



About EnChroma

The mission of EnChroma is to enable those with color blindness to experience all the joy that color brings. An estimated 300 million people suffer from red-green color vision deficiency (CVD).

Our Story

A Frisbee and Some Cool Shades

It all started in 2002 in Santa Cruz, California during an Ultimate Frisbee game. Don McPherson, serial inventor and Ultimate Frisbee enthusiast with a Ph.D. in glass science, wore a pair of specialty eyewear he invented to protect the eyes of surgeons performing laser surgery. A teammate tried them on.

“Dude! I can see the cones!” he called out in amazement. His friend was severely color blind and couldn’t see the bright orange cones marking the game boundaries until that moment. A light bulb went on and Don’s curiosity sparked an initiative that would eventually improve the lives of thousands.

Dr. McPherson applied for a grant from the National Institutes of Health (NIH) to explore why his glasses helped the color blind better see colors. He partnered with Andrew Schmeder, a UC Berkeley-trained mathematician who helped crack the code behind the accidental discovery. The duo spent years perfecting the lens technology to create EnChroma, stylish optical-grade glasses that reveal color as it is meant to be seen—pure, vibrant, and true to life.

Research & Science

Following the support of two National Institutes of Health (NIH) SBIR funded studies on the feasibility of correcting color vision deficiency, EnChroma officially launched in 2010. Based on a rigorous scientific and research foundation, EnChroma used the latest understandings of the genetic basis of color vision deficiency to create a sophisticated computer-based model of human color vision. The founders then developed patent-pending design methods to create special spectral filters to assist color vision in a wide variety of applications.

Proudly based in Berkeley, California, today EnChroma offers a complete collection of high-performance eyewear that combine the latest in color perception neuroscience and lens innovation to enable red-green color blind people around the world to see a broader range of clear, vibrant color.

How Many People are Color Blind?

There are an estimated 300 million people in the world with color vision deficiency (CVD). The trait is inherited genetically and carried on the X-chromosome, affecting about one in 12 men (8%) and one in 200 women (.5%). The colloquial term “color blindness” most commonly refers to deutan-type or protan-type CVD, which are both types of red-green color blindness.

What are the Causes and Challenges of Color Blindness?

In the eyes of color blind individuals, the red and green photopigments have a more pronounced overlap. This causes the retina to receive inaccurate ratios of light, which makes color blind people struggle to correctly interpret many colors with red or green in them.

To the color blind, the world appears less vibrant or “washed out,” and some colors are indistinguishable; like purple and blue. Pink may look gray; red and green stop lights look “white-ish;” red looks brown and peanut butter looks green. Many color blind people find their occupational, sports or artistic pursuits limited by their condition. While color blindness is often considered a mild disability, studies have found that two-thirds of people with CVD feel it is a handicap. To find out if EnChroma glasses can help them, color blind people can take our color vision test at enchroma.com/test.

How EnChroma Glasses Work

EnChroma created specially engineered lenses that enable red-green color blind people to see a broader range of clear, vibrant color. They contain special optical filters that remove small slices of light where the problematic overlap occurs. This establishes a more accurate ratio of light entering the three photopigments in the eye so that the color blind enjoy a more normal spectral response. The glasses enhance the vibrancy and saturation of certain colors and improve color discrimination, depth and detail perception for the color blind. *See the “Deeper Science of How EnChroma Glasses Work” below for additional detail.*

About EnChroma Color Blind Glasses

EnChroma glasses for color blindness are available for men, women and children with outdoor and indoor lenses that can also be customized for prescription. The lenses are made with Trivex® material, a high-performance optical-grade resin that offers the triple benefits of clarity, lightness, and durability. The glasses range in price from \$269 to \$429 and are available in lifestyle, sports and kid’s frames.

EnChroma sells directly to consumers via EnChroma.com. Our glasses are also available at nearly 200 authorized eye care professional at authorized retailer locations throughout the U.S. and several locations worldwide, primarily optometry practices.

Awards

U.S. Small Business Administration - Tibbetts Award

EnChroma received the 2016 Tibbetts Award from the U.S. Small Business Administration in recognition of the firm's innovative impact on the human experience through technology.

American Association for the Advancement of Science – Invention Ambassador
EnChroma's Co-founder and Chief Science Officer was named a 2018-2019 AAAS-Lemelson Invention Ambassador by the prestigious American Association for the Advancement of Science (AAAS) and The Lemelson Foundation.

Photonics Media - Beacons of the Photonics Industry Award

EnChroma received the 2017 Beacons of the Photonics Industry Award in recognition of advancing light-based technologies in the scientific, business, academic and consumer communities.

Founder Bios

Andrew Schmeder

CEO & Co-founder

Andrew Schmeder earned his B.A. in Mathematics from the University of California, Berkeley in 2002. He has co-authored one US and international patent and 19 technical publications. He has spoken at numerous conferences worldwide. Schmeder's expertise spans applied mathematical modeling and optimization, electronic design and fabrication, software automation, and perceptual psychophysics. He has served as Programmer/Analyst with the Research Group at the Center for New Music and Audio Technologies (CNMAT), and with the Hafer Auditory Perception Lab at UC Berkeley.

Don McPherson, Ph.D.

Chief Scientist & Co-founder

Don McPherson received his Ph.D. in Glass Science from Alfred University in 1988. He is the published author of 14 scientific papers, authored six patents and been awarded five NEI, NIH and National Cancer Institute research grants. Dr. McPherson has also served as President of Bay Glass Research, Inc., Vice President of R&D for Vetrazzo, Inc., and as Founder and CEO of Counter Production, LLC.

Contacting EnChroma

For media inquiries, please contact Kent Streeb at pr@enchroma.com. For sales, partnerships or more information about EnChroma, please call 510-497-0048, email info@EnChroma.com or visit EnChroma.com.

Deeper Science: How EnChroma Glasses Work

Most color blind people are not actually “blind” to color, but have trouble seeing certain colors and hues. Normal color vision is based on light entering the eye and activating three photopigments sensitive to different parts of the visible spectrum (blue, green and red). In a normal eye, the green and red photopigments overlap. For the color blind, this overlap is more pronounced, causing distinct hues to become virtually indistinguishable.

The absorption of light in the right ratios by the three photopigments in the eye is critical to color perception. EnChroma created a special patent-pending optical technology that removes small slices of light where the red and green cones overlap the most. This re-establishes a more accurate ratio of light entering the three photopigments so the CVD enjoy a more normal spectral response. Color blind people experience enhanced color, depth and detail perception and can better differentiate hues of colors.

Importantly, EnChroma strives to ensure that consumers and eyecare professionals understand that our glasses are not a cure for color blindness. They are an optical assistive device for enhancing color discrimination in people with color blindness. The glasses are effective for approximately four out of five red-green color blind people and do not provide 100% color vision. Results vary depending on a person’s type and extent of color vision deficiency. The user's typical experience takes about 5 to 15 minutes for an effect.

Trademarks

EnChroma is a registered trademark of EnChroma, Inc.
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