

DIABON[®] top-fired HCl synthesis unit

SGL Carbon offers the broadest portfolio of HCl synthesis units in the market, comprising all state of the art technologies including bottom-fired and top-fired synthesis units as well as porous reactor. Our top-fired HCl synthesis units are compact and cost efficient turn-key solutions for hydrogen chloride synthesis and anhydrous HCl gas generation.

In our closed, water-cooled combustion chamber H₂ and Cl₂ react at temperatures above 2000 °C (3630 °F) to produce HCl gas which is subsequently absorbed in a film of falling water or diluted hydrochloric acid. Residual gas is cleaned in a vent scrubber.

Using SGL Carbon's high-performance, chemical resistant, resin impregnated vibro-moulded DIABON[®] graphite, which sustains the severe process conditions, our systems are designed to produce high-purity crystal clear acids while providing superior operational reliability. A high response bursting-disk protects the system from overpressure. SGL Carbon's in-house engineering ensures tailor-made solutions as to customer requirements.

Your benefits

- **Flexibility:** The SGL Carbon's product portfolio is the most comprehensive in the industry for highest customer benefit. A compact design of the synthesis unit and modular set-up options result in tailor-made solutions. Besides standard synthesis operation, process solutions for your special requirements are available which can include: operation at low-pressures, with low purity feed gases, and other options like steam or hot water generation.
- **Scalability:** Our units are designed to support a large operating range from typically 25 % to 100 % of nameplate capacity. Tailor-made systems allow even operation at 20 % turn-down rate.
- **Efficiency:** SGL Carbon's synthesis systems are characterized by low payback times due to their high energy efficiency, attractive total cost of ownership, low operating cost, low service and maintenance cost, long service intervals, low downtimes and an extended equipment lifetime.
- **Reliability:** In house project execution results in shortest lead times. SGL Carbon's experts with decades of rich experience provide fast, flexible and professional global support, remote and on-site. Our experience in HCl synthesis is based on more than 500 references worldwide.
- **Safety:** State-of-the-art design of the synthesis units, water cooled combustion chamber and gas feed placed far from the ground and automation and monitoring options provide a maximum of operational safety. Additionally, feed gas condensates can be easily treated due to the high position of tie-in points.



↑ Top of combustion chamber and ignition system

Your options

Equipment

- DIABON synthesis unit including burner, combustion chamber, absorber and scrubber
- Warm water and steam recovery

I&C

- Field instrumentation for automatic start up
- Field instrumentation for control
- Field instrumentation for safety interlocks
- Control panel incl. safety system suitable for DCS- or PLC-based operation
- Manual or automatic ignition system (i.e. no blower or ejector required)

Fittings, Piping, Steel

- Flame arrestors, manual valves, POLYFLURON® expansion joints
- Piping: Steel, POLYFLURON PTFE, PP, FRP, CS
- Steel structure and skid mounting

Engineering & Execution

- Feasibility study, basic and detail engineering
- Set-up and design according to customer requirements in terms of product quality and off-gas properties according to local regulations
- Certifications according to applicable codes and standards as well as customer requirements
- Commissioning including on-site training and final documentation

Product information

- Capacity range: 5 to 150 t/d on 100 % HCl basis
- Turndown ratio: 25 % [of nameplate capacity], 20 % for tailor made design
- Product acid concentration: up to 38 % w/w
- Free Cl₂ in product: 2 – 10 ppm [typical values]; lower values possible – dependent on specific conditions
- Pure acid & clean vent gas: as per local norms
- H₂ excess in combustion: typically 5 – 15 % [depending on specific conditions]



↑ Top-fired HCl synthesis unit (3D)



↑ Skid-mounted, top-fired HCl synthesis



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