

## Seminar “Design for Six Sigma BLACK BELT Training” – with certification

We are offering this worldwide recognized method for quality improvement in product and process developments now exclusively under inclusion of our pragmatic Failure Mode Avoidance approach. You will be introduced to the methodology by experienced DfSS Master Black Belts supported by training material in English or, alternatively, German. The seminar will have a practical orientation, will be conducted in small groups and the participants will be coached to achieve certification.

### Target Audience

Persons keen to develop innovative, robust products or processes in an efficient way, especially:

- Managers, engineers and technicians working in Research & Development (R&D), Production Planning and Quality Management.
- Design engineers, test engineers, project leaders, quality engineers and quality managers.
- (Lean) Six Sigma Green Belts.

Aimed at participants from all industry sectors (e.g. renewable energy, aerospace, consumer products, electronics, medical devices etc.) of small & medium-sized businesses and global enterprises developing products and/or processes.

### Subject

Design for Six Sigma (DfSS) is a preventive method to systematically develop new products or processes and to ensure that customer wants and needs are consequently converted into failure-free products (6 sigma design). DfSS supports the product development process combining various tools to an algorithm and therefore to a more efficient development cycle.

The DfSS method focuses on customer requirements and customer satisfaction, ensuring that newly introduced products are well received by customers. DfSS is used to fully understand and optimize the functional behavior of products with the help of mathematical transfer functions. Traditionally, a deterministic method is applied with safety factors. In contrast to that, DfSS uses a stochastic approach to make products robust under usage conditions.

The application of this method in particular yields unique product/process concepts, avoidance of recalls and damage to the corporate image, a reduction of warranty and courtesy costs, an increase of customer satisfaction, less re-releases, as well as shorter development times.

[Read more](#) about this method.

### DfSS Black Belt

DfSS Black Belts are trained method experts in charge of conducting improvement projects in product or process development. The focus is on the systematic application of DfSS tools to avoid failures and to optimize products and/or processes. Black Belts are usually supported by a project team, with members from product-or process development areas. The team might also include DfSS Green Belts supporting DfSS Black Belts with smaller Green Belt projects.

## Objectives & Benefits

After a successful participation in the seminar the participants will have acquired the following skills:

- Create unique product ideas driven by solid consumer insights and technology viewpoints,
- Formulate and develop product concepts that exceed expectations and excite customers,
- Optimize product functional behavior after thorough understanding of the underlying physics,
- Ensure that product failure modes are detected and eliminated before they escape into the field,
- Verify and validate robustness of products under real conditions.

## Contents

The DfSS methodology consists of a unique, structured combination of logically linked tools, which can efficiently be applied according to the IDDOV model. Additionally, all tools of the pragmatic Failure Mode Avoidance method are integrated:

- Introduction to DfSS,
- VOC & Survey Design,
- Kano Model & Survey,
- Quality Function Deployment (QFD),
- Basic Statistics,
- Measurement System Analysis (Variable & Attributive Data),
- Process Capability (Cp, Cpk, Pp, Ppk),
- Transformation non-normal data,
- Confidence Intervals,
- Hypothesis Tests (t, F, Chi<sup>2</sup>, P),
- Power & Sample Size,
- Analysis of Variance (1-way, 2-way, multiple ANOVA),
- Non-Parametric Hypothesis Tests,
- Contingency Tables,
- Principal Component Analysis,
- Factor Analysis,
- Discriminant Analysis,
- Introduction to TRIZ,
- Pugh's Concept Selection,
- Weighted Decision Matrix,
- Axiomatic Design,
- Boundary Diagram,
- Function Definition,
- Part-to-Function Matrix,
- Function-driven Design FMEA,
- Value Analysis (VA/VE),
- Parameter Diagram,
- Design VMEA,
- Enhanced Robustness Matrix,
- Robustness Checklist,
- Taguchi Robust Design,
- Classical Robust Design,
- Correlation & Single Regression,
- Multiple Regression,
- Logistic Regression,
- Design of Experiments (Full Factorial),
- Design of Experiments (Fract. Factorial),
- Blocking, Centerpoints, Randomization,
- Mixed Level Designs,
- Response Surface Designs,
- Multiple Response Optimization,
- Design Scorecard,
- Statistical Tolerancing,
- Process FMEA,
- Development of Control Plans,
- Statistical Process Control (SPC),
- Introduction to Design for Reliability

## Execution

In this intensive seminar the participants will be introduced to the DfSS method and learn the tools necessary for application. The method will be practiced in groups by applying typical tools to a case study that runs across the training. Subsequent to the seminar it is planned that the participants complete a project using the DfSS method.

The section of an appropriate project can be supported by an experienced trainer as Master Black Belt. As we consider it absolutely necessary to apply the acquired skills to a project as soon as possible, coaching is an important element for a successful completion of a DfSS project. We recognize this need of professional support after the seminar and offer individual coaching via email and phone to every participant.

## Certification

The participant will receive a confirmation of attendance after completing the seminar. The exam and the presentation of the completed project will be done several months after the end of session 4 on a separate date, which we will set during the seminar. The exam will be a written multiple choice test and takes four hours for all participants.

After passing the DfSS Black Belt exam and the successful completion of the project the participant will receive the "Design for Six Sigma BLACK BELT CERTIFICATE".

Innovensys has developed a demanding standard for the certification of the "Design for Six Sigma BLACK BELT", which is comparable to the "Certified Six Sigma Black Belt" (CSSBB) of the American Society for Quality (ASQ).

## Prerequisites

At least one year of experience in the area of product development, basic mathematical knowledge.

**Dates** (Seminar no: DFSS-BB20Z-1/2011):

- Session 1: 07/11 – 11/11/2011
- Session 2: 12/12 – 16/12/2011
- Session 3: 16/01 – 20/01/2012
- Session 4: 13/02 – 17/02/2012

## Training Duration

20 days in four sessions:

- Monday 9 am – 5 pm
- Tuesday- Thursday 8 am - 5 pm
- Friday 8 am – 12 am

1 day for exam and certification

## Training Location

Cologne/Dusseldorf area in a renowned conference hotel with excellent service.

Individual locations or division of the training into shorter sessions may be requested for in-house trainings.

## Number of Participants

Training will be conducted in small groups of max 8 participants to increase knowledge transfer and ensure individual support.

## Instructor

Mr. Dipl. Ing. Bert van de Lindeloof MSc.  
Six Sigma & DfSS Master Black Belt

## Attendance Fee

9.500,- € per participant (plus VAT) including exam fee. You will receive an invoice of Innovensys with a confirmation of course registration. Payment of the fee prior to the start of the training is obligatory.

If two or more participants of the same organization visit the seminar, we allow a 10 % discount from the second participant onward.

## Scope of Supply and Services

- Extensive training material in paper form,
- Numerous excel tools (data files) for the exercises,
- Numerous Minitab® data files for the exercises,
- Project coaching up to 2 hours, allowable 2 months after participation in the seminar, starting with the participation of the first session of the seminar,
- Confirmation of attendance,
- Exam,
- Certification after passé exam and a successfully conducted project,
- Daily refreshments in breaks and lunch at full seminar days.

## Software Equipment

Each participant needs a laptop with the following software:

- Microsoft® Excel version 2003 onward,
- Minitab® Release 15 onward (You do not have Minitab? Contact us!)

Are you interested in an individual in-house training, customized to your needs?

We will be pleased to submit you an offer. Please contact us!