

NEC EA275UHD 27-inch UHD Monitor Review

By Christian Eberle , NOVEMBER 29, 2015 12:00 AM




1. Introduction & Specifications

The mainstay of NEC's consumer display offerings are the EA and PA-series screens. PA encompasses professional models with factory-certified calibrations, precise color accuracy, a comprehensive OSD that includes color management, and top-of-the-line build quality. And as you'd expect, they come at a premium price.



If you don't need that final one-percent in the performance department, substantial money can be saved by going with an EA-series monitor. Color accuracy, contrast and picture quality are more than adequate for business use and in some cases sufficient for pro-graphics and color-critical applications. And you get the very same carved-from-stone look and feel that NEC is famous for.

Today we're checking out the latest Ultra HD entry in the 27-inch IPS category. It's the newest size option in a field already crowded with 24, 28 and 32-inch monitors. 27-inches represents a sweet spot for both pixel density and desktop footprint. Introducing the NEC EA275UHD.

Products	<div><div>NEC EA275UHD</div></div>
Pricing	
Panel Type & Backlight	AH-IPS / W-LED, edge array
Screen Size & Aspect Ratio	27in / 16:9
Max Resolution & Refresh	3840x2160 @ 60Hz
Native Color Depth & Gamut	10-bit / sRGB
Response Time (GTG)	6ms
Brightness	350cd/m2
Speakers	2 x 1w
Video Inputs	1 x DisplayPort 1.2, 1 x HDMI 2.0, 1 x DVI
Audio	3.5mm stereo input, 3.5mm headphone output
USB	v3.0 - 1 x up, 2 x down, v2.0 - 1 x down
Power Consumption	49w typical, .37w standby
Panel Dimensions WxHxD w/base	25.2 x 16.5-21.6 x 9.1in 639 x 418-548 x 230mm
Panel Thickness	2.9in / 74mm
Bezel Width	.8in / 20mm
Weight	20.1lbs / 9.1kg

Warranty	Three years
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NEC is not a company to rush to market with every emerging trend in monitor technology. It usually waits a bit to make sure everything is right before releasing a new category of product. When we started reviewing Ultra HD monitors in early 2014, all you could get was a very expensive 32-inch display that cost around \$3000. Today those same screens are under \$2000 and there are plenty of smaller options that are a better fit for both the desktop and your wallet.

Recently we got our hands on the first 27-inch UHD example from ViewSonic, the VP2780-4K. It's a little more expensive than the popular 28-inch TN screens but with fresh new panel parts from LG, these AH-IPS displays offer a sharp bright picture and excellent off-axis image quality. At \$700-\$800 they're not the cheapest way to go but they aren't the most expensive either.

If there's one thing we can say for sure it's that NEC offers the best build quality in the business. Plenty of other brands offer metal stands and solid chassis but there's something extra in the overall package offered by NEC. The quality of materials, the movement of the stand, the way OSD buttons respond; it's all in the details.

Specifically regarding the EA275UHD we're looking at a 163ppi pixel density, a super-bright AH-IPS panel with a 60Hz refresh rate, 10-bit native color and an sRGB gamut. The backlight uses pulse-width modulation at a rate of 23kHz. It's pretty unlikely anyone will perceive flicker with a number that high.

With a comprehensive feature set and a reputation for excellent performance, the EA275UHD appears to be a winning package. Let's take a look.

MORE: Best Computer Monitors
MORE: Display Calibration 101
MORE: The Science Behind Tuning Your Monitor
MORE: All Monitor Content



2. Packaging, Physical Layout & Accessories

We thought we might see NEC pack the EA275UHD in the same plastic air bladders found in the EA244UHD's carton but we found traditional rigid foam instead. There's more than enough protection for the contents and the monitor ships fully assembled. Just lift it out, unwrap the plastic and you're ready to rock.

The cable bundle includes an IEC power cord, USB 3.0 cable, ControlSync cable and a DisplayPort connector. The only documentation is a small setup guide. The full user manual can be downloaded from NEC's website. There are also instructions for setting up NaviSet Administrator. This is an enterprise tool that allows configuration of multiple displays through a desktop app. It also allows the user to change monitor settings without using the OSD.

Product 360



NEC's simple industrial styling is in use once again for this EA-series monitor. High-quality textured plastic covers the chassis which is heavily shielded inside to prevent electrical interference and dissipate heat. The base and upright are already attached so unless you plan to use your own bracket, the display only needs to be plugged in.

The stand is extremely solid and allows for nearly 360 degrees of swivel, five inches of height adjustment and 25 degrees of tilt. You can also rotate the panel to portrait mode. All the movements are firm and precise with ideal smoothness and resistance.

The anti-glare layer is great at preventing reflections while still providing terrific clarity for the 163ppi image. In fact, NEC provides one of the best screen surfaces of any brand. Usually a matte finish like this produces grain and softness but not in this case. The picture is bright and razor-sharp.

OSD controls are in the lower right and employ touch-sensitive buttons. We've become a little spoiled of late by the joysticks and controllers some companies are using now. But NEC's touchpads respond to just the right amount of pressure and work predictably. When the menu is on-screen, small but easily-seen labels pop up to let you know their functions. You don't have to rely on tiny symbols molded into the bezel.



On the left side is a headphone output and a USB port. Even though the upstream port supports version 3.0, this one is a legacy 2.0 connection. There are two additional 3.0 ports on the bottom input panel.



NEC makes no pretense towards slimness here; the panel is nearly three inches deep. You can see substantial metal shielding through the large vents. The EA275UHD

always runs cool and there's no need to be concerned about EM interference.



From the back you can see two 100mm VESA mounts; one slightly higher than the other. This allows a couple of mounting options depending on your particular bracket system. The speakers are mounted at the top of the power bulge and fire upwards. They're small and tinny but not as harsh as some other displays. At only one watt, you won't get a lot of volume but they're sufficient for productivity use.



The input panel is all-digital and contains one each of DVI-D, HDMI 2.0, and DisplayPort 1.2. The small analog jacks are for NEC's ControlSync system which allows daisy-chaining of up to five displays. They are then controlled from a single computer. On the right is an analog audio input along with the USB 3.0 upstream and downstream ports.



3. OSD Setup & Calibration

All the EA-series displays we've reviewed have the same OSD so we didn't find any surprises here. There are many options available but they're all neatly organized into just seven sub-menus.

OSD Tour



The first menu contains all the picture controls except the white balance which is in menu three. NEC turns on some of the power-saving features like Eco Mode by default so if you want complete control over your settings, switch them off before calibrating.

The EA275UHD has proximity and light sensors installed in the bezel. They can be used to automatically control brightness and/or turn the monitor off when you move away from it. All the parameters controlling the sensor's actions can be set here.

There are six picture modes which represent different color and brightness presets. There are no controls for gamma or color gamut. We did all our testing in the Standard mode.



The first four options allow one to size and position the image in windowed mode. That occurs when you turn off UHD upscaling and map the picture in a 1:1 pixel ratio. The Video Level option sets the clipping threshold. Use Normal for computer signals and Expand for AV equipment.

Like most of NEC's monitors, the EA275UHD offers uniformity compensation. We've tested it several times on other displays and found that while it does improve uniformity, it also reduces peak brightness and contrast. You'll see how it affects the test results on pages four and seven.



There are four adjustable white balance presets plus fixed sRGB, Native and DICOM modes. DICOM is a standard used by medical imaging equipment. The numbered slots each start at a different color temp ranging from 5000 to 9200 Kelvins and are all adjustable. The P mode (programmable) can only be accessed with SpectraView software. It allows for software calibration using either a Spyder (\$199) or an i1DisplayPro (\$299) available from NEC.



The fourth menu contains many convenience options including volume and audio input, overdrive, off timer, power save timer, power LED brightness and others. You can also return all settings to their factory defaults by selecting Factory Preset.

Multi Picture is a split screen configuration that shows you two sources at once. Sizing is determined by input resolution.

USB power lets you leave the ports active when the display is turned off to facilitate charging of attached devices like phones or tablets.



The OSD is available in nine languages. You can change its timeout in 5-second increments all the way up to two minutes. It can also be locked out from the user. When this happens, brightness, contrast and volume can still be adjusted.

Data Copy is used to propagate settings to other NEC displays connected through ControlSync.

Customize Setting provides a single memory slot for all options. This way you can recall your configuration if the monitor is reset by holding the Menu button for three seconds.



NEC likes to inform users of its products' energy usage. You can even enter your own values into the currency fields to see the actual dollar costs in real time.



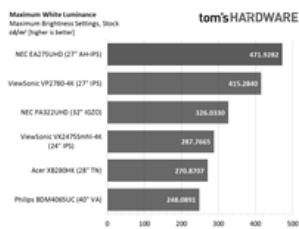
Finally we have the signal information with resolution and both horizontal and vertical refresh rates. The serial number display saves you the trouble of looking around back in the extremely unlikely event of a warranty claim.

Calibration

The EA275UHD ships in its Standard DV mode using the Native white balance preset. You can't calibrate this mode and its grayscale tracking runs visibly red/green. Color gamut accuracy is pretty good in all modes though there are some saturation issues that we'll talk about on page six. If you don't calibrate, sRGB mode offers excellent grayscale accuracy. The only parameter we found fault with was gamma and that can't be addressed in the OSD; only by using SpectraView.






For our tests, we chose the number three preset and adjusted the RGB sliders achieving excellent grayscale tracking and good color gamut accuracy. Please try our settings to optimize your EA275UHD.

NEC EA275UHD Calibration Settings	
DV Mode	Standard
Contrast	50
Brightness 200cd/m2	48
Brightness 120cd/m2	26
Brightness 100cd/m2	20
Brightness 80cd/m2	80
Brightness 50cd/m2	15
Eco	Off
Auto Brightness	Off
Black Level	50



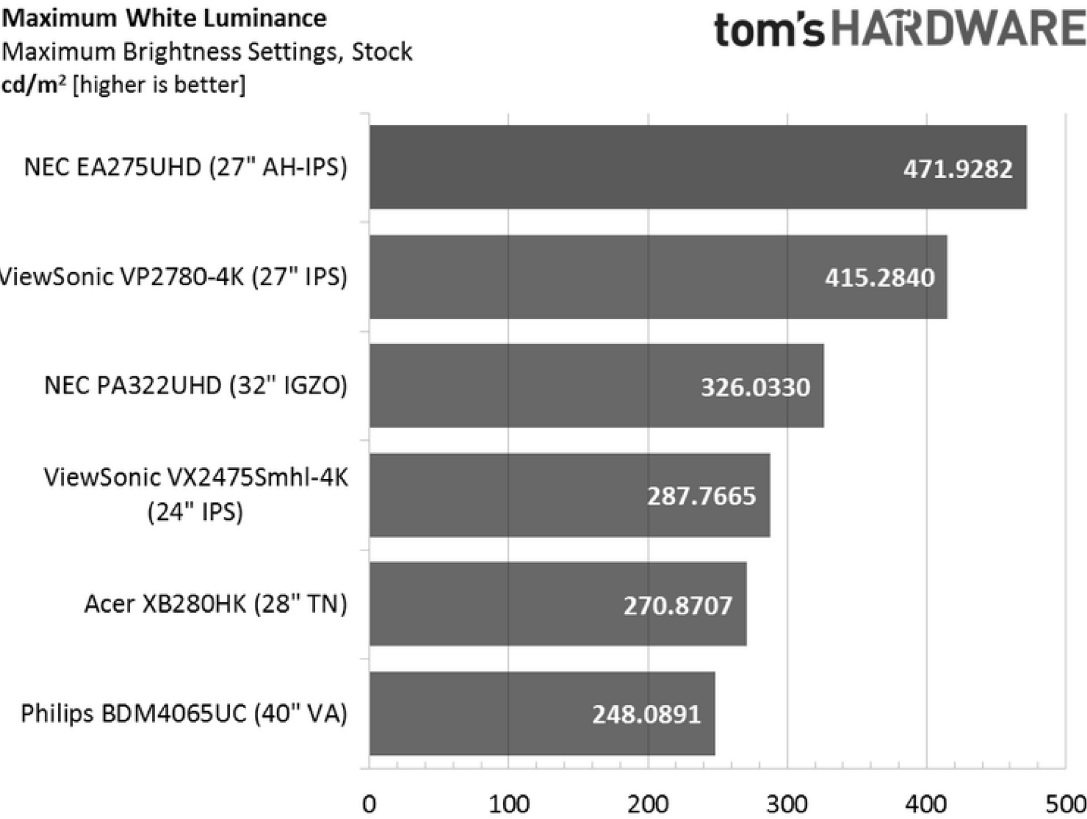
4. Brightness & Contrast

To read about our monitor tests in-depth, please check out [Display Testing Explained: How We Test Monitors and TVs](#). Brightness and Contrast testing is covered on page two.

