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**Limit gauges for parallel pipe  
threads**

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## Foreword

This translation has been made based on the original Japanese Industrial Standard revised by the Minister of Economy, Trade and Industry, through deliberations at the Japanese Industrial Standards Committee as the result of proposal of revision of Japanese Industrial Standard submitted by Japan Precision Measuring Instrument Manufacturers Association (JMA)/Japanese Standards Association (JSA) with the draft being attached, based on the provision of Article 12 Clause 1 of the Industrial Standardization Law applicable to the case of revision by the provision of Article 14.

Consequently **JIS B 0254:1985** is replaced with this Standard.

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Attention is drawn to the possibility that some parts of this Standard may conflict with a patent right, application for a patent after opening to the public or utility model right. The relevant Minister and the Japanese Industrial Standards Committee are not responsible for identifying the patent right, application for a patent after opening to the public or the utility model right.

## Limit gauges for parallel pipe threads

### Introduction

This Japanese Industrial Standard has been prepared based on the second edition of ISO 228-2 published in 1987 with some modifications of the technical contents.

The portions given sidelines or dotted underlines and Annex JA and Annex JB are not contained in the corresponding International Standard. A list of modifications and their explanations is given in Annex JC.

The specifications of limit gauges for screw threads contained in Annex JB are, though not in accordance with ISO 228-2, adopted for alignment with the Annex in JIS B 0202. In the event that the Annex in JIS B 0202 is withdrawn, withdrawal of Annex JB in this Standard will be deliberated.

### 1 Scope

This Standard specifies the limit gauges to be used for dimensional inspection of parallel pipe threads (G) specified in JIS B 0202 and gauges to be used in their checking.

The limit gauges for screw threads and checking gauges are generically referred to as “gauges”.

The gauges applicable to the parallel pipe threads (PF) specified in Annex of JIS B 0202 are specified in Annex JB.

Depending on the applications of the machined pieces, additional checks may be carried out using measuring instruments other than these gauges :

- a) the threaded GO gauges shall ensure that the profile of the machined piece does not exceed the maximum of material provided for by the tolerances applied to the dimensions of the profile defined by JIS B 0202;
- b) the threaded NOT GO gauges for the threads of the pieces fix the minimum material limit on the flanks of the thread.

NOTE : The International Standard corresponding to this Standard and the symbol of degree of correspondence are as follows :

ISO 228-2 : 1987 *Pipe threads where pressure-tight joints are not made on threads — Part 2 : Verification by means of limit gauges* (MOD)

The symbols which denote the degree of correspondence in the contents in the corresponding International Standard and JIS are IDT (identical), MOD (modified) and NEQ (not equivalent) according to ISO/IEC Guide 21-1.

## 2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this Standard. The most recent editions of the standards (including amendments) indicated below shall be applied.

JIS B 0202 *Parallel pipe threads*

NOTE : Corresponding International Standard : ISO 228-1 *Pipe threads where pressure-tight joints are not made on the threads — Part 1 : Dimensions, tolerances and designation* (MOD)

JIS B 0261 *Parallel screw thread gauges — Measuring method of gauges*

JIS B 0680 *Geometrical Product Specifications (GPS) — Standard reference temperature for geometrical product specification and verification*

JIS G 4404 *Alloy tool steels*

## 3 Quantity symbols

For the purpose of this Standard, the following quantity symbols in table 1 apply.

Table 1 Quantity symbols

| Symbol     | Definition                                                                                                                                                     |
|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| $b_3$      | Width of clearance groove at the major and minor diameter respectively of the thread profile with truncated flanks                                             |
| $d, D$     | Basic major diameter of the thread (see JIS B 0202)                                                                                                            |
| $d_1, D_1$ | Basic minor diameter of the thread ( $d_1 = D_1 = d - 1.280\ 654\ P$ )                                                                                         |
| $d_2, D_2$ | Basic pitch diameter of the thread ( $d_2 = D_2 = d - 0.640\ 327\ P$ )                                                                                         |
| $m$        | Distance between the middle of the tolerance zones of the pitch diameter of the threaded ring gauge and the pitch diameter of the GO checking plug             |
| $r_1$      | Radius of rounding at crest and root that are in contact with the linear part of the flank in a profile of a gauge with complete flanks                        |
| $r_2$      | Radius of rounding at crest and root that are in contact with the linear part of the flank in a profile of a gauge with truncated flanks                       |
| $P^{a)}$   | Pitch ( $P = 25.4 / \text{number of threads}$ )                                                                                                                |
| $X$        | Displacement of clearance groove at the major and minor diameter respectively of the thread profile with truncated flanks                                      |
| $S$        | Permissible deviation of $b_3$                                                                                                                                 |
| $T_{CP}$   | Tolerance on the pitch diameter of checking gauge                                                                                                              |
| $T_{d2}$   | Tolerance on the pitch diameter of the external thread                                                                                                         |
| $T_{D2}$   | Tolerance on the pitch diameter of the internal thread                                                                                                         |
| $T_{PL}$   | Tolerance on the pitch diameter of the threaded GO and NOT GO plug gauges                                                                                      |
| $T_R$      | Tolerance on the pitch diameter of the threaded GO and NOT GO ring gauges                                                                                      |
| $u^{b)}$   | The value twice the radial height of rounding at crest and root of thread ( $u = 0.147\ 84\ P$ )                                                               |
| $W_{GO}$   | Distance between the middle of the tolerance zone of the pitch diameter of the threaded GO plug gauge or the threaded GO ring gauge and the wear limit         |
| $W_{NG}$   | Distance between the middle of the tolerance zone of the pitch diameter of the threaded NOT GO plug gauge or the threaded NOT GO ring gauge and the wear limit |

**Table 1 (concluded)**

| Symbol                                                                                                      | Definition                                                                                                                                                         |
|-------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| $Z_{PL}$                                                                                                    | Distance between the middle of the tolerance zone of the pitch diameter of the threaded GO plug gauge and the lower limit of the pitch diameter of internal thread |
| $Z_R$                                                                                                       | Distance between the middle of the tolerance zone of the pitch diameter of the threaded GO ring gauge and the upper limit of the pitch diameter of external thread |
| Notes a) The specified values in JIS B 0202 shall be given precedence over values calculated by formula.    |                                                                                                                                                                    |
| b) The specified values in table 5 and table 7 shall be given precedence over values calculated by formula. |                                                                                                                                                                    |

## 4 Types of gauges

### 4.1 Types and symbols of limit gauges for screw threads

The types and symbols of limit gauges for screw threads are as shown in table 2.

