

# AutoForm-Sigma<sup>®</sup>

Software for Robust Processes



- ▶ Determination of process capability and influence of parameter variations on production
- ▶ Identification of process instability issues and definition of the most appropriate parameters
- ▶ Digital prediction of process stability and rapid evaluation of correction measures during production
- ▶ Reduction of press line downtime and reject rate
- ▶ Enhancement of the process efficiency and reduction of overall production costs



**AUTOFORM**  
*Forming Reality*

# AutoForm-Sigma<sup>®</sup>

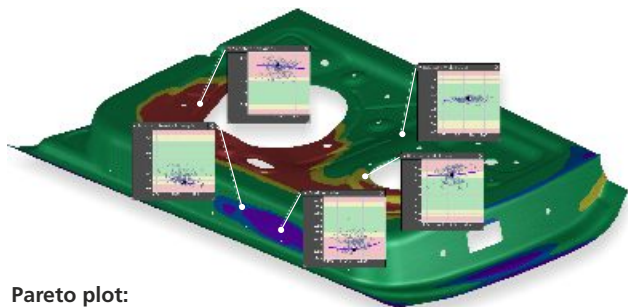
## Efficient Correction Measures During Production and Robust Stamping Process

AutoForm-Sigma enables engineers to design efficient and stable stamping processes. The resulting reduction in downtime of press lines as well as reject rate ensure a cost-efficient manufacturing process. As AutoForm-Sigma allows for effective parameter adjustments during production, unexpected interruptions are limited and deadlines can be met.

Ideally, a stamping production line is set up according to engineering and runs in a perfectly matched simulated environment. However, in reality, parameters in engineering are not as constant as commonly assumed. The reason for this is that in practice there are unavoidable and uncontrollable noise parameters which affect the process conditions.

Material properties can vary from coil to coil, even within the same coil. Lubrication, tool and sheet roughness as well as friction coefficient may vary as well. Press forces, blank position, tool temperature and tool wear may also vary from stroke to stroke in the press.

AutoForm-Sigma takes into account the noise and variability that are inherent in the stamping process and provides a better reflection of the real state of manufacturing. With this software, the effects of noise and variability on the robustness of the stamping process are quantifiable and predictable. Engineers can select the appropriate correction measures in order to ensure a stable and reliable process.



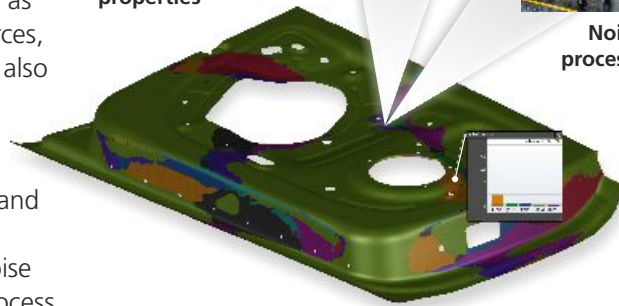
Pareto plot:  
springback as dominant variable



Noise in material properties



Noise in forming process parameters



Variation of springback due to noise

In addition, the software enables them to determine the  $C_{pk}$  process capability, which is an indicator for process stability and reliability. Robust process definition is essential for the efficient production of stamped parts which meet quality standards.

The sensitivity analysis of control parameters, such as press forces or speed, carried out by AutoForm-Sigma enables operators to make effective adjustments that reduce both press line downtime and part rejection rate.

### AutoForm Engineering – Company Offices

Switzerland	Pfäffikon SZ	+41 43 444 61 61
Germany	Dortmund	+49 231 9742 320
The Netherlands	LB Capelle aan den IJssel	+31 180 668 255
France	Aix-en-Provence	+33 4 42 90 42 60
Spain	Barcelona	+34 93 320 84 22
Italy	Turin	+39 011 620 41 11
Czech Republic	Praha	+420 603 248 580
Sweden	Stockholm	+31 180 668 255
United States	Troy, MI	+1 888 428 8636
Mexico	Corregidora, Qro.	+52 442 225 1104
Brazil	São Bernardo do Campo	+55 11 4122 6777
India	Hyderabad	+91 40 4068 9999
China	Shanghai	+86 21 5386 1153
Japan	Tokyo	+81 3 6459 0881
Korea	Seoul	+82 2 2113 0770

© 2020 AutoForm Engineering GmbH, Switzerland.

"AutoForm" and other trademarks listed under [www.autoform.com](http://www.autoform.com) or trade names contained in this documentation or the Software are trademarks or registered trademarks of AutoForm Engineering GmbH. Third party trademarks, trade names, product names and logos may be the trademarks or registered trademarks of their respective owners. AutoForm Engineering GmbH owns and practices various patents and patent applications that are listed on its website [www.autoform.com](http://www.autoform.com). Software and specifications may be subject to change without notice.

Publication SIB-3-E



**AUTOFORM**  
Forming Reality