



A Breathless And Brief Introduction To Stand Development

WARNING: What follows is for the *advanced darkroom practitioner*. It is not for beginners and people should be well acquainted with safety and good darkroom practices. Pyro, in it's various forms, is TOXIC and should be handled with the utmost care and protection of eyes, hands, clothing, in well ventilated settings. You should be using a good lab apron or coat, nitrile gloves, eye protection, and a lab grade respirator mask. If you do not already have a least one film/developer combination "dialed in", don't bother with any of this.

NOTE: Please note that I periodically update this document with new findings. If you've already read it in the past, you can skip to the Updates section at the end of this document

Precis

Low- or no agitation "stand" techniques have been around since the beginning of photography. These techniques are controversial among very fine photographers. I set out to test this for myself.

The Short Version: True stand development (no agitation after initial) does not work reliably with modern films. Infrequent agitation can be made to work reliably and produces useful results ... at least for me.

Introduction

I've been a black and white silver photographer for over four decades. In that time, I've worked with a large number of films and developers, eventually settling down on a few combinations that worked well for me. In every case, I managed time and temperature and agitated the film according to the developer manufacturer's instructions.

Recently, I became aware of a newish staining developer called "Pyrocat-HD", invented by Sandy King. This developer has a great many claimed virtues among them:

- Semi compensating in the highlights with VC papers
- Tight grain comparable to PMK Pyro
- Much lower sensitivity to oxidation effects than PMK Pyro
- Much less fussy about agitation than PMK Pyro
- Produces negatives that work well for both traditional silver and alternative printing processes

This monograph is *not* about Pyrocat-HD, although much of the testing was done with it. Pyrocat-HD turned out to be a gateway drug to my learning about "stand" or "still" development. This is an old technique used by some of the masters like Atget. Today's modern masters like Sandy King and Steve Sherman are making use of variations of stand development to great advantage. But, in the words of Sandy King, "It is fraught with danger". The technique is tricky and prone to failing rather horribly. So ... **don't try this with pictures that matter to you without making backup negatives.** I promise you're going to mess some of them up.

Be aware that the discussion of still development techniques launches all kinds of religious debates. This is particularly true on the internet, where everyone is an expert. I got interested in this because some very fine photographers make good use of it. On the other hand, some very fine photographers think it is nonsense.

There are also people out there claiming this is THE best way to develop everything. These people, in particular, are just ... wrong. Still development *may* have a place in your workflow if you have the patience to learn how to do it repeatably *and* have subjects that would benefit from this *and* you are using formats and film that will work this way.

Why Bother?

When stand (or one of its variants) works, it gives you negatives of great apparent acutance, full box ASA speed and - this was most important to me - a way to increase mid-tone contrast without blowing out the highlights. It is mid-tone contrast that gives prints that "snap" we're always looking for. David Kachel has a very good commentary on this:

<http://davidkachel.com/wpNewDK/wp-content/uploads/2019/05/PrimacyOfLocalContrast.pdf>

For example, I recently shot a scene in which the darkest shadows were on Zone III, and the brightest highlights (snow) were well into Zone VIII. Depending on how you do exposure control, this is either normal development or slight N-. The problem is that the dominant geometry in the scene was a bunch of boards that - at best - showed a Subject Brightness Range of about 3 stops. This was the most important part of the scene but, I was stuck with two bad choices:

- Normal, or worse still, contracted development would shove all these tones together to produce low local contrast in the mid-tones. i.e., A picture that held the entire tonal range, but boring because the primary image geometry had low local contrast.
- But if I did N+ development to improve middle tone contrast there was good chance the snow highlights would blow out to Zone IX or X. Because Pyrocat-HD is a semi-compensating developer, I likely would have been able to burn through this *if* I could control the burn geometry properly.

This is where a form of stand saved the day. By developing the negative using stand techniques, I was able to get full box film speed in the shadows, jack up the mid-tone contrast, and preserve the highlights from getting pushed up too far.