**Table 2 Types and symbols of limit gauges for screw threads**

| Screw thread to be inspected                                                                                                                       | Dimension to be inspected | Types of limit gauges for screw thread | Gauge symbol |
|----------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|----------------------------------------|--------------|
| External thread                                                                                                                                    | Pitch diameter            | Threaded GO ring gauge                 | GR           |
|                                                                                                                                                    |                           | Threaded NOT GO ring gauge             | NR           |
| Internal thread                                                                                                                                    | Pitch diameter            | Threaded GO plug gauge                 | GP           |
|                                                                                                                                                    |                           | Threaded NOT GO plug gauge             | NP           |
| NOTE : Though gauge symbols are not specified in <b>ISO 228-2</b> , this Standard shows the conventional gauge symbols for the users' convenience. |                           |                                        |              |

### 4.2 Types and symbols of checking gauges

The types and symbols of checking gauges are as shown in table 3.

**Table 3 Types and symbols of checking gauges**

| Limit gauges for screw threads to be inspected                                                                                             | Types of checking gauges                                | Gauge symbol |
|--------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|--------------|
| Threaded GO ring gauge                                                                                                                     | GO checking plug for new threaded GO ring gauge         | GRGF         |
|                                                                                                                                            | NOT GO checking plug for new threaded GO ring gauge     | GRNF         |
|                                                                                                                                            | Wear-checking plug for threaded GO ring gauge           | GW           |
| Threaded NOT GO ring gauge                                                                                                                 | GO checking plug for new threaded NOT GO ring gauge     | NRGF         |
|                                                                                                                                            | NOT GO checking plug for new threaded NOT GO ring gauge | NRNF         |
|                                                                                                                                            | Wear-checking plug for threaded NOT GO ring gauge       | NW           |
| NOTE : Though gauge symbols are not specified in ISO 228-2, this Standard shows the conventional gauge symbols for the users' convenience. |                                                         |              |

## **5 Function, control and use of gauges**

### **5.1 Limit gauges for external threads and their checking gauges**

#### **5.1.1 GO threaded ring gauge**

##### **5.1.1.1 Function**

The threaded GO ring gauge checks the virtual size of the external thread i.e., it checks the maximum material limit of the pitch diameter, taking into account deviations of form (departures from roundness and lack of straightness of the thread axis over the gauge length) and deviation of pitch, drunkenness of lead, deviation of half angle of thread which produce an apparent enlargement of the pitch diameter.

In addition, this gauge checks whether the length of the straight flank is adequate, i.e. that the rounding at the root of the profile does not encroach too far upon the flank of the thread.

Checking with this gauge is essentially in accordance with the Taylor principle (see JIS B 0251), and therefore can verify that the thread profile does not exceed the maximum material limit specified in JIS B 0202.

##### **5.1.1.2 Control**

The threaded GO ring gauge shall be checked using the threaded GO and NOT GO checking plugs and should be controlled regularly with the wear-checking plug. If the NOT GO checking plug is not used, other provisions shall be made so as to ensure that the maximum size of the pitch diameter of the threaded GO ring gauge is not exceeded.

##### **5.1.1.3 Use**

The threaded GO ring gauge screwed by hand, without excessive force, shall pass over the whole length of the thread. If this is not possible, the thread does not comply with the specifications.

### **5.1.2 Threaded checking plugs for new threaded GO ring gauge**

#### **5.1.2.1 Function**

These checking plugs (GO and NOT GO) are used to check the limits of the pitch diameter of the new threaded GO ring gauge.

#### **5.1.2.2 Use**

The GO checking plug screwed by hand, without excessive force, shall pass through the new threaded GO ring gauge.

The NOT GO checking plug screwed by hand, without excessive force, may enter into both ends of the new threaded GO ring gauge, but not more than one turn of thread. The number of turns of thread is determined when unscrewing the plug.

### **5.1.3 Wear-checking plug for threaded GO ring gauge**

#### **5.1.3.1 Function**

The wear-checking plug is used to ascertain that the pitch diameter of the threaded

GO ring gauge has not exceeded the wear limit. It embodies the pitch diameter of the threaded GO ring gauge at the prescribed limit of wear.

#### **5.1.3.2 Use**

The wear-checking plug screwed by hand, without excessive force, may enter into both ends of the threaded GO ring gauge, but not more than one turn of thread. The number of turns of thread is determined when unscrewing the plug. If it can be screwed in more than one turn of thread, the threaded GO ring gauge no longer meets the specifications.

#### **5.1.4 Threaded NOT GO ring gauge**

##### **5.1.4.1 Function**

The threaded NOT GO ring gauge is intended to check whether the actual pitch diameter exceeds the specified minimum size. The checking with threaded NOT GO ring gauge does not correspond to the Taylor principle when checking rigid machined pieces. In cases of non-rigid machined pieces, the departure from the Taylor principle is of less importance because of the flexibility of the pieces.

##### **5.1.4.2 Control**

The threaded NOT GO ring gauge shall be checked using the threaded GO and NOT GO checking plugs and should be controlled regularly with the wear-checking plug. If the NOT GO checking plug is not used, other provisions shall be made to ensure that the maximum limit of the pitch diameter of the new threaded NOT GO ring gauge is not exceeded.

##### **5.1.4.3 Use**

Threaded NOT GO ring gauge, screwed by hand without excessive force onto the thread, may be screwed on both sides but not more than two turns of the thread. The number of turns of thread is determined when unscrewing the plug. If the gauge can be screwed more than two turns of thread, the thread does not comply with the specifications.

The threaded NOT GO ring gauge shall not pass completely over a threaded part having a length of three threads or less.

#### **5.1.5 Checking plugs for new threaded NOT GO ring gauge**

##### **5.1.5.1 Function**

The GO and NOT GO checking plugs are used to check the pitch diameter limits of the new threaded NOT GO ring gauge.

The GO checking plug makes sure that the clearance diameter of the new threaded NOT GO ring gauge is too small.

##### **5.1.5.2 Use**

The GO checking plug screwed by hand, without excessive force, shall pass through the corresponding new threaded NOT GO ring gauge.

The NOT GO checking plug gauge screwed by hand, without excessive force, may enter the new threaded NOT GO ring gauge at both ends, but not more than one turn of thread. The number of turns of thread is determined when unscrewing the plug.

