

## DIABON® porous reactor

SGL Carbon's DIABON porous reactor is a unique state-of-the-art technology for various thermal applications in the presence of highly corrosive substances like hydrofluoric acid (HF) or hydrochloric acid (HCl). Examples are the efficient and complete destruction of hydrochlorofluorocarbons (HCFC), acidic off-gas treatment or HCl synthesis by reaction of chlorine and methane (natural gas).

The thermally induced chemical reaction takes place in a porous structure instead of an open flame. As a consequence an extraordinary homogeneous temperature distribution as well as a low dwell time is achieved. SGL Carbon's corrosion-resistant DIABON graphite ensures an outstanding long lifetime and high equipment availability.

### Product description

- The DIABON porous reactor is divided in three main segments, a stabilizing section, a reaction section and a dry quench.
- In the stabilizing section all reactants are intensively premixed and guided to the reaction zone. A tailor-made flame retention ensures a safe and reliable operation.
- The chemical reaction takes place in a porous structure (reaction zone) at temperatures up to 1500 °C.
- Finally the product gas is cooled down below 200 °C within a very short time (sudden quenching), i. e. a recombination of pollutants is not possible.
- The whole porous reactor is made of highly corrosion-resistant DIABON graphite which qualifies the DIABON porous reactor also for discontinuous operations.

### Key applications

Our porous reactor technology can mainly be used for three different applications:

- Destruction of HCFCs, e. g. R11, R12 and R22 plus optional recovery of HF and/or HCl instead of neutralization
- Off-gas treatment, e. g. purification of HCl waste gas streams containing organics
- HCl synthesis, e. g. synthesis of HCl by reaction of chlorine and methane (natural gas)



↑ DIABON porous reactor



↑ View of the porous structure

## Key benefits

- Usage of highly corrosion-resistant DIABON graphite ensures a high equipment availability and a long lifetime as well as a high energy efficiency as no standby mode is required
- Need-based operations possible due to short start-up and shut off times (below 30 min.)
- Homogeneous temperature distribution/no dead spaces due to porous structure
- High safety due to low reaction volume and short shut off time
- Low space requirements due to compact design

## Standard types/range of capacity

Our standard portfolio offers three diameters from 300 mm up to 1100 mm. The resulting capacity is dependent on the specific application. The table below gives an overview of our standard portfolio and the corresponding capacities. All types enable a wide range of control from 10 % to 100 % of the nameplate capacity, resulting in a turn down ratio of 1:10.

## Overview of standard portfolio and corresponding capacities\*

Series	HCFC destruction Max. HCFC feed (kg/h)	Off-gas treatment Max. gas stream (Nm <sup>3</sup> /h)	HCl synthesis 100 % HCl basis (kg/h)
Diameter 300 mm	~ 20	~ 200	~ 75
Diameter 600 mm	~ 80	~ 750	~ 300
Diameter 1100 mm	~ 250	~ 2500	~ 1000

\* Typical values for each application; specific capacity dependent on individual design case



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