CHEMFIX Total Service

# Epoxy Acrylate Styrene Free Resin

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## Product Description

Chemfix Epoxy Acrylate Styrene Free Low Odour Resin is a high performance, rapid curing two part chemical anchoring system. Applied in one single action this resin will produce a cost effective, strong, chemical resistant fixing.

## Approvals

ITB WYRÓB BUDOWLANY

INSTYTUT TECHNIKI BUDOWLANEJ
Aprobacie Technicznej
ITB nr AT-15-6835:2011
ITB-974/W

Tested by:
Imperial College London
Consultants

## Key Features

- For use in Wet holes and underwater.
- Good Chemical Resistance.
- Medium & Heavy Duty Load Applications.
- High Durability.
- Ideal as well for Indoor Usage.

## Available Sizes

380ml / 400ml / 410ml 10:1 Co-axial Cartridge
825ml 10:1 Side by Side Cartridge
330ml / 345ml / 350ml 10:1 Side by Side Cartridge
150ml / 165ml / 280ml 10:1 Foil Bag
300ml / 380ml / 400ml / 410ml 10:1 Foil Bag

ETA - 11 / 0031

ETA 029 Injection for use in masonry

## Typical Gel and Curing Time*

*Figures are based on M12 fixings. Full cure is achieved after 24 hours. All Specifications are based on use of a Chemfix Mixer 14

| BASE MATERIAL TEMPERATURE (°C) | 35 | 25 | 15 | 5 | -5 | -10** |
|---|---|---|---|---|---|---|
| TYPICAL GEL TIME (mins) | 3 | 6 | 8 | 18 | 50 | 60 |
| MIN. LOAD TIME (mins) | 20 | 20 | 20 | 30 | 90 | 180 |

**Resin temperature must be at least 20ºC

## Typical Performance Data at Standard Embedment Depth

| Size | Concrete, $f_{ck,cube}$ = 25N/mm² (C20/25) 5.8 Grade Studding | | | | | | | | | SETTING DATA | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Characteristic Resistance (kN) | | Design Resistance (kN) | | Recommended Load (kN) | | Characteristic Edge Distance (mm) | | Characteristic Spacing | Hole Diameter In Concrete | Hole Diameter In Fixture | Standard Embedment In Concrete | Recommended Torque |
| | Tension ($N_{rk}$) | Shear ($V_{rk}$) | Tension ($N_{rd}$) | Shear ($V_{rd}$) | Tension ($N_{rec}$) | Shear ($V_{rec}$) | Tension ($C_{cr,N}$) | Shear ($C_{cr,V}$) | (mm) | (mm) | (mm) | (mm) | (Nm) |
| M8 | 19.0 | 9.5 | 12.7 | 7.6 | 9.1 | 5.4 | 80 | 100 | 160 | 10 | 9 | 80 | 11 |
| M10 | 30.2 | 15.1 | 16.0 | 12.1 | 11.4 | 8.6 | 90 | 130 | 180 | 12 | 11 | 90 | 22 |
| M12 | 43.8 | 21.9 | 20.3 | 17.5 | 14.5 | 12.5 | 110 | 150 | 220 | 14 | 13 | 110 | 38 |
| M16 | 61.4 | 40.8 | 28.4 | 32.7 | 20.3 | 23.3 | 125 | 170 | 250 | 18 | 17 | 125 | 95 |
| M20 | 97.6 | 63.7 | 38.9 | 51.0 | 27.8 | 36.4 | 170 | 190 | 340 | 24 | 22 | 170 | 170 |
| M24 | 127.1 | 91.8 | 50.4 | 73.4 | 36.0 | 52.4 | 210 | 240 | 420 | 28 | 26 | 210 | 260 |
| M30 | 179.7 | 207.1 | 71.3 | 166.1 | 50.9 | 118.6 | 280 | 350 | 560 | 35 | 33 | 280 | 480 |

