



## Press Information

### Sunglasses can make the wearer look more attractive – that's undisputed – but the important role they play in our vision is still underestimated

Sunglasses are not only a highly attractive accessory for use in the sunshine, but they also offer indispensable protection for our eyes – whether for adults or children, when we are out shopping, driving in the car, hiking in the mountains or lounging on the beach. Rays from the sun can be harmful to our eyes, and long-term exposure can cause permanent damage. High-performance sunglasses offer both protection and optimal vision, all sharply focused on the personal needs of the wearer. The following checklists clarify some of the aspects concerned:

1. Why is sun protection so important for our eyes and our vision?
2. On what criteria should I base my decision when selecting sunglasses that suit me?
3. What sun protection do children and contact lens wearers require?

#### 1. Why is sun protection so important for our eyes and our vision?

Intensive solar radiation is dangerous for the eyes	<p>Too much solar radiation can damage the eyes. Invisible UV light (up to 400 nm), visible blue light (400-500 nm) and very bright and intensive light in general can all pose a danger. Surfaces like sand, water and snow reflect the sunlight and intensify the radiation; sand and water by up to 30%, snow by up to 85%.</p> <p>The alarm signals that should be listened to on overexposure to sunlight: our eyes start to water or redden, or our vision becomes blurred as if we were looking through a veil. When this happens, there is only one resort: we must avoid the sun until our eyes have settled down again.</p>
UV radiation can cause sunburn to the eyes	<p>Strong UV radiation can lead to painful burning of the cornea and conjunctiva. Often, the symptoms don't emerge until hours later. You can then hardly open your eyes, and you must consult an eye doctor immediately. If not treated, the cornea may be scarred, leading to blurred vision in the long term.</p>
Impairment of vision by blue light	<p>Blue can reach the macula, the region of the retina with the greatest visual acuity. Studies show that it can then lead to damage and visual impairment – often without any pain and therefore unnoticed (<a href="http://www.makuladegeneration.org">www.makuladegeneration.org</a>).</p>
Intensive light causes glare	<p>Our eyes adapt to different distances through the dilation and contraction of the pupils. If our surroundings are very bright, however, our eyes are exposed to glare and – regardless of how good our vision is – we can no longer see.</p>



## 2. On what criteria should I base my decision when selecting sunglasses that suit me?

<p>An absolute must for every pair of glasses: UV protection guaranteed by the CE label and "UV 400"</p>	<p>The most important criterion for every pair of sunglasses is good UV protection. Tinted sunglasses without suitable UV protection are dangerous. The darkening effect of the glasses leads to pupil dilation, allowing even more radiation to enter the eye.</p> <p>When choosing sunglasses, it is important to ensure that they have the <b>CE label</b>. The CE label guarantees that the sunglasses meet the basic safety requirements of the European directives. This directive ensures "100% UV protection" for UV radiation with a wavelength of up to 380 nm.</p> <p>Since the harmful rays display a wavelength of up to 400 nm, sunglasses should also feature a "<b>UV 400</b>" label. This indicates that they filter out rays with a wavelength of up to 400 nm.</p> <p><b>Tip:</b> Neither the CE label nor "UV 400" is checked by any authority and can be easily faked. If you want to be on the safe side, you can have the UV protection of your sunglasses checked by an optometrist.</p>
<p>The right lens color and tint intensity for optimal glare protection</p>	<p>The color of the lenses and the intensity of their tint determine the amount of light filtered by the lenses and therefore also the amount of protection provided against glare. When matched to our surroundings and activity, the lenses therefore optimize the quality of your vision.</p> <p>With a tint intensity of up to 95%, <b>brown, gray and green lenses</b> offer the highest glare protection and cause the least possible distortion of surrounding colors. For all other colors, e.g. blue, red and yellow, the eyes need time to adapt and to – at least partially – neutralize the colors. Through a high proportion of yellow, special brown tints provide additional protection against blue light and enhance contrast at the same time.</p> <p>With up to 50% light absorption, <b>yellow and orange lenses</b> offer little glare protection, but they do have a contrast-enhancing effect. Therefore, they optimize vision for outdoor sports performed against single-color backgrounds, e.g. the snow when skiing or the green of a golf course.</p> <p><b>Exactly matching colors</b> for your new summer outfit, for example, are also possible. In addition to an extensive range of colors for sun and sports glasses, suppliers like ZEISS offer custom-made colored lenses – either with or without prescription. Simply give your optometrist a color sample and he or she will order the lenses accordingly.</p> <p>Sunglasses become real eye-catchers if they feature <b>graduated tints</b>, where the top of the lenses displays a darker tint than the bottom, or a <b>colored mirror coating</b>.</p>



