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Product Testing Dishwasher Detergents

The Association of Conscious Consumers tested 38 dishwasher tablets and gels in an accredited laboratory. We selected our test subjects from the most popular eco and non-eco certified products in stores and drugstores and were curious about their effectiveness. A total of 2660 dishes were washed during the study and large differences were found between tablets and gels. Similarly to our previous tests, products with the EU Ecolabel performed well.

What sort of products did we examine?

We measured the efficacy of 25 dishwasher tablets and 13 dishwasher gels. The composition of the two types is completely different, but we use them for the same purpose – washing dishes in a dishwasher – so we were definitely interested in comparing the two groups.

The typical ingredients of dishwashing tablets

The main ingredients in the dishwasher detergent tablets tested are sodium carbonate (also known as **washing soda**) and sodium percarbonate (also known as **stain remover salt** or active oxygen bleach). Sodium percarbonate is a 2:3 mixture of sodium carbonate and hydrogen peroxide. Sodium carbonate is a strong grease cutter due to its alkaline properties. Hydrogen peroxide releases free oxygen, which has a stain-removing effect and decomposes into water during washing, making the substance environmentally friendly. Each dishwasher detergent tablet also contains less than 5% **nonionic surfactant**, which also plays a role in fat dissolution. The tablets also contain **additives** (polycarboxylates, phosphonates) which reduce the hardness of the water and increase the cleaning efficiency.

In 2017, the European Union restricted the phosphate content of dishwashing detergents due to the adverse environmental impact of the substance. Thus, the cleaning products on the market today contain less phosphorus – still, we recommend the use of completely phosphorus-free products to save our environment. Therefore, we show the phosphorus content of each product in the table below.

Dishwasher tablets typically also contain **enzymes** that help clean up by breaking down different types of food ingredients. Examples for the enzymes are **proteases** which are capable of breaking down proteins (e.g. in eggs, meat, milk). Subtilisin for instance is one type of them. Subtilisin can cause an allergic reaction in those who are sensitive to it, so in the EU it is mandatory to put a warning (EUH208) on the packaging should the concentration increase above a certain level. Another type of enzymes, amylase enzymes are able to degrade starch, e.g. in pasta and potatoes.

The typical ingredients of liquid dishwashing detergents

The compositions of the different **liquid dishwashing detergents** that we tested are not as similar to each other as those of the tablets. Based on the ingredients indicated on the label, the test substances can be divided into two major groups: those with **non-ionic surfactants**, less than 5%, and those containing **sodium silicate**. The main role of both active ingredients is degreasing, and sodium silicate also protects the internal metallic and enamel surfaces of dishwashers against corrosion.

What makes a dishwasher safe for the environment?

When defining the 'environmentally friendly composition' of products, we rely on the criteria of the EU Ecolabel. This is very similar to what we had done in our previous detergent tests. The criteria aim to support products that do not have a significant impact on aquatic ecosystems (are easily degraded), contain only a limited amount of hazardous substances, are effective and minimize waste generation by reducing packaging. It is worth noting that the main components of the tablets (sodium carbonate and sodium percarbonate) are substances that have a minimal environmental impact and are traditionally considered environmentally friendly.

The question of packaging includes the issue of the environmental impact of the increasingly popular protective layer of water-soluble film. This water-soluble film is PVA (polyvinyl alcohol), which is a biodegradable substance that is converted by microorganisms into water and carbon dioxide.

What did we test in the lab?

Efficacy was measured using the "normal" contaminant described in the Test of Hand Dishwashing Detergents (IKW, 2002), the method for the EU Ecolabel for hand dishwashing detergents. That is, dishes contaminated with the following ingredients had to be washed clean during the test:

Tallow	4,7%
Vegetable fat	4,7%
Margarine	4,7%

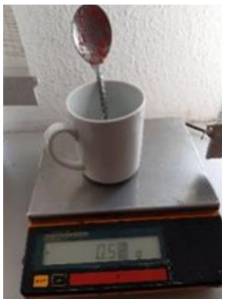
Butter	4,7%
Lard	4,7%
Cooking cream, 30% fat	4,7%
Sunflower oil	4,7%
Olive oil	4,7%
Milk powder, 1% fat	6,3%
Flour	18,8%
Water	37,1%
Food colouring	0,2%

The essence of the test method is to lubricate the above-mentioned mixture (almost half of the mixture is fat, the other half is water, flour and food colouring) and to allow it to dry for 1 hour on different types of dishes.

