Multifocal Intraocular Lenses: Types and Models

12

Michael Mimouni and Jorge L. Alió

In this chapter, we present the pure technical details of the different types of multifocal lenses offered by the international market. Data which will be shown concerns about the optical characteristics of the different lenses, their dimensional characteristics, and their refractive behavior and refractive constants estimated by each manufacturer in order to find the most appropriate diopter power to meet the needs of a presbyopic patient. It should be indicated that each surgeon has always calculated his/her own customized constants according to their experience so that they can obtain a more accurate power. That is, the studies that support the efficiency of each lens are exposed by independent clinical investigators of commercial houses.

This information shown herein has been obtained through web pages of each producer, directly contacting them, with the assistance of the company sales manager, and that one offered by the different companies at the brochures distributed at international conferences such as the American Academy of Ophthalmology (AAO), European Society of Cataract and Refractive Surgery (ESCRS), and American Society of Cataract and Refractive Surgery (ASCRS). The search limit is mainly based on the protocol of each company to provide information.

We want to highlight the fact that the information provided is the one offered by the manufacturing companies. Therefore, they are the only ones responsible for the accuracy of the data. Also, it may be incomplete due to that lack of information or limited release of it to us. In some cases, we cannot be sure whether the lens is original or is a marketing product with a different name manufactured by another company, since the data at hand do not allow us to clarify this fact.

These data are current as of December 25, 2018.

12.1 IOLs Described

1. AcriDIFF (Care Group)
2. Acriva Reviol MF 613 and Acriva Reviol BB MF 613 (VSY Biotechnology)
3. Acriva Reviol MFB 625 (VSY Biotechnology)
4. Acriva Reviol MFM 611 and Acriva Reviol BB MFM 611 (VSY Biotechnology)
5. Acriva Reviol BB T MFM 611 (VSY Biotechnology)
6. Acriva Trinova (VSY Biotechnology)

M. Mimouni (✉)
Department of Ophthalmology, Rambam Health Care Campus, Haifa, Israel
e-mail: michael@internname.co.il

J. L. Alió
Research & Development Department and Department of Cornea, Cataract, and Refractive Surgery, VISSUM Corporation and Miguel Hernández University, Alicante, Spain
e-mail: jlalio@vissum.com

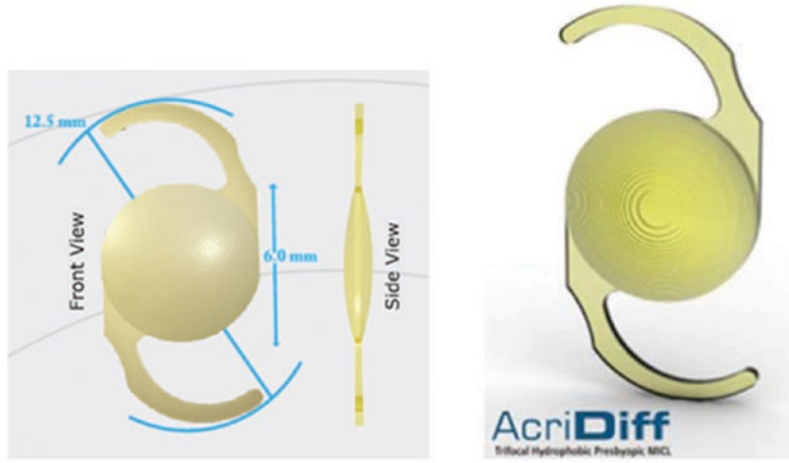
J. L. Alió, J. Pikkel (eds.), *Multifocal Intraocular Lenses*, Essentials in Ophthalmology,
https://doi.org/10.1007/978-3-030-21282-7_12

7. AcrySof IQ PanOptix Trifocal (Alcon)
8. AcrySof IQ ReSTOR MN6AD1 (Alcon)
9. AcrySof IQ ReSTOR SN6AD1 and SN6AD3 (Alcon)
10. AcrySof IQ ReSTOR SND1 T2–T5 (Alcon)
11. Add-On Diffractive sPB and sPBY (HumanOptics)
12. Add-On Toric-Diffractive sPB and sPBY (HumanOptics)
13. Add-On A45 RD (Medicontur)
14. Add-On Progressive A4DW0N, A4EW0N (1stQ)
15. AF-1 iSii Multifocal IOL PY-60 MB (HOYA Surgical Optics)
16. Alsiol-3D and Alsiol-3D Toric (Alsanza)
17. AT LISA 809 M/MP (Zeiss)
18. AT LISA Toric 909 M/MP (Zeiss)
19. AT LISA Tri 839 MP (Zeiss)
20. AT LISA Tri Toric 939 MP (Zeiss)
21. Basis Z Progressive B1EWYN (1STQ)
22. Bi Flex M 677 MY (Medicontur)
23. BunnyLens Multifocal (Hanita Lenses)
24. Camellens 2 FIL622–2 (Soleko)
25. Crystalens (Bausch and Lomb)
26. Diff-aA and Diff-aAY (HumanOptics)
27. Diff-sS and Diff-sSAY (HumanOptics)
28. EDEN (Swiss Advanced Vision)
29. EYECRYL ACTV IOLs DIYHS 600 ROH (Biotech, Moss Vision, Inc.)
30. EYECRYL ACTV IOLs DIYHS 600 (Biotech, Moss Vision, Inc.)
31. FineVision Micro F (PhysIOL)
32. FineVision Pod F (PhysIOL)
33. FineVision Pod F GF (PhysIOL)
34. FineVision Toric (PhysIOL)
35. Harmonis (Swiss Advanced Vision)
36. IC-8 (AcuFocus)
37. iDIFF Plus 1-P and 1-R (Care Group)
38. IPVCL V2.0 (Care Group)
39. I-stream Diffrax (MD Tech)
40. Lentis Comfort LS-313 MF15 (Oculentis, Topcon)
41. Lentis Mplus LS-313MF and MplusX LS-313MF30 (Oculentis, Topcon)
42. Lentis Mplus Toric LU-313MFT and LU-313MTFY (Oculentis, Topcon)
43. LUCIDIS (Swiss Advanced Vision)
44. Lumina (AkkoLens)
45. M-flex 630-F and 580-F (Rayner)
46. M-flex Toric 638-F and 588-F (Rayner)
47. Mini Well Ready (Sifi MedTech)
48. OPTIFLEX TRIO 3FLA6 (Biotech)
49. OptiVis Multifocal (Aaren Scientific)
50. PreciSAL M302A, M302 AC, PM302A, and PM30 2 AC (Millennium Biomedical, Inc. (MBI))
51. Precizon Presbyopic (Ophtec BV)
52. Presbysmart Crystal Evolution (Micro Technologie Ophtalmique (MTO))
53. Presbysmart Plus PSP0, PSP1, PSP2 (Micro Technologie Ophtalmique (MTO))
54. Preziol Multifocal Foldable (Care Group)
55. Preziol Multifocal PMMA (Care Group)
56. RayOne Trifocal (Rayner)
57. Reverso (Cristalens)
58. Review FIL611 PV (Soleko)
59. Review FIL611 PVT (Soleko)
60. Review FIL 65 PVS (Soleko)
61. Revive SQFL 600DF (Omni Lens)
62. ReZoom NXG1 (Abbott)
63. SeeLens Multifocal (Hanita Lenses)
64. Sulcoflex Multifocal 653F (Rayner)
65. Sulcoflex Multifocal Toric 653 T (Rayner)
66. Tecnis MF ZKB00, Tecnis MF ZLB00, Tecnis MF ZMB00 (Abbot)
67. TECNIS Symfony (Abbott)
68. Tetraflex (Lenstec)
69. TriDIFF (Care Group)
70. Versario Multifocal 3F (Bausch and Lomb)
71. WIOL-CF (Medicem)

12.2 Technical Data of the Different Types of Multifocal Lenses

1. AcriDIFF (Care Group) [1]

Fig. 12.1 AcriDIFF (Care Group)



- Type: one-piece diffractive-refractive multifocal IOL
- Optic: biconvex
- Pupil-dependent: no
- Contrast sensitivity: decreased
- Material: hydrophobic acrylic
- Filter: UV
- Total diameter: 12.5 mm
- Optic size: 6.0 mm
- Haptic angulation: 5°
- Haptic style: modified-C
- Edge design: square edge
- Implant location: bag
- Refractive index: 1.525
- Diopter range: +10.0D to +30.0D (0.5D increments)
- ADD IOL plane: +3.25
- Incision size: ≤2.0 mm
- Estimated A-constant: 118.8
- Theoretical ACD: 5.10
- **MTF graph (near and far vision)**

- Corporate office:
  - **Care Group India**
  - Block No.310, Village Sim of Dabhasa,
  - Tal.Padra, Dist. Vadodara – 391 440.
  - Gujarat, India.

4. Acriva Reviol MFM 611 and Acriva Reviol BB MFM 611 (VSY Biotechnology) [2, 3]

- Type: one-piece diffractive-refractive multifocal IOL

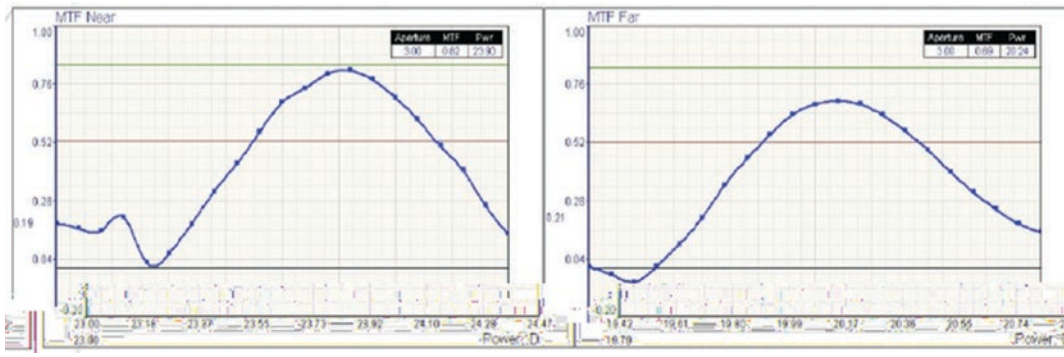


Fig. 12.2 MTF graph (near and far vision)

Fig. 12.3 Acriva Reviol MFM 611 and Acriva Reviol BB MFM 611 (VSY Biotechnology)

- Optic: biconvex active-diffractive (polished special surface), aspheric
- Pupil-dependent: no
- Contrast sensitivity: not affected
- Material: hydrophobic acrylic (25%) surface
- Filter: UV (MFM 611) and blue filter (BB MFM 611)
- Total diameter: 11.0 mm
- Optic size: 6.0 mm
- Haptic angulation: 0°
- Haptic style: plate haptic
- Edge design: square 360°
- Implant location: bag
- Refractive index: 1.509 (index dry), 1.462 (index wet)
- Diopter range:
  - Acriva Reviol MFM 611:
    - Standard: +0.0D to +32.0D (0.5D increments)
    - Special: +32.0D to +45.0D (0.5D increments)
  - Acriva Reviol BB MFM 611: +0.0D to +45.0D (0.5D increments)
- ADD IOL plane: +3.75
- Incision size: MFM 611 ≤ 1.8 mm (MICS) and BB MFM 611 ≤ 2.0 mm
- Injector system recommended: Acrijet injector and cartridge (MFM 611) and Acrijet blue injector and cartridge (MFM BB 611)

- Corporate office:
  - **VSY BIOTECHNOLOGY BV**.
  - Strawinskylaan 1265.
  - 1077 XX Amsterdam (Netherlands)

Table 12.1 A-constants

Estimated A-constant: 118.0	
SRK/T: 118.3	*SRK II*: 118.5

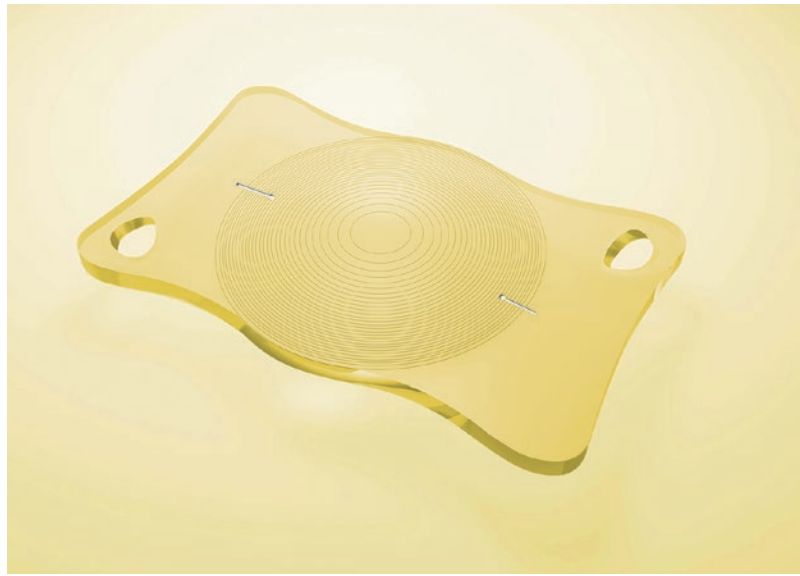


Fig. 12.4 Acriva Reviol BB T MFM 611 (VSY Biotechnology)

5. Acriva Reviol BB T MFM 611 (VSY Biotechnology) [4]

- Type: one-piece diffractive-refractive aspheric toric multifocal IOL
- Optic: biconvex active-diffractive toric multifocal
- Pupil-dependent: no
- Contrast sensitivity: not affected
- Material: hydrophobic acrylic (25%) surface
- Filter: UV and blue filter
- Total diameter: 11.0 mm
- Optic size: 6.0 mm
- Haptic angulation: 0°
- Haptic style: plate haptic
- Edge design: square 360°
- Implant location: bag
- Refractive index: 1.509 (index dry), 1.462 (index wet)
- Diopter range (Custom made):
  - Sphere: +0.0D to +32.0D (0.5D increments)
  - Cylinder: +1.0D to +10.0D (0.5D increments)
- ADD IOL plane: +3.75
- Incision size: ≤1.8 mm (MICS) and ≤2.0 mm
- Injector system recommended: Acrijet blue injector and cartridge

Table 12.2 A-constants

Estimated A-constant: 118.0	
SRK/T: 118.3	*SRK II*: 118.5

- Corporate office:
  - **VSY BIOTECHNOLOGY BV.**
  - Strawinskylaan 1265.
  - 1077 XX Amsterdam (Netherlands)

6. Acriva Trinova (VSY Biotechnology) [5]

- Type: one-piece diffractive-refractive sinusoidal trifocal IOL
- Optic: aspheric diffractive toric multifocal
- Pupil-dependent: no
- Contrast sensitivity: not affected
- Material: hydrophobic
- Filter: UV and blue filter

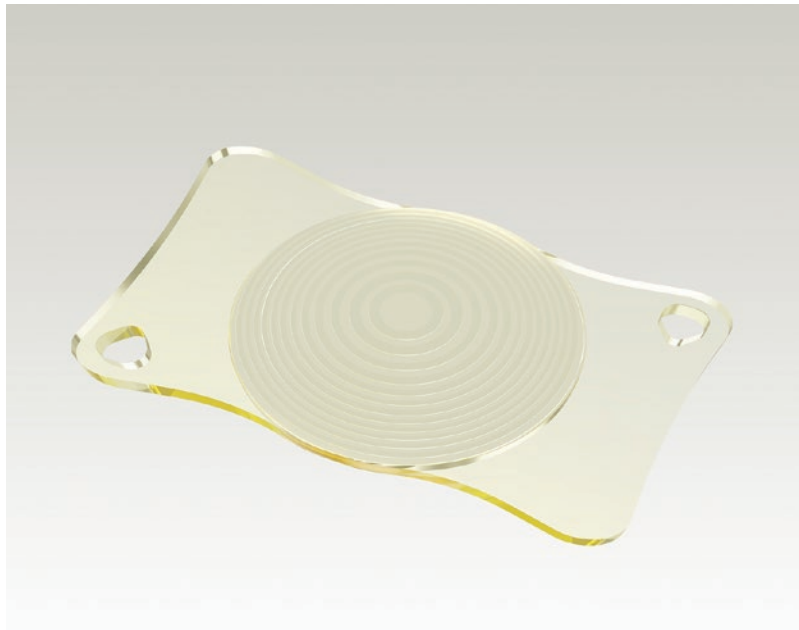


Fig. 12.5 Acriva Trinova (VSY Biotechnology)

- Total diameter: 11.0 mm
- Optic size: 6.0 mm
- Haptic angulation: 0°
- Haptic style: plate haptic
- Edge design: square 360°
- Implant location: bag
- Refractive index: 1.462 (index wet)
- Diopter range (Custom made):
  - Sphere: +0.0D to +32.0D (0.5D increments)
  - Cylinder: +1.0D to +10.0D (0.5D increments)
- ADD IOL plane: +3.75
- Incision size: ≤1.8 mm (MICS) and ≤2.0 mm
- Injector system recommended: Acrijet green injector and cartridge

Table 12.3 A-constants

Estimated A-constant: 118.0	
SRK/T: 117.9	*SRK II*: 118.0

- Corporate office:
  - **VSY BIOTECHNOLOGY BV.**
  - Strawinskylaan 1265.
  - 1077 XX Amsterdam (Netherlands)

7. AcrySof IQ PanOptix Trifocal (Alcon) [6]

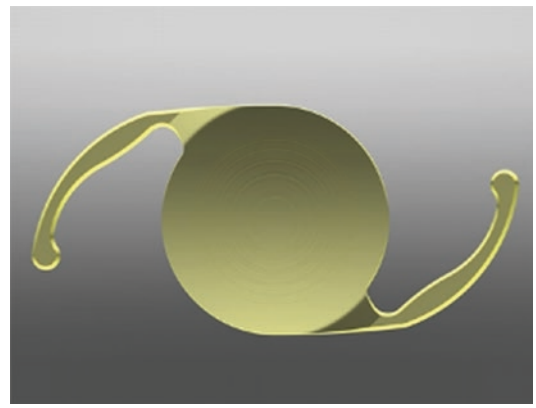


Fig. 12.6 AcrySof PanOptix Trifocal (Alcon)

- Type: one-piece multifocal hydrophobic acrylic IOL
- Optic: trifocal diffractive aspheric
- Pupil-dependent: yes
- Material: acrylic
- Filter: UV and blue light filtering
- Total diameter: 13.0 mm
- Optic size: 6.0 mm
- Haptic angulation: not mentioned
- Edge design: square edge

- Implant location: bag
- Refractive index: not mentioned
- Diopter range:
  - +13.0D to +30.0D (0.5D increments)
  - +31.0D to +34.0 (1.0D increments)

- Corporate office:
  - **Alcon Laboratories, Inc.**
  - 6201 South Freeway
  - Fort Worth, TX 76134–2099 (USA)

8. AcrySof IQ ReSTOR MN6AD1 (Alcon) [7]

- Type: three-piece multifocal hydrophobic acrylic IOL
- Optic: symmetric biconvex with an anterior aspheric, diffractive, apodized surface
- Pupil-dependent: no
- Contrast sensitivity: decreased
- Material: acrylic copolymer
- Filter: UV and blue light filtering
- Total diameter: 13.0 mm
- Optic size: 6.0 mm
- Haptic angulation: 10°
- Haptic style: Monoflex PMMA modified-C
- Edge design: square edge
- Implant location: sulcus
- Refractive index: 1.47
- Diopter range: +6.0D to +30.0D (0.5D increments)
  - +31.0D to +34.0 (1.0D increments)
- ADD IOL plane: +3.0D
- ADD spectacle plane: +2.5D
- Incision size: ≥2.2 mm
- Injector system recommended: single-use Monarch D-cartridge DK7797–2 and Loading Forceps DK7717
- Estimated A-constant: 119.2
- **Pupil dependence**

- Corporate office:
  - **Alcon Laboratories, Inc.**
  - 6201 South Freeway
  - Fort Worth, TX 76134–2099 (USA)

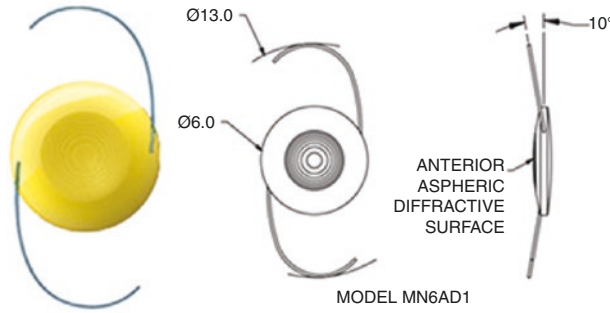


Fig. 12.7 AcrySof IQ ReSTOR MN6AD1 (Alcon)

