DETAN Tension rod system: now with up to 15% higher load capacity!
Modern architecture strives to be both practical and functional, but also to allow design of more artistically exceptional buildings. With the DETAN Rod system, HALFEN provides an innovative product solution which meets all the requirements: maximum aesthetics, technological reliability, and quality.

HALFEN provides a design software and qualified support to optimize planning of your tension and compression rod system.

Quality characteristics

- Project specific configurations for system diameter and length
- High steel load capacities
- Large selection of rod diameters
- Hot-dip galvanized and stainless steel finishes
- Hot-dip galvanized, brushed threads
- Seal-sets for maximum corrosion protection

Additional advantages

- Compression rods complement the DETAN System
- Cross couplers available as an alternative to disc couplers
- Complimentary design-software and planning support

Optimized site-logistics

Efficient rod marking and project specific labelling for easy installation.

DETAN Rod systems are delivered pre-assembled.

Applications

- Lattice frame elements and wind bracing in roofs and walls
- Suspension of pylons and canopies
- Bracing of timber and steel support beams
- Back-bracing of glass façades
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DETAN ROD SYSTEM

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- DETAN as a design element 6
- System overview 8

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- DETAN-S Connection plates 13
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The DETAN Rod system allows smaller steel and wood-beam cross-sections. This makes larger spans possible. This is one example of a beam using two compression rod systems with three tension rods in the mid-section. Minimum material can be used to support glass structures, to allow maximum light into a building.

Statically required wind-bracing in roofs and walls can be aesthetically designed as a visual focus-point using the tension rod system. Cross bracing is possible either with a cross coupler or an anchor disc.

The design of aesthetically demanding structures, such as this pedestrian bridge, is made possible. The requirements of modern architecture complement the static requirements perfectly.
Canopy suspensions

The DETAN Rod system allows bracings to be designed using a minimum of obtrusive structural elements, leaving them almost invisible. Statically required elements are simultaneously used as design elements. The visually, unobtrusive bracing elements give the whole structure an overall lightness. Applications are suspended canopies in all types of commercial and industrial projects. The DETAN Rod system is suitable for tension and compression loads.

Back-braced glass-facades

The DETAN Rod system allows filigree support structures for glass-facades to be realized.
The DETAN Rod system was used as a visual, creative design element in this project.

The effect is an elegant, aesthetic structure.

DETAN fits perfectly into the architectural concept and significantly contributes to the overall style.

Project:
Manchester Civil Justice Centre,
England, UK
Cross bracings provide a futuristic, lightweight construction.

For structural reasons, DETAN Tension rods run diagonally across the glazed façade.

The filigree DETAN system is perfectly integrated, emphasizing the fascinating overall impression of the building.

Project:
The Sage, Gateshead, England, UK
The DETAN Rod systems are only approved for predominantly static loads.

DETAN Tension rod system

**Basic system:**

![DETAN Tension Rod with fork head or spade connector]

Ordering procedure → page 9  
Load capacity, system dimensions and materials:  
Steel → pages 12–13  
Stainless steel → pages 14–15

**System variants:**

- **with couplers or couplers with lug**
- **with cross coupler for cross bracing**

Ordering example → page 9  
Load capacity, system dimensions and materials:  
Steel → pages 12–13  
Stainless steel → pages 14–15

**Cross bracing:**

- **Anchor disc for cross bracing**
- **Cross bracing consists of one system variant with cross coupler and a basic system**

Ordering example → page 11  
Load capacity, system dimensions and materials:  
Steel → pages 12–13  
Stainless steel → pages 14–15

DETAN Compression rod system

![DETAN Compression Rod]

Ordering example → page 16  
Load capacity, system dimensions and materials → pages 16–18

HALFEN Pretension unit

More information → pages 23–24
Ordering procedure

Example order: Tension rod system, DETAN-S, \( d_s = 30 \text{ mm}, \ L = 4500 \text{ mm} \), 1 coupler

**Product / DETAN System/ system diameter \( d_s \) / system length \( L \) / specification**

<table>
<thead>
<tr>
<th>System diameter ( d_s ) [mm]</th>
<th>10</th>
<th>12</th>
<th>16</th>
<th>20</th>
<th>24</th>
<th>27</th>
<th>30</th>
<th>36</th>
<th>42</th>
<th>48</th>
<th>52</th>
<th>56</th>
<th>60</th>
<th>76</th>
<th>85</th>
<th>95</th>
</tr>
</thead>
<tbody>
<tr>
<td>Available minimum system length ( L ) [mm]</td>
<td>250</td>
<td>310</td>
<td>360</td>
<td>440</td>
<td>520</td>
<td>560</td>
<td>600</td>
<td>700</td>
<td>810</td>
<td>940</td>
<td>990</td>
<td>1050</td>
<td>1160</td>
<td>1480</td>
<td>1640</td>
<td>1810</td>
</tr>
<tr>
<td>Rod hot-dip galvanized</td>
<td>6060</td>
<td>6070</td>
<td>12080</td>
<td>12100</td>
<td>12120</td>
<td>12140</td>
<td>12140</td>
<td>12170</td>
<td>12220</td>
<td>12260</td>
<td>12270</td>
<td>12290</td>
<td>12320</td>
<td>15430</td>
<td>15480</td>
<td>15530</td>
</tr>
</tbody>
</table>

**Note:** Maximum 5 couplers are possible.

**System variants**

**with coupler:**

Ordering example (stainless steel): Tension rod system, DETAN-E, \( d_s = 24 \text{ mm}, \ L = 11200 \text{ mm} \), 2 couplers

**coupler with lug:**

Ordering example (material steel HDG): Tension rod system, DETAN-S, \( d_s = 30 \text{ mm}, \ L = 34000 \text{ mm} \), 3 couplers with lug

Abbreviations:
- WB = mill finish
- FV = HDG = hot-dip galvanized

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DETAN ROD SYSTEMS

Product Range Overview: DETAN Tension Rod System

System variants

Cross coupler for cross bracing:

Ordering example (material steel HDG): Tension rod system, DETAN-S, \(d_S = 30\) mm, \(L = 5600\) mm FV, 1 cross coupler

