





Putting our camcorders through their paces

## A tough scene

We examine quality under different conditions using test charts and the specially constructed scene above. The scene's complexity and differing lighting are designed to test each camcorder's ability to capture a sharp image, lots of detail and accurate colours. We test the image stabilisation system using a chart and a special camcorder shaker that mimics the tiny movements of the hand.

# Sharp shooters

The new generation of high-definition camcorders will make your films crystal clear

Camcorders are great for recording those special moments that will be treasured for years. And new high-definition (HD) camcorders mean the quality of those priceless images will be sharper than ever.

With the growing popularity of HD televisions, it was only a matter of time before HD camcorders broke into the mainstream. The good news is that they are very good indeed. Best Buy standard-definition camcorders from this test and our August article are good, but HD camcorders are in a league above for video image quality. Therefore, we rate HD cameras on a different scale from standards in our test. The bad news is that they are still pricey at the moment. For a closer look at HD, see 'High-definition details', p46.

**The good news is that HD camcorders are very good indeed**

A few years ago, Mini-DV tape was by far the most popular recording format. It's still very popular, thanks to it still being the best format for editing – but sales of hard-disk, DVD and memory-card camcorders are rising fast. We have at least one Best Buy for each format.

Whatever the format, though, a decent camcorder is a must for attractive-looking films. Accessories such as microphones, wide-angle lens converters and tripods can also help to give your home movies a more cinematic sheen – we take a look at these in the box below. Finally, good video technique is also essential. See our handy techniques online at [www.which.co.uk/camcorders](http://www.which.co.uk/camcorders) – you'll also find our Best Buys from our last test in August 2007.

## Jargon buster

We translate the complex language of camcorders

■ **AUTOFOCUS** Most camcorders allow you to focus manually, but in many cases, autofocus works quickly and reliably. Under difficult lighting conditions (fluorescent light, household light bulbs and dim light), autofocus is slower and less reliable.

■ **AVCHD** This is a new type of HD format that allows footage to be captured more efficiently. It is commonly found on hard disk, DVD and memory-card camcorders.

■ **CHARGE-COUPLED DEVICE (CCD)** Every digital camcorder has a sensor inside which picks up the picture. The most common type is the CCD sensor. Some camcorders have three CCDs – these usually offer better video quality but are more expensive.

■ **DIGITAL ZOOM** This allows you to zoom in farther than the optical zoom, but at the expense of video quality.

■ **FIREWIRE** All our camcorders that record on Mini-DV have a Firewire connection. Firewire is the best way to transfer Mini-DV footage from your camcorder to your computer for editing, as it's quick and retains high original image quality. It's also useful for connecting a camcorder to a DVD recorder for creating DVDs quickly.

■ **IMAGE STABILISATION** Unless you use a tripod, keep this function on. It can improve a shaky picture.

■ **OPTICAL ZOOM** Usually a little lever on the top of the camera, this lets you zoom in and out without degrading image quality. Our camcorders have an optical zoom range from x10 to x35. The bigger the number, the more it can zoom in.

■ **PANNING** The technique of moving your camcorder from left to right or vice versa to film across a scene.

## Accessories

Optional extras which can help would-be Hitchcocks avoid hitches and cock-ups

### Microphone

Camcorders' sound quality is often not great. If yours has a mic attachment, you can often improve the sound by attaching a separate mic – costing from around £30.



### Wide-angle lens converter

Shooting a scene in a small room can be hard, as you can't zoom out enough to get everyone in the picture.

A wide-angle lens converter (costing from £30) allows you to zoom out further. It doesn't have to be the same brand as the camcorder, but it has to be the right size – check our table on p46 for more details.



### Tripod

Tripods help your films look more professional – no more shaky pictures. A lever also allows you to pan smoothly. When buying a tripod, consider its sturdiness and whether it extends high and low enough. Tripods start from about £25.





## 1 HIGH DEFINITION

## 70% Panasonic HDC-SD1 £700

This Best Buy's image quality is even better than that of other HD camcorders. Despite being compact, it has lots of features and also takes decent still photos. The camcorder

WHICH?  
BEST BUY

records on SD memory card. The 4GB card supplied will hold about 40 minutes of footage. The camcorder is cheapest from Comet.

**WE FOUND** Like the other Panasonic (3), this can record surround sound.

Available Comet Format SD memory card Weight 490g Optical zoom x12 Mic attachment Yes



## 2 HIGH DEFINITION

## 69% Canon HV20 £850

WHICH?  
BEST BUY

This Mini-DV model offers more than two hours of recording time on a single charge – great for long shooting sessions. Autofocusing is more reliable than it is on most other camcorders and it performs quite strongly under difficult light conditions. Cheapest from Jessops.

