

stat teaser

ABOUT STAT-EASE® SOFTWARE, TRAINING, AND CONSULTING FOR DOE
Phone 612.378.9449 Fax 612.378.2152 E-mail info@statease.com Web Site www.statease.com

Workshop Schedule

Experiment Design Made Easy

March 27–29, 2007: Philadelphia, PA
May 8–10, 2007: Minneapolis, MN
July 10–12, 2007: Minneapolis, MN
August 21–23, 2007: Minneapolis, MN

Study the practical aspects of DOE. Learn about simple, but powerful, two-level factorial designs. \$1495* (\$1195 each, 3 or more)

Response Surface Methods for Process Optimization

March 20–22, 2007: Minneapolis, MN
September 25–27, 2007: Minneapolis, MN
Maximize profitability by discovering optimal process settings. \$1495* (\$1195 each, 3 or more)

Mixture Design for Optimal Formulations

April 17–19, 2007: San Jose, CA
June 5–7, 2007: Minneapolis, MN
August 7–9, 2007: Minneapolis, MN
Find the ideal recipes for your mixtures with high-powered statistical tools. \$1495* (\$1195 each, 3 or more)

DOE for DFSS: Variation by Design

June 20–21, 2007: Minneapolis, MN
Use DOE to create products and processes robust to varying conditions, and tolerance analysis to assure your specifications are met. A must for Design for Six Sigma (DFSS). \$995* (\$795 each, 3 or more)

PreDOE: Basic Statistics for Experimenters (Web-Based)

PreDOE is an entry-level course for those who need to go back to the basics. See http://www.statease.com/clar_pre.html for more information. \$95

*Includes a \$95 student materials charge which is subject to state and local taxes.

Attendance is limited to 20. Contact Sherry at 612.746.2038 or sherry@statease.com.



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Stat-Teaser • News from Stat-Ease, Inc.

Design-Expert® 7.1 Software Released!

Stat-Ease announces the release of Design-Expert 7.1 (DX7.1) software for design of experiments (DOE). This release beefs up power and design capabilities and offers clever new interface features that make design and analysis easier than ever. See this innovative DOE program and give it a try by taking advantage of our free 45-day download at <http://www.statease.com/dx7trial.html>.

Purchase Design-Expert 7.1 software with the handy *order form on page 4*, online at <http://www.statease.com/prodsoft.html>, or by calling us at 612.378.9449. If you already own a single-user license of Design-Expert software, purchase an upgrade at a substantial discount. Stat-Ease provides free program support and unsurpassed statistical help from DOE experts.

This latest and greatest release of



DX7.1 Project Leader, Neal Vaughn, demonstrates the software

Design-Expert features:

◦ Upfront power calculation for factorial designs (see Fig. 1): *Avoid the embarrassment of running an experiment that has little chance of detecting an important effect.*

◦ Fraction of design space (FDS) graph for design evaluation (see Fig. 2): *Simple enough that even non-statisticians can see differences at a glance and applicable to any type of experiment—mixture, process or combined—this enhancement provides very helpful information for choosing from alternative test matrices.*

◦ Bookmarks for informative reports to make selection easy (see Fig. 3): *Jump immediately to just the statistics you need to see.*

◦ Grid lines on 3D-graph back-planes

—Continued on page 2.

At this stage one can skip the remainder of the fields – used for calculating the power of your design – and continue on. However, it will be good to gain an assessment of the power of your planned design of experiment. In this case the manufacturing management does not care if averages differ by less than 10 gallons per hour and engineering records provide the standard deviation of 5. Enter these values as shown below so Design-Expert can compute the signal to noise ratio – for this design: 2.

Optional Power Wizard: For each response, you may enter the minimum change the design should detect as statistically significant and also the estimated standard deviation of each response (generally obtained from historical data). The ratio will then be calculated in the Delta/Sigma field. Press Continue to see the calculated power for each response. A probability of 50% or higher is recommended. If power is low, consider adding runs by choosing a larger design or replication, or re-evaluate yourself to not detecting a signal this small.

Leave Sigma and Delta fields blank to skip power calculation.

Response	1	(1 to 999)	Est. Std. Dev.	Delta/Sigma
Name				
Units				
Diff. to detect				
Delta/Sigma				
Power				
Filter Rate	gallons/hr	10	5	2

Optional power wizard – necessary inputs entered

Press Continue to see the positive outcome – power that exceeds 80 percent probability of seeing the desired difference.