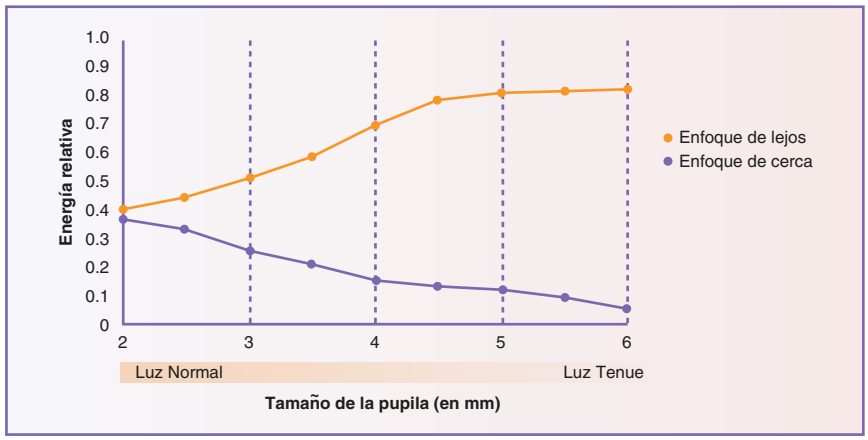


Fig. 12.8 Pupil dependence

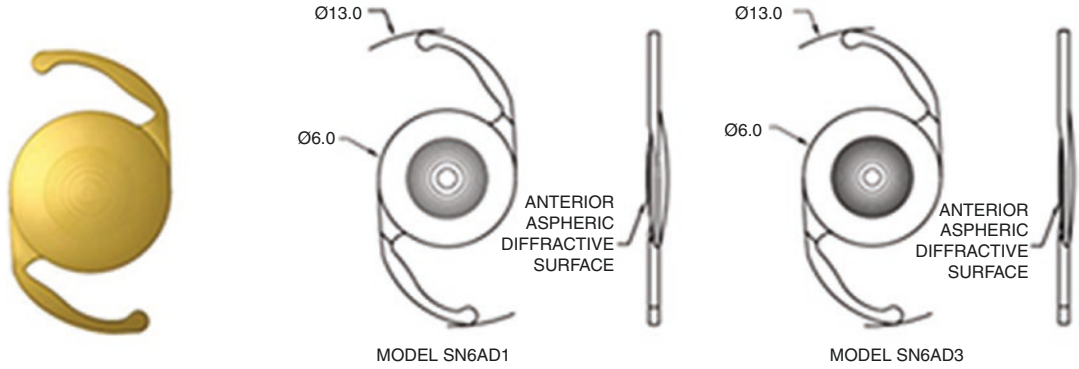


Fig. 12.9 AcrySof IQ ReSTOR SN6AD1 and SN6AD3 (Alcon)

9. AcrySof IQ ReSTOR SN6AD1 and SN6AD3 (Alcon) [8, 9]

- Type: one-piece multifocal hydrophobic acrylic IOL
- Optic: symmetric biconvex with an anterior aspheric, diffractive, apodized surface
- Pupil-dependent: no
- Contrast sensitivity: decreased
- Material: hydrophobic acrylic
- Filter: UV and blue light
- Total diameter: 13.0 mm
- Optic size: 6.0 mm
- Haptic angulation: 0°
- Haptic style: STABLEFORCE modified-L
- Edge design: square 360°
- Implant location: bag
- Refractive index: 1.47
- Incision size: ≥2.2 mm
- Injector system recommended: single-use Monarch D-cartridge DK7797–2 and Loading Forceps DK7717
- Estimated A-constant: 118.9

Table 12.4 Additional IOL specifications

	SN6AD1	SN6AD3
ADD IOL plane	+3.0D	+4.0D
ADD spectacle plane	+2.4D	+3.2D
Number diffractive rings	9	12
Diopter range	+6.0D to +30.0 (0.5D steps) +31.0D to +34.0D (1.0D steps)	+10.0D to +30.0D (0.5D) +31.0D to +34.0 (1.0D steps)

- Corporate office:
  - **Alcon Laboratories, Inc.**
  - 6201 South Freeway
  - Fort Worth, TX 76134–2099 (USA)

10. AcrySof IQ ReSTOR SND1 T2–T5 (Alcon) [10]

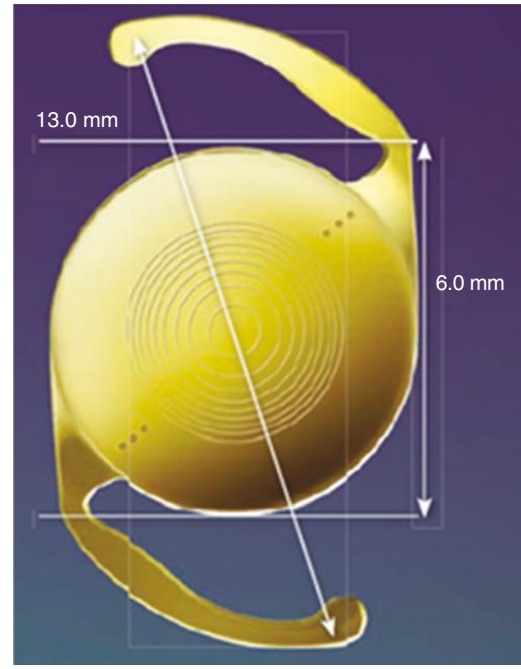


Fig. 12.10 AcrySof IQ ReSTOR SND1 T2–T5 (Alcon)

- Type: one-piece multifocal hydrophobic acrylic IOL

- Optic: symmetric biconvex with an anterior aspheric, diffractive, apodized toric surface
- Pupil-dependent: no
- Contrast sensitivity: decreased
- Material: hydrophobic acrylic
- Filter: UV and blue light
- Total diameter: 13.0 mm
- Optic size: 6.0 mm
- Haptic angulation: 0°
- Haptic style: STABLEFORCE modified-L
- Edge design: square 360°
- Implant location: bag
- Refractive index: 1.55
- Diopter range: +6.0D to +30.0D (0.5D increments)
- ADD IOL plane: +3.0D
- ADD spectacle plane: +2.4D
- Incision size: ≥2.2 mm
- Injector system recommended: single-use Monarch D-cartridge DK7797–2 and Loading Forceps DK7717
- Estimated A-constant: 118.9
- **MTF graph of AcrySof IQ ReSTOR and AcrySof ReSTOR Toric**
- AcrySof IQ ReSTOR Toric calculator: http://www.acrysoftoriccalculator.com/

Table 12.5 Cylinder power

Models	SND1 T2	SND1 T3	SND1 T4	SND1 T5
Toric	0.68D to 1.0D	1.03D to 1.5D	1.55D to 2.25D	2.06D to 3.0D

- Corporate office:
  - **Alcon Laboratories, Inc.**
  - 6201 South Freeway
  - Fort Worth, TX 76134–2099 (USA)

13. Add-On A45 RD (Medicontur) [11]

- Type: one foldable multifocal Add-On IOL for sulcus fixation in pseudophakic eyes
- Optic: spheric, convex-concave, diffractive anterior surface
- Pupil-dependent: yes
- Contrast sensitivity: not affected
- Material: hydrophobic acrylic

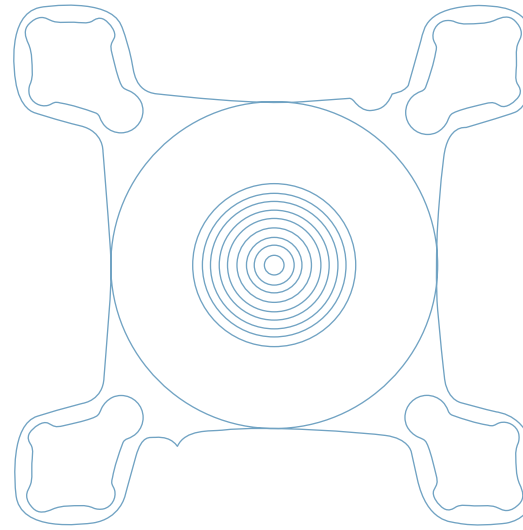


Fig. 12.12 Add-On A45 RD (Medicontur)

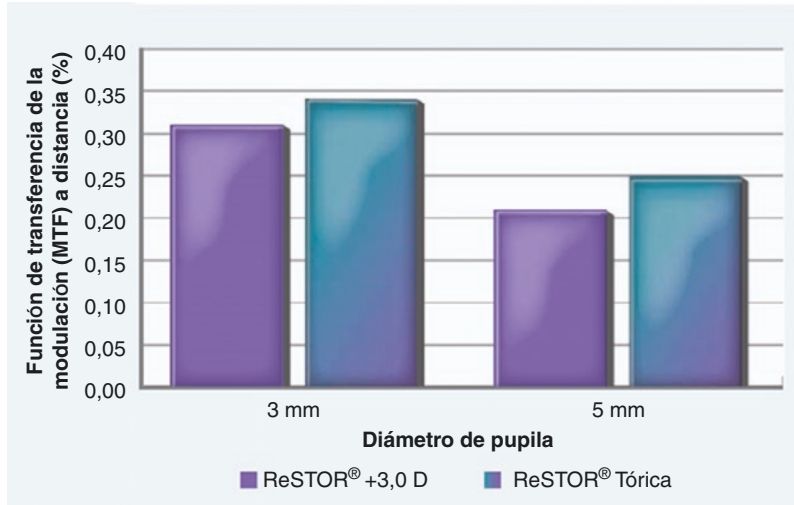


Fig. 12.11 MTF graph of AcrySof IQ ReSTOR and AcrySof ReSTOR Toric

- Filter: UV
- Total diameter: 13.0 mm
- Optic size: 6.0 mm
- Haptic angulation: 0°
- Haptic style: four closed loops
- Edge design: not mentioned
- Implant location: sulcus
- Diopter range:
  - Sphere: −7.0D to +6.0D (0.25D increments)
- ADD IOL plane: +3D
- Incision size: not mentioned
- Estimated A-constant: not applicable (by application principle)

- Corporate office:
  - Medicontur Medical Engineering Ltd
  - Herceghalmi Road
  - 2072 Zsámbék (Hungría)

14. Add-On Progressive A4DW0N, A4EW0N (1stQ) [12]

- Type: one-piece foldable multifocal additional IOL for pseudophakic patients
- Optic: convex-concave multifocal
- Material: hydrophilic acrylic (25% water)
- Filter: UV and blue light filter

Fig. 12.13 Add-On Progressive A4DW0N, A4EW0N (1stQ)

- Total diameter: 13 mm
- Optic size: 6 mm
- Haptic angulation: 0°
- Haptic style: four flex-haptics
- Edge design: square edge
- Implant location: sulcus
- Diopter range:

Table 12.6 IOL ranges and steps

AddOn Progressive	Spherical Equivalent	Steps
A4DW0N	0.0D	
A4EW0N	−3.0D to −0.5D	0.25D
	+0.5D to +3.0D	0.25D

This IOL is available with individual features, upon request

- ADD IOL plane: +3.5

- Corporate office:
  - 1stQ GmbH
  - Harrlachweg 1
  - 68163 Mannheim (Germany)

15. AF-1 iSii Multifocal IOL PY-60 MB (HOYA Surgical Optics) [13]

- **(The images of this lens may be observed at:** http://hoyasurgicaloptics.com/us/professionals/products/**)**
- Type: one-piece refractive multifocal IOL
- Optic: three-zone refractive multifocal
- Pupil-dependent: yes
- Contrast sensitivity: not affected
- Material: hydrophobic acrylic, PMMA chemically bonded haptics
- Filter: UV and blue light filter
- Total diameter: 12.5 mm
- Optic size: 6.0 mm
- Haptic angulation: 5°
- Haptic design: modified-C loop
- Edge design: square edge design and step edge
- Implant location: bag
- Diopter range: +14.0D to +27.0D (0.5D increments)
- ADD IOL plane: +3.0 (for near and intermediate vision)

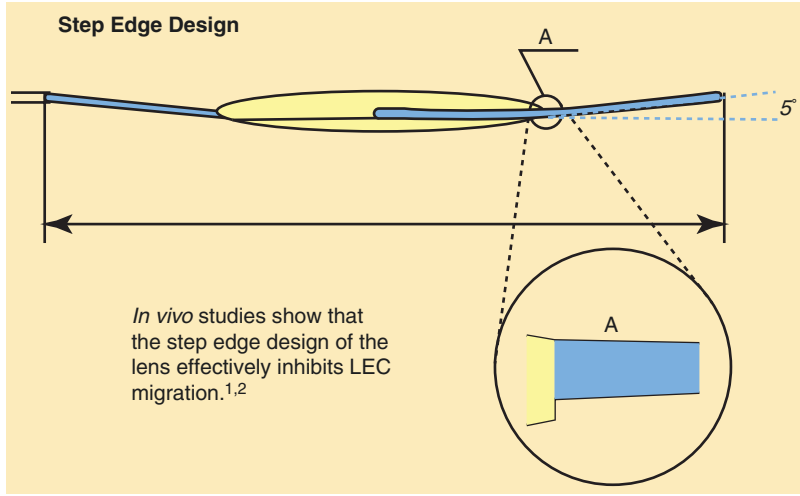


Fig. 12.14 Haptic design: modified-C loop

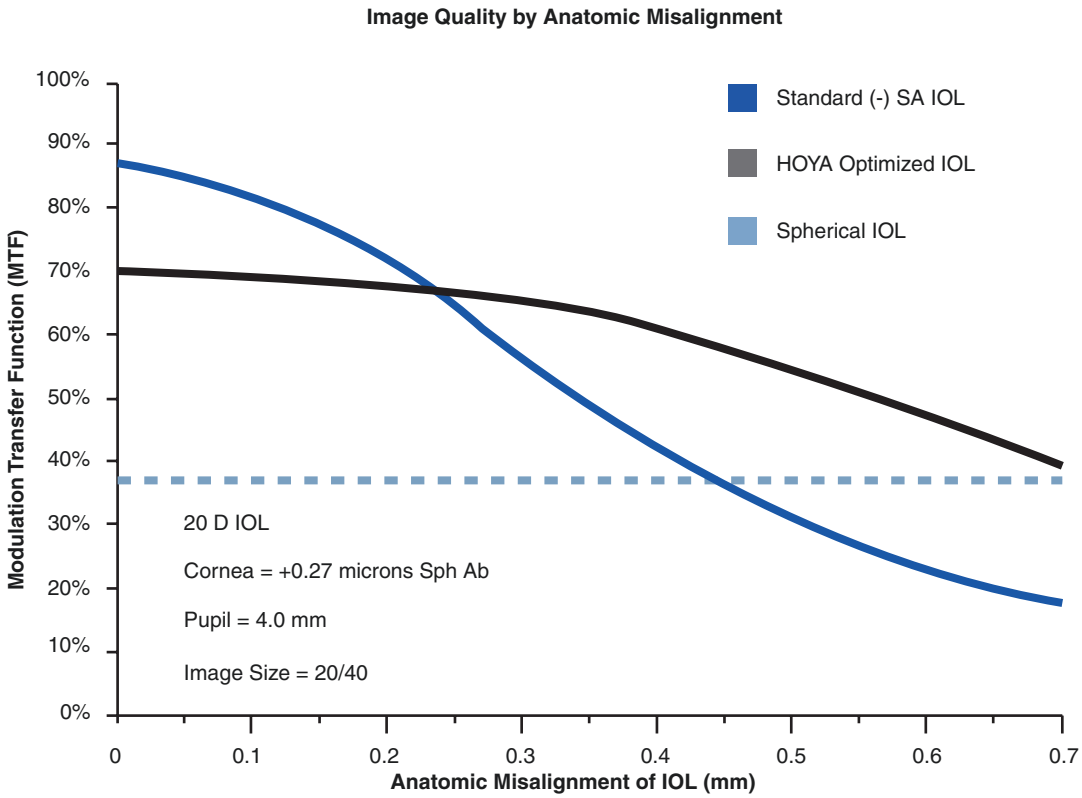


Fig. 12.15 MTF graph of AF-1 iSii MF

- Incision size: ≤2.5 mm
- Injector system: iSert 230 and 231 preloaded injector system
- Estimated A-constant: 118.4
- **MTF graph of AF-1 iSii MF**
- Corporate office:
  - **HOYA Surgical Optics Global Headquarters**
  - One Temasek Avenue
  - Millenia Tower, #35–03/04,
  - 039192, Singapore

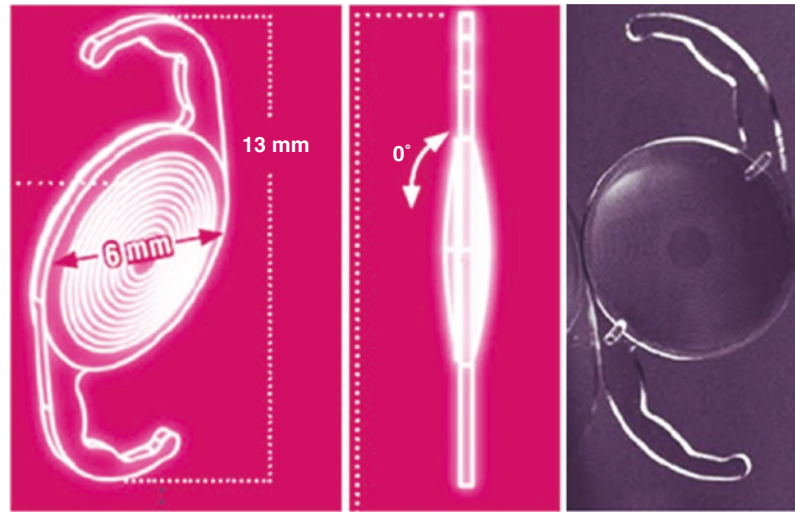


Fig. 12.16 Alsiol-3D and Alsiol-3D toric (Alsanza)

16. Alsiol-3D and Alsiol-3D Toric (Alsanza) [14, 15]

- Type: one-piece biconvex aspheric diffractive 3D multifocal IOL
- Optic: multifocal diffractive 3D
- Pupil-dependent: no
- Contrast sensitivity: not significant decreased
- Material: hydrophilic acrylic biomaterial (25%) with a non-coated hydrophobic surface
- Filter: UV and violet light
- Total diameter: 13.0 mm
- Optic size: 6.0 mm
- Haptic angulation: 0°
- Haptic style: modified-C loops
- Edge design: square 360°
- Implant location: bag
- Sphere Diopter range Alsiol-3D:
  - Standard: +0D to +32D (0.5D increments)
  - Customized: −20.0D to +45.0D (0.5D increments)
- Cylinder Diopter range Alsiol-3D toric:
  - Standard: +1.0D to +6.0D
  - Customized: +6.0D to +12.0D
- ADD IOL plane: +3.75D
- Incision size: ≥1.8 mm
- Injector system recommended: MICS with Alsajet Injector set
- Estimated A-constant: 118.0
- Theoretical ACD: 4.97
- Alsiol-3D calculator: http://alsatoriscan.com/
- Corporate office:
  - **Alsanza GmbH**
  - Hermann-Burkhardt-Straße 3
  - 72793 Pfullingen (Germany)

17. AT Lisa 809 M/MP (Zeiss) [16]

- Type: one-piece multifocal diffractive aspheric hydrophilic acrylic IOL
- Optic: multifocal, diffractive, and aspheric
- Pupil-dependent: no
- Contrast sensitivity: decreased
- Material: hydrophilic acrylic 25% with hydrophobic surface
- Filter: UV
- Total diameter: 11.0 mm
- Optic size: 6.0 mm
- Haptic angulation: 0°
- Haptic style: plate
- Implant location: bag
- Refractive index: 1.46
- Diopter range: +0.0D to +32.0D (0.5D increments)
- ADD IOL plane: +3.75D
- ADD spectacle plane: +3.0D
- Incision size: 1.5 mm AT LISA 809 M/1.8 mm AT LISA 809 MP
- Injector system:
  - AT LISA 809 M – Injector/Cartridge set:
    - AT. Shooter A2–2000/ACM2 (1.5 mm)
    - Viscojet 1.8 Injector Set

Fig. 12.17 AT LISA 809 M/MP (Zeiss)

