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Worms gears — Geometry of worm profiles

Engrenages à vis cylindriques — Géométrie des profils de vis



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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The main task of technical committees is to prepare International Standards, but in exceptional circumstances a technical committee may propose the publication of a Technical Report of one of the following types :

- type 1, when the required support cannot be obtained for the publication of an International Standard, despite repeated efforts
- type 2, when the subject is still under technical development or where for any other reason there is the future but not immediate possibility of an agreement on an International Standard ;
- type 3, when a technical committee has collected data of a different kind from that which is normally published as an International Standard ("state of the art", for example).

Technical Reports of types 1 and 2 are subject to review within three years of publication, to decide whether they can be transformed into International Standards. Technical Reports of type 3 do not necessarily have to be reviewed until the data they provide are considered to be no longer valid or useful.

ISO/TR 10828, which is a Technical Report of type 3, was prepared by Technical Committee ISO/TC 60, *Gears*, Subcommittee SC1, *Nomenclature and wormgearing*.

Introduction

Thread forms of the worms of worm gear pairs are commonly related to the following machining processes:

- the type of machining process (turning, milling, grinding);
- the shapes of edges or surfaces of the cutting tools used;
- the tool position relative to an axial plane of the worm;
- where relevant, the diameters of disc type tools (grinding wheel diameter).

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Worm gears — Geometry of worm profiles

1 Scope

In this Technical Report, thread profiles of the five most common types of worms at the date of publication are described and equations of their axial profiles are given.

The five worm types covered in this technical report are designated by the letters A, C, I, K and N.

2 References

ISO 701-1:—¹⁾, *International gear notation — Part 1: Symbols for geometrical data*.

ISO 1122-2:—²⁾, *Vocabulary of gear terms — Part 2: Geometrical definitions of worm gears*.

3 General

3.1 Definitions

Type A	straight sided axial profile ;
Type C	concave axial profile formed by machining with a convex circular profile disc type cutter or grinding wheel ;
Type I	involute helicoid, straight generatrix in base tangent planes ;
Type N	straight profiles in normal plane of thread space helix ;
Type K	milled helicoid generated by biconical grinding wheel or milling cutter, convex profiles in axial planes.

3.2 Conventions relative to the equations

3.2.1 The worm threads are right-handed.

The equations in this Technical Report define the coordinates of the left flank of the axial profile of worm, i.e. in the plane XOY of figure 1.

To obtain the right flanks, it is necessary to draw a symmetric profile to the left flank relative to a perpendicular axis to the worm axis.

1) To be published. (Revision of ISO 701:1976)

2) To be published.