DETAN-S und DETAN-E System dimensions

| System - \(\varnothing d_S [\text{mm}]\) | 6 | 8 | 10 | 12 | 16 | 20 | 24 | 27 | 30 | 36 | 42 | 48 | 52 | 56 | 60 | 76 | 85 | 95 |
|-------------------------------------|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| Min. L system length                | 190 | 210 | 250 | 310 | 360 | 440 | 520 | 560 | 600 | 700 | 810 | 940 | 990 | 1050 | 1160 | 1480 | 1640 | 1810 |
| Reduction for 2 \times fork         | 44 | 51 | 60 | 73 | 85 | 107 | 128 | 148 | 179 | 220 | 264 | 277 | 290 | 324 | 432 | 482 | 532 |
| \(D_m\)                             | 10.5 | 12.5 | 15.0 | 18.5 | 22.5 | 27.0 | 34.0 | 37.5 | 42.5 | 51.0 | 55.0 | 62.5 | 70.5 | 77.5 | 85.0 | 115.0 | 130.0 | 195.0 |
| \(l_{km}\)                          | 70 | 85 | 100 | 120 | 142 | 166 | 200 | 222 | 242 | 284 | 310 | 348 | 400 | 440 | 478 | 631 | 710 | 830 |
| min. system length                  | 400 | 450 | 550 | 650 | 750 | 900 | 1050 | 1150 | 1200 | 1400 | 1600 | 1850 | 2000 | 2100 | 2300 | 2950 | 3250 | 3650 |

Minimal system length

\[
\text{min. system length} = 1 \times \text{cross coupler}, 2 \times \text{tension rods}, 2 \times \text{forks and 4} \times \text{locking-nuts}
\]

System variant with asymmetric distribution of couplers

Order with specification of system length \(L\):
HALFEN calculates the rod lengths and minimum and maximum system length. The couplers are distributed symmetrically. If an asymmetric distribution of the couplers is required, a drawing with all necessary measurements must be included. Alternatively, order using the HALFEN dimensioning software, see page 21.

HALFEN will detail complex rod systems as one configured system. A drawing with system dimensions is sufficient.

Ordering example:
1. Tension Rod System, DETAN-S, \(d_S = 24\) mm, system length according to drawing, WB, couplers according to drawing
2. Tension Rod System, DETAN-S, \(d_S = 10\) mm, system length \(L = 1050\) mm WB
Cross bracings

Anchor disc

1. Ordering example (material steel): Anchor disc, DETAN-S, \( d_S = 42 \text{ mm} \), 4 holes drilled \( \alpha = 40^\circ \), \( \beta = 140^\circ \) (see drawing), FV
2. Ordering example (material stainless steel): Anchor disc, DETAN-E, \( d_S = 24 \text{ mm} \), 8 holes drilled \( \alpha = 45^\circ \) (see drawing)

Note:
- maximum 8 tension rod connections are possible
- connecting angle \( \alpha_{\text{min}} = 40^\circ \)

| System DETAN-S, European Technical Assessment ETA-05/0207 | System diameter \( d_S \) [mm] | 10 | 12 | 16 | 20 | 24 | 27 | 30 | 36 | 42 | 48 | 52 | 56 | 60 | 76 | 85 | 95 |
|----------------------------------------------------------|-------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|

<table>
<thead>
<tr>
<th>System DETAN-E, European Technical Assessment ETA-11/0311</th>
<th>System diameter ( d_S ) [mm]</th>
<th>6</th>
<th>8</th>
<th>10</th>
<th>12</th>
<th>16</th>
<th>20</th>
<th>24</th>
<th>27</th>
<th>30</th>
</tr>
</thead>
</table>

Set articles and individual components

- Tension rod (specify rod length separately)
- • Pin
- • Fork connection set: Fork, locking nuts, pins, circlips, sealing kit \(^\ominus\), left-hand thread
- • Locking nut, left-hand thread
- • Locking nut, right-hand thread
- • Fork connection set: Fork, locking nuts, pins, circlips, sealing kit \(^\ominus\), right-hand thread
- • Flat seal
- • Round seal
- • Coupler set: coupler + 2 locking nuts, sealing kit \(^\ominus\)
- • Circlip for one fork
- • Coupler set with lug: coupler with lug + 2 locking nuts, sealing kit \(^\ominus\)
- • Coupler, with lug
- • Coupler, without lug
- • Cross coupler set: cross coupler + 2 locking nuts, sealing kit \(^\ominus\)
- • Fork, left-hand thread
- • Fork, right-hand thread
- • Cross coupler

\(^\ominus\) Stainless steel variant is without sealing kit
Type tests and certification are only valid when using components as a complete system

1. Ordering example: Connection set, DETAN-S, \( d_S = 20 \text{ mm} \), left-hand thread, FV
2. Ordering example: Tension rod, DETAN-E, \( d_S = 10 \text{ mm} \), \( L = 500 \text{ mm} \), left thread length \( \approx 120 \text{ mm} \), right thread length \( \approx 150 \text{ mm} \)
## DETAN ROD SYSTEMS

**System DETAN-S, European Technical Assessment ETA-05/0207**

### System load capacities; system- and available rod lengths; material specification, steel strength grade S355 (diameter $d_s\ 10\text{-}12$) or S470/S520

<table>
<thead>
<tr>
<th>System diameter $d_s$ [mm]</th>
<th>10</th>
<th>12</th>
<th>16</th>
<th>20</th>
<th>24</th>
<th>27</th>
<th>30</th>
<th>36</th>
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<th>48</th>
<th>52</th>
<th>56</th>
<th>60</th>
<th>76</th>
<th>85</th>
<th>95</th>
</tr>
</thead>
<tbody>
<tr>
<td>Load capacity $F_{t,R,d}$ [kN]</td>
<td>21.3</td>
<td>30.94</td>
<td>81.22</td>
<td>126.9</td>
<td>182.7</td>
<td>238.1</td>
<td>290.6</td>
<td>423.4</td>
<td>581.1</td>
<td>763.7</td>
<td>911.3</td>
<td>1052.4</td>
<td>1224.5</td>
<td>2016.2</td>
<td>2493.7</td>
<td>3161.6</td>
</tr>
</tbody>
</table>

**Available minimum system length $L$ [mm]**

<table>
<thead>
<tr>
<th>Material</th>
<th>S355J2</th>
<th>S520</th>
<th>S470</th>
</tr>
</thead>
<tbody>
<tr>
<td>mill finish, hot-dip galvanized</td>
<td>250</td>
<td>310</td>
<td>360</td>
</tr>
</tbody>
</table>

**Available maximum system length with one rod [mm]**

<table>
<thead>
<tr>
<th>Material</th>
<th>S355J2</th>
<th>G20 Mn5+QT</th>
</tr>
</thead>
<tbody>
<tr>
<td>mill finish, hot-dip galvanized</td>
<td>6060</td>
<td>6070</td>
</tr>
</tbody>
</table>

**Available maximum rod length $L$ [mm]**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>mill finish, hot-dip galvanized</td>
<td>6000</td>
<td>12000</td>
<td>15000</td>
</tr>
</tbody>
</table>

In accordance with ETA-05/0207 the partial safety value for the table above are assumed as $\gamma_M = 1.0$ and $\gamma_M = 1.25$

Design load $F_{t,R,d}$ according to annex B11 of ETA-05/0207. The load capacities of in this table were determined on the basis of different available material strengths. The up to 15% higher design values can be achieved with strength class S520. The design values of all strength classes can be found in annex B11 of ETA-05/0207.