    - Single-use injector A6/AT. Smart Cartridge Set (1.8 mm)
  - AT LISA 809 MP: preloaded injector BLUEMIXS 180 (1.8 mm)
- Estimated A-constant: 117.8
- Theoretical ACD: 4.85

- Corporate office:
  - **Carl Zeiss Meditec AG**
  - Goeschwitzer Str.51–52
  - 0.7745 Jena (Germany)

19. AT LISA Tri 839 MP (Zeiss) [17]

- Type: one-piece trifocal diffractive aspheric hydrophilic acrylic IOL
- Optic: multifocal, diffractive, and aspheric
- Pupil-dependent: no
- Contrast sensitivity: decreased
- Asphericity: −0.18 μm
- Material: hydrophilic acrylic 25% with hydrophobic surface
- Filter: UV
- Total diameter: 11.0 mm
- Optic size: 6.0 mm
- Haptic angulation: 0°
- Haptic style: plate
- Implant location: bag
- Refractive index: 1.46
- Diopter range: +0.0D to +32.0D (0.5D increments)
- ADD IOL plane: +3.33D for near vision, +1.66D for intermediate vision
- Incision size: 1.8 mm
- Injector system: preloaded injector BLUEMIXS 180 (1.8 mm)
- Estimated A-constant: 118.6
- Theoretical ACD: 5.32

- Corporate office:
  - **Carl Zeiss Meditec AG**
  - Goeschwitzer Str.51–52
  - 0.7745 Jena (Germany)

Fig. 12.18 AT LISA Tri 839 MP (Zeiss)

Fig. 12.19 AT LISA Tri Toric 939 MP (Zeiss)

20. AT LISA Tri Toric 939 MP (Zeiss) [18]

- Type: one-piece trifocal bitoric diffractive aspheric hydrophilic acrylic IOL
- Optic: multifocal, diffractive, and aspheric
- Pupil-dependent: no
- Contrast sensitivity: decreased
- Material: hydrophilic acrylic 25% with hydrophobic surface
- Filter: UV

- Total diameter: 11.0 mm
- Optic size: 6.0 mm
- Haptic angulation: 0°
- Haptic style: plate
- Implant location: bag
- Refractive index: 1.46
- Diopter range: Sphere:
  - +10.0D to +28.0D (0.5D increments)
  - Cylinder: +1.0D to +4.0D (0.5D increments)
- ADD IOL plane: +3.33D for near vision, +1.66D for intermediate vision
- Incision size: 1.8 mm
- Injector system: preloaded injector BLUEMIXS 180 (1.8 mm)
- Estimated A-constant: 118.8
- Theoretical ACD: 5.32

- Corporate office:
  - **Carl Zeiss Meditec AG**
  - Goeschwitzer Str.51–52
  - 0.7745 Jena (Germany)

21. Basis Z Progressive B1EWYN (1STQ) [19]

- Type: one-piece foldable multifocal IOL
- Optic: refractive, progressive, and aspheric
- Material: hydrophilic acrylic (25% water) with hydrophobic surface
- Filter: UV and blue light filter
- Total diameter: 13 mm
- Optic size: 6 mm
- Haptic angulation: 0°
- Haptic style: Z-haptic
- Edge design: square edge
- Implant location: bag
- Diopter range: +0.0D to +10.0D (1.0D increments)
  - +10.0D to +30.0D (0.5D increments)
- ADD IOL plane: +3.5D
- A-constant estimated: 118.0
- Haigis: a0 = 0.39; a1 = 0.242; a2 = 0.153

- Corporate office:
  - 1stQ GmbH
  - Harrlachweg 1
  - 68163 Mannheim (Germany)

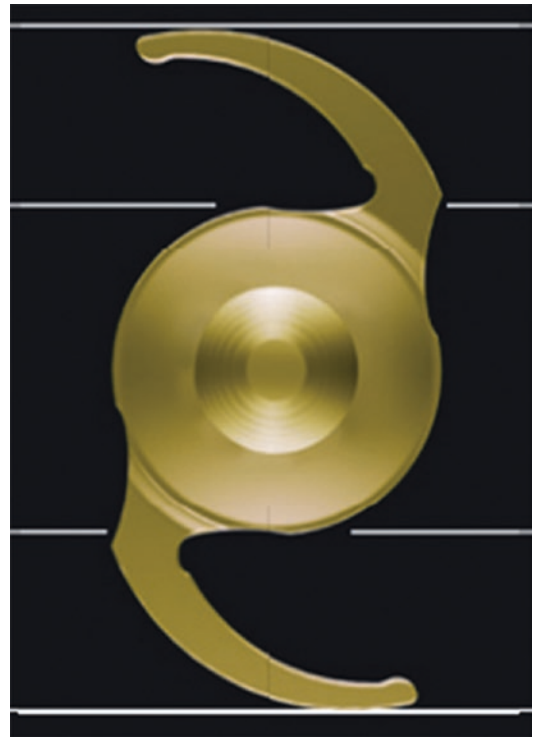


Fig. 12.20 Basis Z progressive B1EWYN (1stQ)

22. Bi Flex M 677 MY (Medicontur) [20]

- Type: one-piece biconvex multifocal diffractive aspheric hydrophilic IOL
- Optic: PAD technology – progressive apodized diffractive. Diffractive anterior surface, aspheric posterior surface
- Pupil-dependent: no
- Contrast sensitivity: decreased
- Material: hybrid copolymer (hydrophilic and hydrophobic)
- Filter: UV and blue light filter
- Total diameter: 13.0 mm
- Optic size: 6.0 mm
- Haptic angulation: 0° – asymmetrical design with posterior vaulting
- Edge design: square 360°
- Implant location: bag
- Edge design: 360° round square edge
- Refractive index: 1.46
- Diopter range: +0.0D to +30.0D (0.5D increments)

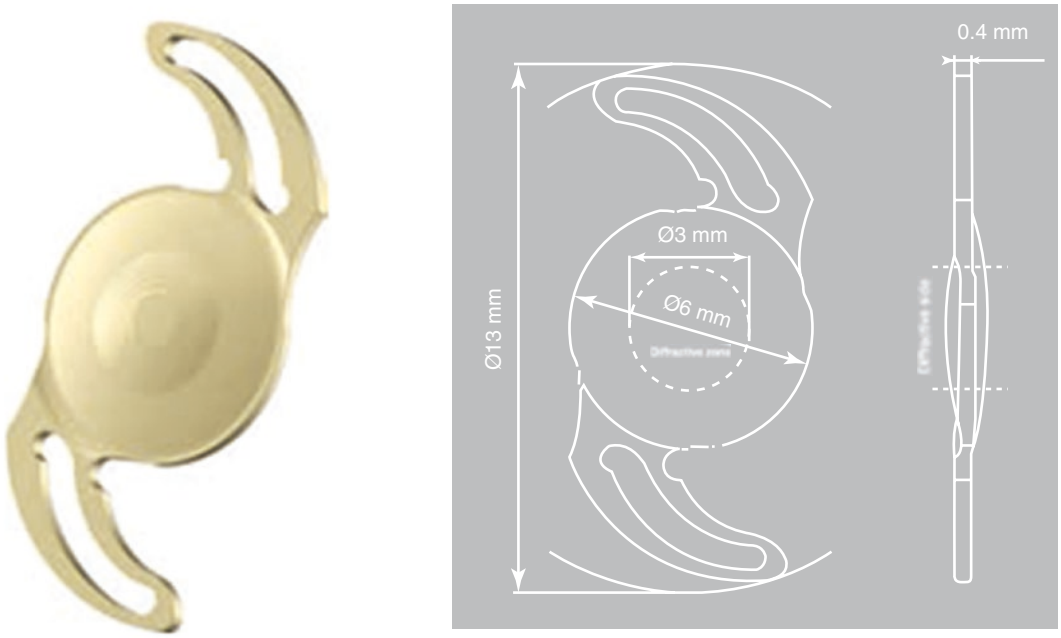


Fig. 12.21 Bi Flex M 677 MY (Medicontur)

- ADD IOL plane: +3.5D
- Incision size: from 1.8 mm to 2.2 mm
- Injector system: single-use injector system MedJet MB 1.8
- Estimated A-constant: 118.6 (subject to changes to optimization)
- ACD: 4.8 mm

- **Corporate office:**
  - Medicontur Medical Engineering Ltd
  - Herceghalmi Road
  - 2072 Zsámbék (Hungría)

23. BunnyLens Multifocal (Hanita Lenses) [21]

- Type: one-piece foldable multifocal IOL for MICS
- Optic: multifocal diffractive apodized aspheric
- Pupil-dependent: yes
- Contrast sensitivity: decreased
- Material: hydrophilic acrylic HEMA/EOEMA copolymer
- Filter: UV and violet light
- Total diameter: 11.0 mm
- Optic size: 6.0 mm
- Haptic angulation: 5°
- Haptic style: four-point haptic design

Fig. 12.22 BunnyLens Multifocal (Hanita Lenses)

- Edge design: square 360°
- Implant location: bag
- Refractive index: 1.46
- Diopter range: +0.0D to +30.0D (0.5D increments); +31.0D to +35.0D (1.0D increments)
- ADD IOL plane: +3.0D, +2.25

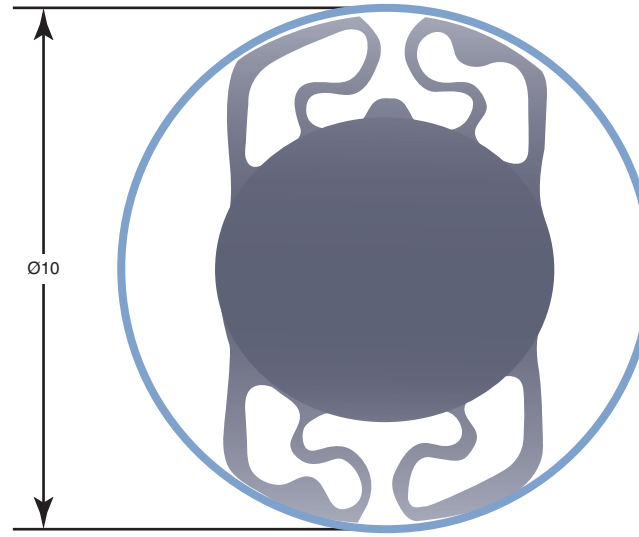


Fig. 12.23 Haptic style: four-point haptic design

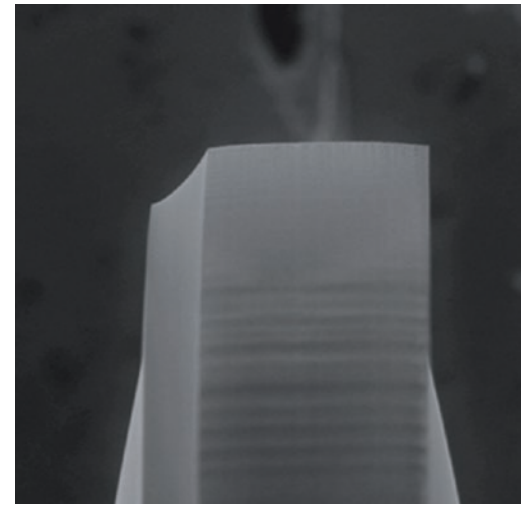


Fig. 12.24 Edge design: square 360°

Fig. 12.25 Injector system: single-use delivery system SoftJect 1.8

Table 12.7 Estimated constants

		IOL Master	US biometry
Hoffer Q	tACD	5.2	4.98
Holladay I	SF	1.42	1.2
SRK II	A	118.78	118.35
SRK/T	A	118.5	118.16
Haigis	a0	0.978	0.753
	a1	0.40	0.40
	a2	0.10	0.10

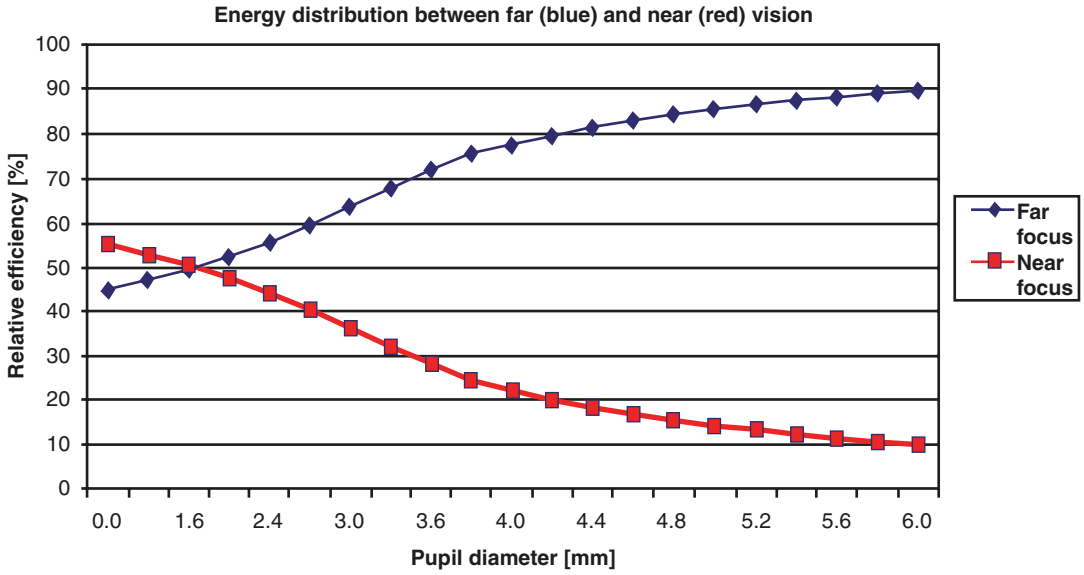


Fig. 12.26 Pupil dependence

- ADD spectacle plane: +2.4D
- Incision size: 1.8 mm
- Injector system: single-use delivery system Softject 1.8
- **Pupil dependence**

- Corporate office:
  - **Hanita Lenses R.C.A Ltd.**
  - Kibbutz Hanita, 22885

24. Camellens 2 FIL622–2 (Soleko) [22]

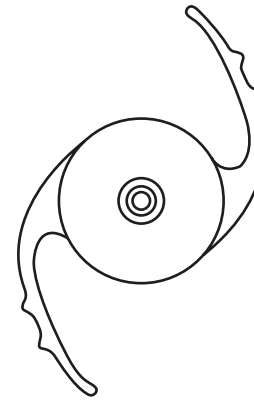


Fig. 12.27 Camellens 2 FIL622–2 (Soleko)

- Type: one-piece foldable multifocal add-on sulcus IOL
- Optic: multifocal diffractive
- Pupil-dependent: yes
- Contrast sensitivity: not mentioned
- Material: hydrophilic acrylic
- Filter: UV
- Total diameter: 15.0 mm
- Optic size: 6.0 mm
- Haptic angulation: 10°
- Edge design: square 360°
- Implant location: sulcus

- Refractive index: 1.461
- Diopter range: −5.0D to +5.0D (0.5D increments)
- Cylinder range: +1.0D to +6.0D (0.5D increments)
- ADD spectacle plane: +3.0D
- Incision size: not mentioned
- Injector system: Medicel Viscojet 2.2 or 2.7

- Corporate office:
  - **Soleko IOL Division**
  - 00198 Rome (Italy)
  - Via Aniene, 10

25. Crystalens (Bausch and Lomb) [23, 24]

- Type: accommodating posterior chamber intraocular lens
- Optic: double aspheric surfaces
- Pupil-dependent: no
- Material: silicone elastomer (Biosil)
- Filter: UV
- Total diameter: 11.5–12.0 mm
- Optic size: 5.0 mm
- Optic\haptic style: modified plate haptic lens with hinges across the plates adjacent to the optic
- Implant location: bag
- Refractive index: 1.43
- Diopter range: +4.0D to +33.0D (0.25–1.00D increments)
- Incision size: 3.5–3.7 mm
- Estimated A-constant: located on outside of package
- Estimated ACD: located on outside of package

- Corporate office:
  - **Bausch & Lomb**
  - 400 Somerset Corporate Blvd.
  - Bridgewater, NJ 08807

28. EDEN (Swiss Advanced Vision) [25]

- (The images of this lens may be observed at https://sav-iol.com/products/eden/)
- Type: foldable one-piece hydrophobic acrylic extended depth of focus (EDOF) IOL
- Optic: aspheric, refractive-diffractive
- Pupil-dependent: yes
- Material: hydrophobic acrylic
- Filter: UV
- Total diameter: 10.8 or 12.4 mm
- Optic size: 6.0 mm
- Haptic angulation: 0°
- Haptic style: closed loop
- Edge design: 360 ° posterior square edge
- Implant location: bag
- Diopter range: +5D to +30D (0.5D increments)
- Cylinder range: +1.50D to 3.75D
- Incision size: 2.2 mm

- Corporate office:
  - **SAV-IOL SA**
  - Route des Falaises 74
  - 2000 Neuchatel
  - Switzerland

29. EYECRYL ACTV IOLs DIYHS 600 ROH (Biotech, Moss Vision, Inc.) [26]

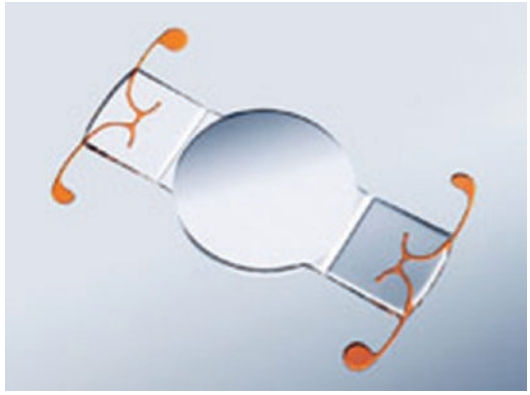


Fig. 12.28 Crystalens (Bausch and Lomb). (Images courtesy of Bausch and Lomb)

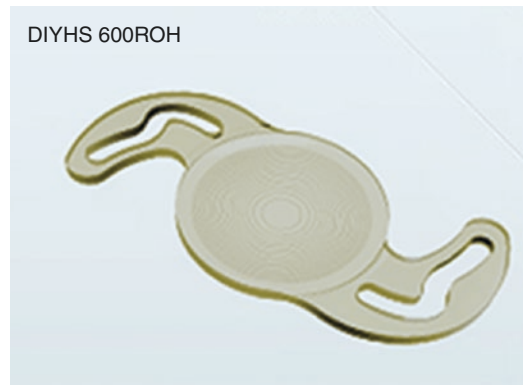


Fig. 12.29 EYECRYL ACTV IOLs DIYHS 600 ROH (Biotech, Moss Vision, Inc.)

- Type: one-piece diffractive-refractive and aspheric hydrophilic acrylic multifocal IOL
- Optic: multifocal, diffractive and aspheric
- Pupil-dependent: no
- Contrast sensitivity: not affected
- Material: hydrophilic acrylic 25% with hydrophobic surface
- Filter: UV
- Total diameter: 12.5 mm
- Optic size: 6.0 mm
- Haptic angulation: 5°
- Implant location: bag
- Edge design: square 360°
- Refractive index: 1.46
- Diopter range: +10.0D to +30.0D (0.5D increments)
- ADD IOL plane: +3.75D
- Incision size: ≤2.0 mm.

Table 12.8 Estimated constants

Fabricate A-constant = 118.0		
Hoffer Q	tACD	4.67
Holladay I	SF (surgeon factor)	0.93
SRK II	A	117.8
SRK/T	A	117.6
Haigis*	a0 a1 a2	0.56 0.40 0.10

*Unoptimized

- Corporate office:
  - **Biotech Visioncare**
  - 401, Sarthik II,
  - Opp. Rajpath Club,
  - S.G. Highway
  - Ahmedabad 380 054
  - Gujarat, India

30. EYECRYL ACTV IOLs DIYHS 600 (Biotech, Moss Vision, Inc.) [26]

- Type: one-piece diffractive-refractive and aspheric hydrophilic acrylic multifocal IOL
- Optic: multifocal, diffractive, and aspheric
- Pupil-dependent: no
- Contrast sensitivity: not affected
- Material: hydrophilic acrylic 25% with hydrophobic surface
- Filter: UV
- Total diameter: 12.5 mm
- Optic size: 6.0 mm
- Haptic angulation: 0°
- Implant location: bag
- Edge design: square 360°
- Refractive index: 1.48
- Diopter range: +10.0D to +30.0D (0.5D increments)
- ADD IOL plane: +3.0D
- Incision size: ≤2.0 mm.

