Statistical case studies for industrial process improvement

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This book contains a broad selection of case studies written by professionals in the semiconductor industry that illustrate the use of statistical methods to improve manufacturing processes. These case studies offer engineers, scientists, technicians, and managers numerous examples of best-in-class practices by their peers. Because of the universal nature of statistical applications, the methods described here can be applied to a wide range of industries, including the chemical, biotechnology, automotive, steel, plastics, textile, and food industries. Many industries already benefit from the use of statistical methods, although the semiconductor industry is considered both a leader in and a model for the wide application and effective use of statistics. Specific case studies address the following statistical methods: gauge studies, passive data collection (sources of variation studies), design of experiments, statistical process control, and equipment reliability. Readers familiar with the statistical methodologies that comprise the Six Sigma tool box will find a wealth of applications. Czitrom has written an introduction to each statistical method, which, along with a glossary, gives basic definitions of frequently occurring statistical terms and suggestions for further reading. The case studies, which can be used in industrial training as well as in academia, are an extremely useful classroom supplement and will remain a rich source of used and useful approaches to real industrial problems for years to come. All of the data sets for each case study are available online.