

## Design-Ease<sup>®</sup> Software, Version 7.0

### Make Breakthrough Improvements with Design of Experiments (DOE)

Design-Ease software, version 7 (DE7) is a powerful, yet easy-to-use program for experimental design. A must for anyone wishing to improve a process or a product, Design-Ease 7 allows you to screen for vital factors, make breakthrough process improvements, and optimize over a set of criteria.

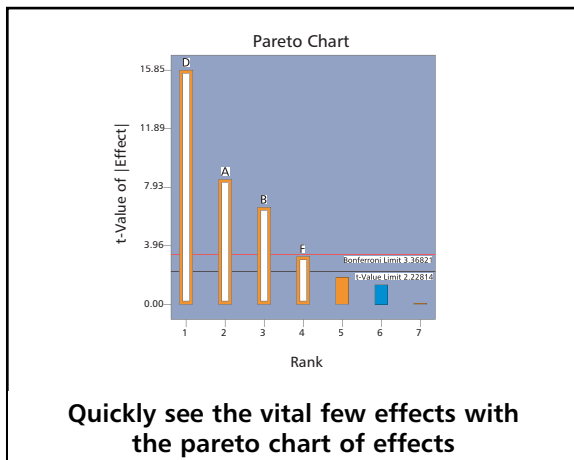
*"Design-Ease is extremely easy to use, flexible and accurate."*

*Martin Gibson, Statistician, Jaguar Cars*

### Design-Ease Features: Powerful, Yet Easy to Use

Designed as an entry-level DOE software package, Design-Ease 7 offers features for ease-of-use and functionality that you won't find in general statistical packages. You'll discover a wide variety of designs, the flexibility to modify designs, unique evaluation capabilities, graphics to simplify interpretation, an intuitive interface and a greatly expanded help system. With the powerful optimization features in Design-Ease 7, you can maximize desirability for dozens of responses simultaneously.

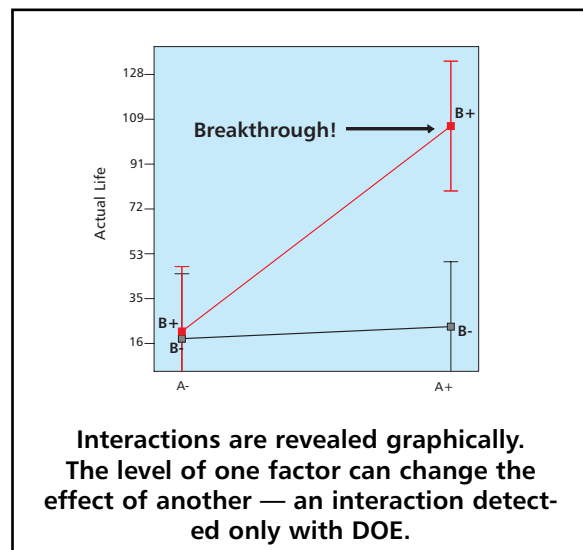
### What's New in Design-Ease 7 — The Highlights



- Pareto chart of effects: Quickly see the vital few effects relative to the trivial many in two-level factorial experiments.
- Multiple Response Optimization: Find your most desirable sweet spot for process settings.
- "Min-Run Res IV" (two-level factorial) designs for 5 to

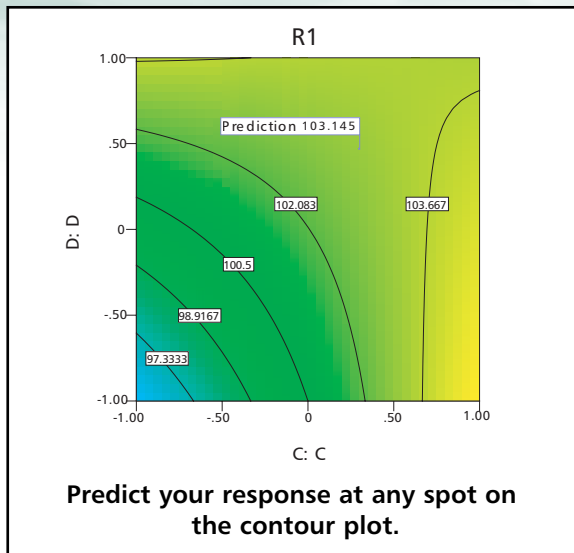
50 factors: Use a minimum number of runs to screen main effects.

