

TV projectors

NEED TO KNOW

A TV projector allows you to beam jumbo images on to a screen or white wall. You can link projectors to a DVD player, VCR or set-top box to watch a big match or film in cinematic style. You can also link one to a PC or laptop to view slideshows of digital snaps or business presentations.

DAYTIME VIEWING

The projectors listed in our table were not suitable for daytime viewing unless you block out the light.

BULBS

A bulb for a projector lamp lasts for about 2,000 hours. If used for the average UK daily TV fix of three hours 43 minutes, the bulb would last less than 18 months. A new bulb can cost over £350 – which amounts to roughly a third of the price of a Best Buy projector.

SCREENS

A smooth white wall is usually fine for viewing pictures and films. However, if it's in a light room, you may need to buy a more reflective screen. Basic screens cost around £100. More reflective screens or electric ones can cost £500 or more.

HDTV

In the US, high-definition television (HDTV) has been hailed as an entertainment revolution. It offers crystal-clear images even on large-screen TVs. Sky plans to start HDTV transmissions here next year. The table on p52 shows which projectors are HD ready.

BEST BUYS

Our Best Buys produced good-quality pictures for graphics, photos, movies and animation when viewed in a darkened room. Liquid crystal display (LCD) models came out top in their battle with digital light processing (DLP) projectors. All the LCD models gained higher overall scores than the DLPs.

The **Panasonic (1)** has the best picture quality of all the projectors on test. It's consistently good for all tasks and although it rated only average for daytime viewing, it fared better in these conditions than most other models. The Panasonic was easy to set up and performed simple tasks well. It has some particularly nifty features, such as a practical lens shift control – rather like a joystick – so you can easily position the image on the wall or screen. The Panasonic also has the highest zoom range of the models we tested. This is useful when showing films in larger rooms as the projector doesn't need to be so close to the screen.

It was the only projector on test to come with a Scart socket. It's also certified as HD ready (see 'HDTV', left). And, compared with some other models, the Panasonic has a quiet fan. It's available in shops for £1,200 but you should find it cheaper online.

The **Epson (2)** did equally well as the Panasonic, offering good overall picture quality. It got the best scores on test for graphics and movies. However, it's let down slightly by below-average pictures when viewed in daylight, and its fan is noisier than other Best Buys'. The Epson has a stylish silver design and was the only model we tested which included electrical focus and zoom which is easier to use (all other projectors have manual focus and zoom controls) and worked well. It's easy to set up and also comes with 'cinema color editor' software which enables you to adjust all settings by computer.

NOISY FANS

All projectors need a fan to stop their lamps from overheating. In some cases the noise of the fan can be distracting. It's important to consider this when choosing a projector. This may affect where you position it, too. Many models allow you to reduce the lamp settings to keep the fan noise down but this will have an adverse affect on picture quality. This Panasonic's fan was one of the quietest in our tests. Check the table on p52 to see how the rest fared.

One downside is that it isn't HD ready. It's available in independent stores at £1,300 but you can find it cheaper online.

The **Hitachi (3)** has good picture quality, particularly for animation. It has a very good vertical and horizontal lens shift and zoom and focus, making it easy to adjust the picture to fit your screen. The Hitachi also has a small, handy remote with illuminated buttons so that you can operate it in the dark. Like the Panasonic, it's HD ready. It's available for around £1,100 but you can find it cheaper online.

The **Sony (4)** is quite large with a simple design. It performs all tasks consistently well, offers a good range of functions. However, we found the zoom and focus tricky to use as it's difficult to grasp the controls properly. The sockets are neatly hidden at the back and include an HDMI digital connection (see 'Connections', right). It's also HD ready. At around £1,700 it's a bit more expensive than our other Best Buys but you should find it cheaper online.