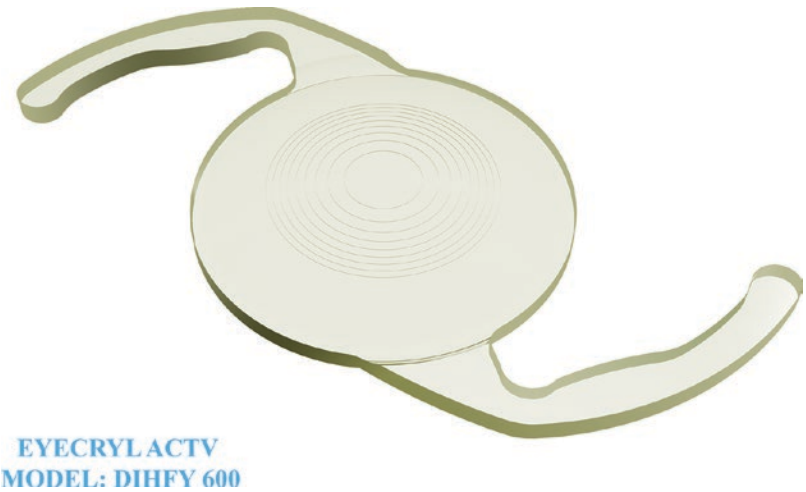


Fig. 12.30 EYECRYL ACTV IOLs DIYHS 600 (Biotech, Moss Vision, Inc.)

Table 12.9 Estimated constants

Fabricate A-constant = 118.5		
Hoffer Q	tACD	5.42
Holladay I	SF (surgeon factor)	1.63
SRK II	A	118.9
SRK/T	A	118.7
Haigis*	a0 a1 a2	1.24 0.40 0.10

*Unoptimized

Table 12.10 Estimated constants

Fabricate A-Constant = 118.5			
		IOL Master	*US*
Hoffer Q	tACD	5.35	5.26
Holladay I	SF (Surgeon Factor)	1.6	1.48
SRK II	A	119.10	118.89
SRK/T	A	118.8	118.59
Haigis*	a0 a1 a2	1.36 0.40 0.10	1.04 0.40 0.10

*Unoptimized

- Corporate office:
  - **Biotech Visioncare**
  - 401, Sarthik II,
  - Opp. Rajpath Club,
  - S.G. Highway
  - Ahmedabad 380 054
  - Gujarat, India

31. FineVision Micro F (PhysIOL) [27]

- Type: one-piece trifocal hydrophilic acrylic IOL
- Optic: diffractive FineVision anterior surface, aspherical posterior surface
- Pupil-dependent: yes
- Contrast sensitivity: not significant decreased
- Asphericity: −0.11 µm
- Material: 25% hydrophilic acrylic
- Filter: UV and BlueTech
- Total diameter: 10.75 mm
- Optic size: 6.15 mm
- Haptic angulation: 5°
- Edge design: double posterior square edge

Fig. 12.31 FineVision Micro F (PhysIOL)

- Implant location: bag
- Refractive index: 1.47
- Diopter range: +10D to +35D (0.5D increments)
- ADD spectacle plane:
  - +1.75D intermediate vision
  - +3.5D near vision
- Incision size: ≥1.8 mm
- Injector system recommended: MICS.
  - Injector Medicel Viscojet ≥1, 8 mm
  - Accujet ≥2.2 mm for >25D.

- Corporate office**:**
  - **PhysIOL s.a**.
  - Liège Science Park – Allée des Noisetiers, 4
  - 4031 Liège (Belgium)

32. FineVision Pod F (PhysIOL) [27]

- Type: one-piece trifocal hydrophilic acrylic IOL
- Optic: diffractive FineVision anterior surface, aspherical posterior surface

Fig. 12.32 FineVision Pod F (PhysIOL)

- Pupil-dependent: yes
- Contrast sensitivity: not significant decreased
- Asphericity: −0.11 µm
- Material: 25% hydrophilic acrylic
- Filter: UV and BlueTech
- Total diameter: 11.40 mm
- Optic size: 6.0 mm
- Haptic angulation: 5°
- Edge design: double posterior square edge
- Implant location: bag
- Refractive index: 1.46
- Diopter range: +6D to +35D (0.5D increments)
- ADD spectacle plane:
  - +1.75D intermediate vision
  - +3.5D near vision

Table 12.11 Estimated constants

Fabricate A-constant = 118.5		
Hoffer Q	tACD	5.59
Holladay I	SF (surgeon factor)	1.83
SRK II	A	119.31
SRK/T	A	118.95
Haigis*	a0 a1 a2	1.36 0.40 0.10

*Unoptimized

- Incision size: ≥2.0 mm
- Injector system recommended: MICS
  - Injector Medicel Viscojet ≥1, 8 mm
  - Accujet ≥2.2 mm for >25D
- **Pupil-dependence**

- Corporate office**:**
  - **PhysIOL s.a**.
  - Liège Science Park – Allée des Noisetiers, 4
  - 4031 Liège (Belgium)

33. FineVision Pod F GF (PhysIOL) [28]

- Type: one-piece toric trifocal hydrophilic acrylic glistening-free IOL
- Optic: biconvex. Diffractive FineVision anterior surface, aspherical posterior surface
- Pupil-dependent: yes
- Asphericity: −0.11 µm
- Material: hydrophilic acrylic glistening-free
- Filter: UV and BlueTech
- Total diameter: 11.40 mm
- Optic size: 6.0 mm
- Haptic angulation: 5°
- Edge design: 360° square edge
- Implant location: bag

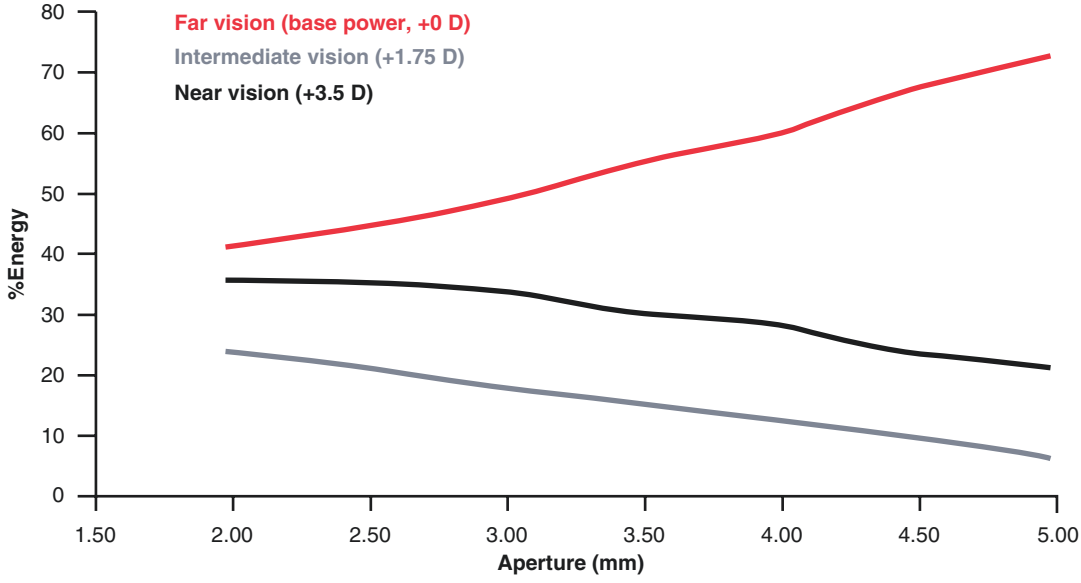


Fig. 12.33 Pupil dependence

Fig. 12.34 FineVision Pod F GF (PhysIOL)

- Refractive index: 1.52
- Diopter range: +10D to +35D (0.5D increments)
- ADD spectacle plane:
  - +1.75D intermediate vision
  - +3.5D near vision
- Incision size: ≥2.0 mm
- Injector system recommended:
  - Medicel Accuject 2.0 from 10D to 24.5D
  - Medicel Accuject 2.1 /2.2 from 25D to 35D
- FineVision Toric calculator: http://www.physioltoric.eu/

- Corporate office**:**
  - **PhysIOL s.a**.
  - Liège Science Park – Allée des Noisetiers, 4
  - 4031 Liège (Belgium)

34. FineVision Toric (PhysIOL) [27]

Fig. 12.35 FineVision Toric (PhysIOL)

- Type: one-piece toric trifocal hydrophilic acrylic IOL
- Optic: biconvex. Diffractive FineVision anterior surface, aspherical posterior surface
- Pupil-dependent: yes
- Contrast sensitivity: not significant decreased
- Asphericity: −0.11 µm
- Material: 25% hydrophilic acrylic
- Filter: UV and BlueTech
- Total diameter: 11.40 mm
- Optic size: 6.0 mm
- Haptic angulation: 5°
- Edge design: double posterior square edge
- Implant location: bag
- Refractive index: 1.46
- Diopter range: +6D to +35D (0.5D increments)
- Cylinder range (on demand): 1.00–1.50 −2.25 −3.00 −3.75 −4.50 −5.25 −6.00D
- ADD spectacle plane:
  - +1.75D intermediate vision
  - +3.5D near vision
- Incision size: ≥2.0 mm
- Injector system recommended: Medicel Accuject 2.0

Table 12.12 Estimated constants

Estimated constants (IOL master)		
Fabricate A-constant: 118.5		
Hoffer Q	tACD	5.59
Holladay II	SF	1.83
SRK II	A	119.31
SRK/T	A	118.95
Haigis*	a0 a1 a2	1.36 0.40 0.10

*Unoptimized

- FineVision Toric calculator: http://www.physioltoric.eu/

- Corporate office**:**
  - **PhysIOL s.a**.
  - Liège Science Park – Allée des Noisetiers, 4
  - 4031 Liège (Belgium)

35. Harmonis (Swiss Advanced Vision) [29]

- (Images of this lens can be viewed at: https://sav-iol.com/products/harmonis/)
- Type: foldable one-piece hydrophilic acrylic extended depth of focus (EDOF) IOL
- Optic: aspheric, refractive-diffractive
- Pupil-dependent: yes
- Material: hydrophilic acrylic
- Filter: UV
- Total diameter: 10.8 or 12.4 mm
- Optic size: 6.0 mm
- Haptic angulation: 0°
- Haptic style: closed loop
- Edge design: 360 ° posterior square edge
- Implant location: bag
- Diopter range: +5D to +30D (0.5D increments)
- Add: +2.5D to +3.5D (0.25D increments)
- EDOF: +1.0D to 2.0D (0.5D increments)
- Cylinder range: +1.50D to 3.75D
- Incision size: 2.2 mm

- Corporate office:
  - **SAV-IOL SA**
  - Route des Falaises 74
  - 2000 Neuchatel
  - Switzerland

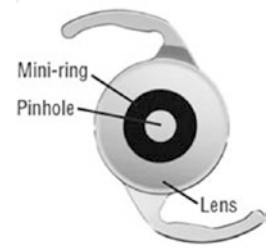


Fig. 12.36 IC-8 (AcuFocus)

36. IC-8 (AcuFocus) [30]

- Type: one-piece small aperture extended depth of focus IOL
- Optic: small aperture aspherical surface
- Pupil-dependent: no
- Material: hydrophilic acrylic
- Filter: none mentioned
- Total diameter: 12.50 mm
- Optic size: 6.0 mm
- Haptic angulation: 5°
- Edge design: posterior square 360°
- Implant location: bag
- Refractive index: not mentioned
- Diopter range: +15.5D to +27.5D (0.5D increments)
- Aperture size: 1.36 mm
- Estimated A-constant for optical biometry: 120.5

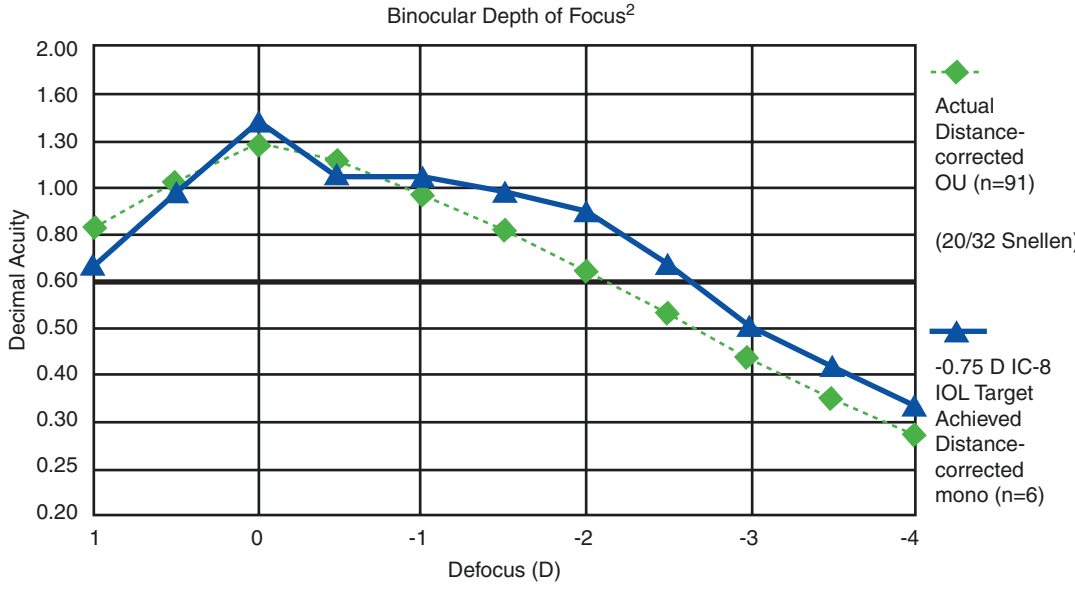


Fig. 12.37 Defocus curve

- Estimated A-constant for ultrasound biometry: 120.15
- **Defocus Curve**

- Corporate office**:**
  - **Acu Focus Inc.**
  - 32 Discovery # 200, Irvine
  - CA 92618, USA

37. iDIFF Plus 1-P and 1-R (Care Group) [31]

- Type: one-piece diffractive-refractive multifocal IOL
- Optic: modified diffractive-refractive and aspherical surface
- Pupil-dependent: yes
- Contrast sensitivity: not affected
- Material: hydrophilic acrylic
- Filter: UV
- Total diameter: 11.0 mm iDIFF 1-P, 12.50 mm iDIFF 1-R
- Optic size: 6.0 mm both IOLs
- Haptic angulation: 0°
- Edge design: square 360°
- Implant location: bag
- Refractive index: 1.467
- Diopter range: +11.0D to +30.0D (0.5D increments)
- ADD IOL plane: +3.0D, +3.5D and + 4.0D
- Incision size: ≥2.0 mm
- Estimated A-constant: 118.0
- **MTF graph**

- Corporate office:
  - **Care Group India**.
  - Block No.310, Village Sim of Dabhasa,
  - Tal.Padra, Dist. Vadodara – 391 440.
  - Gujarat, India.

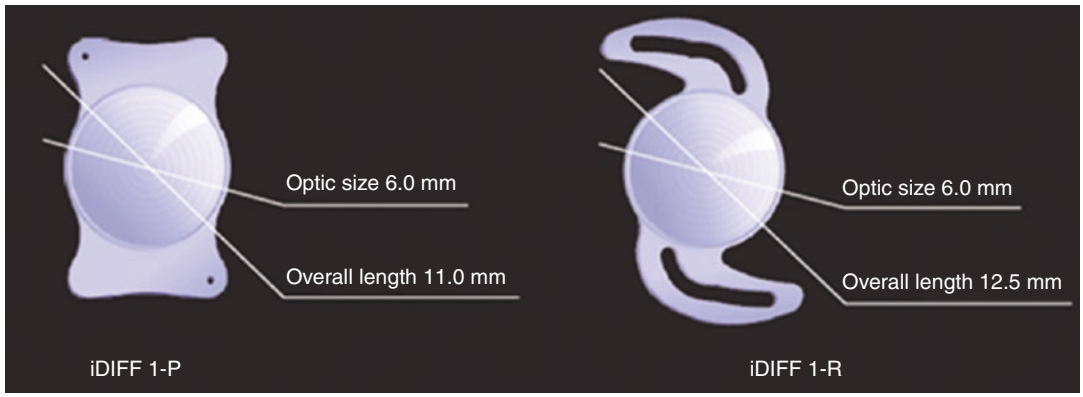


Fig. 12.38 iDIFF Plus 1-P and 1-R (Care Group)

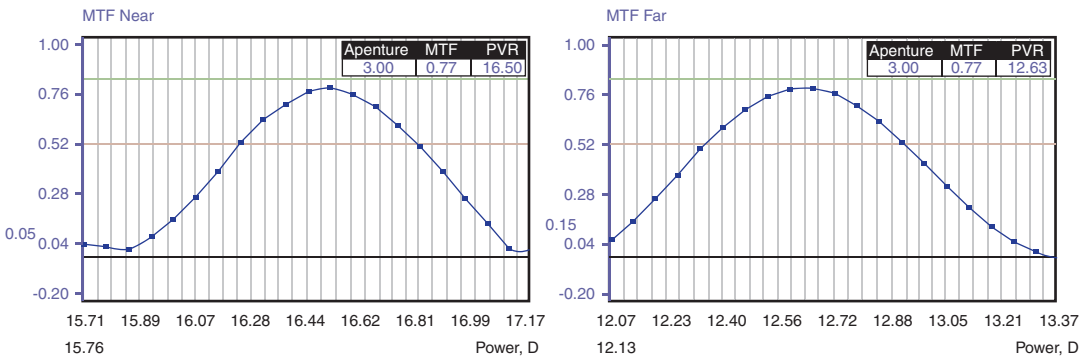


Fig. 12.39 MTF graph

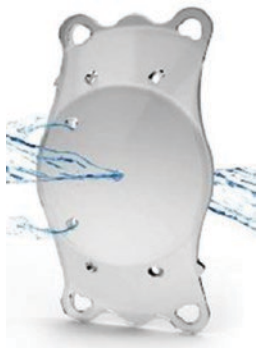


Fig. 12.40 IPVCL V2.0 (Care Group)

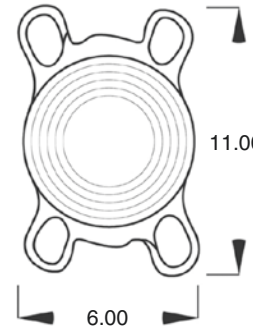


Fig. 12.41 I-stream Diffrax (MD Tech)

38. IPVCL V2.0 (Care Group) [32]

- Type: implantable multifocal contact lens
- Optic: aspheric multifocal
- Pupil-dependent: yes
- Material: hybrid hydrophilic acrylic
- Filter: UV
- Total diameter: 11.5 mm to 14 mm
- Optic diameter: 6.6 mmHaptic angulation – not mentioned
- Edge design: not mentioned
- Implant location: sulcus
- Refractive index: 1.465
- Diopter range: −1.0D to −30.0D (0.5D increment), +1.0D to +15.0D (0.5D increment)
- ADD IOL plane: +1.0D to +4.0D
- Cylinder ranges: +0.50 to +10.0D
- Incision size: 2.8 mm
- Estimated A-constant: not mentioned
- IPCL calculator: http://ipcliol.com/

- Corporate office:
  - **Care Group India**.
  - Block No.310, Village Sim of Dabhasa,
  - Tal.Padra, Dist. Vadodara – 391 440.
  - Gujarat, India.