 <p>Acer XB280HK</p> <p>➤ Read the Review</p>	 <p>NEC PA322UHD</p> <p>➤ Read the Review</p>	 <p>Philips BDM4065UC</p> <p>➤ Read the Review</p>	 <p>Viewsonic VP2780-4K</p> <p>➤ Read the Review</p>	 <p>ViewSonic VX2475SMHL</p> <p>➤ Read the Review</p>

Uncalibrated – Maximum Backlight Level

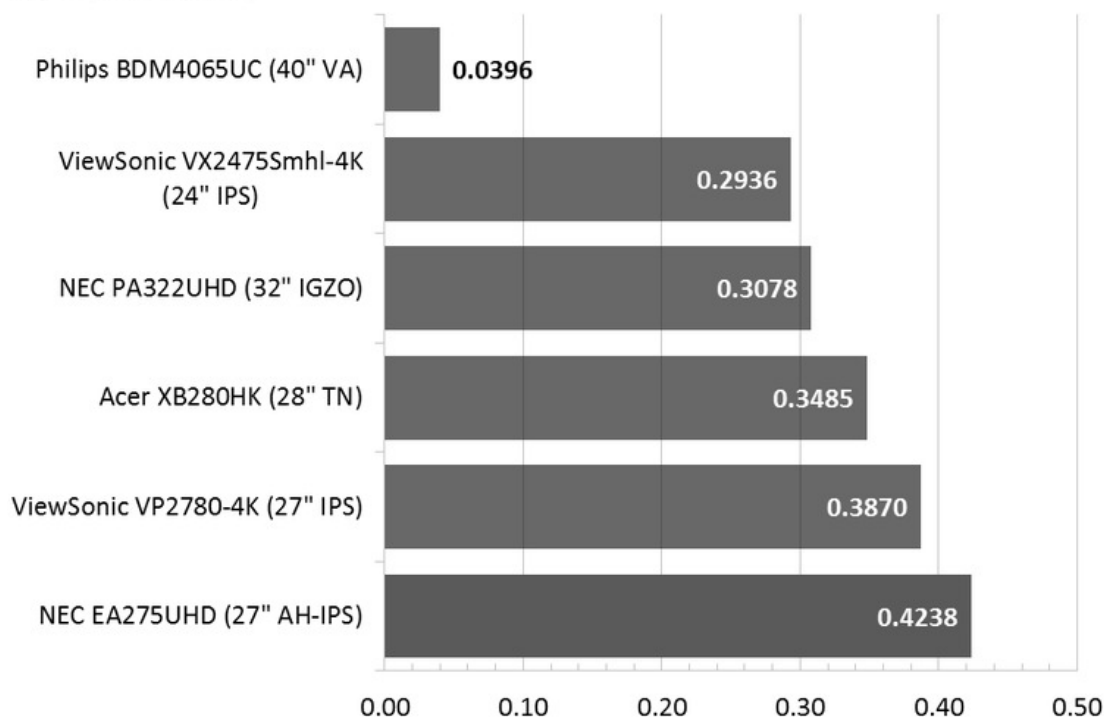
Ultra HD monitors are available in several distinct flavors, 24 and 27-inch IPS, 28-inch TN and 32-inch IPS or IGZO. We’ve reviewed multiple examples of each so for today’s group we’re including NEC’s PA322UHD, ViewSonic’s VP2780-4K and V2475Smhl-4K, Acer’s XB280HK and the unique 40-inch Philips BDM4065UC, the lone VA example.



NEC claims a typical output of 350cd/m² but if you need to light up the main street of a small town, the EA275UHD is up to the task. With over 470cd/m², you can use this display outdoors on a location shoot even in bright sunlight. Luckily there’s plenty of range in the backlight to allow levels more appropriate for indoor use.

Maximum Black Luminance
Maximum Brightness Settings, Stock
cd/m² [lower is better]

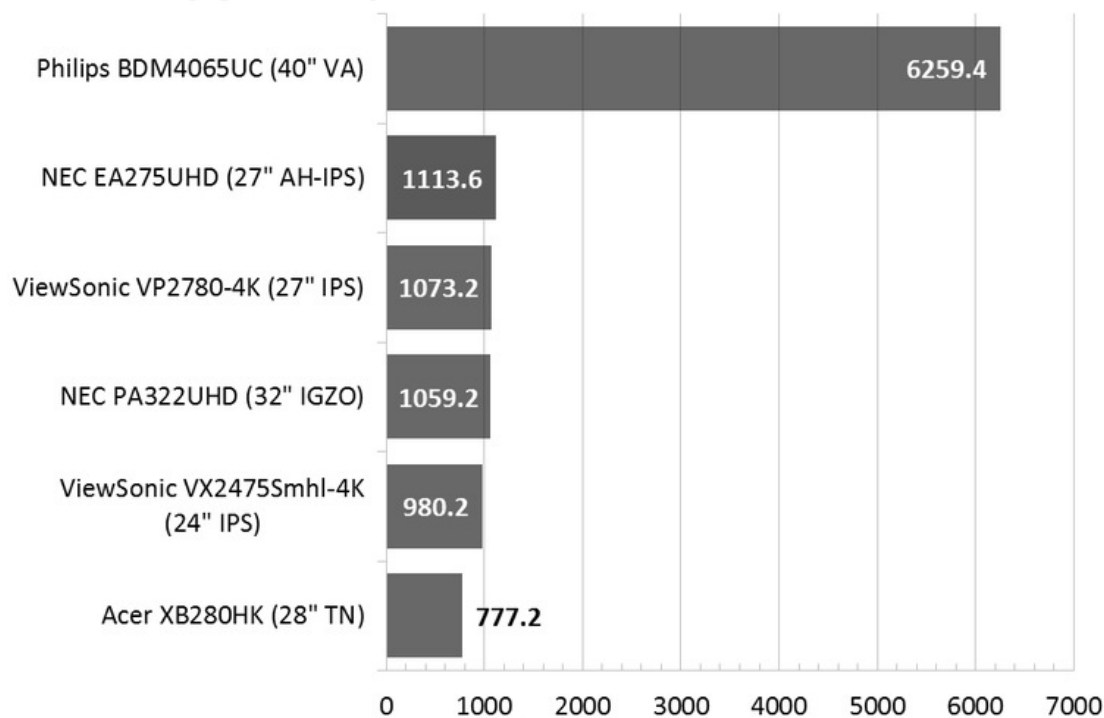
tom's HARDWARE



The super-bright backlight is the main reason for a high max black reading. Actual contrast is quite high as you'll see in the next chart.

Maximum Contrast Ratio
Maximum Brightness Settings, Stock
Contrast Ratio [higher is better]

tom's HARDWARE

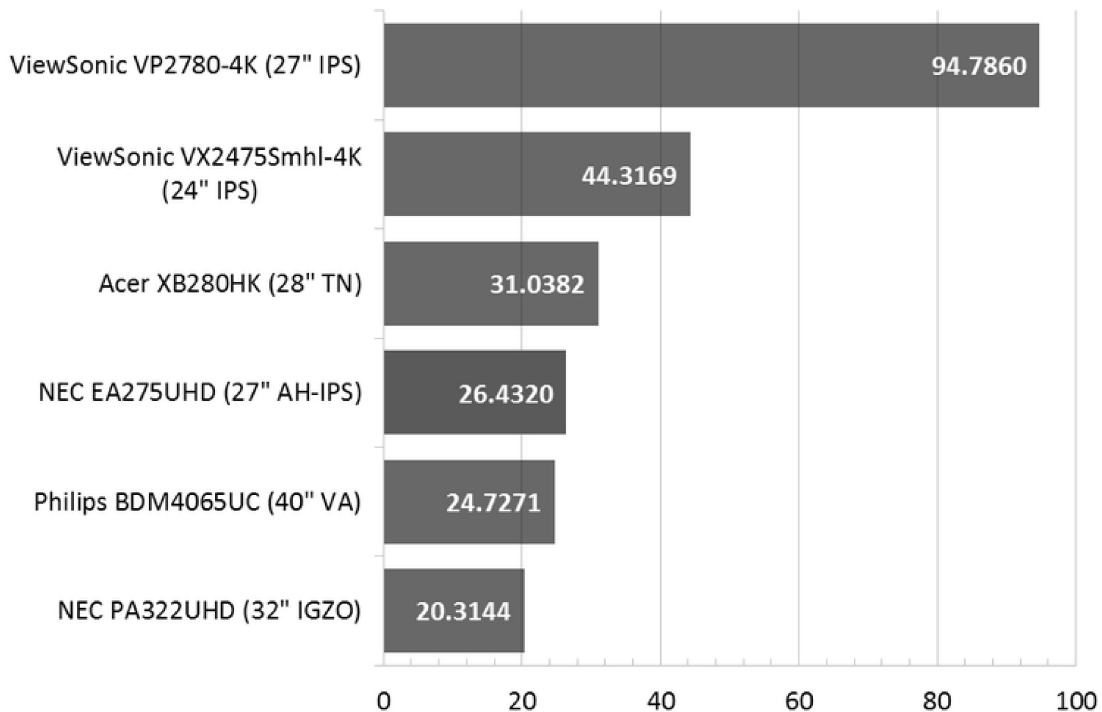


The Philips' VA panel will likely crush the competition for some time to come. But the EA275UHD is the best of the rest. Only the best IPS panel can top 1100:1 and NEC has done that easily. This is one of the factors behind its clear and vivid image.

Uncalibrated – Minimum Backlight Level

Minimum White Luminance
Minimum Brightness Settings, Stock
cd/m² [closest to 50 is better]

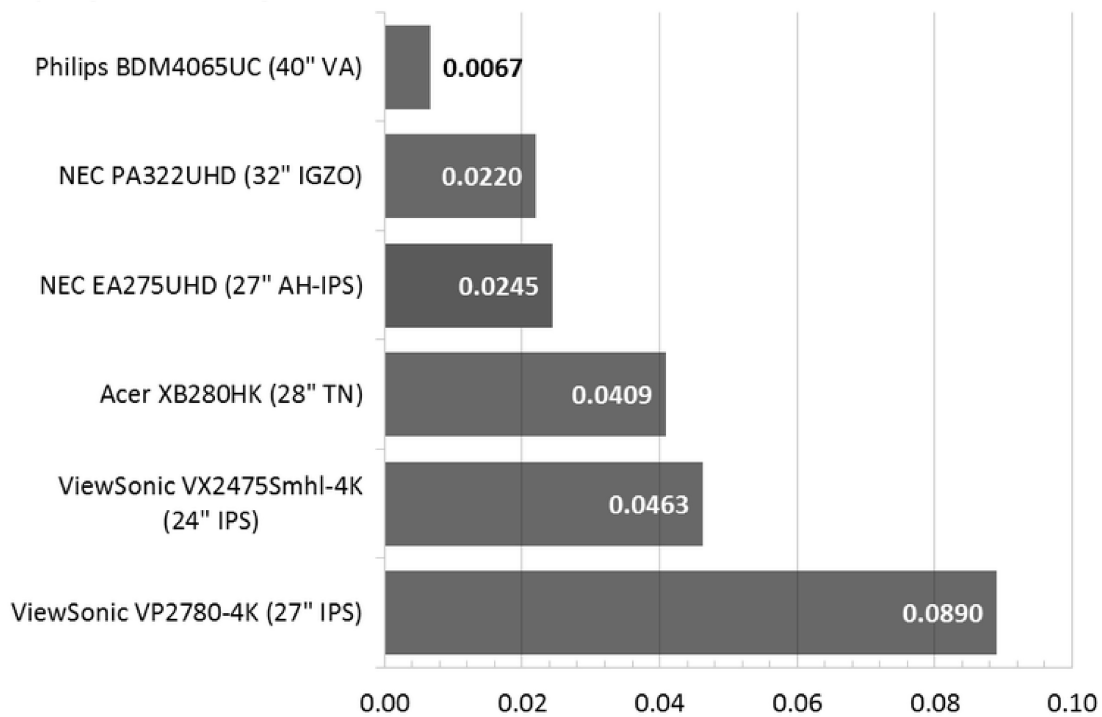
tom'sHARDWARE



NEC favors low minimum backlight output though this display doesn't go as low as some of its others. The only drawback to this approach is that each click of the brightness slider represents at least 3-5cd/m². That makes it a little harder to achieve a precise setting if you need it.

