BUSS ChemTech

REACTION TECHNOLOGY

GAS-LIQUID REACTIONS

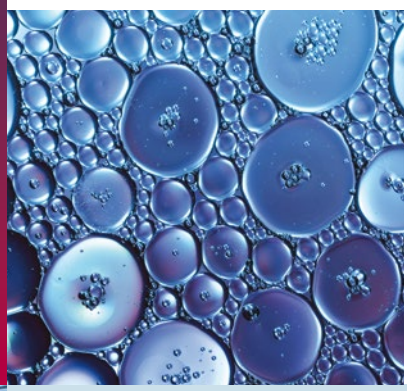
BUSS ChemTech is recognized as a world leading technology supplier for gas-liquid reactions.

For many gas-liquid reactions, the main challenge is overcoming mass transfer limitations.

The BUSS-Loop® Reactor is the tool of choice to maximize gas surface area by vigorous and effective dispersion of the gas into the liquid phase. The homogeneous mixing ensures high performance of the catalyst, when present.

This results in one or more of the following process advantages:

- significantly shorter reaction time
- higher yield and/or selectivity
- reduced catalyst consumption



WE ARE A TECHNOLOGY PROVIDER

Based on our proven technologies, we deliver high level process design packages with the relevant proprietary key equipment for your plant. Together with our strategic partners, we can also supply our clients with expanded scopes of supply and services, up to and including a turnkey plant.

Methylation Reactor, Germany

PROCESS EXPERIENCE

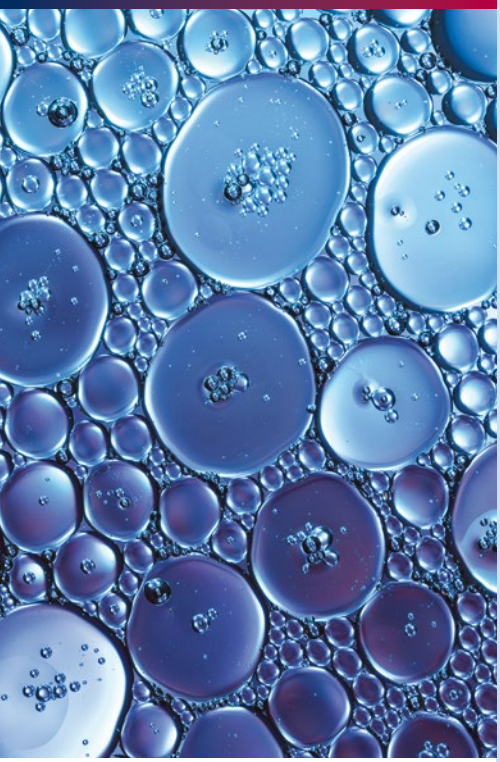
We have developed complete processes in the areas of ethoxylation, hydrogenation (sugar alcohols, resin/rosin, nitroaromatic compounds) as well as for a broad range of reactions starting from fatty-acids (amines, nitriles, amides, chlorides, etc.).

