HALFEN DETAN Rod Systems.
The most Trusted Name. The most Elegant Application.

With DETAN, architectural visions become a structural reality. DETAN Rod Systems offer almost unlimited design opportunities.

HALFEN’s team of professional engineers is always ready to help with the design and measurement calculations.

Quality Features:
- Very high performance steels
- Wide range of system diameters
- Exact project system lengths
- Available galvanized or stainless steel
- Easily adjustable for length with concealed threads
- Concealed threads are sealed to protect against corrosion
- High quality finishes and visual appearance
- No danger of hydrogen embrittlement
- Threads are optimally protected against humidity and contamination

Additional Advantages:
- Compression rods in 6 standard designs
- New cross couplers offered as a cost effective alternative to anchor disks
- FREE dimensioning and configuration software

During pre-assembly, the rod is set to the maximum adjustment position ("Oₘ - o")

Economic and Time Saving:
- No additional assembly work required on site
- No danger of incorrect assembly through mix-ups
- Free movement of threads ensured

Application Ideas:
- Internal and external architectural features
- Structural bracing of steel structures
- Support of canopies
- Bracing of timber, steel, and glass roof structures
- Bracing of glass façades
- Support and bracing of pedestrian bridges

To complement the DETAN Tension Rod System, HALFEN also offers compression rods that fit perfectly both technically and visually with the DETAN Rod Systems.

Many advantages with one result: HALFEN provides safety, reliability and efficiency for you and your customers.
DETAN ROD SYSTEMS

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Footbridges in Figueres, Girona, Spain
In this project DETAN was purposely applied as a visual, creative design element.

DETAN Rod Systems are engineered not only to ensure safe and reliable structural bracing, but also to accentuate the aesthetic elegance of an architectural design.

Project:
Manchester Civil Justice Centre, UK
DETAN Rod Systems provide reliable structural support and help the architect to bring to life visually pleasing, lightweight structures.

DETAN Rod Systems consist of rods and a comprehensive range of matching accessories such as fork ends, anchor disks, cross couplers, and more.

User friendly, DETAN Rod Systems can be easily adjusted for length with hidden threads at the fork connections. When used with the matching coupler, DETAN Rod Systems allow for an even greater construction tolerance range.

Project:
Yale University Cancer Hospital, CT, US
Corrosion protection

Carbon steel DETAN Rod Systems offer high quality finishes and seals to protect against corrosion.

Reliable and durable

- Tension rods are completely hot-dip galvanized after the manufacturing process to provide the best protection with no danger of hydrogen embrittlement
- Rods have a clean and even, flat finish with no runs or flaking zinc
- Neat milled wrench flats are provided for reliable rod tightening and simple length adjustment
- Forks and locking nuts are hot dip galvanized
- Internal threads are also coated
- Seals are provided as a standard for rods 16 mm (5/8”) diameter and higher to protect threads from humidity and contamination

Economic and time saving

- Minimal assembly work on site
- No danger of incorrect assembly
- Rods arrive already adjusted to designed system length (with easy ± length adjustment, if required)
- All components are checked before delivery to site

Sealing DETAN Systems

All fork ends are delivered with a plug installed to the open end of the thread for the rod connection. The plugs are color-coded according to the thread direction. Yellow = right-hand thread. Blue = left-hand thread.

Carbon steel DETAN system diameters in the range M16 (5/8”) – M95 (3 ¾”) are provided with special seals to provide corrosion protection to the threaded areas of the system. We recommend that a permanent elastic silicone (designed for external use) is applied to the outer edge of the locking nut. This process should be applied to locking nuts located at fork ends and couplers. It is recommended that both the inner and the outer edges of the locking nut are sealed with silicone for system diameters < M16 (5/8”).
DETAN Rod Systems: Advantages at a Glance

Product delivery labelling

**Simple and customer-oriented**
- Easy to read product and order-specific information
- Simple to sort assemblies by item numbers and dimensional information
- Quick identification and checking on the construction site
- On customer request: project-specific data, e.g. floor numbers or grid references can be added

Component identification

**Permanent quality control**
- Order and customer specific data (order and item number, rod length, system size)
- Standard for diameter 16 mm systems and larger

Assembly and Safety Notes

Forks must be **correctly aligned** (Fig. 1) and positioned in the same plane (Fig. 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 is not always possible (see figure 3b).

An **anchor disk** must be used in this case; this allows correct installation (see figure 3a).

