

GOV® Myopic System

Systemized Ortho-K

US FDA approved

GOV® XMJ & XM Lens

- Five or over five curves design
- Unique XM curves to help molding
- Aspheric alignment zone
Enhanced peripheral inward force
Better centration & stabilization
- Good up to -15.00
Molds faster & Maintains longer

GOV® reference table

Mean K (S.F.)	-4 DS	-3 DS	-2 DS	-1 DS	0 DS	+1 DS	+2 DS	+3 DS	+4 DS
OAD 11.2 mm Best fit cornea 11.3-11.9 mm									
A 38-47-48.11 (48.100)	40.00/1	40.00/0	40.00/0	40.00/0	40.00/0	40.00/1	40.00/2	40.00/4	40.00/6
B 48-13-48.36 (48.100)	40.75/1	40.75/2	40.75/2	40.75/3	40.75/3	40.75/4	40.75/4	40.75/4	40.75/5
C 48-37-48.66 (48.100)	40.00/1	40.00/2	40.50/2	40.50/3	40.00/3	40.00/4	40.00/4	40.00/4	40.00/4
D 48-87-48.88 (48.100)	40.75/1	40.75/2	40.75/2	40.75/3	40.75/3	40.75/4	40.75/4	40.75/4	40.75/5
E 48-17-48.11 (48.100)	41.00/1	41.00/2	41.00/2	41.00/3	41.00/3	41.00/4	41.00/4	41.00/4	41.00/4
F 41-12-41.36 (41.100)	41.25/1	41.25/2	41.25/2	41.25/3	41.25/3	41.25/4	41.25/4	41.25/4	41.25/4
G 41-37-41.66 (41.100)	41.00/1	41.00/2	41.00/2	41.00/3	41.00/3	41.00/4	41.00/4	41.00/4	41.00/4
H 41-87-41.88 (41.100)	41.75/1	41.75/2	41.75/2	41.75/3	41.75/3	41.75/4	41.75/4	41.75/4	41.75/5
I 41-17-41.11 (41.100)	42.00/1	42.00/2	42.00/2	42.00/3	42.00/3	42.00/4	42.00/4	42.00/4	42.00/4
J 41-12-41.36 (41.100)	42.25/1	42.25/2	42.25/2	42.25/3	42.25/3	42.25/4	42.25/4	42.25/4	42.25/4
OAD 10.8 mm Best fit cornea 11.2-11.6 mm									
K 42-17-42.68 (42.100)	42.00/1	42.00/2	42.00/2	42.00/3	42.00/3	42.00/4	42.00/4	42.00/4	42.00/4
L 42-17-42.68 (42.100)	42.75/1	42.75/2	42.75/2	42.75/3	42.75/3	42.75/4	42.75/4	42.75/4	42.75/5
M 42-87-43.11 (43.100)	43.00/1	43.00/2	43.00/2	43.00/3	43.00/3	43.00/4	43.00/4	43.00/4	43.00/4
N 43-12-43.36 (43.100)	43.25/1	43.25/2	43.25/2	43.25/3	43.25/3	43.25/4	43.25/4	43.25/4	43.25/5
O 43-17-43.66 (43.100)	43.00/1	43.00/2	43.00/2	43.00/3	43.00/3	43.00/4	43.00/4	43.00/4	43.00/4
P 43-87-43.88 (43.100)	43.75/1	43.75/2	43.75/2	43.75/3	43.75/3	43.75/4	43.75/4	43.75/4	43.75/5
OAD 10.4 mm Best fit cornea 10.8-11.4 mm									
Q 43-87-44.11 (44.100)	44.00/1	44.00/2	44.00/2	44.00/3	44.00/3	44.00/4	44.00/4	44.00/4	44.00/4
R 44-12-44.36 (44.100)	44.25/1	44.25/2	44.25/2	44.25/3	44.25/3	44.25/4	44.25/4	44.25/4	44.25/5
S 44-37-44.66 (44.100)	44.00/1	44.00/2	44.00/2	44.00/3	44.00/3	44.00/4	44.00/4	44.00/4	44.00/4
T 44-87-44.88 (44.100)	44.75/1	44.75/2	44.75/2	44.75/3	44.75/3	44.75/4	44.75/4	44.75/4	44.75/5
U 44-17-44.11 (44.100)	45.00/1	45.00/2	45.00/2	45.00/3	45.00/3	45.00/4	45.00/4	45.00/4	45.00/4
V 45-12-45.36 (45.100)	45.25/1	45.25/2	45.25/2	45.25/3	45.25/3	45.25/4	45.25/4	45.25/4	45.25/5
W 45-37-45.66 (45.100)	45.00/1	45.00/2	45.00/2	45.00/3	45.00/3	45.00/4	45.00/4	45.00/4	45.00/4
X 45-87-45.88 (45.100)	45.75/1	45.75/2	45.75/2	45.75/3	45.75/3	45.75/4	45.75/4	45.75/4	45.75/5
Y 45-17-45.11 (45.100)	46.00/1	46.00/2	46.00/2	46.00/3	46.00/3	46.00/4	46.00/4	46.00/4	46.00/4
Z 45-12-45.36 (45.100)	46.25/1	46.25/2	46.25/2	46.25/3	46.25/3	46.25/4	46.25/4	46.25/4	46.25/5
AA 46-17-46.66 (46.100)	46.00/1	46.00/2	46.00/2	46.00/3	46.00/3	46.00/4	46.00/4	46.00/4	46.00/4
AB 46-87-46.88 (46.100)	46.75/1	46.75/2	46.75/2	46.75/3	46.75/3	46.75/4	46.75/4	46.75/4	46.75/5
AC 46-17-46.11 (46.100)	47.00/1	47.00/2	47.00/2	47.00/3	47.00/3	47.00/4	47.00/4	47.00/4	47.00/4
AD 47-12-47.36 (47.100)	47.25/1	47.25/2	47.25/2	47.25/3	47.25/3	47.25/4	47.25/4	47.25/4	47.25/5
AE 47-17-47.66 (47.100)	47.00/1	47.00/2	47.00/2	47.00/3	47.00/3	47.00/4	47.00/4	47.00/4	47.00/4
AF 47-12-47.36 (47.100)	47.25/1	47.25/2	47.25/2	47.25/3	47.25/3	47.25/4	47.25/4	47.25/4	47.25/5

