GUIDE TO

Variable-Contrast Papers

Despite industry turmoil, a range of paper choices remains; find out which is best for your work

by **Fred Newman**

Those who still enjoy going into the darkroom to process film and make prints the old-fashioned way still have a reasonable number of options: There currently are about 10 variable-contrast fiber-based glossy papers available (four are warm toned, while the other six are neutral or coldtoned). Ilford even is talking about coming out with a new paper, a cold-toned, fiber-based paper to complete its line.

Not all the news is good, however: you've probably heard that Kodak will be discontinuing black-and-white photographic papers in about a year. It's quite sad because its Polymax Fine Art paper is a favorite of many photographers and will be missed.

That's the basic landscape. With companies going out of business, scaling back, or tinkering with their paper formulas, black-and-white photographers need to know their current paper options. Therefore, for this article, I tested most, if not all, of the variable-contrast, double-weight glossy papers that are readily available without a special order. All of these papers are available in sizes from 8×10 inches to 20×24, and most are available in 42-inch or larger rolls. I'm including Kodak, both because it's still available for the moment, and to give those in search of a replacement an idea of where it stands in relation to other papers.

I determined the exact response curves of each paper and the filter numbers they actually respond to on my enlarger. Not all papers actually offer 00 to 5 contrast—some reach no further contrast than filter 4, or don't respond before filter 1.

Testing procedure

The main reason for calibrating variable-contrast papers with your own enlarger is that what a manufacturer states about their paper is not done under the same conditions as you have in your darkroom, with your enlarger, chemistry, water, and temperature, and so on. Also, even though my enlarger has a dichroic head, results vary from enlarge to enlarger. The testing procedure for calibrating your enlarger is the one we teach at our BTZS (Beyond the Zone System) workshops and is described in Phil Davis's book *Beyond the Zone System*, 4th edition.

To carry out this test, project a 21-step step-tablet through your enlarger. Make a print of that step-tablet using each paper you're testing, using either variable-contrast filters or the filter settings on your enlarger. The step-tablet features 21 steps that are ½ f-stop apart. Expose the paper so that you have a few black steps at one end and a few pure-paper white steps on the other end.

I used Ilford variable-contrast filter grades 00, 0, 1, 2, 3, 4, and 5. You also could measure the ½ steps (grades ½, 1½, etc.). With dichroic heads, you can measure in 15cc or 30cc steps for both the cyan and magenta filters. Once you've processed your paper, you should record all relevant information such as enlarger height, lens used, f-stop, exposure time, developer and dilution, and the paper used, so the next time you want to calibrate a paper you have a starting point rather than starting over. Having everything calibrated made testing 10 papers easier. Phil Davis also developed the Plotter program, which makes calibrating films and papers easier. The densities of each of the steps for each of the filter grades are read on a reflection densitometer and entered into the Plotter program, which plots the paper curve for each of the grades and calibrates the actual grade for each filter. You get individual curves for each filter and a graph showing the actual grade of each paper's response for filters 00 to 5. This test is not a lot of work, and from start to cleanup should take less than one hour.

Choosing a paper

Now comes the hard part—how do you choose a paper? I'm sure you've seen beautiful prints made on some or most of the papers tested, but that doesn't mean each paper is equally good for every kind of negative.

