

SECTION 8 - FLEXURAL MEMBERS (BEAMS)

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SECTION 8

FLEXURAL MEMBERS (BEAMS)



Look for this blue line in the left margin of the Design Manual documents. This line shows you where the latest update has been made.

SYMBOLS FOR FLEXURAL MEMBERS (BEAMS)

| | |
|------------------------------------|--|
| A_w | Cross-sectional area of web or webs (mm ²) |
| B | Derived constant for use in Eq. B-5 |
| C₁ | Lateral buckling coefficient from Table B-1 |
| E | Modulus of Elasticity about X-X or Y-Y axis (N/mm ²) |
| F_b | Allowable flexural stress (N/mm ²) |
| F_b' | Allowable flexural stress-laterally unsupported beams (N/mm ²) |
| F_u | Ultimate flexural stress-laterally supported beams (N/mm ²) |
| F_u' | Ultimate flexural stress-laterally unsupported beams (N/mm ²) |
| F_v | Allowable shear stress (N/mm ²) |
| G | Shear modulus (N/mm ²) |
| I_x I_y | Moment of inertia about X-X or Y-Y axis (mm ⁴) |
| J | Torsional constant (mm ⁴) |
| K_x K_y | Effective length factor for buckling about X-X or Y-Y axis |
| K_b | Coefficient for flexural deflection |
| K_v | Coefficient for shear deflection |
| L | Length of beam (center to center of supports) (m) |
| L_u | Unbraced length of beam (center to center of lateral braces) (m) |
| M | Bending moment from applied loads (N-m) |
| N | Derived constant for use in Eq. B-5 |
| P | Concentrated load on beam (N) |
| S_x | Section Modulus about X-X axis (mm ³) |
| V | Shear from applied load (N) |
| W | Uniform beam load (N/m) |
| Wt | Weight of section (N) |
| b | Outside dimension of square tube (mm) |
| b_f | Width of flange (mm) |
| d | Full depth of section (mm) |
| f_b | Flexural stress from applied loads (N/mm ²) |
| f_v | Shear stress from applied loads (N/mm ²) |
| l | Length of beam (center to center of supports) (mm) |
| l_u | Unbraced length of beam (center to center of lateral braces) (mm) |
| t | Thickness of section (mm) |
| | Wall thickness of tubes (mm) |
| t_f | Thickness of flange (mm) |
| w | Uniform beam load (N/mm) |
| Δ | Deflection (mm) |

INTRODUCTION

The load carrying capability of **EXTREN**[®] beams may be limited by considerations of strength, stability or deflection. The strength capacity is characterized by an allowable working stress; the stability of the beam is characterized by its resistance to twisting or buckling laterally; and the deflection of the beam is usually limited by architectural or functional requirements.

STRENGTH

For beams sufficiently supported laterally to prevent lateral buckling, beam selection for a given work load will depend upon the flexural stress f_b , the shear stress f_v , or the amount of deflection resulting from the load.

The allowable flexural stress, F_b for W and I shapes, is usually governed by local buckling of the outstanding flange. Equation B-3, developed from extensive product testing, provides values for the ultimate flexural stress F_u , for open shapes. The ALLOWABLE LOAD tables are generated with a **factor of safety of 2.5**. Loads controlled by bending stresses are indicated with asterisks (*). At points of concentrated loads and at supports, it may be necessary to insert stiffeners between the flanges of open structural shapes. If stiffeners are **not provided**, the compression flange of the beam will buckle at a lower stress than that predicted by Equation B-3. The designer is referred to *Structural Plastics Design Manual* — Reference 2 for further information relative to the flange buckling and web crippling effects.

Loads on beams of relatively short span may be limited to the allowable shear stress, F_v . For **EXTREN**[®] 500, 525 and 625 beams, $F_v = 10.342 \text{ N/mm}^2$. The ALLOWABLE LOAD tables designate which loads are limited by shear stress. This represents a **factor of safety of 3.0** against the ultimate short beam shear stress as listed in Section 3 — **PROPERTIES OF EXTREN**[®].

STABILITY

A beam which is not restrained laterally may deflect and/or twist out of the plane of the load at considerably less load than the same member would carry with adequate lateral support. The degree of lateral support for some beams may be obvious in many cases. In some cases, however, it is difficult to accurately assess the restraint to lateral displacement of a beam provided by adjacent members of bracing. Generally, if the compression flange of a beam is attached at frequent points along its length to a floor or roof system, it may be considered to be laterally supported (this section contains a more complete discussion of lateral bracing).

The ALLOWABLE LOAD tables list the uniformly distributed loads (in pounds per foot) at the given unsupported lengths. Generally, the W shapes and rectangular shapes will carry the same load whether laterally supported or unsupported. I shapes will carry reduced loads if laterally unsupported. Equation B-6 can be used to determine the allowable flexural stress for laterally unsupported open symmetrical shapes.

It is strongly recommended that only **EXTREN**[®] beams with geometrical symmetry in the plane of the load be used in a laterally unsupported condition. Before nonsymmetrical shapes are used, the designer should consult *Steel Structures* — Reference 1 or *Structural Plastics Design Manual* — Reference 2.

DEFLECTION

The deflection of **EXTREN**[®] beams results from both flexural and shear stresses. In long beams, deflections are primarily due to flexural stresses, but in short beams, the shear stresses may account for a significant portion of the total deflection. For typical applications of **EXTREN**[®] products as beams, Equations B-13 & B-14 will predict the deflections of **EXTREN**[®] beams to acceptable values. For unusual applications in which beam deflections are a critical factor, the designer is referred to *Mechanics of Materials* — Reference 7 or any contemporary mechanics book.

The load tables at the end of this section were based on the LIMITING stress for the particular structural shape, span and deflection requirements. **The designer is CAUTIONED that when the equations are used in lieu of the tables, one should confirm the lateral support characteristics of a beam.**

**BEAM EQUATIONS FOR LOADS APPLIED
IN THE PLANE OF THE WEB**

STRESSES FROM APPLIED LOADS

Flexural stress:

$$f_b = \frac{M}{S_x} \tag{B-1}$$

Shear stress:

$$f_v = \frac{V}{A_w} \tag{B-2}$$

ULTIMATE AND ALLOWABLE FLEXURAL STRESSES

Laterally Supported EXTREN® W & I Shapes

$$\text{Ultimate: } F_u = \frac{.5E}{(b_f / t_f)^{1.5}} \leq \begin{cases} 206.8 \text{ N/mm}^2 \text{ (EXTREN® 500/525)} \\ 206.8 \text{ N/mm}^2 \text{ (EXTREN® 625 > 101.6 mm)} \\ 227.5 \text{ N/mm}^2 \text{ (EXTREN® 625 } \leq 101.6 \text{ mm)} \end{cases} \tag{B-3}$$

$$\text{Allowable: } F_b = \frac{F_u}{2.5} \tag{B-4}$$

Laterally Unsupported EXTREN® W & I Shapes

$$\text{Ultimate: } F_u' = \frac{C_1}{S_x} \sqrt{N^2 + \frac{d^2 B^2}{4}} \leq F_u \tag{B-5}$$

$$\text{Where: } N = \frac{\pi}{K_y l_u} \sqrt{E I_y GJ}$$

$$\text{And: } B = \frac{\pi^2 E I_y}{(K_y l_u)^2}$$

$$\text{Allowable: } F_b' = \frac{F_u'}{2.5} \tag{B-6}$$

K_y and C_1 are taken from Table B-1 and reflect the beam end conditions in the Y-Y Axis and loading on the beam.

Laterally Supported or Laterally Unsupported EXTREN® Square and Rectangular Tubing:

$$\text{Ultimate: } F_u = \frac{E}{16(b/t)^{0.85}} \leq \begin{cases} 206.8 \text{ N/mm}^2 \text{ (EXTREN® 500/525)} \\ 227.5 \text{ N/mm}^2 \text{ (EXTREN® 625)} \end{cases} \tag{B-7}$$

$$\text{Allowable: } F_b = \frac{F_u}{2.5} \tag{B-8}$$

**BEAM EQUATIONS FOR LOADS APPLIED
IN THE PLANE OF THE WEB**

Laterally Supported EXTREN® Channels

$$\text{Ultimate: } F_u = \leq \frac{E}{27(b_f/t_f)^{95}} \begin{cases} 206.8 \text{ N/mm}^2 \text{ (EXTREN® 500 \& 525)} \\ 227.5 \text{ N/mm}^2 \text{ (EXTREN® 625)} \end{cases} \quad (\text{B-9})$$

$$\text{Allowable: } F_b = \frac{F_u}{2.5} \quad (\text{B-10})$$

It must be stressed that a non-symmetrical shape such as a channel should only be used when the flanges are adequately laterally supported. Current industry experience has shown that satisfactory performance from channels has been achieved when the compression flange was laterally supported with connecting members at the following spacings:

- 600 mm maximum for 76 mm and 102 mm channels
- 900 mm maximum for 127 mm and 152 mm channels
- 1200 mm maximum for 203 mm channels and larger

ALLOWABLE SHEAR STRESSES

EXTREN® structural shapes:

$$F_v = \frac{31.0 \text{ N/mm}^2}{3.0} = 10.3 \text{ N/mm}^2 \quad (\text{B-11})$$

EXTREN® large rectangular shapes:

$$F_v = \frac{27.6 \text{ N/mm}^2}{3.0} = 9.2 \text{ N/mm}^2 \quad (\text{B-12})$$

DEFLECTIONS

EXTREN® structural shapes with uniform loads, w :

$$\Delta = K_b \frac{wl^4}{EI_x} + K_v \frac{wl^2}{A_w G} \quad (\text{B-13})$$

EXTREN® structural shapes with concentrated loads, P :

$$\Delta = K_b \frac{Pl^3}{EI_x} + K_v \frac{Pl}{A_w G} \quad (\text{B-14})$$

K_b is taken from Table B-2 and reflects the beam end conditions.

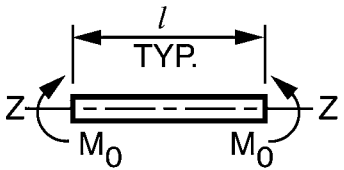
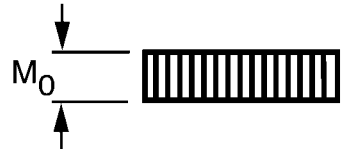
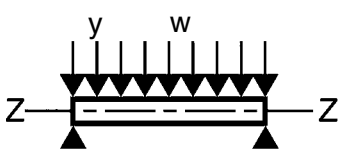
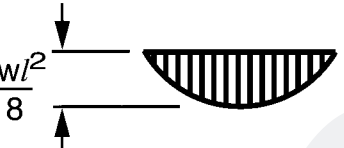
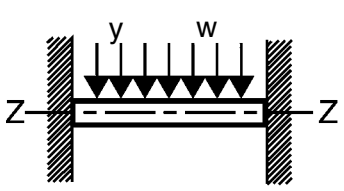

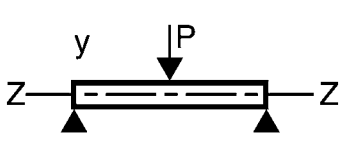

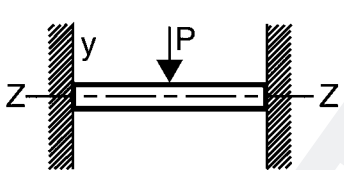
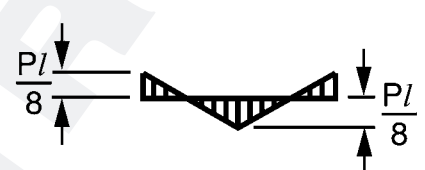
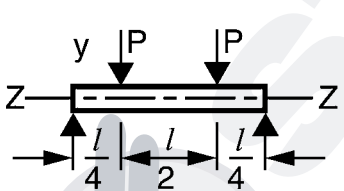
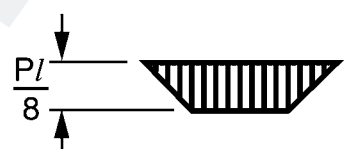
$K_v = 0.35$. This value actually varies slightly depending on load distribution, end constraints and Poisson's Ratio, but the given value will be adequate for most cases with supports at both ends of the beam.

$K_v = 1.2$ for cantilever beams.

For additional information, see *Mechanics of Materials* by Timoshenko & Gere.

TABLE B-1

**LATERAL BUCKLING COEFFICIENTS FOR BEAMS WITH VARIOUS
LOAD AND SUPPORT ARRANGEMENTS**

| Loading and end restraint * about X-axis | Bending Moment diagram | End Restraint about Y-axis | K_y | C_1^* |
|---|---|----------------------------|------------|------------------|
|  |  | None | 1.0 | 1.0 |
|  |  | None Full | 1.0 0.5 | 1.13 0.97 |
|  |  | None Full | 1.0 0.5 | 1.30** 0.86** |
|  |  | None Full | 1.0 0.5 | 1.35 1.07 |
|  |  | None Full | 1.0 0.5 | 1.70 1.04 |
|  |  | None | 1.0 | 1.04 |

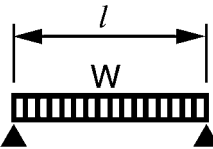
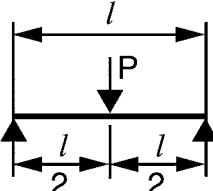
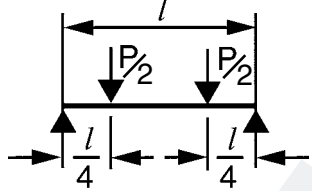
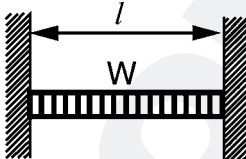
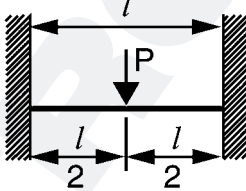
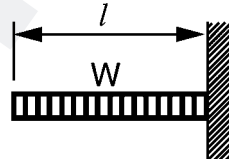
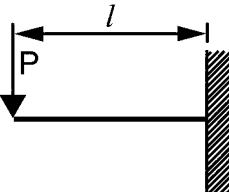
* All beams are restrained at each end against rotation about the X-axis and displacement in the Y and Z directions. Loads applied at beam centroidal axis.

** Critical Stress based on center moment ($w^2/24$).

Table taken from *Structural Plastics Design Manual* - Reference 2.

TABLE B-2

COEFFICIENTS K_b - FOR FLEXURAL DEFLECTION

| END SUPPORT | TYPE OF LOADING | DEFLECTION AT: | K_b |
|-------------------------------|---|-------------------------|----------------|
| Simple Support @ Both Ends |  | Midspan | 0.013 |
| |  | Midspan | 0.021 |
| |  | Midspan Quarter Pts. | 0.029 0.021 |
| Fixed Support @ Both Ends |  | Midspan | 0.003 |
| |  | Midspan | 0.005 |
| Cantilever |  | Free End | 0.125 |
| |  | Free End | 0.333 |

EXAMPLES OF BEAM SELECTION USING THE TABLES

PROBLEM #1

Select an **EXTREN®** 525 W-shape for a clear span of 5.5 m, capable of supporting 3600 N/m (including beam weight) with a maximum deflection not to exceed $l/150$. The beam is laterally supported and is simply supported at each end.

From the applicable ALLOWABLE LOAD table shown in this section, it can be seen that a 254 mm x 254 mm x 9.53 mm W-shape will support a load of 3679 N/m (which is greater than 3600 N/m required) and produce a maximum deflection of $l/150$.

◆ Use a 254 mm x 254 mm x 9.53 mm EXTREN® 525 W-Shape

PROBLEM #2

An **EXTREN®** 625 I-shape must be used to carry 22000 N/m of load over a clear span of 2 m and not produce a deflection greater than $l/150$. Again, the beam will be laterally supported and is simply supported.

From the applicable table shown in this section, a 254 mm x 127 mm x 9.53 mm I-shape, for a 2 m span, lists no value. This indicates that the load required to produce a deflection of $l/150$ is theoretically greater than the maximum allowable uniform load, in this case 23059 N/m, shown to be controlled by F_v (shear). Therefore, the I-shape will support 22000 N/m load and meet the deflection criteria. (From Eq. B-13, it can be shown that the maximum deflection is about 10mm which is an $l/200$ ratio.)

◆ Use a 254 mm x 127 mm x 9.53 mm EXTREN® 625 I Shape

PROBLEM #3

A laterally unsupported **EXTREN®** 525 W-shape, spanning 3 m, is required to carry 3600 N/m of load. Deflection must be kept to a maximum of $l/360$ for architectural reasons. Choose a W-shape adequate for this application. The beam will be simply supported.

Although the applicable table shows that a 152.4 mm x 152.4 mm x 9.53 mm W-shape will support 4111 N/m for a 3 m laterally unsupported span, the deflection column shows that a 1847 N/m load will produce a deflection of $l/360$. A 203.2 mm x 203.2 mm x 9.53 mm W-shape in the laterally unsupported condition will support a load of 11206 N/m and requires a 3978 N/m load (greater than 3600 N/m service load) to produce a deflection of $l/360$.

◆ Use an 203.2 mm x 203.2 mm x 9.53 mm EXTREN® 525 W-Shape

PROBLEM #4

A simply supported **EXTREN®** 625 W-shape, spanning 6 m, is required to carry 1900 N/m, including beam weight. The beam will be laterally supported only at the ends and at the middle. What W-shape will work if the maximum deflection allowed is $l/100$?

The allowable load table for the 203.2 mm x 203.2 mm x 9.53 mm W-shape shows that a laterally supported beam, 6 m long, is capable of carrying 2293 N/m and meet the deflection criteria. The beam is laterally supported at 3m. Therefore, the actual flexural stress F_b' must be checked against the allowable flexural stress, F_b' at $L_u = 3$ m.

From TABLE B-1

$$M = \frac{wl^2}{8} = \frac{(1.9 \text{ N/mm})(6,000 \text{ mm})^2}{8} = 8,550,000 \text{ N-mm}$$

Therefore, $f_b = 8,550,000 \text{ N-mm}/S_x = 8,550,000 \text{ N-mm}/406,000 \text{ mm}^3 = 21 \text{ N/mm}^2$ (Eq. B-1)

From the ALLOWABLE LOAD table, the allowable stress for the 203.2 mm x 203.2 mm x 9.53 mm W-shape when laterally unsupported at 3 m is 31.1 N/mm². Since 31.1 N/mm² allowable > 21 N/mm² actual, the W-shape is adequate.

Using the equations, the procedure yields the same results, but is slightly more involved!

Using Eq. B-5: $F_u' = \frac{C_1}{S_x} \sqrt{N^2 + \frac{d^2 B^2}{4}} < F_u$

with $E = 17,200 \text{ N/mm}^2$, $G = 2.93 \times 10^3 \text{ N/mm}^2$ (Section 3—**PROPERTIES OF EXTREN®**)
 $d = 203 \text{ mm}$, $S_x = 406,000 \text{ mm}^3$, $I_y = 13.3 \text{ mm}^4 \times 10^6$, $J = .170 \text{ mm}^4 \times 10^6$ (Section 6—**ELEMENTS OF SECTIONS**)

$K_y = 1.0$, $C_1 = 1.13$ (TABLE B-1)

$$B = \frac{\pi^2 E I_y}{(K_y l_u)^2} = \frac{\pi^2 (17,200 \text{ N/mm}^2)(13.3 \text{ mm}^4 \times 10^6)}{1.0(3,000 \text{ mm})^2} = 250,863 \text{ N}$$

and

$$\begin{aligned} N &= \frac{\pi}{K_y l_u} \sqrt{E I_y G J} \\ &= \frac{\pi}{1.0 \times (3,000 \text{ mm})} \sqrt{(17,200 \text{ N/mm}^2)(13.3 \text{ mm}^4 \times 10^6)(2.93 \times 10^3 \text{ N/mm}^2)(.170 \text{ mm}^4 \times 10^6)} \\ &= 11,178,330 \text{ N-mm} \end{aligned}$$

Therefore:

$$F_u' = \frac{1.13}{406,000} \sqrt{(11,178,330 \text{ N-mm})^2 + \frac{(203)^2 \times (250,863)^2}{4}} = 70.9 \text{ N/mm}^2$$

and from Eq. B-6: $F_b' = \frac{F_u'}{2.5} = \frac{70.9 \text{ N/mm}^2}{2.5} = 28.4 \text{ N/mm}^2$

Again, since 28.4 N/mm² allowable > 21 N/mm² actual, the 203.2 mm x 203.2 mm x 9.53 mm W-shape is adequate.

◆ Use an 203.2 mm x 203.2 mm x 9.53 mm EXTREN® 625 W-Shape

INTRODUCTION TO FLEXURAL MEMBER (BEAM) LOAD TABLES

The following are the allowable load tables for **EXTREN**[®] W and I shapes, **EXTREN**[®] channels, and **EXTREN**[®] square, rectangular and large rectangular tubes when used as flexural members (beams).

These allowable load tables are based upon:

1. Ambient temperature
2. A safety factor of 2.5 for flexural stresses
3. A safety factor of 3.0 for shear stresses
4. Beams uniformly loaded in the plane of their webs and simply supported at each end.

Controlling values for the **LATERALLY SUPPORTED** condition governed by stress are limited by flexural stress, F_b , when preceded with an asterisk (*) or limited by shear stress, F_v , without an asterisk.

For W and I shapes, the **LATERALLY UNSUPPORTED** allowable uniform load value is generated using the controlling allowable stress as predicted by Eq. B-6 or B-4 and B-11.

The **LATERALLY UNSUPPORTED** stresses listed are the allowable stresses for the respective length as predicted by Eq. B-6. The use of this column to the designer is illustrated in Example Problem #4.

NOTE: All load table data is based on single (simple) span calculations. The effect on strength of notches, copes or other stress concentrations must be considered.



BEAMS

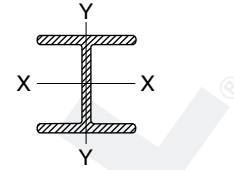
W-SHAPES — EXTREN® 500 & 525
E = 17,900 N/mm²
Allowable Uniform Loads in Newtons Per Meter

| SPAN IN METERS | | | LATERALLY UNSUPPORTED | | LATERALLY SUPPORTED--GOVERNED BY: | | | | | |
|----------------------------------|-------------------------|------|--|--|--|------------|-------|-------|-------|-------|
| | | | F _b ' (N/ mm ²) | (Using F _b , F _b ' or F _v) W | Stress *F _b or F _v | Deflection | | | | |
| | | | | | | l/100 | l/150 | l/180 | l/240 | l/360 |
| 76.2 x 76.2 x 6.35 mm | | | | | | | | | | |
| Wt/m. = | 2.51 kg/m | 1 | 49.1 | 8,373 | 8,373 | — | 7,820 | 6,516 | 4,887 | 3,258 |
| b _f /t _f = | 12.0 | 1.25 | 34.0 | 6,100 | 6,698 | — | 4,571 | 3,809 | 2,857 | 1,905 |
| F _b = | 82.7 N/mm ² | 1.5 | 25.7 | 3,196 | 5,582 | 4,299 | 2,866 | 2,388 | 1,791 | 1,194 |
| A _w = | 406 mm ² | 1.75 | 20.5 | 1,875 | 4,785 | 2,850 | 1,900 | 1,584 | 1,188 | 792 |
| I _x = | 1300000 mm ⁴ | 2 | 17.0 | 1,192 | 4,186 | 1,977 | 1,318 | 1,099 | 824 | 549 |
| S _x = | 35000 mm ³ | 2.25 | 14.6 | 805 | 3,721 | 1,424 | 949 | 791 | 593 | 395 |
| I _y = | 470000 mm ⁴ | 2.5 | 12.7 | 569 | 3,349 | 1,057 | 704 | 587 | 440 | 294 |
| J = | 18300 mm ⁴ | 2.75 | 11.3 | 418 | 3,045 | 805 | 536 | 447 | 335 | 224 |
| 101.6 x 101.6 x 6.35 mm | | | | | | | | | | |
| Wt/m. = | 3.30 kg/m | 1 | 56.0 | 11,695 | 11,695 | — | — | — | 9,679 | 6,453 |
| b _f /t _f = | 16.0 | 1.25 | 49.1 | 9,356 | 9,356 | — | — | 8,018 | 6,014 | 4,009 |
| F _b = | 56.0 N/mm ² | 1.5 | 35.4 | 7,797 | 7,797 | — | 6,299 | 5,249 | 3,937 | 2,625 |
| A _w = | 568 mm ² | 1.75 | 27.2 | 4,614 | 6,683 | 6,461 | 4,308 | 3,590 | 2,692 | 1,795 |
| I _x = | 3300000 mm ⁴ | 2 | 21.8 | 2,829 | 5,848 | 4,584 | 3,056 | 2,547 | 1,910 | 1,273 |
| S _x = | 65000 mm ³ | 2.25 | 18.0 | 1,850 | 5,198 | 3,355 | 2,237 | 1,864 | 1,398 | 932 |
| I _y = | 1110000 mm ⁴ | 2.5 | 15.3 | 1,273 | *4,659 | 2,522 | 1,681 | 1,401 | 1,051 | 701 |
| J = | 25000 mm ⁴ | 2.75 | 13.3 | 912 | *3,851 | 1,940 | 1,293 | 1,078 | 808 | 539 |
| | | 3 | 11.7 | 675 | *3,236 | 1,521 | 1,014 | 845 | 634 | 423 |
| | | 3.25 | 10.4 | 513 | *2,757 | 1,214 | 809 | 674 | 506 | 337 |
| | | 3.5 | 9.4 | 400 | *2,377 | 983 | 655 | 546 | 410 | 273 |

