

Trifocal IOLs

When expectations and outcomes align

Ray One
TRIFOCAL

Ray One
TRIFOCAL
TORIC

 Rayner

Leading the way in ophthalmic innovation

Rayner manufactured the world's first IOL in 1949, and has remained at the forefront of innovation for over 70 years, focused on providing you and your patients with the best IOLs and ophthalmic solutions - always driven by science to improve patient outcomes and safety.

Rayner is the only manufacturer of IOLs in the UK, with its state-of-the-art manufacturing plant and Global Headquarters on the South Coast of England.

1910

Rayner is founded in London, UK.

1949

Rayner makes the world's first IOL.

1979

Rayner has the first IOL approved by the US FDA.

2007

Rayner launches:

- The first multifocal toric IOL
- The first pseudophakic supplementary IOL
- The first FDA approved IOL from a non-American manufacturer in two decades.

2016

- Brand new HQ and state-of-the-art manufacturing facility opens in Worthing, UK.
- RayOne fully preloaded IOL system is unveiled at the 2016 ESCRS congress.
- Rayner acquires Moorfields Pharmaceuticals.

2017

RayOne Trifocal premium preloaded IOL is launched.

2018

- RayOne Hydrophobic and RayOne Toric preloaded IOLs are released.
- Sulcoflex Trifocal, the world's first supplementary trifocal IOL is launched.
- AEON eye drop family is introduced, designed specifically for before and after surgery.

2019

- RayPRO digital platform for patient reported outcomes data is released.
- RayOne Trifocal Toric is launched, completing Rayner's trifocal IOL family.

2020

RayOne Enhanced Monovision preloaded IOL is launched.



Trifocal IOL solutions for all your patients

Patient expectations from lens surgery are changing, with an increasing desire to be spectacle free as they continue to lead highly active and social lifestyles until much later in life.

Whether your patients are having cataract surgery or visiting you for refractive enhancement, our complete family of trifocal IOLs are clinically proven to provide them with the best visual outcomes.

RayPRO

Real-time patient feedback data

RayPRO is a mobile and web-based digital platform that collects insightful Patient Reported Outcomes (PROs) over three years.

• New insightful trends

- Promote your services to new patients, with easy-to-understand metrics.
- Supports appraisals, recertification and auditing.

• Fast and simple

- Patients are registered in seconds.
- Only value-adding data is collected.
- Access metrics anytime from your smartphone (iOS and Android).

• Automated collection of PROs

- Patients provide their feedback in just a couple of minutes.
- Responses are anonymous to encourage patient honesty.
- Reports are always live, with no data analysis needed.
- Use product and patient trends to improve your service.



RayPRO is FREE for
users of Rayner IOLs.
rayner.com/raypro



Optimised diffractive design

Our family of trifocal IOLs use Rayner's patented diffractive profile that was designed in partnership with a leading European technology institute.

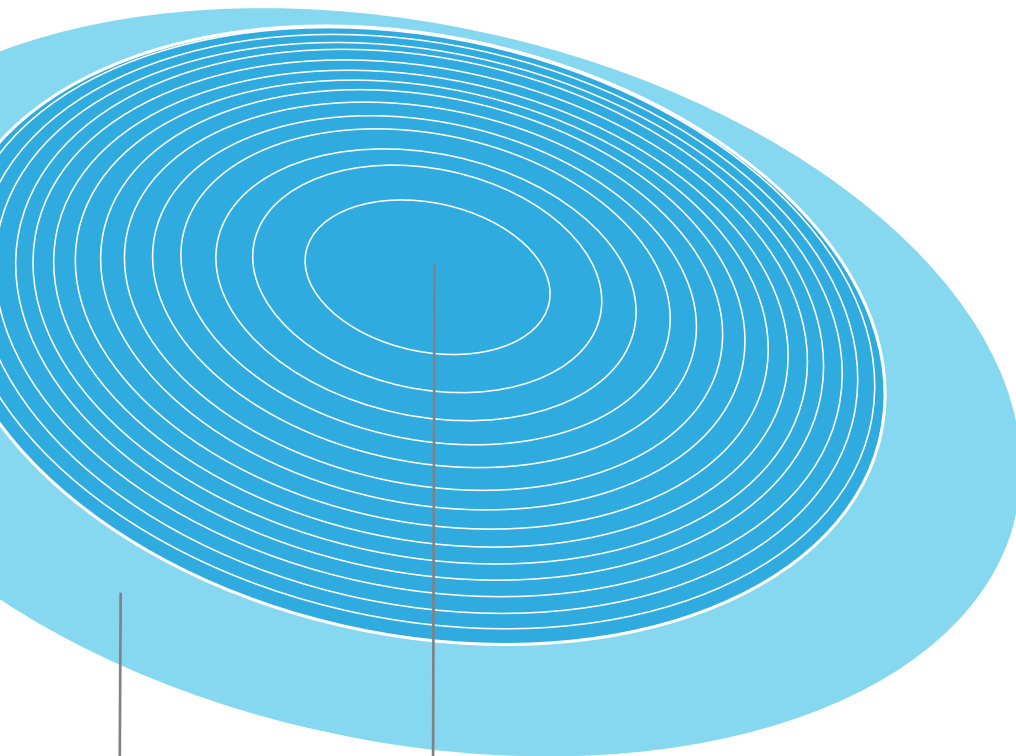
This new design of diffractive technology is the most advanced optic in our history and possibly the most advanced in the industry.