Protected by US patent #6,636,169

Calculator

Data				Data			
Code	ENTER Value	Conversion of mm vs. D		Code	ENTER Value	Conversion of mm vs. D	
Horizontal K	43.25	D	7.80	Horizontal K	44.00	D	7.87
Vertical K	45.00	D	7.99	Vertical K	44.50	D	7.89
Rx Sph	5.25			Rx Sph	5.50		
Rx Cyl	-1.50			Rx Cyl	0.00		
ADD				ADD			
HVID	11.20	mm		HVID	11.20	mm	
Specific lens				Specific lens			
3mm Simk horizontal			Apical HK	3mm Simk horizontal			Apical HK
3mm Simk vertical			Apical VK	3mm Simk vertical			Apical VK
Cornea Optical Zone			Apical decentration	Cornea Optical Zone			Apical decentration
Enter if any				Enter if any			
K-code				K-code			
Power code				Power code			
O.R.				O.R.			
Conform				Conform			
Global-OK				Global-OK			
Items		% of HVID		Items		% of HVID	
Lens Type	44.25			Lens Type	44.25		
K code	4.50			K code	4.50		
Power code	0.00			Power code	0.00		
ADD	10.0		90%	ADD	10.0		90%
OAD				OAD			

Fitting GOV® lenses

A systemized solution for Ortho-K

- External eye exam.
- Determine K-code by Mean K
- Select Power-code by S.E. (cornea cyl)
- Order lenses Empirically or after trial fit
 - Lens type / K-code / Power-code / OAD
- Lens sizes (OAD)
 - Determine from HVID, Trial fit .or.
 - Empirically by default lens size

Figure K-code by mean K

- $\text{MeanK} = (\text{Horizontal K} + \text{Vertical K}) / 2$
- TK and e value is unnecessary
- E value has been figured into lens
- 0.25 D stepwise
- Choose the closest mean K for K-code

Determine Power-code by S.E.

