

ENGINEERING INFORMATION

HELICAL GEARS

GEAR NOMENCLATURE

The information contained in the Spur Gear section is also pertinent to Helical Gears with the addition of the following:

HELIX ANGLE (ψ) is the angle between any helix and an element of its cylinder. In helical gears, it is at the pitch diameter unless otherwise specified.

LEAD (L) is the axial advance of a helix for one complete turn, as in the threads of cylindrical worms and teeth of helical gears.

NORMAL DIAMETRAL PITCH (P_n) is the Diametral Pitch as calculated in the normal plane.

HAND – Helical Gears of the same hand operate at right angles, see Fig. 1
Helical Gears of opposite hands run on parallel shafts. Fig. 2



TWO
RIGHT-HAND
HELICAL GEARS

TWO
LEFT-HAND
HELICAL GEARS

LEFT-HAND AND
RIGHT-HAND
HELICAL GEARS

Figure 1

Figure 2

LEFT HAND HELICAL GEAR

RIGHT HAND HELICAL GEAR

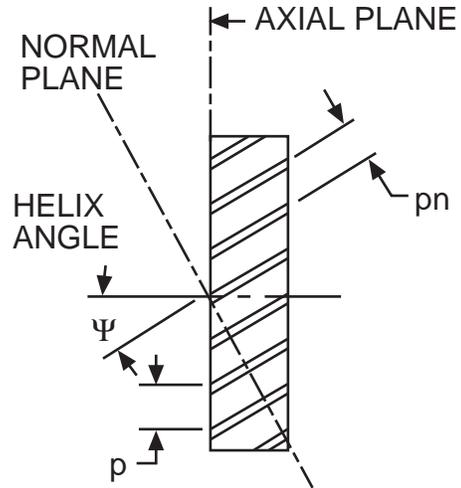


The teeth of a LEFT HAND Helical Gear lean to the left when the gear is placed flat on a horizontal surface.



The teeth of a RIGHT HAND Helical Gear lean to the right when the gear is placed flat on a horizontal surface.

HELIX ANGLE—



p = AXIAL CIRCULAR PITCH
 p_n = NORMAL CIRCULAR PITCH

All Boston Helicals are cut to the Diametral Pitch system, resulting in a Normal Pitch which is lower in number than the Diametral Pitch.

INVOLUTE—The Helical tooth form is involute in the plane of rotation and can be developed in a manner similar to that of the Spur Gear. However, unlike the Spur Gear, which may be viewed as two-dimensional, the Helical Gear must be viewed as three-dimensional to show change in axial features.

Helical gears offer additional benefits relative to Spur Gears, those being:

- Improved tooth strength due to the elongated helical wrap-around.
- Increased contact ratio due to the axial tooth overlap.
- Helical Gears thus tend to have greater load carrying capacity than Spur Gears of similar size.
- Due to the above, smoother operating characteristics are apparent.