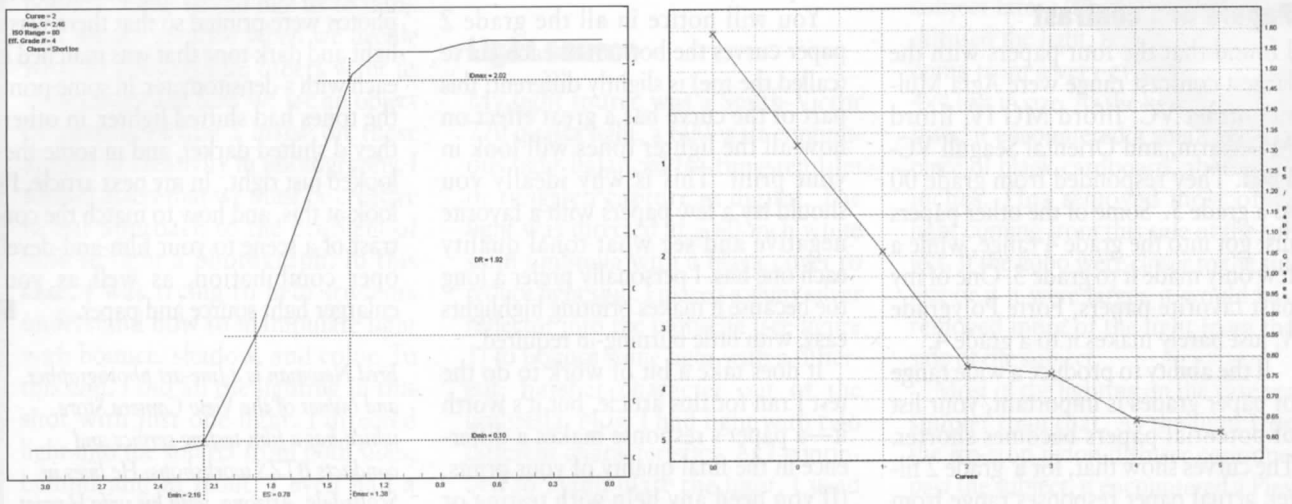
In choosing a paper, you first have to decide what is important to you: do you prefer cold/neutral tone or warm-toned papers? How important is the ability to tone your paper? When put in selenium toner, the blacks in Ilford MG IV and Kodak papers just got blacker, while the blacks in Forte Polygrade V and Oriental VC-FB became purplish—a look that a lot of photographers like.

Choosing a paper is very personal and a tough decision. A few years ago when I did a test for myself to help me decide what paper I was going to work with, I tried printing a negative I really liked on a few different papers. The paper I ended up with was Forte Polygrade V. The negative I worked with had a lot of delicate whites, and with this paper it was quite easy to print. I was able to make a straight print with only a bit of edge burning, and it looked just right.

For this test, I included the grade 2 paper curves (which normally have the same contrast as using no filter at all, and therefore reveal the native response-curve of a paper), and graphs containing all the paper grades. As you can see from the paper-grade graphs, not all papers produce a true grade 5—some barely get a grade 4. For these graphs, the vertical axis on the left represents paper grades (the usual 0 to 5), while the right depicts exposure scale. A grade 2 paper can have an exposure

