

Some light on dark glasses

As the hot months of summer approach, a few tips could help our choice of dark glasses, says S.Ananthanarayanan.

Dark glasses are used to reduce the amount of light entering the eye, generally, and also make dim objects stand out clearer, in bright glare. Another purpose is to absorb harmful, ultra-violet light.

Tinted glass

The most common way to reduce light is to ‘tint’ the glass, or introduce material that absorbs certain colours. Grey tints reduce all colours equally and provide comfort and function. Yellow or amber tints reduce light in the blue-violet range and are useful to cut glare. Green tints also cut blue-side light and glare and provide the best ‘contrast’, which makes them popular with the darkest tinted glass.

How bright is bright?

Brightness corresponds to the level of light energy, which is measured in units called ‘lumens’. In practical terms, a well-lit room is 400 – 600 lumens. In bright sunlight it can vary from 1000 lumens in the shade to 6000 lumens on a concrete road. We can see clearly enough till about 3500 lumens, but beyond 4000 lumens, we see flashes of white and details of objects begin to disappear. Usually, the iris, or ‘aperture’ of our eyes is able to contract in response to bright light, but at 4000 lumens, the iris is as small as it can get. We complain of ‘glare’ and begin to squint, to reduce the light getting in.

At around 10,000 lumens, we stop seeing altogether and prolonged exposure to such bright light seriously damages the eyes.

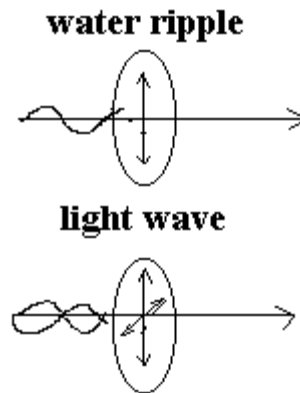
Reducing glare

Glare is the bright background illumination that makes the iris of the eye contract and let in less light, generally. This means very less light comes in from dimmer, or smaller objects and these cannot be seen clearly. Ordinary dark glasses, which reduce the quantity of light of all colours, would clearly not help much. A handy principle to get over the difficulty is that a lot of glare is due to scattered or reflected light. Now it is a property of the light wave that light to the blue-violet end of the spectrum gets scattered the most. This is the reason that the sky itself, which is lit by scattered light, is blue!

Thus, glasses tinted to absorb light towards the blue end of the spectrum cut out some of the reflected background light and let the iris stay wide, to help see other things more clearly.

Polaroid lenses

We are familiar with waves like ripples on a pond, where the water moves up and down, while the wave moves forward. Just think of how it would be if the water also moved from side to side as the wave moved forward, like shown in the picture. This is the way the light wave moves, as the directions of 'up' or 'down' mean nothing to a light wave.



Now when light reflects or is scattered, the scattered light does not have all the planes of vibration of the original wave. In Polaroid lenses, special materials can cut out certain planes of vibration, and this generally reduces more of light that causes glare than light from illuminated objects.

Ultra violet

Our eyes are continuously bombarded by ultraviolet, which is harmful to the retina and also promotes the formation of cataract. Poor quality glasses that only reduce the intensity of visible light leave our irises wide open for more UV to get in. It is hence important that dark glasses provide positive protection against ultraviolet light.