### System components — materials and finish

<table>
<thead>
<tr>
<th>Material</th>
<th>S355J2</th>
<th>S520</th>
<th>S470</th>
</tr>
</thead>
<tbody>
<tr>
<td>Finish</td>
<td>FV</td>
<td>mill finish</td>
<td>hot-dip galvanized</td>
</tr>
<tr>
<td>WB</td>
<td>hot-dip galvanized</td>
<td>hot-dip galvanized</td>
<td>hot-dip galvanized</td>
</tr>
<tr>
<td>WB</td>
<td>mill finish</td>
<td>hot-dip galvanized</td>
<td>hot-dip galvanized</td>
</tr>
</tbody>
</table>

### System dimensions [mm], materials — see table above

<table>
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<th>12</th>
<th>16</th>
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<th>60</th>
<th>76</th>
<th>85</th>
<th>95</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fork length $L_{DT}$</td>
<td>60</td>
<td>73</td>
<td>89</td>
<td>110</td>
<td>133</td>
<td>147</td>
<td>160</td>
<td>192</td>
<td>225</td>
<td>265</td>
<td>285</td>
<td>305</td>
<td>335</td>
<td>460</td>
<td>520</td>
<td>580</td>
</tr>
<tr>
<td>Pin length $l_B$</td>
<td>28</td>
<td>32</td>
<td>44</td>
<td>52</td>
<td>60</td>
<td>65</td>
<td>72</td>
<td>84</td>
<td>97</td>
<td>111</td>
<td>119</td>
<td>130</td>
<td>139</td>
<td>180</td>
<td>202</td>
<td>229</td>
</tr>
<tr>
<td>Fork breadth $p$</td>
<td>20</td>
<td>24</td>
<td>33</td>
<td>40</td>
<td>46</td>
<td>51</td>
<td>57</td>
<td>68</td>
<td>79</td>
<td>90</td>
<td>98</td>
<td>107</td>
<td>116</td>
<td>146</td>
<td>166</td>
<td>189</td>
</tr>
<tr>
<td>Fork height $q$</td>
<td>26</td>
<td>31</td>
<td>41</td>
<td>51</td>
<td>61</td>
<td>69</td>
<td>75</td>
<td>90</td>
<td>105</td>
<td>119</td>
<td>125</td>
<td>137</td>
<td>146</td>
<td>196</td>
<td>216</td>
<td>236</td>
</tr>
<tr>
<td>Thread depth $d_m$</td>
<td>15.0</td>
<td>18.5</td>
<td>22.5</td>
<td>27.0</td>
<td>34.0</td>
<td>37.5</td>
<td>42.5</td>
<td>51.0</td>
<td>55.0</td>
<td>62.5</td>
<td>70.5</td>
<td>77.5</td>
<td>85.0</td>
<td>119</td>
<td>130</td>
<td>155</td>
</tr>
<tr>
<td>Screw adjustment range $q_j$</td>
<td>5.0</td>
<td>6.5</td>
<td>7.5</td>
<td>8.0</td>
<td>11.0</td>
<td>12.5</td>
<td>12.5</td>
<td>14.0</td>
<td>15.0</td>
<td>17.5</td>
<td>20.0</td>
<td>22.5</td>
<td>25.0</td>
<td>39</td>
<td>45</td>
<td>60</td>
</tr>
<tr>
<td>Length locking nut $M$</td>
<td>24.5</td>
<td>37.0</td>
<td>41.0</td>
<td>50.0</td>
<td>58.0</td>
<td>63.0</td>
<td>64.0</td>
<td>72.0</td>
<td>83.0</td>
<td>91.0</td>
<td>98.0</td>
<td>105</td>
<td>112</td>
<td>148</td>
<td>165</td>
<td>205</td>
</tr>
<tr>
<td>Spade length $L_S$</td>
<td>60</td>
<td>73</td>
<td>89</td>
<td>110</td>
<td>133</td>
<td>147</td>
<td>160</td>
<td>192</td>
<td>225</td>
<td>265</td>
<td>285</td>
<td>305</td>
<td>335</td>
<td>460</td>
<td>520</td>
<td>580</td>
</tr>
<tr>
<td>Spade width $s$</td>
<td>28</td>
<td>33</td>
<td>43</td>
<td>56</td>
<td>69</td>
<td>79</td>
<td>87</td>
<td>104</td>
<td>126</td>
<td>144</td>
<td>153</td>
<td>163</td>
<td>174</td>
<td>240</td>
<td>270</td>
<td>300</td>
</tr>
</tbody>
</table>

### Tension rod

- **Spreader width $t_s$**
- **Hook spanner $\odot$**

### Locking nuts

- **Use soft touch pliers**
  - 25-28
  - 30-32
  - 34-36
  - 40-42
  - 45-50
  - 52-55
  - 68-75
  - 86-90
  - 90-90
  - 90-155

- **With hook spanner**
  - 70-70
  - 80-80
  - 90-80
  - 155/8

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**DETAN ROD SYSTEMS**

**System DETAN-S, European Technical Assessment ETA-05/0207**

### Connecting plates

The load transfer from the rod system into the plates is considered as verified if the dimensions in the table have been observed. Plates are not included in the scope of delivery.

#### Examples:

- **Option 1:** Anchor disc, Standard K40 (smallest connecting angle $\alpha_{\text{min}} = 40^\circ$)
- **Example:** Anchor disc with 4 tension rods (max. of 8 rod connections per disc)

#### Dimensions [mm]; Material — minimum qualities for diameter 10 - 12, steel strength grade S235JR; or for diameter 16 - 95, steel strength grade S355J2

