

Reaction Technology. At this year's K trade fair, the major companies of the PU sector are going to present a lot of small, but fine innovations to their customers. In nearly all areas, engineering boosted, thus improving the performance of many products. This has significantly enhanced benefits for the users, and the efficiencies of PU processes.

PUre Evolution?

From the harbingers of this year's K trade fair, at least, one can see no signs of a revolution in PU, as yet. Companies are going to showcase a lot of enhancements for established processes and technologies, as well as some valuable refinements. This pre-report gives you a small taste of what K 2007 will show.

Mixing Head Technology

In the area of mixing heads, there is technological advancement in spray technology. Moreover, some of the new mixing heads are suitable for metering extraordinarily small quantities of PU.

Krauss Maffei GmbH, Munich, Germany, has developed a new mini-volume mixing head, called MK 3,5/5UL-

2KVV (Fig. 1), which is well capable of blending the components and discharging the PU mixture homogeneously, even at a 5 g/s throughput, roughly. Thanks to the individually exchangeable nozzles sitting in the so-called "VV"-position, versatile materials and blend ratios may be mixed homogeneously. 90 degree deflection calms the discharged material, thus providing for consistent throughput.

Krauss Maffei's MK 2.-2K-S-L mixing head (Fig. 2) is part of a PU spray system engineered to produce high quality skins for complex automotive components such as instrument panels, centre consoles and interior door trim. With the Luchs II 2.0 mixing head, however, the polyurethane is sprayed, without admixture of air, using a spray nozzle developed especially for this process. To quote an interesting detail, the mixing head is equipped with a lance to even spray into

complex three-dimensional geometries. Because it contains no mixing element, the lance provides for homogeneous material distribution and little overspraying; in addition, it can easily be cleaned.

It is going to be the first time that **Cannon Deutschland GmbH** of Hanau, Germany, presents to the public the L-type version of its JL mixing head. There are no injection nozzles in the JL head, making operation easy and enabling high throughputs.

Desma engineering company in Achim, Germany, is showcasing an innovative low-pressure mixing head with some particular properties (Fig. 3) designed to process polyurethane. Regarding the



Fig. 3. Self-cleaning low-pressure mixing head (photo: Desma)

low-pressure sector, this mixing head is unique, because it cleans itself. What is more, it can process particle sizes of 0.1 mm up to 4 mm, making the head an outstanding option. It is no more necessary to mix fillers into the polyole prior to production, and this effectively avoids the known problems of filler sedimentation in the feed hoppers and in the machines' duct systems. Moreover, this allows for contents of fillers to be higher than before, and almost any filler is possible, ranging from barium sulfate to cork.

Systems Engineering

Nearly all innovations of systems engineering were made in the field of PU spray technology.

For instance, **Krauss Maffei** is introducing a robot-supported spray technique to coat automotive carpets with soundproof layers. The robot

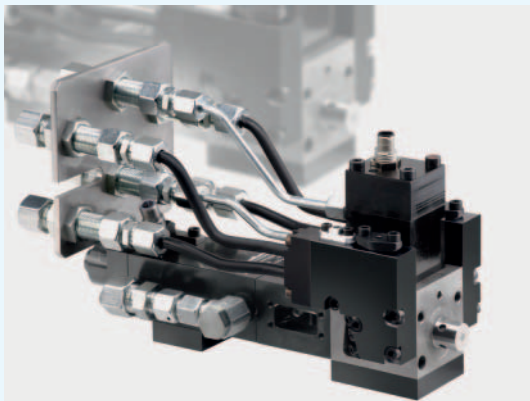


Fig. 1. The MK 3,5/5UL-2KVV mini-volume mixing head (photo: Krauss Maffei)

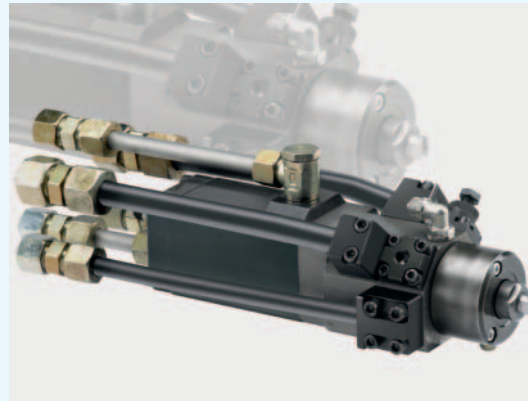


Fig. 2. The MK 2.0-2K-S-L spray mixing head for the production of high-quality PU skins (photo: Krauss Maffei)