Minimum Black Luminance
Minimum Brightness Settings, Stock
cd/m² [lower is better]

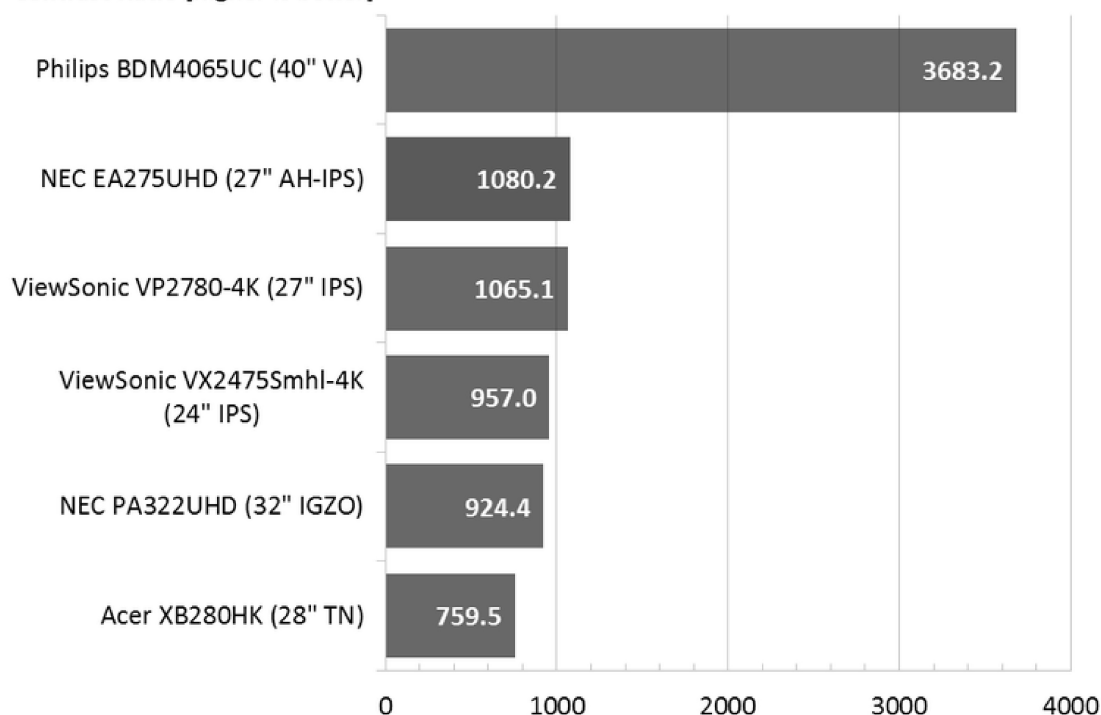
tom'sHARDWARE



Of course a low black level is the natural result of a low minimum white value. It looks like the on/off contrast stays pretty consistent throughout the brightness range.

Minimum Contrast Ratio
Minimum Brightness Settings, Stock
Contrast Ratio [higher is better]

tom's HARDWARE

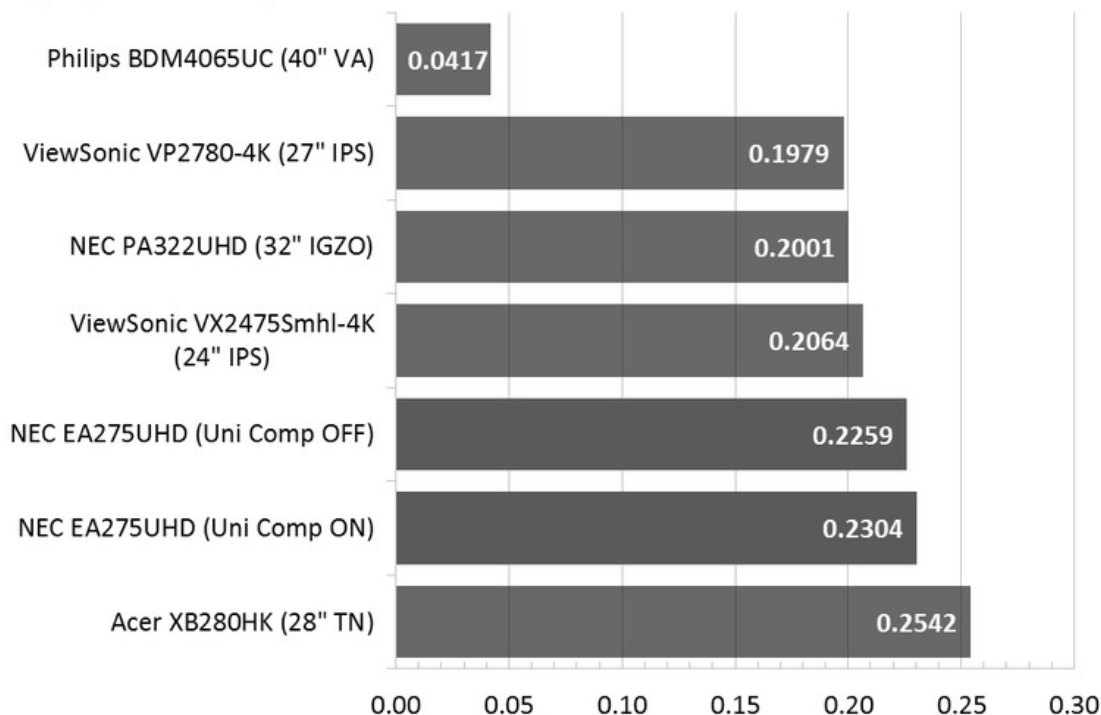


The EA275UHD retains its second-place position in the minimum contrast test. Aside from the Philips, this display has the best contrast of any Ultra HD screen we've tested plus it beats most IPS panels regardless of resolution.

After Calibration to 200cd/m²

Black Luminance
Calibrated to 200 cd/m²
cd/m² [lower is better]

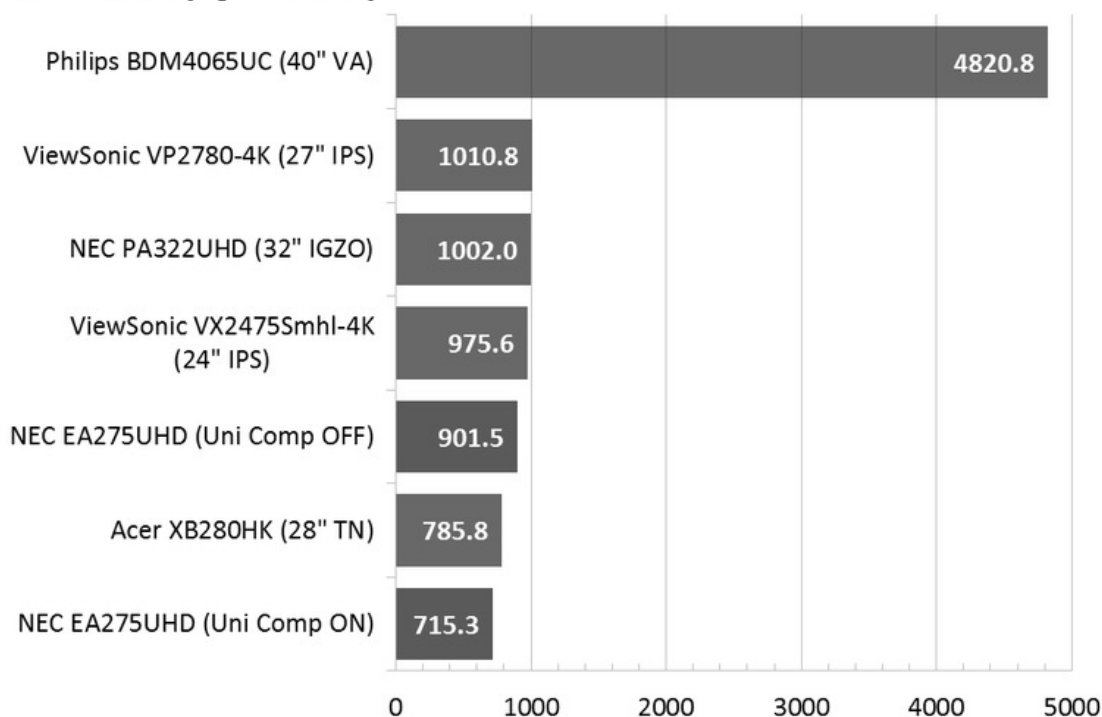
tom's HARDWARE



Since we adjusted a color mode that started at 7500K, the RGB sliders required more tweaking than usual. This results in a hit to both black levels and overall contrast. Here you can also see the results of the uniformity compensation feature. It's pretty subtle but it does raise the black level slightly.

Contrast Ratio
Calibrated to 200 cd/m²
Contrast Ratio [higher is better]

tom's HARDWARE

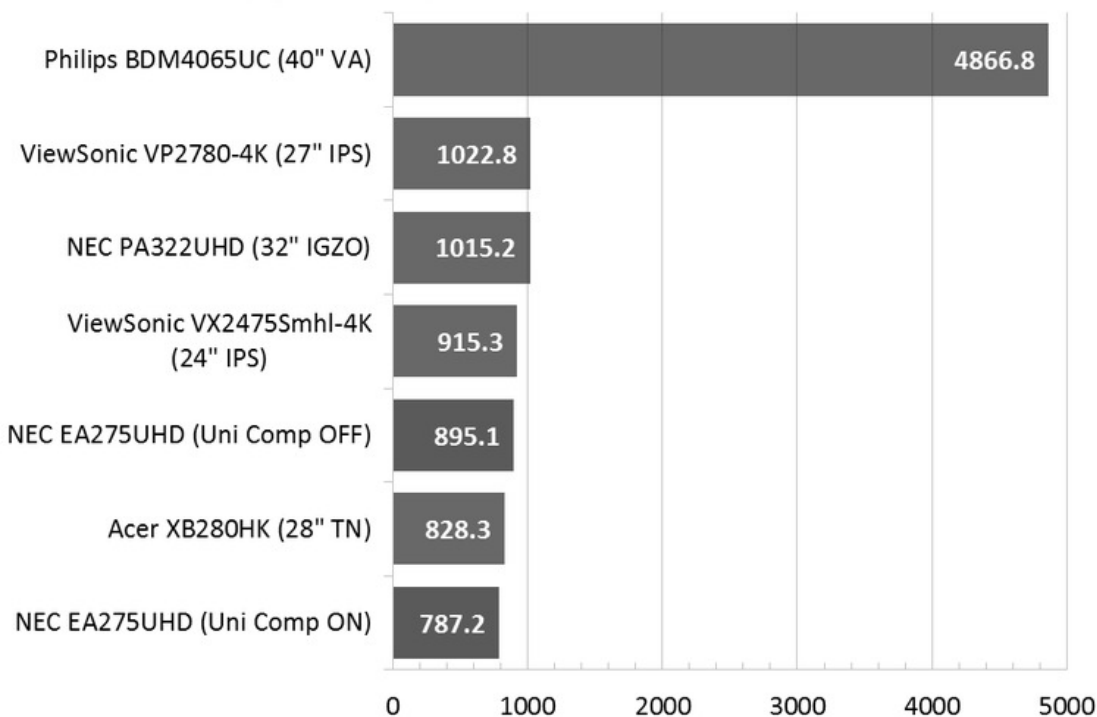


Our calibration knocks around 19-percent off the max contrast value. And engaging uni-comp reduces it by a further 20-percent. Given the excellent results we recorded with the feature off, we recommend only using it when absolutely necessary. There are variations between samples of course but given NEC's top-notch quality control it's hard to image needing the compensation in most situations.