<table>
<thead>
<tr>
<th>System diameter $d_s$</th>
<th>10</th>
<th>12</th>
<th>16</th>
<th>20</th>
<th>24</th>
<th>27</th>
<th>30</th>
<th>36</th>
<th>42</th>
<th>48</th>
<th>52</th>
<th>56</th>
<th>60</th>
<th>76</th>
<th>85</th>
<th>95</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thickness conn. plate $b$</td>
<td>8</td>
<td>10</td>
<td>15</td>
<td>18</td>
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<td>22</td>
<td>25</td>
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<td>40</td>
<td>45</td>
<td>50</td>
<td>55</td>
<td>65</td>
<td>75</td>
<td>85</td>
</tr>
<tr>
<td>Hole diameter for pin $j$</td>
<td>9.5</td>
<td>11.5</td>
<td>15.5</td>
<td>19.5</td>
<td>23.5</td>
<td>26.5</td>
<td>29.5</td>
<td>33.5</td>
<td>41</td>
<td>47</td>
<td>49</td>
<td>53</td>
<td>57</td>
<td>76</td>
<td>86</td>
<td>96</td>
</tr>
<tr>
<td>Hole position $r$</td>
<td>15</td>
<td>18</td>
<td>24</td>
<td>29</td>
<td>35</td>
<td>39</td>
<td>43</td>
<td>51</td>
<td>60</td>
<td>70</td>
<td>76</td>
<td>83</td>
<td>88</td>
<td>129</td>
<td>149</td>
<td>159</td>
</tr>
<tr>
<td>Minimum width $s$</td>
<td>28</td>
<td>33</td>
<td>40</td>
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<td>64</td>
<td>73</td>
<td>80</td>
<td>94</td>
<td>113</td>
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<td>142</td>
<td>151</td>
<td>161</td>
<td>216</td>
<td>240</td>
<td>270</td>
</tr>
</tbody>
</table>

#### Cross bracing

**Option 1:** Anchor disc, Standard K40 (smallest connecting angle $\alpha_{\text{min}} = 40^\circ$)

**Example:** Anchor disc with 4 tension rods (max. of 8 rod connections per disc)

#### Cross coupler — Dimensions [mm]; material specification, steel strength grade S355J2, hot-dip galvanized

<table>
<thead>
<tr>
<th>System diameter $d_s$</th>
<th>10</th>
<th>12</th>
<th>16</th>
<th>20</th>
<th>24</th>
<th>27</th>
<th>30</th>
<th>36</th>
<th>42</th>
<th>48</th>
<th>52</th>
<th>56</th>
<th>60</th>
<th>76</th>
<th>85</th>
<th>95</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coupler length $L_{KM}$</td>
<td>100</td>
<td>120</td>
<td>142</td>
<td>166</td>
<td>200</td>
<td>222</td>
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<td>400</td>
<td>440</td>
<td>478</td>
<td>631</td>
<td>710</td>
<td>830</td>
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<tr>
<td>Coupler diameter $d_{KM}$</td>
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<td>24</td>
<td>32</td>
<td>39</td>
<td>46</td>
<td>52</td>
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<td>93</td>
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<td>112</td>
<td>120</td>
<td>154</td>
<td>173</td>
<td>194</td>
</tr>
</tbody>
</table>

#### Couplers

**Dimensions [mm]; material specification, steel strength grade S355J2, hot-dip galvanized**

<table>
<thead>
<tr>
<th>System diameter $d_s$</th>
<th>10</th>
<th>12</th>
<th>16</th>
<th>20</th>
<th>24</th>
<th>27</th>
<th>30</th>
<th>36</th>
<th>42</th>
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<th>52</th>
<th>56</th>
<th>60</th>
<th>76</th>
<th>85</th>
<th>95</th>
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</thead>
<tbody>
<tr>
<td>Coupler length $L_M$</td>
<td>40</td>
<td>50</td>
<td>62</td>
<td>78</td>
<td>94</td>
<td>104</td>
<td>120</td>
<td>140</td>
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<td>195</td>
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<td>328</td>
<td>370</td>
<td>450</td>
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<tr>
<td>Coupler diameter $d_M$</td>
<td>20</td>
<td>22</td>
<td>28</td>
<td>35</td>
<td>42</td>
<td>47</td>
<td>53</td>
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<td>75</td>
<td>87</td>
<td>93</td>
<td>98</td>
<td>104</td>
<td>155</td>
<td>180</td>
<td>195</td>
</tr>
<tr>
<td>Thread depth $d_{\text{t}}$</td>
<td>15.0</td>
<td>18.5</td>
<td>22.5</td>
<td>27.0</td>
<td>34.0</td>
<td>37.5</td>
<td>42.5</td>
<td>51.0</td>
<td>55.0</td>
<td>62.5</td>
<td>70.5</td>
<td>77.5</td>
<td>85.0</td>
<td>115</td>
<td>130</td>
<td>155</td>
</tr>
<tr>
<td>Screw adjustment range $q_l$</td>
<td>5.0</td>
<td>6.5</td>
<td>7.5</td>
<td>8.0</td>
<td>11.0</td>
<td>12.5</td>
<td>12.5</td>
<td>14.0</td>
<td>15.0</td>
<td>17.5</td>
<td>20.0</td>
<td>22.5</td>
<td>25.0</td>
<td>39</td>
<td>45</td>
<td>60</td>
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<tr>
<td>Suspension system diam. $d_{\text{s}}$</td>
<td>-</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
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<td>10</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>16</td>
<td>16</td>
<td>16</td>
</tr>
<tr>
<td>Offset of suspension hole $k_{\text{m}}$</td>
<td>-</td>
<td>28.0</td>
<td>31.0</td>
<td>44.5</td>
<td>48.0</td>
<td>50.5</td>
<td>57.5</td>
<td>72.0</td>
<td>86.5</td>
<td>98.5</td>
<td>111.5</td>
<td>124.5</td>
<td>137.0</td>
<td>140.0</td>
<td>150.0</td>
<td>157.5</td>
</tr>
<tr>
<td>Hook spanner size</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>155/8</td>
<td>230/10</td>
</tr>
</tbody>
</table>

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## System DETAN-E in Stainless Steel, European Technical Assessment ETA-11/0311

### System components – material and design

<table>
<thead>
<tr>
<th>System components</th>
<th>Tension rod</th>
<th>Fork</th>
<th>Couplers</th>
<th>Locking nuts</th>
<th>Pins</th>
<th>Circlips</th>
<th>Anchor disc</th>
</tr>
</thead>
<tbody>
<tr>
<td>System diameter $d_s$ [mm]</td>
<td>6 - 30</td>
<td>6 - 30</td>
<td>6 - 30</td>
<td>6 - 30</td>
<td>6 - 30</td>
<td>6 - 30</td>
<td>6 - 30</td>
</tr>
<tr>
<td>Material</td>
<td>Stainless steel</td>
<td>Stainless steel</td>
<td>Stainless steel</td>
<td>Stainless steel</td>
<td>Stainless steel</td>
<td>Stainless steel</td>
<td>Stainless steel</td>
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<tr>
<td>Finish</td>
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<td>polished</td>
<td>polished</td>
<td>polished</td>
<td>polished</td>
<td>polished</td>
<td>polished</td>
</tr>
</tbody>
</table>

1. Circlips according to DIN 471, stainless steel 1.4568/1.4568
2. Material stainless steel, strength grade S5235
3. Material stainless steel, strength grade S355
4. Material stainless steel, strength grade S355

Stainless steel acc. to ETA 11/0311, annex B2 corresponds to corrosion resistance class (CRC) III acc. to EN 1993-1-4

### Note:

When using DETAN-E the effects of corrosion for various ambient conditions must be verified by the design engineer for each separate case.

