

Worm Gear Design

Sample document with complete example values. It shows the report the purchased export produces for YOUR input - it is not itself a report for any part.

Project: Sample project

Part/Position: no real part

Prepared by: Sample, not released

Transmission ratio $i = 20$, lead angle $\gamma = 11.31$ degrees, driving efficiency $\eta = 0.792$. The gear is not self-locking.

Gear geometry

Number of starts z_1	2
Worm wheel tooth count z_2	40
Axial module m_x	4 mm
Form factor $q = d_1/m_x$	10
Transmission ratio $i = z_2/z_1$	20
Lead angle γ	11.31 deg
Worm diameter d_1	40 mm
Worm wheel diameter d_2	160 mm
Lead p_z	25.13 mm
Center distance a	100 mm

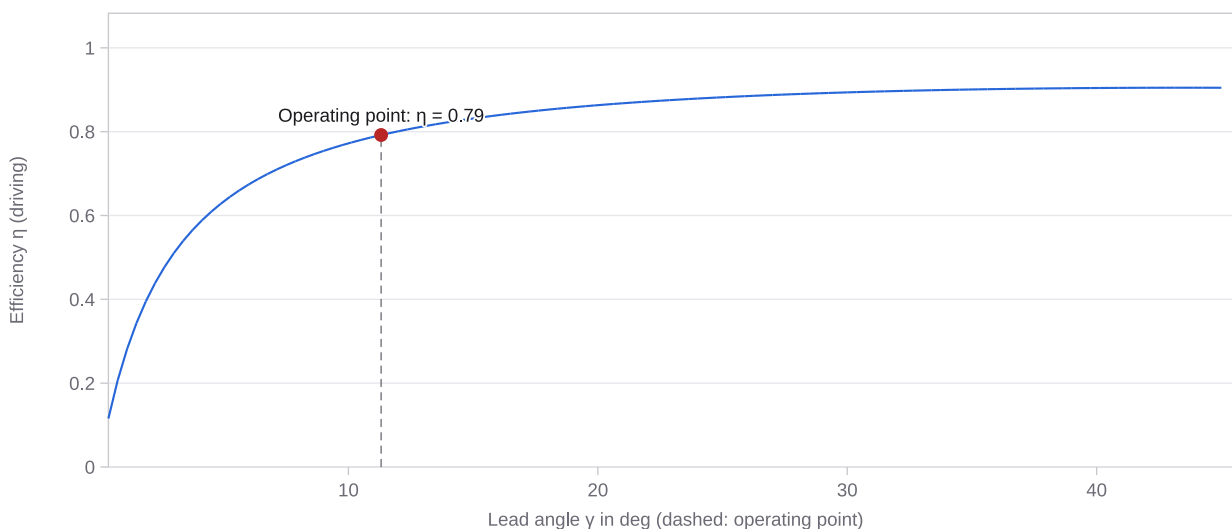
Friction and efficiency

Friction coefficient μ	0.05
Friction angle ρ'	2.86 deg
Driving efficiency η	0.792
Input torque T_1	20 Nm
Output torque $T_2 = T_1 \cdot i \cdot \eta$	316.8 Nm

Assessment

Criterion	Value	Limit	Status
Self-locking ($\gamma > \rho'$ desired for the drive)	$\gamma = 11.31$ deg	$\rho' = 2.86$ deg	● OK
Driving efficiency η	0.792	0.700	● within guideline

Efficiency over lead angle $\eta(\gamma)$



Calculation basis

Cylindrical worm per DIN 3975. The geometry follows from the number of starts z_1 , worm wheel tooth count z_2 , axial module m_x , and form factor $q = d_1/m_x$: $i = z_2/z_1$, $\tan(\gamma) = z_1/q$, $d_1 = q \cdot m_x$, $d_2 = m_x \cdot z_2$, and the center distance $a = (d_1 + d_2)/2$. The

driving efficiency (worm drives wheel) is $\eta = \tan(\gamma) / \tan(\gamma + \rho')$ with the friction angle $\rho' = \arctan(\mu)$; self-locking occurs at $\gamma \leq \rho'$.
The output torque follows as $T_2 = T_1 \cdot i \cdot \eta$.

Load capacity, heating, and wear per DIN 3996 (tooth breakage, pitting, wear, thermal power limit) are not included. The calculator is a geometry and efficiency tool for preliminary design.

About this sample

All values on these pages come from a freely chosen example calculation and belong to no real part. The purchased export contains the same sections with your input, your header data (project, part, prepared by) and as searchable text. Pricing and scope: maschinenbaurechner.de/en/pricing

Note: The results are design and orientation aids. They do not replace independent verification, calculation and approval by a qualified person. The terms of use at maschinenbaurechner.de apply.