Gorgeous output, ink-efficient design, and a complete color calibration and profiling system inside the printer takes wide-format printing in the right direction.

BY DAVID SAFFIR

Big, *easier*

HP DESIGNJET Z3100

One of the newest printers from Hewlett Packard Company, the HP Designjet Z3100, has been in use in my studio since November. I've also been working with other photographers who are using the same model, and I believe it's not just one of the best printers in the HP line, but on today's market in terms of image quality and ease of use.

There are many new inkjet printers that do a very good job, but the Z3100 has more than one edge on the competition. The print quality is excellent in every size print I've made, from 8x10 to 40x60 inches. In printing both photographs and art reproduction, the Vivera 12-ink set provides an excellent, controllable, broad color gamut on a wide variety of media.

My black-and-white prints are shockingly good. I've seen no sign of color casts, and with the gloss enhancer enabled, no bronzing or metamerism.

The new Designjet's efficiency, particularly the economy of ink usage, sets a new standard for cost-effectiveness. The printing speed is only average, but in my book, that's much less important than image quality and per-print cost. *(See David Saffir's essay "Hidden Costs of Inkjet Printing" at www.davidsaffir.com.)* The cost of the printer itself lists at $4,095 for the 24-inch model and $6,295 for the 44-inch.

SETUP. The Designjet Z3100 is available in 24- or 44-inch output capacity; with either, the shipping box is substantial. HP provides some of the best set-up instructions, guides, and tools I've seen. From unpacking the printer (on its own shipping pallet), through ink charging and calibration, to the first print took about 90 minutes.

The machine goes through an automated self-diagnostic, calibration and testing cycle on initial startup, using a relatively small amount of ink.

The printer ships with a well-designed fabric basket to catch the output. The fabric is a little rough, so for fragile art papers you might want to disable the automatic cutter and remove these prints one at a time.

LOADING PAPER. The HP Z3100 can handle a variety of media, from fine-art, to canvas, to photographic inkjet media, including large sheets of heavy, fine art paper. It takes both sheets and roll stock with a 2- or 3-inch core.

The printer prompts you to designate the kind of paper you're loading and adjusts the carriage height automatically. If you indicate

FEATURES AND HIGHLIGHTS: HP DESIGNJET Z3100

- Handles roll or sheet media up to 24 or 44 inches wide, depending on model
- Bundled with sophisticated software that provides a significant degree of automation for printer setup, printer calibration and linearization, display calibration, ICC profile creation and management
- Uses the 12-ink Vivera ink set, which includes four black inks and dedicated red, green, and blue inks
- Rated print color life of up to 200 years (Wilhelm)
- At-will switching from photographic media to fine art or watercolor-style papers, no waiting
- No requirement to purge and waste inks when switching from photographic media to fine art papers
- Onboard spectrophotometer for accurate linearization and color calibration on a wide range of media types
- Can successfully profile and print virtually any good-quality inkjet media intended for use with pigmented inks
- Onboard paper cutter handles all normal photographic inkjet papers. (My preference when using fine art or canvas media with any printer is to advance the paper and cut manually; it keeps dust and fibers from getting into the machine. —DS)
- Black-ink-only printing enabled on both photographic and fine-art media
USB or network connectivity
- Onboard hard drive and Web server for network administration, storage of ICC profiles, etc.

the wrong paper, watch out: the machine might assume a different paper thickness, resulting in head strikes or scuffing.

One nifty new feature: If roll paper is inserted slightly off-line, the printer beeps to notify you, asks you to flip up the paper loading lever, and automatically corrects the alignment, all within about 30 seconds. If this doesn't do the trick, the printer prompts you to correct the loading by hand.

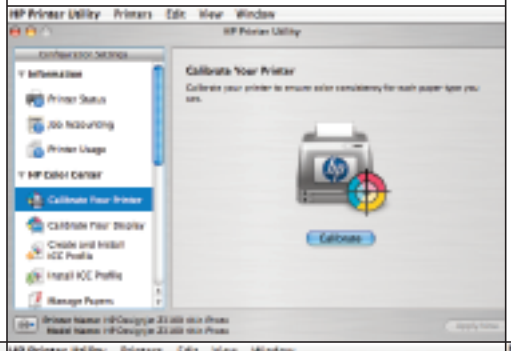
For sheet stock, there's a fold-down loading support at the back of the printer. The printer feeds sheets well and is kind to the printed surface. The paper path for large fine-art sheets is nice and straight, in contrast to the design of one of my older inkjet printers that's so fond of chewing up expensive paper, we call it Jaws. If like me, you save every scrap of paper for test prints and such, you can use them in the HP Z3100, provided they're in good condition and you've squared the sheet with a paper cutter.

