Source: http://www.slrgear.com

Nikon 70-200mm f/2.8G AF-S ED VR II Nikkor (Tested)

Reviews	Views	Date of last review
3	**55279**	**1/12/2010**

Recommended By	Average Purchase
100% of reviewers	**$2,115.00**

User Review Rating Averages

Construction Quality	Image Quality	Overall Rating
9.67	**9.67**	**9.67**

Name	Nikon 70-200mm f/2.8G ED-IF AF-S VR II Nikkor
Image Circle	35mm
Type	Telephoto Zoom
Focal Length	70 - 200mm
APS Equivalent	105 - 300mm
Max Aperture	f/2.8
Min Aperture	f/22
Diaphragm Blades	9 rounded
Lens Construction	21 elements in 15 groups, including 7 ED Elements
Diagonal Angle of View (Based on FX image circle)	34.2 to 12.2 degrees
Focus Details	Silent Wave Motor; Internal Focusing
Front Element Rotation	No
Zoom System	Rotary
Closest Focus	1.4m / 4.6 ft.
Magnification Ratio	0.12x / 1:8.3
Filter Size	77mm
Dimensions (Length x Diameter)	209mm x 87mm / 8.2 in x 3.4 in.
Weight	1540 g / 3.4 lbs
Notes	Image Stabilization; Included Accessories: Hood, Case, Tripod Collar
Typical Online Price	November 2009 - $2,399.95

Source: http://www.slrgear.com

SLRgear Review

January 5, 2010
by Andrew Alexander

The Nikon 70-200mm ƒ/2.8G AF-S ED VR II was announced in July 2009 and released later that year in November. The lens is the second generation in the 70-200mm series, intended to alleviate issues of corner softness and flare.

The lens uses a constant ƒ/2.8 aperture and is designed to fill the 35mm film frame or FX image sensor. While the lens is completely compatible with DX sensor-based camera bodies, the effective field of view will be approximately 105-300mm. The lens is equipped with several accessories: a large, petal-shaped lens hood, attached tripod mounting bracket with removable foot, and a soft lens case. The lens is available now for approximately $2,400.

At this point, it's worth noting that we have two samples of the original version of the 70-200mm ƒ/2.8 lens, with which we'll be running full-frame tests in order to compare the old vs. the new lens. Those tests should be ready within the next two weeks.

Sharpness
The previous version of the 70-200mm ƒ/2.8 had been accused of having unacceptably soft corners; based on the sample of the new version of this lens, we can conclude that Nikon has dramatically improved this performance. Perhaps one of the most telling and interesting observations we can make is that the results for sharpness were nearly identical for both the sub-frame D200 and the full-frame D700.

The lens produces exceptionally sharp images at ƒ/2.8, from 70mm through to 200mm. At this aperture its ''best'' performance comes at 70mm, with just over 1 blur unit in the center and 1.5 blur units in the corners; the center becomes marginally less sharp as the lens is zoomed in to 200mm, but whether this is noteworthy is doubtful - even at 200mm, we're seeing just 1.5 blur units across the frame. Of the lenses we've tested across all manufacturers, none have achieved this performance at ƒ/2.8.

Stopping down does improve performance: at ƒ/4, the lens is basically as sharp as sharp gets, offering 1 blur unit across the frame from 70mm through to 105mm. At 135mm and 200mm, some peeping at the charts shows it is actually slightly above 1 blur unit, but at this point, we're picking the nits pretty closely. Performance at ƒ/5.6 and ƒ/8 is just as good.

Diffraction limiting begins to set in at ƒ/11 with some very marginal loss of sharpness, and even at ƒ/16 we still note results of just 1.5 blur units across the frame. Fully stopped-down at ƒ/22, we note results of just under 2 blur units across the frame.

In summary, these are some of the sharpest results we've seen in a zoom lens.

Chromatic Aberration
For Nikon lenses, the D700 applies automatic chromatic aberration reduction, which is why we still like to do our subframe camera testing with the D200, which does not, and gives us a fairer indication of the lens' performance, rather than the camera's. In this case though, the lens is exceptional at preventing chromatic aberration, with only nominal results to report from the D200. In this case there is slight blue fringing in the corners at the 70mm and 200mm focal lengths at ƒ/2.8. On the D700, there is hardly any CA of note.

Shading (''Vignetting'')
With the 70-200mm ƒ/2.8 VR2 mounted on the D200, corner shading is not an issue, with any focal length and aperture producing less than a quarter-stop of shading in the corners.

It's slightly different when the lens is mounted on the D700. The focal length most affected is 200mm. The worst performance is noted with the lens zoomed to 200mm and the aperture set to ƒ/2.8; with this combination, the corners are up to two-thirds of a stop darker than the center. At other focal lengths at the ƒ/2.8 aperture, we note between a third and a half of a stop worth of shading. Corner shading is marginal for 70-105mm at ƒ/4; for 135mm, it's reduced significantly, but only marginal at ƒ/5.6. To completely remove corner shading at 200mm, you'll have to shoot at ƒ/11, where the corners are less than a quarter-sotp darker than the center.

Distortion
Distortion performance has also been improved in the new version of the 70-200mm ƒ/2.8. The previous version of the lens appears to have attempted to provide an undistorted image at the 105mm mark; in the new version, Nikon has made 85mm the target point, and distortion begins from there. As the lens is zoomed in towards 200mm, average (central) distortion becomes slightly barrel-distorted, while the corners take on a distinct pincushion distortion. On the D200 this effect is not substantial (at 200mm, we note an average of just under +0.1% barrel and extreme corners of -0.5% pincushion). On the full-frame D700 however, distortion is a bit more significant: at 70mm there is actually some noteworthy barrel distortion, +0.2% in the corners; at 200mm, the corners are distinctly pincushion distorted (-0.5%) with some barrel distortion throughout the image (+0.25%).

Autofocus Operation
Nikon has made some significant changes in the focusing system in the new 70-200mm ƒ/2.8 lens. None of these has impacted on the overall speed of the auto-focusing system, which (similarly to the previous version of the lens) is incredibly fast, going from infinity focus to close-focus and back again in under a second. Small changes in focus happen incredibly fast.

The AF-S specification of the lens allows the user to override autofocus results by just turning the focusing ring at any time, however, Nikon has improved upon this feature by adding an additional focusing mode - ''A/M''. (The convention on Nikon lenses for this switch has been ''M/A'' - manual / autofocus - and ''M'' for purely manual focus). The ''A/M'' switch seems to add an additional layer of gearing to the autofocus ring, the effect of which is to make a turn of the ring produce less of a change in the amount of change in focus. In practice, Nikon suggests that this setting would be used in the case where a user did not want to accidentally change focus results. However, in our sample of this lens, any movement of the focus ring still affects focus results, regardless of the setting. When set to the A/M setting, the movement of the ring just has less of an effect.

Nikon has changed the parameters of the focus limiter switch. Where the previous version of the lens enabled the lens to be limited between infinity and 2.5 meters, the new switch enables the lens to be limited between infinity and 5 meters.

Finally, the lens no longer has the three focus hold buttons found in the previous version of the lens.

Macro
The 70-200mm ƒ/2.8 makes a very poor macro lens, with just 0.12x magnification. However, its close-focusing range has been improved, at just 1.4 meters (around four feet from the end of the lens).

Build Quality and Handling
The Nikon 70-200mm ƒ/2.8G AF-S ED VR II is a large and heavy lens - slightly shorter than the previous version (209mm instead of 216mm), but slightly heavier (1,540 grams instead of 1,450 grams). Nikon's improvements to the previous lens include replacing the nine straight diaphragm blades with nine rounded ones, for improved bokeh performance (though truth be told, bokeh performance in the previous lens has been held in very high regard). Nikon has replaced two of the lens elements with ED glass, making for a grand total of seven ED glass elements (21 in 15 groups). Nikon has used its Nano-Crystal coat process to reduce flare and ghosting. Finally, the vibration reduction system employed is now the VR2 system.

Operationally, there has also been some redesigning. As previously mentioned, the focus hold buttons have been removed, a new focusing mode (''A/M'') has been added, and the parameters of the focus limiter switch have changed. The windowed distance scale has been repositioned closer to the middle of the lens, so it can now be seen while the lens hood is mounted for storage. There are still no depth-of-field or infrared index marks on this scale, however. The Vibration Reduction switches have stayed the same: VR can be activated or deactivated with one switch, and changed from normal (2-axis, panning) operation to active (4-axis) operation with the other switch.