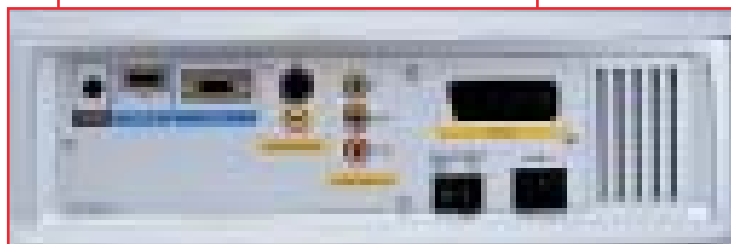
1 Panasonic



**BEST
ON
TEST**

CONNECTIONS

Nearly all projectors come with essential connections which allow you to link them to PCs, DVD players and set-top boxes. Some have digital video interface (DVI) or high-definition media interface (HDMI) sockets, which allow you to transmit high-quality digital pictures from high-definition DVDs or TVs (HDTV). Only this Panasonic included a Scart input. For details of which models have these sockets, see the table, overleaf.



Setting up



Ensure your room is big enough for a projector before you buy one

Make sure you've enough space in your room before buying a TV projector. In our movie tests, to achieve an 81-inch picture we had to position the projectors between 2.8 and 3.8 metres from the screen.

If your living room is particularly big, a wide zoom range will be handy because you won't have to set your projector up so close to the screen. Without a zoom lens, the only way to adjust the picture size is to move the projector backwards or forwards.

Consider where your projector will be placed, too. It's important that it

doesn't obstruct your view but projecting images at angles can adversely affect picture quality.

All models on test have vertical keystone correction to straighten the edges of a picture digitally, to compensate for angling caused by not having the projector directly opposite the centre of the screen. However, none allows you to correct sloping caused by placing the projector to the side of the screen. So position your projector above or below your line of sight. All of the projectors we tested can be attached to a ceiling mount.



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TEST**

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LCD or DLP?

All the projectors on test listed in our table use liquid crystal display (LCD) or digital light processing (DLP) technologies.

LCD projectors work by shining a light through a matrix of coloured liquid crystal cells. Depending on the picture to be displayed, each cell is turned either on or off to allow light to pass through or not. They tend to produce stronger colours than DLP projectors. But they can suffer from the 'chicken wire effect', where you can see the LCD panel structure in the projected picture – a bit like viewing through a wire mesh.

DLP projectors work by bouncing coloured light off

microchips containing thousands of tiny mirrors, each pivoting up and down to build up the elements of the picture.

They have better colour contrast and give a deeper black than LCD projectors. However, DLP projectors can suffer from the 'rainbow effect', where flickering bands of primary colours can be seen on projected images. In our viewing tests, this effect was clearly visible.

If you're considering buying a DLP projector we strongly recommend that you view it in a store beforehand to check whether the rainbow effect bothers you.

WHICH? EXTRA

Other big-screen options include plasma TVs, DLP and LCD TVs. But if you're after the ultimate in picture quality, we wouldn't recommend buying one of these high-tech sets yet. They're expensive and often have worse picture quality than conventional TVs. For more information on high-tech TVs, go to:

www.which.co.uk/plasmaanddplpts

TABLE NOTES

We tested popular liquid crystal display (LCD) and digital light processing (DLP) projectors from leading brands.

Specification

Price Lowest widely available high-street price. You may find lower prices in independent electrical stores or online.

Type See 'LCD or DLP?', above.

Features

DVI/HDMI These sockets enable the transmission of high-quality digital pictures from high-definition sources and set-top boxes. **HD ready** The projector is capable of processing and displaying high-definition TV signals (see 'Need to know', p50).

Picture

Graphics/Photos/Movies/Animation How good the projectors' picture quality is when showing these in a darkened room. **Daylight** Overall picture quality when images are projected in daylight. The ratings are based on the results of our technical tests and viewer ratings.

Performance

Noise The fan with a ● rating made viewing uncomfortably noisy while those with a ★ were fairly quiet. **Versatility** The more useful features, connections and controls the projector has, the more versatile it is. **Ease of use** How easy it is to set up the projectors and use them every day.

