5	6.20	7.20	8.70	10.70
60.00	-18.00	9.1	6.5	6.10	7.10	8.60	10.60

RGP McGuire "GLOBUS" Cone Diagnostic Set

Base Curve	Power	Diameter	Optic Zone	Peripheral Curves 0.3mm + 0.3mm + 0.3mm + 0.4mm = 1.3mm			
50.00	-8.00	9.6	7.0	7.25	8.25	9.75	11.75
51.00	-9.00	9.6	7.0	7.10	8.10	9.60	11.60
52.00	-10.00	9.6	7.0	7.00	8.00	9.50	11.50
53.00	-11.00	9.6	7.0	6.85	7.85	9.35	11.35
54.00	-12.00	9.6	7.0	6.75	7.75	9.25	11.25
55.00	-13.00	9.6	7.0	6.65	7.65	9.15	11.15

ART Optical Extended Keratoconic Fitting System (Center Thickness 0.10)

Base Curve	Diameter	Optic Zone	Front Optic Zone	Secondary Curve Width	Secondary Curve Radius	Tertiary Curve Width	Tertiary Curve Radius	Power
5.00	8.5	4.9	4.80	.9	6.50	.9	8.50	-17.00
5.10	8.5	5.1	5.00	.9	6.60	.8	8.60	-16.50
5.20	8.5	5.1	5.00	.9	6.70	.8	8.70	-16.00
5.30	8.5	5.3	5.20	.9	6.80	.7	8.80	-15.50
5.40	8.5	5.3	5.20	.9	6.90	.7	8.90	-15.00
5.50	8.5	5.5	5.40	.8	7.00	.7	9.00	-14.50
5.60	8.5	5.5	5.40	.8	7.10	.7	9.10	-14.00
5.70	8.5	5.7	5.60	.7	7.20	.7	9.20	-13.50
5.80	8.5	5.7	5.60	.7	7.30	.7	9.30	-13.00
5.90	8.5	5.9	5.80	.6	7.40	.7	9.40	-12.50
6.00	8.5	5.9	5.80	.6	7.50	.7	9.50	-12.00
6.10	8.5	6.1	6.00	.6	7.60	.6	9.60	-11.50
6.20	8.5	6.1	6.00	.6	7.70	.6	9.70	-11.00
6.30	8.5	6.3	6.20	.5	7.80	.6	9.80	-10.50
6.40	8.5	6.3	6.20	.5	7.90	.6	9.90	-10.00
6.50	8.5	6.5	6.40	.5	8.00	.5	10.00	-9.50
6.60	8.5	6.5	6.40	.5	8.10	.5	10.10	-9.00
6.70	8.5	6.7	6.60	.4	8.20	.5	10.20	-8.50
6.80	8.5	6.7	6.60	.4	8.30	.5	10.30	-8.00
6.90	8.5	6.9	6.80	.4	8.40	.4	10.40	-7.50
7.00	8.5	6.9	6.80	.4	8.50	.4	10.50	-7.00
7.10	8.5	7.1	6.00	.3	8.60	.4	10.60	-6.50
7.20	8.5	7.1	7.00	.3	8.70	.4	10.70	-6.00

RGP Fitting Philosophies

Philosophy	Lid Position	Over All Diameter	Base Curve	Comments
INTRA-PALPEBRAL		8.0 TO 9.0	Usually fit ON-K +/- .25 D	Edges are very important for comfort
SUPERIOR CENTRAL		9.0 TO > 9.5	ON - K to .50D Flatter	Most comfortable fit
LID ATTACHMENT		> 9.5	.50 D to 1.00D Flatter	Not used very often

Trial Lens Design (LARGE DIAMETER)				
Diameter 9.5	Optic Zone 8.0	Power -3.00	CT = .15 Minimum	
Base Curve	Secondary Curve	Tertiary Curve	Width	Z - value
7.30	8.1	11.00	.2	.13
7.40	8.4	11.00	.2	.13
7.50	8.5	11.00	.2	.12
7.60	8.6	11.00	.2	.12
7.70	8.7	11.00	.2	.115
7.80	8.8	11.00	.2	.11
7.90	8.9	11.00	.2	.10
8.00	9.2	11.00	.2	.11
8.10	9.3	11.00	.2	.105
8.20	9.4	12.00	.2	.11
8.30	9.5	12.00	.2	.11
8.40	9.6	12.00	.2	.11

