

B.I.G. VISION™ FOR ALL

B.I.G. NORM™

THE NEW NORM FOR BETTER VISION:  
AI-POWERED BIOMETRIC  
PROGRESSIVE LENSES



Read more about B.I.G. VISION™ at  
[rodenstock.com/bigvisionforall](https://rodenstock.com/bigvisionforall)

  
**RODENSTOCK**  
Because every eye is different

  
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## OUR UNIQUE PHILOSOPHY B.I.G. VISION™ FOR ALL

At Rodenstock, we recognise people as individuals, with eyes of different shapes and sizes. That's why we at Rodenstock were the first to measure the individual eye and use thousands of data points to produce individual eyeglass lenses.

We call these lenses B.I.G. – Biometric Intelligent Glasses. It's what motivates us to provide people all around the globe with the best progressive glasses.

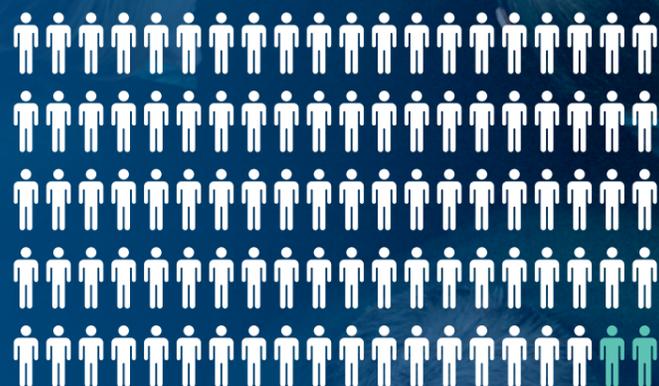
At Rodenstock, we've had an ambition since the launch of our B.I.G. VISION™ philosophy: To create a B.I.G. VISION™ FOR ALL.

# EVERY EYE IS DIFFERENT

## BIOMETRIC PRECISION MAKES THE BIG DIFFERENCE

Today, most lens manufacturers use a standard vision test with just four standard prescription values as inputs for the lens calculation process. These standard values only suit 2% of eyes and leave 98% of the world's progressive lens users with glasses that don't fit their eyes precisely. This has consequences for how precisely the lens can be tailored to the needs of the user's eye.

## STANDARD VALUES ONLY SUIT 2% OF EYES

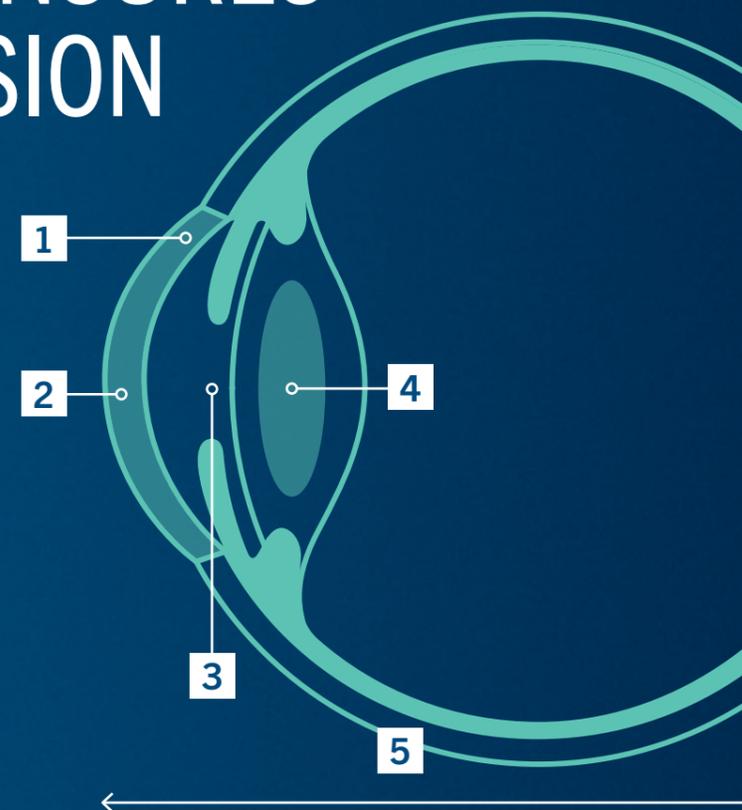


## THE KEY BIOMETRIC PARAMETERS OF THE EYE

# WHY BIOMETRIC PRECISION ENSURES SHARPER VISION

To illustrate which of the biometric parameters would be most important to gain information about, one can turn to the anatomy of the eye and the structure of the vision system.

