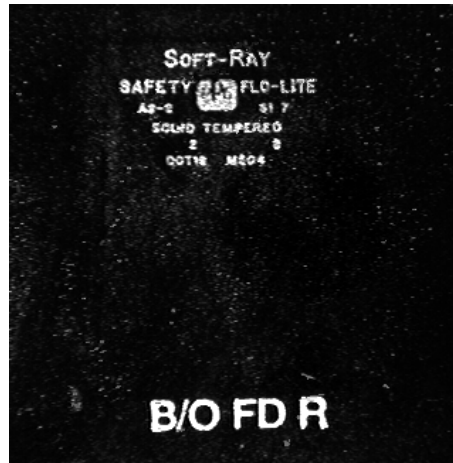


APPLICATION NOTE: 210

Application: Inspection of Graphics on Glass Plate

Problems: 1) Low Contrast of Characters
2) Glare from Flat Reflective Surface



Solution: Screened Graphics on Safety Glass

Inspection of text or graphical characters on glass presents several problems for machine vision inspection systems. The characters can be screened or etched onto the glass. In either case the contrast ratio between the characters and the background may be too low to reliably detect their presence or absence. Many of the techniques that one might use cause significant glare from the front surface of the glass. In some cases backlighting may be used, but many times the contrast ratio is still low and most production lines do not lend themselves easily to the implementation of backlights. Such were the problems presented with the above silkscreened application.

To solve this problem, a set of linear lightlines are used to provide the specialized structure required. Using cylindrical lenses, light from each lightline is focused into orthogonal edges of the glass plate as the plate passes in front of the inspection station. The glass plate acts as a waveguide, with total internal reflection keeping the light from escaping from either the front or back plane. Only in areas where the surface of the plate has an imperfection (defect, etched character, silk-screened character) will the light escape. Therefore the characters will appear white on a very dark background, providing a very high contrast image. The lightlines are being powered using independent 3900 *Smart-Lites* which provide superb stability ensuring long term system reliability.