

[Understanding Vision](#) Oct 16, 2017

What's the difference between individualised spectacle lenses and "off-the-shelf" lenses?

How spectacles can help you regain natural vision.

You can't tell whether a spectacle lens is individualised or "off-the-shelf" by just looking at it. So where does the difference lie? Which spectacle wearers have the most to gain from individually optimised lenses? BETTER VISION put that question to Volker Gahr, Senior Product Manager at Carl Zeiss Vision.

BETTER VISION: Mr Gahr, what makes individualised spectacle lenses different from regular ones?



Volker Gahr, Senior Product Manager at Carl Zeiss Vision

Volker Gahr: Well, obviously even conventional spectacle lenses are to some extent individually

tailor-made for the wearer. That's because you are basically following a prescription, in other words getting the right lens power in the right position in the selected frame to provide the wearer with better vision. If another wearer were to put on my spectacles, it's unlikely they would have optimum vision. When we refer to individually "optimised" lenses we're really talking about taking into account other relevant, personal information about the wearer within the optical design by calculating the ideal lens surfaces for their needs.

As a rule, the optometrist or ophthalmologist will perform a [> refraction](#) and write the lens prescription.

What lenses are required?

- ✓ Single vision lenses for long-range vision
- ✓ Single vision lenses for close-up vision (e.g. reading spectacles)
- ✓ Progressive lenses
- ✓ What diopter power, special cylinders...

The next step is for the wearer to choose a frame. But that's really as far as the conventional approach goes. Of course an optometrist prescribing off-the-shelf lenses will measure the visual point of both eyes positioned within the selected frame in order to ensure correct glazing of the lenses that he or she subsequently orders from a company like ZEISS. But the ultimate position of the lenses in front of the wearer's eyes – which is determined by the specific frame style chosen – will not have been taken into consideration when calculating the lenses.

BETTER VISION: So the biggest difference of individually optimised lenses is how they are tailored to the frame...?

Volker Gahr: That's certainly a crucial difference, though it's not the only one. The more ZEISS understands how a spectacle wearer looks through their lenses with the selected frame, the more accurately the lenses can be crafted, so that the wearer ends up looking through them in the most natural and optimum way possible. That means they end up with a perfect optical vision aid that has been tailored precisely to their individual needs. But to achieve this, the optometrist needs to determine other important individual parameters in addition to the point at which the wearer focuses when they look straight through the lens – and those parameters need to be accurate to a tenth of a millimetre!

For example, what distance do their eyes tend to be from a book or computer screen? At exactly what height do they look through the lens in the frame they've chosen? How does the inclination of the frame affect the wearer's vision? That's something that depends not only on the frame but also on the shape of a person's face. What's the back vertex distance, i.e. the distance between the back surface of the lens and the front of the cornea? What's the curvature of the frame? Precise measurements need to be made of the frame dimensions and the height and width of the lens.



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How well do you see contrast and color? Check your vision quickly and simply here!

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Your glasses fitted to you

The more accurately the optometrist calculates all the parameters, the more precisely the optics, i.e. the lens design, can be optimised by ZEISS. To ensure the frame and the lenses don't end up in a different position on the wearer's nose, the position of the frame on the bridge of the nose is adjusted by the optometrist before they calculate the additional data.

BETTER VISION: Doesn't it take absolutely ages to measure all those parameters? And how can it really be so exact?

Volker Gahr: That's where technology comes into play. The > [i.Terminal[®]2](#) – that's the ZEISS centration system – uses a high-tech camera to take objective images of the wearer and frame from both the front and the side. Then the software measures all the key centration data and saves it to a file. The i.Terminal[®] 2 achieves accuracy down to a tenth of a millimetre, yet the whole measurement process takes very little time, even though it delivers tremendously precise data for all the key parameters.

BETTER VISION: So how do you end up with an individually optimised lens?

Volker Gahr: All the measurement data from the refraction, the centration and in some cases from the objective measurement are compiled by the optometrist using the > [i.Profiler[®]](#). Once all the features are clear – such as the lens material/type, the type of coating and any tint or shade that may be required – all the data is sent to ZEISS. That's where the lenses are individually calculated according to the optometrist's specifications and manufactured using a high-tech production technology known as > [freeform technology](#). ZEISS was one of the pioneers behind the development of this technology and, even today, we are constantly striving to make this method of lens production even better.

