

®DIABON ®LICUFLON ®GENAKOR ®VULCOFERRAN  
®VULKODURIT ®KERABUTYL KARBATE SPECIAL METALS

## SYSTEMS – OUR KNOW-HOW

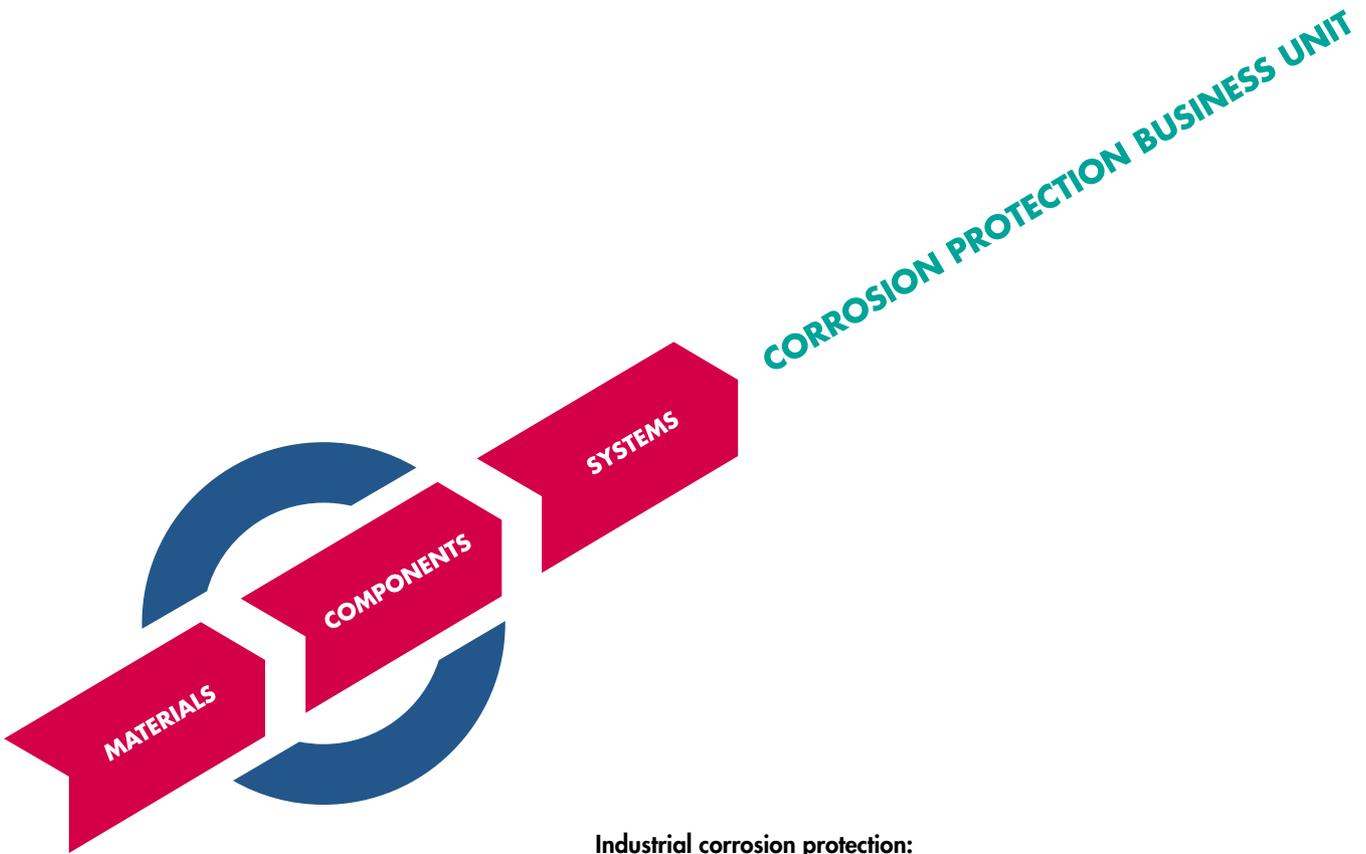
FOR HCl GAS HYDROCHLORIC ACID SULFURIC ACID EXHAUST GAS FLUE GAS



## CONTENTS

Foreword	3
<b>Our know-how</b>	4 - 5
<b>HCl gas and hydrochloric acid</b>	
Absorption of HCl gas	6 - 7
Production of HCl gas from hydrochloric acid	8 - 9
Stripping processes	10 - 11
Concentration of hydrochloric acid	12 - 13
<b>Sulfuric acid</b>	
Dilution and concentration of H <sub>2</sub> SO <sub>4</sub>	14 - 15
<b>Exhaust gas and flue gas</b>	
Specific performance requirements for heat exchangers	16 - 17
Characteristics of flue gas heat exchangers	18 - 19
Quench process and recovery of hydrochloric acid	20 - 21
<b>Summary</b>	22 - 23

# COMPLETE SYSTEMS CREATE NEW BENEFITS



## Industrial corrosion protection:

A host of suppliers and subcontractors, difficult coordination and non-harmonized bids for materials, components, process equipment, packages and systems make efficient planning and execution of new plants a complex, time-consuming task. It doesn't have to be that way. We can now offer you a fully comprehensive range of products and services for industrial corrosion protection – we are the only producer in the world that is able to do so. We offer a complete system from a single source – from optimized material selection through interface management, production, delivery and installation right up to the warranty.

Our system approach is based on the combined expertise in materials and the decades of experience of three leading companies in corrosion protection.

These companies – SGL TECHNIK, HAW LININGS and KCH – have now been merged into the new SGL ACOTEC GmbH, the German-based headquarters of the global Corrosion Protection Business of the SGL CARBON GROUP.

You can save yourself time and trouble in the future – by taking advantage of our comprehensive, system-based range of products and services.

## OUR KNOW-HOW



▲ Storage site of semi-finished **®DIABON** graphite products: **QUALITY** requires materials scheduling with foresight

By using our material brands **®DIABON**, **KARBATE** and **®LICUFLO** in combination with high-alloyed special metals and the rubber lining materials **®GENAKOR**, **®VULCOFERRAN**, **®VULKODURIT** and **®KERABUTYL** – in heat exchangers, columns, tanks and pumps – we are able to cover the complete spectrum of process engineering for corrosive media. From treatment of HCl by absorption, distillation, stripping or evaporation to dilution and concentration of sulfuric acid, including the cleaning of flue gases, we can find solutions to materials and process engineering problems. In the treatment of hydrochloric or sulfuric acid and cleaning of flue gases from hazardous-waste incinerators, we bring our entire

expertise to bear. We offer everything from a single source – from the optimum material for an individual equipment item to complete systems. We develop individually tailored solutions which satisfy our customers' requirements in every respect. For this purpose, a team of experienced design engineers works with experts in plant construction, process engineering and every other field required for the execution of the project. On this basis, optimal solutions are developed which are closely examined before being put into practice. Specialists ensure that every system conforms to the latest state of technological progress and the knowledge gained from operating practice. The best proof: On the basis of the latest developments in materials science,

our systems fulfill the requirements of chemical engineering and environmental protection.

These requirements are:

- Complete corrosion resistance
- Maximum operational reliability
- Cost-efficient use.

