

STN	Regulačné diagramy Časť 2: Shewhartove regulačné diagramy	STN ISO 7870-2 01 0272
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Control charts

Part 2: Shewhart control charts

Cartes de contrôle

Partie 2: Cartes de contrôle de Shewhart

Táto slovenská technická norma obsahuje anglickú verziu medzinárodnej normy ISO 7870-2: 2023 a má postavenie oficiálnej verzie.

This Slovak standard includes the English version of the International standard ISO 7870-2: 2023 and has the status of the official version.

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Úrad pre normalizáciu, metrológiu a skúšobníctvo Slovenskej republiky, 2023

Slovenská technická norma a technická normalizačná informácia je chránená zákonom č. 60/2018 Z. z. o technickej normalizácii v znení neskorších predpisov.

Anotácia

Tento dokument vytvára návod na použitie a pochopenie prístupu Shewhartovho regulačného diagramu k metódam štatistickej regulácie procesu.

Tento dokument sa obmedzuje na postup pri aplikácii metód štatistickej regulácie procesov iba pomocou Shewhartovho systému diagramov. Stručne sú predstavené niektoré doplnkové materiály, ktoré sú v súlade so Shewhartovým prístupom, ako napríklad použitie výstražných medzí, analýza trendových vzorov a spôsobilosti procesu. Existuje však niekoľko ďalších typov regulačných diagramov, ktoré možno použiť v rôznych situáciách.

Národný predhovor

Normatívne referenčné dokumenty

Na nasledujúce dokumenty sa odkazuje v texte takým spôsobom, že časť ich obsahu alebo celý obsah predstavuje požiadavky tohto dokumentu. Pri datovaných odkazoch sa používa len citované vydanie. Pri nedatovaných odkazoch sa používa najnovšie vydanie citovaného dokumentu (vrátane akýchkoľvek zmien).

POZNÁMKA 1. – Ak bola medzinárodná publikácia zmenená spoločnými modifikáciami, čo je indikované označením (mod), použije sa príslušná EN/HD.

POZNÁMKA 2. – Aktuálne informácie o platných a zrušených STN a TNI možno získať na webovom sídle www.unms.sk.

ISO 3534-2 prijatá ako STN ISO 3534-2 Štatistika. Slovník a značky. Časť 2: Aplikovaná štatistika (01 0216)

Vypracovanie slovenskej technickej normy

Spracovateľ: Úrad pre normalizáciu, metrológiu a skúšobníctvo SR, Bratislava

Technická komisia: TK 71 Aplikácie štatistických metód

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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).

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).

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.

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

This second edition cancels and replaces the first edition (ISO 7870-2:2013), which has been technically revised.

The main changes are as follows:

- various clauses have been modified for better understanding;
- some examples for control charts have been modified;
- new examples for control charts have been included.

A list of all parts in the ISO 7870 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.

Introduction

A traditional approach to manufacturing has been to depend on production to make the product and on quality control to inspect the final product and screen out items not meeting specifications. This strategy of detection is often wasteful and uneconomical because it involves after-the-event inspection when the wasteful production has already occurred. Instead, it is much more effective to institute a strategy of prevention to avoid waste by not producing unusable output in the first place. This can be accomplished by gathering process information and analysing it so that timely action can be taken on the process itself.

Dr. Walter Shewhart in 1924 developed the control chart method for controlling the quality during production. Control chart theory recognizes two kinds of variability. The first kind is random variability (also known as natural/inherent/uncontrollable variation) arising due to causes known as chance/common/random causes. This is due to the wide variety of causes that are consistently present and not readily identifiable, each of which constitutes a very small component of the total variability but none of them contributes any significant amount. Nevertheless, the sum of the contributions of all of these unidentifiable random causes is measurable and is assumed to be inherent to the process. The elimination or correction of common causes may well require a decision to allocate resources to fundamentally change the process and system.

The second kind of variability represents a real change in the process. Such a change can be attributed to some identifiable causes that are not an inherent part of the process and which can, at least theoretically, be eliminated. These identifiable causes are referred to as “assignable causes” (also known as special/unnatural/systematic/controllable causes) of variation. They may be attributable to such matters as the lack of uniformity in material, a broken tool, workmanship or procedures, the irregular performance of equipment, or environmental changes.

A process is said to be in a state of statistical control, or simply “in control”, if the process variability results only from random causes. Once this level of variation is determined, any deviation from this level is assumed to be the result of assignable causes that should be identified and eliminated.

The major statistical tool used to do this is the control chart, which is a method of presenting and comparing information based on a sequence of observations representing the current state of a process against limits established after consideration of inherent process variability. The control chart method helps first to evaluate whether a process has attained, or continues in, a state of statistical control. When the process is deemed to be stable and predictable, then further analysis regarding the ability of the process to satisfy the requirements of the customer may be conducted. The control chart also can be used to provide a continuous record of a quality characteristic of the process output while process activity is ongoing. Control charts aid in the detection of unnatural patterns of variation in data resulting from repetitive processes and provide criteria for detecting a lack of statistical control. The use of a control chart and its careful analysis leads to a better understanding of the process and will often result in the identification of ways to make valuable improvements.

Control charts —

Part 2: Shewhart control charts

1 Scope

This document establishes a guide to the use and understanding of Shewhart control chart approach to the methods for statistical control of a process.

This document is limited to the treatment of statistical process control methods using only Shewhart system of charts. Some supplementary material that is consistent with Shewhart approach, such as the use of warning limits, analysis of trend patterns and process capability is briefly introduced. However, there are several other types of control charts which can be used in different situations.

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 3534-2, *Statistics — Vocabulary and symbols — Part 2: Applied statistics*

koniec náhľadu – text ďalej pokračuje v platenej verzii STN