#### **5.1.6 Wear-checking plug for threaded NOT GO ring gauge**

##### **5.1.6.1 Function**

The wear-checking plug checks whether the pitch diameter of the threaded NOT GO ring gauge has exceeded the wear limit. It embodies the pitch diameter of the threaded NOT GO ring gauge at the prescribed limit of wear.

##### **5.1.6.2 Use**

The wear-checking plug screwed by hand, without excessive force, may enter into both ends of the threaded NOT GO ring gauge, but not more than one turn of thread. The number of turns of thread is determined when unscrewing the plug. If it can be screwed in more than one turn of thread, the threaded NOT GO ring gauge no longer meets the specifications.

#### **5.2 Limit gauges for internal threads**

##### **5.2.1 Threaded GO plug gauge**

###### **5.2.1.1 Function**

The threaded GO plug gauge checks the virtual size of the internal thread. This is effected by checking the minimum limit of the pitch diameter, taking into account deviations of form (departures from roundness and lack of straightness of the thread axis over the gauge length) which produce an apparent reduction of the pitch diameter, permissible deviation of pitch, drunkenness of lead, permissible deviation of half-angle of thread.

In addition, it checks whether the length of straight flank is sufficient, i.e. that the rounding at the root of the profile does not encroach too far upon the flank of the thread. Checking with the threaded GO ring gauge is essentially in accordance with the Taylor principle (see **JIS B 0251**), and therefore can verify that the internal thread profile does not exceed the maximum material limit specified in **JIS B 0202**.

###### **5.2.1.2 Control**

The threaded GO plug gauge should be checked regularly for wear.

The wear of the threaded GO plug gauge is found by measuring.

###### **5.2.1.3 Use**

The threaded GO plug gauge screwed by hand, without excessive force, shall pass through the whole length of the thread. If this is not possible, the thread does not comply with the specifications.

##### **5.2.2 Threaded NOT GO plug gauge**

###### **5.2.2.1 Function**

The threaded NOT GO plug gauge checks whether the actual pitch diameter exceeds

the specified maximum size.

#### 5.2.2.2 Control

The threaded NOT GO plug gauge shall be checked regularly for wear.

The wear of the threaded NOT GO plug gauge is found by measuring.

#### 5.2.2.3 Use

The threaded NOT GO plug gauge screwed by hand, without excessive force, may enter into both ends of the threaded part, but not more than two turns of thread. The number of turns of thread is determined when unscrewing the plug. If it can be screwed in more than two turns of thread, the thread does not comply with the specifications.

The threaded NOT GO plug gauge shall not pass completely through a machined piece with a length of three threads or less.

### 6 Entry of the thread

In order that checking is not affected, it is therefore recommended that the incompletely formed part of the thread be removed (to the start of the complete thread) (see figure 1) or, if this is not possible, that a chamfer to the thread root of  $27.5^\circ$  be specified (see figure 2).

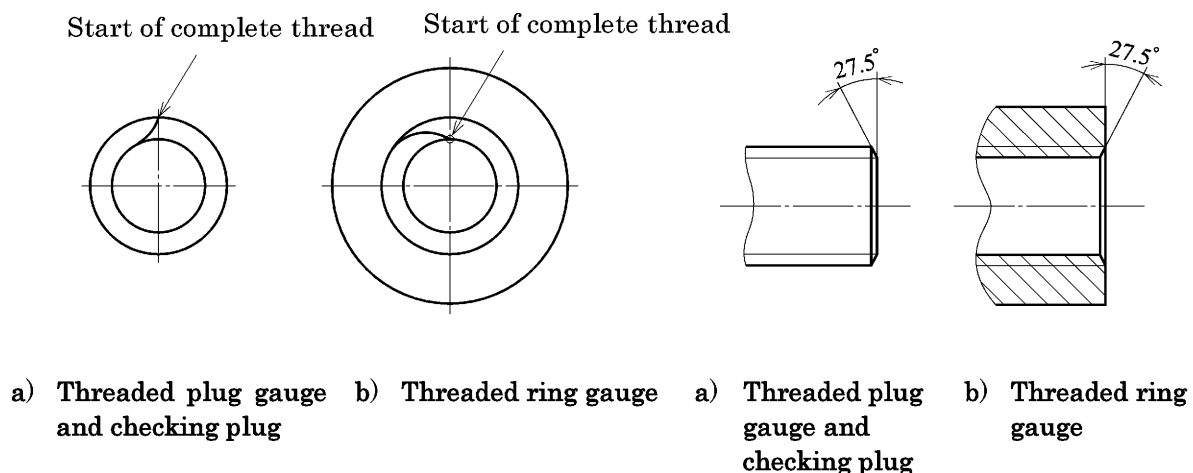


Figure 1 Removal of incomplete thread

Figure 2 Chamfer of start of thread

### 7 Gauges for external threads

#### 7.1 Relative positions of pitch diameter tolerance zones

The relative positions of pitch diameter tolerance zones shall be as shown in figure 3.

