Who Says Film is Dead?

KODAK'S NEW T-MAX 400-2 FILM SHOWS AN OLD DOG CAN LEARN NEW TRICKS

Test image. *Taken in low light, this negative is nearly as fine-grained as T-Max 100 but required a much shorter exposure time.*

BY FRED NEWMAN

I was one of many surprised when Kodak announced an improved version of T-Max 400 film. I thought that T-Max 400 was a really good film and wondered how were they going to improve it—and why?

Kodak found in a 2007 survey that there was an ongoing commitment to black-and-white film. They decided to improve both the grain and sharpness of T-Max 400, and it took them 18 months to do it. Large-format photographers who used a UV light source to print platinum/palladium were bothered by the UV dye layer on the back of the old T-Max 100 sheet film (it protected the film against static electricity). The new T-Max 400-2 is free of UV dye in both 120 and sheet film, though 35mm T-Max 400-2 does have the UV dye layer.

Testing the film

As you can imagine, I was quite excited to test this new film, and did so with both 35mm and 4×5 sheet film. All testing was done by BTZS (Beyond the Zone System) film-testing methods. A number of years ago, Phil Davis (inventor of that system) tested nine films and five developers for an article for our *D-Max* newsletter. The two developers that came out best in those tests were Kodak D-76 and Ilford DDX. I became a big fan of Ilford DDX,

which I used to test the new T-Max. First, I don't like mixing chemistry from powders and prefer diluting liquid chemistry such as DDX. Also, DDX seemed to have a higher film speed for most films than most other developers did.

I did three tests of T-Max 400-2: one of 35mm film and two of 4×5 sheet film. I also have included three older tests for comparison: T-Max 100 4×5, 35mm T-Max 400, and the older T-Max 400 4×5. In BTZS film testing, five rolls or sheets of film are contact printed using a 21-step step tablet and an enlarger light source for a specific time and light intensity. My setup has been calibrated, and my exposure for a 400-speed film is 0.4 seconds at 2 EVs. The film is then developed for 4, 5.5, 8, 11, and 16 minutes. I used a shorter sequence for the T-Max 400-2 test, because I was just looking for normal developing time and film speed.

I processed the 35mm T-Max 400-2 film in a Jobo 2500 series tank using an ATL 3 processor. I diluted DDX developer 1+9 at 75°F. I have standardized on 75° for all my processing because in Arizona, where I live, our "cold" water runs 75°–90°F in the summer.

I processed one film test in a Jobo 3010 drum, the other in 4×5 BTZS film tubes. The three comparison tests (T-Max 100 and older T-Max 400) were also processed in the Jobo 3010 drums, while the older 35mm film was processed in Jobo 2500 series drums. I always use a 5-minute water presoak with Jobo tanks, but with not with BTZS film tubes.

Whenever I try a new film and developer combination, I initially run just the 4-minute test to make sure I'm using the right dilution to produce the correct contrast. I look for a subject brightness range (SBR) of 9 stops. (A normal subject has an SBR of 7 stops, so an SBR of 9 is two stops more contrast than normal.)

Tests and results

Once I read the densities of the 21-step tablet and print and record them in the Plotter Program for PC, I can see if my dilution is correct. The Plotter Program was designed by Phil Davis and does all the analysis for you. The analysis chart for the 4-minute curve shows the SBR in the box on the right (black box with white type). The dilution of the developer is adjusted (increased dilution or decreased dilution) if necessary. My normal dilution for most films is 1+9, but I had to increase the dilution to 1+12 for the 4×5 T-Max 400-2 processed in the Jobo with a presoak. A 1+9 dilution was fine for 4×5 film processed in BTZS tubes and for the 35mm film. The two comparison tests used DDX diluted at 1+9.

All the charts for the six film tests are available online at the *PHOTO Techniques* Web site, www.phototechmag.com/Tmax400.htm. *[Due to space considerations, we're only presenting two graphs here, average gradient versus development time for the old and new versions of T-Max 400 4×5 film, which are figures 2c and 2d.]*

Figures 1a–1f represent the curve family chart, as it summarizes the film test. The curves show the film curve for all five developing times. On each curve, small boxes