When reading about stand development, you'll run into a lot of discussion of "edge effects". These occur as a byproduct of the way stand works chemically, especially when using Pyro staining developers. The edge effects show up as a line in a transition between a light and dark subject. In the extreme case, it can actually manifest itself as a "halo" behind the transition. (This is one of the reasons you don't want to overdo stand development.) This edge effect is perceived by the human eye as higher sharpness. It's sort of an illusion, but it's a useful one. (For those of you who do digital post processing, this is approximately the chemical equivalent of an unsharp mask.)

It's worth mentioning that there are other approaches to the problem of holding highlights while expanding mid-tone contrast. You can use a lower contrast or "compensating" developer like D-23. This is a very simple and inexpensive 2-component developer you can easily mix yourself.

David Kachel - no fan of stand processing but a superb contributor to this craft - has a novel technique called "SLIMT". In a negative with really bright top zones, he adjusts for shadow and mid-tones as necessary, *and then mildly bleaches the negative* during the pre-soak phase prior to development. It's a novel technique and uses minimal chemistry. I plan to also explore this at some point as well:

http://davidkachel.com/wpNewDK/wp-content/uploads/2019/05/SLIMTs_Practical_Application.pdf

So How Does It Work?

Stand techniques depend on a basic property of how film develops - *The highlights develop much faster than the shadows*. One Kodak engineer was heard to say that "Development ends after 3

minutes, the rest of the time is spent increasing contrast." This is just another way of saying the same thing.

As the highlights develop, they exhaust the developer around them much faster than the shadow areas do. In other words, the brighter the object - say white snow - the quicker it will exhaust the nearby developer. The darker the object - say a shadow - the slower it will exhaust. Mid-Tones live, well, somewhere in the middle.

For those of you with a technical bent, I highly recommend a careful reading of this explanation of film behavior by David Kachel:

<http://davidkachel.com/wpNewDK/wp-content/uploads/2019/05/HowFilmWorks.pdf>

Normally, we don't notice this because *we agitate regularly* thereby replenishing the supply for fresh developer everywhere, most especially the highlights that have "run out of" useful developer.

Stand development exploits this by ... *not agitating at all or very little*. Highlights are allowed to exhaust because they develop quickly and don't really need more developer. But by letting the film sit in a really dilute developer solution for a loooooong time without agitation, the shadows continue to develop and so do the mid tones. This means we are:

- Fully developing the shadows (getting full box speed ASA)
- Raising the H/D contrast curve for the mid-tones
- Doing little to the highest tones

In effect, stand techniques add two other things we can control about how we develop film. In addition to time and temperature, we now add developer dilution and frequency/duration of agitation as development controls.

It's worth mentioning that this is super tricky to get right. In the words of a retired Kodak film engineer, "Kodak did not consider still development in formulating its films. It is not a recommended practice." That's right, it's not. And you're not supposed to tune your stock Ford engine to produce more horsepower either. It is not recommended by the manufacturer ;)

What's The Downside?

As film develops, it produces chemical byproducts like bromides that we usually don't notice because ... we're agitating regularly. This serves to "wash away" these byproducts with fresh developer. But when you stand develop, these byproducts can come to rest on your negative and interfere with the development. This results in streaks and marks on your negatives and can be entirely ruinous to the process. That's why the Great Yellow Father, Kodak, recommended so strongly against this approach. This mess is often referred to as "bromide drag".

All manner of techniques exist to avoid these problems, with varying degrees of success. Among them include:

- Developing and standing negatives in open trays
- Using specialty tubes made of PVC plumber's pipe to hold the negative during standing
- Using minimal contact hangers to hold the film during standing

~~Formally and properly, stand development should be done with the negatives laying flat in a tray or the equivalent. They should *stand laying down* not hanging vertically in a tank.~~

(This turns out to not be such a great idea. See Updates section at the end of this document for more commentary on tray processing.)

It's also worth noting that the photographers who pioneered this approach a hundred plus years ago were using very different films and plates. Modern thin films do have more a propensity for bromide drag than their grandfather films did.

Still, this can be conquered and - at least in my view - should be in the arsenal of tools for any advanced monochrome silver photographer.