### **Our construction materials for optimum service**

**®DIABON** and **KARBATE** graphites for the manufacture of chemical process equipment are well known for their outstanding resistance to virtually all corrosive chemicals. **®LICUFLO** fluoroplastic and **®GENAKOR**, **®VULCOFERRAN**, **®VULKODURIT** and **®KERABUTYL** rubber lining materials are used for lining columns, tanks and vessels. These materials effectively protect the steel. This range of corrosion-resistant materials is supplemented by our special metals, from which we fabricate equipment such as heat exchangers and columns using the latest knowledge in materials science and welding technology. These materials are very resistant to corrosion even when used in processes requiring the handling of mixed aggressive media with changing corrosive constituents. Process equipment fabricated from our corrosion-resistant materials is unaffected by sudden changes in temperature. Thanks to their anti-adhesive properties, it is virtually impossible for deposits to accumulate on the material's surface.

To enable us to select the combination of materials and service conditions that are most suitable and cost-efficient for you, please provide us with as accurate a description as possible of the media used in the plant.

### **Our quality management for your plants**

As a leading producer of corrosion-resistant process equipment, plants and systems, we are certified in accordance with DIN EN ISO 9001. All process equipment can be manufactured, tested and documented in conformity with all the usual national and international standards, such as AD codes, TÜV rules, or ASME, BS, CODAP, ISPEL and STOOMWEZEN standards.

### **Our process engineering for greater reliability**

One of the greatest benefits we offer our customers is our expertise in complete systems. This is evidenced above all by the fact that as manufacturers of corrosion-resistant high-tech materials, we are also familiar with the relevant processes and systems. For decades, we have worked with leading engineering and design consultants and with the chemical and environmental protection industries. In doing so we have further optimized the use of our materials and process equipment. The capacities and dimensions of the plants are matched to our customers' individual requirements. Process engineers elaborate the thermal and mechanical details with the aid of up-to-date 3 D CAD and process simulation programs. The underlying equilibrium data also take into account thermodynamic characteristics of the media used which deviate sharply from ideal conditions.

### **Our systems and their special advantages**

- Modular design for greater flexibility
- High acid concentrations achievable
- Compact, space-saving design
- Flexible design matched to customers' requirements.



◀ **Special metals:**  
Heat exchangers for fine chemicals production

▼ **VULCOFERRAN rubber sheet storage site:** A special climate guarantees a **QUALITY** product



## HCl GAS AND HYDROCHLORIC ACID



Isothermal absorption system ▶  
with block heat exchanger,  
scrubber, pumps and tank

# ABSORPTION OF HCl GAS

The absorption of hydrogen chloride in water or dilute hydrochloric acid is a central operation in the production of hydrochloric acid. However, this technique is also often used for cleaning waste gases from chemical production plants or waste incinerators.

The HCl gas is admitted at the bottom of a column, while the absorbing liquid is fed in at the top. Gas and liquid flow in counter-current to ensure optimum absorption. The height, diameter and internals are designed to ensure that the desired acid concentration is obtained and the purity of the gas is maximized. The hot stream of acid is cooled in an integral or separate heat exchanger.

The dissolution of HCl in water is followed by a strongly exothermic reaction in the liquid.

To obtain a solution with a maximum HCl concentration, removal of the appropriate amount of heat is necessary – isothermal absorption. For this reason, water-cooled falling-film absorbers are used for the production of hydrochloric acid. With lower HCl concentrations in the feed gas, adiabatic absorption is an alternative. Because the absorption rate decreases at lower concentrations, multi-stage scrubbers are required; these are designed as columns with trays or with random or structured packings.

For recovery of hydrogen chloride from inert gas streams with fluctuating concentrations, we offer a system for absorption with water followed by production of HCl gas by distillation.

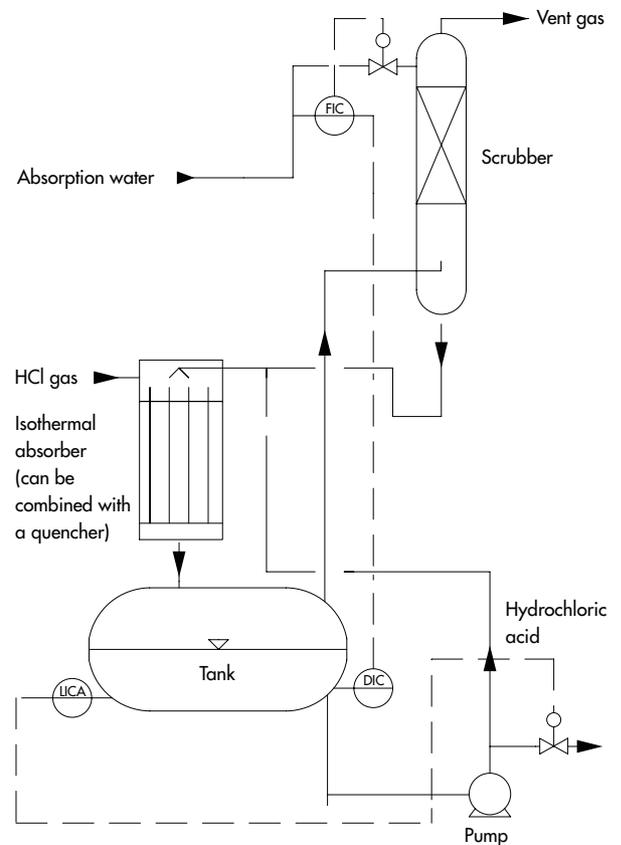
## Construction materials

To ensure optimum resistance to corrosive substances such as hydrochloric acid, various corrosion-resistant materials are used in absorption systems:

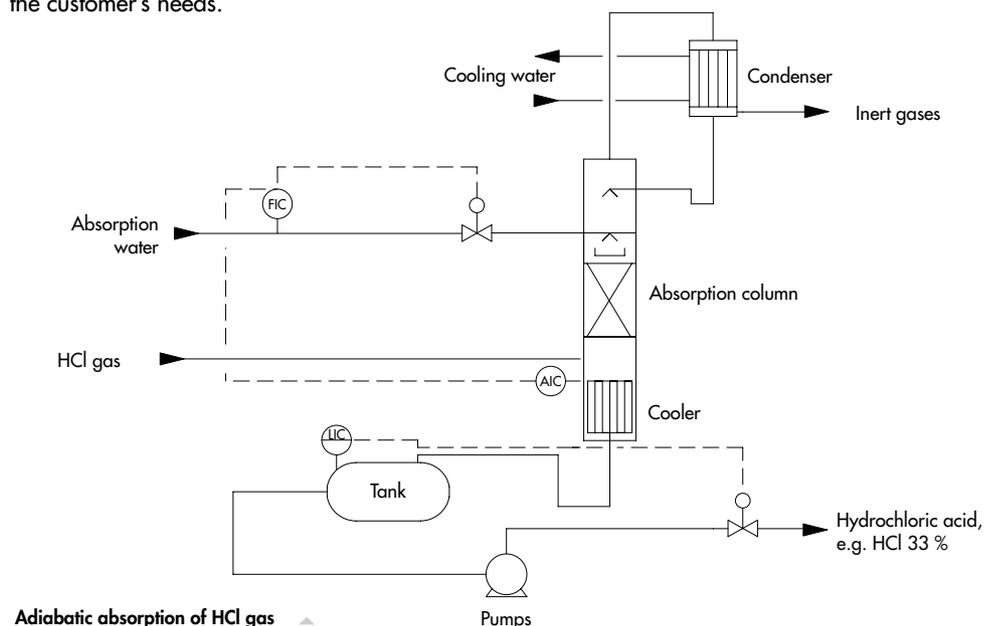
- **DIABON** or **KARBATE** graphites for column shells, heat exchanger tubes, random and structured packings
- **GENAKOR**, **VULCOFERRAN**, **VULKODURIT** or **KERABUTYL** rubber linings for piping and for acid storage tanks.