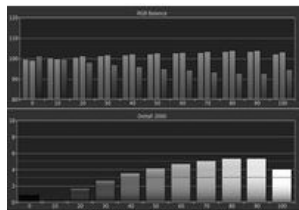
ANSI Contrast Ratio

16-point ANSI Contrast Ratio
Calibrated to 200 cd/m²
ANSI Contrast Ratio [higher is better]

tom's HARDWARE

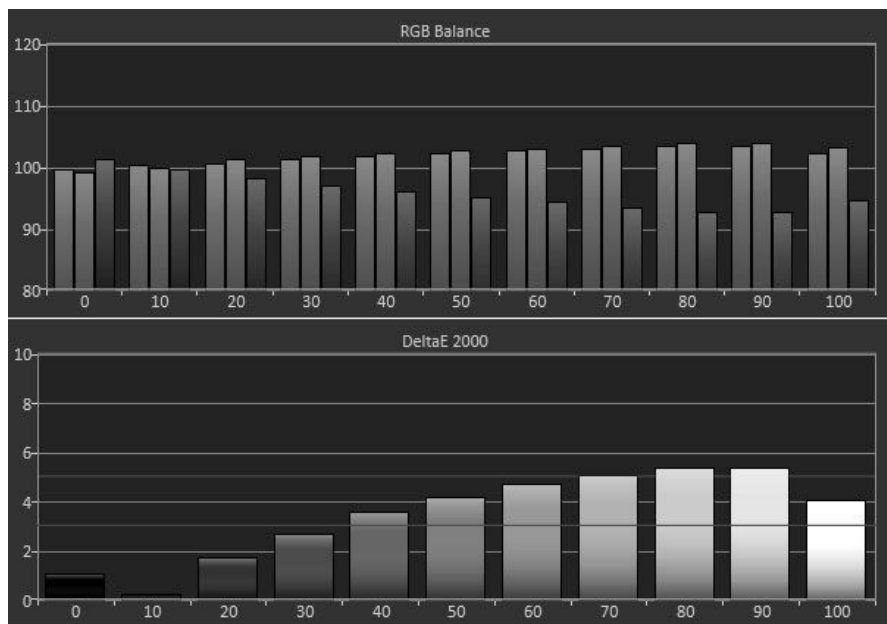


ANSI contrast stays pretty close to the calibrated on/off value which is a very good thing. Turning on the uniformity compensation drops the figure by 12 percent; an amount that's hard to see in a side-by-side comparison. Based on all our contrast and luminance tests we'd say the best mode is sRGB. It has nearly perfect grayscale response and decent color gamut accuracy. And it keeps the contrast level above 1100:1. Calibration doesn't produce much gain unless you need even finer tolerances for color and white point.



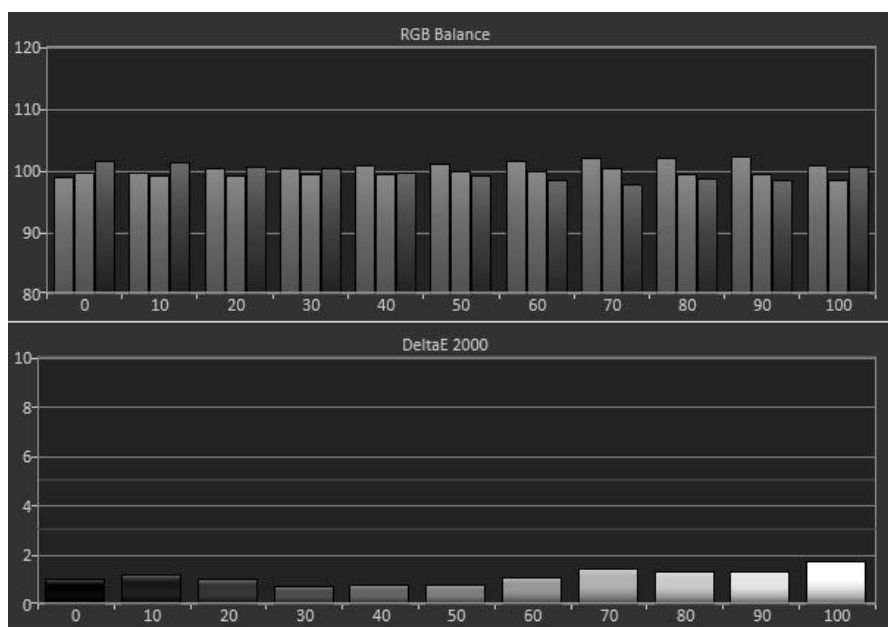
5. Grayscale Tracking & Gamma Response

Our grayscale and gamma tests are described in detail [here](#).



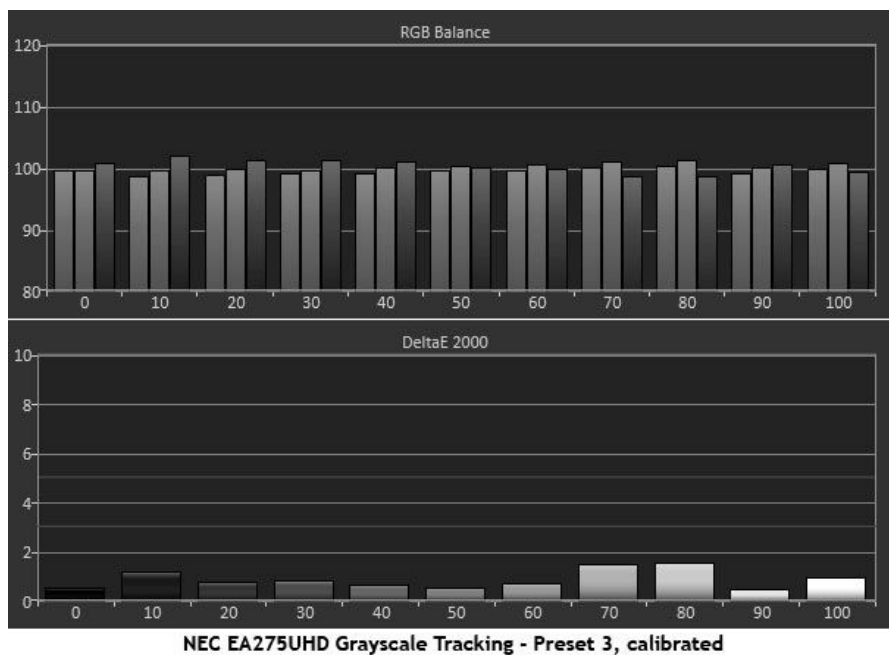
NEC EA275UHD Grayscale Tracking - Native Mode

The EA275UHD ships in its Native color mode with some energy-saving features turned on. We turned off any option that alters brightness before running the white balance and color benchmarks. Native shows a general lack of blue at 40-percent brightness and above. Grayscale patterns look a bit reddish-green and actual content has a slightly visible haze.



NEC EA275UHD Grayscale Tracking - sRGB Mode

Simply switching to the sRGB mode produces almost perfect results. Now all errors are well below 3dE which means they're invisible. If you want the best compromise between accuracy and contrast, choose this mode.



If you nitpick over tiny errors like we do, you'll need to calibrate one of the numbered presets. In this case we used number three which starts at 7500K. The adjustments we made reduce contrast so you'll have to decide which factor is more important when you set up your EA275UHD.

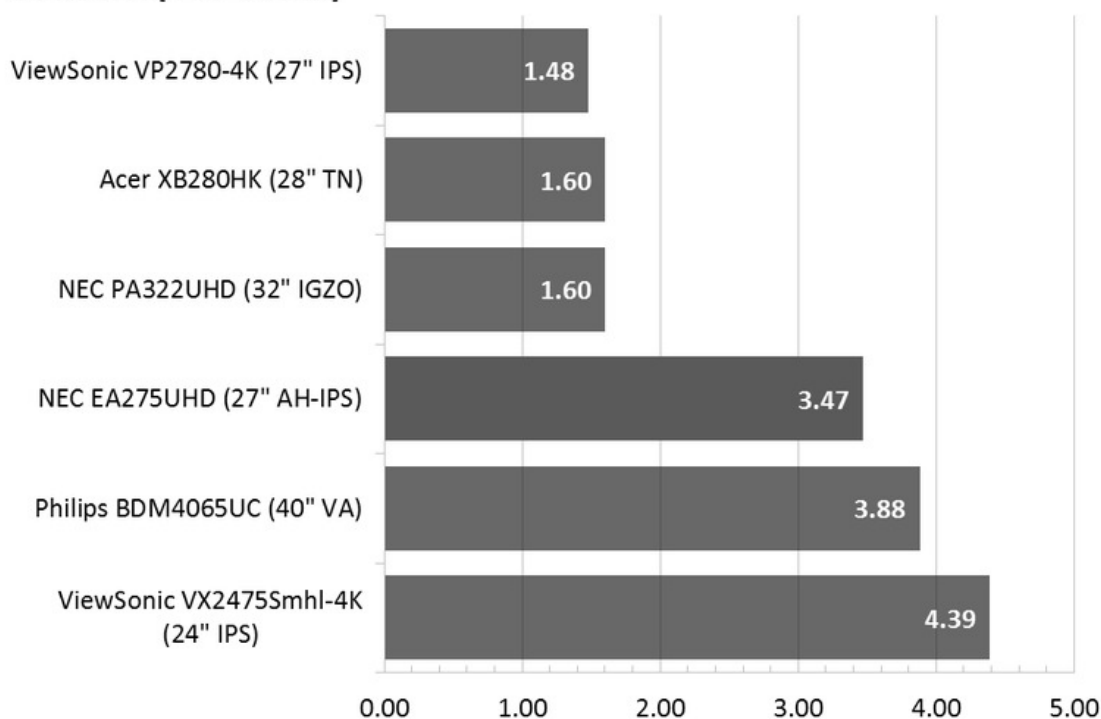
Here is our comparison group.

