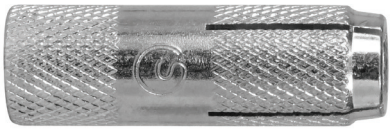
# DI DROP-IN ANCHOR



## PRODUCT FEATURES

- Rapid installation, shallow embedment depth.
- Anchor placement flush with the surface or deeper.
- Temporary or permanent fixings, fixture detachable any time.
- Flexible in fixture thickness with variety sizes of hexagonal bolts.
- Suitable for anchoring in tension zone.



## MATERIAL SPECIFICATIONS

- Carbon steel zinc galvanised ≥ 6µm.
- Stainless steel 304 (A2) and 316 (A4).

Z ZINC | A2 INOX | A4 INOX

## LOADING ZONES

## SUBSTRATES

- RC concrete C20/25 to C50/60 at maximum according to EN 206-1:2000-12.
- Solid stone & other solid masonry

CONC | STONE

## BASIC LOADING DATA

- For static and quasi-static loadings.
- For non-cracked concrete only.
- Only a single anchor is considered.
- No anchor spacing and edge distance influences.
- Concrete compressive strength C20/25 ($f_{ck,cube}$ = 25 N/mm²).
- Applicable to both carbon steel and stainless steel anchor.

### CHARACTERISTIC RESISTANCE [$F_{Rk}$]

| Anchor Size | | M6 (1/4") | M8 (5/16") | M10 (3/8") | | M12 (1/2") | M16 (5/8") | M20 (3/4") |
|---|---|---|---|---|---|---|---|---|
| Tensile Load, $N_{Rk}$ | [kN] | 5.3 | 7.1 | 7.1 | 10.8 | 15.0 | 31.5 | 36.5 |
| Shear Load, $V_{Rk}$ | [kN] | | | | | | | |
| ~ Carbon Steel | | 6.0 | 11.0 | 17.4 | 17.4 | 25.3 | 47.1 | 73.5 |
| ~ Stainless Steel | | 8.4 | 15.4 | 24.4 | 24.4 | 35.4 | 65.9 | 102.9 |

### DESIGN RESISTANCE [$F_{Rd}$]

| Anchor Size | | M6 (1/4") | M8 (5/16") | M10 (3/8") | | M12 (1/2") | M16 (5/8") | M20 (3/4") |
|---|---|---|---|---|---|---|---|---|
| Tensile Load, $N_{Rd}$ | [kN] | 3.5 | 4.7 | 4.7 | 7.2 | 10.0 | 21.0 | 24.3 |
| Shear Load, $V_{Rd}$ | [kN] | | | | | | | |
| ~ Carbon Steel | | 4.8 | 8.8 | 13.9 | 13.9 | 20.2 | 37.7 | 58.8 |
| ~ Stainless Steel | | 5.4 | 9.9 | 15.6 | 15.6 | 22.7 | 42.3 | 66.0 |

### RECOMMENDED LOAD [$F_{Rec}$]

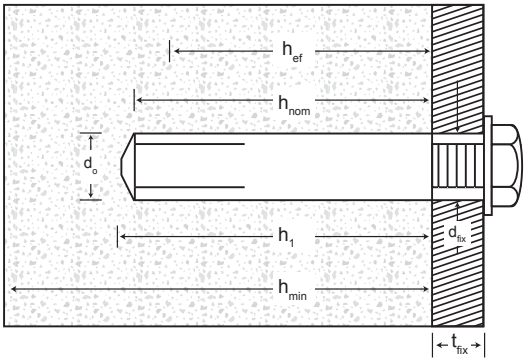
| Anchor Size | | M6 (1/4") | M8 (5/16") | M10 (3/8") | | M12 (1/2") | M16 (5/8") | M20 (3/4") |
|---|---|---|---|---|---|---|---|---|
| Tensile Load, $N_{Rec}$ | [kN] | 2.5 | 3.4 | 3.4 | 5.1 | 7.1 | 15.0 | 17.4 |
| Shear Load, $V_{Rec}$ | [kN] | | | | | | | |
| ~ Carbon Steel | | 3.4 | 6.3 | 9.9 | 9.9 | 14.5 | 26.9 | 42.0 |
| ~ Stainless Steel | | 3.9 | 7.0 | 11.2 | 11.2 | 16.2 | 30.2 | 47.1 |

