RODENSTOCK

Because every eye is different

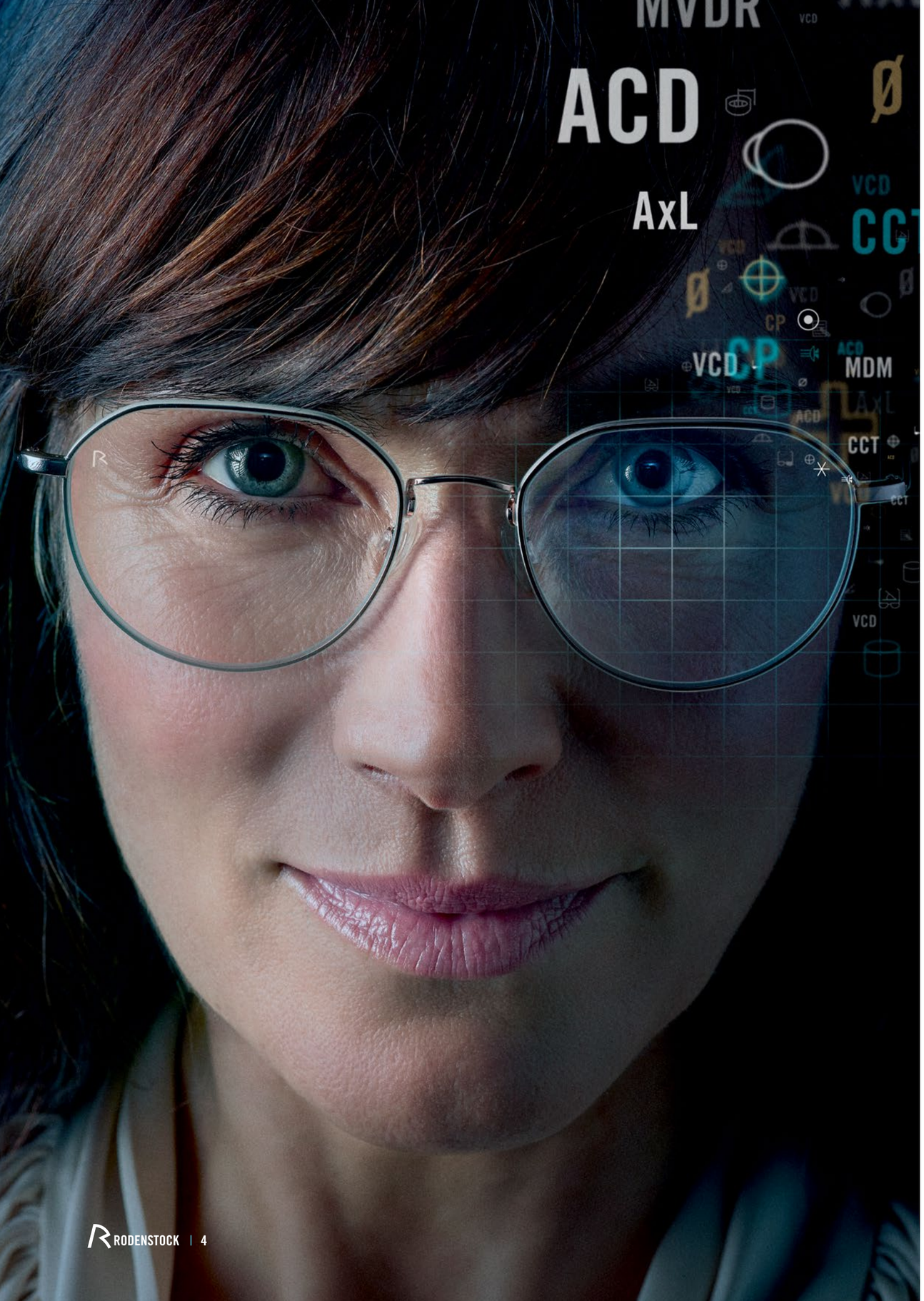
B.I.G. VISION™ FOR ALL

BIOMETRIC INTELLIGENT GLASSES

B.I.G. VISION™

A PARADIGM SHIFT IN INDIVIDUAL PROGRESSIVE LENSES

The time has come to recognise people as individuals, with eyes of different shapes and sizes. To ensure the sharpest possible vision, we need to create lenses based on every person's individual eye measurements. And that requires a paradigm shift in how the industry measures and develops lenses. This way, glasses will ensure the **sharpest possible vision.**



INTRODUCING

the first high-precision progressive lenses made from a complete biometric eye model

At Rodenstock, we determine the biometrics of the whole eye. This includes its length and several thousand data points in the eye – far beyond industry standards. These data points are integrated directly into the lens, orchestrating a construction process which results in the world's most precise lens.

This biometric eye model enables us to precisely hit the sharp vision centre of every individual eye. This provides people with the sharpest vision possible at any angle or with every gaze, both in the glasses' peripheral zones and at distances from mid, near and far.

We call these lenses B.I.G.