The diffractive surface is a construct of two profiles to form our patented design:



Graphical representations only of diffractive surface pattern.

Rayner's diffractive trifocal design has fewer rings on the optic surface than many trifocal IOLs for **reduced potential visual disturbances and improved night vision.**



>4.5 mm
distance zone

4.5 mm diffractive
trifocal zone

FEATURES

- 16 diffractive rings/steps
- 4.5 mm diffractive zone
- >4.5 mm monofocal, distance

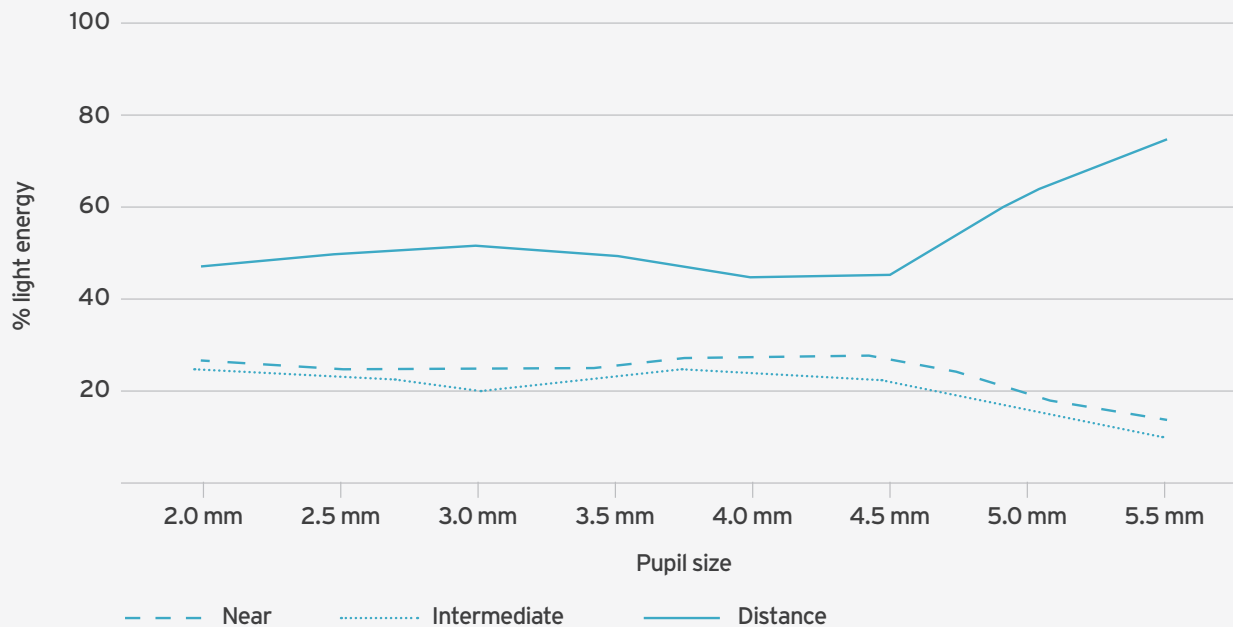
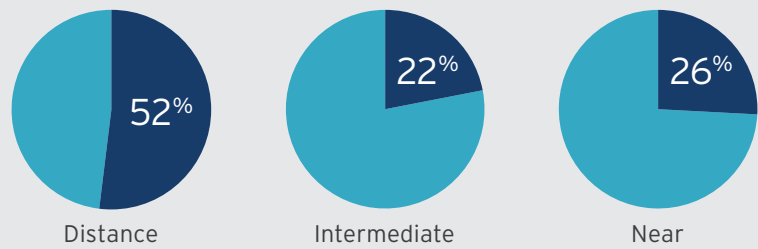
PATIENT BENEFITS

- Reduces visual disturbances
- Developed to be less dependent on pupil size or lighting conditions
- Improves distance vision in mesopic condition

Our patented diffractive step trifocal technology reduces light loss to only 11%

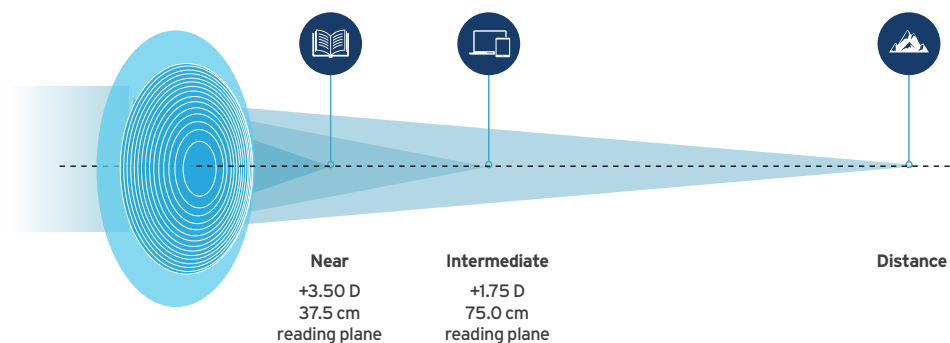
- 89% of light is transmitted to the retina with a pupil of 3.0 mm
- Half the light is allocated for distance
- Remaining light is divided between near and intermediate vision

