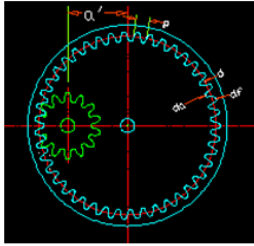


齿轮参数计算公式大全

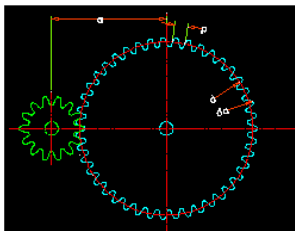
1. 内齿模数齿轮



内齿模数齿轮

齿 距	ρ	$\rho = \pi m = \pi d/z$
齿 数	Z	$Z = d/m = \pi d / \rho$
模 数	m	$m = \rho / \pi = d/z = da / (z+2)$
分度圆	d	$d = mz = da - 2m$
齿顶圆	da	$da = m(z-2)$
齿根圆	d_f	$d_f = (d+2.5)m$
齿 高	h	$h = 2.25m$
齿顶高	ha	$ha = m = \rho / \pi$
齿根高	h_f	$h_f = 1.25m$
齿 厚	S	$S = \rho / 2 = \pi m / 2$
中心距	a	$a = (mz_1 - mz_2) / 2$

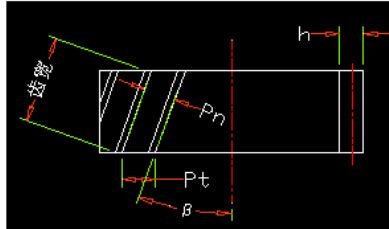
2. 直齿模数齿轮



直齿模数齿轮

齿 距	ρ	$\rho = \pi m = \pi d/z$
齿 数	Z	$Z = d/m = \pi d / \rho$
模 数	m	$m = \rho / \pi = d/z = da / (z+2)$
分度圆	d	$d = mz = da - 2m$
齿顶圆	da	$da = m(z+2) = d + 2m = \rho(z+2) / \pi$
齿根圆	d_f	$d_f = d - 2.5m = m(z-2.5) = da - 2h = da - 4.5m$
齿 高	h	$h = 2.25m$
齿顶高	ha	$ha = m = \rho / \pi$
齿根高	h_f	$h_f = 1.25m$
齿 厚	S	$S = \rho / 2 = \pi m / 2$
中心距	a	$a = (mz_1 + mz_2) / 2 = (d_1 + d_2) / 2$

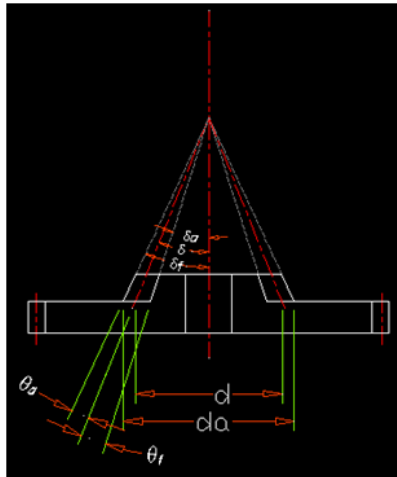
3. 斜齿模数齿轮



斜齿模数齿轮

法向模数	m_n	$m_n = p_n / \pi = m_t \cos \beta = \frac{d}{z} \cos \beta$
端面模数	m_t	$m_t = d / z = m_n / \cos \beta$
法向齿距	p_n	$p_n = \pi m_n$
端面齿距	p_t	$p_t = \pi m_t$
齿数	Z	$Z = d / m_t = \pi d / p_t = d \cos \beta / m_n$
齿高	h	$h = 2.25 m_n$
齿顶高	h_a	$h_a = m_n$
齿根高	h_f	$h_f = 1.25 m_n$
分度圆	d	$d = z m_t = d_a - 2 m_n = z m_n / \cos \beta$
齿顶圆	d_a	$d_a = d + 2 m_n$
齿根圆	d_f	$d_f = d - 2.5 m_n$
法向齿厚	S	$S = p_n / 2$
螺旋角	β	$\cos \beta = z m_n / d ; \tan \beta = \pi d / p_z$
导程	p_z	$p_z = \pi d \cos \beta$
中心距	a	$a = (z_1 + z_2) m_n / 2 \cos \beta$

