



**NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF  
CHINA**

**中华人民共和国国家标准**

**GB/T 8170-2008**

Replace GB/T 1250-1989, GB/T 8170-1987

**Rules of Rounding off for Numerical Values & Expression and  
Judgment of Limiting Values**  
**数值修约规则与极限数值的表示和判定**

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People's Republic of China(AQSIQ) and Standardization Administration of the People's  
Republic of China

## Foreword

This standard is integrated and revised on the basis of GB/T 8170-1987 *Rules of Rounding off for Numerical Values* and GB/T 1250-1989 *Expression and Judgment of Limiting Values*.

This standard substitutes GB/T 8170-1987 and GB/T 1250-1989.

Compared with GB/T 8170-1987 and GB/T 1250-1989, the major difference of technical contents in this standard includes:

- Modify the standard format in accordance with GB/T 1.1-2000 *Directives for Standardization-Part 1: Rules for the Structure and Drafting of Standards*;
- Add terms “*Rounding off for Numerical Values*” and “*Limiting Value*”, modify the definition of “*Rounding Interval*”, delete the term “*Effective Bits*”, “*round off to 0.5 unit*” and “*round off to 0.2 unit*”;
- Delete “*specify to round off the numerical value to n-bit effective bits*” related contents in *Rules of Rounding off for Numerical Values* in Chapter 3 and reserve “*Situation of Specifying Numerical Digit*”;
- Add symbol “+” or “-” at top right corner of the numerical value rounded off other than after the numerical value when necessary to indicate the value is rounded-off; add “*It shall not be changed in case the standard or related document specified to use one of the comparing methods thereof*” in the two kinds of judging methods to compare the determined value or calculated value and limiting value; delete the content concerning absolute limiting value;
- Emphasize to “*report the numerical value obtained with excessive one or more digits according to the specified rounding digits when the test or calculation accuracy permits and then round it off to the specified digits according to procedures in 3.2*” when comparing with rounding off method.

This standard is proposed by China National Institute of Standardization.

This standard is under the jurisdiction of National Technical Committee 21 on Application of Statistical.

Drafting unit of this standard: China National Institute of Standardization, Academy of Mathematics and Systems Science, Chinese Academy of Science, Guangzhou Product Quality Supervision and Testing Institute, Wuxi Product Quality Supervision and Testing Institute and Fuzhou Chun-lun Tea Co., Ltd.

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# Rules of Rounding off for Numerical Values & Expression and Judgment of Limiting Values

## 1. Scope

This standard specifies the rules of rounding off for numerical values, expression and judgment method of limiting values, related terms and symbols as well as the method to compare the determined value or the calculated value with the limiting values specified in this standard.

This standard is applied to various numerical values tested and calculated in scientific technology and production activity. The numerical values obtained shall be rounded off in line with the rules specified in this standard when necessary.

This standard is applied to the preparation of various standards or other technical specifications and determination of test results.

## 2. Terms and Definitions

Terms and definitions as below are applicable for this standard.

### 2.1 Rounding off for numerical values

The process the last value obtained is next to the original numerical value by omitting the last several figures of the original numerical value and adjusting the last figure reserved.

Note: Numerical values rounded off are called as the round-off value (of the original numerical values).

### 2.2 Rounding interval

The minimum numerical value unit of round-off value.

Note: The round-off value is namely the integral multiple of the numerical value when numerical value of rounding interval is determined.

Example 1: When the specified rounding interval is 0.1, the round-off value shall be selected from integral multiple of 0.1, which is equivalent to rounding off the numerical value with one decimal.

Example 2: When the specified rounding interval is 100, the round-off value shall be selected from integral multiple of 100, which is equivalent to rounding off the numerical value to "hundred" digits.

### 2.3 Limiting values

The boundary value with index numerical value range specified to be evaluated in standard (or technical specification), given in quantity form and conforms to this standard (or technical specification).

## 3. Rules of rounding off for numerical values

### 3.1 Determination of rounding interval

- Specify the rounding interval as  $10^{-n}$  ( $n$  represents positive integer), or point out to round the numerical value off with  $n$  decimals;
- Specify the rounding interval as 1, or point out to round the numerical value off to single digits;
- Specify the rounding interval as  $10^n$  ( $n$  represents positive integer), or point out to round the numerical value off to  $10^n$  digits, or to "ten", "hundred", "thousand"... digits.

### 3.2 Rounding rules

3.2.1 When the leftmost figure of the value to be rounded off is less than 5, round it off and reserve other figures.

For example: round 12.149 8 off to single digits, viz. 12; round 12.149 8 off with one decimal, viz. 12.1.

3.2.2 When the leftmost figure of the value to be rounded off is greater than 5, Carry it over, viz. reserving the last figure and plus 1.

For example: Round 1 268 off to "hundred" digits, viz.  $1.3 \times 10^2$  (written as 1,300 in specific cases).

Note: In examples of this standard, "specific cases" refers to the cases when rounding interval is cleared.

3.2.3 When the leftmost figure of the value to be rounded off is 5, and there is figure other than 0 after the digits, carry it over, viz. plus 1 for the last figure of the value reserved.

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