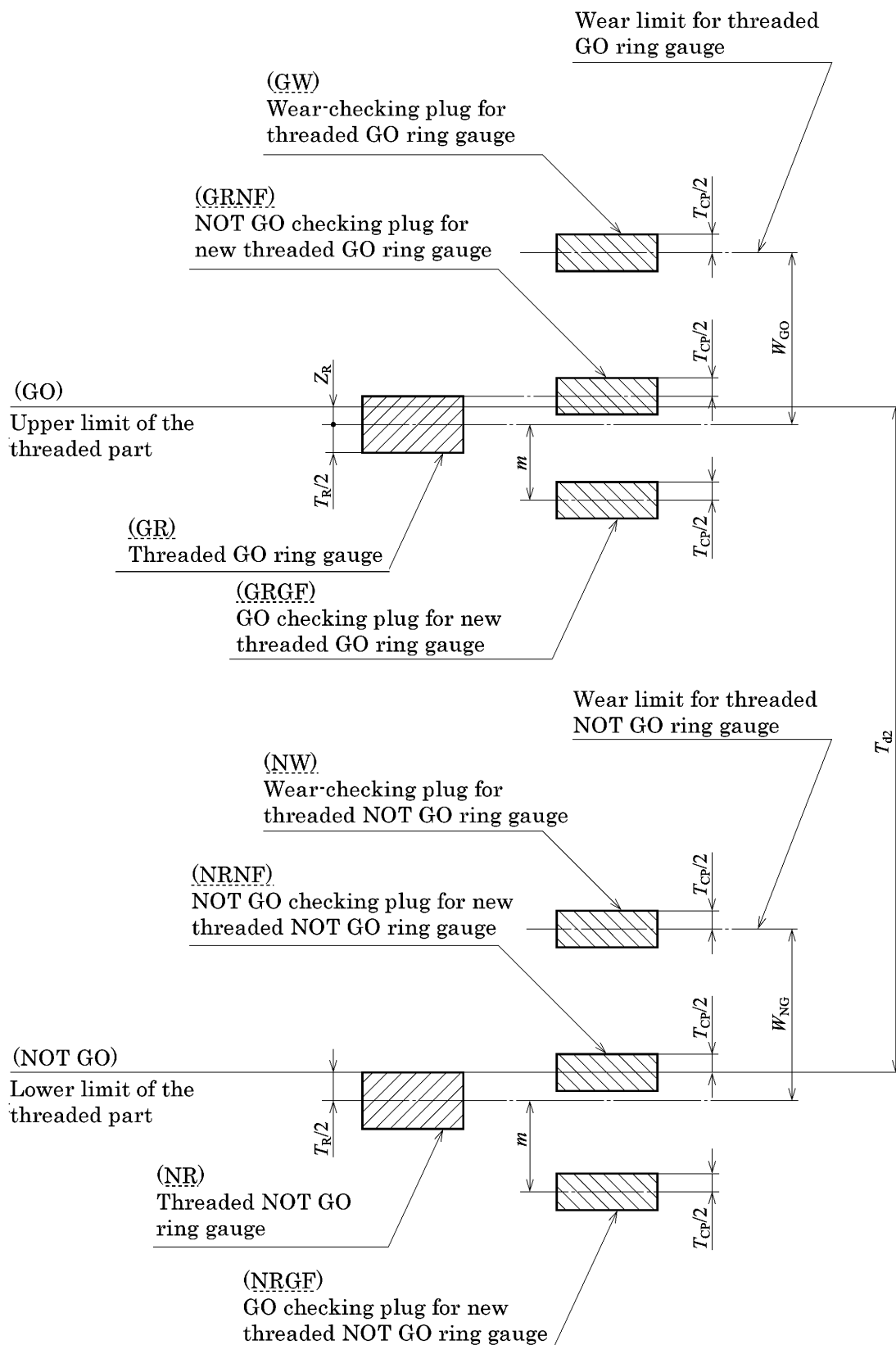


**Figure 3** Relative positions of pitch diameter tolerance of gauge for external thread

## 7.2 Thread profiles

### 7.2.1 GO side

Thread profiles of GO side are as shown in figure 4 and figure 5.