- $SE = (\text{Spherical error}) + (K \text{ astigmatism}) / 2$
- Every 0.50 D for inventory & **NO vertex** of the power
- 0.25 D is available for orders online
- Determine power-code **empirically**
- Prescribe by trial fit & **over refract**



Illustration of calculation

Example:

Km: 42.87 x 44.75 @ 90

RX: - 7.50 - 1.50 x 180

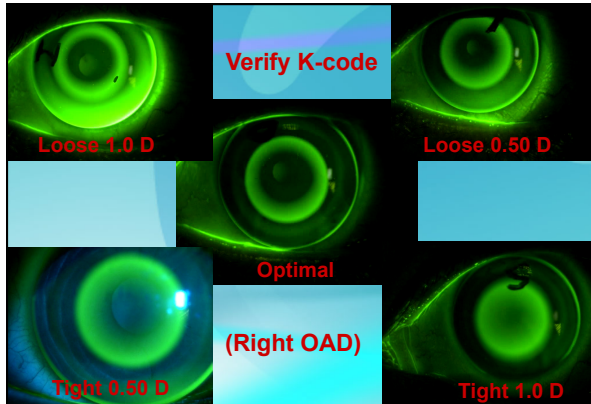
- $\text{Mean K} = (42.87 + 44.75) / 2 = 43.81$
K code = 43.75
- $\text{S.E.} = - 7.50 - (44.75 - 42.87) / 2 = -8.44$
- **Selected lens**
XM / 43.75 / -8.50 / 10.8 mm (standard)

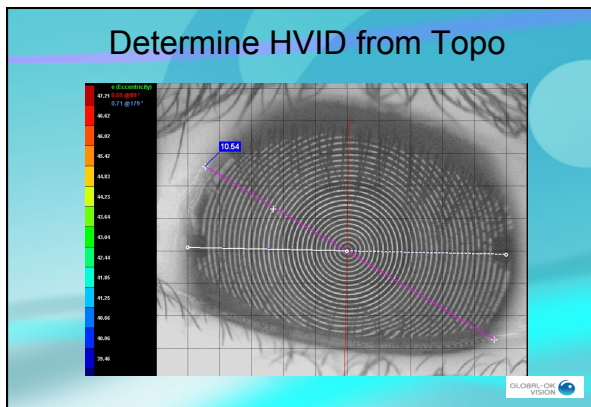


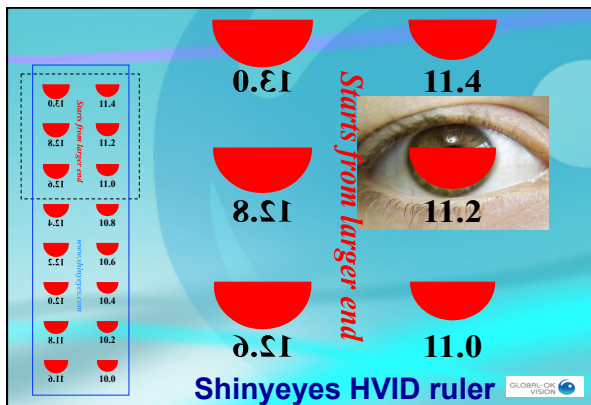
Trial fitting is highly recommended

- Use diagnostic lenses to verify
 - **K-code**, **Power-code**, & Lens size (OAD)
 - 31 lenses for K 40.0 ~ 47.50 in regular set
- May have a bigger set of 0.4mm larger









GOV® Empirical lens size (OAD)

- Empirical lens size works for 80~85% cases
- Larger lens for flatter Ks
- Smaller lens for steeper Ks

KM range	Default OAD	Best-fit HVID	% of HVID
40.00 ~ 42.25	11.2 mm	11.3~11.9 mm	97%
42.50 ~ 43.75	10.8 mm	11.2~11.6 mm	95%
44.00 ~ 47.50	10.4 mm	10.8~11.4 mm	93%

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Verify OAD

86% (too small)

89% (too small)

95% (Optimal)

(Optimal K-code)

98% (slightly large)

105% (very large)

Design your GOV® lens with Three (1-2-3) simple Steps

1. Central K (e-value is optional but useful)
KM (Optical type) .or.
Sim-K (Topography) .or.
Auto-RKM
2. Subjective Refraction
3. Corneal size or HVID (optional)
Size ruler in Topographer .or.
Shinyeyes HVID ruler