BEAMS

W-SHAPES — EXTREN® 625
E = 19,300 N/mm²

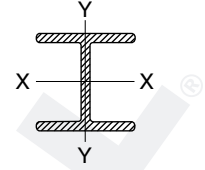
Allowable Uniform Loads in Newtons Per Meter



| SPAN IN METERS | LATERALLY UNSUPPORTED | | LATERALLY SUPPORTED--GOVERNED BY: | | | | | | |
|---------------------------------|--------------------------------|------------------------------------|-----------------------------------|------------|---------|---------|---------|---------|-------|
| | F_b' (N/mm ²) | (Using F_b, F_b' or F_v) W | Stress $*F_b$ or F_v | Deflection | | | | | |
| | | | | $l/100$ | $l/150$ | $l/180$ | $l/240$ | $l/360$ | |
| 76.2 x 76.2 x 6.35 mm | | | | | | | | | |
| Wt/m. = 2.51 kg/m | 1 | 52.4 | 8,373 | 8,373 | — | 8,210 | 6,842 | 5,131 | 3,421 |
| $b_f/t_f = 12.0$ | 1.25 | 36.2 | 6,479 | 6,698 | — | 4,833 | 4,028 | 3,021 | 2,014 |
| $F_b = 91.0$ N/mm ² | 1.5 | 27.2 | 3,383 | 5,582 | 4,567 | 3,045 | 2,537 | 1,903 | 1,269 |
| $A_w = 406$ mm ² | 1.75 | 21.6 | 1,979 | 4,785 | 3,038 | 2,026 | 1,688 | 1,266 | 844 |
| $I_x = 1300000$ mm ⁴ | 2 | 17.9 | 1,255 | 4,186 | 2,113 | 1,409 | 1,174 | 880 | 587 |
| $S_x = 35000$ mm ³ | 2.25 | 15.3 | 846 | 3,721 | 1,524 | 1,016 | 846 | 635 | 423 |
| $I_y = 470000$ mm ⁴ | 2.5 | 13.3 | 597 | 3,349 | 1,132 | 755 | 629 | 472 | 315 |
| $J = 18300$ mm ⁴ | 2.75 | 11.8 | 438 | 3,045 | 863 | 576 | 480 | 360 | 240 |
| | 3 | 10.6 | 331 | 2,791 | 672 | 448 | 374 | 280 | 187 |
| 101.6 x 101.6 x 6.35 mm | | | | | | | | | |
| Wt/m. = 3.30 kg/m | 1 | 60.3 | 11,695 | 11,695 | — | — | — | 10,052 | 6,701 |
| $b_f/t_f = 16.0$ | 1.25 | 52.6 | 9,356 | 9,356 | — | — | 8,396 | 6,297 | 4,198 |
| $F_b = 60.3$ N/mm ² | 1.5 | 37.9 | 7,797 | 7,797 | — | 6,637 | 5,531 | 4,148 | 2,765 |
| $A_w = 568$ mm ² | 1.75 | 29.0 | 4,919 | 6,683 | — | 4,560 | 3,800 | 2,850 | 1,900 |
| $I_x = 3300000$ mm ⁴ | 2 | 23.1 | 3,009 | 5,848 | 4,869 | 3,246 | 2,705 | 2,029 | 1,353 |
| $S_x = 65000$ mm ³ | 2.25 | 19.1 | 1,964 | 5,198 | 3,573 | 2,382 | 1,985 | 1,489 | 993 |
| $I_y = 1110000$ mm ⁴ | 2.5 | 16.2 | 1,348 | 4,678 | 2,692 | 1,794 | 1,495 | 1,121 | 748 |
| $J = 25000$ mm ⁴ | 2.75 | 14.0 | 964 | *4,146 | 2,073 | 1,382 | 1,152 | 864 | 576 |
| | 3 | 12.3 | 713 | *3,484 | 1,628 | 1,085 | 904 | 678 | 452 |
| | 3.25 | 11.0 | 541 | *2,969 | 1,300 | 867 | 722 | 542 | 361 |
| | 3.5 | 9.9 | 421 | *2,560 | 1,054 | 703 | 586 | 439 | 293 |

BEAMS

W-SHAPES — EXTREN® 500, 525 & 625
E = 17,200 N/mm²



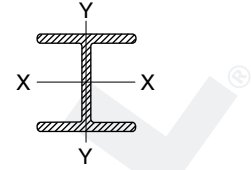
Allowable Uniform Loads in Newtons Per Meter

| SPAN IN METERS | LATERALLY UNSUPPORTED | | LATERALLY SUPPORTED--GOVERNED BY: | | | | | | |
|----------------------------------|--------------------------------|-------------------------------------|-----------------------------------|------------|-------|--------|--------|--------|-------|
| | F_b' (N/mm ²) | (Using F_b', F_b' or F_v) W | Stress $*F_b$ or F_v | Deflection | | | | | |
| | | | | l/100 | l/150 | l/180 | l/240 | l/360 | |
| 152.4 x 152.4 x 6.35 mm | | | | | | | | | |
| Wt/m. = 5.24 kg/m | 1.5 | 29.3 | 12,227 | 12,227 | — | — | — | 9,982 | 6,654 |
| $b_f/t_f = 24.0$ | 1.75 | 29.3 | 10,480 | 10,480 | — | — | 9,610 | 7,208 | 4,805 |
| $F_b = 29.3$ N/mm ² | 2 | 29.3 | 9,083 | *9,083 | — | 8,539 | 7,116 | 5,337 | 3,558 |
| $A_w = 890$ mm ² | 2.25 | 29.3 | 7,177 | *7,177 | — | 6,463 | 5,386 | 4,040 | 2,693 |
| $I_x = 11800000$ mm ⁴ | 2.5 | 24.7 | 4,894 | *5,813 | — | 4,989 | 4,158 | 3,118 | 2,079 |
| $S_x = 155000$ mm ³ | 2.75 | 20.7 | 3,398 | *4,804 | — | 3,919 | 3,266 | 2,449 | 1,633 |
| $I_y = 3750000$ mm ⁴ | 3 | 17.7 | 2,441 | *4,037 | — | 3,127 | 2,606 | 1,954 | 1,303 |
| $J = 37900$ mm ⁴ | 3.25 | 15.4 | 1,804 | *3,440 | — | 2,530 | 2,109 | 1,581 | 1,054 |
| | 3.5 | 13.5 | 1,367 | *2,966 | — | 2,073 | 1,728 | 1,296 | 864 |
| | 3.75 | 12.0 | 1,058 | *2,584 | 2,577 | 1,718 | 1,432 | 1,074 | 716 |
| | 4 | 10.8 | 834 | *2,271 | 2,157 | 1,438 | 1,198 | 899 | 599 |
| | 4.25 | 9.7 | 668 | *2,011 | 1,822 | 1,215 | 1,012 | 759 | 506 |
| | 4.5 | 8.9 | 542 | *1,794 | 1,553 | 1,035 | 863 | 647 | 431 |
| 152.4 x 152.4 x 9.53 mm | | | | | | | | | |
| Wt/m. = 7.63 kg/m | 1.5 | 53.8 | 17,455 | 17,455 | — | — | — | 14,186 | 9,457 |
| $b_f/t_f = 16.0$ | 1.75 | 53.6 | 14,961 | 14,961 | — | — | 13,649 | 10,237 | 6,824 |
| $F_b = 53.8$ N/mm ² | 2 | 42.1 | 13,091 | 13,091 | — | 12,120 | 10,100 | 7,575 | 5,050 |
| $A_w = 1271$ mm ² | 2.25 | 34.2 | 11,636 | 11,636 | — | 9,170 | 7,642 | 5,731 | 3,821 |
| $I_x = 16700000$ mm ⁴ | 2.5 | 28.5 | 8,022 | 10,473 | — | 7,076 | 5,897 | 4,423 | 2,948 |
| $S_x = 220000$ mm ³ | 2.75 | 24.3 | 5,646 | 9,521 | 8,335 | 5,557 | 4,631 | 3,473 | 2,315 |
| $I_y = 5630000$ mm ⁴ | 3 | 21.0 | 4,111 | 8,727 | 6,649 | 4,433 | 3,694 | 2,771 | 1,847 |
| $J = 126100$ mm ⁴ | 3.25 | 18.5 | 3,081 | 8,056 | 5,379 | 3,586 | 2,988 | 2,241 | 1,494 |
| | 3.5 | 16.5 | 2,365 | 7,481 | 4,406 | 2,938 | 2,448 | 1,836 | 1,224 |
| | 3.75 | 14.8 | 1,853 | *6,733 | 3,651 | 2,434 | 2,028 | 1,521 | 1,014 |
| | 4 | 13.4 | 1,478 | *5,918 | 3,056 | 2,037 | 1,698 | 1,273 | 849 |
| | 4.25 | 12.3 | 1,198 | *5,242 | 2,581 | 1,721 | 1,434 | 1,076 | 717 |
| | 4.5 | 11.3 | 984 | *4,676 | 2,199 | 1,466 | 1,222 | 916 | 611 |

BEAMS

W-SHAPES — EXTREN® 500, 525 & 625
E = 17,200 N/mm²

Allowable Uniform Loads in Newtons Per Meter

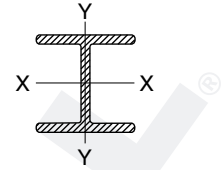


| SPAN IN METERS | LATERALLY UNSUPPORTED | | LATERALLY SUPPORTED--GOVERNED BY: | | | | | | |
|---|--|---|---|------------|--------|--------|--------|--------|--------|
| | F _b ' (N/mm ²) | (Using F _b , F _b ' or F _v) W | Stress *F _b or F _v | Deflection | | | | | |
| | | | | l/100 | l/150 | l/180 | l/240 | l/360 | |
| 203.2 x 203.2 x 9.53 mm | | | | | | | | | |
| Wt/m. = 10.37 kg/m | 2 | 35.0 | 18,075 | 18,075 | — | — | — | 14,747 | 9,831 |
| b _f /t _f = 21.3 | 2.25 | 35.0 | 16,066 | 16,066 | — | — | 15,363 | 11,522 | 7,682 |
| F _b = 35.0 N/mm ² | 2.5 | 35.0 | 14,460 | 14,460 | — | — | 12,180 | 9,135 | 6,090 |
| A _w = 1755 mm ² | 2.75 | 35.0 | 13,145 | 13,145 | — | 11,741 | 9,785 | 7,338 | 4,892 |
| I _x = 41300000 mm ⁴ | 3 | 31.1 | 11,206 | 12,050 | — | 9,547 | 7,955 | 5,967 | 3,978 |
| S _x = 406000 mm ³ | 3.25 | 26.8 | 8,249 | *10,763 | — | 7,848 | 6,540 | 4,905 | 3,270 |
| I _y = 13330000 mm ⁴ | 3.5 | 23.5 | 6,222 | *9,280 | — | 6,518 | 5,431 | 4,073 | 2,716 |
| J = 170200 mm ⁴ | 3.75 | 20.8 | 4,794 | *8,084 | — | 5,463 | 4,552 | 3,414 | 2,276 |
| | 4 | 18.5 | 3,761 | *7,105 | 6,927 | 4,618 | 3,849 | 2,886 | 1,924 |
| | 4.25 | 16.7 | 2,999 | *6,294 | 5,903 | 3,935 | 3,279 | 2,459 | 1,640 |
| | 4.5 | 15.1 | 2,426 | *5,614 | 5,066 | 3,377 | 2,814 | 2,111 | 1,407 |
| | 4.75 | 13.8 | 1,988 | *5,038 | 4,377 | 2,918 | 2,432 | 1,824 | 1,216 |
| | 5 | 12.7 | 1,647 | *4,547 | 3,805 | 2,537 | 2,114 | 1,586 | 1,057 |
| | 5.25 | 11.7 | 1,379 | *4,124 | 3,327 | 2,218 | 1,848 | 1,386 | 924 |
| | 5.5 | 10.9 | 1,166 | *3,758 | 2,925 | 1,950 | 1,625 | 1,219 | 812 |
| | 5.75 | 10.1 | 993 | *3,438 | 2,584 | 1,722 | 1,435 | 1,077 | 718 |
| | 6 | 9.5 | 853 | *3,158 | 2,293 | 1,529 | 1,274 | 955 | 637 |
| | 6.25 | 8.9 | 738 | *2,910 | 2,044 | 1,362 | 1,135 | 851 | 568 |
| | 6.5 | 8.4 | 642 | *2,691 | 1,829 | 1,219 | 1,016 | 762 | 508 |
| | 6.75 | 7.9 | 562 | *2,495 | 1,643 | 1,095 | 913 | 684 | 456 |
| | 7 | 7.5 | 495 | *2,320 | 1,481 | 987 | 823 | 617 | 411 |
| **203.2 x 203.2 x 12.7 mm | | | | | | | | | |
| Wt/m. = 13.74 kg/m | 2 | 53.8 | 23,258 | 23,258 | — | — | — | 18,931 | 12,620 |
| b _f /t _f = 16.0 | 2.25 | 53.8 | 20,674 | 20,674 | — | — | 19,716 | 14,787 | 9,858 |
| F _b = 53.8 N/mm ² | 2.5 | 47.4 | 18,606 | 18,606 | — | — | 15,628 | 11,721 | 7,814 |
| A _w = 2258 mm ² | 2.75 | 40.0 | 16,915 | 16,915 | — | 15,062 | 12,552 | 9,414 | 6,276 |
| I _x = 52900000 mm ⁴ | 3 | 34.3 | 15,505 | 15,505 | — | 12,244 | 10,204 | 7,653 | 5,102 |
| S _x = 520000 mm ³ | 3.25 | 29.8 | 11,749 | 14,313 | — | 10,064 | 8,387 | 6,290 | 4,194 |
| I _y = 17790000 mm ⁴ | 3.5 | 26.3 | 8,931 | 13,290 | 12,535 | 8,357 | 6,964 | 5,223 | 3,482 |
| J = 398700 mm ⁴ | 3.75 | 23.4 | 6,933 | 12,404 | 10,506 | 7,004 | 5,837 | 4,378 | 2,918 |
| | 4 | 21.1 | 5,481 | 11,629 | 8,881 | 5,921 | 4,934 | 3,700 | 2,467 |
| | 4.25 | 19.1 | 4,404 | 10,945 | 7,566 | 5,044 | 4,204 | 3,153 | 2,102 |
| | 4.5 | 17.5 | 3,588 | 10,337 | 6,493 | 4,329 | 3,607 | 2,706 | 1,804 |
| | 4.75 | 16.1 | 2,961 | 9,793 | 5,610 | 3,740 | 3,117 | 2,338 | 1,558 |
| | 5 | 14.8 | 2,471 | *8,952 | 4,877 | 3,251 | 2,709 | 2,032 | 1,355 |
| | 5.25 | 13.8 | 2,082 | *8,120 | 4,264 | 2,843 | 2,369 | 1,777 | 1,184 |
| | 5.5 | 12.9 | 1,771 | *7,399 | 3,748 | 2,499 | 2,082 | 1,562 | 1,041 |
| | 5.75 | 12.1 | 1,519 | *6,769 | 3,311 | 2,207 | 1,839 | 1,380 | 920 |
| | 6 | 11.4 | 1,312 | *6,217 | 2,938 | 1,959 | 1,632 | 1,224 | 816 |
| | 6.25 | 10.7 | 1,141 | *5,729 | 2,619 | 1,746 | 1,455 | 1,091 | 727 |
| | 6.5 | 10.1 | 999 | *5,297 | 2,343 | 1,562 | 1,302 | 976 | 651 |
| | 6.75 | 9.6 | 879 | *4,912 | 2,105 | 1,403 | 1,169 | 877 | 585 |
| | 7 | 9.2 | 778 | *4,568 | 1,897 | 1,265 | 1,054 | 790 | 527 |

** Non-stock size subject to mill run requirements.

BEAMS

W-SHAPES — EXTREN® 500, 525 & 625
E = 17,200 N/mm²



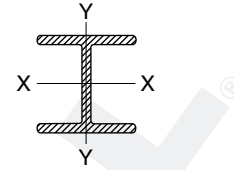
Allowable Uniform Loads in Newtons Per Meter

| SPAN IN METERS | LATERALLY UNSUPPORTED | | LATERALLY SUPPORTED—GOVERNED BY: | | | | | | | |
|---|--|---|--|------------|-------|-------|--------|--------|--------|--------|
| | F _b ' (N/ mm ²) | (Using F _b , F _b ' or F _v) W | Stress *F _b or F _v | Deflection | | | | | | |
| | | | | l/100 | l/150 | l/180 | l/240 | l/360 | | |
| 254 x 254 x 9.53 mm | | | | | | | | | | |
| Wt/m. = 13.07 kg/m | 2 | 25.0 | 23,059 | 23,059 | — | — | — | — | — | 15,454 |
| b _f /t _f = 26.7 | 2.25 | 25.0 | 20,497 | 20,497 | — | — | — | 18,599 | 12,399 | 12,399 |
| F _b = 25.0 N/mm ² | 2.5 | 25.0 | 18,447 | 18,447 | — | — | — | 15,095 | 10,064 | 10,064 |
| A _w = 2239 mm ² | 2.75 | 25.0 | 16,770 | 16,770 | — | — | 16,506 | 12,380 | 8,253 | 8,253 |
| I _x = 82800000 mm ⁴ | 3 | 25.0 | 14,467 | *14,467 | — | — | 13,666 | 10,249 | 6,833 | 6,833 |
| S _x = 651000 mm ³ | 3.25 | 25.0 | 12,327 | *12,327 | — | — | 11,413 | 8,560 | 5,707 | 5,707 |
| I _y = 26030000 mm ⁴ | 3.5 | 25.0 | 10,629 | *10,629 | — | — | 9,610 | 7,207 | 4,805 | 4,805 |
| J = 213900 mm ⁴ | 3.75 | 25.0 | 9,259 | *9,259 | — | — | 8,152 | 6,114 | 4,076 | 4,076 |
| | 4 | 25.0 | 8,138 | *8,138 | — | — | 6,965 | 5,224 | 3,483 | 3,483 |
| | 4.25 | 23.2 | 6,696 | *7,208 | — | 7,188 | 5,990 | 4,492 | 2,995 | 2,995 |
| | 4.5 | 20.9 | 5,371 | *6,430 | — | 6,219 | 5,183 | 3,887 | 2,591 | 2,591 |
| | 4.75 | 18.9 | 4,364 | *5,771 | — | 5,412 | 4,510 | 3,383 | 2,255 | 2,255 |
| | 5 | 17.2 | 3,586 | *5,208 | — | 4,735 | 3,946 | 2,960 | 1,973 | 1,973 |
| | 5.25 | 15.8 | 2,977 | *4,724 | — | 4,164 | 3,470 | 2,603 | 1,735 | 1,735 |
| | 5.5 | 14.5 | 2,495 | *4,304 | — | 3,679 | 3,066 | 2,299 | 1,533 | 1,533 |
| | 5.75 | 13.4 | 2,109 | *3,938 | — | 3,265 | 2,720 | 2,040 | 1,360 | 1,360 |
| | 6 | 12.4 | 1,797 | *3,617 | — | 2,909 | 2,424 | 1,818 | 1,212 | 1,212 |
| | 6.25 | 11.6 | 1,541 | *3,333 | — | 2,602 | 2,168 | 1,626 | 1,084 | 1,084 |
| | 6.5 | 10.8 | 1,331 | *3,082 | — | 2,336 | 1,947 | 1,460 | 973 | 973 |
| | 6.75 | 10.1 | 1,157 | *2,858 | — | 2,105 | 1,754 | 1,315 | 877 | 877 |
| | 7 | 9.5 | 1,011 | *2,657 | — | 1,902 | 1,585 | 1,189 | 793 | 793 |
| | 7.25 | 9.0 | 888 | *2,477 | — | 1,725 | 1,437 | 1,078 | 719 | 719 |
| | 7.5 | 8.5 | 784 | *2,315 | — | 1,568 | 1,307 | 980 | 653 | 653 |
| | 7.75 | 8.0 | 695 | *2,168 | 2,145 | 1,430 | 1,192 | 894 | 596 | 596 |
| | 8 | 7.6 | 619 | *2,034 | 1,961 | 1,307 | 1,089 | 817 | 545 | 545 |
| | 8.25 | 7.2 | 554 | *1,913 | 1,797 | 1,198 | 998 | 749 | 499 | 499 |
| | 8.5 | 6.9 | 497 | *1,802 | 1,650 | 1,100 | 917 | 688 | 458 | 458 |
| | 8.75 | 6.6 | 448 | *1,701 | 1,519 | 1,013 | 844 | 633 | 422 | 422 |
| | 9 | 6.3 | 405 | *1,607 | 1,402 | 934 | 779 | 584 | 389 | 389 |

BEAMS

W-SHAPES — EXTREN® 500, 525 & 625
E = 17,200 N/mm²

Allowable Uniform Loads in Newtons Per Meter

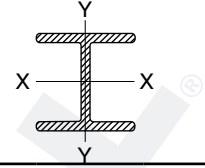


| SPAN IN METERS | LATERALLY UNSUPPORTED | | LATERALLY SUPPORTED--GOVERNED BY: | | | | | | | |
|----------------------------------|---------------------------|------|-----------------------------------|-----------------------------------|---------|--------|--------|--------|--------|--------|
| | | | Stress | Deflection | | | | | | |
| | | | | *F _b or F _v | l/100 | l/150 | l/180 | l/240 | l/360 | |
| **254 x 254 x 12.7 mm | | | | | | | | | | |
| Wt/m. = | 17.32 kg/m | 2 | 38.5 | 29,903 | 29,903 | — | — | — | — | 19,982 |
| b _f /t _f = | 20.0 | 2.25 | 38.5 | 26,581 | 26,581 | — | — | — | 24,038 | 16,025 |
| F _b = | 38.5 N/mm ² | 2.5 | 38.5 | 23,923 | 23,923 | — | — | — | 19,503 | 13,002 |
| A _w = | 2903 mm ² | 2.75 | 38.5 | 21,748 | 21,748 | — | — | 21,318 | 15,989 | 10,659 |
| I _x = | 106600000 mm ⁴ | 3 | 38.5 | 19,935 | 19,935 | — | — | 17,644 | 13,233 | 8,822 |
| S _x = | 839000 mm ³ | 3.25 | 38.5 | 18,402 | 18,402 | — | 17,678 | 14,732 | 11,049 | 7,366 |
| I _y = | 34720000 mm ⁴ | 3.5 | 35.9 | 17,088 | 17,088 | — | 14,881 | 12,401 | 9,301 | 6,200 |
| J = | 502800 mm ⁴ | 3.75 | 31.6 | 15,105 | 15,948 | — | 12,622 | 10,518 | 7,889 | 5,259 |
| | | 4 | 28.2 | 11,811 | 14,952 | — | 10,781 | 8,984 | 6,738 | 4,492 |
| | | 4.25 | 25.3 | 9,386 | 14,072 | 13,905 | 9,270 | 7,725 | 5,794 | 3,863 |
| | | 4.5 | 22.8 | 7,566 | *12,761 | 12,030 | 8,020 | 6,683 | 5,013 | 3,342 |
| | | 4.75 | 20.8 | 6,177 | *11,453 | 10,468 | 6,979 | 5,815 | 4,362 | 2,908 |
| | | 5 | 19.0 | 5,101 | *10,336 | 9,158 | 6,105 | 5,088 | 3,816 | 2,544 |
| | | 5.25 | 17.5 | 4,256 | *9,375 | 8,052 | 5,368 | 4,473 | 3,355 | 2,237 |
| | | 5.5 | 16.2 | 3,585 | *8,543 | 7,113 | 4,742 | 3,952 | 2,964 | 1,976 |
| | | 5.75 | 15.0 | 3,045 | *7,816 | 6,311 | 4,207 | 3,506 | 2,630 | 1,753 |
| | | 6 | 14.0 | 2,607 | *7,178 | 5,623 | 3,749 | 3,124 | 2,343 | 1,562 |
| | | 6.25 | 13.1 | 2,248 | *6,615 | 5,030 | 3,353 | 2,794 | 2,096 | 1,397 |
| | | 6.5 | 12.3 | 1,951 | *6,116 | 4,516 | 3,010 | 2,509 | 1,881 | 1,254 |
| | | 6.75 | 11.6 | 1,703 | *5,672 | 4,068 | 2,712 | 2,260 | 1,695 | 1,130 |
| | | 7 | 10.9 | 1,495 | *5,274 | 3,677 | 2,451 | 2,043 | 1,532 | 1,021 |
| | | 7.25 | 10.3 | 1,320 | *4,916 | 3,333 | 2,222 | 1,852 | 1,389 | 926 |
| | | 7.5 | 9.8 | 1,170 | *4,594 | 3,031 | 2,020 | 1,684 | 1,263 | 842 |
| | | 7.75 | 9.3 | 1,043 | *4,302 | 2,763 | 1,842 | 1,535 | 1,151 | 768 |
| | | 8 | 8.9 | 933 | *4,038 | 2,526 | 1,684 | 1,403 | 1,052 | 702 |
| | | 8.25 | 8.5 | 838 | *3,797 | 2,314 | 1,543 | 1,286 | 964 | 643 |
| | | 8.5 | 8.1 | 755 | *3,577 | 2,126 | 1,417 | 1,181 | 886 | 591 |
| | | 8.75 | 7.8 | 683 | *3,375 | 1,957 | 1,305 | 1,087 | 815 | 544 |
| | | 9 | 7.5 | 620 | *3,190 | 1,805 | 1,204 | 1,003 | 752 | 501 |

