Color Correction Filters - Conversions -*All Trademarks and Copyrights Apply*****

**Mired Shift Data from NYIP

Filter#	Color	Exp.Incr.	Conversion	GamColor	Lee	RoscoLux	R/EColor	Cinegel	Mired**
	DKBlue	2	3200K to 10000+K (Daylite)		Double CTB (-274)200	Alice Blue378	Double CTB (-275)200	Double Blue (-260)3220	-270
	DKBlue	1 1/2	2800K to 5600K (2800deg+)	Extra CTB (-190)1520 AKA City Blue 847					-190
80A	Dk.Blue	2	3200K to 5500K (2300deg+)	Full CTB (-141)1523 (Southern Sky 882)	Full CTB (-137)201	Full Blue (-131)3202	Full CTB (-134)201	Full CTB (-131)3202 Theat. Boost. 371	-130
80B	Dk Blue	1 ½	3400k TO 5500k (2100deg+)	3/4 CTB (-108)1526 (Blue Belle 888)	3/4 CTB (-112)281		3/4 CTB (-113)281	3/4 CTB (-100)3203	-110
80C	Dk Blue	1	3800K to 5500K (1700deg+)	½ CTB (-75)1529 (Whisper Blue 842)	½ CTB (-78)202	No Color Blue 60 Clearwater 360	½ CTB 202	Theat. Boost. 372	-80
80D	Blue	2/3	4200K to 5500K (1300deg+)			½ Blue 3204		½ CTB (-68)3204	-60
82C	Blue	2/3	2800K to 3200K (5100K to 5500K) (400deg+)	1/4 CTB (-38)1532 (Blue Ice 885)	1/4 CTB (-35)203	1/3 Blue 3206	1/4 CTB 203	1/3 CTB (-49)3206 Theat. Boost. 373	-45
82B	PaleBlue	1/2	2900K to 3200K (5200K to 5500K) (300deg+)	1/6 CTB (-28)1534		1/4 Blue 3208		1/4 CTB (-30)3208	-30
82A	PaleBlue	1/2	3000K to 3200K (5300K to 5500K) (200deg+)	1/8 CTB (-20)1535 (Winter White 870)	1/8 CTB (-18)218		1/8 CTB 218		-20
82	LtBlue	1/3	3100K to 3200K (5400K to 5500K) (100deg+)			1/8 Blue 3216		1/8 CTB (-12)3216	-10
81	LtAmber/ Straw	1/3	3300K to 3200K (100deg-)		No Color Straw (+10) 159		No Color Straw (+10) 159		+10
81A	LtAmber/ Straw	1/3	3400K to 3200K (200deg-)	1/8 CTO (+20)1555 (Sand 363)	1/8 CTStr (+20)444	RoscoSun 1/8 CTO (+20)3410	1/8 CTStr (+20)444		+20
81B	Pale Amber	1/2	3500K to 3200K (300deg-)		1/8 CTO (+27)223		1/8 CTO (+26)223	1/8 Straw (+20)3444	+25
81C	Pale Amber	1/2	3600K to 3200K (400deg-)						+35
81D	Amber	2/3	3700K to 3200K (500deg-)	1/4 CTO (+40)1552 (Pale Honey 364)	1/4 CTStr (+42)443	RoscoSun 1/4 CTO (+42)3409	1/4 CTStr (+42)443	1/4 Straw (+42) 3443	+41
81EF	Amber	2/3	3750/3800K to 3200K (600 deg-)		1/4 CTO (+64)206		1/4 CTO (+53)206 1/4 Str 443	Warm Straw 608	+55

