Ground and Hobbed Globoidal Worm Sets

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QUESTION

Are profile ground and hobbed, globoidal worm sets better than multi-axis CNC-generated globoidal worm gear sets for reduction of noise and vibration?

Expert response provided by Prof. Dr. Karsten Stahl. Aspects of the question can be answered by applying the results from a research project within the German Research Association for Power Transmissions Engineering (FVA). Therefore, the noise and excitation characteristics of worm gears have an exceedingly different noise and vibration behavior against cylindrical or bevel gears. Worm gears generally show a homogeneous sound power level distribution within a frequency range of 50 Hz and 5 kHz, and can be characterized as broadband noise.

Reasons for this are the high sliding velocities and the running in effect of the worm wheel — usually made from soft material, like bronze.

Therefore the manufacturing method will play a secondary role regarding the noise and vibration behavior.

Prof. Dr. Karsten Stahl
is Chair, Machine Elements, Mechanical Engineering, at TUM. He leads and conducts research in the area of mechanical drive systems, with particular interest in investigating the load capacity, efficiency and dynamics of all gears types.