As light travels through the eye, it is refracted to hit fovea centralis and form a sharp image on the retina. Each of the elements that the light passes through plays a central role in forming vision. As they have different refractive indexes, each of them must be determined precisely.



### 1 Corneal power and thickness:

As the cornea holds up to 70% of the refractive power in the eye, it is decisive in influencing how light in the eye is refracted. This makes determining the power and thickness of the cornea an important biometric parameter in lens calculation.

### 2 Corneal shape:

The shape of the cornea influences its spherical and cylindrical power, which affects how light is refracted in the eye. This is why the corneal shape of every eye needs to be determined.

### 3 Pupil size:

The size of the pupil in different light conditions determines how much light enters the eye. As it influences vision sharpness, it must be determined precisely.

### 4 Position and shape of the crystalline lens:

The position and shape of the crystalline lens influences how light is refracted. To adapt the spectacle lens optimally to the wearer's needs during the manufacturing process, it is vital to determine the position and power of the lens.

### 5 Eye length:

Every eye is different in size and refractive power. As the length of the eye impacts how light is refracted – and whether the light rays hit the fovea centralis to create sharp vision – it is important to know the eye length when creating lenses.

# THE OLD NORM ...

Before B.I.G. VISION™, when we first began our biometric research, we faced an issue – an old norm used in progressive lens manufacturing. An old norm where the only input most lens manufacturers use to tailor lenses to the user's eyes is a standard calculation based on just the four prescription values from the standard vision test.

# ... LACKS BIOMETRIC PRECISION

Using just these four prescription values means that the biometric parameters of each eye remain undetermined. Instead, standard eye parameters are used to craft the lenses. These fail to take into account the fact that every eye is different – in shape and refractive capabilities.

This is what made us move away from the old norm and begin a journey to bring sharper vision to more progressive lens users by increasing the level of biometric precision in lens calculation.

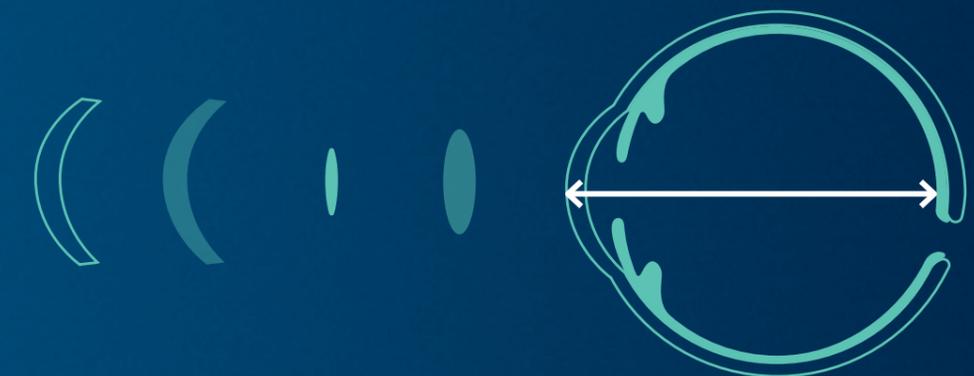
## STANDARD PRESCRIPTION VALUES

	SPHERE	CYL	AXIS	ADD
<b>O.D.</b> (Right eye)	-3.75	-1.25	68°	+2.00
<b>O.S.</b> (Left eye)	-5.00	-1.00	123°	+2.00



combined with

## STANDARD EYE PARAMETERS\*



Shape of the cornea

Corneal power and thickness

Pupil size

Lens shape and position

Eye length

\*Lenses made using standard eye parameters are not optimally tailored to the eye, which means they only suit 2% of people.