The zoom ring hasn't changed much, retaining the rubber texture with large, raised ribs. It's about 7/8 of an inch wide and has great tactile feel. It's smooth to turn, and offers only slight resistance, taking gentle pressure from two fingers. There are about ninety degrees of turning action. For the purists, it should be noted that Nikon has changed the 80mm focal length marking on the previous version of this lens to a more conventional 85mm focal length marking.

The focusing ring is a different design, owing to the new shape of the lens. While the previous version of the lens had a distinct cone-like shape, the new lens is more cylindrical. Where the old version of the lens used a focusing ring that was larger and followed the expanding size of the front of the lens body, the new focus ring is a little less wide (1 inch) and is essentially flat. The extra space at the end of the lens is filled with an immobile ring-shaped rubber grip, for extra stability when holding the lens. The focusing ring has a generous amount of rotation room, about 160 degrees between infinity and close-focus. The ends are bordered with soft stops, so an increased amount of resistance lets you know you've reached the end. The lens will focus past infinity. Finally, attached 77mm filters will not rotate during focus operations.

The tripod mounting bracket is permanently attached to the lens, similarly to the previous version, and the foot can be removed (and perhaps, replaced with a third-party option which is directly Arca-Swiss compatible). The bracket itself is exceptionally stable, and can be rotated fully 360 degrees around the lens. There are rotation points present on the lens body at 90 degree intervals, and a knob tightens the lens well into its rotated position.

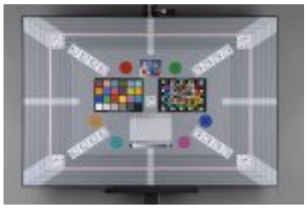
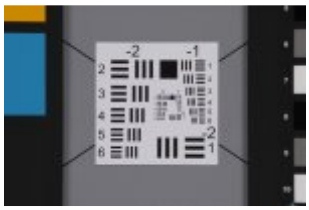
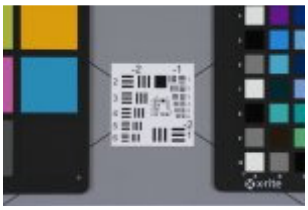
The lens hood has also been revised. The petal-shaped HB-48 (replacing the HB-29) is much shorter, down to 2 1/2 inches (compared to the original 3 1/4). Consequently this allows the user to access the manual focus ring with the lens hood in storage position. Users have also reported that the reduction in size for both the lens and hood have allowed them to place a camera/lens combination in their bag without having to switch the hood to its storage orientation.

We haven't had the time to extensively test the new VR2 vibration reduction system in this lens, but we can say through casual use that it does work, at least as well as the system in the previous lens. From conversations with other photographers who have taken to using this lens, we have heard nothing but praise for the new VR system.

The Close-Focusing Focal Length Controversy
This issue has been the cause of much debate across photography forums on the internet and the shop floor of many a camera store. In a nutshell, while the lens is marked as a 70-200mm focal length lens, this is only the case if you are focused to infinity. Focusing closer results in a reduction in the longest possible focal length; at the minimum close-focusing distance of 140 centimeters, the lens is offering an actual focal length that's reported to be 128mm. This effect isn't actually all that new, it's the case with many lens designs, it's just been brought to light by the substantiality of the difference found with the new Nikkor. If it was 180mm instead of 128mm, it could be that people wouldn't notice.

In the interest of informing the consumer, we have taken some standardized photographs showing the actual difference in focal length with the lens set to 200mm.

Source: http://www.slrgear.com

Distance	Old Version, 200mm	New Version, 200mm
49 feet (96%)		
24 feet (92%)		
5 feet (68%)		

Alternatives

Nikon 70-200mm ƒ/2.8G ED-IF AF-S VR ~$?
Though now discontinued, the previous version of the 70-200mm remains a popular lens. Optically, it's outdone by the new version in terms of sharpness, chromatic aberration, distortion and corner shading. The lens has its champions though, especially in light of the new lens' performance at 200mm and at close-focus. Some people will miss the focus hold buttons.

Nikon 80-200mm ƒ/2.8D ED AF ~$1,100
If you don't want or need VR, this lens remains a popular choice. It's not as sharp as the new Nikon at ƒ/2.8, but stopped down to ƒ/5.6 it performs as well everywhere except 200mm. It even has a dedicated macro mode, though magnification at this setting is only 0.17x.

Sigma 70-200mm ƒ/2.8 II EX DG Macro HSM APO ~$750
Sigma offers a 70-200mm ƒ/2.8 lens alternative, however, without optical stabilization. We haven't tested the newest version of this lens, but the previous generation we tested proved to be exceptionally sharp when stopped down to ƒ/4. CA performance was very good, though corner shading and distortion were somewhat high, especially when mounted on full-frame.

Tamron 70-200mm ƒ/2.8 Di LD IF Macro SP AF ~$750
Tamron also produces a 70-200mm ƒ/2.8 alternative, also without optical stabilization. Of the alternatives, this one approaches the new Nikon 70-200mm in terms of sharpness at ƒ/2.8. The lens isn't as fast to autofocus as the Nikkor, and it does show more corner shading.

Conclusion

There's little doubt that the lens represents some of the best optical engineering to date, and that the purchase of the lens represents an investment that's not likely to lose its value. For Nikon shooters, the 70-200mm lens has been the *de facto* pro lens, and Nikon has come through with excellent improvements. Whether they're worth the price premium is going to depend solely on the intended usage of the lens, though there's little doubt that working photographers will, if they haven't already, find much that justifies the upgrade.

Source: http://www.slrgear.com

Sample Photos

The VFA target should give you a good idea of sharpness in the center and corners, as well as some idea of the extent of barrel or pincushion distortion and chromatic aberration, while the Still Life subject may help in judging contrast and color. We shoot both images using the default JPEG settings and manual white balance of our test bodies, so the images should be quite consistent from lens to lens.

Still Life shot

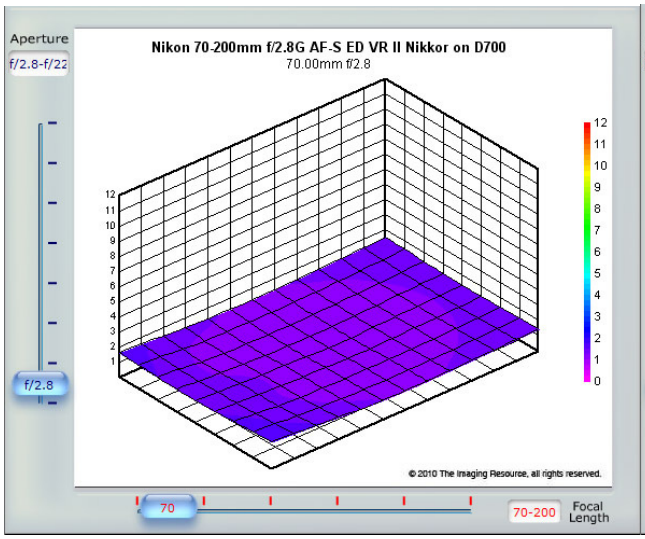
VFA target

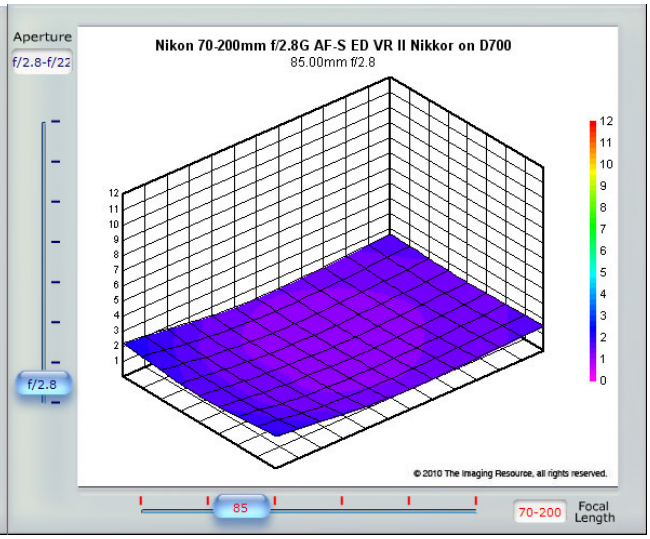
As appropriate, we shoot these with both full-frame and sub-frame bodies, at a range of focal lengths, and at both maximum aperture and ƒ/8. For the ''VFA'' target (the viewfinder accuracy target from Imaging Resource), we also provide sample crops from the center and upper-left corner of each shot, so you can quickly get a sense of relative sharpness, without having to download and inspect the full-res images. To avoid space limitations with the layout of our review pages, indexes to the test shots launch in separate windows.