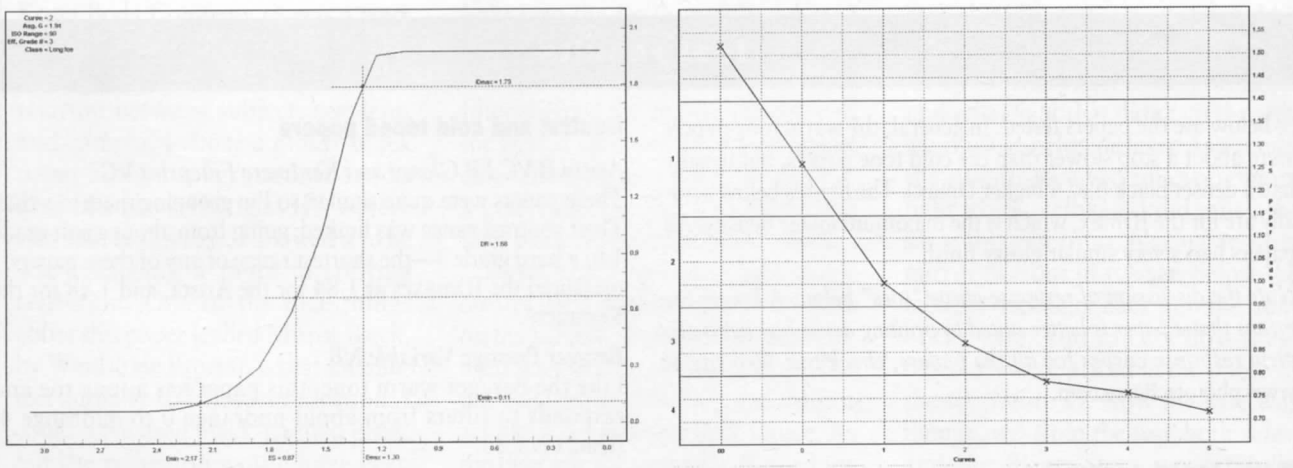
Paper Curves

Agfa



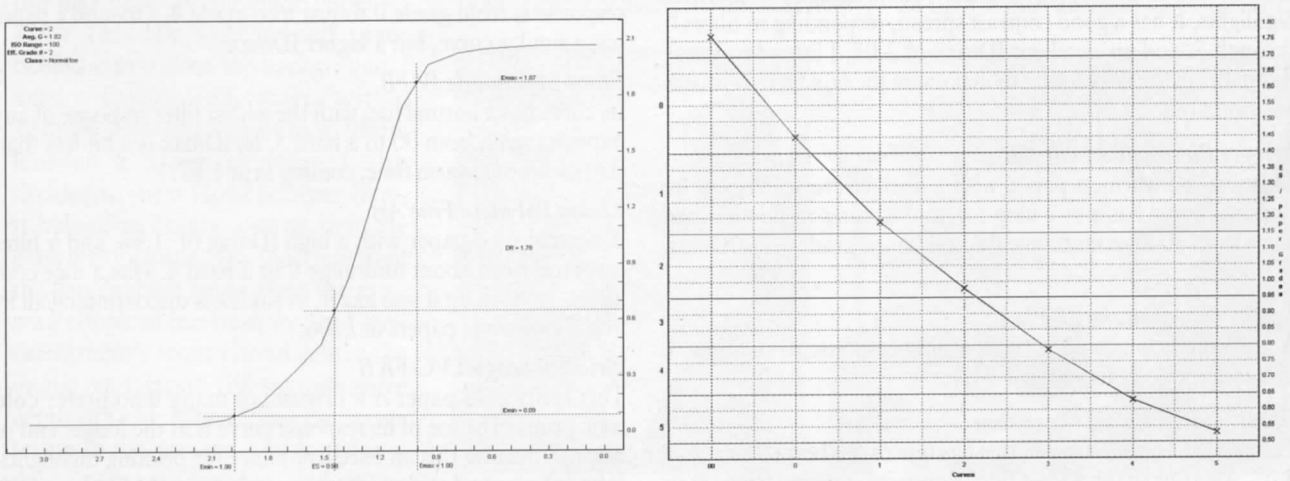
Agfa's Multicontrast MCC 111 FB warmtone has a short toe and a good range of filter responses.

Bergger



Bergger's Prestige Variable CB, a warmtone paper, has a longer toe than the Ilford, but a shorter range of filter responses.

Ilford



Ilford's Ilford Multigrade IV FB coldtone has a normal toe and responds to the full range of variable-contrast filters.

scale ranging from .95 (hard grade 2) to 1.15 (soft grade 2).

Papers and contrast

I found that the four papers with the largest contrast range were Agfa Multicontrast VC, Ilford MG IV, Ilford MG Warm, and Oriental Seagull VC-FB II. They responded from grade 00 to a grade 5. Some of the other papers just got into the grade 4 range, while a few only made it to grade 3. One of my past favorite papers, Forte Polygrade V, just barely makes it to a grade 4.

If the ability to produce a wide range of paper grades is important, your list of potential papers becomes shorter. The curves show that, for a grade 2 filter, actual paper responses range from grade 4 to grade 3 to grade 2. If you like a particular paper and it responds at grade 3 for a #2 filter, you may want to start printing on it with a #1 filter (which might actually produce a grade 2 response).