- "Min-Run Res V" designs for 6 to 31 factors: Resolve two-factor interactions (2FI's) with a minimum number of runs.



- Two-level fractional factorials for up to 512 runs and 21 factors: Accommodate more factors than ever before possible.
- New "Color By" option: Color-code points on graphs according to the level of another factor — a great way to incorporate another piece of information into a graph.
- "Screen tips": Press the new tips button for enlightenment on the current screen — this is especially helpful for novice users.
- Full-color contour and 3D surface plots: Graduated colorization adds life to response surface methods (RSM).
- 3D plots for categorical factors: See colored bars towering above others where effects are the greatest.
- On plots of effects simply draw a box (lasso) around the ones you want selected for your model: This is much easier than clicking each one with your mouse.
- Data Points on 3D graphs: See "lollipops" protruding from surfaces where actual responses were collected.
- Crosshairs window: Predict your response at any place

on the contour plot.



- Magnification feature: Incredible tool for expanding a mixture graph that is originally a small sliver and difficult to interpret.
- Row(s) in the design layout are highlighted when point(s) are selected on diagnostics: The highlighting feature makes identification of problematic data much easier.
- Numerical optimization solutions are now carried over to graphical optimization and point prediction: Explore the results of the numerical optimization on other screens.
- Right-click on any response cell and "ignore" it: Previously one had to ignore an entire row in the design matrix, even though the other responses may have good data.

## A Tremendous Variety of Designs Meet All Your Experimental Needs

- Optimal (minimum-aberration) blocking choices
- Design-builder updates resolution of two-level fractional factorials when the number of blocks has changed: Immediately see how segmenting a design might reduce its ability resolve effects **\*NEW!**
- Block names are now entered during design build: Identify how you will break up your experiment, for example by specific subject, material lot or the like **\*NEW!**
- User-defined base factors for design generators: More flexibility to customize fractional factorial designs **\*NEW!**
- "Min-Run Res IV plus two" option: Ask for two extra runs to make your experiment more robust to missing data **\*NEW!**

- High-resolution irregular fractions, such as 4 factors in 12 runs
- Plackett-Burman designs for 11, 19, 23, 27 or 31 factors in up to 64 runs respectively
- General (multilevel) factorial designs (up to 32,766 runs) for categorical factors with mixed levels
- Expanded D-optimal capabilities — impose balance penalty, force categoric balance: This feature helps users equalize the number of treatments **\*NEW!**
- In General or Factorial D-optimal designs, categorical factors can be specified as either nominal or ordinal (orthogonal polynomial contrasts): This affects the layout of analysis of variance (ANOVA) **\*NEW!**
- Taguchi orthogonal arrays
- Coordinate exchange capability for D-optimal designs: Allows you to use more factors and levels in your D-optimal design **\*NEW!**

## Enjoy Incredible Flexibility in Design Modification

- "Semifold": In only half the runs needed by a normal foldover, augment Res IV designs to resolve specified 2FI's aliased in the original block of runs **\*NEW!**
- Add center points, blocks and replicates without rebuilding the design: This will be a real time-saver **\*NEW!**
- Define your own generators for fractional factorial designs
- Ignore a row of data while preserving the numbers
- Add new factors and blocking to existing designs
- Edit factor names and levels even after a design is created
- Change factors from numeric to categoric and back
- Fold over one or more factors for any two-level design
- Easily analyze designs with botched or missing data

