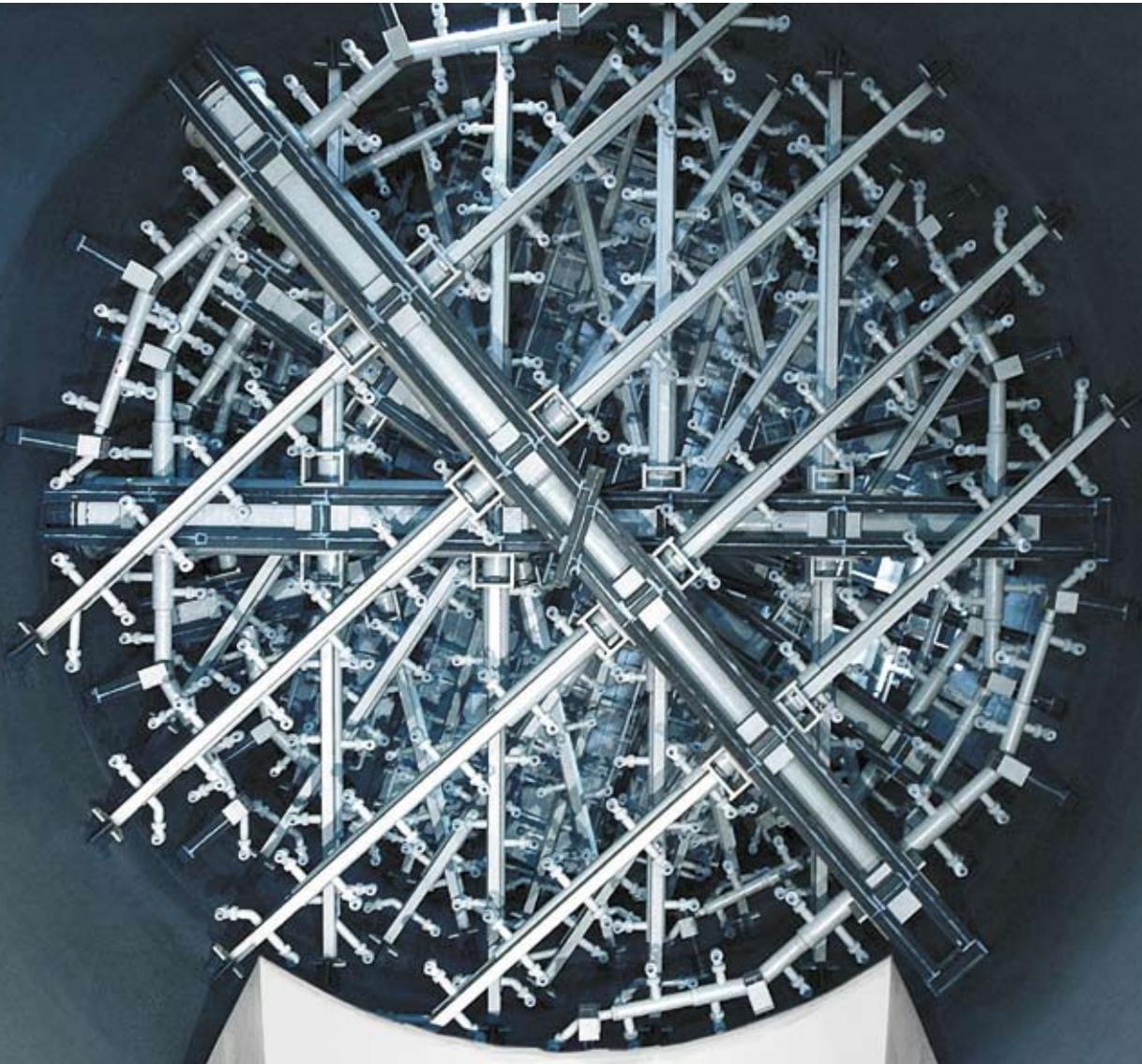


STEULER

Industrieller Korrosionsschutz GmbH



**Steuler Industrial Corrosion Protection
Polypropylene Spray Levels and Linings in
Flue Gas Desulphurisation Plants**

We master aggressive media

Prefabrication of the spray piping systems in the workshop. All interior weld joints are required to have flush contours. Welders working with plastics must be highly qualified in order to satisfy the exacting standards.

Sieve boxes prefabricated by Steuler are installed in the scrubbers.

