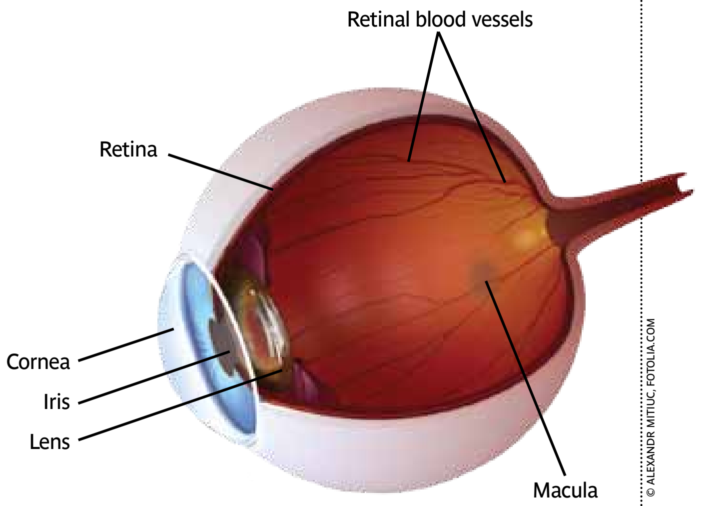
How to Shop for Sunglasses



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Editor's note: The following information is adapted from an article available at www.AviationMedicine.com.

Sunglasses are as much a part of your uniform as shoulder boards and cuff stripes. And they can be both functional and stylish. But with all the options to choose from, how do you know which ones to buy?

No single type is ideal for every pilot. Needs change based on age, light sensitivity, ambient lighting conditions, and type of flying. Some sunglasses are not right for any pilot at any time.

Reasons for wearing sunglasses while flying include improved night vision adaptation, enhanced contrast in the visual field, reduced glare, decreased UV exposure, and reduced eye fatigue. Safety-conscious pilots should focus on selecting proper lenses rather than frame styles with cheap lenses.

Visual acuity varies with the light available and a person's sensitivity to various degrees of brightness. The pupil controls the amount of light reaching the retina. Older eyes do not transmit as much light as younger eyes, so many older people need more light for optimum acuity and may need sunglasses that transmit more light.

Glare

On high-glare days, such as over snow or sand, the pupils contract to protect the eyes from the glare. Sunglasses will reduce glare and allow the pupil to let more light reach the retina, thus enhancing vision.

Glare can also be caused by indirect blue light and UV light. The intensity of UV light increases by 4 percent for every 1,000 feet of altitude and contributes to the blue color of the sky. Some researchers feel that UV light can cause haziness on the retina, decreasing visual acuity even when viewed indirectly. Fortunately, most aircraft windscreens eliminate much of these wavelengths.

Near sunrise and sunset, the atmosphere filters out blue and UV light, giving the sky its characteristic red-orange color. Yellow lenses, often called "blue blockers," will block out blue and UV light and are said to improve vision on hazy days, though no scientific proof exists for this claim. However, they may distort colors and decrease a pilot's ability to view some cockpit displays.

Sunglasses options

Tinted lenses distort colors. Yellow-shaded "blue blockers" will alter color perception if they block out 30 percent of the light. Green and grey

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lenses create the least distortion of color vision. Brown distorts colors slightly more but can block some of the blue-light blurring in haze.

Lenses' darkness or degree of light reduction is indicated by numbers. A No. 1 lens blocks only 20 percent of incoming light and has little value for aviators. The exception may be the No. 1 yellow lenses for hazy or smoggy days.

A No. 2 lens blocks 70 percent of light and is useful for most aviation situations.

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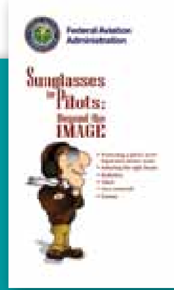
What We Recommend

On bright days, consider using neutral tint (green or grey) glass, CR-39 plastic or polycarbonate lenses that block 70 – 85 percent of the incoming light, possibly with a gradient that lightens on the lower portion of the lenses. On a hazy or smoggy day, consider wearing brown lenses that block 20 percent of the light, but avoid wearing them if color perception (IMC flight), as opposed to visual acquisition (VMC flight), is important.

