CHELIX
520 MERCURY DRIVE
SUNNYVALE, CA 94085
PHONE 408.735.1515
FAX 408.735.1586

CLC Polarizing Films

Introduction

Narrowband CLC film reflects one handedness of circularly polarized light in designed wavelengths. For example, in the case of a piece of right-handed reflecting CLC film with center wavelength at 630 nm, the film reflects 50% of the un-polarized light and it appears to be red at normal incidence. The polarization of the reflected light is right-handed. The remaining portion of light (50% of the left-handed polarized light at 630 nm and 100% of the un-polarized light outside of the reflection band) gets transmitted.

The reflective color appears vivid from a dark background. This is because that when CLC film is placed on light background, the reflection of the remaining light from the light background "washes out" the color reflected from the CLC film. Figures 1 and 2 explain the mechanism.

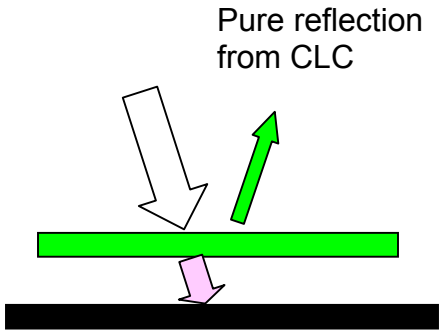

Figure 1 Remaining light is absorbed by black background

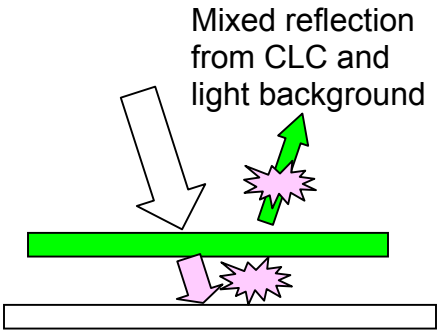

Figure 2 Remaining light is reflected by the light background

CLC polarizing film can be made on surface-treated substrates. Treated glass substrates are widely used to achieve the best result of CLC molecules alignment. However, certain plastic substrates are suitable for aligning CLC molecules as well. Among these plastics, PET is found to be a good candidate.

CHELIX
520 MERCURY DRIVE
SUNNYVALE, CA 94085
PHONE 408.735.1515
FAX 408.735.1586

Chelix's CLC films on PET

Chelix has developed a web-coating process to produce up to 8" wide narrowband CLC films at length. The reflective wavelength can be custom designed at anywhere in between 350 nm and to more than 2 microns. Figure 3 is a picture of a red reflecting CLC film.

Color Flop

Due to wavelength "blue shift" versus viewing angle, the color reflected from CLC film changes from red to green (shown in Figure 3), or green to blue. This property is also true for the invisible wavelength bands. The color flopping property together with the flexibility of the PET CLC film further extends the applications of CLC polymers.

Figure 3 Red reflecting CLC film

Specifications of CLC film on PET substrates

Substrate (*)	2 mil, 3 mil, 4 mil PET
Reflective wavelength	custom
In-band reflectivity	~40% @ 630 nm for film thick around 6 micron
CLC film thickness	3~15 micron
Film width	up to 8"
Film length	up to 10 ft

*double PET substrates (sandwich) films are available

Cost

Call for quote