## Capacity and available sizes

The absorption systems can be designed for a capacity of 0.5 to 360 t/d of 100 % HCl per system. The equipment sizes are matched to the customer's needs.



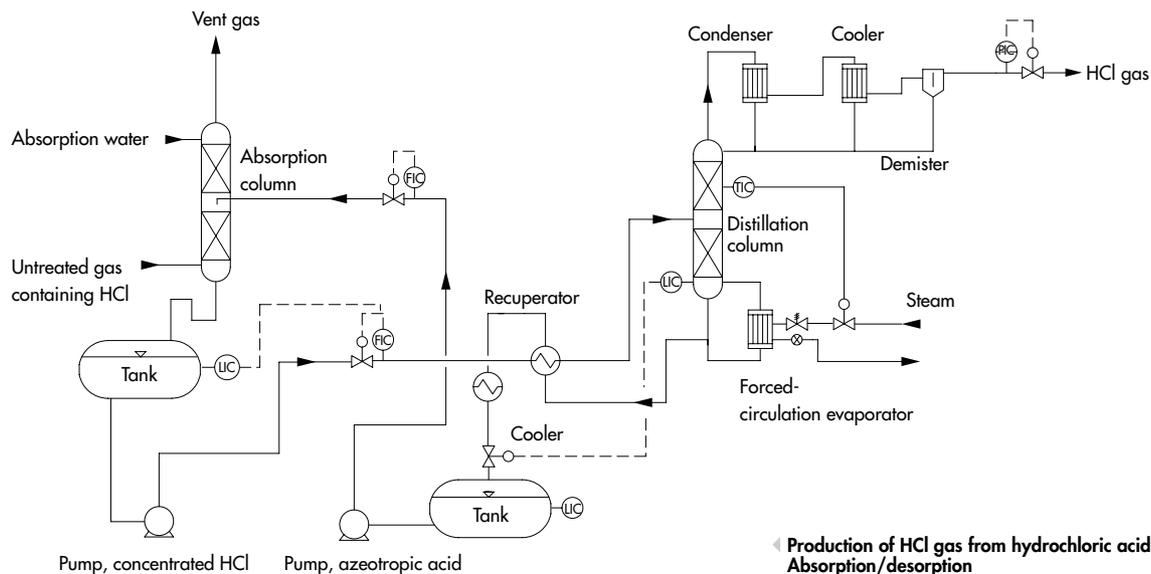
▲ Isothermal absorption of HCl gas



▲ Adiabatic absorption of HCl gas

## PRODUCTION OF HCl GAS FROM HYDROCHLORIC ACID





HCl gas is produced by distillation of hydrochloric acid solutions with a concentration of 25 - 35 % under pressure. The hydrochloric acid solution can be produced in an absorption system, as shown in the flow diagram above.

The HCl gas may originate from a combustion process or an HCl synthesis plant. HCl gas from an HCl synthesis plant always contains an excess of hydrogen for complete reaction of chlorine. In this case, the hydrogen is removed from the HCl gas by absorption followed by distillation.

Absorption is usually carried out at atmospheric pressure. Depending on the resulting absorption temperature, the absorption solution has to be cooled in a downstream heat exchanger. To minimize the consumption of steam and cooling water, the feed stream to the column is heated with hot, azeotropic acid. The preheated solution is fed into the column below the reflux stream. Water-containing HCl gas is distilled. The concentration of the HCl gas

increases in the first condenser and in subsequent gas coolers. In these heat exchangers, water is removed from the gas stream. After passing through a high-performance demister, a moisture content of 5 - 10 ppm in the product gas can ultimately be achieved.

#### The special advantages of our HCl distillation plants

- Production of highly pure, dry HCl gas with low inert gas and moisture contents
- No risk of explosion
- Gas pressure and temperature in accordance with customer's wishes
- Long service life, low maintenance cost
- Modular design of system, including pipework, instrumentation and control equipment
- We engineer, erect and commission the plant.

#### Construction materials

To offer you the maximum possible safety and reliability, distillation plants are fabricated solely from our corrosion-resistant materials:

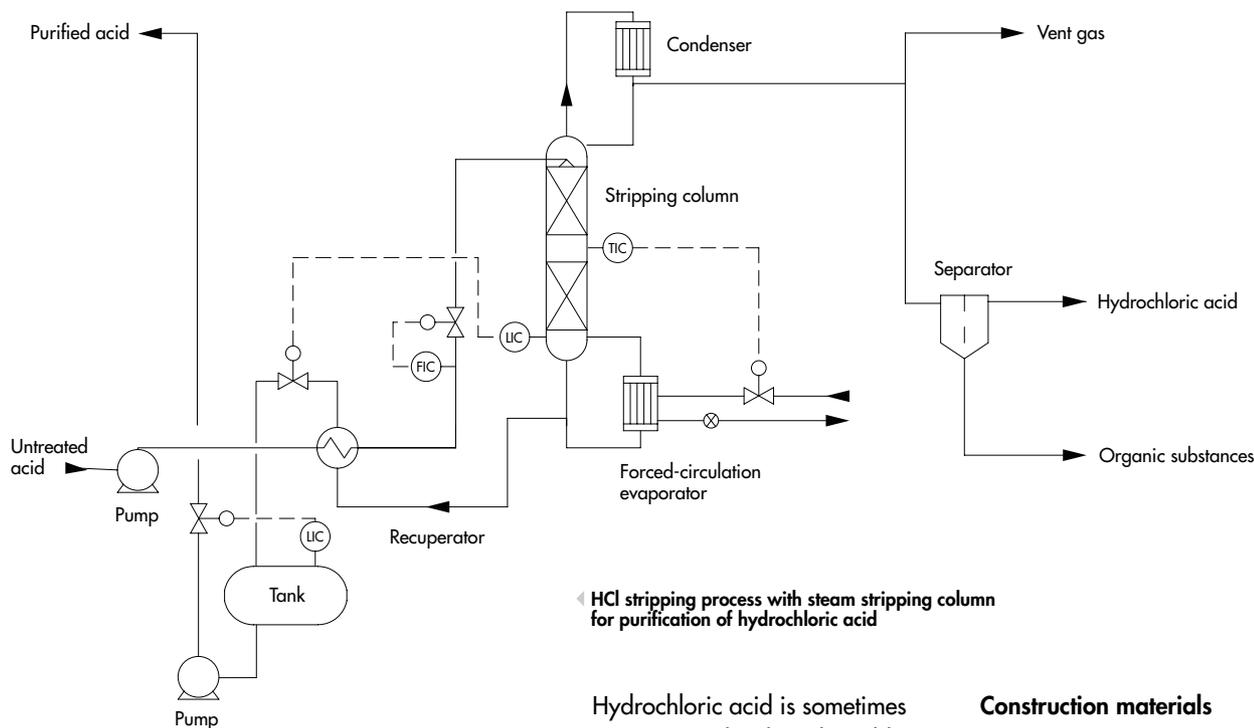
- <sup>®</sup>DIABON and KARBATE graphites for heat exchangers
- <sup>®</sup>DIABON graphite and <sup>®</sup>LICUFロン fluoroplastic for columns
- <sup>®</sup>GENAKOR, <sup>®</sup>VULCOFERRAN, <sup>®</sup>VULKODURIT and <sup>®</sup>KERABUTYL rubber linings for distillation columns, tanks and piping
- <sup>®</sup>DIABON graphite or plastic for column internals
- DIAPACK carbon or MELLACARBON™ CFC for column packings.

