FINDING VC PAPER GRADE #2; EYEBALL CALIBRATION

by

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If you are doing film testing following my procedure outlined in my book, "The Film Exposure Workbook" or Fred Picker's "Zone VI Workshop" or any other simple calibration methods, commonly known as 'Visual' testing, you need to calibrate your film to a grade #2 paper. Visual film testing works well. It is easy, and requires nothing but your time. The only thing that can be trouble is if you choose to use a Variable Contrast printing paper.

How do you know exactly which filter, or setting, gives you a true grade #2 contrast? Each manufacturer publishes guidelines for contrast adjustment. You can use a set of VC filters; some manufacturers give you approximate settings for a color head; if you have a VC head, what settings for the blue and green grid do you use? If you calibrate your developing time to something other than a grade #2, you can end up with negatives that are difficult to print.

GRADE	log ER
#5	0.50 – 0.65
#4	0.65 – 0.80
#3	0.80 – 0.95
#2	0.95 – 1.15
#1	1.15 – 1.40
#0	1.40 – 1.70

Table 1
These values define paper grade as a function of log Exposure Range as described by ANSI method ANSI PH2.2-1984.

What is needed is a way to know where grade #2 lies, whether using filters, a dichroic color head, or a VC head in the darkroom. Wouldn't you rather have a better idea of what settings, or filters, actually produce a #2 paper grade within some reasonable amount of certainty before you do those film tests?

What is needed is a standard for measuring paper contrast. Fortunately, there is a standard for determining the contrast grade of B&W printing papers. Table 1 outlines paper grades as they relate to the printed log Exposure Range (log ER) of a paper as described by ANSI method ANSI PH2.2-1984. It does not matter what type of light source is used, whether an adjustable head, or a VC filter set. If you can find the log ER for any particular filter, or light source setting, this chart will tell you the equivalent paper grade.

So, the question now is, how do you find the log ER of the paper? If you are interested in the scientific approach to calibrating VC papers, take a look at my article "USING BTZS TO CALIBRATE A VARIABLE CONTRAST COLD LIGHT" originally published in the Sep/Oct 2007 issue of View Camera Magazine. Also, if you are interested in more information about VC papers, I would suggest you look up this article, since it goes into more detail about the origins and workings of the paper and how the color of the light creates varying contrast. This article is also available on our web site.

The trouble with this method is that it is just way too complex. This highly 'scientific' approach requires some expensive equipment and a computer, or at the least, that you make measurements and plot curves by hand. I feel too much technical jabber gets in the way of creativity. All you need to know in order to run your film tests is how to produce a grade #2 contrast with your chosen paper and equipment.

What if I told you that you can easily find the approximate grade #2 setting, or filter, for any VC paper, within a reasonable degree of accuracy, using nothing but a Stouffer 21-Step Tablet and your eyes? This visual method is pure simplicity. Using the 'scientific' method outlined in my previous article you need an expensive reflection densitometer to read the log ER of the test paper. But in reality, all the information you need is the approximate number of steps visible on the paper between pure white to pure black, and each step must be calibrated in some known value of exposure.

log ER	Grade
0.35	6 1/2
0.43	6
0.50	5 1/2
0.58	5
0.65	4 1/2
0.73	4
0.80	3 1/2
0.88	3
0.95	2 1/2
1.05	2
1.15	1 1/2
1.28	1
1.40	0 1/2
1.55	0
1.70	-0 1/2

Table 2
Dividing the log ER ranges into half grade increments makes for a more accurate portrayal of paper grade as it relates to log ER values.

The test is easily done using a Stouffer 21-Step Tablet. Each step on the tablet is exactly separated by one half (1/2) stop. The measured density of the step wedge increases by 0.15 log units per step. So, if you print the step wedge onto your test paper and count the number of visible steps produced by the paper, then multiply by 0.15, you will have the log ER, within a reasonable amount of accuracy, for any particular VC setting. For film testing purposes, you are looking for the setting, or filter, that yields a log ER close to 1.05. If you count seven (7) distinct steps from black to white then; 0.15 x 7 = 1.05. Look up the log ER of 1.05 and you have a grade #2 setting.

