



## A Review

### The Perfect (sized) monitor

The number of manufacturers still producing high end proofing monitors has fallen in recent years. However, NEC still continues and its new SpectraView 241 is a medium sized, high quality monitor at a reasonable price.

There are five main criteria to look at in a monitor for colour critical work. The first is to ensure that the monitor has a colour gamut large enough to match the printing condition you want to proof. A good rule of thumb says that a monitor which can match the gamut of Adobe RGB, preferably with some margin to spare, will also match the gamut of offset-based printing on coated quality



*The NEC SpectraView 241 can be hardware-calibrated using the SpectraView Profiler software. It uses an IPS panel, meaning it is non-sensitive with regard to viewing angle, which is good. But for highest quality softproofing we still recommend the Reference model, which unlike the base models, comes with a hood and has better uniformity over the screen surface.*

paper. If you want to match spot colours you need an even larger colour gamut. The NEC SpectraView 241 has a large enough gamut to proof offset printing, but not wide gamut applications like spot colours or Hexachrome (multicolour) printing. See the gamut table below!

The second criteria is for the monitor to have high enough brightness and contrast, to match the viewing condition in a viewing booth. While most LCD-based monitors can

achieve quite a high brightness of 300 cd/m<sup>2</sup> or more, you need to reach up to about 700 cd/m<sup>2</sup> to really match the brightness of a viewing booth. The NEC SpectraView 241 has a maximum brightness of 360 cd/m<sup>2</sup>, so like most other proofing monitors you need to dim the light in the viewing booth a bit, if you make side-by-side comparisons of prints or hardcopy proofs and the softproof on screen.

The third, and perhaps the most critical aspect, is to be able to do a full hardware-based calibration. This term is often misunderstood, compared to a software-based calibration. In reality we, of course, always use software to perform the calibration, and hardware-based calibration doesn't only mean that we use a measuring device in the calibration process. What's important here is that the monitor can be fully controlled by the calibrating software, so no manual intervention is needed from the operator, once the settings have been decided on.

The calibration should also be made with 10 or 12-bit signal processing, to achieve a smooth gradual tone reproduction, and high level of accuracy. The SpectraView Profiler software used with SpectraView 241 provides such hardware calibration and supports the use of the DVI ports, or even better, the Display Port.

A fourth point to investigate is the uniformity of the monitor, so the colour reproduction across the whole monitor surface is stable and even. Only monitors built to tight tolerances will pass this test. The NEC SpectraView 241 we tested was a bit over the edge here, showing around 15% variation across the surface. This should ideally be below 10%. The test we made earlier of the model SpectraView Reference 271 (see Spindrift 10-1 of April this year) showed a maximum variation (non-uniformity) of only 4%, so monitors in the Reference series are capable of passing this part of the test. There is a colour stability function in the SpectraView 241 called Backlit Ageing Correction, and this helps maintain correct brightness and white point over time. But it doesn't seem to take care of non-uniformity. It seems clear that you get something for your money when you choose the Reference model over the standard version.

The fifth, and often overlooked, criteria is that the appearance of the colours has to be independent of the

Fig 1 – Test results; Colour gamut

Model	Total colours at D50	Total colours at D65	% of Adobe RGB at D50	% of Adobe RGB at D65
Adobe RGB 1998		1330000	–	100
NEC SpectraView 241	1301000	1383000	98	104

Fig 2 – Test results; U-DACT validation and view angle

Model	Multi Color	ISO 12647-2*	Uniformity (average)	Uniformity (max)	View angle (1-5)
NEC SpectraView 241	No**	Yes	5%	15%	5

\* ISO 12647-2 Offset printing on coated paper

\*\* Not at D50

Fig 3 – Specifications and approx price

Model	Screen size (inch)	Resolution	Price EU (approx)*
NEC SpectraView 241	24	1920x1200	1000

\*VAT excluded

viewing angle you use. Both the tested NEC SpectraView 241 and the SpectraView Reference 241 use an IPS (In-Plane Switching) panel, and this technology offers very good view angle independency.

An additional, and sort of given criteria, is that the monitor should be equipped with a hood to screen off incoming light onto the screen. The base model of the SpectraView 241 doesn't come with a hood, while the SpectraView Reference 241 model does, and we strongly recommend this for serious softproofing. What you also get with the Reference model is a "No Pixel Defect Guarantee", which again is what you want in a high end proofing monitor.

## How the test was done

We test for four of the five main criteria using the UGRA U-DACT v 2.0 analysis tool, while view angle sensitivity is tested through visual evaluation of a test form developed by Digital Dots. We give marks between 1 and 5, where 3 means acceptable view angle sensitivity, and 5 means the colours and tone values don't change their appearance even if you move sideways or up and down in front of the monitor.

The colour gamut is calculated using the Chromix ColorThink Pro software, where the total number of colours is extracted from the ICC profile. Monitors at or above the gamut of Adobe RGB will also do well when

doing softproofing of spot colours and multicolour printing.

## The results in numbers

For colour gamut we use Adobe RGB as the reference, but the Adobe RGB has a whitepoint close to 6500 K, and softproofing is normally made towards the D50 reference. So we show the results after having made calibration for both white point references.

Following up the SpectraView 271 with a 24ins model is a logical move for NEC – this is a monitor size which should be ideal for many users. The use of IPS panels and support for Display Port is also a good move for high end monitors. The SpectraView series matches process colours (CMYK) well, and has a colour gamut that borders what is needed for proofing spot colours and other wide gamut applications.

It was interesting to test the standard model, and compare the results to the Reference 271 we tested in April. It's clear to us that you get your money's worth when you pay €200 more for the higher quality panels used in the Reference series, plus you get the hood which is necessary for serious viewing.

