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Self-tinting spectacle lenses: comfortable and relaxed vision for everyone

BETTER VISION asked Volker Gahr – the Senior Product Manager responsible at ZEISS for ZEISS PhotoFusion – to describe the key features of modern photochromic lenses

As every spectacle wearer knows, the ideal scenario is when you don't even notice you're wearing spectacles because they adapt so well to each and every situation. So the need to keep switching back and forth between normal spectacles and sunglasses can be very irritating. For a few uncomfortable moments your vision isn't perfect as you switch pairs and put the ones you don't need back in their case – a tiresome process that wastes valuable time. Self-tinting lenses can offer a good solution to this predicament. But how do you go about choosing a good pair of self-tinting or "photochromic" lenses? To find out more about this subject, BETTER VISION talked to Volker Gahr, the Senior Product Manager at ZEISS who is responsible for ZEISS PhotoFusion.

BETTER VISION: Self-tinting lenses have been around for a long time. The way they switch from clear to dark almost seems like magic, but many wearers still consider them to be old-fashioned and unattractive. What does the latest generation of self-tinting lenses have to offer? And how are they an improvement on older models?

Volker Gahr: Before embarking on the development of the ZEISS photochromic lenses known as [PhotoFusion](#) we asked spectacle wearers to describe exactly what their ideal self-tinting lenses would look like and what qualities and features they would have.

The top priority cited by wearers was the lenses' ability to **react quickly** to sunlight and to turn back from dark to clear indoors. The moment I walk outdoors into the sun the lenses should darken, and as soon as I step back inside they should go clear as fast as possible. It's hard to describe how unpleasant it is to go into a shop, for example, and suddenly be plunged into darkness!

As far as your other point goes – the idea that self-tinting lenses are considered to be outdated or

unfashionable – that is largely attributable to the problems experienced with older generations of self-tinting lenses. When these were supposed to go clear they seemed to spend ages in a kind of intermediate state. That made the brown variations of these older lenses appear slightly yellow in their clear state, which was considered to be rather unattractive cosmetically.

That's why today's spectacle wearers consider it so important to have self-tinting lenses that go **completely clear** indoors so that they look like a normal pair of spectacles. This was the second major point that wearers said was important in addition to the lenses' ability to react quickly to changing light conditions.

Modern self-tinting lenses are also expected to offer the same levels of **UV and glare protection** as normal sunglasses.

These were the key features requested by customers that gave us the basis for developing PhotoFusion. And they also represent the key criteria that spectacle wearers should be looking for and comparing when they buy self-tinting lenses.

BETTER VISION: How do you make lenses react faster to changing light conditions?

Volker Gahr: The secret lies in special photoactive molecules incorporated within the lens which react to high-energy UV light. When sunlight hits the lens it increases the surface area of these molecules which makes the lenses darken. The stronger the sunlight or UV light, the darker the lens gets. Take away the UV light and the molecules shrink back to their original size.

Photoactive molecules are simply special chemical compounds that we have optimized for PhotoFusion lenses to ensure that they do their job as fast as possible.

BETTER VISION: On the subject of UV light, do ZEISS self-tinting lenses really offer the same high level of UV protection as ZEISS sunglass lenses? Could I even wear them in extremely bright sunlight in the mountains, for example?

Volker Gahr: Just like our sunglass lenses, PhotoFusion lenses offer 100% UV protection* which means you can be confident of having the best possible protection. The UV filter effect of PhotoFusion is fully active even when the lenses are clear. Sunlight is particularly strong in the mountains because UV radiation becomes more and more intense the higher you go. So by choosing PhotoFusion you can be sure you're not taking any unnecessary risks. But UV protection isn't the only key to relaxed vision: you also need glare protection to deal with dazzling sunlight. That's why people who undertake more extreme activities at high altitudes could benefit from lenses designed for special applications. These might include lateral protection, a darker tint and mirror coatings if you are looking at activities such as climbing glaciers or taking long hikes through the snow. Snow reflects light like a mirror which increases the intensity even more.

BETTER VISION: Who can benefit from self-tinting lenses in your opinion?

