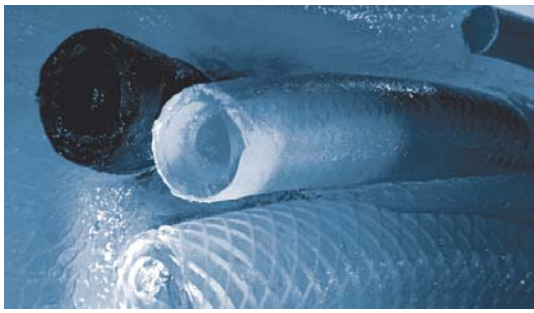
Innovations for the Rubber Industry

Cross Head with Hydraulic Tool Centering: Step by Step to the Ideal Rubber Hose

PRODUCT
INNOVATION



TROESTER

EXCELLENCE IN EXTRUSION.

Cross Head with Hydraulic Tool Centering: Step by Step to the Ideal Rubber Hose

The demands on the manufacture of hoses, particularly in the automotive field, are steadily increasing. Besides the material selection and the manufacturing process, a uniform wall thickness distribution over the whole hose circumference represents an essential quality criterion.

Based on the comprehensive know-how from the manufacture of high-quality extrusion heads for the cable industry and many years of experience in the manufacture of hose lines, TROESTER presents a new system for the automatic wall thickness centering for the hose production. The main item of the new system is a cross head optimized for the hose production. The head is provided with a conventional manual die piece adjustment by screws in the front area and additionally allows for a very sensitive swivelling of the inner tools (mandrel tip, extrusion mandrel) by means of a hydraulic drive. Contrary to well-known solutions where considerable force has to be applied hydraulically onto the outer tooling (die piece), the new design offers the possibility to position the mandrel tip in radial direction relatively smoothly and with highest precision. As the hydraulic drive is positioned on the rear side of the head being averted from the compound output, a safe mechanical functioning of the adjusting unit is ensured even in the rough daily production routine.

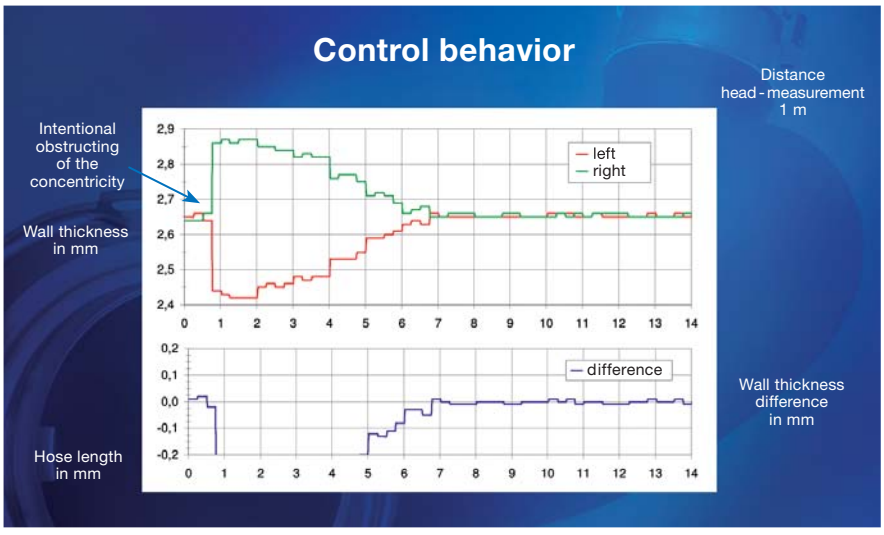
The new extrusion head meets all demands on a user-friendly operation: besides the possibility of hydraulic tool centering it offers the advantages of a smooth axial pintle movement for the wall thickness adjustment as well as a hydraulic push-out device for the guide piece. Furthermore, a stable hinge facilitates handling of the head for cleaning purposes and protects the material distribution unit from damage.

