

Gel mixing systems made with SIMONA® PE 100 for the battery industry



Overview of the tanks in the mixing system. All components must have permanent resistance to aggressive acids.

KUSTAN GmbH & Co. KG, a specialist in industrial and environmental plant made of plastic, manufactures entire mixing units used in the production of sulphuric acid gel for the battery industry. For gel mixing systems operated by Chinese and Indian customers the choice of material, the structural properties and the selection of equipment had to be considered very carefully. Since the material for making the sulphuric acid storage tank and the gel mixing tank had to be extremely reliable, the company opted for PE 100.

The project at a glance

Project

Design of a gel mixing system for the manufacture of VRLA batteries, using plastic storage tanks with double-wall insulation and additional outer wall cooling

Size of the mixing tanks

- Acid storage and cooling tank with a diameter of 2.0m and a height of 1.5 m
- Gel mixing tank with a diameter of 1.8 m and a height of 2.1 m
- Production volume: approx. 700 ltr./h

Requirements

- Media: Sulphuric acid (50% max.), silicic acid, phosphoric acid
- Service temperature: +4°C
- High stress crack resistance
- Long service life

Manufacturer

KUSTAN GmbH & Co. KG,
Gelsenkirchen

Technical consultancy

Technical Service Center
SIMONA AG, Kirn

Products used

- SIMONA® PE 100 sheets
- SIMONA® PE 100 pipes and fittings

Project time

- 2008/2009



From left to right: Connection points for adding liquid, valves and high-performance disperser; separate heat exchanger for reducing temperature; monitoring the process states

SIMONA® PE 100 – the proven tank material for chemically aggressive media

Initial situation

The use of AEROSIL® 200 silicic acid or the condensed type, AEROSIL® 200 V, can improve the limits of common lead acid batteries with liquid electrolytes. Conventional batteries that are used in most cars are not usually safe with regard to acid and can only be used in an upright position. Highly caustic battery acid may leak, depending on off-road conditions. Adding AEROSIL® 200/200 V, which alters the acid to give it a gel consistency, prevents the contents of the battery from leaking. Thickening with AEROSIL® 200/200 V substantially increases the current performance and service life of the batteries.

Task

Two battery manufacturers from China and India each required a gel mixing system that would meet the following requirements:

- High chemical resistance
- Suitable for use at low media temperatures
- Excellent processing capability
- Long service life

Solution

KUSTAN opted for SIMONA® PE 100 as the material of choice for the two gel mixing systems. The proven material PE 100 is particularly impressive due to its high chemical resistance, toughness and stress crack resistance even at low media temperatures down to –50 °C. Furthermore, PE 100 is very easy to process and its weldability in particular is excellent.

KUSTAN GmbH & Co. KG is acknowledged as a leading company in the field of specialist plant for the battery industry. For this sector, corrosion-resistant plastics are used to plan, make and assemble waste air systems, waste air scrubbers, sulphuric acid mixing systems and battery formation systems, for example.

SIMONA® PE 100

Properties

- High chemical resistance
- Extreme toughness and rigidity
- Good stress crack resistance
- Excellent corrosion resistance
- Service temperature range –50 °C to +80 °C
- Permanently watertight and strong welded joints

Product range

- Extruded sheets
- Pressed sheets
- Welding rods
- Solid rods
- Profiles
- Pipes
- Fittings

Further information

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