ANSI/AGMA 6123-B06

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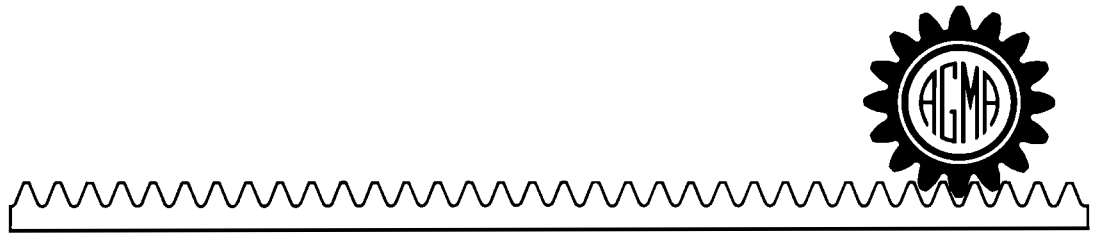
AMERICAN NATIONAL STANDARD

Design Manual for Enclosed Epicyclic Gear Drives

ANSI/AGMA 6123-B06



AGMA STANDARD

American National Standard

Design Manual for Enclosed Epicyclic Gear Drives
AGMA 6123–B06
[Revision of ANSI/AGMA 6023–A88 and ANSI/AGMA 6123–A88]

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[Tables or other self–supporting sections may be referenced. Citations should read: See ANSI/AGMA 6123–B06, *Design Manual for Enclosed Epicyclic Gear Drives,* published by the American Gear Manufacturers Association, 500 Montgomery Street, Suite 350, Alexandria, Virginia 22314, http://www.agma.org.]

Approved September 20, 2006

ABSTRACT

This is a design manual for drives employing epicyclic gear arrangements. It includes descriptions of epicyclic drives, nomenclature, application information and design guidelines with reference to other AGMA standards.

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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 6123–B06, *Design Manual for Enclosed Epicyclic Gear Drives*.]

This standard presents design information and rating methods for epicyclic enclosed gear drives. This standard supersedes ANSI/AGMA 6023–A88 and ANSI/AGMA 6123–A88.

The initial AGMA publication that addressed epicyclic gearing was a portion of AGMA 420.04, *Practice for Enclosed Speed Reducers or Increasers Using Spur, Helical, Herringbone and Spiral Bevel Gears*. It was published in 1975, but was subsequently superseded by ANSI/AGMA 6123–A88, *Design Manual for Enclosed Epicyclic Gear Drives*, a much more comprehensive epicyclic gear document, published in 1988.

AGMA reactivated the Epicyclic Gear Committee to develop a revision to ANSI/AGMA 6123–A88 that would incorporate additional guidelines, the latest gearing technology as applied to epicyclic gears, and SI units exclusively.

The purpose of this standard is to provide the user of enclosed epicyclic gear drives with a method of specifying and comparing proposed designs to help predict the relative performance of different units. This standard is intended to establish a common base for rating epicyclic gear units and to encourage the maximum practical degree of uniformity and consistency between rating practices in the gear industry. It emphasizes the complexity of epicyclic unit design, and the need to consider the entire system of housings, bearings, gears and shafts in establishing the rating of a drive.

The formulas presented in this standard contain numerous terms whose individual values can vary significantly depending on application, system effects, accuracy, and manufacturing methods. Proper evaluation of these terms is essential for realistic rating. The knowledge and judgment required to evaluate properly the various rating factors comes primarily from years of accumulated experience in designing, testing, manufacturing, and operating similar gear units. The detailed treatment of the general rating formulas for specific product applications is best accomplished by those experienced in the field.

The first draft of ANSI/AGMA 6123–B06 was created in September 2001. It was approved by the membership in March 2006 and as an American National Standard on September 20, 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 –

Design Manual for Enclosed Epicyclic Gear Drives

1 Scope

This standard is applicable to enclosed epicyclic speed reducers and increasers which use spur and helical gears. It applies to non-aircraft, industrial, vehicular, or machine tool gear units with carrier speeds less than 1800 rpm.

1.1 Limitations

Rating methods and influences identified in this standard are limited to enclosed drives of single and multiple stage designs. A more detailed engineering study should be undertaken if conditions such as the following exist:

- light weight;
- pitch line velocity greater than 35 m/s;
- high power;
- minimum space;
- lubrication other than specified by ANSI/AGMA 9005-E02;
- low speed;
- double helical gearing;
- unusual ambient temperature.

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1.2 Annexes

Annexes are for reference only and are not a part of this standard.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this American National Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this American National Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below.

AGMA 925-A03, *Effect of Lubrication on Gear Surface Distress*

AGMA 927-A01, *Load Distribution Factors - Analytical Methods for Cylindrical Gears*

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

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

ANSI/AGMA 2101-D04, *Fundamental Rating Factors and Calculation Methods for Involute Spur and Helical Gear Teeth*

ANSI/AGMA/AWEA 6006-A03, *Standard for Design and Specification of Gearboxes for Wind Turbines*

ANSI/AGMA 6110-F97, *Standard for Spur, Helical, Herringbone and Bevel Enclosed Drives*

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

ISO 281:2000, *Rolling Bearings - Dynamic Load Ratings and Rating Life*

ISO 6336-1:1996, *Calculation of load capacity of spur and helical gears - Part 1: Basic principles, introduction and general influence factors*

ISO 6336-2:1996, *Calculation of load capacity of spur and helical gears - Part 2: Calculation of surface durability (pitting)*