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Control charts —

Part 5: Specialized control charts

Cartes de contrôle —

Partie 5: Cartes de contrôle particulières

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Foreword

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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).

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/TC 69, *Applications of statistical methods*, Subcommittee SC 4, *Applications of statistical methods in process management*.

ISO 7870 consists of the following parts, under the general title *Control charts*:

— *Part 1: General guidelines*

— *Part 2: Shewhart control charts*

— *Part 3: Acceptance control charts*

— *Part 4: Cumulative sum control charts*

— *Part 5: Specialized control charts*

— *Part 6: EWMA control charts*

Introduction

The Shewhart control charts as given in ISO 7870-2 aid in detection of unnatural patterns of variations in data from repetitive processes and provide criteria for detecting a lack of statistical control.

However, there may be several special situations for variables data where Shewhart control charts may be inadequate, insufficient or less efficient in detecting the unnatural patterns of variation of the process, particularly where:

a) it takes considerable time to produce an item and as such sample results are available at large intervals;

b) there are several subgroup sources that have approximately the same production rate, process average and process capability;

c) process average is changing systematically;

d) sample size is large and sequence of production is irrelevant;

e) process does not have a constant target value.

In such situations, specialized control charts are to be used.

Similarly, special situations may be encountered in dealing with attributes data. There may be situations when criticality of an incidence in a subgroup (nonconformity) is a matter of concern, but different nonconformities are having different criticality. As such, all types of nonconformities cannot be treated alike. Depending upon criticality, different ratings (weights) are required to be given to each class of nonconformity, and accordingly demerit scores are calculated. The control limits are calculated based on such demerit scores and accordingly control charts are plotted to exercise process control.

There may be situations when inspection by attributes is preferred to that by variables, from practical considerations, for controlling both the location and the variability parameters of a measureable characteristic of a process (for example, inspection by gauging). The information is also available on the number of items less than the lower specification limits (no-go gauge) as well as the number of items above upper specification limit (go gauge) in assembly operations. In such situation, a specialized pair of control charts may be used.

There may also be situations when data do not follow normal distribution. Such situations of non-normal data are quite often encountered in service industry, besides in special processes of manufacturing. In such a situation specialized control chart is to be used.

This part of ISO 7870 has been prepared to provide guidance on the use of specialized control charts to address above typical, unusual situations.