### Load capacities, system and available rod lengths, material: stainless steel

<table>
<thead>
<tr>
<th>System diameter $d_s$ [mm]</th>
<th>6</th>
<th>8</th>
<th>10</th>
<th>12</th>
<th>16</th>
<th>20</th>
<th>24</th>
<th>27</th>
<th>30</th>
</tr>
</thead>
<tbody>
<tr>
<td>System load capacities</td>
<td></td>
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<td></td>
<td></td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>Load capacity $P_{L,R,d}$ [kN]</td>
<td>9.42</td>
<td>17.13</td>
<td>27.14</td>
<td>39.44</td>
<td>73.32</td>
<td>114.6</td>
<td>165.0</td>
<td>215.0</td>
<td>262.4</td>
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<tr>
<td>Available minimum system length $L$ [mm]</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Polished</td>
<td>190</td>
<td>210</td>
<td>250</td>
<td>310</td>
<td>360</td>
<td>440</td>
<td>520</td>
<td>560</td>
<td>600</td>
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<tr>
<td>Available maximum system length with one rod $L$ [mm]</td>
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</tr>
<tr>
<td>Polished</td>
<td>3040</td>
<td>6050</td>
<td>6060</td>
<td>6070</td>
<td>6080</td>
<td>6100</td>
<td>6120</td>
<td>6140</td>
<td>6140</td>
</tr>
<tr>
<td>Available maximum rod length $L$ [mm]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Polished</td>
<td>3000</td>
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<td></td>
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<td></td>
<td></td>
<td>6000</td>
</tr>
</tbody>
</table>

In accordance with ETA-11/0311 the partial safety value for the table above are assumed as $\gamma_{M0} = 1.1$ and $\gamma_{M2} = 1.25$

If other partial safety factors are to be applied the load capacities have to be calculated according to ETA 11/0311.

Longer system lengths $L$ consisting of several rods with connecting couplers are possible!

### Fork

![Fork diagram]

### System dimensions [mm]: materials, see table above

<table>
<thead>
<tr>
<th>System diameter $d_s$</th>
<th>6</th>
<th>8</th>
<th>10</th>
<th>12</th>
<th>16</th>
<th>20</th>
<th>24</th>
<th>27</th>
<th>30</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fork length $L_{DT}$</td>
<td>42</td>
<td>50</td>
<td>60</td>
<td>73</td>
<td>89</td>
<td>110</td>
<td>133</td>
<td>147</td>
<td>160</td>
</tr>
<tr>
<td>Pin length $l_g$</td>
<td>18</td>
<td>22</td>
<td>28</td>
<td>32</td>
<td>42</td>
<td>50</td>
<td>58</td>
<td>63</td>
<td>70</td>
</tr>
<tr>
<td>Fork width $p$</td>
<td>12</td>
<td>16</td>
<td>21</td>
<td>24</td>
<td>33</td>
<td>40</td>
<td>46</td>
<td>51</td>
<td>57</td>
</tr>
<tr>
<td>Fork height $q$</td>
<td>17</td>
<td>21</td>
<td>26</td>
<td>31</td>
<td>41</td>
<td>51</td>
<td>61</td>
<td>69</td>
<td>75</td>
</tr>
<tr>
<td>Thread depth $o_m$</td>
<td>10.5</td>
<td>12.5</td>
<td>15.0</td>
<td>18.5</td>
<td>22.5</td>
<td>27.0</td>
<td>34.0</td>
<td>37.5</td>
<td>42.5</td>
</tr>
<tr>
<td>Screw adjustment range $q_l$</td>
<td>4.5</td>
<td>4.5</td>
<td>5.0</td>
<td>6.5</td>
<td>7.5</td>
<td>8.0</td>
<td>11.0</td>
<td>12.5</td>
<td>12.5</td>
</tr>
<tr>
<td>Length locking nut $M$</td>
<td>17.5</td>
<td>20.0</td>
<td>24.5</td>
<td>37.0</td>
<td>41.0</td>
<td>50.0</td>
<td>58.0</td>
<td>63.0</td>
<td>64.0</td>
</tr>
<tr>
<td>Tension rod assembly: Spanner width $t_q$</td>
<td>5</td>
<td>6</td>
<td>8</td>
<td>10</td>
<td>14</td>
<td>18</td>
<td>21</td>
<td>24</td>
<td>27</td>
</tr>
<tr>
<td>Locking nut assembly: Hook spanner size $j$</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Use soft-touch pliers</td>
<td>25-28</td>
<td>30-32</td>
<td>34-36</td>
<td>40-42</td>
<td>45-50</td>
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<tr>
<td>Edge distance $r$</td>
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<td></td>
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<td></td>
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<td></td>
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<tr>
<td>Pin hole diameter $j$</td>
<td></td>
<td></td>
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<td></td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>Thickness of connection plate $b$</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

→ see table on page 15 for dimensions of connecting plates
DETAN ROD SYSTEMS
System DETAN-E in Stainless Steel, European Technical Assessment ETA-11/0311

Connecting plates
The load transfer from the rod system into the connection plates is considered as verified if the dimensions in the table have been observed. Connection plates are not included in the scope of delivery.

<table>
<thead>
<tr>
<th>Dimensions [mm]; material — minimum qualities: Stainless steel, strength grade S235</th>
</tr>
</thead>
<tbody>
<tr>
<td>System diameter $d_s$</td>
</tr>
<tr>
<td>Thickness conn. plate $b$</td>
</tr>
<tr>
<td>Hole diameter for pin $j$</td>
</tr>
<tr>
<td>Hole position $r$</td>
</tr>
<tr>
<td>Minimum width $s$</td>
</tr>
</tbody>
</table>

Cross bracing
Option 1: Anchor disc, Standard K40 (smallest connecting angle $\alpha_{min} = 40^\circ$) Example: Anchor disc with 4 tension rods (maximum 8 tension rod connections per disc)

Option 2: Cross coupler (connecting angle $\alpha = 40^\circ$ to $90^\circ$)