#### Capacity and available sizes

Distillation columns can be fabricated in all standard sizes up to 3 meters in diameter. Distillation units can be designed for capacities of 3 to 360 t/d of 100 % HCl per column.

# STRIPPING PROCESSES





◀ HCl stripping process with steam stripping column for purification of hydrochloric acid

Hydrochloric acid is sometimes contaminated with undesirable volatile constituents such as chlorine or chlorinated organic substances. These impurities can be removed by stripping or rectification in a relatively simple process.

In this process, the feed stream enters at the top of a stripping column. Column internals bring about intensive contact between the liquid and the upward-flowing stripping medium. As a result, low-boiling organic substances and a small amount of hydrogen chloride are vaporized. The purified hydrochloric acid leaves the system at the bottom of the column. The stripping medium is air, live steam or steam produced in an evaporator. Overhead vapors can be condensed in order to separate recyclable liquid phases.

### Construction materials

To ensure optimum resistance to corrosive substances at the particular service conditions, the most suitable materials for each equipment item are used:

- <sup>®</sup>DIABON and KARBATE graphites for stripping columns and heat exchangers
- <sup>®</sup>LICUFLON fluoroplastic for stripping columns with larger diameters
- <sup>®</sup>GENAKOR, <sup>®</sup>VULCOFERRAN, <sup>®</sup>VULKODURIT or <sup>®</sup>KERABUTYL rubber linings for piping and for acid storage tanks.

### Capacity and available sizes

<sup>®</sup>LICUFLON stripping columns are able to treat up to 300 t/h of hydrochloric acid solution. Rubber-lined columns are capable of even higher capacities. Equipment sizes are matched to the customer's requirements.

◀ Stripping column in <sup>®</sup>DIABON graphite for purification of hydrochloric acid

# CONCENTRATION OF HYDROCHLORIC ACID



▲ Blind flange of a <sup>®</sup>LICUFLON evaporation vessel

One of the major standard operations in environmental protection technology is the evaporation of liquid wastes. <sup>®</sup>DIABON graphite heat exchangers represent the latest state of the art in the evaporation of dilute acids, aggressive flue gas scrubbing water, landfill leachates and industrial effluents.

- Evaporation systems are used if salts or other high-boiling substances have to be removed from HCl solutions. HCl and water are evaporated; the waste products are retained in the concentrate.

- Concentrated hydrochloric acid can also be recovered from heavily diluted solutions. These hydrochloric acid solutions can be concentrated by evaporation to approx. 20 % HCl (azeotropic). Even higher concentrations can be achieved by means of CaCl<sub>2</sub> distillation, in which evaporation plays a crucial role. CaCl<sub>2</sub> modifies the chemical equilibrium in such a way as to enable selective distillation of HCl in a column. The CaCl<sub>2</sub> solution is diluted by the residual water; this diluted

CaCl<sub>2</sub> solution can be re-concentrated in a following evaporation stage.

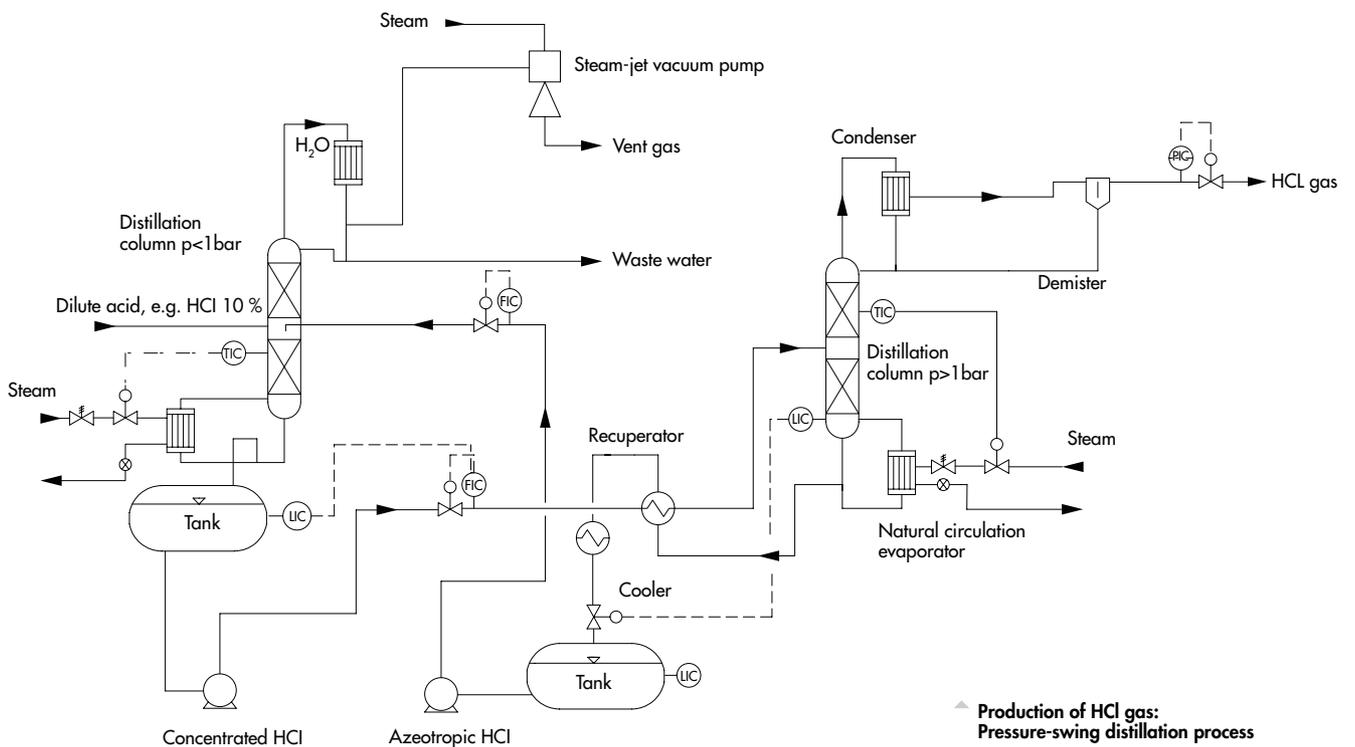
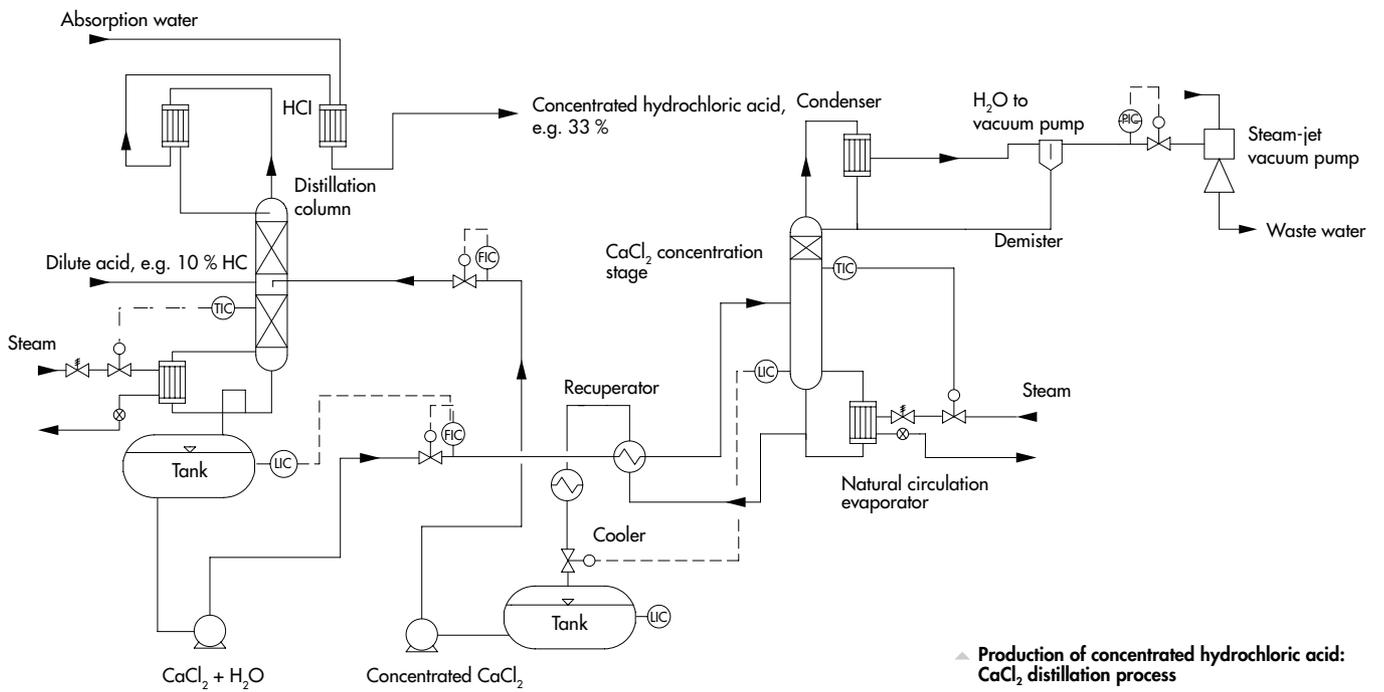
- If traces of other substances build up in the CaCl<sub>2</sub> circuit or if the use of this chemical is undesirable, an alternative option is to use pressure-swing distillation for recovery of HCl from dilute hydrochloric acid solutions. At high pressure, the azeotropic HCl concentration is low (16 - 18 %). At low pressure, it rises to 22 - 24 %. This makes it possible to remove water by distillation in a column operated at low pressure. The concentrate in the bottom of this column is pumped into another column operated at high pressure, where HCl gas is distilled. The azeotropic bottom product flows back into the low-pressure column.

