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## Guidelines for implementation of statistical process control (SPC) —

### Part 4: Reference data sets for measurement process analysis software validation

*Lignes directrices pour la mise en œuvre de la maîtrise statistique des  
processus (MSP) —*

*Partie 4: Jeu de données pour la validation des logiciels d'analyse de  
processus de mesure*



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## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see [www.iso.org/directives](http://www.iso.org/directives)).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see [www.iso.org/patents](http://www.iso.org/patents)).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

This document was prepared by Technical Committee ISO/TC 69, *Applications of statistical methods*, Subcommittee SC 4, *Applications of statistical methods in product and process management*.

A list of all parts in the ISO 11462 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at [www.iso.org/members.html](http://www.iso.org/members.html).

## Introduction

The test examples were developed for the assessment of systems performing a measurement system analysis (MSA). They allow MSA software developers to evaluate their systems. Thus, the end user of those systems can be sure that the data sets are evaluated correctly with a high level of reliability. In order to cover as wide a spectrum as possible, suitable data sets were prepared individually for various constellations. The evaluation results of those data sets are documented and commented on the following pages.

The results were verified multiple times using different computer programs. This turns the data sets and the results into references for validation of the software. The data sets are listed in the related clauses of this document or can be accessed via <https://standards.iso.org/iso/tr/11462/-4/ed-1/en>.



# Guidelines for implementation of statistical process control (SPC) —

## Part 4:

## Reference data sets for measurement process analysis software validation

### 1 Scope

This document describes examples for software validation for software implementing the standards of ISO 22514-7 on the capability of measurement processes. In detail, the following standards are covered:

— ISO 22514-7.

It provides data sets and test results for testing the implementation of the evaluation methods described in these standards. This includes:

- a) the calculation of standard uncertainties from other sources (other than experiments – type B – ISO/IEC Guide 98-3);
- b) the estimation of uncertainty components using repeated measurements on reference parts;
- c) the estimation of uncertainty components using repeated measurements on multiple parts with different operators and their evaluation using the ANOVA method;
- d) the combination of uncertainty components using the Gaussian law of uncertainty propagation;
- e) the calculation of measurement process capability indices;
- f) the influence of operators on attributive measurements;
- g) the uncertainty range and capability indices for attributive measurements.

The test examples are intended to cover the calculation of the measuring system capability and measurement process capability according to ISO 22514-7.

### 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 22514-2, *Statistical methods in process management — Capability and performance — Part 2: Process capability and performance of time-dependent process models*

### 3 Terms and definitions, and symbols and abbreviated terms

#### 3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 22514-2 apply.