



90 Bissel Street

Joliet, IL 60432

phone 800.876.7216

fax 815.723.9207

INTERNAL HELICAL GEARS - Determining Dimension Under Pins or Balls

TO GET	HAVING	RULE	FORMULA
N	Number of teeth	Given	16
DP	Normal diametral pitch	Given	6
h	Pitch helix angle	Given	12.16370
α_n	Normal pressure angle	Given	25
sn	Normal arc space width	Given	0.26220
d	Ball diameter	Given	0.24000
α_d	Transverse pressure angle	$TAN(\alpha_d) = TAN(\alpha_n) / COS(h)$	25.50193
sd	Transverse arc space width	$sn / COS(h)$	0.26822
H	Base helix angle	$TAN(H) = TAN(h) \bullet COS \alpha_d$	11.00905
dD	Transverse ball diameter	$d / COS(H)$	0.24450
PD	Pitch diameter	$N / [DP \bullet COS(h)]$	2.72791
Bd	Base Diameter	$PD \bullet COS(\alpha_d)$	2.46213
INVα_d	Involute function of α_d	$TAN(\alpha_d) - [\alpha_d(\pi/180)]$	0.03192
A		sd / PD	0.09833
D		dD / BD	0.09930
INVβ	Involute function of β	$A + INV \alpha_d - D$	0.03095
β	Pressure angle to ball center	See tables	25.25264
CC	Twice the center distance of ball and gear	$DB / COS(\beta)$	2.72229
DE	Dimension under balls even # of teeth	$CC - d$	2.18229
DO	Dimension under balls odd # of teeth	$CC \bullet COS(90/N) - d$	*****
Φ	Pressure angle to point of tangency	$TAN(\Phi) = TAN(\beta) + [d \bullet COS(H) / BD]$	29.56926
RT	Radius to point of tangency	$BD / [2 \bullet COS(\Phi)]$	1.41541