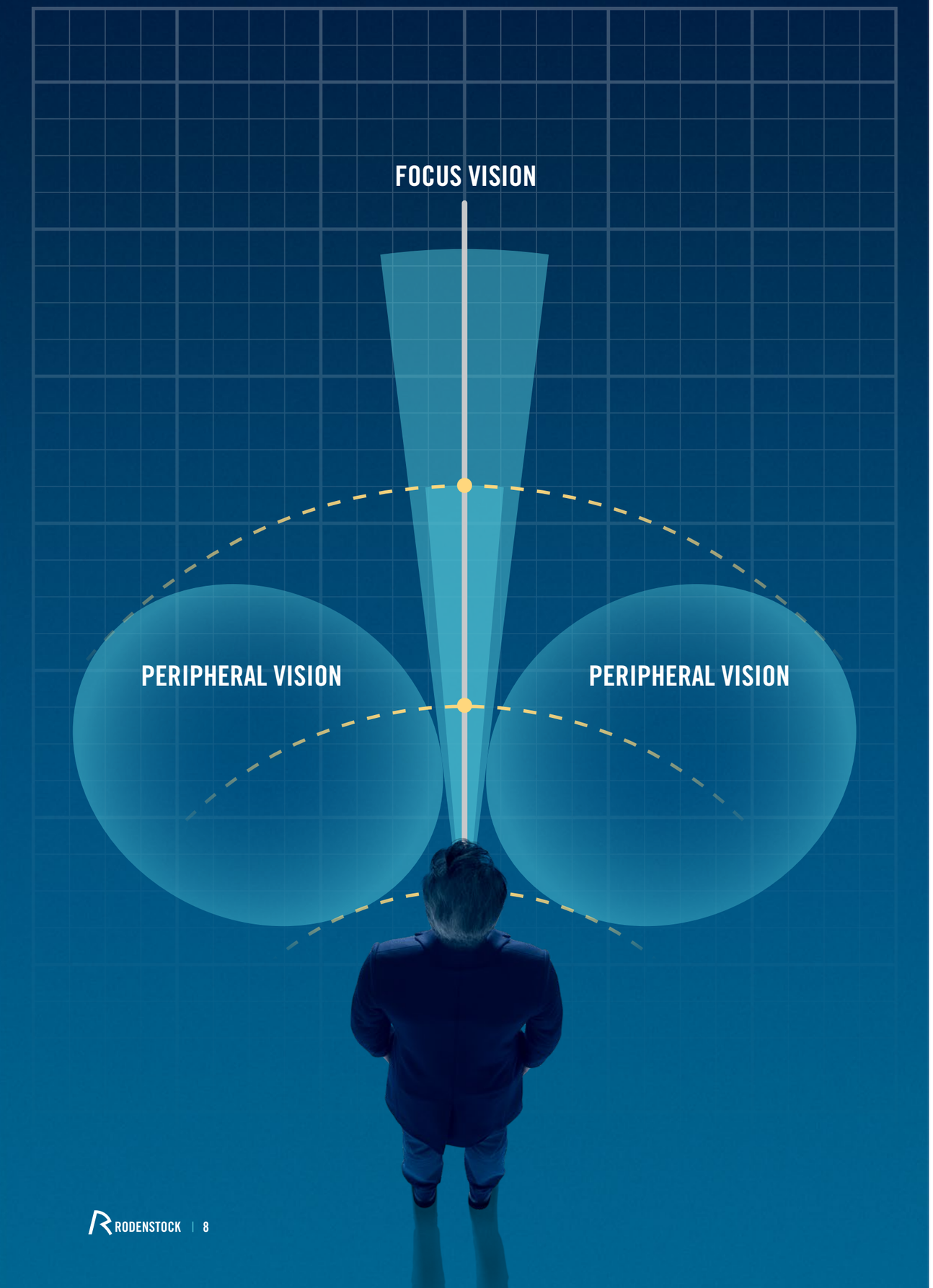
BIOMETRIC INTELLIGENT GLASSES™

WHY BIOMETRIC INTELLIGENT GLASSES™?

In order to understand this technological breakthrough and the importance of utilising individual biometric data when constructing the lenses, we first have to understand the dynamic demands of the complete vision system and the fact that you see with your brain, not with your eyes.

You don’t see with your eyes. You see with your brain.

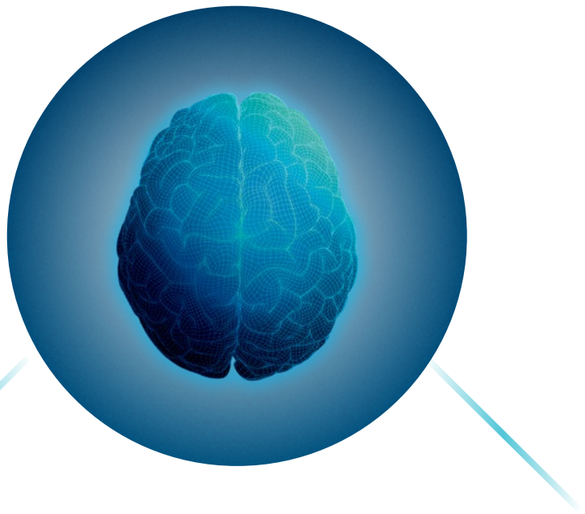
It’s actually your brain that senses what is happening in the environment around you. To make sure you navigate easily through it, you need glasses able to provide you with the best possible input. This ensures your brain receives the input it needs to accurately orientate and determine what’s going on around you, allowing you to decide what to focus on and then act accordingly.