4. 伞齿模数齿轮



伞齿模数齿轮

法向模数	m_n	$m_n = p_n / \pi = m_t \cos \beta = \frac{d}{z} \cos \beta$
端面模数	m_t	$m_t = d / z = m_n / \cos \beta$
法向齿距	p_n	$p_n = \pi m_n$
端面齿距	p_t	$p_t = \pi m_t$
齿数	Z	$Z = d / m_t = \pi d / p_t = d \cos \beta / m_n$
齿高	h	$h = 2.25 m_n$
齿顶高	h_a	$h_a = m_n$
齿根高	h_f	$h_f = 1.25 m_n$
分度圆	d	$d = z m_t = d_a - 2 m_n = z m_n / \cos \beta$
齿顶圆	d_a	$d_a = d + 2 m_n$
齿根圆	d_f	$d_f = d - 2.5 m_n$
法向齿厚	S	$S = p_n / 2$
螺旋角	β	$\cos \beta = z m_n / d ; \tan \beta = \pi d / p_z$
导程	p_z	$p_z = \pi d \cos \beta$
中心距	a	$a = (z_1 + z_2) m_n / 2 \cos \beta$

5. 变位模数齿轮

变位模数齿轮

齿 距	ρ	$\rho = \pi m = \pi d/z$
齿 数	Z	$Z = d/m = \pi d / \rho$
模 数	m	$m = \rho / \pi = d/z = da / (z+2)$
分度圆	d	$d = mz = da - 2m$
齿顶圆	da	$da = m(z+2)$
齿根圆	d_f	$d_f = (d - 2.5)m$
齿 高	h	$h = 2.25m$
齿顶高	ha	$ha = m = \rho / \pi$
齿根高	h_f	$h_f = 1.25m$
齿 厚	S	$S = \rho / 2 = \pi m / 2$
中心距	a	$a = (mz_1 + mz_2) / 2$

6. 直齿径节齿轮

直齿径节齿轮

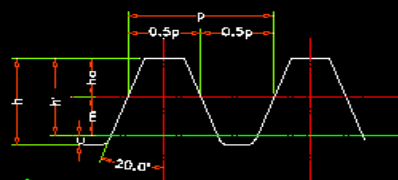
径 节	P	$P = \pi / \rho = z/d = (z+2)/da$
齿 距	ρ	$\rho = \pi / p = \pi d/z$
齿 数	z	$z = dP = daP - 2 = \pi \rho$
分度圆	d	$d = da - 2ha = z/p = z da / z + 2$
齿顶圆	da	$da = (z+2) / P = (z+2) h$
齿根圆	d_f	$d_f = da - 2h = da - (4.314/p)$
齿 高	h	$h = 2.157/P = 0.6866 \rho$
齿顶高	ha	$ha = 1/P = 0.3183 \rho$
齿根高	h_f	$h_f = 1.157/P = 0.3683 \rho$
齿 厚	S	$S = 1.5708/P = \rho / 2$
中心距	a	$a = (z_1 + z_2) / 2P$

7. 斜齿径节齿轮

斜齿径节齿轮

垂直径节	P_n	$P_n = P_t / \cos \beta = \pi / P_n = z / d \cos \beta$
端面径节	P_t	$P_t = z / d = P_n \cos \beta$
法向齿距	P_n	$P_n = P_t \cos \beta = \frac{\pi d}{z} \cos \beta$
端面齿距	P_t	$P_t = \pi / P_t$
齿数	Z	$Z = P_t d = d P_n \cos \beta$
齿高	h	$h = 2.157 / P_n$
齿顶高	h_a	$h_a = 1 / P_n$
齿根高	h_f	$h_f = 1.157 P_n$
分度圆	d	$d = z / P_n \cos \beta = z / P_t$
齿顶圆	d_a	$d_a = d + 2 / P_n$
齿根圆	d_f	$d_f = d - 2.314 / P_t$
弧齿厚	S	$S = P_n / 2$
螺旋角	β	$\cos \beta = z / P_n d$
导程	P_z	$P_z = \pi d \cos \beta$
中心距	a	$a = (z_1 + z_2) / (2 P_n \cos \beta)$

8. 齿条



齿条

齿距	P	$P = \pi m$
齿厚	S	$S = 1.5708m$
顶隙	C	$C = 0.25m$
齿顶高	H_a	$H_a = m$
齿根高	H_f	$H_f = 1.25m$
工作高度	h'	$h' = 2.25m$
模数	m	$m = P / \pi$