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High myopia & Advanced Ortho-K



The limit we were taught in myopia molding

- Mountford (1997)
 - Corneal eccentricity or *e* value of 0.20 = 1.00D of myopic correction
 - $e / 0.20$ = Refractive change
- Swarbrick et al (1998)
 - Munnerlyn's formula can be applied to predict refractive change due to epithelial thinning
 - Maximum degree of central epithelial thinning with Ortho-K appears to be 20 micron



Munnerlyn's formula

- Application of Munnerlyn's formula for Ortho-K:
 - Epithelial thinning = $RD^2 / 3$
 - R=refractive change (D)
 - D=treatment zone diameter
- Maximum epithelial thinning of 20 microns
 - As refractive change increases, the TxZ reduces
 - For pupil zone of 3.00mm, a refractive change of up to -6.00D may be possible
 - To correct more than -6.00D, the TxZ must be smaller than 3.00mm



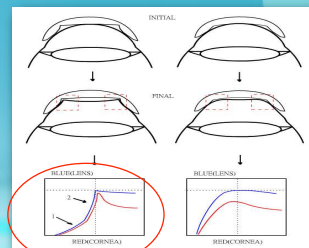
Reciprocal highlighting curves in high myopic orthok

- Relative curvatures of adjacent zones
 - (LASIK) **Flat center** — **steep mid-periphery**
 - (Ortho-K) **Steep mid-periphery** — **flat center**
- Epithelium also available in **peripheral cornea**
 - Unlimited to **central 5mm** or **20 microns**
 - **Peripheral inward** molding is the key for high prescription orthok



GOV® XM for High myopia is Safe & Effective

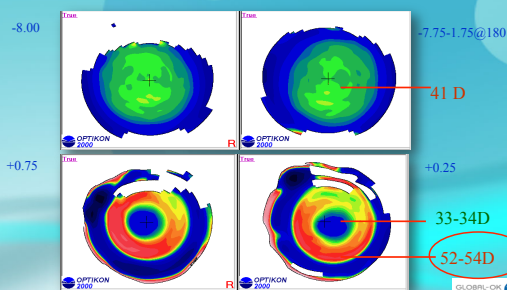
- XM pushes peripheral inward for a steep rim
- Regular Rx up to -10.0 D
- Available for -12.0 ~ -15.0 D (steep corneas)

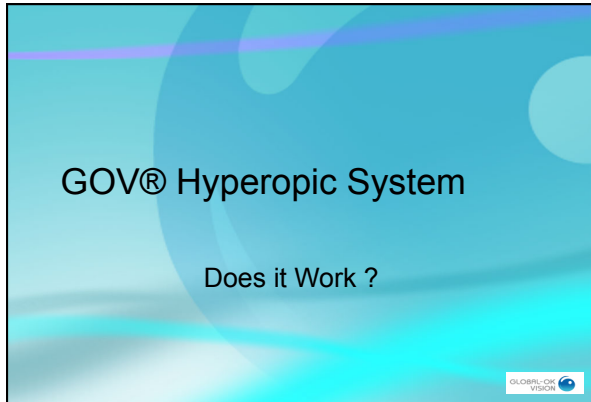


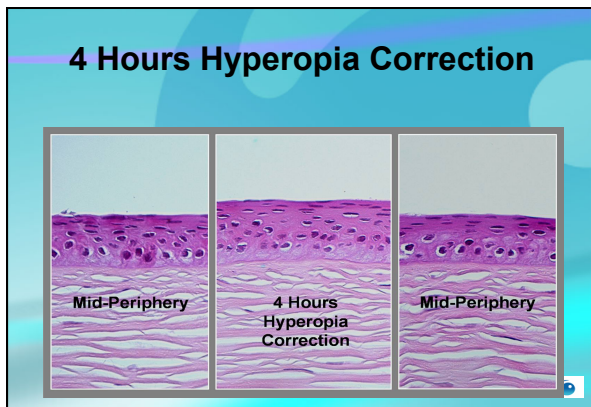
(SE = -11.5 D)