Couplers

<table>
<thead>
<tr>
<th>Dimensions [mm]; material, stainless steel, strength grade S355</th>
</tr>
</thead>
<tbody>
<tr>
<td>System diameter $d_s$</td>
</tr>
<tr>
<td>Coupler length $l_{KM}$</td>
</tr>
<tr>
<td>Coupler diameter $d_{KM}$</td>
</tr>
<tr>
<td>Thread depth $\sigma_m$</td>
</tr>
<tr>
<td>Screw adjustment range $\sigma_i$</td>
</tr>
<tr>
<td>Suspension system diam. $d_{sa}$</td>
</tr>
<tr>
<td>Offset, suspension hole $k_m$</td>
</tr>
</tbody>
</table>

Note: A only possible when simultaneously using the circular anchor disc at $45^\circ$, see page 19.
DETAN ROD SYSTEMS

Product Range Overview: DETAN Compression Rod System

DETAN Compression rod

To complement the DETAN Tension rod system HALFEN also offers compression rods, which can be incorporated technically and aesthetically perfect into a system. Compression rods consist of larger diameter tubes, which are tapered at each end allowing standard DETAN Fork heads to be used.

Ordering example: Compression rod system, DETAN-S, Ds = 42 mm, L = 2000 mm, fork connector ds = 16 mm

<table>
<thead>
<tr>
<th>Rod cross-sections — examples / recommended configurations</th>
</tr>
</thead>
<tbody>
<tr>
<td>System - Ø Ds [mm]</td>
</tr>
<tr>
<td>Rod diameter</td>
</tr>
<tr>
<td>Wall thickness</td>
</tr>
</tbody>
</table>

Other rod dimensions are also available. Please contact HALFEN for further information.

Static calculation of compression rods is required for individual projects. A free DETAN Calculation program is available. Contact HALFEN if you require assistance. An enquiry with drawings, system dimensions and static verification is also possible.

System components and materials

All fork and connecting plate system dimensions; see page 12–13 (steel), 14–15 (stainless steel)

<table>
<thead>
<tr>
<th>Compression rod in steel</th>
</tr>
</thead>
<tbody>
<tr>
<td>System diameter Ds [mm]</td>
</tr>
<tr>
<td>Material</td>
</tr>
<tr>
<td>Finish</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Compression rod in stainless steel</th>
</tr>
</thead>
<tbody>
<tr>
<td>System diameter Ds [mm]</td>
</tr>
<tr>
<td>Material</td>
</tr>
<tr>
<td>Finish</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

Note: The design engineer is responsible for verifying the corrosion resistance is suitable for the various ambient conditions for each individual case when using DETAN-E.
System assembly

Length adjustment at the forks.
The cone (lathe workpiece) is inserted in the rod and secured with a continuous weld.
Available as a custom piece with at least one fork.

Duplex-coatings

Custom colour design: Powder coating
Two criteria can be met with a protective powder coating:
Free architectural design using colour with simultaneous improvement of the corrosion protection.
Contact HALFEN for information on possible coatings.
The coatings are applied by a certified coating specialist.

Safety instructions and installation information

See page 19 for assembly and safety instructions. More information for DETAN Rod systems assembly can be found in the installation instruction INST_DT.

Scan the QR to download the assembly instructions as a pdf file or go to, www.halfen.com/products/tension rod systems/detan rod system/product information

Fire protection

Fire protection classification for tension rod systems:
Individual consultation for enquiries concerning fire protection classification is available.
Example: reactive fire protection system for steel elements with round profiles approved by the German Building Authority (DIBt).
**DETAN ROD SYSTEMS**

**Couplers and Compression Rods**

**DETAN Cross couplers**

The DETAN Cross coupler is an alternative to the anchor disc cross coupler. The new cross coupler can be used for minimum crossing angle. The cross coupler can be used instead of the anchor disc and 4 fork heads. In both cases the same load capacity is guaranteed. The new cross coupler is also available in two finishes.

- hot-dip galvanized steel
- stainless steel

The DETAN Cross couplers are elegant solutions and allow contactless crossing of tension rods in the same plane. Other advantages are the moderate costs compared to an anchor disc solution and the easy installation.

**HALFEN DETAN Compression rods**

The DETAN Rod system is an intelligent system combining tension and compression rods. To complement the DETAN Rod system HALFEN also supplies compression rods that integrate perfect both visually and technically into the system. To blend in and to match the tension rods the compression rods taper towards the rod-ends. This allows use of the same design of fork and locking-nuts to give a uniform design. The concept is especially convincing as the forks are suitable for compression as well as for tension loads. This combination of tension and compression rods is therefore technically very beneficial.

As with the DETAN-S and DETAN-E the compression rods are also available in steel and stainless steel. In addition to standard pipe profiles HALFEN also provides other pipe cross sections and special solutions.

The compression rod systems are pre-assembled with standard HALFEN Forks and locking-nuts.
Examples — Connection plates and anchor discs

Connection plates

The connecting elements shown here are only examples of custom HALFEN solutions illustrating possible shapes of connecting plates discs. These steel plates are not standard products; drawings are always required for enquiries and estimates.

Installation and safety notes

Forks must be correctly aligned and positioned in the same plane (Figure 1 and 2a) to ensure that the tension system is not subjected to bending.

To ensure the rod can be installed, one fork end of the rod must be able to swing into place; this may not always be possible (see figure 3b). An anchor disk must be used in this case, to allow correct installation (see figure 3a).

Prior to installation all DETAN Rod system components must be checked for damage. Damaged components must not be used.

More information can be found in the installation instruction INST_DT (see page 17)
**Corrosion protection**

The DETAN Rod systems offer high protection against corrosion, especially for vulnerable parts of the system, e.g. the threads. The forks and locking nuts are hot-dip galvanized to ensure durable top-quality protection against corrosion as well as to ensure good mechanical resistance.

**Reliable and durable**

- tension rods are completely hot-dip galvanized after production
- no danger of hydrogen embrittlement
- no flaking zinc
- large spanner flats ensure that rod can be properly tightened
- forks and locking nuts are hot-dip galvanized
- threads are corrosion protected
- threads are additionally protected against humidity and contamination
- sealing-sets as standard for rods with diameter 16 mm or larger

**Sealing systems for system-component (for tension and compressure rods) – effective protection against humidity and contamination**

All forks are delivered with a threaded cap inserted to protect the thread as standard. The caps are colour-coded to help identify the thread direction: Yellow = right-hand thread, Blue = left-hand thread. A special sealing system is provided as standard for additional protection for all rod diameters larger 16 mm. We recommend sealing the outer joint of the locking nuts on-site with a durable elastic silicone suitable for outdoor application. In general, all connecting couplers smaller than M16 should always be sealed using suitable silicone sealant.

