

# Laundry detergent, washing machines, and foam/suds

Some notes on washing machines and detergents that I've collected, in no particular order.

Foam or suds are actually a *bad* thing in washing machines, not a good thing. The job of the detergent is to get the dirt out of the fibers of your clothes, but in the end it's the water that actually transports the dirt away from your laundry. Suds prevent the dirty water from evacuating your laundry, by creating a sort of 'protective barrier' around it - the dirt may have gotten loose from the fibers, but it's still trapped inside your laundry. The right amount of suds is "few to none, but there's still detergent in the water and the water looks dirty". All the dirt that's in the water is not in your clothes!

There are roughly two types of laundry detergent:

1. Machine detergent - in the Netherlands (and probably elsewhere in Europe) this is just the standard type of laundry detergent. In the US, this is labelled "high-efficiency" and specifically sold as being suitable for front-loading washing machines. Machine detergent produces minimal suds, because most of the agitation work is done by the machine, and you'd just get excessive suds.
2. Hand-washing detergent - in the Netherlands this is specifically labelled as such. It produces more suds, and (as I understand it) the agitation is provided by a combination of your manual actions, and the chemical processes that produce the suds. This detergent foams a lot more, and *should not* be used in a washing machine.

(Sidenote: this differentiation between "chemical cleaning" and "mechanical cleaning" is something you'll find in *all sorts* of cleaning situations - for example, a dishwasher cleans almost entirely chemically, which is how it can get away with such weak jets. And it even applies when cleaning things by hand; sometimes things require less scrubbing because the cleaning agent is doing the work! It's interesting to pay attention to different cleaning procedures and ask yourself whether it's mechanical cleaning, chemical cleaning, or both - and maybe whether that answer should be different for what you're trying to clean.)

If your washing machine seems to spontaneously interrupt its spin/centrifuge cycle, suddenly braking from a high spin speed, then chances are that it detected excessive water in the drum that it couldn't drain in time. There are a few reasons this can happen (including a problem with the pump), but one of the possible reasons is that the outlet got blocked by excessive suds or foam. Some machines will recirculate the foamy water for a while and occasionally add fresh water, in an attempt to remove the suds. But this can take a long time, and doesn't always succeed - in which case the machine will leave your laundry wet because it couldn't finish its spin cycle.

A related problem is 'foam lock', where the drum encounters excessive friction against its casing, caused by foam buildup sort of "sticking the two together" like a suction cup. The drum motor will detect this and abort its spin cycle, to prevent damage to the motor from overloading it. The machine may or may not activate a foam removal procedure in this case. This problem is more prominent with high-capacity and especially-energy-efficient machines, as these tend to have less 'buffer space' between the drum and the casing.

Excessive foam is often used by using too much detergent, but counterintuitively it can also be caused by too *little* detergent. This apparently happens because the detergent also contains anti-foaming agents, and with a too small amount of detergent, there's not enough of it in the water to effectively prevent suds. It seems that "enough" is not just a matter of ratio (perhaps it's about surface area of the water pool?), so even though the amount of active detergent vs. the amount of included anti-foaming agents stays at the same ratio, the total amount of detergent powder can still make a difference.

The right amount of detergent can vary strongly by machine, even for the same laundry load with the same amount of water, so experiment and see what works with your machine. The differences can be bigger than you expect! If your drain pump has clogged with suds, sometimes evacuating water through an emergency drain hose or (if your machine doesn't have one) the filter opening can help to clear the blockage, and allow the machine to drain properly again. Keep in mind that a lot more water can come out of this than you expect and it's low to the ground, so be prepared to catch all of it and to quickly close the outlet again if you can't!

Run a self-cleaning cycle on your machine every month. Make sure the drum is empty, toss an all-in-one *dishwasher* tablet (note: *not* tested with liquid packets!) into the drum, and run it on the 90 celsius cleaning cycle - pretty much every machine has one, but sometimes it's hidden behind a button combination or sequence. This cleaning cycle not only deals with biofilms and mold, but also clears out detergent residue buildup, which can be a problem especially if you typically use liquid detergent. The detergent tray itself should also be cleaned regularly; it'll likely have something you can hold pressed to 'unlock' it from the machine and slide it out in its entirety.

Powder and liquid detergents both have their own upsides and downsides, also for the machine, so it's a good idea to alternate between the two. Your detergent tray should have some sort of divider wall or flippable wall to ensure that the liquid detergent stays in the tray until the (main) washing cycle actually starts - always use it for liquid detergent and *never* use it with powder detergent! If you can only use one of the two (eg. for logistical reasons), use powder detergent and wash the detergent tray more regularly.

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