

RUBBER LININGS
VERSATILE AND SAFE
ON STEEL AND CONCRETE



From the development of the materials, through in-house production up to and including reliable selection by our application engineering support team - Steuler has optimum technology for every requirement.

OWN RESEARCH AND DEVELOPMENT **EXTREMELY VERSATILE**

The variety of loads exerted on parts in process engineering systems makes anti-corrosion measures essential. Steuler rubber linings are used to protect steel constructions and concrete parts. Tanks, pipes, reaction towers and gas scrubbers are typical steel constructions that are protected with rubber. The concrete parts include e.g. drainage ditches and tanks.

Steuler rubber linings are completely resistant to chemical, thermal and mechanical loads. Chemical loads comprising acids, lyes, salt solutions and various chemicals are also covered, as is the effect of steam. Higher temperatures or temperature changes and mechanical loads, such as pressure or abrasion, increase the aggressive force of the load. In these cases, solutions with Steuler rubber linings are also possible.

Rubber linings are the first choice when it comes to optimum protection against permanent or on-going exposure to aggressive media, if resistance to permeation processes needs to be taken into consideration. This applies in particular to chemicals with a small molecule size (hydrogen chloride, ammoniac, water) and operating temperatures above the ambient temperature because this accelerates permeation processes as the temperature increases.

We can offer additional protection for our rubber linings against mechanical and thermal loads by means of a combination with corrosion-resistant brick linings and board surfaces made of ceramic or carbon material. Rubber linings that are approx. 2 - 6 mm are used as corrosion protection. In case of heavily abrasive loads, thicker soft rubber surfaces or multi-layer versions may be necessary.



Steuler technicians realise all engineering specifications correctly based on their competence and experience.



With an eye for the bigger picture and also for the special details - perfect execution with reworking of the seams.

SOFT RUBBER LININGS

The flexible Steuler soft rubber linings can withstand torsion of the static carrier much better than rigid systems. They facilitate a lighter and less expensive construction. Soft rubber linings can bypass cracks in concrete constructions elastically and in the long-term and they are resistant to impact loads. Their wear resistance is extremely useful in practice. The elastic properties are retained even at temperatures below 0 °C and therefore allow transport and assembly even at sub-zero temperatures. If there are any subsequent modifications of the static carrier, Steuler rubber linings can simply be adapted to the new situation. Local repairs are carried out quickly and with no impact on the quality.

HARD RUBBER LININGS

Hard rubber linings achieve hardness and strength values similar to those of duroplastic materials. The high degree of cross-linking significantly increases the resistance to permeation of steam and other substances. Hard rubber linings are also highly resistant to a wide range of chemicals.

In addition to the material-specific resistance properties, the durability of rubber linings also depends on other factors:

- Material type and design of the part that needs to be protected
- Surface quality of the part
- Climatic conditions during the application
- Pretreatment of the surfaces that need to be protected

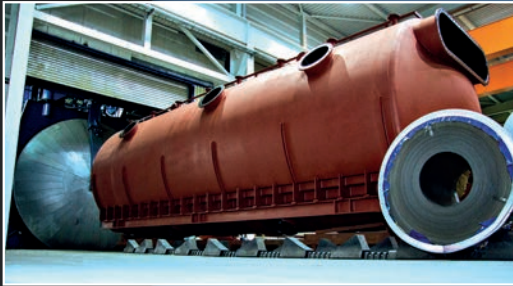
Steuler can carry out the application under workshop conditions (workshop rubber linings) and also at the operating site (construction site approval). For both options, we have developed extensive material palettes so that the different application conditions can be taken into account.

CUSTOMIZED PRECISION **CONSTRUCTION SITE AND WORKSHOP RUBBER LININGS**

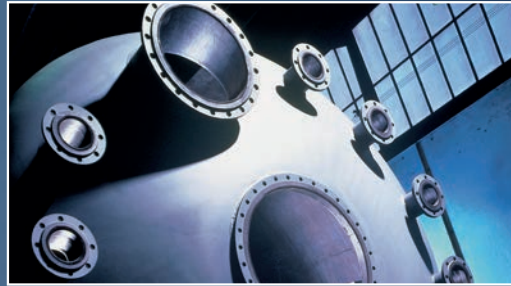
CONSTRUCTION SITE RUBBER LININGS

Steuler has developed rubber lining systems specially for construction sites in which the vulcanisation process is completed before the application. The pre-vulcanised one and two-layer rubber linings can be used without any special precautions for transport and the storage even under extreme climate conditions. Special precautions for final vulcanisation are not necessary, so that panels with pre-vulcanised rubber strips can be exposed to full loads even after a short time. In addition to these pre-vulcanised single and two-layer rubber linings, self-vulcanising grades are also used for rubber lining work on the construction site in which the vulcanisation is realised at normal temperatures by using special accelerators.

