

POLARIZATION

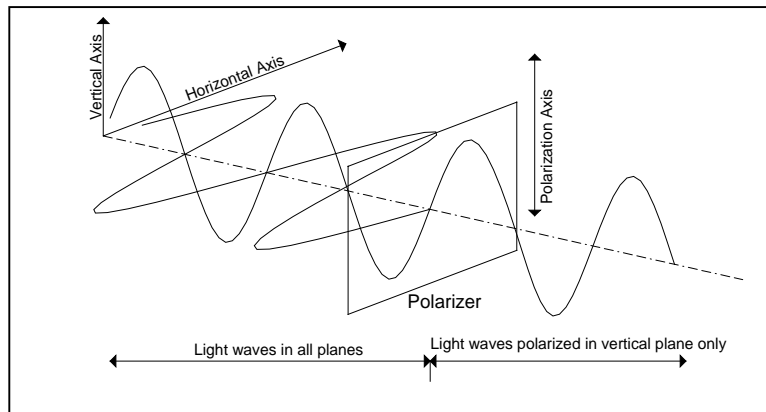
Natural daylight is partially polarized. When light from the sun hits molecules in the atmosphere, the blue end of the spectrum (the short wavelengths) is significantly scattered. This scattered light is partially polarized. The red end of the spectrum is largely unscattered and consequently less polarized. The resulting light reaches the surface of the earth from all directions and makes the sky appear bright and blue. Without an atmosphere the sky would appear black.

Use of Formatt polarizing filters can remove the scattered (and partially polarized) component of the light and only allow light in one plane to pass. The effect of this is to darken clear skies. Where there is moisture present, mist, haze, smoke etc, the scattered light appears white owing to the large size of the molecules. These larger molecules have a depolarising effect. Consequently using a Formatt polarizer will significantly increase the contrast between clouds and sky.

Fig 1 Linear Polarization

From the left the light waves are in all planes. When they reach the polarizer only the waves in the vertical plane can pass.

Changing the polarization axis changes the angle of the waves which are allowed to pass.



From Malus's Law the maximum level of light which can pass through a polarizer is 50%. Formatt filters are HN38 polarizers, meaning that a maximum of 38% can pass. This equates to 1 1/3 stops and suitable adjustments should be made. Formatt uses a very high specification iodine tinted polymer for its polarizers, ensuring a neutral grey with a flat transmission curve, minimising the risk of any colour distortion.

Extinction values on crossed Formatt Polarizers are better than 98%.

Removing unwanted reflections



Fig 2 Light reflected from the car windscreen obscures the subject



Fig 3 The Formatt polarizer significantly reduces the reflected light.

In view of our policy of continuous improvement Formatt Filters reserves the right to change methods, materials and specifications without prior consultation.

When light hits a reflective surface such as glass or water, it is polarised in one particular plane. A Formatt polarizer can be set at right angles to the polarization plane to remove this unwanted reflection. Round polarizers by Formatt are mounted in a rotating ring to allow the filter to be adjusted. Square or rectangular filters should be rotated to the correct angle with a matte box.



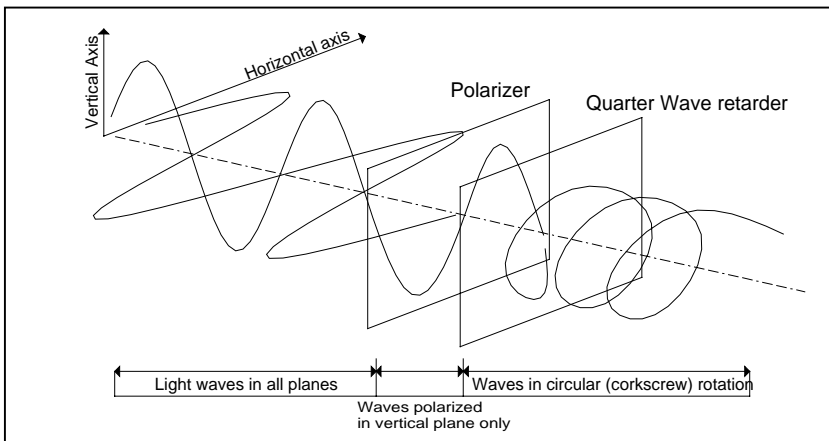
Fig 4 Unwanted reflections from pond surface.



Fig 5 Formatt polarizer removes unwanted reflections

Circular Polarizers

Many modern cameras employ beamsplitters to determine light values for many of the automated functions. For these cameras the use of a circular polarizer is recommended. This is because in some circumstances birefringence can be caused by use of linearly polarized light. In order to eliminate this risk Formatt manufacture a circular polarizer which polarizes the light in a circular motion.



From the left the light waves are in all planes. When they reach the polarizer only the waves in the vertical plane can pass. When they reach the quarter wave retarder they are slowed down by 90° producing a cork screw type of polarization.

Fig 6 Circular Polarization

Formatt Circular polarizers are available as right hand and left hand rotation. Right hand is normally supplied unless left hand is specifically requested. If a circular polarizer is used with the wave retarder to the front then it will act as a linear polarizer.

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Formatt Filters
Unit 23 Aberaman Park Industrial Estate Aberdare
Rhondda Cynon Taf CF44 6DA United Kingdom
(0044) 1685 807979
www.formatt.co.uk