

First edition
2023-11

Statistical methods in process management — Capability and performance —

Part 9:

Process capability statistics for characteristics defined by geometrical specifications

Méthodes statistiques dans la gestion de processus — Aptitude et performance —

Partie 9: Méthodes statistiques pour l'aptitude des processus dont les caractéristiques sont définies par des spécifications géométriques



Reference number
ISO/TR 22514-9:2023(E)

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Published in Switzerland

This is a preview of ISO/TR 22514-9:2023. Click here to purchase the full version from the ANSI store.

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Foreword

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

This document is a second draft for approval and only editorial changes will be made before publication.

A list of all parts in the ISO 22514 series can be found on the ISO website.

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Introduction

Many organizations will need to evaluate the capability and performance of their key processes when the specifications are defined by requirements other than linear size. The methods described in this document are intended to assist the organization in this respect.

During the last couple of years, it has been more common in the design and development departments in companies to not only use linear tolerances alone, but also including modifiers as well as geometrical tolerances with or without use of the maximum material requirements.

This situation has been supported by new measurement methods used in production, where it is common to use measurement equipment, where the results are given in form of point clouds instead of one single value.

It is a challenge in such cases to calculate capability and performance, but organizations and customers still require the capability indices in acceptance of produced or delivered batches of parts.

This document describes how to calculate capability or performance where functional requirements on parts are given.

As an example, the “maximum material requirement”, MMR, covers “assemble ability” and the “least material requirement”, LMR, covers, for example, “minimum wall thickness” of a part. Each requirement (MMR and LMR) combines two independent requirements into one collective requirement, which simulates the intended function of the workpiece. In some cases of both MMR and LMR, the “reciprocity requirement”, RPR, can be added.

In [Annex D](#), a case study of process analysis, where the characteristic to be improved is perpendicularity, is introduced.