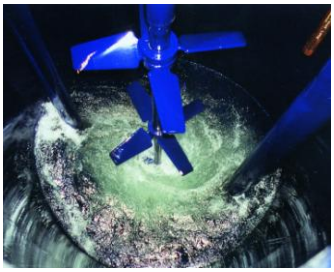
Fluid Mixing Processes (FMP)

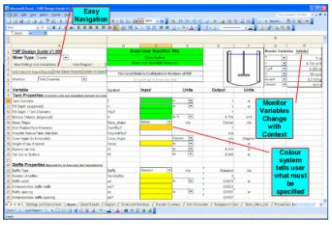
An Industrial Consortium

Scale-up Rules and Design Tools for STRs, In-line and Jet Mixed Systems. FMP has enabled its Members world wide to save millions in revenue

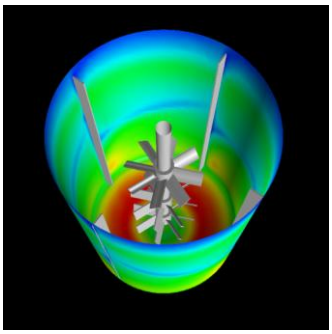
FMP (Fluid Mixing Processes) is a multi-sponsor industrial research, design and development consortium project, which has been run continuously since 1983 by BHR Group. Chemical, pharmaceutical and personal care product companies recognise that mixing knowledge is critical to successful process development and production. Practical tools and data gained through FMP membership enables them to operate one step ahead of their competitors.



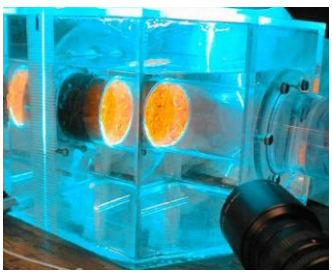
Industrial Scale STR



Excel Design Guide



CSTR Optimisation (CFD)



In-Line Mixture Quality

Key Features include:

- 5 – 10 Year Technical Advantage
- Funded and directed by industrial members
- Industrially relevant mixer geometries at a range of scales
- Exploitable data, models and correlations
- Independent and Confidential

Excel Design Guide

- Accurate and reliable
- Rate new and existing configurations
- Easy to use and disseminate

8 Days Confidential Consultancy from BHR Group Experts

Typical applications include:

- Plant and process audits to improve your own products and processes
- Design, scale-up, and feasibility studies
- Independent checking of equipment vendor proposals
- Can be used in conjunction with physical or mathematical simulation (e.g. CFD) work commissioned with BHR Group

In-company Mixing Course

- Covers introductory and advanced aspects of mixing
- Batch and continuous mixing processes
- Scale-up/scale-down
- Tailored for your industry sector and processes
- Can be combined with a process audit using your company's consultancy entitlement

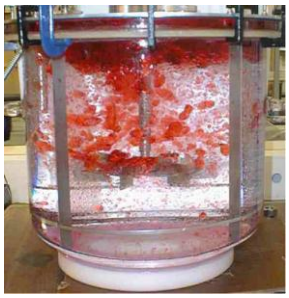
Steering the Project

- Meetings held 6 monthly in UK and annually in USA
- Detailed technical presentations from BHR Group staff
- Network with peers from other organisations

Members Using FMP Information

The knowledge (data, correlations, models, and best practice and design guidelines) produced by FMP is entirely relevant to Members and practical for Members to apply.

The work programme is dictated by Members via a voting system, ensuring continuing industrial focus



- Data is generated using actual industrial geometries under realistic process conditions. Both single and multi-phase mixing processes are considered, in both impeller and jet agitated tanks as well as in-line mixers
- Design guidelines produced include scale-up rules that can be confidently applied in developing processes from laboratory to pilot plant to plant scale
- Information is disseminated electronically so that it can be easily integrated into existing member company design procedures and IT systems.
- Ultimately, FMP know-how enables members to carry out plant design, trouble-shooting and process development with greater confidence and reduced risk
- FMP Staff are available to help at very short notice

Example:
$10 million Saved by Applying FMP Proprietary Information

A difficult-to-wet powder was being incorporated into a liquid to form a slurry. Former practice was to use a large quantity of wetting agent to aid in the formation of slurry from floating solids. During subsequent chemical processing the wetting agent was converted to an undesirable chemical compound which required costly waste treatment.

With knowledge of mixing gained through FMP, the member was able to identify mixing equipment capable of drawing down the solids using minimal quantities of the wetting agent. The technology eliminated the need to construct expensive waste treatment facilities dedicated to the plant. There were further savings through the elimination of virtually all the wetting agent. The total saving was US$10 million.

Past and Present Members include:

End User Members

Air Products and Chemicals
Akzo Nobel
Borealis
BNFL
BP
Dow Chemical Company
Dow Corning
DSM Research
DuPont Engineering
Eastman Chemicals
Eli Lilly
ExxonMobil
The Gillette Company
GlaxoSmithKline
Hunstman
ICI
JGC
Kemira
Lyondell
Merck
Mitsubishi Chemical Corporation
Praxair
Procter and Gamble
Rhodia
Rohm and Haas
Shell Global Systems
Sumitomo
Syngenta
Tetrapak

Equipment Manufacturers

Chemineer
Ekato
Hayward Tyler Fluid Handling
ITT Flygt
Joshua Greaves
Lightnin – SPX Process Equipment
Mixing Solutions
Noram
Pfaudler Balfour
Philadelphia Mixing Solutions
Statiflo
Sulzer

CFD Code Vendors

Ansys
Computational Dynamics
Fluent

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