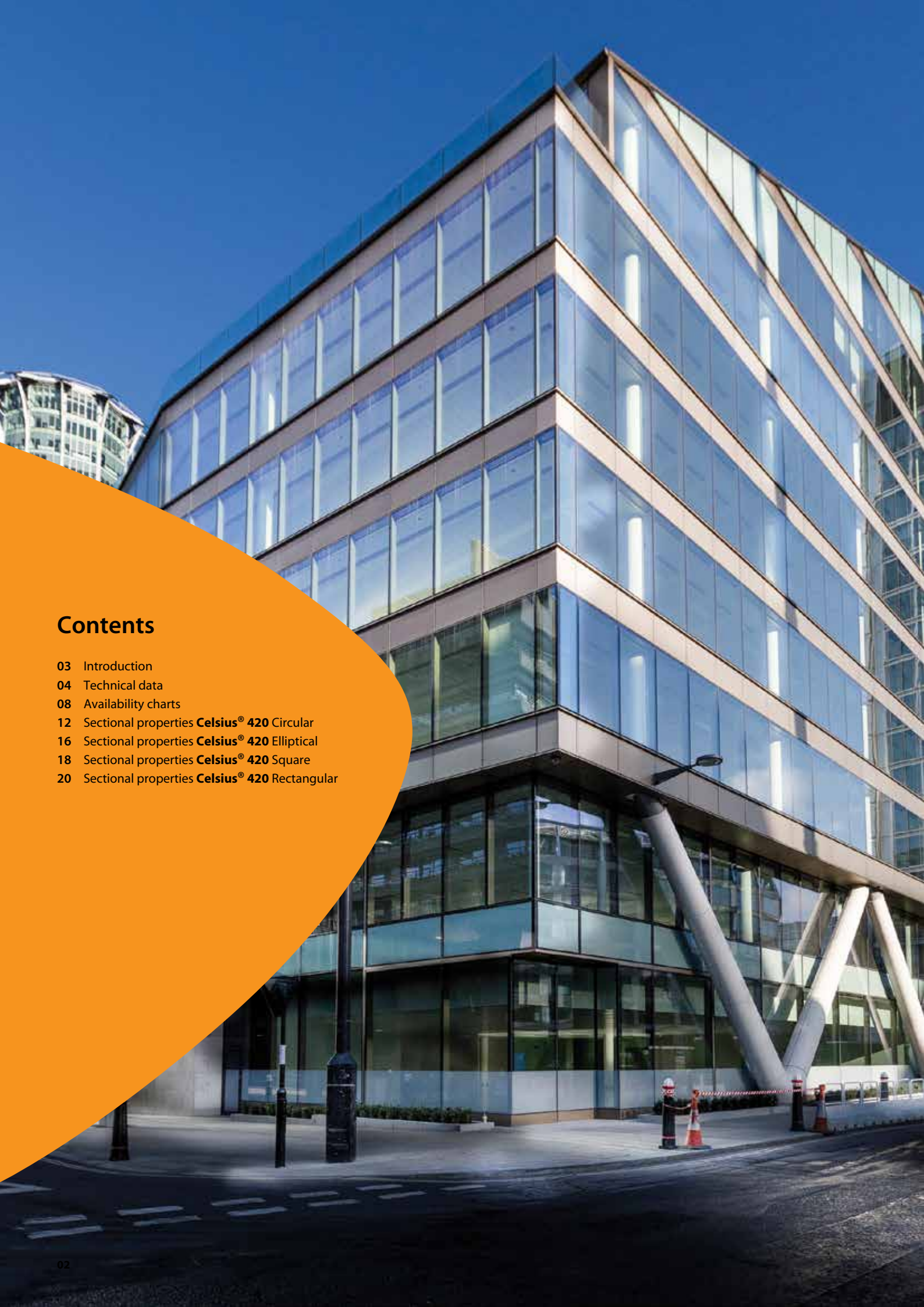
TATA STEEL

TATA

# Celsius® 420 NH technical guide

Structural hollow sections



# Contents

# CELSIUS® 420 NH

At Tata Steel we are committed to supplying our customers with high quality products. Our latest development comes from our leading product range **Celsius®** and through advances in steel manufacturing we are now able to offer our latest innovation in structural steel grades, **Celsius® 420**.

**Celsius® 420 key features:**

- Normalised fine grain steel, so free of internal stresses and with a minimum strength of 420 MPa – allowing the highest fabrication factors and enabling material cost savings and lighter structures
- Available in a wide range of circular, square, rectangular and elliptical hollow sections
- Tight corner radii, exceeding the standard - enhancing the product's aesthetic appeal whilst avoiding the risk of brittle fracture which occurs in some cold formed products
- Dimensional consistency, high levels of formability and, because the steel is fully-killed, excellent weldability
- Certified as suitable for all structural applications, fully compliant with design codes and overcomes design risks associated with other forms of hollow sectons
- Certified as suitable for mechanical applications, especially those involving cyclic loading
- Suitable for low temperature applications (40J @ -20°C)
- Batch-tested to give the properties of the specific delivered material; full test certification supplied
- Clearly marked as **Celsius® 420**, with the reassurance of batch traceability
- Full technical support available
- Excellent supply availability through approved stockholders
- All **Celsius® 420** material is CE marked and is fully compliant with the Construction Products Regulation
- Suitable for galvanising with guaranteed silicon content between 0.15 and 0.25%
- Guaranteed CEV 0.45 max compared to standard of 0.5 CEV.

