

Prop and Scenery Lighting, LLC

www.propscenerylights.com

Application Note: AN-1802

Blacklight Effects Filter Diffuser Plate

P/N: BEF-DP1



The Blacklight Effects Filter Diffuser Plate, part number BEF-DP1, reduces glare and helps hide LED blacklight illumination sources. The BEF-DP1 improves the visual experience for themed entertainment environments that use fluorescent painted scenery illuminated by LED blacklights. The BEF-DP1 is a textured translucent diffuser primarily designed for LED blacklights in the 380nm to 405nm ultraviolet UVA range.

Diffusing the ultraviolet light provides a reduction of glare when an LED blacklight source is directly viewed. The BEF-DP1's visibility is minimized in dark settings due to its low reflection matte surface. Additionally, a blackout appearance is achieved when the LEDs are off. The scatter from the textured surface also provides an improved uniformity of the blacklight ultraviolet energy cast on fluorescent surfaces.

The BEF-DP1 uses visible light absorbing dyes which darken the appearance of the filter while removing residual long wavelength energy from the LED blacklight source. The dyes absorb light predominantly above 500nm in the green through red range. The polycarbonate plastic resin used to mold the BEF-DP1 is optimized for transmission in the near UVA ultraviolet blacklight spectral range. The filter dyes in the resin effectively absorb longer wave length spectral energy in the 515nm green range to 730nm red which is responsible for much of the white glow lumens that can be seen in the ultraviolet LEDs emission spectrum. White glow lumens emitted by ultraviolet LEDs in the 380nm to violet 405nm range are typically absorbed by 80%. The transmission for 405nm violet blacklight LEDs is typically 64% and for 380nm UVA blacklight LEDs it is typically 40% transmission. The spectral transmission chart can be found in the specification sheet.

Without a diffuser filter, directly viewing a blacklight source can create glare. The glare is from the eye adapting to the dark, low ambient light conditions found in settings using fluorescent blacklight illuminated scenery. A high luminance difference, or contrast, exists between low light level emission fluorescent surfaces and the LED blacklight source. The low ambient light and low fluorescent emission light contribute to the glare of the illuminating blacklight source. The BEF-DP1 reduces direct glare from the LED blacklight source and increases uniformity of the blacklight emission from the source. Improving the ability to conceal the LED source and reducing glare improves the visual quality of the blacklight amusement attraction experience.

The BEF-DP1 is injection molded from robust polycarbonate resin 0.125" thick. The polycarbonate material has superior impact resistance over glass and acrylic materials and has excellent thermal ratings. The material is easily cut and drilled with standard plastic fabrication tools and equipment. The BEF-DP1 is made with a polycarbonate resin of a UL94HB flammability rating and heat resistance up to 125°C. The BEF-DP1 should be mounted with the textured surface on the exterior, away from the LEDs. Typical distance from the LEDs to the diffuser range from 0.50" to 2.0". For use with LED sources only.

Applications:

- Dark Rides, glare reduction and fixture hiding
- Blacklight Mini-Golf Courses provides shatter protection and vandal resistance to blacklight fixtures along with glare reduction for miniature golf blacklight courses
- Blacklight themed entertainment projects, glare reduction and fixture hiding
- Fluorescent blacklight art, illumination glare reduction and increased spectral purity

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