

ICS 21.120.30
CCS J 18



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

GB/T 3478.5-2008

**Straight cylindrical involute splines -- Metric module, side fit --
Part 5: Inspection
(English Translation)**

Issued on: September 22, 2008

Implemented on: May 1, 2009

**Issued by: General Administration of Quality Supervision, Inspection and
Quarantine of PRC**

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Foreword

GB/T 3478 "Straight cylindrical involute splines - Metric module, side fit" is

divided into 9 parts:

- Part 1: Generalities;
- Part 2: 30° pressure angle dimensions tables;
- Part 3: 37.5° pressure angle dimensions tables;
- Part 4: 45° pressure angle dimensions tables;
- Part 5: Inspection;
- Part 6: 30° pressure angle M and W values;
- Part 7: 37.5° pressure angle M and W values;
- Part 8: 45° pressure angle M and W values;
- Part 9: Measuring pin.

This part is the part 5 of GB/T 3478.

This part modifies and adopts ISO 4156-3:2005 "Straight cylindrical involute splines - Metric module, side fit - Part 3: Inspection". The main differences are as follows:

- Respectively INCLUDE the calculation of the diameter of the measuring bar D_{Ri} and D_{Re} in clause 8.5, the calculation of pin spacing M_{Ri} and cross-pin distance M_{Re} in clause 8.6, the calculation of the average length W of the common nominal line of the external spline in clause 9 of ISO 4156-3:2005 into part 6, part 7, part 8 of GB/T 3478;

- MOVE the gauge design part of clause 10 of ISO 4156-3:2005 into Appendix A;

- ADD the one-way test method;

- ADD the analytical inspection; INCLUDE the appendix (indexing error analysis) of ISO 4156-3:2005 into clause 5.4.

This part is a revision of GB/T 3478.5-1995 "Straight cylindrical involute splines

- Inspection methods".

The main differences between this part and GB/T 3478.5-1995 are as follows:

Straight cylindrical involute splines -

Metric module, side fit - Part 5: Inspection

1 Scope

This part of GB/T 3478 specifies the test method for the straight cylindrical involute splines.

This part is applicable to the inspection of splines manufactured according to GB/T 3478.1. It may also be used as a reference when using the gauge to inspect the straight cylindrical involute splines.

2 Normative references

The provisions in following documents become the provisions of this part through reference in this part of GB/T 3478. For the dated references, the subsequent amendments (excluding corrections) or revisions do not apply to this part; however, parties who reach an agreement based on this standard are encouraged to study if the latest versions of these documents are applicable.

For undated references, the latest edition of the referenced document applies.

GB/T 1957 Tolerances and general features for plain limit gauges

GB/T 3478.1 Straight cylindrical involute splines - Metric module side fit -

Part 1: Generalities (GB/T 3478.1-2008, ISO 4156-1:2005, MOD)

GB/T 3478.6 Straight cylindrical involute splines - Metric module side fit -

Part 6: 30° pressure angle M and W values

GB/T 3478.7 Straight cylindrical involute splines - Metric module side fit -

Part 7: 37.5° pressure angle M and W values

GB/T 3478.8 Straight cylindrical involute splines - Metric module side fit -

Part 8: 45° pressure angle M and W values

GB/T 3478.9 Straight cylindrical involute splines - Metric module side fit -

Part 9: Measuring pin

GB/T 13924 Inspection code for accuracy of involute cylindrical gears

3 Standard temperature

The standard temperature for measurement is 20 °C.

4 Inspection of major diameter and minor diameter of

spline

4.1 The limit size of the minor diameter of the internal spline D_{ii} may be checked

by the general smooth GO plug gauge and the NO GO plug gauge, it may also be measured by other methods.

4.2 The limit size of the minor diameter of the external spline D_{ee} may be

checked by the general smooth GO plug gauge and the NO GO plug gauge, it may also be measured by other methods.

4.3 The use of general smooth plug gauge and ring gauge shall comply with

the provisions of GB/T 1957.

4.4 The major diameter of internal spline D_{ei} , the minor diameter of external

spline D_{ie} , the minimum radius of curvature of the root arc may be guaranteed by the process. If necessary, it shall be tested.

5 Inspection of the space width of internal spline, tooth

thickness of external spline, diameter of involute end

circle, diameter of involute starting circle

In GB/T 3478.1, it specifies three composite inspection methods and one single-

item inspection method, totally four inspection methods, which are used to inspect four limit sizes of the space width and the tooth thickness (see Figure 1), as well as the minimum value of diameter of the involute's end circle DFi_{min} and the maximum value of the diameter of the starting circle DFe_{max} . See Appendix A for the involute spline gauges used to inspect the space width and tooth thickness.

thereby controlling the minimum value Cv_{min} of the active side gap.

At the same time, use the non-whole-depth NO GO spline gauge (plug gauge or ring gauge) or use the measured M value (pin spacing MRi or cross-pin distance MRe) (for the external spline, it may use the average length W value of the measured common normal line), to control the maximum value of actual space width of the internal spline E_{max} or the minimum value of the actual tooth thickness of the external spline S_{min} , thereby controlling the minimum physical size of the internal and external.

5.2 Method-A

On the basis of the basic method, add the use of NO GO composite spline gauge (plug gauge or ring gauge), to control the maximum value of the active space width of the internal spline $E_{v_{max}}$ or the minimum value of the active tooth thickness of the external spline $S_{v_{min}}$, thereby controlling the maximum value Cv_{max} of the active side gap.

This method is suitable for two-way-rotation transmissions that have return requirements.

5.3 Method-B

Use the GO composite spline gauge and the NO GO composite spline gauge (plug gauge or ring gauge) to respectively control the minimum value $E_{v_{min}}$ and the maximum value $E_{v_{max}}$ of the active space width of the internal spline or the maximum value $S_{v_{max}}$ and the minimum value $S_{v_{min}}$ of the active tooth thickness of the external spline, thereby controlling the minimum value Cv_{min} and the