**Optimal on-site logistics**

**Avoid mix-ups on-site with system specific rod marking**

- all rods are clearly marked with contract and customer specific data (order and rod position number, rod length, system size)
- standard for systems diameter 16-60 mm (DETAN-S)

**Easy and customer-friendly labels with specific information**

- includes product-specific information, e.g. system length, system diameter
- exact identification and sorting with item position numbers
- optimized and efficient on-site logistics
- customer specified information possible: Project-data, e.g. floor numbers or node position
DETAN ROD SYSTEMS

The Advantages at a Glance

Certified HALFEN quality

Pre-assembled delivery

The DETAN Rod systems up to and including 60 mm diameter will be delivered pre-assembled. (76 mm diameter rods and larger are delivered in separate components). Larger system elements will be separated at the couplers as required to enable delivery.

Economic and time saving

- no further on-site assembly required
- no danger of mix-ups
- pre-assembled to system length
  \( L + o_j \) → see pages 12–14
- free movement of threads ensured
- easy online forms available for tender request, or use the order forms attached → see pages 26–27

DETAN Design software

The DETAN design software:
Structural calculation and planning tool in one programme.

- user-friendly programme interface

- Structural calculation:
  tension rod system design according to ETA Assessment, compression rod system design according to EC3 and ETA Assessment

- various material options and finishes

- planning and ordering of custom solutions and standards

- dimension results are used to generate item lists with individual positions listed in a print-out

- up-to-date versions of the calculation program available on the internet in German, English, French, Polish, Dutch, Czech, Italian, Spanish, Portuguese, Magyar and Slovenian

www.halfen.com/Downloads/Software-CAD/ Dimensioning Software/DETAN
The Advantages at a Glance

ETA-European Technical Assessment — a reliable base for structural design

**European Technical Assessment for DETAN-E**
- tension rod system DETAN-E in stainless steel with European Technical Assessment ETA-11/0311
- permanent quality and production monitoring by a supervisory institution
- CE marking recognized in all European Union countries
- 25% higher loads compared to strength class S355 due to the higher tensile strength of the tension rods
- design of allowable loads considering country-specific coefficients $\gamma_M0$ and $\gamma_M2$ (NAD) using the DETAN software
- minimum requirements (strength class 235) for building-site connection plates facilitates simple procurement
- EU wide, standardised design concept
- no national approvals or certificates required
- cross couplers are a cost effective alternative to anchor discs for cross bracings

**Design of compression rods**
- compression rods are regulated in the ETA
- dimensioning of DETAN-E compression rods in stainless steel strength class 235, according to Eurocode 3 (EN1993-1-4)

**DETAN approvals and type test reports available on the internet:**
[www.halfen.com/Products/Tension rod system/DETAN Rod System /Product information](http://www.halfen.com/Products/Tension rod system/DETAN Rod System /Product information)

**NEW!**

**Assessment for DETAN-S**
- tension rod system DETAN-S with European Technical Assessment ETA-05/0207
- Up to 15% higher load capacities with the additional S470 and S520 strength classes which are included in the new ETA; compared with strength class S460
- CE marking recognized in all European Union countries
- design of allowable loads considering country-specific coefficients $\gamma_M0$ and $\gamma_M2$ (NAD) using the DETAN software
- EU wide standardised design concept
- no national approvals or certificates required
- cross couplers are a cost effective alternative to anchor discs for cross bracings

**Design of compression rods**
- compression rods are regulated in the ETA
- dimensioning of DETAN-S compression rods from tube material, strength class S355, according to Eurocode 3 (EN1993-1-1)
**DETAN Pretension unit — Advantages and basics**

The exact application of pretension for system diameters 30 and larger can be difficult, therefore additional tools such as hydraulic jacks become necessary. The HALFEN Pretension unit for use with DETAN Rod systems from M30 to M60 provides an effective solution with load transfer using a threaded-plate preventing damages to the rod surface.

**Additional advantages**

- The system is optimised for DETAN Rods
- Extra lightweight aluminium design for simple assembly
- Targeted hydraulic application for tension up to 425 kN
- No power-source needed
- The high-quality galvanized surface is protected by special load transfer plates
- Simple control of load application with a calibrated manometer

**Applying pretension**

If pretensioning a system is intended then this should be considered at the planning-stage. Our technical support team is available to assist in any enquires. Contact information can be found at the back of this catalogue.

To apply pretension, special pretension units are available from our technical support team. The necessary rod force is converted into the required hydraulic pressure and then applied using the DETAN Pretension unit.

**Pretension check**

If the rod was previously gauge-marked, the pretension force can be controlled using an extensometer. This system can be used during, as well as after load application. This allows load control using hydraulic pressure as well as monitoring direct rod strain. Similar to the DETAN Pretension unit this device is easy to use, is robust and also requires no power-source.
Assembly of the pretension unit

Easy to attach and to operate

To avoid possible damage to the rod surface load transfer is via threaded plates. The hydraulic system is attached in front and behind the coupler. The hydraulic jacks temporarily relieve the strain on the coupler, allowing the coupler to be easily turned by hand. When reaching the desired pressure, the hydraulic unit is released and removed. After release the coupler takes the load.

To ensure that the maximum recommended load has been reached the required hydraulic pressure is needed. Please refer to the table below. Alternatively the load can be checked using an extensometer.

A detailed assembly instruction is available on the Internet: www.halfen.com/Service/Brochures/Installation instructions/DETAN

System variations

with pretension coupler:

Ordering example (material steel): Tension rod system, DETAN-S, ds = 30 mm, L = 5600 mm FV, 1 pretension coupler

System load capacities, system lengths and available rod lengths

<table>
<thead>
<tr>
<th>System diameter ds [mm]</th>
<th>Cross section A [mm²]</th>
<th>Thread length o [mm]</th>
<th>Available min. system length with coupler L [mm]</th>
<th>Load capacity NR,d [kN]</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>707</td>
<td>105</td>
<td>1076</td>
<td>290.6</td>
</tr>
<tr>
<td>36</td>
<td>1018</td>
<td>118</td>
<td>1244</td>
<td>423.4</td>
</tr>
<tr>
<td>42</td>
<td>1385</td>
<td>126</td>
<td>1440</td>
<td>581.1</td>
</tr>
<tr>
<td>48</td>
<td>1810</td>
<td>139</td>
<td>1652</td>
<td>763.7</td>
</tr>
<tr>
<td>52</td>
<td>2124</td>
<td>176</td>
<td>1758</td>
<td>911.3</td>
</tr>
<tr>
<td>56</td>
<td>2463</td>
<td>188</td>
<td>1866</td>
<td>1052.4</td>
</tr>
<tr>
<td>60</td>
<td>2827</td>
<td>195</td>
<td>2056</td>
<td>1224.5</td>
</tr>
</tbody>
</table>

