

3. Optical filters

Chapters 1 and 2 have introduced the basic principles for selecting an optimal lighting solution. Results can be further improved by the use of optical filters.

An optical filter is used to alter the light in accordance with certain criteria. Depending on the kind of filter used, the passage of light is either permitted or blocked (attenuated).

Various optical filters are available for effects such as the following:

- Increasing the contrast in an image
- Suppressing extraneous light
- Minimising distractions such as reflections/specular reflections
- Colour separation

In this Knowledge Base, we will explain the three filters most commonly used.

- **Chapter 3.1 – Bandpass filters**

Bandpass filters, also known as interference filters, separate out certain wavelengths. The selected wavelength passes through the filter. The remainder of the light is reflected and does not reach the image acquisition device. These filters are used to suppress extraneous light, for example, or for fluorescence applications.

- **Chapter 3.2 – Polarisation filters**

Apart from being used to select certain wavelengths, filters can also be used to let light pass only if it is in a certain state of polarisation. This can be used to minimise problematic (specular) reflections.

- **Chapter 3.3 – Other filters**

Apart from bandpass and polarisation filters, there are many other approaches to using filters to optimise the test object image.

Naturally, there is a multitude of optical filters and application scenarios in which they are used. Chapter 5 of this Knowledge Base will explain the use of special filters for fluorescence applications. Feel free to contact us if you need any additional information or support when choosing a suitable filter for your application.

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