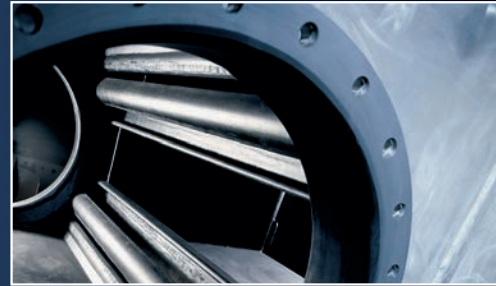
Parts that are designed as pressurized tanks can usually be used as autoclaves themselves. Similar to the workshop, the types of rubber used in these cases are applied to the surface in a non-vulcanised state. Steam vulcanisation can be used to produce both hard and soft rubber linings in steel tanks. Rubber linings can be vulcanised with steam and also hot water. Hot water vulcanisation is applied especially when steam vulcanisation is no longer technically feasible due to the construction. The composition of the rubber strips that are used means that they vulcanise under the effect of hot water.



Workshop rubber linings: The best possible rubber lining quality is achieved in Steuler autoclaves at high temperatures and pressures.



Material-homogeneous lining technology: Fully rubberised process apparatus.



Surfaces, nozzles, installations - every detail of the process engineering parts is protected effectively.

WORKSHOP RUBBER LININGS

A rubber lining can also be applied in our rubber lining workshop for steel parts and constructions. The advantages here are controlled workshop conditions and direct proximity to our autoclaves. On completion of the panelling work, the rubber strips are vulcanised in an autoclave at temperatures of about 140 °C and at a pressure of 4 to 7 bar. The rubber molecules are cross linked at this stage, and the level of cross-linking decides about the hardness of the product. Hard rubber mixtures contain much more sulphur and thereby form a much more closely meshed network as soft rubber linings. The vulcanizates achieve their final properties after a few hours and therefore their high chemical and thermal resistance. Also, values for the adhesion between rubber linings and steel constructions are reached that prevent rubber linings coming away when exposed to thermal loads or vacuums.

The use of works rubber linings is only limited by the size of the autoclave or the transport options. The largest Steuler autoclave at the production site in Siershahn is more than 15 m long and 6 m in diameter.

Steuler Linings' services also include the correct removal of rubber linings from parts that have already been subject to loads and parts that require a new rubber lining. On request, autoclave rubber linings can also be delivered including the steel parts from Steuler Linings.

MATERIALS AND INSTALLATION

FULL SERVICE



STEULER RUBBER LININGS FOR MORE SAFETY ON RAILS, ROADS AND WATERWAYS

There are high requirements relating to the safety of transport tanks used for hazardous fluids on rails, roads or waterways. This applies in particular to the transport of corrosive media. Steuler rubber linings have proven their worth for many years in the transport of corrosive media, such as phosphoric acid.

Rubber linings offer decisive advantages with phosphoric acid compared to tanks made of alloyed steels. This includes good resistance to existing chemical loads and normal soiling in the acid. Another big advantage is the fact of carrying out repairs quickly and easily if the acid tanks are damaged.

Experienced engineers and processing technicians help you solve your special anti-corrosion tasks. Made-to-measure design proposals take your requirements into account and keep an eye on efficiency. As an international full-range provider of corrosion protection, Steuler offers a complete package of all services connected to rubber lining work:

- Removal of rubber and attachment of new rubber including coating
- Preparation and cleaning of metal surfaces
- Acceptances with corresponding test certificate
- Execution of repairs in the workshop and on site

Our service range also includes all secondary services connected to new rubber linings and repaired rubber linings such as removal and the attachment of additional equipment and tightness tests. Profit from Steuler's professional competence when finding solutions for your project.



Rubber-coated gas channel. Also heat exchangers, quenches and pipes can be protected reliably with the Steuler materials up to 150 °C.



Flue gas desulphurization scrubber – Steuler rubber linings for very high chemical, thermal and mechanical requirements.



Absorbers, process basins and pipes are e.g. lined with rubber and additional bricks in non-ferrous metal extraction and acid production plants.

MATCHING TECHNOLOGY FOR EVERY REQUIREMENT

Steuler is a global supplier and partner for industrial corrosion protection and apparatuses. Steuler provides a full service consisting of planning and design support correct material processing through to the construction work on site. In cooperation with its international subsidiaries and agents, Steuler offers its customers a global network that successfully realises projects and large systems.

The product portfolio of **Steuler Surface Protection Linings** includes coatings and rubber linings as well as brick linings and tile linings for all areas of industrial surface and corrosion protection field.

Steuler Plastic Linings supplies pipelines, tanks and apparatuses for high chemical thermal and mechanical loads. They are manufactured both of pure thermoplastics as well as glass fibre-reinforced plastics with and without inner liners or a fibre-reinforced phenolic resin. They guarantee reliable and sustainable chemical resistance.

Steuler Refractory Linings is one of the international leaders in the field of refractory lining systems. Whether dense thermal, chemical and mechanically resistant or lightweight insulating materials – as a full-range supplier, we deliver all materials and complete anchoring systems required for refractory linings. Here, too, Steuler Linings offers everything from materials through application-specific support up to and including entire engineering concept for all panel details and processes.

STEULER

Surface Protection | **Linings**

Together with its subsidiaries and representatives, Steuler offers a worldwide network that develops and implements comprehensive system solutions.

Alphaplast, S.L.U.

Spain

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.**

China

STEULER Chile SpA

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