Safe storage of sodium hydroxide solution at Covestro AG thanks to SIMONA® PP-C-PK internal tank lining

SIMONA® PP-C-PK is a genuine all-rounder when it comes to the internal lining of tanks for the chemical process industry. The material combines high chemical resistance with excellent weldability and owing to the polypropylene backing it provides an optimal bond with the load-bearing material of the tanks. These properties also impressed our partner, Plasticon Germany, who, in the production of a new elevated catholyte tank, opted for an internal lining with PP-C-PK sheets from SIMONA.
Initial situation
Covestro Deutschland AG is one of the leading manufacturers of high-tech polymer materials. For its site at Krefeld-Uerdingen, in the west of Germany, the company required a new elevated catholyte tank. Its purpose was to safely store the sodium hydroxide solution resulting from electrolysis.

Task
The new elevated catholyte tank, with an inside diameter of 2.50 m and a tank volume of nearly 20 m³, had to ensure safe storage of a 32% sodium hydroxide solution.

Plasticon Germany GmbH was commissioned by Covestro to make the tank. After consultation with Covestro experts, the company opted for a structure made of glass-fibre reinforced vinyl ester resin with a lining on the liquid side. The internal lining material had to feature not only a high level of chemical resistance but also a high level of temperature resistance because the tank was to be located in the open air when in operation and therefore had to withstand an ambient temperature of –10 °C. In addition, the material had to be easy to process and it had to be certain that the material would cling to the load-bearing material of the tank without any problems. A glass backing was ruled out as a potential adhesion promoter from the very beginning because that type of backing would not be resistant in the event of a leak and consequently would not be able to ensure a safe bond.

Solution
SIMONA® PP-C-PK sheets were identified to be a suitable internal lining material for the catholyte tank. As with all SIMONA types of polypropylene, SIMONA® PP-C is a convincing choice on account of its excellent resistance to chemicals and long service life. In PP-C, a copolymer, the monomers propylene and ethylene are chemically bonded, which enhances the impact strength of the material when it is exposed to the cold and enables use at temperatures between –20 °C and +90 °C.

The polypropylene backing of SIMONA® PP-C-PK sheets acts as an adhesion promoter and ensures secure attachment of the thermoplastic to the load-bearing tank wall. Identical chemical resistance of the thermoplastic and the adhesion promoter makes it possible to prolong service of the composite system in the case of permeating liquids. For the welding work it is not necessary to completely remove the backing in the weld seam zone, which simplifies processing.