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

Installation Instructions can be found at: www.halfenusa.com → Products → Tension Rod Systems → DETAN → Installation Instructions

**DETAN ROD SYSTEMS**

**System Overview**

**DETAN Tension Rod Systems**

**Basic system:**

![DETAN Tension Rod](image)

- Load capacity, system dimensions and materials → pp. 12 - 14

**System variants:**

- with couplers or with couplers with lug

- with cross coupler for cross bracing

- Suspension consists of a system variant with coupler with lug and one basic system

- Cross bracing consists of one system variant with cross coupler and one basic system

- Dimensions and materials → pp. 13 - 15

**Cross bracing:**

- Anchor disc for cross bracing

- Cross bracing consists of one anchor disc and up to 8 basic systems

- Dimensions and materials → pp. 13 - 15

**DETAN Compression Rod System**

- DETAN Compression Rod

- Load capacity, system dimensions and materials → p. 16

**DETAN Pretension Unit**

- Further information → pp. 17 - 18
If the basic system length is greater than the maximum span possible with a single rod, then couplers are added.

Note: Maximum 5 couplers possible

Using couplers with support lugs:

Couplers with support lugs enable long spans of joined DETAN rods to be supported from above using vertical lengths of DETAN rods connected to the structure. This method is used to reduce deflection across long system lengths.

Note: Maximum 5 couplers possible. Delivery in single components.
DETAN ROD SYSTEMS

Product Range Overview: DETAN Tension Rod System

System Variants

Using **cross couplers** for cross bracing:

DETAN rods can pass through cross couplers to enable cross bracing in the same plane.

Note: Maximum 2 cross couplers possible.
Delivery in single components.

| Carbon Steel System DETAN-S-460 – Availability with Cross Couplers |
|---|---|---|---|---|---|---|
| System diameter \(d_s\) [mm] | 16 | 20 | 24 | 27 | 30 | 36 |
| [inches] | 5/8 | 13/16 | 15/16 | 1 1/16 | 1 3/16 | 1 7/16 |
| Minimum system length \(L\) [mm] | 1100 | 1200 | 1400 |
| [inches] | 43 | 47 | 55 |

| Carbon Steel System DETAN-E – Availability with Cross Couplers |
|---|---|---|---|---|---|
| System diameter \(d_s\) [mm] | 16 | 20 | 24 | 27 | 30 |
| [inches] | 5/8 | 13/16 | 15/16 | 1 1/16 | 1 3/16 |
| Minimum system length \(L\) [mm] | 1100 | 1200 |
| [inches] | 43 | 47 |

System Variant with Asymmetric Distribution of Couplers

Normally DETAN systems are simply ordered by specifying the desired system diameter \(d_s\) and the system length \(L\). HALFEN calculates the rod lengths and checks the minimum and/or maximum system lengths. Couplers are automatically distributed symmetrically.

If an asymmetric distribution of the couplers is required, a dimensioned drawing must be included with the purchase order. A typical example of the dimensions required is illustrated in the drawing below.

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

Ordering example:
① Tension Rod System, DETAN-S460, \(d_s = 15/16"\), system length according to drawing, wb, couplers according to drawing
② Tension Rod System, DETAN-S460, \(d_s = 3/8"\), system length \(L = 42"\) wb
DETAN ROD SYSTEMS

Product Range Overview: Cross Bracings, Set Articles, and Individual Components

Cross Bracing

Anchor Disc:

DETAN Anchor Discs provide an architectural center connection for DETAN rods when they are used for cross bracing. Please specify material, finish, system diameter $d_s$, number of holes, and connecting angle $\alpha$ when ordering.

Note:
- max. 8 tension rod connections possible
- Connecting angle $\alpha_{\text{min}} = 40^\circ$

Complete DETAN cross bracing assemblies with either cross couplers or anchor discs are available. Please provide a dimensioned drawing with your order.

Set Articles and Individual Components

- Tension rod (specify rod length separately)
- Fork connection set: Fork, locking nuts, pins, snap rings, seal kit ①, left-hand thread
- Fork connection set: Fork, locking nuts, pins, snap rings, seal kit ①, right-hand thread
- Coupler set: coupler + 2 locking nuts, seal kit ①
- Coupler with lug set: coupler with lug + 2 locking nuts, seal kit ①
- Cross coupler set: cross coupler + 2 locking nuts, seal kit
- Peg wrench
- Pin
- Locking nut, left-hand thread
- Locking nut, right-hand thread
- Flat seal
- Round seal
- Snap ring for one fork
- Coupler with lug
- Coupler without lug
- Fork, left-hand thread
- Fork, right-hand thread
- Cross coupler

Use of DETAN components with products from other manufacturers invalidates performance data and any warranties. ① not available with stainless steel

Materials, designs, and dimensions according to → pp. 12-16
System design load capacities are based on a 1.1 factor to yield and a 1.25 factor to ultimate.