Trial Lens Design (MEDIUM DIAMETER)				
Diameter 9.0	Optic Zone 7.8	Power -3.00	CT = .15 Minium	
Base Curve	Secondary Curve	Tertiary Curve	Width	Z - value
7.30	8.5	11.00	.2	.11
7.40	8.6	11.00	.2	.11
7.50	8.7	11.00	.2	.10
7.60	8.8	11.00	.2	.10
7.70	8.9	11.00	.2	.105
7.80	9.0	12.00	.2	.10
7.90	9.1	12.00	.2	.10
8.00	9.4	12.00	.2	.10
8.10	9.5	12.00	.2	.10
8.20	9.6	12.00	.2	.10
8.30	9.7	12.00	.2	.10
8.40	9.8	12.00	.2	.10

Trial Lens Design (SMALL DIAMETER)				
OAD 8.5	Optic Zone 7.4	Power -3.00	CT = .15 Minimum	
Base Curve	Secondary Curve	Tertiary Curve	Width	Z - value
7.30	8.8	11.00	.2	.10
7.40	8.9	11.00	.2	.10
7.50	9.0	11.00	.2	.10
7.60	9.1	11.00	.2	.10
7.70	9.2	11.00	.2	.09
7.80	9.3	11.50	.2	.09
7.90	9.4	11.50	.2	.09
8.00	9.5	11.50	.2	.09
8.10	9.6	11.50	.2	.09
8.20	9.7	11.50	.2	.09

Diopters to Radius of Curvature Conversion Table				
D to R	D to R	D to R	D to R	D to R
36.00 - 9.37	40.00 - 8.43	44.00 - 7.67	48.00 - 7.03	52.00 - 6.49
36.12 - 9.33	40.12 - 8.41	44.12 - 7.64	48.12 - 7.01	52.12 - 6.47
36.25 - 9.30	40.25 - 8.38	44.25 - 7.62	48.25 - 6.99	52.25 - 6.46
36.37 - 9.27	40.37 - 8.36	44.37 - 7.60	48.37 - 6.97	52.37 - 6.44
36.50 - 9.24	40.50 - 8.33	44.50 - 7.58	48.50 - 6.95	52.50 - 6.42
36.62 - 9.21	40.62 - 8.30	44.62 - 7.56	48.62 - 6.94	52.62 - 6.41
36.75 - 9.18	40.75 - 8.28	44.75 - 7.54	48.75 - 6.92	52.75 - 6.39
36.87 - 9.15	40.87 - 8.25	44.87 - 7.52	48.87 - 6.90	52.87 - 6.38
37.00 - 9.12	41.00 - 8.23	45.00 - 7.50	49.00 - 6.88	53.00 - 6.36
37.12 - 9.19	41.12 - 8.20	45.12 - 7.48	49.12 - 6.87	53.12 - 6.35
37.25 - 9.06	41.25 - 8.18	45.25 - 7.45	49.25 - 6.85	53.25 - 6.33
37.37 - 9.03	41.37 - 8.15	45.37 - 7.43	49.37 - 6.83	53.37 - 6.32
37.50 - 9.00	41.50 - 8.13	45.50 - 7.41	49.50 - 6.81	53.50 - 6.30
37.62 - 8.97	41.62 - 8.10	45.62 - 7.39	49.62 - 6.80	53.62 - 6.29
37.75 - 8.94	41.75 - 8.08	45.75 - 7.37	49.75 - 6.78	53.75 - 6.27
37.87 - 8.91	41.87 - 8.06	45.87 - 7.35	49.87 - 6.76	53.87 - 6.26
38.00 - 8.88	42.00 - 8.03	46.00 - 7.33	50.00 - 6.75	54.00 - 6.25
38.12 - 8.85	42.12 - 8.01	46.12 - 7.31	50.12 - 6.73	54.12 - 6.23
38.25 - 8.82	42.25 - 7.98	46.25 - 7.29	50.25 - 6.71	54.25 - 6.22
38.37 - 8.79	42.37 - 7.96	46.37 - 7.27	50.37 - 6.70	54.37 - 6.20
38.50 - 8.76	42.50 - 7.94	46.50 - 7.25	50.50 - 6.68	54.50 - 6.19
38.62 - 8.73	42.62 - 7.91	46.62 - 7.23	50.62 - 6.66	54.62 - 6.17
38.75 - 8.70	42.75 - 7.89	46.75 - 7.21	50.75 - 6.65	54.75 - 6.16
38.87 - 8.68	42.87 - 7.87	46.87 - 7.20	50.80 - 6.63	54.87 - 6.15
39.00 - 8.65	43.00 - 7.84	47.00 - 7.18	51.00 - 6.61	55.00 - 6.13
39.12 - 8.62	43.12 - 7.82	47.12 - 7.16	51.12 - 6.60	55.12 - 6.12
39.25 - 8.59	43.25 - 7.80	47.25 - 7.14	51.25 - 6.58	55.25 - 6.10
39.37 - 8.57	43.37 - 7.78	47.37 - 7.12	51.37 - 6.56	55.37 - 6.09
39.50 - 8.54	43.50 - 7.75	47.50 - 7.10	51.50 - 6.55	55.50 - 6.08
39.62 - 8.51	43.62 - 7.73	47.62 - 7.08	51.62 - 6.53	55.62 - 6.06
39.75 - 8.49	43.75 - 7.71	47.75 - 7.06	51.75 - 6.52	55.75 - 6.05
39.87 - 8.45	43.87 - 7.69	47.87 - 7.05	51.87 - 6.50	55.87 - 6.04

