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Machines for Elastomers, Silicones and TPE at K 2013

Solutions for the Automated Process Chain in Elastomer Engineering

Zero-defect manufacturing of O-Rings and Rubber Seals

Ternitz (A), 02.07.2013: In elastomer engineering, the processors demand efficient system solutions. Six partner companies from Austria and Italy display a "transalpine" process chain for elastomer sealing parts at K 2013 under the name "Carousel". Processors from all over the world are given the opportunity to study an entire process chain: from the development of rubber compounds through machines and tools culminating in quality assurance measures as reworking, optical final inspection and automatic final sorting.

The core of the facility concept is an injection moulding machine MHF700/300XL editionS from Maplan Austria and a 4x54-fold mould from the Italian mould maker ORP Stampi with 4-drop cold runner technology. Thus the seals can be dispatched flawless, a quality assurance final inspection was involved in the concept. Rudolf Eisenhuber, the

director engineering at Maplan says: “The objective is to identify the potentials of improving of added value in all these areas from elastomer to manufacturing and quality assurance. Furthermore this facility concept provides an overview of a continuous production up to an defect-free production.”

Cold Runner Mould Technology for Seals with 216 Cavities

ORP Stampi is a specialist in developing, projecting and manufacturing moulds for rubber moulded parts. A focus lies in the manufacturing of cold runner systems with direct gating of cavities to save material and optimise processes. The mould engineering of the exhibit of ORP Stampi shows a 4x54-fold mould where sealings are produced in four pads. The 4-nozzle cold runner mould (CRB=Cold Runner Block) of the latest generation is designed with open nozzles, quick opening device, temperature control and regulators for volume flow control. The four nozzles fill each pad (containing 54 cavities) with an elastomer. This brings an output capacity of 216 sealings per cycle. NBR 65Sh A in orange is used as a sealing material which is originated from the compounder Mesgo. Each part has a weight of about 0.25 g. The total shot weight of the four pads amounts to 420 g.

“Adapted Machine” for elastomer processing from Maplan’s “Modular Kit”

The high standard which is set to the mould is reflected also in the machine technology. The horizontal injection moulding machine MHF700/300XLeditionS from Maplan is equipped with some special options from the manufacturers modular kit fitting to the

injection process. Besides higher reproducibility and injection capacity, the FIFO dual injection unit is equipped with a nozzle retract and is now also available in “1200-ccm execution“. The energy concept of the drive corresponds to the Cool Drive II Standard. A very short nozzle assures maximal injection pressure directly on the cold runner. The operator can control all process parameters of the machine transparently via a proven user interface of the 5th generation of control. Highest precision and the FIFO System are coupled with energy efficiency and low cost of maintenance as well as quick material and colour change if required. The daylight of the machine has been increased to 850 mm while the minimum mould height of 40 mm remains unchanged. Thus the machine covers all current mould concepts from simple two-plate moulds to cold-runner systems with automatic demoulding. The brushing system is made by Rubber System and consists of an electrically driven single-arm servo brush with horizontal adjustment for effective demoulding of parts.

To the point: Configuration of the component of quality assurance system

The task of GiBiTre instruments is to plan the entire production process and to create production related work equipments for measurements and tests. GiBiTre has at its disposal a consolidated horizon of experience in processing elastomers. This includes effective tests of not vulcanised compounds as well as the test of the finished rubber moulded parts.

It's come full circle: Integrated reworking and zero-defect manufacturing

From Gamma Stampi comes the punching machine for separating parts. It guarantees a perfect job punching out the sealings and hence avoid "reworking". This not only saves time and costs, but also makes the parts directly available for final inspection. The final inspection is carried out by devices from UTP Vison which is a manufacturer of high precision equipments for "intelligent inspection". Their tasks are twofold: testing quality of parts and sorting out faulty parts. The inspection consists of an optical test installation. It checks the dimensional accuracy of the sealings, surface finish and injection deviation. Sealings that do not meet the required criteria are sorted out via a turnout. The finished parts can then be shipped directly to the processors. The inspection module of UTP Vision is thus an important tool for zero-defect manufacturing in elastomer processing.

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Captions

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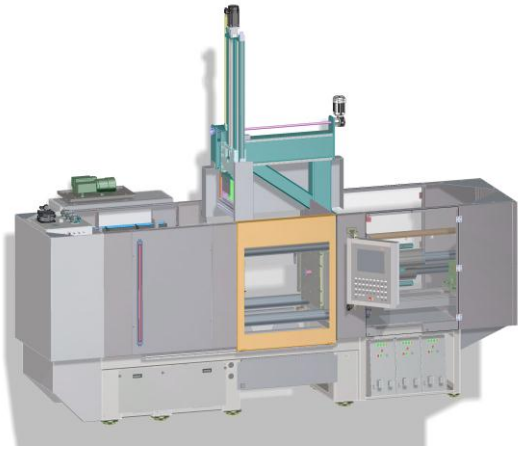
CAP 0 (main image): For O-rings and sealing elements also at high shot weights up to 1200 ccm: MHF700/300XLeditionS by Maplan

CAP 1: Rudolf Eisenhuber: (director engineering, R&D at Maplan): “The objective is to show processors in all areas of the production chain from elastomer through manufacturing and quality assurance what a zero-defect manufacturing can look like nowadays.“

CAP 2: Cold runner technology for the 4x54-fold mould by ORP Stampi

CAP 3. Glossy image of O-rings



CAP 4: 3D model of MHF700/300XLeditionS by Maplan

Maplan at K 2013, Düsseldorf: Hall 16 Stand B47

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About Maplan

Maplan was founded as a plant engineering company under the name "Maschinen und technische Anlagen Planungs- und Fertigungs-Ges.m.b.H." in the south of Vienna in 1970. From 1993 onwards the division "rubber injection moulding" has been further expanded, starting with the takeover of company Werner & Pfeiderer Gummitechnik.
MAPLAN covers the various requirements of vulcanisation and injection moulding in elastomer processing with a modular design system. All drive (CoolDrive II) and controller (PC5000touch V3) elements are used for both elastomer technology processes, to ensure precision, repeatability and availability. For application-compatible processing, high-precision FIFO injection units from our "work shelf" are available. The orientation and development of Maplan's machine programme focuses categorically on energy-efficient, process reliable and compact solutions to improve the processors' net product.

The company manufactures 250 elastomer injection moulding machines with a clamp force between 150 to 12 000 kN and an injection volume of 10 to 30,000 ccm each year.

All mechanical components of machine technology are produced by European manufacturers with a correspondingly high quality level and longevity.

The export share is 99%. Additionally to the production location in Austria, MAPLAN is represented by a number of service- and sales offices in more than 60 countries worldwide.

At the moment, MAPLAN has 160 employees at the headquarters in Ternitz/ Lower Austria (a total of 195 people worldwide) and generates revenue of 40 million EUR (2012).

MAPLAN - The Elastomer Champion