

REACTION ENGINEERING



INNOVATION

ENGINEERING

OPTIMIZATION

The heart of a chemical production plant is the reactor

Our service ...

Bayer Technology Services offers you capable one-stop support in solving problems relating to reaction engineering. In this, we draw on our many years of experience in developing and optimizing reaction technology for converting gases, liquids and solids.

Our philosophy is to support our customers throughout the entire life cycle of a chemical process and we have aligned our activities in the field of reaction engineering accordingly.

We provide the following services to help you solve your problems:

- concept studies;
- feasibility studies;
- process development on laboratory and pilot plant scale;
- process optimization;
- debottlenecking;
- troubleshooting in the event of operating problems

In the development and optimization of chemical processes, a frequent question is how best to achieve the targets set. The concept studies we perform enable you to make initial strategic decisions and plan how to proceed. In the course of feasibility studies, we can assess your ideas and proposals in our laboratory by means of test reactions.

The development of new and innovative processes and the optimization of existing processes with respect to reaction engineering form one focus of our work. We can use our extensive experimental facilities in our laboratories and pilot plants to help you solve your problems. Our state-of-the-art process engineering simulation tools enable us to accelerate and streamline the development process.

If you plan to expand production capacities, we can analyze your reactors and customize concepts for the necessary debottlenecking measures. Bayer Technology Services can also plan and execute construction and engineering projects or any necessary plant modifications.

We also provide post-commissioning support to customers, applying our extensive process engineering expertise in optimizing plant operation and overcoming operating problems.



... is your gain

Bayer Technology Services is your one-stop provider of all services related to reaction engineering. Our development team will provide you with innovative custom solutions to your problems.

Bayer Technology Services not only offers the development of a reactor concept tailored to your individual needs but, as proved many times in the past, has the construction and engineering expertise to successfully implement such concepts.



Bayer Technology Services
Powering Your Performance

You too can benefit from our many years of experience with various types of reactors for processes including hydrogenation, oxidation and nitration. To us, size is a relative concept: we have successfully developed reactors ranging from kilogram scale for the manufacture of fine chemicals to world-scale production facilities for bulk chemicals.

As an independent service provider, we select for you the reactor type best suited to your application – whether an established fixed bed reactor or an innovative microreactor. You can always be certain that the reactor concept we develop for you is ideally tailored to your needs, both in terms of technology and price.

Our approach

Setting-up an experimental unit tailored to your requirements, both lab or pilot plant scale, is all part of our individual service for you. Our experimental facilities offer a wide degree of flexibility in terms of operating temperature and pressure. We have experience with units operating from low temperatures up to 1,400 °C in both vacuum and high-pressure ranges. In addition to conventional single and multi-phase reactor technologies, our expertise also covers:

- high-temperature reaction technology;
- process intensification;
- aerosol reactors.



Thanks to the modular arrangement of our experimental facilities, we can respond to your request quickly and efficiently. We have the following reactor types available:

- fluidized bed reactors;
- riser/downer reactors;
- reactors for spray pyrolysis;
- bubble column reactors;
- fixed bed reactors;
- compact modular tubular reactor;
- stirred reactors;
- microreactors.

Our experimental options are rounded off by state-of-the-art process analysis. If necessary, we can guarantee 24-hour operation of experimental units. Furthermore, we can produce sample quantities of product in our pilot plants.

In the case of complex problems, we can supplement our technical experiments with specific hydrodynamic studies in cold-flow apparatus using model substance systems. This approach enables us to reliably scale-up from the laboratory or pilot plant to the production unit.

The use of process engineering simulation software combined with our experimental work allows us to gain an in-depth understanding of the mechanisms of your process. In this, we can draw on an extensive library of reactor models. Alternatively, our experts can customize models to solve your specific problem. This proven approach of combining experimental and theoretical methods provides us with the basis for rapidly and successfully completing the work with which you entrust us.

References

We have provided many reaction engineering solutions in a number of fields. The list below includes just a few of these:

- development of a process for the manufacture of silicium;
- development of a process for the manufacture of chlorosilane;
- development of a process for gas-phase polymerization;
- development of a high-temperature process for the manufacture of ceramics;
- development of a high-temperature process for the manufacture of iron oxide;
- optimization of reaction conditions in the manufacture of maleic anhydride;
- optimization of reaction conditions in the chlorination of aromatic hydrocarbons;
- manufacture of fine chemicals in a compact modular tubular reactor.