VERTEX CONVERSION CHART								
Spec Power	PLUS LENSES 11	12	13	14	MINUS LENSES 11	12	13	14
4.00	4.12	4.25	4.25	4.25	3.87	3.87	3.75	3.75
4.50	4.75	4.75	4.75	4.75	4.25	4.25	4.25	4.25
5.00	5.25	5.25	5.37	5.37	4.75	4.75	4.75	4.62
5.50	5.87	5.87	5.87	6.00	5.12	5.12	5.12	5.12
6.00	6.37	6.50	6.50	6.50	5.62	5.62	5.50	5.50
6.50	7.00	7.00	7.12	7.12	6.00	6.00	6.00	6.00
7.00	7.62	7.62	7.75	7.75	6.50	6.50	6.37	6.37
7.50	8.12	8.25	8.25	8.37	6.87	6.87	6.87	6.75
8.00	8.75	8.87	8.87	9.00	7.37	7.25	7.25	7.25
8.50	9.37	9.50	9.50	9.62	7.75	7.75	7.62	7.62
9.00	10.00	10.12	10.25	10.37	8.25	8.12	8.00	8.00
9.50	10.62	10.75	10.87	11.00	8.62	8.50	8.50	8.37
10.00	11.25	11.37	11.50	11.62	9.00	8.87	8.87	8.75
10.50	11.87	12.00	12.12	12.25	9.37	9.37	9.25	9.12
11.00	12.50	12.75	12.87	13.00	9.75	9.75	9.62	9.50
11.50	13.12	13.37	13.50	13.75	10.25	10.12	10.00	9.87
12.00	13.87	14.00	14.25	14.50	10.62	10.50	10.37	10.25
12.50	14.50	14.75	15.00	15.25	11.00	10.87	10.75	10.62
13.00	15.25	15.50	15.62	16.00	11.37	11.25	11.12	11.00
13.50	15.87	16.12	16.37	16.62	11.75	11.62	11.50	11.37
14.00	16.50	16.75	17.12	17.50	12.12	12.00	11.87	11.75
14.50	17.25	17.50	17.87	18.25	12.50	12.37	12.25	12.00
15.00	18.00	18.25	18.62	19.00	12.87	12.75	12.50	12.37
15.50	18.25	18.75	19.00	19.75	13.25	13.00	12.87	12.75
16.00	19.37	19.75	20.25	20.50	13.62	13.50	13.25	13.00
16.50	20.25	20.50	21.00	21.50	14.00	13.75	13.62	13.50
17.00	21.00	21.50	22.00	22.25	14.25	14.12	14.00	13.75
17.50	21.75	22.25	22.75	23.25	14.75	14.50	14.25	14.00
18.00	22.50	23.00	23.50	24.00	15.00	14.75	14.62	14.37
18.50	23.25	23.75	24.50	25.00	15.37	15.12	14.87	14.75
19.00	24.00	24.75	25.25	26.00	15.75	15.50	15.25	15.00