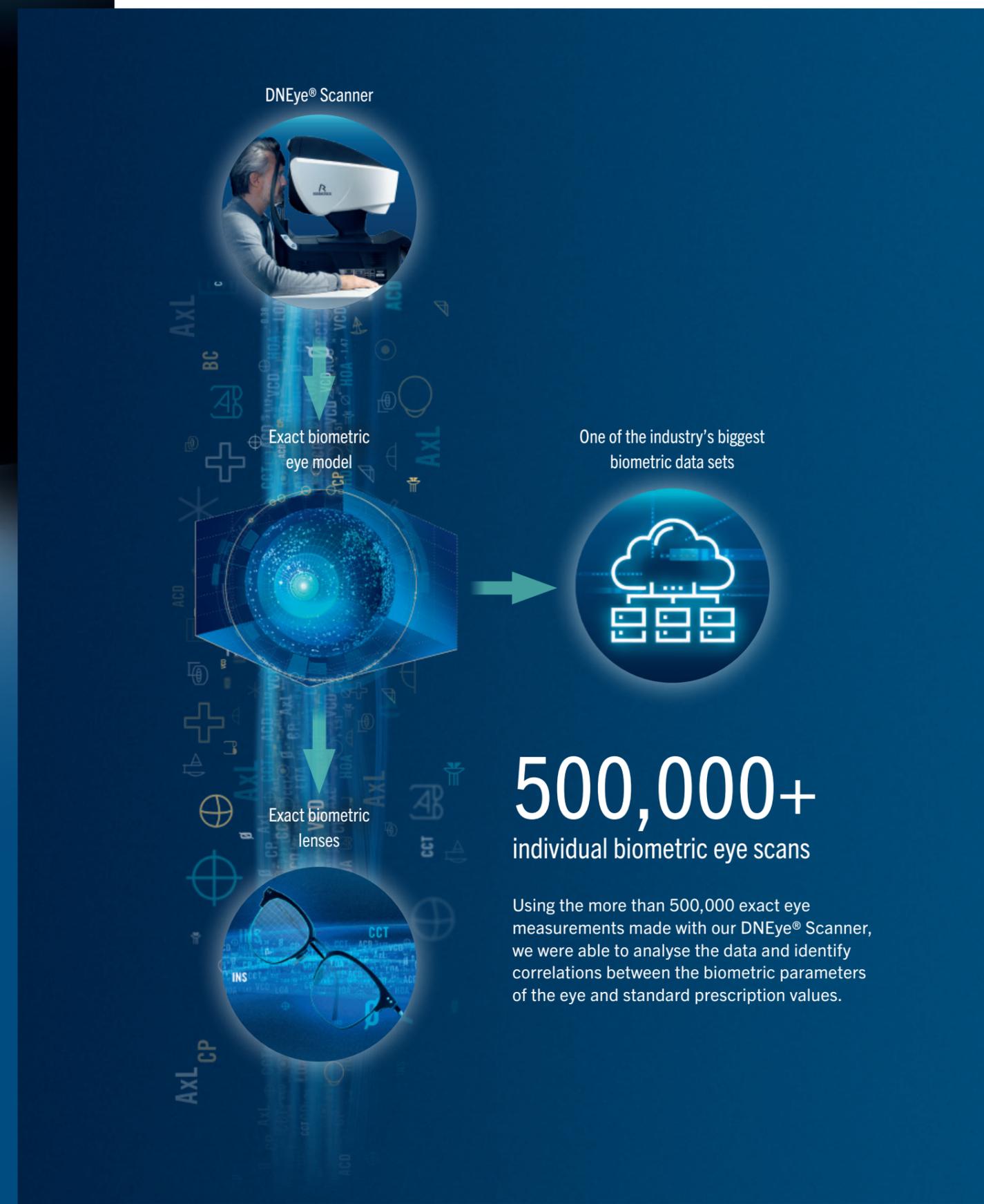
# MOVING AWAY FROM AN OLD NORM BASED ON LIMITED BIOMETRIC KNOWLEDGE

At Rodenstock, we use the measurements of an advanced biometric vision test with a DNEye® Scanner\* to determine more than 7,000 data points and over 80 parameters of the eye. Combined with the standard prescription values, this biometric data can then be used as input in the lens manufacturing process to determine how the lens can be created so that it suits the user's eyes more precisely.

## ONE OF THE INDUSTRY'S BIGGEST BIOMETRIC DATA SETS

With the DNEye® Scanner, we have measured the biometric parameters of hundreds of thousands of eyes to create Biometric Intelligent Glasses. These scans have become one of the biggest biometric data sets in the industry.