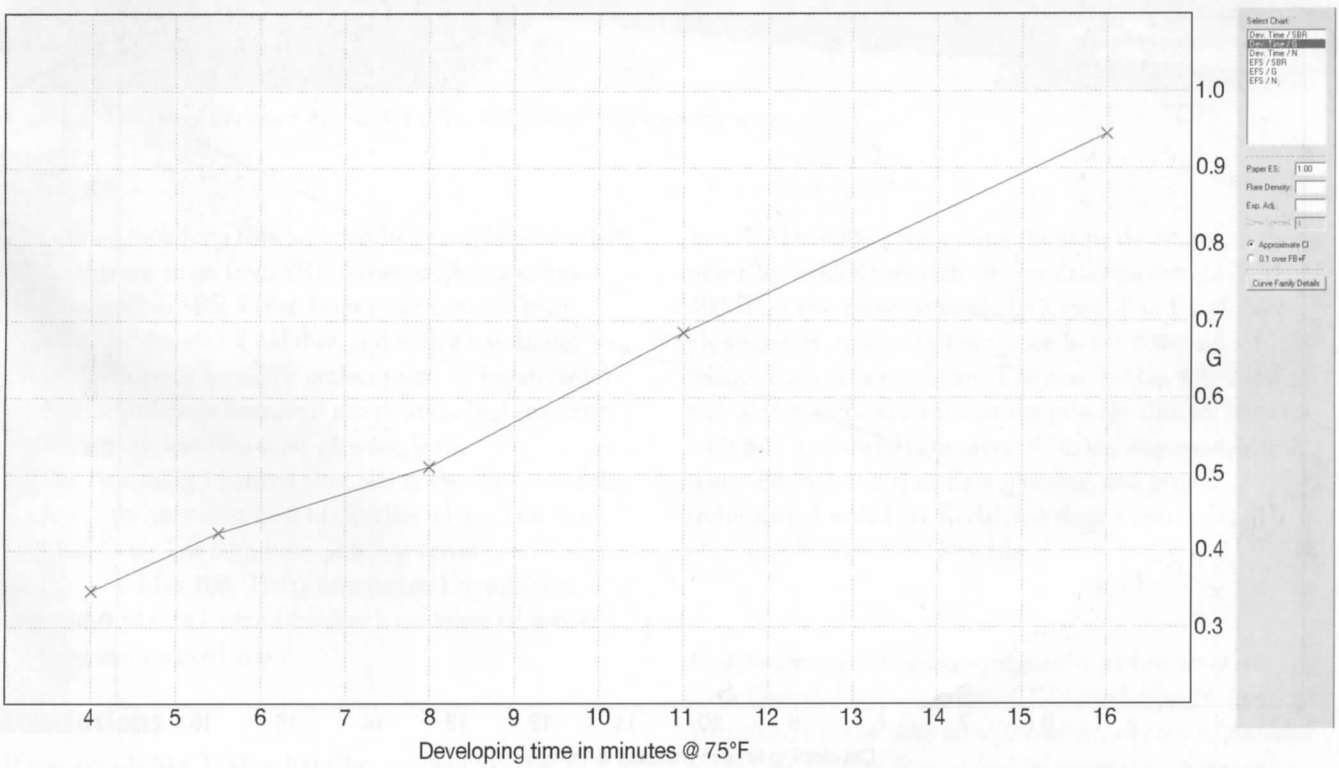

Figure 2c. *T-Max 400 (old) 4×5, in Ilford DDX diluted 1+9 at 75°F, in a Jobo drum.*

show from left to right: developing time, film speed, average gradient, and SBR. For large-format film tests I like to see the SBR go from 5 to 9. Figures 2a–2f graph the SBR versus developing time in minutes. Figures 3a–3f graph SBR versus effective film speed. For a better understanding of the BTZS film testing procedure, please read the article by Phil Davis, *How to Read a Film Test*, on the BTZS.org Web site.

Notice that for the 35mm film, a flare density of 0.02 is used and there is no flare density for the 4×5 film. For roll films, you can read the normal developing time and film speed off charts 1c and 1d. So the normal developing time for the 35mm T-Max 400 (old) is 8 minutes with a film speed just a bit over 400 (⅙ stop), while for the new T-Max 400-2, 35mm is about 7 minutes, 20 seconds with a film speed of 400. I graph the average gradient versus film speed, and the average gradient versus developing time to determine the film speed and developing time. I like the idea of having a 35mm film that is a true 400-speed film, especially when you can't use a tripod (as in street photography).

For the 4×5 films, I used a flare density of 0.0 since the developing time, film speed, and reciprocity are imported into the Expo/Dev program for the Palm Pilot when using the Power Dial (both developed by Phil Davis). For more information about the Expo/Dev program go to the BTZS.org Web site and check out the software section.

The first thing I noticed in doing these tests was that the T-Max 400-2 sheet film was more contrasty than the older one—I had to increase the dilution from 1+9 to 1+12 to get similar results. Interestingly, the actual densities, film-curve shapes, and film speeds are all quite similar. There are differences but nothing significant. The T-Max 400 (old) has slightly higher densities for step 21 than the other test, but the densities of step 21 for T-Max 400-2 and T-Max 100 are quite close. Now that is impressive—having a 400-speed film with similar characteristics to a 100-speed film.

I've included two photographs taken with T-Max 400-2. I used the first one (the test image on the first page of this article) to check whether the reciprocity was similar to the older film (I used the Expo/Dev program to calculate the exposure). I was quite pleased to see the reciprocity was still the same. The exposure was done with an incident meter, and the light was extremely flat in a very dark room with an EV value of 2 for both the high and low readings, for an SBR of 5. The exposure was about 2 minutes, 30 seconds at *f*/32, and the development time was 12 minutes, 22 seconds.

The T-Max 400-2 is a winner if you are interested in night and low-light photography. If the exposure in the test image had been taken with T-Max 100, it would have been 23 minutes, 42 seconds—a lot longer than the 2 minutes, 30 seconds required with T-Max 400-2. The test image is a straight scan of the negative, with no contrast adjustments.