# DI DROP-IN ANCHOR

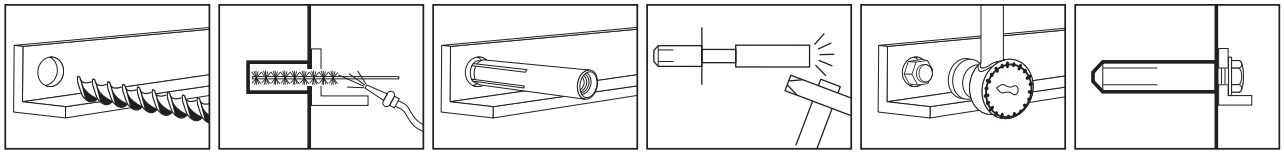
## SETTING DETAILS

| ANCHOR SIZE | | M6 (1/4") | M8 (5/16") | M10 (3/8") | | M12 (1/2") | M16 (5/8") | M20 (3/4") |
|---|---|---|---|---|---|---|---|---|
| Anchor Length, L | [mm] | 25 | 30 | 30 | 40 | 50 | 65 | 80 |
| Thread Length, $L_t$ | [mm] | 11 | 13 | 13 | 15 | 20 | 25 | 30 |
| Drilled Hole Diameter, $d_0$ | [mm] | 8 | 10 | 12 | | 16 | 20 | 25 |
| Recommended Torque, $T_{inst}$ | [Nm] | 5 | 10 | 15 | 20 | 40 | 95 | 175 |
| Fixture Hole Diameter, $d_{fix}$ | [mm] | 7 | 9 | 12 | | 14 | 18 | 22 |
| Minimum Drilled Hole Depth, $h_1$ | [mm] | 30 | 35 | 35 | 45 | 55 | 70 | 90 |
| Embedment Depth, $h_{nom}$ | [mm] | 25 | 30 | 30 | 40 | 50 | 65 | 80 |
| Effective Anchorage Depth, $h_{ef}$ | [mm] | 25 | 30 | 30 | 40 | 50 | 65 | 80 |
| Minimum Concrete Thickness, $h_{min}$ | [mm] | 60 | 70 | 70 | 80 | 100 | 130 | 160 |
| Critical Anchor Spacing, $s_{cr}$ | [mm] | 75 | 90 | 90 | 120 | 150 | 195 | 240 |
| Minimum Anchor Spacing, $s_{min}$ | [mm] | 25 | 30 | 30 | 40 | 50 | 65 | 80 |
| Critical Edge Distance, $c_{cr}$ | [mm] | 38 | 45 | 45 | 60 | 75 | 98 | 120 |
| Minimum Edge Distance, $c_{min}$ | [mm] | 25 | 30 | 30 | 40 | 50 | 65 | 80 |

## SETTING DIAGRAM




## INSTALLATION PROCEDURES



1. Examine the concrete base is well compact and porosity is insignificant. Drill a hole through the pre-drilled hole fixture into concrete at right angle on the substrate surface, to the specified diameter and depth.
2. Clean the drilled hole by using air pump or brush prior inserting the anchor.
3. Insert the anchor into the drilled hole until it is flush with the concrete surface.
4. Use the setting tool and drive the expansion cone in the anchor until it reaches the neck of the setting tool.
5. Attach fixture and then tighten the anchor according to the recommended torque.

## MECHANICAL PROPERTIES

| ANCHOR SIZE | | M6 (1/4") | M8 (5/16") | M10 (3/8") | M12 (1/2") | M16 (5/8") | M20 (3/4") |
|---|---|---|---|---|---|---|---|
| Cross Sectional Area, $A_s$ | [mm²] | 20.1 | 36.6 | 58.0 | 84.3 | 157.0 | 245.0 |
| Nominal Tensile Strength, $f_{uk}$ | [N/mm²] | | | | | | |
| ~ Carbon Steel | | 500 | 500 | 500 | 500 | 500 | 500 |
| ~ Stainless Steel | | 700 | 700 | 700 | 700 | 700 | 700 |
| Elastic Moment Of Resistance, $W_{el}$ | [mm³] | 12.7 | 31.2 | 62.3 | 109.2 | 277.5 | 540.9 |
| Design Bending Moment, $M_{Rd,s}$ | [Nm] | | | | | | |
| ~ Carbon Steel | | 6.1 | 15.0 | 29.9 | 52.4 | 133.2 | 259.6 |
| ~ Stainless Steel | | 6.8 | 16.8 | 33.5 | 58.8 | 149.4 | 291.3 |

