

Calculation of LTPD sampling plans for inspection by variables

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Summary

Quality control represents one of the major issues for many business entities. Selected problems of statistical acceptance sampling, with focus on computational aspects and discussion of software available for solving these tasks are addressed in this book. Calculation of LTPD acceptance sampling plans for sampling by variables when the remainder of rejected lots is inspected which minimize mean inspection cost per lot of process average quality (Klůfa, 2010) is addressed, together with its software implementation.

In the introduction, a brief overview and explanation of some concepts and techniques used further is included. Brief introduction to acceptance sampling is given, followed by a short overview of some of the approaches to acceptance sampling. Motives for selected approaches to acceptance sampling are recalled and the situations in which particular acceptance sampling procedures are applicable are described.

LTPD plans for sampling inspection by variables when the remainder of rejected lots is inspected and methods for their calculation are described in more detail in chapters 2 and 3. The calculation of the plans is done using exact formula for operating characteristic of acceptance sampling plan and such plans have better characteristics compared to the plans computed in a usual way using just approximately valid formula for operating characteristic. References to relevant code in R language for statistical computing (R Development Core Team, 2011) used for calculations discussed in this book is made throughout the book. Calculation and analysis of LTPD plans is performed with LTPDvar package (Kaspříková, 2011) for R computing environment, which is in more detail discussed in chapter 3 of this book. R computing environment, in which methods for LTPD plans calculation discussed in this book are implemented, is briefly introduced and a choice of R as an environment for development of the tools designed and used in this book is explained. There is also a user's reference documentation for LTPDvar package included, with detailed description of all input parameters and output values of the functions implemented.

The tables of LTPD sampling plans are provided in chapter 4 for selected values of input parameters. Values listed in tables may also be used as an empirical support for getting an idea about how the values of variables which are of interest change in response to changing input parameters. LTPDvar software may be used as a supposedly more convenient way to obtain LTPD plan for particular values of input parameters, even for those not covered in the tables.