NOTE: *To find the grade of a particular paper, you will need to make test exposures using several settings, or filters. You want to first find an exposure that centers the gray steps on the test paper. There should be several steps that are pure black ranging from step 1 up through about 6 to 7, and pure paper white from about step 15 up to 21. If you are using filters, be sure to make one test sheet with no filter. Be sure to process each test sheet exactly the same and examine them dry. Do not forget to write the VC setting, or filter number, on the back of each sheet. Keep in mind that if you are a contact printer, then contact printing the step wedge will get you very close. On the other hand, if you enlarge your film, your calibration will be more accurate if you make your test prints by enlarging the step*

wedge. Either way, having some information, even if it is only close, is better than absolutely no information.

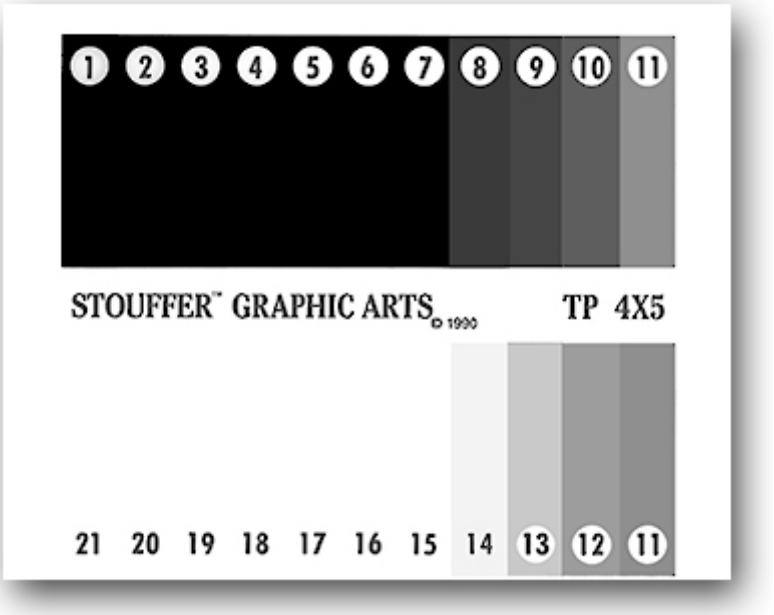

Figure 1
In this example, you can clearly see seven steps between pure white and total black. This would be a grade #2 paper contrast.

EXAMPLE: *Refer to Figure 1. Begin by looking for the first signs of anything other than paper base white. This occurs with step #14 in the example. Next find the last hint of dark tone before total black, this would be step #8. Now count the total number of steps. Notice that step #11 is repeated in each row, do not count it twice. In this example there are seven (7) distinct steps. Then the log ER would be; 0.15 x 7 = 1.05. Look up the DR of 1.05 in the chart (Table 2) and you have a grade #2 paper. Simple!*

Once you find grade #2 for your chosen VC paper, you can continue with your film EI and developing time tests. The above example is all the information you need in order to achieve proper film calibration. Once you know the settings, or filter, that produces a correct grade #2 contrast, your film calibration will be valid.

When you have completed film testing, you can run more visual paper tests to check for the contrast range and settings of any particular VC paper you wish to print with using this visual method. Just make a test print with each filter, or a range of settings of your enlarger head, visually find the log ER, and you can make a table of settings, or filters, that are calibrated to a known value of contrast. The most important thing is to record your findings and keep them in your darkroom notebook for easy access. It is a good idea to test every VC paper that you use so that you will know how each will respond. This information is particularly good to have if you decide to change papers during a printing session. If you know where you are contrast wise on one paper, you can easily dial up the same grade on the second paper for a starting point without having to guess.

No matter how far you choose to go with your visual paper testing, you can, at the least, use this method to find grade #2 and be sure your film testing is valid. This is not rocket science, it is not mathematically dead on, but it will get you close enough for the creation of your art with a minimum investment of money and time. I firmly believe that your time is better spent making photographs, not measuring, plotting, and testing.

Eyeball calibration really is simple, quick, easy, and inexpensive.

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References

NOTE: You do not have to use a Stouffer step wedge. Kodak and others made step wedges in several different formats. You can sometimes find these used. All you need is a step wedge that is calibrated to some known density per step. You do not need a precision calibrated 'certified' step wedge for this test.

Transmission Step Wedge
Stouffer Industries, Inc http://www.stouffer.net
Bostic & Sullivan http://www.bostick-sullivan.com

BTZS:
The book *Beyond the Zone System* by Phil Davis along with the BTZS Plotter software and Stouffer Step Tablets are available from The View Camera Store, Inc., P.O. Box 19450, Fountain Hills, AZ 85269
http://www.viewcamerastore.com

Beyond the Zone System BTZS.org B&W Photographic Community
http://btzs.org