



TECHNOLOGY REVIEW

By Chris and Kathi Morrison

Chris and Kathi Morrison own and operate The Image Specialists, a full-service graphics company based in Clements, CA. Chris is also a Microsoft-certified systems engineer.

Mutoh's SpectroVue VM-10 Spectrophotometer

For accurate colors, add the VM-10 to Mutoh's ValueJet 1608HS hybrid printer.



Want to see a digital-signshop operator cringe? Just hear a client say, "Oh, and the colors need to match." The phrase strikes fear into the hearts of large-format printmakers everywhere – and for good reason – color management is probably the leading irritant in modern, digital-print shops.

The reason? Matching colors isn't easy. Lighting affects color interpretation, and such machine factors as ink and media variances also directly influence color output.

To this, add idiosyncratic metamerism (where two colors appear the same under one light source, but not another), color-space conversions, out-of-gamut colors, device-dependent/independent calibrations, and the scientific fact that nothing, really, has color – it's all about light wavelengths reflecting off objects ...

So, to produce color-accurate prints, create an on-the-spot print profile – a data file that represents your printer, paper and ink fusion via a printed test chart and, as a result, provides a series of custom settings that produces the best print results for the then-in-place appurtenances.

Having recognized the color-profiling issue, Mutoh responded by offering its patent-pending, SpectroVue VM-10 color-calibration instrument that attaches to the Mutoh ValueJet 1608HS Hybrid, bio-ink printer. Developed by Mutoh's Phoenix-based Advanced Engineering Group, the SpectroVue is a miniature spectrophotometer that connects to the ValueJet 1608HS printhead, to help automate color calibration. The system is supported by Onyx Graphics' ProductionHouse and RIPCenter Mutoh Edition software.

Essentially, a spectrophotometer separates white, or "polychromatic" light, into discrete wavebands, then measures the relative intensity of each waveband. The VM-10's DP1 spectral sensor separates white light into

Key Information

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Company Profile: Founded in 1953, Mutoh Industries Ltd. (Tokyo) initially manufactured and distributed mechanical-drafting products. It soon produced automatic drafting/plotting machines (which became the forerunners of today's cutting plotters) and, in 1995, built and marketed Japan's first large-format inkjet printer for outdoor applications, the 54-in.-wide RJ-1300 and 72-in.-wide RJ-1800. Many innovative print and cutting products have followed.

Today, ISO 9000-certified Mutoh comprises three core businesses: Graphics, which focuses on large-format inkjet printers; CAD-peripheral equipment, which offers inkjet plotters, pen plotters and full-color scanners; and consumables and supplies, which provides materials for the firm's many customers. The company's key engineering, manufacturing and distribution centers reside in Japan, the U.S. and Belgium. Mutoh America is located in Phoenix, AZ.

At a Glance: Mutoh's SpectroVue VM-10 spectrophotometer incorporates its DP1 spectral sensor, a high-resolution digital prism that converts visible light to a digital spectrum. It provides both spectral and colorimetric values for any one of 18 standard illuminants, or any standard daylight illuminant. This color-calibration instrument, which works with Onyx Graphic System's (Salt Lake City) ProductionHouse and RIPCenter Mutoh Edition software, attaches to the Mutoh ValueJet 1608HS Hybrid, bio-ink printer and allows you to profile the printer for various media.

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128 discrete wavebands which are automatically converted to colorimetric values, such as CIELAB or XYZ, by the instrument itself, or reported as spectral reflectance values.

Interestingly, Mutoh developed the DP1 technology for its own use and as a product to license into other industries. A company white paper says, "While Mutoh is interested in pursuing commercial applications of this technology for use in its own products, the company believes that this technology has application in numerous other markets ... such as consumer applications, biomedical, food and beverage testing, and chemical analysis among others."

Meaning, they built a premium system.