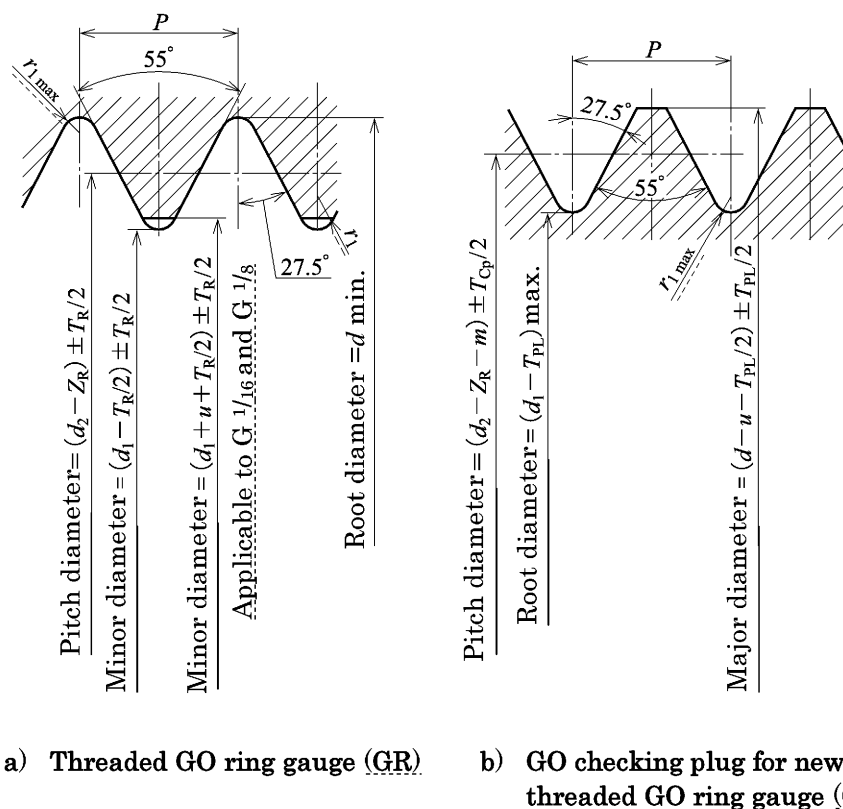


**Figure 4** Profiles with complete flanks

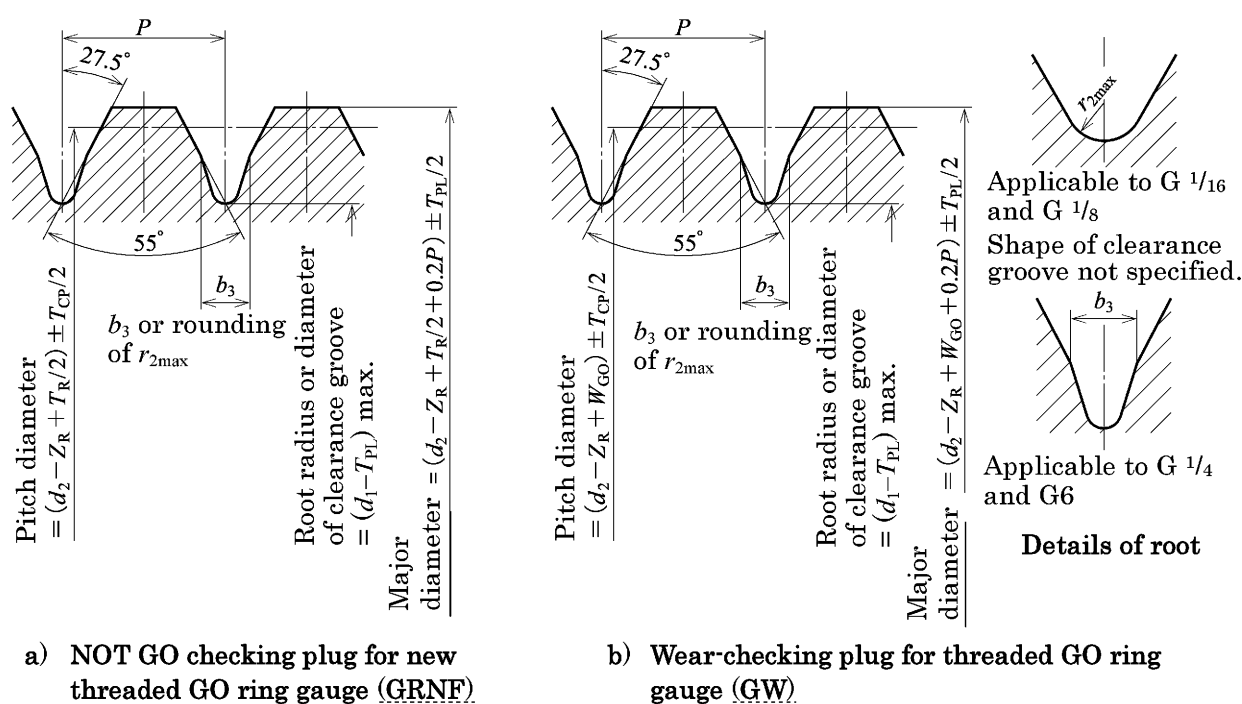
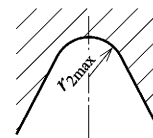
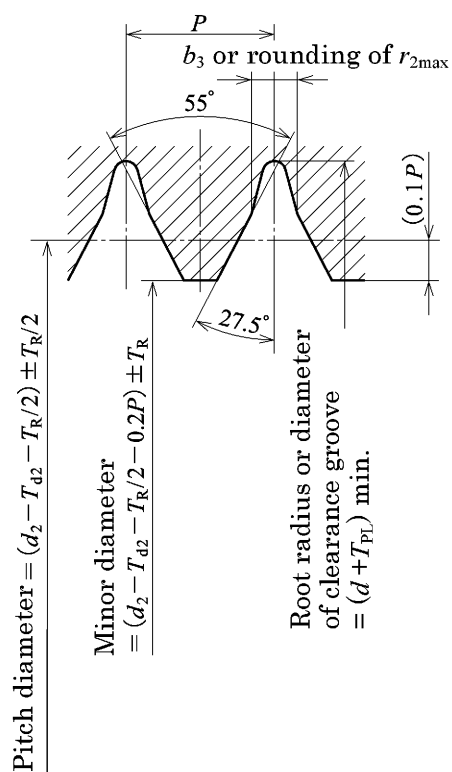


Figure 5 Profiles with truncated flanks

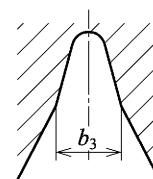
## 7.2.2 NOT GO side

Thread profiles of NOT GO side are as shown in figure 6 and figure 7.



Applicable to G  $1/16$   
and G  $1/8$

Shape of clearance  
groove not specified.

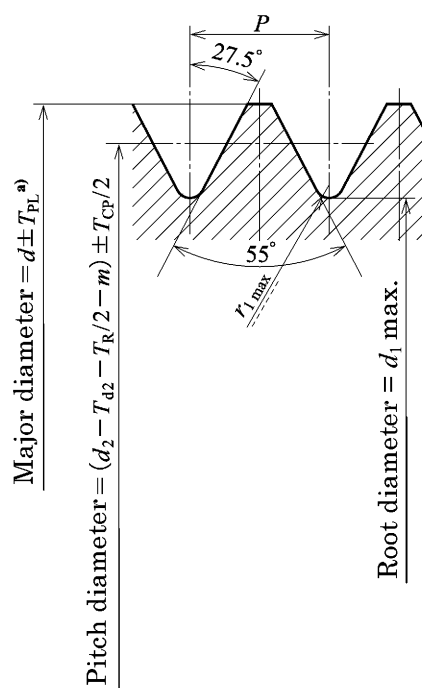


Applicable to G  $1/4$   
and G 6

Details of root

Threaded NOT GO ring gauge (NR)

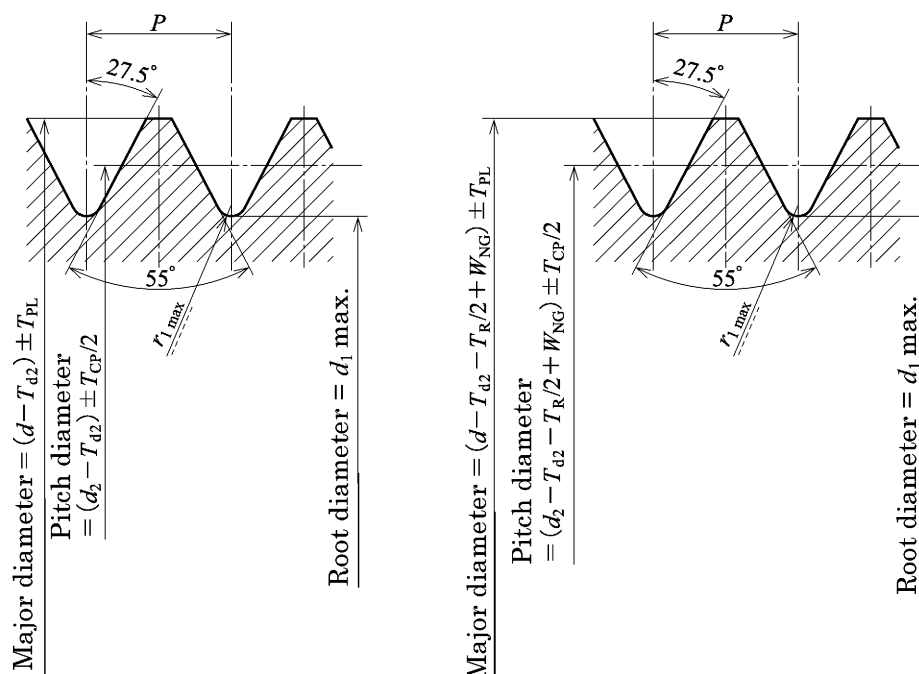
Figure 6 Profile with truncated flank



Note <sup>a)</sup> The major diameter of gauges for Grade B threads of nominal designations G  $1/16$  to G  $3/8$  and G  $2 1/4$  to G 6 shall be calculated by the following formula to weaken the sharpness of the crest.