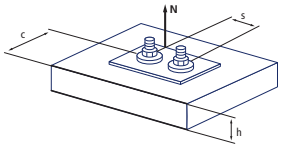
*The design bending moment is derived from $M_{Rd,s} = M_{Rk,s} / \gamma_{Ms,N}$ where the partial safety factor is 1.25 for carbon steel and 1.56 for stainless steel. The recommended bending moment is derived from $M_{Rec,s} = M_{Rd,s} / \gamma_F$ where the partial safety factor is 1.4.*

## TENSION LOAD [$N_{Rd}$]

Design Tensile Resistance, $N_{Rd}$: lower value of [$N_{Rd,s}$ ; $N_{Rd,c}$]

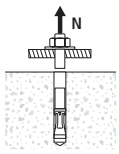
Design Steel Tensile Resistance: $N_{Rd,s}$

Design Concrete Cone / Pull-Out Resistance: $N_{Rd,c} = N^0_{Rd,c} * \Psi_{\beta,N} * \Psi_{s,N} * \Psi_{c,N}$




## STEEL TENSILE RESISTANCE [$N_{Rd,s}$]

- For static and quasi-static loadings.
- Only a single anchor is considered.
- For non-cracked concrete only.

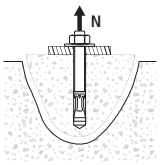



| ANCHOR SIZE | | M6 (1/4") | M8 (5/16") | M10 (3/8") | M12 (1/2") | M16 (5/8") | M20 (3/4") |
|---|---|---|---|---|---|---|---|
| $N_{Rd,s}$ | [kN] | | | | | | |
| ~ Carbon Steel | | 6.7 | 12.2 | 19.3 | 28.1 | 52.3 | 81.7 |
| ~ Stainless Steel | | 7.5 | 13.7 | 21.7 | 31.6 | 58.8 | 91.7 |

*The design steel tensile resistance is derived from $N_{Rd,s} = N_{Rk,s} / \gamma_{Ms,N}$ where the partial safety factor is 1.5 for carbon steel and 1.87 for stainless steel. The recommended load is derived from $N_{Rec,s} = N_{Rd,s} / \gamma_F$ where the partial safety factor is 1.4.*

## CONCRETE CONE / PULL-OUT RESISTANCE [$N_{Rd,c}$]

- For static and quasi-static loadings.
- For non-cracked concrete only.
- Only a single anchor is considered.
- No anchor spacing and edge distance influences.
- Concrete compressive strength C20/25 ($f_{ck,cube}$ = 25 N/mm²).
- Loading applicable to both carbon steel and stainless steel anchor.




| ANCHOR SIZE | | M6 (1/4") | M8 (5/16") | M10 (3/8") | | M12 (1/2") | M16 (5/8") | M20 (3/4") |
|---|---|---|---|---|---|---|---|---|
| $h_{ef}$ | [mm] | 25 | 30 | 30 | 40 | 50 | 65 | 80 |
| $N^0_{Rd,c}$ | [kN] | 3.5 | 4.7 | 4.7 | 7.2 | 10.0 | 21.0 | 24.3 |

*The design concrete cone resistance is derived from $N^0_{Rd,c} = N^0_{Rk,c} / \gamma_{Mc,N}$ where partial safety factor of 1.5. The recommended load is derived from $N^0_{Rec,c} = N^0_{Rd,c} / \gamma_F$ where the partial safety factor is 1.4.*

# DI DROP-IN ANCHOR

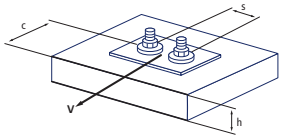
## SHEAR LOAD [$V_{Rd}$]

Design Shear Resistance, $V_{Rd}$: lower value of [$V_{Rd,s}$ ; $V_{Rd,c}$ ; $V_{Rd,cp}$]

Design Steel Shear Resistance: $V_{Rd,s}$

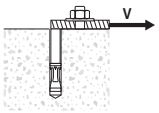
Design Concrete Edge Shear Resistance: $V_{Rd,c} = V^0_{Rd,c} * \Psi_{\beta,V} * \Psi_{\alpha,V} * \Psi_{sc,V}$

Design Concrete Pry-Out Resistance: $V_{Rd,cp} = V^0_{Rd,cp} * \Psi_{\beta,V} * \Psi_{s,N} * \Psi_{c,N}$




## STEEL SHEAR RESISTANCE [$V_{Rd,s}$]

- For static and quasi-static loadings.
- Only a single anchor is considered.
- For non-cracked concrete only.

