



# Hierros Libertad S.A.

Hierros - Caños - Chapas - Mallas - Perfiles

TODO PARA LA CONSTRUCCION, HERRERO E INDUSTRIA

## Áreas, baricentros, momentos de inercia y resistentes

Sección	Area y otros datos	Distancia baricéntrica	Momento de inercia	Momento resistente y otros datos mínimo
	$F = bh$	$e_x = \frac{h}{2}$ $e_y = \frac{b}{2}$	$J_x = \frac{bh^3}{12} \quad J_b = \frac{bh^3}{3}$ $J_y = \frac{hb^3}{12}$	$W_x = \frac{bh^2}{6}$ $W_x = \frac{hb^2}{6}$
	$F = h^2$	$e_x = e_y = \frac{h}{2}$ $e_\xi = e_\eta = \frac{h}{2} \sqrt{2}$	$J_x = J_y = \frac{h^4}{12}$ $J_\xi = J_\eta = \frac{h^4}{12}$	$W_x = W_y = \frac{h^3}{6}$ $W_\xi = W_\eta = \frac{h}{6} = \frac{\sqrt{2}}{12} h^3$ $\approx 0,1178 h^3$
	$F = \frac{bh}{2}$	$e_x = \frac{1}{3} h$	$J_x = \frac{bh^3}{36} \quad J_y = \frac{hb^3}{48}$ $J_b = \frac{bh^3}{12} \quad J_s = \frac{bh^3}{4}$	$W_x = \frac{bh^2}{24}$ $W_y = \frac{hb^2}{24}$
	$F = \frac{\sqrt{3}}{2} r^2 \sqrt{3}$	$e_x = \frac{a}{2} \approx 0,866 r \quad e_y = r$ $a = r\sqrt{3}, \quad r = \frac{a}{\sqrt{3}}$	$J_x = J_y \quad J_\xi = J_\eta \quad \left. \vphantom{J_x} \right\} = \frac{5\sqrt{3}}{144} a^4$ $\approx 0,060 a^4$	$W_x = W_\xi = \frac{5\sqrt{3}}{72} a^3$ $\approx 0,1203 a^3$ $W_y = W_\eta = \frac{5}{48} a^3$ $\approx 0,1042 a^3$

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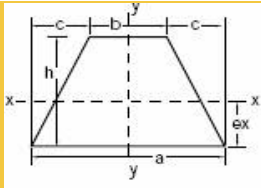
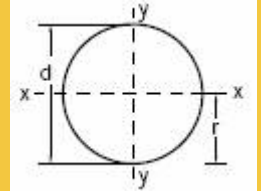
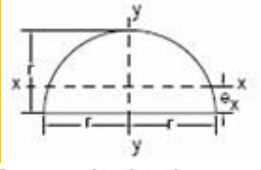
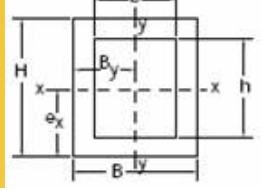
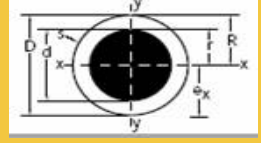
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**HL**

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	$F = \frac{h}{2} (a+b)$	$e_x = \frac{h}{3} \frac{a+2b}{a+b}$	$J_x = \frac{h^3}{36} \frac{a^2+4ab+b^2}{a+b}$ $J_y = \frac{h}{48} (a^3+a^2b+ab^2+b^3)$	$W_x = \frac{J_x}{h-e_x}$ $W_y = \frac{2J_y}{a}$
	$F = \pi r^2 = \frac{\pi d^2}{4}$ perimetro= $d\pi$	$e_x = \frac{d}{2}$	$J_x = J_y = \frac{\pi d^4}{64} = \frac{\pi r^4}{4}$ $\approx 0,05 d^4 \approx 0,7854 r^4$	$W_x = W_y = \frac{\pi d^3}{32} = \frac{\pi r^3}{4}$ $\approx 0,1 d^3 \approx 0,7854 r^3$
	$F = \frac{\pi}{2} r^2 = 1,57080 r^2$	$e_x = \frac{4r}{3\pi} \quad r^2 \approx 0,4244 r$	$J_x = r^4 \left( \frac{\pi}{8} - \frac{8}{9\pi} \right) \approx 0,1098 r^4$ $J_y = \frac{r^4 \pi}{8} \approx 0,3927 r^4$	$W_x \approx 0,1907 r^3$ $W_y = \frac{\pi r^3}{8} \approx 0,3927 r^3$
	$F = BH - bh$	$e_x = \frac{H}{2}$ $e_y = \frac{B}{2}$	$J_x = \frac{1}{12} (BH^3 - bh^3)$ $J_y = \frac{1}{12} (HB^3 - hb^3)$	$W_x = \frac{1}{6H} (BH^3 - bh^3)$ $W_y = \frac{1}{6B} (HB^3 - hb^3)$
	$F = \frac{\pi}{4} (D^2 - d^2)$	$e_x = e_y = \frac{D}{2}$	$J_x = \left\{ \begin{array}{l} \frac{\pi}{64} D^4 - d^4 \\ \frac{\pi}{4} (R^4 - r^4) \end{array} \right.$	$W_x = \left\{ \begin{array}{l} \frac{\pi}{64} \frac{D^4 - d^4}{D} \\ \frac{\pi}{4} \frac{(R^4 - r^4)}{R} \end{array} \right.$ $W_y = \left\{ \begin{array}{l} \frac{\pi}{64} \frac{D^4 - d^4}{D} \\ \frac{\pi}{4} \frac{(R^4 - r^4)}{R} \end{array} \right.$

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