## Construction materials

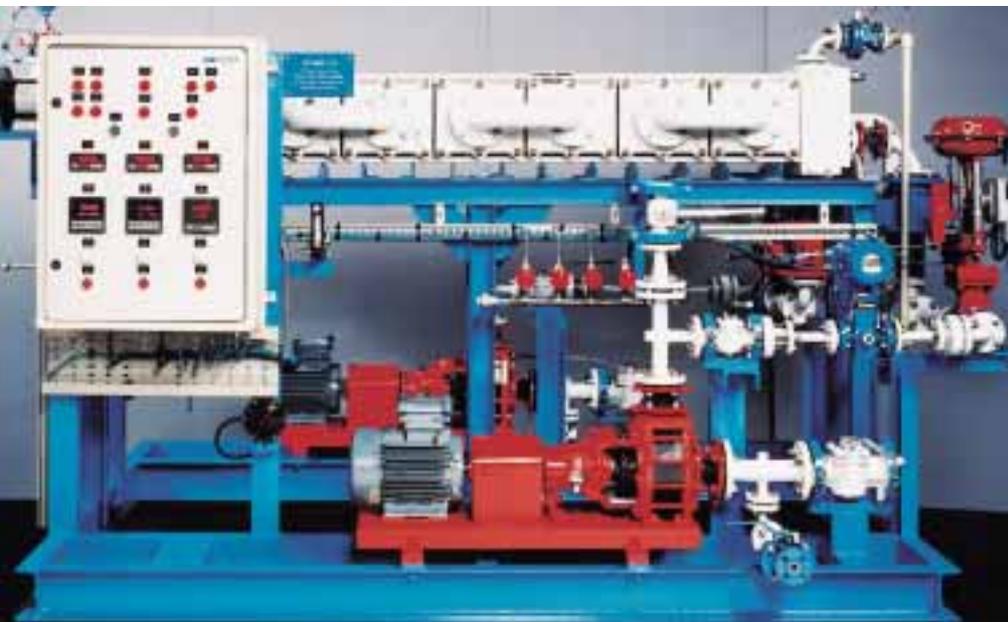
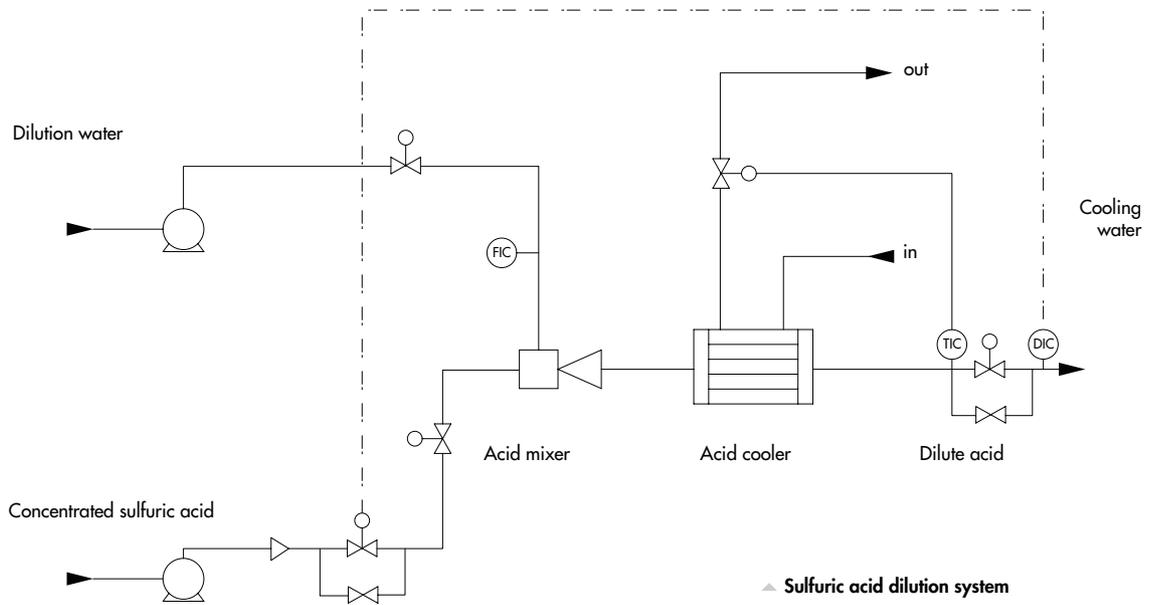
- <sup>®</sup>DIABON and KARBATE graphites for heat exchangers and final condensers
- <sup>®</sup>DIABON, KARBATE, <sup>®</sup>GENAKOR, <sup>®</sup>VULCOFERRAN, <sup>®</sup>VULKODURIT, <sup>®</sup>KERABUTYL and <sup>®</sup>LICUFLON brands or tantalum for lining of separators.

