

## Topic 048

### Filters

Two classifications of filters are used in television production: glass or gel filters and post-production or electronic filters.

#### Glass Filters

Glass filters consist of a transparent, colored gel sandwiched between two precisely ground and sometimes coated pieces of glass.

The filter can be the type that screws over the end of the camera lens (as shown here) or is inserted into a filter wheel behind the camera lens.



A type of filter that's much cheaper than glass is the gel, which is a small square or rectangular sheet of optic plastic used in front of the lens in conjunction with a matte box. (See below.)

#### Post-Production Filters

The use of post-production filters (post filtration) takes place after scenes are shot.

Although these electronic filters typically have the same names as the familiar glass or gelatin filters, they often have a slightly different effect.

Tiffen's Dfx 2.0 software and special effect filters -- some 1,000 of them -- represent one example of post-production filters. They are used as plug-ins for programs, such as Apple's Final Cut Pro, Aperture, Avid, Adobe's After Effects, and Photoshop.

Post filtration not only provides a greater range of effects, but, unlike optical filtration, the effects can be readily reversed and modified during editing.

At the same time, there are certain effects that are better achieved with glass and gelatin filters.

### **Ultraviolet Filters**

News photographers often put an ultraviolet filter (UV filter) over the camera lens to protect it from the often adverse conditions encountered in ENG (electronic newsgathering) work.

It's considerably cheaper to replace a damaged filter than a lens.

Protection of this type is particularly important when the camera is used in high winds where dirt or sleet can be blown into the lens.

Video cameras tend to be sensitive to ultraviolet light, which can add a kind of haze to some scenes. Because UV filters screen out ultraviolet light while not appreciably affecting colors, many videographers keep an ultraviolet filter permanently over the lens to protect it. (Camera lenses are often more expensive than the camera itself.)

### **Using Filters to Create Major Color Shifts**

Although optical and electronic camera adjustments are responsible for general color correction in a video camera, you may sometimes want to introduce a strong, dominant color into a scene.

For example, when one scene called for a segment shot in a ▲photographic darkroom, the camera operator simulated a red darkroom safelight by placing a dark red glass filter over the camera lens. (A safelight is a lamp with a filter that screens out rays that will expose photographic paper. Darkrooms switched to yellow-green filters decades ago, but since audiences still associate red filters with darkrooms, directors feel they must continue to support the myth.)

If the camera has an internal white balance sensor, a video camera must be white balanced before placing the filter over the lens. If not, the white balance system will try to cancel out the effect of the colored filter.

### Neutral Density Filters

Under some bright conditions you may want to reduce the amount of light passing through a lens without stopping down the iris.

As we've noted, keeping the iris at a low number (opened up to a large degree) makes selective focus possible.

Although using a higher shutter speed is normally the best solution in these cases (we'll get to that later), using a neutral density or ND filter will achieve the same result.

A neutral density filter is a gray filter that reduces light by one or more f-stops without affecting color.

Professional video cameras normally have one or more neutral density filters included in their internal filter wheels. To select a filter, you simply rotate it into position behind the lens.

The table below shows ND filter grades and the amount of light they subtract.

0.3 ND filter*	1 f-stop
0.6 ND filter	2 f-stops
0.9 ND filter	3 f-stops
1.2 ND filter	4 f-stops

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\*Although these numbers represent the official designations, many of today's video cameras use fractions such as 1/8th and 1/64th to represent levels of light reduction.