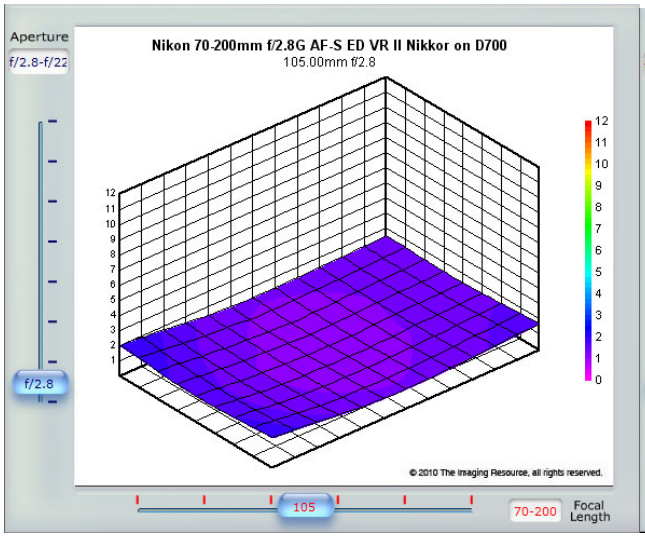
Source: http://www.slrgear.com

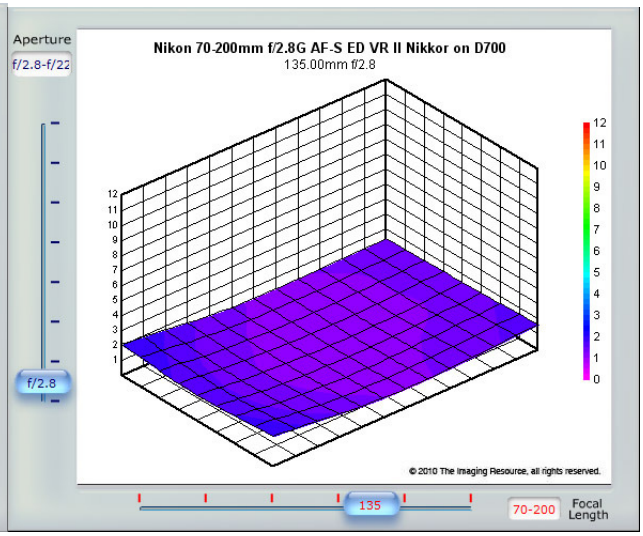
Sharpness on D700:

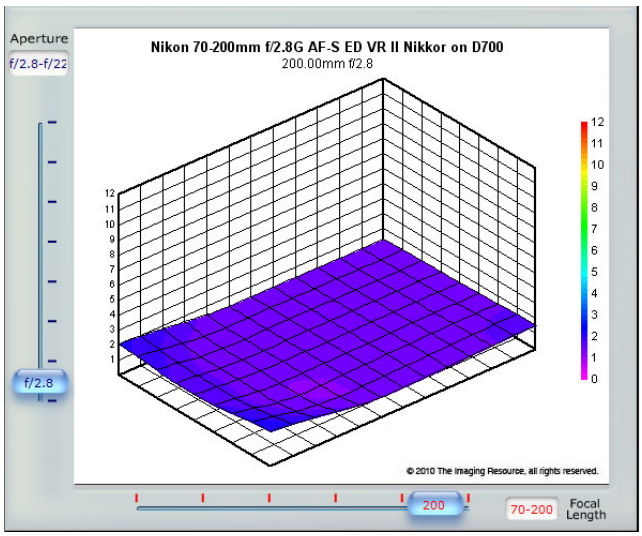
At f/2.8 (70mm-85mm-105mm-135mm-200mm):







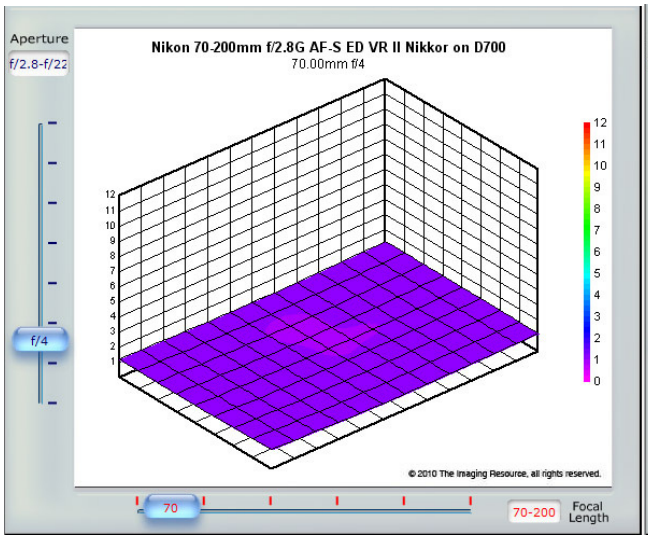


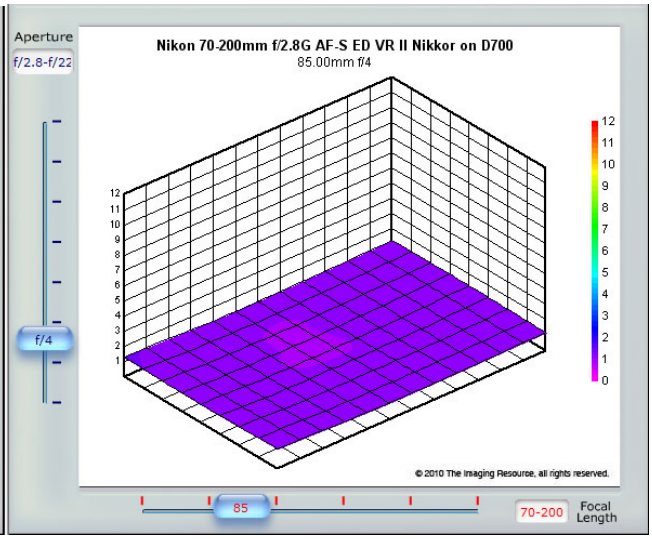


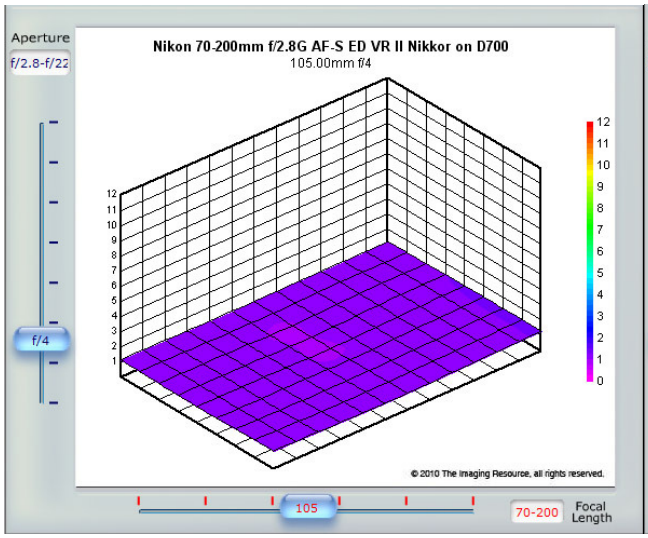
Source: http://www.slrgear.com

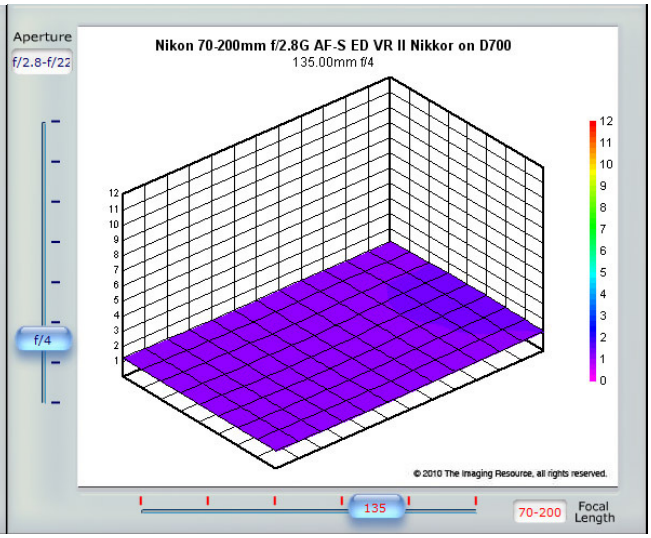
Sharpness on D700:

