# Washing machines and detergents

We've tested 20 washing machines to see which clean the best. And, so you can get the best out of your machine, we've found the most effective detergents

Think your washing pile is big? You should see the one we've got through recently. Finding the best washing machines and detergents is a formidable task and one that needs an enormous pile of seriously stained clothes.

Dyson's washing machine (right) has fought its way to first place, thanks to some innovative features. We haven't made it a Best Buy, though – not enough people own a Dyson for it to show up in our reliability survey yet. So we just don't know how often its washing machines need repairing.

Thankfully, there are other brands hot on its heels. Siemens, Bosch and Miele are making great new machines; Bosch and Miele now have Best Buys throughout the kitchen – for washing machines, tumble driers and dishwashers. And an old Best Buy from Tricity Bendix has managed to stay among the best machines for another year.

We test washing machines and detergents by spending hours washing clothes carefully smeared with chocolate ice cream, hamburger grease, blood, wine and umpteen other nasty stains. Then we measure the change in how much light the stains reflect, to see how much of the stain has been washed away. We carry out more tests on the washing machines to find out how well they spin, how noisy they are, and how much they cost to run.

#### WASHING DETERGENTS

If you're taking the time to choose a good washing machine, it's worth using a good detergent. There are so many different detergents in the supermarket aisles, it's easy to get bewildered – but there are big differences in how well they clean.

For the cleanest clothes, use a biological washing powder rather than tablets or a non-biological powder. And choose a powder from one of the big brands, Ariel, Persil or Surf: they're better than supermarkets' own brands. It's a similar story for colour powders, where Persil comes out on top.

If you have sensitive skin, opt for a non-biological powder to clean your whites. They tend to be less effective but the best ones – Ariel, Persil and Fairy – are nearly as good as biological powders.

Of course, for some of us, measuring out powder is too much like hard work. If you prefer to chuck a tablet in with the wash, the decision is much easier – there's little difference between brands in how well they clean.

#### Whiter than white

Most ordinary detergents contain chemicals called optical brighteners – these attach themselves to your clothes during the wash cycle. They don't contribute to the detergent's cleaning effect; instead, they perform a clever trick with light. Brighteners absorb ultra-violet light, which we can't see, and re-emit it as light, which we can. This gives fabrics a cleaner and whiter appearance.

#### **Cleaning fatty stains**

Most detergents are poor at shifting fatty stains – make-up and lipstick cause particular problems. So keep a stain remover on hand for mishaps with salad dressing and girls' night-in makeovers.

#### Sorting your load

Dye creeps between clothes in the wash. Detergent manufacturers try to prevent this, but it's not easy. The best way to avoid it is the old-fashioned way. Sort your clothes into white, dark and similarlycoloured loads before you wash them – there are some things even a Best Buy can't do for you.



#### WIDE DOOR

The Flowcheck's door is wider than any of the other machines' on test. That makes it a lot easier to stuff clothes in.

Dyson

The Dyson can take an impressive 7kg load, compared with the usual 5kg or 6kg.

### 1 Dyson CR02 Flowcheck 66% Best for cleaning

#### £800 from Currys and Miller Brothers

Dyson has a reputation for challenging the status quo. James Dyson set his engineers the task of 'experimenting with every imaginable way of washing to design a better washing machine', and our test results suggest they're on target. The Dyson CRO2 Flowcheck's brilliant cleaning makes it the highest scoring machine on test.

At £800, it has the highest price tag, too – £300 more than its nearest competitor. You're paying partly for the distinctive looks, partly for some neat design features. For example, there's a coin trap to catch any stray change in your washing. You can also program and save your own individual washes. But the important thing is the unique drum.

It actually has two drums, which sit side by side but move in opposite directions. The idea is that this moves your clothes around more vigorously. As well as getting the best results, this design lets the Flowcheck wash more quickly than other machines. It takes only one hour and 21 minutes for a standard wash – most machines take around two hours. And its quick wash gets good results in superfast time.

The size of the drum compartment is impressive. Only four machines we tested take loads of 7kg or more, and this is the only one that gets the top rating for a standard wash. A wider-than-average door lets you stuff it full with minimal effort.