Thanks to freeform technology, the lenses can be produced to the perfect specifications for the spectacle wearer and the frame he or she has selected. This restores the most natural vision possible for the spectacle wearer and, especially in the case of progressive lenses, creates the largest and sharpest possible ranges of vision at all the different distances. Unless you attain perfect harmony between the frame, lenses, individual visual needs and the shape of the wearer's face, then relaxed and natural vision will be impossible to achieve. With an imperfect solution, the wearer will potentially have to make major efforts to merge the individual impressions from each eye into a coherent whole. This can result in poor adaptation to the lenses, with headaches and tension for the wearer

BETTER VISION: So the distinctive quality of progressive lenses depends on the individual parameters that are incorporated in each lens?

Volker Gahr: Exactly. As a comparison, imagine looking through a telescope. You're looking through some highly sophisticated optics, but if you don't have the telescope at the right distance from your eye, then things will look blurred. Or imagine looking through a keyhole. You only get good, relaxed vision if you put your eyes really close to the keyhole. You can show the difference like this:

Ranges of progressive lenses





The advantage of an [individually optimised progressive lens](#) is that we achieve high wearer adaptation right from the start. Of course everyone needs time to get used to new progressive lenses – and the time that takes varies considerably from case to case – but an individualised progressive lens is something that you get used to far, more quickly.

BETTER VISION: One last question: What type of spectacle wearer will benefit most from individually optimised spectacle lenses?

Volker Gahr: Generally speaking, you could say that everyone gets the best possible solution by choosing individually optimised spectacle lenses. But the higher or more complex the prescription, the more you notice the gain in performance over conventional spectacle lenses, and the more relaxed and stress-free your vision is likely to be.

For people with night vision problems it's also possible to use our [i.Scription® technology to individually optimise the lens](#) power for night vision or low-light conditions. This is particularly important for people whose prescription actually changes when their pupils are heavily dilated. Individual vision defects can be ironed out by taking additional steps to optimise the lens power.

But there are many other types of customer who can benefit from individually optimised spectacle lenses, too. [Take office lenses for example](#). This application allows us to optimize the lenses for each individual's occupational needs, especially at the middle distance ranges used for computer work and similar activities. Discussing your medical history with your optometrist is very important in this context because he or she needs to have a very clear idea of what your individual vision needs are and how they can best be addressed.

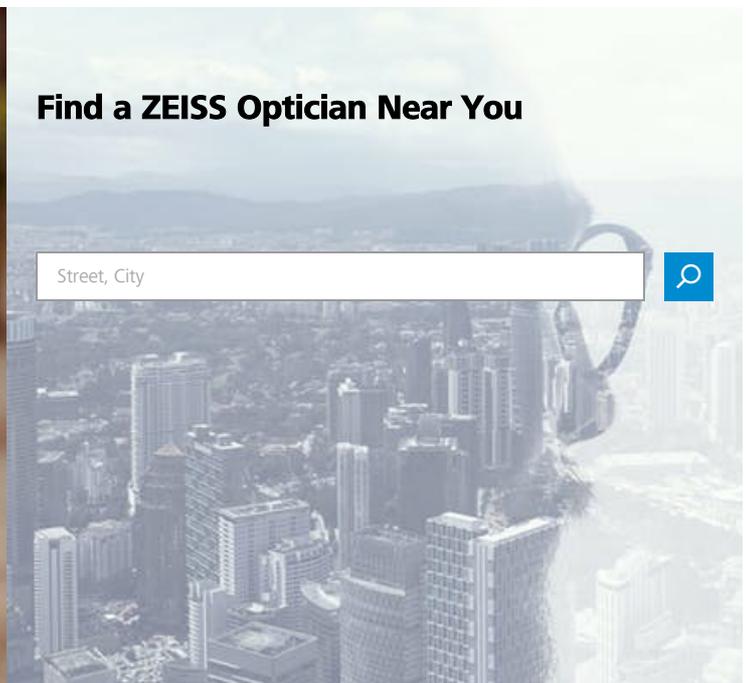
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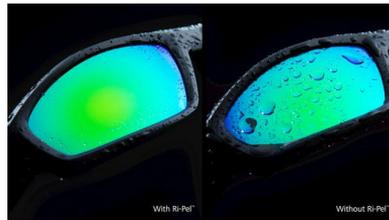
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