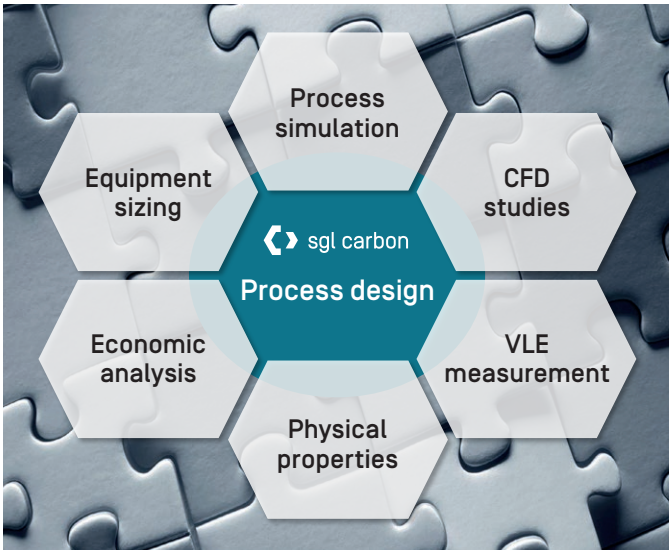
sgl carbon

Process design

Process Technology – White paper

Accurate equipment sizing and the design of safe and reliable as well as energy efficient processes require a profound design basis and know-how to ensure long lifetime and prevent poor performance or even equipment damage.
For the extreme process conditions under which highly corrosive applications are often operated accurate experimental data are rare.



↑ Scope of process design

For this reason, we use engineering design software including process simulators, which are powerful tools that provide reliable process data to optimize the process design. Based on real operating data our tools have been retrofitted and optimized since decades.

Process design

Continuously, our material expertise has been enriched by computer-aided engineering tools for designing not only heat exchangers, but also for developing and optimizing the processes in which our equipment is typically applied. Most common examples are the applications that involve hydrochloric acid, sulfuric acid, phosphoric acid, hydrofluoric acid as well as complex mixtures of organic and inorganic acids. Using state-of-the-art simulation software, we are able to design customized processes or debottleneck existing units for such applications.

These tools allow to conduct economic analyses and rate different process routes respecting product quality, safety, operability, energy demand (OPEX) and CAPEX. Sensitivity studies allow to understand deviations from design conditions and to adequately add design margins wherever needed.

The vast databases provide reliable physical property data, (density, viscosity, thermal conductivity, heat capacity, vapor pressure, etc.) for accurate sizing of heat exchangers, columns or other process equipment for individual feed conditions.
For unknown mixtures we can measure physical properties in our laboratory and determine the vapor/liquid compositions with our in-house phase equilibrium apparatus.
Whenever required, we conduct CFD analyses to optimize the equipment geometries. Dynamic simulation allows the understanding of hazardous scenarios, such as over pressure relief to an emergency scrubber, or the optimization of required buffer volumes for selected control concepts. The above-mentioned methods and tools along with our longterm field experience enables us to design a reliable process solution and to minimize any potential process risk.

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