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Diffusion Material for Luminous Mosaic Images: Letter to the Editor

Richard Travis

Letter to the Editor: Diffusion Material for Luminous Mosaic Images

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Richard Travis, MFA
Tallahassee, FL, USA

ABSTRACT:
(None required for editorial work)

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Dear Editor,

In two articles that were published in CR&A last year,[1,2] I described a method of demonstrating additive color mixture using luminous mosaic images (LMI) displayed on computer screens and viewed with optical diffusers. The material noted for optical diffusion was material I had used in the earliest stages of development: simple wax paper. I recommended that the diffusion material be mounted on a cardboard frame.

For demonstrating additive color mixture on computer screens, LMI should be designed with red, green, and blue (RGB) mosaic elements uniformly distributed across an image. A cyclic array of RGB vertical lines would be the simplest pattern to work with, and could represent at the macro level the mosaic pattern of electronic screens at the micro level (TVs, computers, and etc.). The RGB mosaic elements should be large enough to be visually conspicuous when viewed directly. Additive color mixture occurs when LMI are then viewed with optical diffusion.

Specific steps for creating and viewing LMI are described in the two articles.

From initial use of wax paper as an optical diffuser, it was a logical step to begin testing diffusion materials made by the theatrical lighting filter companies. Along with their color filter selections, these companies offer a great variety of diffusion materials in sheet form (called 'gels') to be used as stage, cinema, and photographic lighting modifiers. For viewing LMI, however, a viable diffuser must have very specific optical properties.

The ideal optical diffuser must have “see-through” translucency so that objects beyond it can be seen, but, have good diffusion when held a suitable distance from the screen. It also should have minimal neutral density (the least amount of light absorption) and haze–a milky, foggy effect that inordinately reduces image contrast, impeding an observer's view of a luminous mosaic image.

From tests of theatrical lighting diffusion gels, I have found a few items that are quite superior to wax paper, or any other material tested so far.

The diffusion material with the most desirable optical properties is *Lee #257 Quarter Hampshire Frost* (sometimes identified as Lee *#257 1/4 Hampshire Frost*). Two similar alternatives to this item are *Lee #256 Half Hampshire Frost* and *Rosco e-colour #257 Quarter Hanover Frost*. These three items all perform well. Lee and Rosco are two well-known suppliers of theatrical lighting gels.

The distance that an optical diffuser should be held from the screen is dependent both on the size of the RGB mosaic elements comprising the LMI and the strength or degree of diffusion provided by the diffuser.

As LMI diffusers, a major difference between these lighting gel materials and wax paper is in their diffuser-to-screen distances. Wax paper had to be held relatively close to the screen, and far from the observer's eyes, so that no more than about 3 inches (75mm) separated the diffuser and the screen. The tested diffusion gels instead are held much closer to the observer's eyes and farther from the screen.

An advantage of being able to hold the diffuser closer to one's eyes is that it can be made considerably smaller than if it had to be held close to the screen. To encompass an LMI, an optical diffuser held near the screen would have to be almost as large as the image itself. But, when held closer to the eyes, a much smaller diffuser would be able to encompass the same image.

Richard Travis
Tallahassee, FL, USA
rtravis10@gmail.com

ORCID
Richard Travis https://orcid.org/0000-0001-5278-0561

References:

[1] Travis R. New method for observing, demonstrating, and teaching additive color mixture. *Color Res Appl. 2021;*46:954-960. *https://doi.org/10.1002/col.22672*

[2] Travis R. Revisiting the fluorescent mosaic technique. *Color Res Appl.* 2021;46:943-953. *https://doi.org/10.1002/col.22643*