Porcelain plates (12 dinner plates, 3 bowls), porcelain mugs (5), plastic containers (3) were used, each with 5 g of artificial dirt, and 0.5 g for cutlery (3 spoons, 3 forks, 3 knives). The glasses (3) were placed in the dishwasher next to the contaminated dishes without direct application of the greasy dirt. In all test cases, the dishes were packed in the dishwasher in the same way and washed with the same program at 55°C.

In the case of tablets, 1 dose was used, and in the case of gels, the dosage specified by the manufacturer for medium level contamination was used. Each product was tested twice, so **a total of 2660 dishes were washed up** during the test! The pictures below show how we prepared for the test.




The evaluation was based on a scale of 10 and on visual observation by **two experts**. Evaluation criteria: **cleanliness, stain-free, drying**. In the case of 'cleanliness', the amount of residues of the applied dirt was examined, in the case of 'stain-free' water stains and

deposits were observed under daylight conditions, while in the case of drying, the number of water droplets on the dishes was evaluated by experts. The final result was weighted: cleanliness 50% – stain-free 30% – drying 20%.

Evaluation of test results

Liquid dishwashing detergents are less effective

The difference between tablets and gels is spectacular. Only two liquid dishwashing detergents can compete with solid products. One is **Somat All in 1 Lemon & Lime Gel** and the other is **Herbow Machine Dishwashing Concentrate**, the only product (in the test) containing soap nuts extract! We did not test it, but another test, the Stiftung Warentest 2020 dishwasher tablet test included a study showing the effects of long-term use and found that the gel capsule was the only product that did not scratch the surface of the glass cups after 300 washes. Therefore it is worth considering using more effective gels, especially because their ingredients are less risky for health. Of the 13 gels, seven do not have a hazard label, while none of the tablets have one. Signs of danger on tablets usually indicate an irritant or corrosive effect.

The best products of the test are more or less the same efficient, some of them are environmentally friendly

It is important to note that **there is very little difference in efficiency between the top products**, they all perform well. That's why we advise conscious consumers to look for products that contain the least harmful ingredients possible, with the EU Ecolabel being the best guide in our test, 12 of the tested products are EU ecolabelled. **Of the EU ecolabelled products, eight performed with a result of over 90%.** In addition, the price can be an important aspect, therefore we included the price per load in the table below. The variance between the tablets is quite large in this respect, the cheapest tablets cost 17 HUF, while the most expensive 126 HUF, the gels belong to the slightly higher price category with 44 and 159 HUF per load. In terms of price / value ratio, similarly to the previous detergent tests, private label products (**Blink, Splendid, Tesco, W5, Tandil, Denkmit, Domol, Auchan**) performed well in the test.

The performance of the non-certified 'eco-products' lags behind

The "eco" block at the end of the field should not be left out of the evaluation. Here we come across agents that suggest eco-friendly qualities with their looks, brand names and fancy names. However, these products do not have an independent, authentic certification, ie their environmental properties have not been confirmed by an independent test.

According to our test, their performance is well below the midfield, and they are among the most expensive tested products. This is certainly not a great combination. And among them is the only product for which we were unable to obtain a safety data sheet, **Tierra Verde** liquid dishwasher detergent. In addition, there is nothing on the product label in Hungarian, which also violates the legal regulations.

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The bests

- Best Tablet and Absolute Winner: **Jar Platinum All in One**
- Best gel: **Somat All in 1**
- Top3 EU Ecolabel products: **Somat pro nature All in One**, **Sunlight Powered by Nature All in one**, **Cif Complete Clean All in 1**
- 10 points on 'cleanliness': **Jar Platinum All in One**, **Finish Powerball All in 1 Max**, **domol Multi Perfect 12-Fach Power**
- The best 'stain-free' product: **denkmit Multi Power Revolution**
- The best 'drying' products: **Jar Platinum All in One**, **Somat pro nature All in One**, **denkmit Multi Power Revolution**, **Sunlight Powered by Nature All in one**, **Ecover All-in-One**
- The best price / value ratio: **Blink Classic dishwasher tablets** (9.2 points, 17 HUF/load)

