

Uniformity of Fiber Optic Products

SCHOTT North America, Inc. manufactures two product lines which require a uniformity specification across a given area: lightlines, also referred to as spot to line converters, or cross-section transformers and backlights.

The uniformity of lightlines and backlights can be evaluated utilizing a Machine Vision System:

- CCD area scan camera
- a frame grabber card
- image analysis software

Backlights

The backlight is placed directly under the camera at a defined distance based on the size of the active area. The camera will be focused onto the top surface of the backlight diffuser. Then the uniformity is measured by using an area of interest (AOI) histogram. The AOI will be slightly smaller than the active area to compensate for edge fall-off. The light source used for backlight calibration is a DCR® III with an EKE lamp.

Lightlines

Lightlines smaller than 16" (406 mm) in length are mounted on a 45 degree angle fixture. The fixture has a diffuser plate which is located .5" (13 mm) above the fiber line. The line is projected onto the diffuser plate, which is positioned directly below an area scan camera. The distance from the camera to the diffuser is determined by line length but is approximately 24" (610 mm). The camera's focus is adjusted to the top surface of the diffuser. The uniformity is then measured by taking a line profile of the image. The line profile will be approximately .5"-1" (13 mm-25 mm) shorter than the product to compensate for fall-off. The light source used for lightline calibration is a DCR® III with a DDL lamp. The above information is an overview of our calibration process.

Using these set-ups, backlights and lightlines will be calibrated to predefined uniformity values. Details are provided on the individual data sheets.