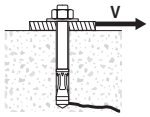



| ANCHOR SIZE | | M6 (1/4") | M8 (5/16") | M10 (3/8") | M12 (1/2") | M16 (5/8") | M20 (3/4") |
|---|---|---|---|---|---|---|---|
| $V_{Rd,s}$ | [kN] | | | | | | |
| ~ Carbon Steel | | 4.8 | 8.8 | 13.9 | 20.2 | 37.7 | 58.8 |
| ~ Stainless Steel | | 5.4 | 9.9 | 15.6 | 22.7 | 42.3 | 66.0 |

*The design steel shear resistance is derived from $V_{Rd,s} = V_{Rk,s} / \gamma_{Ms,v}$ where the partial safety factor is 1.25 for carbon steel and 1.56 for stainless steel. The recommended load is derived from $V_{Rec,s} = V_{Rd,s} / \gamma_F$ where the partial safety factor is 1.4.*

## CONCRETE EDGE SHEAR RESISTANCE [$V_{Rd,c}$]

- For non-cracked concrete.
- Only a single anchor is considered.
- No anchor spacing and edge distance influences.
- Single embedded depth is used for loading tabulation.
- Concrete compressive strength C20/25 ($f_{ck,cube}$ = 25 N/mm²).
- Loading applicable to both carbon steel and stainless steel anchor.

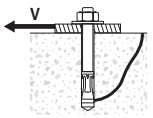



| ANCHOR SIZE | | M6 (1/4") | M8 (5/16") | M10 (3/8") | | M12 (1/2") | M16 (5/8") | M20 (3/4") |
|---|---|---|---|---|---|---|---|---|
| $h_{ef}$ | [mm] | 25 | 30 | 30 | 40 | 50 | 65 | 80 |
| $c_{min}$ | [mm] | 25 | 30 | 30 | 40 | 50 | 65 | 80 |
| $V^0_{Rd,c}$ | [kN] | 1.6 | 2.4 | 2.6 | 4.0 | 6.4 | 10.6 | 16.2 |

*The design concrete edge shear resistance is derived from $V^0_{Rd,c} = V^0_{Rk,c} / \gamma_{Mc,V}$ where the partial safety factor is 1.5. The recommended load is derived from $V^0_{Rec,c} = V^0_{Rd,c} / \gamma_F$ where the partial safety factor is 1.4.*

## CONCRETE PRY-OUT RESISTANCE [$V_{Rd,cp}$]

- For non-cracked concrete.
- Only a single anchor is considered.
- No anchor spacing and edge distance influences.
- Single embedded depth is used for loading tabulation.
- Concrete compressive strength C20/25 ($f_{ck,cube}$ = 25 N/mm²).
- Loading applicable to both carbon steel and stainless steel anchor.




| ANCHOR SIZE | | M6 (1/4") | M8 (5/16") | M10 (3/8") | | M12 (1/2") | M16 (5/8") | M20 (3/4") |
|---|---|---|---|---|---|---|---|---|
| $h_{ef}$ | [mm] | 25 | 30 | 30 | 40 | 50 | 65 | 80 |
| $V^0_{Rd,cp}$ | [kN] | 3.5 | 4.7 | 4.7 | 7.2 | 10.0 | 42.0 | 48.6 |

*The design concrete pry-out resistance is derived from $V^0_{Rd,cp} = V^0_{Rk,cp} / \gamma_{Mp,v}$ where the partial safety factor is 1.5. The recommended load is derived from $V^0_{Rec,cp} = V^0_{Rd,cp} / \gamma_F$ where the partial safety factor is 1.4.*

## COMBINED TENSION & SHEAR

Combined Tension & Shear: $\frac{N_{Sd}}{N_{Rd}} + \frac{V_{Sd}}{V_{Rd}} \leq 1.2$

The resultant force must be satisfied with the above conditions. The designer must cross check the loading conditions, types of applied loads and substrate to ensure the recommended anchor is applicable to the actual site applications. This would avoid any design faults which commonly caused by inconclusive load requirements with respective to actual site conditions.

