

# Design for Six Sigma Training - Black Belt Level



Your Lean Six Sigma Partner  
...providing practical solutions for you

## Brief training overview

Our DFSS Black Belt training can be tailored to client needs. The duration depends upon trainees' previous Six Sigma experience but is usually a 4 week course conducted over a 4 month period for those candidates with no prior knowledge.

Our approach involves each DFSS Black Belt working on a project during training. The chosen product or process selected as the improvement project needs to be of a suitable scope for a training project and to deliver an improved product or process and a financial saving. It is vital that the necessary product, parts and data are available for the DFSS Black Belt to analyse.

We recommend that a Paloma Master Black Belt discusses with the nominated DFSS Black Belt candidates, Project Champions and Process Owners suitable processes/products that could be used during the training sessions prior to commencement of training.



## About us

**Paloma Consulting Limited** is a specialist provider of Lean Six Sigma DMAIC and DFSS Black Belt training. We aim to deliver rapid returns on investment and position DFSS Black Belts to be self sufficient internal process and product design consultants. A selection of project case studies, along with our Six Sigma project e-mail review brochure, Black Belt support brochure and Black Belt certification brochure can be viewed by visiting our website.

## Our Approach

Class tuition consists of a mixture of teaching and practical exercises to aid and reinforce tool usage. We place considerable emphasis during each training week on formal reporting of project progress to classmates and project Champions. Detailed feedback is given in writing to DFSS Black Belt candidates and management about Lean Design Six Sigma tool usage and project progress.

In addition to advising on DFSS Six Sigma project selection, we typically visit students on-site between training weeks to provide one to one Six Sigma project and tool use advice. Telephone and email project review advice is also provided during and after training to ensure the projects are completed promptly, that the appropriate Six Sigma tools have been properly applied and that the DFSS candidate achieves certified DFSS Black Belt status.

The detailed content of our training and support is tailored to suit participant knowledge and individual business requirements.

## Phase Content and Objectives

**Common approaches used** for Design for Six Sigma projects are DMADV and IDOV. DMADV is used when a product or process has been optimised and still doesn't meet customer requirements. IDOV (Identify, Design, Optimise and Verify) is used when designing a completely new product or business process. The IDOV approach is shown below.

**In the identify phase** the objectives of the development activity are established. What is the product or process to be developed? Why is it being developed? Identify and quantify customer needs and management objectives. These needs are then translated in to measurable characteristics and objectives.

**In the design phase** the objective is to design the new product, service or process. Predictive models, simulation, prototypes, and pilot runs are used to ensure the design concepts meet the objectives and critical criteria established earlier. Performance of similar best-in-class designs is evaluated.

**In the optimise phase** the aim is to optimise the design. The best design concept is scaled up. Preventative measures are incorporated into the new designs. Concepts are re-evaluated against customer and business criteria.

**In the verify phase** the new design, service or process is evaluated to ensure it meets the pre-defined customers' requirements and business objectives prior to launch.

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## Typical training content for those candidates with no prior Six Sigma knowledge

### Week 1 Content

Design for Six Sigma Overview  
Understanding Value  
Business Planning  
Value Package Introduction (VPI),  
DFSS Tools and project  
management  
Project management  
Market Segmentation  
Customer Involvement and Visits  
Concept Engineering  
Interviewing Skills  
KJ Basics (Affinity and Abstraction  
analysis)  
Customer Requirements KJ  
Prioritizing Customer Requirements  
Quality Function Deployment (QFD)  
Concept Generation  
Pugh Concept Selection  
Critical Parameter Management  
Process Mapping  
Project Presentations

### Week 2 Content

Review of week 1  
House of Quality  
Introduction to Minitab  
Basic Statistics  
Graphical Analysis  
Statistical Process Control  
Capability  
Measurement Systems Analysis  
Dimensional Variance Analysis  
Monte Carlo Simulation  
Cause and Effect Matrix  
Design FMEA  
Design for Manufacture & Assembly  
Introduction to TRIZ  
Project Presentations

### Week 3 Content

Review of week 2  
Hypothesis Testing  
Central Limit theorem  
Confidence Intervals  
T-tests  
ANOVA  
Correlation and Regression  
Polynomial & Multiple Regression  
Multi-Vari  
Introduction to DOE  
Full Factorial Designs  
Centre Points and Blocking  
Fractional Factorial designs  
DOE Planning  
Central Composite Designs  
Implementation of Improvements  
Project Presentations

### Week 4 Content

Review of week 3  
Response Surface Methodology  
Multiple Factor Optimizer  
Mixture Designs  
Robust Design  
Empirical Tolerancing  
Reliability  
Capability Review  
Control Plans  
Visual Management  
Mistake Proofing  
Standardised Work  
Project Presentations

The programme above has been developed for trainees with no prior Six Sigma knowledge, and covers tools used for both the DMADV and IDOV approaches.

For trainees who are already Six Sigma Black Belt trained, a 2 week conversion course is available. For more information contact [info@palomaconsulting.com](mailto:info@palomaconsulting.com)

## Client Recommendation

*'..... we benefited by your counsel and review of the (DFSS) Greenbelt projects. Your input and direction was instrumental in defining the certification and reporting requirements.'*

*William E Ryan*

*DFSS BB, Master Black Belt  
Director of Engineering Coupling Group  
Rexnord Industries*

## Certification

Certification of DFSS Black Belts is available upon completion of DFSS Black Belt training, and 2 successfully completed projects with targeted savings. Both projects should be written up in a report to demonstrate tools and methodology knowledge (including at least one DOE). Further information is available on request or by downloading the certification brochure from our website.

Paloma Consulting Limited Master Black Belts have been responsible for judging Best in Europe Six Sigma projects and for writing the Black Belt certification criteria for a leading national body.

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