Grayscale Error

Default Settings, Stock

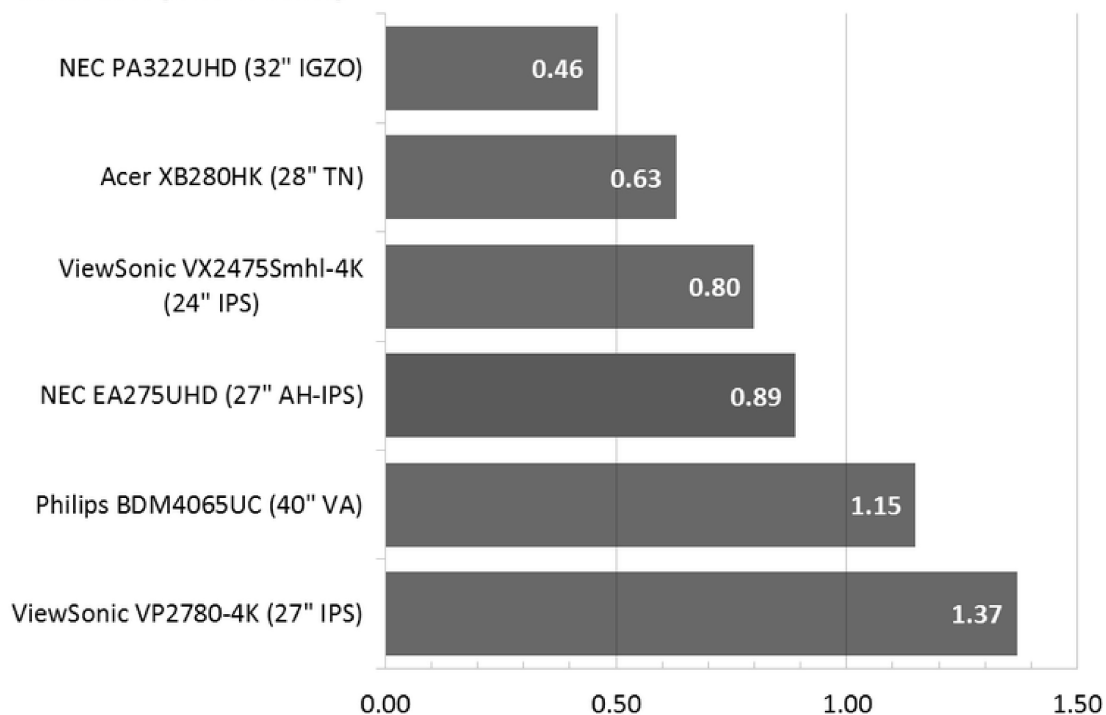
DeltaE 2000 [lower is better]

tom's HARDWARE



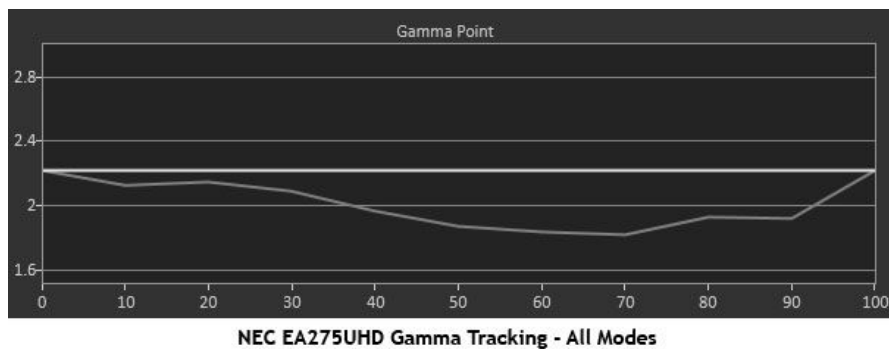
Obviously we'd prefer to see a number under three in this test but the EA275UHD comes pretty close. This represents the Native color mode, sRGB is much more accurate at only 1.14dE. That's a good choice whether you can calibrate or not because as you'll see below, there's only a little more performance available with the RGB adjustments.

Grayscale Error
Calibrated to 200 cd/m²
DeltaE 2000 [lower is better]



The best numbers happen when you calibrate the number three preset. .89dE isn't the best result in this particular group but any monitor that scores under one is worthy of consideration for professional use.

Gamma Response

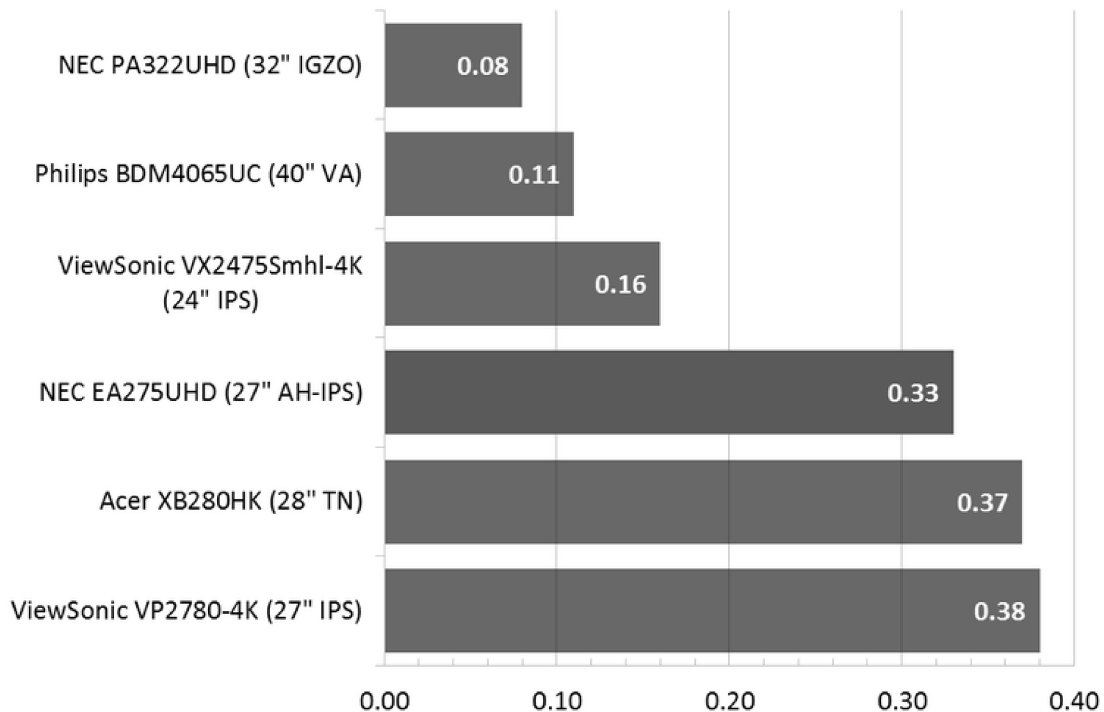


The one flaw we discovered in our tests was the EA275UHD's gamma tracking. As you can see it's not consistent throughout the brightness range and it runs light. Even though the impact on image quality isn't significant, NEC is leaving a little performance under the table. If you buy the SpectraView package you can correct this error using a software calibration. Or you can use CalMAN to do the same thing.

Here is our comparison group again.

Gamma Value Range
Calibrated to 200 cd/m²
Gamma Range [lower is better]

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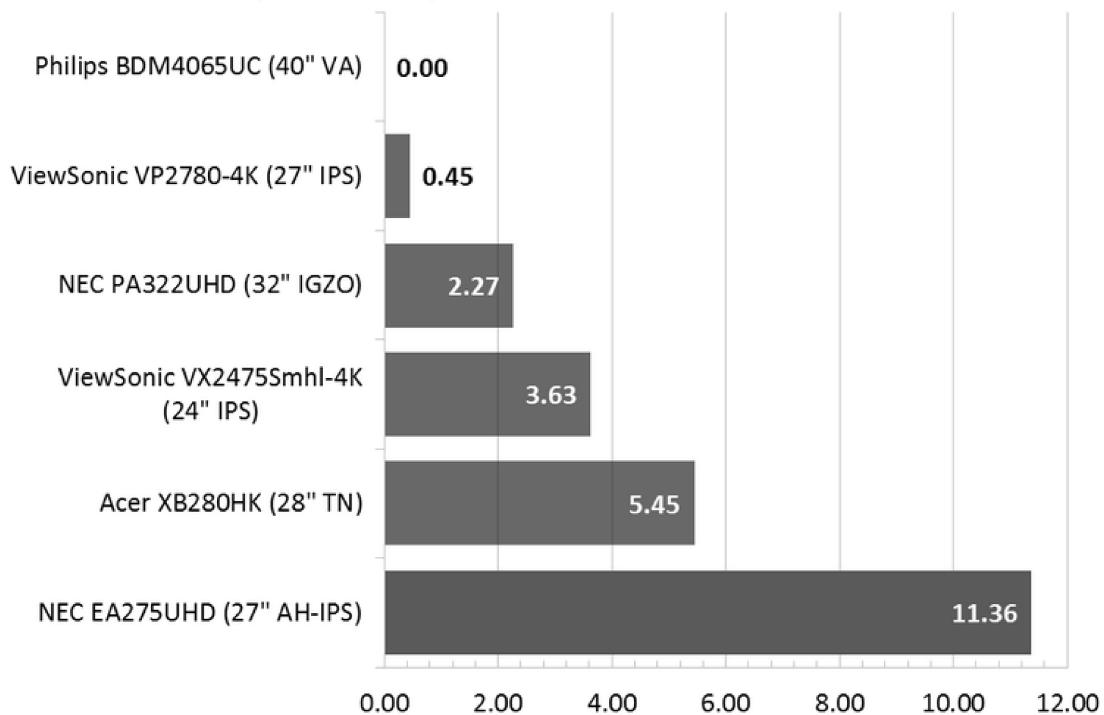


Even though tracking isn't terribly flat, it isn't the worst in the group. It's interesting to note the last-place finish of the VP2780-4K since it uses the same panel part as the EA275UHD. That screen posted a similar result but it has an sRGB mode that fixes its tracking issues.

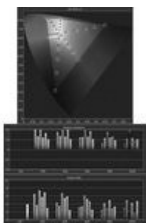
We calculate gamma deviation by simply expressing the difference from 2.2 as a percentage.

Average Gamma - Deviation From 2.2
Calibrated to 200 cd/m²
Deviation In Percent [lower is better]

tom'sHARDWARE

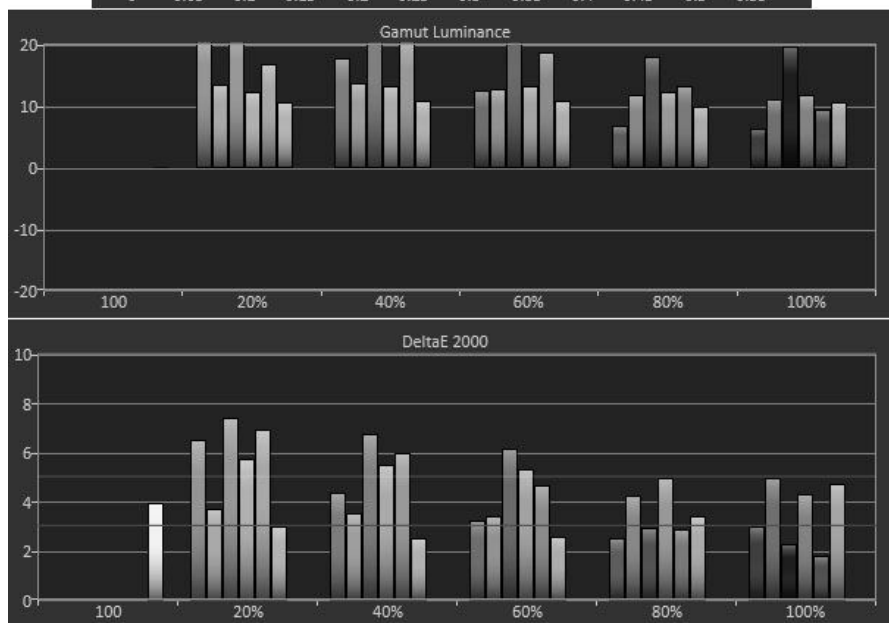
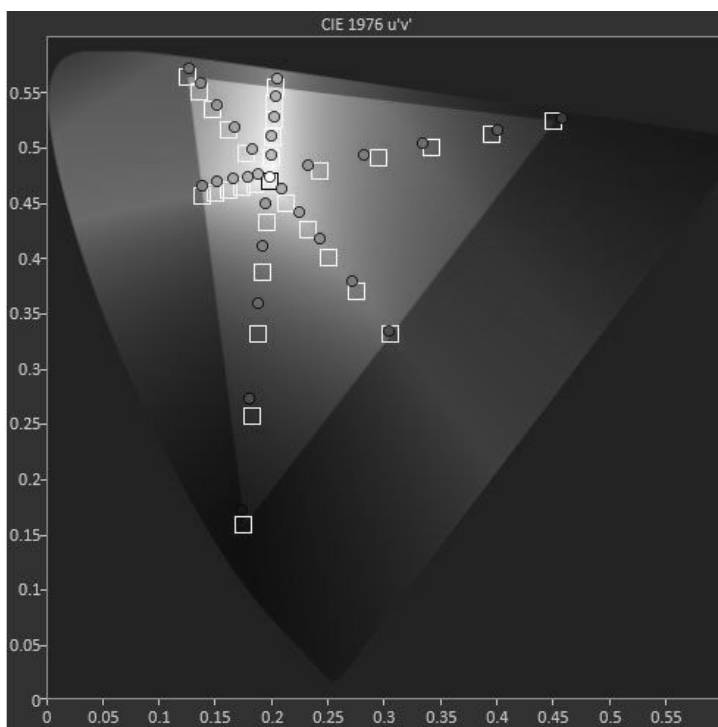


With an average value of 1.95, the EA275UHD is further away from 2.2 than many monitors we've tested. Perhaps a firmware update could fix this issue because performance is excellent in every other respect.



