**SUBJECT:** **Color Vision Standard for Police Officers**

**PURPOSE:** **Commission Information**

| DATE | SECTION | EXECUTIVE DIRECTOR | AUTHOR |
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| November 22, 2022 | Standards Compliance | Timothy Bourgeois | Leon Boyer |

**Background:**

The State of Michigan requires a person selected to become a law enforcement officer meet the medical selection qualifications set forth in R 28.14204. Per the Licensing Standards for Michigan Law Enforcement Officer [1] applicants must "*Possess normal color vision without the assistance of color enhancing lenses.*" This standard is supported in the 2018 Job Task Analysis (JTA) results.[2]

The Career Development Section conducted a comprehensive review of the color vision standard and the use of color vision contact lenses. The results of the review found no products provide the level of correction needed for a law enforcement officer position.

The Career Development Section researched color vision and the use of color vision contact lenses. In 2009, the Commission reviewed and revalidated the color vision standard keeping the current standard in place.

The current standard reads:

> *"Possess normal color vision without the assistance of color enhancing lenses. The unaided eye shall be tested using pseudoisochromatic plates. The Farnsworth Dichotomous D-15 panels shall be used for any candidate who fails the pseudoisochromatic plates."*

Research was conducted into the status of a color vision standard at the state level across the country. The data collected shows that of the 50 states contacted, 33 did not have a standard for color vision, 14 did, and 3 did not respond. The states that did not have the color vision standard left the establishment of the standard to the individual agencies. MCOLES researched the 20 largest police departments across the country, according to the World Atlas. The data shows 19 of the 20 largest police departments have a color vision standard in the police officer qualifications. Anecdotal information suggests the combined state and agency standard for color vision acuity covers the vast majority of police officers across the United States.

**Issues:**

[1] https://www.michigan.gov/mcoles/standard-training/licensing-standards-for-michigan-law-enforcement-officers
[2] https://www.michigan.gov/mcoles/issues-news-info/2018/12/09/2018-statewide-job-task-analysis-for-the-patrol-officer-position

The Commission requested the research after remarks regarding the color vision requirements were made during public comment section of the Commission meeting held September of 2022.

The Career Development Section conducted a comprehensive review of the color vision standard and the use of spectacle and contact lenses that claim to correct color vision deficits. This review was conducted in the form of open-source information, individual contact with each Commission counterparts in each state, peer reviewed journals and periodicals, federal regulations, and consultation with the Commission's subject matter experts. During the review there were several issues that were revealed. These include:

Color vision and how we see color-

Vision begins at the level of the retina where four different photoreceptors absorb light and convert it to electrical impulses that are sent to the brain through nerve pathways. Rod photoreceptors contain a photopigment that absorbs the energy in the blue-green portion of the visible spectrum and are primarily responsible for detecting low levels of light for vision in dim environments and motion detection. Rods make minimal contribution to the perception of color. Cone photoreceptors are concentrated in the macula for central vision and color perception. There are three types of cone photoreceptors based on the type of photopigment they have: L-cones are most sensitive to long wavelength red-end of the color spectrum, M-cones are most sensitive to middle wavelength green-region of the color spectrum, and S-cones are most sensitive to short wavelength blue-end of the color spectrum. Humans can perceive all of the colors of the spectrum because each "color" will stimulate each cone at different intensities. Humans perceive different colors when they receive different balances of nerve stimulation from the photoreceptors. Therefore, each color has its unique neural signature. The human brain will perceive a specific color depending on the neural signature it receives from the 3 classes of cone cells.

Some people are born with, or have a disease that causes, a deficiency or shift in sensitivity of one or more of the photopigments. This causes the relative nerve stimulus from certain colors viewed by the eye to be distorted. The person with deficient photoreceptors will perceive the color differently than people with a normal balance of photopigments. Studies also show 1 in 12 males will have some sort of inherited color vision deficiency as opposed to 1 in 200 females and 98% of inherited color vision defects involve red and green colors.

**Michigan testing for police officer color vision:**

The Commission uses two tests to check for color vision deficiencies. These tests are:

*Ishihara Test:* This test checks for total color blindness and red-green color blindness by assessing an individual's ability to perceive primary colors and shades of color. The Ishihara book contains a series of polychromatic plates of primary-colored dots arranged to form a numeral against the background of similar dots of contrasting colors.

*Farnsworth D-15 Test:* The D15 set is a modification of the well-known Farnsworth Hue Test. The D15 test is intended for classification. Each D15 set contains a reference disc and fifteen numbered discs, which make up an incomplete color circle within a standardized color space. The observer arranges the colored discs by similarity in a sequential color series. The sequence of arrangement determines whether the observer has one of the 3 types of color vision deficiency.

## Color vision correcting or color altering spectacle and contact lenses:

One organization in the United States claims that their color altering spectacle and contact lenses are designed to help an individual pass a specific test for color vision impairment.[3] These lenses are custom made and claim to filter certain wavelengths of light, which will enhance the differences between two colors that would otherwise be perceived as being the same color by a color deficient individual. These lenses are touted as a cure for color vision deficiencies or used inappropriately to pass color vision tests.