We've got just a handful of reservations about the Flowcheck. It's one of the noisiest machines; its rinsing isn't great; and we don't yet know how often it needs repairing – so we can't make it a Best Buy.

#### **DOUBLE DRUM**

According to Dyson, it's hard to beat a hand wash. So the double drum inside the Flowcheck is designed to emulate the action of hand washing. Don't be confused, though: it can't necessarily wash all clothes labelled 'hand wash only'

The two drums inside the machine move in opposite directions, to manipulate and flex your laundry more than a single drum. This is supposed to release more dirt from the fibres – and, from the results we've seen in our tests, it's an idea that works.



# NEED TO KNOW

It's worth choosing your washing machine carefully. The best machines get your clothes much cleaner, much more quickly. But they vary in how well they spin and rinse, and how much of a racket they make.

ENERGY EFFICIENCY All washing machines have an energy label which carries three ratings – AAB, say.

The first rating is for overall energy efficiency, the second for how well it cleans, and the third for how well it spin dries. The highest rating is A; the lowest is G.

All three are provided by the manufacturer and, in the past, we've found energy labels to be inaccurate. We measure cleaning and spin drying ourselves, and look at how much energy it takes to run each machine. Running costs vary from around £21 to £41 a year.

#### **FEATURES**

There's a whole host of programs and features on most modern washing machines.

Different models have different features but not all are worth looking out for.

For example, reduced-ironing programs don't make much difference to the state of your clothes. And a fancy-looking display panel isn't always a good thing.

On the other hand, features such as time delay and child locks can be really useful.

### Washing detergents

The big brand names trump supermarket own brands. We've tested the

leading powders and tablets on 15 stains – from fats such as butter, to proteins such as egg yolk, and vegetable stains such as blueberry. And we checked how they affect clothes' colour and whiteness, too.

The samples, right, show how two bio powders dealt with a lipstick stain.





Best: Ariel



#### DISPLAY PANELS

Electronic displays are increasingly popular, but they vary in what they do. Some, as on this Bosch, just give basic information, such as when your wash will be ready. Others, like the Dyson's (1), are an integral part of the programming. Dyson has done away with the traditional dials you program the CRO2 using only buttons.

REDUCED IRONING

These programs cut down creasing less than you'd think. This Siemens has the most effective one we tried but, like the Bosch Best Buys (3 and 6), all it does is reduce the spin speed. Dyson's (1) program is slightly less effective – probably because it's so good at throwing the clothes around.



# **2** Siemens WXL 146A 65%

#### Best for the quietest wash £500 from Comet

This is the only washing machine that clocked in at under 70dB, more than 10dB quieter than the noisiest machines. Decibels aren't measured on a linear scale – a reduction of just three decibels dramatically reduces the noise level so 10dB is a big difference.

As well as being one of the quietest spinners, it's one of only a few machines that gets good marks for spin drying clothes.

Your clothes won't be coming out of the wash completely

sodden, and they shouldn't be too crumpled either: the reducedironing option gives fewer creases than the other new Best Buys. However, it's not a miracle cure, and the tidy-minded will still want to run an iron over their clothes.

This machine washes well, though it's let down slightly by average cleaning on quick wash. And it doesn't cost the earth to run – energy and water use is fairly low. Along with the cheaper of the Boschs (3), the Miele (5) and the LG (7), it's a good cleaner that gets top marks for running costs.

#### QUICK WASH

Different manufacturers have rather different ideas about how quick a 'quick' wash should be.

At one end of the scale are models like this Bosch, which do the job in well under an hour. At the other end, there are models like the LGs (7 and 20), which take more than twice as long.

Surprisingly, the machines that wash most effectively on the quick program tend to be quite fast – models like this Bosch and the Dyson (1).

## **Biological powder**

The big-name brands' biggest lead over supermarkets is in biological powders. In our tests, they knocked spots off the own brands at removing stains.

Ariel has the edge over Persil because it gives the fabled 'whitest whites'. Most bio powders boost the whiteness of the clothes, and clothes washed in the



should stay brighter looking for longer. Ecover's score is poor because it has no optical brighteners, the chemicals that make clothes look whiter.

