

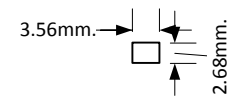
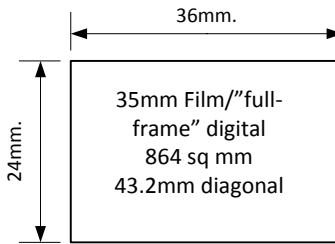
Matt's Handy Guide to format sizes, image areas and "normal" lens focal lengths

This is the 56mm x 56mm format of the Mamiya 6 on 120 film. The diagonal of this square is 79.2mm. The actual "normal" lens for the M6 is a 75mm f/3.5 while Hasselblads and Rolleiflexes had 80mm normals. Often referred to as 6X6 (cm) or 2 ¼ Squared (it's about 2 ¼ inches a side). This is only one format for 120 film, which also saw 6 X 4.5cm, 6 X 7, 6 X 8, 6 X 9, 6 X 12 and even some luscious 6 X 17cm cameras made for it.

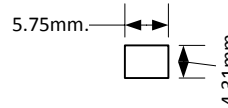


This page shows the actual size of the sensors from several current cameras. Sensor size matters because the focal length of the lens which gives a "normal" perspective is more or less the diagonal of the image area. The smaller the sensor, the shorter the focal length and the more the depth of field. The formats on this page range from the iPhone 3G with a tiny sensor, short lens and such immense depth of field that it doesn't bother focusing up to the 6X6 film format with a 75 or 80 mm normal lens and an almost always-constrained depth of field. In digital, the 35mm film-equivalent "full frame" digitals offer the most flexibility in depth of field control; as the sensors get progressively smaller and the lenses shorter, large depth of field gets easier to manage but it gets more difficult to achieve limited depth of field and the "film" look. If this is important to you, you should understand the interplay between sensor size/lens focal lengths/depth of field as well as the dynamics of aperture selection and its effects on depth of field. As usual, there is no one correct answer, but there is informed choice.

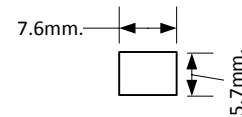
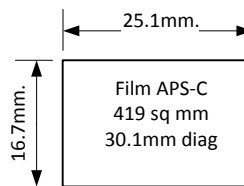
This is the 24 x 36mm format of traditional 35mm film cameras. This is also the format of the "full-frame" Digital SLRs like the Nikon D3 & D700, Canon EOS 5D or Sony A900. In film, nearly all 35mm cameras had the same image size; in digital, it is currently only the most expensive DSLRs that have sensors this large. The diagonal of this format is 43.2 mm. Most SLRs came with 50mm normal lenses; the Contax G cameras had a 45mm and many point and shoots had 35-40mm lenses.



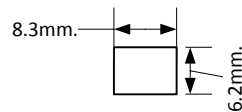
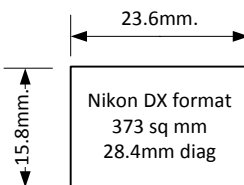
The really small sensors, tiny diagonals, short focal lengths and massive depth of field come on mobile phones and consumer compact cameras. The upper sensor to the left is the iPhone camera size, yielding a area of 10 sq mm, a diagonal of 4.5mm and a 9.7x crop factor. The lower sensor is from a Kodak V705, with an area of 25 sq mm, a diagonal of 7.2mm and a 6x crop factor. With lenses this short, it's hardly worth focusing, and the iPhone 3G had a fixed focus lens.



The original APS (Advanced Photo System) C film format was 16.7 x 25.1mm. Many digital cameras now refer to themselves as APS-x and are close to this format. On the right are shown the original film APS-C size and then the Nikon DX and Canon APS-C sensor sizes. Because there is no standard here, the diagonals vary a bit; the original Film APS-C would be 30.1mm; the Nikon DX, 28.4mm; and the Canon APS-C, 26.7mm. Divide these diagonals into 43.2mm (the diagonal of full-frame 35mm), and you get the "crop factors": 1.4 for APS film, 1.5 for Nikon DX and 1.6 for Canon's APS-C.

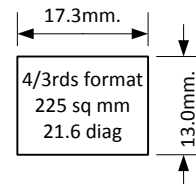
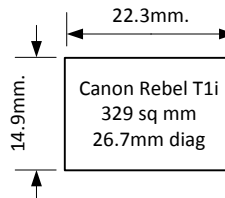
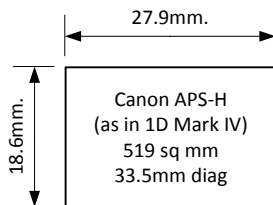


The hot Canon compacts are the G11 and S90, which both share this sensor size. This yields an area of 43 sq mm, a diagonal of 9.5mm and a 4.6x crop factor. This sensor is considered a real improvement over most compacts.



The Panasonic LX-3/Leica D-Lux 4 has a relatively large sensor for a small camera. The image is 52 sq mm with a 10.4mm diagonal and 4.2x crop factor. The actual lens on this camera is a 5.1 to 12.8mm zoom.

Canon has some other variants around this size as well, such as the somewhat-larger APS-H (which also is not the same as the APS-H film size, but is close). The crop factor for this format is 1.3.



The 4/3rds/Micro 4/3rds format by Olympus and Panasonic looks interesting. The normal lens on the GF-1 is a 20mm, the normal on the EP-2 is 17mm, a tad wide. The crop factor is almost exactly 2 on this format. The body's not much bigger than the LX-3; big sensors in tiny bodies are an exciting development.