Human vision consists of two subsystems: focus vision and peripheral vision

Our vision consists of two subsystems that simultaneously work together with the brain: focus vision and peripheral vision.

We use our peripheral vision to orientate ourselves and to detect motion in our environment, while our focus vision moves to whatever point of interest the brain picks up on, no matter if it's near or far away. Based on this input, our brain then decides how to act on the information received.



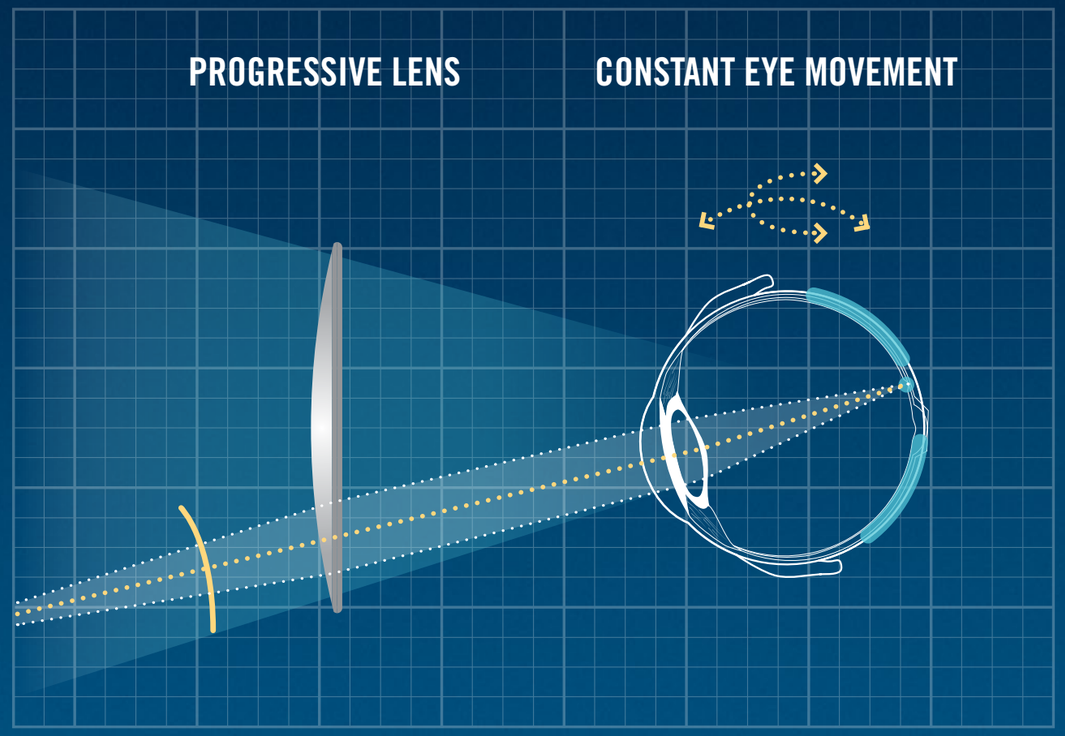
PERIPHERAL VISION

Peripheral vision secures that the brain can orientate and detect changes.

FOCUS VISION

Focus vision moves to whatever point of interest the brain picks up.

YOUR EYES MOVE 250,000 TIMES A DAY



Eye movement is continuous. In fact, the human eye moves up to 250,000 times a day. This means our vision is constantly in a dynamic state, focusing at near, mid and far distances while we use our peripheral vision to orientate ourselves while the eye moves. That's why progressive lenses must support vision at every angle – and not just at one focus point in the middle. But in order to do that, you need precise data on the individual eye – because every eye is different.

EVERY EYE IS DIFFERENT

To make lenses that support eye movement you need to recognise that every eye is different.

Eye length and shape are as individual as people and the location of the sharp vision centre varies. This means that to ensure sharp vision, you need to be able to calculate lenses based on precise data on each eye. However today, almost all progressive lenses are created using the same standard reduced eye model.

98%

of the world's progressive lenses don't fit the user's eyes

The challenge is that a narrow mind-set has controlled the world of progressive lenses for far too long. A mind-set committed to limited eye measurements. Of one-sided focus attention. To too little understanding of the role of the brain.

Instead, this narrow mind-set has focused on understanding the eye just from the limited perspective of a standardised reduced eye model, and not from an understanding of individual eyes. This mind-set has left 98% of the world's progressive lens users with glasses that don't fit their eyes precisely.

