

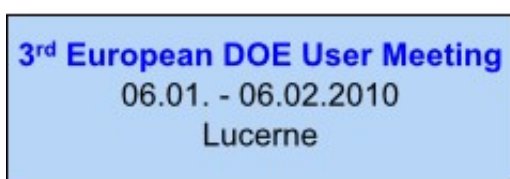
Case Study at the 3rd European DOE User Meeting in Lucerne „Mixture Optimisation in Practice – Using the Example of an Adhesive Formulation“

(06.01.2010 – 11:20 to 11:40 by Reto Dohner, Sika Technology AG)

Abstract

For the development of a 1 component Polyurethane adhesives, SikaTechnology AG performed a DOE with the target to optimise a product formulation with six components (and two additional restrictions). The basic mechanical and adhesion properties of the adhesive are the defined target values. This includes two categorical values (one ordinal and one nominal) as well many adhesion data, which are given in percentage cohesive failure. The design was carried out with Design Expert and consists of 43 runs (D-Optimal, Quadratic, No Blocks). The standard mechanical properties are analysed in Design Expert with an appropriate transformation and regression-model. All regression-models for the adhesion results were calculated using DesignExpert and percentages transformed according to J.W.Tukeys "First Aid Transformation" $y'=\arcsin(\sqrt{y/100})$. The two categorical values have been processed with logistic regression models in "R" with `polr(...)` and `regr(...)`. The data analysis performed in Design Expert allow the determination of the most influential variables for each target value and the calculation of "best suitable" adhesive formulations.

The following questions arise from this study: How can I judge the quality of a design in DesignExpert with the estimated variances, before the testing starts? Is it possible with Design Expert to test calculated regression models with additional confirmation trials, without integrating them into the model? Is the transformation for percentages $y'=\arcsin(\sqrt{y/100})$ always useful (and what are the alternatives)? Why it is not possible to use GLM's in DesignExpert and what must be regarded analysing DesignExpert data in an external applications (as "R")?



June 1st to June 2nd 2010 in Lucern / Switzerland

The registration fee is 420,- Euro excl. of VAT

All lectures are given in English

For more information please have a look at the conference page (english / german)

http://www.statcon.de/dxusermeeting_63_en.html