Connecting plates (page 13) are not provided by HALFEN. ASTM - A 572 grade 50 or ASTM - A 572 grade 60 carbon steel is assumed for the plate dimensions and design loads shown. Conversions between metric and inch plate thicknesses are not exact to take account of commonly available material. Other materials or thicker/thinner connection plates (dimension b) should not be used without consulting HALFEN. For system diameter 10 (3/8"), 42 (1-5/8") and 85 (3-3/8") maximum plus tolerance on the connection plate thickness (b) is + 1/64 " or 0.4 mm

Anchor discs can accommodate up to 8 rod connections. The minimum spacing between rods is 40°

Couplers with lugs for vertical support connections are offered for carbon steel system diameters 12 (1/2") to 95 (3 3/4")

System Engineering ‒ Important Notes

- System design load capacities are based on a 1.1 factor to yield and a 1.25 factor to ultimate.
- Connecting plates (page 13) are not provided by HALFEN. ASTM - A 572 grade 50 or ASTM - A 572 grade 60 carbon steel is assumed for the plate dimensions and design loads shown. Conversions between metric and inch plate thicknesses are not exact to take account of commonly available material. Other materials or thicker/thinner connection plates (dimension b) should not be used without consulting HALFEN. For system diameter 10 (3/8"), 42 (1-5/8") and 85 (3-3/8") maximum plus tolerance on the connection plate thickness (b) is + 1/64 " or 0.4 mm
- Anchor discs can accommodate up to 8 rod connections. The minimum spacing between rods is 40°
- Couplers with lugs for vertical support connections are offered for carbon steel system diameters 12 (1/2") to 95 (3 3/4")
### DETAN ROD SYSTEMS

**Carbon Steel System DETAN-S460**

#### Couplers

**Regular couplers**

![Coupler Diagram](diagram1)

- **Dimensions**
  - System diameter [mm]: 10, 12, 16, 20, 24, 30, 36, 42, 48, 52, 60, 76, 85, 95
  - Connection diameter [mm]: 3/8, 5/8, 7/8, 1, 1 1/16, 1 3/16, 1 7/16, 1 5/8, 1 7/8, 2 1/16, 2 3/16, 2 3/8, 3, 3 3/8, 3 3/4

**Connectors**

- **Coupler length** [mm]: 19 1/16, 15 1/16, 27 1/16, 31 1/16, 4 1/8, 4 3/4, 5 1/2, 6 1/4, 7 1/16, 7 11/16, 8 1/4, 9 5/8, 12 15/16, 14 9/16, 17 11/16
- **Coupler diameter** [mm]: 13 1/16, 7/8, 1 1/16, 1 1/2, 2 1/2, 2 3/4, 3 1/3, 3 3/8, 4 3/4, 5 3/8, 6 1/8
- **Screw-in depth** [mm]: 15.0, 18.5, 22.5, 34.0, 37.5, 42.5, 51.0, 55.0, 62.5, 70.5, 77.5, 85.0, 90.0, 115.0, 130.0, 155.0
- **Length adjustment** [mm]: 10, 10, 10, 10, 10, 10, 10, 10, 12, 12, 12, 12, 12, 155/8, 230/10, 230/10

**Support system diam.** [mm]: 10, 10, 10, 10, 10, 10, 10, 10, 12, 12, 12, 12, 12, 16, 16

**Lug offset** [mm]: 28.0, 31.0, 44.5, 48.0, 50.5, 57.5, 72.0, 86.5, 98.5, 111.5, 124.5, 137.0, 140.0, 150.0, 157.5

**Cross coupler length** [mm]: 142, 166, 200, 222, 284

** Peg wrench size [mm]: 155/8, 230/10, 230/10

### Connecting Plates and Anchor Discs

**Note:** A can only be used when simultaneously using the circular anchor disc at 45°, see page 7!

#### Connecting Plates

- **Dimensions**
  - System diameter [mm]: 10, 12, 16, 20, 24, 30, 36, 42, 48, 52, 60, 76, 85, 95
  - Connection diameter [mm]: 3/8, 5/8, 7/8, 1, 1 1/16, 1 3/16, 1 7/16, 1 5/8, 1 7/8, 2 1/16, 2 3/16, 2 3/8, 3, 3 3/8, 3 3/4

