

Aimed at providing up-to-date information on gear drive design and application, some of today's standards activities are reviewed.

As indicated in past columns, one of the reasons geared products are among the most-reliable mechanical systems used in our economy today is the continual development and refinement of gearing standards. This requires that standards be revised to keep up with progressive changes in gear manufacturing technology, gear design methods, and applications.

A Revised Standard's Development

This summer AGMA will ballot a number of revised standards for gear drive application designs. One of the most extensive standards revisions has been developed by the Epicyclic Enclosed Drive Committee, ANSI/AGMA 6123-BXX. This "Design Manual for Enclosed Epicyclic Gear Drives" covers design and operation guidelines for epicyclic gear arrangements. It includes such topics as tooth geometry, components, load rating, assembly requirements, thermal rating, lubrication, and application information.

Epicyclic drives that include sun, planet, and ring gear arrangements are relevantly new, being attributed to a 1781 patent by James Watt—reportedly filed to avoid patent infringement on one for a crank-shaft—that was secured "for certain new methods of producing a continued rotative motion around an axis or centre, and thereby to give motion to the wheels of mills or other machines." Epicyclic arrangements allow concentric input and output shafts with good power to weight ratio and are being used in such diverse applications as salad spinners, automatic transmissions, mill drives, and high power wind turbines. The use in multi-megawatt wind

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turbines has pushed the revision of the AGMA standard that was originally published in 1988. The AGMA committee has revised the epicyclic standard with heavy reliance placed on experience with system performance in many applications, rather than based on theoretical studies or scaled-up laboratory research data.

Other Drive Standard Revisions

In addition to the epicyclic standard, AGMA committees have also revised, or are presently revising other Standards that are near final ballot, or publication during the last half of 2005:


- *1012 Gear Nomenclature, Definition of Terms with Symbols*—this revision adds, improves, and rearranges definitions for the nomenclature of all standard gear terms;
- *6013 Standard for Industrial Enclosed Gear Drives*—this new comprehensive enclosed drive standard, with component and lubrication requirements

included, is actually a revision and combination of two previous standards for enclosed drives and gearmotors;

- *6033 Materials for Marine Propulsion Gearing*—revises the material requirements for marine gear drives; and
- *9002 Bores and Keyways for Flexible Couplings (Inch Series)*—this is a revision of the coupling dimension standard and there is also an enhanced metric version, 9112.

Two new Information Sheets that are also being prepared for publication are:

- *930 Calculated Bending Load Capacity of Powder Metallurgy (P/M) External Spur Gears*—this is a new document for designing P/M gearing.
- *932 Rating the Pitting Resistance and Bending Strength of Hypoid Gears*—the latest supplement to the power rating of bevel gearing.

These are only a few of the active standards development projects within AGMA committees. It is important to understand the specifics of all standards so that you can benefit from their strengths. Therefore, everyone interested in any of these subjects is encouraged to participate in the ballots or appropriate committee activities. Detailed information on all of the subjects discussed is provided on the AGMA Web site [www.agma.org]. Send e-mail to tech@agma.org. 

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