

# Making sense of ballast water holding time

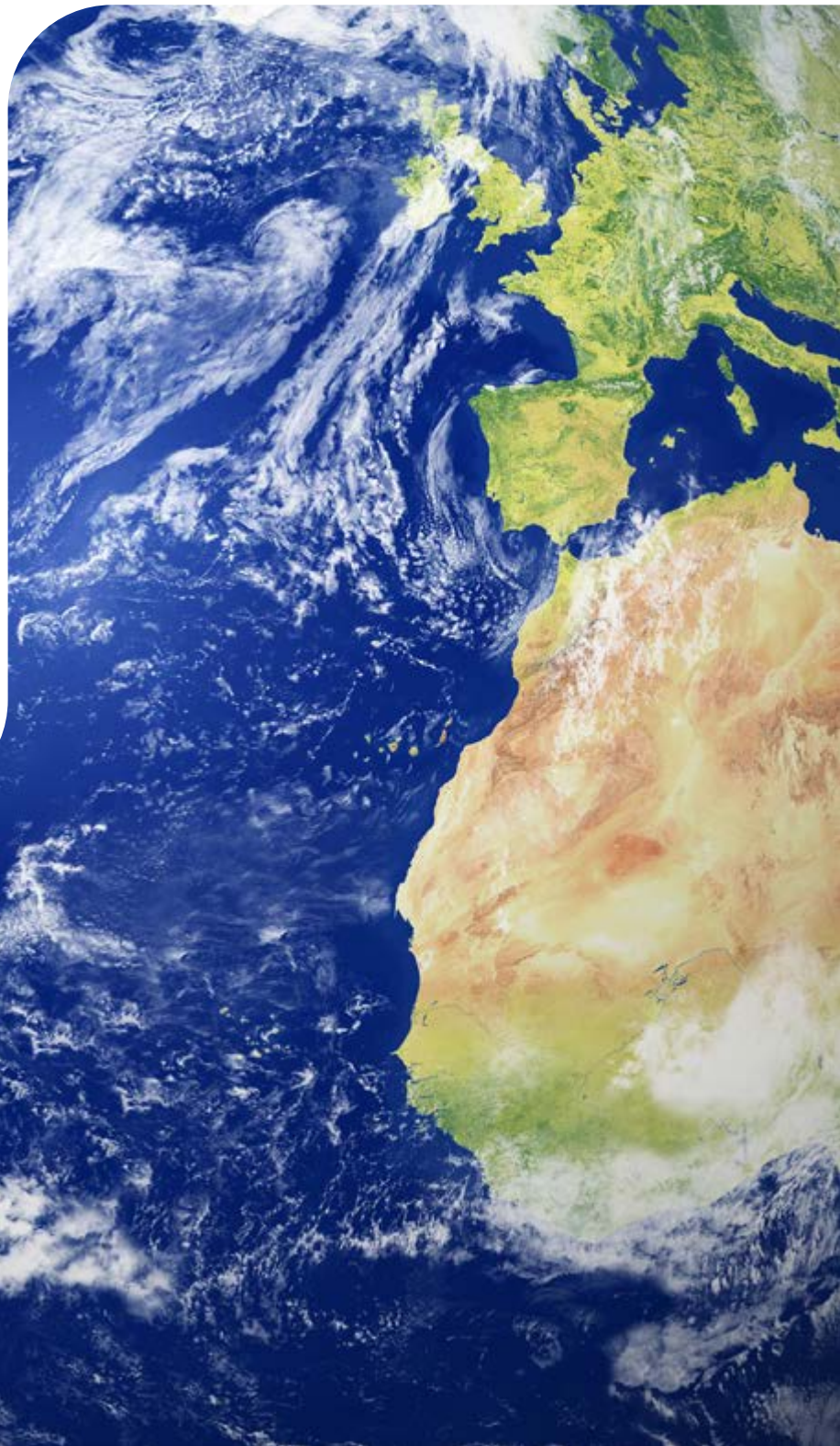
## How it works and why it matters

How much time can your business spare? In ballast water treatment, holding time is an important system parameter. But how it affects you depends on the type of technology and the legislation you sail under.