## Typical Ultimate Physical Properties

| | N/mm² | TEST METHOD | STORAGE / SHELF LIFE | IMPORTANT |
|---|---|---|---|---|
| COMPRESSIVE STRENGTH | 62.70 | (EN ISO 604) / (ASTM 695) | This product should be stored between +5˚C & +25˚C.<br><br>The Shelf life of the product is 12 months from the manufacture date. | The information and data given is based on our own experience, research and testing and is believed to be reliable and accurate. However, as Chemfix Products cannot know the varied uses to which its products may be applied, or the methods of application used, no warranty as to the fitness or suitability of its products is given or implied. It is the users responsibility to determine suitability of use. For further information please contact our Technical Department. |
| FLEXURAL STRENGTH | 23.88 | (EN ISO 178) / (ASTM 795) | | |
| FLEXURAL MODULUS | 3250.33 | " | | |
| TENSILE STRENGTH | 12.85 | (EN ISO 527) / (ASTM 638) | | |
| E MODULUS | 6860.33 | " | | |

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25/08/2011 V.3

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## Performance Data for Various Stud Strengths, Material and Rebar

**Concrete Strength Class:** C20/25 (25N/mm² Cylinder; 30N/mm² 150mm cube).

**IMPORTANT NOTE**:
Performance based on clean holes;
HAMMER DRILLED - Blown and then brushed with a stiff metal brush & blown again.

### 5.8 Grade Studding

| Stud Diameter (mm) | Hole Diameter (mm) | Design Resistance ($N_{rd}$) (kN) | | | | | | | | | | | | | | | | | | | Fd,s hef failure (mm) | Fd,s design load (kN) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8 | 10 | 12.7 | | | | | | | | | | | | | | | | | | | 78 | 12.7 |
| 10 | 12 | | 16.0 | 17.8 | 19.6 | 20.1 | | | | | | | | | | | = | Steel Failure | | | 113 | 20.1 |
| 12 | 14 | | | | 20.3 | 22.1 | 24.0 | 25.8 | 27.7 | 29.2 | | | | | | | | | | | 159 | 29.2 |
| 16 | 18 | | | | | 27.0 | 29.3 | 31.5 | 33.8 | 36.0 | 38.3 | 40.5 | 42.8 | 45.0 | 49.5 | 54.1 | 54.4 | | | | 242 | 54.4 |
| Depth (mm) | | 80 | 90 | 100 | 110 | 120 | 130 | 140 | 150 | 160 | 170 | 180 | 190 | 200 | 220 | 240 | 260 | 280 | 300 | 350 | | |
| 20 | 24 | 38.9 | 41.2 | 43.5 | 45.7 | 50.3 | 54.9 | 59.5 | 64.0 | 68.6 | 80.1 | 84.9 | | | | | | | | | 371 | 84.9 |
| 24 | 28 | | | | 48.0 | 52.8 | 57.6 | 62.4 | 67.2 | 72.1 | 84.1 | 96.1 | 108.1 | 120.1 | 122.4 | | | | | | 510 | 122.4 |
| 30 | 40 | | | | | | | | 71.3 | 76.4 | 89.1 | 101.8 | 114.5 | 127.3 | 140.0 | 152.7 | 178.2 | 203.6 | 229.1 | 254.5 | 1096 | 278.9 |
| Depth (mm) | | 170 | 180 | 190 | 200 | 220 | 240 | 260 | 280 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 700 | 800 | 900 | 1000 | | |

### 8.8 Grade Studding

| Stud Diameter (mm) | Hole Diameter (mm) | Design Resistance ($N_{rd}$) (kN) | | | | | | | | | | | | | | | | | | | Fd,s hef failure (mm) | Fd,s design load (kN) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8 | 10 | 13.0 | 14.6 | 16.2 | 17.8 | 19.5 | | | | | | | | | | | | | | | 121 | 19.5 |
| 10 | 12 | | 16.0 | 17.8 | 19.6 | 21.3 | 23.1 | 24.9 | 26.7 | 28.5 | 30.2 | 30.9 | | | | | = | Steel Failure | | | 174 | 30.9 |
| 12 | 14 | | | | 20.3 | 22.1 | 24.0 | 25.8 | 27.7 | 29.5 | 31.3 | 33.2 | 35.0 | 36.9 | 40.6 | 44.2 | 45.0 | | | | 244 | 45.0 |
| 16 | 18 | | | | | 27.0 | 29.3 | 31.5 | 33.8 | 36.0 | 38.3 | 40.5 | 42.8 | 45.0 | 49.5 | 54.1 | 58.6 | 63.1 | 67.6 | 78.8 | 372 | 83.7 |
| Depth (mm) | | 80 | 90 | 100 | 110 | 120 | 130 | 140 | 150 | 160 | 170 | 180 | 190 | 200 | 220 | 240 | 260 | 280 | 300 | 350 | | |
| 20 | 24 | 38.9 | 41.2 | 43.5 | 45.7 | 50.3 | 54.9 | 59.5 | 64.0 | 68.6 | 80.1 | 91.5 | 102.9 | 114.4 | 125.8 | 130.7 | | | | | 571 | 130.7 |
| 24 | 28 | | | | 48.0 | 52.8 | 57.6 | 62.4 | 67.2 | 72.1 | 84.1 | 96.1 | 108.1 | 120.1 | 132.1 | 144.1 | 168.1 | 188.3 | | | 784 | 188.3 |
| 30 | 40 | | | | | | | | 71.3 | 76.4 | 89.1 | 101.8 | 114.5 | 127.3 | 140.0 | 152.7 | 178.2 | 203.6 | 229.1 | 254.5 | 1096 | 278.9 |
| Depth (mm) | | 170 | 180 | 190 | 200 | 220 | 240 | 260 | 280 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 700 | 800 | 900 | 1000 | | |