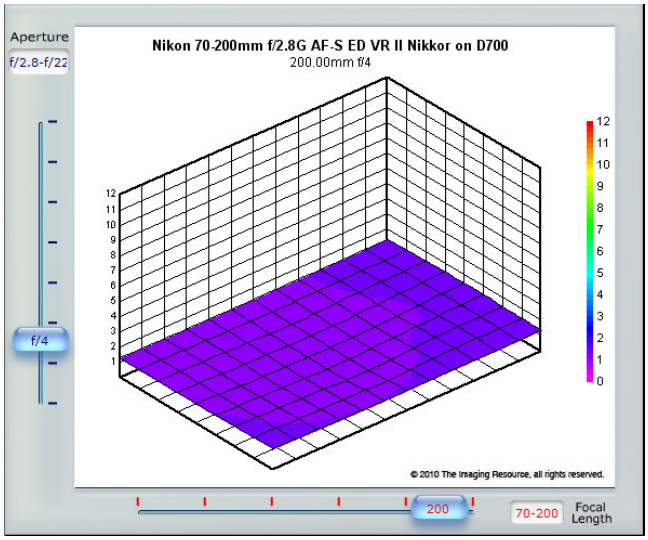
At f/4 (70mm-85mm-105mm-135mm-200mm):







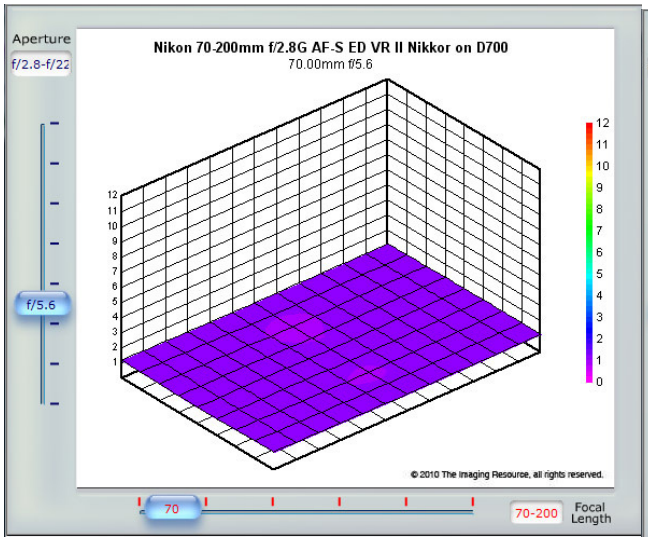


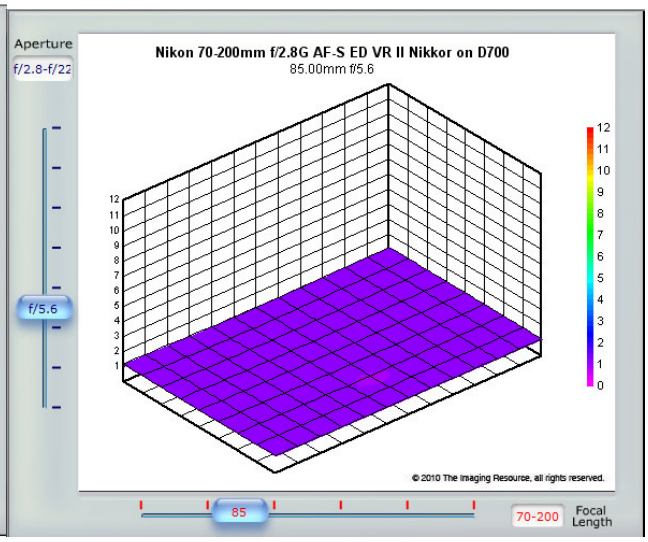


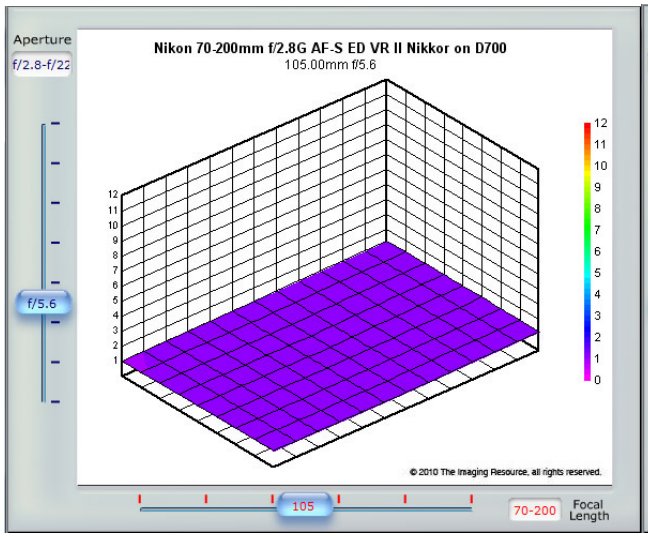
Source: http://www.slrgear.com

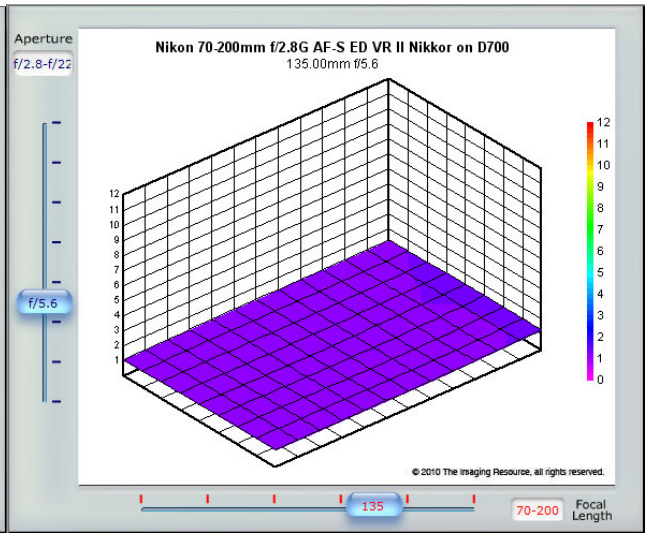
Sharpness on D700:

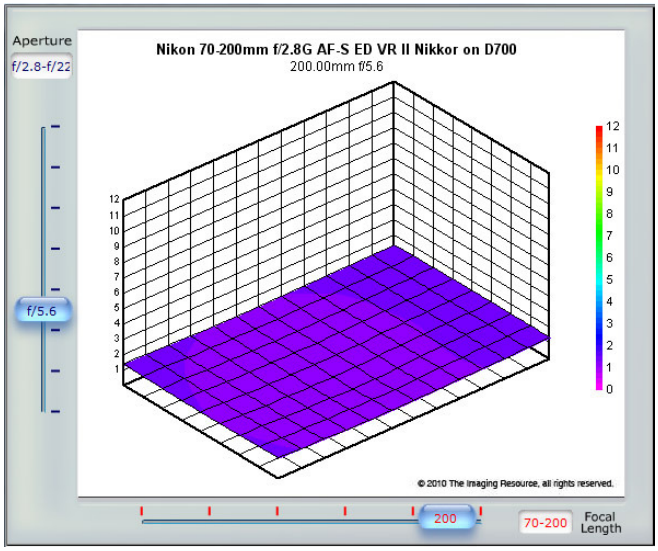
At f/5.6 (70mm-85mm-105mm-135mm-200mm):