# INFLUENCING FACTORS - TENSION

## INFLUENCE OF CONCRETE STRENGTH ON PULL-OUT AND CONCRETE CONE RESISTANCE [$\Psi_{\beta,N}$]

$$\Psi_{\beta,N} = \sqrt{\frac{f_{ck,cube}}{25}}$$

Limits: 25 MPa $\leq f_{ck,cube} \leq$ 60 MPa

| Concrete Strength Designation (ENV 206) | | C 20/25 | C 25/30 | C 30/37 | C 35/45 | C 40/50 | C 50/60 |
|---|---|---|---|---|---|---|---|
| Concrete Cylinder Strength, $f_{ck,cyl}$ | [MPa] | 20 | 25 | 30 | 35 | 40 | 50 |
| Concrete Cube Strength, $f_{ck,cube}$ | [MPa] | 25 | 30 | 37 | 45 | 50 | 60 |
| Concrete Strength Factor, $\Psi_{\beta,N}$ | | 1.00 | 1.10 | 1.22 | 1.34 | 1.41 | 1.55 |

## INFLUENCE OF ANCHOR SPACING [$\psi_{s,N}$]

| Anchor Spacing 's' [mm] | M6 (1/4") | M8 (5/16") | M10 (3/8") | M12 (1/2") | M16 (5/8") | M20 (3/4") |
|---|---|---|---|---|---|---|
| 25 | 0.67 | | | | | |
| 30 | 0.70 | 0.67 | | | | |
| 40 | 0.77 | 0.72 | 0.67 | | | |
| 50 | 0.83 | 0.78 | 0.71 | 0.67 | | |
| 65 | 0.93 | 0.86 | 0.77 | 0.72 | 0.67 | |
| 75 | 1.00 | 0.92 | 0.81 | 0.75 | 0.69 | |
| 80 | | 0.94 | 0.83 | 0.77 | 0.71 | 0.67 |
| 90 | | 1.00 | 0.88 | 0.80 | 0.73 | 0.69 |
| 120 | | | 1.00 | 0.90 | 0.81 | 0.75 |
| 150 | | | | 1.00 | 0.88 | 0.81 |
| 195 | | | | | 1.00 | 0.91 |
| 240 | | | | | | 1.00 |
| Critical Spacing '$s_{cr}$' [mm] | 75 | 90 | 120 | 150 | 195 | 240 |
| Minimum Spacing '$s_{min}$' [mm] | 25 | 30 | 40 | 50 | 65 | 80 |

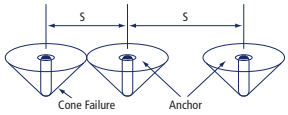
**Note: M10 x 30mm may refer to M8 influencing factor of anchor spacing.*

$$\Psi_{s,N} = 0.5 + \frac{s}{6 * h_{ef}}$$

Limits: $s_{min} \leq s \leq s_{cr}$

$s_{min} = 1.0 * h_{ef}$

$s_{cr} = 3.0 * h_{ef}$




## INFLUENCE OF EDGE DISTANCE [$\psi_{c,N}$]

| Edge Distance 'c' [mm] | M6 (1/4") | M8 (5/16") | M10 (3/8") | M12 (1/2") | M16 (5/8") | M20 (3/4") |
|---|---|---|---|---|---|---|
| 25 | 0.76 | | | | | |
| 30 | 0.85 | 0.76 | | | | |
| 38 | 1.00 | 0.89 | | | | |
| 40 | | 0.92 | 0.76 | | | |
| 45 | | 1.00 | 0.82 | | | |
| 50 | | | 0.88 | 0.76 | | |
| 60 | | | 1.00 | 0.85 | | |
| 65 | | | | 0.90 | 0.76 | |
| 75 | | | | 1.00 | 0.83 | |
| 80 | | | | | 0.87 | 0.76 |
| 98 | | | | | 1.00 | 0.87 |
| 120 | | | | | | 1.00 |
| Critical Edge Distance '$c_{cr}$' [mm] | 38 | 45 | 60 | 75 | 98 | 120 |
| Minimum Edge Distance '$c_{min}$' [mm] | 25 | 30 | 40 | 50 | 65 | 80 |

