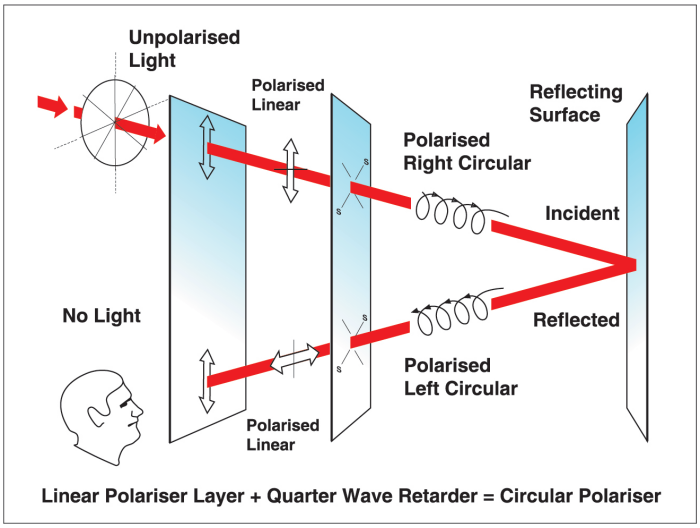
How do circular and linear polarisers work

Circular Polarisers

A circular polariser comprises a linear polariser and a 14 wave retarder whose slow and fast axes are at 45 degrees to the axis of the polariser. A ray of unpolarised light, passing through the linear polariser, becomes polarised at 45 degrees to the axis of the retarder. When this polarised light ray passes through the retarder it's oscillation direction is made to move in a helical pattern.

After the light ray is reflected from a specular surface the sense of rotation of the oscillation reverses. This rotation is stopped in the return through the retarder. The light ray is now linearly polarised in a plane 90 degrees to its original polarisation plane, and is absorbed by the linearly polarised component of the circular polariser.



Linear Polariser Layer + Quarter Wave Retarder = Circular Polariser

A circular polariser effectively acts like a light valve blocking light completely and therefore offers the ultimate in contrast enhancement.

Linear Polarisers

Synthetic linear polarising filters (polarisers) possess special properties for selectively absorbing light oscillations in certain planes. When unpolarised light, which is a complex mixture of oscillation directions lying in all possible directions perpendicular to the line of travel, is passed through a linear polariser it's oscillations become confined to a single linear plane and the light is considered "polarised". This linearly polarised light can be modified to suppress unwanted reflections and to eliminate glare for a variety of applications.