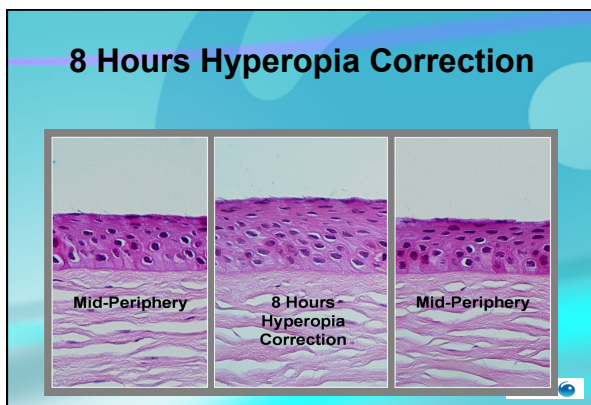


Sharpen mid-periphery for High Myopia molding

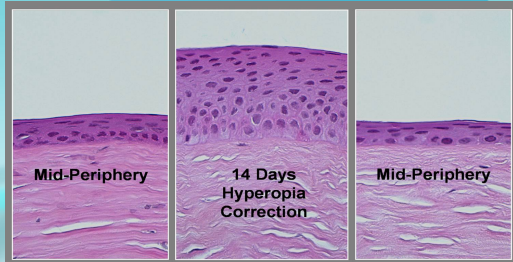








14 Days Hyperopia Correction



OCT of Hyperopic Lens

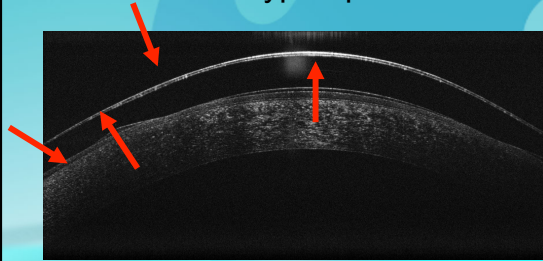
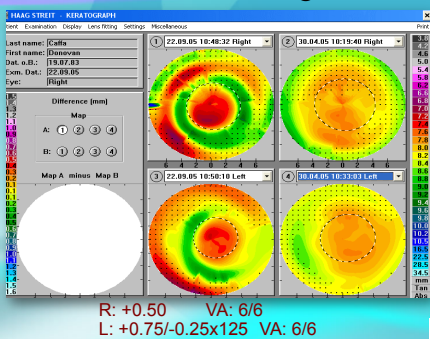
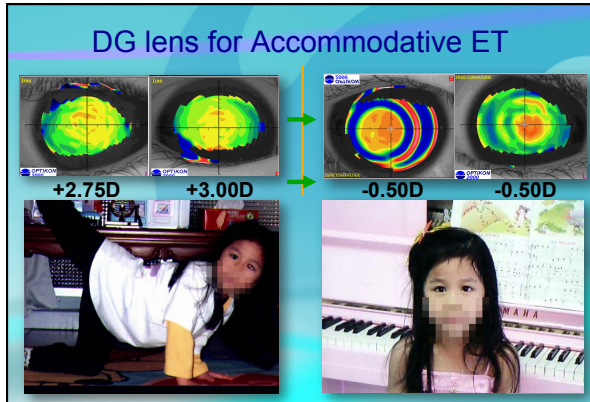


Photo: Courtesy of Lachlan Scott-Hoy

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Post molding







New! The GOV® Progressive Dual / Tilt Lens

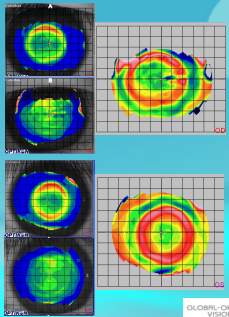
- GOV® Dual : Progressive Toric AZ
 - The Toric AZ seals the AZ and enables peripheral molding
- GOV® Tilt : Inclined Aspheric AZ
 - The Tilt AZ straightens the lens for uniform center molding
- Back curves of AZ is made **Progressively** Toric / Tilt
 - The edge figured rotationally identical thickness
- Dual / Tilt gradient by #1 ~ #8
 - Dual gradient base upon the corneal cylinder (#3 for 2-3 D; #4 for 3-4 D)
 - Tilt gradient base upon the **Difference** of K reading at **3-4 mm off-center** along the Tilting meridian