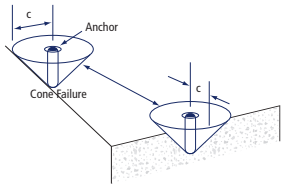
**Note: M10 x 30mm may refer to M8 influencing factor of edge distance.*

$$\Psi_{c,N} = 0.29 + 0.47 * \frac{c}{h_{ef}}$$

Limits: $c_{min} \leq c \leq c_{cr}$

$c_{min} = 1.0 * h_{ef}$

$c_{cr} = 1.5 * h_{ef}$



# INFLUENCING FACTORS - SHEAR

## INFLUENCE OF CONCRETE STRENGTH ON CONCRETE EDGE SHEAR AND CONCRETE PRY-OUT RESISTANCE [$\Psi_{\beta,V}$]

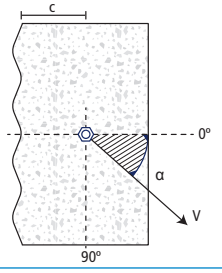
$$\Psi_{\beta,V} = \sqrt{\frac{f_{ck,cube}}{25}}$$

Limits: 25 MPa $\leq f_{ck,cube} \leq$ 60 MPa

| Concrete Strength Designation (ENV 206) | | C 20/25 | C 25/30 | C 30/37 | C 35/45 | C 40/50 | C 50/60 |
|---|---|---|---|---|---|---|---|
| Concrete Cylinder Strength, $f_{ck,cyl}$ | [MPa] | 20 | 25 | 30 | 35 | 40 | 50 |
| Concrete Cube Strength, $f_{ck,cube}$ | [MPa] | 25 | 30 | 37 | 45 | 50 | 60 |
| Concrete Strength Factor, $\Psi_{\beta,V}$ | | 1.00 | 1.10 | 1.22 | 1.34 | 1.41 | 1.55 |

## INFLUENCE OF SHEAR LOAD DIRECTION [$\Psi_{\alpha,V}$]

| Load Type | Angle, α [°] | $\Psi_{\alpha,V}$ |
|---|---|---|
| Oblique 0° | 0° < α ≤ 15° | 1.00 |
| Oblique 30° | 15° < α ≤ 37.5° | 1.14 |
| Oblique 45° | 37.5° < α ≤ 52.5° | 1.35 |
| Oblique 60° | 52.5° < α ≤ 67.5° | 1.71 |
| Oblique 90° | 67.5° < α ≤ 90° | 2.00 |

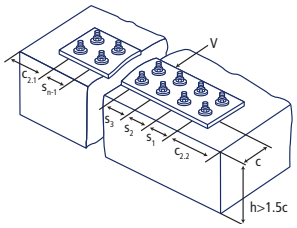



## INFLUENCE OF ANCHOR SPACING AND EDGE DISTANCE ON CONCRETE EDGE SHEAR RESISTANCE [$\Psi_{sc,V}$]

$$\Psi_{sc,V} = \frac{c}{c_{min}} * \sqrt{\frac{c}{c_{min}}}$$ for single anchor towards a concrete edge

$$\Psi_{sc,V} = \frac{3c + s}{6c_{min}} * \sqrt{\frac{c}{c_{min}}}$$ for two anchors when $s \leq 3c$

$$\Psi_{sc,V} = \frac{3c + s_1 + s_2 + s_{n-1}}{3nc_{min}} * \sqrt{\frac{c}{c_{min}}}$$ for multiple anchors when $s_1$ to $s_{n-1} \leq 3c$ and $c_2 \geq 1.5c$




