

The brewing of fermentable materials is a matter for specialists.

South Korea: A Mixel agitator with a 24 m shaft and 8 m diameter blades.

Sizing carried out using simulation software

The performance of a methanization unit depends in particular on the effective mixing of fermentable materials within the digester. This process is ensured by agitators. To optimize the operation of the digester, these agitators must be designed and manufactured to measure. Update with Benoît Delaval, Global Sales Director at Mixel.

What is the role of input agitation at the heart of a biogas digester?

This involves maximizing contact between organic matter and the microorganisms that digest it to produce biogas. For this, stirring is carried out for five minutes per hour. It is also necessary to avoid the formation of a floating layer which would prevent the biogas from rising in the top of the tank. As such, it should be noted that the immersed and emerged parts of the agitator must withstand two particularly aggressive environments. In addition, the tightness of the installations is guaranteed by a hydraulic seal without wearing parts, in order to minimize maintenance operations. Beyond taking these issues into account – which also include compliance with the ATEX standard – Mixel's core business is to design bespoke stirrers.

How do you proceed?

We carry out - thanks to simulation software - a sizing work that integrates many parameters: density, viscosity and volume of the materials to be stirred; target degree of agitation in the tank; possible variations in level, etc. The objective is to provide a response on a case-by-case basis - with optimal agitation and "no dead zone" - while many manufacturers offer catalog devices. It should be noted that the energy performance of the agitator is also at the heart of the sizing studies. It is a question of finding the ideal compromise between optimal mixing and energy consumption of the agitator.

Do you have an example of a custom design?

Yes, in South Korea, we recently equipped a 3,500 m³ digester with an agitator with a 24 m shaft, 8 m diameter propellers and a 22 kW motor. This unit recovers sludge from wastewater treatment plants and organic waste. Such heterogeneity has notably led us to propose an engine that can rotate in the opposite direction, in order to eliminate materials that can attach to the shaft and the blades of the propellers. Also in South Korea, we will soon be equipping a 10,000 m³ digester in which we will have to mix inputs with 40 g of solid matter per liter. For this, it is better to have a stirrer that is as efficient as it is robust.