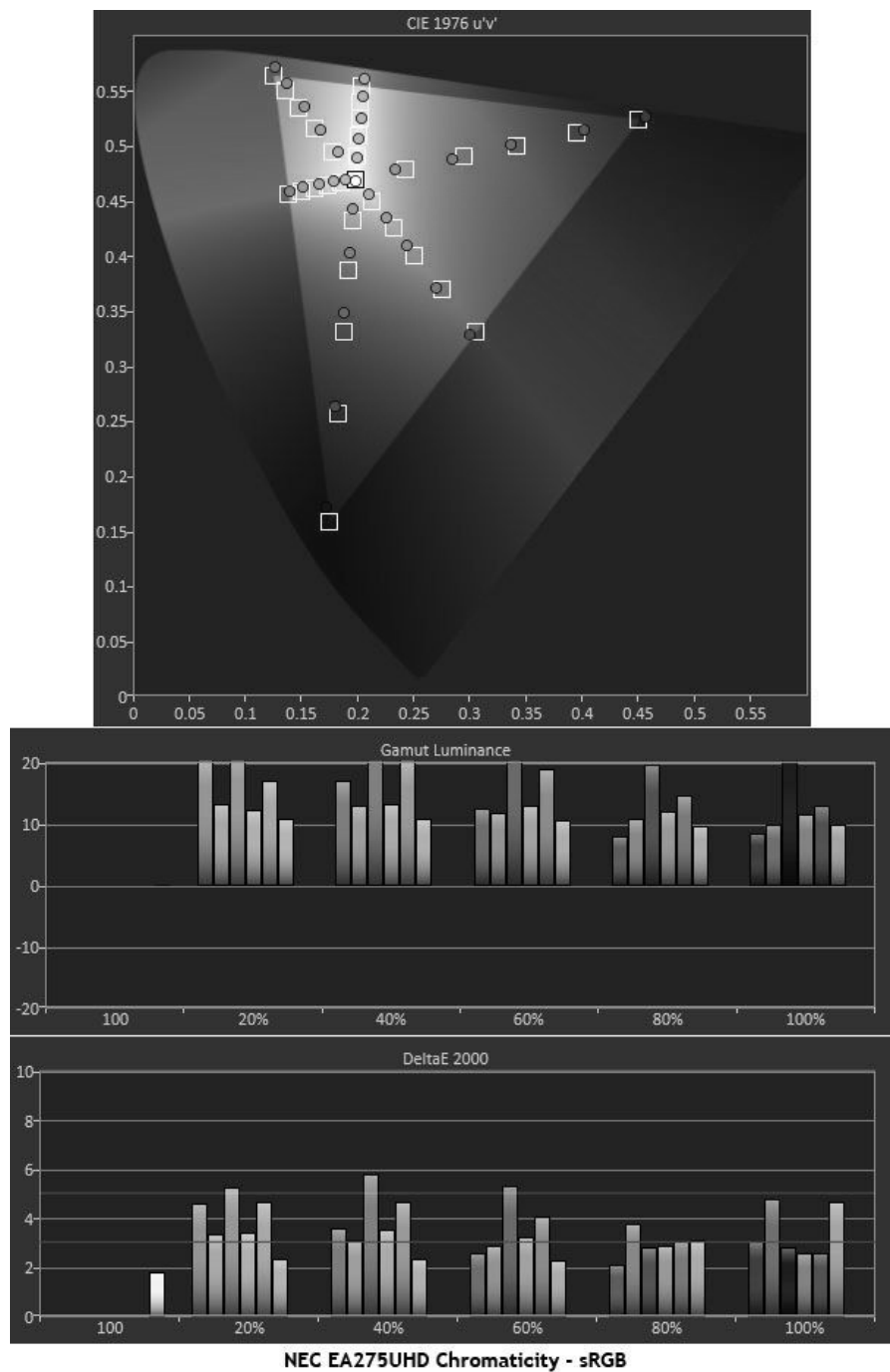
6. Color Gamut & Performance

For details on our color gamut testing and volume calculations, please [click here](#).

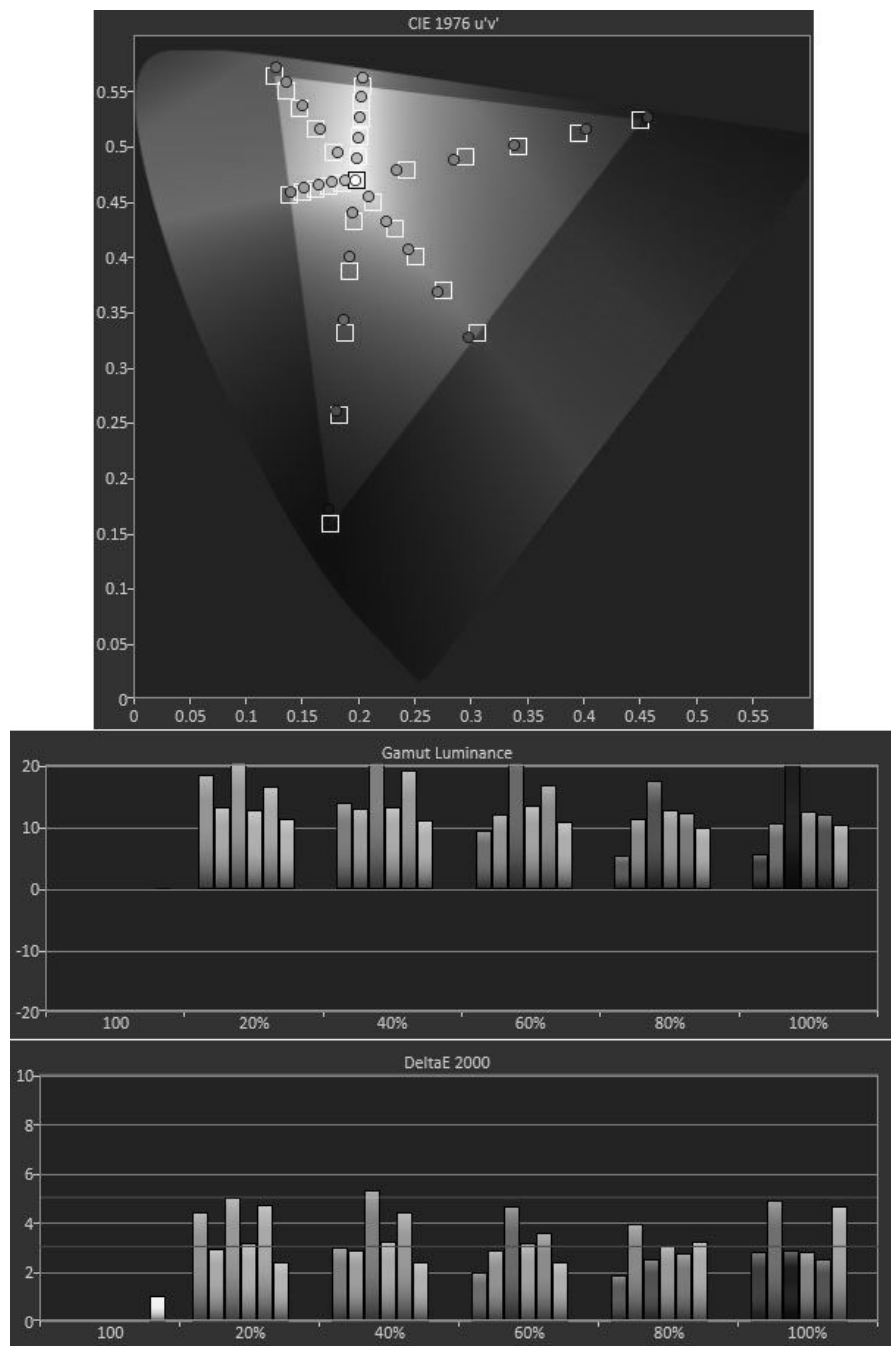


NEC EA275UHD Chromaticity - Native

In the past we've shown you the relationship between gamma and color saturation. The charts generated by the EA275UHD further demonstrate the concept. At the 100-percent level, all six colors are pretty much on-target except blue which is slightly under-saturated. But look at the targets inside the gamut triangle. Light gamma coupled with high luminance values create under-saturation most significantly in red, blue and magenta. A fix to gamma tracking would yield a better result in this test.



sRGB mode is a little better but it still has higher luminance values than it should. The net result is decent color accuracy as you can see by the Delta E numbers. But there is more performance available here.

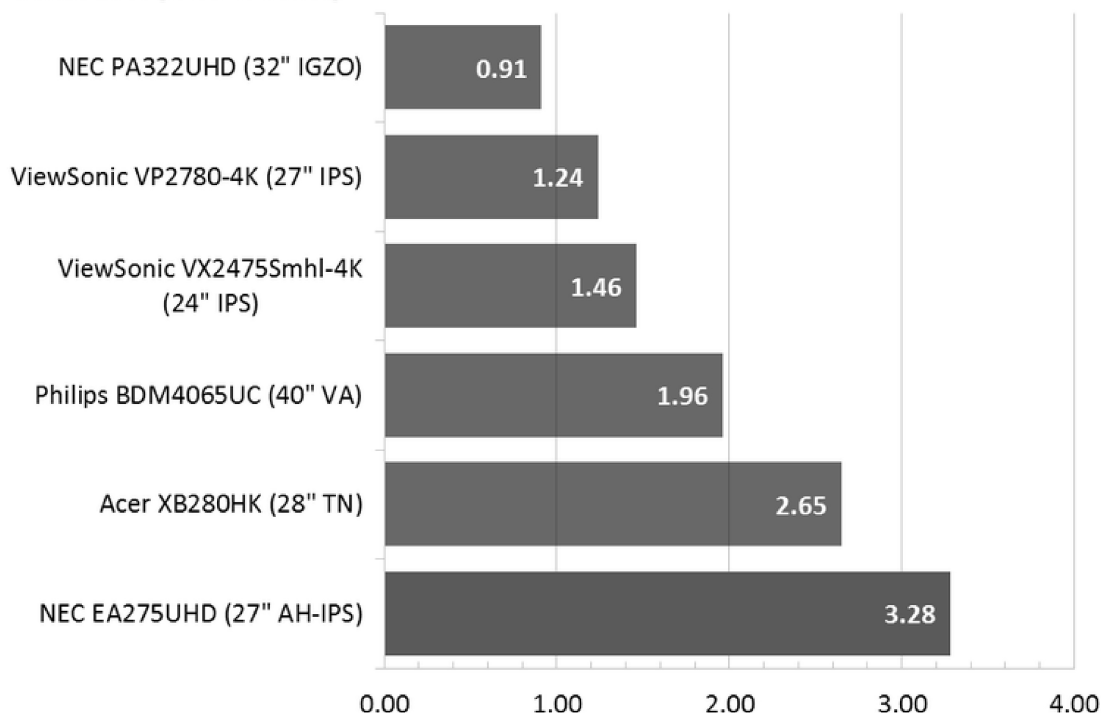


Calibration of the number three preset brings down the error levels a little more but doesn't completely solve the saturation and luminance issues. It seems the only way to improve upon these results is to use SpectraView to correct the gamma tracking.

Now we return to the comparison group.

