6 Apply (7) to $m = 6$ mm

$\check{s} = \max\left(-0.5, \frac{30-19}{40}\right) = 0.275 \quad \therefore \check{s} = 0.275\times 6 = 1.65$ mm

$\hat{s} = 0.6 \quad \Rightarrow \quad \hat{s} = 0.6\times 6 = 3.60$ mm

Without profile shift

pitch dia $D = mz = 6\times 19 = 114$ mm

base ⊙ dia, $D_0 = D\cos 20° = 107.1$ mm

and is "basic", no matter what profile shift.

With profile shift of 0.4

extended pitch dia, $D' = D + 2ms = 118.8$ mm

& dedendum dia $= D' - 2mb$

$= 118.8 - 2\times 6\times 1.25 = 103.8$ mm

addendum dia $= D' + 2ma = 118.8 + 2\times 6\times 1 = \underline{\underline{130.8}}$ mm

The base pitch is the distance around base ⊙ circumference from one tooth to the next.

$p_0 = \pi D_0/z = \pi\times 107.1/19 = \underline{\underline{17.71}}$ mm

From the worked example, for unit module:

$\gamma = (h + s\tan\alpha)/R + \tan\alpha - \alpha$

$= (\frac{\pi}{4} + 0.4\tan 20°)/\frac{1}{2}\times 19 + \tan 20° - \frac{\pi}{180}\times 20$

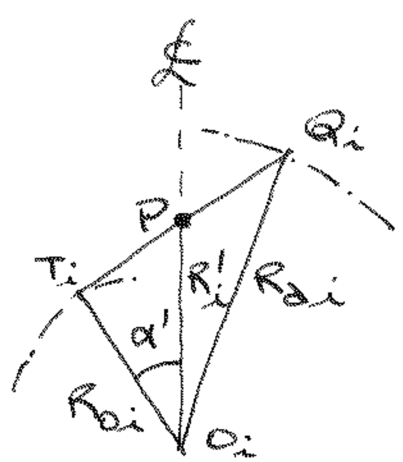
$= 0.1129$ rad $(6.47°)$

7

The contribution of the i'th mating gear to the path of contact is:

$PQ_i = T_iQ_i - T_iP \; ; i = 1, 2$

$= \sqrt{(R_{ai}^2 - R_{oi}^2)} - R'_i \sin\alpha'$



So, for the two gears, the length of the path of contact is:

$Q_1PQ_2 = \Sigma\sqrt{(R_{ai}^2 - R_{oi}^2)} - \Sigma R'_i\sqrt{1-\cos^2\alpha'}$

where, for unit module:

$R_{ai} = R_i + s_i + a = \frac{1}{2}z_i + s_i + 1$

$R_{oi} = R_i\cos\alpha = \frac{1}{2}z_i\cos\alpha$

$\Sigma R'_i = C = \frac{1}{2}\Sigma z + \Sigma s$ from (9)

$\cos\alpha' = \Sigma R_{oi}/C = \frac{1}{2}\Sigma z\cos\alpha / C$

So $\epsilon_\gamma = 2Q_1PQ_2/2\pi\cos\alpha$ from (6)

$$2\pi\cos\alpha . \epsilon_\gamma = \Sigma_{i=1,2}\sqrt{[(z_i + 2(1+s_i))^2 - (z_i\cos\alpha)^2]} - \sqrt{[(\Sigma z + 2\Sigma s)^2 - (\Sigma z\cos\alpha)^2]}$$