

Rule of 400

Capturing stars as points instead of trails.

$400 / \text{focal length} \times \text{LMF} = \text{Max number of seconds before stars blur due to earth's rotation.}$

Example: Full frame camera, focal length 28mm.

$400 / 28 = 14.3$ seconds is the longest acceptable shutter speed.

Full Frame Camera:

14 mm = 29 seconds

16 mm = 25 seconds

17 mm = 24 seconds

18 mm = 22 seconds

20 mm = 20 seconds

22 mm = 18 seconds

24 mm = 17 seconds

28 mm = 14 seconds

35 mm = 11 seconds

50 mm = 8 seconds

1.5 LMF:

10 mm = 27 seconds

12 mm = 22 seconds

14 mm = 19 seconds

16 mm = 18 seconds

18 mm = 15 seconds

20 mm = 13 seconds

24 mm = 11 seconds

28 mm = 10 seconds

35 mm = 8 seconds

50 mm = 5 seconds

I always recommend buying lenses made by the manufacturer of the camera, but here is an exception:

An affordable (approx. \$325) lens for night, sky photography that has been well received by enthusiasts is the Rokinon, 14 mm, 2.8. This is a manual lens, no big deal, but will require adjustments to one's field workflow.

Rokinon is not generally recognized as a high quality lens manufacturer, but this lens performs surprising well. Of course manufacturing quality control sometimes allows poor copies of this lens make it to market. As always I recommend testing the lens for acceptability upon purchase. These lenses should be checked before use as they may not be as durable as name brand lenses.