** Non-stock size subject to mill run requirements.

BEAMS

W-SHAPES — EXTREN® 500, 525 & 625
E = 17,200 N/mm²



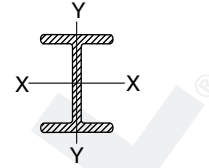
Allowable Uniform Loads in Newtons Per Meter

| SPAN IN METERS | LATERALLY UNSUPPORTED | | LATERALLY SUPPORTED--GOVERNED BY: | | | | | | |
|--|--|---|--|------------|-------|--------|--------|--------|--------|
| | F _b ' (N/ mm ²) | (Using F _b , F _b ' or F _v) W | Stress *F _b or F _v | Deflection | | | | | |
| | | | | l/100 | l/150 | l/180 | l/240 | l/360 | |
| **304.8 x 304.8 x 12.7 mm | | | | | | | | | |
| Wt/m. = 20.80 kg/m | 2 | 29.3 | 36,548 | 36,548 | — | — | — | — | 27,939 |
| b _f /t _f = 24.0 | 2.25 | 29.3 | 32,487 | 32,487 | — | — | — | — | 22,873 |
| F _b = 29.3 N/mm ² | 2.5 | 29.3 | 29,239 | 29,239 | — | — | — | 28,375 | 18,916 |
| A _w = 3548 mm ² | 2.75 | 29.3 | 26,581 | 26,581 | — | — | — | 23,673 | 15,782 |
| I _x = 188400000 mm ⁴ | 3 | 29.3 | 24,366 | 24,366 | — | — | — | 19,907 | 13,271 |
| S _x = 1237000 mm ³ | 3.25 | 29.3 | 22,491 | 22,491 | — | — | 22,481 | 16,861 | 11,240 |
| I _y = 59980000 mm ⁴ | 3.5 | 29.3 | 20,885 | 20,885 | — | — | 19,168 | 14,376 | 9,584 |
| J = 606900 mm ⁴ | 3.75 | 29.3 | 19,492 | 19,492 | — | — | 16,446 | 12,335 | 8,223 |
| | 4 | 29.3 | 18,122 | *18,122 | — | 17,032 | 14,194 | 10,645 | 7,097 |
| | 4.25 | 29.3 | 16,053 | *16,053 | — | 14,781 | 12,317 | 9,238 | 6,159 |
| | 4.5 | 29.3 | 14,319 | *14,319 | — | 12,893 | 10,744 | 8,058 | 5,372 |
| | 4.75 | 27.2 | 11,921 | *12,851 | — | 11,302 | 9,419 | 7,064 | 4,709 |
| | 5 | 24.7 | 9,785 | *11,598 | — | 9,953 | 8,294 | 6,221 | 4,147 |
| | 5.25 | 22.6 | 8,115 | *10,520 | — | 8,804 | 7,336 | 5,502 | 3,668 |
| | 5.5 | 20.8 | 6,794 | *9,585 | — | 7,819 | 6,516 | 4,887 | 3,258 |
| | 5.75 | 19.2 | 5,736 | *8,770 | — | 6,972 | 5,810 | 4,357 | 2,905 |
| | 6 | 17.8 | 4,880 | *8,054 | — | 6,239 | 5,199 | 3,899 | 2,600 |
| | 6.25 | 16.5 | 4,183 | *7,423 | — | 5,603 | 4,669 | 3,502 | 2,335 |
| | 6.5 | 15.4 | 3,608 | *6,863 | — | 5,048 | 4,207 | 3,155 | 2,104 |
| | 6.75 | 14.4 | 3,132 | *6,364 | — | 4,563 | 3,802 | 2,852 | 1,901 |
| | 7 | 13.5 | 2,734 | *5,917 | — | 4,136 | 3,447 | 2,585 | 1,724 |
| | 7.25 | 12.7 | 2,399 | *5,516 | — | 3,760 | 3,134 | 2,350 | 1,567 |
| | 7.5 | 12.0 | 2,115 | *5,155 | 5,142 | 3,428 | 2,856 | 2,142 | 1,428 |
| | 7.75 | 11.4 | 1,874 | *4,828 | 4,699 | 3,132 | 2,610 | 1,958 | 1,305 |
| | 8 | 10.8 | 1,667 | *4,531 | 4,304 | 2,869 | 2,391 | 1,793 | 1,196 |
| | 8.25 | 10.2 | 1,489 | *4,260 | 3,952 | 2,635 | 2,196 | 1,647 | 1,098 |
| | 8.5 | 9.7 | 1,335 | *4,013 | 3,637 | 2,424 | 2,020 | 1,515 | 1,010 |
| | 8.75 | 9.3 | 1,202 | *3,787 | 3,353 | 2,236 | 1,863 | 1,397 | 931 |
| | 9 | 8.9 | 1,085 | *3,580 | 3,098 | 2,066 | 1,721 | 1,291 | 861 |
| | 9.25 | 8.5 | 983 | *3,389 | 2,868 | 1,912 | 1,593 | 1,195 | 797 |
| | 9.5 | 8.1 | 893 | *3,213 | 2,660 | 1,773 | 1,478 | 1,108 | 739 |
| | 9.75 | 7.8 | 813 | *3,050 | 2,471 | 1,647 | 1,373 | 1,030 | 686 |
| | 10 | 7.5 | 743 | *2,900 | 2,300 | 1,533 | 1,278 | 958 | 639 |
| | 10.25 | 7.2 | 680 | *2,760 | 2,143 | 1,429 | 1,191 | 893 | 595 |
| | 10.5 | 7.0 | 624 | *2,630 | 2,001 | 1,334 | 1,112 | 834 | 556 |
| | 10.75 | 6.7 | 574 | *2,509 | 1,871 | 1,247 | 1,039 | 779 | 520 |
| | 11 | 6.5 | 530 | *2,396 | 1,751 | 1,168 | 973 | 730 | 486 |
| | 11.25 | 6.3 | 489 | *2,291 | 1,642 | 1,095 | 912 | 684 | 456 |
| | 11.5 | 6.1 | 453 | *2,192 | 1,541 | 1,027 | 856 | 642 | 428 |
| | 11.75 | 5.9 | 420 | *2,100 | 1,449 | 966 | 805 | 604 | 402 |
| | 12 | 5.7 | 391 | *2,014 | 1,363 | 909 | 757 | 568 | 379 |

** Non-stock size subject to mill run requirements.

BEAMS

I-SHAPES — EXTREN® 500 & 525
E = 17,900 N/mm²

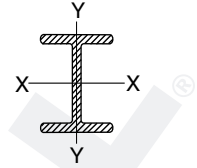


Allowable Uniform Loads in Newtons Per Meter

| SPAN IN METERS | LATERALLY UNSUPPORTED | | LATERALLY SUPPORTED--GOVERNED BY: | | | | | | |
|---------------------------------|--------------------------------|------------------------------------|-----------------------------------|------------|---------|---------|---------|---------|-------|
| | F_b' (N/mm ²) | (Using F_b, F_b' or F_v) W | Stress $*F_b$ or F_v | Deflection | | | | | |
| | | | | $l/100$ | $l/150$ | $l/180$ | $l/240$ | $l/360$ | |
| 76.2 x 38.1 x 6.35 mm | | | | | | | | | |
| Wt/m. = 1.65 kg/m | 1 | 17.5 | 2,655 | 8,373 | 7,511 | 5,007 | 4,173 | 3,130 | 2,086 |
| $b_f/t_f = 6.0$ | 1.25 | 13.2 | 1,283 | 6,698 | 4,178 | 2,785 | 2,321 | 1,741 | 1,160 |
| $F_b = 82.7$ N/mm ² | 1.5 | 10.6 | 717 | 5,582 | 2,537 | 1,691 | 1,409 | 1,057 | 705 |
| $A_w = 406$ mm ² | 1.75 | 8.9 | 442 | *4,105 | 1,646 | 1,097 | 915 | 686 | 457 |
| $I_x = 700000$ mm ⁴ | 2 | 7.7 | 292 | *3,143 | 1,125 | 750 | 625 | 469 | 313 |
| $S_x = 19000$ mm ³ | 2.25 | 6.8 | 203 | *2,483 | 801 | 534 | 445 | 334 | 223 |
| $I_y = 60000$ mm ⁴ | 2.5 | 6.0 | 147 | *2,011 | 590 | 393 | 328 | 246 | 164 |
| $J = 12100$ mm ⁴ | 2.75 | 5.5 | 110 | *1,662 | 447 | 298 | 248 | 186 | 124 |
| | 3 | 5.0 | 84 | *1,397 | 346 | 231 | 192 | 144 | 96 |
| 101.6 x 50.8 x 6.35 mm | | | | | | | | | |
| Wt/m. = 2.20 kg/m | 1 | 20.8 | 5,999 | 11,695 | — | 10,860 | 9,050 | 6,787 | 4,525 |
| $b_f/t_f = 8.0$ | 1.25 | 14.8 | 2,736 | 9,356 | — | 6,343 | 5,286 | 3,964 | 2,643 |
| $F_b = 82.7$ N/mm ² | 1.5 | 11.5 | 1,467 | 7,797 | 5,962 | 3,975 | 3,312 | 2,484 | 1,656 |
| $A_w = 568$ mm ² | 1.75 | 9.3 | 877 | 6,683 | 3,952 | 2,634 | 2,195 | 1,647 | 1,098 |
| $I_x = 1800000$ mm ⁴ | 2 | 7.9 | 566 | 5,848 | 2,741 | 1,827 | 1,523 | 1,142 | 761 |
| $S_x = 36000$ mm ³ | 2.25 | 6.8 | 387 | *4,705 | 1,973 | 1,315 | 1,096 | 822 | 548 |
| $I_y = 140000$ mm ⁴ | 2.5 | 6.0 | 276 | *3,811 | 1,464 | 976 | 813 | 610 | 407 |
| $J = 16200$ mm ⁴ | 2.75 | 5.4 | 204 | *3,149 | 1,115 | 743 | 619 | 465 | 310 |
| | 3 | 4.9 | 156 | *2,646 | 868 | 578 | 482 | 362 | 241 |
| | 3.25 | 4.4 | 121 | *2,255 | 688 | 459 | 382 | 287 | 191 |
| | 3.5 | 4.1 | 96 | *1,944 | 554 | 370 | 308 | 231 | 154 |

BEAMS

I-SHAPES — EXTREN® 625
E = 19,300 N/mm²

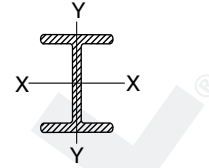


Allowable Uniform Loads in Newtons Per Meter

| SPAN IN METERS | LATERALLY UNSUPPORTED | | LATERALLY SUPPORTED--GOVERNED BY: | | | | | | | | | | | |
|--|-----------------------|------|-----------------------------------|-----------------------------------|-------|--------|-------|-------|-------|-------|-------|-------|-------|--|
| | | | Stress | Deflection | | | | | l/100 | l/150 | l/180 | l/240 | l/360 | |
| | | | | *F _b or F _v | | | | | | | | | | |
| 76.2 x 38.1 x 6.35 mm | | | | | | | | | | | | | | |
| Wt/m. = 1.65 kg/m | 1 | 18.3 | 2,789 | 8,373 | 7,961 | 5,307 | 4,423 | 3,317 | 2,211 | | | | | |
| b _f /t _f = 6.0 | 1.25 | 13.8 | 1,343 | 6,698 | 4,451 | 2,967 | 2,473 | 1,855 | 1,236 | | | | | |
| F _b = 91.0 N/mm ² | 1.5 | 11.1 | 750 | 5,582 | 2,711 | 1,807 | 1,506 | 1,130 | 753 | | | | | |
| A _w = 406 mm ² | 1.75 | 9.3 | 461 | *4,517 | 1,763 | 1,175 | 980 | 735 | 490 | | | | | |
| I _x = 700000 mm ⁴ | 2 | 8.0 | 304 | *3,458 | 1,207 | 805 | 670 | 503 | 335 | | | | | |
| S _x = 19000 mm ³ | 2.25 | 7.0 | 211 | *2,732 | 860 | 574 | 478 | 359 | 239 | | | | | |
| I _y = 60000 mm ⁴ | 2.5 | 6.3 | 153 | *2,213 | 634 | 423 | 352 | 264 | 176 | | | | | |
| J = 12100 mm ⁴ | 2.75 | 5.7 | 114 | *1,829 | 480 | 320 | 267 | 200 | 133 | | | | | |
| | 3 | 5.2 | 87 | *1,537 | 372 | 248 | 207 | 155 | 103 | | | | | |
| 101.6 x 50.8 x 6.35 mm | | | | | | | | | | | | | | |
| Wt/m. = 2.20 kg/m | 1 | 22.1 | 6,368 | 11,695 | — | 11,404 | 9,503 | 7,127 | 4,752 | | | | | |
| b _f /t _f = 8.0 | 1.25 | 15.7 | 2,892 | 9,356 | — | 6,708 | 5,590 | 4,192 | 2,795 | | | | | |
| F _b = 91.0 N/mm ² | 1.5 | 12.1 | 1,546 | 7,797 | 6,335 | 4,223 | 3,519 | 2,640 | 1,760 | | | | | |
| A _w = 568 mm ² | 1.75 | 9.8 | 921 | 6,683 | 4,213 | 2,809 | 2,340 | 1,755 | 1,170 | | | | | |
| I _x = 1800000 mm ⁴ | 2 | 8.2 | 594 | 5,848 | 2,929 | 1,952 | 1,627 | 1,220 | 814 | | | | | |
| S _x = 36000 mm ³ | 2.25 | 7.1 | 405 | *5,177 | 2,112 | 1,408 | 1,173 | 880 | 587 | | | | | |
| I _y = 140000 mm ⁴ | 2.5 | 6.3 | 289 | *4,193 | 1,569 | 1,046 | 872 | 654 | 436 | | | | | |
| J = 16200 mm ⁴ | 2.75 | 5.6 | 214 | *3,466 | 1,196 | 797 | 664 | 498 | 332 | | | | | |
| | 3 | 5.1 | 162 | *2,912 | 932 | 621 | 518 | 388 | 259 | | | | | |
| | 3.25 | 4.6 | 126 | *2,481 | 739 | 493 | 411 | 308 | 205 | | | | | |
| | 3.5 | 4.3 | 100 | *2,139 | 596 | 397 | 331 | 248 | 166 | | | | | |

BEAMS

I-SHAPES — EXTREN® 500, 525 & 625
E = 17,200 N/mm²

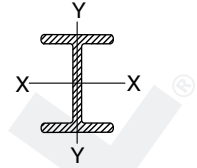


Allowable Uniform Loads in Newtons Per Meter

| SPAN IN METERS | LATERALLY UNSUPPORTED | | LATERALLY SUPPORTED--GOVERNED BY: | | | | | | | |
|----------------------------------|--|---|-----------------------------------|------------|--------|-------|--------|--------|--------|-------|
| | F _b ' (N/mm ²) | (Using F _b , F _b ' or F _v) W | Stress | Deflection | | | | | | |
| | | | *F _b or F _v | l/100 | l/150 | l/180 | l/240 | l/360 | | |
| 139.7 x 63.5 x 6.35 mm | | | | | | | | | | |
| Wt/m. = | 2.90 kg/m | 1 | 24.2 | 12,767 | 16,613 | — | — | — | 13,336 | 8,891 |
| b _f /t _f = | 10.0 | 1.25 | 16.5 | 5,568 | 13,290 | — | 13,173 | 10,978 | 8,233 | 5,489 |
| F _b = | 82.7 N/mm ² | 1.5 | 12.2 | 2,872 | 11,075 | — | 8,583 | 7,153 | 5,364 | 3,576 |
| A _w = | 806 mm ² | 1.75 | 9.6 | 1,662 | 9,493 | 8,773 | 5,849 | 4,874 | 3,656 | 2,437 |
| I _x = | 4600000 mm ⁴ | 2 | 7.9 | 1,044 | 8,306 | 6,208 | 4,139 | 3,449 | 2,587 | 1,725 |
| S _x = | 66000 mm ³ | 2.25 | 6.7 | 698 | 7,383 | 4,535 | 3,024 | 2,520 | 1,890 | 1,260 |
| I _y = | 260000 mm ⁴ | 2.5 | 5.8 | 490 | 6,645 | 3,404 | 2,269 | 1,891 | 1,418 | 946 |
| S _y = | 8000 mm ⁴ | 2.75 | 5.1 | 357 | *5,774 | 2,615 | 1,743 | 1,453 | 1,089 | 726 |
| J = | 22900 mm ⁴ | 3 | 4.6 | 268 | *4,852 | 2,049 | 1,366 | 1,138 | 854 | 569 |
| | | 3.25 | 4.1 | 207 | *4,134 | 1,634 | 1,089 | 908 | 681 | 454 |
| | | 3.5 | 3.8 | 163 | *3,565 | 1,322 | 881 | 735 | 551 | 367 |
| | | 3.75 | 3.5 | 131 | *3,105 | 1,085 | 723 | 603 | 452 | 301 |
| | | 4 | 3.2 | 107 | *2,729 | 900 | 600 | 500 | 375 | 250 |
| | | 4.25 | 3.0 | 88 | *2,417 | 755 | 503 | 420 | 315 | 210 |
| | | 4.5 | 2.8 | 74 | *2,156 | 639 | 426 | 355 | 266 | 178 |

BEAMS

I-SHAPES — EXTREN® 500, 525 & 625
E = 17,200 N/mm²



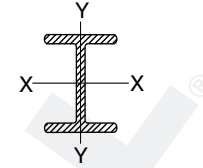
Allowable Uniform Loads in Newtons Per Meter

| SPAN IN METERS | LATERALLY UNSUPPORTED | | LATERALLY SUPPORTED--GOVERNED BY: | | | | | | |
|--|--|---|--------------------------------------|------------|--------|--------|--------|--------|-------|
| | F _b ' (N/ mm ²) | (Using F _b , F _b ' or F _v) W | Stress | Deflection | | | | | |
| | | | *F _b or F _v | l/100 | l/150 | l/180 | l/240 | l/360 | |
| **152.4 x 76.2 x 6.35 mm | | | | | | | | | |
| Wt/m. = 3.44 kg/m | 1.5 | 16.3 | 5,056 | 12,227 | — | 11,343 | 9,452 | 7,089 | 4,726 |
| b _r /t _f = 12.0 | 1.75 | 12.6 | 2,856 | 10,480 | — | 7,857 | 6,547 | 4,910 | 3,274 |
| F _b = 82.7 N/mm ² | 2 | 10.1 | 1,756 | 9,170 | 8,443 | 5,628 | 4,690 | 3,518 | 2,345 |
| A _w = 890 mm ² | 2.25 | 8.4 | 1,151 | 8,151 | 6,225 | 4,150 | 3,459 | 2,594 | 1,729 |
| I _x = 6600000 mm ⁴ | 2.5 | 7.1 | 794 | 7,336 | 4,706 | 3,138 | 2,615 | 1,961 | 1,307 |
| S _x = 87000 mm ³ | 2.75 | 6.2 | 570 | 6,669 | 3,636 | 2,424 | 2,020 | 1,515 | 1,010 |
| I _y = 470000 mm ⁴ | 3 | 5.5 | 422 | 6,114 | 2,862 | 1,908 | 1,590 | 1,192 | 795 |
| J = 25000 mm ⁴ | 3.25 | 4.9 | 322 | *5,449 | 2,290 | 1,527 | 1,272 | 954 | 636 |
| | 3.5 | 4.4 | 251 | *4,699 | 1,859 | 1,239 | 1,033 | 775 | 516 |
| | 3.75 | 4.0 | 200 | *4,093 | 1,529 | 1,019 | 849 | 637 | 425 |
| | 4 | 3.7 | 161 | *3,597 | 1,271 | 848 | 706 | 530 | 353 |
| | 4.25 | 3.4 | 132 | *3,187 | 1,068 | 712 | 593 | 445 | 297 |
| | 4.5 | 3.2 | 110 | *2,842 | 906 | 604 | 503 | 377 | 252 |
| **152.4 x 76.2 x 9.53 mm | | | | | | | | | |
| Wt/m. = 5.04 kg/m | 1.5 | 20.2 | 8,743 | 17,455 | — | 16,054 | 13,378 | 10,034 | 6,689 |
| b _r /t _f = 8.0 | 1.75 | 15.9 | 5,078 | 14,961 | — | 11,110 | 9,259 | 6,944 | 4,629 |
| F _b = 82.7 N/mm ² | 2 | 13.1 | 3,202 | 13,091 | 11,931 | 7,954 | 6,628 | 4,971 | 3,314 |
| A _w = 1271 mm ² | 2.25 | 11.1 | 2,147 | 11,636 | 8,794 | 5,862 | 4,885 | 3,664 | 2,443 |
| I _x = 9300000 mm ⁴ | 2.5 | 9.7 | 1,510 | 10,473 | 6,645 | 4,430 | 3,692 | 2,769 | 1,846 |
| S _x = 122000 mm ³ | 2.75 | 8.5 | 1,103 | 9,521 | 5,132 | 3,421 | 2,851 | 2,138 | 1,426 |
| I _y = 710000 mm ⁴ | 3 | 7.7 | 831 | 8,727 | 4,038 | 2,692 | 2,244 | 1,683 | 1,122 |
| J = 82400 mm ⁴ | 3.25 | 6.9 | 641 | *7,642 | 3,231 | 2,154 | 1,795 | 1,346 | 897 |
| | 3.5 | 6.3 | 506 | *6,589 | 2,622 | 1,748 | 1,457 | 1,093 | 728 |
| | 3.75 | 5.9 | 406 | *5,740 | 2,156 | 1,437 | 1,198 | 898 | 599 |
| | 4 | 5.4 | 331 | *5,045 | 1,793 | 1,195 | 996 | 747 | 498 |
| | 4.25 | 5.1 | 274 | *4,469 | 1,506 | 1,004 | 837 | 628 | 418 |
| | 4.5 | 4.7 | 229 | *3,986 | 1,277 | 852 | 710 | 532 | 355 |

** Non-stock size subject to mill run requirements.

BEAMS

I-SHAPES — EXTREN® 500, 525 & 625
E = 17,200 N/mm²



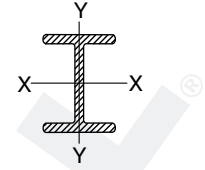
Allowable Uniform Loads in Newtons Per Meter

| SPAN IN METERS | LATERALLY UNSUPPORTED | | LATERALLY SUPPORTED--GOVERNED BY: | | | | | | |
|---|---------------------------------------|---|--|------------|--------|--------|--------|--------|-------|
| | F _b ' (N/mm ²) | (Using F _b ', F _b ' or F _v) W | Stress *F _b or F _v | Deflection | | | | | |
| | | | | l/100 | l/150 | l/180 | l/240 | l/360 | |
| 203.2 x 101.6 x 9.53 mm | | | | | | | | | |
| Wt/m. = 6.86 kg/m | 2 | 17.3 | 7,870 | 18,075 | — | 16,755 | 13,962 | 10,472 | 6,981 |
| b _f /t _f = 10.7 | 2.25 | 14.2 | 5,110 | 16,066 | — | 12,678 | 10,565 | 7,924 | 5,282 |
| F _b = 82.7 N/mm ² | 2.5 | 12.0 | 3,491 | 14,460 | — | 9,784 | 8,153 | 6,115 | 4,076 |
| A _w = 1755 mm ² | 2.75 | 10.3 | 2,485 | 13,145 | 11,525 | 7,684 | 6,403 | 4,802 | 3,201 |
| I _x = 23100000 mm ⁴ | 3 | 9.1 | 1,829 | 12,050 | 9,194 | 6,130 | 5,108 | 3,831 | 2,554 |
| S _x = 227000 mm ³ | 3.25 | 8.1 | 1,384 | 11,123 | 7,438 | 4,959 | 4,132 | 3,099 | 2,066 |
| I _y = 1680000 mm ⁴ | 3.5 | 7.2 | 1,073 | 10,328 | 6,094 | 4,062 | 3,385 | 2,539 | 1,693 |
| J = 111600 mm ⁴ | 3.75 | 6.6 | 848 | 9,640 | 5,049 | 3,366 | 2,805 | 2,104 | 1,402 |
| | 4 | 6.0 | 682 | 9,037 | 4,226 | 2,817 | 2,348 | 1,761 | 1,174 |
| | 4.25 | 5.5 | 557 | *8,315 | 3,570 | 2,380 | 1,983 | 1,488 | 992 |
| | 4.5 | 5.1 | 461 | *7,416 | 3,041 | 2,028 | 1,690 | 1,267 | 845 |
| | 4.75 | 4.8 | 385 | *6,656 | 2,611 | 1,741 | 1,451 | 1,088 | 725 |
| | 5 | 4.5 | 326 | *6,007 | 2,257 | 1,505 | 1,254 | 941 | 627 |
| | 5.25 | 4.2 | 278 | *5,449 | 1,964 | 1,309 | 1,091 | 818 | 546 |
| | 5.5 | 4.0 | 239 | *4,965 | 1,719 | 1,146 | 955 | 716 | 477 |
| | 5.75 | 3.8 | 207 | *4,542 | 1,512 | 1,008 | 840 | 630 | 420 |
| | 6 | 3.6 | 181 | *4,172 | 1,338 | 892 | 743 | 557 | 372 |
| ** 203.2 x 101.6 x 12.7 mm | | | | | | | | | |
| Wt/m. = 8.97 kg/m | 2 | 20.2 | 11,678 | 23,258 | — | 21,404 | 17,837 | 13,378 | 8,918 |
| b _f /t _f = 8.0 | 2.25 | 16.9 | 7,701 | 20,674 | — | 16,187 | 13,489 | 10,117 | 6,745 |
| F _b = 82.7 N/mm ² | 2.5 | 14.4 | 5,338 | 18,606 | — | 12,486 | 10,405 | 7,804 | 5,202 |
| A _w = 2258 mm ² | 2.75 | 12.6 | 3,850 | 16,915 | 14,703 | 9,802 | 8,168 | 6,126 | 4,084 |
| I _x = 29400000 mm ⁴ | 3 | 11.2 | 2,867 | 15,505 | 11,726 | 7,817 | 6,514 | 4,886 | 3,257 |
| S _x = 289000 mm ³ | 3.25 | 10.0 | 2,194 | 14,313 | 9,484 | 6,323 | 5,269 | 3,952 | 2,634 |
| I _y = 2250000 mm ⁴ | 3.5 | 9.1 | 1,716 | 13,290 | 7,768 | 5,178 | 4,315 | 3,237 | 2,158 |
| J = 260100 mm ⁴ | 3.75 | 8.3 | 1,368 | 12,404 | 6,435 | 4,290 | 3,575 | 2,681 | 1,787 |
| | 4 | 7.7 | 1,109 | 11,629 | 5,385 | 3,590 | 2,992 | 2,244 | 1,496 |
| | 4.25 | 7.1 | 912 | *10,586 | 4,549 | 3,033 | 2,527 | 1,895 | 1,264 |
| | 4.5 | 6.6 | 759 | *9,442 | 3,875 | 2,583 | 2,153 | 1,615 | 1,076 |
| | 4.75 | 6.2 | 638 | *8,474 | 3,326 | 2,217 | 1,848 | 1,386 | 924 |
| | 5 | 5.9 | 542 | *7,648 | 2,875 | 1,917 | 1,597 | 1,198 | 799 |
| | 5.25 | 5.5 | 465 | *6,937 | 2,501 | 1,668 | 1,390 | 1,042 | 695 |
| | 5.5 | 5.3 | 401 | *6,321 | 2,189 | 1,459 | 1,216 | 912 | 608 |
| | 5.75 | 5.0 | 349 | *5,783 | 1,926 | 1,284 | 1,070 | 803 | 535 |
| | 6 | 4.8 | 305 | *5,311 | 1,703 | 1,136 | 946 | 710 | 473 |

