





PITCH DEVIATIONS

$^{\mathrm{F}}\mathbf{p}$

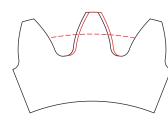
Cumulative circular pitch errors from the accumulating summation of adjacent pitch errors fp.



Largest cumulative circular pitch error over $\approx z/8$ pitches.



Adjacent pitch error is the difference between the actual and nominal individual circular pitches in the transverse section of a right or left flank





F_{II}

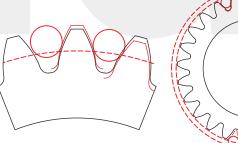
Difference between successive actual individual circular pitches in the transverse section of a right or left flank.

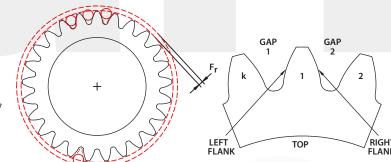


RADIAL RUNOUT

F_{\parallel}

From gear axis this is the range of radial positional deviation of all tooth gaps. Defined by a ball in all tooth gaps.





TOOTH THICKNESS

Mdk

Distance over two balls of diameter D_m sat in tooth gap at or as close to 180 degrees as possible.

MdR

Distance over two rollers of diameter D_m sat in tooth gap at or as close to 180 degrees as possible.

$\mathrm{M}_{ extsf{r} extsf{K}}$

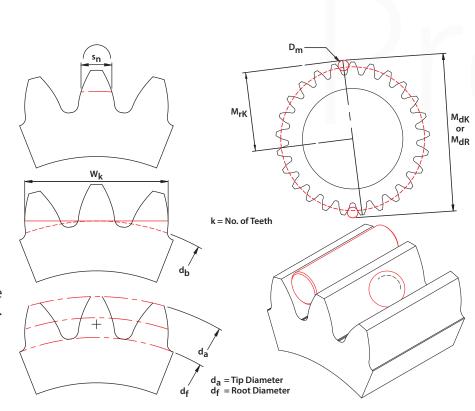
Radial distance from gear axis to outer surface (inner surface for an internal gear) of a ball of diameter D_m.

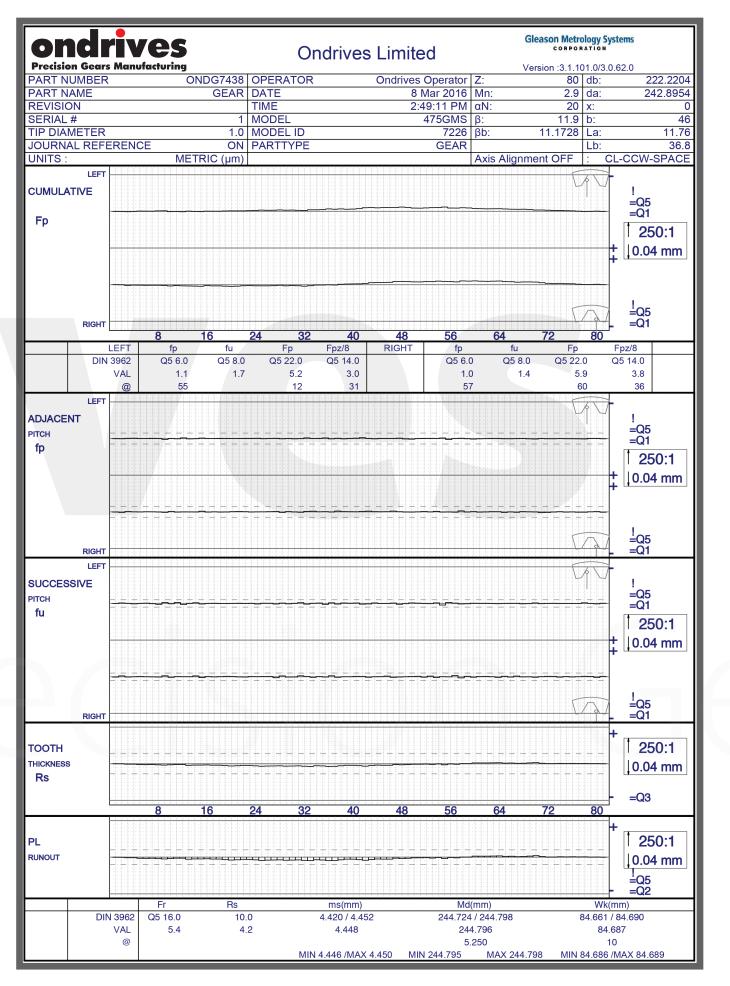
$W_{\boldsymbol{k}}$

Base tangent (span) over k teeth. Linear distance in normal section over k teeth which is tangent or as close as possible to the cylinder formed by base diameter db. For internal gear k is number of gaps.

^Sn

Circular tooth thickness in normal section at reference diameter d.