SCORE

This ignores price and is based on:

Picture quality	45%
Ease of use	25%
Noise/power	15%
Features	15%

KEY

★ ☆ ○ ●
Best —————> Worst
■ Best Buy

BEST BUY

BEST BUY

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TV projectors

MODEL

- 1 Panasonic PT-AE 700E
- 2 Epson EMP-TW200H
- 3 Hitachi Illumina PJ-TX100
- 4 Sony VPL-HS50
- 5 Sanyo PLV-Z3
- 6 Infocus ScreenPlay 480S
- 7 NEC HAT 510G
- 8 Toshiba TDP-MT 200
- 9 BenQ PE 5120
- 10 HP vp 6210
- 11 ThemeScene H 30 A
- 12 Mitsubishi HC100
- 13 Toshiba TDP-S25
- 14 Acer PD 116



3 Hitachi



SOUND

Some projectors come with built-in speakers. But for the best sound, connect your PC, set-top box or DVD player to an amplifier and hi-fi speakers. If you connect to a home-cinema system, use the manufacturer's guidance as much as you can, then try out speaker positions and channel settings to suit your viewing room.

Canon XEED SX50



The Canon XEED SX50 projector isn't an LCD or DLP projector. It uses liquid crystal on silicon (LCOS) technology, which is less common. LCOS can be thought of as a hybrid of LCD and DLP – see p52 for explanations of these two systems. LCOS is a reflective technology that uses liquid crystals instead of individual mirrors.

The Canon is also significantly more expensive than the other models tested – it costs around £3,000 so it's not comparable with the other models and we haven't included it in our table.

We were really impressed with the Canon's picture quality. It scored top marks (★) for all our viewing tests. And unlike the other

projectors on test, it produced excellent pictures in daylight (also scoring a ★).

It's HD ready (see 'Need to know', p50) and has some handy features. Whereas the other projectors have only vertical keystone correction, the Canon has horizontal keystone correction. This gives you greater flexibility when positioning the projector. And the remote includes a small mouse function so you can control a connected PC, making it handy for business presentations.

However, we were very concerned by the noise of its fan (it scored a ☹). It's much louder than our Best Buy projectors and we found it really distracting.

Specification			Features		Picture					Performance			Score
Price (£)	Type	Size wxhxd (cm)	DVI/HDMI	HD ready	Graphics	Photos	Movies	Animation	Daylight	Noise	Versatility	Ease of use	(%)
1,200	LCD	34x10x27	✓	✓	☆	☆	☆	☆	○	★	★	☆	74
1,300	LCD	44x13x32			★	☆	★	☆	☹	○	☆	☆	74
1,100	LCD	34x15x28	✓	✓	☆	☆	☆	★	○	☆	☆	☆	69
1,700	LCD	35x14x37	✓	✓	☆	☆	☆	☆	☹	☆	☆	☆	68
1,250	LCD	36x10x27	✓	✓	☆	☆	☆	☆	☹	★	☆	☆	66
1,000	DLP	25x11x33	✓		☆	☆	☆	☆	○	☹	○	☆	61
1,095	DLP	19x12x35			○	○	☆	☆	☹	★	○	○	61
1,000	DLP	30x10x27	✓		☆	☆	★	★	☹	☆	○	○	59
750	DLP	26x10x22	✓		○	☆	○	☆	☹	☆	☹	☆	59
700	DLP	31x11x22			☆	☆	☆	☆	☹	☆	○	○	57
995	DLP	27x10x22	✓		○	☆	☆	☆	☹	☆	○	○	56
865	DLP	31x11x25	✓		☆	☆	☆	☆	○	☆	○	○	56
800	DLP	29x10x25			☆	○	☆	☆	☹	○	○	○	54
700	DLP	28x11x25			☆	☆	○	○	☹	☆	○	○	54