			Stain rei	moval	Fadi	Score	
		Fat	Fat Protein Vegetable		White	Colour	(%)
POWDERS		0 0 0 0 0 0 0	6 6 6 6 6 6 6			8 9 9 9 9 9	
1	Ariel	0	*	*	*	0	72
2	Persil Biological	0	*	*	${\leftarrow}$	0	69
3	Surf Sunshine Biological	0	☆	0	*	0	65
4	Bold 2 in 1		0	☆	0	0	57
5	Tesco Automatic Bio Powder		0	0	\$	0	50
6	Asda Biological Performance		0	0	*	0	48
7	Waitrose Ultima Biological Powder		0	0	0	0	44
8	Ecover Bio Powder		☆	☆	•	☆	43
9	Co-op Ultra Biological Powder	•	0	0	0	0	42





#### **SCORE**

For detergents, this ignores price and is based on: Stain removal 60% 20% White fading Colour fading 20%

#### FILTER ACCESS

Washing machines have filters, which need cleaning regularly, to catch the fluff from your wash.

Filters tend to be positioned close to the ground, but this Miele's is high enough to let you catch any mess that spills out of it.



# **3 Bosch WFO 2466 64%**

#### Easiest to program £279 from Sainsbury's

If you get annoyed by too many fussy buttons and hundreds of options you'll never use, this is the machine for you.

It's the easiest machine to program. There's one dial for selecting the wash program, another to let you select your own spin speed, and just a handful of buttons for extra options. A small display shows the time remaining until the end of your wash, and there's a series of lights to show whether

your laundry is at the wash, rinse or spin stage.

There's a special option for clothes that aren't really dirty but need freshening up. However, it isn't really different from setting any machine to the rinse and spin part of the cycle.

With a price tag of £279 and low running costs, it's difficult to fault this model on value for money. It gives a great wash across the board, including one of the most effective quick washes. The only drawback is that it's on the noisy side.

# 5 Miele W2203 63%

#### Good all-rounder £609 from Sainsbury's

This Miele gives a great wash and has some design features that make it a bit different.

It's the only washing machine with a metal rather than a plastic door, which gives it a really solid, well-built feel (and Miele is one of the most reliable brands).

Its filter is easy to clean, too. Washing machines' filters are usually so close to the floor that it's difficult to fit anything underneath to catch all the flotsam and jetsam when you

clean it. By contrast, this Miele leaves enough space to fit a container underneath, so it's easier to avoid messy spills.

Cleaning of cottons and delicate clothes is good, though the quality of the quick wash is disappointingly average.

The only other thing to be aware of is the relatively small 5kg drum – for £609, you'd expect more space. That said, it's an issue only if you have a large family and a lot of washing to do.

### Non-biological powder

Non-bio detergents are best for people who have eczema and dermatitis.

They don't contain enzymes, the 'biological' part of ordinary detergents, which break down food stains, especially protein stains such as cocoa. But the Ariel, Persil and Fairy non-bios are still

almost as good as the best bio powders.

They do struggle with proteins, but not with vegetable stains, such as wine, which they tackle with bleaching agents.

Waci						
	Stain removal			Fadir	Score	
	Fat	Protein	Vegetable	White	Colour	(%)
POWDERS		* * * * * *	· · · · · · · · · · · · · · · · · · ·		*	
1 Ariel Non-Bio	*	0	*	\$	0	67
2 Persil Non-Biological	0	☆	*	*	0	66
3 Fairy Non-Biological	0	0	*	☆	0	62
4 Tesco Automatic Non Bio Powder		e	0	☆	0	44
5 Waitrose Ultima Non-Biological	•	e	0	☆	0	40
6 Co-op Ultra Non-Biological	٠	٠	0	*	0	39
7 Asda Non-Biological Sensitive and Gentle	•	•	0	0	0	39
8 Surcare Sensitive	•	٠	O	☆	☆	33





### Tumble driers

If you want a tumble drier to go with your washing machine, the best condenser model we've found is the Miele T4652C (£800). If you're on a budget, try the Zanussi-Electrolux TC 7102X (£215). The best vented drier is Miele's T4123 (£500); a cheaper option is the Bosch WTA4107 (£250).

For more on these and other Best Buys, go to www.which.co. uk/tumbledriers.

Alternatively, see p36 for our latest test of washer-driers.



