

## Case Study

### Coolant expansion tank in Durethan® DP AKV 30 HR H2.0



Fig. 1 Coolant expansion tank

Alongside its original line of business in hand-operated tools, **HEYCO** is also a well-known supplier of plastic parts and forged components for the automotive industry. Customers value HEYCO as a competent development partner for module and system business. With its 800 employees, the company produces technically sophisticated, high-quality components, including complex parts for the cooling circuit.

The function of the coolant expansion tank shown in Fig. 1 is essentially to accommodate the expanding coolant from the whole of the cooling circuit as the coolant heats up. It also allows the coolant to be topped up via the filler neck and indicates the coolant level. The component essentially comprises two large shells which are joined together by vibration welding.

The expansion tank is made of Durethan® DP AKV 30 HR H2.0, a 30 % glass fiber reinforced heat- and hydrolysis-stabilized polyamide 66 from LANXESS. This thermoplastic fulfils the following requirements that are placed on the application:

- high dynamic load bearing capacity
- very good resistance to media such as cooling agents and the typical chemicals used in the engine

**Grade:** Durethan® DP AKV 30 HR H2.0

**Manufacturer:** HEYCO-WERK Heynen GmbH & Co. KG

- high heat resistance and heat distortion temperature
- excellent weld strength

The weld, in particular, is subject to a high level of stress: its position means that it is always in contact with hot coolant and, in addition to this it is subject to static and dynamic loading through the pressure prevailing inside the tank.

The test program for the tanks thus includes long-term immersion in a hot water/glycol mix, followed by burst pressure tests at up to 6 bar.

These requirements can be fulfilled all the more readily if special attention is paid to achieving a suitable tank design, as was the case here.

LANXESS provided HEYCO with support at the design stage too, conducting comprehensive FEM analyses which made it possible to design an optimized rib structure inside the tank.



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