Color Gamut Error
Calibrated to 200 cd/m²
DeltaE 2000 [lower is better]

tom's HARDWARE

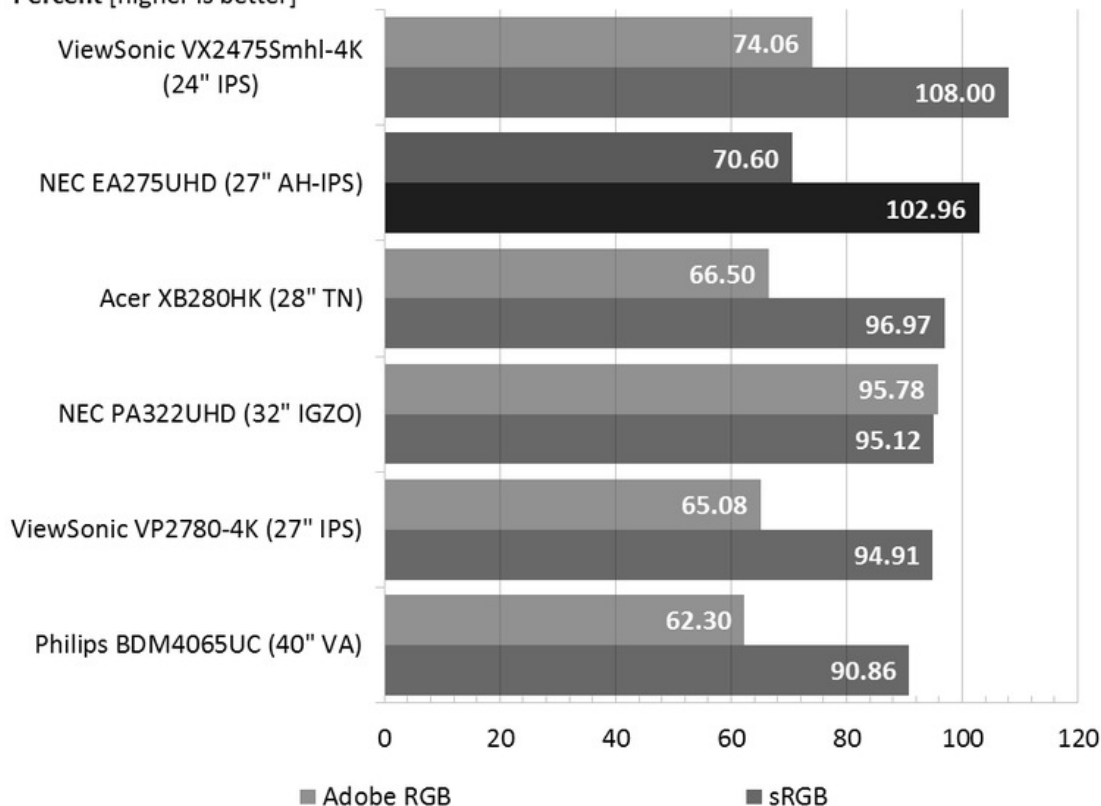


We've been saying overall errors aren't too far above the visible threshold. 3.28dE is the best we could do with an instrumented calibration. If you choose the sRGB mode, the error is only slightly higher at 3.47dE. Native mode yields an average of 4.30dE. Since sRGB provides more contrast than Preset 3, that's the mode we recommend.

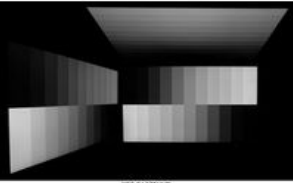
Gamut Volume: Adobe RGB 1998 And sRGB

Color Gamut Volume
Rendered Percentage of Adobe RGB 1998
and sRGB, Calibrated to 200 cd/m²
Percent [higher is better]

tom's HARDWARE

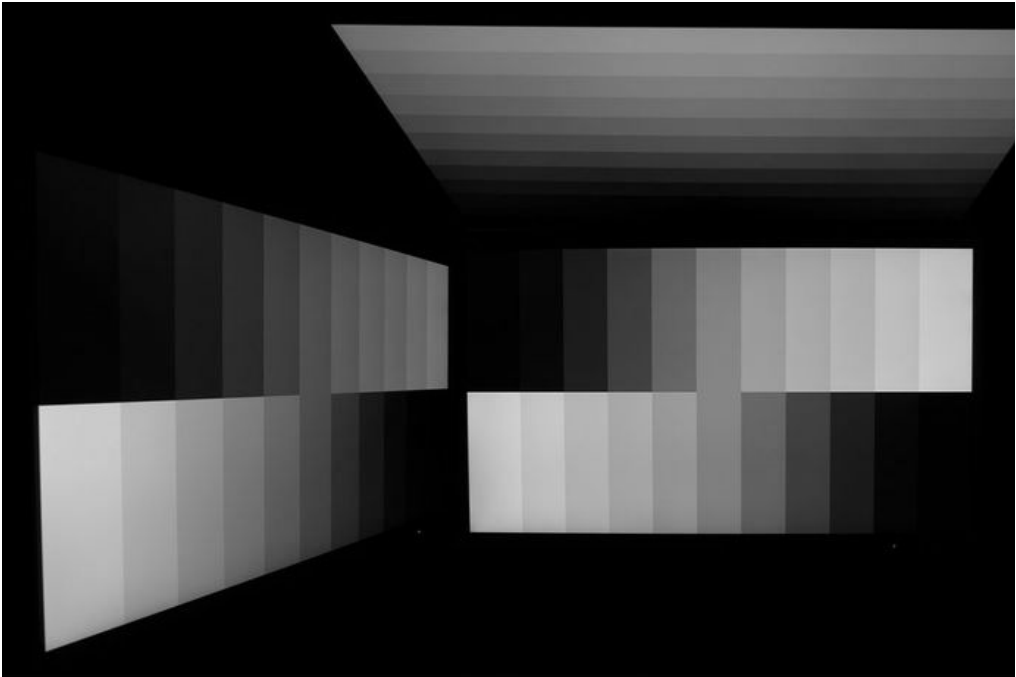


There's a tiny bit of bonus red and green available so the total gamut volume exceeds 100-percent sRGB by 2.96-percent. It looks like some tweaking has happened here since the VP2780-4K, which uses the same panel part, has seven-percent less volume. In NEC's case however, if you want exactly 100-percent volume you can achieve it with SpectraView or CalMAN.



7. Viewing Angles, Uniformity, Response & Lag

To learn how we measure screen uniformity, please [click here](#).



NEC EA275UHD

Off-axis viewing is pretty typical for an IPS panel. Light falloff to the sides is minimal but there is a red/green shift. From the top down you can see at least 50-percent less output but detail is retained pretty well. If you're looking for a 27 or 28-inch Ultra HD display, the only way to enjoy the superior viewing angles of IPS is to go for the more-expensive 27-inch option. The 28-inchers are currently all TN-based.

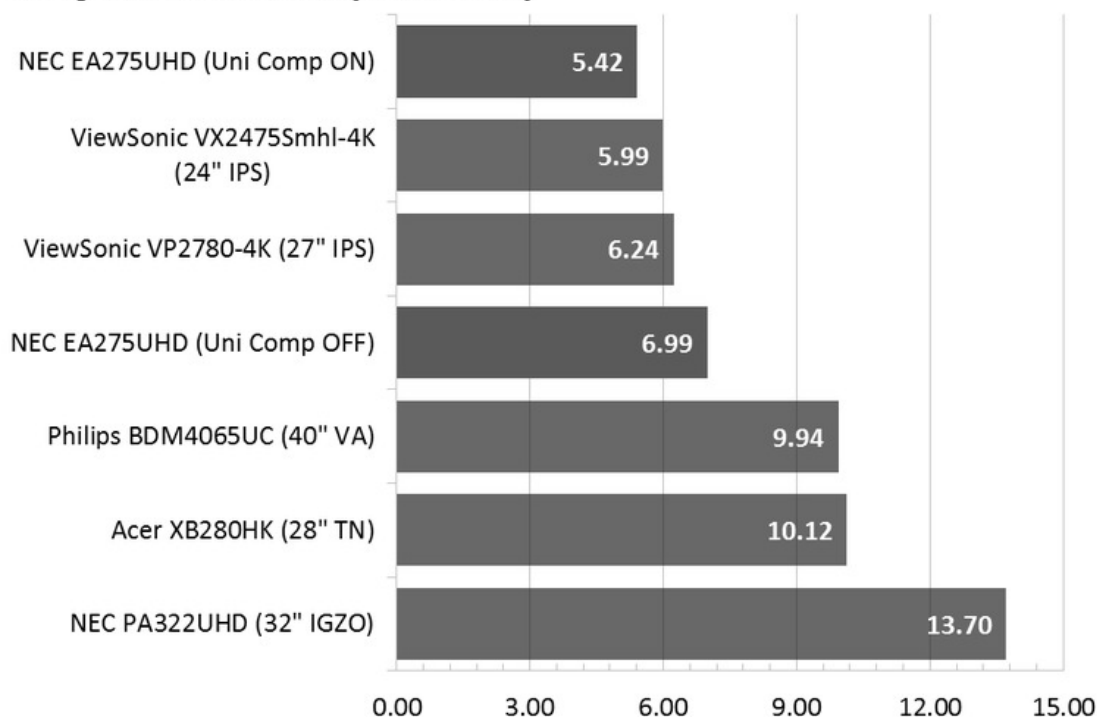
Screen Uniformity: Luminance

Screen Uniformity - Deviation From Center

0% Black Field

tom's HARDWARE

Average Deviation In Percent [lower is better]



NEC's EA-series monitors have only on/off uniformity compensation. To get the five-level option, you have to buy a PA-series screen. As you can see in the EA275UHD's case, the feature is both subtle and unnecessary. 6.99 percent is among the best we've recorded and a drop to 5.42 percent is not a difference you'll be able to see. You will see the reduction in contrast however.

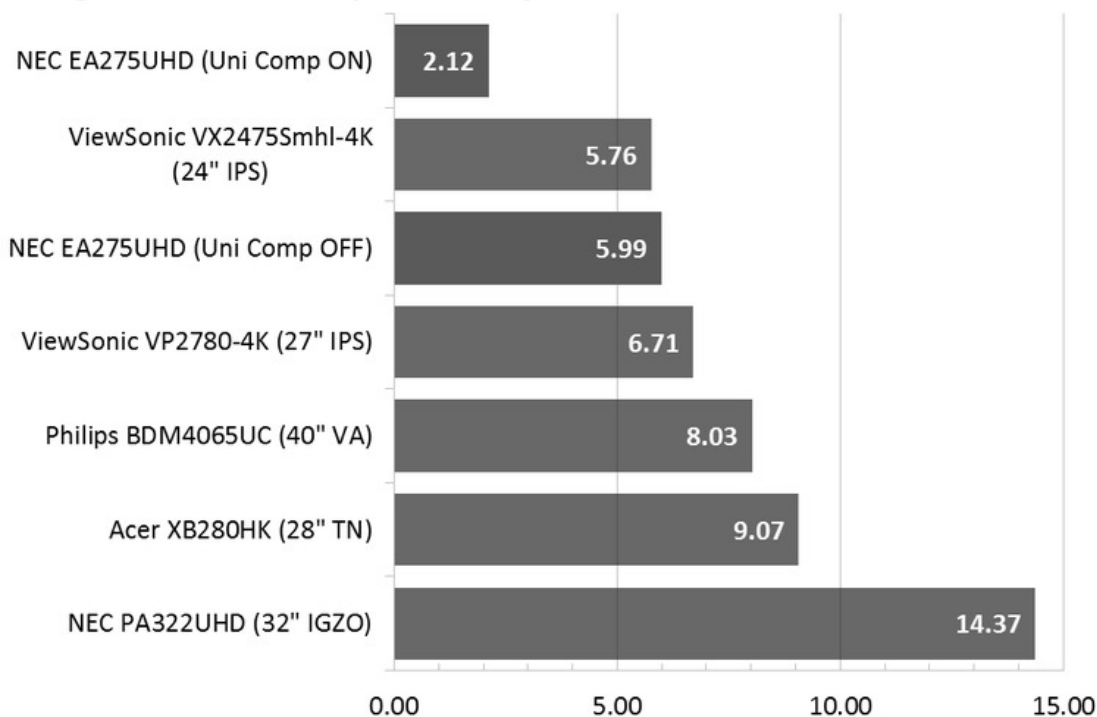
Here's the white field measurement.

