eGlassWindows.com
A DIVISION OF INNOVATIVE GLASS CORP

eGLASS WINDOWS: Tips for Minimizing Haze

INTRODUCTION

The objective of eGlass Windows is to obtain a maximum level of **privacy** when unpowered, and **clarity** when powered, but there are technical limitations that prevent 100% privacy and clarity. This document discusses best known practices to minimize and control the cloudiness or "white haze" in eGlass windows while in the transparent state. "Haze" is user-influenced by choice of tints of glass, direct and indirect artificial lighting, types of lighting, general exposure to sunlight, and viewing angle.

OVERVIEW OF THE LC TECHNOLOGY

eGlass windows, featuring LC Privacy Glass, are produced by laminating two pieces of glass over an electrically switchable LC Privacy film. The core LC film is naturally white and there is always a certain amount of resultant "white haze" or cloudiness when the glass is in the "On" state.

The film contains a mixture of Liquid Crystals and white polymers which diffuse and scatter the light when in the Unpowered / Default / Privacy mode. When electricity is applied to the film, the Liquid Crystal particles align and allow light and vision to pass through to the opposite side, thereby making it transparent.

- With a thinner coat of crystals in the film, you might be able to obtain greater clarity, but would not get the desired privacy.
- In contrast, a thicker coat of crystals might make the film more private, but then the clarity in the clear state goes down.

This varies by manufacturer, manufacturing processes and materials, and the environment it is viewed in. There are a few different manufacturers of LC film in this industry. Some provide a higher level of clarity, but at the expense of privacy. And some offer a lower level of clarity, which gives them greater privacy. Although the obvious objective of LC Privacy Glass is to obtain a maximum level of privacy when unpowered, and clarity when powered, it never reaches 100% clarity.

ACHIEVING AN OPTIMAL BALANCE

Our years of experience have taught us that there is an optimal balance to provide the best of both worlds. We therefore custom-blend our own formulation to satisfy even the most discriminating clients — with the widest dynamic range to provide enough privacy, while maximizing the amount of optical clarity.

Additionally, we offer our customers the following suggestions to further minimize and control the effect of LC haze.

HAZE: INFLUENCED BY POSITION OF LIGHT SOURCES

Light positon and placement should be carefully considered. The following are factors that amplify the appearance of haze when the glass is in the transparent state are:

- Pointing lights directly at the glass.
- Wall washing the glass with overhead or floor can lights.
- Placing ceiling lights or hi-hat lights too close to the surface of the glass.
- Having too much sunlight hitting the glass.

HAZE: INFLUENCED BY TYPE OF LIGHT

LED lights and CFC (Compact Fluorescent) lights can display "halo" like effects on the glass, as well as "strobing" and "flickering" of the glass. The angle of the glass to the light fixture itself will make the "halo" appear. This type of lighting is not recommended and should be tested with the Glass.

HAZE: INFLUENCED BY BALANCE OF LIGHTING

The amount of light on either side of an eGlass window is a key factor in the noticeable haze levels when it is in its transparent state. Here are some guidelines to follow when considering the "balance" of light on each side of the glass.

- The worst case scenario is when light is present on only one side of the glass. For example, a hallway is lit, but the lights are off in the room with the LC Privacy Glass. This will create an imbalance in the light causing the haze to be most evident.
- When the lights are on in both areas, but the strength of the light is greater on one side of the glass than on the other, haze will be less visible, but may still be fairly obvious.
- The best scenario for light "balance" is when the strength of the lighting is virtually the same on both sides of the glass. This will have the best results and the lowest haze visibility.

HAZE: VIEWING ANGLE AND OFF-AXIS INDUCED

The haze of eGlass windows in the transparent state varies based on viewing angle. Haze visibility is lowest when viewing straight through the glass at a 90° angle. The haze increases when viewing at a more oblique angle of 160°. The greater or wider the viewing angle, the more you will see the haze.

Designers should carefully consider the placement of interior walls in multi-angular installations.

SOLUTIONS TO MINIMIZE HAZE AFTER INSTALLATION

- Reduce the amount of direct sunlight in the room.
- Do not place overhead lights closer than 3' from the glass panel.
- Do not place floor or can lights too close to the glass panel.
- Reduce / adjust the lighting level in the room with light dimmers.
- Apply commercially available tinted window film to the glass on the side of the light source.
- Avoid use of LED, Fluorescent, and CFC bulbs.