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Filter	**Color**	**Exp.Inc**	**Conversion**	**GamColor**	**Lee**	**RoscoLux**	**R/EColor**	**CineGel**	**Mired**
85C	DkAmber	2/3	5500K to 3800K (4900K to 3200K) (1700deg-)	½ CTO (+79)1549 (Amber Blush 360)	½ CTStr (+81)442	RoscoSun 1/2 CTO (+81)3408	½ CTStr (+81)442	1/2 Straw (+81)3442	+81
85	DkAmber	1	5500K to 3400K (5300K to 3200K) (2100deg-)		½ CTO (+109)205		½ CTO (+87)205		+112
85B	DkAmber	1 1/3	5500K to 3200K (2300deg-)	3/4 CTO (+125)1546	3/4 CTO (+124)285	RoscoSun 85 (+131) 3401	3/4 CTO 285	RoscoSun 3/4 CTO (+131)3411	+131
	Deep Amber	1 ½	5500K to 3000K (2500deg-)	Full CTO (+146)1543 (Honey 343)	Full CTO (+159)204 Full CT Str (+160)441	RoscoSun CTO (+167) 3407	Full CTO 204 Full CTStr 441	Full Straw CTS (+160) 3441	+160
	Extra Amber	2	10000+K (daylite) to 2800K (7200deg-)	Extra CTO (+240)1540 (Coral 335)		RoscoSun Double CTO (+320)3240			
	Dk Amber	1 2/3	6000+K to 3200K (2800deg-)		HMI to Tungsten 236		HMI to Tungsten 236		

ND Filter Crossover Guide *****All Trademarks and Copyrights Apply*****

Lee = Lee Filters - RoscoLux= Roscolux - R-EColor=Rosco E-Colour (Euro)(identical to Lee) - GAM= Great American Market GAMColor - CineGel= Rosco CineGel

ND.15 (1/2 Stop)	Lee 298	R-EColor 298	Gam 1514	RoscoLux 397	CineGel 3415	
ND.3 (1 Stop)	Lee 209	R-EColor 209	Gam 1515	RoscoLux 97	CineGel 3402	
ND.6 (2 Stops)	Lee 210	R-EColor 210	Gam 1516	RoscoeLux 98	CineGel 3403	
ND.9 (3 Stops)	Lee 211	R-EColor 211	Gam 1517		CineGel 3404	
ND 1.2 (4 Stops)	Lee 299	R-EColor 299	Gam 1518			

I originally made up this chart to help me with my own still photography because I felt I could use gels instead of buying those ridiculously expensive Glass filters for my camera. I got info from various sources and ended up with the precursor to this table. It came in handy at work (set lighting) more than once and this table was the result. Quite often, a Cameraman or Gaffer will call for a specific color correction - and there is not enough room on the truck for ALL the possibilities - This is a listing of gels that are as CLOSE as possible. Mired shift data is based on the GLASS color filter AND/or averaged between close colors. If confused about MIRED, please read the included article below. Feel free to contact me with more info at JFranz2777 @ AOL.com - Thanks to all who helped-

Abridged from: <u>Let There Be Lighting</u>: by Andy Ciddor --Color Temperature: The Battle Rages On

There are a formidable variety of correction filters available to aid us in the battle of the color temperature. In their simplest applications, correction filters are intended to adjust the color temperature of full spectrum (black body) light sources to match shooting conditions and available light sources. Color Temperature Orange (CTO) filters shift the color temperature downwards and Color Temperature Blue (CTB) filters shift the color temperature upwards. In theory, full CTB is intended to shift a standard 3200K incandescent studio lamp up to 5700K (the color of summer sunlight), while a full CTO is intended to shift 5700K daylight down to match 3200K incandescent lamps. In practice, no two brands of CTO and CTB filters are the same and are not always safely interchangeable.

Here is a test that you can perform. Take a piece of full CTO filter and a piece of full CTB filter, place one in front of the other (the

order is unimportant) and look at a white surface through the combination. What you should see is the white surface, but at reduced brightness (the same effect as a neutral density filter).

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What you probably also see is a color shift in the white surface due to the upwards and downwards color temperature corrections not being equal. The results of an in-depth survey (picking up the two swatch books laying within arm's reach on my desk) revealed that the filter book with the yellow cover produces a noticeably warm gray, while the one with the blue cover produces a slightly green gray. Doing this test between different brands of correction filter produces even more interesting evidence of color inconsistency.