Screen Uniformity - Deviation From Center

100% White Field

tom's HARDWARE

Average Deviation In Percent [lower is better]

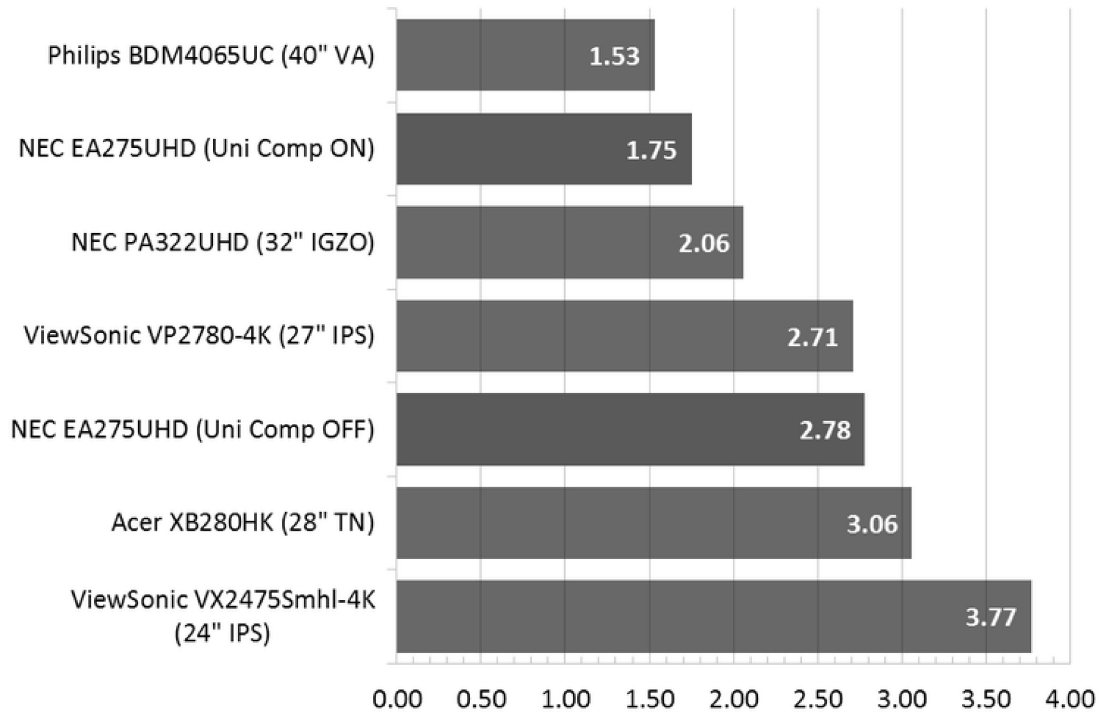


The improvement is greater in the white field test which tells us that NEC concentrates its correction on the brighter output levels. We're still not convinced you should use the feature though. 5.99 percent beats many other monitors.

Screen Uniformity: Color

Color Uniformity
DeltaE 2000 Variation
Variation High To Low [lower is better]

tom'sHARDWARE



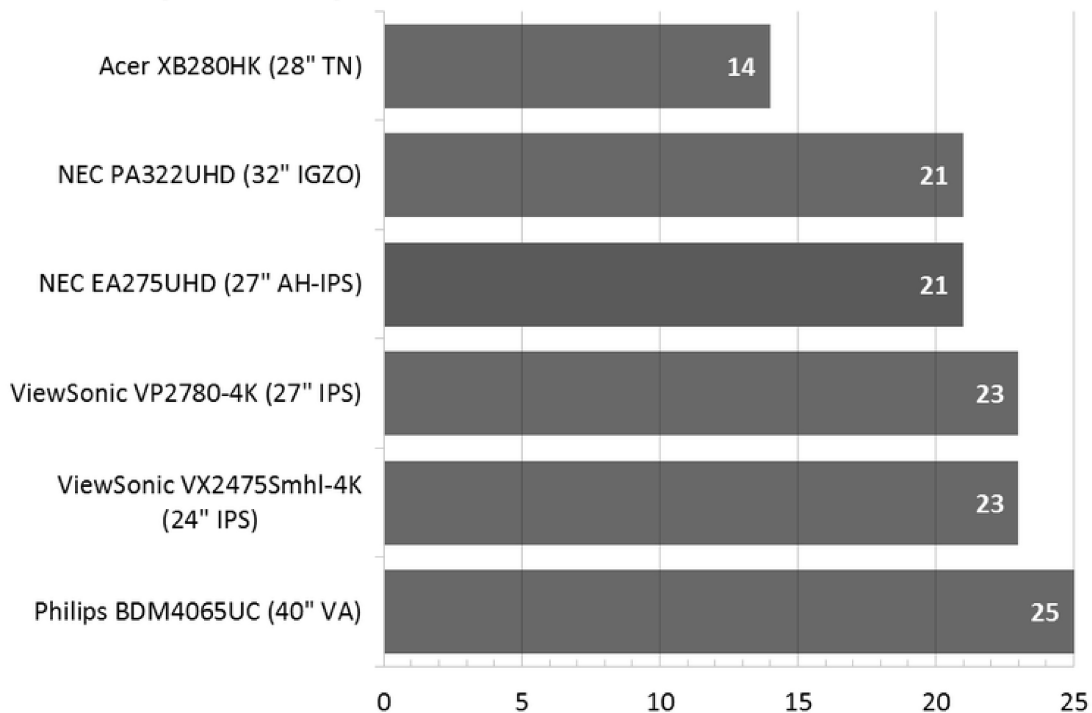
The improvement in color uniformity is fairly small. Neither result is visible to the naked eye. Our sample looks perfect from edge to edge. There are no color shifts nor are there hotspots or light bleed.

Pixel Response And Input Lag

[Please click here to read up on our pixel response and input lag testing procedures.](#)

Response Time
Full Black To White Transition
Milliseconds [lower is better]

tom'sHARDWARE

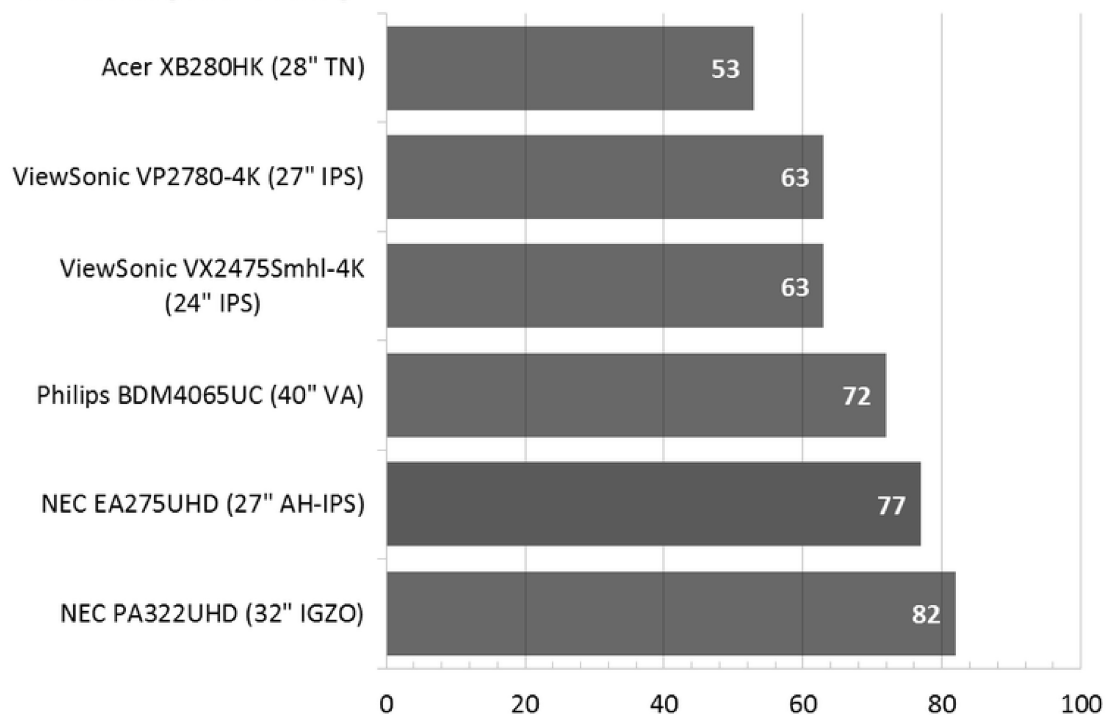


We don't expect many gamers to shop this monitor but if you do, know that its response is fairly snappy among its 60Hz competition. Overdrive is turned on for this test and it improves motion blur without ghosting. The Acer remains the fastest 60Hz panel we've ever tested with its 14ms result.

Here are the lag results.

Absolute Input Lag
Full Black To White Transition
Milliseconds [lower is better]

tom's **HARDWARE**



If you're gaming in Ultra HD there are faster screens available. At 60Hz you'll have a hard time besting the XB280HK but the EA275UHD is in line with the jumbo 32 and 40-inch models of the group. Until interface standards and graphics processors allow for higher refresh rates, you'll have to drop to QHD or FHD resolution for the absolute lowest lag and motion blur.



8. Conclusion

We've reviewed a variety of NEC displays here at Tom's and without exception they perform well, look great and impart the feel of a precision-built tool. Whether you choose from the professionally-oriented PA series or an enterprise-ready EA screen, you'll get high-end quality with performance and factory support to match.

With this new 27-inch IPS category in the Ultra HD realm, users have a good choice that works well from the standpoint of size, image quality and price. They're more expensive than the 28-inch TN screens but with both the ViewSonic VP2780-4K and NEC EA275UHD, you get more features, a better build and a better overall picture.



Both displays offer excellent contrast, comfortably over 1000:1 which is our preferred standard. Color accuracy is also competitive with more expensive professional screens. And brightness is extremely high with max outputs over 400cd/m². In fact the only flaw we ran into here was less-than-stellar gamma tracking. And NEC offers a fix for that in the form of SpectraView calibration software.

If you're interested in Ultra HD for gaming, this monitor doesn't break any new ground. It's a 60Hz panel and forgoes both G-Sync and FreeSync. A 60Hz refresh rate at 3840x2160 resolution is likely to be with us until newer DisplayPort and HDMI standards are able to handle the extra bandwidth. And at this writing the only frame-rate-matching-capable UHD screen available is Acer's XB280HK which offers G-Sync technology.

The EA275UHD therefore is squarely aimed at the enterprise. Pretty much anything NEC makes can be considered luxury business class based on build quality alone. The Ultra HD factor however takes this display to the top of its category.

If you're looking for the ultimate in performance, check out the PA series. That's where you'll find factory-certified calibrations and a menu system that can do just about anything including full color management. Those screens have proven themselves ready for mission-critical work right out of the box. But if you're looking to save a few bucks, an EA series monitor will satisfy the majority of users regardless of application. The addition of the EA275UHD to that line just creates another excellent choice from both NEC and the Ultra HD category.

For general computing tasks and casual gaming it's hard to imagine a monitor with the look and feel of an NEC. There are displays of equal performance but the overall package, build quality and all the details that go into its design are hard to find elsewhere. The EA275UHD may not have the lowest price in class but we sure wouldn't regret buying one. That's why we're giving it our Editor Approved Award.

PROS: Carved-from-stone build quality, bright sharp picture, complete OSD, software calibration tools

available

CONS: Inaccurate gamma without SpectraView

VERDICT : The EA275UHD isn't perfect; no monitor is, but we think any user outside a hardcore gamer would be happy to own one. It sports a bright sharp image with excellent contrast, good color saturation and pixel density to spare. Build quality is second-to-none and even though it's not the cheapest 27-inch Ultra HD monitor out there, it isn't over-priced either. We'd be happy to have one of these displays on our desks.

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