

## Why the term “water quality” is misleading...

We need to focus on “CONDITIONS OF ...” instead of on water quality itself. TT20 explains that water analysis does not provide protection against corrosion damage. In this TT28, we clarify that the term “water quality” might have been better named “system immunity,” but even that term is flawed.

### What is the cause of corrosion damage?

The cause is, of course, dissolved oxygen in the water, so it is assumed that the issue can be controlled by measuring water quality. However, this is not only technically very difficult (see TT20), but it also involves a significant misconception: oxygen binds to metal so quickly that it is gone before you realize it, and thus before you can measure it. The only correct moment is immediately after the oxygen enters, but since you never know when that will happen, periodic measurements are irrelevant. A permanent oxygen measurement could be the answer, but it is technically very complex and expensive.

### Water quality, water analysis, water what?

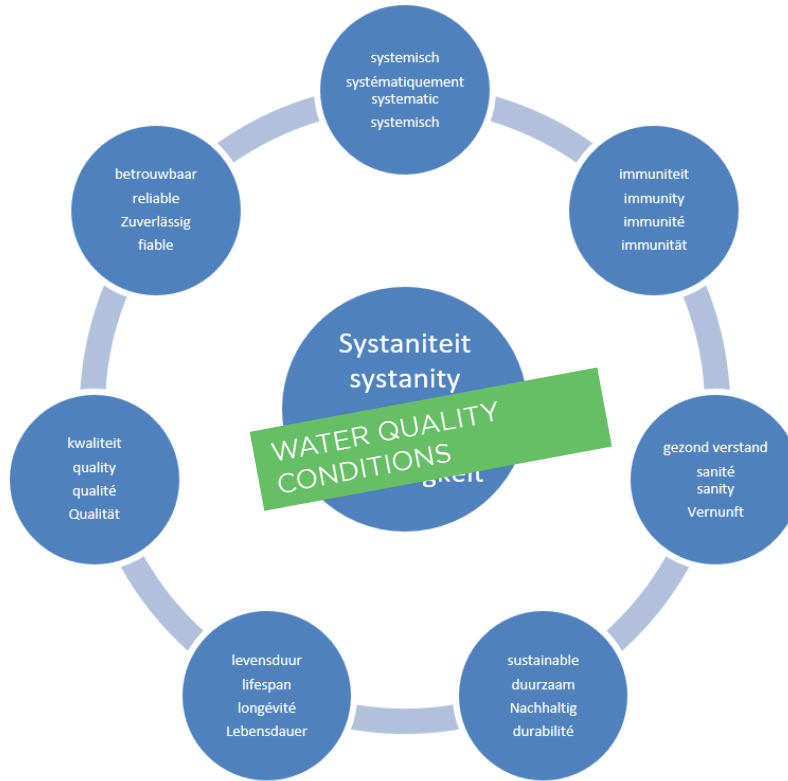
The term water quality is very misleading because it suggests that you could measure the quality of the system water to draw conclusions, and we just explained that this line of thinking is flawed. In addition to the unfortunate terminology, there was also no technically feasible way to detect oxygen ingress in time. However, now there is permanent corrosion monitoring, which, like a smoke detector, warns in time of impending disaster by observing if “pathogens” (oxygen ingress) enter the system. This allows corrosion damage to be efficiently avoided in a very simple and cost-effective manner. The problem of terminology remains...

### System immunity?

Analogous to human health, we might have spoken of system immunity, but even that term does not adequately cover the concept. After all, you can have high immunity and still suffer from heart, lung, muscle, skin, eye, or kidney diseases. Moreover, the term “immunity” has also become somewhat associated with “vaccination,” suggesting that you could increase the system immunity of a heating or cooling system with a vaccine (read: an anti-corrosion inhibitor). The concept of “immunity” is thus insufficient because a vaccine can weaken viral attacks but is not relevant to other health problems or diseases. Similarly, an inhibitor can reduce chemical sludge formation and scale formation but cannot repair a defective expansion vessel or prevent oxygen ingress.

**Water quality conditions**

We want a trouble-free, long-lasting, sustainable, reliable, efficient, and «systemically healthy» heating or cooling system. Since there is no single word for this, we mixed several of these concepts in various languages and coined the term «systanity» to succinctly express what we believe it is all about.



It is doubtful whether the term “systanity” has any chance of becoming commonplace. The sector’s response to the fact that corrosion monitoring can save a lot of misery and unnecessary costs remains lukewarm. However, everything indicates that the intensity and frequency of problems related to water quality are continuously increasing. Perhaps the minds in the installation world are not (yet) mature enough for this?

**Guidelines**

Good water quality alone does not ensure safety from corrosion damage, as the main issue (oxygen ingress) is practically unmeasurable. The goal should be to design, build, and maintain systems in such a way that they remain operational as long as possible without the need for corrective interventions. To this end, most countries have clear and detailed guidelines that, as a safety measure, strongly recommend corrosion monitoring (a guideline cannot legally mandate, but it serves as a “code of good practice” and thus has a compelling character).

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**Good water quality results from the right conditions, with preventing oxygen ingress being the most crucial factor. Correct pressure maintenance is the most important «condition».**