THERE ARE

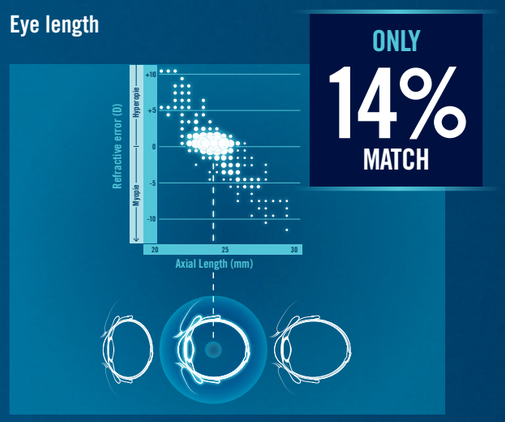
7.5 BILLION

people in the world. Each of their eyes has a different length and shape.

Today, progressive lenses are made using a static reduced eye model that doesn't match the individual eye.

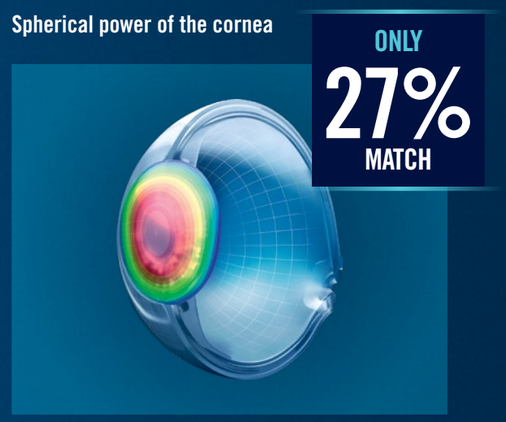
Currently, almost all progressive lenses are made using a static, reduced eye model featuring fixed parameters and suitable for very few people. When it comes to eye length the standard matches just 14%, for spherical corneal power 27%, astigmatic corneal power 16%, and anterior chamber depth 25%. When all these values are combined, the model actually represents just 2% of eyes globally. It's time we leave this old way of thinking behind.

Eye length



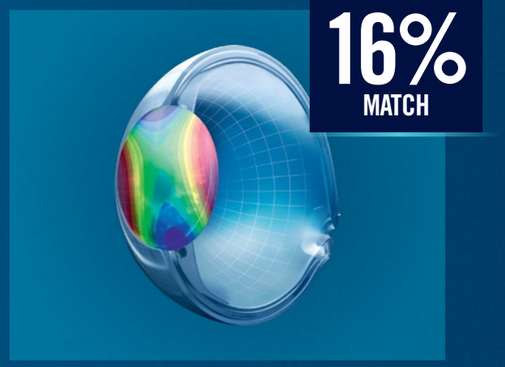
When using the standard eye length as a measurement for the eye, it is only accurate for 14% of users.

Spherical power of the cornea



For the spherical power of the eye, the reduced eye model matches only 27% of users.

Astigmatic power of the cornea



For astigmatic power, the reduced eye model provides accurate measurements for just 16% of users.

Anterior chamber depth

For the depth of the anterior eye chamber, only 25% of eyes match the reduced eye model.

When combining the different standard eye parameters from the reduced eye model, it ends up matching just 2% of eyes.

We need to leave this old way of thinking behind.

WE SIMPLY NEED TO THINK BIGGER

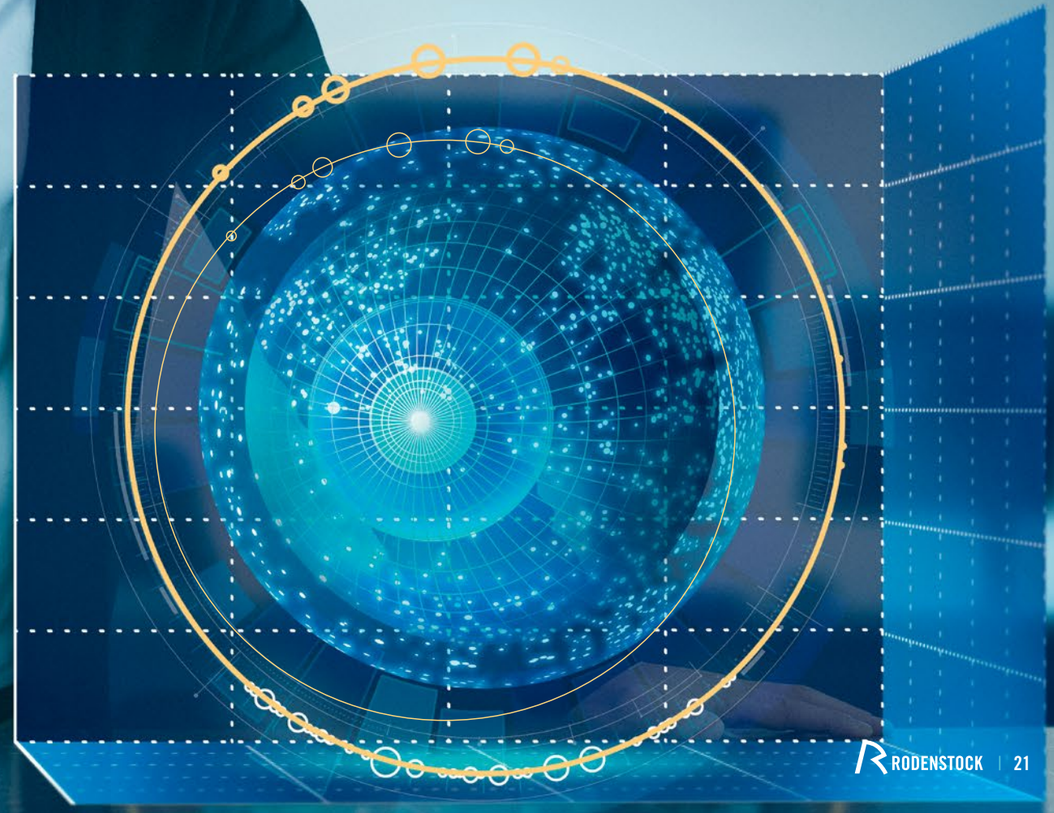
To go beyond the static thinking of how human vision works. To bring high-precision progressive lenses to everyone.