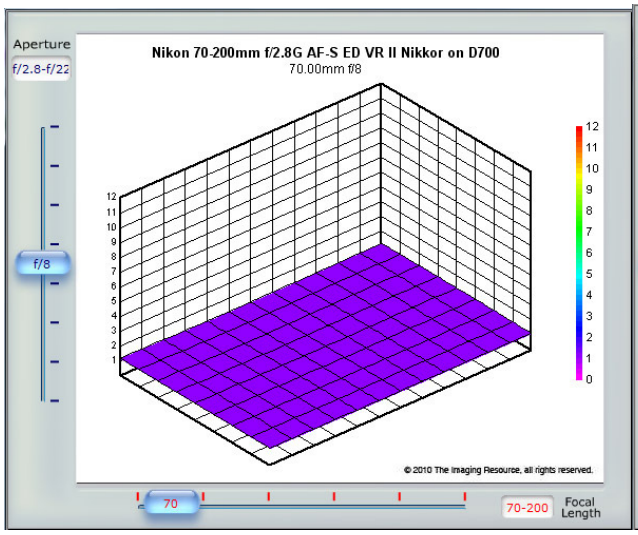


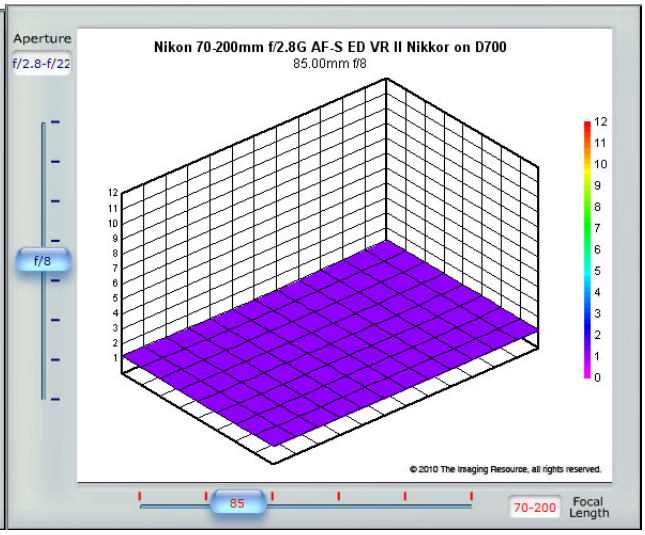


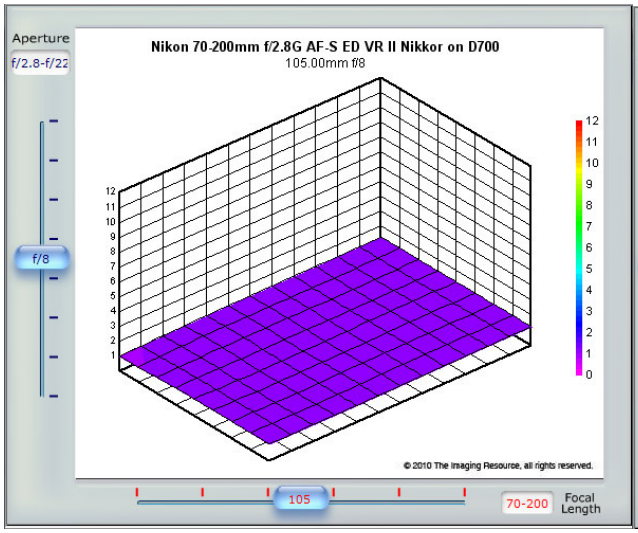
Source: http://www.slrgear.com

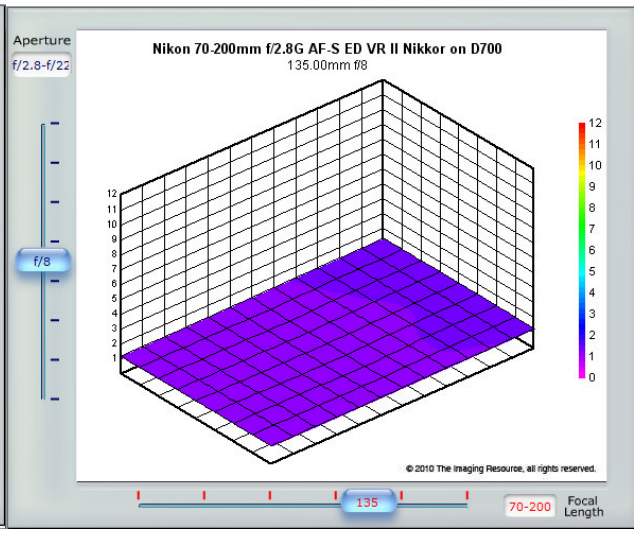
Sharpness on D700:

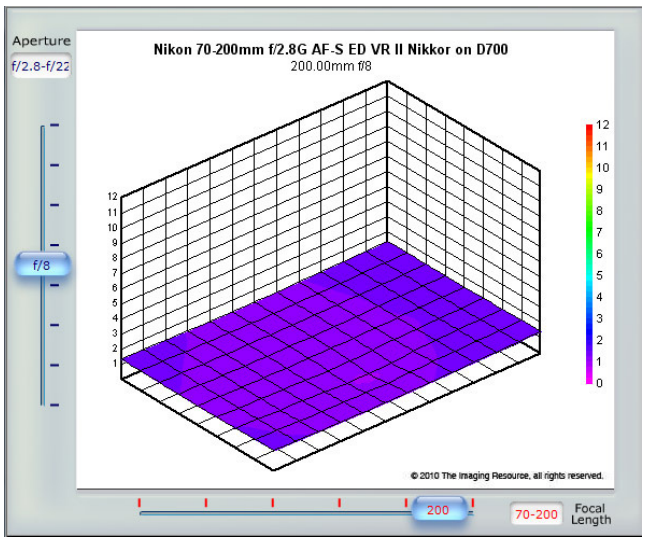
At f/8 (70mm-85mm-105mm-135mm-200mm):