**Plate thickness** [mm]: 8, 10, 15, 18, 20, 22, 25, 30, 35, 40, 45, 50, 55, 65, 75, 85

**Pin hole diameter** [mm]: 9.5, 11.5, 15.5, 19.5, 23.5, 26.5, 29.5, 33.5, 41, 47, 49, 53, 57, 76, 86, 96

**Min. plate width** [mm]: 1 1/8, 1 5/16, 1 9/16, 2, 2 1/2, 2 7/8, 3 1/8, 3 11/16, 4 7/16, 5 1/16, 5 15/16, 6 5/16, 8 1/2, 9 7/16, 10 5/8

#### Anchor Discs

- **Dimensions**
  - System diameter [mm]: 3 1/16, 3 3/4, 4, 4 5/8, 5, 6, 8, 10, 12, 14, 16, 20, 24, 30, 40, 50
  - Connection diameter [mm]: 3/8, 5/8, 7/8, 1, 1 1/16, 1 3/16, 1 7/16, 1 5/8, 1 7/8, 2 1/16, 2 3/16, 2 3/8, 3, 3 3/8, 3 3/4

**Pin hole** [mm]: 9.5, 11.5, 15.5, 19.5, 23.5, 26.5, 29.5, 33.5, 41, 47, 49, 53, 57, 76, 86, 96

**Min. plate** [mm]: 1 1/8, 1 5/16, 1 9/16, 2, 2 1/2, 2 7/8, 3 1/8, 3 11/16, 4 7/16, 5 1/16, 5 15/16, 6 5/16, 8 1/2, 9 7/16, 10 5/8

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**Stainless Steel System DETAN-E**

**Tension Rods**

![Diagram of Tension Rods]

**System Load Capacities and Dimensions**

<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>[inches]</td>
<td>1/4</td>
<td>5/16</td>
<td>3/8</td>
<td>1/2</td>
<td>5/8</td>
<td>13/16</td>
<td>15/16</td>
<td>1 1/16</td>
<td>1 3/16</td>
</tr>
</tbody>
</table>

| Connecting plates (page 15) are not provided by HALFEN. Stainless steel grade 304 or 316 with a minimum yield of 36 ksi is assumed for the plate dimensions and design loads shown. Conversions between metric and inch plate thicknesses are not exact to take account of commonly available materials. Other materials or thicker/thinner connection plates (dimension $b$) should not be used without consulting HALFEN. For system diameter 12 (1/2") and 27 (1-1/8") maximum plus tolerance on the connection plate thickness ($b$) is $+\ 1/64\ "$ or 0.4 mm |

| Loads are based on Grade 36 stainless steel. If connecting plates differ from Grade 36, then please contact our office, 1.800.423.9140, and we will provide new load capacities for you. |

| Anchor discs can accommodate up to 8 rod connections. The minimum spacing between rods is 40° |

| Couplers with lugs for vertical support connections are offered for stainless steel system diameters 12 (1/2") to 30 (1 3/16") |

**Stainless Steel System: System components – Materials and design**

<table>
<thead>
<tr>
<th>Component</th>
<th>Material</th>
<th>Tension rod</th>
<th>Couplers, locking nuts</th>
<th>Pins</th>
<th>Anchor disc</th>
<th>Circlips</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fork</td>
<td>Stainless Steel 316/316 Ti 2304/S32202/S32101 (Grade S460)</td>
<td>Stainless Steel 2205 (Grade S460)</td>
<td>Stainless Steel 316/316Ti/2205/2304 (Grade S355)</td>
<td>Stainless Steel 316/316Ti/2205/2304 (Grade S460)</td>
<td>Stainless Steel 316/316Ti (Grade S235)</td>
<td>Stainless Steel 631 (1.4568)</td>
</tr>
<tr>
<td>Pin</td>
<td>Stainless Steel 2205 (Grade S460)</td>
<td>Stainless Steel 316/316Ti/2205/2304 (Grade S355)</td>
<td>Stainless Steel 316/316Ti/2205/2304 (Grade S460)</td>
<td>Stainless Steel 316/316Ti (Grade S235)</td>
<td>Stainless Steel 631 (1.4568)</td>
<td></td>
</tr>
<tr>
<td>Anchor disc</td>
<td>Stainless Steel 316/316Ti (Grade S235)</td>
<td>Stainless Steel 631 (1.4568)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**System Engineering – Important notes**

