Worms and wheels: some formulae

- ***Worms and wheels offer very high reductions in speed***
- *Under certain conditions systems can prevent back-drive.*
- *The efficiency of the system is low and rises as the gearing angle increases*
- *The helix direction is the same for both the worm and wheel*
- *There is little standardisation for wheels and worms. If a part breaks, it must be replaced by an identical part. Most of the time, replacement parts must be produced from samples.*

Wheels	Symbols	Formulae	Units
Module	m	$p \div \varpi$	mm
Pitch	p	$m \times \varpi$	mm
PCD	d	Z x m	mm
Number of teeth	Z	d ÷ m	
Outside diameter	dc	(Z + 2) x m	mm

Worms	Symbols	Formulae	Units
Outside diameter	D	(2 x m) + d	mm
Helix angle tangent	ß	(m x Z) ÷ d	
PCD	d	$\frac{p \times Z}{\pi \tan ß}$	mm

Distance between centres

- *HPC worms and wheels are machined to have a backlash of between 0.07mm and 0.3mm depending on the module.* ***The distance between centres when assembling them should be the nominal distance between centres -0/+0.05mm.***

$$\text{Nominal distance between centres} = \frac{\text{d(wheel)} + \text{d(worm)}}{2}$$