AMERICAN NATIONAL STANDARD

DRAFTING PRACTICES

Gear Drawing Standards - Part 1 for Spur, Helical, Double Helical and Rack

ANSI Y14.7.1 - 1971

(PARTIAL REVISION OF Y14.7 – 1958)

REAFFIRMED 1998

FOR CURRENT COMMITTEE PERSONNEL
PLEASE SEE ASME MANUAL AS-11

SECRETARIAT

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THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS
SOCIETY OF AUTOMOTIVE ENGINEERS, INC.

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FOREWORD

For many years there was a growing desire for a national standard for engineering drawings, and as far back as December 1914 the ASME approved and published the report of its Committee on Standards for Cross-Sections.

The subject of standard practice was laid before the ASME Standardization Committee in April 1925 and in May the ASME Council voted to approve the recommendation of the Committee that the American Standards Association be requested to authorize the organization of a nationally representative committee under its procedure to develop standards for drawings and drafting room practice. This recommendation was considered favorably and a preliminary conference was called by the ASA for October 14, 1925, and a general conference for December 4, 1925.

At the meeting of the ASA Standards Council, December 1925, the project was finally approved, its scope was outlined, and the Society for the Promotion of Engineering Education and the American Society of Mechanical Engineers were designated as joint sponsors. The organization meeting of the sectional committee was held September 24, 1926, at which Dean Franklin deR. Furman was elected chairman. Subsequently six subcommittees were appointed. These subcommittees undertook the formulation of tentative drafts of the several sections of the final report which were distributed for criticism and comment.

In the spring of 1931 an Editing Committee, Dr. Thomas E. French, Chairman, combined and harmonized the final reports of the several subcommittees. The proposed standard was approved by the sectional committee and was subsequently approved by the sponsor societies and transmitted to the American Standards Association for approval and designation as an American Standard, a status which was granted in May, 1935.

The sectional committee authorized the revision of the American Standard in December, 1940, and the Subcommittee on Revision was appointed in September, 1941. A draft dated August, 1944 received the approval of the sectional committee. The proposal was subsequently submitted to the sponsors and to the American Standards Association for their approval. This approval with designation as an American Standard was received on April 12, 1946.

In 1948, the scope of the project was enlarged, and a revision was begun in view of the increased drafting standardization work in Great Britain and Canada. An Executive Committee was formed in 1949 to supervise the work. It was decided to publish the eventual revision in separate sections. Upon completion and sectional committee approval of the last of the first six sections, they were sent to sponsors and to ASA for approval. Succeeding sections, as approved by the sectional committee were subsequently submitted to sponsors and ASA.

A section, Gears, Splines and Serrations, Y14.7, was approved and published as an American Standard on April 8, 1958.

Recognizing the need for a universal gear drafting standard, a COR Committee was organized, in December 1961, for the purpose of coordinating the views of the SAE, Y14, the Military and the AGMA on a drafting standard for gears which could provide a fundamental document for wide national use of all interested parties.

During this time the American Standards Association became the United States of America Standards Institute and, as of October 6, 1969, the American National Standards Institute, Inc. In addition, the Society of Automotive Engineers became a cosponsor, along with the ASEE and the ASME of all Y14 Drafting Practices.

It was recommended by the SAE Drawing Standards Committee and concurred in by the members of the COR Committee that this section be divided into two parts with Part 1 covering spur, helical, double-helical, and rack gears. Part 2 would cover matched sets, worms and wormgears and conical type gears. Also, in coordination with the AGMA Nomenclature Committee, Part 2 will contain, as an appendix, some fundamental gear nomenclature and abbreviations.

After eight meetings, the COR Committee was incorporated into Subcommittee 7 of Standards Committee Y14. Many drafts were circulated among the members of AGMA, AOA, SAE, Y14 and the Military for suggestions and criticisms. This section covering Part 1 received the approval of the Y14 Standards Committee and was subsequently approved by the sponsor societies and submitted to the American National Standards Institute. It was designated an American National Standard on November 1, 1971.

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AMERICAN NATIONAL STANDARD

DRAFTING PRACTICES

GEAR DRAWING STANDARDS – PART 1
FOR SPUR, HELICAL, DOUBLE HELICAL, AND RACK

7-1 Scope

This standard sets forth methods to be followed for specifying drawing data for gears operating on axes which are parallel.

7-2 Purpose

It is the purpose of this standard to provide formats, nomenclature, and definitions for the following types of gears: Spur, Helical, Double-Helical, and Spur and Helical Racks. The minimum data for the various gear types are defined. Where additional data are required, methods for specifying these data are shown. Slight deviations for critical applications are recognized, provided general formats are maintained.

7-2.1 Examples. Various types of gears are illustrated by sample drawings which show the methods of delineating specifications.

7-2.2 Dimensioning and Notes. Illustrations show only those dimensions which control the gear teeth and their relation to the specified mounting. All other dimensions and specifications shall conform to recommended drafting practice. Dimensional values are indicated by X's to show the number of decimal places recommended in each instance.

Where required to assure calculations, such as for pin measurement or master gears, accurate to the fourth place to the right of the decimal point, it is necessary to specify the base diameter, pitch diameter, helix angle, and non-whole number diametral pitch to eight or seven significant places as shown in Figures 4 through 9.

7-2.2.1 All angular dimensions shall be expressed in degrees and decimal portions thereof. (Where desired, the angle may be given in degrees, minutes and seconds.)

7-2.3 Abbreviations. Notes and data may include those abbreviations listed in ANSI Z32.13 – 1950, Abbreviations for Use on Drawings; AGMA 112.04, Gear Nomenclature – Terms, Definitions, Symbols, and Abbreviations; or latest revisions. For use on military drawings and in technical type publications, MIL-STD-12, Abbreviations, should be used.

7-3 General Drawing Practices.

General drawing practices are covered in ANSI Y14.1 through ANSI Y14.5 of these American National Standard Drafting Practices. For the particular practices, refer to the applicable subsection.