Indication for GOV® Dual

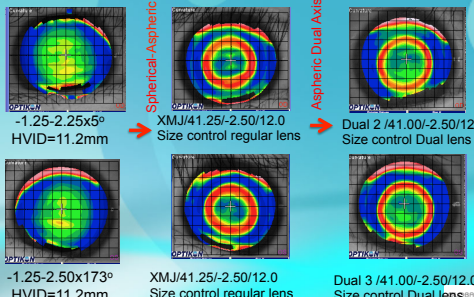
-- Low Myopia with High Astigmatism

- 9 y/o Male
- Refraction: (Low myopic hi cyl)
 - OD 20/20 -0.75 - 2.75 x 0
 - OS 20/20 -1.25 - 2.75 x 175
- KM: OD 39.75 / 42.50 (mean 41.00)
OS 39.50 42.00 (mean 40.75)
- Order:
 - OD XMJ dual 3 /40.75/-2.00 /11.6
 - OS XMJ dual 3 /40.75/-2.50/11.6
- 3 days after delivery: 20/20



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GOV® Dual to refit residual astigmatism



-1.25-2.25x5°
HVID=11.2mm

→ XMJ/41.25/-2.50/12.0
Size control regular lens

→ Dual 2 /41.00/-2.50/12.0
Size control Dual lens

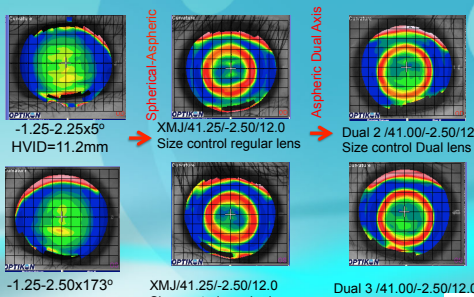
-1.25-2.50x173°
HVID=11.2mm

XMJ/41.25/-2.50/12.0
Size control regular lens

Dual 3 /41.00/-2.50/12.0
Size control Dual lens

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GOV® Dual to refit residual astigmatism



-1.25-2.25x5°
HVID=11.2mm

→ XMJ/41.25/-2.50/12.0
Size control regular lens

→ Dual 2 /41.00/-2.50/12.0
Size control Dual lens

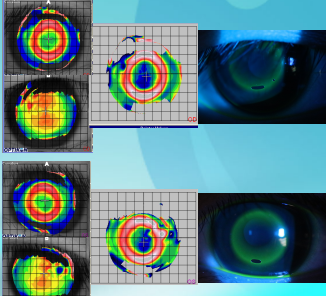
-1.25-2.50x173°
HVID=11.2mm

XMJ/41.25/-2.50/12.0
Size control regular lens

Dual 3 /41.00/-2.50/12.0
Size control Dual lens

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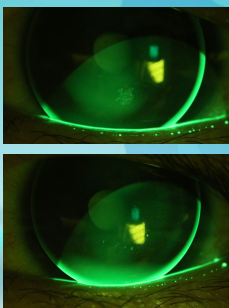
GOV® Dual for High corneal cyl



- 12 y/o Female
- Refraction:
-3.75 -2.25 x0
-3.75 - 2.50 x 170
- KM: 44.25/47.25 @90
44.25/47.50 @80
- Order:
XM/Dual 3/45.5/-5.25/10.8
XM/Dual 3/45.5/-5.25/10.8
- 20/20 (OU) in 1 month

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GOV® Dual for daywear RGP



- Ref:
OD -8.00 - 6.00 x 15
OS -6.00 - 5.50 x 0
- KM: OD 42.25 / 48.00
OS 42.00 / 47.50
- OD Dual3 / 45.0 / -9.00 /10.4
OS Dual3 / 44.5 / -7.00 /10.4
- VA 20/20 (OU)

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Dr. Tung Worldwide issued patents



Rigid OK Lenses

- #6,361,169
- #6,543,897
- #6,500,273
- #6,864,307
- #6,662,095
- #7,070,275
- #6,950,859
- #6,997,555
- #7,503,835

Soft Lenses

- #6,500,273
- #6,864,307
- #6,662,095
- #7,070,275
- #6,950,859
- #6,997,555
- #7,503,835

Patents

- USA
- Australia
- Canada
- China
- Europe
- India
- Korea
- Japan
- Taiwan

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