자동차 판넬의 스프링백 평가
- 오토폼 시그마를 통한 요인 및 민감도 분석 -

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Valuation of Springback, Influence and Sensitivity on a real world automotive part

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Abstract

Forming simulations have become fully integrated into product, tool and process design over the last few years. Representing the entire production cycle including springback is a hurdle that has been taken lately. Valuation of constrained springback and process capability prediction of a real world part with simulation tools is the aim of this work.

The tool development of an automotive part has been followed from its first draft till the series production tool. Tool adjustments for springback compensation were needed to achievea part within the required tolerances. The required tolerances were defined by a springback measurement in a check gage.

The process of tool adjustments and springback measurements are validated with help of simulations. The main question to be answered was whether the simulation was able to predict the springback correctly. During a certain period in the series production, the part has been monitored to identify the influence and sensitivity of parameter variations like material properties. Also numerical influence and sensitivity analyses haven been performed to validate the accuracy of the numerical model and whether it was possible to determine the parameters influencing the springback behaviour the most.

Concluding can be stated that it is possible to simulate springback in a check gage including all the positioning pilots and clamps. The prediction of the springback in the check gage is within acceptable tolerances. Also the influence of the parameter variation during the series production could be identified. So, in the future springback effects and parameter variations can be incorporated in series production process design.

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