$$[d_2 - T_{d_2} - (T_R/2) - m - (T_{CP}/2) + 0.831\,785\,P - T_{PL}] \pm T_{PL}$$

a) GO checking plug for new threaded NOT GO ring gauge (NRGF)



- b) NOT GO checking plug for new threaded NOT GO ring gauge (NRNF)
- c) Wear-checking plug for threaded NOT GO ring gauge (NW)

Figure 7 Profiles with complete flanks

### 7.3 Numerical values

#### 7.3.1 Numerical values related to thread profile

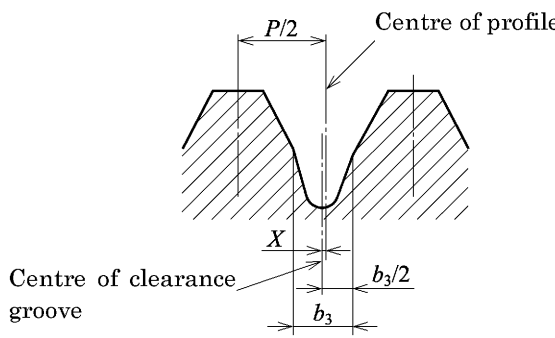
Numerical values related to thread profile shall be as given in table 4.

**Table 4 Numerical values related to thread profiles**

Unit : mm

| Designation of screw thread to be inspected | Number of threads (per 25.4 mm) | Pitch $P$ (informative) | Profile with complete flanks |                                             |                                                        | Profile with truncated flanks<br><u>GRNF, GW, NR</u>   |                               |                               |                                                         |                                             |                                                            |
|---------------------------------------------|---------------------------------|-------------------------|------------------------------|---------------------------------------------|--------------------------------------------------------|--------------------------------------------------------|-------------------------------|-------------------------------|---------------------------------------------------------|---------------------------------------------|------------------------------------------------------------|
|                                             |                                 |                         | <u>GR</u>                    | <u>GR, GRGF, NRGF, NRNF, NW</u>             |                                                        | <u>Maximum value of rounding of root</u><br>$r_{2max}$ |                               |                               | <u>Width of clearance groove</u><br>$b_3$ <sup>a)</sup> |                                             | <u>Permissible deviation of half-angle of thread (min)</u> |
|                                             |                                 |                         |                              | <u>Round-<br/>ing of<br/>crest</u><br>$r_1$ | <u>Maximum value of rounding of root</u><br>$r_{1max}$ |                                                        |                               |                               |                                                         |                                             |                                                            |
|                                             |                                 |                         |                              |                                             |                                                        | <u>GRNF, GW</u>                                        | <u>For Grade A threads NR</u> | <u>For Grade B threads NR</u> | <u>Basic size</u>                                       | <u>Permissible deviation <math>S</math></u> |                                                            |
| G $1/16$ ,<br>G $1/8$                       | 28                              | 0.907 1                 | <u>0.12</u>                  | <u>0.12</u>                                 | ±15                                                    | <u>0.12</u>                                            | <u>0.07</u>                   | <u>0.02</u>                   | —                                                       | —                                           | ±16                                                        |
| G $1/4$ ,<br>G $3/8$                        | 19                              | 1.336 8                 | <u>0.18</u>                  | <u>0.18</u>                                 | ±13                                                    | —                                                      | —                             | —                             | 0.4                                                     | ±0.04                                       | ±16                                                        |
| G $1/2$ to<br>G $7/8$                       | 14                              | 1.814 3                 | <u>0.25</u>                  | <u>0.25</u>                                 | ±11                                                    | —                                                      | —                             | —                             | 0.5                                                     | ±0.05                                       | ±14                                                        |
| G 1 to<br>G 6                               | 11                              | 2.309 1                 | <u>0.32</u>                  | <u>0.32</u>                                 | ±10                                                    | —                                                      | —                             | —                             | 0.8                                                     | ±0.05                                       | ±14                                                        |

Note <sup>a)</sup> The maximum displacement permitted between the middle of the groove and that of the profile is  $X$ , which should be equal to the permissible deviation of  $b_3$ ,  $S$ . If the effective displacement  $X$  is less than  $S$ , the permissible deviation of  $b_3$  may be twice the difference between  $S$  and  $X$ .



#### 7.3.2 Numerical values for calculating the size, permissible deviation and tolerance of gauge

Numerical values for calculating the size, permissible deviation and tolerance of gauge shall be as given in table 5.

**Table 5 Numerical values for calculating the size,  
permissible deviation and tolerance of gauge**

Unit :  $\mu\text{m}$

| Designation<br>of screw<br>thread to be<br>inspected | Threaded GO ring gauge for common use for Grade A<br>and Grade B threads, and checking gauge<br><u>GR, GRGF, GRNF, GW</u><br>Threaded NOT GO ring gauge for Grade A threads,<br>and checking gauge<br><u>NR, NRGF, NRNF, NW</u> |       |          |          |     |       |          |          |           | Threaded NOT GO ring gauge for<br>Grade B threads and checking<br>gauge<br><u>NR, NRGF, NRNF, NW</u> |       |          |          |     |          |
|------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|----------|----------|-----|-------|----------|----------|-----------|------------------------------------------------------------------------------------------------------|-------|----------|----------|-----|----------|
|                                                      | $T_{d2}$                                                                                                                                                                                                                        | $T_R$ | $T_{PL}$ | $T_{CP}$ | $m$ | $Z_R$ | $W_{NG}$ | $W_{GO}$ | $u$<br>mm | $T_{d2}$                                                                                             | $T_R$ | $T_{PL}$ | $T_{CP}$ | $m$ | $W_{NG}$ |
| G $1/16$ , G $1/8$                                   | 107                                                                                                                                                                                                                             | 16    | 10       | 10       | 17  | 2     | 13       | 18       | 0.134     | 214                                                                                                  | 26    | 16       | 14       | 24  | 21       |
| G $1/4$ , G $3/8$                                    | 125                                                                                                                                                                                                                             | 16    | 10       | 10       | 17  | 2     | 13       | 18       | 0.198     | 250                                                                                                  | 26    | 16       | 14       | 24  | 21       |
| G $1/2$ to G $7/8$                                   | 142                                                                                                                                                                                                                             | 20    | 12       | 10       | 20  | 9     | 17       | 23       | 0.268     | 284                                                                                                  | 26    | 16       | 14       | 24  | 21       |
| G 1 to G 2                                           | 180                                                                                                                                                                                                                             | 20    | 12       | 10       | 20  | 9     | 17       | 23       | 0.341     | 360                                                                                                  | 34    | 20       | 18       | 30  | 28       |
| G $2 1/4$ to G 4                                     | 217                                                                                                                                                                                                                             | 26    | 16       | 14       | 24  | 13    | 21       | 28       | 0.341     | 434                                                                                                  | 34    | 20       | 18       | 30  | 28       |
| G $4 1/2$ to G 6                                     | 217                                                                                                                                                                                                                             | 26    | 16       | 14       | 24  | 13    | 21       | 28       | 0.341     | 434                                                                                                  | 34    | 20       | 18       | 30  | 28       |

### 7.3.3 Permissible deviation of pitch

The permissible deviation of the pitch measured between any two threads over the whole length of gauge is  $\pm 5 \mu\text{m}$ .