## Capacity and available sizes

The design and capacity of the evaporation systems are matched to the customer's requirements.



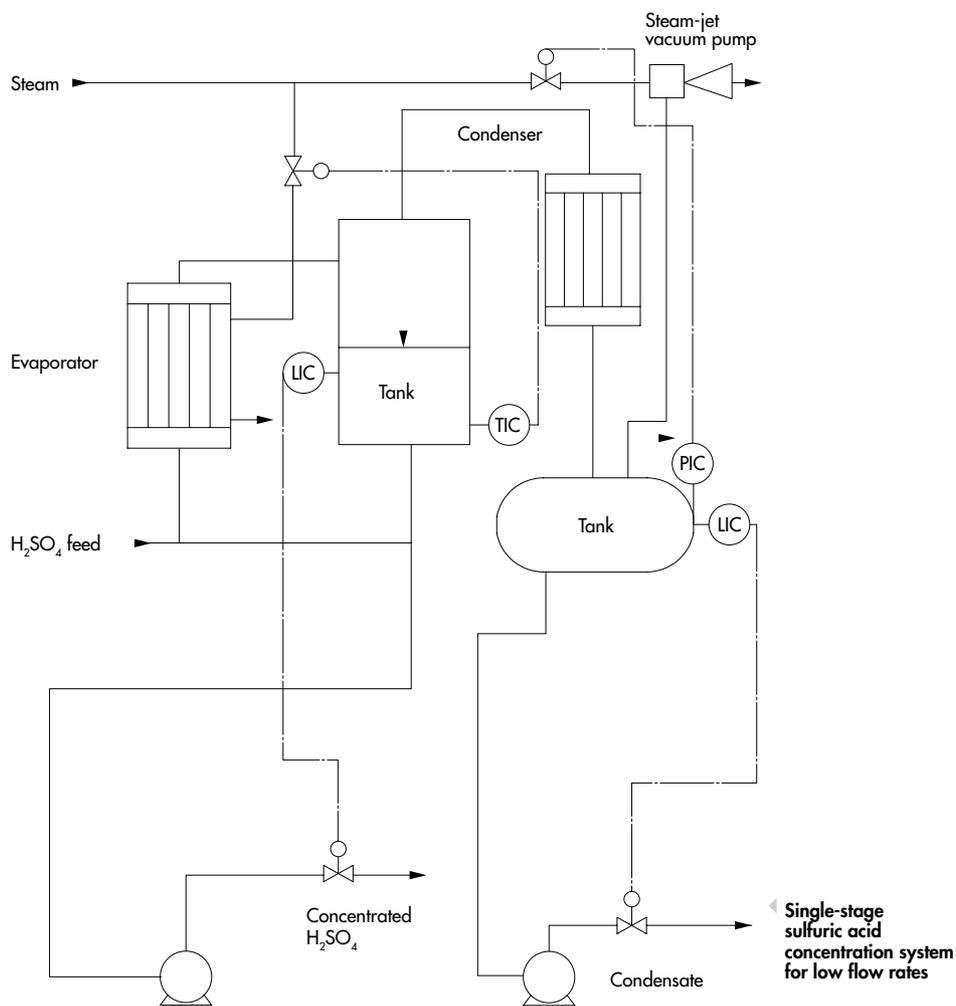
# SULFURIC ACID – DILUTION AND CONCENTRATION OF H<sub>2</sub>SO<sub>4</sub>



## Dilution of sulfuric acid

®DIABON and KARBATE graphite heat exchangers for dilution of sulfuric acid produce a homogeneous acid with a constant temperature. In this way, downstream piping is protected. The resistant materials selected for this process are extremely reliable. The acid concentration can be controlled manually and automatically.

▲ Complete pre-assembled module for dilution of sulfuric acid and tempering of electroplating baths



### Concentration of sulfuric acid

This process was developed in order to maximize the energy efficiency of resource recovery and waste disposal processes. Two- and three-stage concentration systems are characterized by 45 % and 65 % lower steam consumption respectively compared with single-stage designs. Such systems are aimed chiefly at reducing the cost of waste disposal and therefore have to pay for themselves in a short time.

The acid solution usually flows by natural circulation through a heat exchanger and is evaporated in a separator. The steam which leaves the separator is condensed in a following evaporation stage or a final condenser.

Complete turnkey units of modular design with heat exchangers, pumps, piping, control equipment and structural steelwork can be supplied.

**For further information, please ask us for our brochure „Corrosion Protection in Sulfuric Acid Plants“.**

### Construction materials

- <sup>®</sup>DIABON and KARBATE graphites for heat exchangers and final condensers
- <sup>®</sup>DIABON, KARBATE, <sup>®</sup>GENAKOR, <sup>®</sup>VULCOFERRAN, <sup>®</sup>VULKODURIT, <sup>®</sup>KERABUTYL and <sup>®</sup>LICUFロン brands or tantalum for lining of separators and H<sub>2</sub>SO<sub>4</sub> mixers.

### Capacity and available sizes

Sulfuric acid dilution systems can be constructed for capacities ranging from 0.5 to 100 m<sup>3</sup>/h of diluted H<sub>2</sub>SO<sub>4</sub>. The capacity and size of the concentration systems are matched to customers' requirements.

# EXHAUST GAS AND FLUE GAS – SPECIFIC PERFORMANCE REQUIREMENTS FOR HEAT EXCHANGERS

## Exhaust gas treatment

Due to the aggressiveness of the substances involved, corrosion problems can occur in almost any process aimed at preventing pollutant emissions and recovering harmful substances from exhaust gases. By combining our expertise in the field of exhaust gas cleaning and heat recovery with our range of corrosion-resistant materials, we can offer tailor-made engineering solutions for your particular problem:

- Equipment and complete systems for cleaning hydrogen halide-containing exhaust gases and recovering hydrogen halides
- Quenchers and absorbers for cooling and subsequent absorption of pollutants from flue gases and exhaust gases
- Equipment and systems for cooling and reheating flue gases
- Plant components and equipment for thermal decomposition of waste, including subsequent exhaust gas cleaning and recovery of acid components
- Systems for recovering heat from the exhaust gases of large heating plants.

## Flue gas treatment

®DIABON graphite modular heat exchangers for flue gas treatment are used in the power generation industry and in waste incineration in combination with wet scrubbing processes. In these processes, hot flue gases are cooled to condensation temperature in a heat exchanger, scrubbed, and then reheated in the same heat exchanger.

Modular heat exchangers are operated as gas/gas heat exchangers or as condensers. By this means significantly improved heat transfer and complete condensation are achieved. The saturated flue gases can be cooled in the condensers to well below the dew point. ®DIABON graphite is an optimum material for such applications, as it has excellent thermal conductivity.

The corrosive substances contained in the gases, such as HCl, HF or SO<sub>3</sub>, and other water-soluble substances, e.g. Hg, are absorbed in the condensing water. As a result, the condensate is very corrosive. Since our ®DIABON graphite heat exchangers are resistant to almost all concentrations of these gaseous or condensed substances, there is no risk of corrosion at temperatures up to 300°C respectively. Damage by pitting, crevice corrosion or stress-corrosion cracking is unknown with ®DIABON graphite.