That's why at Rodenstock, we use thousands of data points to measure and determine the parameters of the eye. This allows us to not only determine eye length, but also biometric parameters such as individual lower and higher order aberrations and individual pupil size at near and far. It also determines reactions to different light conditions and the individual corneal topography, as well as the individual anterior chamber's depth.

CONSTRUCTING A COMPLETE INDIVIDUAL BIOMETRIC EYE MODEL

With the combination of our DNEye® Scanner and our patented technologies, we can determine all relevant biometric data.

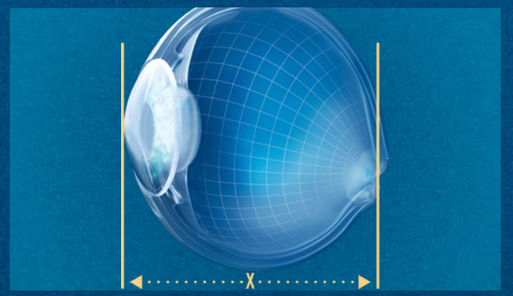
This data is used to create a unique biometric eye model and, based on this model, we are able to calculate a lens that matches each individual person to the micrometre. We call this our DNEye® PRO Technology and Rodenstock is the only lens manufacturer able to directly transfer all of these measurements into the production of the lens. This means we create unique biometric eye models for both eyes. That data is then digitally transferred to Rodenstock.



How Rodenstock measures and calculates individual eyes

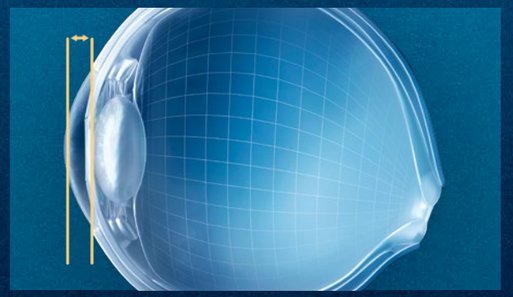
Using the DNEye® Scanner, we measure all the eye's relevant biometric parameters that are necessary to create a unique biometric eye model.

This biometric eye model includes eye length, corneal power and thickness, anterior chamber depth, pupil size in photopic and mesopic light conditions, crystalline lens power and vitreous chamber depth. This is why at Rodenstock we measure the eye using thousands of data points with our groundbreaking DNEye® Scanner. This means we can precisely determine all relevant biometric parameters as well as more refraction error data than anyone else.

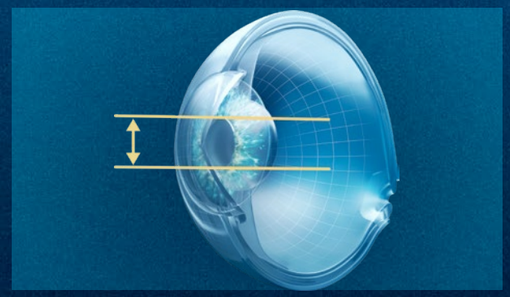


Eye length
The length of individual eyes can vary by up to 10 mm between people.

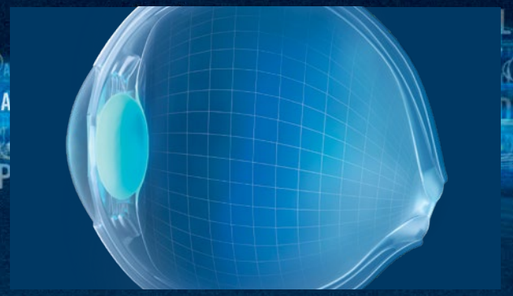
Corneal power and thickness
Both the power and thickness of the cornea influences how light is refracted and focused on the retina.



