**DESIGN FOCUS: MAXIMIZE TORQUE** 

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)	
Helicon	765	
Worm*	405	
Advantage	Helicon 88.9%	

Resultant Efficiency (%)	
78.3	
76.8	
Helicon 2.0%	

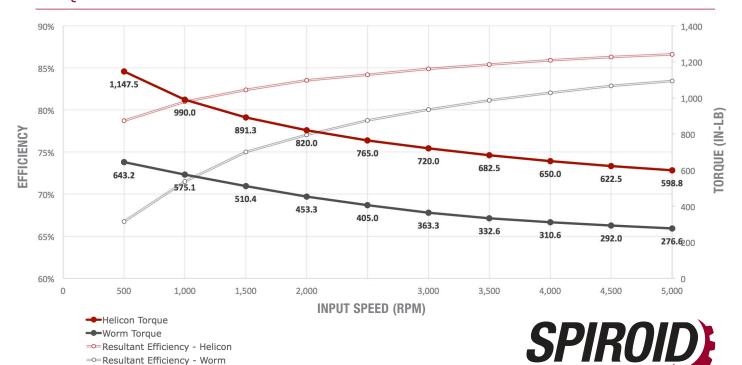
Resultant Space Claim (in.)	Resultant Space Claim (in.3)	
3.25 x 3.25 x 0.90	9.5	
3.70 x 2.90 x 0.97	10.4	
Helicon 8.7%		

METRIC	Maximum Torque (Nm.)	
Helicon	86.4	
Worm*	45.8	
Advantage	Helicon 88.9%	

Resultant Efficiency (%)	
78.3	
76.8	
Helicon 2.0%	

Resultant Space Claim (mm.)	Resultant Space Claim (mm.3)	
82.55 x 82.55 x 22.86	155.8	
93.85 x 73.66 x 24.69	170.8	
Helicon 8.7%		

## **TORQUE CURVES**



<sup>\*</sup>Worm gearset design per ANSI/AGMA specification # 6034-B92