

The Great Paper/Developer Shoot-Out

Part Four: Azo and the Azo Enlarging Light Source



Parts One and Two compared ten papers in eleven paper developers. Part Three tested thirteen papers for drydown. All are available in prior [View Camera](#) issues, or in the subscriber section of the [View Camera](#) web site, www.viewcamera.com.

Now, we turn to Azo.

The stereo magazines that used to get (until I found that the stereo dealers were getting too much of my cash!) would have equipment reviews that sometimes ended with: “I liked this so much I bought the review sample!” It was always at the end. Here, I’ll start with the conclusion: “I bought 500 sheets of Azo grade 3, and feel the urge to reprint all my best work as contact prints.” Azo wins, but it wasn’t a slam-dunk, for reasons that cite some interesting lessons. Amidol wins, too. Subsequently, I bought 500 sheets of Azo Grade 2, also.

There’s a problem in this universe, however. Kodak no longer makes Azo, and someone (we know not whom) bought the remaining rolls of Kodak’s last production run. There will be no more Azo. So why bother with this article? Well, Michael Smith tells us that he’s close to having another paper manufacturer make a silver chloride paper similar to Azo, so all may not be lost. If Michael Smith and Paula Chamlee are working on it so that they’ll have it for their own use, I think my testing Azo will be close to transferable. They have four of the sharpest eyes I have ever seen, and chances are good that any new paper will be at least as good as Azo. I have faith.

Azo

Kodak Azo is old stuff. It’s a horrendously slow speed paper designed for contact printing. It boasts a long scale, tones in highly diluted toner, and is kept alive mainly through the efforts of

Michael A. Smith and his wife, Paula Chamlee, who, in order to preserve it for their own work, became Kodak Azo dealers, and sell the paper in many different sizes. Many photographers swear by Azo, and others swear at it because it is so slow that enlarging is impractical. But how does it compare to “modern” silver papers? Paula Chamlee asked me in Monterey why I hadn’t tested Azo (I had no way to do a fair test the first time, and plenty to do anyway). She is so charming that it is impossible for anyone to say no. Michael Smith agreed to coach me on using Azo, for which I am grateful.

Enlarging on Azo

Enlarging on Azo was impractical, until an enterprising workshop student of Michael and Paula’s, Pat Brady, invented a high-output cold light head that promised to give short exposure times to Azo enlargements in Omega and Beseler 4x5 enlargers. He developed a cold-light tube that will put out enough light without melting the negative and yield printing times most people will tolerate. Pat approached me at the Large Format Conference in Monterey, and asked me if I would test the head and Azo. I said I’d think about it.

I had a dream that night about how such a test would have to be done. That’s how bad it gets. The following morning, I found Pat and agreed to do the test.

Michael Smith to the Rescue

I e-mailed Michael Smith to get Mr. Brady’s phone number to take him up on the offer of borrowing an enlarger head, and asking (begging!) for a donation of Azo to the cause. Michael counter-offered to come visit he and Paula Chamlee for a weekend, go into his darkroom, and work with Azo and my negatives. That was a no-brainer, but I thought it would be insufficient, based on my preconceived notions of Azo. I didn’t think my negatives would print well, and so would offer an unfair comparison that wouldn’t serve Azo well. Nevertheless, we worked out the details, including bringing Forte and Galerie with me to test in Amidol.

What Transpired in (Less) Dark

First off, because of Azo’s slow speed, the safelights in Michael and Paula’s darkroom almost make sunglasses necessary. A Thomas Super Safelight in an approximately 16x18 foot space had the vanes cranked up all the way, and it emitted a cheery, bright light that made working very pleasant. Points for Azo.

Michael contact prints using a 250-watt bulb suspended about three feet above a vacuum easel. He looked at my test negative and laughed: “It’s so THIN compared to our Super XX negatives.” Michael and Paula bought out Kodak’s inventory of Super XX when Kodak discontinued it, and while it stays frozen in a big freezer, it continues to acquire base fog as years go by. He told me his base densities are running .4 or so, but because Super XX can handle increased development, he can compensate.

My thin negative had him guessing exposure for Azo Grade 2 under the 250-watter. We started with a test strip (“I never make test strips,” grumbled Michael) to find minimum exposure for maximum black, which had been my original test procedure, so that we would not dump any shadow values and take what the high values gave us. We failed, because the film edge became so black so quickly that we couldn’t discern the test stripes.

Instead, Michael chose just to make the best print he could, which sets up a major lesson. After about three tries, he settled on an exposure of about 5 seconds. As he worked, we discussed his method of using a metronome, which I had read about but never actually seen anyone do. It's clear he's done it a few thousand times, and all his motions are swift and sure. I have some lingering doubts about precision and repeatability, but I sure can't quarrel based on results.