For the hose production the use of the new head system is particularly advantageous in combination with a downstream profile measuring system. The wall thickness, continuously measured online, is transmitted to an optimized digital controller which adjusts the eccentricity of the hose automatically step by step, within shortest time and with an impressive precision. In combination with an X-ray measuring device of type Sikora X-Ray 6000 it was possible under all tested production conditions to achieve an eccentricity per axis of below one hundredth of a millimetre and to maintain this value over the whole period of production.

Due to the fact that – in case of manual centering of the wall thickness – such a value can only be reached with a lot of time and effort and can rarely be maintained over a longer period of time, there are strong arguments for the use of the new technique, especially from an economical point of view.

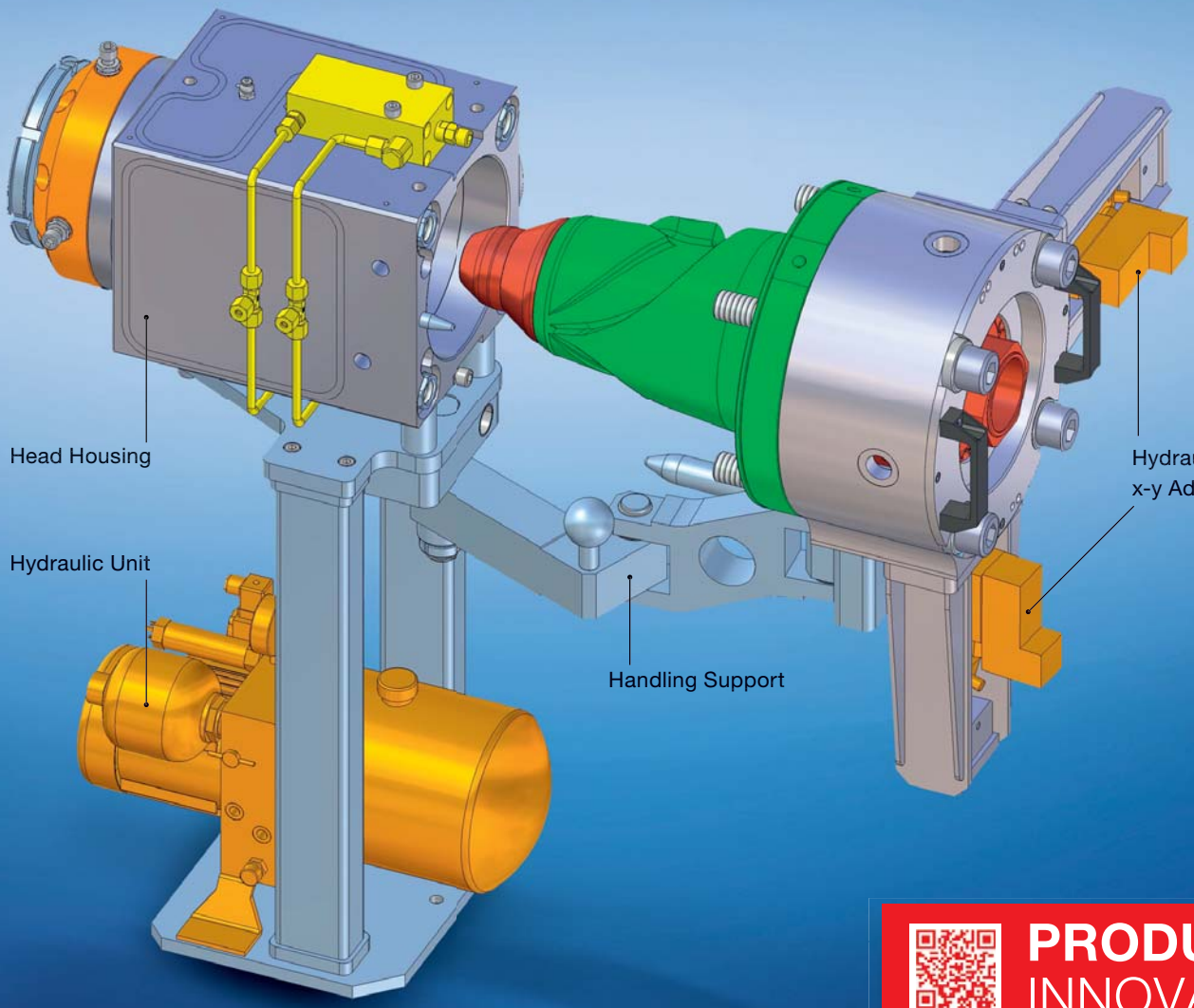
On the one hand, the use of a sensitive hydraulic wall thickness centering in combination with a high-precision measuring technique allows considerably to reduce both, the starting-up waste and the manual adjustment work during production. On the other hand, the eccentricity of the hose is continuously monitored over the whole period of production and reliably adjusted to a value close to zero by means of the control system. Once the ideal hose centering is ensured permanently, a great deal of material cost can be saved in the production just by reducing the wall thickness to a few hundredth of millimetres, so that the combination of extrusion head, X-ray measuring technique and adjustment may pay off in less than one year.