Light energy split with a 3.0 mm pupil:



Comfortable transition from near to distance activities

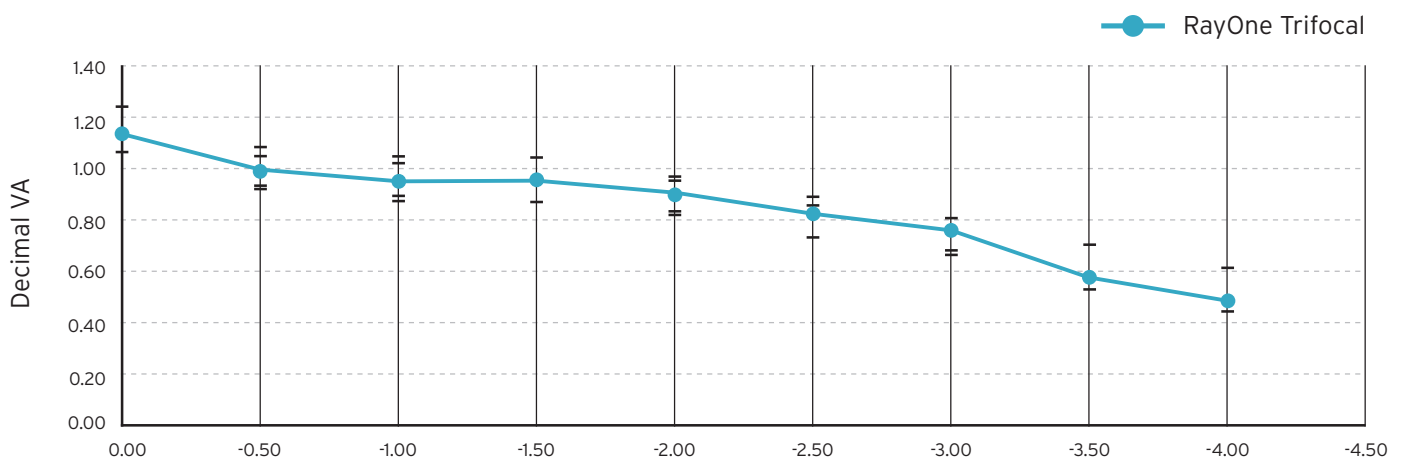
Our trifocal optic improves intermediate visual acuity, enabling patients to feel more comfortable transitioning from near to distance activities



Clinically-proven and industry leading trifocal technology

Defocus curve

The defocus curve for RayOne Trifocal shows impressive visual acuity results from distance to near.¹

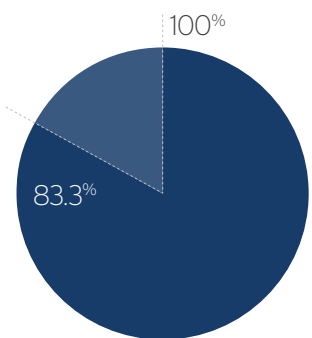


EXCELLENT REFRACTIVE PREDICTABILITY

At three months,

100%

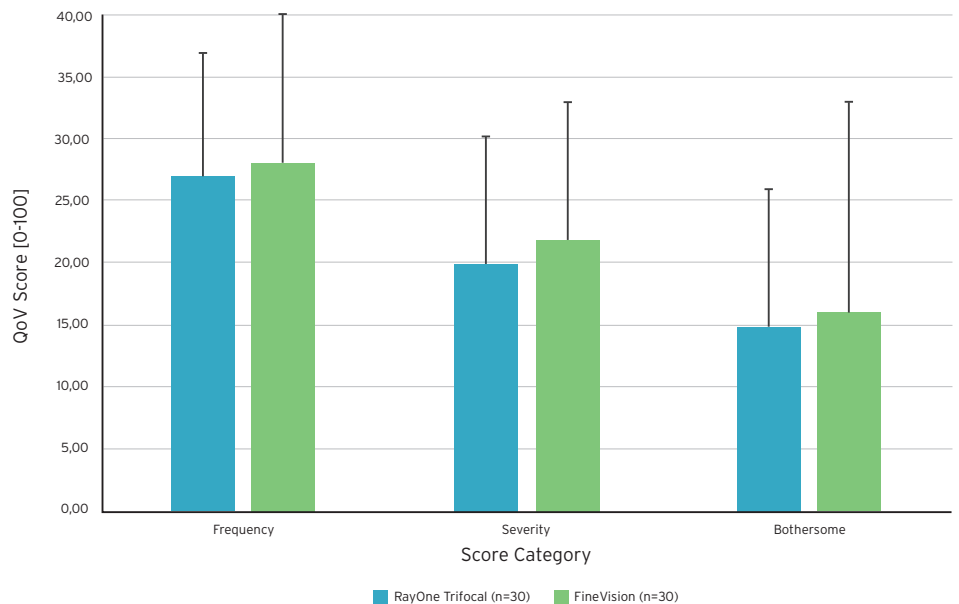
of eyes within $\pm 0.5D$ of the target SEQ²