** Non-stock size subject to mill run requirements.

BEAMS

I-SHAPES — EXTREN® 500, 525 & 625
E = 17,200 N/mm²



Allowable Uniform Loads in Newtons Per Meter

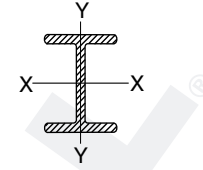
| SPAN IN METERS | LATERALLY UNSUPPORTED | | LATERALLY SUPPORTED--GOVERNED BY: | | | | | | |
|----------------------------------|--------------------------------|------------------------------------|-----------------------------------|------------|---------|---------|---------|---------|--------|
| | F_b' (N/mm ²) | (Using F_b, F_b' or F_v) W | Stress $*F_b$ or F_v | Deflection | | | | | |
| | | | | $l/100$ | $l/150$ | $l/180$ | $l/240$ | $l/360$ | |
| **254 x 127 x 9.53 mm | | | | | | | | | |
| Wt/m. = 8.60 kg/m | 2 | 23.7 | 17,338 | 23,059 | — | — | — | 17,599 | 11,733 |
| $b_f/t_f = 13.3$ | 2.25 | 19.1 | 11,045 | 20,497 | — | — | 18,203 | 13,652 | 9,101 |
| $F_b = 70.8$ N/mm ² | 2.5 | 15.8 | 7,406 | 18,447 | — | 17,210 | 14,342 | 10,756 | 7,171 |
| $A_w = 2239$ mm ² | 2.75 | 13.4 | 5,176 | 16,770 | — | 13,752 | 11,460 | 8,595 | 5,730 |
| $I_x = 46500000$ mm ⁴ | 3 | 11.5 | 3,743 | 15,372 | — | 11,131 | 9,276 | 6,957 | 4,638 |
| $S_x = 366000$ mm ³ | 3.25 | 10.0 | 2,786 | 14,190 | 13,673 | 9,115 | 7,596 | 5,697 | 3,798 |
| $I_y = 3270000$ mm ⁴ | 3.5 | 8.9 | 2,125 | 13,176 | 11,317 | 7,544 | 6,287 | 4,715 | 3,144 |
| $J = 140700$ mm ⁴ | 3.75 | 7.9 | 1,655 | 12,298 | 9,459 | 6,306 | 5,255 | 3,941 | 2,627 |
| | 4 | 7.2 | 1,312 | 11,529 | 7,976 | 5,318 | 4,431 | 3,324 | 2,216 |
| | 4.25 | 6.5 | 1,057 | 10,851 | 6,782 | 4,521 | 3,768 | 2,826 | 1,884 |
| | 4.5 | 6.0 | 864 | *10,237 | 5,810 | 3,873 | 3,228 | 2,421 | 1,614 |
| | 4.75 | 5.5 | 715 | *9,188 | 5,011 | 3,341 | 2,784 | 2,088 | 1,392 |
| | 5 | 5.1 | 598 | *8,292 | 4,351 | 2,900 | 2,417 | 1,813 | 1,208 |
| | 5.25 | 4.8 | 505 | *7,521 | 3,799 | 2,533 | 2,111 | 1,583 | 1,055 |
| | 5.5 | 4.5 | 431 | *6,853 | 3,336 | 2,224 | 1,853 | 1,390 | 927 |
| | 5.75 | 4.2 | 370 | *6,270 | 2,944 | 1,963 | 1,635 | 1,227 | 818 |
| | 6 | 3.9 | 321 | *5,758 | 2,610 | 1,740 | 1,450 | 1,088 | 725 |
| | 6.25 | 3.7 | 279 | *5,307 | 2,325 | 1,550 | 1,291 | 969 | 646 |
| | 6.5 | 3.5 | 245 | *4,907 | 2,079 | 1,386 | 1,155 | 866 | 577 |
| | 6.75 | 3.4 | 216 | *4,550 | 1,866 | 1,244 | 1,037 | 778 | 518 |
| | 7 | 3.2 | 192 | *4,231 | 1,681 | 1,121 | 934 | 700 | 467 |
| | 7.25 | 3.1 | 171 | *3,944 | 1,520 | 1,013 | 844 | 633 | 422 |
| | 7.5 | 2.9 | 153 | *3,685 | 1,378 | 919 | 766 | 574 | 383 |

** Non-stock size subject to mill run requirements.

BEAMS

I-SHAPES — EXTREN® 500, 525 & 625
E = 17,200 N/mm²

Allowable Uniform Loads in Newtons Per Meter

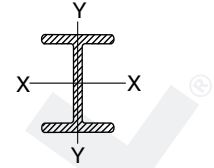


| SPAN IN METERS | LATERALLY UNSUPPORTED | | LATERALLY SUPPORTED—GOVERNED BY: | | | | | | | |
|---|--|---|--------------------------------------|------------|--------|--------|--------|--------|--------|--|
| | F _b ' (N/ mm ²) | (Using F _b , F _b ' or F _v) W | Stress | Deflection | | | | | | |
| | | | *F _b or F _v | l/100 | l/150 | l/180 | l/240 | l/360 | | |
| **254 x 127 x 12.7 mm | | | | | | | | | | |
| Wt/m. = 11.28 kg/m | 2 | 26.0 | 24,475 | 29,903 | — | — | — | 22,698 | 15,132 | |
| b _f /t _f = 10.0 | 2.25 | 21.2 | 15,765 | 26,581 | — | — | 23,462 | 17,597 | 11,731 | |
| F _b = 82.7 N/mm ² | 2.5 | 17.8 | 10,689 | 23,923 | — | 22,172 | 18,477 | 13,858 | 9,238 | |
| A _w = 2903 mm ² | 2.75 | 15.2 | 7,552 | 21,748 | — | 17,710 | 14,758 | 11,069 | 7,379 | |
| I _x = 59700000 mm ⁴ | 3 | 13.2 | 5,521 | 19,935 | — | 14,329 | 11,941 | 8,956 | 5,970 | |
| S _x = 470000 mm ³ | 3.25 | 11.7 | 4,151 | 18,402 | 17,596 | 11,730 | 9,775 | 7,332 | 4,888 | |
| I _y = 4370000 mm ⁴ | 3.5 | 10.4 | 3,198 | 17,088 | 14,560 | 9,707 | 8,089 | 6,067 | 4,044 | |
| J = 328000 mm ⁴ | 3.75 | 9.4 | 2,514 | 15,948 | 12,167 | 8,111 | 6,759 | 5,069 | 3,380 | |
| | 4 | 8.6 | 2,012 | 14,952 | 10,258 | 6,839 | 5,699 | 4,274 | 2,849 | |
| | 4.25 | 7.9 | 1,635 | 14,072 | 8,720 | 5,814 | 4,845 | 3,634 | 2,422 | |
| | 4.5 | 7.3 | 1,346 | 13,290 | 7,469 | 4,980 | 4,150 | 3,112 | 2,075 | |
| | 4.75 | 6.7 | 1,122 | 12,591 | 6,442 | 4,295 | 3,579 | 2,684 | 1,790 | |
| | 5 | 6.3 | 945 | 11,961 | 5,592 | 3,728 | 3,107 | 2,330 | 1,553 | |
| | 5.25 | 5.9 | 804 | *11,282 | 4,883 | 3,255 | 2,713 | 2,035 | 1,356 | |
| | 5.5 | 5.5 | 689 | *10,279 | 4,287 | 2,858 | 2,382 | 1,786 | 1,191 | |
| | 5.75 | 5.2 | 596 | *9,405 | 3,783 | 2,522 | 2,102 | 1,576 | 1,051 | |
| | 6 | 5.0 | 519 | *8,638 | 3,354 | 2,236 | 1,863 | 1,398 | 932 | |
| | 6.25 | 4.7 | 454 | *7,960 | 2,987 | 1,991 | 1,659 | 1,245 | 830 | |
| | 6.5 | 4.5 | 400 | *7,360 | 2,671 | 1,781 | 1,484 | 1,113 | 742 | |
| | 6.75 | 4.3 | 354 | *6,825 | 2,397 | 1,598 | 1,332 | 999 | 666 | |
| | 7 | 4.1 | 315 | *6,346 | 2,160 | 1,440 | 1,200 | 900 | 600 | |
| | 7.25 | 3.9 | 282 | *5,916 | 1,952 | 1,301 | 1,084 | 813 | 542 | |
| | 7.5 | 3.8 | 253 | *5,528 | 1,770 | 1,180 | 983 | 738 | 492 | |

** Non-stock size subject to mill run requirements.

BEAMS

I-SHAPES — EXTREN® 500, 525 & 625
E = 17,200 N/mm²



Allowable Uniform Loads in Newtons Per Meter

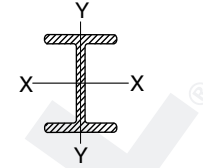
| SPAN IN METERS | LATERALLY UNSUPPORTED | | LATERALLY SUPPORTED--GOVERNED BY: | | | | | | |
|--|--|---|--|------------|--------|--------|--------|--------|--------|
| | F _b ' (N/mm ²) | (Using F _b , F _b ' or F _v) W | Stress *F _b or F _v | Deflection | | | | | |
| | | | | l/100 | l/150 | l/180 | l/240 | l/360 | |
| **304.8 x 152.4 x 12.7 mm | | | | | | | | | |
| Wt/m. = 13.75 kg/m | 2 | 34.2 | 36,548 | 36,548 | — | — | — | 33,473 | 22,315 |
| b _f /t _f = 12.0 | 2.25 | 27.5 | 30,136 | 32,487 | — | — | — | 26,519 | 17,680 |
| F _b = 82.7 N/mm ² | 2.5 | 22.7 | 20,153 | 29,239 | — | — | 28,376 | 21,282 | 14,188 |
| A _w = 3548 mm ² | 2.75 | 19.2 | 14,047 | 26,581 | — | — | 23,038 | 17,279 | 11,519 |
| I _x = 105800000 mm ⁴ | 3 | 16.4 | 10,132 | 24,366 | — | 22,685 | 18,904 | 14,178 | 9,452 |
| S _x = 693000 mm ³ | 3.25 | 14.3 | 7,521 | 22,491 | — | 18,798 | 15,665 | 11,749 | 7,833 |
| I _y = 7540000 mm ⁴ | 3.5 | 12.6 | 5,721 | 20,885 | — | 15,719 | 13,099 | 9,824 | 6,550 |
| J = 398700 mm ⁴ | 3.75 | 11.3 | 4,444 | 19,492 | — | 13,255 | 11,046 | 8,284 | 5,523 |
| | 4 | 10.1 | 3,516 | 18,274 | 16,896 | 11,264 | 9,387 | 7,040 | 4,693 |
| | 4.25 | 9.2 | 2,827 | 17,199 | 14,462 | 9,641 | 8,034 | 6,026 | 4,017 |
| | 4.5 | 8.4 | 2,305 | 16,244 | 12,462 | 8,308 | 6,923 | 5,192 | 3,462 |
| | 4.75 | 7.7 | 1,903 | 15,389 | 10,805 | 7,203 | 6,003 | 4,502 | 3,001 |
| | 5 | 7.2 | 1,589 | 14,619 | 9,422 | 6,282 | 5,235 | 3,926 | 2,617 |
| | 5.25 | 6.7 | 1,340 | 13,923 | 8,261 | 5,508 | 4,590 | 3,442 | 2,295 |
| | 5.5 | 6.2 | 1,140 | 13,290 | 7,280 | 4,853 | 4,044 | 3,033 | 2,022 |
| | 5.75 | 5.8 | 978 | 12,712 | 6,445 | 4,296 | 3,580 | 2,685 | 1,790 |
| | 6 | 5.5 | 846 | 12,183 | 5,731 | 3,820 | 3,184 | 2,388 | 1,592 |
| | 6.25 | 5.2 | 736 | 11,695 | 5,116 | 3,411 | 2,842 | 2,132 | 1,421 |
| | 6.5 | 4.9 | 644 | *10,852 | 4,586 | 3,057 | 2,548 | 1,911 | 1,274 |
| | 6.75 | 4.7 | 568 | *10,063 | 4,125 | 2,750 | 2,292 | 1,719 | 1,146 |
| | 7 | 4.4 | 502 | *9,357 | 3,723 | 2,482 | 2,068 | 1,551 | 1,034 |
| | 7.25 | 4.2 | 447 | *8,723 | 3,371 | 2,247 | 1,873 | 1,405 | 936 |
| | 7.5 | 4.1 | 399 | *8,151 | 3,062 | 2,041 | 1,701 | 1,276 | 850 |
| | 7.75 | 3.9 | 358 | *7,634 | 2,788 | 1,859 | 1,549 | 1,162 | 775 |
| | 8 | 3.7 | 323 | *7,164 | 2,547 | 1,698 | 1,415 | 1,061 | 707 |
| | 8.25 | 3.6 | 292 | *6,736 | 2,331 | 1,554 | 1,295 | 971 | 648 |
| | 8.5 | 3.5 | 265 | *6,346 | 2,140 | 1,427 | 1,189 | 892 | 594 |
| | 8.75 | 3.3 | 241 | *5,988 | 1,968 | 1,312 | 1,094 | 820 | 547 |
| | 9 | 3.2 | 220 | *5,660 | 1,815 | 1,210 | 1,008 | 756 | 504 |
| | 9.25 | 3.1 | 201 | *5,359 | 1,676 | 1,118 | 931 | 698 | 466 |
| | 9.5 | 3.0 | 185 | *5,080 | 1,552 | 1,034 | 862 | 647 | 431 |
| | 9.75 | 2.9 | 170 | *4,823 | 1,439 | 959 | 799 | 600 | 400 |
| | 10 | 2.8 | 157 | *4,585 | 1,337 | 891 | 743 | 557 | 371 |
| | 10.25 | 2.7 | 145 | *4,364 | 1,244 | 829 | 691 | 518 | 346 |
| | 10.5 | — | — | *4,159 | 1,160 | 773 | 644 | 483 | 322 |
| | 10.75 | — | — | *3,967 | 1,083 | 722 | 601 | 451 | 301 |
| | 11 | — | — | *3,789 | 1,012 | 675 | 562 | 422 | 281 |
| | 11.25 | — | — | *3,623 | 948 | 632 | 527 | 395 | 263 |
| | 11.5 | — | — | *3,467 | 889 | 592 | 494 | 370 | 247 |
| | 11.75 | — | — | *3,321 | 834 | 556 | 464 | 348 | 232 |
| | 12 | — | — | *3,184 | 784 | 523 | 436 | 327 | 218 |

** Non-stock size subject to mill run requirements.

BEAMS

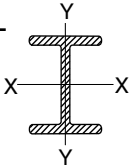
I-SHAPES — EXTREN® 500, 525 & 625
E = 17,200 N/mm²

Allowable Uniform Loads in Newtons Per Meter



| SPAN IN METERS | LATERALLY UNSUPPORTED | | LATERALLY SUPPORTED--GOVERNED BY: | | | | | | |
|--|--|---|---|------------|--------|--------|--------|--------|--------|
| | F _b ' (N/mm ²) | (Using F _b , F _b ' or F _v) W | Stress *F _b or F _v | Deflection | | | | | |
| | | | | l/100 | l/150 | l/180 | l/240 | l/360 | |
| **457.2 x 9.53 x 114.3 x 12.7 mm | | | | | | | | | |
| Wt/m. = 12.41 kg/m | 1.5 | 27.5 | 56,484 | 56,484 | — | — | — | — | 50,043 |
| b _f /t _f = 9.0 | 1.75 | 20.4 | 48,415 | 48,415 | — | — | — | — | 39,802 |
| F _b = 82.7 N/mm ² | 2 | 15.8 | 29,558 | 42,363 | — | — | — | — | 32,152 |
| A _w = 4113 mm ² | 2.25 | 12.7 | 18,706 | 37,656 | — | — | — | — | 26,291 |
| I _x = 213600000 mm ⁴ | 2.5 | 10.4 | 12,456 | 33,890 | — | — | — | 32,578 | 21,719 |
| S _x = 935000 mm ³ | 2.75 | 8.7 | 8,644 | 30,809 | — | — | — | 27,152 | 18,101 |
| I _y = 3190000 mm ⁴ | 3 | 7.5 | 6,207 | 28,242 | — | — | — | 22,810 | 15,207 |
| J = 280500 mm ⁴ | 3.25 | 6.5 | 4,587 | 26,069 | — | — | 25,737 | 19,303 | 12,868 |
| | 3.5 | 5.7 | 3,473 | 24,207 | — | — | 21,927 | 16,445 | 10,964 |
| | 3.75 | 5.1 | 2,686 | 22,594 | — | 22,560 | 18,800 | 14,100 | 9,400 |
| | 4 | 4.5 | 2,116 | 21,181 | — | 19,457 | 16,214 | 12,161 | 8,107 |
| | 4.25 | 4.1 | 1,694 | 19,935 | — | 16,875 | 14,062 | 10,547 | 7,031 |
| | 4.5 | 3.7 | 1,376 | 18,828 | — | 14,712 | 12,260 | 9,195 | 6,130 |
| | 4.75 | 3.4 | 1,131 | 17,837 | — | 12,890 | 10,742 | 8,057 | 5,371 |
| | 5 | 3.1 | 941 | 16,945 | — | 11,347 | 9,456 | 7,092 | 4,728 |
| | 5.25 | 2.9 | 791 | 16,138 | 15,049 | 10,033 | 8,360 | 6,270 | 4,180 |
| | 5.5 | 2.7 | 670 | 15,405 | 13,361 | 8,907 | 7,423 | 5,567 | 3,711 |
| | 5.75 | 2.5 | 573 | 14,735 | 11,909 | 7,939 | 6,616 | 4,962 | 3,308 |
| | 6 | 2.4 | 494 | 14,121 | 10,655 | 7,103 | 5,919 | 4,439 | 2,960 |
| | 6.25 | 2.2 | 429 | 13,556 | 9,566 | 6,377 | 5,314 | 3,986 | 2,657 |
| | 6.5 | 2.1 | 374 | 13,035 | 8,617 | 5,744 | 4,787 | 3,590 | 2,394 |
| | 6.75 | 2.0 | 329 | 12,552 | 7,786 | 5,191 | 4,326 | 3,244 | 2,163 |
| | 7 | 1.9 | 290 | 12,104 | 7,057 | 4,705 | 3,921 | 2,940 | 1,960 |
| | 7.25 | 1.8 | 258 | 11,686 | 6,414 | 4,276 | 3,564 | 2,673 | 1,782 |
| | 7.5 | 1.7 | 230 | *10,997 | 5,846 | 3,897 | 3,248 | 2,436 | 1,624 |
| | 7.75 | 1.7 | 206 | *10,299 | 5,341 | 3,561 | 2,967 | 2,226 | 1,484 |
| | 8 | 1.6 | 185 | *9,666 | 4,892 | 3,262 | 2,718 | 2,038 | 1,359 |
| | 8.25 | 1.5 | 167 | *9,089 | 4,491 | 2,994 | 2,495 | 1,871 | 1,248 |
| | 8.5 | 1.5 | 151 | *8,562 | 4,132 | 2,755 | 2,296 | 1,722 | 1,148 |
| | 8.75 | 1.4 | — | *8,080 | 3,810 | 2,540 | 2,117 | 1,588 | 1,058 |
| | 9 | 1.4 | — | *7,637 | 3,520 | 2,347 | 1,956 | 1,467 | 978 |
| | 9.25 | 1.3 | — | *7,230 | 3,258 | 2,172 | 1,810 | 1,358 | 905 |
| | 9.5 | 1.3 | — | *6,854 | 3,021 | 2,014 | 1,679 | 1,259 | 839 |
| | 9.75 | 1.2 | — | *6,507 | 2,807 | 1,871 | 1,559 | 1,169 | 780 |
| | 10 | 1.2 | — | *6,186 | 2,612 | 1,741 | 1,451 | 1,088 | 725 |
| | 10.25 | 1.1 | — | *5,888 | 2,434 | 1,623 | 1,352 | 1,014 | 676 |
| | 10.5 | 1.1 | — | *5,611 | 2,272 | 1,515 | 1,262 | 947 | 631 |
| | 10.75 | 1.1 | — | *5,353 | 2,124 | 1,416 | 1,180 | 885 | 590 |
| | 11 | 1.1 | — | *5,112 | 1,988 | 1,326 | 1,105 | 829 | 552 |
| | 11.25 | 1.0 | — | *4,888 | 1,864 | 1,243 | 1,036 | 777 | 518 |
| | 11.5 | 1.0 | — | *4,677 | 1,750 | 1,166 | 972 | 729 | 486 |
| | 11.75 | 1.0 | — | *4,481 | 1,644 | 1,096 | 914 | 685 | 457 |
| | 12 | 0.9 | — | *4,296 | 1,547 | 1,032 | 860 | 645 | 430 |

** Non-stock size subject to mill run requirements.
Rev.1013



I-SHAPES — EXTREN® 500, 525 & 625
E = 17,200 N/mm² Allowable Uniform Loads in Newtons Per Meter

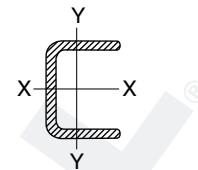
| SPAN IN METERS | LATERALLY UNSUPPORTED | | LATERALLY SUPPORTED--GOVERNED BY: | | | | | | |
|--|--|------|-----------------------------------|------------|--------|--------|--------|--------|--------|
| | F _b ' (N/mm ²) | W*** | Stress | Deflection | | | | | |
| | | | *F _b or F _v | l/100 | l/150 | l/180 | l/240 | l/360 | |
| 609.6 x 9.53 x 190.5 x 19.05 mm | | | | | | | | | |
| Wt/m. = 23.96 kg/m | 1.5 | 82.7 | 74,691 | 74,691 | — | — | — | — | — |
| b _f /t _f = 10.0 | 1.75 | 65.5 | 64,021 | 64,021 | — | — | — | — | 63,785 |
| F _b = 82.7 N/mm ² | 2 | 50.3 | 56,019 | 56,019 | — | — | — | — | 53,876 |
| A _w = 5439 mm ² | 2.25 | 40.0 | 49,794 | 49,794 | — | — | — | — | 46,078 |
| I _x = 792300000 mm ⁴ | 2.5 | 32.5 | 44,815 | 44,815 | — | — | — | — | 39,788 |
| S _x = 2599000 mm ³ | 2.75 | 27.0 | 40,741 | 40,741 | — | — | — | — | 34,619 |
| I _y = 21990000 mm ⁴ | 3 | 22.8 | 37,346 | 37,346 | — | — | — | — | 30,309 |
| J = 1044700 mm ⁴ | 3.25 | 19.6 | 34,473 | 34,473 | — | — | — | — | 26,676 |
| | 3.5 | 17.0 | 28,861 | 32,011 | — | — | — | — | 23,586 |
| | 3.75 | 14.9 | 22,059 | 29,877 | — | — | — | — | 20,938 |
| | 4 | 13.2 | 17,169 | 28,009 | — | — | — | 27,982 | 18,654 |
| | 4.25 | 11.8 | 13,579 | 26,362 | — | — | — | 25,014 | 16,676 |
| | 4.5 | 10.6 | 10,893 | 24,897 | — | — | — | 22,430 | 14,953 |
| | 4.75 | 9.6 | 8,850 | 23,587 | — | — | — | 20,171 | 13,448 |
| | 5 | 8.7 | 7,273 | 22,407 | — | — | — | 18,190 | 12,127 |
| | 5.25 | 8.0 | 6,039 | 21,340 | — | — | — | 16,446 | 10,964 |
| | 5.5 | 7.4 | 5,061 | 20,370 | — | — | 19,876 | 14,907 | 9,938 |
| | 5.75 | 6.8 | 4,278 | 19,485 | — | — | 18,058 | 13,544 | 9,029 |
| | 6 | 6.3 | 3,644 | 18,673 | — | — | 16,445 | 12,333 | 8,222 |
| | 6.25 | 5.9 | 3,127 | 17,926 | — | — | 15,008 | 11,256 | 7,504 |
| | 6.5 | 5.5 | 2,701 | 17,236 | — | 16,471 | 13,726 | 10,295 | 6,863 |
| | 6.75 | 5.1 | 2,347 | 16,598 | — | 15,095 | 12,579 | 9,435 | 6,290 |
| | 7 | 4.8 | 2,051 | 16,005 | — | 13,861 | 11,551 | 8,663 | 5,776 |
| | 7.25 | 4.6 | 1,802 | 15,453 | — | 12,753 | 10,627 | 7,970 | 5,314 |
| | 7.5 | 4.3 | 1,591 | 14,938 | — | 11,754 | 9,795 | 7,346 | 4,898 |
| | 7.75 | 4.1 | 1,411 | 14,456 | — | 10,853 | 9,044 | 6,783 | 4,522 |
| | 8 | 3.9 | 1,257 | 14,005 | — | 10,038 | 8,365 | 6,274 | 4,183 |
| | 8.25 | 3.7 | 1,124 | 13,580 | — | 9,300 | 7,750 | 5,812 | 3,875 |
| | 8.5 | 3.5 | 1,009 | 13,181 | 12,944 | 8,630 | 7,191 | 5,393 | 3,596 |
| | 8.75 | 3.3 | 909 | 12,804 | 12,030 | 8,020 | 6,683 | 5,013 | 3,342 |
| | 9 | 3.2 | 821 | 12,449 | 11,197 | 7,465 | 6,221 | 4,665 | 3,110 |
| | 9.25 | 3.1 | 745 | 12,112 | 10,437 | 6,958 | 5,798 | 4,349 | 2,899 |
| | 9.5 | 2.9 | 677 | 11,793 | 9,741 | 6,494 | 5,412 | 4,059 | 2,706 |
| | 9.75 | 2.8 | 617 | 11,491 | 9,105 | 6,070 | 5,058 | 3,794 | 2,529 |
| | 10 | 2.7 | 565 | 11,204 | 8,521 | 5,681 | 4,734 | 3,550 | 2,367 |
| | 10.25 | 2.6 | 517 | 10,930 | 7,984 | 5,323 | 4,436 | 3,327 | 2,218 |
| | 10.5 | 2.5 | 475 | 10,670 | 7,491 | 4,994 | 4,162 | 3,121 | 2,081 |
| | 10.75 | 2.4 | 438 | 10,422 | 7,036 | 4,691 | 3,909 | 2,932 | 1,955 |
| | 11 | 2.4 | 404 | 10,185 | 6,617 | 4,411 | 3,676 | 2,757 | 1,838 |
| | 11.25 | 2.3 | 374 | 9,959 | 6,229 | 4,153 | 3,461 | 2,595 | 1,730 |
| | 11.5 | 2.2 | 346 | 9,742 | 5,871 | 3,914 | 3,261 | 2,446 | 1,631 |
| | 11.75 | 2.1 | 322 | 9,535 | 5,538 | 3,692 | 3,077 | 2,308 | 1,538 |
| | 12 | 2.1 | 299 | 9,336 | 5,230 | 3,487 | 2,906 | 2,179 | 1,453 |
| | 12.25 | 2.0 | 279 | 9,146 | 4,944 | 3,296 | 2,747 | 2,060 | 1,373 |
| | 12.5 | 2.0 | 260 | 8,963 | 4,678 | 3,119 | 2,599 | 1,949 | 1,299 |
| | 12.75 | 1.9 | — | 8,787 | 4,430 | 2,953 | 2,461 | 1,846 | 1,231 |
| | 13 | 1.8 | — | 8,618 | 4,199 | 2,800 | 2,333 | 1,750 | 1,166 |
| | 13.25 | 1.8 | — | 8,456 | 3,984 | 2,656 | 2,213 | 1,660 | 1,107 |
| | 13.5 | 1.8 | — | 8,299 | 3,783 | 2,522 | 2,102 | 1,576 | 1,051 |
| | 13.75 | 1.7 | — | 8,148 | 3,595 | 2,396 | 1,997 | 1,498 | 999 |
| | 14 | 1.7 | — | 8,003 | 3,419 | 2,279 | 1,899 | 1,424 | 950 |
| | 14.25 | 1.6 | — | 7,862 | 3,254 | 2,169 | 1,808 | 1,356 | 904 |
| | 14.5 | 1.6 | — | 7,727 | 3,099 | 2,066 | 1,722 | 1,291 | 861 |
| | 14.75 | 1.6 | — | 7,596 | 2,954 | 1,969 | 1,641 | 1,231 | 821 |
| | 15 | 1.5 | — | 7,469 | 2,818 | 1,878 | 1,565 | 1,174 | 783 |