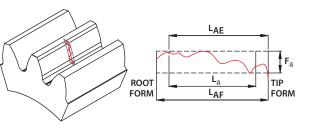


PROFILE (INVOLUTE) DEVIATIONS

Typically measured on 4 evenly spaced teeth or gaps. Left & right flank measured for each tooth or gap over the usable length LAF. Analysis region L_{α} is typically 92% of the active length LAF.

Total Profile Deviation

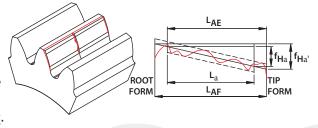
Distance between the highest and lowest points on the profile trace within the analysis region L_{α} measured perpendicular to a zero-error reference line. When working to ISO or DIN standards any high point in region from end of L_{α} to end of L_{AE} is included.



fHa

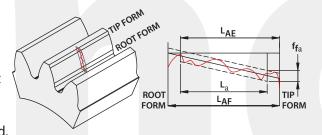
Profile Slope Deviation

Positive or negative deviation of a best-fit reference line through the profile trace. Measured perpendicular to the start point of a zero-error reference line over the analysis region L_{α} . When given the symbol $f_{H\alpha'}$ the value is from reference lines over the active length LAF.



Profile Form Deviation

Distance between highest & lowest reference lines that touch the profile trace & are parallel to the best-fit reference line. Measured perpendicular to a zero-error line. When working to ISO or DIN standards any high point in region from end of L_{α} to end of LAF is included.

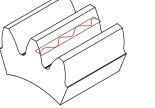


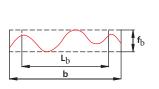
LEAD (HELIX) DEVIATIONS

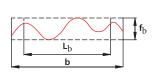
Typically measured on 4 evenly spaced teeth or gaps. Left and right flank measured for each tooth or gap. Analysis region Lb is typically 80% of the gear face width b.

Total Lead Deviation

Distance between the highest and lowest points on the flank trace within the analysis region Lb measured perpendicular to a zero-error reference line. When working to ISO or DIN standards any high point outside of the analysis region is included.



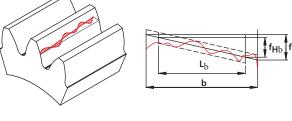




fHb

Lead Slope Deviation

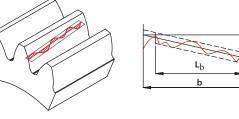
Positive or negative deviation of a best-fit reference line through the flank trace. Measured perpendicular to the start point of a zero-error reference line over the analysis region. When given the symbol f_{Hb}, the value is from reference lines over the full face width of the gear.





Lead Form Deviation

Distance between the highest and lowest reference lines that touch the flank trace and are parallel to the best-fit reference line. Measured perpendicular to a zero-error reference line. When working to ISO or DIN standards any high point outside of the analysis region is included.



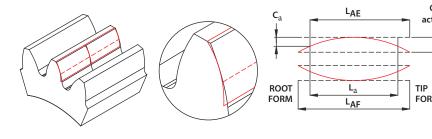
PROFILE MODIFICATIONS

Typically used to compensate for tooth deflection under load and influence load and transmission error TE of gear systems. Modifications can be different on left and right flanks.

C_a

Crowning

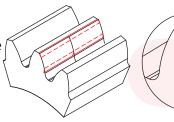
Increasing reliefs of the transverse tooth profile from a point typically central over usable profile length LAF, in an arc like progression.

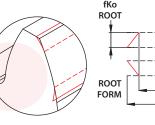


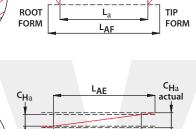
fKo

Tip and Root Relief

Increasing reliefs of the transverse tooth profile either from the tip, tip form diameter or root form diameter. Can be linear, arc like or parabolic in shape.



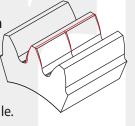


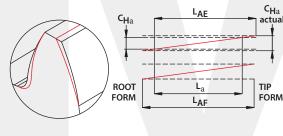


C_{Ha}

Pressure Angle Modification

A linear relief applied over the full length of the usable profile length LAF. Per ISO 21771 a positive value removes material at the tip and increases the effective pressure angle.





LEAD MODIFICATIONS

Typically used to compensate for system deflection and influence load distribution over the face width of the gear.

C_{b}

Lead Crowning

Constantly increasing relief of the flank line in an arc like progression. Typically central over the face width of the gear.

C_{bTop} C_{bBottom}

Constantly increasing relief of

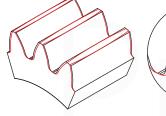
distance at one or both ends of

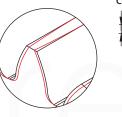
the flank line applied over a short

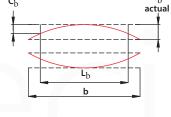
the face width of the gear. Can be

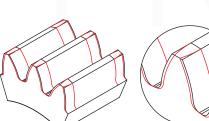
linear, arc like or parabolic in shape.

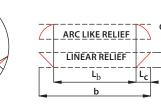
Lead End Relief











C_{Hb}

Lead Slope Modification

Constantly increasing relief of the flank line applied over the full face width of the gear. It is not necessarily linear.