Terminology

There are many references to this sort of development in the literature and the terminology isn't used consistently. For our purposes we'll define things as follows:

- **Normal Development** - Using developer at recommended dilutions and agitating regularly once or twice a minute.
- **Stand Development** - Using highly dilute developer, agitating vigorously for the first 1-2 minutes and then just letting the film sit untouched in the developer for 45-60 minutes or even more.
- **Semistand Development** - Using highly dilute developer, agitating vigorously for the first 1-2 minutes, and then once again for 10-15 seconds at the development halfway point. So, for a 60 min stand, we'd agitate at the 30 min mark.
- **Extreme Minimal Agitation (EMA)** (Attributed to Steve Sherman). Using highly dilute developer, agitating for the first 1-2 minutes, and then again for 10-15 seconds at 2 or 3 evenly spaced intervals for the remaining time. Say we initially agitate for 2 minutes and want a total development time 30 minutes. We could split up the remaining 28 minutes into three intervals and do 10-15 second agitations at 9 minutes, 16 minutes, and 23 minutes.

Semistand and EMA were conceived to overcome the nasty development artifacts (artefacts if you live in the UK ;) like bromide drag. The occasional short agitation during stand development

reduces the likelihood you'll see these gremlins appear in your negatives.

Surprisingly, I discovered that even the single midpoint agitation of a semistand development can increase apparent contrast and - in the case of Pyrocat-HD - level of stain (as well as Film Base Plus Fog). So each of these techniques has a place.

How Did I Test?

I exposed and developed a variety of films using all four of the development techniques above. As I did so (and failed more often than not) I began to do my down "dialing it" of what worked and what did not.

- For all cases, I used Pyrocat-HD as the developer at a nominal 68F/20C.

I should mention that I designed and built my own temperature-sensitive timer to keep temperature considerations out of mind in the darkroom. You can find the details here:

<https://gitbucket.tundraware.com/tundra/devtimer>

This is certainly not a requirement and you can do ordinary time/temperature corrections as usual in your own work.

- Pyrocat-HD is a developer mixed from two stock solutions. Dilution is expressed as Part A : Part B : Water . For Normal development, dilution was 1:1:100 . For the various stand tests, dilution was either 1.5:1:150 or 1.5:1:200 .
- Developer and fixer were mixed with distilled water.
- 4x5 films tested included Kodak TXT, Agfapan APX 100, and Ilford FP4+. Not every film was tested with every agitation method, but across all film types, the tests covered stand, semistand, and extreme minimal agitation.
- I tested 120 Ilford FP4 as well as 35mm Tri-X and Agfapan APX 100. Both formats were tested using semistand in open half-gallon tanks with Nikor stainless developing reels.
- Development was in open tanks and - in a few cases - a Yankee 4x5 tank with insert.
- A variety of different film suspension systems were tried including Kodak "framed" film hangars, a Yankee 4x5 tank, and a "frameless" Kodak film hanger.
- Film was presoaked for 5 minutes in running water to wash off the anti-halation layer and prepare the emulsion to accept developer. It's not clear this is entirely necessary with open tanks but it does no harm.

What I Have Discovered

First of all, these are **my** findings, built on my workflow and darkroom technique. These are intended to be guideposts, not definitive rules. They are intended to be a starting point for you to explore, not some final word in how to do this stuff. Every statement below should be read to say "In my case ..."

- Stand development is *really* fussy about how the film is held in the developer. Framed hangers and the Yankee tank insert all showed bromide drag effects in varying and unpredictable ways. My theory - which I cannot prove - is that turbulent effects and developer trapping are taking place along- and under the hanger frames/insert supports and promoting bromide drag.
- Semistand development is at lower risk of this, but still shows some evidence of bromide drag with framed hangers and tank inserts.
- For this reason, all my sheet film is now hung using old frameless Kodak hangers. They have minimal points of contact with the film. A likely viable alternative here would be a dental X-ray film clip. In either case, having more than one sheet in the tank will be tricky to agitate because there is no frame to keep it in place. Patience is your friend here.

How good is this? I was able to get a perfect negative with stand development (no agitation during stand period) using these hangers.

