

A Practical Guide to Film Characteristic Curves – Part 3

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If you are scanning film, what is the effect of pushing or pulling the development to realize a higher or lower ISO?

I have been using FP4 as a control against which I compare all other films. I have found that I could achieve a useful distribution of tones by developing it at 75°F in Xtol 1+2.

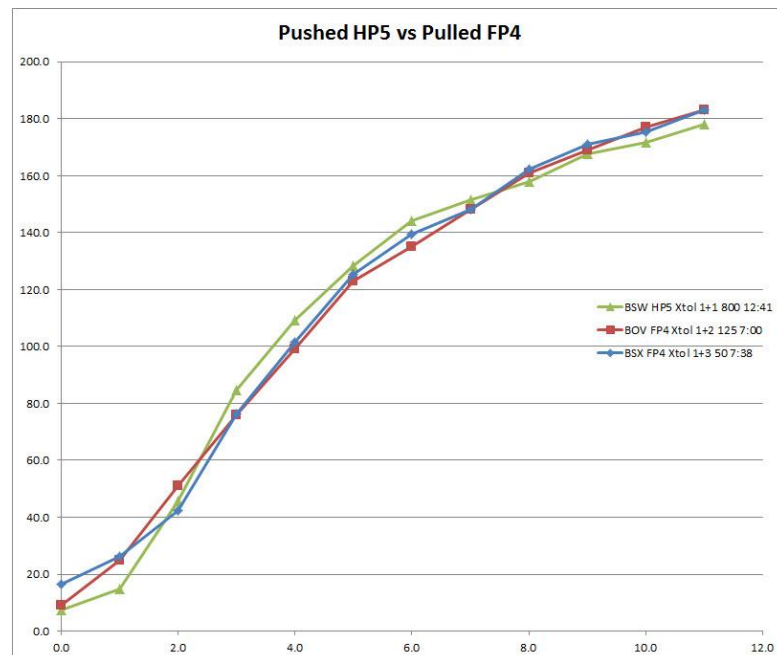
To explore this question I used a Hasselblad and two Ilford films, FP4+ and HP5+ with suggested ISO assumptions (box speed) of 125 and 400 respectively. I used these two films because I had plenty of them on hand but the results will be similar for others.

You can expose film base at an ISO that is different (within reason) from the box speed but you will need to adjust development time or development concentration. The goal of adjusting the development is to produce a negative with a similar tonality and characteristic curve as the control. This makes it easier to scan and assures that the developed film will provide a normal range of densities.

To pull about one stop I exposed FP4 at ISO 50 and developed it in Xtol 1+3 for 7:40 @ 75°F. This resulted in more exposure on the film than normal and the decreased development brought the tonality back in line with the control.

I pushed HP5 to ISO 800 and developed it in Xtol 1+1 for 12:30. This gave the film less exposure and the increased development also brought the tonality back to normal.

The adjusted times and concentrations were based on an earlier test that resulted in this set of characteristic overlapping curves:



As you can see, the two FP4 curves are quite close together over most of their range. But the HP5 curve, although it produced about the same overall contrast from EC-5 to EC+6 (exposure zone 0 through 11 with middle gray at about 5), has a slightly different shape. The following side by side comparisons show whether this can make a difference. Each image pair has HP5 on the left and FP4 on the right.

By using ISO 800 for HP5 and 50 for FP4 the pairs of exposures were separated by 4 stops. In other words, FP4 got four stops more exposure than HP5. Both films were scanned normally with an Epson V750 at 2400 ppi with no tonality adjustments

For a scene in broad daylight both films produced pretty much the same result.



A 100% view shows the expected difference in grain.

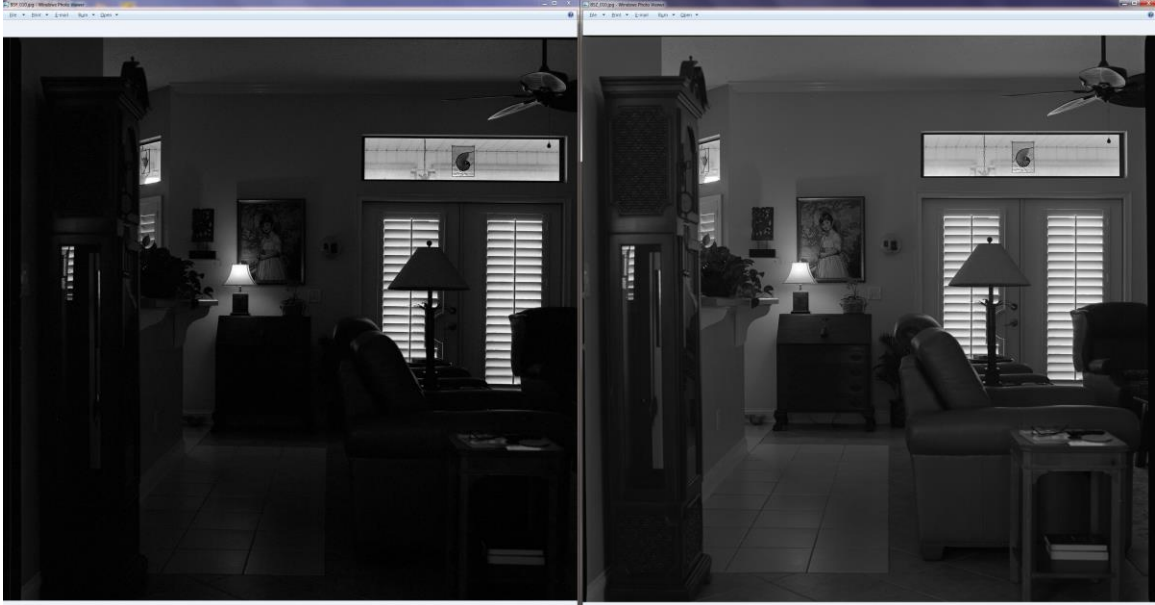


In the shade there is a difference in the overall rendition.



This is because of the way that the HP5 curve deviates from the control.

The difference is more pronounced when the scene's dynamic range is unusually wide.



The pulled FP4 version can render the shadows better but it could have also done this without pulling.



Conclusion

If you intend to scan your negatives there is little to be gained from pushing or pulling. And if you are using a conventional or T-grained film you are probably better off shooting at box speed and developing to match a standard characteristic curve as described in [part one of this series](#).