Bayer AG finds cutting-edge solution for large acid tanks

In 2003, Bayer AG commissioned Christen & Laudon to manufacture two storage tanks based on a GRP composite design (glass-fibre backed plastic) for the storage of hydrochloric acid. The size of the tanks and the special requirements of the application called for high-end materials.

The project at a glance

<table>
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<th>Project</th>
<th>Construction of two horizontal tanks in GFRP composite construction in segment shells with a diameter of 2.4 m and a length of 6 m</th>
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| Requirements |  - Very high chemical resistance  
  - Medium: Hydrochloric acid: 17 to 30%  
  - Operating pressure: –0.10/+0.50 bar  
  - Operating temperature: –25 to +60°C |
| Client | Bayer AG |
| Contractor | Christen & Laudon GmbH, Bitburg-Staffelstein |
| Technical support | Technical Service Center, SIMONA AG, Kirn |
| Products used | In-liner  
  - SIMONA® PVDF-GK sheets, thickness = 4 mm  
  - SIMONA® PVDF welding rods  
  Resin type (structural laminate)  
  - Epoxy vinyl ester resin DERAKANE-MOMENTUM 411-350 |
| Project time | 2003 |
SIMONA® PVDF-GK – the intelligent choice for chemically resistant composite tank constructions

Initial situation
Bayer AG is a global player with core competencies in the fields of health, nutrition and production of premium-quality substances. Most of the chemicals required for production have to be stored in large quantities – in tanks that meet the highest quality standards.

Task
Christen & Laudon were commissioned to develop two large-sized storage tanks for hydrochloric acid. The following criteria were of key importance:
- Outstanding chemical resistance
- High corrosion resistance
- High stability
- Cost-effective choice of materials

Solution
Due to the enormous size of the planned tanks, Christen & Laudon only considered a GRP composite construction. This comprises a chemically resistant thermoplastic as the in-liner – PVDF in this case, thanks to its good resistance to aggressive media – and structural laminate in GRP, a composite material made from resin and glass. However, as resin does not bond directly to the PVDF surface, the material selected was SIMONA® PVDF-GK, a high-quality PVDF with glass fibre backing.

In the subsequent production process the PVDF-GK sheets were cut into segments, formed in a hot-air oven and joined with PVDF welding rods. An electrically conductive carbon strip was applied to all weld seams to prove tightness. The cylinder was then reinforced with GRP in a winding machine and welded to the pre-fabricated bases and supports.

Further information
SIMONA AG
Technical Service Center
Phone +49 (0) 6752 14-587
Fax +49 (0) 6752 14-302
tsc@simona.de