**WORTH KNOWING** It can take a long time – up to three hours and 20 minutes – to fully charge the battery.

Available Jessops, John Lewis Format Mini-DV Weight 600g Optical zoom x10 Mic attachment Yes



## 3 HIGH DEFINITION

## 68% Panasonic HDC-DX1 £650

WHICH?  
BEST BUY

This offers great HD video quality and performs as strongly as the Panasonic (1) in dim light. It also has a large and clear LCD display – the best on test, even under bright light. But it's the slowest HD camcorder to power up – taking 13.5 seconds to be ready for filming. Cheapest at Comet.

**WE FOUND** At a little less than 800g, this is the heaviest camcorder we've tested in more than two years.

Available Comet Format DVD Weight 780g Optical zoom x12 Mic attachment Yes

The Panasonic HDC-SD1's image quality is better than that of the other HD camcorders



## 9 STANDARD DEFINITION

## 71% Panasonic SDR-H250 £600

This is our first-ever hard-disk Best Buy camcorder. Its sleek body houses a 30GB disk, enough for seven hours of footage. Among standard-definition camcorders, it has the best sound quality, and video quality is very good. Battery life is fantastically long, at two hours and 18 minutes. Cheapest from Jessops.

WHICH?  
BEST BUY

**WORTH KNOWING** A 512MB memory card is included, which you can use to record and easily transfer short clips.

Available Jessops Format Hard disk Weight 480g Optical zoom x10 Mic attachment No



## 10 STANDARD DEFINITION

## 69% Sony DCR-SR290E £520

WHICH?  
BEST BUY

This Sony offers the best image quality from a standard camcorder. Sound quality is decent, too and there's an attachment for a separate mic if you want to improve it, though only a Sony-branded one can be fitted. The SR290E records on a 40GB hard disk – holding up to 9.5 hours of footage. Cheapest at Comet.

**WE LIKE** The LCD display doubles as a touchscreen for selecting certain controls.

Available Comet, Jessops Format Hard disk Weight 540g Optical zoom x10 Mic attachment Yes



## 11 STANDARD DEFINITION

## 66% Canon DC230E £310

WHICH?  
BEST BUY

The x35 zoom on this Canon DVD model allows you to film from a long distance. Video image quality is almost as good as on the Sony (10), and it is the best standard-definition camcorder at taking good-quality footage when the light is dim. Cheapest at Argos.

**WORTH KNOWING** If you do want to make the most of this Canon's huge zoom power, a tripod is virtually a must to avoid excessive camera shake.

Available Argos, Jessops Format DVD Weight 460g Optical zoom x35 Mic attachment No

EXCEPTIONAL  
VALUE

## High-definition details

We look at how high-definition camcorders will change the way we watch our home movies

### Q WHAT IS SO GOOD ABOUT HD CAMCORDERS?

A HD camcorders look like standard camcorders from the outside, but inside their sensors can record more detail. Most can record 1,080 horizontal lines of an image – the same as a typical HDTV can display. Image quality is so good, we rate it on a different scale from that of standard camcorders. You see more fine detail and a sharper picture. Colours are often better, too.



### Q HOW ABOUT VIEWING ON A COMPUTER AND EDITING?

A You transfer HD footage on to your computer in the same way as you would with a standard camcorder (see [www.which.co.uk/camcorders](http://www.which.co.uk/camcorders) for more). However, make sure you have a powerful computer, especially if you want to edit. We recommend an Intel Core 2 Duo (2.4GHz) processor and 2GB of Ram. Most recent editing software is HD compatible.

### Q AFTER EDITING, HOW CAN I WATCH MY HD FOOTAGE ON A TELEVISION?

A You can burn a standard DVD, with your HD footage on it, using DVD burning software (most video-editing software has this built in). A standard DVD will hold about only 20 minutes of HD film, initially recorded on Mini-DV. You'll then need an HD DVD or Blu-ray player to play it. Alternatively, if you have a Blu-ray or HD DVD drive on your computer, which is still rare, you can burn it using this and play a disc back on your television using a compatible player. A third option is to transfer your edited footage back on to the camcorder and connect to an HDTV.

### Q WHAT OTHER EQUIPMENT DO I NEED?

A To make the most of an HD camcorder, you need a good, large HDTV (see [www.which.co.uk/tvs](http://www.which.co.uk/tvs) for Best Buy HDTVs). An HD DVD player or Blu-ray player can also be useful when playing back discs you've created using a computer (see 'How about viewing on a computer and editing?', above, right).

### Q WHAT IF I DON'T HAVE AN HDTV?

A You can still use a normal, standard-definition TV, but you won't benefit from your HD camcorder's better video quality.