	<p>The <b>glare protection</b> offered by sunglasses depending on their tint intensity is normally indicated on the inside of the frame temples. There are five categories:</p> <p>protection level 0 (0-20% absorption of light, e.g. for the evening)</p> <p>Protection level 1 (20-57% absorption, e.g. for cloudy days)</p> <p>Protection level 2 (57%-82% absorption, e.g. for the summer)</p> <p>Protection level 3 (82%-92% absorption, e.g. for water, beach and mountains)</p> <p>Protection level 4 (92-97% absorption, e.g. for high mountainous regions and glaciers)</p> <p>In a typical north European climate category 2 offers optimal glare protection in everyday use.</p> <p><b>Tip:</b> Sunglasses help prevent eye wrinkles. When the eye is exposed to glare, it blinks to ensure that less light can enter it. This contracting of the eyes promotes the formation of eye wrinkles.</p>
Sunglass lenses for use in traffic	<p>If you want to use sunglasses in traffic, you have to ensure that they are indeed suitable for driving.</p> <p>It is decisive that traffic lights and the blue lights of emergency vehicles can be correctly recognized. Red and blue sunglass lenses are not therefore suitable for use in traffic. In addition, the light absorption must not exceed 92% (glare protection level 4) during the day, and 25% (categories 1-4) at night. Sunglasses are very rarely labeled with their suitability for use in traffic, making consultation with your optometrist advisable.</p>
High-quality sunglass lenses for good, relaxed vision	<p>Sunglasses should contain ground, not molded lenses. Many low-priced sunglass models have molded lenses that often display small bubbles, inclusions or other quality defects. These impair your vision, leading to eye fatigue and headache.</p> <p>A simple test is normally enough: if an object viewed through the sunglasses becomes distorted when the glasses are moved to and fro, the lenses have quality defects.</p> <p><b>Tip:</b> Have an anti-reflective coating applied to your sunglass lenses. Reflections are even more irritating on colored lenses than on clear lenses.</p>
"Anti-glare technology" for glare-free vision in traffic, on water or in snow	<p>Particularly for driving and other situations in which glare-free vision must be guaranteed, polarizing lenses with anti-glare technology are available. These minimize glare caused by sunlight reflecting off wet roads, the sea or on snow and enhance the colors and contrast you see through your lenses.</p> <p><b>Tip:</b> Enhanced contrast also enhances your overall vision. This means the eyes are subjected to less strain and do not tire as quickly.</p>



<p>Self-tinting lenses for comfortable indoor and outdoor vision</p>	<p>Self-tinting lenses adapt automatically to changing light. In sunlight they darken in a few seconds and clear again indoors. Regardless of the tint intensity, they offer 100% UV protection. The wearer no longer has to keep switching between normal prescription eyewear and sunglasses when moving between sun and shade.</p> <p><b>Tip:</b> Self-tinting lenses also darken outdoors in bright light without direct sunlight (e.g. snow, broken clouds) and hence offer optimal UV protection at all times. They hardly darken at all behind window panes, including windscreens.</p>
----------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

### 3. What sun protection do children and contact lens wearers require?

<p>UV protection confirmed by the CE and "UV 400" labels is the minimum requirement for children.</p>	<p>Children's eyes are clearer and transmit more light than those of adults. As a result, UV rays can cause much more damage. In children's glasses, there is always a great temptation to choose colorful, fun designs, but the requirements for good UV protection must nevertheless be fully met and confirmed by the CE and "UV 400" labels. Color-distorting lens tints (e.g. yellow, blue, red) are not suitable for children's eyes. For safety reasons, only break-resistant, ground plastic lenses can be used for children.</p> <p><b>Tip:</b> When choosing the sunglasses, involve the child in the decision process. This approach is more likely to ensure that he or she actually wears them.</p>
<p>Contact lens wearers also need sunglasses</p>	<p>Contact lens wearers should also protect their eyes by wearing sunglasses. Although many contact lenses feature an integrated UV filter which protects the interior of the eye, they only cover part of the eye. This means that only a suitable pair of sunglasses offers an optimal solution.</p> <p><b>Tip:</b> Select sunglasses with lenses that are large enough to protect the entire eye. Otherwise, UV rays can enter the eye from the side or the top.</p>

Press contact  
Joachim Kuss, Carl Zeiss, Vision Care  
Phone +49 (0)7361 5578 1295, email: Joachim.Kuss@zeiss.com

[www.zeiss.com/press](http://www.zeiss.com/press)



#### **Carl Zeiss**

The Carl Zeiss Group is an international leader in the fields of optics and optoelectronics. The company's nearly 24,000 employees generated revenues of about 4.2 billion euros in fiscal year 2011/12. In the markets for Industrial Solutions, Research Solutions, Medical Technology and Consumer Optics, Carl Zeiss has contributed to technological progress for more than 160 years and enhances the quality of life of many people around the globe. The Carl Zeiss Group develops and produces planetariums, eyeglass lenses, camera and cine lenses and binoculars as well as solutions for biomedical research, medical technology and the semiconductor, automotive and mechanical engineering industries. Carl Zeiss is present in over 40 countries around the globe with about 40 production facilities, over 50 sales and service locations and approximately 20 research and development sites. Carl Zeiss AG is fully owned by the Carl Zeiss Stiftung (Carl Zeiss Foundation). Founded in 1846 in Jena, the company is headquartered in Oberkochen, Germany.

#### **Vision Care**

As a leading global manufacturer, the Vision Care business group of Carl Zeiss is the only manufacturer to combine ophthalmic expertise and solutions with an international brand. The business group develops and produces technologically excellent instruments and offerings for the entire eyeglass value chain. With around 9,500 employees, the business group is one of the world's leading providers of eyeglass lenses and generated revenue totaling EUR 860 million in fiscal year 2011/12.