

## Tiltrekningskraft fra tiltrekningsmoment iht. sb-Skrueforbindelser 2016

M27

DIN 976

$$F := 136.6 \text{ kN}$$

$$D_{min} := 41.44 \text{ mm}$$

$$D_1 := 24.8 \text{ mm}$$

$$P := 3 \text{ mm}$$



- a) The Stud Bolt will be according to DIN 976.  
 b) Threads will be F.T & conform to Class 2A.  
 c) Material High grade carbon/alloy steel & stainless steel.  
 d) Heat Treatment Property Class Grade A2, A4, B, B7, B7M, B8, B8M, B8T, L7, L7M, L43.  
 e) Coating & Marking will be done as per requirement.  
 f) Tolerance of Total Length of Stud Bolt is  $-0.0/+3.0$  In required length.  
 g) Chemical & Mechanical Properties as per ISO 898-1 or DIN 267.

| Nominal | Pitch of thread<br>P | Thread Length b | Major Diameter (D) | Pitch Diameter (D1) | Minor Diameter (D2) |
|---------|----------------------|-----------------|--------------------|---------------------|---------------------|
|---------|----------------------|-----------------|--------------------|---------------------|---------------------|

$$\alpha := 30 \text{ deg} \quad \text{halve gjengevinkelen}$$

$$r_m := \frac{D_1}{2} = 12.4 \text{ mm}$$

$$\varphi := \arctan\left(\frac{P}{\pi \cdot D_{min}}\right) = 1.3201 \text{ deg}$$

$$\mu := 0.10 \quad \text{friksjonskoeffisient gjenge}$$

$$\mu' := 0.10 \quad \text{friksjonsfaktor mellom skruehode / mutter og underlag}$$

$$\varepsilon_1 := \arctan\left(\frac{\mu}{\cos(\alpha)}\right) = 0.115$$

$$M_V := F \cdot \tan(\varphi + \varepsilon_1) \cdot r_m = 235.246 \text{ N m}$$

$$\text{Key\_Width} := 41 \text{ mm} \quad \text{nøkkelvidde}$$

$$\text{Normal\_Fit\_Hole} := 30 \text{ mm}$$

$$r'_m := \frac{\text{Key\_Width} + \text{Normal\_Fit\_Hole}}{4} = 17.75 \text{ mm}$$

$$M_s := \mu' \cdot F \cdot r'_m = 242.465 \text{ N m}$$

$$M := M_s + M_V = 477.711 \text{ N m}$$

$$M_s = F_f \cdot r'_m = \mu' F \cdot r'_m$$

hvor:  $F_f$  = friksjonskraft

$F$  = aksialkraften

$\mu'$  = friksjonskoeffisienten mellom skruehode / mutter og underlag

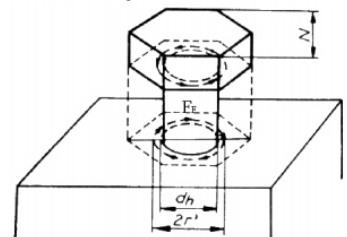
$r'_m$  = den radius som friksjonskraften antas å virke på

$$r'_m = \frac{N + d_h}{4}$$

hvor:  $N$  = nøkkelvidde

$d_h$  = hullets diameter

$N$  og  $d_h$  finner du i skruetabeller.



Figur 4.8

Ved tiltrekking oppstår friksjonskraft  $F_f$  mellom skruehode og underlag.

| Nominal | Pitch of thread<br>P | Thread Length b | Major Diameter (D) |       | Pitch Diameter (D1) |       | Minor Diameter (D2) |
|---------|----------------------|-----------------|--------------------|-------|---------------------|-------|---------------------|
|         | MM                   |                 | Min.               | Min.  | Min.                | Max.  | Max.                |
| M-16    | 2.0                  | Full Thread     | 15.68              | 15.96 | 14.50               | 14.60 | 13.80               |
| M-18    | 2.5                  | Full Thread     | 17.62              | 17.96 | 16.15               | 16.25 | 15.25               |
| M-20    | 2.5                  | Full Thread     | 19.62              | 19.96 | 18.15               | 18.25 | 17.25               |
| M-22    | 2.5                  | Full Thread     | 21.62              | 21.96 | 20.15               | 20.25 | 19.25               |
| M-24    | 3.0                  | Full Thread     | 23.58              | 23.95 | 21.80               | 21.90 | 20.70               |
| M-27    | 3.0                  | Full Thread     | 26.58              | 26.95 | 24.80               | 24.90 | 23.70               |
| M-30    | 3.5                  | Full Thread     | 29.52              | 29.95 | 27.50               | 27.60 | 26.16               |
| M-33    | 3.5                  | Full Thread     | 32.52              | 32.95 | 30.50               | 30.60 | 29.16               |
| M-36    | 4.0                  | Full Thread     | 35.46              | 35.94 | 33.15               | 33.25 | 31.61               |
| M-39    | 4.0                  | Full Thread     | 38.46              | 38.94 | 36.20               | 36.30 | 34.61               |
| M-42    | 4.5                  | Full Thread     | 41.44              | 41.94 | 38.80               | 38.90 | 37.07               |
| M-45    | 4.5                  | Full Thread     | 44.44              | 44.94 | 41.80               | 41.90 | 40.07               |
| M-48    | 5.0                  | Full Thread     | 47.40              | 47.93 | 44.50               | 44.60 | 42.52               |
| M-52    | 5.0                  | Full Thread     | 51.40              | 51.93 | 48.50               | 48.60 | 46.52               |
| M-56    | 5.5                  | Full Thread     | 55.36              | 55.92 | 52.10               | 52.20 | 49.97               |
| M-60    | 5.5                  | Full Thread     | 59.36              | 59.92 | 57.85               | 57.95 | 53.97               |
| M-64    | 6.0                  | Full Thread     | 63.32              | 63.92 | 59.80               | 59.90 | 57.42               |