** Non-stock size subject to mill run requirements.

*** Using F_b, F_b' or F_v

BEAMS

CHANNELS — EXTREN® 500 & 525
E = 17,900 N/mm²
Allowable Uniform Loads in Newtons Per Meter



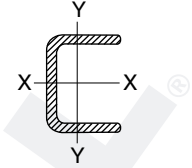
| SPAN IN METERS | LATERALLY SUPPORTED--GOVERNED BY: | | | | | | |
|--|--|---------------|---------------|---------------|---------------|---------------|--|
| | Stress *F_b or F_v | Deflection | | | | | |
| | | <i>l</i> /100 | <i>l</i> /150 | <i>l</i> /180 | <i>l</i> /240 | <i>l</i> /360 | |
| 76.2 x 22.3 x 6.35 mm | | | | | | | |
| Wt/m. = 1.15 kg/m 1 | 8,240 | 5,711 | 3,807 | 3,173 | 2,379 | 1,586 | |
| <i>b_f</i> / <i>t_f</i> = 3.5 1.25 | *5,378 | 3,115 | 2,077 | 1,731 | 1,298 | 865 | |
| F _b = 80.8 N/mm ² 1.5 | *3,735 | 1,869 | 1,246 | 1,038 | 779 | 519 | |
| A _w = 400 mm ² 1.75 | *2,744 | 1,204 | 803 | 669 | 502 | 334 | |
| I _x = 500000 mm ⁴ 2 | *2,101 | 819 | 546 | 455 | 341 | 227 | |
| S _x = 13000 mm ³ 2.25 | *1,660 | 581 | 387 | 323 | 242 | 161 | |
| I _y = 20000 mm ⁴ 2.5 | *1,345 | 427 | 284 | 237 | 178 | 118 | |
| J = 8300 mm ⁴ 2.75 | *1,111 | 322 | 215 | 179 | 134 | 90 | |
| **76.2 x 25.4 x 4.76 mm | | | | | | | |
| Wt/m. = 1.01 kg/m 1 | *4,770 | 4,559 | 3,039 | 2,533 | 1,900 | 1,266 | |
| <i>b_f</i> / <i>t_f</i> = 5.3 1.25 | *3,053 | 2,488 | 1,659 | 1,382 | 1,037 | 691 | |
| F _b = 54.2 N/mm ² 1.5 | *2,120 | 1,494 | 996 | 830 | 622 | 415 | |
| A _w = 316 mm ² 1.75 | *1,557 | 962 | 642 | 535 | 401 | 267 | |
| I _x = 400000 mm ⁴ 2 | *1,192 | 654 | 436 | 364 | 273 | 182 | |
| S _x = 11000 mm ³ 2.25 | *942 | 464 | 310 | 258 | 194 | 129 | |
| I _y = 30000 mm ⁴ 2.5 | *763 | 341 | 227 | 190 | 142 | 95 | |
| J = 4200 mm ⁴ 2.75 | *631 | 258 | 172 | 143 | 107 | 72 | |
| **88.9 x 38.1 x 4.76 mm | | | | | | | |
| Wt/m. = 1.31 kg/m 1 | *5,299 | — | — | 4,540 | 3,405 | 2,270 | |
| <i>b_f</i> / <i>t_f</i> = 8.0 1.25 | *3,391 | — | 3,075 | 2,562 | 1,922 | 1,281 | |
| F _b = 36.8 N/mm ² 1.5 | *2,355 | — | 1,884 | 1,570 | 1,178 | 785 | |
| A _w = 378 mm ² 1.75 | *1,730 | — | 1,230 | 1,025 | 769 | 513 | |
| I _x = 800000 mm ⁴ 2 | *1,325 | 1,267 | 844 | 704 | 528 | 352 | |
| S _x = 18000 mm ³ 2.25 | *1,047 | 905 | 603 | 503 | 377 | 251 | |
| I _y = 80000 mm ⁴ 2.5 | *848 | 668 | 445 | 371 | 278 | 185 | |
| J = 5400 mm ⁴ 2.75 | *701 | 506 | 338 | 281 | 211 | 141 | |
| 3 | *589 | 393 | 262 | 218 | 164 | 109 | |

** Non-stock size subject to mill run requirements.

BEAMS

CHANNELS — EXTREN® 625
E = 19,300 N/mm²

Allowable Uniform Loads in Newtons Per Meter



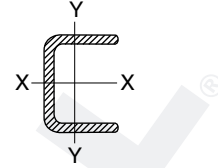
| SPAN IN METERS | LATERALLY SUPPORTED--GOVERNED BY: | | | | | |
|---|--|---------------|---------------|---------------|---------------|---------------|
| | Stress *F_b or F_v | Deflection | | | | |
| | | <i>l</i> /100 | <i>l</i> /150 | <i>l</i> /180 | <i>l</i> /240 | <i>l</i> /360 |
| 76.2 x 22.3 x 6.35 mm | | | | | | |
| Wt/m. = 1.15 kg/m 1 | 8,240 | 6,076 | 4,051 | 3,376 | 2,532 | 1,688 |
| b _f /t _f = 3.5 1.25 | *5,791 | 3,328 | 2,219 | 1,849 | 1,387 | 925 |
| F _b = 87.0 N/mm ² 1.5 | *4,021 | 2,002 | 1,335 | 1,112 | 834 | 556 |
| A _w = 400 mm ² 1.75 | *2,954 | 1,292 | 861 | 718 | 538 | 359 |
| I _x = 500000 mm ⁴ 2 | *2,262 | 879 | 586 | 488 | 366 | 244 |
| S _x = 13000 mm ³ 2.25 | *1,787 | 624 | 416 | 347 | 260 | 173 |
| I _y = 20000 mm ⁴ 2.5 | *1,448 | 459 | 306 | 255 | 191 | 127 |
| J = 8300 mm ⁴ 2.75 | *1,196 | 347 | 231 | 193 | 144 | 96 |
| **76.2 x 25.4 x 4.76 mm | | | | | | |
| Wt/m. = 1.01 kg/m 1 | *5,130 | 4,850 | 3,233 | 2,695 | 2,021 | 1,347 |
| b _f /t _f = 5.3 1.25 | *3,283 | 2,659 | 1,772 | 1,477 | 1,108 | 739 |
| F _b = 58.3 N/mm ² 1.5 | *2,280 | 1,600 | 1,067 | 889 | 667 | 444 |
| A _w = 316 mm ² 1.75 | *1,675 | 1,032 | 688 | 574 | 430 | 287 |
| I _x = 400000 mm ⁴ 2 | *1,283 | 703 | 469 | 390 | 293 | 195 |
| S _x = 11000 mm ³ 2.25 | *1,013 | 499 | 333 | 277 | 208 | 139 |
| I _y = 30000 mm ⁴ 2.5 | *821 | 367 | 245 | 204 | 153 | 102 |
| J = 4200 mm ⁴ 2.75 | *678 | 277 | 185 | 154 | 116 | 77 |
| **88.9 x 38.1 x 4.76 mm | | | | | | |
| Wt/m. = 1.31 kg/m 1 | *5,717 | — | — | 4,798 | 3,598 | 2,399 |
| b _f /t _f = 8.0 1.25 | *3,659 | — | 3,269 | 2,724 | 2,043 | 1,362 |
| F _b = 39.7 N/mm ² 1.5 | *2,541 | — | 2,011 | 1,676 | 1,257 | 838 |
| A _w = 378 mm ² 1.75 | *1,867 | — | 1,316 | 1,097 | 823 | 548 |
| I _x = 800000 mm ⁴ 2 | *1,429 | 1,357 | 905 | 754 | 566 | 377 |
| S _x = 18000 mm ³ 2.25 | *1,129 | 971 | 647 | 539 | 404 | 270 |
| I _y = 80000 mm ⁴ 2.5 | *915 | 717 | 478 | 398 | 299 | 199 |
| J = 5400 mm ⁴ 2.75 | *756 | 544 | 363 | 302 | 227 | 151 |
| | 3 | *635 | 422 | 282 | 176 | 117 |

** Non-stock size subject to mill run requirements.

BEAMS

CHANNELS — EXTREN® 500 & 525
E = 17,900 N/mm²

Allowable Uniform Loads in Newtons Per Meter



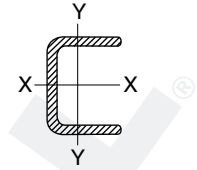
| SPAN IN METERS | LATERALLY SUPPORTED--GOVERNED BY: | | | | | |
|---|---|------------|-------|-------|-------|-------|
| | Stress *F _b or F _v | Deflection | | | | |
| | | l/100 | l/150 | l/180 | l/240 | l/360 |
| **101.6 x 27.0 x 3.18 mm | | | | | | |
| Wt/m. = 0.86 kg/m 1 | *3,619 | — | — | 3,463 | 2,597 | 1,731 |
| b _f /t _f = 8.5 1.25 | *2,316 | — | — | 1,945 | 1,459 | 972 |
| F _b = 34.8 N/mm ² 1.5 | *1,609 | — | 1,426 | 1,188 | 891 | 594 |
| A _w = 303 mm ² 1.75 | *1,182 | — | 929 | 774 | 581 | 387 |
| I _x = 600000 mm ⁴ 2 | *905 | — | 637 | 531 | 398 | 265 |
| S _x = 13000 mm ³ 2.25 | *715 | 681 | 454 | 379 | 284 | 189 |
| I _y = 20000 mm ⁴ 2.5 | *579 | 503 | 335 | 279 | 209 | 140 |
| J = 1700 mm ⁴ 2.75 | *479 | 381 | 254 | 212 | 159 | 106 |
| | 3 | *402 | 295 | 197 | 164 | 82 |
| 101.6 x 28.6 x 6.35 mm | | | | | | |
| Wt/m. = 1.65 kg/m 1 | 11,695 | — | 8,174 | 6,811 | 5,109 | 3,406 |
| b _f /t _f = 4.5 1.25 | *7,490 | 6,920 | 4,613 | 3,845 | 2,883 | 1,922 |
| F _b = 63.6 N/mm ² 1.5 | *5,201 | 4,241 | 2,827 | 2,356 | 1,767 | 1,178 |
| A _w = 568 mm ² 1.75 | *3,821 | 2,769 | 1,846 | 1,538 | 1,154 | 769 |
| I _x = 1200000 mm ⁴ 2 | *2,926 | 1,900 | 1,267 | 1,056 | 792 | 528 |
| S _x = 23000 mm ³ 2.25 | *2,312 | 1,357 | 905 | 754 | 566 | 377 |
| I _y = 50000 mm ⁴ 2.5 | *1,872 | 1,002 | 668 | 557 | 417 | 278 |
| J = 12500 mm ⁴ 2.75 | *1,547 | 760 | 506 | 422 | 316 | 211 |
| | 3 | *1,300 | 589 | 393 | 327 | 246 |
| 101.6 x 34.9 x 4.76 mm | | | | | | |
| Wt/m. = 1.40 kg/m 1 | *6,720 | — | — | 5,958 | 4,468 | 2,979 |
| b _f /t _f = 7.3 1.25 | *4,301 | — | 4,090 | 3,409 | 2,556 | 1,704 |
| F _b = 40.0 N/mm ² 1.5 | *2,987 | — | 2,528 | 2,107 | 1,580 | 1,053 |
| A _w = 439 mm ² 1.75 | *2,194 | — | 1,660 | 1,384 | 1,038 | 692 |
| I _x = 1100000 mm ⁴ 2 | *1,680 | — | 1,144 | 954 | 715 | 477 |
| S _x = 21000 mm ³ 2.25 | *1,327 | 1,230 | 820 | 683 | 512 | 342 |
| I _y = 80000 mm ⁴ 2.5 | *1,075 | 909 | 606 | 505 | 379 | 253 |
| J = 5800 mm ⁴ 2.75 | *889 | 691 | 460 | 384 | 288 | 192 |
| | 3 | *747 | 536 | 358 | 298 | 223 |

** Non-stock size subject to mill run requirements.

BEAMS

CHANNELS — EXTREN® 625
E = 19,300 N/mm²

Allowable Uniform Loads in Newtons Per Meter

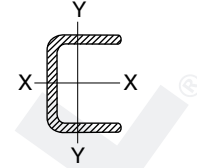


| SPAN IN METERS | LATERALLY SUPPORTED--GOVERNED BY: | | | | | | |
|---------------------------------|--|---------------|---------------|---------------|---------------|---------------|-------|
| | Stress *F_b or F_v | Deflection | | | | | |
| | | <i>l</i> /100 | <i>l</i> /150 | <i>l</i> /180 | <i>l</i> /240 | <i>l</i> /360 | |
| **101.6 x 27.0 x 3.18 mm | | | | | | | |
| Wt/m. = 0.86 kg/m | 1 | *3,890 | — | — | 3,663 | 2,747 | 1,832 |
| $b_f/t_f = 8.5$ | 1.25 | *2,489 | — | 2,483 | 2,069 | 1,552 | 1,035 |
| $F_b = 37.4 \text{ N/mm}^2$ | 1.5 | *1,729 | — | 1,522 | 1,268 | 951 | 634 |
| $A_w = 303 \text{ mm}^2$ | 1.75 | *1,270 | — | 994 | 828 | 621 | 414 |
| $I_x = 600000 \text{ mm}^4$ | 2 | *972 | — | 682 | 569 | 427 | 284 |
| $S_x = 13000 \text{ mm}^3$ | 2.25 | *768 | 731 | 488 | 406 | 305 | 203 |
| $I_y = 20000 \text{ mm}^4$ | 2.5 | *622 | 540 | 360 | 300 | 225 | 150 |
| $J = 1700 \text{ mm}^4$ | 2.75 | *514 | 409 | 273 | 227 | 171 | 114 |
| | 3 | *432 | 318 | 212 | 176 | 132 | 88 |
| 101.6 x 28.6 x 6.35 mm | | | | | | | |
| Wt/m. = 1.65 kg/m | 1 | 11,695 | — | 8,639 | 7,199 | 5,399 | 3,599 |
| $b_f/t_f = 4.5$ | 1.25 | *8,067 | 7,357 | 4,904 | 4,087 | 3,065 | 2,044 |
| $F_b = 68.5 \text{ N/mm}^2$ | 1.5 | *5,602 | 4,525 | 3,017 | 2,514 | 1,885 | 1,257 |
| $A_w = 568 \text{ mm}^2$ | 1.75 | *4,116 | 2,962 | 1,974 | 1,645 | 1,234 | 823 |
| $I_x = 1200000 \text{ mm}^4$ | 2 | *3,151 | 2,036 | 1,357 | 1,131 | 848 | 566 |
| $S_x = 23000 \text{ mm}^3$ | 2.25 | *2,490 | 1,456 | 971 | 809 | 607 | 405 |
| $I_y = 50000 \text{ mm}^4$ | 2.5 | *2,017 | 1,076 | 717 | 598 | 448 | 299 |
| $J = 12500 \text{ mm}^4$ | 2.75 | *1,667 | 816 | 544 | 453 | 340 | 227 |
| | 3 | *1,400 | 633 | 422 | 352 | 264 | 176 |
| 101.6 x 34.9 x 4.76 mm | | | | | | | |
| Wt/m. = 1.40 kg/m | 1 | *7,241 | — | — | 6,280 | 4,710 | 3,140 |
| $b_f/t_f = 7.3$ | 1.25 | *4,634 | — | 4,339 | 3,616 | 2,712 | 1,808 |
| $F_b = 43.1 \text{ N/mm}^2$ | 1.5 | *3,218 | — | 2,694 | 2,245 | 1,683 | 1,122 |
| $A_w = 439 \text{ mm}^2$ | 1.75 | *2,364 | — | 1,774 | 1,478 | 1,109 | 739 |
| $I_x = 1100000 \text{ mm}^4$ | 2 | *1,810 | — | 1,225 | 1,021 | 765 | 510 |
| $S_x = 21000 \text{ mm}^3$ | 2.25 | *1,430 | 1,318 | 879 | 732 | 549 | 366 |
| $I_y = 80000 \text{ mm}^4$ | 2.5 | *1,159 | 976 | 650 | 542 | 407 | 271 |
| $J = 5800 \text{ mm}^4$ | 2.75 | *957 | 742 | 494 | 412 | 309 | 206 |
| | 3 | *805 | 576 | 384 | 320 | 240 | 160 |

** Non-stock size subject to mill run requirements.

BEAMS

CHANNELS — EXTREN® 500 & 525
E = 17,900 N/mm²



Allowable Uniform Loads in Newtons Per Meter

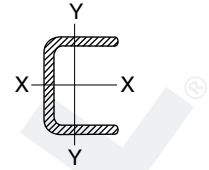
| SPAN IN METERS | LATERALLY SUPPORTED--GOVERNED BY: | | | | | | |
|--|--|---------------|---------------|---------------|---------------|---------------|--|
| | Stress *F_b or F_v | Deflection | | | | | |
| | | <i>l</i> /100 | <i>l</i> /150 | <i>l</i> /180 | <i>l</i> /240 | <i>l</i> /360 | |
| 127 x 34.9 x 6.35 mm | | | | | | | |
| Wt/m. = 2.08 kg/m 1.5 | *7,107 | — | 5,252 | 4,377 | 3,283 | 2,188 | |
| b _f /t _f = 5.5 1.75 | *5,221 | — | 3,488 | 2,907 | 2,180 | 1,454 | |
| F _b = 52.6 N/mm ² 2 | *3,998 | 3,634 | 2,423 | 2,019 | 1,514 | 1,010 | |
| A _w = 723 mm ² 2.25 | *3,159 | 2,619 | 1,746 | 1,455 | 1,091 | 727 | |
| I _x = 2400000 mm ⁴ 2.5 | *2,558 | 1,945 | 1,297 | 1,081 | 810 | 540 | |
| S _x = 38000 mm ³ 2.75 | *2,114 | 1,482 | 988 | 823 | 617 | 412 | |
| I _y = 100000 mm ⁴ 3 | *1,777 | 1,154 | 769 | 641 | 481 | 321 | |
| J = 16600 mm ⁴ 3.25 | *1,514 | 915 | 610 | 509 | 381 | 254 | |
| | 3.5 | *1,305 | 738 | 492 | 410 | 307 | |
| | 3.75 | *1,137 | 603 | 402 | 335 | 251 | |
| | 4 | *999 | 499 | 333 | 277 | 208 | |
| | 4.25 | *885 | 418 | 279 | 232 | 174 | |
| | 4.5 | *790 | 353 | 235 | 196 | 147 | |
| **139.7 x 38.1 x 4.76 mm | | | | | | | |
| Wt/m. = 1.77 kg/m 1 | *10,304 | — | — | — | 8,409 | 5,606 | |
| b _f /t _f = 8.0 1.25 | *6,595 | — | — | — | 5,007 | 3,338 | |
| F _b = 36.8 N/mm ² 1.5 | *4,580 | — | — | 4,239 | 3,179 | 2,119 | |
| A _w = 619 mm ² 1.75 | *3,365 | — | — | 2,835 | 2,127 | 1,418 | |
| I _x = 2400000 mm ⁴ 2 | *2,576 | — | 2,375 | 1,979 | 1,485 | 990 | |
| S _x = 35000 mm ³ 2.25 | *2,035 | — | 1,718 | 1,432 | 1,074 | 716 | |
| I _y = 90000 mm ⁴ 2.5 | *1,649 | — | 1,279 | 1,066 | 800 | 533 | |
| J = 7500 mm ⁴ 2.75 | *1,363 | — | 977 | 814 | 611 | 407 | |
| | 3 | *1,145 | 1,143 | 762 | 635 | 476 | |
| | 3.25 | *976 | 908 | 605 | 504 | 378 | |
| | 3.5 | *841 | 733 | 488 | 407 | 305 | |
| | 3.75 | *733 | 599 | 400 | 333 | 250 | |
| | 4 | *644 | 497 | 331 | 276 | 207 | |
| | 4.25 | *570 | 416 | 277 | 231 | 173 | |
| | 4.5 | *509 | 352 | 234 | 195 | 146 | |

** Non-stock size subject to mill run requirements.

BEAMS

CHANNELS — EXTREN® 625
E = 19,300 N/mm²

Allowable Uniform Loads in Newtons Per Meter



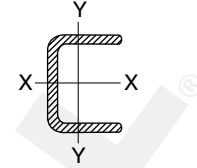
| SPAN IN METERS | LATERALLY SUPPORTED--GOVERNED BY: | | | | | |
|--|--|---------------|---------------|---------------|---------------|---------------|
| | Stress *F_b or F_v | Deflection | | | | |
| | | <i>l</i> /100 | <i>l</i> /150 | <i>l</i> /180 | <i>l</i> /240 | <i>l</i> /360 |
| 127 x 34.9 x 6.35 mm | | | | | | |
| Wt/m. = 2.08 kg/m 1.5 | *7,647 | — | 5,578 | 4,648 | 3,486 | 2,324 |
| b _f /t _f = 5.5 1.75 | *5,618 | 5,576 | 3,717 | 3,098 | 2,323 | 1,549 |
| F _b = 56.6 N/mm ² 2 | *4,302 | 3,882 | 2,588 | 2,157 | 1,618 | 1,078 |
| A _w = 723 mm ² 2.25 | *3,399 | 2,802 | 1,868 | 1,557 | 1,168 | 778 |
| I _x = 2400000 mm ⁴ 2.5 | *2,753 | 2,084 | 1,389 | 1,158 | 868 | 579 |
| S _x = 38000 mm ³ 2.75 | *2,275 | 1,589 | 1,060 | 883 | 662 | 442 |
| I _y = 100000 mm ⁴ 3 | *1,912 | 1,239 | 826 | 688 | 516 | 344 |
| J = 16600 mm ⁴ 3.25 | *1,629 | 983 | 655 | 546 | 410 | 273 |
| | 3.5 | *1,405 | 793 | 529 | 330 | 220 |
| | 3.75 | *1,224 | 649 | 432 | 270 | 180 |
| | 4 | *1,075 | 537 | 358 | 224 | 149 |
| | 4.25 | *953 | 449 | 300 | 187 | 125 |
| | 4.5 | *850 | 380 | 253 | 158 | 106 |
| **139.7 x 38.1 x 4.76 mm | | | | | | |
| Wt/m. = 1.77 kg/m 1 | *11,116 | — | — | — | 8,799 | 5,866 |
| b _f /t _f = 8.0 1.25 | *7,114 | — | — | 7,039 | 5,279 | 3,520 |
| F _b = 39.7 N/mm ² 1.5 | *4,940 | — | — | 4,493 | 3,370 | 2,246 |
| A _w = 619 mm ² 1.75 | *3,630 | — | 3,620 | 3,017 | 2,262 | 1,508 |
| I _x = 2400000 mm ⁴ 2 | *2,779 | — | 2,534 | 2,112 | 1,584 | 1,056 |
| S _x = 35000 mm ³ 2.25 | *2,196 | — | 1,836 | 1,530 | 1,148 | 765 |
| I _y = 90000 mm ⁴ 2.5 | *1,779 | — | 1,370 | 1,141 | 856 | 571 |
| J = 7500 mm ⁴ 2.75 | *1,470 | — | 1,047 | 873 | 654 | 436 |
| | 3 | *1,235 | 1,226 | 817 | 511 | 341 |
| | 3.25 | *1,052 | 975 | 650 | 406 | 271 |
| | 3.5 | *907 | 787 | 525 | 328 | 219 |
| | 3.75 | *790 | 644 | 429 | 268 | 179 |
| | 4 | *695 | 534 | 356 | 222 | 148 |
| | 4.25 | *615 | 447 | 298 | 186 | 124 |
| | 4.5 | *549 | 378 | 252 | 158 | 105 |