The other photo (Figure 4) is a contrasty scene taken in my backyard, and has an SBR of 9. The high reading was taken just below the AC plug and the low reading was taken inside the beehive fire place. This is also a straight scan of the negative.

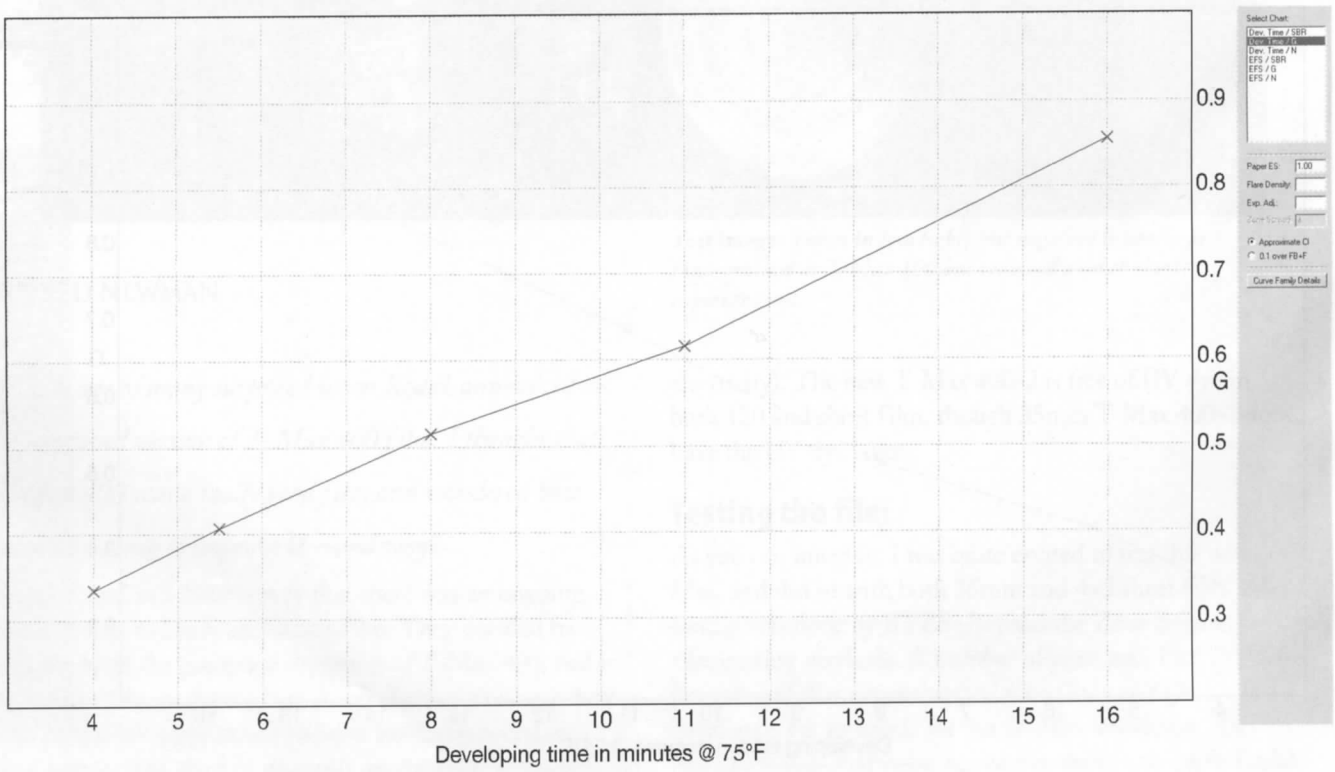

Figure 2d. *T-Max 400-2 4×5, in Ilford DDX diluted 1+12 at 75°F, in a Jobo drum.*

Figure 4. *This image illustrates how well T-Max 400-2 deals with contrasty scenes.*

I always look for a film and developer combination that will enable me to go from SBR 5 (two stops less contrast than normal) to SBR 9 (two stops more contrast than normal). T-Max 400-2 did that, and with a less diluted DDX developer it would be perfect to create negatives for alternative processes because it can produce high-contrast negatives with low film-base-plus-fog levels.

The first thing I noticed after taking the film out of the wash was the very clear look of the film edges. This new film has a very low film-base-plus-fog density and is very similar to T-Max 100. That's impressive. For roll-film users, it's a plus to have a film that has a lower film-base-plus-fog and reduced grain.

Conclusions

If you already like T-Max 400 film, you will like the improvements in T-Max 400-2. I recommend retesting the new T-Max 400-2, since using the same developer on the new film yielded very different results from the old T-Max 400. This also means it would be a great film for pinhole photography, where the f-stops are in the 100s and reciprocity is always a factor. The new T-Max 400-2 is a real winner and could become the primary film for both for both roll- and sheet-film users. With the improvements in sharpness, reduced film-base-plus-fog, and great reciprocity, I would say Kodak has done a great job for photographers that still love film. ■

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