39. I-stream Diffrax (MD Tech) [33]

- Type: one-piece, refractive-diffractive multifocal IOL
- Optic: aspheric biconvex
- Pupil-dependent: yes
- Material: hybrid copolymer with surface hydrophobic
- Filter: UV
- Total diameter: 11.0 mm
- Optic diameter: 6.6 mmHaptic angulation – not mentioned
- Edge design: not mentioned
- Implant location: bag
- Refractive index: 1.46
- Diopter range: 0.0D to +40D
- ADD IOL plane: +4.0D
- Incision size: not mentioned.
- Estimated A-constant: 118.2

- Corporate office:
  - **MD Tech**.
  - Via A. De Gasperi 35 00165
  - Rome, Italy

40. Lentis Comfort LS-313 MF15 (Oculentis, Topcon) [34]

- Type: one-piece foldable bifocal hydrophobic acrylic IOL to intermediate and far vision
- Optic: biconvex, aspherical posterior surface. Sector-shaped addition
- Pupil-dependent: no
- Contrast sensitivity: not affected
- Material: HydroSmart acrylate copolymer with hydrophobic surface
- Filter: UV
- Total diameter: 11.0 mm
- Optic size: 6.0 mm
- Central thickness: 0.97 mm (+22.0D)

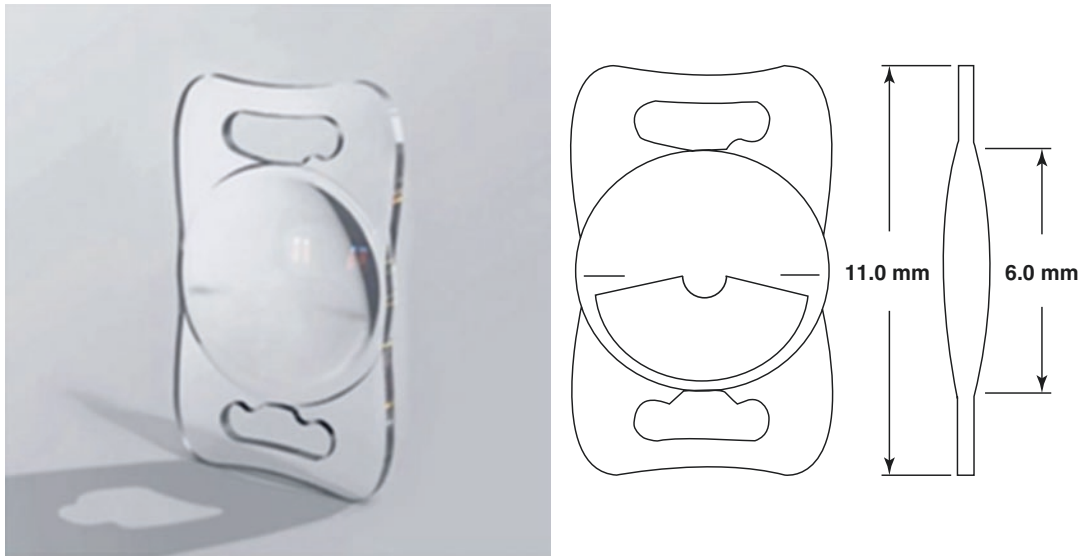


Fig. 12.42 Lentis Comfort LS-313 MF15 (Oculentis, Topcon)

Table 12.13 Recommended injectors

Recommended injector (reusable)	Injector: Viscoject 1-hand: L1604205 Viscoject 2-hand: L1604215
	Cartridges Viscoject BIO 1.8 cartridge-set: LP604205C (max. 25D) Viscoject BIO 2.2 cartridge-set: LP604240C
Recommended injector-sets (disposable)	Viscoject BIO 1.8 injector-set: LP604350C(max.25D) Viscoject BIO 2.2 injector-set: LP604340C

Table 12.14 Estimated constants

Estimated constants (IOL Master)		
Fabricate A-constant: 118.0 / ACD: 4.97		
Hoffer Q	tACD	5.21
Holladay I	SF	1.47
SRK II	A	118.6
SRK/T	A	118.5
Haigis	a0 a1 a2	0.95 0.40 0.10

- Haptic angulation: 0°
- Haptic style: Monoflex PMMA modified-C
- Edge design: square edges, posterior 360° continuous barrier effect
- Implant location: bag
- Refractive index: 1.46
- Diopter range:
  - −10.0D to −1.0D (1.0D increments)
  - +0.0D to +36.0D (0.5D increments)
- ADD IOL plane: +1.5D
- ADD spectacle plane: +1.2D
- Incision size (recommended): 2.2 mm/2.6 mm
- Injector system:

- Corporate office:
  - **Oculentis GmbH**
  - Am Borsigturm 58
  - 13507 Berlin (Germany)

41. Lentis Mplus LS-313MF and MplusX LS-313MF30 (Oculentis, Topcon) [35]

- Type: one-piece multifocal acrylic IOL
- Optic: biconvex, aspherical posterior surface. Sector-shaped addition of +3.0D
- Pupil-dependent: no. Independent increased in MplusX, also for very small pupils
- Contrast sensitivity: not affected
- Material: HydroSmart acrylate copolymer with hydrophobic surface
- Filter: UV
- Total diameter: 11.0 mm
- Optic size: 6.0 mm

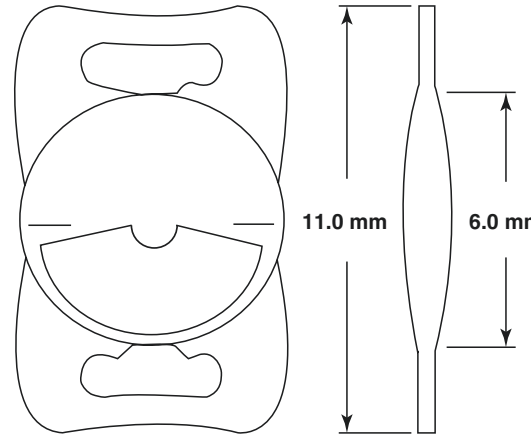


Fig. 12.43 Lentis Mplus LS-313 MF and MplusX LS-313 MF30 (Oculentis, Topcon)

Table 12.15 IOL ranges and recommended incision size

	Lentis Mplus	Lentes MplusX
Diopter range	+15.0D to +25.0D (0.5D steps)	−10.0D to +1.0D (1.0D steps) +0.0D to +36.0D (0.5D steps)
Incision size	2.6 mm	2.2 mm / 2.6 mm

Table 12.16 Recommended injectors

Recommended injector (reusable)	Injector: Viscoject 1-hand: L1604205 Viscoject 2-hand: L1604215
	Cartridges Viscoject 2.2 cartridge-set: LP604240M
Recommended injector-sets (disposable)	Viscoject-injector + Viscoglide 2.2 cartridge LP604340

- Central thickness: 1.04 mm (+22.0D)
- Haptic angulation: 0°
- Edge design: optic and haptics with 360° square edge

Table 12.17 Estimated constants

Estimated constants (IOL Master)		
Fabricate A-constant: 118.0 ACD: 4.97		
Hoffer Q	tACD	5.21
Holladay I	SF	1.47
SRK II	A	118.6
SRK/T	A	118.5
Haigis	a0	0.95
	a1	0.40
	a2	0.10

- Implant location: bag
- Refractive index: 1.46
- ADD IOL plane: +3.0D
- ADD spectacle plane: +2.5D
- Injector system:
- **Different areas of focus**
- **Pupil dependent**

- Corporate office:
  - **Oculentis GmbH**
  - Am Borsigturm 58
  - 13507 Berlin (Germany)

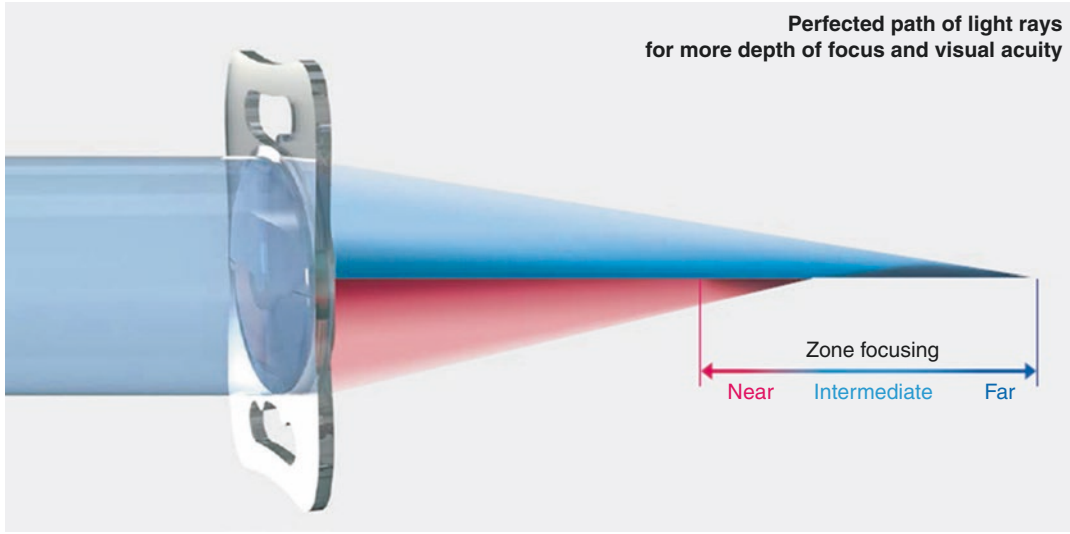
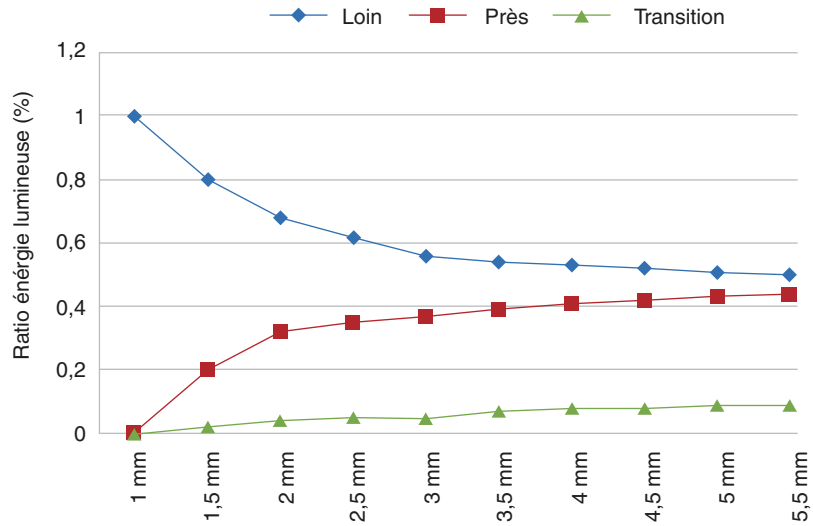


Fig. 12.44 Different areas of focus

Fig. 12.45 Pupil dependent



42. Lentis Mplus Toric LU-313MFT and LU-313MTFY (Oculentis, Topcon) [36]

- Type: one-piece multifocal-toric acrylic IOL
- Optic: biconvex, aspherical, and toric posterior surface. Sector-shaped addition of +3.0D
- Pupil-dependent: no
- Contrast sensitivity: not affected
- Material: HydroSmart acrylate copolymer with hydrophobic surface
- Filter: UV (LU-313MFT) or UV with violet light filter (LU-313MTFY)
- Total diameter: 11.0 mm
- Optic size: 6.0 mm
- Haptic angulation: 0°
- Edge design: optic and haptics with 360° square edge
- Implant location: bag
- Refractive index: 1.46
- Diopter range: +0.0 to +36.0D (0.01 increments)
  - Cylinder: +0.25 to +12.0 (1° scale)
  - Sph + Cyl < 40.0D
- ADD IOL plane: +3.0D

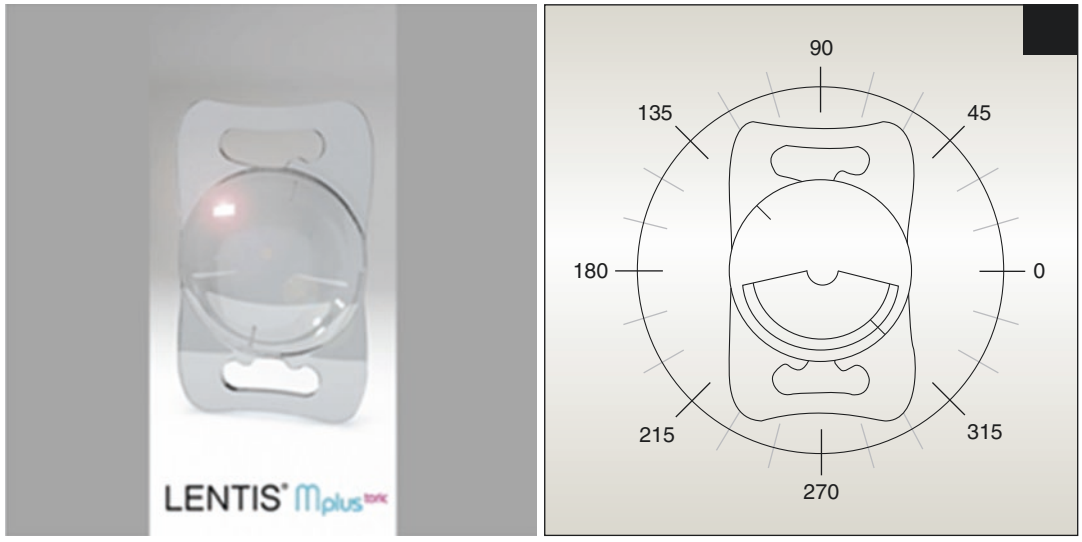


Fig. 12.46 Lentis Mplus Toric LU-313 MFT and LU-313 MTFY (Oculentis, Topcon)

Table 12.18 Recommended injectors

Recommended injector (reusable)	Injector: Viscoject 1-hand: L1604205 Viscoject 2-hand: L1604215
	Cartridges Viscoject 2.2 cartridge set: LP604240M
Recommended injector-sets (disposable)	Viscoject-injector + Viscoglide 2.2 cartridge LP604340

Table 12.19 Estimated constants

Estimated constants (IOL Master)		
Fabricate A-constant: 118.0 / ACD: 4.97		
Hoffer Q	tACD	5.11
Holladay I	SF	1.33
SRK II	A	118.2
SRK/T	A	118.2
Haigis	a0 a1 a2	0.87 0.40 0.10

- ADD spectacle plane: +2.5D
- Incision size recommended: 2.6 mm
- Injector system:

- Corporate office:
  - **Oculentis GmbH**
  - Am Borsigturm 58
  - 13507 Berlin (Germany)

43. LUCIDIS (Swiss Advanced Vision) [37]

- (Images of this lens can be viewed at https://sav-iol.com/products/lucidis/)
- Type: foldable one-piece hydrophobic acrylic extended depth of focus (EDOF) IOL
- Optic: aspheric refractive
- Pupil-dependent: yes
- Material: hydrophilic acrylic
- Filter: UV
- Total diameter: 10.8 or 12.4 mm
- Optic size: 6.0 mm
- Haptic angulation: 0°
- Haptic style: closed loop
- Edge design: 360 ° posterior square edge
- Implant location: bag
- Diopter range: +5D to +30D (0.5D increments)
- Add: +3.0D
- EDOF: +1.0D to 2.0D (0.5D increments)
- Cylinder range: +1.50D to 3.75D
- Incision size: 2.2 mm.

- Corporate office:
  - **SAV-IOL SA**
  - Route des Falaises 74
  - 2000 Neuchatel
  - Switzerland

Fig. 12.47 Lumina (AkkoLens)

44. Lumina (AkkoLens) [38]

- Type: two optical component accommodative IOL
- Optic: two optical elements with elastic spring function
- Pupil-dependent: yes
- Material: hydrophilic acrylic
- Filter: UV
- Implant location: sulcus
- Total diameter: customized for each patient eye, based on OCT sulcus to sulcus measurement
- Optical diameter: unaccommodated approximately 5.7 mm
- Refractive index: not mentioned
- Incision size recommended: 2.8–3.0 mm
- Injector system: standard disposable injector system with an adapted proprietary AkkoLens butterfly cartridge

- Corporate office:
  - **AkkoLens International BV**
  - 2288 GG Rijswijk
  - The Netherlands

45. M-flex 630-F and 580-F (Rayner) [39]

- Type: one-piece multifocal hydrophilic acrylic IOL
- Optic: multifocal refractive aspheric IOL, with four or five annular zones (depending on IOL base power)
- Pupil-dependent: yes

Fig. 12.48 M-flex 630-F and 580-F (Rayner)

Table 12.20 IOL diameters

	M-flex 630F	M-flex 580F
Optic size	6,25 mm	5,75 mm
Total diameter	12,50 mm	12,0 mm

- Contrast sensitivity: not affected
- Material: hydrophilic acrylic
- Filter: UV
- Haptic angulation: 0°
- Edge design: amon-apple enhanced square edge
- Implant location: bag
- Refractive index: 1.46
- Incision size recommended: 1.8 mm
- Injector system: Rayner single-use soft-tipped injector

Table 12.21 IOL ranges

	M-flex 630F	M-flex 580F	ADD IOL plane	ADD spectacle plane
Diopter range	+14,0D to +25,0D (0,5D steps)	–	+3,0D	+2,25D
	+14,0 to +25,0D (0,5D steps)	+25,5D to +30,0D (0,5D steps)	+4,0D	+3,0D

Table 12.22 Estimated constants

Estimated constants		M-flex 630F	M-flex 580F
SRK/T	A	118.6	118.6
Hoffer Q	tACD	4.97	4.97

- Corporate office:
  - **Rayner Intraocular Lenses Ltd.**
  - Sackville Road, Hove, East Sussex, BN3, 7AN (England)

46. M-flex Toric 638-F and 588-F (Rayner) [39]

- Type: one-piece multifocal toric hydrophilic acrylic IOL
- Optic: multifocal toric aspheric IOL, with four or five annular zones (depending on IOL base power)
- Pupil-dependent: yes
- Contrast sensitivity: not affected
- Material: hydrophilic acrylic

Fig. 12.49 M-flex Toric 638-F and 588-F (Rayner)

Table 12.23 IOL diameters

	M-flexT 638F Base powers ≤25D	M-flexT 588F Base powers >25D
Optic size	6.25 mm	5 75 mm
Total diameter	12 50 mm	12 0 mm

Table 12.24 IOL ranges

	Standard power range	Premium power range
Spherical equivalent∗	+14,0D to +32,0D (0,5D steps)	+14,0D to +32,0D (0,5D steps)
Cylinder	+1.0D, +2.0D, +3.0D	+1.0D to +6.0D (0.5D increments)
ADD	+3.0 or + 4.0	+3.0 or + 4.0

∗Spherical equivalent is defined as Sphere + (0.5 × cylinder)

Table 12.25 Estimated constants

Estimated constants		M-flexT 638F	M-flexT 588F
SRK/T	A	118.6	118.6
Hoffer Q	tACD	4.97	4.97

- Filter: UV
- Haptic angulation: 0°
- Edge design: amon-apple enhanced square edge
- Implant location: bag
- Refractive index: 1.46
- Incision size recommended: 1.8 mm
- Injector system: Rayner single-use soft-tipped injector

- Corporate office:
  - **Rayner Intraocular Lenses Ltd.**
  - Sackville Road, Hove, East Sussex, BN3, 7AN (England)

47. Mini Well Ready (Sifi MedTech) [40]

- Type: one-piece extended depth of focus (EDOF) IOL
- Optic: purely aberration-based EDOF lens based on double asphericity optical design
- Pupil-dependent: yes
- Material: copolymer
- Filter: not mentioned
- Total diameter: 10.75 mm

Fig. 12.50 Mini Well Ready (Sifi MedTech)**. © SIFI**

- Optic size: not mentioned
- Edge: double squared
- Haptic angulation: 5°
- Implant location: bag
- Refractive index: not mentioned
- Diopter range: +0.0D to +30.0D (0.5D increments from 10.5D to 30D)
- Incision size: not mentioned
- Estimated A-constant: 118.6
- Theoretical ACD: 5

- Corporate office:
  - **SIFI SPA**
  - Via Ercole Patti, 36
  - 95025 Lavinaio Aci Sant'Antonio (CT) – ITALIA

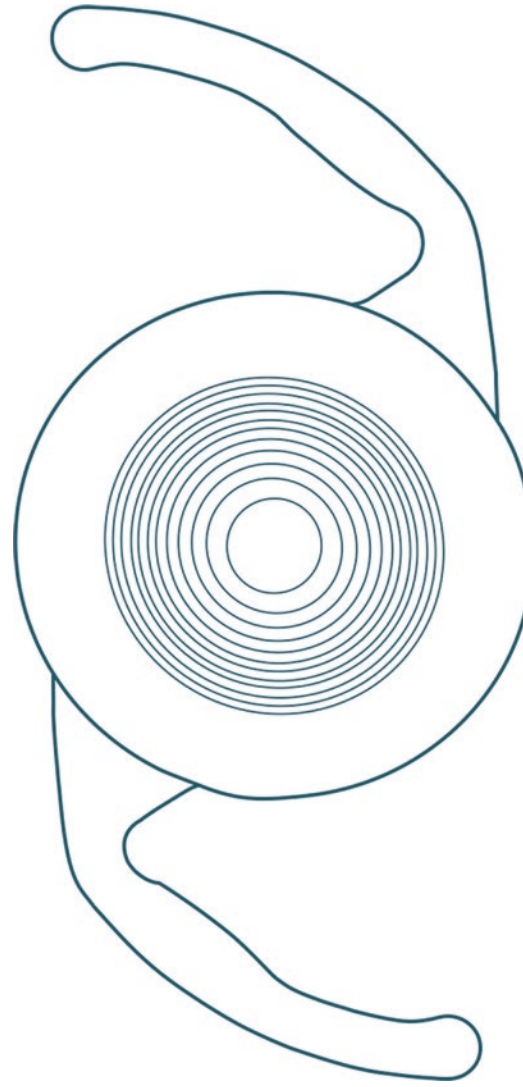


Fig. 12.51 OPTIFLEX TRIO 3FLA6 (Biotech)