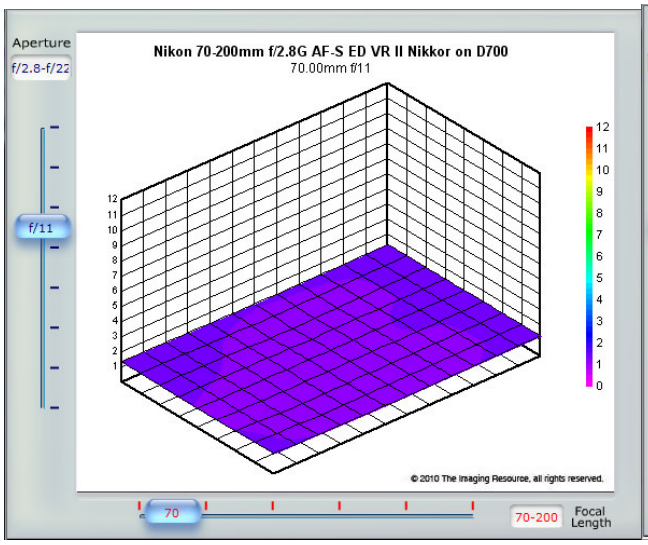


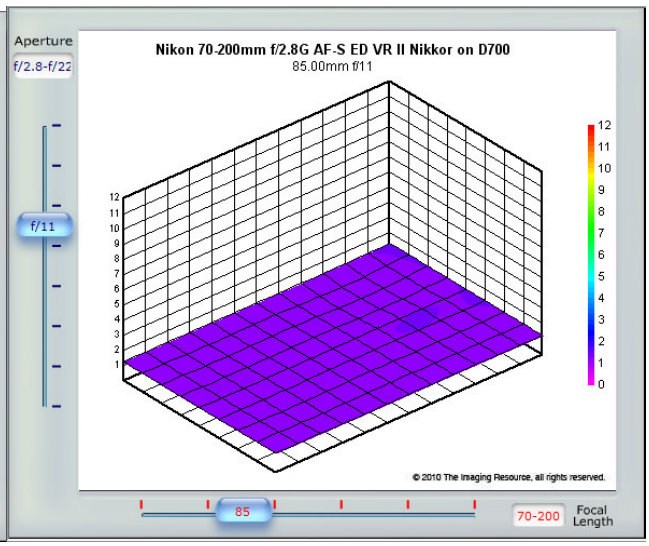


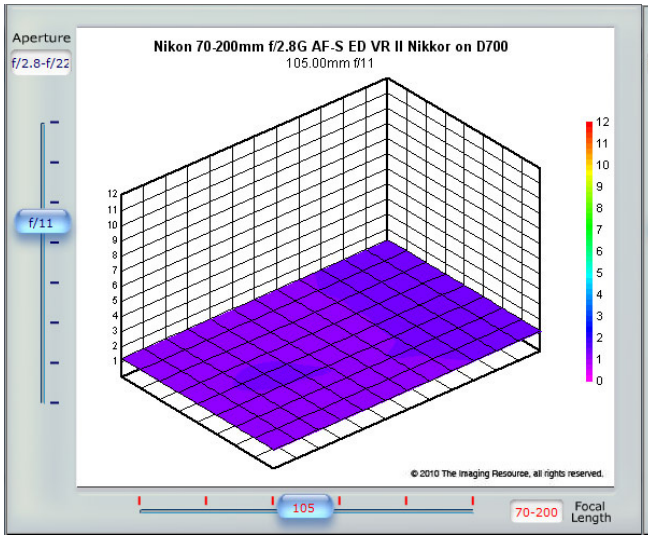
Source: http://www.slrgear.com

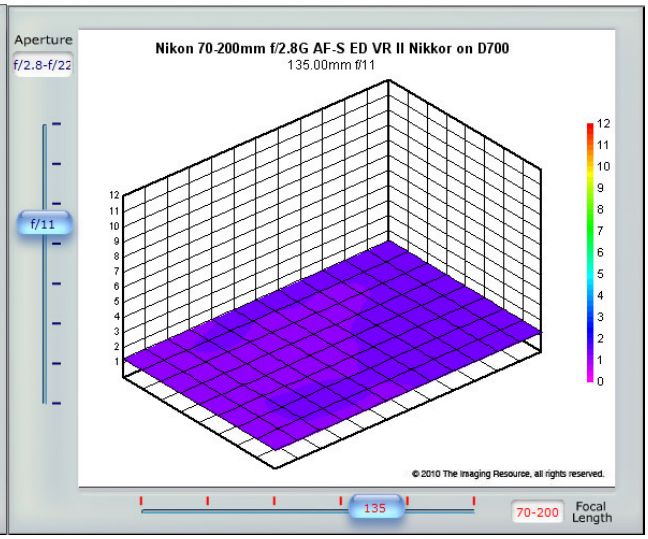
Sharpness on D700:

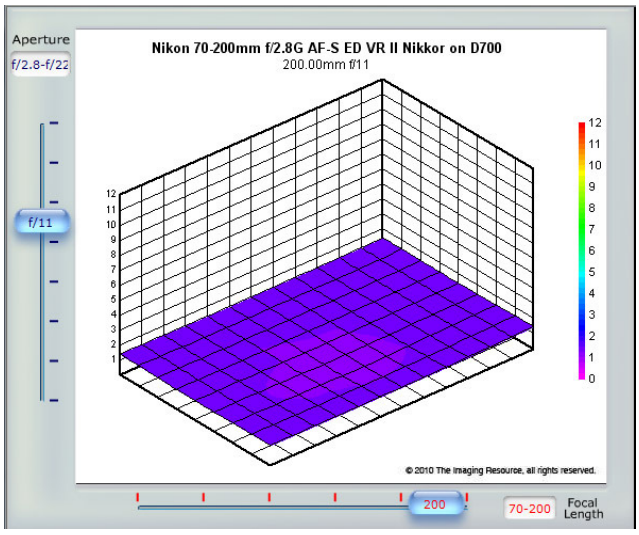
At f/11 (70mm-85mm-105mm-135mm-200mm):









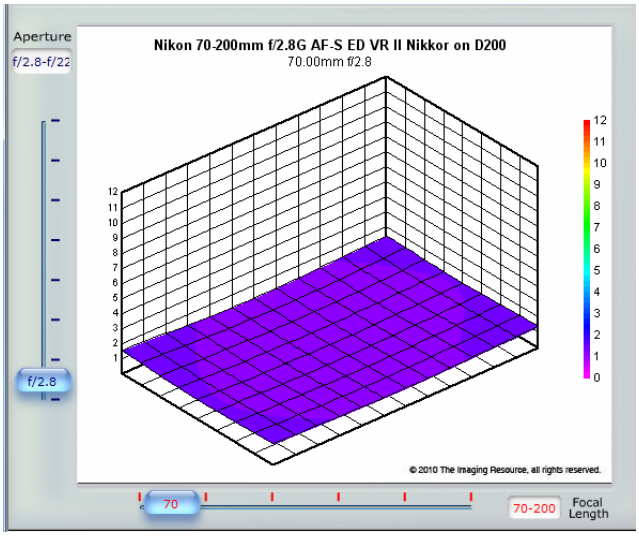


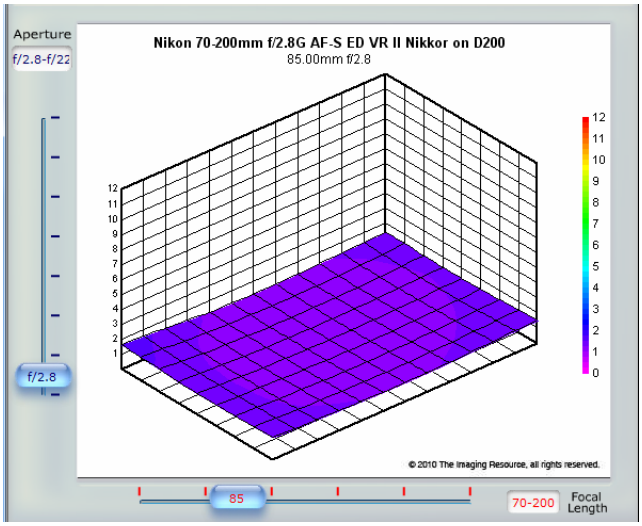
For D700 f/16 & f/22 sharpness diagrams see original source.

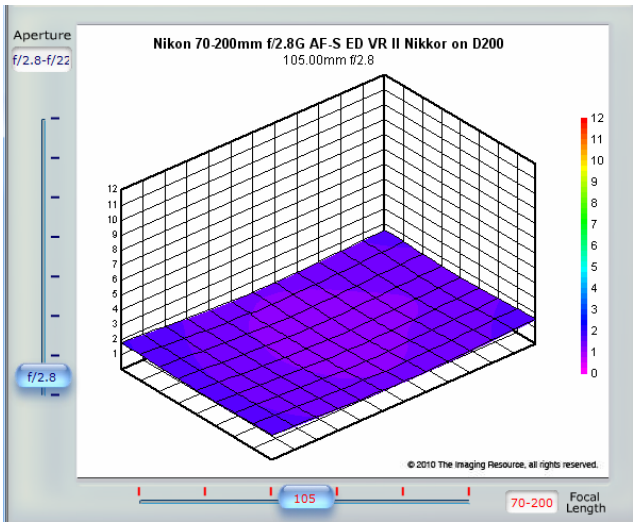
Source: http://www.slrgear.com

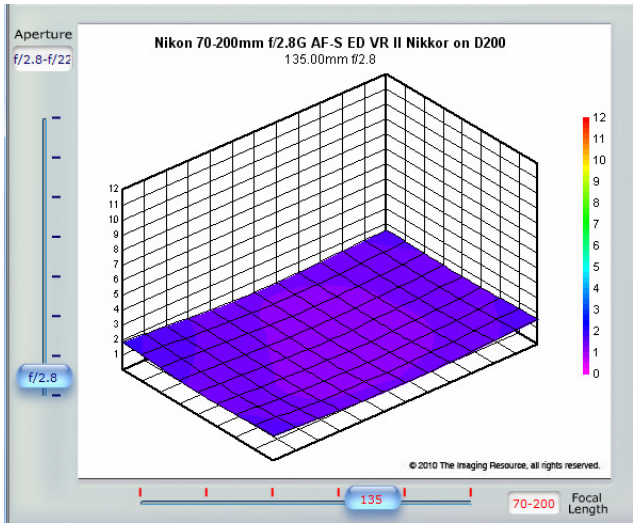
Sharpness on D200:

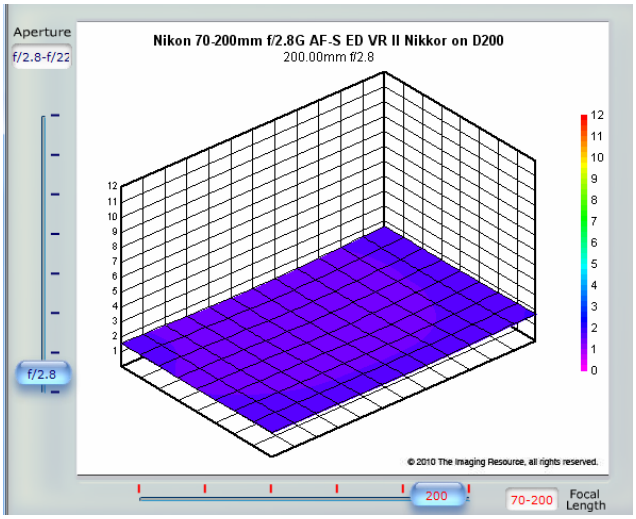
At f/2.8 (70mm-85mm-105mm-135mm-200mm):







