

Bevel Gears

Bevel gears have their teeth formed on a conical surface and are used to transfer motion between intersecting shafts. This poster covers *straight-tooth bevel gears*. *Spiral bevel gears* are quite similar but have their teeth cut so that they are no longer straight but form a circular arc. For both *straight* and *spiral bevel gears*, the shafts have to be perpendicular and in the same plane. *Hypoid gears* can transfer motion between shafts that are offset and don't intersect.



Straight Tooth Bevel Gear

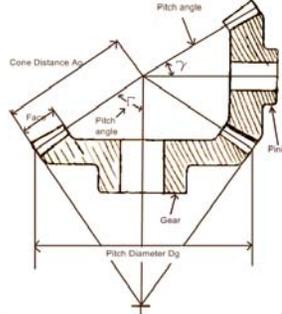


Spiral Bevel Gear



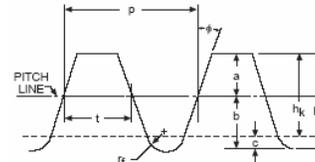
Hypoid Bevel Gear

Bevel Gears



mechanical engineering Mind Works

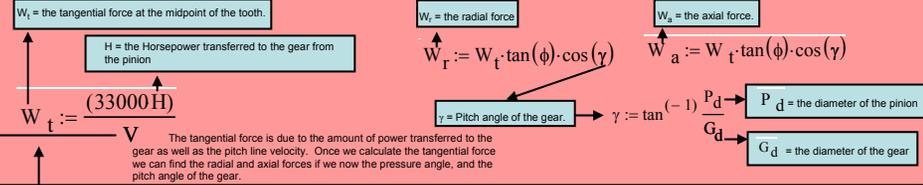
By: Brian Chamberlin, Luke Rust, and Bryan Blakey
Source: Mechanical Engineering Design, 5th Edition, Shigley and Mischke, McGraw-Hill, 1989



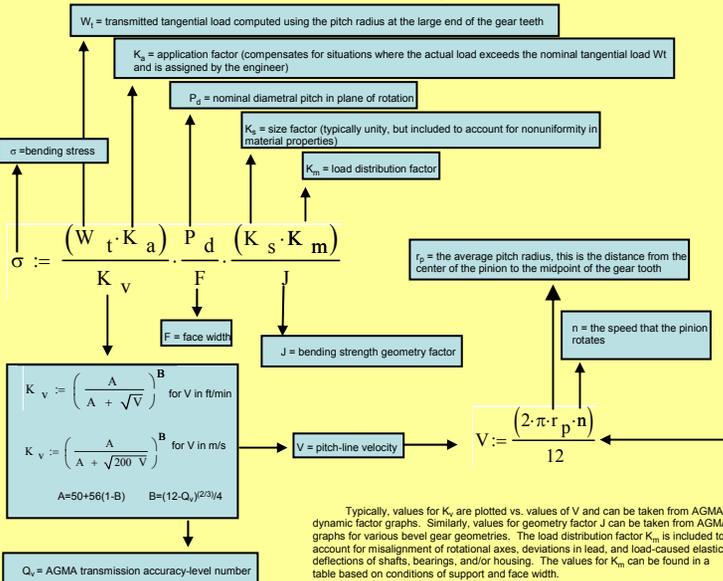
- a = ADDENDUM
- b = DEDENDUM
- c = CLEARANCE
- h_k = WORKING DEPTH
- h_t = WHOLE DEPTH
- p = CIRCULAR PITCH
- r_f = FILLET RADIUS
- t = CIRCULAR TOOTH THICKNESS
- φ = PRESSURE ANGLE

Force Analysis

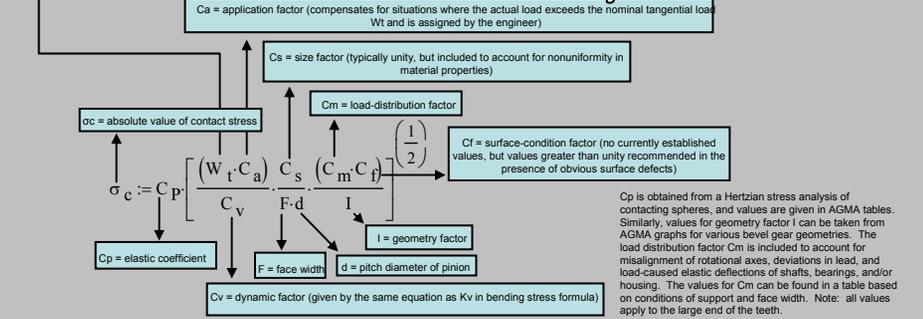
Goal: Find the force (W) that would occur if all the forces were concentrated at the midpoint of the gear tooth. This force is composed of three component forces, a tangential, a radial and an axial force. Once the force acting at the midpoint we can perform a simple statistical analysis to find the reactions in the shaft and/or the bearings.



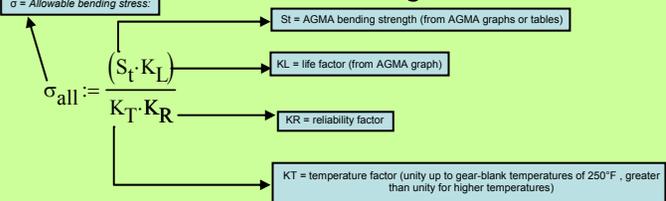
AGMA Stress Analysis



AGMA Contact Stress Analysis



Allowable Bending Stress



Allowable Contact Stress