| $\Psi_{sc,V}$ | | c / $c_{min}$ | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1.0 | 1.2 | 1.4 | 1.6 | 1.8 | 2.0 | 2.2 | 2.4 | 2.6 | 2.8 | 3.0 | 3.2 | 3.4 | 3.6 | 3.8 | 4.0 |
| Edge influence with single anchor | | 1.00 | 1.31 | 1.66 | 2.02 | 2.41 | 2.83 | 3.26 | 3.72 | 4.19 | 4.69 | 5.20 | 5.72 | 6.27 | 6.83 | 7.41 | 8.00 |
| s / $c_{min}$ | 1.0 | 0.67 | 0.84 | 1.03 | 1.22 | 1.43 | 1.65 | 1.88 | 2.12 | 2.36 | 2.62 | 2.89 | 3.16 | 3.44 | 3.73 | 4.03 | 4.33 |
| | 1.5 | 0.75 | 0.93 | 1.12 | 1.33 | 1.54 | 1.77 | 2.00 | 2.25 | 2.50 | 2.76 | 3.03 | 3.31 | 3.60 | 3.89 | 4.19 | 4.50 |
| | 2.0 | 0.83 | 1.02 | 1.22 | 1.43 | 1.65 | 1.89 | 2.13 | 2.38 | 2.63 | 2.90 | 3.18 | 3.46 | 3.75 | 4.05 | 4.35 | 4.67 |
| | 2.5 | 0.92 | 1.11 | 1.32 | 1.54 | 1.77 | 2.00 | 2.25 | 2.50 | 2.77 | 3.04 | 3.32 | 3.61 | 3.90 | 4.21 | 4.52 | 4.83 |
| | 3.0 | 1.00 | 1.20 | 1.42 | 1.64 | 1.88 | 2.12 | 2.37 | 2.63 | 2.90 | 3.18 | 3.46 | 3.76 | 4.06 | 4.36 | 4.68 | 5.00 |
| | 3.5 | | 1.30 | 1.52 | 1.75 | 1.99 | 2.24 | 2.50 | 2.76 | 3.04 | 3.32 | 3.61 | 3.91 | 4.21 | 4.52 | 4.84 | 5.17 |
| | 4.0 | | | 1.62 | 1.86 | 2.10 | 2.36 | 2.62 | 2.89 | 3.17 | 3.46 | 3.75 | 4.05 | 4.36 | 4.68 | 5.00 | 5.33 |
| | 4.5 | | | | 1.96 | 2.21 | 2.47 | 2.74 | 3.02 | 3.31 | 3.60 | 3.90 | 4.20 | 4.52 | 4.84 | 5.17 | 5.50 |
| | 5.0 | | | | | 2.33 | 2.59 | 2.87 | 3.15 | 3.44 | 3.74 | 4.04 | 4.35 | 4.67 | 5.00 | 5.33 | 5.67 |
| | 5.5 | | | | | | 2.71 | 2.99 | 3.28 | 3.57 | 3.88 | 4.19 | 4.50 | 4.82 | 5.15 | 5.49 | 5.83 |
| | 6.0 | | | | | | 2.83 | 3.11 | 3.41 | 3.71 | 4.02 | 4.33 | 4.65 | 4.98 | 5.31 | 5.65 | 6.00 |
| | 6.5 | | | | | | | 3.24 | 3.53 | 3.84 | 4.16 | 4.47 | 4.80 | 5.13 | 5.47 | 5.82 | 6.17 |
| | 7.0 | | | | | | | | 3.67 | 3.98 | 4.29 | 4.62 | 4.95 | 5.29 | 5.63 | 5.98 | 6.33 |
| | 7.5 | | | | | | | | | 4.11 | 4.43 | 4.76 | 5.10 | 5.44 | 5.79 | 6.14 | 6.50 |
| | 8.0 | | | | | | | | | | 4.57 | 4.91 | 5.25 | 5.59 | 5.95 | 6.30 | 6.67 |
| | 8.5 | | | | | | | | | | | 5.05 | 5.40 | 5.75 | 6.10 | 6.47 | 6.83 |
| | 9.0 | | | | | | | | | | | 5.20 | 5.55 | 5.90 | 6.26 | 6.63 | 7.00 |
| | 9.5 | | | | | | | | | | | | 5.69 | 6.05 | 6.42 | 6.79 | 7.17 |
| | 10.0 | | | | | | | | | | | | | 6.21 | 6.58 | 6.95 | 7.33 |
| | 10.5 | | | | | | | | | | | | | | 6.74 | 7.12 | 7.50 |
| | 11.0 | | | | | | | | | | | | | | | 7.28 | 7.67 |
| | 11.5 | | | | | | | | | | | | | | | | 7.83 |
| | 12.0 | | | | | | | | | | | | | | | | 8.00 |