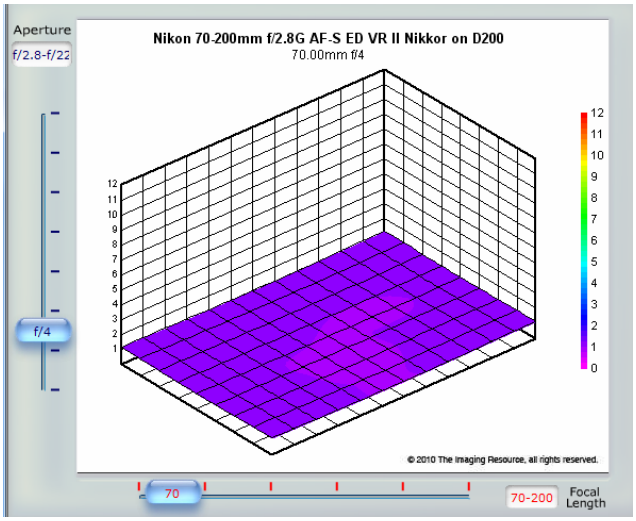


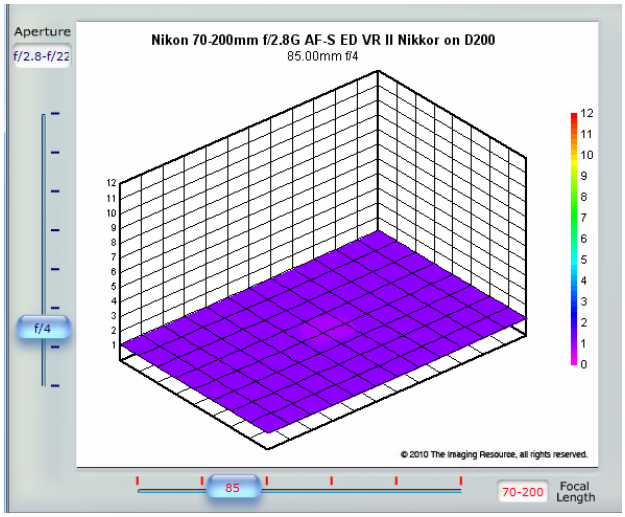


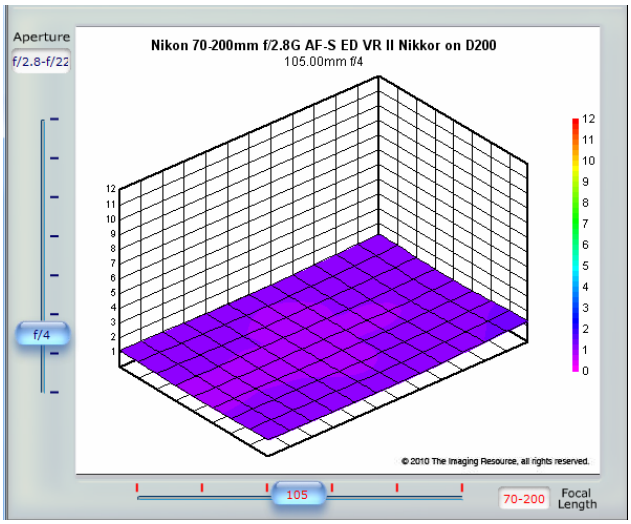
Source: http://www.slrgear.com

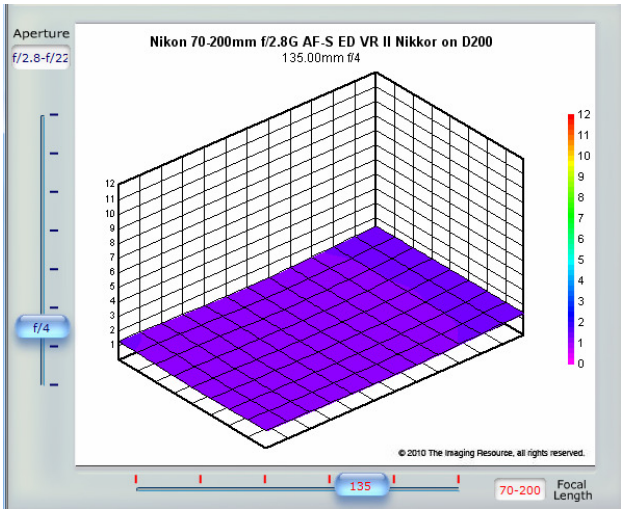
Sharpness on D200:

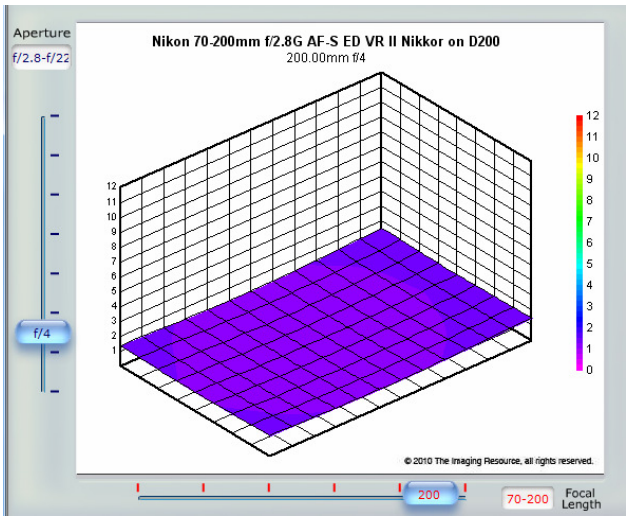
At f/4 (70mm-85mm-105mm-135mm-200mm):







