

Mathematical Model of a Compound Gear Pump

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Abstract : The generation and design of compound involute spur gearings can be used in gear pump. A compound rack cutter with asymmetric involute teeth is presented for determining the mathematical model of compound gear pumps. This paper covers the following topics: (a) generation and geometry of compound rack cutter is presented and used to generate a compound gear and a compound pinion. (b) Based on the developed compound gears, stress analysis was performed for the symmetric gears and the asymmetric gears. Comparing the results of the stress analysis for the asymmetric involute teeth is superior to the symmetric involute teeth. A numerical example that illustrates the developed compound rack cutter is represented.

Keywords : compound, involute teeth, gear pump, rack cutter

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