Interpretation of Standards

When AGMA receives questions about standards, the questions are submitted to the appropriate Technical Committee for a response. The questions and AGMA's response are published in the *Gear Industry Journal* to ensure wide distribution of the information. Send your questions to tech@agma.org.

Comment restated:

As a Gear Design Consultant, I have come across two conflicting practices in industry related to the test radius calculation method described in ANSI/AGMA 2002-B88, Section 8.4. Both practices give different test radius results. I have heard arguments that would tend to make one think that either practice is valid according to ANSI/AGMA 2002-B88. I am writing to you to request an official AGMA interpretation to clarify the intent of ANSI/AGMA 2002-B88 as it relates to its treatment of test radius limits.

Equation 8.1 introduces the term tb1 as the maximum transverse base tooth thickness used in the calculation of the test radius limits. What to select as the value of this term seems to be the crux of the issue.

In what I will call "Method A", one portion of the industry uses a value for tb1 that is derived or calculated from the tooth thickness specified on the drawing (i.e., either the maximum circular tooth thickness, maximum span measurement, or maximum measurement over pins). If this value of tb1 is used for the test radius limits to control the manufacture of the gear, the effect is that the actual gear tooth produced will be slightly thinner than if the over pins or span measurement methods are used in the manufacture of the gear.

In what I will call "Method B", the value for tb1 in the test radius calculation is not derived from the tooth thickness drawing specification limits, but is based on a different tooth thickness which predicts the effect of total composite variation in the tb1 value selected. In this approach, if the producer of the gear uses test radius limits to control the manufacture of the gear, the gear tooth will be the same as if controlled by the over pins or span methods.

The numerical example shown in annex A does not seem to provide clarification as to how the tb1 value was obtained.

Please clarify the intent of ANSI/AGMA 2002-B88 in the treatment of this subject.

AGMA's response:

Clause 8.4.1 states that "The maximum test radius is based on the maximum effective tooth thickness as defined in 3.1.4." Clause 3.1.4 states this is "the thickness it would have if meshed at the tightest center distance and minimum backlash with a perfect, maximum tooth thickness, mating gear." Therefore the maximum effective tooth thickness is equivalent to the functional tooth thickness for which the test radius is being calculated. If the tooth thickness specified on the drawing is the desired effective thickness, then this can be used directly to calculate tb1. However, if the circular tooth thickness specified on the drawing is directly related to an over pins or span measurement without corrections for tooth deviations given in equations 6.20 and 7.12, then an appropriate correction for these deviations should be used when calculating the value for the effective base tooth thickness.