



Pure, safe water.

Always.

UV TRANSMITTANCE (UVT): WHAT YOU SHOULD KNOW

A UVT Primer and Why UV Pure Technologies Inc. Pays Careful Attention to UVT

UV systems work by exposing pathogens in water to a minimum dose of energy, in a known volume of water, flowing at a maximum flow rate; to be effective the water must have a minimum UVT, below which too little energy will reach pathogens.

Why is UVT critical?

UVT or UV Transmittance is the measure of UV energy at a particular wavelength or frequency which is actually transmitted through water from the UV lamp; The higher the UVT, usually expressed as a percentage (%), the more energy is transmitted through the water, and therefore the more effective the deactivation of pathogens. Put another way, if there is low UVT, the amount of UV energy that reaches pathogens in the water may be too low to deactivate them, making the UV system ineffective.

UV light effectiveness as a sterilizer is determined primarily by the combined effects of UV light intensity, the exposure time of the system (defined by the flow rate of the system) and the UVT of the water. The first two variables, flow rate and lamp dosage, are determined by the selection of the correct UV treatment system. The third, UVT, is dependent on the specific water source being treated and it can significantly challenge the effectiveness of the UV disinfection system.

UVT is impacted by the quantity of organics, colloidal solids and other material in the water. The less clear the water is, the lower the UVT and the more these water borne materials absorb and scatter the UV light as the water passes by the UV lamp. Since UV disinfects water using a very precise 254 nm wavelength of light, these water borne materials impede the "transmittance" of that light to the water and its microbes, thereby reducing the effective UV dose delivered by the system.

You can't estimate UVT levels simply by looking at the water

It is often thought that if the water appears clear to the naked eye, or if the turbidity is low, then this means the UVT will be high. However, this is not correct. Turbidity is a measure of the quantity of suspended solids in the water and is not related to the organics or fine particles that tend to affect UVT. It is true that color usually does indicate the presence of organics such as tannins and humic material. However, it does not follow that just because the water doesn't appear colored that it will have a high UVT. This is because some organics and other matter that cause low UVT can be present in water but do not add any visible color to the water. Due to the critical effect that UVT has on the performance of all UV disinfection systems, it is vital the UVT of a water sample be known for every UV disinfection system application to ensure proper treatment.

NSF (www.nsf.com - the global authority and certification body for UV systems) certifies UV systems' effectiveness at 70% UVT. To pass NSF/ANSI 55 Class A standards, a UV system must deliver a safe dose of energy at a maximum flow rate of water that has 70% UVT. Many conventional UV system manufacturers make performance claims for

non-NSF certified systems at 95% UVT. To put these UVT values in more real-life terms – 95% UVT water would be much like distilled water; a deep drilled well might be between 75% and 85% UVT; lake water in Spring might be as high as 70% UVT and in fall could be as low as 55% UVT. A conventional system which claims effectiveness at 95% UVT levels could be ineffective in real-life situations.

Buyer Beware - Don't be Fooled by UV Performance Claims

The importance of UVT on UV systems' effectiveness is the reason UV Pure sets a minimum real-world UVT for each of its UV disinfection models, below which the system will not meet the dose requirements and will trigger the on-board alarm.

NSF certified models, such as the Hallett™ system, are certified based on clearly stated UVT levels as defined by NSF.

UV Pure's Upstream Models are the first UV systems to be designed and specified to operate safely at UVT levels as low as 50% UVT.

UV Pure's Upstream series offers two UVT levels: 75% UVT specified systems will effectively treat water that is 75% UVT or better and will alarm when the UVT goes below 75%. 50% UVT Upstream systems will effectively treat water at 50% UVT or better. These UVTs are significantly lower and more realistic than the 90-95% levels often specified by conventional technologies.

Click [here](#) to review the six Upstream models and their corresponding UVT levels, flow rates and specifications for each of the models.

To find out everything, visit www.puresafewater.com or call 888-407-9997.

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