48. OPTIFLEX TRIO 3FLA6 (Biotech) [41]

- Type: one-piece trifocal IOL
- Optic: diffractive-refractive
- Pupil-dependent: yes
- Material: hydrophobic acrylic
- Filter: UV
- Total diameter: 13 mm
- Optic size: 6 mm
- Edge: 360°
- Haptic angulation: 0°
- Implant location: bag
- Refractive index: 148
- Diopter range: +7.5D to +30.0D (0.5D increments)
- Incision size: not mentioned
- Estimated A-constant: 118.5
- Theoretical ACD: 5.28

- Corporate office:
  - **Block 1, Abhishree Corporate Park**
  - Bopal-Aambli Road
  - Ahmedabad, India 380 058

50. PreciSAL M302A, M302 AC, PM302A, and PM302AC (Millenium Biomedical, Inc. (MBI)) [42]

- (**The images of this lens may be observed at** http://www.mbius.com/en/pdf/SAL%20M302A,%20 M302 AC,%20PM302A%20, %20 PM30 2 AC.pdf)
- Type: one-piece hydrophobic diffractive and aspheric multifocal IOL
- Optic: biconvex diffractive
- Material: hydrophobic acrylic
- Filter: UV – M302 AC, PM30 2 AC UV and blue light: M302A, PM302A
- Total diameter: 13.0 mm
- Optic size: 6.0 mm
- Haptic angulation: 0°
- Haptic style: modified-C
- Edge design: square 360°
- Implant location: bag
- Refractive index: 1.5
- Diopter range: +0.0D to +10.0D (1.0D increments), +10.0D to +30.0D (0.5D increments)
- Incision size: ≥2.2 mm
- Injector system: preloaded injector system P302A y P302AC

Table 12.26 Estimated constants

Fabricate A-constant: 118.7 / ACD: 5.51		
Holladay I	SF	1.75
SRK II	A	119.2
SRK/T	A	118.9
Haigis	a0	1.32
	a1	0.40
	a2	0.10

∗Estimates only: surgeons are recommended to use their own values based upon their own experience

- Corporate office:
  - **Millennium Biomedical Inc.**
  - 360 E. Bonita Ave. Pomona
  - CA. 91767 (U.S.A)

51. Precizon Presbyopic (Ophtec BV) [43]

- Type: one-piece hybrid hydrophobic and hydrophilic with continuous transition focus

Fig. 12.52 Precizon Presbyopic (Ophtec BV)

- Optic: aberration neutral
- Material: hybrid hydrophobic and hydrophilic monomers
- Filter: UV
- Total diameter: 12.5 mm
- Optic size: 6.0 mm
- Haptic angulation: 0°
- Haptic style: open modified-C loops with offset-shaped haptics
- Edge design: not mentioned
- Implant location: bag
- Refractive index: 1.46
- Diopter range: +1.0D to +35.0D (0.5D increments)
- ADD IOL plane: +3.0D
- A-constant ultrasound: +2.75D

- Corporate office:
  - **OPHTEC BV**
  - Schweitzerlaan 15
  - 9728 NR Groningen, The Netherlands

54. Preziol Multifocal Foldable (Care Group) [44]

- Type: one-piece refractive aspheric multifocal IOL
- Optic: central zone for distance vision has a diameter of 1.5 mm, second zone for near vision with a diameter of 2.5 mm, and peripheral zone for intermediate vision
- Pupil-dependent: no
- Contrast sensitivity: decreased

Fig. 12.53 Preziol Multifocal Foldable (Care Group)

- Material: acrylic
- Filter: UV
- Total diameter: 12.5 mm
- Optic size: 6.0 mm
- Haptic angulation: 0°
- Edge design: square 360°
- Implant location: bag
- Refractive index: 1.467
- ADD IOL plane:
- Near vision +4.0D
- Intermediate vision +1.0 over central zone
- Incision size: ≥2.8 mm
- Estimated A-constant: 118.0
- Theoretical ACD: 5.10

- Corporate office:
  - **Care Group India**.
  - Block No.310, Village Sim of Dabhasa,
  - Tal.Padra, Dist. Vadodara – 391 440.
  - Gujarat, India.

Fig. 12.54 Preziol Multifocal PMMA (Care Group)

55. Preziol Multifocal PMMA (Care Group) [44]

- Type: one-piece refractive aspheric multifocal IOL
- Optic: central zone for distance vision has a diameter of 1.5 mm, second zone for near vision with a diameter of 2.5 mm, and peripheral zone for intermediate vision.
- Pupil-dependent: no
- Contrast sensitivity: decreased
- Material: PMMA
- Filter: UV
- Total diameter: 12.5 mm
- Optic size: 5.25 mm/6.0 mm
- Haptic angulation: 0°
- Haptic style: modified-C
- Edge design: square 360°
- Implant location: bag
- Refractive index: 1.49
- ADD IOL plane:
- Near vision +4.0D
- Intermediate vision +1.0 over central zone
- Incision size: ≤2.8 mm
- Estimated A-constant: 118.2

- Corporate office:
  - **Care Group India**.
  - Block No.310, Village Sim of Dabhasa,
  - Tal.Padra, Dist. Vadodara – 391 440.
  - Gujarat, India.

56. RayOne Trifocal (Rayner) [45]

- Type: one-piece, trifocal diffractive aspheric multifocal IOL
- Optic: biconvex double aspheric
- Pupil-dependent: less dependent on pupil size
- Material: hydrophilic acrylic
- Filter: UV
- Total diameter: 12.5 mm
- Optic size: 6.0 mm
- Haptic angulation: 0°
- Haptic style: closed loop with anti-vaulting haptic (AVH) technology
- Edge design: amon-apple 360° enhanced square edge
- Implant location: bag
- Refractive index: 1.46
- ADD IOL plane:
  - Near vision +3.5 D
  - Intermediate vision +1.75 D
- Incision size: ≥1.65 mm
- Estimated A-constant: 118.6
- Defocus curve:

Fig. 12.55 RayOne Trifocal (Rayner)

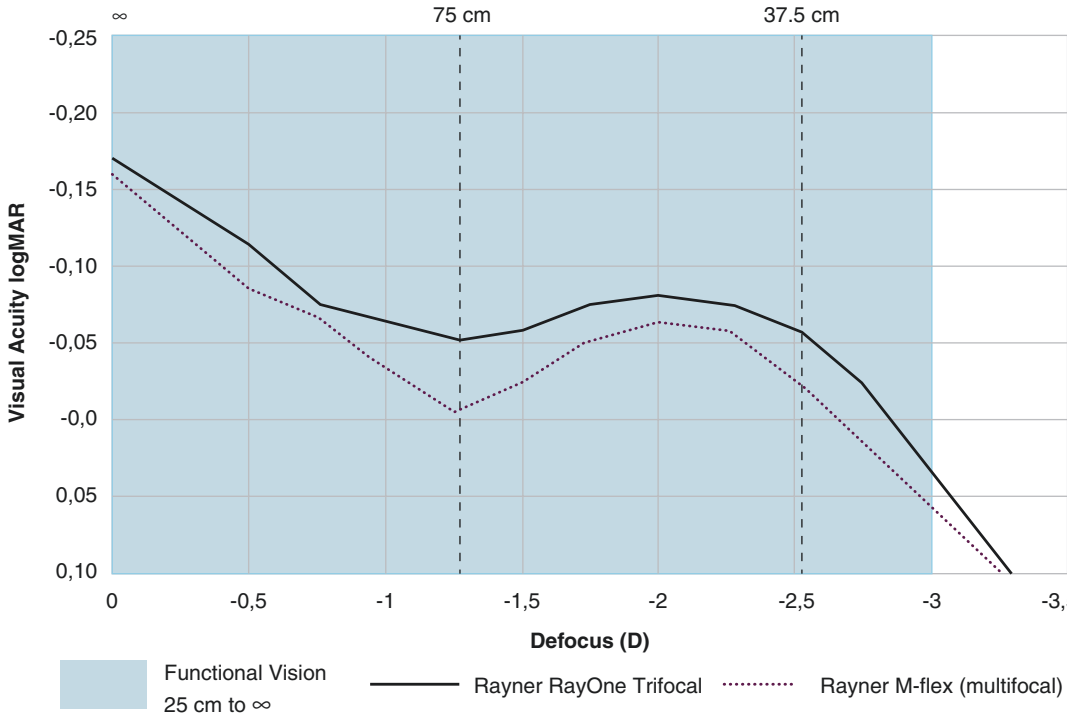


Fig. 12.56 Defocus curve

- Corporate office:
  - **Rayner Intraocular Lenses Ltd.**
  - Sackville Road, Hove, East Sussex, BN3, 7AN (England)

57. Reverso (Cristalens) [46]

- Type: one-piece spherical IOL for implantation in pseudophakic eyes
- Optic: convex anterior surface, concave multifocal diffractive posterior surface
- Material: hydrophilic acrylic 25%
- Filter: UV
- Total diameter: 13.80 mm
- Optic size: 6.5 mm
- Haptic angulation: 10°
- Haptic style: open-loop haptics
- Edge design: round edge 360°
- Implant location: sulcus
- Refractive index: 1.46
- Diopter range:
  - Standard:– 0.0D.
  - On request: −3.0D to +3.0D (0.5D increments)
- ADD IOL plane: +3.0D
- Incision size: from 1.8 mm to 2.0 mm
- Estimated A-constant: not applicable

- Corporate office:
  - **CRISTALENS**
  - Hyde park – Bât Westminster
  - 12 allée Rosa Luxemburg
  - BP 50240 Eragny
  - 95615 Cergy Pontoise Cedex (France)

58. Review FIL611 PV (Soleko) [47]

- Type: one-piece refractive multifocal hydrophilic acrylic IOL
- Optic: central zone with different vision steps
- Pupil-dependent: no
- Material: foldable acrylic (25%)
- Filter: UV
- Total diameter: 11.0 mm
- Optic size: 6.0 mm
- Haptic angulation: 5[a]
- Edge design: square 360°
- Implant location: bag
- Refractive index: 1.461
- Diopter range: +9.0D to +26.0D (0.5D increments)
- ADD IOL plane: +3.75D
- Incision size: 2.0–3.0 mm
- Injector system recommended: Medicel Viscojet or similar (2.2 for 2.0 mm incision, 2.0 for 1.8 mm incision)

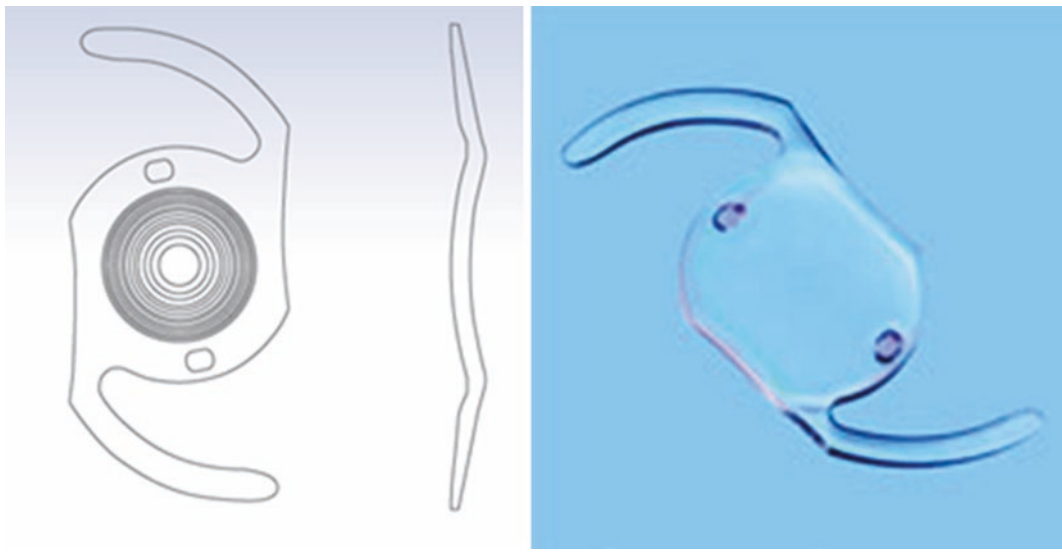


Fig. 12.57 Reverso (Cristalens)

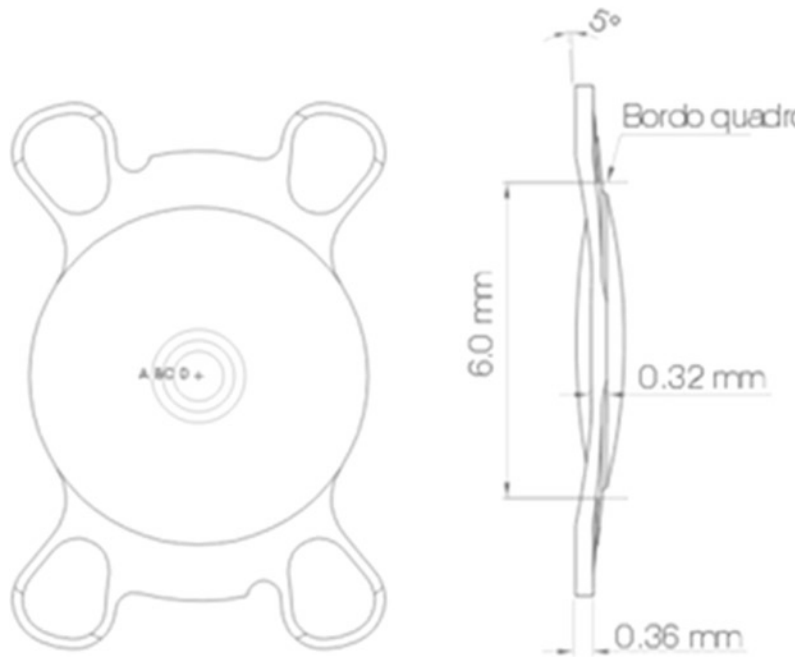


Fig. 12.58 Review FIL611 PV (Soleko)

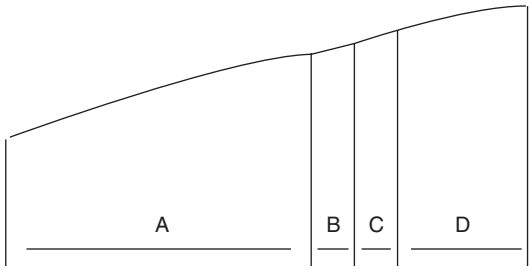


Fig. 12.59 Optic: central zone with different vision steps

Table 12.27 Addition powers

Zone	Additional power (IOL plane)	
A	0	Distance
B	0.9	Join zone
C	2.1	Medium distance
D	3.75	Accommodation zone

Table 12.28 Estimated constants

Fabricate A-constant: 118.5		
Hoffer Q	pACD	5.26
Holladay I	SF	1.73
SRKII/ SRKT	A (IOL master/US)	118.5
Haigis	a0 a1 a2	1.044 0.40 0.10

- Corporate office:
  - **Soleko IOL Division**
  - Via Aniene, 10
  - 00198 Rome (Italy)

59. Review FIL611 PVT (Soleko) [48]

- Type: one-piece customized toric multifocal hydrophilic IOL. The axis marks of the cylinder are always positioned on the axis 0°-180°.
- Optic: refractive toric
- Pupil-dependent: no
- Material: foldable acrylic
- Filter: UV
- Total diameter: 11.80 mm
- Optic size: 6.0 mm
- Haptic angulation: 5[a]
- Edge design: square 360°
- Implant location: bag
- Refractive index: 1.461
- Diopter range: +9.0D to +26.0D (0.5D increments)
- Cylinder range: +1.0D to +6.0D
- ADD IOL plane: +3.75D
- Incision size: 2.0–3.0 mm
- Injector system recommended: Medicel Viscojet or similar (2.2 for 2.5 mm incision, 1.8 for 2.0 mm incision)

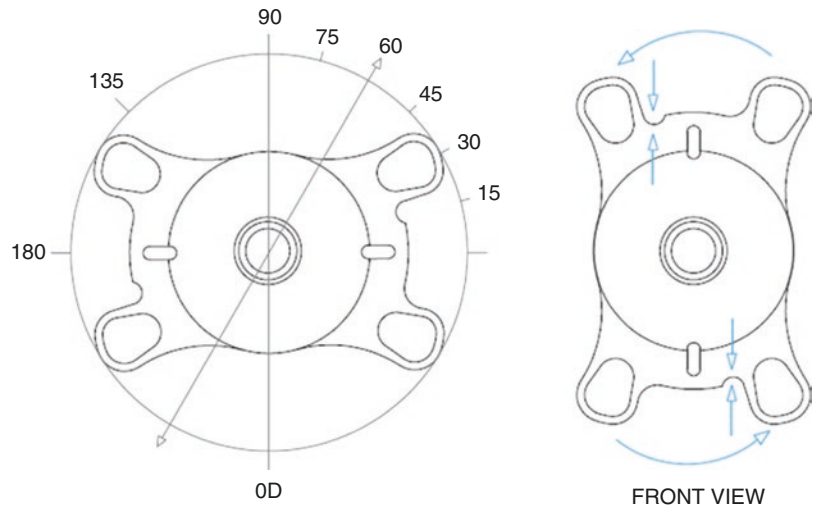


Fig. 12.60 Review FIL611 PVT (Soleko)

Table 12.29 Estimated constants

Fabricate A-constant: 118.3		
Hoffer Q	pACD	5.26
Holladay I	SF	1.73
SRK II/SRKT	A (IOL master/US)	118.9/118.8
Haigis	a0 a1 a2	1.044 0.40 0.10

- Corporate office:
  - **Soleko IOL Division**
  - Via Aniene, 10
  - 00198 Rome (Italy)

60. Review FIL 65 PVS (Soleko) [49]

- Type: one-piece refractive multifocal hydrophilic acrylic IOL for pediatric patients

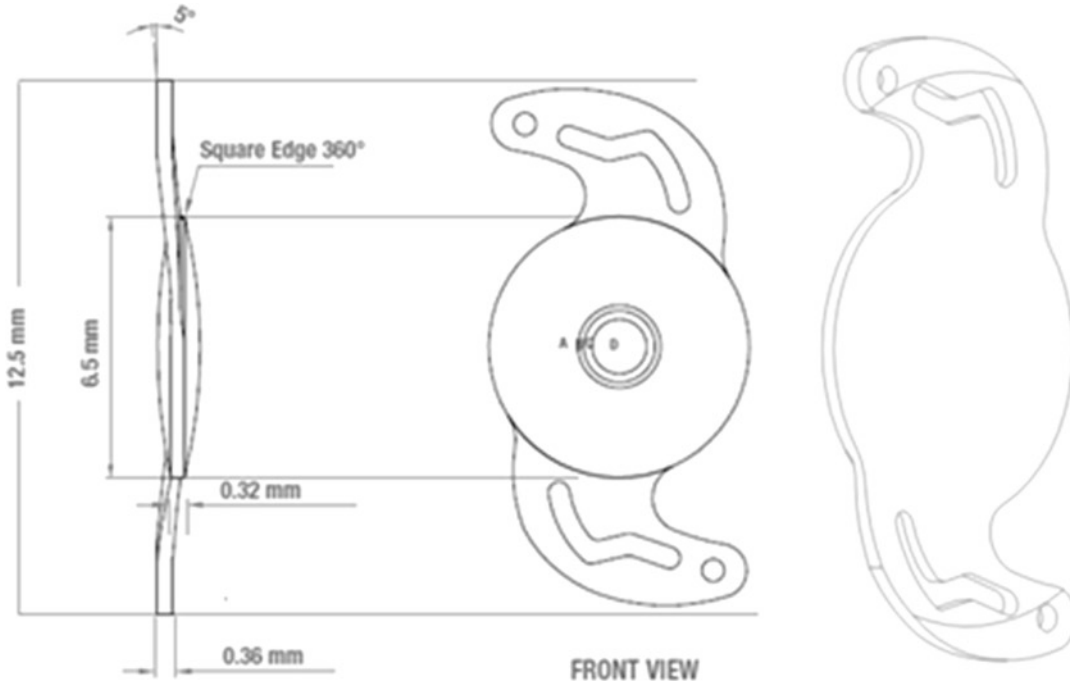


Fig. 12.61 Review FIL 65 PVS (Soleko)