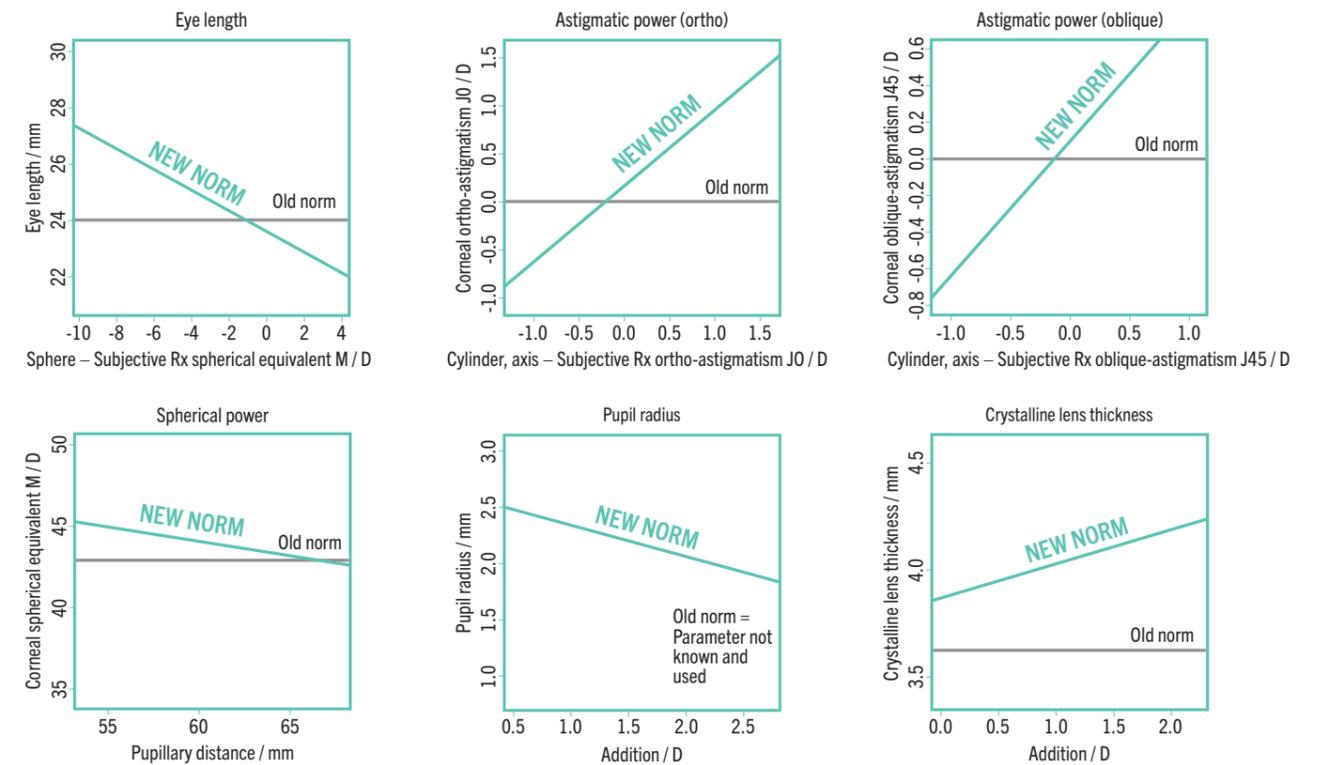
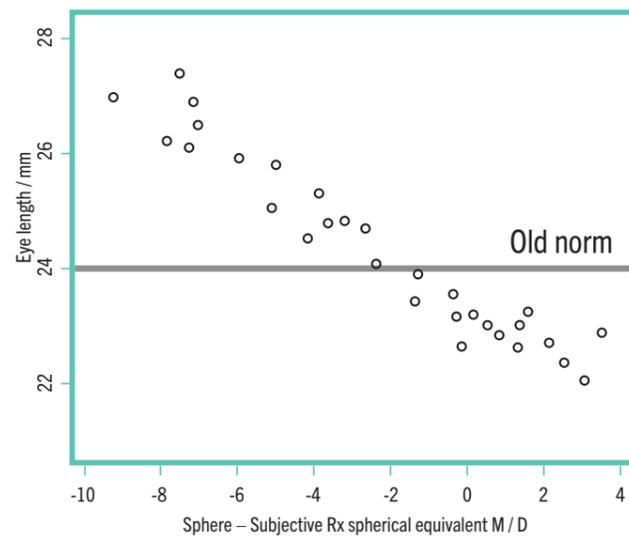
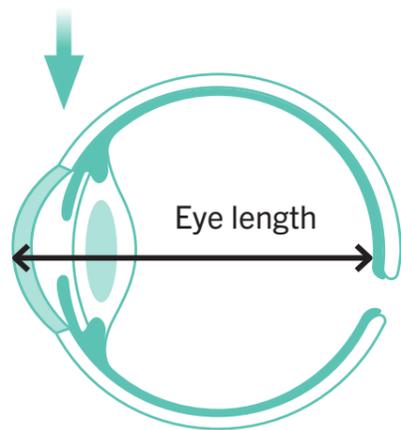
\*The Rodenstock DNEye® Scanner technology is introduced and used in Europe and selected markets worldwide.



