

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 torque** capacity. 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	370 in-lb	41.8 Nm
Minimum Efficiency	70%	
Operating Speed	2,500 RPM	
Reduction Ratio	30:1	
Expected Life	1,000 hours	

RESULTS:

IMPERIAL	Maximum Torque (in. lbs)	Resultant Efficiency (%)	Resultant Space Claim (in.)	Resultant Space Claim (in. ³)
Helicon	765	78.3	3.25 x 3.25 x 0.90	9.5
Worm*	405	76.8	3.70 x 2.90 x 0.97	10.4
Advantage	Helicon 88.9%		Helicon 8.7%	

METRIC	Maximum Torque (Nm.)	Resultant Efficiency (%)	Resultant Space Claim (mm.)	Resultant Space Claim (mm. ³)
Helicon	86.4	78.3	82.55 x 82.55 x 22.86	155.8
Worm*	45.8	76.8	93.85 x 73.66 x 24.69	170.8
Advantage	Helicon 88.9%		Helicon 8.7%	

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

TORQUE CURVES

