

Beam formula reference

Case	Reactions	Max moment	Max deflection
Simply supported, UDL w	$wL/2$ each	$wL^2/8$	$5wL^4/384EI$
Simply supported, central P	$P/2$ each	$PL/4$	$PL^3/48EI$
Simply supported, P at a	Pb/L , Pa/L	Pab/L	$Pb(L^2-b^2)^{1.5} / (9\sqrt{3}\cdot EI \cdot L)$ ($a > b$)
Cantilever, UDL w	wL , $M = wL^2/2$	$wL^2/2$	$wL^4/8EI$
Cantilever, end P	P , $M = PL$	PL	$PL^3/3EI$
Fixed both ends, UDL w	$wL/2$ each	$wL^2/12$ (ends), $wL^2/24$ (mid)	$wL^4/384EI$
Propped cantilever, UDL w	$5wL/8$, $3wL/8$	$wL^2/8$ (fixed end)	$wL^4/185EI$

Linear elastic, prismatic beams. Check with a qualified engineer.