# HOW RODENSTOCK CREATED A NEW NORM



	SPHERE	CYL	AXIS	ADD
<b>O.D.</b> (Right eye)	-3.75	-1.25	68°	+2.00
<b>O.S.</b> (Left eye)	-5.00	-1.00	123°	+2.00



## A NEW, MORE PRECISE STANDARD CALCULATION TO DETERMINE EYE LENGTH

As our statistical analysis showed, the length of the eye is in fact related to the power of the eye (sphere). As the power of the user's eye is identified in any standard vision test, our statistical analysis enables us to gain information about individual eye length without actually measuring it.

## A NEW NORM IN LENS CALCULATION

Determining the length of an eye as precisely as possible in the lens calculation process is crucial to being able to tailor lenses to the individual user's eyes. Rodenstock's more precise standard calculation of individual eye length allows us to create a new norm in lens calculation that provides a far higher level of biometric precision.

## CREATING NEW LENS CALCULATION NORMS FOR ALL KEY BIOMETRIC EYE PARAMETERS

Using statistical analysis, we are able to determine new, more precise lens calculations for all of the most important biometric parameters in the eye. As well as eye length, this includes the astigmatic power of the cornea, the spherical power of the cornea, pupil radius, crystalline lens thickness, and more.

With these new lens calculation norms, we can unleash the potential of our 500,000 individual biometric eye scans and bring a new level of biometric precision into lens calculation that will help users achieve sharper vision, even when exact DNEye® Scanner measurements are unavailable.

# CREATING AN APPROXIMATE BIOMETRIC EYE MODEL

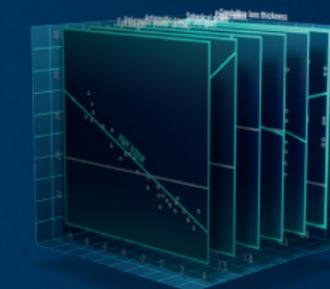
By identifying correlations in the data and putting them into an advanced AI algorithm, we can move away from the old norm used in lens calculation. Rodenstock's new lens calculation norms allow us to create an approximate biometric model of the eye, using just the standard prescription values delivered to Rodenstock by opticians as input. The norms enable us to introduce a far higher level of biometric precision to standard progressive lenses and provide B.I.G. VISION™ FOR ALL.

We call these lenses:

## B.I.G. NORM™

	SPHERE	CYL	AXIS	ADD
<b>O.D.</b> <small>(Right eye)</small>	-3.75	-1.25	68°	+2.00
<b>O.S.</b> <small>(Left eye)</small>	-5.00	-1.00	123°	+2.00

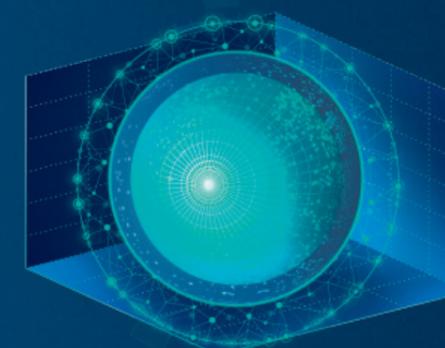
Standard prescription values



New norms in lens calculation



Rodenstock's AI algorithm



Approximate biometric eye model

# RODENSTOCK IS RAISING THE BAR FOR PROGRESSIVE LENSES

By crafting the lenses with an approximate biometric eye model using our new AI technology, we are able to tailor each lens far more precisely than when standard values are used in the lens calculation process.

In a spectacle wearer trial of our new AI-powered B.I.G. NORM™ lenses, we explored the effects of the AI technology. The vision benefits were clear.