** Non-stock size subject to mill run requirements.

BEAMS

CHANNELS — EXTREN® 500 & 525
E = 17,900 N/mm²

Allowable Uniform Loads in Newtons Per Meter



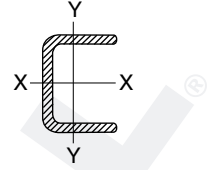
| SPAN IN METERS | LATERALLY SUPPORTED--GOVERNED BY: | | | | | | |
|--|---|------------|-------|--------|--------|--------|-------|
| | Stress *F _b or F _v | Deflection | | | | | |
| | | l/100 | l/150 | l/180 | l/240 | l/360 | |
| 139.7 x 38.1 x 6.35 mm | | | | | | | |
| Wt/m. = 2.31 kg/m | 1 | 16,613 | — | — | 14,812 | 11,109 | 7,406 |
| b _f /t _f = 6.0 | 1.25 | *11,399 | — | 10,609 | 8,840 | 6,630 | 4,420 |
| F _b = 48.4 N/mm ² | 1.5 | *7,916 | — | 6,747 | 5,622 | 4,217 | 2,811 |
| A _w = 806 mm ² | 1.75 | *5,816 | — | 4,518 | 3,765 | 2,824 | 1,883 |
| I _x = 3200000 mm ⁴ | 2 | *4,453 | — | 3,157 | 2,631 | 1,973 | 1,315 |
| S _x = 46000 mm ³ | 2.25 | *3,518 | 3,426 | 2,284 | 1,904 | 1,428 | 952 |
| I _y = 140000 mm ⁴ | 2.5 | *2,850 | 2,553 | 1,702 | 1,419 | 1,064 | 709 |
| J = 17500 mm ⁴ | 2.75 | *2,355 | 1,950 | 1,300 | 1,084 | 813 | 542 |
| | 3 | *1,979 | 1,522 | 1,014 | 845 | 634 | 423 |
| | 3.25 | *1,686 | 1,209 | 806 | 672 | 504 | 336 |
| | 3.5 | *1,454 | 976 | 650 | 542 | 407 | 271 |
| | 3.75 | *1,267 | 798 | 532 | 444 | 333 | 222 |
| | 4 | *1,113 | 661 | 441 | 367 | 276 | 184 |
| | 4.25 | *986 | 554 | 369 | 308 | 231 | 154 |
| | 4.5 | *880 | 468 | 312 | 260 | 195 | 130 |

** Non-stock size subject to mill run requirements.

BEAMS

CHANNELS — EXTREN® 625
E = 19,300 N/mm²

Allowable Uniform Loads in Newtons Per Meter



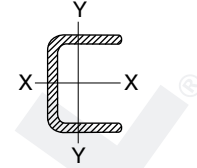
| SPAN IN METERS | LATERALLY SUPPORTED--GOVERNED BY: | | | | | | |
|---------------------------------|-----------------------------------|------------|---------|---------|---------|---------|-------|
| | Stress $*F_b$ or F_v | Deflection | | | | | |
| | | $l/100$ | $l/150$ | $l/180$ | $l/240$ | $l/360$ | |
| 139.7 x 38.1 x 6.35 mm | | | | | | | |
| Wt/m. = 2.31 kg/m | 1 | 16,613 | — | — | 15,492 | 11,619 | 7,746 |
| $b_f/t_f = 6.0$ | 1.25 | *12,271 | — | 11,181 | 9,317 | 6,988 | 4,659 |
| $F_b = 52.1$ N/mm ² | 1.5 | *8,521 | — | 7,149 | 5,957 | 4,468 | 2,979 |
| $A_w = 806$ mm ² | 1.75 | *6,261 | — | 4,805 | 4,005 | 3,003 | 2,002 |
| $I_x = 3200000$ mm ⁴ | 2 | *4,793 | — | 3,367 | 2,806 | 2,104 | 1,403 |
| $S_x = 46000$ mm ³ | 2.25 | *3,787 | 3,662 | 2,441 | 2,034 | 1,526 | 1,017 |
| $I_y = 140000$ mm ⁴ | 2.5 | *3,068 | 2,733 | 1,822 | 1,518 | 1,139 | 759 |
| $J = 17500$ mm ⁴ | 2.75 | *2,535 | 2,090 | 1,393 | 1,161 | 871 | 581 |
| | 3 | *2,130 | 1,632 | 1,088 | 907 | 680 | 453 |
| | 3.25 | *1,815 | 1,297 | 865 | 721 | 541 | 360 |
| | 3.5 | *1,565 | 1,048 | 699 | 582 | 437 | 291 |
| | 3.75 | *1,363 | 858 | 572 | 477 | 357 | 238 |
| | 4 | *1,198 | 711 | 474 | 395 | 296 | 198 |
| | 4.25 | *1,061 | 596 | 397 | 331 | 248 | 165 |
| | 4.5 | *947 | 504 | 336 | 280 | 210 | 140 |

** Non-stock size subject to mill run requirements.

BEAMS

CHANNELS — EXTREN® 500 & 525
E = 17,900 N/mm²

Allowable Uniform Loads in Newtons Per Meter



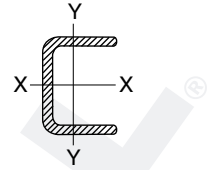
| SPAN IN METERS | LATERALLY SUPPORTED--GOVERNED BY: | | | | | |
|--|--|---------------|---------------|---------------|---------------|---------------|
| | Stress *F_b or F_v | Deflection | | | | |
| | | <i>l</i> /100 | <i>l</i> /150 | <i>l</i> /180 | <i>l</i> /240 | <i>l</i> /360 |
| 152.4 x 41.3 x 6.35 mm | | | | | | |
| Wt/m. = 2.50 kg/m 1.5 | *8,940 | — | 8,644 | 7,203 | 5,402 | 3,602 |
| b _f /t _f = 6.5 1.75 | *6,568 | — | 5,848 | 4,873 | 3,655 | 2,437 |
| F _b = 44.9 N/mm ² 2 | *5,029 | — | 4,116 | 3,430 | 2,573 | 1,715 |
| A _w = 890 mm ² 2.25 | *3,973 | — | 2,995 | 2,496 | 1,872 | 1,248 |
| I _x = 4300000 mm ⁴ 2.5 | *3,218 | — | 2,241 | 1,868 | 1,401 | 934 |
| S _x = 56000 mm ³ 2.75 | *2,660 | 2,576 | 1,718 | 1,431 | 1,073 | 716 |
| I _y = 180000 mm ⁴ 3 | *2,235 | 2,015 | 1,343 | 1,119 | 840 | 560 |
| J = 20800 mm ⁴ 3.25 | *1,904 | 1,604 | 1,069 | 891 | 668 | 446 |
| | 3.5 | *1,642 | 1,297 | 865 | 720 | 540 |
| | 3.75 | *1,430 | 1,063 | 708 | 590 | 443 |
| | 4 | *1,257 | 881 | 588 | 490 | 367 |
| | 4.25 | *1,114 | 739 | 493 | 410 | 308 |
| | 4.5 | *993 | 625 | 417 | 347 | 261 |
| **152.4 x 42.9 x 9.53 mm | | | | | | |
| Wt/m. = 3.66 kg/m 1.5 | 17,455 | — | 12,282 | 10,235 | 7,676 | 5,117 |
| b _f /t _f = 4.5 1.75 | *13,125 | 12,460 | 8,307 | 6,922 | 5,192 | 3,461 |
| F _b = 63.6 N/mm ² 2 | *10,049 | 8,769 | 5,846 | 4,871 | 3,654 | 2,436 |
| A _w = 1271 mm ² 2.25 | *7,940 | 6,379 | 4,253 | 3,544 | 2,658 | 1,772 |
| I _x = 6100000 mm ⁴ 2.5 | *6,431 | 4,773 | 3,182 | 2,651 | 1,989 | 1,326 |
| S _x = 79000 mm ³ 2.75 | *5,315 | 3,657 | 2,438 | 2,032 | 1,524 | 1,016 |
| I _y = 220000 mm ⁴ 3 | *4,466 | 2,860 | 1,907 | 1,589 | 1,192 | 794 |
| J = 62400 mm ⁴ 3.25 | *3,805 | 2,277 | 1,518 | 1,265 | 949 | 632 |
| | 3.5 | *3,281 | 1,840 | 1,227 | 1,022 | 767 |
| | 3.75 | *2,858 | 1,508 | 1,005 | 838 | 628 |
| | 4 | *2,512 | 1,251 | 834 | 695 | 521 |
| | 4.25 | *2,225 | 1,048 | 699 | 582 | 437 |
| | 4.5 | *1,985 | 887 | 591 | 493 | 370 |

** Non-stock size subject to mill run requirements.

BEAMS

CHANNELS — EXTREN® 625
E = 19,300 N/mm²

Allowable Uniform Loads in Newtons Per Meter



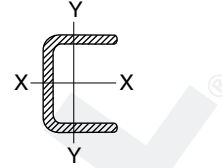
| SPAN IN METERS | LATERALLY SUPPORTED--GOVERNED BY: | | | | | | |
|--|--|---------------|---------------|---------------|---------------|---------------|-----|
| | Stress *F_b or F_v | Deflection | | | | | |
| | | <i>l</i> /100 | <i>l</i> /150 | <i>l</i> /180 | <i>l</i> /240 | <i>l</i> /360 | |
| 152.4 x 41.3 x 6.35 mm | | | | | | | |
| Wt/m. = 2.50 kg/m 1.5 | *9,617 | — | 9,133 | 7,611 | 5,708 | 3,806 | |
| b _f /t _f = 6.5 1.75 | *7,066 | — | 6,205 | 5,171 | 3,878 | 2,586 | |
| F _b = 48.3 N/mm ² 2 | *5,410 | — | 4,382 | 3,651 | 2,739 | 1,826 | |
| A _w = 890 mm ² 2.25 | *4,274 | — | 3,196 | 2,663 | 1,997 | 1,332 | |
| I _x = 4300000 mm ⁴ 2.5 | *3,462 | — | 2,395 | 1,996 | 1,497 | 998 | |
| S _x = 56000 mm ³ 2.75 | *2,861 | 2,757 | 1,838 | 1,532 | 1,149 | 766 | |
| I _y = 180000 mm ⁴ 3 | *2,404 | 2,159 | 1,439 | 1,199 | 900 | 600 | |
| J = 20800 mm ⁴ 3.25 | *2,049 | 1,720 | 1,147 | 956 | 717 | 478 | |
| | 3.5 | *1,766 | 1,392 | 928 | 773 | 580 | 387 |
| | 3.75 | *1,539 | 1,141 | 761 | 634 | 475 | 317 |
| | 4 | *1,352 | 947 | 631 | 526 | 394 | 263 |
| | 4.25 | *1,198 | 794 | 529 | 441 | 331 | 221 |
| | 4.5 | *1,069 | 672 | 448 | 373 | 280 | 187 |
| **152.4 x 42.9 x 9.53 mm | | | | | | | |
| Wt/m. = 3.66 kg/m 1.5 | 17,455 | — | 12,979 | 10,816 | 8,112 | 5,408 | |
| b _f /t _f = 4.5 1.75 | *14,136 | 13,223 | 8,815 | 7,346 | 5,509 | 3,673 | |
| F _b = 68.5 N/mm ² 2 | *10,823 | 9,334 | 6,223 | 5,186 | 3,889 | 2,593 | |
| A _w = 1271 mm ² 2.25 | *8,552 | 6,806 | 4,537 | 3,781 | 2,836 | 1,891 | |
| I _x = 6100000 mm ⁴ 2.5 | *6,927 | 5,101 | 3,401 | 2,834 | 2,126 | 1,417 | |
| S _x = 79000 mm ³ 2.75 | *5,725 | 3,914 | 2,609 | 2,174 | 1,631 | 1,087 | |
| I _y = 220000 mm ⁴ 3 | *4,810 | 3,064 | 2,043 | 1,702 | 1,277 | 851 | |
| J = 62400 mm ⁴ 3.25 | *4,099 | 2,441 | 1,628 | 1,356 | 1,017 | 678 | |
| | 3.5 | *3,534 | 1,975 | 1,317 | 1,097 | 823 | 549 |
| | 3.75 | *3,079 | 1,619 | 1,080 | 900 | 675 | 450 |
| | 4 | *2,706 | 1,344 | 896 | 746 | 560 | 373 |
| | 4.25 | *2,397 | 1,127 | 751 | 626 | 469 | 313 |
| | 4.5 | *2,138 | 954 | 636 | 530 | 397 | 265 |

** Non-stock size subject to mill run requirements.

BEAMS

CHANNELS — EXTREN® 500 & 525
E = 17,900 N/mm²

Allowable Uniform Loads in Newtons Per Meter



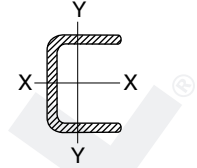
| SPAN IN METERS | LATERALLY SUPPORTED--GOVERNED BY: | | | | | |
|--|--|---------------|---------------|---------------|---------------|---------------|
| | Stress *F_b or F_v | Deflection | | | | |
| | | <i>l</i> /100 | <i>l</i> /150 | <i>l</i> /180 | <i>l</i> /240 | <i>l</i> /360 |
| **203.2 x 55.6 x 6.35 mm | | | | | | |
| Wt/m. = 3.45 kg/m 2 | *6,963 | — | — | — | 5,553 | 3,702 |
| b _f /t _f = 8.8 2.25 | *5,501 | — | — | — | 4,128 | 2,752 |
| F _b = 33.8 N/mm ² 2.5 | *4,456 | — | — | 4,187 | 3,140 | 2,093 |
| A _w = 1213 mm ² 2.75 | *3,683 | — | — | 3,250 | 2,438 | 1,625 |
| I _x = 10500000 mm ⁴ 3 | *3,095 | — | 3,082 | 2,568 | 1,926 | 1,284 |
| S _x = 103000 mm ³ 3.25 | *2,637 | — | 2,474 | 2,062 | 1,546 | 1,031 |
| I _y = 460000 mm ⁴ 3.5 | *2,274 | — | 2,014 | 1,678 | 1,259 | 839 |
| J = 25000 mm ⁴ 3.75 | *1,981 | — | 1,660 | 1,383 | 1,037 | 692 |
| 4 | *1,741 | — | 1,383 | 1,152 | 864 | 576 |
| 4.25 | *1,542 | — | 1,164 | 970 | 727 | 485 |
| 4.5 | *1,375 | — | 988 | 824 | 618 | 412 |
| 4.75 | *1,234 | — | 846 | 705 | 529 | 352 |
| 5 | *1,114 | 1,094 | 730 | 608 | 456 | 304 |
| 5.25 | *1,010 | 950 | 633 | 528 | 396 | 264 |
| 5.5 | *921 | 830 | 553 | 461 | 346 | 231 |
| 5.75 | *842 | 729 | 486 | 405 | 304 | 203 |
| 6 | *774 | 644 | 429 | 358 | 268 | 179 |
| 203.2 x 55.6 x 9.53 mm | | | | | | |
| Wt/m. = 5.07 kg/m 2 | *14,641 | — | 12,672 | 10,560 | 7,920 | 5,280 |
| b _f /t _f = 5.8 2.25 | *11,568 | — | 9,411 | 7,843 | 5,882 | 3,921 |
| F _b = 49.8 N/mm ² 2.5 | *9,370 | — | 7,155 | 5,962 | 4,472 | 2,981 |
| A _w = 1755 mm ² 2.75 | *7,744 | — | 5,551 | 4,626 | 3,470 | 2,313 |
| I _x = 14900000 mm ⁴ 3 | *6,507 | — | 4,385 | 3,654 | 2,741 | 1,827 |
| S _x = 147000 mm ³ 3.25 | *5,545 | 5,279 | 3,519 | 2,933 | 2,199 | 1,466 |
| I _y = 590000 mm ⁴ 3.5 | *4,781 | 4,295 | 2,864 | 2,386 | 1,790 | 1,193 |
| J = 83200 mm ⁴ 3.75 | *4,165 | 3,539 | 2,359 | 1,966 | 1,475 | 983 |
| 4 | *3,660 | 2,948 | 1,966 | 1,638 | 1,228 | 819 |
| 4.25 | *3,242 | 2,481 | 1,654 | 1,378 | 1,034 | 689 |
| 4.5 | *2,892 | 2,106 | 1,404 | 1,170 | 878 | 585 |
| 4.75 | *2,596 | 1,803 | 1,202 | 1,002 | 751 | 501 |
| 5 | *2,343 | 1,554 | 1,036 | 864 | 648 | 432 |
| 5.25 | *2,125 | 1,349 | 900 | 750 | 562 | 375 |
| 5.5 | *1,936 | 1,179 | 786 | 655 | 491 | 327 |
| 5.75 | *1,771 | 1,035 | 690 | 575 | 431 | 288 |
| 6 | *1,627 | 914 | 610 | 508 | 381 | 254 |

** Non-stock size subject to mill run requirements.

BEAMS

CHANNELS — EXTREN® 625
E = 19,300 N/mm²

Allowable Uniform Loads in Newtons Per Meter

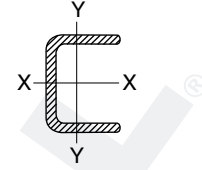


| SPAN IN METERS | LATERALLY SUPPORTED--GOVERNED BY: | | | | | |
|--|--|---------------|---------------|---------------|---------------|---------------|
| | Stress *F_b or F_v | Deflection | | | | |
| | | <i>l</i> /100 | <i>l</i> /150 | <i>l</i> /180 | <i>l</i> /240 | <i>l</i> /360 |
| **203.2 x 55.6 x 6.35 mm | | | | | | |
| Wt/m. = 3.45 kg/m 2 | *7,498 | — | — | — | 5,867 | 3,911 |
| b _f /t _f = 8.8 2.25 | *5,925 | — | — | 5,834 | 4,375 | 2,917 |
| F _b = 36.4 N/mm ² 2.5 | *4,799 | — | — | 4,450 | 3,337 | 2,225 |
| A _w = 1213 mm ² 2.75 | *3,966 | — | — | 3,461 | 2,596 | 1,731 |
| I _x = 10500000 mm ⁴ 3 | *3,333 | — | 3,288 | 2,740 | 2,055 | 1,370 |
| S _x = 103000 mm ³ 3.25 | *2,840 | — | 2,643 | 2,203 | 1,652 | 1,101 |
| I _y = 460000 mm ⁴ 3.5 | *2,448 | — | 2,154 | 1,795 | 1,346 | 897 |
| J = 25000 mm ⁴ 3.75 | *2,133 | — | 1,777 | 1,481 | 1,110 | 740 |
| 4 | *1,875 | — | 1,482 | 1,235 | 926 | 617 |
| 4.25 | *1,661 | — | 1,248 | 1,040 | 780 | 520 |
| 4.5 | *1,481 | — | 1,060 | 883 | 663 | 442 |
| 4.75 | *1,329 | — | 908 | 757 | 567 | 378 |
| 5 | *1,200 | 1,175 | 783 | 653 | 490 | 326 |
| 5.25 | *1,088 | 1,020 | 680 | 567 | 425 | 283 |
| 5.5 | *992 | 892 | 594 | 495 | 372 | 248 |
| 5.75 | *907 | 784 | 522 | 435 | 326 | 218 |
| 6 | *833 | 692 | 461 | 385 | 288 | 192 |
| 203.2 x 55.6 x 9.53 mm | | | | | | |
| Wt/m. = 5.07 kg/m 2 | *15,758 | — | 13,392 | 11,160 | 8,370 | 5,580 |
| b _f /t _f = 5.8 2.25 | *12,451 | — | 9,979 | 8,316 | 6,237 | 4,158 |
| F _b = 53.6 N/mm ² 2.5 | *10,085 | — | 7,606 | 6,338 | 4,754 | 3,169 |
| A _w = 1755 mm ² 2.75 | *8,335 | — | 5,914 | 4,928 | 3,696 | 2,464 |
| I _x = 14900000 mm ⁴ 3 | *7,004 | — | 4,679 | 3,899 | 2,924 | 1,950 |
| S _x = 147000 mm ³ 3.25 | *5,968 | 5,640 | 3,760 | 3,133 | 2,350 | 1,567 |
| I _y = 590000 mm ⁴ 3.5 | *5,146 | 4,595 | 3,063 | 2,553 | 1,914 | 1,276 |
| J = 83200 mm ⁴ 3.75 | *4,482 | 3,789 | 2,526 | 2,105 | 1,579 | 1,053 |
| 4 | *3,940 | 3,159 | 2,106 | 1,755 | 1,316 | 878 |
| 4.25 | *3,490 | 2,660 | 1,773 | 1,478 | 1,108 | 739 |
| 4.5 | *3,113 | 2,260 | 1,506 | 1,255 | 941 | 628 |
| 4.75 | *2,794 | 1,935 | 1,290 | 1,075 | 806 | 537 |
| 5 | *2,521 | 1,669 | 1,113 | 927 | 695 | 464 |
| 5.25 | *2,287 | 1,450 | 966 | 805 | 604 | 403 |
| 5.5 | *2,084 | 1,267 | 844 | 704 | 528 | 352 |
| 5.75 | *1,906 | 1,113 | 742 | 618 | 464 | 309 |
| 6 | *1,751 | 983 | 655 | 546 | 410 | 273 |

** Non-stock size subject to mill run requirements.

BEAMS

CHANNELS — EXTREN® 500 & 525
E = 17,900 N/mm²



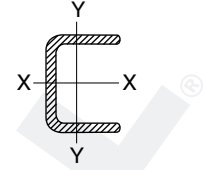
Allowable Uniform Loads in Newtons Per Meter

| SPAN IN METERS | LATERALLY SUPPORTED--GOVERNED BY: | | | | | | |
|---|--|---------------|---------------|---------------|---------------|---------------|--------|
| | Stress *F_b or F_v | Deflection | | | | | |
| | | <i>l</i> /100 | <i>l</i> /150 | <i>l</i> /180 | <i>l</i> /240 | <i>l</i> /360 | |
| 254 x 69.9 x 12.7 mm | | | | | | | |
| Wt/m. = 8.18 kg/m | 2 | 29,903 | — | 28,588 | 23,823 | 17,867 | 11,912 |
| b _f /t _f = 5.5 | 2.25 | *25,186 | — | 21,684 | 18,070 | 13,552 | 9,035 |
| F _b = 52.6 N/mm ² | 2.5 | *20,400 | — | 16,767 | 13,972 | 10,479 | 6,986 |
| A _w = 2903 mm ² | 2.75 | *16,860 | — | 13,189 | 10,991 | 8,243 | 5,496 |
| I _x = 38500000 mm ⁴ | 3 | *14,167 | — | 10,536 | 8,780 | 6,585 | 4,390 |
| S _x = 303000 mm ³ | 3.25 | *12,071 | — | 8,533 | 7,111 | 5,333 | 3,555 |
| I _y = 1660000 mm ⁴ | 3.5 | *10,408 | — | 6,997 | 5,831 | 4,373 | 2,915 |
| J = 249700 mm ⁴ | 3.75 | *9,067 | 8,703 | 5,802 | 4,835 | 3,626 | 2,417 |
| | 4 | *7,969 | 7,289 | 4,860 | 4,050 | 3,037 | 2,025 |
| | 4.25 | *7,059 | 6,162 | 4,108 | 3,423 | 2,567 | 1,712 |
| | 4.5 | *6,296 | 5,252 | 3,501 | 2,918 | 2,188 | 1,459 |
| | 4.75 | *5,651 | 4,510 | 3,007 | 2,506 | 1,879 | 1,253 |
| | 5 | *5,100 | 3,901 | 2,600 | 2,167 | 1,625 | 1,084 |
| | 5.25 | *4,626 | 3,395 | 2,263 | 1,886 | 1,415 | 943 |
| | 5.5 | *4,215 | 2,972 | 1,981 | 1,651 | 1,238 | 826 |
| | 5.75 | *3,856 | 2,616 | 1,744 | 1,453 | 1,090 | 727 |
| | 6 | *3,542 | 2,314 | 1,543 | 1,286 | 964 | 643 |
| | 6.25 | *3,264 | 2,057 | 1,371 | 1,143 | 857 | 571 |
| | 6.5 | *3,018 | 1,836 | 1,224 | 1,020 | 765 | 510 |
| | 6.75 | *2,798 | 1,645 | 1,097 | 914 | 685 | 457 |
| | 7 | *2,602 | 1,480 | 986 | 822 | 617 | 411 |
| | 7.25 | *2,426 | 1,336 | 890 | 742 | 557 | 371 |
| | 7.5 | *2,267 | 1,210 | 806 | 672 | 504 | 336 |