## Evaluate Your Experimental Design with Unique Tools

- Annotation option on reports: This will be a boon to those who may be unfamiliar with all the esoteric statistics needed for design evaluation **\*NEW!**
- Customizable design evaluation content and power levels: Use the OPTIONS button to select which statistics to display, specific power levels to report, and whether to display the standard error or variance on the graph (with option to scale by N — the number of runs in the design) **\*NEW!**

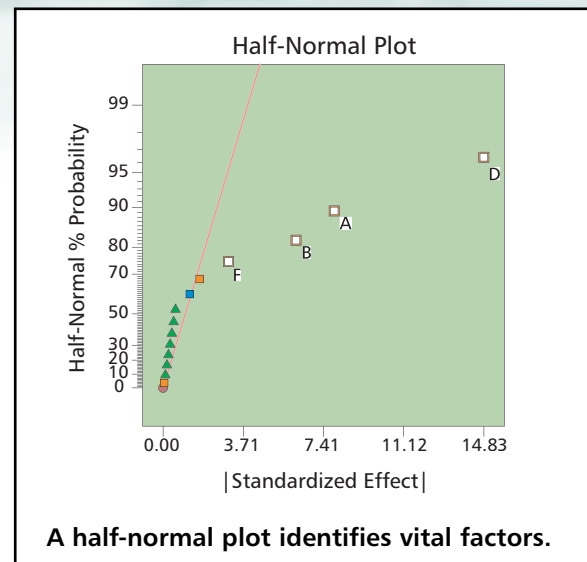
- Specify model terms to ignore so they don't display in the alias list: For example, don't bother showing interactions of four or more factors **\*NEW!**
- Evaluation can be done on either a design or a particular response: Shows the effect when data is missing from a specific response, but not all responses. **\*NEW!**
- Graph any two columns of data on the XY graph (this is a great way to view a block effect)
- Power calculations provide assurance that you can detect effects
- Get all the details you need on aliases, degrees of freedom, leverage, correlation, etc.
- From the Alias List, Pareto Chart or Effects Plots views, right-click on effects to show aliases: Never lose sight of what really is being measured in fractional-factorial designs **\*NEW!**
- Select alternative aliased effects: Choose what you think makes the most sense based on your subject matter knowledge **\*NEW!**
- Backward stepwise regression is now applicable to factorial designs: Useful for quickly analyzing general (categorical) factorials **\*NEW!**

### Locate Your Sweet Spot with Multiple Response Optimization **(\*ALL NEW!)**

- Maximize, minimize or target specific levels for both responses and factors
- Set weight and importance levels to prioritize responses for desirability
- Choose 2-D contour, 3-D surface, histogram or ramp desirability graphs
- Include categorical factors
- Set factors at constant levels
- Add equation-only responses, such as cost, to the optimization process
- Look at the overlay plot to view constraints on your process or formulation
- Predict responses at any set of conditions (including confidence levels)
- Discover optimal process conditions or formulations

### Simplify Interpretation with Terrific Graphics

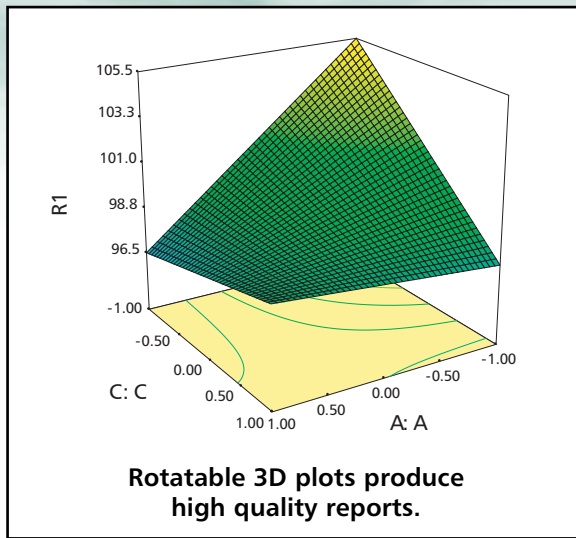
- Discover significant effects at-a-glance with half-normal or normal probability plots, include points to represent estimates of pure error (if available from your design)