Volker Gahr: > [Self-tinting lenses offer comfortable and relaxed vision](#). Whether you're indoors or outdoors, they make sure your vision is just right. So I would say self-tinting lenses are a great solution for anyone who spends a lot of time going in and out of buildings and who finds having to switch between two pairs of spectacles a real hassle. And obviously they are a particularly good choice for people who are sensitive to light because constantly screwing up your eyes can get very tiring and even lead to headaches in the most extreme cases.

BETTER VISION: And to wrinkles...

Volker Gahr: Perhaps. But our main focus at ZEISS is of course to achieve optimum, relaxed vision. If that also results in fewer wrinkles then that's obviously an added bonus!

BETTER VISION: How long are the molecules used in PhotoFusion capable of doing their job?

Volker Gahr: They never get tired! Their ability doesn't decrease to any noticeable degree during the lifetime of a lens. Having said that, a self-tinting lens is an "optical device" in the same category as binoculars, microscopes and camera lenses, so it does require a certain amount of > [care](#) and protection. There's no doubt that a good surface finish comprising a > [hard lens coating with excellent anti-reflective properties](#) will increase the life of a lens and provide added comfort.

BETTER VISION: There's a lot of discussion about wearing self-tinting lenses while

driving. Are PhotoFusion lenses suitable for drivers?

Volker Gahr: You can certainly drive while wearing PhotoFusion lenses because they are designed to be an all-around solution that can tackle all your everyday visual needs. But as I mentioned before, PhotoFusion lenses react to UV light, which means they don't darken as much in the car as they do in the open air because the windscreen absorbs part of the UV light. That means you get slightly less glare protection, so for long sunny drives it might be more comfortable to wear sunglasses. Your eye care professional can tell you whether it is advisable to have an additional pair of spectacles for those kinds of situations.

BETTER VISION: Can you combine PhotoFusion with all prescriptions and ZEISS lens coatings?

Volker Gahr: It's very important to us that our customers have as much flexibility as possible when it comes to combining ZEISS products. So, in principle, PhotoFusion can be combined with everything: with all our lens types, all our different types of coating, all lens powers and all types of frame. That means that absolutely everyone can experience and benefit from the added comfort of PhotoFusion lenses.

BETTER VISION: Does PhotoFusion mark the end of the development process, or can self-tinting lenses be improved even further?

Volker Gahr: ZEISS already has over 100 years of innovation in spectacle lens development under its belt. With PhotoFusion® we have achieved a major level of expertise in the field of photochromic lenses, and that's something we obviously want to build on in the future. It's a bit like a sport in the sense that we have to pursue the goal of constantly improving our performance. Right now we're in the lead and that's where we want to stay!

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

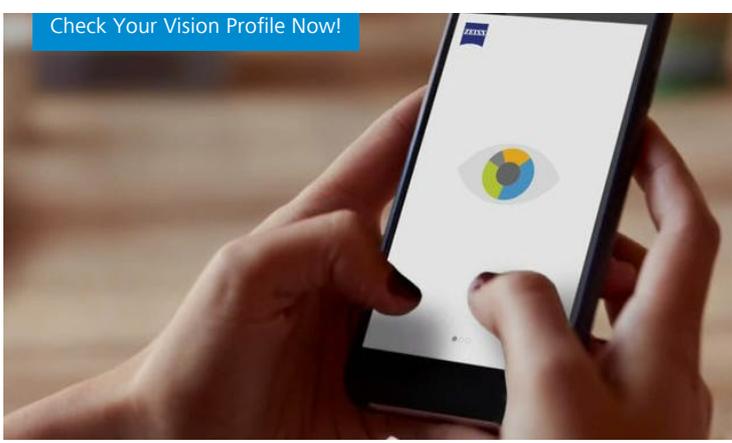
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* UV radiation is divided into three bands, though only UVA and UVB actually reach the Earth's surface. Short-wavelength, high-energy UVC radiation (100 - 280 nm) is almost entirely absorbed in the Earth's atmosphere. The term solar UV radiation is used solely to refer to the UVA and UVB components that reach us on the Earth's surface. UVA and UVB radiation is absorbed by the eye to differing degrees unless it is blocked by spectacle lenses.

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