

Force Calculation on Single Point Load Lifting

Force calculations on single point lifting, using basic trigonometry.

Example:

Single point lifting, without spread bar, 3m above a 3000Kg load, 2.2m wide.

Angle α is the key value to be used for the force calculations; and may be calculated by:

$$\alpha = \tan (0,5 w / h)$$

(aprox. 20°).

Considering the 3000Kg unit, lifted by 4 slings, we have a 750Kg force ($F1$) on each point ($H / 4$).

$F2$ may be obtained by:

$$(H / 4) / \cos \alpha = 798\text{Kg}$$

$F3$ may be obtained by:

$$F2 \times \cos \alpha = 273\text{Kg}$$

This force $F3$ is forcing each side coil on 2 points.

Force increases with the unit weight (H) and with the reduction of lifting height (h).