THE VALUE OF MIRED

On closer examination, the specifications for the different brands of filter quote different correction factors, despite giving very similar descriptions of the filter's functions. Color correction factors are usually quoted in Mireds, a measurement system with long history in color photography. Mired is an acronym for MIcro REciprocal Degree, a measurement derived by dividing one million by the color temperature in Kelvin. For example 3200K is 313 mired (1,000,000 ÷ 3200) and 5700K is 175 mired (1,000,000 ÷ 5700). Therefore the filter needed to correct from studio incandescent to summer d aylight is 137 mired and the reverse, from 5700K to 3200K, requires a -137 mired filter.

Mireds have proved really valuable for selecting correction filters. Although the color temperature shift produced by a filter is dependent on the color temperature of the light source it is correcting, the mired shift for that filter is always the same. The CTB correction from 3200K to 5700K produces a 2500K (-137 mired) shift, however the correction from 3600K (278 mired) to 6100K (164 mired) is also a 2500K shift, but its mired shift is -113, which equates to a Lee 3/4 CTB filter. One of the major benefits of using mireds is that you can add and subtract mired values to get the mired shift needed for a particular job. Surprisingly enough, a Cinegel 1/2 CTO correction (81 mireds) has the same effect as combining two Cinegel 1/4 CTO corrections (42 mired), and a Lee 3/4 CTB (-112 mired) is equal to combining a Lee 1/4 CTB (-35 mired) with a Lee 1/2 CTB (-78 mired).

In practice, there is rarely a circumstance where a single off-the-shelf filter will solve the mismatches between light sources. Our 5700K daylight reference point of northern hemisphere summer sunlight is almost never the actual color temperature that we need in our pictures. If our shot is not in direct sunlight, or not in the middle of the day, or not in the summer time, then using a tungsten camera light for fill on a daytime shot, we usually require more correction than that offered by a single full CTB. A Double CTB (-260 mired or -274 mired, depending on where you shop) kicks your color temperature up into the 10,000K range.

NO STANDARD DAYLIGHT

On the other hand, if there is effectively no such thing as "standard daylight" outside a standards laboratory, how can we rely on an HMI or other Metal Halide "daylight" source to provide the appropriate fill in for our daylight shots? The answer of course is that we can't use "Metal Halide daylight" straight from the can: we (usually) have to spice it up a little to make it work.

Other than direct sunlight, which can range from 1500K at dawn/sunset to around 5000-6000K in the middle of a summer's day, the majority of daytime light comes to us via reflections off clouds, the sky and everything else around us. The huge blue sky component of this reflected light can easily shift the color temperature up into the 10,000K to 16,000K region. This is what we are unconsciously adapted to seeing in a picture-a warmer key source of sunlight, filled in by much cooler sky light.

If we don't follow this pattern in our own lighting setups, we can produce a look that our audience will identify as artificial, even if they can't pinpoint the reason. The daylight fill that we add to a typical talking head shot should probably be at least a thousand degrees or two cooler than the prevailing key source. It may seem a little odd at first to be correcting daylight sources with daylight filters, but this is the mark of an enhanced, naturalistic picture.

When dealing with conversions (in either direction) between tungsten light and daylight, be very wary of relying on the labels on the lamps or filters. Just because it's labeled "Daylight" doesn't mean that it will do the job for you in all circumstances. Your eye, or better still a color monitor or color meter, will give you a good indication of whether or not you are within the right color-temperature ballpark.

Applying a layer of CTO over a window so that you can use tungsten light for an interior shot often results in the window looking way too blue. The chances are that the light coming through the window is well above the 5700K for which CTO is intended to correct. Try out a full CTO combined with a 1/4 CTO for a healthy 220+ mired conversion that will deal with 12,000K skylight. If the shot shows that you are looking through a window, be careful to leave the exterior looking just a little bluer than the interior, because that's what the audience expects to see.

Despite the numbers and the formulae, color temperature correction is much more of an art than a science. The numbers are a big help in looking for the right solutions. However they rarely provide you with answers that will look great, rather than merely adequate.. Becoming an artist with color temperature correction firstly involves very careful observation of the way light behaves in the world. Next, grab a camera, a few lights and a selection of conversion filters and try some looks out for yourself. It's only then that you discover tricks like using uncorrected tungsten for fill in the last fleeting moments of a sunset.

Andy Ciddor has been involved in lighting for more than three decades