## Contacts

**Canon** 0870 514 3723; [www.canon.co.uk](http://www.canon.co.uk)  
**Hitachi** 01628 643000; [www.hitachi.co.uk](http://www.hitachi.co.uk)  
**JVC** 0870 330 5000; [www.jvc.co.uk](http://www.jvc.co.uk)  
**Panasonic** 0870 535 7357  
[www.panasonic.co.uk](http://www.panasonic.co.uk)

**Samsung** 0870 726 7864  
[www.samsung.co.uk](http://www.samsung.co.uk)  
**Sanyo** 01923 246363  
[www.sanyo.co.uk](http://www.sanyo.co.uk)  
**Sony** 0870 511 1999; [www.sony.co.uk](http://www.sony.co.uk)

MODEL	PRICE (£)	FORMAT
<b>HIGH DEFINITION</b>		
1 <b>PANASONIC</b> HDC-SD1	700	SD memory card <sup>a</sup>
2 <b>CANON</b> HV20	850	Mini-DV
3 <b>PANASONIC</b> HDC-DX1	650	DVD (RAM, -R, -R DL, -RW)
4 <b>SONY</b> HDR-HC5E	625	Mini-DV
5 <b>SONY</b> HDR-SR7E	950	HDD (60GB/8 hours <sup>b</sup> )
6 <b>SONY</b> HDR-UX3E	565	DVD (-R, -R DL, +R, -RW, +RW)
7 <b>SANYO</b> Xacti HD2	400	SD memory card <sup>c</sup>
8 <b>JVC</b> GZ-HD7	1,200	HDD (60GB/5 hours <sup>b</sup> )
<b>STANDARD</b>		
9 <b>PANASONIC</b> SDR-H250	600	HDD (30GB/7 hours <sup>b</sup> )
10 <b>SONY</b> DCR-SR290E	520	HDD (40GB/9.5 hours <sup>b</sup> )
11 <b>CANON</b> DC230E	310	DVD (-R, -R DL, -RW)
12 <b>CANON</b> DC201	200	DVD (-R, -R DL, -RW)
13 <b>HITACHI</b> DZ-HS500E	300	DVD (RAM, -R, -RW, +RW) & HDD (30GB/7hr <sup>b</sup> )
14 <b>PANASONIC</b> VDR-D220	295	DVD (RAM, -R, -R DL, -RW)
15 <b>SONY</b> DCR-SR72E	405	HDD (60GB/14.5 hours <sup>b</sup> )
16 <b>JVC</b> GZ-MG575	700	HDD (40GB/9.5 hours <sup>b</sup> )
17 <b>SANYO</b> Xacti VPC-CG65	190	SD memory card <sup>c</sup>
18 <b>PANASONIC</b> SDR-S10	330	SD memory card <sup>d</sup>
19 <b>JVC</b> GR-D760	235	Mini-DV
20 <b>SAMSUNG</b> VP-DC175	300	DVD (-R, -R DL, +R, -RW, +RW)
21 <b>SAMSUNG</b> VP-D371	145	Mini-DV

<sup>a</sup> Contains a 4GB memory card, holding approximately 40 minutes of footage when recorded at the highest  
<sup>d</sup> Contains a 2GB card, holding approximately 25 minutes of footage when recorded at the highest quality

### USING THE TABLE

The more stars the better.

### Specification

**Price** For Best Buys, we give the widely available high-street price as we went to press. Prices for others are a guide to what you should expect to pay.  
**Format** Recording formats that the camcorder accepts. Mini-DV is the best format if you want to get into editing. DVD is the best format if you want to create a DVD quickly for playing in a home DVD player. Hard-disk models (HDD) do without tapes or discs, so they

are often smaller and sleeker. Memory-card models are the smallest of all, but you often can't store as much footage as you can with the other formats.  
**Size** Dimensions looking at the camcorder side-on to the nearest half centimetre.  
**Optical zoom** The higher the number, the more you can zoom in. An optical zoom of x10 is enough for most shooting situations. **Lens converter attachment** Fitting a lens converter allows you to zoom in or out more closely than the lens alone; n/a (not applicable) means one cannot



