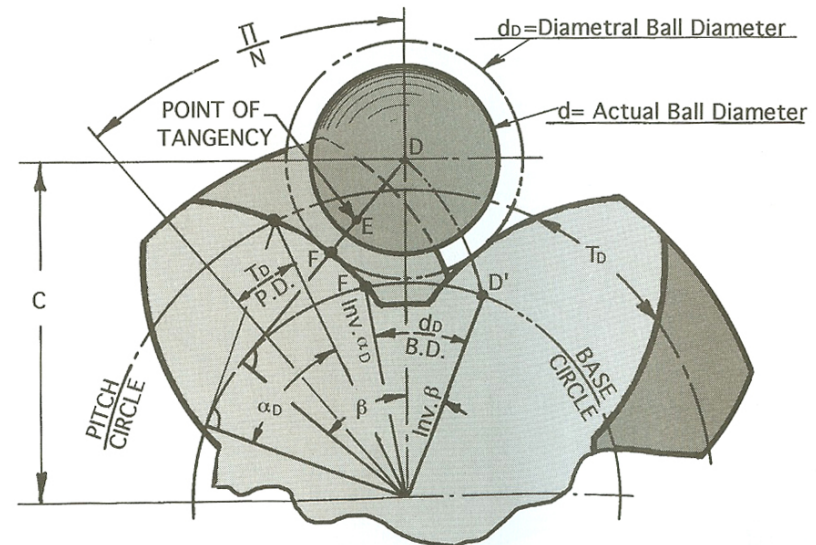


EXTERNAL HELICAL GEARS- Determining Dimensions Over Pins or Balls

TO GET	HAVING	RULE	FORMULA
N	Number of teeth	Given	50
DP	Diametral pitch	Given	10
h	Pitch helix angle	Given	31.5
α_n	Normal pressure angle	Given	30
tn	Normal arc tooth thickness	Given	0.15440
DP	Pin diameter	Given	0.17280
α_d	Transverse pressure angle	$TAN(\alpha_n) = TAN(\alpha_n) / COS(h)$	34.10320
td	Transverse arc tooth thickness	$tn / COS(h)$	0.18108
H	Base helix angle	$TAN(H) = TAN(h) \cdot COS(\alpha_d)$	26.90400
dD	Transverse pin diameter	$d / COS(H)$	0.19377
PD	Pitch diameter	$N / [DP \cdot COS(h)]$	5.86414
BD	Base diameter	$PD \cdot COS(\alpha_d)$	4.85568
INV α_d	Involute function of α_d	$TAN(\alpha_d) - [\alpha_d(\pi/180)]$	0.08192
A		td/PD	0.03088
D		dD/BD	0.03991
E		π/N	0.06283
INV β	Involute function of β	$A + D + INV \alpha_d - E$	0.08987
Φ	Pressure angle to pin center	See tables (page G14)	35.06197
CC	Twice the center distance	$BD / COS(\beta)$	5.93218
DE	Dimension over pins even # of teeth	$CC + d$	6.10498



TO GET	HAVING	RULE	FORMULA
DO	Dimension over pins odd # of teeth	$COS(90/N) \cdot CC + d$	*****
Φ	Pressure angle to point of tangency	$TAN(\Phi) = TAN(\beta) - [d \cdot COS(H) / BD]$	33.82546
RT	Radius to point of tangency	$BD / [2 \cdot COS(\Phi)]$	2.92251