### 10.9 Grade Studding

| Stud Diameter (mm) | Hole Diameter (mm) | Design Resistance ($N_{rd}$) (kN) | | | | | | | | | | | | | | | | | | | Fd,s hef failure (mm) | Fd,s design load (kN) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8 | 10 | 13.0 | 14.6 | 16.2 | 17.8 | 19.4 | 21.0 | 22.7 | 24.3 | 25.9 | 27.2 | | | | | | | = | Steel Failure | | 168 | 27.2 |
| 10 | 12 | | 16.0 | 17.8 | 19.6 | 21.3 | 23.1 | 24.9 | 26.7 | 28.5 | 30.2 | 32.0 | 33.8 | 35.6 | 39.1 | 43.1 | | | | | 242 | 43.1 |
| 12 | 14 | | | | 20.3 | 22.1 | 24.0 | 25.8 | 27.7 | 29.5 | 31.3 | 33.2 | 35.0 | 36.9 | 40.6 | 44.2 | 47.9 | 51.6 | 55.3 | 62.6 | 340 | 62.6 |
| 16 | 18 | | | | | 27.0 | 29.3 | 31.5 | 33.8 | 36.0 | 38.3 | 40.5 | 42.8 | 45.0 | 49.5 | 54.1 | 58.6 | 63.1 | 67.6 | 78.8 | 518 | 116.6 |
| Depth (mm) | | 80 | 90 | 100 | 110 | 120 | 130 | 140 | 150 | 160 | 170 | 180 | 190 | 200 | 220 | 240 | 260 | 280 | 300 | 350 | | |
| 20 | 24 | 38.9 | 41.2 | 43.5 | 45.7 | 50.3 | 54.9 | 59.5 | 64.0 | 68.6 | 80.1 | 91.5 | 102.9 | 114.4 | 125.8 | 137.2 | 160.1 | 182.0 | | | 796 | 182.0 |
| 24 | 28 | | | | 48.0 | 52.8 | 57.6 | 62.4 | 67.2 | 72.1 | 84.1 | 96.1 | 108.1 | 120.1 | 132.1 | 144.1 | 168.1 | 192.1 | 216.2 | 240.2 | 1092 | 262.2 |
| 30 | 40 | | | | | | | | 71.3 | 76.4 | 89.1 | 101.8 | 114.5 | 127.3 | 140.0 | 152.7 | 178.2 | 203.6 | 229.1 | 254.5 | 1527 | 388.5 |
| Depth (mm) | | 170 | 180 | 190 | 200 | 220 | 240 | 260 | 280 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 700 | 800 | 900 | 1000 | | |