- System design load capacities are based on a 1.1 factor to yield. Rod yield strength = 460 MPa (66,700 psi), ultimate strength = 650 MPa (94,000 psi)
- Connecting plates (page 15) are not provided by HALFEN. Stainless steel grade 304 or 316 with a minimum yield of 36 ksi is assumed for the plate dimensions and design loads shown. Conversions between metric and inch plate thicknesses are not exact to take account of commonly available materials. Other materials or thicker/thinner connection plates (dimension $b$) should not be used without consulting HALFEN. For system diameter 12 (1/2") and 27 (1-1/8") maximum plus tolerance on the connection plate thickness ($b$) is $+\ 1/64\ "$ or 0.4 mm
- Loads are based on Grade 36 stainless steel. If connecting plates differ from Grade 36, then please contact our office, 1.800.423.9140, and we will provide new load capacities for you.
- Anchor discs can accommodate up to 8 rod connections. The minimum spacing between rods is 40°
- Couplers with lugs for vertical support connections are offered for stainless steel system diameters 12 (1/2") to 30 (1 3/16")

**Finish**

- A4 p
- Polished

[1] Tension rods are grounded (bright finish), other parts are electropolished (matt finish), hand polished products are available on request.
## DETAN ROD SYSTEMS

### Stainless Steel System DETAN-E

#### Couplers

**Regular couplers**

![Coupler Diagram](image1)

**Dimensions**

<table>
<thead>
<tr>
<th>System diameter</th>
<th>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>d_0 / d_{sk}</td>
<td>[inches]</td>
<td>1/4</td>
<td>5/16</td>
<td>3/8</td>
<td>1/2</td>
<td>5/8</td>
<td>13/16</td>
<td>15/16</td>
<td>1 3/16</td>
<td>1 3/16</td>
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<tr>
<td>Coupler length</td>
<td>[mm]</td>
<td>34</td>
<td>40</td>
<td>40</td>
<td>50</td>
<td>62</td>
<td>78</td>
<td>94</td>
<td>104</td>
<td>120</td>
</tr>
<tr>
<td></td>
<td>[inches]</td>
<td>1 1/2</td>
<td>1 9/16</td>
<td>1 9/16</td>
<td>1 15/16</td>
<td>2 7/16</td>
<td>3 1/16</td>
<td>3 11/16</td>
<td>4 1/8</td>
<td>4 3/4</td>
</tr>
<tr>
<td>Coupler diameter</td>
<td>[mm]</td>
<td>12</td>
<td>15</td>
<td>20</td>
<td>22</td>
<td>28</td>
<td>35</td>
<td>42</td>
<td>47</td>
<td>53</td>
</tr>
<tr>
<td></td>
<td>[inches]</td>
<td>1/2</td>
<td>9/16</td>
<td>13/16</td>
<td>7/8</td>
<td>1 1/8</td>
<td>1 3/8</td>
<td>1 5/8</td>
<td>1 7/8</td>
<td>2 1/16</td>
</tr>
<tr>
<td>Screw-in depth</td>
<td>[mm]</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></td>
<td>[inches]</td>
<td>4 1/16</td>
<td>4 3/4</td>
<td>6 1/8</td>
<td>7 1/2</td>
<td>9 1/2</td>
<td>11 1/2</td>
<td>12 1/2</td>
<td>13 5/8</td>
<td></td>
</tr>
<tr>
<td>Length adjustment</td>
<td>[mm]</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>
</tbody>
</table>

**Note:** can only be used when simultaneously using the circular anchor disc at 45°, see page 7!

#### Connecting Plates and Anchor Discs

**Connecting Plates**

![Connecting Plate Diagram](image2)

