SHORT GUIDE

Understanding salinity, temperature and UVT

How they affect ballast water treatment systems

What's the water like where you sail? Every ballast water treatment system has limitations related to water conditions. (Don't let anyone say otherwise.) Which conditions are important depends on which technology you choose: electrochlorination or UV treatment.

If you choose electrochlorination

Electrochlorination (EC) uses electric current to produce disinfecting chlorine from salt water. That means there has to be salt – and even water temperature makes a difference.

Salinity (salt content)

Why it matters:
Without salt, an EC system can't produce chlorine for compliance. So long as you sail in salty seas, that's not a problem. But different areas have different amounts of salt. And if you sail into brackish or fresh waters, there's definitely not enough of it.

What it means if you sail in less salty waters:

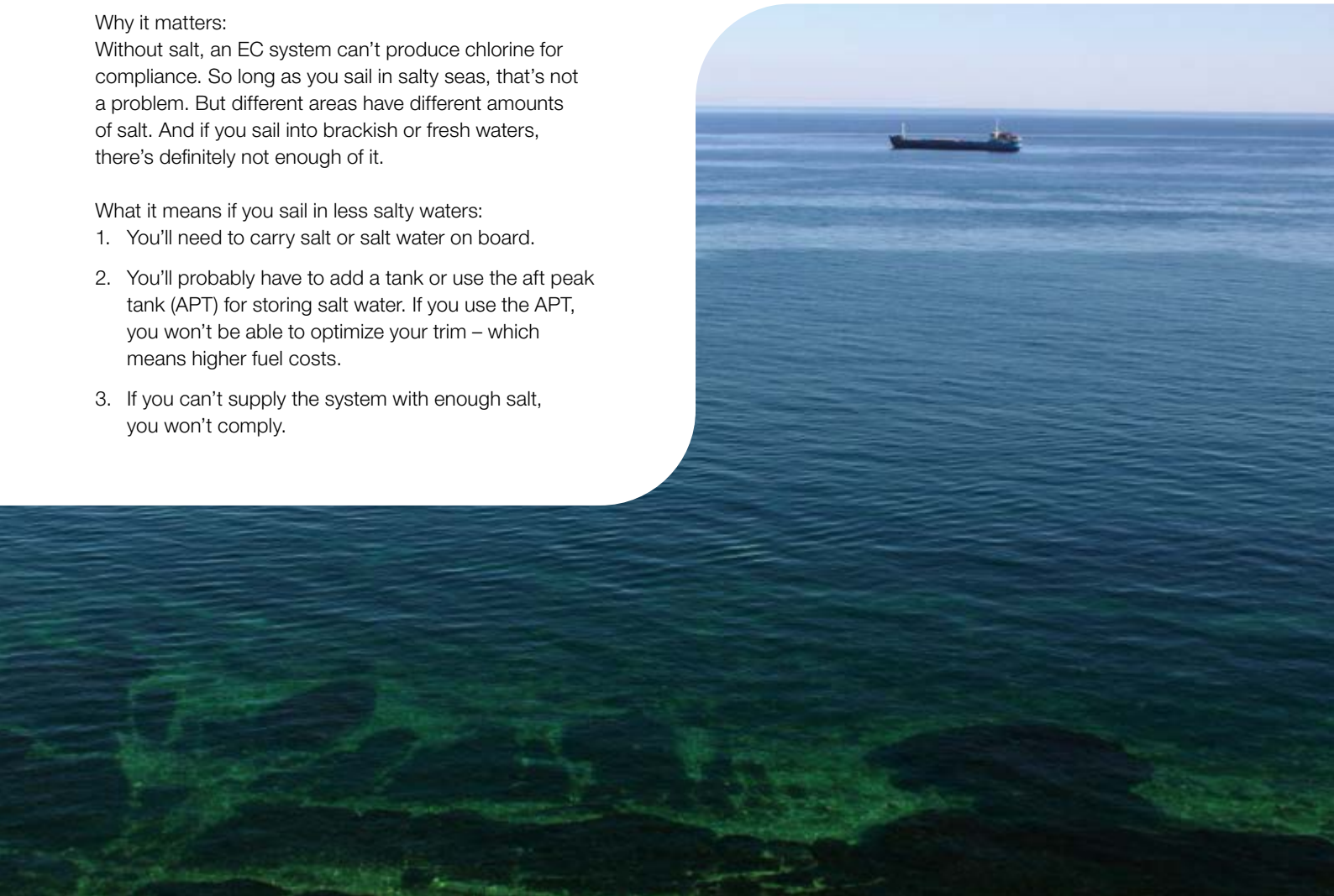
1. You'll need to carry salt or salt water on board.
2. You'll probably have to add a tank or use the aft peak tank (APT) for storing salt water. If you use the APT, you won't be able to optimize your trim – which means higher fuel costs.
3. If you can't supply the system with enough salt, you won't comply.

Water temperature

Why it matters:
Electrochlorination works fine in warmer waters. But not everyone sails in the tropics. The colder that water gets, the less chlorine electrochlorination produces – and the harder it is to comply.

What it means if you sail in colder waters:

1. You'll need to add heating equipment to keep the ballast water warm. That's additional CAPEX that's probably not in your supplier's offer.
2. Heating requires energy, so OPEX in colder waters will be higher too.



Compliance Navigator will show you more

Want an easy way to see the water conditions where you sail, plus how they impact different ballast water treatment systems? Try the free Compliance Navigator tool at **www.pureballast-compliancenavigator.com**

If you choose UV treatment

UV systems use ultraviolet light to disinfect the ballast water. No chemicals are involved, and they're not affected by temperature or salinity. But you do need to be aware of UVT.

UVT (UV transmittance, i.e. clarity)

Why it matters:
For UV light to neutralize organisms, it has to be able to reach them. UVT is a measurement of water clarity, i.e. how easily UV light travels through the water. UVT varies from port to port, but it makes a big difference. If you only sail where UVT is high, most UV systems will be fine. But many ports have low UVT. In those ports, some UV systems will use more energy – and some won't comply at all.

What it means when selecting UV systems:

- The lower the UVT value on a system's type approval certificate, the more ports you can call on.
- A system that handles lower UVT may use less power where UVT is high (if it offers power management).

Don't be fooled by UVI!

Some UV system suppliers promote UVI (UV intensity). But UVT and UVI are not the same!

- UVT is a standard measurement of water clarity, which is the same for all systems. Perfect for benchmarking.
- UVI is a relative measurement of light reaching a UV sensor. Just changing the sensor's distance from a UV lamp will change the UVI value. It's system-specific, so it's useless for benchmarking.

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.

Salinity

- No impact on PureBallast 3 (UV technology)
- No additional tanks needed
- Aft peak tank can still be used to optimize trim

Temperature

- No impact on PureBallast 3 (UV technology)
- Energy-efficient compliance even in the coldest waters

UVT

- PureBallast 3 handles the lowest UVT values of any system
- Compliance down to 42% UVT in IMO-regulated waters
- Compliance down to as low as 55% UVT in USCG-regulated waters*

* The difference compared to IMO comes from differences in type approval methods. Contact Alfa Laval for details.

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

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