



Technical & Applications Information on the
Products of GTI Graphic Technology, Inc.

| technote |

FACTS AND GUIDELINES ON THE CONTROL OF GLARE IN VIEWING AREAS

What is Glare?

Glare is the annoying visual sensation that occurs when a light source shines into the eye of an observer (direct glare), or reflects from the surface of a material to the eye of an observer (reflected glare). Glare can cause eye discomfort for press operators and others who inspect color images on press sheets, and it can distort color appearance by “washing-out” or “veiling” those images. Even a slight degree of glare, moreover, becomes more noticeable in graphic arts standard viewing facilities due to the high illuminance specified for critical color inspection.

What Causes or Influences Glare?

There are many factors which cause or influence glare, including:

1. Viewing angle.
2. Illumination angle.
3. Specularity of the light source/viewer.
4. Intensity (illuminance) of illumination.
5. Surface gloss of materials being viewed.
6. Surface gloss of surround surfaces.
7. Lightness/darkness of materials being viewed.
8. Brightness difference or contrast between task and ambient viewing conditions.
9. Number and total area of light sources.

Do Parabolic Louvers (Diffusers) Affect Glare?

No...and yes. Reflected glare is caused by the geometric relationship between the light source, the object being viewed, and the eye of the observer. Parabolic louvers do not change that relationship, they simply reduce the total amount of light falling on the viewing surface. These devices do, however, virtually eliminate direct glare - or the light shining into the eye of an observer who is looking obliquely up at the light fixture.

Is There a “Cure” for Glare?

There is probably more truth than humor in the statement that “glare can be completely eliminated only by turning the lights out!” While glare can be minimized by properly controlling the angle of illumination and viewing conditions, it cannot be completely eliminated under all illuminating/viewing conditions for all materials.

The Illuminating Geometry of the Graphiclite® CVX Color Viewing Station.

The Graphiclite CVX is designed to keep glare at a minimum by illuminating the proof or press sheet at an angle approximately 15 degrees greater than that of the viewing plane (i.e. 23 degrees vs 8 degrees). An observer, standing in front of the CVX and looking at a mirror placed in the center of the viewing area, sees an image of the overhead (matte neutral gray) angled panel of the CVX rather than an image of the light source, so there is no apparent glare.

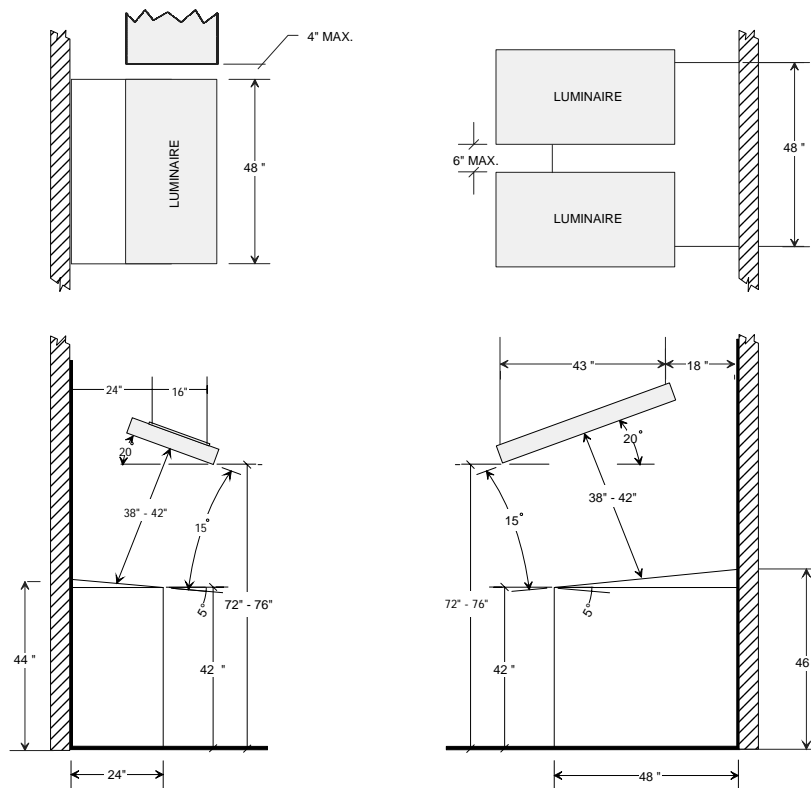
If the observer leans forward and looks down at the lower portion of the sheet, however, he may experience glare because his eye can see a direct reflection of the overhead light source on the sheet. In such a case, it is necessary to move back, away from the sheet, to eliminate the mirror image of the light source on the sheet.

The Graphiclite EVS Viewing System and Asymmetrical Luminaires.

In addition to the standard CVX color viewing facility, GTI produces the EVS (Executive Viewing System) which incorporates an overhead luminaire with an asymmetrical reflector system. This fixture also illuminates the viewing surface at an angle of approximately 15 degrees. The difference between the CVX and EVS lighting systems lies in the installation angle of the fixtures themselves. The EVS fixture is parallel to the floor, while the CVX fixture is positioned at an angle of 23 degrees. Like standard symmetrical luminaires, asymmetrical luminaires do not completely eliminate glare under all viewing angles, but properly used, they can control and minimize it.

Installing (Symmetrical) Luminaires for Standard Viewing with Minimum Glare.

The diagrams below depict the proper angles and distances for the installation of standard four-lamp luminaires above a typical viewing surface. Note that in each case, the luminaire is positioned at a differential angle approximately 15 degrees greater than that of the viewing surface, and an imaginary line, perpendicular to the center face of the luminaire, strikes the center of the viewing surface.



The installation geometry shown is designed to provide graphic arts standard illuminance of 2000 lux (apx. 185 footcandles) and light evenness across the viewing plane, while minimizing glare. In order to fully comply with the specifications of ISO 3664:2009, however, the surround walls and panels must be a neutral gray, ideally equivalent to Munsell Notation N8/, and the viewing area must be sufficiently screened or baffled to occlude the affects of ambient, non-Standard room light.