## Specific performance requirements for heat exchangers

Flue gas heat exchangers which are used in condensation processes are classed as heavy-duty equipment and have to meet very demanding requirements:

- Leakproofness must be absolutely guaranteed even at high temperatures. This requirement is critically important during startup and shutdown, when the material is subjected to additional stress and attack due to thermal expansion and corrosive condensates.
- In cooling of flue gases, condensation of sulfuric acid and hence severe corrosion can occur at temperatures of about 160°C, resulting in the destruction of non-resistant materials in the equipment.
- In the temperature range in which water condenses, the HCl and HF gases present in the flue gases are absorbed as hydrochloric and hydrofluoric acid respectively.
- Combinations of the phenomena described can occur during startup and shutdown if all the temperature ranges are passed through slowly and corrosive vapors flow through the heat exchanger.

**For further information, please ask us for our brochure „Corrosion Protection in Phosphoric Acid Plants“.**

Gas/gas heat exchanger of modular design fabricated from ®DIABON graphite and glass tubes, for cooling flue gas with fresh air



**CHARACTERISTICS OF OUR FLUE GAS HEAT EXCHANGERS**



The tubes of flue gas heat exchangers in ®DIABON graphite are joined to both tube sheets without seals. The ends of the tubes, and the holes in the tube sheets, are conical in shape. These conical components are cemented together with an adhesive consisting of synthetic resin and cementing powder. The joint produced is gasproof and used under normal conditions up to a material temperature of approx. 200°C. If specially impregnated material is used, service up to approx. 300°C is possible. The maximum permitted gas temperatures are about 10°C above these levels.

The sealing between tube and tube sheet must withstand thermal stresses and also be resistant to high temperatures and corrosion.

This requirement is fully met by our joining technique. As the tubes and tube sheets are made of the same material, variations in temperature have no adverse consequences; no stresses due to thermal expansion arise.

The combustion gases are passed through the inside of the tubes.

Owing to the high gas velocity, no dust deposition problems occur even if the electrostatic dust precipitator fails.

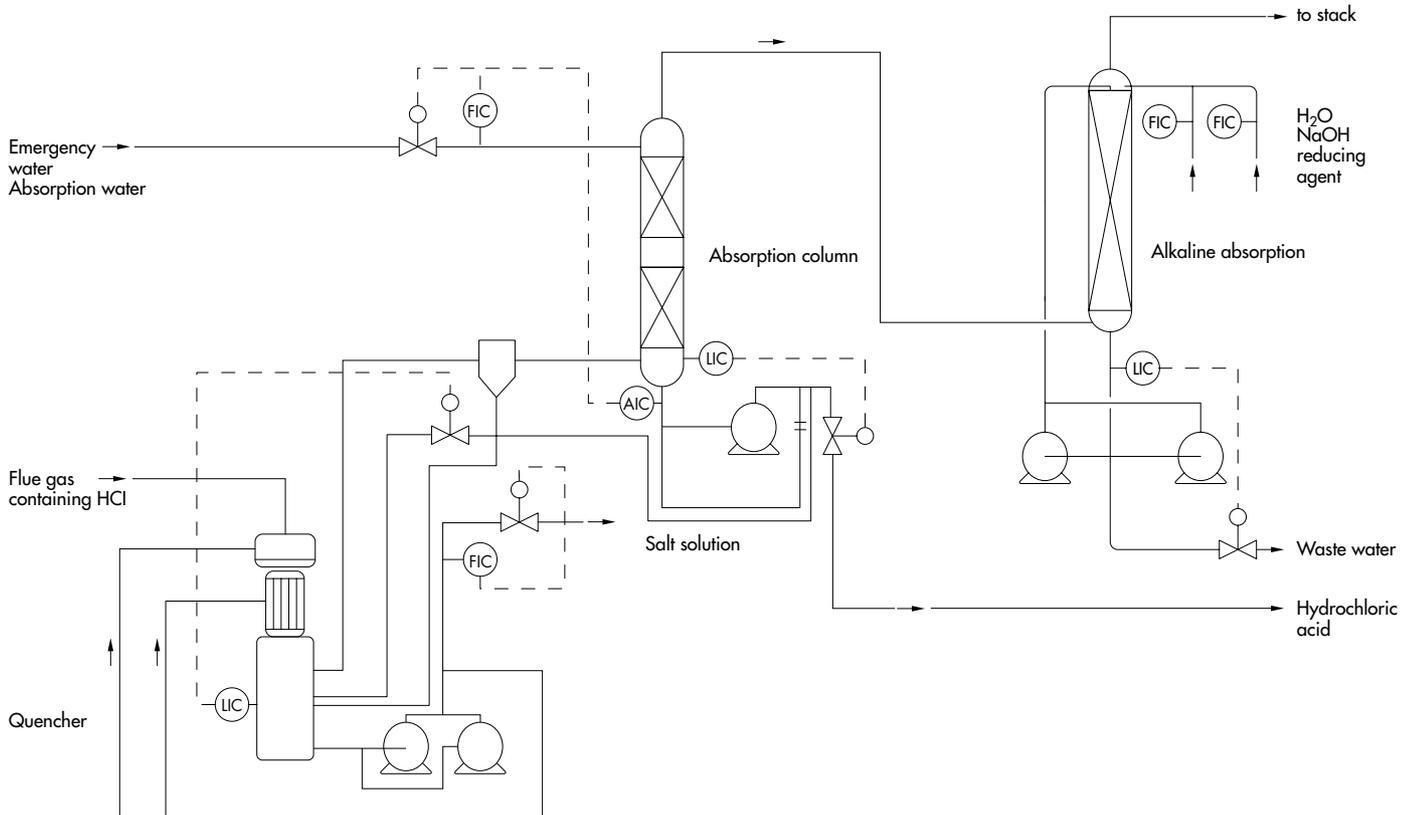
The cleaned gases pass through the shell space of the heat exchanger.

To ensure trouble-free operation, the gases should be free from salt droplets.

The steel structure is lined with a resistant material, which is selected according to the gas composition and temperature.

Experience shows that flue gas heat exchangers fabricated from ®DIABON graphite ensure high operational reliability and long service.