BEAMS

CHANNELS — EXTREN® 625
E = 19,300 N/mm²

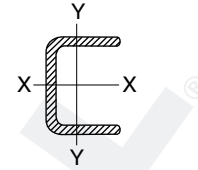
Allowable Uniform Loads in Newtons Per Meter



| SPAN IN METERS | LATERALLY SUPPORTED--GOVERNED BY: | | | | | | |
|---|---|------------|--------|--------|--------|--------|--------|
| | Stress *F _b or F _v | Deflection | | | | | |
| | | l/100 | l/150 | l/180 | l/240 | l/360 | |
| 254 x 69.9 x 12.7 mm | | | | | | | |
| Wt/m. = 8.18 kg/m | 2 | 29,903 | — | — | 24,996 | 18,747 | 12,498 |
| b _f /t _f = 5.5 | 2.25 | 26,581 | — | 22,842 | 19,035 | 14,276 | 9,517 |
| F _b = 56.6 N/mm ² | 2.5 | *21,952 | — | 17,720 | 14,766 | 11,075 | 7,383 |
| A _w = 2903 mm ² | 2.75 | *18,142 | — | 13,976 | 11,647 | 8,735 | 5,823 |
| I _x = 38500000 mm ⁴ | 3 | *15,244 | — | 11,189 | 9,324 | 6,993 | 4,662 |
| S _x = 303000 mm ³ | 3.25 | *12,989 | — | 9,079 | 7,566 | 5,674 | 3,783 |
| I _y = 1660000 mm ⁴ | 3.5 | *11,200 | 11,184 | 7,456 | 6,213 | 4,660 | 3,107 |
| J = 249700 mm ⁴ | 3.75 | *9,756 | 9,286 | 6,191 | 5,159 | 3,869 | 2,579 |
| | 4 | *8,575 | 7,786 | 5,191 | 4,326 | 3,244 | 2,163 |
| | 4.25 | *7,596 | 6,588 | 4,392 | 3,660 | 2,745 | 1,830 |
| | 4.5 | *6,775 | 5,620 | 3,747 | 3,122 | 2,342 | 1,561 |
| | 4.75 | *6,081 | 4,830 | 3,220 | 2,683 | 2,012 | 1,342 |
| | 5 | *5,488 | 4,179 | 2,786 | 2,322 | 1,741 | 1,161 |
| | 5.25 | *4,978 | 3,639 | 2,426 | 2,022 | 1,516 | 1,011 |
| | 5.5 | *4,535 | 3,188 | 2,125 | 1,771 | 1,328 | 885 |
| | 5.75 | *4,150 | 2,807 | 1,871 | 1,559 | 1,170 | 780 |
| | 6 | *3,811 | 2,484 | 1,656 | 1,380 | 1,035 | 690 |
| | 6.25 | *3,512 | 2,208 | 1,472 | 1,227 | 920 | 613 |
| | 6.5 | *3,247 | 1,972 | 1,314 | 1,095 | 821 | 548 |
| | 6.75 | *3,011 | 1,767 | 1,178 | 982 | 736 | 491 |
| | 7 | *2,800 | 1,590 | 1,060 | 883 | 663 | 442 |
| | 7.25 | *2,610 | 1,436 | 957 | 798 | 598 | 399 |
| | 7.5 | *2,439 | 1,300 | 867 | 722 | 542 | 361 |

BEAMS

CHANNELS — EXTREN® 500 & 525
E = 17,900 N/mm²

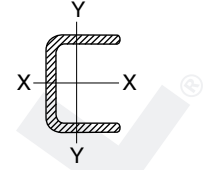


Allowable Uniform Loads in Newtons Per Meter

| SPAN IN METERS | LATERALLY SUPPORTED--GOVERNED BY: | | | | | | |
|---|--|---------------|---------------|---------------|---------------|---------------|--------|
| | Stress *F_b or F_v | Deflection | | | | | |
| | | <i>l</i> /100 | <i>l</i> /150 | <i>l</i> /180 | <i>l</i> /240 | <i>l</i> /360 | |
| 304.8 x 76.2 x 12.7 mm | | | | | | | |
| Wt/m. = 9.38 kg/m | 2 | 36,548 | — | — | 33,641 | 25,231 | 16,821 |
| b _f /t _f = 6.0 | 2.25 | *29,829 | — | — | 25,838 | 19,379 | 12,919 |
| F _b = 48.4 N/mm ² | 2.5 | *24,161 | — | — | 20,187 | 15,140 | 10,094 |
| A _w = 3548 mm ² | 2.75 | *19,968 | — | 19,221 | 16,017 | 12,013 | 8,009 |
| I _x = 59400000 mm ⁴ | 3 | *16,779 | — | 15,464 | 12,887 | 9,665 | 6,443 |
| S _x = 390000 mm ³ | 3.25 | *14,297 | — | 12,599 | 10,500 | 7,875 | 5,250 |
| I _y = 2110000 mm ⁴ | 3.5 | *12,327 | — | 10,384 | 8,653 | 6,490 | 4,326 |
| S _y = 36000 mm ⁴ | 3.75 | *10,738 | — | 8,647 | 7,206 | 5,404 | 3,603 |
| J = 312200 mm ⁴ | 4 | *9,438 | — | 7,269 | 6,057 | 4,543 | 3,029 |
| | 4.25 | *8,360 | — | 6,163 | 5,136 | 3,852 | 2,568 |
| | 4.5 | *7,457 | — | 5,267 | 4,390 | 3,292 | 2,195 |
| | 4.75 | *6,693 | — | 4,534 | 3,779 | 2,834 | 1,889 |
| | 5 | *6,040 | 5,894 | 3,929 | 3,274 | 2,456 | 1,637 |
| | 5.25 | *5,479 | 5,139 | 3,426 | 2,855 | 2,141 | 1,427 |
| | 5.5 | *4,992 | 4,506 | 3,004 | 2,503 | 1,877 | 1,252 |
| | 5.75 | *4,567 | 3,971 | 2,648 | 2,206 | 1,655 | 1,103 |
| | 6 | *4,195 | 3,518 | 2,345 | 1,954 | 1,466 | 977 |
| | 6.25 | *3,866 | 3,129 | 2,086 | 1,739 | 1,304 | 869 |
| | 6.5 | *3,574 | 2,796 | 1,864 | 1,553 | 1,165 | 777 |
| | 6.75 | *3,314 | 2,508 | 1,672 | 1,393 | 1,045 | 697 |
| | 7 | *3,082 | 2,258 | 1,505 | 1,254 | 941 | 627 |
| | 7.25 | *2,873 | 2,039 | 1,360 | 1,133 | 850 | 567 |
| | 7.5 | *2,685 | 1,848 | 1,232 | 1,027 | 770 | 513 |
| | 7.75 | *2,514 | 1,680 | 1,120 | 933 | 700 | 467 |
| | 8 | *2,360 | 1,532 | 1,021 | 851 | 638 | 425 |
| | 8.25 | *2,219 | 1,400 | 933 | 778 | 583 | 389 |
| | 8.5 | *2,090 | 1,283 | 855 | 713 | 535 | 356 |
| | 8.75 | *1,972 | 1,178 | 786 | 655 | 491 | 327 |
| | 9 | *1,864 | 1,085 | 723 | 603 | 452 | 301 |

BEAMS

CHANNELS — EXTREN® 625
E = 19,300 x 10³ N/mm²



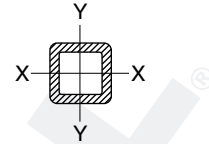
Allowable Uniform Loads in Newtons Per Meter

| SPAN IN METERS | LATERALLY SUPPORTED--GOVERNED BY: | | | | | |
|--|---|------------|--------|--------|--------|--------|
| | Stress *F _b or F _v | Deflection | | | | |
| | | l/100 | l/150 | l/180 | l/240 | l/360 |
| 304.8 x 76.2 x 12.7 mm | | | | | | |
| Wt/m. = 9.38 Kg/m 2 | 36,548 | — | — | 35,152 | 26,364 | 17,576 |
| b _f /t _f = 6.0 2.25 | *32,109 | — | — | 27,112 | 20,334 | 13,556 |
| F _b = 52.1 N/mm ² 2.5 | *26,008 | — | 25,509 | 21,258 | 15,943 | 10,629 |
| A _w = 3548 mm ² 2.75 | *21,494 | — | 20,300 | 16,917 | 12,688 | 8,458 |
| I _x = 59400000 mm ⁴ 3 | *18,061 | — | 16,373 | 13,645 | 10,233 | 6,822 |
| S _x = 390000 mm ³ 3.25 | *15,390 | — | 13,369 | 11,141 | 8,355 | 5,570 |
| I _y = 2110000 mm ⁴ 3.5 | *13,270 | — | 11,037 | 9,198 | 6,898 | 4,599 |
| S _y = 36000 mm ⁴ 3.75 | *11,559 | — | 9,205 | 7,671 | 5,753 | 3,835 |
| J = 312200 mm ⁴ 4 | *10,160 | — | 7,748 | 6,457 | 4,843 | 3,228 |
| 4.25 | *8,999 | — | 6,577 | 5,481 | 4,111 | 2,741 |
| 4.5 | *8,027 | — | 5,627 | 4,689 | 3,517 | 2,344 |
| 4.75 | *7,205 | — | 4,848 | 4,040 | 3,030 | 2,020 |
| 5 | *6,502 | 6,306 | 4,204 | 3,503 | 2,628 | 1,752 |
| 5.25 | *5,898 | 5,502 | 3,668 | 3,056 | 2,292 | 1,528 |
| 5.5 | *5,374 | 4,827 | 3,218 | 2,682 | 2,011 | 1,341 |
| 5.75 | *4,917 | 4,257 | 2,838 | 2,365 | 1,774 | 1,182 |
| 6 | *4,515 | 3,772 | 2,514 | 2,095 | 1,572 | 1,048 |
| 6.25 | *4,161 | 3,357 | 2,238 | 1,865 | 1,399 | 932 |
| 6.5 | *3,847 | 3,000 | 2,000 | 1,667 | 1,250 | 833 |
| 6.75 | *3,568 | 2,692 | 1,795 | 1,496 | 1,122 | 748 |
| 7 | *3,317 | 2,424 | 1,616 | 1,347 | 1,010 | 673 |
| 7.25 | *3,093 | 2,190 | 1,460 | 1,217 | 913 | 608 |
| 7.5 | *2,890 | 1,986 | 1,324 | 1,103 | 827 | 552 |
| 7.75 | *2,706 | 1,805 | 1,204 | 1,003 | 752 | 501 |
| 8 | *2,540 | 1,646 | 1,097 | 914 | 686 | 457 |
| 8.25 | *2,388 | 1,505 | 1,003 | 836 | 627 | 418 |
| 8.5 | *2,250 | 1,379 | 920 | 766 | 575 | 383 |
| 8.75 | *2,123 | 1,267 | 845 | 704 | 528 | 352 |
| 9 | *2,007 | 1,167 | 778 | 648 | 486 | 324 |

BEAMS

SQUARE TUBES — EXTREN® 500 & 525
E = 17,900 N/mm²

Allowable Uniform Loads in Newtons Per Meter



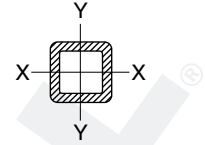
| SPAN IN METERS | | | LATERALLY SUPPORTED--GOVERNED BY: | | | | | |
|----------------------------------|-------------------------|------|---|------------|--------|--------|-------|-------|
| | | | Stress *F _b or F _v | Deflection | | | | |
| | | | | l/100 | l/150 | l/180 | l/240 | l/360 |
| 76.2 x 76.2 x 6.35 mm | | | | | | | | |
| Wt/m. = | 3.27 kg/m | 1 | *16,477 | 15,815 | 10,544 | 8,786 | 6,590 | 4,393 |
| b _f /t _f = | 12.0 | 1.25 | *10,545 | 8,843 | 5,896 | 4,913 | 3,685 | 2,456 |
| F _b = | 54.2 N/mm ² | 1.5 | *7,323 | 5,387 | 3,591 | 2,993 | 2,245 | 1,496 |
| A _w = | 806 mm ² | 1.75 | *5,380 | 3,504 | 2,336 | 1,947 | 1,460 | 973 |
| I = | 1500000 mm ⁴ | 2 | *4,119 | 2,398 | 1,599 | 1,332 | 999 | 666 |
| S _x = | 38000 mm ³ | 2.25 | *3,255 | 1,710 | 1,140 | 950 | 712 | 475 |
| J = | 2461200 mm ⁴ | 2.5 | *2,636 | 1,260 | 840 | 700 | 525 | 350 |
| | | 2.75 | *2,179 | 955 | 636 | 530 | 398 | 265 |
| | | 3 | *1,831 | 740 | 493 | 411 | 308 | 206 |
| **88.9 x 88.9 x 6.35 mm | | | | | | | | |
| Wt/m. = | 3.82 kg/m | 1 | 19,935 | — | 15,648 | 13,040 | 9,780 | 6,520 |
| b _f /t _f = | 14.0 | 1.25 | *13,404 | — | 8,945 | 7,454 | 5,590 | 3,727 |
| F _b = | 47.6 N/mm ² | 1.5 | *9,308 | 8,289 | 5,526 | 4,605 | 3,454 | 2,302 |
| A _w = | 968 mm ² | 1.75 | *6,839 | 5,441 | 3,628 | 3,023 | 2,267 | 1,511 |
| I = | 2400000 mm ⁴ | 2 | *5,236 | 3,749 | 2,499 | 2,083 | 1,562 | 1,041 |
| S _x = | 55000 mm ³ | 2.25 | *4,137 | 2,685 | 1,790 | 1,492 | 1,119 | 746 |
| J = | 3572100 mm ⁴ | 2.5 | *3,351 | 1,985 | 1,324 | 1,103 | 827 | 551 |
| | | 2.75 | *2,769 | 1,508 | 1,005 | 838 | 628 | 419 |
| | | 3 | *2,327 | 1,171 | 781 | 650 | 488 | 325 |
| 101.6 x 101.6 x 6.35 mm | | | | | | | | |
| Wt/m. = | 4.58 kg/m | 1.5 | *10,854 | — | 8,119 | 6,765 | 5,074 | 3,383 |
| b _f /t _f = | 16.0 | 1.75 | *7,975 | — | 5,389 | 4,491 | 3,368 | 2,245 |
| F _b = | 42.4 N/mm ² | 2 | *6,106 | 5,612 | 3,741 | 3,118 | 2,338 | 1,559 |
| A _w = | 1129 mm ² | 2.25 | *4,824 | 4,042 | 2,695 | 2,246 | 1,684 | 1,123 |
| I = | 3700000 mm ⁴ | 2.5 | *3,908 | 3,002 | 2,001 | 1,668 | 1,251 | 834 |
| S _x = | 72000 mm ³ | 2.75 | *3,229 | 2,287 | 1,524 | 1,270 | 953 | 635 |
| J = | 6217200 mm ⁴ | 3 | *2,714 | 1,780 | 1,187 | 989 | 742 | 495 |
| | | 3.25 | *2,312 | 1,412 | 941 | 784 | 588 | 392 |
| | | 3.5 | *1,994 | 1,138 | 759 | 632 | 474 | 316 |
| | | 3.75 | *1,737 | 930 | 620 | 517 | 388 | 258 |
| | | 4 | *1,526 | 770 | 513 | 428 | 321 | 214 |

** Non-stock size subject to mill requirements.

BEAMS

SQUARE TUBES — EXTREN® 625
E = 19,300 N/mm²

Allowable Uniform Loads in Newtons Per Meter



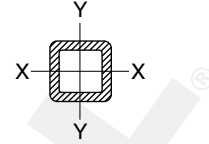
| SPAN IN METERS | | | LATERALLY SUPPORTED--GOVERNED BY: | | | | | |
|----------------------------------|-------------------------|------|---|------------|--------|--------|--------|-------|
| | | | Stress *F _b or F _v | Deflection | | | | |
| | | | | l/100 | l/150 | l/180 | l/240 | l/360 |
| 76.2 x 76.2 x 6.35 mm | | | | | | | | |
| Wt/m. = | 3.27 kg/m | 1 | 16,613 | — | 11,164 | 9,303 | 6,977 | 4,652 |
| b _f /t _f = | 12.0 | 1.25 | *11,362 | 9,414 | 6,276 | 5,230 | 3,923 | 2,615 |
| F _b = | 58.4 N/mm ² | 1.5 | *7,890 | 5,755 | 3,836 | 3,197 | 2,398 | 1,599 |
| A _w = | 806 mm ² | 1.75 | *5,797 | 3,751 | 2,501 | 2,084 | 1,563 | 1,042 |
| I = | 1500000 mm ⁴ | 2 | *4,438 | 2,572 | 1,714 | 1,429 | 1,071 | 714 |
| S _x = | 38000 mm ³ | 2.25 | *3,507 | 1,835 | 1,224 | 1,020 | 765 | 510 |
| J = | 2461200 mm ⁴ | 2.5 | *2,841 | 1,354 | 903 | 752 | 564 | 376 |
| | | 2.75 | *2,348 | 1,026 | 684 | 570 | 428 | 285 |
| | | 3 | *1,973 | 796 | 530 | 442 | 332 | 221 |
| **88.9 x 88.9 x 6.35 mm | | | | | | | | |
| Wt/m. = | 3.82 kg/m | 1 | 19,935 | — | 16,498 | 13,748 | 10,311 | 6,874 |
| b _f /t _f = | 14.0 | 1.25 | *14,418 | 14,236 | 9,491 | 7,909 | 5,932 | 3,954 |
| F _b = | 51.2 N/mm ² | 1.5 | *10,012 | 8,831 | 5,887 | 4,906 | 3,680 | 2,453 |
| A _w = | 968 mm ² | 1.75 | *7,356 | 5,813 | 3,876 | 3,230 | 2,422 | 1,615 |
| I = | 2400000 mm ⁴ | 2 | *5,632 | 4,013 | 2,675 | 2,229 | 1,672 | 1,115 |
| S _x = | 55000 mm ³ | 2.25 | *4,450 | 2,878 | 1,919 | 1,599 | 1,199 | 799 |
| J = | 3572100 mm ⁴ | 2.5 | *3,604 | 2,130 | 1,420 | 1,184 | 888 | 592 |
| | | 2.75 | *2,979 | 1,619 | 1,079 | 900 | 675 | 450 |
| | | 3 | *2,503 | 1,258 | 839 | 699 | 524 | 349 |
| 101.6 x 101.6 x 6.35 mm | | | | | | | | |
| Wt/m. = | 4.58 kg/m | 1.5 | *11,699 | — | 8,623 | 7,186 | 5,389 | 3,593 |
| b _f /t _f = | 16.0 | 1.75 | *8,595 | — | 5,743 | 4,786 | 3,589 | 2,393 |
| F _b = | 45.7 N/mm ² | 2 | *6,581 | 5,995 | 3,997 | 3,331 | 2,498 | 1,665 |
| A _w = | 1129 mm ² | 2.25 | *5,200 | 4,326 | 2,884 | 2,403 | 1,802 | 1,202 |
| I = | 3700000 mm ⁴ | 2.5 | *4,212 | 3,216 | 2,144 | 1,787 | 1,340 | 893 |
| S _x = | 72000 mm ³ | 2.75 | *3,481 | 2,453 | 1,635 | 1,363 | 1,022 | 681 |
| J = | 6217200 mm ⁴ | 3 | *2,925 | 1,911 | 1,274 | 1,062 | 796 | 531 |
| | | 3.25 | *2,492 | 1,517 | 1,011 | 843 | 632 | 421 |
| | | 3.5 | *2,149 | 1,223 | 815 | 680 | 510 | 340 |
| | | 3.75 | *1,872 | 1,000 | 667 | 556 | 417 | 278 |
| | | 4 | *1,645 | 828 | 552 | 460 | 345 | 230 |

** Non-stock size subject to mill run requirements.

BEAMS

SQUARE TUBES — EXTREN® 500 & 525
E = 17,900 N/mm²

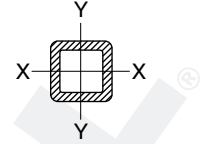
Allowable Uniform Loads in Newtons Per Meter



| SPAN IN METERS | LATERALLY SUPPORTED--GOVERNED BY: | | | | | | |
|---|--|---------------|---------------|---------------|---------------|---------------|--------|
| | Stress *F_b or F_v | Deflection | | | | | |
| | | <i>l</i> /100 | <i>l</i> /150 | <i>l</i> /180 | <i>l</i> /240 | <i>l</i> /360 | |
| 76.2 x 76.2 x 9.53 mm | | | | | | | |
| Wt/m. = 4.60 kg/m | 1 | 22,461 | 20,334 | 13,556 | 11,296 | 8,472 | 5,648 |
| b _f /t _f = 8.0 | 1.25 | 17,968 | 11,318 | 7,546 | 6,288 | 4,716 | 3,144 |
| F _b = 76.5 N/mm ² | 1.5 | *13,328 | 6,876 | 4,584 | 3,820 | 2,865 | 1,910 |
| A _w = 1090 mm ² | 1.75 | *9,792 | 4,464 | 2,976 | 2,480 | 1,860 | 1,240 |
| I = 1900000 mm ⁴ | 2 | *7,497 | 3,052 | 2,034 | 1,695 | 1,271 | 848 |
| S _x = 49000 mm ³ | 2.25 | *5,924 | 2,174 | 1,449 | 1,208 | 906 | 604 |
| J = 2822000 mm ⁴ | 2.5 | *4,798 | 1,601 | 1,067 | 889 | 667 | 445 |
| | 2.75 | *3,965 | 1,212 | 808 | 673 | 505 | 337 |
| | 3 | *3,332 | 939 | 626 | 522 | 391 | 261 |
| | 3.25 | *2,839 | 742 | 495 | 412 | 309 | 206 |
| | 3.5 | *2,448 | 596 | 397 | 331 | 248 | 166 |
| | 3.75 | *2,132 | 486 | 324 | 270 | 203 | 135 |
| | 4 | *1,874 | 402 | 268 | 223 | 167 | 112 |
| 101.6 x 101.6 x 9.53 mm | | | | | | | |
| Wt/m. = 6.37 kg/m | 1 | 32,428 | — | 30,148 | 25,123 | 18,842 | 12,562 |
| b _f /t _f = 10.7 | 1.25 | 25,943 | — | 17,611 | 14,676 | 11,007 | 7,338 |
| F _b = 59.9 N/mm ² | 1.5 | *20,872 | 16,555 | 11,037 | 9,197 | 6,898 | 4,599 |
| A _w = 1574 mm ² | 1.75 | *15,334 | 10,974 | 7,316 | 6,097 | 4,572 | 3,048 |
| I = 5000000 mm ⁴ | 2 | *11,740 | 7,612 | 5,074 | 4,229 | 3,172 | 2,114 |
| S _x = 98000 mm ³ | 2.25 | *9,276 | 5,479 | 3,652 | 3,044 | 2,283 | 1,522 |
| J = 7433900 mm ⁴ | 2.5 | *7,514 | 4,066 | 2,711 | 2,259 | 1,694 | 1,130 |
| | 2.75 | *6,210 | 3,096 | 2,064 | 1,720 | 1,290 | 860 |
| | 3 | *5,218 | 2,410 | 1,607 | 1,339 | 1,004 | 669 |
| | 3.25 | *4,446 | 1,911 | 1,274 | 1,062 | 796 | 531 |
| | 3.5 | *3,834 | 1,540 | 1,027 | 856 | 642 | 428 |
| | 3.75 | *3,339 | 1,259 | 839 | 699 | 524 | 350 |
| | 4 | *2,935 | 1,042 | 694 | 579 | 434 | 289 |
| | 4.25 | *2,600 | 872 | 581 | 484 | 363 | 242 |
| | 4.5 | *2,319 | 737 | 491 | 409 | 307 | 205 |
| | 4.75 | *2,081 | 628 | 419 | 349 | 262 | 174 |
| | 5 | *1,878 | 539 | 360 | 300 | 225 | 150 |
| | 5.25 | *1,704 | 467 | 311 | 259 | 195 | 130 |
| | 5.5 | *1,552 | 407 | 271 | 226 | 169 | 113 |
| | 5.75 | *1,420 | 357 | 238 | 198 | 149 | 99 |
| | 6 | *1,304 | 314 | 209 | 175 | 131 | 87 |

BEAMS

SQUARE TUBES — EXTREN® 625
E = 19,300 N/mm²

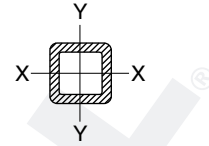


Allowable Uniform Loads in Newtons Per Meter

| SPAN IN METERS | | | LATERALLY SUPPORTED--GOVERNED BY: | | | | | |
|----------------------------------|-------------------------|------|---|------------|--------|--------|--------|--------|
| | | | Stress *F _b or F _v | Deflection | | | | |
| | | | | l/100 | l/150 | l/180 | l/240 | l/360 |
| 76.2 x 76.2 x 9.53 mm | | | | | | | | |
| Wt/m. = | 4.60 kg/m | 1 | 22,461 | 21,548 | 14,366 | 11,971 | 8,978 | 5,986 |
| b _f /t _f = | 8.0 | 1.25 | 17,968 | 12,058 | 8,038 | 6,699 | 5,024 | 3,349 |
| F _b = | 82.4 N/mm ² | 1.5 | *14,356 | 7,349 | 4,899 | 4,083 | 3,062 | 2,041 |
| A _w = | 1090 mm ² | 1.75 | *10,547 | 4,781 | 3,187 | 2,656 | 1,992 | 1,328 |
| I = | 1900000 mm ⁴ | 2 | *8,075 | 3,273 | 2,182 | 1,818 | 1,364 | 909 |
| S _x = | 49000 mm ³ | 2.25 | *6,380 | 2,334 | 1,556 | 1,297 | 972 | 648 |
| J = | 2822000 mm ⁴ | 2.5 | *5,168 | 1,720 | 1,147 | 956 | 717 | 478 |
| | | 2.75 | *4,271 | 1,303 | 869 | 724 | 543 | 362 |
| | | 3 | *3,589 | 1,010 | 673 | 561 | 421 | 281 |
| | | 3.25 | *3,058 | 798 | 532 | 444 | 333 | 222 |
| | | 3.5 | *2,637 | 642 | 428 | 357 | 267 | 178 |
| | | 3.75 | *2,297 | 523 | 349 | 291 | 218 | 145 |
| | | 4 | *2,019 | 432 | 288 | 240 | 180 | 120 |
| 101.6 x 101.6 x 9.53 mm | | | | | | | | |
| Wt/m. = | 6.37 kg/m | 1 | 32,428 | — | 31,656 | 26,380 | 19,785 | 13,190 |
| b _f /t _f = | 10.7 | 1.25 | 25,943 | — | 18,624 | 15,520 | 11,640 | 7,760 |
| F _b = | 64.5 N/mm ² | 1.5 | 21,619 | 17,591 | 11,727 | 9,773 | 7,329 | 4,886 |
| A _w = | 1574 mm ² | 1.75 | *16,512 | 11,699 | 7,799 | 6,499 | 4,875 | 3,250 |
| I = | 5000000 mm ⁴ | 2 | *12,642 | 8,133 | 5,422 | 4,519 | 3,389 | 2,259 |
| S _x = | 98000 mm ³ | 2.25 | *9,989 | 5,864 | 3,910 | 3,258 | 2,443 | 1,629 |
| J = | 7433900 mm ⁴ | 2.5 | *8,091 | 4,358 | 2,905 | 2,421 | 1,816 | 1,211 |
| | | 2.75 | *6,687 | 3,322 | 2,215 | 1,845 | 1,384 | 923 |
| | | 3 | *5,619 | 2,587 | 1,725 | 1,437 | 1,078 | 719 |
| | | 3.25 | *4,788 | 2,053 | 1,369 | 1,141 | 855 | 570 |
| | | 3.5 | *4,128 | 1,655 | 1,103 | 920 | 690 | 460 |
| | | 3.75 | *3,596 | 1,353 | 902 | 752 | 564 | 376 |
| | | 4 | *3,161 | 1,120 | 747 | 622 | 467 | 311 |
| | | 4.25 | *2,800 | 938 | 625 | 521 | 391 | 260 |
| | | 4.5 | *2,497 | 793 | 528 | 440 | 330 | 220 |
| | | 4.75 | *2,241 | 676 | 451 | 375 | 282 | 188 |
| | | 5 | *2,023 | 581 | 387 | 323 | 242 | 161 |
| | | 5.25 | *1,835 | 503 | 335 | 279 | 209 | 140 |
| | | 5.5 | *1,672 | 438 | 292 | 243 | 183 | 122 |
| | | 5.75 | *1,529 | 384 | 256 | 213 | 160 | 107 |
| | | 6 | *1,405 | 338 | 226 | 188 | 141 | 94 |