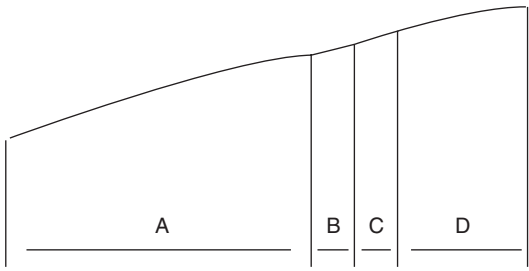


Fig. 12.62 Optic: central zone with different vision steps

Table 12.30 Addition powers

Zone	Additional power (IOL plane)	
A	0	Distance
B	0.9	Join zone
C	2.1	Medium distance
D	3.75	Accommodation zone

- Optic: central zone with different vision steps
- Pupil-dependent: yes
- Material: foldable acrylic
- Filter: UV
- Total diameter: 12.5 mm
- Optic size: 6.5 mm
- Haptic angulation: 5[a]
- Edge design: square 360°
- Implant location: bag, sulcus, or scleral fixation
- Refractive index: 1.461
- Diopter range: +18.0D to +28.0D (0.5D increments)
- ADD IOL plane: +3.0D
- Incision size: 2.0–3.0 mm
- Injector system recommended: Medicel Viscojet (2.7 for 3.0 mm incision)

Table 12.31 Estimated constants

Fabricate A-constant: Bag 118.7 / sulcus 118.3 / scleral fixation 117.5		
Hoffer Q	pACD	5.26
Holladay I	SF	1.73
SRK II/SRKT	A (IOL master/US)	118.9/118.8
Haigis	a0 a1 a2	1.044 0.40 0.10

- Corporate office:
  - **Soleko IOL Division**
  - Via Aniene, 10
  - 00198 Rome (Italy)

61. Revive SQFL 600DF (Omni Lens) [50]

- Type: one-piece apodized diffractive multifocal foldable IOL
- Optic: diffractive multifocal optic with aspheric profile
- Pupil-dependent: yes
- Contrast sensitivity: not affected
- Material: hybrid acrylic (copolymer HEMA+EOEMA)
- Filter: UV
- Total diameter: 12.5 mm
- Optic size: 6.0 mm
- Haptic angulation: 5[a]

Fig. 12.63 Revive SQFL 600DF (Omni Lens)

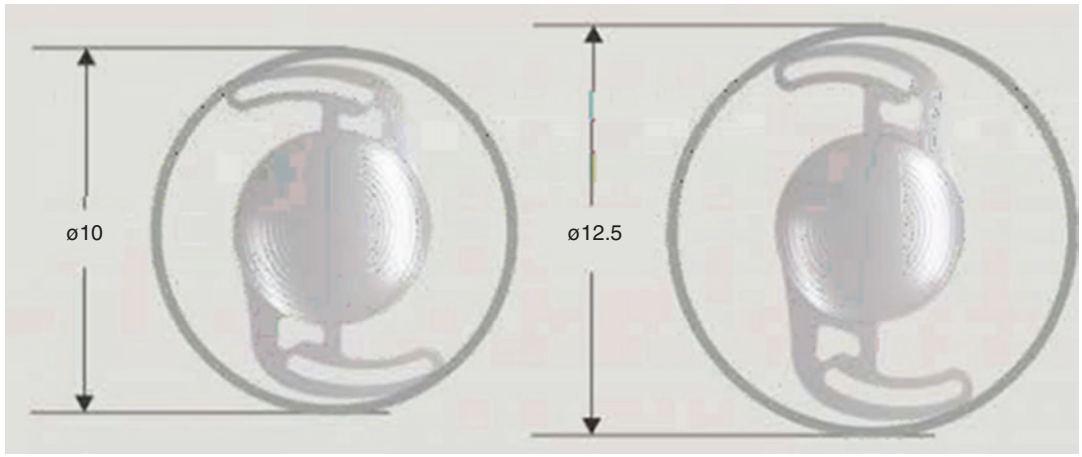


Fig. 12.64 Haptic style: elastic band

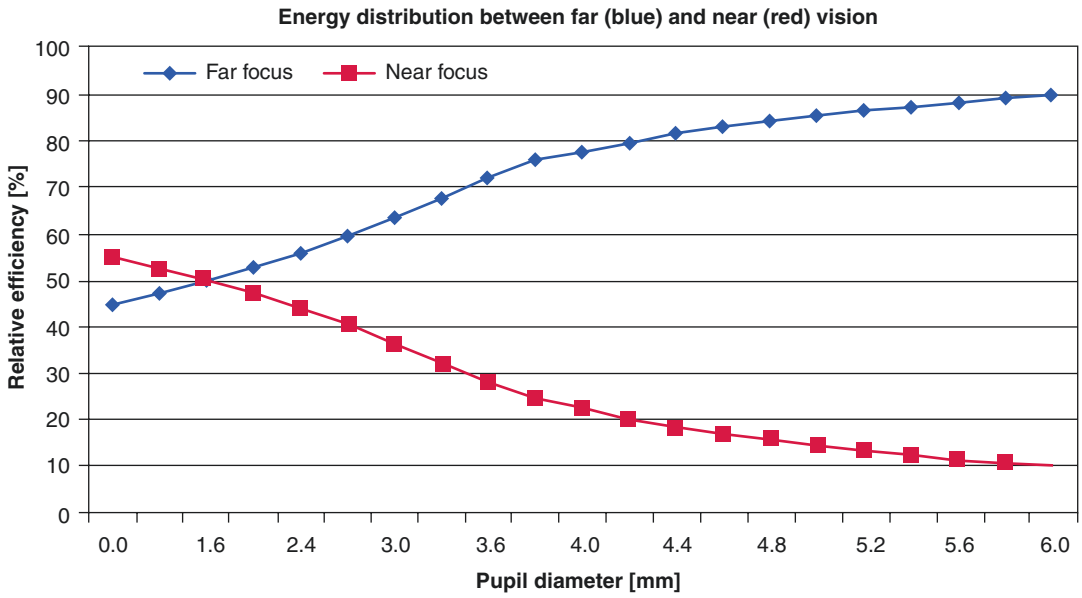


Fig. 12.65 Pupil dependence

- Haptic style: elastic band
- Edge design: square 360°
- Implant location: bag
- Refractive index: 1.46
- Diopter range:
  - From +8.0D to +15.0D and from +25.0D to +30.0D (1.0D increments)
  - From +15.0D to +25.0D (0.5D increments)
- ADD IOL plane: +3.5D
- ADD spectacle plane: +2.8D
- Incision size: 2.2 mm
- Injector system recommended: Aquaject Plus
- Estimated A-constant: 118.2
- Theoretical ACD: 5.08
- **Pupil-dependence**

- Corporate office:
  - **Omni Lens Pvt. Ltd.**
  - 5 "Samruddhi", Opp.Sakar-III
  - Nr.Sattar Taluka Society, Navrangpura,
  - Ahmedabad-380014.
  - Gujarat (India).

62. ReZooM NXG1 (Abbott) [51]

- (Images of this lens may be observed at https://accessgudid.nlm.nih.gov/devices/05050474520189)
- Type: three-piece multifocal acrylic IOL
- Optic: biconvex with an anterior refractive zonal-progressive surface
- Pupil-dependent: yes
- Contrast sensitivity: decreased
- Material:
  - Optic zone: foldable acrylic
  - Haptics: 60% blue core PMMA monofilament
- Filter: UV
- Total diameter: 13.0 mm
- Optic size: 6.0 mm
- Haptic angulation: 5ª
- Haptic style: modified-C
- Edge design: square OptiEdge design
- Implant location: bag
- Refractive index: 1.47
- Diopter range: +6.0D to +30.0D (0.5D increments)
- ADD IOL plane: +3.5D
- ADD spectacle plane: +2.4D to +2.8D
- Incision size: ≥3.2 mm
- Injector system recommended:
  - UNFOLDER Emerald series Handpiece (EmeraldT)
  - UNFOLDER Emerald series cartridge (EmeraldC)

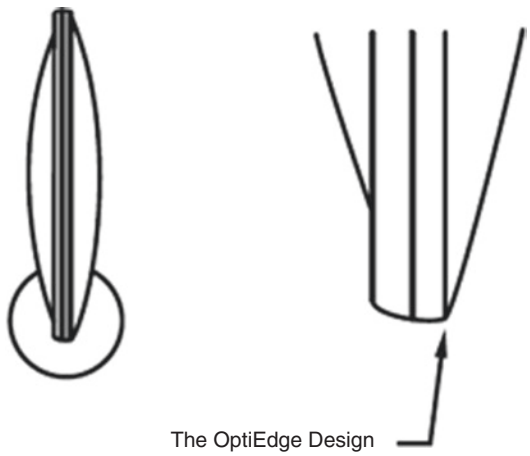


Fig. 12.66 Edge design: square OptiEdge design

Table 12.32 Estimated constants

Hoffer Q	tACD	5.2
Holladay I	SF	1.45
SRK/T	A	118.4

- Corporate office:
  - **Abbott Laboratories**
  - 100 Abbott Park Road
  - Abbott Park, Illinois 60064
  - 3500, USA

63. SeeLens Multifocal (Hanita Lenses) [52]

- Type: one-piece foldable multifocal IOL for MICS
- Optic: multifocal diffractive apodized aspheric
- Pupil-dependent: yes
- Contrast sensitivity: decreased
- Material: hydrophilic acrylic HEMA/EOEMA copolymer
- Filter: UV and violet light
- Total diameter: 13.0 mm
- Optic size: 6.0 mm
- Haptic angulation: 5°
- Implant location: bag
- Edge design: 360° double square edge
- Refractive index: 1.46
- Diopter range: +10.0D to +30.0D (0.5D increments); +31.0D to +35.0D (1.0D increments)
- ADD IOL plane: +3.0D
- ADD spectacle plane: +2.4D
- Incision size: 1.8 mm
- Injector system: single-use delivery system Softject 1.8
- **Pupil-dependence**
- **Contrast sensitivity**

Corporate office:
- **Hanita Lenses R.C.a Ltd.**
- Kibbutz Hanita, 22885

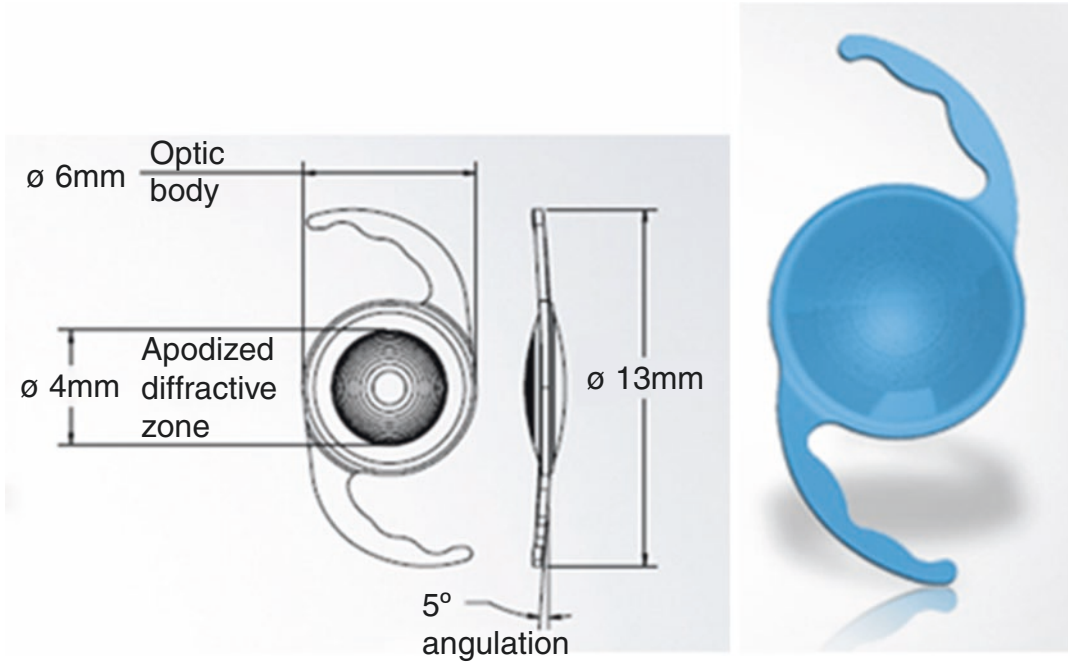


Fig. 12.67 SeeLens Multifocal (Hanita Lenses)

Table 12.33 Estimated constants

		IOL Master	US biometry
Hoffer Q	tACD	5.26	5.05
Holladay I	SF	1.48	1.27
SRK II	A	118.9	118.48
SRK/T	A	118.6	118.26
Haigis	a0	1.044	0.819
	a1	0.4	0.40
	a2	0.1	0.10

∗Estimates only: surgeons are recommended to use their own values based upon their own experience

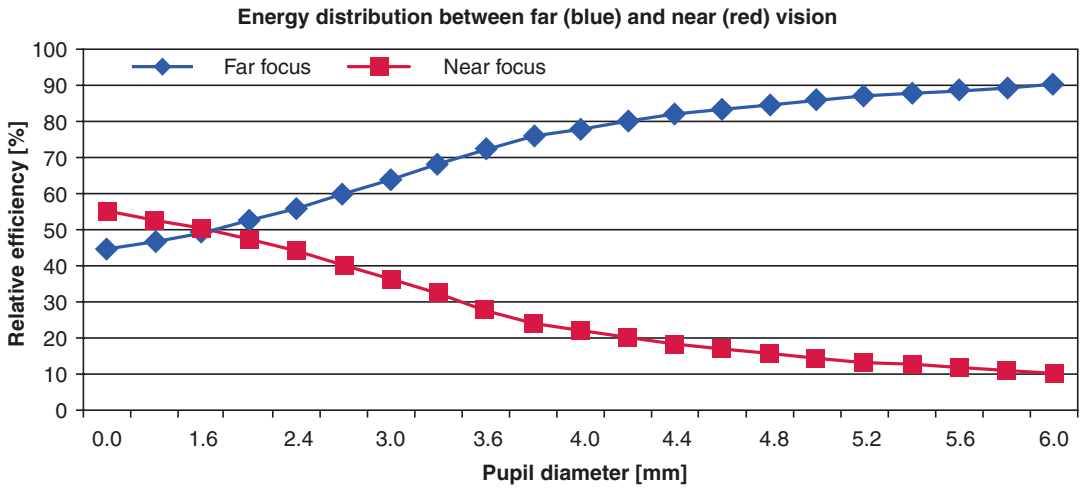


Fig. 12.68 Pupil dependence

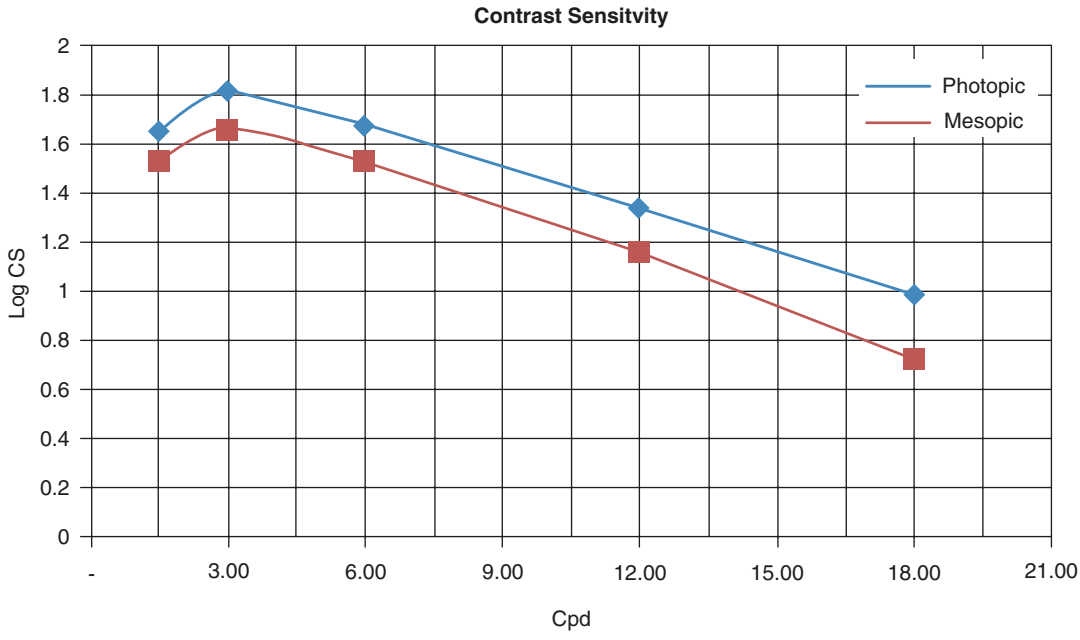


Fig. 12.69 Contrast sensitivity

64. Sulcoflex Multifocal 653F (Rayner) [53]

- Type: one-piece multifocal hydrophilic acrylic IOL for sulcus fixation in pseudophakic eyes
- Optic: convex anterior surface, concave posterior surface
- Pupil-dependent: yes
- Contrast sensitivity: not affected
- Material: hydrophilic Rayacryl
- Filter: UV
- Total diameter: 14.0 mm
- Optic size: 6.5 mm
- Haptic angulation: 10°
- Haptic style: undulating haptics
- Implant location: sulcus

Fig. 12.70 Sulcoflex Multifocal 653F (Rayner)

- Diopter range: +3.0D to −3.0D (0.5D increments)
- ADD IOL plane: +3.5D
- ADD spectacle plane: +3.0D
- Incision size recommended: 3.0 mm
- Injector system: Rayner single-use soft-tipped injector
- Estimated A-constant: 118.9

- Corporate office:
  - **Rayner Intraocular Lenses Ltd.**
  - Sackville Road, Hove, East Sussex, BN3
  - 7AN (England)

65. Sulcoflex Multifocal Toric 653 T (Rayner) [53]

- Type: one-piece multifocal toric hydrophilic acrylic IOL for sulcus fixation in pseudophakic eyes
- Optic: convex anterior surface, concave posterior surface
- Pupil-dependent: yes
- Contrast sensitivity: not affected
- Material: hydrophilic Rayacryl
- Filter: UV

Fig. 12.71 Sulcoflex Multifocal Toric 653 T (Rayner)

- Total diameter: 14.0 mm
- Optic size: 6.5 mm
- Haptic angulation: 10°
- Haptic style: undulating haptics
- Implant location: sulcus

- Diopter range:
  - Standard range:
  - Premium range:

- ADD IOL plane: +3.5D
- ADD spectacle plane: +3.0D
- Incision size recommended: 3.0 mm

Table 12.34 Power ranges

Equivalent sphere	−3.0D to +3.0D (0.5D steps)		
Cylinder (1.0D steps)	+1.0D	+2.0D	+3.0D
Min. sphere	−3.5D	−4.0D	−4.5D
Max. sphere	+2.5D	+2.0D	+1.5D

- Injector system: Rayner single-use soft-tipped injector
- Estimated A-constant: 118.9

- Corporate office:
  - **Rayner Intraocular Lenses Ltd.**
  - Sackville Road, Hove, East Sussex, BN3
  - 7AN (England)

66. Tecnis MF ZKB00, Tecnis MF ZLB00, Tecnis MF ZMB00 (Abbot) [54]

- Type: foldable one-piece diffractive hydrophobic acrylic IOL
- Optic: biconvex, aspherical anterior surface, diffractive posterior surface
- Pupil-dependent: no
- Contrast sensitivity: decreased
- Material: hydrophobic acrylic
- Filter: UV
- Total diameter: 13.0 mm
- Optic size: 6.0 mm
- Haptic angulation: 0°
- Haptic style: modified-C
- Edge design: ProTec frosted continuous 360 ° posterior square edge
- Implant location: bag
- Refractive index: 1.47
- Diopter range: +5D to +34D (0.5D increments)
- Incision size: ≥2.2 mm
- Injector system recommended:
  - UNFOLDER Platinum set 1 injector thread (DK 7796)
  - UNFOLDER Platinum set 1 cartridge (1 MTEC 30)
  - ONE SERIES Ultra syringe injector (DK 7786)
  - ONE SERIES Ultra injector thread (DK 7791)
  - ONE SERIES Ultra cartridge (1 VIPR 30)

