More About Filters: Color Correction Media

by Bentley Miller

In the first part of this article carried in last month's *BT*, we attempted to relate and decipher some of the history of the use of filters in the craft of lighting. We now turn to the color correction media.

Color Correction Media

Color correction or conversion filters have been created to alter and render correct almost every light source commonly found in use today. (Rendered correct so that there is a predominent bandwidth or part of the visible spectrum that is useable for film or television.) There are filters to convert carbon arc, HMI, fluorescent, and tungsten light sources. The conversion is either up or down in color temperature, depending on the film stock or video target. One of the first filters used to convert tungsten to daylight was the Macbeth filter. This filter, composed of glass impregnated with a blue dye, was superseded by the development of dichroic filters. The dichroic filter is made of a heat-resistent glass which has layers of micro thin coating applied to its surface. The coating, which is applied by a vacuum chamber process, is composed of alternating layers which are one-quarter to one-half the wavelength of that part of the spectrum that is to be eliminated. The alternating layers create a series of light wave interreflections that effectively cancel out the unwanted wavelengths. The early versions of these dichroic filters tended to fade with age and exposure to heat, and as they faded the color temperature dropped. To compensate for this reduction in color temperature, blue color correction filters were put into use. The name ascribed to these filters was Booster Blue, because they boosted the color temperature of the flagging dichroic filter. The name Booster Blue is a blanket term used to describe a series of filters which boost the color temperature up to 2200K. The boosters named Tough Blue 50 boost color temperature 2200K ± 100K, Booster Blue raises the color temperature 900K ± 100K; Half Booster Blue raises the color temperature 600K ± 100K, Quarter Booster Blue raises the color temperature 300K ± 100K and Eighth Booster Blue raises the color temperature 100K. The dichroic filters which are available today are far more color stable, so using Booster Blue is a matter of personal preference—not necessity. Boosters are now used in applications where full or only partial correction of tungsten or daylight sources is desired.

(*Note*: In the article on luminaires, I didn't full and precisely explain what an F A Y bulb is. Specifically, an F A Y is the (ANSI) American National Standards Institute three-letter code used to designate a dichroic coated bulb which is a PAR 36 650 watt 5000K bulb with a spot beam and ferrule contracts. There are other bulbs labelled F A Y, such as the FGN 1000 watt 5200K bulb, which has a wide flood beam pattern, and the FGP, which is a narrow spot bulb. Each has an extended mogul end prong base. F A Y should not be used routinely to refer to any dichroic coated PAR lamp; that useage is incorrect.)

Correcting the Carbon Arc

Carbon arc luminaires utilize two different types of carbon rods. Each has a different chemical composition and they are known as white flame and yellow flame rods respectively. The burning of these rods creates a high-intensity source which is rich in ultraviolet light. This makes it necessary to filter out some of this radiation to make the light compatible with the limited spectral sensitivity of our film emulsion or video target. Ultra-violet radiation is invisible to the naked eye, but because film is non-adaptive, it would show up as a bluish cast in the picture if left unfiltered. An unfiltered white flame carbon arc (which is used as a daylight source) has an uncorrected color temperature of roughly 6200K ± 300K. A yellow flare carbon is also available and is the carbon of choice when used to augment tungsten sources. In either case, there are a number of color correction filters available for balance to either standard. A Y-1 filter would be used to correct a white flame carbon arc to a "daylight" color temperature of 5700K ± 300K. To correct for tungsten 3100K ± 300K an MT-2 could be used in combination with a Y-1 to bring the color temperature to roughly 3100K. Unfortunately, this combination would reduce the light output by almost half. Remember, to achieve the proper luminance use the appropriate filter. In this in-

→