- Well... *almost* perfect. The negative shows just a slight hint of bromide drag. It is at the end of that negative that was at the bottom of the tank - exactly where gravity would land it. The exact same scene exposed identically but processed with EMA and semistand do not show this artifact.
- In short, *I was unable to consistently get stand processing to produce artifact-free negatives*. So, even with better film suspension, at least one midpoint agitation is a really good idea. This is confirmed in discussions with other photographers doing this sort of thing, even in trays. (Almost) no one is getting decent results with pure stand. The issue here isn't that stand doesn't work. The issue is that stand doesn't work **consistently**.

As a practical matter, there is no reason to do stand over semistand or EMA. Both of the latter techniques give good results.

- I did some testing with 35mm and 120 on stainless steel reels, but dunked into open 4x5 tanks rather than the usual daylight tanks favored by small format shooters. As expected, Normal development worked fine. To my surprise, semistand was OK as well. I was expecting bromide drag problems because of the way the reels support the film. Again, I think strong initial agitation helped here.

I've also noticed a considerable difference of reel spacing from different manufacturers. If you are going to do 35mm or 120 this way, I'd stick with the old Nikor reels. They're a bit expensive but widely available on eBay. I'd also recommend doing these smaller formats in an open tank, rather than the smaller stainless tanks that are normally used with these. Why? Because you'll get more developer around the film no matter what the agitation model. It does mean working in the dark, though. Under no circumstance would I use the adjustable plastic reels sometimes found in cheaper kit. The ridges for holding the film in place are tall and inhibit smooth developer flow. Using this just begs for bromide drag problems.

- Stand and semistand did best with the 1.5:1:200 dilution. EMA did best with the 1.5:1:150 dilutions. This makes sense, since EMA times tend to be a lot shorter than true stand development and more dilute developers will take longer to act on the shadows.
- Both stand and semistand really need 45-60 minutes to fully do their jobs.
- Both stand and semistand need a full 2 minutes of initial agitation and it needs to be "vigorous". Again, I suspect - but cannot prove - that really kicking the development off hard at the beginning reduces the likelihood of bromide drag later.
- EMA was fine with only 90 seconds of more normal initial agitation.
- The single agitation introduced at the midpoint in semistand development seems to noticeably reduce the risk of bromide drag.
- The single agitation introduced by semistand development seems to increase overall contrast and density as compared to a no-agitation stand period. It's not night and day, but given that doing this reduces the risk of bromide drag, it's probably the preferred long stand technique and this extra contrast has to be considered.
- Given a normal dilution of 1:1:100 and an EMA dilution of 1.5:1:150, I found that a good first order guess for EMA development time was to double my Normal development time with 2 or 3 equally spaced agitations during the stand time.
- You can do contrast control with EMA much like you do with Normal development - increase- or decrease overall time. With stand and semistand, it's a bit more difficult because you really want that long development time to fill in the shadows and crank up the mid-tones. I've not tried it, but changing developer dilution is likely a better tactic for these development methods.
- You can overdo this. If you have a scene that already has good mid-tone local contrast, these techniques can give you a cartoon-like local contrast expansion.
- All the stand techniques gave me full box speed ASA for every film I tried.
- You have to be merciless to "expose for the shadows" properly. If you underexpose, nothing

can save you. You cannot develop content that isn't present in the negative. If you overexpose, you will get the entire tonal range of the image sliding up the H/D curve in ugly ways with stand techniques. In this regard, exposure control and ASA management is much more demanding than most conventional film-developer Normal development methods.

Is It Worth It?

Yes, in certain cases. Low- or no agitation development is slow and finicky. But, it really shines when you want to emphasize mid-tone local contrast, but have a competing highlight that would get blown out (or hard to print) if you just did N+ Development.

More generally, these techniques are great when you need to get maximum shadow detail, but reign in highlight placement.

Stand techniques also work nicely when you want to get best apparent sharpness on subjects that show a lot of bright-to-dark transition lines - for example, articulated rock faces.

Think of stand as another arrow in your quiver. You won't always use it, but it can be a really nice enhancement to your arsenal of tools.

I **strongly** recommend that, if you're going to try this, take at least two exposures (on separate sheets or rolls) of every scene you care about. Try one with stand techniques, and have a backup you can process normally if needed.

When Should You NOT Use These Techniques?