SOFTWARE. The Designjet Z3100 software includes the print driver, media profiles/ICC profiles, HP Printer Utility and HP Color Center. It's fantastic that the software gives you onscreen access to the status of the ink supply, a spreadsheet listing each print job and the media it consumed, the total printer usage, a variety of printer and color calibration tools, color profile management, printer documentation and more, all in one place ***(Figure 1)***.

COLOR MANAGEMENT. With its powerful color management tools, the Designjet Z3100 can not only calibrate itself for ink density and control, but can also create ICC color profiles for almost any inkjet media available ***(Figure 2)***.

The best reason to use these features is for the improved image quality. Any inkjet printer benefits from consistent color controls, calibration, and accurate ICC profiles for each paper-ink combination. Image quality drives competition. A good teacher of mine once said, "It's all about your *book*, not your haircut or your nice smile."

Figure 2: The Z3100 can create custom ICC profiles for almost any inkjet media available.



With this new HP, shadow and highlight detail, overall sharpness, color transition smoothness (e.g., skin tones), overall color accuracy, color palette, artifact minimization and aliasing have all improved over any other printer I've seen.

Calibration ensures consistent output through the normal changes that occur in the use of the printer, after ink changes or with boxes of new paper or in response to significant changes in temperature or humidity. Calibrating the Z3100 is a simple matter ***(Figure 3)***. Check that the correct paper is loaded, go to Calibrate Your Printer, and click on the Calibrate button. Select the paper you intend to use and click Continue. The printer will print the color target, measure it, calculate the results, and you're done!

Creating an ICC profile for just about any paper is just as straightforward. Open the HP Color Center, go to Create and Install ICC Profile, and click Create. You'll get a list of papers, and if you use HP media, you just click on the appropriate paper and continue. If you use non-HP media, you have to add a paper type to the list before continuing ***(Figure 4)***.

Click Continue, and the printer automatically prints a color profiling target (almost 500 patches). Allow the printed target to dry for the designated length of time, then feed it back into the machine for reading and calibration. The software automatically creates a custom ICC profile for the media.

Figure 1: HP Printer Utility software accesses a variety of useful information, including ink status and a per-job media consumption spreadsheet.

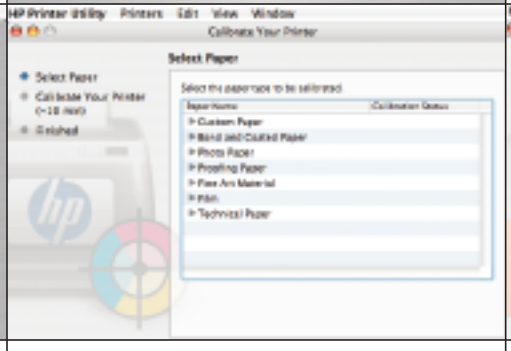


Figure 3: Using the included calibration software, the Designjet Z3100 prints a color target, measures it and calculates the results.

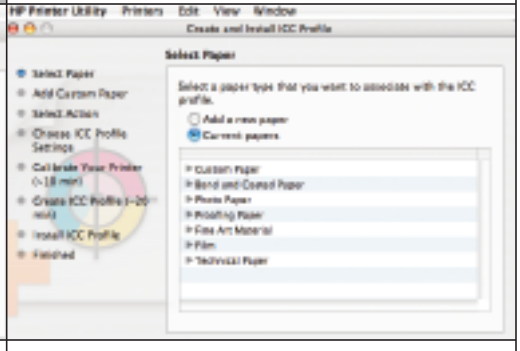


Figure 4: ICC profiling is easy and straightforward.

The onboard spectrophotometer is a full-featured, fully embedded GretagMacbeth/X-Rite unit that consistently delivers accurate profiles. It's one of the major features that make this printer unique. It does a good job with both smooth and textured papers and canvas. It will profile papers that are printed using the built-in gloss enhancer (GE) and papers that do not use GE.

WORKFLOW. If you make your own profiles, you know it's a time-consuming, sometimes fussy job. It can keep me busy for an hour or more. Now I'm just a few mouse clicks away from an accurate profile, and I can do other work while the profile routine is running. Big benefit.