**Dimensions**

<table>
<thead>
<tr>
<th>System diameter</th>
<th>[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>d_0 / d_{sk}</td>
<td>[inches]</td>
<td>1/4</td>
<td>5/16</td>
<td>3/8</td>
<td>1/2</td>
<td>5/8</td>
<td>13/16</td>
<td>15/16</td>
<td>1 3/16</td>
<td>1 3/16</td>
</tr>
<tr>
<td>Connection diam.</td>
<td>[mm]</td>
<td>55</td>
<td>75</td>
<td>90</td>
<td>110</td>
<td>140</td>
<td>180</td>
<td>210</td>
<td>240</td>
<td>260</td>
</tr>
<tr>
<td></td>
<td>[inches]</td>
<td>2 3/16</td>
<td>2 15/16</td>
<td>3 9/16</td>
<td>4 5/16</td>
<td>5 1/2</td>
<td>7 1/6</td>
<td>8 1/4</td>
<td>9 7/16</td>
<td>10 1/4</td>
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<tr>
<td>Disc diam.</td>
<td>[mm]</td>
<td>73</td>
<td>99</td>
<td>120</td>
<td>146</td>
<td>186</td>
<td>238</td>
<td>280</td>
<td>318</td>
<td>346</td>
</tr>
<tr>
<td></td>
<td>[inches]</td>
<td>2 7/8</td>
<td>3 7/8</td>
<td>4 3/4</td>
<td>5 3/4</td>
<td>7 5/16</td>
<td>9 3/8</td>
<td>11</td>
<td>1 1/2</td>
<td>1 3/8</td>
</tr>
<tr>
<td>Plate thickness</td>
<td>[mm]</td>
<td>6</td>
<td>8</td>
<td>10</td>
<td>12</td>
<td>16</td>
<td>20</td>
<td>22</td>
<td>25</td>
<td>30</td>
</tr>
<tr>
<td>Pin hole diam.</td>
<td>[mm]</td>
<td>6.5</td>
<td>7.5</td>
<td>9.5</td>
<td>11.5</td>
<td>14.5</td>
<td>18.5</td>
<td>21.5</td>
<td>24.5</td>
<td>26.5</td>
</tr>
<tr>
<td></td>
<td>[inches]</td>
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<td>1/2</td>
<td>3/8</td>
<td>15/32</td>
<td>9/16</td>
<td>23/32</td>
<td>27/32</td>
<td>31/32</td>
<td>1 1/16</td>
</tr>
<tr>
<td>Pin hole position</td>
<td>[mm]</td>
<td>9</td>
<td>12</td>
<td>15</td>
<td>18</td>
<td>24</td>
<td>29</td>
<td>35</td>
<td>39</td>
<td>43</td>
</tr>
<tr>
<td></td>
<td>[inches]</td>
<td>3/8</td>
<td>1 1/2</td>
<td>9/16</td>
<td>11/16</td>
<td>15/16</td>
<td>1 1/8</td>
<td>1 3/8</td>
<td>1 9/16</td>
<td>1 11/16</td>
</tr>
<tr>
<td>Min. plate width</td>
<td>[mm]</td>
<td>18</td>
<td>22</td>
<td>28</td>
<td>33</td>
<td>43</td>
<td>55</td>
<td>67</td>
<td>76</td>
<td>80</td>
</tr>
<tr>
<td></td>
<td>[inches]</td>
<td>11/16</td>
<td>7/8</td>
<td>1 1/8</td>
<td>1 5/16</td>
<td>1 11/16</td>
<td>2 3/16</td>
<td>2 5/8</td>
<td>3</td>
<td>3 1/8</td>
</tr>
</tbody>
</table>
DETAN ROD SYSTEMS

Product Range Overview: DETAN Compression Rod System

Compression Rod

To complement the DETAN Tension Rod System, HALFEN also offers matching compression rods. These provide elegant technical and visual solutions for the support of structural compression loads. Compression rods consist of large diameter tubes, which are tapered at each end so that standard DETAN fork connectors can be used. Standard assemblies are provided in carbon steel, and are dimensioned by HALFEN according to the acting compression forces and the span of the rod. Stainless steel compression rods can also be provided on request. The compression rods are delivered unassembled.

<table>
<thead>
<tr>
<th>Compression Rod Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tube diameter</td>
</tr>
<tr>
<td>[inches]</td>
</tr>
<tr>
<td>System diameter</td>
</tr>
<tr>
<td>[inches]</td>
</tr>
<tr>
<td>Minimum System Length L</td>
</tr>
<tr>
<td>[inches]</td>
</tr>
<tr>
<td>Maximum System Length L</td>
</tr>
<tr>
<td>[inches]</td>
</tr>
</tbody>
</table>

Materials and designs of all components plus special designs → table below

System Components and Materials

<table>
<thead>
<tr>
<th>DETAN Compression Rod System: System components – Materials and finish</th>
</tr>
</thead>
<tbody>
<tr>
<td>System-diameter d_s [mm]</td>
</tr>
<tr>
<td>42 - 114</td>
</tr>
<tr>
<td>1 5/8 - 4 1/2</td>
</tr>
<tr>
<td>Material</td>
</tr>
<tr>
<td>Finish</td>
</tr>
<tr>
<td>w_b</td>
</tr>
</tbody>
</table>

* Available in stainless steel on request.
Some DETAN Tension Rods applications require a pretension load to be applied. Normally it is difficult to accurately apply a pretension load to large diameter DETAN Tension Rods using regular wrenches. Thus, hydraulic jacks are often used to apply pretension loads.