Mutoh says its SpectroVue VM-10, combined with compatible RIP software, helps ensure optimum color

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Fig. 1: The system prints and dries the color swatches prior to the color-measurement actions. Note, also, that the printed, measurement pattern spans the media width; thus, it uses minimal media.

reproduction, and the device's employment of a printer's full gamut further enhances print quality. In addition, the system helps multi-run print jobs (and jobs printed on different substrates) achieve superior color-consistency levels.

Specifications

One vexing, color-management aspect arises because printmakers use a computer monitor, with its additive (backlit) color characteristics, for image creation and/or editing. A monitor transmits backlit, red, green and blue pixels, which create images that vary greatly from everyday, out-the-window scenes. Also, a computer's incremental processing capability (8, 16, 32 or 64 bits) exponentially increases the color information and also determines the monitor's color gamut.

If the monitor/printer gamuts don't match, a spectrophotometer can't make them, nor can color-management software make earth-to-sky adaptations. The best hope is via an intermediate conversion process – a color profile – that understands the source-image, color-composition and output-device capabilities. A competent RIP will decide if the computer-displayed gamut is broader than the designated printer's gamut, and either warn you about the non-gamut colors or create what it (mathematically) sees as a closer match. Either result may be a surprise.

Prior to the release of the VJ-1608HS, Mutoh worked with Onyx Graphic Systems (Salt Lake City) to add support for the SpectroVue VM-10 to Onyx ProductionHouse, PosterShop and RIPCenter Mutoh Edition RIP software packages. Mutoh expects future ValueJet-RIP packages to support the SpectroVue VM-10.

How it works

Imagine your shop equipped with a SpectroVue VM-10 and a Mutoh ValueJet 1608HS Hybrid printer that's

coupled to a computer loaded with Onyx Production House software. You've received a media shipment from a new supplier and want to create a profile that ensures the media produces satisfactory color prints.

After you load the media, key your prepress computer to load Production House software, and then click on Media Manager, and select the SpectroVue measuring device. Now click on the New Profile tag and name it; then complete the question list (ink set, target resolution, surface type, spot-color requirements and other print-mode options). Finally, you'll encounter the Print Swatch button; clicking it activates the printer. The 1608HS uses the entire media width, to ensure minimal material use (Fig. 1).

When the swatches are printed, the software asks you to attach the SpectroVue. Snap the SpectroVue into place and then remove it prior to printing. Press "enter" and watch the carriage roll to the left, to expose the printheads' access area. Next, remove the VM-10 cap, grasp the SpectroVue instrument, and gently press the side-release buttons to lock it in place.

Once it's installed, click the Read Swatch button. Onyx designed the basic swatch reading for easy interpretation; an Advanced setting allows more participation, and settings. When the reading scan is complete, the printheads will track left again, and the system will be prompt you to remove the VM-10.

Return to Media Manager to read the values and, also, reply to more questions. Once done, print the reference image to examine it for consistency and accuracy.

It's easier to do than describe – and, believe us, the VM-10 will save a ton of time.

The ValueJet 1608HS

We'll add a few comments about Mutoh's ValueJet 1608-HS Hybrid printer for both flexible and rigid media. The 64-in.-wide, 1,440-dpi printer uses a dual set of CMYK printheads; its production-mode print speed is 120 sq. ft. per hour and a set of removable tables allows it to function as a flatbed. Its fast-drying, bio-based, MP inks, which comprise 60% plant-derived substances, contain no harmful VOCs or heavy metals.

Mutoh says the 1608HS prints signs, car wraps and on rigid substrates; it will directly image onto corrugated plastics, polystyrene, PVC, acrylic, polycarbonate, foamboard, aluminum composite, banner material, vinyl, wall coverings and more.

Mutoh will soon provide its subscription-service, Internet-based, ColorVerify tool that will allow users to implement in-shop process control – to track color repeatability over time, for multiple materials and across multiple printers, with sophisticated analysis tools to identify potential issues with batch-to-batch media and ink variation, and printer drift. This service can be used with both Mutoh and non-Mutoh printers in the same shop. If color management is important, take a long look at the ValueJet 1608HS and SpectroVue VM-10 package. ■