

ECO WATER TREATMENT FROM DEVIN

DESIGNING TO PASSIVE HOUSE, PWTAG AND BEYOND

PASSIVE HOUSE GUIDELINES

The Passive House Guidelines on pool water treatment are an excellent starting point for addressing energy efficiency. They identify a number of critical metrics to be addressed, while ensuring safe and appealing water:

- power for unit flow of water by the circulating pump of 25 to 40W per m³/hr
- total static and friction head of water of 5 to 10m
- overall circulating pump (inclusive of motor and frequency drive) efficiency greater than 70%.

The above metrics are inter-related; if the head is less than 10m and the pump efficiency is > 70%, then the power will be less than 40W.

A recent survey of nearly 100 pools in the UK identified that over 80% of the pools were operating outside of the upper 40W per m³/hr. This reflects outdated design, construction and operation of facilities in the UK, and identifies that collectively, the industry must do better in the future. Passive House and the new PWTAG guideline on Net Zero Carbon Pools, set out very clearly the wide range of options that are available to the various stakeholders to provide highly energy efficient water treatment systems; most of these options are not surprisingly design orientated.

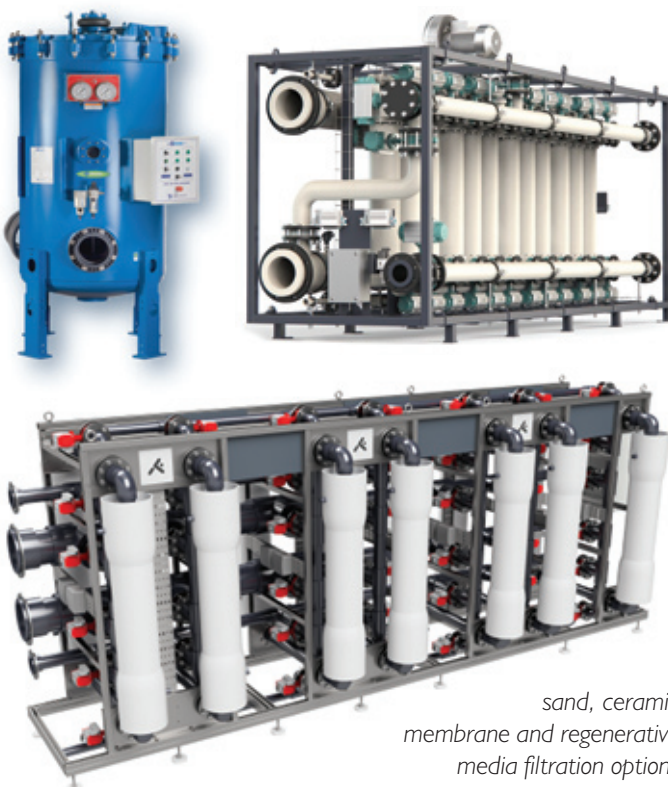
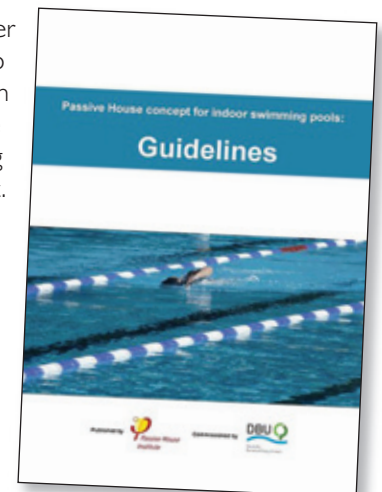
SUSTAINABILITY

Open the door to increased sustainability

ECO water treatment is the new design approach developed by Devin, taking full account of Passive House and PWTAG Net Zero guidelines. ECO criteria commences with setting energy targets and then addresses up to 26 specific aspects of system design, including complete system headloss modelling, to provide for a fully optimised low-energy plant.

A Devin designed ECO water treatment system can be up to **50% more efficient** than a standard plant design. We would be delighted to bring this expertise to your project.

50%
MORE
EFFICIENT



*sand, ceramic
membrane and regenerative
media filtration options*



ECO WATER TREATMENT

- PASSIVE HOUSE AND MORE

In the early project design stage, ECO water treatment will address the following:

- establish energy targets
- optimise system capacity/plant size
- optimise plant and balance tank location and design
- optimise surface water removal/transfer channel design
- pump flooded suction
- optimum filtration methodology
- backwash water recovery
- backwash water heat recovery

In the detailed design stages ECO water treatment will address the following:

- headloss modelling for a fully optimised low-energy plant
- design of strainer baskets, pump reducers and expanders
- pump overall efficiency, VSD's
- pipework layout, velocities and fittings
- UV system hydraulics and dosing efficiency
- instrumentation, monitoring, operational flexibility
- insulation

- **A crucial part of the overall process is monitoring the installation and the commissioning, to check that the design is properly executed.**
- **Applying ECO on a typical 25m pool, reducing the head from 16m to 8m, would result in an annual energy saving of circa 50,000 kWhr.**

Devin offers two levels of ECO - ECO ESSENTIAL (applied on every scheme), and ECO GREEN (full ECO, applied as an option).



CAN WE DO BETTER THAN PASSIVE HOUSE?

Yes is the answer, we can do more.

The energy required by the circulation pump is normally the main power requirement. However what is often ignored are the power requirements for other items such as booster pumps, control panels and crucially UV systems, and if not carefully addressed they can be significant. This is clearly demonstrated by readings taken for two recent projects, one designed to Passive House and the other designed to very high overall energy efficiency standards.

| Metric | Project A | Project B |
|--|-----------|-----------|
| Power per unit flow - circulating pumps W per m ³ /hr | 53 | 64 |
| Power per unit flow - all treatment plant W per m ³ /hr | 89 | > 100 |

DOES PASSIVE HOUSE REQUIRE THE USE OF CERAMIC MEMBRANE FILTERS?

No is the answer, as there are many other areas where the headloss of the treatment system can be reduced. Some ceramic membrane filters require system pressures and water usage similar to sand filters, so the reason to use this type of filtration technology would not necessarily be for energy saving alone; there are however other considerations that may prompt their use.

The key message to be taken from the above is that a better and more inclusive performance metric is one that considers all of the electrical power requirements of the treatment system.