Influence of biofilms on phosphorous uptake

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Marcin Gasiorowski has learned everything from scratch to work on natural and man-made waters as part of his in-depth university education. The chemical, physical and biological parameters in waters are very complex and interact with each other. To understand these ecosystem-related relationships and to steer them in the desired direction by means of planning or construction measures (clear water, less algae) absolutely requires such sound training.
For almost 20 years Marcin Gasiorowki has been working full-time with the planning of swimming ponds. His job is also his private passion. He has already realized hundreds of such systems of all sizes and construction totals.
Founder and President of the Polish Swimming Pond Association PNSWK

At the beginning I would like to emphasize that there is no significant investigation and statistics in the area of swimming ponds. What I present in this presentation is based on a 30-year experience of myself and my colleagues.
The first plants (type 2) were created (1989) with very simple means. There was a lack of, for example, prepared filter systems. Everything just came from the do-it-yourself store.
The next stage of development was the implementation of the experiences gained in the construction of wetland plants in the area of swimming ponds.
It followed the search for suitable filter media. After several attempts, we tried porous calcium silicates from rock formations found in the southeast of Poland. Agricultural Academy of Warsaw already tested these substrates earlier, especially in water purification and wastewater treatment. Interesting in the case of calcium silicates are their special ability to bind phosphorus. This resulted in an exchange of information and experience with the Academy in Warsaw. Several laboratory and field tests were carried out. An experiment and results on the influence of biofilm formation on phosphorus removal was presented 2 years ago at the Leeuvarden conference. The use of calcium silicates in the construction of green roof substrates was also tested with the aim of obtaining low-phosphorus water for ponds and retention systems.
These investigations have led to consequences in the construction of filter systems and the development of peripheral devices such as CO2 dispensers. (Examples, photos etc.)
Current laboratory and field trials (lime silicates and iron hydrooxide granules at constant flow at different phosphorus concentrations).
Overview of equipment created by various companies in Poland, examples and technical concepts.
Use of biological treatment systems for retention and parking facilities.