



The Dow Chemical Company, Inc.

*Delivering quality products and services
using JMP® for Six Sigma®*

“Every department at Dow uses JMP. It is our global standard for statistical software.”

Dan Obermiller

Master Black Belt, Corporate R&D
Dow Chemical Company



Dow is a leading science and technology company that provides innovative chemical, plastic and agricultural products and services to a wide range of markets, including food, transportation, health and medicine, personal and home care, and building and construction, among others. Augmenting the company’s commitment to deliver environmentally safe quality products that help customers lead better lives, Dow utilizes JMP® software to continually strive for process improvement and exceed the expectations of its customers.

“JMP is part of Dow’s corporate-wide Six Sigma® initiative,” said Dan Obermiller, Master Black Belt, Corporate R&D Six Sigma for Dow. “Every department at Dow uses JMP. It is our global standard for statistical software.”

Dow embraces Six Sigma as its methodology and culture in pursuit of business excellence. Six Sigma coordinates with and builds on other quality initiatives, with the goal of creating an environment in which anything less than Six Sigma quality is unacceptable.

Dow has established quality measurement systems to evaluate its progress in continuous quality improvement. Some of the tools used to monitor progress in each business include external and internal customer surveys, auditing or organizational self-assessments, customer complaint and resolution system, and statistical tools.

What Dow Needed

“At Dow we were looking for statistical software that would meet the needs of 95% of the people 95% of the time. The product needed to work under Windows and be affordable,” said Obermiller. “An extensive evaluation of Windows-based statistical software was conducted. The evaluation consisted of looking for the typical statistical techniques as well as advanced statistical techniques, ease of use, accuracy, documentation, expandability/customizability, and price. After this thorough evaluation, JMP was picked as the best overall product. We then standardized on JMP as the statistical software for The Dow Chemical Company.”

What JMP® Provides

According to Obermiller, “JMP users are using the product for virtually every technique you can imagine. We have a set of users who are ‘data miners’ that are using JMP’s 5.0 partition models, PLS, and neural networks quite heavily. Dow’s R&D effort has been utilizing JMP’s Design of Experiments capabilities for about 12 years. The Six Sigma initiative has users analyzing data and validating root causes to problems by using JMP’s statistical techniques and model-building capabilities.”

An example¹ of where Dow has seen great success using JMP’s capabilities is in the automotive industry. The Federal Motor Vehicle Safety Standard (FMVSS) 201U requires passenger cars, trucks and vans to provide protection when an occupant’s head strikes upper interior

components such as side rails, front headers and the roof during a crash. Thus, automobile manufacturers are now equipping such areas as headliners with foam or other structural composite countermeasures to manage energy during simulated head impact crash tests.

In an effort to optimize the performance of high efficiency energy absorbing olefinic foam headliner countermeasures, statistically designed head impact tests were performed. A Box-Behnken response surface design for five variables was created and analyzed in JMP. The resulting statistical model identified the significance of the variables as well as several interactions. The development of the model will enable automobile manufacturers and Tier I suppliers to minimize design cycle times which incorporate olefinic foam countermeasures in the headliner of an automobile as well as make the automobiles safer.

Raising Awareness and Expectations

"A large population of Dow employees are familiar with JMP and how it works," says Obermiller. "This has raised the level of statistical awareness throughout the company as well as provided a common language related to data analysis. Now, during a presentation that is comparing groups of data, it is not uncommon to hear 'where are the Tukey-Kramer circles for that comparison?'. It has raised our expectations of how one should look at data. Since JMP is our primary data analysis tool for our Six Sigma programs, JMP has been a key enabler to help us achieve our year-end 2003 goal of \$1.5 billion in cumulative EBIT (earnings before income taxes) a full year early."

¹The automotive example appeared in the 2000 APE Automotive TPO Global Conference proceedings. The authors are Myron Maurer, John Penkala, Jeff Sweeney, Martin Tusim, Gavin Vogel, Joe Lemmon, and Shawn Williams. All authors, excluding Lemmon and Williams, are from The Dow Chemical Company. Lemmon and Williams are from Daimler-Chrysler Corporation. The official title of the case study: "Optimization of High Efficiency Energy Absorbing Olefinic Foam Headliner Countermeasures via a Statistical Design of Experiment (DOE)".



JMP Headquarters
SAS Institute Inc.
SAS Campus Drive
Cary, NC 27513
USA
Tel: +1 919.677.8000
Fax: +1 919.677.4444
jmpsales@jmp.com
www.jmp.com

JMP Europe
SAS Institute
Henley Road
Medmenham
Marlow
SL7 2EB
United Kingdom
Tel: +44 (0)1628 486 933
Fax: +44 (0)1628 483 203
jmpsaleseur@jmp.com
www.jmp.com

JMP Japan
SAS Japan Head Office
Inui Bldg. Kachidoki
1-13-1 Kachidoki
Chuo-ku Tokyo 104-0054
Japan
Tel: +81 3 3533 3887
Fax: +81 3 3533 1600
jmpjapan@jmp.com
www.jmp.com/japan