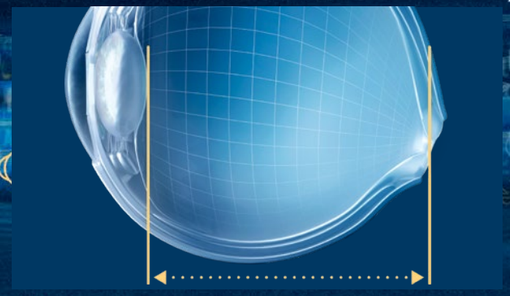
Anterior chamber depth
Rodenstock's ability to measure the depth of the anterior chamber is part of what allows us to accurately determine eye length.



Pupil size
The pupil size changes in different light conditions, which has to be accounted for in the lens calculation.



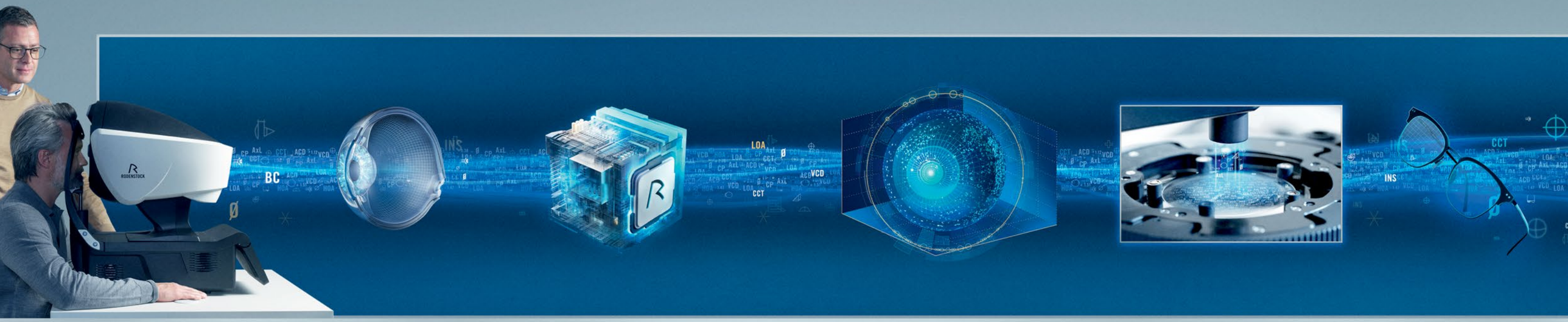
Crystalline lens power
The power of the individual lens varies from person to person and eye to eye.



Vitreous chamber depth
The vitreous chamber takes up the largest part of the eye, making it an important biometric parameter.

From precise eye measurements to true precision vision with biometric intelligence.

Data from the DNEye® Scanner is integrated directly into the lens.



Measuring the individual eye with the DNEye® Scanner

At the optician, the eye dimensions of the individual are scanned with the DNEye® Scanner.

Transmitting data to Rodenstock

While competitors also use measurement devices, no one actually transmits this full set of data directly into the production of the lens. We do.

Calculating the biometric data set

Our patented calculations are used to create the extremely rich biometric data set.

Constructing the biometric eye model

This data is then used to produce a precise biometric eye model that is unique to the individual eye.

Transferring data digitally into the lens

The eye model is used in the lens calculation and finally transferred into the lens during production. Each lens is then customised according to the biometric parameters.

Biometric Intelligent Glasses™

Finally, the person receives their glasses integrated with biometric intelligence – and all this takes just a few days.

APPLYING BIOMETRIC INTELLIGENCE IS WHAT MAKES THE BIG DIFFERENCE

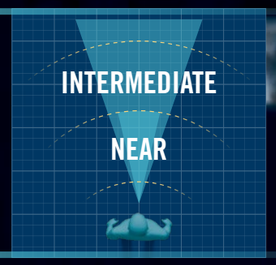
Biometric Intelligent Glasses™ give people the ability to experience every dynamic aspect of life.

As you go through each day, you navigate through many different situations and your complete vision system is continuously at work, shifting focus distance, direction and angles.

Rodenstock's B.I.G. Vision™ with DNEye® Technology delivers a seamless, dynamic and natural experience that works perfectly together with the brain.

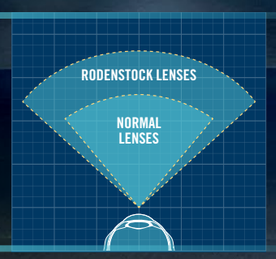
B.I.G. Vision™ delivers:

UP TO **40%** sharper vision at near and intermediate distances



INCREASED **BRAIN** support through sharper vision

AN **8.5°** wider field of sharp vision at near



Source: Jeremias, K., Urech, D. (2013). Von der Wissenschaft zur Praxis –und zurück. DOZ 2013(2) 58

B.I.G. VISION™ GIVES PEOPLE BIG BENEFITS

A Swiss customer survey of 283 people, of which 90% had previously worn glasses, proved an outstanding success for B.I.G. Vision™. It demonstrated clearly that using a complete biometric model in lens development tailored to the individual, significantly improved their vision experience.

When asked about their experience with Biometric Intelligent Glasses™, a high percentage of survey* respondents experienced a wide-range of benefits to their vision.

* DNEye® customer survey (2018), Zurich.