At dusk or in lighting that is comfortable without sunglasses, remove them to increase visual acuity. Don't use polarized or photochromatic lenses in the cockpit. Don't waste your money on soft plastic lenses or mirrored lenses. Scratch-resistant coating may increase the life of polycarbonate lenses. When driving or engaging in outdoor activities, you may use the same sunglasses, although a polarized lens will reduce some glare and reflection, particularly when on the water or snow on a sunny day.



The FAA has published a pilot safety brochure titled "Sunglasses for Pilots: Beyond the Image," available at www.faa.gov/pilots/safety/pilotsafetybrochures/media/sunglasses.pdf.

It provides a balance of glare protection, luminescence reduction, and UV protection without significantly reducing visual acuity.

The light reduction of a No. 3 lens (85 percent) may be useful for pilots who are particularly sensitive to bright light, while others may find the No. 3 lens reduces visual acuity.

The No. 4 lens blocks out 95 percent of incoming light and significantly reduces visual acuity because the macula, where sharpest vision is found on the retina, requires light to activate the cones of the retina. Aviators wearing these lenses in flight may not meet FAA minimum distant visual acuity standards.

Mirrored glasses use metal particles to reflect images. They scratch easily and can cause distortion or blind spots. While popular with Hollywood movie pilots, professional pilots should leave them to actors and other imitators.

Photochromatic lenses darken when exposed to UV light. Because aircraft windscreens block most UV light, the lenses will not darken substantially inside an airplane or car. Military pilots are prohibited from using these sunglasses for good reason. Pilots flying open-cockpit airplanes are the only ones who may benefit from this feature. These lenses may take several minutes to lighten when moving from a bright to dark environment.

Gradient lenses usually have a darker tint on the upper portion of the lens and a gradually lightening color near the bottom. This may be useful when viewing instruments on a very bright day. The lighter tinting below allows more light from the relatively dark instrument panel to reach the retina and improve visual acuity while the darker upper portion blocks out the glare from the outside view.

UV protection is desirable in lenses worn outdoors but is not as important for glasses worn inside the aircraft because the windscreen blocks UV light. Glass and polycarbonate block nearly all UV-B light. Soft plastic lenses may block visible light but not block any UV wavelengths. The probability of developing cataracts increases when using soft plastic lenses because the pupil dilates in response to decreased visible light. The dilated pupil allows more UV light to enter the eye and penetrate the lens, thus increasing the risk of cataracts.

A scratch-resistant coating may increase the life of polycarbonate lenses and plastic lenses. Ironically, polycarbonate will withstand direct hammer strikes without breaking but scratches relatively easily. Glass will shatter but is more resistant to scratching. Polycarbonate lenses are thinner and lighter than glass lenses.

Pilots should not wear polarized lenses in the cockpit. Fine parallel lines resembling closely spaced prison bars on polarized lenses block glare from flat surfaces such as snow and water. Light parallel to the lines is transmitted, while nonparallel light (glare) is blocked. Unfortunately, if the windscreen is polarized and the lenses are not precisely oriented the same as the windscreen, all light may be blocked. Changing bank angle and head position can create blind spots. Cockpit instruments with glare-reducing coatings may not be visible when using polarized sunglasses.

For boaters who need glare protection from light reflected off the water, however, polarized lenses are an excellent choice.

ALPA members in good standing can get free, confidential consultations and assistance with aeromedical certification by calling ALPA's Aeromedical Office at 303-341-4435, Monday-Friday, 8:30 a.m. to 4:00 p.m. Mountain Time. Information regarding FAA policies, medical conditions, and medications is available at www.AviationMedicine.com.

For more information on aeromedical issues, scan the QR code.

Solution to this month's ALPA sudoku on page 38.

2	7	8	6	4	1	9	3	5
3	1	6	5	8	9	7	2	4
5	9	4	2	7	3	6	8	1
1	8	7	3	5	6	4	9	2
6	3	5	9	2	4	1	7	8
4	2	9	7	1	8	5	6	3
9	6	2	1	3	5	8	4	7
7	4	1	8	9	2	3	5	6
8	5	3	4	6	7	2	1	9