



PHOSPHORIC ACID

**PROTECT WHAT MATTERS.**

Your technology partner for robust systems that are made to last.



## Phosphoric Acid – An Indispensable Raw Material

**Phosphoric acid is an essential chemical feedstock that is used in a wide range of applications, including the manufacture of fertilizers, detergents, food and feedstuffs, as well as batteries.**

The basic process of phosphoric acid production has not changed substantially over the years, however the lining systems and quality requirements have improved. The quality requirements are primarily determined by the final use of the phosphoric acid. This is implemented via specifically tailored production processes and lining systems.

**Steuler is your technology partner of choice when it comes to phosphoric acid production processes.**

We offer custom solutions that meet the stringent requirements for phosphoric acid production. We tailor solutions to mitigate chemical and thermal stress as well as abrasive wear on a project by project basis. Depending on the mineral feedstocks used, the occurrence of hydrofluoric acid may also need to be taken into consideration.

Whether during **planning, execution or operation** - your expectation is that everything runs smoothly throughout your project. **As your reliable technology partner, Steuler is there to support you every step of the way.**



### Planning

With Steuler, you can rest assured, all the corrosion-protection-relevant factors have been taken into consideration during planning. Your project has unique requirements? Together with our in-house development and engineering departments, we work with you to devise solutions that are precisely tailored to your needs. Our dedicated teams and wealth of experience ensure you find the optimal balance between service life and cost-effectiveness. Having a single point of contact for all matters relating to corrosion protection minimizes planning time and planning risk as well.



### Realization

With Steuler, you can rest assured, your project will be successfully completed. With our qualified professionals and international network of specialists, we ensure that your corrosion protection work is performed to the highest quality standards. Steuler has over 100 years of operating experience and a track record of meeting deadlines, you can rely on us to bring your project to a successful conclusion. If you wish, we can even manage your project on a turnkey basis.



### Operation

With Steuler, you can rest assured, your plant is running at its best. The quality of our corrosion protection services is a key factor in the operational safety of your plant. As such, we make a major systems contribution to ensuring long periods of uninterrupted operation with minimal unscheduled downtime. In the event that something unexpected occurs, we have the technical expertise and manpower to help you find and implement the appropriate solutions. If something unforeseen does occur, we support you with technical expertise and man power in finding and implementing solutions.

By choosing Steuler, you're in safe hands when it comes to preventative maintenance too. Many of our customers safeguard the long-term operation of their plants by engaging us to perform routine inspection and maintenance.



# Our Corrosion Protection Services

Corrosion protection in phosphoric acid plants covers two main areas: Protecting floors, sumps, trenches and channels on the one hand, and individual plant components (reactors, storage tanks, etc.) on the other.

## Floors, sumps, trenches and channels:

The chemical stress, partially diluted acids or only short exposure times is lower than the direct chemical stress within plant components (reactors, storage tanks, etc.). Protection is provided by liquid-tight and crack-bridging coatings based on e.g. epoxy or polyurethane resins, which are then protected from mechanical damage by ceramic tiles. Phenolic or furan resin mortars are used for laying and grouting the tiles. In the case of exposure to hydrofluoric acid, carbon bricks in a silicate-free mortar must be used instead of the ceramic materials.

Trenches can be permanently protected also with anchored thermoplastic materials. For certain areas without major mechanical loads a coating system, e.g. based on polyurethane, can be sufficient. This offers a cost-effective alternative.

## Plant Components: Reactors, Storage Tanks, etc.

Selecting suitable corrosion protection systems for individual plant components is a more complex matter. The standard design of a corrosion protection system in such components includes a soft or hard rubber lining. Alternatively, a combination of a rubber lining with an additional carbon brick lining laid in silica-free furan mortar is used.



Component	Sealing layer	Additional protective layer
Agitators (shaft, rotor, blade)	Hard rubber lining, double rubber lining	-
Attack tanks / Reactors	Rubber lining	Carbon bricks in synthetic resin mortar
Attack tanks / Reactors - roof	BEKAPLAST	-
Cooling towers	Coatings (epoxy / vinylester combined system)	Carbon bricks in synthetic resin mortar
Crystalizers / Maturation tanks	Rubber lining	Carbon bricks in synthetic resin mortar
Digesters	Rubber lining	Carbon bricks in synthetic resin mortar
Floors	Coatings (epoxy resin or polyurethane)	Ceramic tiles in synthetic resin or potassium silicate mortar Carbon tiles in synthetic resin mortar
Flue gas scrubber	Flake coatings, rubber lining	Carbon bricks in synthetic resin mortar
Heat exchangers	Hard rubber lining	-
Intermediate tanks	Rubber lining	-
Ion exchangers	Hard rubber lining	-
Mixing vessels	Rubber lining	Carbon bricks in synthetic resin mortar
Storage tanks	Rubber lining	Additional brick lining on bottom surfaces
Thickeners	Rubber lining	Carbon bricks in synthetic resin mortar
Transitional vessels / tanks	Rubber lining	Carbon bricks in synthetic resin mortar
Trenches and Sumps	Coatings (epoxy or vinylester resin), BEKAPLAST	Ceramic or carbon tiles in synthetic resin mortar

# Safe and Reliable Corrosion Protection Solutions for Various Applications

When implementing safe and reliable corrosion protection solutions, we trust on our self-developed and self-manufactured lining systems. This always allows us to meet all your project requirements. We tailor solutions for your specific application.

Area of application	Linings
Protection of plant components	VULCOFERRAN 2194, KERABUTYL BBS, KERABUTYL V, KERAPREN VB
Tiling and brick linings	FURADUR MORTAR, FURADUR F MORTAR
Protection of plant components (subject to drinking water or food-related regulations)	VULKODURIT 1250 KTW, VULCOFERRAN 2206 FDA, KERABUTYL BS FDA

## Added value:

Phosphorus-containing minerals are extracted by sulfuric acid. For this reason, phosphoric acid plants are often operated in combination with sulfuric acid plants, for which we also have a comprehensive portfolio of corrosion protection solutions.

### Note:

Phosphoric acid production is not an isolated process, but has many interfaces to upstream and downstream processes. Think about logistics for example. Acid-resistant containers, freight cars, and ships are required to transport the aggressive phosphoric acid. We can help you to find a suitable solution for this task too.

# Services in Combination

In addition to specific corrosion protection services, the Steuler Group can also provide linings for sulfur incinerators, fluidized bed roasters, sulfuric acid incineration plants and pipework.

➔ Let's talk and work together to find the perfect solution for your requirements.



# STEULER

Surface Protection | Linings

Together with our international subsidiaries and agents, Steuler offers customers a global network that develops and implements comprehensive plant solutions.

**Alphaplast, S.L.U.**  
Spain

**Ancorite Surface Protection Ltd.**  
United Kingdom

**CIMA S.r.l.**  
Italy

**Ditescor S.A. de C.V.**  
Mexico

**STEULER-KCH Polska Sp.z o.o.**  
Poland

**Shanghai STEULER-KCH  
Anticorrosion Engineering Co., Ltd.**  
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Spain

**TECNICAS DE REFRACTARIOS,  
S.A.U. (TECRESA)**  
Spain

**STEULER-KCH GmbH**  
Berggarten 1  
56427 Siershahn | GERMANY  
+49 2623 600-221  
surface-protection@steuler-kch.de

**[www.steuler-linings.de](http://www.steuler-linings.de)**

Find more  
information here.