Fig. 1: Explanation of power in the tutorials accompanying the free trial

—Continued from page 1.

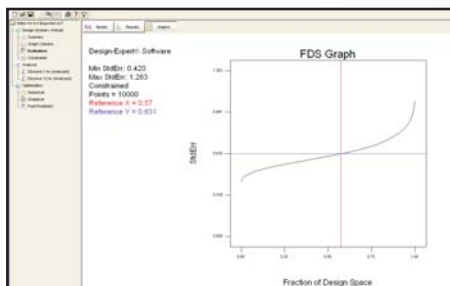


Fig. 2: FDS graph shows how well the design predicts inside the space

(see Fig. 4): Gain valuable perspective on optimal regions of your response surface.

◦ Save graphs to encapsulated postscript (EPS), PNG, JPEG, GIF, and a number of other formats: Facilitate publication of your exciting discoveries.

◦ Screening designs now available for up to 50 factors: Discover significant main effects in the least runs possible while maintaining a balance in low versus high levels.

◦ Characterization design catalog for minimum-run (Min-Run) designs now available up to 50 factors: Resolve two-factor interactions (2FIs) at an affordable cost.

◦ Central composite designs (CCD) increased to 50 factors: This widens the horizon for quickly generating useful transfer functions from costly computer

simulations based on finite element analysis and the like.

◦ Simple ratio constraints, such as $A/B > 1$, can be entered in directly: For example, A might be air pressure upstream of a check valve and B the pressure after, but it will work only when A exceeds B .

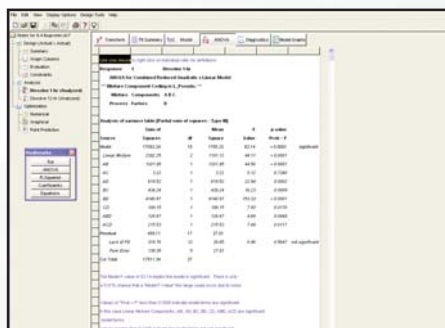


Fig. 3: Bookmarks make it easy to jump to the statistics you need

◦ Select columns for point type and other informative attributes to the design layout: Make your "recipe" sheet more helpful to the actual experimenters.

◦ Write transfer functions in a format (.vta) readable by VarTran® software (Taylor Enterprises): Popular with those in Design for Six Sigma (DFSS) programs, this capability sets the stage for statistical tolerancing and sensitivity analysis.

For additional new features in DX7.1 and detailing of the complete capabilities of Design-Expert software, view <http://www.statease.com/dx71descr.html>.

If you have questions about use of the software, call us at 612.378.9449 and ask for a statistical consultant to explain things for you.

PS. If you have a hot project that could really benefit from a statistically designed experiment, consider setting up consulting projects with Stat-Ease.

Most DOE's can be done with a 10-hour purchase of statistical consulting at \$200 per hour—\$2,000 in total—not a great expense in the context of costly R&D time and equipment, and one that may very well generate an order of magnitude pay-back.

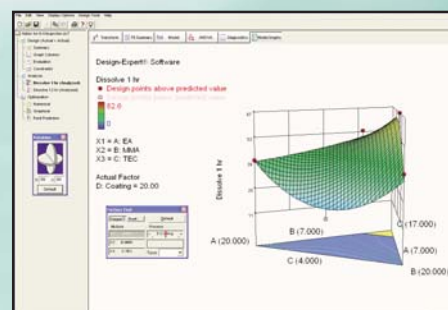


Fig. 4: Graph grid lines provide added perspective on optimal regions

Where can you find us in 2007?

April 11-13, 2007 — Joint ENBIS–DEINDE 2007 Conference, Torino, Italy

April 29–May 2 — ASQ World Conference, Orlando, FL, Talk by Mark Anderson, Booth 331

June 4–6 — 2007 Quality & Productivity Research Conf., Santa Fe, New Mexico, Talk by Pat Whitcomb, Booth

July 29–August 2 — Joint Statistical Meetings 2007, Salt Lake City, UT, Booth 305, Q&P Roundtable Luncheon

September 24–26 — ENBIS 7 Dortmund, Dortmund, Germany, Talk by Pat Whitcomb, Booth

October 11–12 — 51st Fall Technical Conference, Jacksonville, FL, Talk, Booth

October — MN Quality Conference, MN, Booth

October 17–18 — MD&M Minneapolis 2007, Minneapolis, MN, Booth 1149

DOE for DFSS: Variation by Design Workshop

This June Stat-Ease offers a new workshop whimsically titled “DOE for Design for Six Sigma: Variation by Design.” Anyone with prior DOE experience and the desire to create an ideal product or process should attend. This workshop will focus on design of experiments (DOE) and tolerance analysis. You will come away with the skills you need to create products and processes that are robust to varying conditions, while at the same time meet all of your specifications.