- Select effects using probability values
- See the effects plot in the original scale after transforming the response
- View a complete array of diagnostics graphs to check statistical assumptions and detect possible outliers (bonus feature: predicted-versus-actual graphs with a 45° line)
- See the Box-Cox plot for advice on the best response transformation
- Graph alternative aliased interactions
- Generate interactive 2-D contours and rotatable 3-D graphics (see next page)
- Edit colors, text and more to produce professional reports
- DFFITS: Spot influential runs via this deletion diagnostic that measures difference in fits when any given response is removed from the dataset **\*NEW!**
- DFBETAS: See from this deletions diagnostic how model terms change due to an influential run **\*NEW!**
- Confidence bands on one-factor plots: Get a good feel for the uncertainty in predicted response as a function of the factor level **\*NEW!**
- Color-codes for positive versus negative effects: Assess plus or minus impacts on half-normal and Pareto plots **\*NEW!**
- Smart tic marks: Get more reasonably rounded settings straight off **\*NEW!**

### Build Confidence with Statistical Analysis of Data

- Make substitutions for aliased effects



- Select optional annotated views for assistance with ANOVA interpretation
- Inspect F-test values on individual model terms and confidence intervals on coefficients
- Means and standard deviations for all experimental inputs (factors) and outputs (responses) have been added to the Design Summary screen: Provides a handy assessment of your system **\*NEW!**
- Define preference for sums of squares calculations for both numeric and categoric factors as sequential, classical, or partial: These distinctions are important for statisticians who want to do ANOVA in specific ways **\*NEW!**
- If your model is aliased, a warning will pop up prior to viewing the ANOVA for two-level fractional factorials, allowing you to make substitutions for aliased effects
- Take advantage of user preferences, ex: make a global change in significance threshold (0.05 by default vs. 0.01 & 0.1)

### Save Time with Design-Ease's Intuitive Interface

- Easily maneuver through the program: go down the tree, through wizards, and across progressive toolbars
- View numerical outputs spreadsheet style
- Cut and paste graphics to your word processor or presentation, or numbers to or from a spreadsheet
- View several graphs simultaneously using the handy pop-out option

### Find the Answers to your Questions in the Expanded Help System

- Tutorial movies: See Flash demo's of features via the

Screen Tips tool — a very effective way to show how to navigate through the software **\*NEW!**

- Internet links: Helpful connections to further information **\*NEW!**
- Open reports and graphs for automatic updating
- View numerical outputs spreadsheet style
- Export any grid view as ASCII text, for example, design layouts or ANOVA reports
- XML (eXtensible Markup Language) capability: Export design file or reports in viewable format that can be manipulated for further processing (XML tool also allows import of designs created externally) **\*NEW!**
- Export graph to file: Save as enhanced metafile (.emf) that can be inserted as a picture from file to Microsoft Word and the like **\*NEW!**
- Set row status to normal, ignore or highlight: This allows users control over their design matrix **\*NEW!**
- Set single response cell status to normal, ignore or highlight: Even better! **\*NEW!**
- Context-sensitive help provides immediate response
- Better guidance helps you choose the best model
- A bonus help section provides "getting started" advice to novices
- Special user tips offer hints not normally found in a help system

### System Requirements

- Pentium IV 1 GHz or greater recommended (minimum Pentium 266)
- Windows 98 SE, ME, 2000 or XP
- CD-rom drive
- 40 MB hard-disk space or greater
- Memory: 128 MB minimum, 512 MB recommended
- Annual network licenses available **\*NEW!**

### Extra!

- Free technical support
- Limited free statistical support
- Helpful tutorials illustrate the most powerful features
- 30-day money-back guarantee
- Go to <http://www.statease.com/de7descr.html> to see more new features in Design-Ease 7