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GB/T 10086-2018

Replacing GB/T 10086-1988

Symbols for cylindrical worm and wormwheel

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Foreword

GB/T 10086-2018 was issued on 14 May 2018 by the State Administration for Market Regulation and the Standardization Administration of the People's Republic of China, and has been in force since 1 December 2018. It replaces GB/T 10086-1988.

The document is a recommended national standard: the /T in the designation marks it as recommended rather than compulsory.

1 Scope

China's national standard for the symbols used to write down the geometry of cylindrical worm gearing. A worm drive is described by several dozen quantities - centre distance, module, lead angle, pitch and throat diameters of both members, addendum and dedendum, tooth thickness measured three different ways, profile and helix angles - and every one of them exists separately for the worm and for the wormwheel. Without a fixed notation a drawing, a calculation sheet and a supplier's data sheet will each name the same dimension differently, and the mistakes that follow are expensive because they are discovered after cutting. This standard fixes that notation: it specifies the symbols for cylindrical worms and wormwheels, laying down how a symbol is built from a main symbol with subscripts or a superscript, which alphabet and typeface each part takes, and what the common main symbols, compound main symbols and subscripts mean. It applies to cylindrical worm gearing with a shaft angle of 90 degrees, and to its worms and wormwheels.

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2 Normative references

The following documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document, including all amendments, applies.

GB/T 2821-2003 Symbols for gear geometrical elements.

3.1 Rules for composing the basic symbols

The basic symbols for worms and wormwheels follow the requirements of 2.1 of GB/T 2821-2003. The main rules are: a) a symbol consists of a main symbol, or of a main symbol together with one or more subscripts or one superscript; b) the main symbol may be a single upper-case or lower-case letter, and the letter shall be an italic Roman or Greek letter; c) subscripts shall be Roman letters, Arabic numerals, or a combination of the two; d) all subscripts shall be set on the same line and lower than the main symbol; e) symbols with a rule drawn above or below them, superscripts other than exponents, pre-subscripts, pre-superscripts, secondary subscripts, secondary superscripts and dashes shall all be avoided.

3.2 Main symbols

The most common main symbols for worms and wormwheels are given in Table 1. The lower-case italic Roman letters cover the linear and counting quantities - centre distance, face width, bottom clearance, diameter, tooth space, tooth depth, transmission ratio, backlash, the number of teeth or pitches within a given range, module, rotational speed, helix parameter, diameter quotient, radius, tooth thickness, number of teeth, gear ratio and linear velocity. The lower-case italic Greek letters cover the angular quantities and the ratios - profile angle and pressure angle, helix angle and reference cylinder helix angle, lead angle and reference cylinder lead angle, contact ratio, tooth width angle, radius of curvature and profile radius of curvature, and angular velocity - while the shaft angle takes an upper-case italic Greek letter.

3.3 Compound main symbols

The common compound main symbols are given in Table 2. They cover the quantities that need to be distinguished between the two members or between the several ways of measuring the same feature: the bottom clearance factor and the addendum coefficient, the cutter diameter and the cutter profile angle, the reference and pitch diameters of the worm and of the wormwheel, the tip diameter of the worm and the throat diameter of the wormwheel, the base diameter, the outside diameter of the wormwheel, the root diameter, the normal tooth space width, the working depth, the addendum and the dedendum, the normal chordal addendum, the base pitch, the normal pitch, the transverse pitch of the

wormwheel, the axial pitch, the lead of the worm, the throat radius of the wormwheel, the normal tooth thickness and the normal chordal tooth thickness, the axial tooth thickness, the profile shift coefficient of the wormwheel, the number of threads of the worm and the number of teeth of the wormwheel, and the base cylinder lead angle with the tip and root fillet radii. The notes explain the three modifiers used: an asterisk marks a dimensionless coefficient, a prime marks a working, meshing or base quantity, and a bar above the symbol marks a chordal quantity.