

Technical note: damage in polarizers

Polarizers acquire damage during service. There are two main damage mechanisms:

1. Heat,
2. Humidity.

The damage in polarizers is manifested by structural deformation and polarization extinction decrease (“bleaching”). Polarizers supported by glass do not deform, but at elevated temperatures the supporting glass will shatter.

Polarizer damage due to humidity depends on service temperature and environmental conditions. Glass encapsulated polarizers (POLAR and SPAR types) are immune to humidity damage.

Polarizer lifetime can be extended by increasing the beam spot size area on the polarizer. Large spot size serves to decrease the peak temperature at the spot center. Advisol recommends adjusting the distance between the polarizer and the projector so that the beam spot covers at least half of the filter area. This rule should be followed both in 4:3 and 16:9 projectors.

It is recommended that the polarizer temperature will not exceed 65°C during service.

Heat induced bleaching normally occurs locally at the spot center, where the temperature is highest. A typical thermal bleaching damage is shown in Figure 1. Note that such damage is usually invisible. The easiest way to make it visible is to inspect the damaged polarizer with another polarizer in crossed orientation.

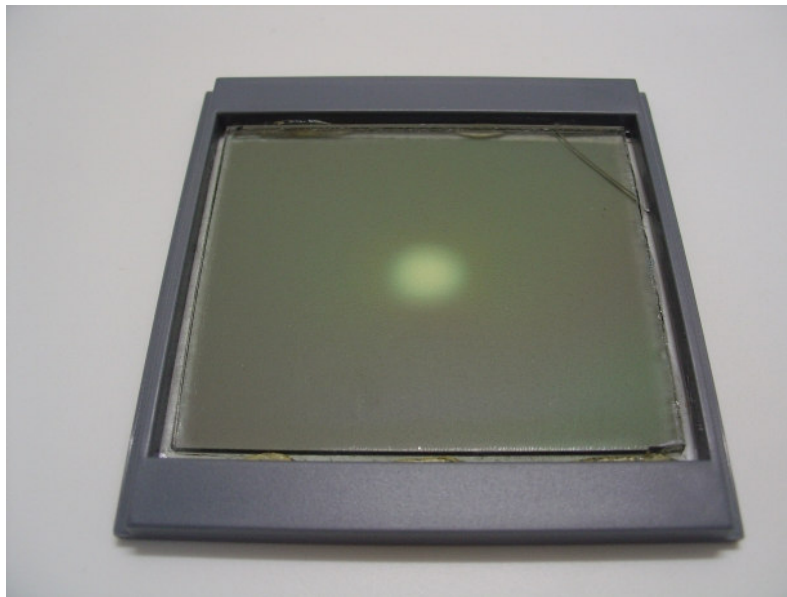


Figure 1: A filter with heat induced bleaching.

The damage in this particular StereoPol™ filter was caused by exposure to DLP projector. This exposure also caused the glass shatter.