



American
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Association

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American National Standard

Standard for Industrial Enclosed Gear Drives

ANSI/AGMA 6013-A06

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Approved April 25, 2006

ABSTRACT

This standard includes design, rating, lubrication, testing and selection information for enclosed gear drives, including foot mounted, shaft mounted, screw conveyor drives and gearmotors. These drives may include spur, helical, herringbone, double helical, or bevel gearing in single or multistage arrangements, and wormgearing in multistage drives, as either parallel, concentric or right angle configurations.

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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 AGMA Standard 6013-A06, *Standard for Industrial Enclosed Gear Drives*.]

This standard revises, combines and supersedes two previous independent standards, ANSI/AGMA 6009-A00, *Standard for Gearmotors, Shaft Mounted and Screw Conveyor Drives*, and ANSI/AGMA 6010-F97, *Standard for Spur, Helical, Herringbone and Bevel Enclosed Drives*. The history of these standards have their roots in:

- AGMA 420.04, *Practice for Enclosed Speed Reducers or Increasesers Using Spur, Helical, Herringbone and Spiral Bevel Gears*
- AGMA 460.05, *Practice for Gearmotors Using Spur, Helical, Herringbone and Spiral Bevel Gears*
- AGMA 480.06, *Practice for Spur, Helical and Herringbone Gear Shaft-Mounted Speed Reducers*

ANSI/AGMA 6013-A06 presents general guidelines and practices for design, rating and lubrication of parallel, concentric and right angle shaft drives. It includes foot mounted, shaft mounted, screw conveyor drives and gearmotors. It includes the available data, gear technology, and operational experience.

The comprehensive thermal rating procedure has been removed but is included by reference to AGMA ISO 14179-1.

This standard reflects the consolidation of "Enclosed Drives", to include gearmotors, shaft mounted and screw conveyor drives, into a single document.

The allowable stress numbers used in this standard are derived from ANSI/AGMA 2001-D04, *Fundamental Rating Factors and Calculation Methods for Involute Spur and Helical Gear Teeth*, and, along with other rating factors, provide a rating basis for enclosed gear reducers and increasesers. The rating formulas are based on many years of experience in the design and application of enclosed gear drives for industrial use. Provisions are included in this standard for using stress cycle factors other than 1.0 to adjust the rating for extended or reduced life. Using a stress cycle adjustment factor does not guarantee a certain number of life hours or stress cycles, but is a method of approximating gear life under different load and speed conditions.

The competence to design enclosed gear drives, especially the knowledge and judgment required to properly evaluate the various rating factors, comes primarily from years of experience in designing, testing, manufacturing and operating similar gear drives. The proper application of the general rating formulas for enclosed gear drives is best accomplished by those experienced in the field.

The first draft of ANSI/AGMA 6013-A06 was made in November, 2000. It was approved by the AGMA membership in March, 2006. It was approved as an American National Standard on April 25, 2006.

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.

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American National Standard – Standard for Industrial Enclosed Gear Drives

1 Scope

This standard is applicable to enclosed gear drives including configurations of parallel, concentric and right angle shafts. It includes foot mounted, shaft mounted, screw conveyor drives and gearmotors. These enclosed drives utilize spur, helical, herringbone, double helical, or bevel gearing in single or multistage, and may include wormgearing in multistage drives. Bevel gear drives may include shaft angles other than 90 degrees.

1.1 Limitations

This standard is applicable to gear drives having single or multiple stage gearing with pitch line velocities not exceeding 7000 ft/min for spur, helical, and spiral bevel gearing and 6000 ft/min for straight bevel, spiral bevel and wormgearing, and component speeds not exceeding 4500 rpm for helical, spur, straight bevel and spiral bevel gearing and 3600 rpm for wormgearing. Wormgearing operating at sliding velocities greater than 2000 ft/min may require special lubricants, pressurized systems or both.

1.2 Exceptions

This standard does not cover epicyclic or crossed-helical gear drives. This standard does not cover the rating of spur, helical or bevel gears due to wear or scuffing. The design and rating of the electric motor is beyond the scope of this standard. This standard does not apply to gear drives that are covered by other specific AGMA application standards.

2 Normative references

The following documents contain provisions which, through reference in this text, constitute provisions of this 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.

AGMA 908-B89, *Geometry Factors for Determining the Pitting Resistance and Bending Strength of Spur, Helical and Herringbone Gear Teeth*

AGMA ISO 14179-1, *Gear Reducers – Thermal Capacity Based on ISO/TR 14179-1*

ANSI/AGMA 1010-E95, *Appearance of Gear Teeth – Terminology of Wear and Failure*

ANSI/AGMA 1012-G05, *Gear Nomenclature, Definitions of Terms with Symbols*

ANSI/AGMA 2001-D04, *Fundamental Rating Factors and Calculation Methods for Involute Spur and Helical Gear Teeth*

ANSI/AGMA 2003-B97, *Rating the Pitting Resistance and Bending Strength of Generated Straight Bevel, Zerol Bevel, and Spiral Bevel Gear Teeth*

ANSI/AGMA 6000-B96, *Specification for Measurement of Linear Vibration on Gear Units*

ANSI/AGMA 6001-D97, *Design and Selection of Components for Enclosed Gear Drives*

ANSI/AGMA 6025-D98, *Sound for Enclosed Helical, Herringbone, and Spiral Bevel Gear Drives*

ANSI/AGMA 6034-B92, *Practice for Enclosed Cylindrical Wormgear Speed Reducers and Gearmotors*

ANSI/AGMA 6035-A02, *Design, Rating and Application of Industrial Globoidal Wormgearing*

ANSI/AGMA 9002-A86, *Bores and Keyways for Flexible Couplings (Inch Series)*

ANSI/AGMA 9005-E02, *Industrial Gear Lubrication*

ANSI B17.1 – 1967, *Keys and Keyseats*

ISO R773:1969, *Rectangular or Square Parallel Keys and their Corresponding Keyways (Dimensions in Millimeters)*