

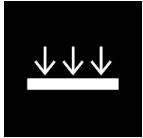
$$\begin{aligned}A_{c,eff,D04} &= m * d * (l_{a,D04} + 30) \\t_{iii,mit,D04} &= h_{e,D04} / 20 \\A_{S,D04} &= m * d * h_{e,D04} + n * d_i * t_{iii,mit,D04} \\s_{y,S,D04} &= (m * d * h_{e,D04}^2 / 2 + n * d_i * t_{iii,mit,D04}^2 / 2) / A_{S,D04} \\I_{y,S,D04} &= m * d * h_{e,D04}^3 / 12 + m * d * h_{e,D04} * (h_{e,D04} / 2 - s_{y,S,D04})^2 + n * d_i * t_{iii,mit,D04}^3 / 12 + n * d_i * t_{iii,mit,D04} * (t_{iii,mit,D04} / 2 - s_{y,S,D04})^2 \\S_{y,D04} &= m * d * s_{y,S,D04}^2 / 2 + n * d_i * t_{iii,mit,D04} * (s_{y,S,D04} - t_{iii,mit,D04} / 2) \\A_{w,D04} &= m * d * I_{y,S,D04} / S_{y,D04} \\h_{Sy,T,D04} &= h_{e,D04} - t_{iii,mit} / 2 \\I_{Sy,T,D04} &= h_{Sy,T,D04} / 24 * (d * m * (-4 * h_{Sy,T,D04}^2 + 6 * h_{Sy,T,D04} * (2 * s_{y,S} - t_{iii,mit}) - 12 * t_{iii,mit} * s_{y,S} + 9 * t_{iii,mit}^2) + 12 * b * t_{iii,mit} * (2 * s_{y,S} - t_{iii,mit})) \\r_{v,D04} &= 1 - I_{Sy,T,D04} / I_{y,S}\end{aligned}$$

$$\begin{aligned}R_{v,z,k,D04} &= \text{MIN} (A_{c,eff,D04} * k_{c,90} * f_{c,90,k} / b ; A_{w,D04} * f_{v,k} / b ; n_{s,D04} * f_{ax,k} * d_s * s_{gew,eff,D04} / (1000 * 1.3 * r_{v,D04})) \\R_{v,z,d,D04} &= R_{v,z,k,D04} * K_{mod} / Y_M\end{aligned}$$

Mit: $k_{c,90} = 1;$ $f_{c,90,k} = 2.5 \text{ N/mm}^2;$ $f_{v,k} = 2.0 \text{ N/mm}^2$

Formeln Nachweise D04

Schraubenwerte abhängig von Elementhöhe – vgl. nächst Seite



Schraubenlänge $l_{s,D04}$ in Abhängigkeit der Elementhöhe h

Gewindelänge $s_{gew,D04}$ in Abhängigkeit der Elementhöhe h

h in mm	$l_{s,D04}$ in mm	$s_{gew,D04}$ in mm
$h \leq 140$	100	45
$160 \leq h \leq 160$	130	60
$180 \leq h \leq 200$	150	70
$220 \leq h \leq 220$	190	90
$240 \leq h \leq 360$	215	100

$$s_{gew,eff,D04} = \text{MIN} (s_{gew,D04} ; h_{e,D04} ; h - h_{e,D04} - 20 \text{ mm})$$

Mit: $n_{s,D04} = 5$; $d_s = 6.5 \text{ mm}$; $f_{ax,k} = 12.5 \text{ N/mm}^2$

Schraubenwerte für Nachweise D04