Photo below: Refurbishment measures in a brown coal-fired power plant – the spray piping system has a total length of 15 m in each main distribution direction. The outgoing distributing pipes with the spray outlet ducts and spray nozzles are positioned to the left and right of the main distributor.



Modernisation measures in a brown coal-fired power plant: Steuler was awarded the contract for the execution of the design, manufacture and assembly of the spray piping systems for the scrubber of the new flue gas desulphurisation plant.

Steuler makes use of thermoplastic materials in new fields of application: Spray levels and sieve boxes made of polypropylene in flue gas desulphurisation plants



The corrosive sulphur compounds contained in the flue gas place very exacting demands on chemical resistance properties in the scrubbing towers. In addition to the chemical loads, severe mechanical loads are also encountered, particularly as a result of abrasion by finely dispersed solid materials.

The surfaces and components of the steel vessel constructions utilized up until now required extensive and costly protection measures. Considering that the service life and durability of subsequently applied protection systems are clearly limited, this is an expensive and time-consuming procedure.

Experience gained over the course of 25 years, during which Steuler utilised the most diverse corrosion protection materials in flue gas scrubbers, led to the development of a technically advanced and economically viable manufacturing concept. Instead of following the standard – and costly – practice of protecting spray levels against the severe chemical, thermal and mechanical loads encountered, Steuler now manufactures these large-dimensional components entirely out of polypropylene.

The main advantage of using polypropylene is that this material does not require additional protection. The surface is smooth and without pores, which prevents the formation of caking deposits or incrustations. The service life of this material is virtually unlimited.

Damages caused by the absorption of media, the formation of deposits or chemical changes in the surface can be effectively ruled out. As a result of the structural design of these piping systems, an anticipated service life in excess of 25 years is fully justified.

The ease of replacement, definable assembly time-spans and the standardized construction effectively meet all requirements in terms of optimal economic efficiency, freedom from maintenance and a long service life, particularly in the case of retrofit applications or the refurbishing of scrubbers.

The scope of delivery, in addition to the manufacture, delivery and final assembly of the spray levels, also includes the complete engineering as well as the preparation of all constructional and manufacturing drawings. Welding operations are carried out in accordance with the guidelines established by the German Association of Welding Engineering (DVS).



Photo above: Often there is only a very narrow aperture through which the spray pipes have to be installed. To facilitate their installation, Steuler manufactures all distribution pipes in pre-determined segment lengths.

Photo below: Assembly and welding of the spray systems: In this manner a complex spray distribution system is achieved, which covers the entire area of the scrubber.





Photo on the left: Concrete girder construction, lined with Bekaplast, designed to support the mist eliminators.

Photo on the right: Concrete scrubber construction with mechanically anchored polypropylene lining and spray levels. The thermoplastic sheets are welded together to ensure a gas- and water-tight assembly. This process guarantees the execution of a testable, homogeneously lined chamber that is resistant to severe chemical, thermal and mechanical loads.

