Area Moment of Inertia

Mechanical Engineering

Standard values of I, and the parallel axis rule that moves them.

I about the centroidal axis, for bending about that axis.

Section	Second moment of area
Rectangle, width b, depth h	$bh^3 \div 12$
Circle, diameter d	$\pi d^4 \div 64$
Tube, outer do, inner di	$\pi(do^4 - di^4) \div 64$
Triangle, base b, height h	$bh^3 \div 36$
Shifted axis, distance d	$I = Ic + Ad^2$
Circle, polar J	$\pi d^4 \div 32$, twice the bending I

Doubling the depth of a rectangle multiplies I by eight. Depth buys stiffness; width only adds it.