97%

experienced reduced  
peripheral aberrations

94%

experienced a wider  
progression zone in the  
lens

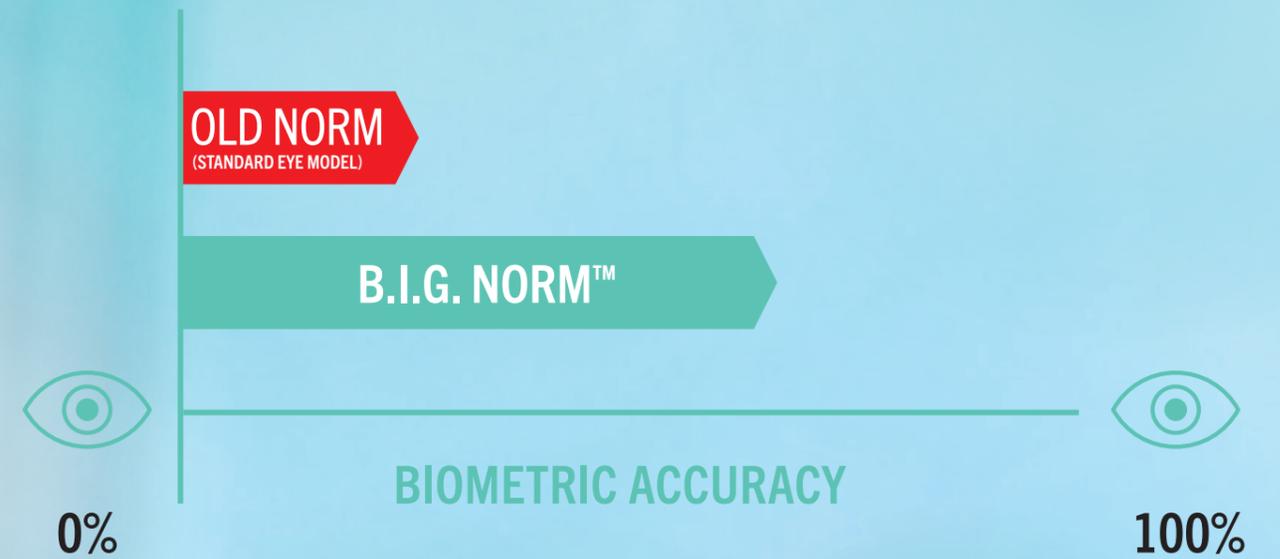
91%

experienced a  
reduced swimming  
effect

97%

experienced  
reduced aberrations  
at far

Results of an external wearer trial conducted with the  
University of Applied Sciences in Munich



Biometric accuracy describes the degree to which the biometric parameters of the eye are accurately determined and implemented in the lens calculation process.

# AI: A GIANT STEP TOWARDS BRINGING B.I.G. VISION™ TO ALL

In 2020, we launched our B.I.G. VISION™ philosophy. Our ambition at the time was to one day bring B.I.G. VISION™ TO ALL.

Our new B.I.G. NORM™ lenses enable us to realise our ambition for progressive lenses. They allow us to start a biometric revolution that will finally make B.I.G. VISION™ available to everyone.

# OUR B.I.G. VISION™ EXPERIENCE

It's a combination of leading and patented technologies that makes Rodenstock the only lens manufacturer able to deliver the unique B.I.G. VISION™ experience.

All our B.I.G. VISION™ technologies are further strengthened by protective lens technologies. Together, they ensure that 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™.

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 that dirt and particles are barely able to settle or stick on coated lenses.



## COLORMATIC® 3

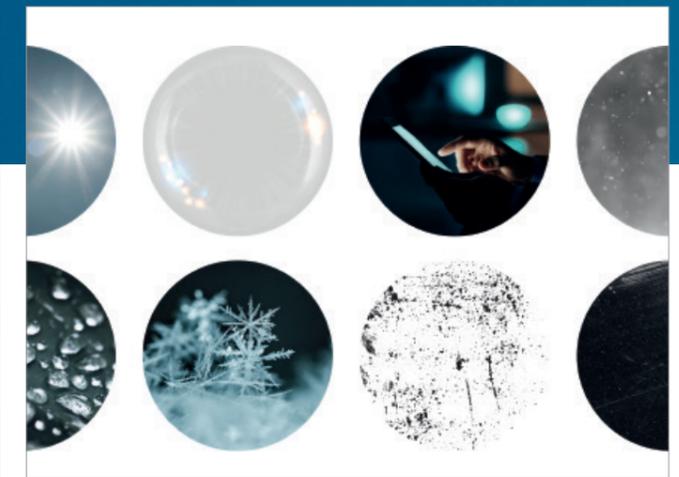
ColorMatic® 3 glasses are able to fade back up to 30%\* faster and provide noticeable visual comfort. With blue-light filters and a wide selection of colours – whether it's eyeglasses or sunglasses – ColorMatic® 3 offers comfortable, sharp vision in any situation, in all light conditions.

\*compared to ColorMatic IQ® 2 high index



## PRO410

This advanced technology protects eyes against potentially harmful elements of blue light and ensures that 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.