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AD 101 - ANAEROBIC DIGESTION SYSTEM SELECTION CONSIDERATIONS

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ABSTRACT

With increasing emphasis on low energy wastewater treatment, energy neutrality, carbon emission reductions, and alternative fuel sources, the need for anaerobic digestion as a treatment options are increasing, particularly in industrial wastewater and putrescible wastes applications.

Anaerobic bacteria are some of the oldest bacteria on earth, however while we think of the anaerobic processes as old and well established, this process is being developed constantly. Like the activated sludge process there are numerous configurations of anaerobic process and these configurations are often better suited to specific applications. Examples of systems discussed include granular sludge systems (UASB, EGSB), Anaerobic contact, CSTR systems, as well as low rate systems. A brief overview of the different CSTR options such as Temperature Phased Anaerobic Digestion. (TPAD) will also be given.

With anaerobic digestion, a common problem has been that the appropriate configuration for an application is not well understood. The configuration of anaerobic digestion technology has a significant influence on the performance of the system, and it is common for inappropriate technologies to be selected resulting in poor treatment performance.

"When the only tool you have is a hammer, every problem is a nail"

In the context of anaerobic digestion, many suppliers are experts at one configuration of anaerobic digester and therefore seek to change the problem to suit their solution rather than use the technology most appropriate for the problem. They often state that their solution is appropriate and all you need to do is pre-treat the waste but fail to acknowledge the effects that occur if the pre-treatment doesn't work effectively. Unfortunately, this can (and has often) resulted in digestion systems that don't do what they are meant to do.

The paper will look at the various configurations of anaerobic digestion technologies, their benefits and disadvantages, and when and why the technologies might be appropriate.

This paper is intended as an informative presentation that shares the authors experiences with anaerobic digestion systems over twenty years designing and building anaerobic systems around the world.

A range of example projects will be discussed, along with issues associated with different technologies, and the potential performance that can be achieved with carefully selected and well designed systems.

KEYWORDS

Anaerobic digestion, system selection, process configurations, typical performance