But alas! Azo Grade 2 produced a flat, dead print. Not enough stuff in the negative. But enough to give us hope with Grade 3. And in fact, after a few trials (and even a test strip again), an Azo Grade 3 contact print sat on the viewing stand and glowed. Grade 3 is radically slower, we were now using about a 35-40 second exposure time. A lesson, however: Michael cut back the development time in the Amidol from one minute to 30 seconds, and at 30 seconds carefully slid the print into a tray of water. It continued to develop more gently, taming the contrast back to about grade 2.5. That worked to maintain the delicacy of the high values while separating the shadows just enough. Points for Azo: I don't have to make special negatives to use Grade 3, and what negatives I have will work just fine.

Michael had done the selection exercise from my test prints of the same negative and, like many others, had selected Forte Elegance in Fine Art VersaPrint II as his favorite. We held it up next to the Azo print, and I was embarrassed. It wasn't even close. The blacks weren't as black as the Azo, the whites weren't as delicate and separated, but most of all the mid-tones were flat as a pancake compared to the separation in the Azo print. Michael didn't feel it was a fair comparison, however, and felt we should make contacts of Forte and Galerie in Amidol and really see how Azo measured up.

So, we did. First, we changed from a 250-watt bulb to a 15-watt bulb! Then we cranked down the vanes of the Super Safelight, making his space a lot darker, but keeping from fogging the faster papers. Exposure times were still only around 6 seconds, to give some idea of how fast projection papers are. After some work, he made Galerie looked awfully darn good, but we had to go to Grade 3 Galerie to come close to matching the mid-tone separation of the Azo. Nevertheless we couldn't hold the detail in the low shadows. We couldn't get the same contrast out of Forte, but neither could we use VC filtration under his bulb. I had a homework assignment. Forte still looked good, but it wasn't in the class of the Azo. Galerie was definitely in the class, but not at the head of it. But, more points for Azo, because we did no burning or dodging of any of the test prints, and looking at them, we would need much less, if any, with Azo than with Galerie.

But, I think, here lies the Big Lesson: Galerie looked good because Michael Smith printed it, trying his best. Any of these papers and developers I tested can be made to look really good, if one puts in the effort to do so. In this case, that the effort was put forth by one of the best printers in the world. That matters. I used a test procedure designed to try to see the character of the materials in a controlled, standard way. I most certainly did not work to make the best print I could. If I had, I would still be at it 6 months later, and I'm clearly not Michael Smith. Does it invalidate my results? No. Does it reinforce my urging to the curious to try for themselves? Yes.

Azo is a single-weight paper, the first I've used in many years, and it was strange to work with paper that seemed so insubstantial. I got over it.

What about developer? We tried VersaPrint II with Azo. Again, the results were very close, and VersaPrint II held its own. Amidol, using the water bath, had slightly less contrast and held the shadows open a bit better, and had a depth to the mid-tones that VersaPrint II couldn't quite match. More homework: VersaPrint II diluted 1:2 instead of the base recommendation of 1:1.

In the end, I think Michael and I were both surprised a little. He expected Azo and Amidol to blow away anything else. I had come, truthfully, with a little skepticism about whether

Azo was really that good. In the end, Azo and Amidol are clearly better, but it isn't quite a slam-dunk.

Enlarging Azo

We took a break to reset the darkroom. Since Michael and Paula typically only contact print, there is no enlarger in the darkroom. They have a Beseler 45 MX chassis, but it lives in their storage room. The vacuum easel went out and the enlarger went in its place. Pat Brady's Azo light source was installed over two diffusion disks instead of the usual one, which would cut the light intensity some. The light has a high UV content, and Pat supplied UV glasses and a filter for the grain focuser to mitigate bad effects on the eyes. The filter is surely necessary, but the glasses are perhaps overkill, since we were never looking directly into the light source, except to confirm that all 4 tubes were lit, and then only for a second. We used a Nikon 135mm lens at Pat's recommendation, since he said that Nikons transmit more of the UV than some others.

It went the test negative, and Azo Grade 3. After a trial, we found 40 seconds with two stops down to be the right exposure. But, we saw basically a dark stripe up the full middle of the print. We called Pat, and he said that his head was like all other cold light heads for Beseler and Omega enlargers: there's fall-off at the edges and we needed to burn in edges. Michael winced: "I never burn in edges!" I assured him that just about everybody I knew who used a cold light head on a Beseler or Omega burned in edges. So, we burned in edges on both sides pretty substantially, and top and bottom a bit. Result: gorgeous. It blows my test print on Forte away. The life in the top rocks and the local contrast in the bottom rock is stunning, and the depth of tones in the shadows is incredible. We had hoped for a comparison with Forte, but the Azo head is way too powerful for projection papers (could one sandwich a neutral density filter between the diffusion disks? Don't see why not.). More homework, since once again Michael was doing his best, rather than finding minimum time for maximum black. Can I get Forte closer? Surely. How close? The limiting factor is that I'm not Michael Smith.

Next, he printed one of my 35mm negatives on both Azo and Galerie, making 5x7 prints. No edge-burning required with the smaller negative. The results were again quite close, with Azo claiming a slight edge, being more open in the shadows and with a greater range in the mid-tones that gave the Azo print a sense of life that my best print on Forte (which I had brought) couldn't match.