vs. 83.3% with PhysIOL FineVision POD F

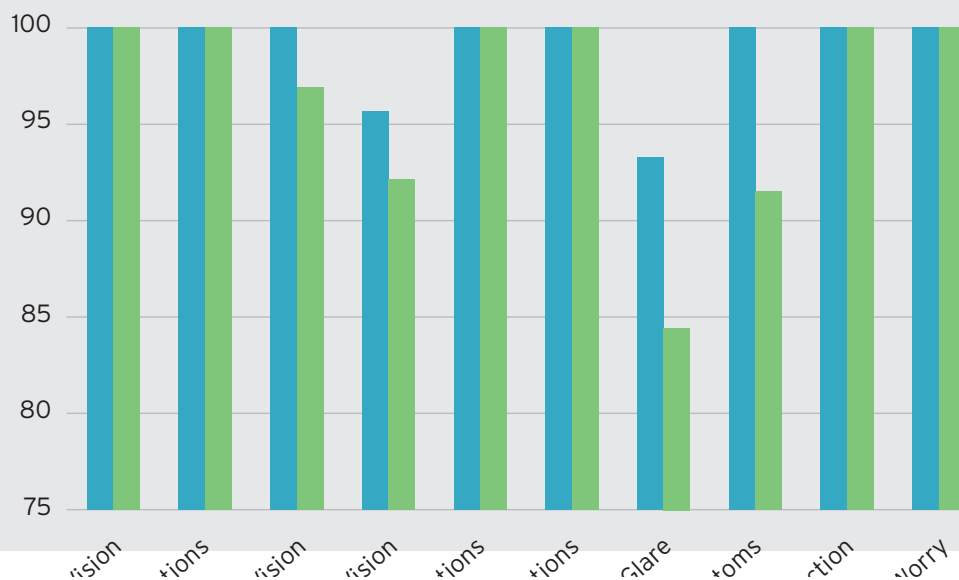
Less photic phenomena

In a prospective study of 60 eyes, a statistically significant difference favouring the RayOne Trifocal versus the FineVision POD F was achieved in an objective evaluation of photic phenomenon.²



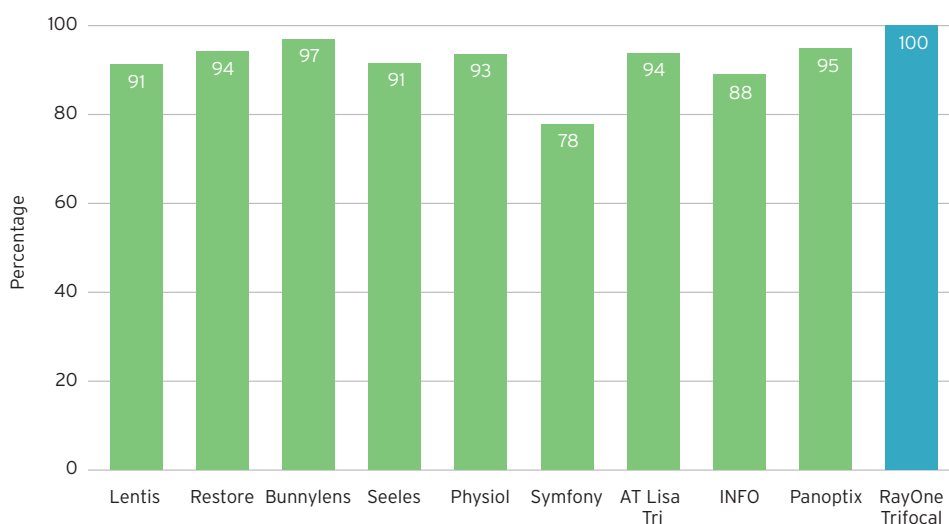
Less photic phenomena and increased patient satisfaction

In a prospective comparative study of 64 eyes of 32 patients, the RayOne Trifocal group is associated with better scores for glare, symptoms and near and distance VA against the PanOptix Trifocal group.¹⁵



100% spectacle independence

In a prospective study of 16 eyes implanted with RayOne Trifocal, 100% of patients achieved spectacle independence and agreed they would have the operation again at 1 month follow up.³



In a prospective comparative study of 60 eyes²

40% vs. 67%
Glare

40% vs. 53%
Halos

7% vs. 33%
Difficulties in depth perception

RayOne Trifocal
FineVision POD F

For me, the most important question for judging patient satisfaction asks...