#### SCORE

For detergents, this ignores priceand is based on:Stain removal60%White fading20%Colour fading20%

60% 20% 20%



CHILD LOCKS

This Bosch and the Dyson (1) both have child locks to stop kids from changing the program once the selected cycle has started.

The Dyson's child lock can also be used when the machine isn't on, to keep the outer door locked.

To activate the locks, you press and hold the buttons for other functions.

# 6 Bosch WFX 2867 63%

6 Bosch

#### Good for handy features £399 from Sainsbury's

This is the more expensive of the two Bosch Best Buys. You're paying for a higher spin speed, a fancy display, less noise, and the odd extra feature. The first two aren't really worth the extra money, but lots of us will appreciate the other two.

The flashier programming system loses the spin speed dial in favour of an LCD display. You select the spin speed and some other features using a button. The screen displays information about the wash cycle and how long you've got before the wash is complete. It's a little bit more fiddly than the other Bosch (3).

The relatively quiet running is worth paying extra for, though, and the features are good. It's the only Best Buy with a childproof lock, which stops pesky kids changing the program.

There's also a little 'frothing sink' symbol, which lights up if you've put in too much detergent – this can reduce the effectiveness of your wash, because the foam stops the clothes moving around. If it happens, the machine runs an extra rinse cycle automatically.

### TIME DELAY

Ten of the machines we tested let you delay when the wash cycle starts. This is useful if you have

cheaper electricity at night or if you want to time the washing to finish as you get home from work. This Bosch, the Siemens

(2) and the LGs (7 and 20) let you delay the start by up to 19 hours; others can be programmed even further ahead. The Dyson (1), Hotpoint (4), Zanussi (11) and AEG (13) can delay the wash by 23 or 24 hours.

The Indesit (12) and Zanussi (19) let you delay the start of your wash by up to eight and 12 hours respectively.

#### WHICH? EXTRA

You can find more about washing machines – and see the test results for models we've tested previously which are still available – at www. which.co.uk/washingmachines.

### **Biological tablets**

Tablets are usually seen as the easy choice because there's no messing about with measuring scoops. But our tests show that popping a couple of tablets in with the wash gives worse results than a biological powder. Tablets are pretty hopeless at removing fatty stains. So oil, grease and make-up will leave their mark. We haven't named any Best Buys because none of the tablets was that much better than the others.

			Stain rei	noval	Fadi	Score	
		Fat	Protein	Vegetable	White	Colour	(%)
T/	TABLETS		- - - - - - - - - - - - - - - - - - -			- - - - - - - - - - - - - - - - - - -	- - - - - - - - - - - - - - - - - - -
1	Waitrose Ultima Bio	•	☆	*	\$	0	59
2	Persil Biological	٠	*	☆	0	0	56
3	Asda Biological Performance	•	☆	☆	\$	0	53
4	Surf Sunshine Biological	٠	☆	0	0	0	53
5	Tesco Bio	e	☆	0	0	0	52
6	6 Ecover Bio Tablets		0	☆	•	☆	41



SPIN SPEED

At 1,600rpm, this LG has the highest spin speed in our tests (the rest range from 1,200 to 1,400). All our Best Buys let you lower the spin speed to avoid fabrics such as wool going out of shape.



# 7 LG WM 16220FD 63%

#### Best for a big wash £600 from Comet and Currys

If you're the sort of person who gets down to your last pair of undies before facing the laundry, this LG is for you. It takes up to a whopping 7.5kg of clothes.

It also has the fastest spin speed in our test (1,600rpm) and it's one of only a few models that score well for spin drying.

The downside of the large capacity and fast spinning is that it's on the noisy side. It struggles slightly with rinsing, too.

Cleaning quality is great on the standard cotton wash, if a

little slow (more than an hour longer than the Dyson). The results for other programs are variable. For example, it's only average at cleaning delicate fabrics. On the other hand, its quick wash gives better results than most – though, again, it's slow, taking nearly twice as long as other machines.

LG isn't a common make so it hasn't appeared in our reliability survey – until we know how often LG machines need repairing, we can't make this one a Best Buy. But, if you're not in a hurry, it's certainly an effective cleaner.

# 9 Tricity Bendix 62%

#### Good value for money £293 from Sainsbury's

The best washing machines tend to be the more expensive – along with the first Bosch (3), this is one of only two Best Buys which cost less than £300.