Azo at Home

At home, I found that I could contact print Azo Grade 3 by removing the lens and lensboard from my enlargers, lowering the heads as far as I could while still being able to open the contact print frame, and blasting away. The contact printing exposure time for each enlarger was basically the same: I could produce maximum black though clear film with about 48 seconds. That's comparable to Mr. Brady's enlarging head, but I'm only contact printing.

The experience showed me that I did need to trim my development time for Tri-X by about 20% to get a good negative for Azo. It would print in Amidol without the water bath. Otherwise, when the highlights sang, the shadows sank.

How close could I get by trying to make the best print I could make on Forte and Galerie? Close, but not close enough. Going to Grade 3, I could match most (but not all) of the mid-tone and highlight sparkle that Azo imparted, but only at the cost of closing up the shadow detail substantially. A lot of burning and dodging got me closer, but the amount of work required was substantial. I prefer easy, and Azo was easier by far.

I tried diluting VersaPrint II more than my original 1:1 to see if that would soften Galerie's contrast. I quit trying at 1:4 after seeing no effect. That surprised me, but it seems to suggest that a working dilution of 1:2 makes VersaPrint more economical without sacrificing quality.

Amidol at Home

I bought the chemicals for Michael Smith's Amidol formula from Artcraft. We have a precise scale for measuring very small quantities, and feeling like a high school chemistry student, it took me all of 5 minutes to weigh and mix a liter of Amidol working solution. Not as easy as emptying a bottle of Dektol and diluting it, but I knew I would be using Amidol for Azo, and it seems to be a small inconvenience. Would I use Amidol for other papers? I mixed my liter according to Michael's enlarging paper formula (it adds a little benzotriazole compared to his Azo formula), and tested away. While I might want to impress my friends with black fingernails from dipping into Azo, I followed Michael's method of wearing one latex glove on my left hand, and dipping only with that. Easy, since I only developed one print at a time, and rinsed the glove in a bucket of water after each print.

Since my original testing, I have been using up papers in the inventory, so I don't have as comprehensive a list as in Part 2. I took the earlier paper tests with different developers, and added the Amidol prints to each pile. Then I did my blind ranking.

Amidol is good, and looked especially good with Ilford Multigrade IV, Galerie Grade 2, Bergger NBVC, and Bergger Prestige Elite, and Kodak Polycontrast IV RC.

Amidol costs about \$5.00 per liter of working solution, unless one buys a pound of Amidol, which I wasn't quite ready to do. Very expensive, but for Azo it is definitely worth it.

Drydown

I tested Azo Grade 3 for drydown, using an 8x10 negative and contact printing. I exposed for the high values of the negative, and made prints at -2%, -4%, -7%, and -10%. I expected a low percentage of drydown based on a conversation with Michael, where he thought that there would be no drydown at all. Paula disagreed, saying that she always made her final prints just a little lighter. To my great surprise, Azo grade 3 dries down 10 percent. Why did Michael say what he did? I think it's because he automatically compensates when he prints, whereas Paula and I do it at the end of the process in a more conscious way. That's the only explanation I can offer, since his results speak for themselves.

10% of a long exposure should be easy to do in the future.

Yeah, OK, then I contacted printed a lovely stream scene in 5x7. I got everything right, and backed off 10% for the final prints. Result: too light after they were dry. Indicating drydown of less than 10%. Time to retest, but Michael may be right after all, and one should test for one's self rather than take either Michael's or my word for it.

Other Eyes

I brought all my print tests to the View Camera Conference in Springfield, Mass. I walked everyone through the exercise of selecting a favorite paper, and then selecting a developer and development time with that paper. When they were done, I handed them my Azo test print. All

but one preferred Azo by far. One soul felt that the Azo was “too intense” for my test image. An interesting and valid response, but ultimately one with which I disagree. Suffice it to say that Azo won going away.

Conclusions

As I said at the beginning: I bought 500 sheets of 8x10 Azo grade 3, and another 500 of grade 2, which brought its cost to roughly \$.66 a sheet – very much in line with enlarging papers. I’m saving my money to get the Azo enlarging head – current price \$1,900. Once I have it, I’ll use Azo with Amidol. It’s the best I have seen. If I buy a pound of Amidol the cost-per-liter drops considerably, and Michael and Paula have been using the same batch of Amidol that Michael bought many, many years ago. We printed all day with the same liter of working solution, developing many prints and seeing no degradation, so Michael’s formula has a long tray life.

Amidol is a great print developer, but for now, I’ll stick to Dektol for the remainder of my paper inventory. I have lots of each, and plenty of enlarging paper. The projects I need to print are large and cumbersome, and I need all the convenience and economy I can wring out of them.

I have an urge to go back and reprint old favorites on Azo, but I think the urge to make new images tailored to it is even greater. Another incentive to drag out that big, heavy 8x10.

Thanks to Artcraft. Special thanks to Michael A. Smith and Paula Chamlee for their hospitality and invaluable help.