You will notice in all the grade 2 paper curves the bottom of each curve (called the toe) is slightly different; this part of the curve has a great effect on how all the lighter tones will look in your print. This is why ideally you should try a few papers with a favorite negative and see what tonal quality each one has. I personally prefer a long toe because it makes printing highlights easy, with little burning-in required.

It does take a bit of work to do the test I ran for this article, but it's worth it—a paper's response makes a difference in the final quality of your prints. (If you need any help with testing or more information please e-mail me.)

A few years ago in one of our BTZS workshops, Phil Davis made a series of prints from the same negative on many different papers—the prints looked quite different from one another. The photos were printed so that there was a light and dark tone that was matched in each with a densitometer. In some prints the tones had shifted lighter, in others they'd shifted darker, and in some they looked just right. In my next article, I'll look at this, and how to match the contrast of a scene to your film-and-developer combination, as well as your enlarger light source and paper. ■

Fred Newman is a fine-art photographer and owner of the View Camera Store, which has a film-testing service and conducts BTZS workshops. He lives in Scottsdale, Arizona, with his wife Harriet. He can be contacted at the View Camera Store at fred@viewcamerastore.com or 480-767-7105.

Test results

Below are the papers tested. In general, the warm tone papers were about a stop slower than the cold tone papers, but usually had a denser black (i.e., a higher Dmax). The figures below actually are for the IDmax, which is the maximum image density. All papers had a very similar glossy finish.

Note the discussion of response-curve "toes" below. A longer toe means that a paper is better suited to printing dense highlights. To view response curves for all the papers, check our Web site at www.phototechmag.com.

Warm-toned papers

Agfa Multicontrast MCC 111 FB
To my surprise, this moderately warm paper—formerly long-toed—now has a short toe, making it challenging to print dense highlights. It has a good contrast spread, responding to filters 0 through 5, and an excellent IDmax of 2.02. I intend to retest this paper in the near future to make sure the box I tested wasn't an anomaly.

Bergger Prestige Variable CB
This was the warmest paper, with a distinct brownish cast. Its response curve has a nice long toe, and its filter-response range went from about a midrange 0 to midrange grade 4. Its IDmax is 1.83.

Forte Polywarmtone FB Plus
A moderately warm paper with a filter response from about 1 to midrange 4. Its IDmax is 1.91.

Ilford Multigrade FB Warmtone
The second-warmest paper, this has one of the best IDmaxes at 2.02. Also one of the widest filter responses, ranging from 00 to midrange 5.

Neutral and cold toned papers

Arista II VC FB Glossy and Kentmere Fineprint VC
These papers were quite similar, so I'm grouping them together. Their contrast range was limited, going from about a soft grade 1 to a hard grade 3—the shortest range of any of these papers. I measured the IDmaxes at 1.84 for the Arista, and 1.88 for the Kentmere.

Bergger Prestige Variable NB
Like the Bergger warm tone, this paper has a long toe and responds to filters from about midrange 0 to midrange 4. IDmax is 1.83.

Forte Polygrade V FB
The nice long toe of its response curve makes this one of my favorite papers, though its IDmax was only 1.69. A good paper for selenium toning, turning a purplish blue-black. Its filter response is from grade 0 to just into grade 4. Oriental's paper has a similar curve, but a higher IDmax.

Ilford Multigrade IV FB
Its curve has a normal toe, with the widest filter response of any paper, ranging from 00 to a hard 5. Its IDmax is a bit less than that of Ilford's warm tone, coming in at 1.87.

Kodak Polymax Fine Art
A normal-toed paper with a high IDmax of 1.98, and a filter response from about midrange 0 to a hard 4. Has a nice cool tone—so stock up if you like it, as Kodak is discontinuing all its black-and-white papers in 2006.

Oriental Seagull VC-FB II
This fairly cold paper is a favorite of many who prefer cold tone prints. The toe of its response curve is at the longer end of normal, making this an excellent paper for printing highlights. It had the second-widest filter response, from 0 a hard grade 5, and a IDmax of 1.91.