BEAMS

SQUARE TUBES — EXTREN® 500 & 525
E = 17,900 N/mm²



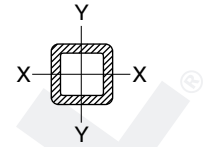
Allowable Uniform Loads in Newtons Per Meter

| SPAN IN METERS | LATERALLY SUPPORTED--GOVERNED BY: | | | | | |
|--|---|------------|--------|--------|--------|--------|
| | Stress *F _b or F _v | Deflection | | | | |
| | | l/100 | l/150 | l/180 | l/240 | l/360 |
| 152.4 x 152.4 x 9.53 mm | | | | | | |
| Wt/m. = 9.61 kg/m 0.75 | 69,818 | — | — | — | — | 52,854 |
| b _f /t _f = 16.0 1 | 52,364 | — | — | — | 47,335 | 31,557 |
| F _b = 42.4 N/mm ² 1.25 | 41,891 | — | — | 40,002 | 30,002 | 20,001 |
| A _w = 2542 mm ² 1.5 | 34,909 | — | 31,902 | 26,585 | 19,939 | 13,293 |
| I = 17700000 mm ⁴ 1.75 | *25,696 | — | 22,065 | 18,387 | 13,790 | 9,194 |
| S _x = 232000 mm ³ 2 | *19,674 | — | 15,789 | 13,157 | 9,868 | 6,579 |
| J = 27779300 mm ⁴ 2.25 | *15,545 | — | 11,632 | 9,694 | 7,270 | 4,847 |
| | 2.5 | *12,591 | — | 8,788 | 7,323 | 5,493 |
| | 2.75 | *10,406 | 10,178 | 6,785 | 5,654 | 4,241 |
| | 3 | *8,744 | 8,007 | 5,338 | 4,449 | 3,336 |
| | 3.25 | *7,450 | 6,405 | 4,270 | 3,558 | 2,669 |
| | 3.5 | *6,424 | 5,198 | 3,466 | 2,888 | 2,166 |
| | 3.75 | *5,596 | 4,274 | 2,849 | 2,374 | 1,781 |
| | 4 | *4,918 | 3,554 | 2,369 | 1,974 | 1,481 |
| | 4.25 | *4,357 | 2,985 | 1,990 | 1,659 | 1,244 |
| | 4.5 | *3,886 | 2,531 | 1,688 | 1,406 | 1,055 |
| | 4.75 | *3,488 | 2,164 | 1,443 | 1,202 | 902 |
| | 5 | *3,148 | 1,864 | 1,243 | 1,036 | 777 |
| | 5.25 | *2,855 | 1,617 | 1,078 | 898 | 674 |
| | 5.5 | *2,601 | 1,411 | 941 | 784 | 588 |
| | 5.75 | *2,380 | 1,239 | 826 | 688 | 516 |
| | 6 | *2,186 | 1,094 | 729 | 608 | 456 |

BEAMS

SQUARE TUBES — EXTREN® 625
E = 19,300 N/mm²

Allowable Uniform Loads in Newtons Per Meter



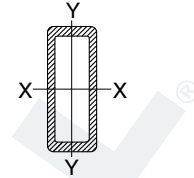
| SPAN IN METERS | LATERALLY SUPPORTED--GOVERNED BY: | | | | | |
|--|--|---------------|---------------|---------------|---------------|---------------|
| | Stress *F_b or F_v | Deflection | | | | |
| | | <i>l</i> /100 | <i>l</i> /150 | <i>l</i> /180 | <i>l</i> /240 | <i>l</i> /360 |
| **152.4 x 152.4 x 9.53 mm | | | | | | |
| Wt/m. = 9.61 kg/m 0.75 | 69,818 | — | — | — | — | 54,148 |
| b _f /t _f = 16.0 1 | 52,364 | — | — | — | 48,992 | 32,661 |
| F _b = 45.7 N/mm ² 1.25 | 41,891 | — | — | 41,750 | 31,312 | 20,875 |
| A _w = 2542 mm ² 1.5 | 34,909 | — | 33,513 | 27,928 | 20,946 | 13,964 |
| I = 17700000 mm ⁴ 1.75 | *27,696 | — | 23,295 | 19,412 | 14,559 | 9,706 |
| S _x = 232000 mm ³ 2 | *21,205 | — | 16,732 | 13,944 | 10,458 | 6,972 |
| J = 27779300 mm ⁴ 2.25 | *16,754 | — | 12,364 | 10,303 | 7,727 | 5,152 |
| | 2.5 | — | 9,362 | 7,802 | 5,851 | 3,901 |
| | 2.75 | 10,862 | 7,241 | 6,034 | 4,526 | 3,017 |
| | 3 | *9,424 | 8,558 | 5,705 | 4,755 | 2,377 |
| | 3.25 | *8,030 | 6,854 | 4,569 | 3,808 | 1,904 |
| | 3.5 | *6,924 | 5,568 | 3,712 | 3,093 | 1,547 |
| | 3.75 | *6,032 | 4,581 | 3,054 | 2,545 | 1,272 |
| | 4 | *5,301 | 3,812 | 2,541 | 2,118 | 1,059 |
| | 4.25 | *4,696 | 3,204 | 2,136 | 1,780 | 890 |
| | 4.5 | *4,189 | 2,718 | 1,812 | 1,510 | 755 |
| | 4.75 | *3,759 | 2,325 | 1,550 | 1,291 | 646 |
| | 5 | *3,393 | 2,003 | 1,336 | 1,113 | 556 |
| | 5.25 | *3,077 | 1,738 | 1,159 | 966 | 483 |
| | 5.5 | *2,804 | 1,517 | 1,012 | 843 | 422 |
| | 5.75 | *2,565 | 1,332 | 888 | 740 | 370 |
| | 6 | *2,356 | 1,176 | 784 | 653 | 327 |

** Non-stock size subject to mill run requirements.



BEAMS

RECTANGULAR TUBES — EXTREN® 500 & 525
E = 17,900 N/mm²



Allowable Uniform Loads in Newtons Per Meter

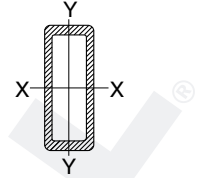
| SPAN IN METERS | LATERALLY SUPPORTED--GOVERNED BY: | | | | | | |
|---|--|---------------|---------------|---------------|---------------|---------------|-------|
| | Stress *F_b or F_v | Deflection | | | | | |
| | | <i>l</i> /100 | <i>l</i> /150 | <i>l</i> /180 | <i>l</i> /240 | <i>l</i> /360 | |
| 101.6 x 3.18 x 50.8 x 6.35 mm | | | | | | | |
| Wt/m. = 2.26 kg/m | 1.5 | 8,329 | 6,034 | 4,023 | 3,352 | 2,514 | 1,676 |
| <i>b_f</i> / <i>t_f</i> = 8.0 | 1.75 | 7,139 | 3,989 | 2,659 | 2,216 | 1,662 | 1,108 |
| <i>F_b</i> = 76.5 N/mm ² | 2 | *5,508 | 2,761 | 1,841 | 1,534 | 1,150 | 767 |
| <i>A_w</i> = 606 mm ² | 2.25 | *4,352 | 1,985 | 1,323 | 1,103 | 827 | 551 |
| <i>I_x</i> = 1800000 mm ⁴ | 2.5 | *3,525 | 1,471 | 981 | 817 | 613 | 409 |
| <i>S_x</i> = 36000 mm ³ | 2.75 | *2,913 | 1,119 | 746 | 622 | 466 | 311 |
| <i>I_y</i> = 460000 mm ⁴ | 3 | *2,448 | 871 | 580 | 484 | 363 | 242 |
| <i>J</i> = 1098900 mm ⁴ | 3.25 | *2,086 | 690 | 460 | 383 | 288 | 192 |
| | 3.5 | *1,799 | 556 | 371 | 309 | 232 | 154 |
| **165.1 x 6.35 x 50.8 x 12.7 mm | | | | | | | |
| Wt/m. = 5.61 kg/m | 1.5 | 24,366 | — | 19,801 | 16,501 | 12,376 | 8,251 |
| <i>b_f</i> / <i>t_f</i> = 4.0 | 1.75 | 20,885 | 20,322 | 13,548 | 11,290 | 8,467 | 5,645 |
| <i>F_b</i> = 82.7 N/mm ² | 2 | 18,274 | 14,423 | 9,616 | 8,013 | 6,010 | 4,007 |
| <i>A_w</i> = 1774 mm ² | 2.25 | 16,244 | 10,561 | 7,040 | 5,867 | 4,400 | 2,933 |
| <i>I_x</i> = 10400000 mm ⁴ | 2.5 | *13,338 | 7,940 | 5,293 | 4,411 | 3,308 | 2,206 |
| <i>S_x</i> = 126000 mm ³ | 2.75 | *11,023 | 6,107 | 4,071 | 3,393 | 2,545 | 1,696 |
| <i>I_y</i> = 1160000 mm ⁴ | 3 | *9,262 | 4,791 | 3,194 | 2,661 | 1,996 | 1,331 |
| <i>J</i> = 3338200 mm ⁴ | 3.25 | *7,892 | 3,823 | 2,548 | 2,124 | 1,593 | 1,062 |
| | 3.5 | *6,805 | 3,096 | 2,064 | 1,720 | 1,290 | 860 |
| | 3.75 | *5,928 | 2,541 | 1,694 | 1,412 | 1,059 | 706 |
| | 4 | *5,210 | 2,110 | 1,407 | 1,172 | 879 | 586 |
| | 4.25 | *4,615 | 1,771 | 1,181 | 984 | 738 | 492 |
| | 4.5 | *4,117 | 1,500 | 1,000 | 833 | 625 | 417 |

** Non-stock size subject to mill run requirements.

BEAMS

RECTANGULAR TUBES — EXTREN® 625
E = 19,300 N/mm²

Allowable Uniform Loads in Newtons Per Meter



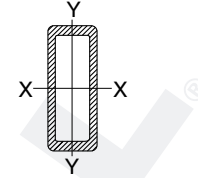
| SPAN IN METERS | LATERALLY SUPPORTED--GOVERNED BY: | | | | | |
|---|---|------------|--------|--------|--------|-------|
| | Stress *F _b or F _v | Deflection | | | | |
| | | l/100 | l/150 | l/180 | l/240 | l/360 |
| 101.6 x 3.18 x 50.8 x 6.35 mm | | | | | | |
| Wt/m. = 2.26 kg/m 1.5 | 8,329 | 6,417 | 4,278 | 3,565 | 2,674 | 1,782 |
| b _f /t _f = 8.0 1.75 | 7,139 | 4,255 | 2,837 | 2,364 | 1,773 | 1,182 |
| F _b = 82.4 N/mm ² 2 | *5,933 | 2,952 | 1,968 | 1,640 | 1,230 | 820 |
| A _w = 606 mm ² 2.25 | *4,688 | 2,125 | 1,417 | 1,181 | 885 | 590 |
| I _x = 1800000 mm ⁴ 2.5 | *3,797 | 1,577 | 1,052 | 876 | 657 | 438 |
| S _x = 36000 mm ³ 2.75 | *3,138 | 1,201 | 801 | 667 | 501 | 334 |
| I _y = 460000 mm ⁴ 3 | *2,637 | 935 | 623 | 519 | 390 | 260 |
| J = 1098900 mm ⁴ 3.25 | *2,247 | 742 | 494 | 412 | 309 | 206 |
| | 3.5 | *1,937 | 598 | 398 | 249 | 166 |
| **165.1 x 6.35 x 50.8 x 12.7 mm | | | | | | |
| Wt/m. = 5.61 kg/m 1.5 | 24,366 | — | 20,861 | 17,384 | 13,038 | 8,692 |
| b _f /t _f = 4.0 1.75 | 20,885 | — | 14,339 | 11,949 | 8,962 | 5,975 |
| F _b = 91.0 N/mm ² 2 | 18,274 | 15,319 | 10,213 | 8,510 | 6,383 | 4,255 |
| A _w = 1774 mm ² 2.25 | 16,244 | 11,246 | 7,497 | 6,248 | 4,686 | 3,124 |
| I _x = 10400000 mm ⁴ 2.5 | 14,619 | 8,472 | 5,648 | 4,707 | 3,530 | 2,353 |
| S _x = 126000 mm ³ 2.75 | *12,129 | 6,527 | 4,351 | 3,626 | 2,720 | 1,813 |
| I _y = 1160000 mm ⁴ 3 | *10,192 | 5,126 | 3,418 | 2,848 | 2,136 | 1,424 |
| J = 3338200 mm ⁴ 3.25 | *8,684 | 4,095 | 2,730 | 2,275 | 1,706 | 1,137 |
| | 3.5 | *7,488 | 3,319 | 2,213 | 1,844 | 922 |
| | 3.75 | *6,523 | 2,726 | 1,818 | 1,515 | 757 |
| | 4 | *5,733 | 2,265 | 1,510 | 1,259 | 629 |
| | 4.25 | *5,078 | 1,902 | 1,268 | 1,057 | 528 |
| | 4.5 | *4,530 | 1,612 | 1,074 | 895 | 448 |

** Non-stock size subject to mill run requirements.

BEAMS

RECTANGULAR TUBES — EXTREN® 500 & 525
E = 17,900 N/mm²

Allowable Uniform Loads in Newtons Per Meter

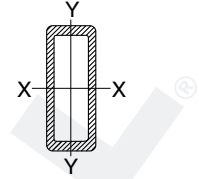


| SPAN IN METERS | LATERALLY SUPPORTED--GOVERNED BY: | | | | | | |
|--|--|---------------|---------------|---------------|---------------|---------------|--------|
| | Stress *F_b or F_v | Deflection | | | | | |
| | | <i>l</i> /100 | <i>l</i> /150 | <i>l</i> /180 | <i>l</i> /240 | <i>l</i> /360 | |
| 177.8 x 101.6 x 6.35 mm | | | | | | | |
| Wt/m. = 6.10 kg/m | 1 | 43,193 | — | — | — | 38,539 | 25,693 |
| <i>b_f</i> / <i>t_f</i> = 16.0 | 1.25 | 34,555 | — | — | 32,469 | 24,351 | 16,234 |
| <i>F_b</i> = 42.4 N/mm ² | 1.5 | *24,121 | — | — | 21,527 | 16,146 | 10,764 |
| <i>A_{w(x-x)}</i> = 2097 mm ² | 1.75 | *17,721 | — | — | 14,862 | 11,147 | 7,431 |
| <i>I_x</i> = 14200000 mm ⁴ | 2 | *13,568 | — | 12,745 | 10,620 | 7,965 | 5,310 |
| <i>S_x</i> = 160000 mm ³ | 2.25 | *10,720 | — | 9,380 | 7,816 | 5,862 | 3,908 |
| <i>J</i> = 12695100 mm ⁴ | 2.5 | *8,684 | — | 7,080 | 5,900 | 4,425 | 2,950 |
| | 2.75 | *7,176 | — | 5,463 | 4,553 | 3,414 | 2,276 |
| | 3 | *6,030 | — | 4,296 | 3,580 | 2,685 | 1,790 |
| | 3.25 | *5,138 | — | 3,435 | 2,862 | 2,147 | 1,431 |
| | 3.5 | *4,430 | 4,180 | 2,787 | 2,322 | 1,742 | 1,161 |
| | 3.75 | *3,859 | 3,436 | 2,290 | 1,909 | 1,431 | 954 |
| | 4 | *3,392 | 2,856 | 1,904 | 1,587 | 1,190 | 793 |
| | 4.25 | *3,005 | 2,399 | 1,599 | 1,333 | 1,000 | 666 |
| | 4.5 | *2,680 | 2,034 | 1,356 | 1,130 | 847 | 565 |
| | 4.75 | *2,405 | 1,739 | 1,159 | 966 | 724 | 483 |
| | 5 | *2,171 | 1,497 | 998 | 832 | 624 | 416 |
| | 5.25 | *1,969 | 1,299 | 866 | 722 | 541 | 361 |
| | 5.5 | *1,794 | 1,133 | 756 | 630 | 472 | 315 |
| | 5.75 | *1,641 | 995 | 663 | 553 | 415 | 276 |
| | 6 | *1,508 | 878 | 585 | 488 | 366 | 244 |
| 101.6 x 177.8 x 6.35 mm | | | | | | | |
| Wt/m. = 6.10 kg/m | 1 | 23,258 | — | — | — | 18,203 | 12,136 |
| <i>b_f</i> / <i>t_f</i> = 28.0 | 1.25 | *15,544 | — | — | 14,907 | 11,181 | 7,454 |
| <i>F_b</i> = 26.4 N/mm ² | 1.5 | *10,795 | — | — | 9,676 | 7,257 | 4,838 |
| <i>A_{w(y-y)}</i> = 1129 mm ² | 1.75 | *7,931 | — | 7,891 | 6,576 | 4,932 | 3,288 |
| <i>I_y</i> = 5900000 mm ⁴ | 2 | *6,072 | — | 5,572 | 4,644 | 3,483 | 2,322 |
| <i>S_y</i> = 115000 mm ³ | 2.25 | *4,798 | — | 4,065 | 3,387 | 2,540 | 1,694 |
| | 2.5 | *3,886 | — | 3,047 | 2,539 | 1,904 | 1,270 |
| | 2.75 | *3,212 | — | 2,338 | 1,949 | 1,462 | 974 |
| | 3 | *2,699 | — | 1,831 | 1,526 | 1,144 | 763 |
| | 3.25 | *2,299 | 2,188 | 1,459 | 1,216 | 912 | 608 |
| | 3.5 | *1,983 | 1,771 | 1,180 | 984 | 738 | 492 |

BEAMS

RECTANGULAR TUBES — EXTREN® 625
E = 19,300 N/mm²

Allowable Uniform Loads in Newtons Per Meter



| SPAN IN METERS | LATERALLY SUPPORTED--GOVERNED BY: | | | | | | |
|--|---|------------|-------|--------|--------|--------|--------|
| | Stress *F _b or F _v | Deflection | | | | | |
| | | l/100 | l/150 | l/180 | l/240 | l/360 | |
| 177.8 x 101.6 x 6.35 mm | | | | | | | |
| Wt/m. = 6.10 kg/m | 1 | 43,193 | — | — | — | 39,909 | 26,606 |
| b _f /t _f = 16.0 | 1.25 | 34,555 | — | — | 33,904 | 25,428 | 16,952 |
| F _b = 45.7 N/mm ² | 1.5 | *25,998 | — | — | 22,625 | 16,969 | 11,313 |
| A _{w(x-x)} = 2097 mm ² | 1.75 | *19,101 | — | 18,837 | 15,697 | 11,773 | 7,849 |
| I _x = 14200000 mm ⁴ | 2 | *14,624 | — | 13,511 | 11,259 | 8,444 | 5,630 |
| S _x = 160000 mm ³ | 2.25 | *11,555 | — | 9,973 | 8,311 | 6,233 | 4,155 |
| J = 12695100 mm ⁴ | 2.5 | *9,359 | — | 7,545 | 6,287 | 4,716 | 3,144 |
| | 2.75 | *7,735 | — | 5,832 | 4,860 | 3,645 | 2,430 |
| | 3 | *6,500 | — | 4,592 | 3,827 | 2,870 | 1,914 |
| | 3.25 | *5,538 | 5,514 | 3,676 | 3,063 | 2,298 | 1,532 |
| | 3.5 | *4,775 | 4,478 | 2,985 | 2,488 | 1,866 | 1,244 |
| | 3.75 | *4,160 | 3,683 | 2,455 | 2,046 | 1,535 | 1,023 |
| | 4 | *3,656 | 3,064 | 2,043 | 1,702 | 1,277 | 851 |
| | 4.25 | *3,239 | 2,575 | 1,717 | 1,431 | 1,073 | 715 |
| | 4.5 | *2,889 | 2,184 | 1,456 | 1,213 | 910 | 607 |
| | 4.75 | *2,593 | 1,868 | 1,245 | 1,038 | 778 | 519 |
| | 5 | *2,340 | 1,609 | 1,073 | 894 | 671 | 447 |
| | 5.25 | *2,122 | 1,396 | 931 | 776 | 582 | 388 |
| | 5.5 | *1,934 | 1,219 | 812 | 677 | 508 | 339 |
| | 5.75 | *1,769 | 1,070 | 713 | 594 | 446 | 297 |
| | 6 | *1,625 | 944 | 630 | 525 | 394 | 262 |
| 101.6 x 177.8 x 6.35 mm | | | | | | | |
| Wt/m. = 6.10 kg/m | 1 | 23,258 | — | — | — | 18,942 | 12,628 |
| b _f /t _f = 28.0 | 1.25 | *16,722 | — | — | 15,639 | 11,729 | 7,820 |
| F _b = 28.4 N/mm ² | 1.5 | *11,612 | — | — | 10,212 | 7,659 | 5,106 |
| A _{w(y-y)} = 1129 mm ² | 1.75 | *8,532 | — | 8,365 | 6,971 | 5,228 | 3,485 |
| I _y = 5900000 mm ⁴ | 2 | *6,532 | — | 5,926 | 4,939 | 3,704 | 2,469 |
| S _y = 115000 mm ³ | 2.25 | *5,161 | — | 4,333 | 3,611 | 2,708 | 1,806 |
| | 2.5 | *4,180 | — | 3,255 | 2,712 | 2,034 | 1,356 |
| | 2.75 | *3,455 | — | 2,501 | 2,084 | 1,563 | 1,042 |
| | 3 | *2,903 | — | 1,961 | 1,634 | 1,226 | 817 |
| | 3.25 | *2,474 | 2,346 | 1,564 | 1,303 | 977 | 652 |
| | 3.5 | *2,133 | 1,899 | 1,266 | 1,055 | 791 | 528 |

BEAM DIAGRAMMS AND FORMULAS

The beam diagrams and formulas that follow represent frequently occurring beam loadings and beam end conditions found in civil/structural applications. They are included herein for the convenience of those engineering and designers who have relatively infrequent use for such formulas and hence may find them necessary.

Though formulas for Δ_{max} , Δ_a , Δ_x , and Δ_{x1} are shown, the engineer and designer of fiberglass flexural members is reminded that it represents only **maximum flexural deflection**. To obtain the true total deflection, the effects of **shear deflection** must be added. Please refer to equations B-13 and B-14 as applicable to your particular loading condition.

EFFECTIVE LATERAL BRACING SYSTEMS

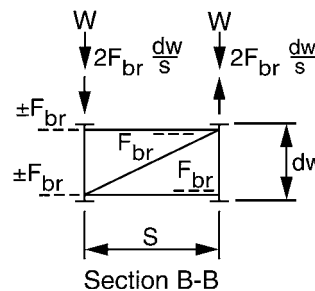
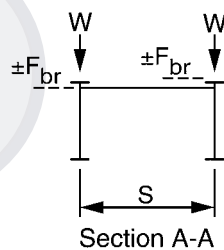
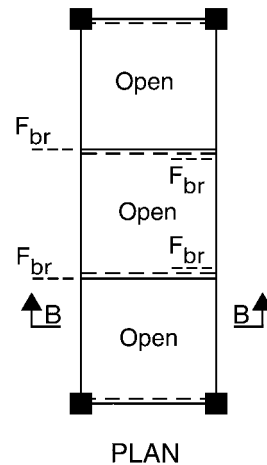
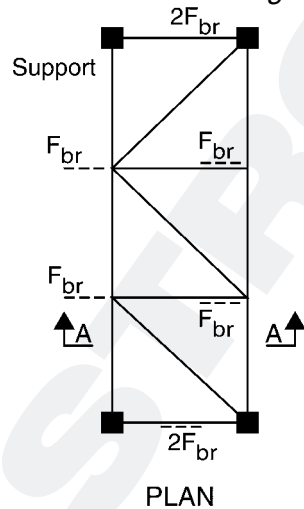
Lateral support must be effective in preventing lateral deflection of the beam compression flange and must limit the laterally unsupported length of the beam to obtain the required level of stress.

Two common methods for the lateral support of the compression flange are shown below.

TYPE 1 supports the compression flange by a lateral bracing system that prevents significant lateral deflection. Each lateral support should be designed for two percent (2%) of the total compression force at that brace point in the laterally braced beam.

TYPE 2 prevents twisting of the entire cross section at the brace points. Rigid diaphragms are provided between two parallel beams. Each diaphragm should be designed for 2% of the total compression flange force at the brace points. Note that this system produces small upward and downward loads on the adjacent beams.

For additional discussion on lateral buckling and lateral bracing systems, the designer is referred to the *ASCE Structural Plastics Design Manual*.



Type 1
Top Chord Braced Against
Lateral Bending

Type 2
Bracing Prevents
Rotation at Brace Points