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### A4-70 Stainless Steel Studding

| Stud Diameter (mm) | Hole Diameter (mm) | Design Resistance ($N_{rd}$) (kN) | | | | | | | | | | | | | | | | | | | Fd,s hef failure ( mm) | Fd,s design load (kN) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8 | 10 | 13.0 | 13.7 | | | | | | | | | | | | | | | | | | 85 | 13.7 |
| 10 | 12 | | 16.0 | 17.8 | 19.6 | 21.3 | 21.7 | | | | | | | | | | = | Steel Failure | | | 122 | 21.7 |
| 12 | 14 | | | | 20.3 | 22.1 | 24.0 | 25.8 | 27.7 | 29.5 | 31.3 | 31.6 | | | | | | | | | 171 | 31.6 |
| 16 | 18 | | | | | 27.0 | 29.3 | 31.5 | 33.8 | 36.0 | 38.3 | 40.5 | 42.8 | 45.0 | 49.5 | 54.1 | 58.8 | | | | 261 | 58.8 |
| Depth (mm) | | 80 | 90 | 100 | 110 | 120 | 130 | 140 | 150 | 160 | 170 | 180 | 190 | 200 | 220 | 240 | 260 | 280 | 300 | 350 | | |
| 20 | 24 | 38.9 | 41.2 | 43.5 | 45.7 | 50.3 | 54.9 | 59.5 | 64.0 | 68.6 | 80.1 | 91.7 | | | | | | | | | 401 | 91.7 |
| 24 | 28 | | | | 48.0 | 52.8 | 57.6 | 62.4 | 67.2 | 72.1 | 84.1 | 96.1 | 108.1 | 120.1 | 132.1 | | | | | | 550 | 132.1 |
| 30 | 40 | | | | | | | | 71.3 | 76.4 | 89.1 | 101.8 | 114.5 | 127.3 | 139.8 | | | | | | 549 | 139.8 |
| Depth (mm) | | 170 | 180 | 190 | 200 | 220 | 240 | 260 | 280 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 700 | 800 | 900 | 1000 | | |

### A4-80 Stainless Steel Studding

| Stud Diameter (mm) | Hole Diameter (mm) | Design Resistance ($N_{rd}$) (kN) | | | | | | | | | | | | | | | | | | | Fd,s hef failure (mm) | Fd,s design load (kN) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8 | 10 | 13.0 | 14.6 | 15.7 | | | | | | | | | | | | | | | | | 97 | 15.7 |
| 10 | 12 | | 16.0 | 17.8 | 19.6 | 21.3 | 23.1 | 24.8 | | | | | | | | | = | Steel Failure | | | 140 | 24.8 |
| 12 | 14 | | | | 20.3 | 22.1 | 24.0 | 24.8 | 27.7 | 29.5 | 31.3 | 33.2 | 35.0 | 36.1 | | | | | | | 196 | 36.1 |
| 16 | 18 | | | | | 27.0 | 29.3 | 31.5 | 33.8 | 36.0 | 38.3 | 40.5 | 42.8 | 45.0 | 49.5 | 54.1 | 58.6 | 63.1 | 67.2 | | 298 | 67.2 |
| Depth (mm) | | 80 | 90 | 100 | 110 | 120 | 130 | 140 | 150 | 160 | 170 | 180 | 190 | 200 | 220 | 240 | 260 | 280 | 300 | 350 | | |
| 20 | 24 | 38.9 | 41.2 | 43.5 | 45.7 | 50.3 | 54.9 | 59.5 | 64.0 | 68.5 | 80.1 | 91.5 | 102.9 | 104.8 | | | | | | | 458 | 104.8 |
| 24 | 28 | | | | 48.0 | 52.8 | 57.6 | 62.4 | 67.2 | 72.1 | 84.1 | 96.1 | 108.1 | 120.1 | 132.1 | 144.1 | 151.0 | | | | 629 | 151.0 |
| 30 | 40 | | | | | | | | 71.3 | 76.4 | 89.1 | 101.8 | 114.5 | 127.3 | 140.0 | 152.7 | 187.2 | 203.6 | 223.7 | | 879 | 223.7 |
| Depth (mm) | | 170 | 180 | 190 | 200 | 220 | 240 | 260 | 280 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 700 | 800 | 900 | 1000 | | |