Pretension table for DETAN Rod system S (some values are rounded)

<table>
<thead>
<tr>
<th>Max. recommended pretension [kN]</th>
<th>N</th>
<th>116</th>
<th>169</th>
<th>232</th>
<th>305</th>
<th>365</th>
<th>421</th>
<th>425</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydraulic pressure [bar]</td>
<td>p</td>
<td>190</td>
<td>277</td>
<td>380</td>
<td>500</td>
<td>596</td>
<td>688</td>
<td>695</td>
</tr>
<tr>
<td>Strain [%]</td>
<td>ε</td>
<td>0.78</td>
<td>0.79</td>
<td>0.80</td>
<td>0.80</td>
<td>0.82</td>
<td>0.81</td>
<td>0.72</td>
</tr>
<tr>
<td>Stress [N/mm²]</td>
<td>σ</td>
<td>164</td>
<td>166</td>
<td>168</td>
<td>169</td>
<td>172</td>
<td>171</td>
<td>150</td>
</tr>
<tr>
<td>Elongation [μm/10 cm]</td>
<td>Δl</td>
<td>78</td>
<td>79</td>
<td>80</td>
<td>80</td>
<td>82</td>
<td>81</td>
<td>72</td>
</tr>
</tbody>
</table>

¹ Maximum recommended pretension without precise verification ▲ 40% of NRd ² Maximum hydraulic pressure at approx. 700 bar

Pretension coupler (all dimensions in [mm])

<table>
<thead>
<tr>
<th>System diameter ds [mm]</th>
<th>Coupler length Lc</th>
<th>Coupler diameter dc</th>
<th>Locking nut length Ml</th>
<th>Coupler assembly SW</th>
<th>Tension rod assembly</th>
<th>Locking nut assembly</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>120</td>
<td>53</td>
<td>99</td>
<td>46</td>
<td>27</td>
<td>45-50</td>
</tr>
<tr>
<td>36</td>
<td>140</td>
<td>64</td>
<td>107</td>
<td>55</td>
<td>32</td>
<td>52.55</td>
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<tr>
<td>42</td>
<td>158</td>
<td>75</td>
<td>118</td>
<td>65</td>
<td>36</td>
<td>68-75</td>
</tr>
<tr>
<td>48</td>
<td>180</td>
<td>87</td>
<td>126</td>
<td>75</td>
<td>41</td>
<td>68-75</td>
</tr>
<tr>
<td>52</td>
<td>195</td>
<td>93</td>
<td>158</td>
<td>80</td>
<td>46</td>
<td>80-90</td>
</tr>
<tr>
<td>56</td>
<td>210</td>
<td>98</td>
<td>165</td>
<td>85</td>
<td>50</td>
<td>80-90</td>
</tr>
<tr>
<td>60</td>
<td>245</td>
<td>104</td>
<td>172</td>
<td>90</td>
<td>55</td>
<td>80-90</td>
</tr>
</tbody>
</table>
**HALFEN Tension rod system DETAN-E**

HALFEN Tension rod system type DETAN-E made of stainless steel, corrosion resistance class (CRC) III according to EN 1993-1-4: 2006, consisting of 1 right-hand threaded fork, 1 left-hand thread fork, plus 1 tension rod including 2 pins, 4 circlips and 2 DT-E nuts, with European Technical Assessment ETA 11/0311, pre-assembled and product-specific-labelled tension rod system, type DETAN-E, $d_s, L$

with

$d_s$ = system-diameter [mm] …… (6 / 8 / 10 / 12 / 16 / 20 / 24 / 27 / 30)

$L$ = system-length [mm] (from bolt-axis/to bolt-axis),

or equivalent; deliver and install according to the manufacturer’s installation instructions. Includes welding the connector plates according to the specifications provided by the planner.

---

**HALFEN Tension rod system DETAN-S**

HALFEN Tension rod system type DETAN-S, consisting of 1 right-hand threaded fork, 1 left-hand threaded fork, plus 1 tension rod including 2 pins, 4 circlips and 2 DT-S nuts, with European Technical Assessment ETA 05/0207, pre-assembled and product-specific-labelled tension rod system, type DETAN-S $d_s = 30, L, F$

with

$d_s$ = system-diameter [mm] …… (10 / 12 / 16 / 20 / 24 / 27 / 30 / 36 / 42 / 48 / 52 / 56 / 60 / 76 / 85 / 95)

$L$ = system-length [mm] (from bolt-axis/to bolt-axis),

$F$ = …… (material FV /WB) for hot-dip galvanized or mill finished surface

completely hot-dip galvanized finish (alternative; mill finished tension rod), or equivalent; deliver and install according to the manufacturer’s installation instructions. Includes welding the connector plates according to the specifications provided by the planner.
Please send the completed form to HALFEN by email to es.det@halfen.com.
Please contact us for an estimate.
**CHECKLIST**

**DETAN Cross bracings**

Customer: ___________________________ Contact name: ___________________________
Phone: ___________________________ Fax: ___________________________ email: ___________________________
Project: ___________________________ Project address: ___________________________
Date: ___________________________ Customer no.: ___________________________ □ Enquiry □ Estimate □ Order

### Cross bracing

- **Height H [mm]**
- **Width B [mm]**
- **System-diam. ds**

### Choice of material:

- **DETAN-S - FV** (hot-dip galvanized)
  ETA-05/0207; EN1993
- **DETAN-S - WB** (mill finish)
  ETA-05/0207; EN1993
- **DETAN-E** (Stainless steel)
  ETA-11/0311; EN1993

### Item | Quantity | ds [mm] | ZEd,max [kN] | B [mm] | H [mm] | Material choice |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
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<tbody>
<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>mill finish</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>hot-dip galva-</td>
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<td></td>
<td>nized</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Stainless steel</td>
</tr>
</tbody>
</table>

- **Example**: 3 40 9600 4200

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
<th>ds [mm]</th>
<th>ZEd,max [kN]</th>
<th>B [mm]</th>
<th>H [mm]</th>
<th>Material choice</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>mill finish</td>
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<td></td>
<td>hot-dip galva-</td>
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<td>nized</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>Stainless steel</td>
</tr>
</tbody>
</table>

- **①**: maximum tension load required if diameter is unknown
- **②**: smallest installation angle α = 40°

More order forms available at:
www.halfen.com/Products/Tension rod system/Order form
Information about DETAN Dimensioning software → page 21

Please send the completed form to HALFEN by email to es.det@halfen.com.
Please contact us for an estimate.
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