# RAPID® T-Lift

## lifting capacity for floor elements and beams

The lifting capacities in Table 1 are based on the RAPID® T-Lift operating instruction of the Schmid Schrauben Hainfeld GmbH and the ETA-12/0373. The values are valid for softwood (solid wood, glulam and CLT) with a characteristic density $\rho_k$ of at least 350 kg/m³ and:

a) orthogonal insertion to the members side face (RAPID® T-Lift screw insertion angle of 90°)
b) minimum end and edge distances according to ETA-12/0373
c) embedding of entire threaded part in the timber member to be lifted
d) only axial load for the RAPID® T-Lift screw (compare Figure 1 and 2)
e) once-only use of the RAPID® T-Lift screw
f) short duration of loading (≤ 30 min)

**Table 1: maximum lifting capacity *M* (actual total weight) per RAPID® T-Lift screw for selected dynamic coefficients φ**

| | | | max. lifting capacity *M* per RAPID® T-Lift screw | | | |
|---|---|---|---|---|---|---|
| | | | **stationary crane** (slewing or gantry crane) | | lifting and transport with **mobile crane** | |
| | | | lifting velocity | | terrain | |
| | | | ≤ 90 m/min | > 90 m/min | even (asphalt, etc.) | uneven (gravel, etc.) |
| | **dimension d x L** | $l_{ef}$ | **φ = 1.10** | **φ = 1.30** | **φ = 1.65** | **φ = 2.00** |
| | [mm] | [mm] | [kg] | [kg] | [kg] | [kg] |
| **ø 12.0** | ø 12 x 60 | 48 | 307 | 259 | 204 | 169 |
| | ø 12 x 80 | 68 | 434 | 368 | 290 | 239 |
| | ø 12 x 100 | 85 | 543 | 459 | 362 | 299 |
| | ø 12 x 120 | 105 | 671 | 567 | 447 | 369 |
| | ø 12 x 140 | 125 | 798 | 676 | 532 | 439 |
| | ø 12 x 160 | 145 | 926 | 784 | 617 | 509 |
| | ø 12 x 180 | 165 | 1054 | 892 | 703 | 580 |
| | ø 12 x 220 | 205 | 1300 | 1108 | 873 | 720 |
| **ø 16.0** | ø 16 x 180 | 155 | 1296 | 1097 | 864 | 713 |
| | ø 16 x 240 | 215 | 1798 | 1522 | 1199 | 989 |
| | ø 16 x 280 | 255 | 2133 | 1805 | 1422 | 1173 |
| | ø 16 x 320 | 295 | 2467 | 2088 | 1645 | 1357 |

**Note 1:** The actual dynamic coefficient φ depends on the given boundary conditions (type of crane, drive, weather conditions (wind), terrain, etc.) and has to be defined by the user. The dynamic coefficients in Table 1 rely on recommended values given in the RAPID® T-Lift operating instruction of the Schmid Schrauben Hainfeld GmbH.

**Note 2:** The capacity of the corresponding spherical head anchor must not be exceeded in any case (for d = 12 mm max. 1.3 t and for d = 16 mm max. 2.5 t)

The German original of this document shall apply in the event of any doubt.

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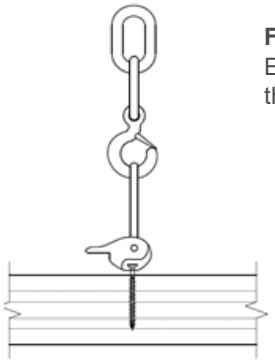

**Figure 1:**
Exclusively axial screw loading through orthogonal lifting.

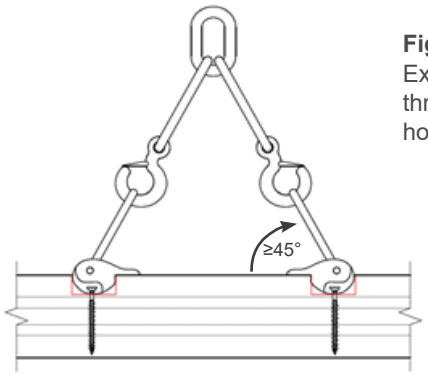


**Figure 2:**
Exclusively axial screw loading through applying exact plug hole.

## Background:

lifting capacity for floor elements and beams

$$M \leq min\begin{Bmatrix} withdrawal \\ steel\ failure\ (screw) \\ \max load\ lifting\ anchor \end{Bmatrix} = min\left\{ \begin{matrix} \frac{1}{g*\gamma_G*\varphi} * \min \begin{Bmatrix} \frac{F_{ax,Rk}*k_{mod}}{\gamma_M} \\ \frac{f_{tens,k}}{1{,}25} \end{Bmatrix} \\ 1\,300\ \ resp.\ \ 2\,500 \end{matrix} \right\} \ldots \text{ lifting capacity } [kg]$$

with:

$F_{ax,Rk} = f_{ax,k,90} * l_{ef} * d * k_{ax} * k_{dens} \ \ldots \ [N]$

Ø 12 mm: $f_{ax,k,90} = 11.2 \left[\frac{N}{mm^2}\right]$, $f_{tens,k} = 45\,000\ [N]$

Ø 16 mm: $f_{ax,k,90} = 11.0 \left[\frac{N}{mm^2}\right]$, $f_{tens,k} = 88\,600\ [N]$

$k_{ax,(\alpha=90°)} = 1.0 \qquad k_{dens\left(\rho_k=350\left[\frac{kg}{m^3}\right]\right)} = 1.0$

$k_{mod} = 0.9 \qquad \gamma_M = 1.3 \qquad \gamma_G = 1.35 \qquad g = 9.81\left[\frac{m}{s^2}\right]$

$\varphi$ ... dynamic coefficients (acc. Table 1)

**Table 2: correction factors for varying densities**

| strength class | standard | density $\rho_k$ [kg/m³] | factor |
|---|---|---|---|
| C16 | EN 338 | 310 | 0.90 |
| C24 | EN 338 | 350 | 1.00 |
| C30 | EN 338 | 380 | 1.06 |
| GL24c | EN 14080 | 365 | 1.03 |
| GL28c | EN 14080 | 390 | 1.09 |
| GL30c | EN 14080 | 390 | 1.09 |
| GL32c | EN 14080 | 400 | 1.11 |
| GL24h | EN 14080 | 385 | 1.07 |
| GL28h | EN 14080 | 425 | 1.16 |
| GL30h | EN 14080 | 430 | 1.17 |
| GL32h | EN 14080 | 440 | 1.20 |

**Note:** The correction factor for the lowest corresponding strength class has to be used.

Further details on the correct use of the RAPID® T-Lift transport system can be found in our operating instructions. Available to download at our home page: **www.schmid-screw.com/en/downloadcenter**

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ETA-12/0373

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