** Muschielok, A. (2017). Personalisierte Gleitsichtgläser nach Kundenwunsch – Ergebnisse einer wissenschaftlichen Studie. Presentation at the Opti-Forum, Munich.

88%

noticed greater visual comfort with their DNEye® glasses compared to their old glasses*

92%

experienced sharper vision than before*

84%

experienced better contrast vision*

87%

experienced reduced adaptation time**

80%

experienced better vision at dusk*

IT ALL STARTS WITH THE DNEye® SCANNER

With the DNEye® Scanner, Rodenstock measures more eye parameters than any other lens manufacturer.

PARAMETER	RODENSTOCK	MANUFACTURER 1	MANUFACTURER 2
Lower- and higher-order aberrations at far	●	●	○
Lower- and higher-order aberrations at near	●	●	●
Mesopic pupil size at far	●	●	○
Mesopic pupil size at near	●	●	●
Photopic pupil size	●	○	○
Corneal topography (incl. higher- and lower-order aberrations of cornea)	●	○	○
Anterior chamber depth	●	●	○
Crystalline lens power	●	●	●
Vitreous chamber depth	●	●	●
Axial eye length	●	●	●

● Measured or determined and implemented in the lens
○ Measured but not implemented in the lens
● Not measured at all

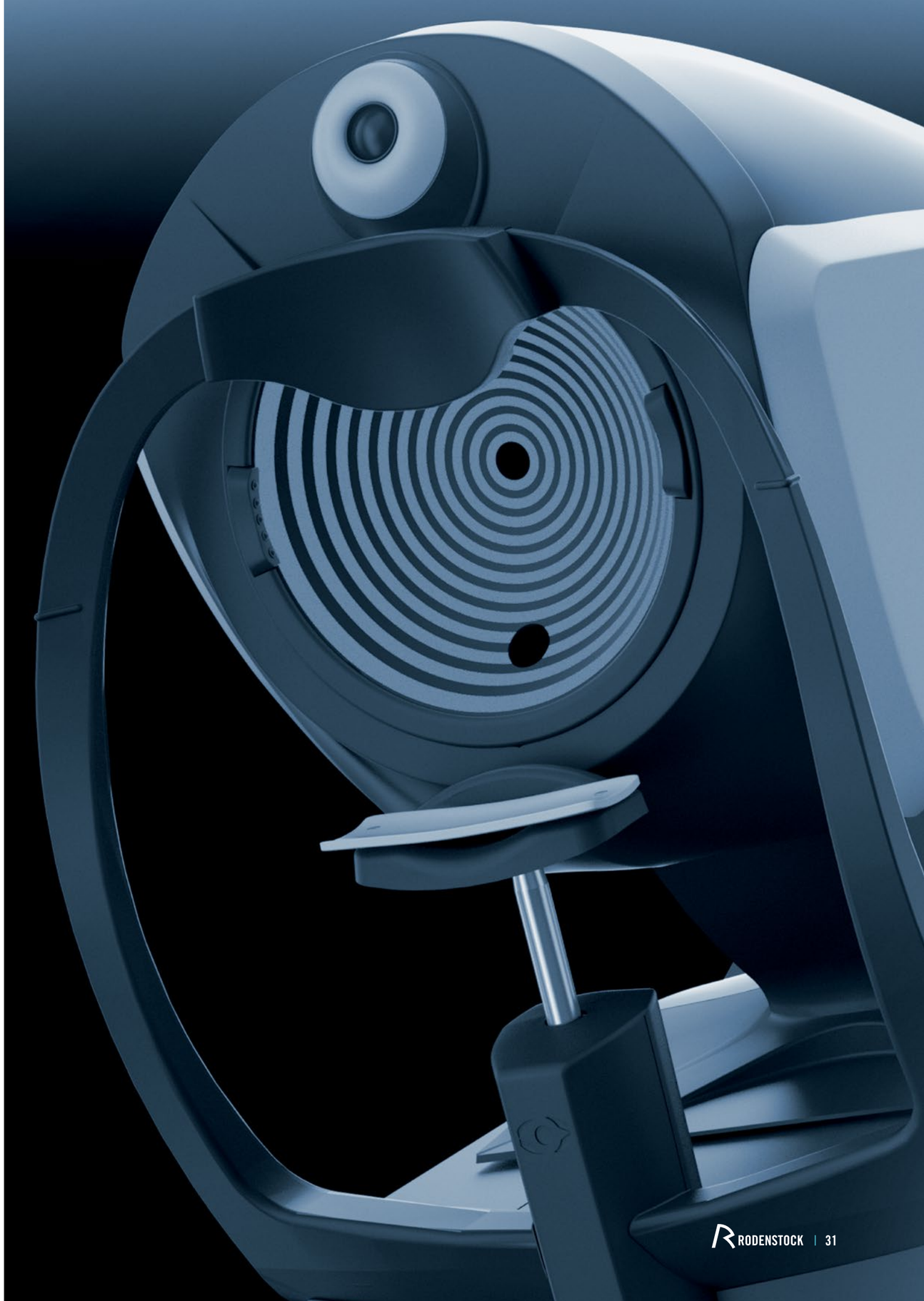
BUT WHAT ROLE DO ALL THESE MEASUREMENTS ACTUALLY PLAY IN IMPROVING PEOPLE'S VISION?