It's a simple, basic machine – there's no extra rinse, easy iron or hand wash program – but it cleans well. And not all of us want loads of programs. Here, you can just twist a dial to get things started.

Anyone looking for the very best value should stick with the Bosch. It's more efficient and its quick wash is much better (the Tricity Bendix is almost an hour slower but still cleans less effectively). Its rinsing is more effective, too. You won't see detergent on your wash with the Tricity Bendix but even invisible amounts cause skin irritation for some people.

The only exception is if you want a reasonably priced machine that isn't too noisy – this model is quieter than the Bosch.

Tricity Bendix is a reliable brand so this machine shouldn't need many visits from the repairman.



### Colour powder



If your wardrobe is packed full with a rainbow of colourful fabrics – or, for that matter, you're a cardcarrying black-clad Goth – use a powder specifically for coloured clothes. These don't have

bleaching agents, which

break down the coloured dyes in the fabric. Leaving them out protects colours but makes the powders poor at tackling vegetable stains, such as tea, wine and tomato ketchup.

Most of them leave out optical brighteners. These

are designed to make white clothes look whiter, but they make coloured clothes fade.

Ariel Colour is the only colour powder on test which has optical brighteners. That makes it a good choice for clothes that are a mixture of white and coloured fabric – the colours will be less bright but the white won't dull.

Our Best Buy is Persil because it's excellent at coping with protein stains, such as bolognese sauce and baby food.

1 69	9	Stain rer	noval	Fadi	Score	
	Fat	Protein	Vegetable	White	Colour	(%)
POWDERS		9 9 9 9 9 9 9 9 9 9 9 9	•         •           •         •           •         •           •         •           •         •           •         •           •         •           •         •           •         •           •         •		* * * * *	
1 Persil Colour Care	0	*	•	•	*	60
2 Ariel Colour	☆	☆	•	0	☆	55
3 Waitrose Ultima Colour	٠	0	•	•	*	47
4 Tesco Automatic Colour	٠	0	•	•	*	46
5 Co-op Ultra Colour	٠	0	•	•	*	46
6 Asda Biological Colour Powder	٠	0	•	•	*	45

#### KEY ★ ☆ ○ ⊕ ● Best Worst ■ Best Buy

#### SCORE

For colour detergents, this ignores								
price and is based on:								
Stain removal	60%							
White fading	10%							
Colour fading	30%							



You don't have to wait around for ages to get a good wash – unless you buy the wrong machine. Quick programs don't wash as well as normal programs, but you still get pretty good results from a model like the Dyson (1). However, others – like the Zanussi (19) – rush the job and give poor results.

#### SCORE

This ignores price and is based on:										
Cleaning		40%								
Running c	ost	30%								
Convenien	ice	20%								
Spin dryin	g	10%								

### WASHING MACHINES

We tested popular models from leading manufacturers.

#### Specification

Price Lowest on high street.

#### Efficiency

Energy label The maker's rating for energy efficiency, cleaning and spin drying on 60°C wash. Running cost Water and electricity costs, assuming machine's run full.

#### Washing quality

**Cotton** The standard 40°C wash. **Delicates** The standard wash for materials such as silk. **Quick** The quick option for cottons.

#### Spin and rinse

Spin dry How dry the load was after the final spin. Rinse How well the machine rinses away detergent.

#### KEY

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*	$\overrightarrow{\Delta}$	0	$\bigcirc$	
Best			W	orst
	Best	Buy		

# Washing machines

#### MODEL

- 1 Dyson CRO2 Flowcheck
- 2 Siemens WXL 146A
- **3 Bosch** WFO 2466
- 4 Hotpoint Aquarius+ WF645
- **5 Miele** W2203
- 6 Bosch WFX 2867
- 7 LG WM 16220FD
- 8 Hotpoint Aquarius WF430
- 9 Tricity Bendix AW1260
- **10 Нооver** HNF 2137
- 11 Zanussi ZWF1430
- 12 Indesit WIL 133
- 13 AEG L62600
- 14 Whirlpool AWO 3561
- 15 Servis M6003W
- 16 Servis M6030W
- **17 Candy** CN146
- 18 Hoover HNL 3146
- 19 Zanussi ZWF1220W
- 20 LG WM14225FD

#### DETERGENTS

We tested the bestselling detergents. We omitted Sainsbury's and Daz, and Ariel biological tablets, because the formulations changed during our tests.

