

RECENT DEVELOPMENTS IN MAGNETIC MIXING TECHNOLOGY

Nicole ZANGL ZETA GmbH, Lieboch, Austria

Magnetic mixing technology stands out with its many advantages compared to mechanically sealed agitators. In particular, the lower risk of contamination and the resulting lower costs are powerful arguments for the application of magnetic stirrers. The development of magnetic mixing technology has progressed in giant strides in recent years, making its use possible for a wide range of stirring processes. Scaling up mixing processes to industrial scale is a big challenge because of the conflicting demands on the mixing time, shear forces and hygienic design. A few years ago, it was still inconceivable to equip e.g. bioreactors of 15.000 L and more with magnetic mixers, although the demand from the biotech industry for large volume vessels for cell cultures, without any quality loss due to inadequate mixing, has always been huge. To meet these requirements, a bottom-mounted magnetic agitator was developed and tested for its use in XXL fermenters. The collected results confirmed that the prototype is applicable to vessel sizes up to 30.000 L.

In the course of the past few years, magnetic agitators have been used increasingly for special and complex mixing applications, and this has driven their technical development. Some of the latest innovations in magnetic mixing technology will be presented.

With the powerful magnetic mixers, aseptic process capability can be combined with large-scale power transmission and stable and precise running and can be used for preparation systems with viscosities up to 1000 cp.

Beside the BMRF development we have also established a system for larger top-driven magnetic mixers in the recent year. Their advantage lies in the easy and cost-efficient maintenance compared to agitators with a mechanical sealing.

In the field of top-driven magnetic mixers, the so-called AMRi, ZETA has now launched a product innovation. ZETA's top-mounted magnetic mixers were mainly designed for magnetic couplings up to 8 Newton meters (Nm). The areas of application were limited to reactors in the laboratory sector and smaller process vessels. The further development of the ZETA AMRi - a top-mounted magnetic agitator with internal magnetic coupling - now enables applications on a larger scale and for inclined installation positions of up to 20°. The optimized design leads to an increase in transmittable torques with better stability of the agitator shaft and bearing housing.

REFERENCES:

[1] Nicole Zangl, ZETA GmbH, Zetaplatz 1, A-8501 Lieboch

