

INTERNAL HELICAL GEARS - Determining Space Thickness Given Dimensions Under Pins or Balls

TO GET	HAVING	RULE	FORMULA
N	Number of teeth	Given	60
DP	Normal diametral pitch	Given	24
α_n	Normal pressure angle	Given	22.5
h	Pitch helix angle	Given	7.50000
d	Ball diameter	Given	0.07377
DE	Dimension under balls even # of teeth	Given	2.41200
DO	Dimension under balls odd # of teeth	Given	*****
α_d	Transverse pressure angle	$TAN(\alpha_n) = TAN(\alpha_n) / COS(h)$	22.67458
H	Base helix angle	$TAN(H) = TAN(h) \cdot COS \alpha_d$	6.92618
dD	Transverse ball diameter	$d / COS(H)$	0.07431
PD	Pitch diameter	$N / [DP \cdot COS(h)]$	2.52157
BD	Base diameter	$PD \cdot COS(\alpha_d)$	2.32668
CE	Twice the center distance of ball and gear even # of teeth	$DE + d$	2.48577
CO	Twice the center distance of ball and gear odd # of teeth	$(DO + d) / COS(90/N)$	*****
β	Pressure angle to ball center	$COS(\beta) = BD / CE$ or CO	20.60986
INV β	Involute function of β	$TAN(\beta) - [\beta(p/180)]$	0.01636
INV α_d	Involute function of α_d	$TAN(\alpha_d) - [\alpha_d(p/180)]$	0.02204
D		dD / BD	0.03194
sd	Transverse arc space width	$PD \cdot (INV\beta + DINV\alpha_d)$	0.06621
sn	Normal arc space width	$sd \cdot COS(h)$	0.06565