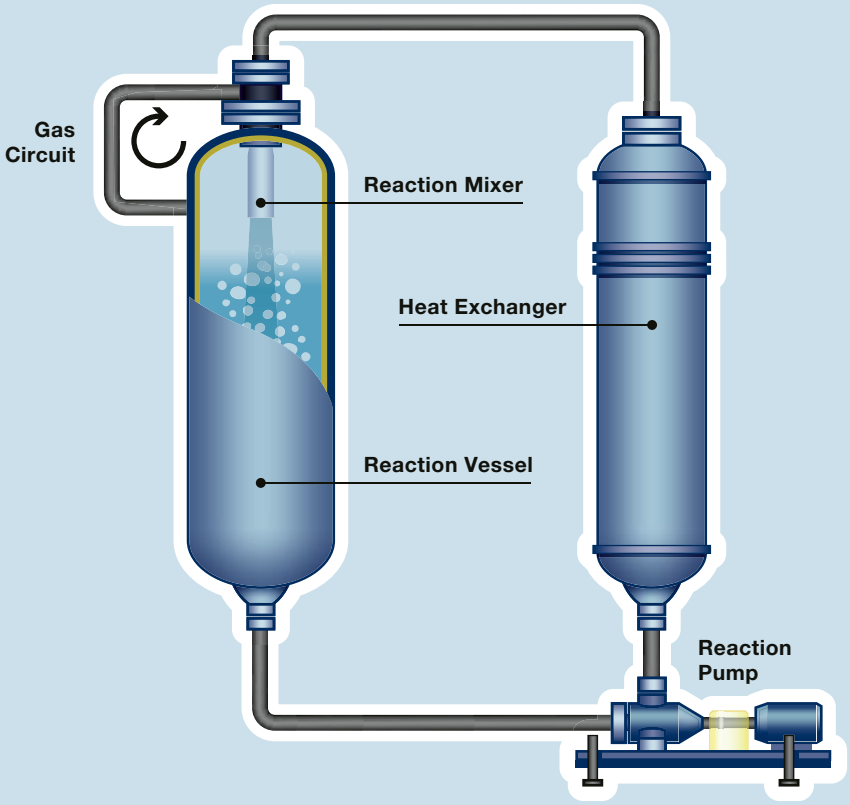
CHEMISTRY KNOW-HOW

During the last several decades, we developed and/or optimized reactions involving more than one thousand different chemicals, scaling up many of them to the design of industrial plants worldwide. Such distinctive experience allows us to support our clients with cost effective and optimized time-to-market solutions.

PROCESS DEVELOPMENT

Our laboratory and pilot plant facilities are suitable to mimic existing industrial applications or set up trials for new chemical processes.

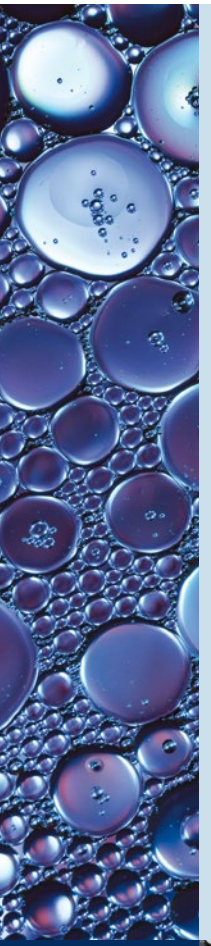




PRINCIPLES OF THE BUSS-LOOP® REACTOR

The BUSS-Loop® Reactor consists of the Reaction Mixer (Venturi “jet ejector”), the Reaction Vessel, the Reaction Pump and an external heat exchanger. As the entire gas-liquid mixture (including catalyst) is circulated through the loop, its entire volume is considered working volume and the whole system acts as a reactor.

- The Reaction Mixer is a high performance gassing tool and generates very small gas bubbles (µm range) producing very high mass transfer rates. The two-phase mixture created in the reaction mixer is then injected into the fluid of the autoclave.
- The Reaction Vessel of a BUSS-Loop® Reactor has a simple geometry (no baffles or internal heat exchange devices), so it is easy to empty and easy to clean. The two-phase mixture that “jets” into the reaction autoclave causes intensive secondary mixing, maintaining high mass transfer and homogeneous conditions in the whole reaction volume.
- The external heat exchanger can be built as large as required by the heat load and is not limited by the reactor’s volume and geometry.
- The circulation pump produces high power input per unit volume (kW/m³). Its special design allows pumping of liquids with high solid (catalyst) contents and high gas loads (up to 30 vol %) without cavitation.



SUMMARY

Our main focus is on plant safety, process intensification, reliability of scale-up and guaranteed plant performance:

- "Safety First" is not just a slogan for BUSS ChemTech, it is our commitment towards the environment, our clients and our employees.
- According to an "inherently safer design" approach, we perform a safety analysis during the design stage, specifying the appropriate monitoring instruments and safety procedures of the process control scheme.
- Improved performance, whether through improved selectivity and yield, shorter reaction times or lower catalyst usage, is the goal of our process development efforts.
- The features of the BUSS-Loop® Reactor system allow us to scale up to virtually any size reactor with confidence: process guarantees are derived from our know-how, experience and project-specific lab and/or pilot scale testing when necessary.
- With the BUSS ChemTech approach, we help our clients to minimize the cost and the time to obtain the key information they need to estimate CAPEX, OPEX and payback period for their new industrial plants planning.

Discover more about our technologies. Scan the QR code now!

Phosgenation Module, United Kingdom

BUSS-LOOP® REACTOR TECHNOLOGY IS SUITABLE FOR VARIOUS PROCESSES, ESPECIALLY IF ONE OR MORE OF THE FOLLOWING CONDITIONS APPLY:

- catalytic gas/liquid reactions
- highly exothermic reactions
- flexible operating volume required
- continuous processes
- removal of gaseous by-products

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