#### Stain removal

Fat Removal of butter, meat grease, motor oil, make-up and lipstick. Protein Removal of bolognese, cocoa, chocolate ice cream, egg yolk and baby food. Vegetable Removal of coffee, ketchup, blueberry, tea and wine.

#### Fading

White How much washing powders increase whiteness after ten washes. Colour How little colour fades after 25 washes.



In October 2003, we sent questionnaires to 30,000 Which? readers. This table is based on 6,349 replies for washing machines up to six years old. On average, 81 per cent haven't needed repairing. There are substantial differences between brands in how often their washing machines need repairing. For the most reliable brands, as few as 5 per cent of machines up to six years old need repairing. For some of the worst brands, over 30 per cent need you to wait in for the repairman.

The two Hotpoints in our test (4 and 8) clean well, but Hotpoint has a history of unreliable washing machines. That's why they're not Best Buys.

For the fuller picture, this table shows what you told us in our last annual survey (see May, p12).



This Hotpoint would be a Best Buy if the brand was more reliable

Specification		Effi	ciency	Wa	shing qua	lity	Was	shing tim	ne	Spin and	l rinse	Conve	nience	Score	
Price (£)	Capacity (kg)	wxhxd (cm)	Energy label	Running cost	Cotton	Delicates	Quick	Cotton	Delicates	Quick	Spin dry	Rinse	Use	Noise	(%)
800	7	60x85x70	AAA	e	*	☆	☆	1h 21m	1h 28m	39m	0	e	☆	٠	66
500	6	60x86x59	AAB	*	☆	☆	0	2h 9m	1h 20m	54m	☆	0	☆	0	65
279	6	60x86x59	AAB	*	☆	☆	☆	2h 10m	1h 19m	51m	0	0	☆	e	64
480	6	60x85x59	AAB	•	☆	☆	☆	1h 48m	1h 6m	58m	☆	0	☆	0	64
609	5	59x85x59	AAB	*	☆	☆	0	1h 56m	1h 16m	1h 1m	0	0	☆	0	63
399	6	60x86x59	AAB	☆	0	☆	0	2h 10m	1h 19m	52m	0	0	☆	0	63
600	7.5	60x85x62	AAA	*	☆	0	☆	2h 25m	1h 29m	1h 57m	☆	e	☆	e	63
370	6	60x85x59	AAB	e	☆	☆	☆	1h 39m	1h 4m	55m	0	e	0	e	62
293	6	60x85x60	AAB	☆	☆	☆	0	1h 58m	1h 17m	1h 43m	0	e	☆	0	62
350	7.5	60x85x63	AAB	*	☆	☆	0	2h 27m	1h 28m	45m	0	e	0	e	59
380	5.5	60x85x62	AAB	☆	☆	☆	0	1h 52m	1h 16m	1h 4m	0	0	☆	e	59
250	5	60x84x56	AAB	•	☆	☆	☆	1h 46m	52m	54m	0	0	☆	e	58
420	5	60x85x61	AAB	e	0	☆	0	1h 55m	1h 18m	1h 3m	0	0	☆	e	57
300	6	60x84x60	AAB	*	0	0	0	2h 15m	1h 24m	1h 4m	0	0	☆	e	56
220	5	60x85x56	AAB	*	0	0	0	1h 55m	1h 34m	31m	0	e	0	0	55
255	5	60x85x56	AAB	*	0	0	0	2h 2m	1h 35m	42m	0	0	0	•	53
245	6	60x85x57	AAA	*	0	0	0	2h 32m	1h 15m	1h 9m	0	e	0	0	52
300	6	60x85x58	AAA	*	0	0	0	2h 33m	1h 25m	1h 7m	0	•	0	e	52
314	5	60x85x60	AAB	•	☆	0	e	2h 29m	1h 17m	33m	0	☆	☆	0	50
550	7.5	60x85x65	AAA	*	0	0	0	2h 21m	1h 24m	1h 55m	☆	•	☆	•	48