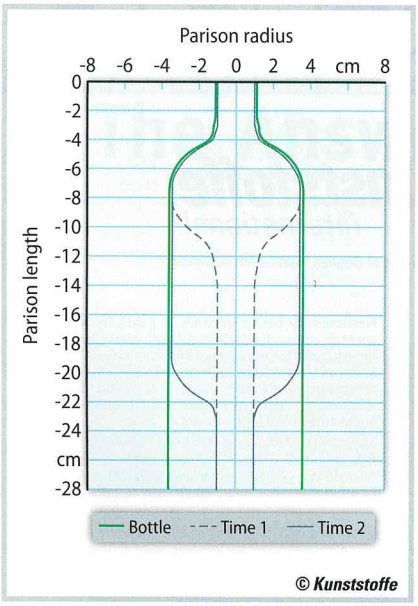


Fig. 7. General development of the outer contour of the parison at 110 °C during inflation in a glass bottle (source: IKV)

wall and the parison can only extend downwards along the wall.

In contrast to observations on thermoplastics, it is noticeable that the parison does not expand in the center first, slowly followed by the marginal areas [8], but first inflates in the upper area and the sections located further down do not follow until the upper part has come into contact with the glass wall. This could be due to the comparatively slow extrusion speed and the associated temperature differences over the length of the parison. This means that the upper area is hotter and can be inflated more easily and quickly than the lower end of the parison.

Conclusion and Outlook

The blow molding of solid silicone rubber allows complex hollow bodies to be made of silicone rubber. In order to facilitate processing by blow molding, a temperature-controlled die head was developed that enables the material to be pre-crosslinked during the process. The investigations on the blowing behavior of the material presented in this paper show that pre-crosslinking is a suitable method for achieving high degrees of stretch with silicone rubber. Pre-crosslinking can be produced in the die head without difficulty during parison extrusion. In conjunction with suitable process control, stretching ratios of up to 4.5 can be achieved and blow molded parts can be formed.

In the next step, blow molded parts are manufactured by using a heated metal mold and tested for their quality. The investigations focus on the wall thickness distribution of the component and the strength of the weld seam. ■

Foamed Sealant Steps up Efficiency

Precise Sealing and Bonding for Filters

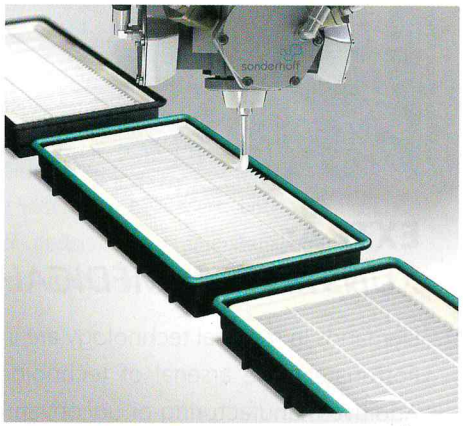
It is essential for filters to be fixed well and for filter frames to provide for density, so that no air can pass unfiltered. System supplier **Sonderhoff Holding GmbH**, Cologne, Germany, offers the corresponding dosing units and materials systems for adhesives, thus enabling the filter industry to meet these targets. Adhesive sealants on a PU basis are particularly interesting here, if applied as foam to bond and seal filter media.

At the Filtech 2018 trade show Sonderhoff will have their Smart-M dosing cell on display to show a state-of-the art application. The mixing head of the machine will apply the 2-component PU system (Fermadur type) over the entire surface of an MDF filter frame's interior. The pleated filter sitting inside the filter frame is thus sealed to make it air-proof from all sides. Thanks to the cellular structure applied upon the filter, the required amount of adhesive material is reduced by up to 50 %. This saves money and weight. However, the system reliably meets the requirements in terms of adhesive and sealing properties.

The PU-based materials offer features such as low emission for low VOC (Volatile Organic Compounds) values in clean rooms, antifungal or antibacterial properties, flame proofing according to UL94 HF1 for sealing foams or UL94 V0 for adhesive sealants, respectively. Heat-resistant silicone foams of the Fermasil product system are applied to seal air filters in the engine compartment at high temperatures.

Used especially for air conditioning units in vehicles, the sealing foam Fermapor K31 Low-Emission from Sonderhoff makes sure the filter is perfectly positioned at the air intake duct. What is more, low-emission PU systems, most of all, prevent air pollution with VOC emissions in the passenger compartment. For example, they meet Daimler's DBL 5452-13 specification demanding target values of 100 µg for VOC emissions and 250 µg considering fogging behavior per gram of polyurethane.

The antifungal and antibacterial properties of filter adhesives and foamed gaskets make sure no microorganisms or mold are produced in the gaskets of filter frames of air conditioning units or in the fresh air intake areas of vehicles. The ILH institute in Berlin, Germany, concerned with air hygiene undertook investigations confirming this.



To bond and seal pleated filters, the mixing head applies the foamed Fermadur adhesive sealant along the contour of the filter frame (© Sonderhoff)

At the trade show, the components are fed into the dosing cell via a rotary index table, for user convenience. Inserting and operating positions change by 180° at a 1.5 s cycle. The dosing cell's three-axis linear robot that applies the 2-component reactive materials operates along component edges in a traversing area up to 500 x 600 mm and up to a maximum component height of 250 mm. Working on component radii, Sonderhoff's linear robot achieves a maximum acceleration of 5 m/s².

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