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PEOPLE'S REPUBLIC OF CHINA**

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**Statistical methods in monitoring process capability and
performance - Part 4: Process capability estimates and
performance measures**

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Foreword

The plan of GB/T 40681 "Statistical Methods for Monitoring Production Process Capability and Performance" is divided into the following 8 parts.

- Part 1.General principles and concepts;
- Part 2.Process capability and performance of time-dependent process models;
- Part 3.Research on machine performance of discrete product measurement data;
- Part 4.Process capability estimation and performance measurement;
- Part 5.Process capability and performance estimation of counting characteristics;
- Part 6.Multivariate normal process capability analysis;

---Part 7.Measuring process capability;

---Part 8.Equipment performance analysis of multi-state production process.

This part is Part 4 of GB/T 40681.

This section was drafted in accordance with the rules given in GB/T 1.1-2009.

This part uses the redrafting method to modify and adopt ISO 22514-4:2016 "Statistical Methods Capability and Performance in Process Management No. 4

Part. Process Capability Estimation and Performance Measurement.

Compared with ISO 22514-4:2016, this part has made the following structural adjustments.

---The 3.1 of ISO 22514-4:2016 is deleted, and the "assessment and measurement methods involved in this part" in 3.1 are only applicable to metrological

Data is not applicable to attribute data. For relevant content of attribute data, please refer to ISO 22514-5" to adjust to Chapter 1, and revise

Changed to "This section applies to the process capability and performance evaluation of measurement data in the common production process, and does not apply to attribute characteristics

Process capability and performance evaluation. "

The technical differences between this part and ISO 22514-4:2016 and the reasons are as follows.

--- Delete "P0.135%. 0.135% quantile", "P99.865%. 99.865% quantile", "pi. geometric constant" and "e. Euler constant" in 2.1

In addition, the reason is that the definition is repeated;

--- Modify the "Palpha.alpha quantile" in 2.1 to "Palpha standardized Pearson curve alpha quantile" to be more accurate;

--- Replace "sigmat" in 2.1 and the full text with "sigmat. total standard deviation of the process";

--- Delete "Y1, Y2" in 2.1 and the full text. The meanings are different in different figures, and they have been explained in the text without symbol explanation;

---Modify the expression "CpkL =0.86, CpkU =0.91" involving numerical calculation in 4.8 to the estimated form "CpkL =0.86,

CpkU=0.91", modified the incorrectly used estimated value symbol;

--- Estimate the parameters of μ and σ^2 in C.3.1 " $\mu=X=$

Nsum

$i=1$

X_i " and $\sigma^2 =$

$\sum_{i=1}^{N-1}$

$i=1$

$(X_i - \bar{X})^2$ ", amended to

$\mu = \log X =$

$\sum_{i=1}^N$

$i=1$

$\log X_i$ " and $\sigma^2 =$

$\sum_{i=1}^{N-1}$

$i=1$

$(\log X_i - \log \bar{X})^2$ ";

--- Modify " $X_{\alpha} = Y - x_i(-\log(1-\alpha)) - \beta$ " in C.5 to " $X_{\alpha} = Y x_i[-\log(1-\alpha)]$
beta".

This section has made the following editorial changes.

---Modified the standard name;

--- Modified the non-standard expression of the data index in Table 3;

--- Modify " $K_{I0.95}$ " in D.1.3 to " K_I ";

--- Modify " $K_{U0.95}$ " in D.1.3 to " K_U ;

---The full text formula adds the serial number;

---Revised references.

This part is proposed and managed by the National Standardization Technical Committee for the Application of Statistical Methods (SAC/TC21).

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