

Topic 81

Camera Filters

In photography and videography, a filter is a camera accessory consisting of an optical that can be inserted into the optical path. The filter can be of a square or oblong shape and mounted in a holder accessory, or, more commonly, a glass or plastic disk in a metal or plastic ring frame, which can be screwed into the front of or clipped onto the camera lens.

Filters modify the images recorded. Sometimes they are used to make only subtle changes to images; other times the image would simply not be possible without them. In monochrome photography coloured filters affect the relative brightness of different colours; red lipstick may be rendered as anything from almost white to almost black with different filters. Others change the colour balance of images, so that photographs under incandescent lighting show colours as they are perceived, rather than with a reddish tinge. There are filters that distort the image in a desired way, diffusing an otherwise sharp image, adding a starry effect, etc. Supplementary close-up lenses may be classified as filters. Linear and circular polarizing filters reduce oblique reflections from non-metallic surfaces.

Many filters absorb part of the light available, necessitating longer exposure. As the filter is in the optical path, any imperfections—non-flat or non-parallel surfaces, reflections (minimized by optical coating), scratches, dirt—affect the image.

There is no universal standard naming system for filters. The Written numbers adopted in the early twentieth century by Kodak, then a dominant force in film photography, are used by several manufacturers. Colour correction filters are often identified by a code of the form CC50Y—CC for colour correction, 50 for the strength of the filter, Y for yellow.

Optical filters are used in various areas of science, including in particular astronomy; they are essentially the same as photographic filters, but in practice often need far more accurately controlled optical properties and precisely defined transmission curves than filters exclusively for photographic use. Photographic filters sell in larger quantities at correspondingly lower prices than many laboratory filters. The article on optical filters has material relevant to photographic filters.

In *digital* photography the majority of filters used with film cameras have been rendered redundant by digital filters applied either in-camera or during post processing. Exceptions include the ultraviolet (UV) filter typically used to protect the front surface of the lens, the neutral density (ND) filter, the polarizing filter and the infra-red (IR) filter. The neutral density filter permits effects requiring wide apertures or long exposures to be applied to brightly lit scenes, while the graduated neutral density filter is useful in situations where the scene's dynamic range exceeds the capability of the sensor. Not using optical filters in front of the lens has the advantage of avoiding the reduction of image quality caused by the presence of an extra optical element in the light path and may be necessary to avoid vignetting when using wide-angle lenses.