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**Cylindrical worm and wormwheel information of the  
dimensional data to be given on the drawing**

圆柱蜗杆、蜗轮图样上应注明的尺寸数据

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# Cylindrical worm and wormwheel information of the dimensional data to be given on the drawing

## 1 Scope

This Standard specifies the cylindrical worm and wormwheel information of the dimensional data to be given on the drawing, and recommends the data to be given for the worm gearing (SEE Appendix A).

This Standard is applicable to the drawing of cylindrical worms, wormwheels, and gearings with a shaft angle  $\Sigma=90^\circ$ ; or is used as the basis for the necessary technical parameters provided by the user to the manufacturer.

## 2 Normative references

The following documents are indispensable for the application of this document. For the dated references, only the versions with the dates indicated are applicable to this document. For the undated references, the latest version (including all the amendments) are applicable to this document.

GB/T 4459.2-2003 Mechanical drawings - Conventional representation of gears

GB/T 10087 Basic tooth profile of cylindrical worm

GB/T 10089 Accuracy of cylindrical worm and wormwheel

## 3 Dimensional data to be given on the worm drawing

### 3.1 General dimensional data to be given on the drawing

3.1.1 Tip diameter  $d_{a1}$  and its tolerance.

3.1.2 Standard pitch diameter  $d_1$ .

3.1.3 Tooth width  $b_1$ .

3.1.4 Shaft (bore) diameter and its tolerance.

3.1.5 Locating surface and its requirements.

3.1.6 The surface roughness of worm gear tooth.

## 5 Other

**5.1** According to the requirements of the specific structural shape of worm and wormwheel and the technical conditions, other data necessary for processing and measurement shall also be given.

**5.2** For worms and wormwheels with shafts, and wormwheels whose shafts and bores are not used as centering references, radial runout tolerance shall be given for the measurement surface for centering inspection or check before gear cutting.

**5.3** For the ZI worm, the base circle diameter  $d_{b1}$  and the base circle lead angle  $\gamma_{b1}$  shall also be given and listed in the parameter table.

**5.4** For ZK<sub>1</sub>, ZK<sub>3</sub>, ZC<sub>1</sub>, ZC<sub>2</sub> worms, the forming tool diameter  $d_0$ , as well as the tool tooth profile angle  $\alpha_0$  or the tool arc radius  $\rho$ , shall be given and listed in the parameter table.

**5.5** As the reference for inspecting the machining accuracy of gear tooth, its dimensional data and geometric tolerance, such as the top cylindrical surface of worm and wormwheel, the worm center bore, etc., shall be given.

**5.6** According to the specific structure of worm and wormwheel, other necessary structural dimensional data shall be given.

**5.7** Other necessary technical requirements shall be given for worm and wormwheel respectively.

## 6 Legend

The drawing of worm and wormwheel patterns shall comply with the provisions of GB/T 4459.2-2003. The parameter table in the drawing is generally placed at the upper right of the drawing. The data items listed in the parameter table can be increased or decreased as needed. The inspection items shall be determined based on the requirements of use and the opinions of users in accordance with the provisions of GB/T 10089 and relevant standards. The technical requirements of drawings are generally placed at the bottom right of the drawing.

An example for labeling of the dimensional data to be given on the worm drawing is shown in Figure 1.

An example for labeling of the dimensional data to be given on the wormwheel drawing is shown in Figure 2.

## Appendix A

### (Informative)

#### Data to be given for worm and wormwheel gearing

The data to be given for worm and wormwheel gearing shall be listed in a table, for reference when users order from the manufacturer, or when designing power worm gearing and drawing worm and wormwheel patterns. It mainly includes the following contents:

- a) The type, boundary dimensions, and corresponding markings of the gearing;
- b) Characteristic parameters:
  - 1) Transmission center distance  $a$ ;
  - 2) Nominal transmission ratio;
  - 3) Actual transmission ratio  $i=z_2/z_1$ ;
  - 4) Rated input power  $P_1$ , kW;
  - 5) Rated output torque  $T_2$ , N · m;
  - 6) Maximum output torque  $T_{max}$ , N · m;
  - 7) Input speed  $n_1$ , r/min;
  - 8) Rotational direction of worm;
  - 9) Type of work: continuous or intermittent.
- c) Technical requirements:
  - 1) Limit deviation  $\pm f_a$  of transmission center distance, limit deviation  $\pm f_x$  of mid-plane, and limit deviation  $\pm f_\Sigma$  of shaft angle of worm and wormwheel;
  - 2) Center-symmetry of worm thread length;
  - 3) Axial clearance of bearing;
  - 4) The minimum backlash  $j_{nmin}$  or  $j_{tmin}$  of worm transmission;
  - 5) Contact spot of worm transmission;

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