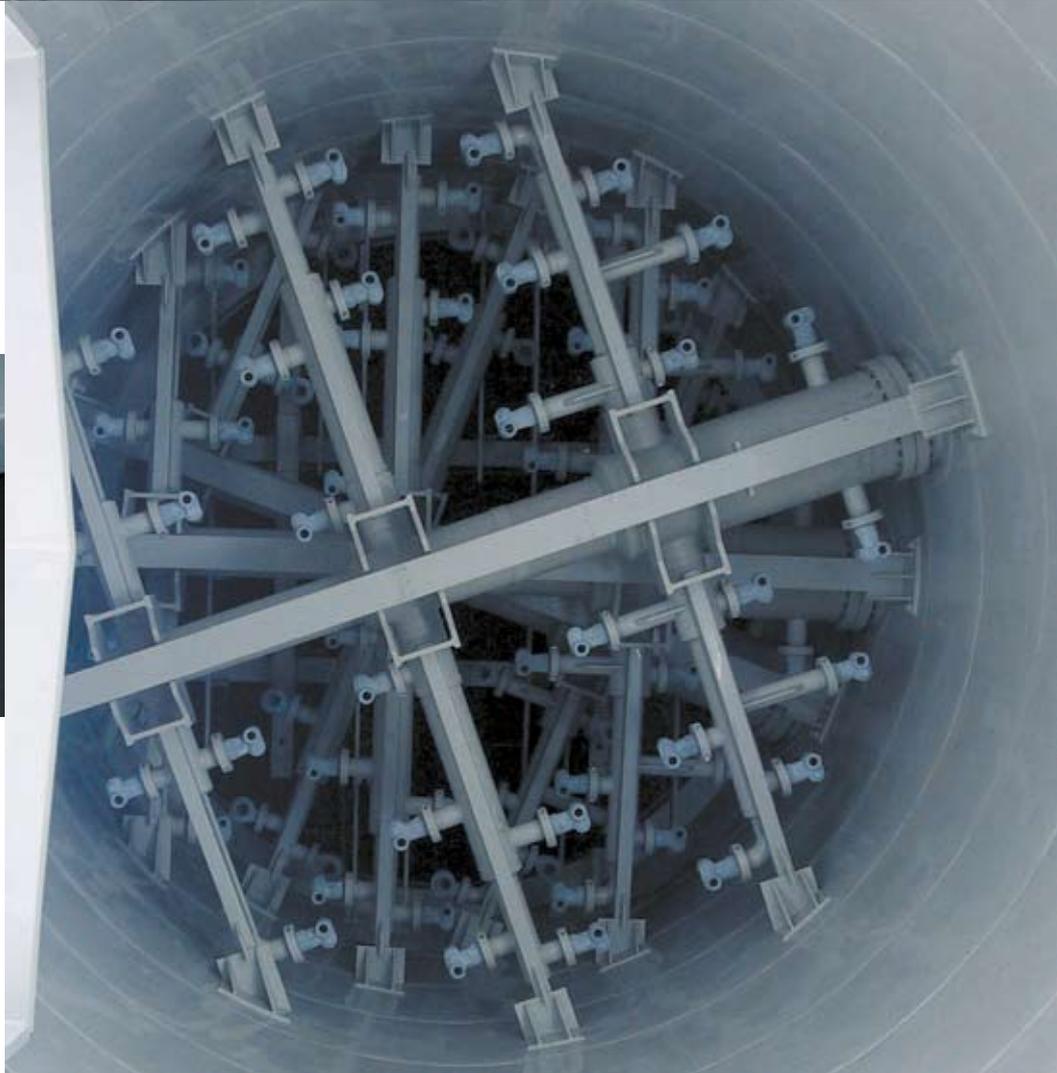


Photo above: Polypropylene supports together with the thermoplastic-lined steel girders provide support for the main ducts of the spray levels.



Photo on the left: The Bekaplast sheets are mounted onto the inner formwork for the concreting operation the individual sheets are still interconnected by means of special sealing strips.

Photo below: The Bekaplast sheets are attached to the interior formwork and then cast into place while the concrete structure is being built. The concrete structure and thermoplastic lining are executed in one operation.

Steuler also makes use of the advantages of polypropylene as mechanically anchored linings in concrete scrubber constructions



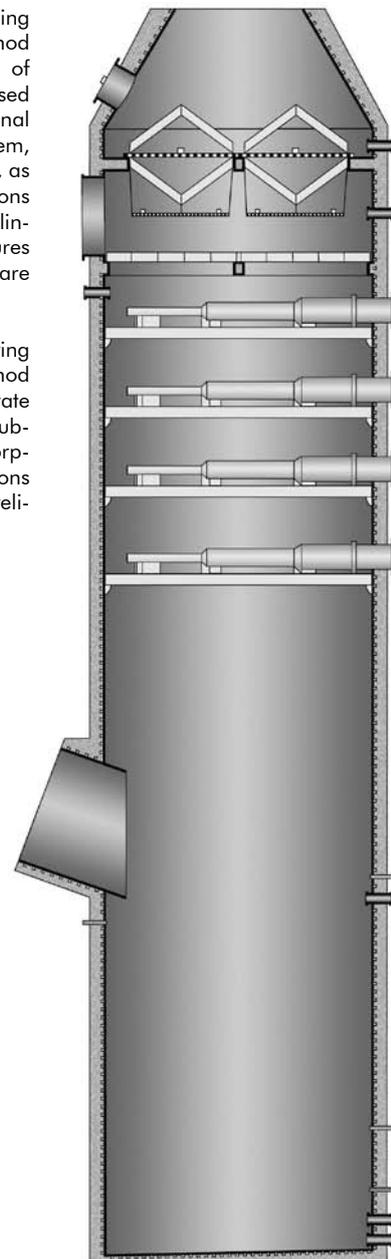
Thanks to its outstanding chemical, thermal and mechanical resistance properties as well as its exceptionally high resistance to abrasion, polypropylene is also employed as a mechanically anchored corrosion protection lining in concrete scrubber constructions.