Table 12.35 Power ranges

Equivalent Sphere: −3.0D to +3.0D (0.5D increments)											
Cylinder (1.0D steps)	1.0D	1.5D	2.0D	2.5D	3.0D	3.5D	4.0D	4.5D	5.0D	5.5D	6.0D
Min. sphere	−6.5	−6.5	−7.0	−7.0	−7.5	−7.5	−8.0	−8.0	−8.5	−8.5	−9.0
Max. sphere	+5.5	+5.0	+5.0	+4.5	+4.5	+4.0	+4.0	+3.5	+3.5	+3.0	+3.0

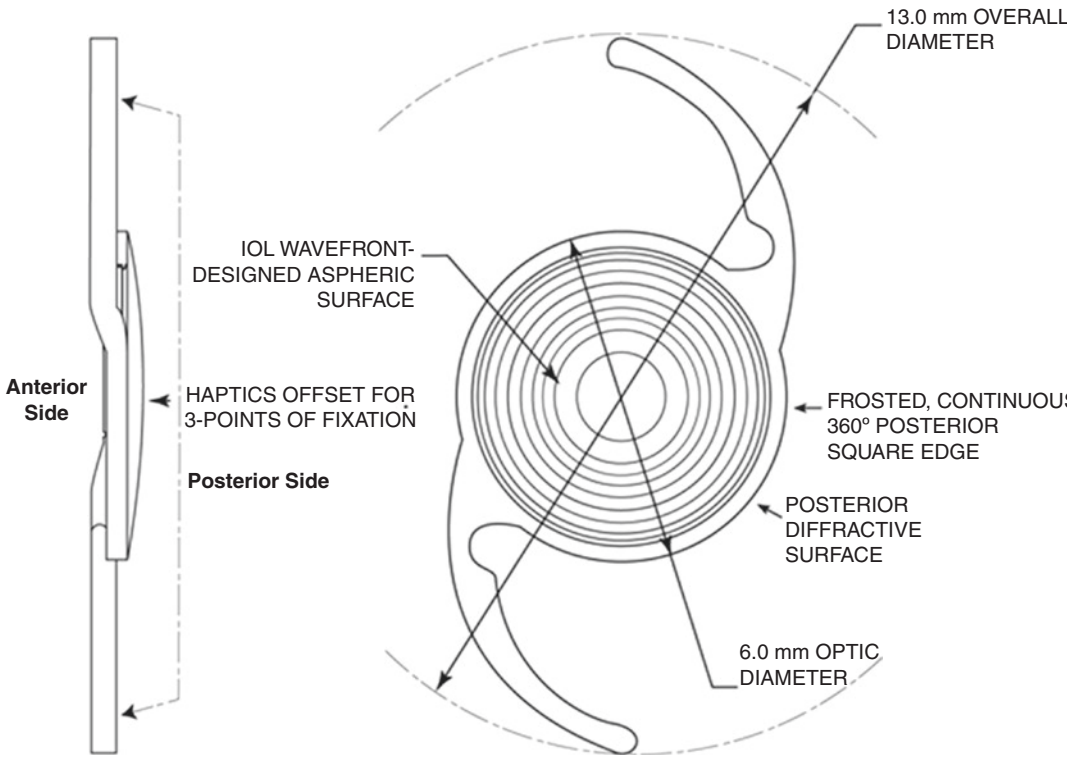


Fig. 12.72 Tecnis MF ZKB00, Tecnis MF ZLB00, and Tecnis MF ZMB00 (Abbott)

Table 12.36 Power ranges and planes

	ZKB00	ZLB00	ZMB00
ADD IOL plane	+2.75	+3.25	+4.0
ADD spectacle plane	+2.01	+2.37	+3.0
Theoretical reading distance	50 cm	42 cm	33 cm

Table 12.37 Estimated constants

		IOL Master	US
Hoffer Q	tACD	5.72	5.40
Holladay I	SF	1.96	1.68
SRK II/ SRK/T	A	119.3∗	118.8∗

∗A theoretical value derived from a typical lens of 20.0 D. AMO recommends that surgeons adapt the constant A according to the surgical techniques used and the team, experience with the model of the lens and postoperative results

- Corporate office:
  - **Abbott Laboratories**
  - 100 Abbott Park Road
  - Abbott Park, Illinois 60064
  - 3500, USA

67. TECNIS Symfony (Abbot) [55]

- Type: foldable one-piece hydrophobic acrylic extended depth of focus (EDOF) IOL
- Optic: biconvex anterior aspheric surface, posterior achromatic diffractive surface
- Pupil-dependent: yes
- Asphericity: −0.27 μm
- Material: hydrophobic acrylic
- Filter: UV
- Total diameter: 13.0 mm
- Optic size: 6.0 mm
- Haptic angulation: 0°
- Haptic style: modified-C
- Edge design: 360 ° posterior square edge
- Implant location: bag
- Refractive index: 1.47
- Diopter range: +5D to +34D (0.5D increments)
- Cylinder range: +1.50D to 3.75D
- Incision size: not mentioned

Fig. 12.73 TECNIS Symfony (Abbot)

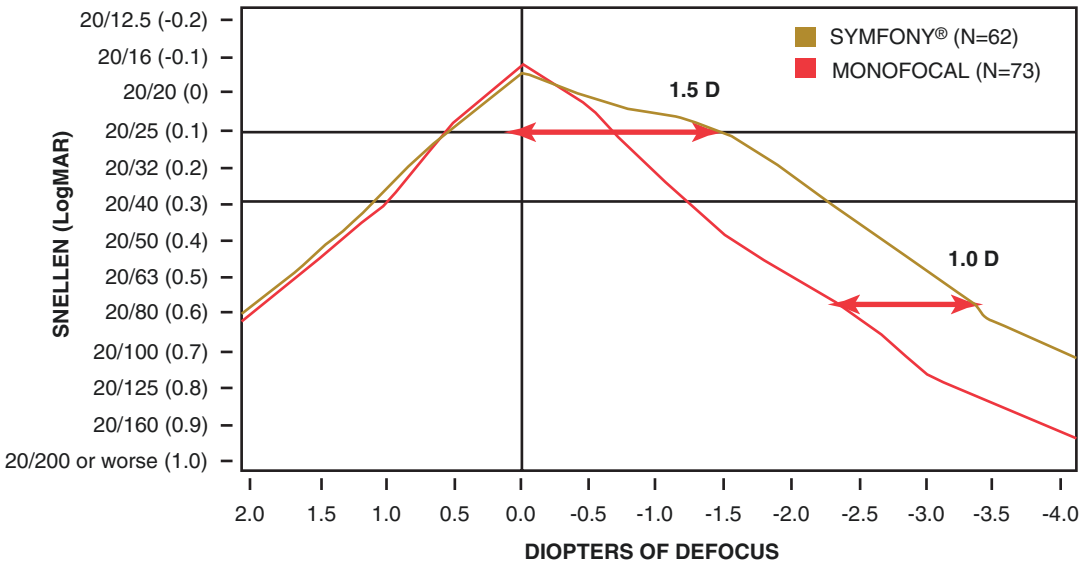


Fig. 12.74 Defocus curve

- Injector system recommended:
  - UNFOLDER Platinum set 1 injector thread (DK 7796)
  - UNFOLDER Platinum set 1 cartridge (1 MTEC 30)
  - ONE SERIES Ultra syringe injector (DK 7786)
  - ONE SERIES Ultra injector thread (DK 7791)
  - ONE SERIES Ultra cartridge (1 VIPR 30)
- A-constant: ultrasound (118.8), optical (119.3)
- Defocus curve:

- Corporate office:
  - **Abbott Laboratories**
  - 100 Abbott Park Road
  - Abbott Park, Illinois 60064
  - 3500, USA

68. Tetraflex (Lenstec) [56]

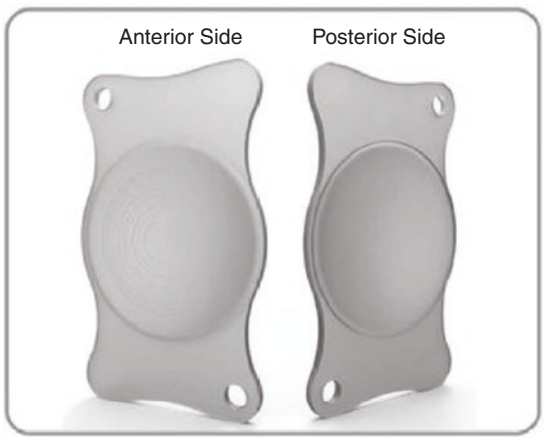
- Type: foldable one-piece hydrophobic acrylic accommodating IOL
- Optic: biconvex aspheric
- Pupil-dependent: yes
- Material: hydrophobic acrylic
- Filter: UV
- Total diameter: 11.50 mm (from 5D to 27.5D), 10.75 mm (from 28D to 36D)
- Optic size: 5.75 mm
- Haptic angulation: 5°
- Haptic style: Tetraflex
- Edge design: square edge 360°
- Implant location: bag
- Refractive index: 1.46
- Diopter range:
  - +5.0 to +36.0 (1D increment)
  - +5.0 to +30.0 (0.5D increment)
  - +15.0 to 25.0 (0.25D increment)
- Recommended incision size: not mentioned
- A-constant: 118.57

- Corporate office:
  - **Lenstec, Inc.**
  - 1765 Commerce Avenue North
  - St Petersburg, Florida 33716 USA

Fig. 12.75 Tetraflex (Lenstec)

69. TriDIFF (Care Group) [57]

- Type: one-piece refractive-diffractive trifocal IOL
- Optic: modified plate haptic, aspheric
- Pupil-dependent: reduced pupil dependency
- Material: proprietary hydrophilic
- Filter: UV
- Total diameter: 10.75 mm
- Optic size: 6.0–6.5 mm
- Haptic angulation: 0°
- Haptic style: modified plate haptic
- Edge design: square edge
- Implant location: bag
- Refractive index: not mentioned
- Diopter range: +0.0D to +40.0D (0.5D increments)
- ADD IOL plane: +3D
- Incision size: not mentioned



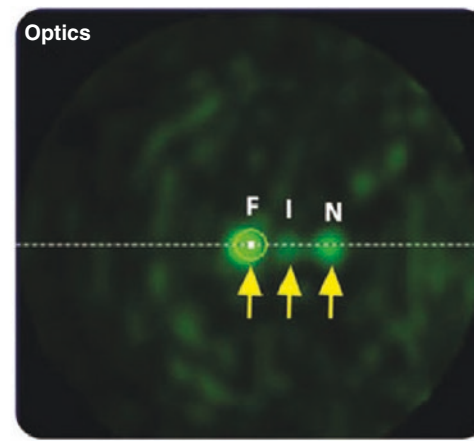


Fig. 12.76 TriDIFF (Care Group)

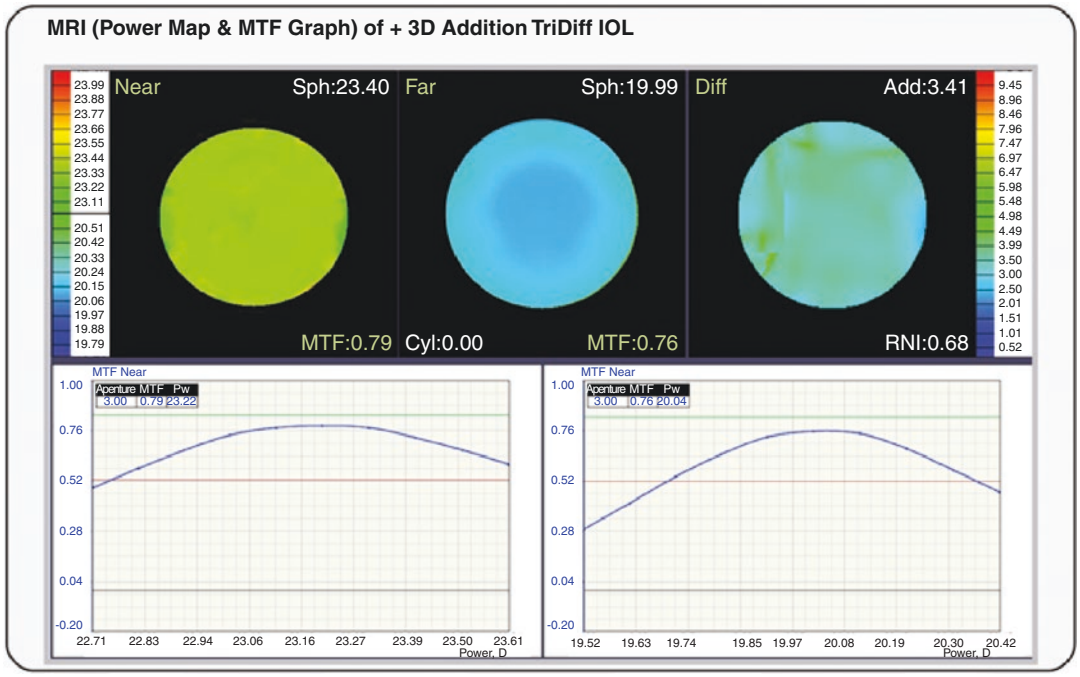


Fig. 12.77 MTF graph

- Estimated A-constant: not mentioned
- **MTF graph (near and far vision)**

- Corporate office:
  - **Care Group India**.
  - Block No.310, Village Sim of Dabhasa,
  - Tal.Padra, Dist. Vadodara – 391 440.
  - Gujarat, India.

70. Versario Multifocal 3F (Bausch and Lomb) [58]

- Type: one-piece trifocal multifocal IOL
- Optic: negative aspheric diffractive
- Pupil-dependent: yes
- Material: hydrophilic acrylic with hydrophobic surface
- Filter: UV and violet filter
- Total diameter: 11 mm
- Optic size: 6 mm
- Haptic angulation: plate haptic with 0°
- Edge design: 360° posterior square edge
- Implant location: bag
- Refractive index: 1.46
- Diopter range: +0.0D to +32.0D (0.5D increments)

Fig. 12.78 Versario Multifocal 3F (Bausch and Lomb) (mages courtesy of Bausch and Lomb)

- Incision size: 1.8 mm
- Estimated A-constant: 118.6
- Estimated ACD: 5.26
- Recommended injector: Viscoject™ BIO 1.8 LP604350C

- ADD IOL plane: Intermediate +1.50D, Near +3.0D

71. WIOL Calculator: http://www.wiols.com/en/calculator-attention/

- Corporate office:
  - **Bausch + Lomb (Global Headquarters)**
  - 400 Somerset Corporate Blvd.
  - Bridgewater, NJ 08807

Compliance with Ethical Requirements Michael Mimouni and Jorge L. Alió declare that they have no conflict of interest. No human or animal studies were carried out by the authors for this chapter.

References

1. http://www.caregroupindia.com/downloads/AcriDiff.pdf
2. http://www.vsybiotechnology.com/acriva-reviol-mfm-611/
3. http://www.vsybiotechnology.com/acriva-reviol-bb-mfm-611/
4. http://www.vsybiotechnology.com/acriva-reviol-bb-t-mfm-611/
5. http://www.vsybiotechnology.com/acriva-trinova/
6. https://www.nuevocristalino.es/lente-intraocular/acrysof-iq-panoptix/
7. https://p.widencdn.net/jc3sz2/40-500-133_AcrySof_CERT
8. https://p.widencdn.net/fkuip1/40-500-092_I_ACRSOF_ReSTOR_CERT
9. https://p.widencdn.net/pmhjnm/SN6AD3_40-500-085-NEW
10. https://p.widencdn.net/zd0otc/40-500-135_us_en
11. http://www.medicontur.com/files/For_professionals/eIFU/2017/NEW/ENG/LB-IFU-MC-AHLNP-EN(ADDON)_v04_e.pdf
12. http://www.1stq.de/media/raw/Datenblatt_EN_AddOnprogr.pdf
13. http://hoyasurgicaloptics.com/us/professionals/products/
14. http://www.alsanza.com/multifocal-iols/alsiol-3d-vf/
15. http://www.alsanza.com/toric-iols/alsafit-toric-vf/
16. https://www.zeiss.es/meditec/productos/oftalmologia-y-optometria/catarata/iol-implantation/plataforma-mics/mics-preloaded-multifocal-iol/at-lisa-809m-mp.html
17. https://www.zeiss.com/content/dam/Meditec/downloads/pdf/Campaigns/at_lisa_tri_family_clinical_leaflet_new.pdf
18. https://www.zeiss.de/content/dam/Meditec/downloads/pdf/ESCRS/czm_AT%20LISA.pdf
19. http://www.1stq.de/media/raw/Datenblatt_EN_BasisZprogr.pdf
20. http://www.medicontur.com/multifocal_aspheric_diffractive_lenses
21. http://www.hanitalenses.com/blog/product/bunnylens-mf/
22. http://www.soleko-iol.it/wp-content/materiale/schedetecniche/Brochure%20Camellens.pdf
23. http://www.bausch.com/Portals/77/-/m/BL/United%20States/Files/Package%20Inserts/Surgical/REF-CRS-0127-Crystalens-DFU-2016.pdf?ver=2017-01-10-093253-903
24. http://www.bausch.com/ecp/our-products/cataract-surgery/lens-systems/crystalens-ao
25. https://sav-iol.com/products/eden/
26. http://www.biotechvisioncare.com/home/ophthalmic/cataract_products/intraocular_lenses/eyecryl.shtml
27. https://www.physiol.eu/getattachment/b441fd10-6db6-41bc-952d-37975671e967/brochure_finevision
28. https://www.physiol.eu/getattachment/291def20-8cce-424b-a8ad-b3b41f360cb7/brochure_finevisionhp
29. https://sav-iol.com/products/harmonis/
30. http://www.acufocus.com/int/sites/default/files/MK-1268%20Rev%20C%2C%20IC-8%20IOL%20Physician%20Brochure.pdf
31. http://www.caregroupindia.com/downloads/iDIFF-PLUS.pdf
32. http://caregroupiol.com/ipclv2/
33. http://www.md-tech.it/products/i-stream-diffrax/
34. http://www.oculentis.com/lentis-comfort.html#
35. http://www.oculentis.com/lentis-mplus-x.html
36. http://www.oculentis.com/lentis-mplus-x-toric.html
37. https://sav-iol.com/products/lucidis/
38. https://www.akkolens.com/
39. https://www.rayner.com/en/iols/multifocal/m-flex-multifocal-and-m-flex-t-multifocal-toric
40. http://surgical.sifigroup.com/en/category/prodotti/area-chirurgica-prodotti/iol/#
41. http://www.biotechhealthcare.com/ophthalmology/ophtalmology-product-page/optiflex-trio/
42. http://www.mbius.com/en/pdf/SAL%20M302A,%20M302AC,%20PM302A%20,%20PM302AC.pdf
43. https://www.ophtec.com/products/cataract-surgery/iols/precizon-presbyopic
44. http://contacare.com/iols/preziol-multifocal-foldable/
45. https://www.rayner.com/en/iols/multifocal/rayone-trifocal
46. http://cristalens.fr/index.php?page=produits&rub=1&srub=4&ssrub=1
47. http://www.soleko-iol.it/wp-content/materiale/schedetecniche/FIL611PV.pdf
48. http://www.soleko-iol.it/wp-content/materiale/schedetecniche/FIL611PVT.pdf
49. http://www.soleko-iol.it/wp-content/materiale/schedetecniche/FIL65PVS.pdf
50. http://www.omnilens.in/revive.html
51. https://accessgudid.nlm.nih.gov/devices/05050474520189

52. http://www.hanitalenses.com/blog/product/seelensmf/
53. https://www.rayner.com/en/sulcoflex-multifocal
54. https://www.surgical.jnjvision.com/iols/toric.html
55. https://surgical.jnjvision.com/us/sites/vision_us/files/tecnis_symfony_spec_sheet_updated.pdf
56. https://www.lenstec.com/technical-specifications7.html
57. http://caregroupiol.com/tridiff/
58. https://www.bauschsurgical.eu/products/cataract/intraocular-lenses-monofocal-and-premium/versario-multifocal-3f/