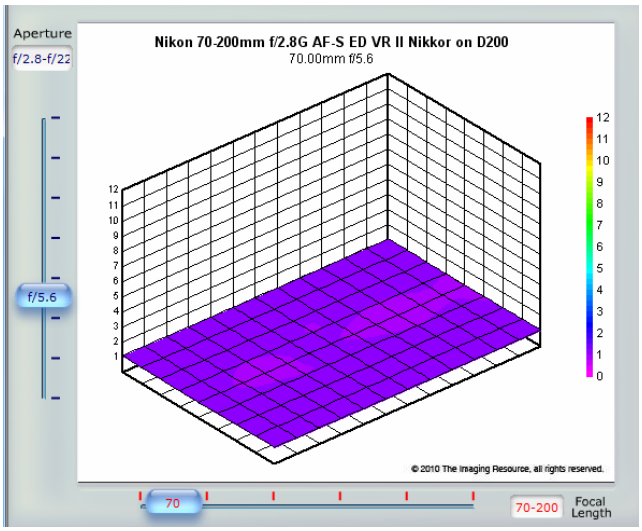


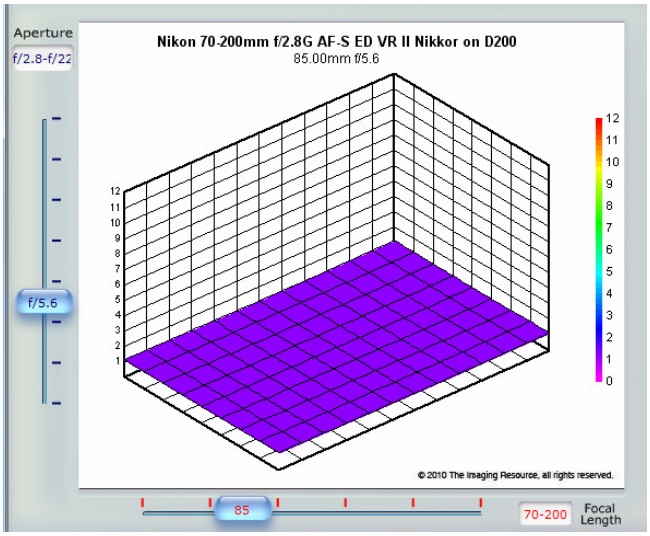


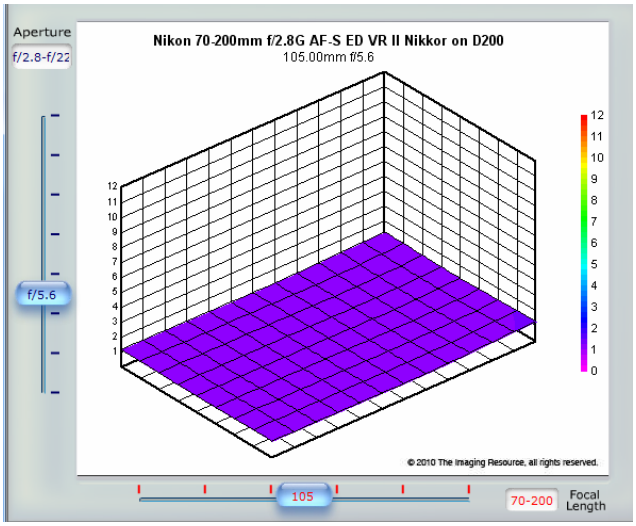
Source: http://www.slrgear.com

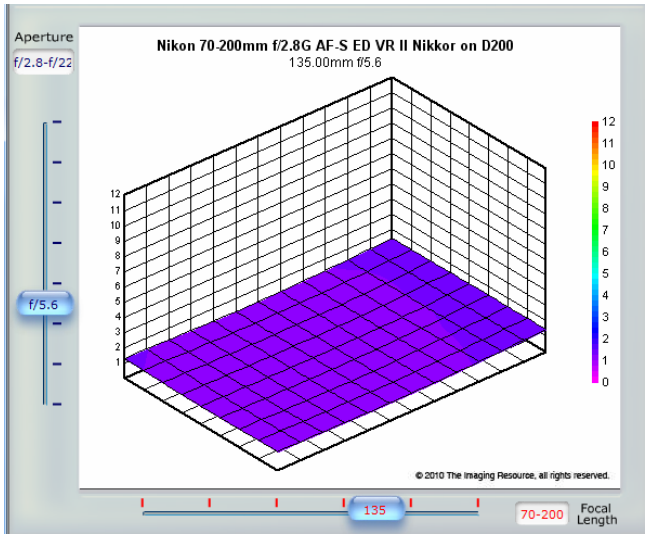
Sharpness on D200:

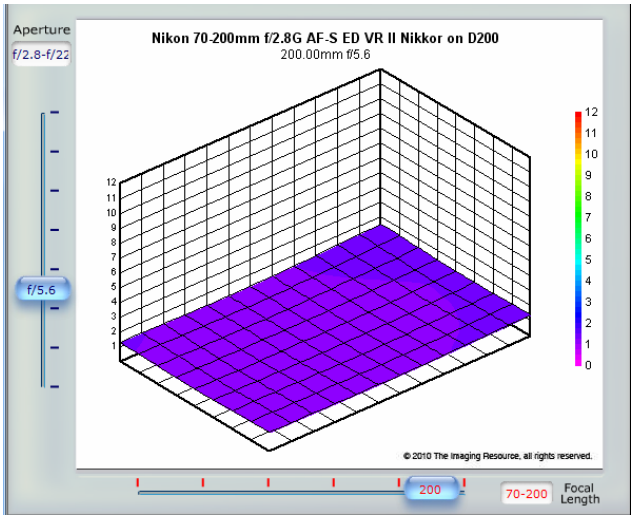
At f/5.6 (70mm-85mm-105mm-135mm-200mm):







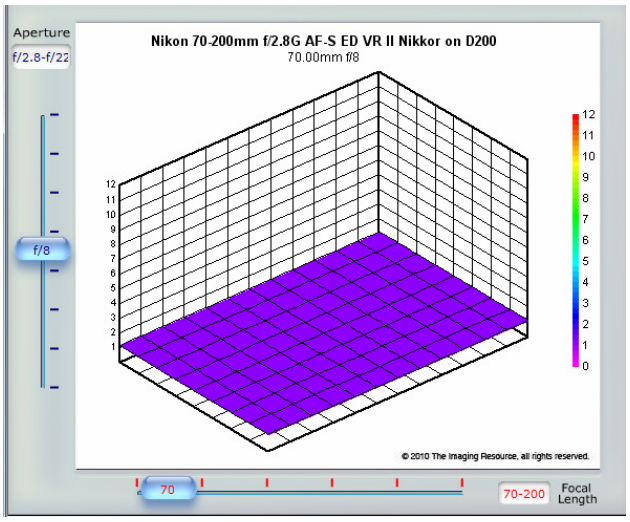


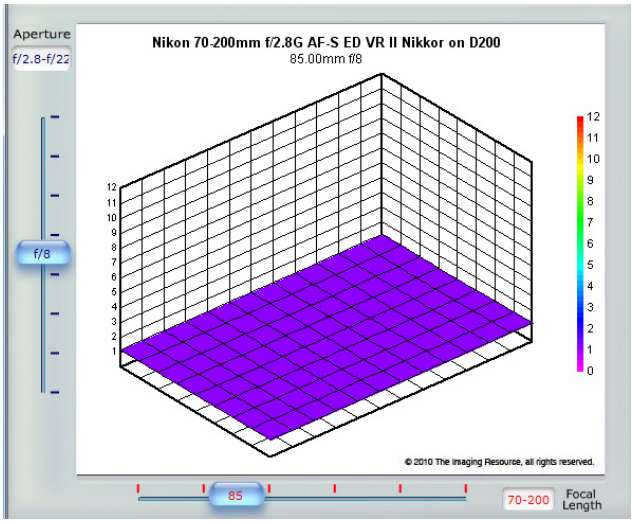


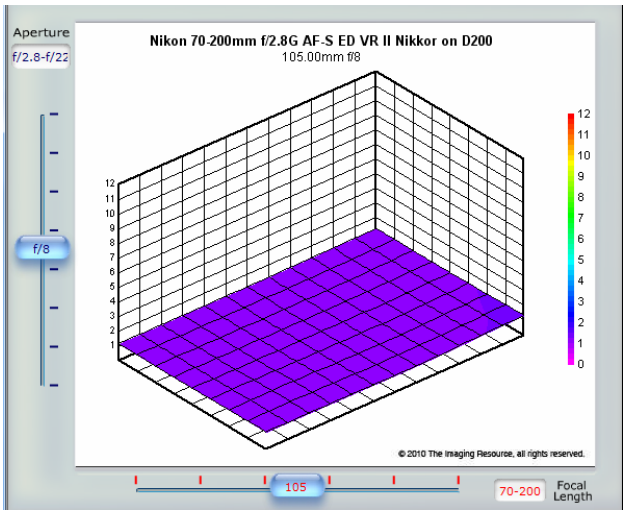
Source: http://www.slrgear.com

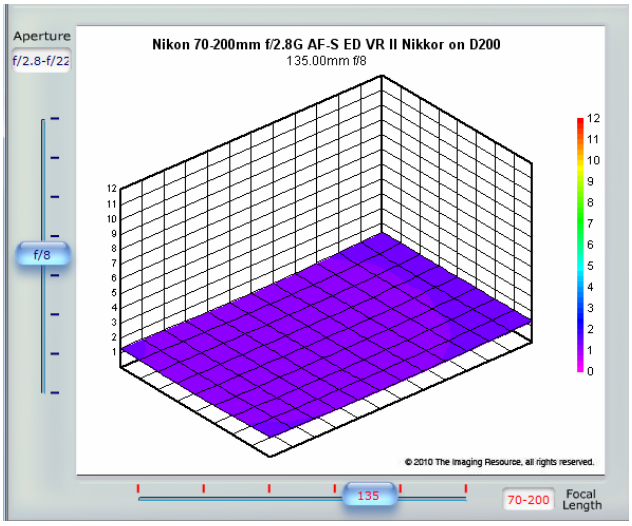
Sharpness on D200:

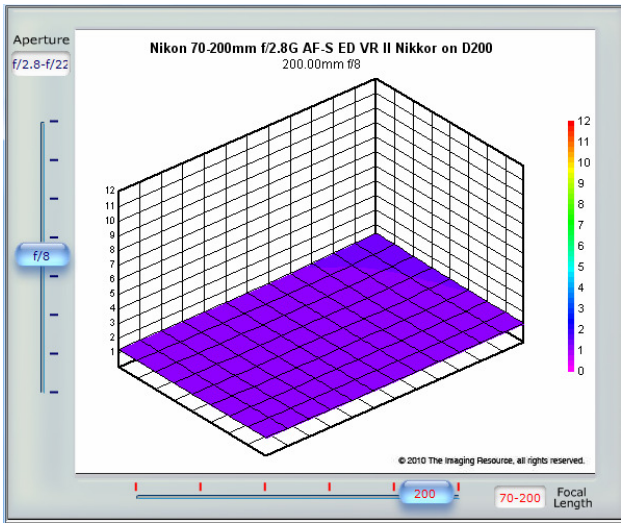
At f/8 (70mm-85mm-105mm-135mm-200mm):











For D200 f/11 & f/16 & f/22 sharpness diagrams see original source. Resolution is lower than at f/8 at all focal lengths due to diffraction.