Plus Lenses (Lenticular)					
OAD 9.5	Optic Zone 8.0	Power - 3.00	CT = .20		
Base Curve	Secondary Curve	Tertiary Curve	Width	Z - value	Carrier Radius
7.30	8.1	11.00	.2	.128	8.34
7.40	8.4	11.00	.2	.13	8.55
7.50	8.5	11.00	.2	.127	8.62
7.60	8.6	11.00	.2	.121	8.69
7.70	8.7	11.00	.2	.115	8.75
7.80	8.8	11.00	.2	.110	8.82
7.90	8.9	11.00	.2	.105	8.84
8.00	9.0	11.00	.2	.109	9.08
8.10	9.1	11.00	.2	.104	9.14
8.20	9.2	12.00	.2	.10	9.21
8.30	9.3	12.00	.2	.10	9.27
8.40	9.4	12.00	.2	.09	9.3

SPE Design:

1. Determine the **Flat Base Curve.**
   - Typically 0.25D to 0.50D Flatter than K.
2. Calculate the **Power** in the Flat Meridian.
   - Adjust according to SAM & FAP.
3. Choose the **Steep Base Curve.**
   - Choose one that is steep enough to stabilize the lens.
   - Make the Steep Curve Flatter than the Steep K by about 1.00D.
4. Calculate the **Base Curve Toricity.**
   - The difference between the Flat Base and the Steep Base (Delta K).
5. Calculate the **Power** in the steep meridian.
   - Need the cylinder equal to Delta K (P steep = P flat - Delta K).
6. Choose **Diameter, Optic Zone** and **Periphery** the same way as a spherical lens design.
7. Choose **Material.**

Making Lens Design Changes

A. To maintain the **SAME** fitting relationship:
1. **Flatten** the BC 0.25D for every 0.4 - 0.5 mm **Increase** in OZD .
2. **Steepen** the BC 0.25D for every 0.4 - 0.5 mm **Decrease** in OZD.

B. To **Improve** fitting relationship, make large change in lens design:
1. Change the OAD/OZD at least 0.3 mm.
2. Change the BC at least 0.50D.
3. Change CT at least 0.03 mm
   a. **Decrease** if lens decenters inferiorly
   b. **Increase** if flexure is present.
4. Change the PC radius at least 1.0 mm
   a. **Flatten** if there is peripheral sealoff.
   b. **Steepen** if there is excessive edge clearance.
5. Change the PC width at least 0.2 mm
   a. **Increase** if there is peripheral sealoff.
   b. **Decrease** if the is excessive edge clearance.

HARD LENS DESIGN			
Diameter	8.5	9.0	9.5
Optic Zone	7.4	7.7 - 7.8	8.0 - 8.2
Secondary Curve	1.5 mm Flatter than the B.C.	1.2 - 1.4 mm Flatter than B.C.	0.8 - 1.2 mm Flatter than B.C.
Tertiary Curve	11.00 - 11.50 @ .2 wide	11.00 - 12.00 @ 2	11.00 - 12.00 @ 2
FIT	On-K to +0.25 Steeper than K	On-K	On-K to .50 Flatter than K

Bitoric RGP Fitting:

1. Adjust the K- readings according to the chart by subtracting:

Cylinder	Flat K	Steep K
2.00	0.25	0.25
3.00	0.25	0.50
4.00	0.25	0.75
5.00	0.50	0.75

2. Those are your base curves.
3. Do a spherical over refraction over a spherical RGP at the adjusted Flat K base curve.
4. Order the over refraction in the flat meridian P1 and the P2 equals P1 + (K-flat - K-steep).

EXAMPLE:

Keratometry 42.00 @ 180 and 46.50 @ 090
Refraction -3.00 - 4.00 x 180
1. The 42.00 meridian goes to 41.75 (8.08 mm)
   The 46.50 meridian goes to 45.75 (7.38 mm)
2. Using a BC 8.10, -3.00, 9.2 trial lens the OR is +.25
3. Power 1 -2.75
4. Power 2 = -2.75 + (41.75 - 45.75 = -4.00) Power 2 = -6.75
5. Order 8.08 by 7.38 / -2.75 by -6.75 / 9.2 diameter