

PROJECTORS

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Q.: May I have your advice for buying a digital projector?

A.: Which digital projector is the best for you depends on the intended use of the projector. For home use, a digital projector is not needed if the computer has a monitor with a 20" or larger screen. Viewing images on a computer screen is so convenient, no projector and screen to set up, that buying a projector makes little sense.

A projector is needed for showing digital images to a larger group of people. The useful features of the projector depend on the size of the room and the screen, as well as the ambient light in the room.

Aspect ratio. Even the best digital projector is not a true replacement of a slide projector. The photographic images require a projector with a square field to accommodate vertical and horizontal orientation. Digital projectors are designed for PowerPoint presentations and not for photography. The aspect ratio 4:3 of digital projectors is too narrow for vertical images. Consequently, the projected vertical images (512x768 pixels) are smaller than the horizontal images (1024x683 pixels) and have only 56% of the area of horizontal images.

Brightness. The brightness of the projector is expressed with ANSI lumens. A high lumen rating means that the screen is brighter and the projector can be used in semi-darkened rooms. If the room is small and dark, a brightness rating of 2000 lumens is adequate. If the room is large and not completely darkened, a brightness of 3000 lumens is needed. If the brightness of the projector is excessive, the projector can be used in the low power mode. The reduced brightness extends the life of the lamp. Consequently, it is better to have an excess of lumens than to have less brightness than needed. The only limitation is the cost – at the present time the price of a projector is almost one dollar per lumen but the price is coming down

Resolution. The standard resolution is XGA, which has 1024x768 pixels. The SXGA resolution of 1280x1024 pixels is slightly higher and the SXGA+ resolution is 1400x1050 pixels. The SVGA resolution (800x600 pixels) of inexpensive projectors is inadequate for photographic projection

Projection technology. A colored image is projected by using one of three different technologies. The LCD (Liquid Crystal Display) technology passes the light through three LCD panels, a red, green, and a blue. The advantages are superior color fidelity and light efficiency. The DLP (Digital Light Processing) technology uses small mirrors to reflect light through a color wheel. The DLP projectors have a high contrast ratio and can reduce the size of the projector. The new LCOS (Liquid Crystals on Silicon) technology uses liquid crystals on reflective chips, instead of mirrors. The advantage is a high resolution (1400x1050 pixels). It is difficult to say which technology is the best because they have different advantages. The projection technology is still a developing field and improvements can be expected.

Contrast. The contrast ratio expresses the range of tonal values from pure black to pure white. A high contrast ratio indicates that the projector can deliver a saturated black and a detailed tonal range. A projector with the LCD or LCOS technology has a contrast ratio of 400:1 or less, whereas a DLP technology has a contrast ratio of 1000: 1 or even above 2000:1. As a reference, a typical CRT monitor of a computer has a contrast ratio of about 1:700.

Lens. A high quality lens reduces flair and ghosting. Most of the projectors have a 1.6x or a 1.7x zoom lens which simplifies the positioning of the projector.

Keystone correction. Because the projector is usually positioned close to the screen, a correction of the keystone distortion is essential. Some projectors have automatic keystone correction.

Color control. The color correction is needed for adjusting the projected color to the color of the screen.

Lamp. This expensive part (about \$200 to 400) of the projector can last a long time when treated with care. The lifetime is usually rated between 1000 and 3000 hours. The deterioration of the lamp is gradual before total failure. The projector loses brightness when the lamp ages. The lifetime is expressed with the number of hours the lamp can be used before the brightness of the lamp has decreased to 50% of its original brightness. This means that a 3000 lumen projector will be a 1500 lumen projector at the end of the lamp life.

Size and weight. The size and weight are not essential, especially in comparison to a slide projector. Small projectors are convenient to carry but some lack sufficient ventilation and run hot.

Price. Even the best digital projectors do not match the color fidelity, resolution, and tonal range of a projected slide. A higher price of the digital projector means usually a better performance. However, buying an expensive projector may not be a good investment because the projector may be obsolete in two years.