

green, making the output of fluorescents compatible with a daylight balanced emulsion. Supplemental light sources balanced for daylight could be used without color rendition problems. The Fluorofilter (FLF-S—a trademark of Rosco) is used to correct daylight or cool white fluorescent tubes to be balanced for tungsten emulsions or the video target. Any supplemental light sources must be of tungsten balance for correct color rendition throughout the scene.

The second filtration method is to use a combination of color compensating (CC) filters on the camera lens and color conversion or light balancing filters on the camera lens. Color Compensating (CC) filters selectively attenuate certain frequencies (color of the spectrum) while passing other unaltered. Color compensating filters are generally used to make small color changes to correct for small color differences. CC filters are available in graduated densities and the six colors (three primary, three secondary) of the color wheel.

When you use these filters, it is important to bear in mind that each primary color blocks the other two primary colors (a green filter, for example, blocks red and blue), but each complementary color blocks only one of the primary colors; a cyan filter blocks red, yellow blocks blue, and magenta blocks green. This blocking will not necessarily be complete; how much of the light is absorbed depends on the density of the filter(s) being used.¹ Included here is a table to illustrate the effects of color compensating filters.

There are two primary groups of color conversion filters, the 80 and 85 series. The 80 series which is blue in color and includes the 80A, 80B, 80C and 80D filters. This series of filters effectively converts the tungsten sources in a scene to within a range of 4200K to 5500K (from 3200K to 3800K). The 85 series includes the 85A, 85B, 85C, is amber colored, and effectively converts daylight sources of 5500K \pm 200K to within the 3200K range of tungsten balanced emulsions or the video target. After making gross adjustments with the 80 to 85 series filters, further fine adjustments towards the red or blue ends of the spectrum can be made with light

balancing filters. The 81 series, yellow in color, includes the 81A, 81B, 81C, 81D and 81EF, and would be used to make incremental changes of 100K towards the red end of the spectrum. Series 82 filters, which are blue in color and include the 82, 82A, 82B and 82C filters, permit incremental adjustments towards the blue end of the spectrum. Remember, of course, that each additional filter reduces the light reaching the emulsion or target through the lens, so a compensatory adjustment must be made by increasing the f stop.

Light Loss Factor

Table 1 illustrates the degree to which light is lost through the filter media that have been mentioned in this article and provides graphic evidence of the light loss through lighting fixtures.² This should clearly show that there is always an exposure cost when using filters of any kind. The exposure cost (f stop increase, or whatever you care to call it) is part of the jargon used to convey a complex concept in a simple way.

Owing to the extensive nature of this topic, we have merely scratched the surface in our attempts to relate and decipher some of the common terms used in the craft of lighting. Polarizers, color-graduated and effects filters were not even mentioned. Not because they are unimportant, but because the scope of these filters is too great to handle in such a brief article. Filters serve to control, enhance and alter light to aid the craftsman to create lasting visual impressions, not unlike those that occur in nature.

Bentley Miller is a lighting director/designer at CITY-TV/MuchMusic in Toronto, and is also a member of the Society of Television Lighting Directors (Canada).

BIBLIOGRAPHY

1. The Complete Tiffen Filter Manual, p. 28. Jorma Hyppia. Amphoto Book Publishing, 1515 Broadway, New York, NY 10036, 1981.
2. The Complete Tiffen Filter Manual, p. 29.

TABLE 1: LIGHT LOSS ASSOCIATED WITH SOME COMMONLY USED FILTERS.

Fixture Type	Filter	Color	Approximate Light Loss in f-stops
Carbon Arc	Y1	Pale Yellow	1/4 stop
Carbon Arc	MT 2	Amber	3/4 stop
Carbon Arc	MTY	Orange	1/2 stop
Tungsten	Macbeth Glass	Deep Blue	1-1/2 stops
Tungsten	Dichroic	Medium Blue	1-3/4 stops
Fluorescent (warm)	Minusgreen	Pale Rose Pink	3/4 stop
Fluorescent (cool)	Fluorofilter	Orange	1 stop