With over a year's experience under my belt at this point, and having tested many film/developer combinations across a variety of subjects, I've concluded that Semistand/EMA is a superior development strategy for many things. It yields full box ASA, protects the highlights from blowing out, and gives you snappy midtone local contrast.

However, there are some subjects that don't respond really well to this. The increased midtone contrast can look gritty and get almost a cartoon like quality to it. Specifically, when an image has a textured surface that already has noteworthy local contrast, the image can become unrealistically harsh.

This is especially true with very high acutance films like Efke PL100M or Adox CMS 100 II. When the actance of the film is combined with the edge effects of extended development, you can get a kind of comic book or graphic arts effect. It's subtle but very real, though it might be useful as an aesthetic tool.

The worst offender here is EMA. The repeated agitations drives up edge effects far more so than does the 1 midpoint agitation of Semistand. Given a subject with a lot of midtone texture and local contrast, you might prefer Semistand with a film like Shanghai GP3 or Agfapan APX 100. Of course, conventional development is always a thought if the dynamic range of the scene can be properly managed.

Updates

New findings since the document first went live can be found below.

Update 6-3-2021: Very Old Film

Since this was first written, I've done a fair bit of testing using low agitation with very old, expired film. So far, I've discovered several things worth noting:

- Old Kodak Tri-X (expired 7/1993) takes semistand processing in Pyrocat-HD perfectly, shows full speed, and has no notable fog.
- Very old Kodak Plus-X (expired 11/1974) is another matter. It shows horrible bromide drag at the hanger suspension locations - even using the most minimal support.

Whether this is the nature of this film or its age isn't clear. I have to do further testing with other Plus-X vintages. What is clear is that this is definitely induced by the Pyrocat-HD. When I took the same film/scene and semistand processed it in D-23 1:1 for 60 minutes, I got perfect negatives that actually showed slightly better film speed than the Pyrocat-HD negs.

Update 8-29-2021: Very VERY Old Film

I was interested in seeing how this worked with really old film and explore just how "old" was too old:

- So, I shot some sheets of 2x3 Kodak Super-XX (expired 1/1961). That's right, this film has been out of date for over *60 years*. I used both Pyrocat-HD 1.5:1:200 and D-23 1:1 to semistand process a couple of these negatives.
- The results? Perfectly printable negatives. The Pyrocat produced a bit more negative fog, but noticably less visible grain. The D-23 produced a "cleaner" negative, but had a lot more grain. It's worth noting that Super-XX was always a rather grainy film and was pretty much replaced by Tri-X in short order, particularly for smaller formats. Both developers produced the full box ASA 200.
- Unsurprisingly, there were non-development artifacts due to the physical deterioration of the

film. The sheets were stuck together a bit in the box and I did see some mottling on the non-emulsion side of the film. This resulted in some spots in the final negative.

- All-in-all this demonstrates several things. First of all, "reasonably" out-of-date film can pretty much be used as if it were new. Secondly, semistand processing may offer a path for rescuing "found" old films.

Update 12-18-2021: Low Agitation With Super-Dilute HC-110

I wanted to see how super-dilute HC-110 behaved when agitated minimally. Officially, the Kodak datasheet stops at 1:79 (Dilution F). But I wanted to see if very high dilution and minimal agitation worked well with this well regarded staple of the darkroom.

For this test, I exposed a 120 roll of Arista 100 at ASA 100. The film reel was elevated from the bottom of a Kodak 1/2 gal rubber tank with a stopper to try to keep it away from any residual bromide byproducts.

1/2 gallon of HC-110 was diluted 1:128. The film was prewashed for 3 minutes then placed in the developer. It was initially agitated continuously for 2 minutes and then left to stand. At 31 minutes, another 15 seconds of agitation was applied. The film was removed from developer at 60 minutes and fixed/washed as usual.

Findings:

- The film developed nicely with no evidence of bromide drag and hit full box ASA as one might expect.
- Compared to Pyrocat-HD negatives, there seems to be very slightly more grain (not surprising) compared to other ASA 100 films. However, I've not processed Arista 100 rollfilm in Pyrocat-HD so it could also just be how the film is made.
- The biggest thing I noticed is that super-dilute HC-110 has some highlight compensating effect but it is noticeably less pronounced than Pyrocat-HD. I'd guess this is because of the lack of staining effect.