### High Bond Reinforcing Bars fyk=500N/mm²

| Rebar Diameter (mm) | Hole Diameter (mm) | Design Resistance ($N_{rd}$) (kN) | | | | | | | | | | | | | | | | | | | Fd,s hef failure (mm) | Fd,s design load (kN) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8 | 12 | 13.0 | 16.2 | 19.4 | 21.9 | | | | | | | | | | | | | | | | 135 | 21.9 |
| 10 | 14 | | 17.8 | 21.4 | 24.9 | 28.5 | 32.1 | 34.1 | | | | | | | | | = | Steel Failure | | | 192 | 34.1 |
| 12 | 16 | | | 22.2 | 25.9 | 29.6 | 33.3 | 36.9 | 40.6 | 44.3 | 48.0 | 49.2 | | | | | | | | | 266 | 49.2 |
| 14 | 18 | | | | 28.9 | 33.1 | 37.2 | 41.3 | 45.5 | 49.6 | 53.8 | 57.9 | 62.0 | 66.2 | 66.9 | | | | | | 324 | 66.9 |
| 16 | 22 | | | | | 36.0 | 40.5 | 45.0 | 49.5 | 54.1 | 58.6 | 63.1 | 67.6 | 72.1 | 76.6 | 81.1 | 85.6 | 87.4 | | | 388 | 87.4 |
| Depth (mm) | | 80 | 100 | 120 | 140 | 160 | 180 | 200 | 220 | 240 | 260 | 280 | 300 | 320 | 340 | 360 | 380 | 400 | 450 | 500 | | |
| 20 | 28 | 45.7 | 51.5 | 57.2 | 62.9 | 68.6 | 80.1 | 91.5 | 102.9 | 114.4 | 125.8 | 136.6 | | | | | | | | | 597 | 136.6 |
| 25 | 32 | | | 62.5 | 68.8 | 75.1 | 87.6 | 100.1 | 112.6 | 125.1 | 137.6 | 150.1 | 175.1 | 200.1 | 213.4 | | | | | | 853 | 213.4 |
| 32 | 40 | | | | | 81.4 | 95.0 | 108.6 | 122.2 | 135.7 | 149.3 | 162.9 | 190.0 | 217.2 | 244.3 | 271.5 | 298.6 | 325.8 | 349.7 | | 1288 | 349.7 |
| 40 | 50 | | | | | | | 123.2 | 138.6 | 154.0 | 169.4 | 184.7 | 215.5 | 246.3 | 277.1 | 307.9 | 338.7 | 369.5 | 400.3 | 431.1 | 1774 | 546.3 |
| Depth (mm) | | 200 | 225 | 250 | 275 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 700 | 800 | 900 | 1000 | 1100 | 1200 | 1300 | 1400 | | |

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## Typical Performance in Hollow Substrate

| SIZE | Recommended Load (kN) Tension or Shear ($F_{ec}$) | |
|---|---|---|
| | Brickwork 20.5 N/mm² | Blockwork 7 N/mm² |
| M8 | 1.7 | 0.8 |
| M10 | 3.4 | 1.7 |
| M12 | 4.8 | 2.7 |
| M16 | 5.6 | 3.6 |

## Edge Reduction Factor (Concrete)

| EDGE (mm) | TENSILE | | | | | | |
|---|---|---|---|---|---|---|---|
| | M8 | M10 | M12 | M16 | M20 | M24 | M30 |
| 50 | 0.65 | | | | | | |
| 60 | 0.70 | 0.67 | | | | | |
| 70 | 0.75 | 0.71 | | | | | |
| 80 | 1.00 | 0.76 | 0.69 | | | | |
| 90 | | 1.00 | 0.73 | 0.69 | | | |
| 100 | | | 0.76 | 0.72 | 0.64 | | |
| 110 | | | 1.00 | 0.75 | 0.66 | | |
| 125 | | | | 1.00 | 0.70 | 0.64 | |
| 150 | | | | | 0.75 | 0.69 | |
| 170 | | | | | 1.00 | 0.72 | |
| 190 | | | | | | 0.76 | 0.67 |
| 210 | | | | | | 1.00 | 0.70 |
| 240 | | | | | | | 0.74 |
| 260 | | | | | | | 0.77 |
| 280 | | | | | | | 1.00 |
| | | | | | | | |
| | | | | | | | |

| EDGE (mm) | SHEAR | | | | | | |
|---|---|---|---|---|---|---|---|
| | M8 | M10 | M12 | M16 | M20 | M24 | M30 |
| 60 | 0.65 | | | | | | |
| 75 | 0.76 | 0.70 | | | | | |
| 90 | 0.88 | 0.80 | 0.69 | | | | |
| 100 | 1.00 | 0.87 | 0.75 | 0.68 | | | |
| 115 | | 0.97 | 0.83 | 0.75 | | | |
| 130 | | 1.00 | 0.91 | 0.83 | 0.66 | | |
| 150 | | | 1.00 | 0.92 | 0.73 | 0.63 | |
| 170 | | | | 1.00 | 0.80 | 0.69 | |
| 190 | | | | | 1.00 | 0.74 | |
| 210 | | | | | | 0.80 | 0.65 |
| 240 | | | | | | 1.00 | 0.71 |
| 280 | | | | | | | 0.80 |
| 300 | | | | | | | 0.84 |
| 325 | | | | | | | 0.90 |
| 350 | | | | | | | 1.00 |
| | | | | | | | |
| | | | | | | | |