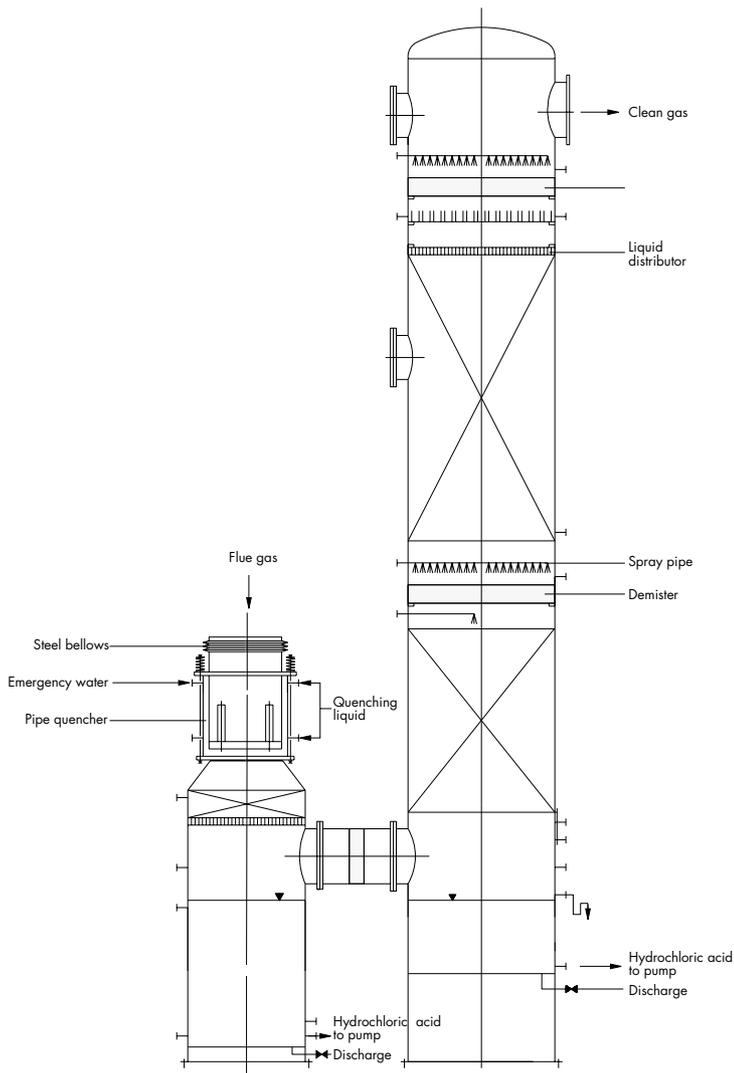
# QUENCH PROCESS AND RECOVERY OF HYDROCHLORIC ACID



▲ Quench process with recovery of hydrochloric acid in an absorption column and removal of chlorine in an alkaline absorption unit

Gases from incineration systems often contain considerable amounts of hydrogen chloride and elemental chlorine. To facilitate the treatment of these exhaust gases in downstream systems, they must be reliably cooled to temperatures close to the saturation point (60 - 90°C) either immediately following incineration or after heat recovery in a steam generator or a flue gas heat exchanger. In addition, recycling of the HCl gas as industrial-grade hydrochloric acid is desirable. Finally, any Cl<sub>2</sub> present in the flue gases must also be removed. Systems made from <sup>®</sup>DIABON graphite fully meet these requirements. On its way to the stack, the gas flows through a quencher, an HCl absorption column operated with fresh water, and finally

an alkaline absorption unit for Cl<sub>2</sub> removal, which is operated with water, NaOH and a reducing agent (e.g. Na<sub>2</sub>SO<sub>3</sub>). In the quencher, the top-fed gas causes evaporation of the circulating liquid. Gas and liquid flow together through the quenching pipes, which allows the gases to be quickly and reliably cooled to temperatures close to the saturation point. The circulating liquid can be cooled in a heat exchanger. This increases the HCl recovery rate if the temperature of the HCl solution is too high after the absorption stage.



◀ **®DIABON graphite pipe quencher with separate quenching circuit for removal of salts from flue gas and recovery of industrial-grade hydrochloric acid in an absorption column**



▲ **Flue gas scrubbing with ®DIABON graphite pipe quencher (installed height 1.3 m approx.) mounted on a co-current scrubber. Liquid feed: to pipes at left, to cooling ring at top**

In the first absorption column, the HCl gases are absorbed in counter-current by fresh water. This column is usually operated at atmospheric pressure. The HCl solution is added to the circulating quenching liquid. In the second absorption column (packed section), the inert gases are absorbed in counter-current by a mixture of water, NaOH and a reducing agent (e.g. Na<sub>2</sub>SO<sub>3</sub>).

- The first absorption column ensures complete saturation of the gases after quenching and complete absorption of hydrochloric acid
- The quencher can be combined with a falling-film absorber for removal of very large quantities of heat

- In certain cases, high hydrochloric acid concentrations can only be attained by means of an integral distillation stage
- In subsequent treatment stages, highly pure hydrochloric acid can be produced by removal of chlorine or metal salts
- We can handle the engineering, erection and commissioning.

The quench process and the process for recovery of hydrochloric acid comply with the requirements of all the current international emission standards.

### Capacity and available sizes

Quenchers can be fabricated up to a maximum diameter of approx. 2,700 mm. This enables very large volumes of flue gas (up to approx. 160,000 Nm<sup>3</sup>/h) to be treated in a single unit. Depending on the chosen design (e.g. with or without a cooling ring), ®DIABON graphite quenchers can be used at temperatures from 150 up to 1,500°C.

The obtainable HCl concentration in the recovered acid depends on the composition of the flue gas. Normal concentrations are 15 to 30 %.

# SUMMARY



The illustration at the left and our cover photo demonstrate the way in which our systematic solutions harmonize with our environment. On the cover photo of this brochure, ponds for production of sodium chloride are visible in the background. The raw material salt was the reason for building a chemical plant based on the use of chlorine near the source of the raw material (NaCl). Sodium chloride is used for the production of chlorine, which is the raw material for HCl production. The blue sky makes it clear that the operation of an industrial plant without harming nature is a reality today.

We make a contribution to this: By using our material brands <sup>®</sup>DIABON, KARBATE and <sup>®</sup>LICUFLON – in combination with high-alloyed special metals and the <sup>®</sup>GENAKOR, <sup>®</sup>VULCOFERRAN, <sup>®</sup>VULKODURIT and <sup>®</sup>KERABUTYL rubber linings – in heat exchangers, columns, tanks and pumps, we are able to cover the entire spectrum of process engineering for corrosive media. From the treatment of HCl by absorption, distillation, stripping or evaporation to the dilution and concentration of sulfuric acid, and also in the cleaning of flue gases, we can find solutions to materials and process engineering problems. Our range of products and services is rounded off by floor coating and tiling systems, as well as a wide corrosion protection product portfolio for secondary containment systems, channels and pump casings. To enable us to give our customers a quick and precise answer to their technical questions, we list below the most important requirements for specifying a system.

#### **Specification of feed**

- Flow rate
- Source
- Composition
- Temperature
- Pressure
- Variations and impurities
- Physical properties
  - Heat capacities
  - Density
  - Viscosity

#### **Specification of product**

- Concentration (e.g. H<sub>2</sub>O, HCl, Cl<sub>2</sub>)
- Temperature
- Pressure

#### **Heating and cooling media**

- Available quantity (analysis)
- Temperature
- Pressure

#### **Acceptance inspection standards**

- TÜV, ASME, ....

#### **Scope of supply**

- Process equipment
- Piping and valves
- Instrumentation, control equipment, computer process control system
- Complete module (including structural steelwork)

#### **Price**

- Budget price +/- 30 %
- Guide price +/- 10 %
- Fixed price

#### **Design concept**

- Absorption
- Concentration
- Stripping
- Dilution
- Quenching
- Heat transfer
- Distillation
- Desorption

◀ Plant for HCl synthesis and HCl absorption, assembled from three prefabricated modules. In the foreground are hydrochloric acid storage tanks

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The data contained herein represent the current state of our product knowledge and are intended to provide general information on our products and their application spectra. In view of the variety and large number of application possibilities, these data should be regarded merely as general information that gives no guarantee of any specific properties and/or suitability of those products for any particular application. Consequently, when ordering a product, please contact us for specific information on the properties required for the application concerned. On request, our technical service will supply a profile of characteristics for your specific application requirements without delay.

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