Measuring refractions for both near and far sharpens people's vision.

Determining high-order aberrations for both near and far, as well as pupil size in different light conditions, results in sharper vision and better vision at dusk.

Determing corneal power, anterior chamber depth, vitreous chamber depth, axial eye length and crystalline lens power gives people sharper vision at all gaze angles and object distances. The ability to focus more intuitively on different object distances increases. Blurred vision and adaptation time is reduced.

Altogether, these measurements ensure people have lenses individualised enough to create true precision vision.



B.I.G. VISION™ IS OUR UNIQUE PHILOSOPHY

We recognise that every person and eye is unique. That's why we were the first to measure the individual eye and use thousands of data points to produce individual eyeglass lenses. This made us what we are today. We are the vision experts. It's what motivates us to provide people all around the globe with the best progressive glasses. We don't settle for standard – we always go one step further.
We go for B.I.G. Vision™.

Rodenstock – because every eye is different.

2000

Individual Lens Technology

Rodenstock introduced Individual Lens Technology (ILT) – a groundbreaking innovation. It enables us to transfer the individual parameters determined by the ImpressionIST®, digitally into the lens. In addition to the biometric data, these individual parameters can significantly improve the imaging properties of a lens.

2005

ImpressionIST®

Just like eyes, faces differ too and knowing how lenses are positioned is crucial to delivering sharp vision. Rodenstock's ImpressionIST® is the world's first video centration system to use a patented stereo camera system without an additional calibrating clip.

2011

Eye Lens Technology

We revolutionised progressive lens technology in 2011 with Eye Lens Technology or EyeLT®. This patented technology significantly improves vision. Thanks to EyeLT®, Rodenstock is able to implement a near cylinder in a progressive lens independently of the distance cylinder. This results in up to 40% better vision in near and intermediate distances and is unique to the industry.

2012

DNEye® Scanner and Technology

Our DNEye® Scanner allows us to measure all relevant biometric parameters of the eye. Thousands of data points are then delivered by DNEye® Technology to provide a detailed visualisation of ametropia and all individual aberrations and pupil reactions during day and night.

2014

Flexible Design Technology

As well as objective measurement and subjective refraction data, it's important to consider the wearer's lifestyle. Rather than using standard progressive lens designs for everyone, our patented Flexible Design Technology, allows us to create an almost infinite number of progressive lens designs to meet individual lifestyle demands.

2020

B.I.G. Vision™

Launch of our B.I.G. Vision™ concept with Biometric Intelligent Glasses™. The patents and technologies we have developed over the years have allowed us to innovate the technology necessary to push the boundaries of what's possible in lens manufacturing and create Biometric Intelligent Glasses.

2018

DNEye® PRO Technology

New DNEye® PRO Technology now allows us to include individual biometric measurement data of the eye in lens calculation. This highly complex optimisation method means lens evaluation can be performed for the first time at the retina. The result is Biometric Intelligent Glasses™ that give people sharp vision at any angle.

It’s a combination of leading and patented technologies that means Rodenstock is the only lens manufacturer able to deliver the unique B.I.G. Vision™ experience.

All of the technologies mentioned earlier are further strengthened by our portfolio of protective lens technologies. Together, they ensure people receive optimal lenses – not only individualised to suit each eye, but also to suit their lifestyle needs. The result is that people enjoy all the benefits of B.I.G. Vision™.

OUR B.I.G. VISION™ EXPERIENCE

TECHNOLOGIES	ImpressionIST®	Individual Lens Technology	Eye Lens Technology	Flexible Lens Technology	DNEye® Scanner & DNEye® Technology
ADDED BENEFITS	X-tra Clean				
	ColorMatic®				
	PRO410				
	Solitaire				

X-tra Clean

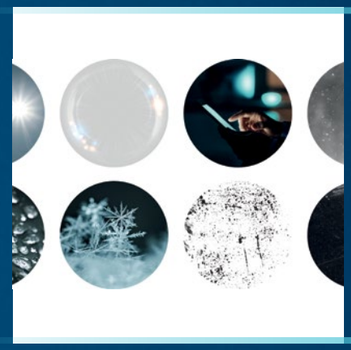
Rodenstock’s X-tra Clean sets a new standard in ophthalmic optics by ensuring dirt or particles are barely able to settle or stick on coated lenses.

ColorMatic® IQ2

Our self-tinting lenses,ColorMatic® IQ2, automatically adapts to every light situation to ensure high-level comfort and anti-glare vision at all times. The ability to lighten or darken quickly reduces eye fatigue and 100% UV protection provides excellent eye protection.

PRO410

This advanced technology protects eyes against potentially harmful elements of blue light and ensures they only get the light they truly need.



Solitaire

This premium coating is standard in our premium progressive lenses. Solitaire coatings are durable and offer anti-reflection properties and scratch protection.