American
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Technical Resources

(Revision of ANSI/AGMA 1012–F90)
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American National Standard

Gear Nomenclature, Definition of Terms with Symbols

ANSI/AGMA 1012–G05

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[Revision of ANSI/AGMA 1012–F90]

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Approved September 29, 2005

ABSTRACT

This standard lists terms and their definitions with symbols for gear nomenclature.

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Foreword

[The foreword, footnotes and annexes, if any, in this document are provided for informational purposes only and are not to be construed as a part of ANSI/AGMA 1012–G05, *Gear Nomenclature, Definitions of Terms with Symbols.*]

In 1926 the AGMA adopted a recommended practice for gearing nomenclature, terms and definitions. It included some symbols and abbreviations.

A complete revision of terms and definitions by the AGMA Nomenclature Committee was issued as AGMA 112.02 in October, 1948. This later became AGMA 112.03, and American Standard B6.10–1954, with ASME as a co–sponsor.

A separate project dealing with *Letter Symbols for Gear Engineering* appeared in 1943 as AGMA 111.01, later becoming AGMA 111.03 and American Standard B6.5–1954.

Abbreviations for Gearing was another separate project released as AGMA 116.01 in 1955. Most of these abbreviations were already listed in American Standard Z32.13–1950 *Abbreviations for Use on Drawings*, and it was, therefore, unnecessary to process gearing abbreviations as a separate American Standard. The number of abbreviations used in gearing has intentionally been kept very small to permit memorizing without the need to refer to the standard.

AGMA Standard 112.04, *Gear Nomenclature (Geometry) Terms, Definitions, Symbols and Abbreviations*, was a complete revision and integration of the three standards previously mentioned. Because of the widespread acceptance of the previous standards, changes were kept to a minimum. The standard in this form was approved by the AGMA Membership on April 25, 1965.

AGMA 112.05 included several revisions to keep it abreast of the then current gearing techniques. It was approved by Standards Committee B6, Gears, the Co–Secretariats and the American National Standards Institute on February 3, 1976 and designated ANSI B6.14–1976.

ANSI/AGMA 1012–F90 was a revision of 112.05. This revision incorporated the terms from AGMA Standard 116.01 (Oct., 1972), *Glossary of Terms Used in Gearing*, and terms from ANSI/AGMA 2000–A88, *Gear Classification and Inspection Handbook, Tolerances and Measuring Methods for Unassembled Spur and Helical Gears (Including Metric Equivalents)*. In addition, terms which started to be commonly used in gear load rating were introduced in the annex.

ANSI/AGMA 1012–G05 is a revision that updates the style of presentation, reordered the sequence of some terms, added definitions for right and left flank, and modified annexes B and C.

The first draft of ANSI/AGMA 1012–G05 was made in June 2002. It was approved by the AGMA membership in July, 2005. It was approved as an American National Standard on September 29, 2005.

Suggestions for improvement of this standard will be welcome. They should be sent to the American Gear Manufacturers Association, 500 Montgomery Street, Suite 350, Alexandria, Virginia 22314.

PERSONNEL of the AGMA Nomenclature Committee

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American National Standard –

Gear Nomenclature, Definitions of Terms with Symbols

1 Scope

This standard establishes the definitions of terms, symbols and abbreviations which may be used to communicate the technology and specifications of external and internal gear teeth. It provides definitive meanings by the use of words and illustrations, for commonly used gearing terms.

2 Normative references

The following documents contain provisions which, through reference in this text, constitute provisions of the standard. At the time of publication, the editions were valid. All publications are subject to revision, and the users of this standard are encouraged to investigate the possibility of applying the most recent editions of the publications listed.

ISO 701:1998, *International gear notation – Symbols for geometrical data.*

3 Terms and symbols

3.1 Terms

The terminology used in this standard is intended for use in all AGMA documents and is summarized in the index.

Many terms are listed in the index more than once by restating alphabetically with rearranged key words, to aid user look-up of related terms.

3.2 Symbols

The purpose of standard symbols for gear engineering is to establish a uniform practice in mathematical notation for equations and formulas dealing with toothed gearing. Such equations and corresponding calculations may be used in connection with design, application, manufacture, inspection, new methods, and new problems.

NOTE: The symbols and definitions used in this standard may differ from other AGMA standards. The user should not assume that familiar symbols can be used without a careful study of these definitions.

SI (metric) units of measure, where applicable, are shown in the text. Where equations require a different format or constant for use with SI units, the primary equation has an (M) appended and the secondary expression is shown after the first, indented.

Example:

$$d = z\,m \qquad \text{(2M)}$$

$$D = \frac{N}{P_{\mathrm{d}}} \qquad \text{(2)}$$

Symbols must be distinguished from abbreviations which are shortened forms of words often used on drawings and in tables, but not suitable for mathematical work (see annex A). For example, the symbol for circular pitch is p, whereas the abbreviation is CP.

AGMA is changing to use symbols consistent with symbols used by ISO. In the definition titles, where the old AGMA symbol is still commonly used but differs from the ISO symbol, both symbols are listed with the ISO symbol at the end of the line. Annex C contains an alphabetical list of the old symbols with the new symbols also listed.

3.2.1 Subscripts

A subscript following the general symbol may be used to indicate a value applying to a particular gear or tool, or a value taken at a particular position or in a particular direction. For convenience and brevity, it is desirable to use a general symbol without a subscript when only one value of a given kind is involved. Thus, in a spur gear or a straight-tooth bevel gear, there is occasion to consider only one cross section of the teeth, namely, the transverse