In conclusion, it can be said that the new technique developed by TROESTER not only contributes to raise the product quality by a reliable online process but also increases the economic efficiency of the hose production by saving raw material and minimizing waste.



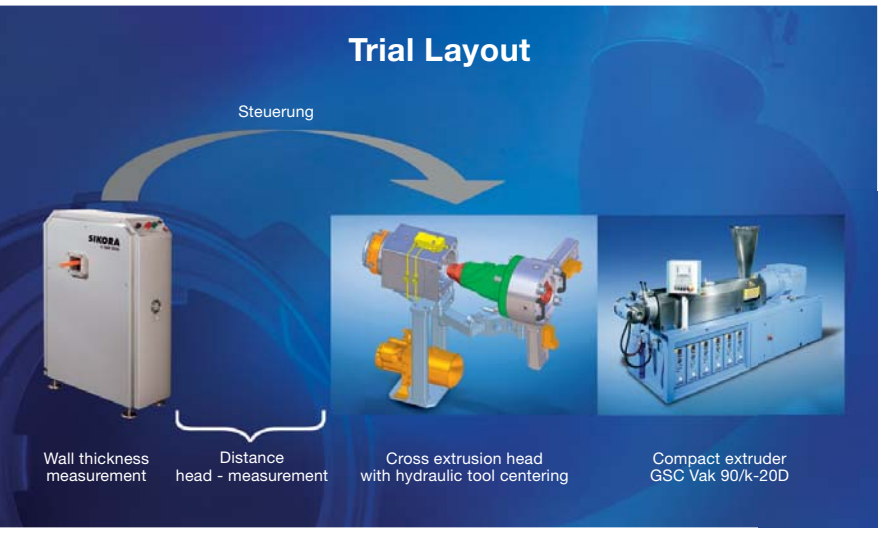
Control of the wall thickness difference, using the example of left – right

Cross Extrusion Head Qu 120/65–90° with Hydraulic Tool Centering



PRODUCT INNOVATION

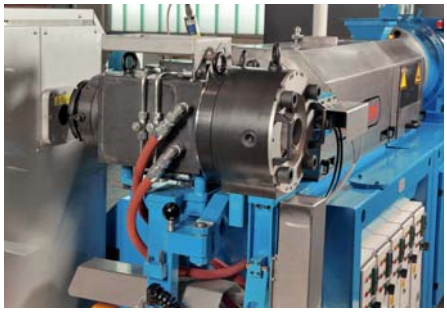
Trial Layout



Wall thickness adjustment by means of a smooth manual axial mandrel movement

Concentricity adjustment by sensitive swiveling of the inner tools and by means of a hydraulic drive during the production

The new technology concept from TROESTER and SIKORA for quality assurance by automatic wall thickness centering



Compact Extruder GSC Vak 90/k-20D

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