In just two days you will discover how to take your DOE knowledge to the next level, making improved design decisions that lead to defect-free products. Apply the techniques you learn to minimize expensive design rework and accelerate product scale-up and commercialization.

This workshop is limited to just 20 students. Register by April 15th to assure your spot!

Date, Location, & Cost

June 20-21, 2007 (Minneapolis, MN)
\$995 (\$795 each if your company sends 3 or more students)

Three Ways To Register

Web: www.statease.com/prodwork.html
Phone: Sherry at 612.746.2038
E-mail: sherry@statease.com

More Details

Learn how to build and run designed experiments that pinpoint settings which are robust to sources of noise and create a

viable transfer function. Then use that transfer function to determine the best tolerances for your product design. Through “knowledgeable design” discover which product or process design parameters are critical to performance. Achieve optimum values with minimal variation.

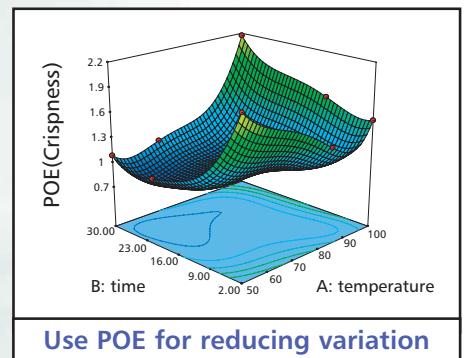
Together, DOE and tolerance analysis lead to ideal products and processes. *DOE* helps to identify factor levels that maximize the performance of a response and minimize the effect of uncontrolled variables. It also identifies factors that have no significant effect on performance, allowing tolerances to be relaxed—which leads to reduced costs. *Tolerance analysis* pinpoints the factors that are critical to process capability. It also reveals the impact of reducing the variation transmitted from factors to responses.

Concepts You’ll Master

- How to apply robust design in the Design for Six Sigma (DFSS) setting
- Which design of experiment is best for

verification studies

- Putting propagation of error (POE) to use for optimizing factor levels and minimizing sensitivity to noise
- Comparing the pros and cons of worst-case tolerancing, statistical tolerancing, and process tolerancing
- Improving the process capability indexes (Cpk’s) for your process via tolerance analysis



Use POE for reducing variation

Computer-Intensive Class—Free Trials Provided of:

- Design-Expert® software for DOE
- VarTran® software for tolerance analysis by Taylor Enterprises, Inc.

Workshop Prerequisites

A working knowledge of both factorial and response surface designs is a must. We recommend the “Experiment Design Made Easy” and “Response Surface Methods for Process Optimization” workshops, or their equivalent.

For more information or to enroll online please go to <http://www.statease.com> or call Sherry at 612.746.2038. See you in June!

Thoughts for the Day...

“Without data, all you are is just another person with an opinion.” --Unknown

“With many calculations, one can win; with few one cannot. How much less chance of victory has one who makes none at all!” --Sun Tzu 'Art of War'

Place Your Order Now for DX7.1 Software

Order your copy of Design-Expert (DX) 7.1 software today and experience the power and ease-of-use that make DX7.1 a top DOE package. Visit the Stat-Ease® web site at <http://www.statease.com> for product details and to download a free 45-day trial.

To place your order, fax this form to 1.612.378.2152 or mail it to the address below. Thank you for your business!

Qty	Item	Other Required Information	Unit Cost	Ext. Cost
	Design-Expert 7.1 Annual Network [3-seat annual license (includes free upgrades and updates)]		\$1050/year	
	Design-Expert 7.1 Single-User Perpetual (DX7.1) [for quantity discounts (3+ copies), call for a quote]		\$995	
	Upgrade to DX7.1 from DX7.0 Old Serial # required:		\$195	
	Upgrade to DX7.1 from DX6 or older Old Serial # required:		\$395	
	Upgrade to DX7.1 from version of DE Old Serial # required:		\$595	
	RSM Simplified Book (Comes with a 180-day CD-ROM of Design-Expert 7 software)		\$50	
	Shipping within the USA —Add \$15 for each software package & \$5 for each book. All others, please call for a quote.			
	Total			

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