

335a 2005 Namf Award Lecture: Mixer Design for the Masses

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Not all mixer design comes from extensive research of carefully evaluated scale-up. Most mixer design uses a combination of documented experience and rules-of-thumb. Sales representatives do much of the initial design work, some with limited engineering background and many with only a few years of experience. The design tools used in these cases can be computer programs, design tables, manuals describing experience, or a combination of these methods.

A look at these design methods gives clues about how mixer design and scale-up can be organized for use by many engineers and scientists. The basic techniques solve many everyday problems and assist in the evaluation of complicated applications. A better understanding of the basics of mixing can help solve problems and improve processes. Understanding the relationship between fluid dynamics and mixer applications can take advantage of many scale-up and scale-down opportunities. The design of mixers for typical industrial applications is less about the details of chemical reactions and often more about how many and how quickly problems can be solved. Although mixer design is probably best accomplished with ten or more years of experience, understanding the basics and evaluating mixing systematically can be keys to success.