One of the test scenes has deep shadows in a building directly illuminated by late afternoon sun. There was probably something like a 13-15 stop subject brightness range. Pyrocat-HD would have handled those highlights just fine, but the super-dilute HC-110 yielded a thick, dense negative. It WAS printable and there WAS detail in the highlights, so the highlight exhaustion inherent in low agitation development definitely came into play. It just wasn't as pronounced a correction as I am used to. (It made the negative super fun to print with 100 seconds of soft light required to punch through the highlight density.)

Although this will never be my own daily driver, it could be useful for teaching low agitation.

As an aside, HC-110 and D-76 have very similar behaviours. It might be fun to try super dilute D-76 some time.

Update 1-9-2022: What About Tray Processing?

When I first started on this journey, the common wisdom was that laying sheets of film flat in a tray was one of the preferred ways to do low agitation development.

After extensive fiddling around and some limited attempts at doing tray processing, I recommend NOT doing this for several reasons:

- It is very difficult to tray process multiple sheets without scratching them.
- Practically speaking, you cannot stack negatives in a tray for low agitation. Each sheet's emulsion needs to be in full contact with the developer for the shadows to fully develop.
- My testing strongly suggests that gravity plays a significant role in draining away development byproducts. I've not tested this, but I question whether laying a sheet of film face down will have enough gravitational effect to pull the byproducts to the bottom of the tray. Perhaps this would work with a deep tray and lots of developer, but this seems like a clumsy way to deal with the issue.

In short, tray stand processing may work, but it's clumsy and unnecessary. For best results, just use minimal suspension to hang the film vertically well above the bottom of the tank.

Update 4-3-2022: Old Tri-X 220 Rollfilm

I acquired some old TXP 220 that had expired 8/1992. After the good successes seen with old sheet film, I was anxious to see how ancient rollfilm would work in (semi)stand development.

The first roll was processed in 9 month old D-23 1:1 with an initial 3 minutes agitation (stand) for a total time of 60 min. The film showed streaking, blotchiness, and some discoloration. The streaking was most prominent in the first few exposures.

Suspecting the developer and possible bromide drag, I did a second roll in fresh D-23 1:1 with an initial 2 minutes agitation with another 15 seconds at 31 minutes (semistand). The film showed no blotchiness or discoloration. Again, there was a thin horizontal line across parts of the center of exposures 1 and 2.

Both rolls were exposed at ASA 320. The shadow detail suggests that the film pretty much hit full box speed, as is common with (semi)stand development. In neither case was there significant fog and the negatives are quite printable.

I am at a loss to explain the lines/streaking the in early exposures. Each roll was shot on a different camera, so that's not the issue.

One possibility is that the film is mechanically compromised for having been wound on the spool for 30 years. But I'd expect this sort of problem to most pronounced on the last exposures which are wrapped on a much tighter diameter near the center of the spool.

Another possibility is that - in both rolls - the first few exposures were wrapped close to the inner core of the development reel and this somehow contributed to the problem. Bear in mind that 220 reels are way larger than 120 reels and film is approximately twice as long.

Finally, it may be that the label/paper that holds the roll tightly closed when manufactured somehow compromised the first few images. Recall that - unlike 120 film - 220 only has a paper leader and trailer, there is no paper along the length of the film. This was necessary to make 220 film fit in the same dimensions as 120 rolls. As manufactured, the tight leader is wrapped around the reel above the first few exposures.

In short, the defect here looks much less like bromide drag or bad processing. It looks like a mechanical artifact with film that's been left rolled up tight for 30 years.

Since the film is quite usable and I have a few rolls left, I'll just avoid shooting anything of consequence in the first few frames.

Update 4-24-2022: More On The Use Of Reels

Per a prior update, there is (at least in my experience) compelling evidence that you reduce the risk of bromide drag when you let gravity pull away the development artifacts from the film. With reels, this means suspending them off the bottom of the tank a bit a fair distance.

After some further testing, it's pretty clear that the reels need to be well above the bottom of the tank. The bromide artifacts seem to sink there and you want the film well clear of them. I'd suggest finding a way to suspend your reels so that the lowest part of the reel is 1-2 inches off the bottom of the tank.