## 8 Gauges for internal threads

### 8.1 Relative positions of pitch diameter tolerance zones

The relative positions of pitch diameter tolerance zones shall be as shown in figure 8.

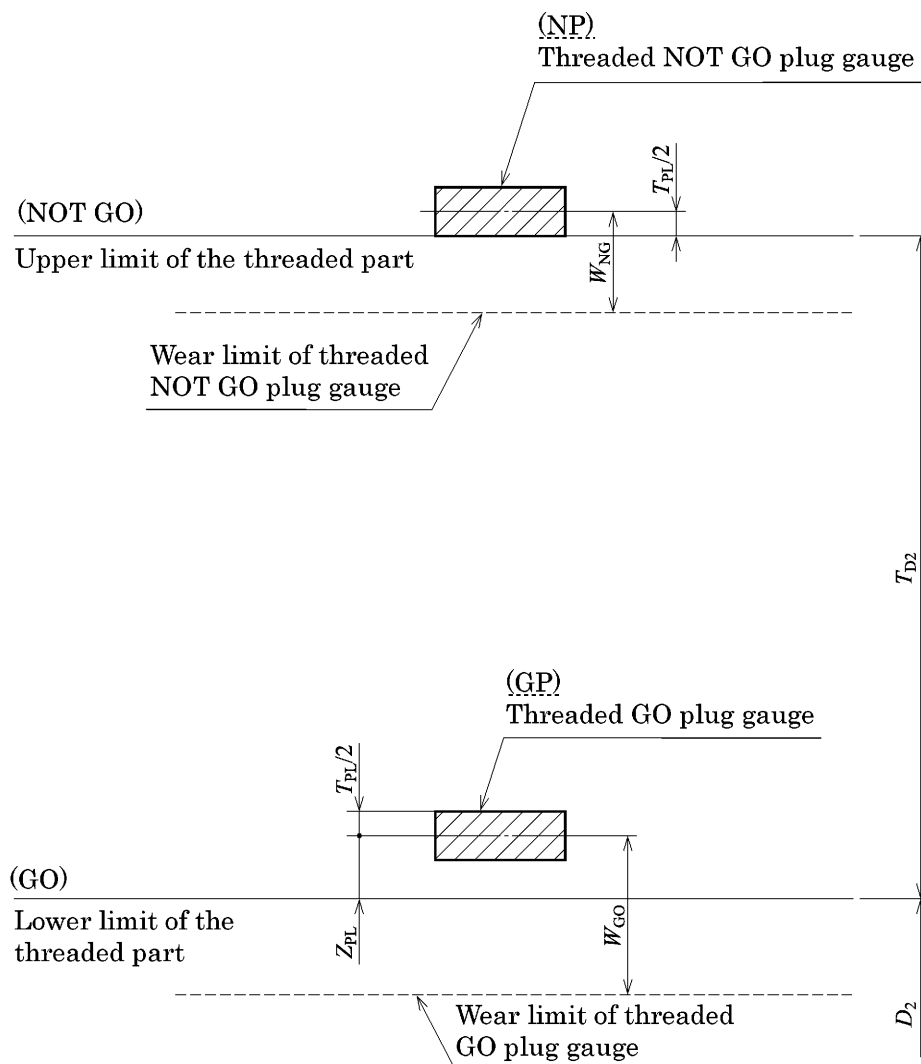


**Figure 8** Relative positions of pitch diameter tolerance zones of gauges for internal thread

## 8.2 Thread profiles

Thread profiles shall be as shown in figure 9 and figure 10.