'Would you repeat the treatment with the same procedure?'

and 100% said

'YES'

- Fernando Llovet-Osuna, MD, PhD, Medical Director of Clínica Baviera, Spain¹

RayOne Trifocal



STATS

- Industry leading 11% light loss²
- Diffractive +3.5 D near add, +1.75 D intermediate add
- Fully preloaded from 0.0 D to +30.0 D (0.5 D increments)

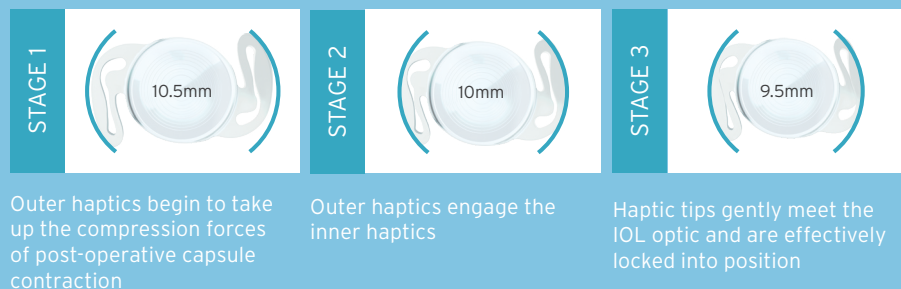
FEATURES & BENEFITS

- Aberration-neutral aspheric optic for visual quality and acuity in all light conditions
- Amon-Apple enhanced square edge for minimal PCO 1.7% at 24 months⁴
- Based on proven haptic technology for excellent stability⁵
- Zero glistenings
- Biocompatible hydrophilic acrylic material with a long safety record - over 7.5 million lenses sold since 2003
- Fully preloaded across the entire power range

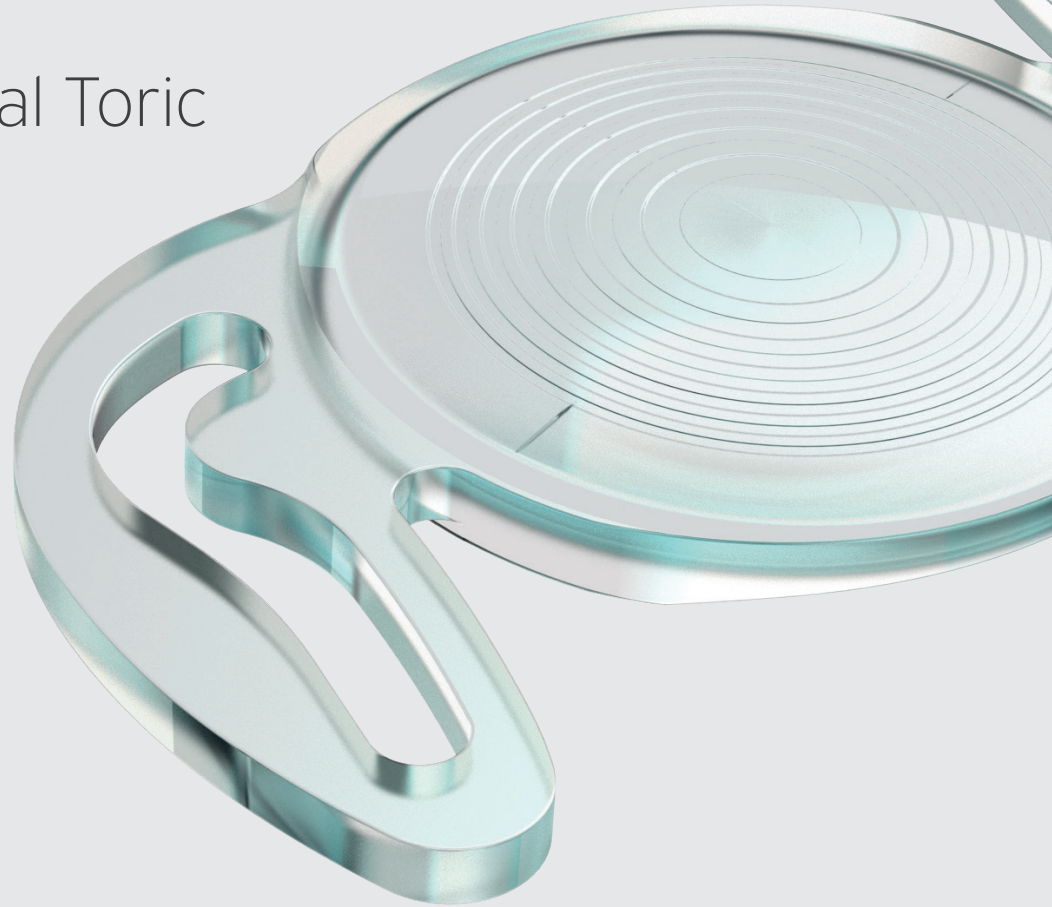
Proven haptic technology for excellent stability

Any rotation, tilt or decentration of a multifocal lens could affect patient outcomes and cause photopic disturbances. Our anti-vaulting haptic technology gives proven rotational and centration stability, plus excellent fixation in the capsular bag:

- **Superb centration** - Average offset of only 0.08 mm 3 to 6 months after surgery⁵
- **Excellent rotational and torsional stability** - 1.83° mean IOL rotation 3 to 6 months after surgery⁵



RayOne Trifocal Toric



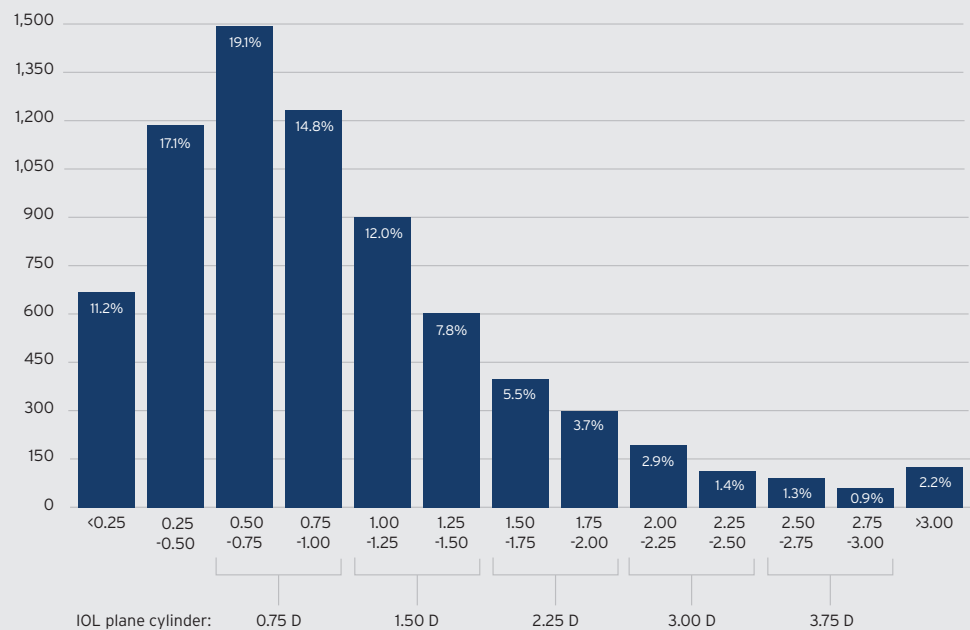
STATS

- 1.83° mean post-operative rotation at 3 to 6 months⁵
- 100% lenses rotated $\leq 5^\circ$ ⁵
- 0.08 mm average centration offset at 3 to 6 months⁵

FEATURES & BENEFITS

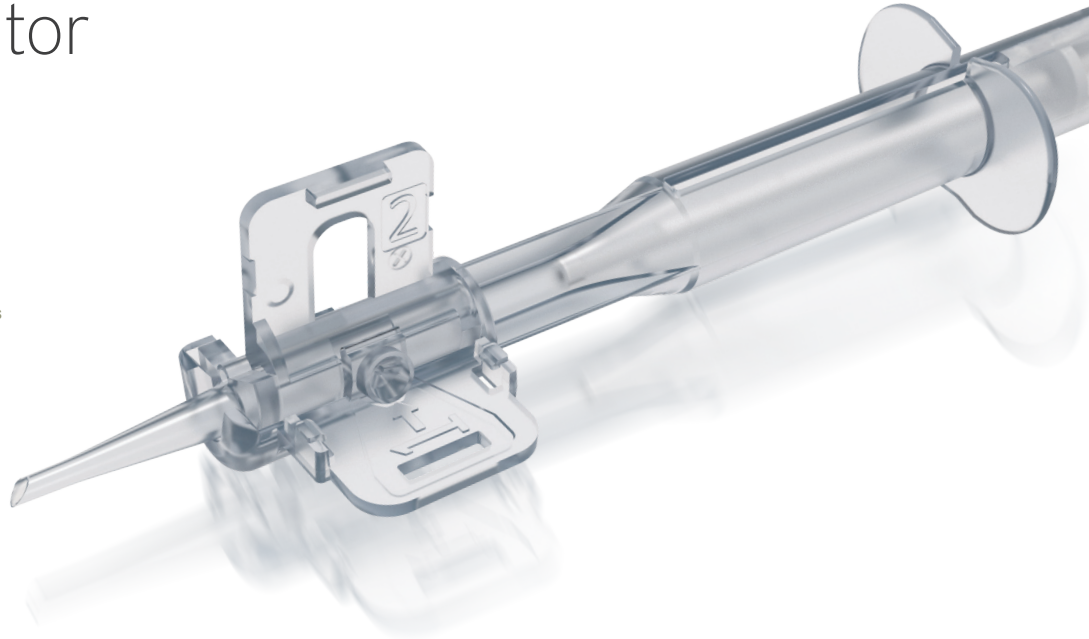
- Correct more of your patients, even those with significant corneal astigmatism.
- Proven rotational stability and centration⁵ with predictable, sustainable and accurate visual results
- Aberration-neutral aspheric optic for visual quality and acuity in all light conditions
- Fully preloaded across the entire power range
- Simplified range of IOL plane cylinders:
 - +0.75 D
 - +1.5 D
 - +2.25 D
 - +3.0 D
 - +3.75 D
 - +4.5 D

