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

GB/T 3478.1-2008

**Straight cylindrical involute splines -- Metric module, side fit --
Part 1: Generalities
(English Translation)**

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Table of Contents

Foreword...	3
1 Scope...	5
2 Normative References...	5
3 Terms and Definitions...	5
4 Basic Parameters...	9
5 Basic Tooth Profiles...	10
6 Dimension Series...	12
7 Tolerance Classes...	21
8 Tolerances...	21
9 Side Fit...	62
10 Effective Dimensions and Actual Dimensions...	63
11 Inspection Methods...	66
12 Parameter Annotation...	69
13 Calculation Examples...	70

Foreword

GB/T 3478, under the general title "Straight Cylindrical Involute Spline - Metric Module, Side Fit", consists of the following 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 Part 1 of GB/T 3478.

This part modifies and adopts ISO 4156.1.2005 "Straight Cylindrical Involute Splines - Metric Module, Side Fit - Part 1.Generalities". The main differences are as follows.

- The terms and definitions were presented in a table, for the convenience of use;
- The figures for side fit were deleted; and figures for involute spline joints were added;
- Theoretical analysis figures for profile error, tooth alignment error and total error of tooth pitch were deleted; and tables for specific tolerance numbers were added;
- Single item inspection method was added;
- Appendix A "Conditions and Requirements for Application of Linear Tooth Form for Internal Spline" and Appendix B "Radial Runout Tolerance of Tooth Ring" were added.

This part is a revision to GB/T 3478.1-1995 "Straight Cylindrical Involute Splines- Modules, Basic Rack Profiles and Tolerances". The main differences are as follows.

- The standard title was changed from "Straight Cylindrical Involute Splines - Modules, Basic Rack Profiles and Tolerances" into "Straight Cylindrical Involute Splines - Metric Module, Side Fit - Part 1.Generalities";
- The mistakes in the former standard were corrected; and editorial modifications were made according to GB/T 1.1;
- Figure 5 and Appendix C "Calculation Examples of Spline" were added.

Appendix A of this part is normative; Appendix B and Appendix C are informative.

This part was proposed by and shall be under the jurisdiction of National Technical Committee on Shafts for Machinery and Accessories of Standardization Administration of China.

Drafting organizations of this part. China Productivity Center for Machinery, Harbin Dongan Automotive Engine Manufacturing Co., Ltd., Shijiazhuang Sprocket General Factory, China National Erzhong Group Company, and Taiyuan Heavy Industry Co., Ltd.

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The previous editions replaced by this part are.

- GB 3478.1-83 and GB/T 3478.1-1995.

Straight Cylindrical Involute Splines -

Metric Module, Side Fit - Part 1.Generalities

1 Scope

This part of GB/T 3478 specifies the series of modules, basic tooth profiles, tolerances and side-fit classification for straight cylindrical involute splines.

2 Normative References

The following documents contain provisions which, through reference in this part of GB/T 3478, constitute provisions of this Part. For dated reference, subsequent amendments (excluding corrigendum) or revisions of these publications do not apply. However, parties who enter into agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. For any undated references, the latest edition of the document referred to applies.

3 Terms and Definitions

See Table 1 and Figure 1 for the terms and definitions applied in this part (for 30° pressure angle flat root, hereinafter it is referred to as 30° flat root; for 30° pressure angle fillet root, it is referred to as 30° fillet root; for 37.5° pressure angle fillet root, it is referred to as 37.5° fillet root; for 45° pressure angle fillet root, it is referred to as 45° fillet root).

4 Basic Parameters

a For comparison, the size of spline tooth is provided - standard pressure angle α_D is 30°; number of teeth is 30; and ratio is 1.1 with different modules.

5 Basic Tooth Profiles

- a) 30° Flat Root
- b) 30° Fillet Root
- c) 37.5° Fillet Root

6 Dimension Series

Calculation formulae of spline dimensions are shown in Table 3.

7 Tolerance Classes

This part specifies four tolerance classes - Classes 4, 5, 6 and 7.

8 Tolerances

The calculation formulae for the total tolerances of space width and tooth thickness are as follows (unit. μm).

The machining tolerance is derived from the difference between the tolerance $(T+\lambda)$ and the deviation allowance λ , i.e. $(T+\lambda)-\lambda$.

9 Side Fit

In connection of involute spline, the spline side is provided with functions of both driving and self-centering, which shall be considered during structure design.

If any coaxial error in terms of installation reference of internal and external splines, the effective clearance of spline pair will be reduced or the effective interference will be increased. Therefore, methods such as adjusting the type of side fit may be adopted for compensation, if necessary.

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