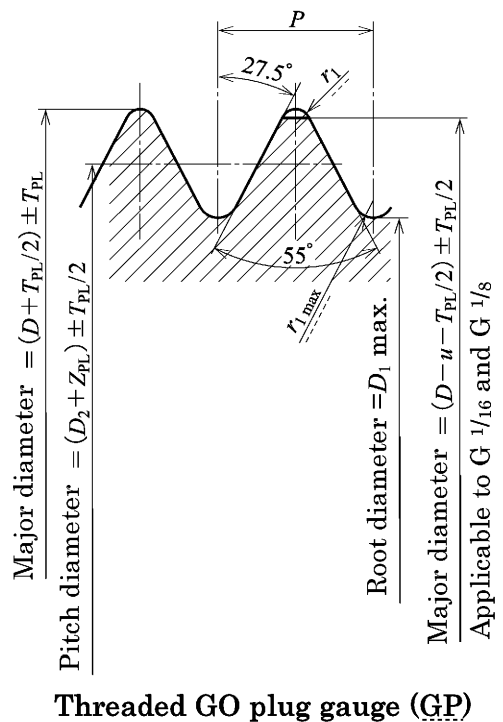


Figure 9 Profile with complete flank

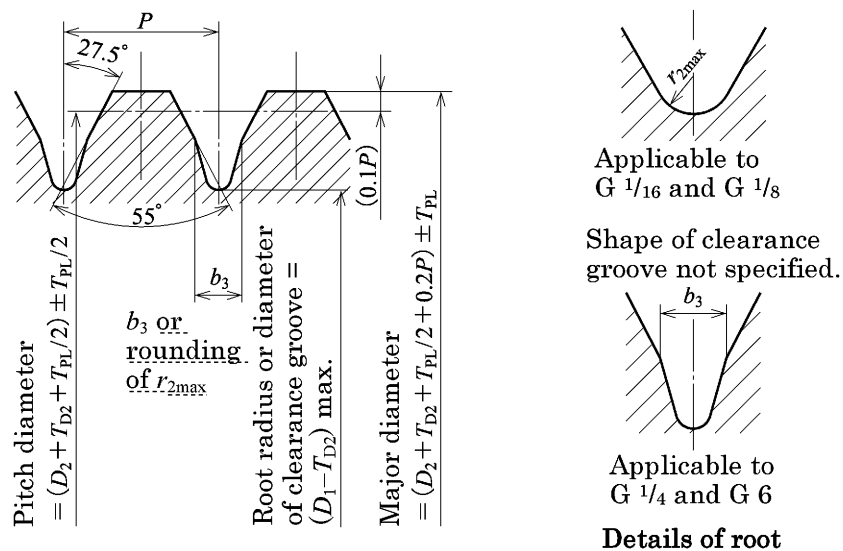


Figure 10 Profile with truncated flank

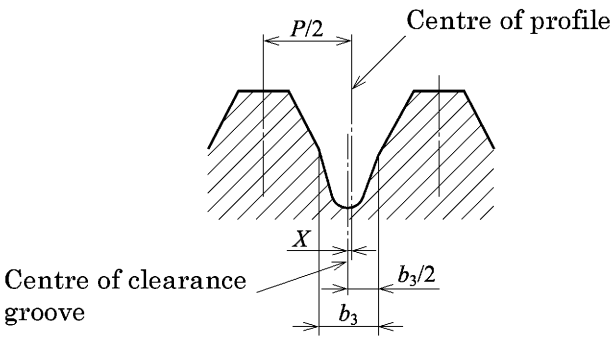
### 8.3 Numerical values

#### 8.3.1 Numerical values of thread profile

Numerical values of thread profile shall be as given in table 6.

**Table 6 Numerical values of thread profile**

Unit : mm

| Designation of screw threads to be inspected                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Number of threads (per 25.4 mm) | Pitch $P$ (informative) | Profile with complete flank GP |                                               |                                                     | Profile with truncated flank NP               |                                               |                           |                                                     |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|-------------------------|--------------------------------|-----------------------------------------------|-----------------------------------------------------|-----------------------------------------------|-----------------------------------------------|---------------------------|-----------------------------------------------------|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                 |                         | Rounding of crest $r_1$        | Maximum value of rounding of root $r_{1\max}$ | Permissible deviation of half-angle of thread (min) | Maximum value of rounding of root $r_{2\max}$ | Width of clearance groove $b_3$ <sup>a)</sup> |                           | Permissible deviation of half-angle of thread (min) |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                 |                         |                                |                                               |                                                     |                                               | Basic size                                    | Permissible deviation $S$ |                                                     |
| G $1/16$ , G $1/8$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 28                              | 0.907 1                 | 0.12                           | 0.12                                          | $\pm 15$                                            | 0.07                                          | —                                             | —                         | $\pm 16$                                            |
| G $1/4$ , G $3/8$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 19                              | 1.336 8                 | 0.18                           | 0.18                                          | $\pm 13$                                            | —                                             | 0.4                                           | $\pm 0.04$                | $\pm 16$                                            |
| G $1/2$ to G $7/8$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 14                              | 1.814 3                 | 0.25                           | 0.25                                          | $\pm 11$                                            | —                                             | 0.5                                           | $\pm 0.05$                | $\pm 14$                                            |
| G 1 to G 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 11                              | 2.309 1                 | 0.32                           | 0.32                                          | $\pm 10$                                            | —                                             | 0.8                                           | $\pm 0.05$                | $\pm 14$                                            |
| <p>Note <sup>a)</sup> The maximum displacement permitted between the middle of the groove and that of the profile is <math>X</math>, which should be equal to the permissible deviation of <math>b_3</math>, <math>S</math>. If the effective displacement <math>X</math> is less than <math>S</math>, the permissible deviation of <math>b_3</math> may be twice the difference between <math>S</math> and <math>X</math>.</p>  |                                 |                         |                                |                                               |                                                     |                                               |                                               |                           |                                                     |

### 8.3.2 Numerical values for calculating the size, permissible deviation and tolerance of gauge

Numerical values for calculating the size, permissible deviation and tolerance of gauge shall be as given in table 7.

**Table 7 Numerical values for calculating the size,  
permissible deviation and tolerance of gauge**Unit :  $\mu\text{m}$ 

| Designation of<br>screw thread to<br>be inspected | Gauge for internal thread GP, NP |          |          |          |          |           |
|---------------------------------------------------|----------------------------------|----------|----------|----------|----------|-----------|
|                                                   | $T_{D2}$                         | $Z_{PL}$ | $T_{PL}$ | $W_{NG}$ | $W_{GO}$ | $u$<br>mm |
| G $1/16$ , G $1/8$                                | 107                              | 8        | 10       | 10       | 14       | 0.134     |
| G $1/4$ , G $3/8$                                 | 125                              | 8        | 10       | 10       | 14       | 0.198     |
| G $1/2$ to G $7/8$                                | 142                              | 13       | 12       | 13       | 19       | 0.268     |
| G 1 to G 2                                        | 180                              | 13       | 12       | 13       | 19       | 0.341     |
| G 2 $1/4$ to G 4                                  | 217                              | 18       | 16       | 17       | 23       | 0.341     |
| G 4 $1/2$ to G 6                                  | 217                              | 18       | 16       | 17       | 23       | 0.341     |

### 8.3.3 Permissible deviation of pitch

The permissible deviation of the pitch measured between any two threads over the whole length of gauge is  $\pm 5 \mu\text{m}$ .

## 9 Standard temperature

All dimensions specified in this Standard are the values at the standard temperature of  $20^\circ\text{C}$  as specified in JIS B 0680.

## 10 Gauge sizes, and permissible deviations and tolerances thereof

The gauge sizes, and permissible deviations and tolerances thereon shall be calculated by the formulae in clause 7 and clause 8, and the calculated results shall be in accordance with Annex JA.

## 11 Hardness and surface roughness

The hardness of the gauge shall be 660 HV min. or 58 HRC min., and surface roughness of the gauge shall be  $Ra 0.2$ .

## 12 Measurement method

The measurement method for gauges shall be as specified in JIS B 0261.

## 13 Inspection

The inspection of gauges shall be performed according to clause 12, and the results shall satisfy the requirements in clauses 7, 8, 10 and clause 11.

## 14 Marking

The following information shall be marked on a conspicuous place of the gauge.

- Designation of the screw thread to be inspected — Symbol of class of screw thread <sup>1) 2)</sup>
- Helix direction of thread profile <sup>3)</sup>