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Ranking of the products with the best authentic certification, ie the EU Ecolabel:

Dishwasher detergent (tablet or gel)	Score	Price per load (HUF)	Phosphorus content	Hazard label	Ecolabel

foszfonátok = phosphonates

irritáló hatású = irritant

nincs címke = no label

	WC tisztító	Teszt-eredmény	Ár / mosogatás (Ft)	Foszfor-tartalom	Veszélyességi címke	Ökocímke
	Somat pro nature All in One tabletta	94	58	nincs	Irritáló hatású	Ecolabel
	Sunlight Powered by Nature All in one tabletta	93	52	nincs	Irritáló hatású	Ecolabel
	Cif Complete Clean All in 1 tabletta	93	41	foszfonátok	Irritáló hatású	Ecolabel
	Blink Öko tabletta	92	33	foszfonátok	Irritáló hatású	Ecolabel
	Ecover All-in-One tabletta	91	126	nincs	Irritáló hatású	Nordic Swan Ecolabel
	L'Arbre Vert öko mosogatógép tabletta	91	100	nincs	Irritáló hatású	Ecolabel
	Cif Powered by Nature All-in-1 tabletta	90	100	nincs	Irritáló hatású	Ecolabel
	Denkmit nature tabletta	90	43	foszfonátok	Irritáló hatású	Ecolabel
	Seventh Generation Free and Clear All-in-one tabletta	89	70	nincs	Irritáló hatású	Ecolabel
	Green emotion öko gépi mosogatógél Citrom	75	52	nincs	Nincs címke	Ecolabel
	Cif Powered by Nature All in 1 mosogatógél	72	72	nincs	Nincs címke	Ecolabel
	Finish 0% Power gél	71	57	foszfonátok	Nincs címke	Ecolabel

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Consumer Guide

Tablet or Powder, Classic or All in 1: What are they for?

Dishwasher detergents are available in many variations: powder, tablet or gel, classic and multitablets. We have gathered their pros and cons.

Multitablets, which can usually be found in stores as All in 1, are highly sophisticated dishwashing detergents. They clean, rinse, dry and soften the water. But you don't always need the full palette. If you live in an area with soft water, you can use your dishwasher more environmentally friendly by using fewer chemicals, which is cheaper too. And if the water is hard, even the multitablet can reach its limits.

Multitablets are easy and convenient to use, they deal with dirt relentlessly. Just open the dispenser compartment of the dishwasher, insert the tablet, close the lid and start the program. Tablets with a water-soluble film do not even need to be unpacked. The best

multitablets clean very efficiently, which is important if the machine only runs every few days and food residue dries on the dishes.

Limitations of the multitablet. With the tablet, the entire amount of chemicals is always released into the wastewater – even in the case of not too contaminated dishes and soft water. The composition is usually designed for medium-hard water, and if the water is harder, the water softening additives in the multitablet may not be enough to do the job. If you often find glasses with milk deposits after the program has run, it may be due to a bad detergent, but it could be hard tap water too. If you do not want to switch to another tablet, add regenerating salt to the machine, which will prevent the formation of white deposits on the dishes.

Powder and classic tablets for all types of water hardness. These types make optimal use of dishwasher technology, but additional rinse aid and – regardless of water hardness – regenerating salt are required in addition to the dishwasher water softener system. Check with your water supplier how hard the water is. Set up the machine according to the instructions. The powder or classic tablet then cleans the dishes while softening the water and the rinse aid is added to the cleaning cycle specifically at the end of the wash cycle.

The powder and gel can be added as desired. The advantage of powder and liquid dishwashing detergent is that it can be dispensed flexibly and economically – a small amount is enough for slightly stained dishes, and the full dose recommended by the manufacturer fights stubborn dirt. Although in our test we have seen that the cleaning ability of gels does not yet reach the level of solid products, their composition is often more favorable to health than tablets and their use does not involve inhaling dust.

Powder for short and fast programs. For the tablets, it take some time to dissolve completely, so after a short program, the undissolved lumps may remain in the dishwasher. You can avoid this problem by choosing a good combination of powder plus rinse aid and machine salt instead.

Pictures: Canva, Pixabay