Kistler is launching "ComoNeo" – likely the most innovative process monitoring system on the market. It offers a host of groundbreaking new features that will make day-to-day plastic injection molding work so much easier.

Kistler has long been present in the global market as a provider of innovative solutions to enhance process reliability in injection molding. The common denominator of these technically complex systems is that quality testing is integrated into the injection molding process. The benefit: defective parts can be excluded from the production process in order to eliminate unnecessary costs. ComoNeo process monitoring system – premiered at the 2015 Fakuma – moves automated production process monitoring into a new dimension.

It's never been easier to implement automated monitoring.

Simple, Intuitive Operation

The ComoNeo process monitoring system breaks new ground in the development of hardware and software. To start with, the entirely new design sets standards: the display features touch-based operation – perfectly matched to users' needs. Users also benefit directly from the increased number of channel inputs on ComoNeo: twice as many cavity pressure sensors can now be recorded so that an increased number of parts can be evaluated individually. ComoNeo's software is also committed to a process-oriented operating philosophy. This is reflected in the variety of new tools that provide active support for users with tasks, such as process fluctuation analysis and monitoring of part

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Cavity pressure in the injection molding process, ComoNeo reduces retooling times. In a nutshell: when the software). Automated mold selection also reduces development between the mold and the integrated monitoring system (which prevents errors on the interface between user roles) and automatic mold detection includes the redesigned user management feature. Additional Tools to Improve Analyses can be carried out.

The “Dashboard” is a second highlight: all information on current mold status, changes in color schemes for the curve display, and monitoring boxes for good/bad evaluations are coordinated. Now, the software scanning itself can therefore be merged for unlimited data storage. The CoMo DataCenter’s extensive database history is quick and easy to search with the help of various filters. Users can easily carry out multi-level searches for production orders and batches. To perform detailed analyses of process fluctuations and cycle times, ComoNeo’s DataCenter comes with a variety of evaluation functions. The expert version (available as an option) also allows integration of the data into the user’s IT infrastructure. All production data can therefore be merged for unlimited data comparability.

Benefits of the ComoNeo DataCenter

1. Central data storage for all recorded production data
2. Simple, speedy searches for production orders (filter option)
3. Production efficiencies can be compared across multiple batches
4. Process fluctuations are quickly detected
5. Recording and comparison of machine capacity utilization and efficiency

ComoNeo – Cavity View

- Monitoring boxes for all cavities
- Curve superposition for analyze-process fluctuations
- Cursor function to analyze curves
- Comment function to note other influences
- Reference cycle management
- Change color schemes for the curve display
- Show/hide cavities

ComoNeo – Dashboard

- Trend display of process fluctuations
- Information on current mold
- Current production with production and forced use
- Live measuring cycle
- Pressure differences in cavities to measure mold balance
- Active monitoring and monitoring results from the last cycle for all cavities

Thermo-setting plastic molding compounds have high heat deflection temperatures, good insulation properties, and high resistance to chemicals. Thanks to these properties, they are used for many components. Parts made from thermo-setting plastic molding compounds can be impregnated, especially in the electrical and electronics sector. For example, parts and sub-assemblies are manufactured from modified thermo-setting plastic materials because no other material can meet the demanding thermal and mechanical requirements. Another primary reason for the widespread use of thermo-setting plastic materials is their low cost compared with high-tech filled thermoplastic materials.

In the electrical and electronics industry, components must often meet strict mechanical requirements. In most cases, 100% quality control can only be achieved with destructive testing—which makes it impossible. This means that a stable manufacturing process is the only more necessary for consistently good quality: the number of good parts must be maximized but at the same time, cycle times must be kept short. Cavity pressure sensors from Kistler make it possible to optimize the process in two ways: first, with regard to the quality of injected or pressed parts, and second, in terms of cycle times. The benefits: cost-effective production. The individual processing characteristics of thermo-setting plastic molding compounds can easily be identified in the pressure in the injection molding process and features of the pressure curve are known, process errors and statistical errors can be identified by a process engineer in a short time. At maximum pressure, complete filling of the cavity and core occurs. As the mold is opened, in conjunction with monitoring of the shrinkage phases, conclusions can also be drawn about crack formation and mechanical properties (see the left-hand chart). Furthermore, the pressure curve provides information about viscosity and reactivity of the processed raw material, so producers can react rapidly to changes in it (the right-hand chart).

The processing characteristics of thermo-setting plastic molding compounds require specially adapted sensors. Since most materials have very low viscosity, material can penetrate the gap between the mold and the liner in conventional sensors without diaphragms, hence the need for an anti-shear design to maximize measured data and destroy the sensor. This is why sensors with a diaphragm structure are typically used when processing thermo-setting plastic. Kistler types 6142 and 6143 sensors are filled with a diaphragm on their tip. The diaphragm transmits the pressure to the quartz element located behind it. These sensors are also worked into a sleeve so that they are fully sealed and can meet demanding requirements during day-to-day operation.

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Lightweight Components: Make Production More Cost-Effective with Kistler

Sensor technology from Kistler plays a crucial role in the automated production of composite components. The benefits: cost-efficient production of reproducible component qualities, backed by documented proof.

Fiber-reinforced plastics (FRP) feature impressively low weight combined with very high strength. Thanks to these advantages, the use of composite materials is increasing – not only in the aerospace sector, but also in the automotive industry.

Until recently, fiber composite parts were manufactured using complex manual methods, but presently these have largely been replaced by processes that allow a high degree of automation. Processes such as RTM (Resin Transfer Molding) and wet molding offer potential for highly automated manufacture.

Based on sensors and systems that are specifically matched to these production methods, Kistler offers individual solutions to automate manufacturing processes and for related quality assurance procedures. Kistler’s sensors can efficiently identify the characteristic process phases, such as evacuation, injection and curing from the pressure curve. The results: optimized process parameters and more cost-efficient production.

Process Efficiency Thanks to Sensor Technology from Kistler
Kistler’s sensors offer virtually unlimited service lifetimes; they deliver highly linear measurement results and they operate independently of temperature.

Charge Amplifiers
Kistler offers charge amplifiers that are specifically tailored to the RTM process, with amplification ranges that provide excellent support for the relatively low pressures involved.

Process Monitoring System
CoMo Injection from Kistler, for optimization, control, monitoring and documentation: compact, compliant with industrial standards and easy-to-use.

Process Optimization with Cavity Pressure Measurements:
• Process-integrated quality testing
• Shorter setup times
• Process control
• Early detection of defects (in the preform, as well as the part being produced) thanks to cavity pressure monitoring

RTM

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For applications with multiple cavities, the spacer sleeves should be numbered and adapted to the individual sensors.

Dismounting the Sensor and Spacer Sleeve
Before the sensor can be dismounted, the spacer sleeve must be removed from the mold insert. Due to the play between the spacer sleeve and the bore, the sleeve simply slips out of the bore when the mold insert is turned round. The sensor can then be pulled out of the bore with the help of an appropriate extraction tool (see the table below).

Spacer sleeves should always remain assigned to the relevant sensor during this process.

Due to their low weight and high strength, composite components are ideal for use in the aerospace and automotive industries.

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