

Demo: Fitting a Logistic Regression Model with Interactions

In this video, we use the MetalCoating example and fit a model for the response, Outcome. For this demonstration, we include only the continuous predictors and their two-way interactions as model effects.

We begin by selecting Fit Model on the Analyze menu.

We select Outcome as the Y variable.

Then we select humidity through belt speed as model effects and click Add. To enter a specific interaction term in the model, we select the columns and then click Cross.

Rather than adding interactions one at a time, we can add them at the same time. Let's remove the model effects and start over.

To enter all five continuous main effects and their two-way interactions to the model simultaneously, we select the five columns and then select Macros, Factorial to Degree.

The default personality is Nominal Logistic, and the target category is Defective.

The Effect Summary table shows the terms in the model, in ascending order of p-value. There are many nonsignificant terms.

The LogWorth statistic is related to the p-value. The higher the LogWorth, the lower the p-value. A blue line is drawn at a LogWorth of 2, which is equivalent to a p-value of 0.01.

We slowly reduce this model until only significant terms remain.

The reduced model includes three main effects and two two-way interactions.

Let's look at the Prediction Profiler.

Belt speed is involved in the two-way interactions. When we change the value of belt speed and keep everything else constant, we can see the influence of paint viscosity and pump pressure on the defective rate.

For example, at higher belt speeds, higher paint viscosity and lower pump pressure are required to minimize the defective rate.

We can use this information to determine the best settings for these process parameters.

Close