Steuler utilizes its special lining system known as Bekaplast, which has been field-proven for over 30 years in the chemical industry. It consists of large-format thermoplastic sheets having a thickness of 5 to 8 mm. Conical knobs are welded onto the reverse side. These large knobs create a permanent, inseparable mechanical bond between the plastic lining and concrete construction. In this case, the service life of the materials is also virtually unlimited. Damages caused by the absorption of media, the formation of deposits or chemical changes in the surface can be effectively ruled out. Spray piping systems, linings for the scrubbers and components, such as sieve boxes for example, are manufactured out of the same material and round off the protection system.

The scrubber lining is delivered directly to the construction site in large-size sheets. While the concrete structure is being built, the sheets are attached to the inner formwork and then cast into place together with the walls and ceiling. The floor sheets are subsequently laid and bedded in either screed or mortar. Following the concreting operation all sheet joints are welded to ensure that the structure is gas and water tight. This process guarantees the construction of a testable, homogeneously lined chamber. Subsequent structural alterations can be carried out inexpensively.

Since the concrete structure and the lining are executed in one operation, this method offers significant advantages in terms of time. The finished structure may be exposed to loads immediately and is operational without waiting times. With this system, both elaborate pre-treatment measures, as normally required for retrofit applications of the customary corrosion protection linings, as well as health protection measures due to the use of dangerous chemicals are unnecessary.

The conversion of process engineering plants to a concrete construction method also eliminates the necessity of elaborate prefabrication procedures and costly substrate pretreatment for large-scale absorption towers. Even complex constructions can be executed with great speed and reliability.



Diagrammatic view on the right: Bekaplast-concrete-scrubber construction with gas inlet, spray levels and mist eliminators.

Steuler also installs thermoplastic channels mechanically anchored into the foundation with special design solutions for connection to tiled industrial floorings.



Crack-bridging floor coating in an absorber building, FRP-pipework, channel systems and gratings – produced and installed by Steuler.



Bekaplast-DWS™ System prefabricated double wall neutralisation vessels are set into the prepared structure and cast in.



Floor surfaces in the absorber areas and/or in the gypsum dehydration process areas must be securely and reliably protected against chemical loads caused by gypsum suspensions, acids, alkaline solutions, deionised water and electrolytes. They must also be protected against fluctuations in temperature, vehicular traffic carrying heavy loads and scraping with sharp-edged metal components during production or maintenance work. Industrial floorings and ceramic tile floorings supplied by Steuler will withstand a wide range of load conditions safely and dependably.



Steuler offers complete corrosion protection solutions for all plant sections in flue gas desulphurisation systems

The most important feature of industrial corrosion protection systems in flue gas desulphurisation plants is to ensure continuous plant availability and operational safety at all times. Steuler is one of the leading suppliers of corrosion protection systems in the flue gas desulphurisation sector as a result of innovative material developments and lining techniques, many years of experience and an outstanding performance record in the execution of projects.

The close interface between business units specialised in surface protection systems, refractory systems and plastics engineering have created a unique supply spectrum of application technologies and know-how.

Steuler offers custom-designed solutions for every area of a facility including the various production processes: the scope ranges from research and development to consulting, construction and production, all the way through to installation and servicing. Numerous references substantiate Steuler's expertise in the field of new construction, retrofit and maintenance projects. With more than 260 experienced, specially trained fitters and applicators as well as national and international subsidiaries and branch offices, Steuler is a specialised global contractor, guaranteeing reliable project execution within the scheduled deadlines.

Shaped bricks, mortar and compounds for refractory linings.

Ceramic tiling systems, brick linings and cements for industrial corrosion protection applications.

Apparatus and tank linings for severe chemical, mechanical and thermal loads.

Coating systems according to the German Water Resources Act [WHG] with General Building Regulation Approval issued by the DIBt.

Industrial floorings.

Mechanically anchored thermoplastic linings for sewage pipe systems, basins, vessels, shafts and process tanks.

Apparatus, pipelines, tanks and special constructions made of duroplastics and thermoplastics individually cut to size.

Photo below: Line slurry tanks and large-dimensional solution tank for flue gas desulphurisation plants are constructed by Steuler entirely as reinforced concrete vessels with a mechanically anchored thermoplastic lining.



Photo below: The tank and ceiling construction of the solution tank are completely lined with Bekaplast – smooth surfaces without pores, antiadhesive, highly resistant to chemicals.



**Nearly 100 years of know-how and
practical experience in the field of industrial
corrosion protection**



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