Black and White Contrast Filters

Various Photoshop Channel Mixer RGB percentages can be set in Monochrome mode to replicate typical B&W contrast filters. For example:

	RED	GREEN	BLUE
Yellow	60%	28%	12%
Orange	78%	22%	0%
Red	90%	10%	0%
Green	10%	70%	20%
Blue	5%	15%	80%
Infra Red	-30%	+200%	-70%

More exact equivalents can be derived from the transmission spectrum of a specific filter. For example Kodak's Handbook of Photographic FIlters tabulates the percentage wavelength transmission from 400nm to 490nm (Blues), 500nm to 590nm (Greens) and 600nm to 700nm (Reds) in 10nm intervals for many Wratten filters. Averaging the transmission percentages for the Red, Green and Blue ranges, adding them together and then normalising to 100% (ie. by dividing into 100) will produce the relative Channel Mixer percentages for each filter. For example:

	RED	GREEN	BLUE
Wratten # 8 (Yellow)	50%	47%	3%
Wratten # 11 (Yellowish-Green)	16%	71%	13%
Wratten # 15 (Deep Yellow)	60%	40%	0%
Wratten # 21 (Orange)	72%	28%	0%
Wratten # 23A (Light Red)	88%	12%	0%
Wratten # 29 (Deep Red Tricolor)	100%	0%	0%
Wratten # 47B (Deep Blue Tricolor)	0%	0%	100%
Wratten # 61 (Deep Green Tricolor)	0%	100%	0%

In the absence of published wavelength transmission data, a spectrophotometer such as an EyeOne Pro (www.xrite.com) can be used with a program like Babel Color CT & A (www.babelcolor.com) to measure the filter's transmission spectrum at 10nm intervals. Saved as text data rather than a graph will enable the above formula to be easily applied.

nm	400	410	420	430	440	450	460	470	480	490	500	510	520	530	540	550	560	570	580	590	600	610	620	630	640	650	660	670	680	690
%	0	0	0	0	0	0	0.2	1.8	7.6	20.0	34.7	49.1	64.8	78.0	85.3	89.4	89.7	90.0	90.1	90.2	90.2	90.3	90.4	90.5	90.5	90.6	90.6	90.6	90.7	90.7

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Different Photoshop Channel Mixer Monochrome RGB combinations can be saved as B&W Contrast Filter settings and quickly reloaded for evaluation on each new image.

Original RGB Image

Wratten # 8 Yellow (50%R 47%G 3%B)

Wratten # 23A Light Red (88%R 12%G 0%B)

Wratten # 61 Green (0%R 100%G 0%B)

Wratten # 47B Blue (0%R 0%G 100%B)

Mild Infra Red (-30%R 200%G -70%B)

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