Finding Hypoallergenic and Non-toxic Glasses

Glasses can cause problems for people with allergies or chemical sensitivities. We discuss the options for choosing safer eyewear.

Keywords: *eyewear, eyeglasses, glasses, non-toxic, hypoallergenic, MCS, chemical sensitivity*

Glasses can cause various symptoms if you are reactive to the materials they are made of. The most common symptoms are irritation where the frame touches the skin on the nose and by the ears, but the irritation can spread further out. People with chemical sensitivities can also react to the fumes given off from the glasses, which can cause irritation of the eyes or airways, as well as neurological symptoms.

There are four major parts to a pair of glasses that can cause trouble:

- The frame

- The nose pads (if any)
- The lenses
- The lens coatings

Plastic Frames

The frame is usually made of plastic or metal, but there are other materials too.

Plastic frames are made from either of these types:

- Acetate (Zyl)
- Nylon
- Propionate
- Polycarbonate
- Polyamide
- Epoxy

Acetate is currently the most common plastic frame. The material is made from cellulose, which is treated with various chemicals and dyes, including acetone. Acetate is often said to be hypoallergenic, and it does seem to work for most people, but not everyone

Nylon (TR-90) is another material that seems well-tolerated by most.

We do not recommend using polycarbonate frames for sensitive people.

Metal frames

Metal frames are usually heavier and may require a nose pad. The metals available are:

- Coated steel
- Stainless steel
- Titanium
- Aluminum
- Beryllium

The regular steel frames are coated with something so they do not rust. Nickel is a common coating, which causes a lot of allergy problems.

Other coatings are electroplated gold or silver, clear lacquers or some sort of paint.

Stainless steel contains chromium (usually 18%) and other metals. Nickel is a common additive, though usually only about 8%, so it may be tolerable.

Titanium is the most tolerable metal and it is also lightweight, so you may be able to go without a nose pad. But this is an expensive material.
Pure titanium is the most expensive. Titanium alloys with nickel and copper cost less.

Aluminum is too soft on its own to be used in a frame, so it will have to be some sort of alloy. Make sure to check what is in the alloy.

We've heard of beryllium frames. That is a toxic material, at least when inhaled as dust in extremely small amounts. At least for the sake of the workers in the factory, do not use beryllium.

All metals conduct electricity and reflects EMF. For that reason, people with electrical sensitivities should avoid metallic frames (more on this later).

Other frame materials

There are various other exotic frame materials available, but they are very costly and hard to find:

- Leather
- Carbon fiber
- Animal bone
- Animal horn

Do your own frame coating

People reacting to their frames have been able to coat them in various ways that worked for their needs.

If the frame is metal, it can be electroplated with a very thin layer of gold, which doesn't cost much. Some jewelry shops can do this.

We have also heard of someone who coated her frame using a clear nail polish. This is initially highly toxic, but will offgas after some days.

Nose pads

Heavier frames will include nose pads to distribute the weight on the nose. This also goes for heavy lenses, either made with glass or very thick plastic lenses.

The nose pads are made of:

- Silicone
- Acetate
- PVC
- Polycarbonate
- Titanium

Silicone is the most common, and also a common cause of trouble. The safest materials on this list are acetate and titanium.

Some frames allow the nose pad to be changed. The manufacturer may offer other nose pads, or it may be possible to find one that fits from another company.

Many years ago, we heard about people with severe MCS who were able to find nose pads made of porcelain and glass.

Lenses

The lenses are either made of plastic or glass, and there is usually some sort of coating. Glass lenses are thicker and heavier, so you'll probably need to use a nose pad. Glass also breaks a lot easier if dropped on the floor or during active sports.

There are various types of plastic lenses available, such as Trivex, CR-39, and polycarbonate.

Polycarbonate should be avoided, at least if the lens will be in contact with the skin (rimless frame).

Lens coatings

Lenses are usually coated with a sprayed-on film that reduces glare (anti-reflective), reduces UV light, and makes the lens resistant to scratches, fogging, and fingerprints.

You may need to offgas new glasses for some days to make these coatings tolerable, or forego any of them.

Some lens materials naturally reduce UV light, such as polycarbonate. But polycarbonate scratches more easily than other plastic lenses, unless there is a scratch-resistant coating.

Offgassing

If you don't tolerate the fumes from a new set of glasses, let them air out for some weeks. Sunlight can work much faster.

Before leaving plastic frames in the sun, make sure that they are fitted for you. The sun's rays will make the plastic harder so it may not be possible to bend the frame afterwards.

EMF issues

Metal parts in eyewear can reflect and sometimes channel radio waves (waveguide). This is probably an issue only for wireless transmitters close to the head, such as mobile phones, wireless earpieces, and augmented reality headsets.

British scientists looked into this issue for mobile phones held in front of the head while talking, as that is generally considered safer than holding the phone to the ear. They found the irradiation of the eyes was up to three times stronger with metal eyeglasses than without (Whittow, 2004).

They found a similar effect for metallic jewelry worn on the head (Whittow, 2008).

Other scientists support this, according to these two papers, but their articles are mostly behind paywalls (especially IEEE's), so we could not verify this. But the issue seems very plausible to someone with some EMC knowledge.

More information

Other articles on how to live with chemical sensitivities are available at www.eiwellspring.org

Sources

We based this article on personal experiences, and those of a few friends. We also looked at the websites of several eyewear vendors, which discuss materials and allergies.

For the EMF issues, we mostly looked at these two:

Whittow, Will and Rob Edwards. A study of changes to specific absorption rates in the human eye close to perfectly conductive spectacles within the radio frequency range 1.5 to 3.0 GHz, *IEEE Transactions on Antennas and Propagation,* December 2004.

Whittow, W.G. et al. On the effects of straight metallic jewellery on the specific absorption rates resulting from face-illuminating radio communications devices at popular cellular frequencies, *Physics in Medicine and Biology,* April 2008.

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