

# DOE Screening Experiment Analysis

This guide provides instructions on analyzing screening experiments (e.g., fractional factorial) using the **Fit Two Level Screening** platform. Though the **Fit Model** platform can also be used, the **Fit Two Level Screening** platform produces graphs and analysis results designed for identifying the important effects in a fully saturated experiment. This example is a 20 run  $2^5$  screening experiment generated from the **Custom Design** platform. This design allows estimation of all main effects and two-factor interactions.

## Specify the Model and Analyze

Most experiments designed in JMP will have **Screening** and **Model** scripts saved to the data table. The **Screening** script launches the **Screening** analysis platform and automatically fits a saturated model.

1. Launch the **Fit Two Level Screening** platform under **DOE > Classical > Two Level Screening** or Click on the **green triangle** next to **Screening** to run the script if saved to the data table.
2. JMP fits a saturated model (here, 19 terms plus the intercept). The **Contrasts** table and **Half Normal Plot** identify active factors using **Lenth Pseudo Standard Error (PSE)**.

Notes: In screening experiments, we assume that most effects are inactive and their estimates are essentially random noise.

The line in the **Half Normal Plot** is drawn with a slope equal to the **Lenth PSE** (an estimate of the residual standard error). Most effects are inactive and fall close to this line. Effects that deviate substantially from this line are labeled as active.

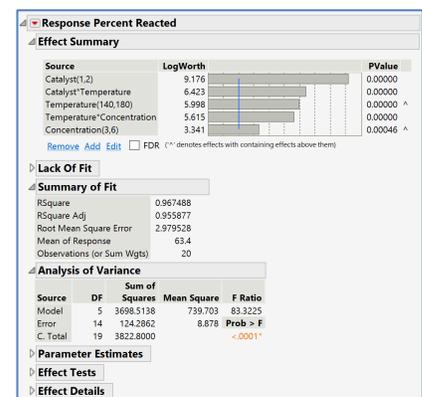
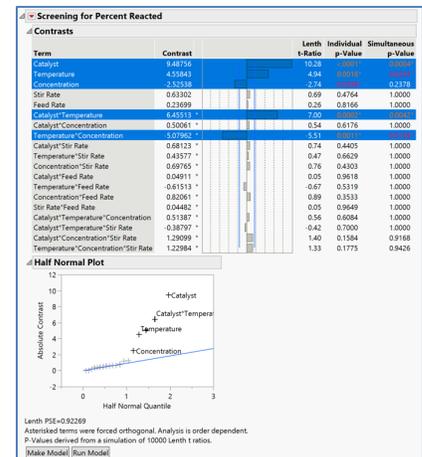
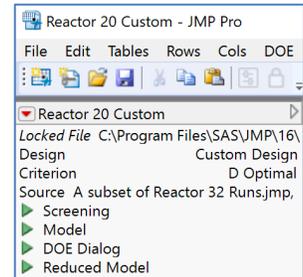
3. Select **Run Model** (at the bottom) to launch the **Fit Model** platform with only the active effects. Note: You need to include the main effects for any factors that are included in a significant interaction regardless of the p-value for that main effect. Add those terms by selecting them in the table while holding the command key. Results include: Effect Summary, **Lack of Fit** (if replicated points), Summary of Fit, **ANOVA table** and more.

Other options – such as **residuals or normal plot, profiler and interaction plots** – are available under the **top red triangle**.

Tips:

- **Individual and Simultaneous p-Values** in the **Fit Two Level Screening** platform are based on Monte Carlo simulation (and will vary).
- An alternative approach to running the analysis is to use **Analyze > Fit Model** specifying the model or run the **Model** script. See the “DOE Fractional Factorial Analysis” guide.

Reactor 20 Custom.jmp (Help > Sample Data Folder > Design Experiment)



Visit **Design of Experiments Guide** in **JMP Help** to learn more.