Prevalence of corneal astigmatism prior to cataract surgery



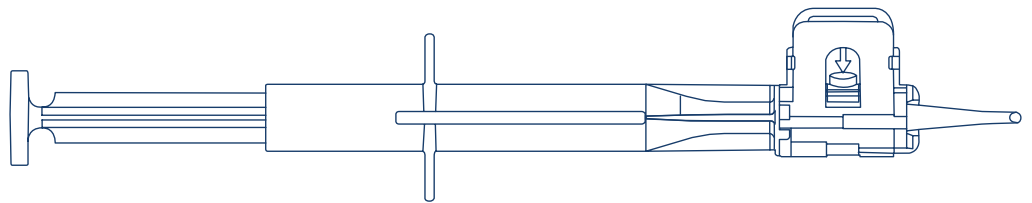
n = 6,000. Warren E. Hill, MD. Keratometry database.

RayOne injector



TWO-STEP SYSTEM

- Easy to use⁶
 - i. Minimal learning curve
 - ii. Minimises error
- Efficient IOL delivery time⁶
 - i. Designed for repeatability
 - ii. Reduces operating time
- **Step 1:** Insert OVD into cartridge via port
- **Step 2:** Lock cartridge ready for implantation



FEATURES & BENEFITS

- 1.65 mm nozzle for sub 2.2 mm incision
- Smallest fully preloaded injector nozzle
 - i. Ease of insertion
 - ii. Enables true micro incision
- Ergonomic design for ease of handling
- Single handed plunger with minimal force required
- Parallel sided for minimal stretch
 - i. Sub 2.2 mm delivery
 - ii. Maintains incision architecture

Unique patented Lock & Roll technology for consistent delivery

- Rolls the lens to under half its size before injection
 - i. Consistent, smoother delivery
 - ii. Reduces insertion forces
- Fully enclosed cartridge with no lens handling
 - i. Reduces the risk of lens damage
 - ii. Minimises chance of contamination

Lock & Roll technology



Consistently locked and rolled to under half its size in one simple action

Technical information

Model Name	RayOne Trifocal RA0603F	RayOne Trifocal Toric RA0613Z
Power Range	Trifocal: 0.0 D to +30.0 D (0.5 D increments)	Trifocal Toric: Spherical Equivalent: +6.0 D to +30.0 D (0.5 D increments) Cylinders: +0.75 D, +1.5 D, +2.25 D, +3.0 D, +3.75 D, +4.5 D
	Trifocal, diffractive, +3.5 D near add and +1.75 D intermediate add at the IOL plane	

RayOne IOLs	
Material	Single piece Rayacryl hydrophilic acrylic
Water Content	26% in equilibrium
UV Protection	Benzophenone UV absorbing agent
UV Light Transmission	UV 10% cut-off is 380 nm
Refractive Index	1.46
ABBE	56
Overall Diameter	12.5 mm
Optic Diameter	6 mm
Optic Shape	Biconvex (positive powers)
Asphericity	Aberration-neutral technology
Optic Edge Design	Amon-Apple 360° enhanced square edge
Haptic Angulation	0°, uniplanar
Haptic Style	Anti-Vaulting Haptic (AVH) technology

RayOne delivery system	
Injector Type	Single use, fully preloaded IOL injection system
Incision Size	1.65 mm nozzle for sub 2.2 mm incision
Bevel Angle	45°
Lens Delivery	Single handed plunger

Estimated Constants for Optical Biometry									
	SRK/T	Haigis			HofferQ	Holladay	Holladay II	Barrett Universal II	
	A-constant	a0	a1	a2	pACD	SF	pACD	LF	DF
RayOne Trifocal & RayOne Trifocal Toric	118.6	1.044	0.40	0.10	5.32	1.56	5.32	1.67	3.5

