

Due to the trade-offs associated with key performance characteristics, gear types do not lend themselves to universal statements comparing one to another. If a comparison between two gear technologies is required, it must be made within the context of a specific application and focused on a specific performance characteristic.

In this case study, Helicon and Worm gear types are compared within the context of an application in which the primary objective is to **maximize efficiency**. The application's requirements are shown to the right.

APPLICATION REQUIREMENTS:

Maximum Available Space	3.7 in. x 3.7 in. x 1.0 in.	94 mm. x 94 mm. x 25.4 mm.
Minimum Torque	270 in-lb	30.5 Nm
Minimum Efficiency	70%	
Operating Speed	2,500 RPM	
Reduction Ratio	30:1	
Expected Life	1,000 hours	

RESULTS:

IMPERIAL	Maximum Efficiency (%)	Resultant Torque (in.-lbs)	Resultant Space Claim (in.)	Resultant Space Claim (in. ³)
Helicon	84.2	315	3.25 x 3.25 x 0.70	7.4
Worm*	82.6	278	3.36 x 2.90 x 0.67	6.6
Advantage	Helicon 1.9%	Helicon 13.3%	Worm 12.0%	

METRIC	Maximum Efficiency (%)	Resultant Torque (Nm.)	Resultant Space Claim (mm.)	Resultant Space Claim (mm. ³)
Helicon	84.2	35.6	82.55 x 82.55 x 17.78	121.1
Worm*	82.6	31.4	93.85 x 73.66 x 24.69	108.2
Advantage	Helicon 1.9%	Helicon 13.3%	Worm 12.0%	

*Worm gearset design per ANSI/AGMA specification # 6034-B92

EFFICIENCY CURVES