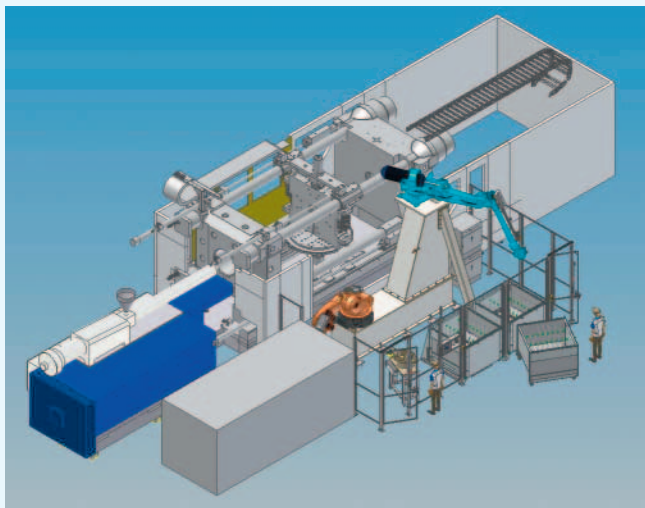


Fig. 4. SkinForm process using a spin-platen (illustration: Krauss Maffei)

moves the mixing head, while spraying the PU mixture upon the carpet, which was given its three-dimensional shape prior to that. A special fixture added to the spray head makes it much easier to program the robot's patterns of motion. Two laser beams simulate the spray cone's limits. This way, programming of the robot motion can be checked and optimized in a test run, without even employing materials.

Eventually, **Krauss Maffei** has completely integrated the SkinForm process (Fig. 4) into PU processing on spin-platen injection molding machines. This way, the enterprise consequently developed their production concept already intro-

duced at the last K fair, aimed at serial production as a target. Engineers are going to show a system that enables the user to link thermoplastic carriers to polyurethane layers of different colors and thicknesses, while demanding no time for re-fitting, whatsoever.

Hennecke GmbH, Sankt Augustin, Germany, is presenting an equipment to meter small volumes with precision, i.e. MicroLine (Fig. 5). This machine is typically used for automotive applications. Allowing for minimum material volumes of approx. 5 g/s per component, high-quality parts can be realized, such as PU components to be used inside cars. As examples one might

think of gearshift levers, cable grommets and small backfoamed parts. The machine concept here is based upon TopLine; this is the company's successful high-pressure metering equipment. As usually, Hennecke delivers the machine including comprehensive serial equipment, such as frequency-controlled motors, component tempering and an intuitive touch screen control interface.

Measuring Technology

VSE Volumenteknik GmbH of Neuenrade, Germany, is a producer of volume measurement equipment. Since one year, roughly, the company has been furnishing all their volume sensors of the VS series (Fig. 6) with a new sensor system to replace the Differential-Magnetic Dependent Resistors used up to then. As a benefit incurred in the new system, supply voltage is now the same for all types, i.e. 10 to 28 V. In addition, the range of operational temperatures is enlarged, now

for highly viscous media and low throughput rates.

Conclusion and Outlook

Using spray technology for PU systems has been growing more and more important, actually being the predominant subject of press releases. Metering and mixing low shot weights in high-pressure technology, as well as adding the filler only in the mixing head, with high as well as low pressures are further evolutionary steps boosting PU machine technology.



Fig. 5. MicroLine suited for minimum throughputs (photo: Hennecke)



Fig. 6. Volume sensors of the VS series (photo: VSE Volumenteknik)

being between 40°C and 120°C. In parallel with the new sensor system, VSE developed a new pre-amplifier, which offers improved resolution, meaning that the K-factor of the volume sensor can be increased by the factor 64. The higher resolution helps determine changes in throughput more quickly and precisely. It also provides more information and more details concerning the actual state of the throughput. This way, even for small volumes, the new system safeguards exact measurement and monitoring, thus guaranteeing exact metering. What is more, engineers can use the amplifier also with large-volume sensors

All in all, the various suppliers are going to present a bunch of interesting new ideas and evolutionary solutions, once again making a visit to the PU processing area at the K 2007 fair an enthralling experience. ■

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