



Pentax 20mm XW Eyepiece

by David Knisley [click to email author](#)

msrp: \$340

Decent wide-field eyepieces are becoming more popular these days despite their expense. Photography equipment giant Pentax has recently moved into the eyepiece market with their new XW series of oculars with 70 degree apparent fields of view in focal lengths ranging from 3.5mm to as high as 40mm. The 20mm smc Pentax XW eyepiece is one example of the product, having both a wide field and fairly good correction over much of that field.

Description

The 20mm XW is a rather large size 6 element eyepiece in an 1.25 inch standard barrel format, and has the overall look of one tough eyepiece! The unit is about 3.39 inches (86mm) long, and 2.4 inches (61mm) wide, with a weight of 12.6 ounces (0.786 lb or 355 grams). This makes it larger and heavier than the Tele Vue 24mm Panoptic, but only about half the weight of the Meade 14mm Ultrawide. The main section is wide and

somewhat tapered towards the eye end rather than cylindrical, with the entire upper segment being rubber armored for shock resistance and with linear knurling along the sides for a better grip.

The 1.24 inch barrel is chromed with a narrow but shallow safety groove towards its upper end, and the end of the barrel is beveled and threaded for standard 1.25" filters. The eye lens is about 35mm across but there is no eyecup to position the eye, although one really isn't needed. The eye lens cap is a recessed one similar to that found on some camera lenses, and it fit snugly in the rubber eye end of the eyepiece, although it could be a slight problem to remove if the user is wearing gloves. The optical elements are said to be multi-coated, and from the looks of things visually, that appears to be true.

In optical specifications, the eyepiece apparent field of view measured out to be 70 degrees which was exactly what was claimed in the specs sheet. The field stop diameter was estimated at around 25 mm, but calculated at 24.4mm based on the true field the eyepiece yielded in my 10 inch f/5.55 Newtonian (59.41 arc minute true field at 70.5x).

The eye relief was quite good at approximately 20mm or so, which again is what is claimed on the specs sheet. The specs sheet was a little amusing, as some translation errors yielded some rather hilarious sentences. For example, one sentence read, "Considering rain, it features JIS Class 4 weather-proof construction." (I know we are supposed to be optimistic about the weather at times, but observing in the RAIN??).

Performance

I tested the Pentax 20mm XW eyepiece in my 10 inch f/5.55 Newtonian and my Celestron NexStar 9.25XLT f/10 Schmidt-Cassegrain. It performed pretty well (certainly better than many other 1.25 inch barrel eyepieces), although the performance wasn't exactly perfect. I noted fairly crisp star images across most of the field, with little if any astigmatism and little lateral color except near the outermost portions of the field of view, where the bright lunar limb's very edge sometimes took on a faint bluish tint. The eye relief was generous enough to allow me to barely see all of the field of view with my glasses on, although the lens of my glasses was close to touching the eye lens of the 20mm Pentax. The field was nice and dark with very good overall contrast and no significant kidney-beaning as the eye is moved around.

However, the eyepiece does have some curvature of field in the outer portions of its field of view, which, while not huge in amount, is definitely the most significant problem with the eyepiece. I first noticed this when looking at the moon in the NexStar 9.25 inch f/10

SCT, as the lunar detail near the field edges was not quite in focus. With the 10 inch f/5.55 telescope, the curvature of field began to be detectable on star images beyond about 3/4ths of the field radius from the center and became more noticeable as I looked more towards the edge of the field stop. In fact, in my 10 inch Newtonian, star images right next to the visible field stop were just enough out of focus to begin to barely show hints of the darkening due to my secondary mirror. I could refocus and get better star images at the field edges, but then the star images near the center of the field were just a bit out of focus. The field curvature was also noted on stars in the f/10 SCT.

I put in the 2.5x Powermate to give about f/13.8 with the Newtonian, and the 20mm Pentax then showed somewhat less curvature of field, so the eyepiece may perform a bit better at longer f/ratios like those of Maksutov-Cassegrains. This curvature of field was just a little disappointing for an eyepiece in this price class, as neither the 24mm Panoptic nor the Meade 14mm Ultrawide show this aberration in my two instruments. The 20mm Pentax also showed some mild pin-cushion distortion, although it was not all that significant (comparable to what I see near the edges of the somewhat smaller field of my 20mm Plossl).

Normally, I don't compare eyepieces of vastly different focal length. However, for those in my eyepiece stable which were close, I did have some interesting observations. In overall performance, I liked the Tele Vue 24mm Panoptic better than the Pentax 20mm XW. This was mostly due to the lack of field curvature with the Pan. The Pan doesn't have quite the eye relief of the Pentax 20mm, so this will definitely be a factor in the choice of eyepieces if the observer needs to use glasses while observing. The 24 Pan also has less lateral color than the 20mm Pentax, although neither eyepiece is exactly plagued with that aberration. Lastly, the 24 Pan is less expensive, which is a big factor in my book. My 14mm Ultrawide has noticeably less light throughput than the 20mm Pentax, but again, the 14mm doesn't have much in the way of field curvature either.

What I liked

- Good rugged construction.
- Good contrast and middle field sharpness.
- Very good eye relief (allows glasses to be used).

What I did not like

- Some Curvature of Field in the outer parts of the field of view.
- Size/Weight
- Cost.

Conclusion

For the observer who wants a moderate to large field of view (and especially one who needs to wear glasses while observing), the Pentax 20mm XW may be a fairly good choice for a wide-field eyepiece. The eyepiece's overall performance is good, but there may be a few better eyepieces on the market which might serve the needs of the most critical observer a bit better.

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