

## Reliability Green Belt®

Training number: Reliability\_A01

### About the topic:

Effective reliability engineering is about knowledge engineering: knowing why you do what you do, knowing that you do it well, and always learning how to do it better. The Reliability Green Belt® provides a methodical approach to reliability development necessary to meet the complex challenges of today's systems.

### Training procedure and goal:

The Reliability Green Belt® comprises the first of three modules in the qualification as a Reliability Engineer. It is highly relevant to engineers, specialists and managers in other product development and manufacturing roles.

In this module, the most important qualitative and quantitative methods of reliability engineering are covered. The Reliability Green Belt training is deliberately structured to teach the participant when, how and why the individual methods can be applied in the product development process.

The Certified Reliability Green Belt® will be able to implement core reliability tools in the company organization.

### Target group:

Engineers, technicians, specialists, managers and executives from the areas of development, testing, design, research, production and quality assurance

### Training Content:

- **Introduction**  
Introduction to reliability engineering | Reliability in the product development process
- **Mathematical Description of Reliability**  
Basic concepts of statistics and probability theory | Weibull distribution | Failure probability | Density function | Failure rate | Reliability | Confidence interval | Estimation of distribution parameters | Regression analysis | Maximum likelihood estimation
- **System and Component Reliability**  
Boolean system model | Reliability block diagram | System reliability evaluation and optimization
- **Data Analysis I (Complete Data)**  
Median rank method | Weibull probability plot | Weibull analysis | Acceleration factor
- **Data Analysis II (Censored Data)**  
Type I and type II censoring | Multiple censoring | Weibull analysis based on censored data | Mixed Weibull | Batch problems | Competing failure modes | Various exercises
- **Reliability Test Planning and Analysis**  
Binomial distribution approach | Success run | Parametric binomial | Exponential chisquared | Weibayes | Accelerated life testing | Step-stress method | Highly accelerated life testing HALT

- **Lifetime Calculation**  
Stress-strength-interference | S/N-curve | Load spectra | Cumulative damage models | Damage accumulation
- **Qualitative Methods of System(Risk)Analysis**  
Failure mode and effects analysis FMEA | Fault tree analysis FTA | Hazard and operability study HAZOP | Design review based on failure mode DRBFM

**Prerequisites:**

There are no prerequisites for this topic. No prior knowledge of reliability engineering is required.

**Software requirements:**

Each participant must have a laptop with the following software: Microsoft Excel, Adobe Reader and Minitab (Version R15 or above). A demo version of the software Minitab can be downloaded from [www.minitab.com](http://www.minitab.com).

**Examination / certification:**

The training will end in all cases with a certificate of participation. Furthermore, participants may elect to take a written examination for a certified **Reliability Green Belt**<sup>®</sup> at the end of the course. The certificate will be awarded by the University of Stuttgart and the Institute of Machine Components. The examination is in multiple choice form.

**Training duration:**

5-day training:                      Monday from 09:00 am to 05:30 pm  
   Tuesday to Thursday from 08:15 am to 05:30 pm  
   Friday from 08:15 am to 01:30 pm

Examination:                      Friday from 01:30 pm to 03:30 pm

**Training fee:**

Detailed information is available on our website [www.reliability-academy.de](http://www.reliability-academy.de)

**Scope of services:**

- Training documents in paper form
- Training documents as pdf document
- Certificate of participation
- Catering during the training

**Examination fee / certification:**

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**Dates / Registration:**

Detailed information is available on our website [www.reliability-academy.de](http://www.reliability-academy.de)

**In-house:**

We also offer all our seminars and trainings as an in-house event.

**Coaching:**

Should you so wish, we can put together a time and content tailored coaching concept for you after completion of the training.