I've been using the faucet adapter that comes with the Kodak Tray Siphon to do this. I stick the narrow end into the bottom of the reel and slide the lift rod through it. This raises the reel off the tank floor about 1 1/2 inches or so. You could also probably use a small inverted funnel to do this. ~~Another possibility would be to get an appropriate sized rubber stopper and drill a hole through it to make room for the lift rod.~~ I found that the usual rubber stopper does not lift the reel off the bottom of the tank enough to consistently avoid bromide artifacts on the bottom edge of the film.

Update 8-5-2023: Super Dilute D-23

D-23 is easy to make and is often used when you need to control a very long Subject Brightness

Range. That's because it's a so-called "compensating" developer that nicely reins in the highlights.

NOTE: Ignore rumors you may have heard that D-23 is a "low contrast" developer. It will deliver the contrast you want based on how you work with it.

I've gotten very good results with D-23 stock as well as 1:1 when doing semistand and EMA development. But I wanted to push the dilution envelope a bit. Why? D-23 is a "solvent" developer made of only Metol and Sodium Sulfite. The Metol is the development agent and the Sodium Sulfite acts as a preservative and produces the required alkalinity for the developer to work properly.

In normal dilutions, the Metol "chews away" at the grain. That's the "solvent" effect. This helps keep the grain under control, but it does so at the expense of absolute sharpness.

By diluting beyond the recommended amount, we reduce the amount of Metol in the working developer so there is less of that solvent effect and the negative is rendered more sharply.

Up to dilutions of about 1:4, I got consistently good results from semistand with D-23. Beyond that, though, the reduction in the amount of Sodium Sulfite in solution reduces its alkalinity to the point that the developer stops working well.

Someone on the UK Large Format forum suggested that I try D-23 at a 1:9 dilution but add 0.5 grams/liter of lye (Sodium Hydroxide) to the mix to kick up the alkalinity. This works just great - you get super sharp negatives with this scheme. HOWEVER, you won't want to do this with smaller format/grainer films. For example, 35mm Kodak Double-X done this way produced really grainy negatives reminiscent of highly dilute Rodinol.

WARNING: Be careful handling lye. It will burn skin, cause damage to eyes, and so on. As always, use sensible lab techniques and wear protection in the darkroom. Lye added to liquid is exothermic and can generate a lot of heat, so be careful and take your time.

Using highly dilute D-23 without the lye might also be a way to handle situations where extreme contraction is called for - i.e., Scenes with huge SBRs.

I also tried this with DK-50 at 1:5 and got less wonderful results. It certainly worked, but I didn't like how the tonal range got handled. The negatives came out sharp but sort of harsh looking. I think the culprit may be the Hydroquinone in DK-50, but I'm not sure. I didn't test it as thoroughly as I did D-23, so it might just be a lack of understanding on my part.

Update 12-16-2023: Using A Conventional Daylight Tank For Rollfilm

Periodically going into a darkened darkroom to agitate film in an open tank is inconvenient. For

sheet film, it's sort of the easiest way to do it, unless you want to resort to making your own light tight tubes in the manner of someone like Steve Sherman. Either way, you want to keep the film off the bottom of the container and have minimal contact between the film and it's support mechanis. For this reason, I continue to open tank process sheet film and suspend it with Kodak #6 hangers.

For 35mm and rollfilm, it's appealing to be able to do this in a conventional Nikor style daylight tank. The issue is that you still have to suspend the film above the bottom of the tank to reduce the risk of bromide drag.

Someone suggested the idea of using an empty reel at the bottom of the tank, and loading the reel with film on top of it. I tried this with 35mm and got ... lots of streaking along the edge of the film closest to the empty reel below it. This supports the hypothesis that too much material in the way tends to trap used developer and produce bromide byproducts. So no, an empty reel to hold the film off the bottom is not recommended.

Next, I tried a small inverted funnel in the tank. This lifts the reel off the bottom of the tank, with nothing immediately below the loaded reel's film wind layers. This worked great, and is now how I do 35mm EMA and semistand.

I have not tried this with 120 rollfilm, but I suspect I'd get similar results and for the same reasons.

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