SPECIFICATION							WHICH? TEST PERFORMANCE							SCORE %
WEIGHT (g)	SIZE (cm) (hxxwxd)	OPTICAL ZOOM	LENS CONVERTER ATTACHMENT(mm)	GAIN UP	BACKLIGHT COMPENSATION	EXTERNAL MIC ATTACHMENT	BATTERY LIFE (hr:min)	IMAGE STABILISATION	AUTOFOCUSING	OVERALL VIDEO IMAGE QUALITY	SOUND	STILL PHOTOS	EASE OF USE	
490	9x14.5x8	12	43	✓	✓	✓	1:17	★★★★★	★★★	★★★★★	★★★★	★★★★	★★★★	70
600	8x14.5x10.5	10	43		✓	✓	2:02	★★★★★	★★★★	★★★★	★★★★	★★★★	★★★★	69
780	9x17.5x9.5	12	43	✓	✓	✓	2:07	★★★★	★★★	★★★★	★★★★	★★★★	★★★★	68
610	8x13.5x9.5	10	37		✓	✓	1:42	★★★	★★★	★★★★	★★★★	★★★★	★★★★	65
620	7.5x14.5x9	10	37		✓	✓	1:24	★★★★★	★★★	★★★★	★★★★	★★★★	★★★★	64
600	9x14.5x8	10	37		✓	✓	1:28	★★★	★★★	★★★★	★★★★	★★★★	★★★★	62
250	12x8.5x4	10	n/a			✓	1:26	★★★★★	★★★	★★★	★★★★	★★★★	★★★★	60
730	8x18.5x10	10	46	✓	✓	✓	1:14	★★★	★★	★★★	★★★★	★★★★	★★★★	59
480	8x14x8.5	10	37	✓	✓		2:18	★★★★★	★★★	★★★★	★★★★	★★★★	★★★★	71
540	7.5x15x8.5	10	37		✓	✓	1:36	★★★★★	★★★	★★★★★	★★★★	★★★★	★★★★	69
460	9.5x13x6.5	35	n/a				1:48	★★★★★	★★★	★★★★	★★★★	★★★★	★★★★	66
440	9x12.5x6	30	n/a				1:56	★★★★★	★★★	★★★★	★★★★	★★	★★★★	60
570	9x13.5x8	30	34		✓		1:45	★★★★★	★★★	★★★	★★★★	★★	★★★★	60
580	9.5x15.5x9	32	37	✓	✓		1:18	★★★★	★★★★	★★★	★★★★	★★	★★★★	59
420	7x11.5x8.5	25	30		✓	✓	1:28	★★★★	★★★	★★★	★★★★	★★★★	★★★★	58
470	7.5x12x8	10	46	✓	✓	✓	1:20	★★★★	★★	★★★	★★★★	★★★★	★★★★	56
180	10x7x3.5	5	n/a				1:06	★★★★	★★	★★★	★★★★	★★★★	★★★★	53
210	6.5x11.5x3.5	10	n/a	✓	✓		1:08	★★★★★	★★★★	★★	★★★★	★★	★★★★	49
480	9x13x6	34	27	✓	✓		1:45	★★★★★	★★★	★★	★★★★	★★	★★★★	48
430	9x12.5x7	34	30		✓		0:58	★★★	★★	★★	★★	★★	★★★	43
420	9.5x12.5x7.5	34	30		✓		1:46	★★★	★★★	★★	★★★★	★ <sup>e</sup>	★★★	42

quality <sup>b</sup> Amount of recording time when used at the highest quality level <sup>c</sup> SD memory card sold separately from camcorder

<sup>e</sup> This model records still photos on to the Mini-DV tape, not a memory card, so it's very difficult to then create image files from them for printing

be fitted. Size given in millimetres. **Gain up** This brightens up all parts of a picture. But watch out for noise – coloured speckles that detract from image quality. **Backlight compensation** Brightens up the darkest areas of a picture – good for filming a person in front of a window, for example. Again noise is a downside. **External mic attachment** Lets you attach a separate microphone for better sound quality.

#### Test performance

**Battery life** The amount of recording time you can expect

on a single charge.

**Image stabilisation** This reduces the effect of hand shake. **Autofocusing** The reliability and speed of the autofocusing system, tested in various light conditions. **Overall video image quality** Tested in a variety of conditions, including dim light and artificial light, and in both standard and widescreen modes. **Sound** The performance of each model's built-in microphone. **Still photos** Image quality, shutter delay and start-up time of still photo function. **Ease of use** This

summarises our experts' views on how easy each model is to use when recording and playing back footage, how portable it is, and how easy it is to use the LCD, viewfinder and follow the instruction manual.

#### Score

Ignores price and is based on:

Video image quality	35%
Ease of use	20%
Sound quality	15%
Still photos	10%
Features	10%
Autofocusing	5%
Battery life	5%

#### OUR RESEARCH

When selecting camcorders to test, we consult manufacturers, market intelligence reports and industry experts, then check availability on the high street and online. Tested models include top-sellers from the most popular brands, products with innovative features and widely available Best Buys from past tests.

#### MORE ONLINE

Go online at [www.which.co.uk/camcorders](http://www.which.co.uk/camcorders) for more information on each camcorder and results from past tests. See [www.which.co.uk/loginhelp](http://www.which.co.uk/loginhelp) for help logging in.