The DETAN Pretension Unit is a jacking system designed especially for the DETAN System with diameters that range between M30 (1 3/16”) and M60 (2 3/8”). The system uses threaded shells to apply the preload thus preventing the damage to rod finishes often associated with using traditional hydraulic systems.

Features of the DETAN Pretension Unit
- System is built especially for the DETAN Rod Systems
- Extra lightweight aluminum design for easy use

Accurate pretension up to 425 kN (95,600 lbs)
- No electrical power needed
- Surface damage to the finish of the rods is avoided
- Calibrated manometer for accurate preload application
- Additional checks are possible using an optional extensometer (if gauge marks are applied)
- Functional, simple & robust
- Available for rent or purchase

Application of pretension

The photograph to the left shows pressure being applied using the DETAN Pretension Unit. The application of pretension loads at the jobsite should be planned in advance with the HALFEN engineering department, which will assist with the conversion of the preloads to the hydraulic pressures required. Maximum recommended preloads, the matching hydraulic pressure, and the stress values are given in the table on page 18.

Adjusting the rod length

The pretension is applied via a special coupler located within the length of the rod. While the jacks unload the coupler temporarily, the coupler can easily be tightened to adjust the rod length to match the correct preload. After the adjustment the DETAN Pretension Unit is released and removed so that the full load is transferred to the coupler.

Optional checking of pretension

The photograph on the far right shows a mechanical extensometer being used to double check the preload by measuring strain in the rod. This device requires gauge marks on the rod surface, but it is a good method for both initial verification and later checks during the structure’s life. Just like the DETAN tension unit, this device is simple to use, robust, and needs no external electrical power source.
DETAN ROD SYSTEMS

DETAN Pretension Unit

**Pretension System Variant**

with Pretension Coupler:

![Diagram of DETAN Pretension Unit with Pretension Coupler]

### Dimensions and Load Capacities

<table>
<thead>
<tr>
<th>System diameter $d_s$ [mm]</th>
<th>30</th>
<th>36</th>
<th>42</th>
<th>48</th>
<th>52</th>
<th>56</th>
<th>60</th>
</tr>
</thead>
<tbody>
<tr>
<td>[inches]</td>
<td>1 3/16</td>
<td>1 7/16</td>
<td>1 5/8</td>
<td>1 7/8</td>
<td>2 1/16</td>
<td>2 3/16</td>
<td>2 3/8</td>
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<tr>
<td>Cross section area $A$ [mm²]</td>
<td>707</td>
<td>1018</td>
<td>1385</td>
<td>1810</td>
<td>2124</td>
<td>2463</td>
<td>2827</td>
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<tr>
<td>[inches²]</td>
<td>1.095</td>
<td>1.577</td>
<td>2.146</td>
<td>2.805</td>
<td>3.292</td>
<td>3.817</td>
<td>4.381</td>
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<tr>
<td>Thread length $o$ [mm]</td>
<td>105</td>
<td>118</td>
<td>126</td>
<td>139</td>
<td>176</td>
<td>188</td>
<td>195</td>
</tr>
<tr>
<td>[inches]</td>
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<td>4 5/8</td>
<td>5</td>
<td>5 1/2</td>
<td>6 7/8</td>
<td>7 3/8</td>
<td>7 5/8</td>
</tr>
<tr>
<td>Min. system length with coupler $L$ [mm]</td>
<td>600</td>
<td>700</td>
<td>810</td>
<td>940</td>
<td>990</td>
<td>1050</td>
<td>1160</td>
</tr>
<tr>
<td>[inches]</td>
<td>24</td>
<td>28</td>
<td>32</td>
<td>37</td>
<td>39</td>
<td>42</td>
<td>46</td>
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<tr>
<td>System design load $N_{R,d}$ [kN]</td>
<td>217</td>
<td>302</td>
<td>487</td>
<td>611</td>
<td>695</td>
<td>746</td>
<td>1,020</td>
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<tr>
<td>[kips]</td>
<td>48.78</td>
<td>67.89</td>
<td>109.48</td>
<td>137.35</td>
<td>156.24</td>
<td>167.70</td>
<td>229.30</td>
</tr>
</tbody>
</table>