## Spacing Reduction Factor(Concrete)

| Spacing (mm) | TENSILE | | | | | | |
|---|---|---|---|---|---|---|---|
| | M8 | M10 | M12 | M16 | M20 | M24 | M30 |
| 130 | 0.72 | | | | | | |
| 140 | 0.75 | 0.75 | | | | | |
| 150 | 0.78 | 0.78 | | | | | |
| 160 | 1.00 | 0.82 | 0.70 | | | | |
| 180 | | 1.00 | 0.75 | 0.70 | | | |
| 200 | | | 0.80 | 0.73 | | | |
| 220 | | | 1.00 | 0.79 | | | |
| 250 | | | | 1.00 | | | |
| 280 | | | | | 0.72 | | |
| 300 | | | | | 0.75 | | |
| 320 | | | | | 0.78 | | |
| 340 | | | | | 1.00 | 0.69 | |
| 370 | | | | | | 0.73 | |
| 390 | | | | | | 0.75 | 0.68 |
| 420 | | | | | | 1.00 | 0.69 |
| 490 | | | | | | | 0.75 |
| 560 | | | | | | | 1.00 |

## Characteristic (Vrk,s) & Design (Vrd,s) Shear Loads for Various Stud Grades + Rebar

| Stud Diameter (mm) | Stud Grade 5.8 | | Stud Grade 8.8 | | Stud Grade 10.9 | | Stud Grade A4-70 | | Stud Grade A4-80 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Vrk,s (kN) | Vrd,s (kN) | Vrk,s (kN) | Vrd,s (kN) | Vrk,s (kN) | Vrd,s (kN) | Vrk,s (kN) | Vrd,s (kN) | Vrk,s (kN) | Vrd,s (kN) |
| M8 | 9.5 | 7.6 | 14.6 | 11.7 | 19.0 | 15.2 | 12.8 | 8.2 | 14.6 | 9.4 |
| M10 | 15.1 | 12.1 | 23.2 | 18.6 | 30.2 | 24.1 | 20.3 | 13.0 | 23.2 | 14.9 |
| M12 | 21.9 | 17.5 | 33.7 | 27.0 | 43.8 | 35.1 | 29.5 | 18.9 | 33.7 | 21.6 |
| M16 | 40.8 | 32.7 | 62.8 | 50.2 | 81.6 | 65.3 | 55.0 | 32.5 | 62.8 | 40.3 |
| M20 | 63.7 | 51.0 | 98.0 | 78.4 | 127.4 | 101.9 | 85.8 | 55.0 | 98.0 | 62.8 |
| M24 | 91.8 | 73.4 | 141.2 | 113.0 | 183.6 | 146.8 | 123.6 | 79.2 | 141.2 | 90.5 |
| M30 | 207.1 | 166.1 | 207.6 | 166.1 | 269.9 | 215.9 | 129.8 | 64.9 | 207.6 | 103.8 |

| Rebar Diameter (mm) | BSt 500 Rebar | |
|---|---|---|
| | Vrk,s (kN) | Vrd,s (kN) |
| 8 | 16.6 | 11.1 |
| 10 | 25.9 | 17.3 |
| 12 | 37.3 | 24.9 |
| 14 | 50.8 | 33.9 |
| 16 | 66.4 | 44.3 |
| 20 | 103.9 | 69.3 |
| 25 | 162.0 | 108.0 |
| 32 | 265.1 | 176.7 |
| 40 | 414.6 | 276.4 |

## Notes:

All grades shown for information.
M30 studding is 8.8 grade instead of 5.8 grade.
M30 for A4-70 tensile strength of 500N/mm2, instead of 700N/mm2.
Safety Factor is 1.25 for all carbon steel.
Safety Factor is 1.56 for stainless steel, up to M24, M30 is 2.0.
Safety Factor is 1.5 for BSt 500 rebar.

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