

AMERICAN GEAR MANUFACTURERS ASSOCIATION

*Inspection Practices - Part 1:
Cylindrical Gears -
Tangential Measurements*

AGMA 915-1-A02



AGMA INFORMATION SHEET

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American
Gear
Manufacturers
Association

**Inspection Practices - Part 1: Cylindrical Gears - Tangential
Measurements**

AGMA 915-1-A02

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ABSTRACT

This information sheet provides a code of practice dealing with inspection relevant to tangential element and composite deviations of cylindrical involute gears (measurements referred to single flank contact) and serves as a supplement to ANSI/AGMA 2015-1-A01, *Accuracy Classification System - Tangential Measurements for Cylindrical Gears*.

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Foreword

This Information Sheet, AGMA 915-1-A02, *Inspection Practices - Part 1: Cylindrical Gears - Tangential Measurements* is provided for informational purposes and is intended for use with the Standard ANSI/AGMA 2015-1-A01, *Accuracy Classification System - Tangential Measurements for Cylindrical Gears*.

AGMA 915-1-A02 replaces AGMA ISO 10064-1, *Cylindrical Gears - Code of Inspection Practice - Part 1: Inspection of Corresponding Flanks of Gear Teeth*, and the information on similar subjects as covered in ANSI/AGMA 2000-A88, *Gear Classification and Inspection Handbook - Tolerances and Measuring Methods for Unassembled Spur and Helical Gears*.

The user of this Information Sheet is alerted that differences exist between it and ANSI/AGMA 2000-A88 and AGMA ISO 10064-1. These include, but are not limited to:

- Measuring methods refer to an accuracy grade numbering system that is reversed, such that the smallest number represents the smallest tolerance;
- Probe direction and measurement requirements for elemental and composite tolerances may differ from ANSI/AGMA 2000-A88 or AGMA ISO 10064-1;
- The measurement "profile evaluation range" and "helix evaluation range", where the tolerances are applied, are defined for different area than in ANSI/AGMA 2000-A88 or AGMA ISO 10064-1;
- The measurement of undulations is included;
- Concepts of "mean measurement trace", "design trace", "slope deviation", "form deviation", "gear form filter cutoff", "tolerance diameter" and "data density" are defined.

Therefore, the user of this information sheet must be very careful when comparing measurement methods formerly specified using ANSI/AGMA 2000-A88 or AGMA ISO 10064-1.

The first draft of AGMA 915-1-A02 was made in May, 1998. This document was approved by the Inspection Handbook Committee on January 31, 2002. It was approved by the Technical Division Executive Committee as an AGMA Information Sheet on April 16, 2002.

Suggestions for improvement of this document will be welcome. They should be sent to the American Gear Manufacturers Association, 1500 King Street, Suite 201, Alexandria, Virginia 22314.

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American Gear Manufacturers Association – Inspection Practices – Part 1: Cylindrical Gears – Tangential Measurements

1 Scope

This information sheet constitutes a code of practice dealing with tangential measurements on flanks of individual cylindrical involute gears, i.e., with the measurement of pitch, profile, helix and tangential composite characteristics.

In providing advice on gear measuring methods and the analysis of measurement results, it supplements the standard ANSI/AGMA 2015-1-A01, *Accuracy Classification System – Tangential Measurements for Cylindrical Gears*.

2 References

The following standards contain provisions which are referenced in the text of this information sheet.

At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this document are encouraged to investigate the possibility of applying the most recent editions of the standards indicated.

AGMA 915-3-A99, *Inspection Practices – Gear Blanks, Shaft Center Distance and Parallelism*

ANSI/AGMA 2015-1-A01, *Accuracy Classification System – Tangential Measurements for Cylindrical Gears*

ISO 53:1998, *Cylindrical gears for general and heavy engineering – Standard basic rack tooth profile*

ISO 54:1996, *Cylindrical gears for general engineering and for heavy engineering – Modules*

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

ISO 1122-1:1998, *Vocabulary of gear terms – Part 1: Definitions related to geometry*

3 Symbols and corresponding terms

The symbols and terms used throughout this manual are in basic agreement with the symbols and terms given in ISO 701:1998, *International gear notation – Symbols for geometrical data*. In all cases, the first time that each symbol is introduced, it is defined and discussed in detail. See table 1.

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

Table 1 – Symbols and definitions

Symbols	Definition ¹⁾	Units	Where first used
b	Facewidth	mm	Figure 24
D	Design pitch diameter	mm	Eq 4
D_b	Design base diameter	mm	Eq 3
d	Reference diameter	mm	Eq 24
$d_{b\text{ eff}}$	Effective base diameter	mm	6.5.3
d_T	Tolerance diameter	mm	6.2
F_β	Total helix deviation	μm	Figure 22

(continued)