## Research on color altering contact lenses:

*Clinical Trials*

*ChromaGen Contact lens*: Swarbrick et al. (2001):

Lens wear had no significant effect on Farnsworth Lantern test performance. Subjectively, subjects reported enhanced color perception, but poor vision in dim light. Judgement of distance and motion were only slightly affected. We conclude that ChromaGen lenses may enhance subjective color experience and assist in certain color-related tasks but are not indicated as an aid for CVD in occupations with color vision-related restrictions.

*Clinical Analysis 2021*: According to Hathibelagal in 2022

An analysis of color vision and color vision lenses was conducted in patients from 2010 -2021. The individuals with color vision discrepancies were analyzed regarding color vision and the use of color altering lenses. The analysis showed that the tinted lenses did provide some enhancement of color perception when tested. The article cautioned that this came at the cost of loss of depth perception and issues related to rivalry between eyes.

U.S. Food and Drug Administration (FDA) Approval:

Research into the use of color altering lenses shows the FDA has researched the lenses. The article shows in 1998, ColorMax Lenses attempted to obtain labeling implying the lenses "correct" or "Cure" color deficiencies and allow patients to see "normal colors". The claims had to be changed to a red-green deficiency aid. In 2000, ChromaGen contact lenses requested approval. The FDA required ChromaGen to express the limited extent of the filters. The FDA conducted a study and found that some subjects were able to appreciate improvements. With a virtually non-existent risk the FDA allowed labeling as long as it shows minimal therapeutic effectiveness.

## Key Function:

The current job task analysis consists of 305 tasks that are common for a police officer to conduct in performance of their duties. This job task analysis breaks down the duties into specifics and by group. Out of the 305 tasks there are 84 of tasks that are associated with color vision as part of your duties. As an example, Job Task #121 states as follows

"*Observe and identify colors of automobiles, suspects' clothing, paint chips, etc.*"

*Color is a bona fide occupational qualification.* A Bona Fide Occupational Qualification (BFOQ) is a very narrowly interpreted exception to Equal Employment Opportunity (EEO) laws. A BFOQ allows employers to base employment decisions for a particular job on such factors as sex, religion or national origin if they

[3] https://colormax.org/pass-a-color-blind-test/

are able to demonstrate that such factors are an essential qualification for performing a particular job. (Society of Human Resource Management).

In this case, the ability to see color is a BFOQ as it is a vital part of the daily duties of a police officer. A police officer routinely is dispatched to look for a certain color vehicle, person in a specific color shirt etc. or is similarly required to accurately perceive and name colors as a part of descriptions or routine, daily tasks. The citations and reports that have been reviewed provide a space to articulate the color of the vehicle. Court testimony often requires identification of color. This frequency of use and articulation in the job task analysis provide a reasonable justification for the BFOQ.

**Banned Color Altering Contact Lenses:**

The Federal Aviation Administration (FAA) specifically disallows the use of color-altering contact lenses like X-Chrom for passing their flight physical.[4] As another example, the California Department of Corrections and Rehabilitation disallows Peace Officers from using these color filter contact lenses to pass their color vision testing. Many other occupations that depend on the ability to distinguish color such as mariners, military security personnel, special forces operators, likewise disallow use of X-Chrom and other color filters to protect public safety.

**Impact of Police Officer Reaction Time:**

(According to Lovells Dissertation)

Color vision has an imperative use for individuals in occupations that require quick responses to visual presentations. Color vision is used as a visual aid in many different ways such as authorized routes on maps (snowmobile, hiking, roadways) or weather radar maps. The listed examples are a few examples where delays could be cause by the inability to perceive colors.

**Police officer color vision court case:**

Federal court dismisses an ADA suit brought by a police applicant who was rejected because of a color vision impairment. He was not regarded as disabled, and the lack of normal color vision is not a substantial limitation on the ability to see. Finally, he was not entitled to reasonable accommodation. Lekich v. Munic. Police Officers Educ. Training Cmsn., #08-1048, 2009 U.S. Dist. Lexis 16645, 21 AD Cases (BNA) 1409 (E.D. Pa.).

Federal court concludes that color blindness is not a protected disability. Lekich v. Municipal Police Officers Educational Training Commission, #08-1048, 2009 U.S. Dist. Lexis 16645 (E.D. Pa.).

**Conclusion:**

The Career Development Section cautions there is a difference between using lenses to pass a color vision test and having suitable color vision to perform as a police officer. There are several areas of concern regarding the potential removal of the color vision requirement. The inability to distinguish color has the potential for serious public safety concerns, especially during low light and/or high stress situations. In addition, violations of individuals' constitutional rights, increased liability, and courtroom credibility issues may come into question as a result of failing to distinguish color.

[4] https://www.faa.gov/about/office_org/headquarters_offices/avs/offices/aam/ame/guide/app_process/exam_tech/item52/amd/

Routine tasks such a nighttime driving or other low light operations may be impacted using these lenses. Numerous studies have demonstrated most officer involved shooting or critical incidents happen during low lights hours. Lenses that filter light may cause an officer to misidentify or completely fail to see objects is a serious safety concern.

Research substantiates that the use of color altering spectacles and contact lenses do not restore color vision, they may simply assist a person with one color spectrum while diminishing the effect of another color spectrum. The tint associated with these types of spectacles and lenses reduce visual acuity due to the light reduction.

Finally, it is important to note the Commission's current color vision standard allows for mild but not moderate or severe color vision impairment. The standard was set to avoid the significant onset of color-naming errors that begin at the moderate impairment level.

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