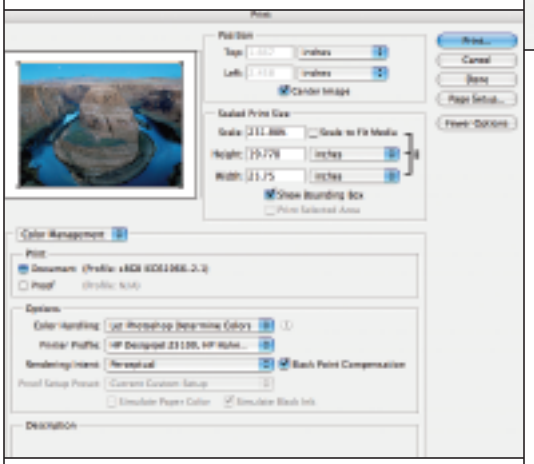


Figure 5: Select Let Photoshop Manage Color when specifying use of ICC profiles.

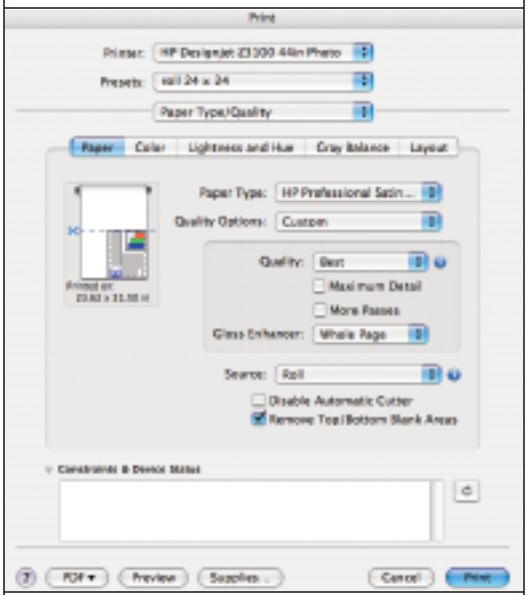


Figure 6: The next print dialogue box provides options for paper type, print quality, use of the Gloss Enhancer feature, the automated cutter, etc.

Figure 7: If you are using ICC profiles, specify Application Managed Color.

If you use manufacturers' canned profiles, you'll usually see—particularly high-quality third-party fine art papers—a noticeable improvement in print quality when using custom profiles. It saves time, reduces the number of proof prints, and keeps costs down.

PRINTING. Printing directly from Photoshop CS2 yields excellent results. This 12-ink system packs a lot of power. I was accustomed to making image adjustments and edits for other printers, but I got good results with smaller adjustments with the Designjet Z3100.

The printer dialogues accessible through Photoshop contain few, if any, surprises. Paper selection, print quality, and similar features will look familiar (***Figures 5, 6, 7***). For best results, specify 300ppi (without interpolation) in Photoshop before printing images.

RESULTS. I've had the opportunity to print on a variety of media, including HP glossy, satin, fine art, and canvas. Image quality is excellent using the Best setting, or by adding Maximum detail. The black point is superb, whatever the media. Blacks are deep and rich, and consistent corner to corner. If the print is made on glossy or satin paper, the gloss enhancer eliminates gloss differential or bronzing, and adds significant dimensionality and vibrancy to colors.

Shadow and highlight detail is excellent, provided I've done my part in capturing the image. Skin tones are very good, including areas with significant highlight-shadow transitions.

I've observed that images captured at high ISO show more noise and grain onscreen than in the print. What I thought might be objectionable noise in the image was barely evident in the print.

I've used other manufacturers' papers as well, including Hahnemuhle Photo Satin, Innova Fiba, Ilford Pearl, and Lexjet Satin Canvas. If you want to try different media, be patient and use smaller adjustments in Photoshop than you're accustomed to using with other printers. Less is more.

I've had great experiences with this printer thus far, but I have two minor criticisms of its performance, one of which is probably my fault. First, the Designjet is a bit noisy—not obnoxious, but I'd like the next model to be quiet as a mouse. Second, the printer sometimes stops talking to the computer when connected by a long USB cable. The fix was simple—I used a shorter cable.

I've made prints for myself, other photographers, and artists, and no one, including me, wants to switch back to one of my other printers.

I suggest you take a look at this printer, get some test prints, and compare this machine to your other options. The HP Designjet Z3100 is worth serious consideration. ■

David Saffir is the author of "Mastering Digital Color: A Photographers' and Artists' Guide to Controlling Color" (Thomson Course Technology).