### Pretension Capacities

<table>
<thead>
<tr>
<th>System diameter $d_s$ [mm]</th>
<th>30</th>
<th>36</th>
<th>42</th>
<th>48</th>
<th>52</th>
<th>56</th>
<th>60</th>
</tr>
</thead>
<tbody>
<tr>
<td>[inches]</td>
<td>1 3/16</td>
<td>1 7/16</td>
<td>1 5/8</td>
<td>1 7/8</td>
<td>2 1/16</td>
<td>2 3/16</td>
<td>2 3/8</td>
</tr>
<tr>
<td>Max. allow. pretension $N_{empf}$ [kN]</td>
<td>100</td>
<td>145</td>
<td>200</td>
<td>265</td>
<td>315</td>
<td>365</td>
<td>425</td>
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<tr>
<td>[kips]</td>
<td>22.50</td>
<td>32.63</td>
<td>45.00</td>
<td>59.63</td>
<td>70.88</td>
<td>82.13</td>
<td>95.63</td>
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<tr>
<td>Hydraulic pressure $p$ [bar]</td>
<td>165</td>
<td>240</td>
<td>330</td>
<td>435</td>
<td>515</td>
<td>600</td>
<td>695</td>
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<tr>
<td>[psi]</td>
<td>2,393</td>
<td>3,481</td>
<td>4,786</td>
<td>6,309</td>
<td>7,469</td>
<td>8,702</td>
<td>10,080</td>
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<tr>
<td>Strain $ε$ [%]</td>
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<td>0.69</td>
<td>0.69</td>
<td>0.70</td>
<td>0.71</td>
<td>0.71</td>
<td>0.72</td>
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<tr>
<td>Stress $σ$ [N/mm²]</td>
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<td>144</td>
<td>146</td>
<td>147</td>
<td>148</td>
<td>148</td>
<td>150</td>
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<td>[psi]</td>
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<td>20,885</td>
<td>21,176</td>
<td>21,321</td>
<td>21,466</td>
<td>21,466</td>
<td>21,756</td>
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<td>Elongation $Δl$ [μm/10cm]</td>
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<td>69</td>
<td>69</td>
<td>70</td>
<td>71</td>
<td>71</td>
<td>72</td>
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<tr>
<td>[%]</td>
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<td>0.069</td>
<td>0.069</td>
<td>0.069</td>
<td>0.070</td>
<td>0.071</td>
<td>0.071</td>
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</table>

### Pretension Coupler Dimensions

<table>
<thead>
<tr>
<th>System diameter $d_s$ [mm]</th>
<th>30</th>
<th>36</th>
<th>42</th>
<th>48</th>
<th>52</th>
<th>56</th>
<th>60</th>
</tr>
</thead>
<tbody>
<tr>
<td>[inches]</td>
<td>1 3/16</td>
<td>1 7/16</td>
<td>1 5/8</td>
<td>1 7/8</td>
<td>2 1/16</td>
<td>2 3/16</td>
<td>2 3/8</td>
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<tr>
<td>Coupler length $L_M$ [mm]</td>
<td>120</td>
<td>140</td>
<td>158</td>
<td>180</td>
<td>195</td>
<td>210</td>
<td>245</td>
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<tr>
<td>[inches]</td>
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<td>5 1/2</td>
<td>6 1/4</td>
<td>7 1/6</td>
<td>7 11/16</td>
<td>8 1/4</td>
<td>9 5/8</td>
</tr>
<tr>
<td>Coupler diameter $d_M$ [mm]</td>
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<td>64</td>
<td>75</td>
<td>87</td>
<td>93</td>
<td>98</td>
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<tr>
<td>[inches]</td>
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<td>2 1/2</td>
<td>2 15/16</td>
<td>3 7/16</td>
<td>3 11/16</td>
<td>3 7/8</td>
<td>4 1/8</td>
</tr>
<tr>
<td>Locking nut length $M_v$ [mm]</td>
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<td>107</td>
<td>118</td>
<td>126</td>
<td>158</td>
<td>165</td>
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<td>5</td>
<td>6 1/4</td>
<td>6 1/2</td>
<td>6 3/4</td>
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<td>Wrench size $SW$ [mm]</td>
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<td>55</td>
<td>65</td>
<td>75</td>
<td>80</td>
<td>85</td>
<td>90</td>
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</table>
Questions or Comments?

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E-mail: info@halfenusa.com
Phone: 1 (800) 423 - 9140

HALFEN USA Inc.
8521 F.M. 1976
Converse, TX 78109

Our professional engineers provide support throughout the design and construction phases. We calculate the required dimensions and help you to choose the right DETAN Rod System for your project.