For Contact Ultrasound, the estimated A-constant is 118.0

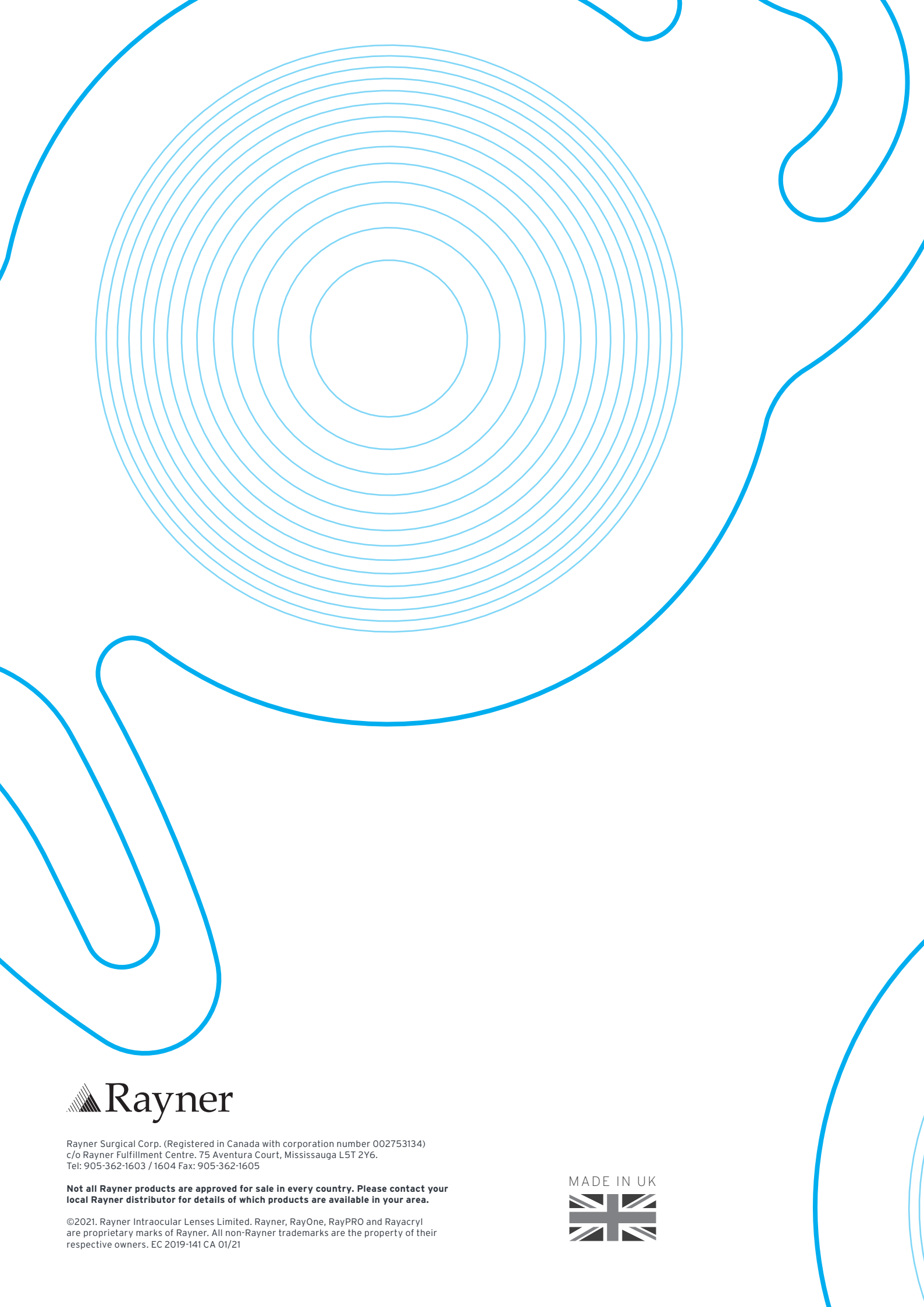
Please note that the constants indicated for all Rayner lenses are estimates and are for guidance purposes only. Surgeons must always expect to personalise their own constants based on initial patient outcomes, with further personalisation as the number of eyes increases.

For lens calculations,

visit www.raytrace.rayner.com

References:

1. Eurotimes Supplement Feb 2019. RayOne Trifocal & Sulcoflex Trifocal. 2. Ferreira TB and Ribeiro FJ. J Refract Surg. 2019;35(7):418-425. 3. De Lange J. Ophthalmology Times Europe article March 2019. 4. Mathew RG and Coombes AGA. Ophthalmic Surg Lasers Imaging. 2010 Nov-Dec;41(6):651-5. 5. Bhogal-Bhamra GK et al. Journal of Refractive Surgery. 2019;35(1):48-53. 6. Nanavaty MA and Kubrak-Kisza M. J Cataract Refract Surg. 2017 Apr;43(4):558-563. 7. Prager F et al. J Cataract Refract Surg. 2017;43(5):643-647. 8. Amon MI. Cataract Refract Surg Today Europe. 2009;56-9. 9. Kahrman G and Amon M. J Cataract Refract Surg. 2010 Jul;36(7):1090-4. 10. Manzouri B et al. Asia-Pacific Journal of Ophthalmology. Vol 6, Number 4, July/August 2017. 11. Khan MI, Muhtaseb M. CRSTE June 2010. 12. Claoué et al. CRST Euro Supple. 2009. 13. Amon MI et al. ESCRS Euro Times Supple. 2012;2-3. 14. Khoramnia R et al. J Refract Surg. 2020;36(9):570-577. 15. Data on file, Jan 2021.



Rayner Surgical Corp. (Registered in Canada with corporation number 002753134)
c/o Rayner Fulfillment Centre, 75 Aventura Court, Mississauga L5T 2Y6.
Tel: 905-362-1603 / 1604 Fax: 905-362-1605

Not all Rayner products are approved for sale in every country. Please contact your local Rayner distributor for details of which products are available in your area.

©2021. Rayner Intraocular Lenses Limited. Rayner, RayOne, RayPRO and Rayacryl are proprietary marks of Rayner. All non-Rayner trademarks are the property of their respective owners. EC 2019-141 CA 01/21

MADE IN UK