### What's holding time and why does it exist?

Holding time (sometimes called hold time) is the amount of time that ballast water must be kept on board after treatment. It's how long you have to wait between treatment and deballasting. If timing is critical to your operations, it can make a big difference.

As for why it exists, that's a little complicated. The reasons for holding time depend on technology and legislation.



## Holding time for electrochlorination (EC) and other chemical technologies

Chemicals are one way to neutralize organisms. They can be added directly to the ballast water, or they can be created through a process. An EC system produces chlorine with salt water and electricity, for example.

The time it takes for the chemicals to neutralize the organisms depends on the dose, i.e. the amount of chemicals added or created. A lower dose will require holding time for the chemicals to do their job, while a higher dose won't. This is the holding time defined in the system's certificate, but it's only half the story. Once the ballast water is disinfected, the chemicals that are left over in the water (total residual oxidants, or TRO) have to be neutralized too – because you can't just dump them overboard. That requires either:

- A. More chemicals (and OPEX) to counteract the TRO
- B. Additional holding time, so that the chemicals can break down naturally

This applies anywhere you sail, worldwide. If you don't want to use more chemicals, you simply have to wait.

## Holding time for UV technologies

UV systems are chemical-free, but they still involve a dose – in this case, the amount of UV light that organisms are exposed to. Just like chemical systems, UV systems differ in their dose's neutralizing efficiency. Under IMO regulations, which cover nearly 95% of the world's ports, some UV systems have holding times while others have none at all.

In United States waters, all UV systems have some amount of holding time. To make a complex story simple, that's largely because IMO and U.S. Coast Guard (USCG) testing procedures define neutralized organisms differently:

- IMO: neutralized = dead or unable to reproduce
- USCG: neutralized = dead

Realistically, keeping organisms from reproducing is just as effective in stopping invasive species (which is the point). But that doesn't matter for type approvals and holding time.

Although UV light damages cell membranes and DNA, it may not kill organisms directly. Under IMO regulations, the organisms are as good as dead – so holding time can be avoided. But under USCG regulations, holding time is needed for the organisms to actually die. To reduce it, the system has to reduce flow or use more energy to increase the UV dose.

In addition to the efficiency of the UV dose, this can be another reason why some UV systems have IMO holding times while others don't. Some suppliers have simply used the narrower USCG procedures for IMO

## Holding time and what affects it

	Is holding time needed?	Can holding time be reduced?
<b>Chemical technologies (e.g. electrochlorination)</b>	IMO: For most systems USCG: For most systems	No, not the holding time defined on the certificate. The additional holding time for neutralizing TRO can be shortened, but only by adding more neutralization chemicals. This will mean additional OPEX.
<b>UV technologies</b>	IMO: For some systems USCG: Yes	No, but suppliers may offer different modes to provide holding time options in USCG waters. This lets customers choose the best balance between holding time and other parameters.

testing as well. That reduces type approval costs, but it may lead to more limited IMO parameters.

## Comparing systems

Both chemical and UV systems can be more or less effective. Chemical systems may produce more or less TRO. Some UV systems use their UV light better than others. So the required holding time also varies from system to system. Be sure to check holding times with suppliers.

When it comes to United States waters, UV systems take different approaches to holding time. Alfa Laval PureBallast 3, for example, offers different options to suit different business needs. If required, USCG holding time can be minimized to just 2.5 hours.

### What does all this mean for Alfa Laval PureBallast 3?

Here's a quick overview of how holding time applies to Alfa Laval's ballast water treatment solution.

#### IMO

- No holding time (efficient UV technology)

#### USCG

- Different USCG modes to meet different business needs
- Holding time as little as 2.5 hours
- Holding time only needed when crossing between Captain of the Port Zones

## How to contact Alfa Laval

Up-to-date Alfa Laval contact details for all countries are always available on our website at [www.alfalaval.com](http://www.alfalaval.com)

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