# TECHNICAL DATA

High strength hot-finished hollow sections suitable for all construction and mechanical applications. **Celsius® 420** is suitable for all internal and external applications to EN1993.

**Celsius® 420** hollow sections are supplied with a minimum yield strength of 420 N/mm$^2$ and comply fully with the European Standard for hot finished structural hollow sections, EN10210: S420NH.

## Mechanical properties

| **Yield strength $R_{eH}$ min N/mm$^2$** | **Tensile strength $R_m$ N/mm$^2$** | **Elongation % min $L_0 = 5{,}65\sqrt{S_0}$ specimen** | **Impact strength 10mm x 10mm** | | **Carbon equivalent (CEV) max** |
|---|---|---|---|---|---|
| T ≤ 16mm | ≤ 65mm | T | °C | J | |
| 420 | 520-680 | 19 | -20 | 40 | 0.45 |

## Chemical composition % by mass

| **C max** | **Si max** | **Mn** | **P max** | **S max** | **Nb max** | **V max** | **Al total min** | **Ti max** | **Cr max** | **Ni max** | **Mo max** | **Cu max** | **N max** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.22 | 0.60 | 1.00<br>1.70 | 0.035 | 0.030 | 0.050 | 0.20 | 0.020 | 0.03 | 0.30 | 0.80 | 0.10 | 0.70 | 0.025 |

**Celsius® 420** is produced from fully-killed steel – critical to formability and weldability.

### Inspection and testing

**Celsius® 420** hollow sections EN10210: S420NH are subject to specific inspection and testing and are supplied with an inspection certificate type 3.1 to EN10204.

### Designation

**Celsius® 420** hollow sections are designated by their product name, outside dimensions and thickness in millimetres.

### CE marking

All **Celsius® 420** material is CE marked and is fully compliant with the Construction Products Regulation.

### Examples

Circular hollow section:
**Celsius® 420 114.3 x 6.3**
or **114.3 x 6.3 CHS EN10210: Part 1: S420NH**

Rectangular hollow section:
**Celsius® 420 100 x 50 x 5.0**
or **100 x 50 x 5.0 RHS EN10210: Part 1: S420NH**

Elliptical hollow section:
**Celsius® 420 elliptical 400 x 200 x 8.0**
or **400 x 200 x 8.0 EHS EN10210: Part 1: S420NH**
or simply
**Celsius® 420 EHS 400 x 200 x 8.0**


## Dimensional tolerances EN10210: Part 2

| | Circular/Ellipticals | Square/Rectangular |
|---|---|---|
| Outside dimension (D B and H) | Circular ±1% with a min of ±0.5mm and maximum of ±10mm<br>Ellipticals ±1% with a min of ±0.5mm (The permitted tolerance is twice the value for H < 250) | ±1% with a min of ±0.5mm |
| Thickness (T) | -10%<br>Note: Positive deviation limited by mass tolerance | -10%<br>Note: Positive deviation limited by mass tolerance |
| Squareness of side | – | 90 degrees ±1 degree |
| External corner profile | – | 2T max at each corner*<br>(EN10210 has 3T max) |
| Concavity/convexity (x) | – | ±1% of the side, measured independently of the tolerance on the outside dimension |
| Twist (V) | Ellipticals: 2mm plus 0.5mm/m max<br>(The permitted tolerance is twice the value for H < 250) | 2mm plus 0.5mm/m max<br>Section is placed on a flat surface with one end held flat. At the other end the height difference of the two lower corners is taken |
| Mass (M) | ±6% on individual lengths | ±6% on individual lengths |
| Straightness | Maximum 0.2% of the total length & 3mm over every 1m length<br>Ellipticals: The permitted tolerance is twice the value for H < 250 | Maximum 0.2% of total length & 3mm over every 1m length |
| Length | +150mm/-0mm | +150mm/-0mm |
| Out-of-roundness (O) | Circular 2% for hollow sections having a diameter to thickness ratio not exceeding 100 | – |

* Unless shown otherwise

## Celsius® 420 Square Hollow Sections – length and tolerances

| Size | Thickness | Standard mill lengths | Special mill lengths | Tolerance |
|---|---|---|---|---|
| mm | mm | m | m** | mm |
| 40 x 40 uti 100 x 100 | All | 6.0, 6.4, 7.5, 10.0 & 12.0 | 5.4 - 14.6 | + 150-0 |
| 120 x 120 uti 150 x 150 x 12.5 | All | 6.0, 6.4, 7.5, 10.0 & 12.0 | 6.0 - 14.5 | + 150-0 |
| 150 x 150 x 16.0 | All | Check availability | 6.0 - 13.5 | + 150-0 |
| 160 x 160 uti 400 x 400 x 16.0 | All | 10.0 & 12.0 | 6.0 - 15.3 | + 150-0 |
| 400 x 400 x 20.0 | All | 12.0 - 12.7 subject to availability | – | – |

(uti – up to and including)

## Celsius® 420 Rectangular Hollow Sections – length and tolerances

| Size | Thickness | Standard mill lengths | Special mill lengths | Tolerance |
|---|---|---|---|---|
| mm | mm | m | m** | mm |
| 50 x 30 uti 120 x 80 | All | 6.0, 6.4, 7.5, 10.0 & 12.0 | 5.4 - 14.6 | + 150-0 |
| 150 x 100 uti 200 x 100 x 12.5 | All | 6.0, 6.4, 7.5, 10.0 & 12.0 | 6.0 - 14.5 | + 150-0 |
| 200 x 100 x 16.0 | All | Check availability | 6.0 - 13.5 | + 150-0 |
| 200 x 120 uti 500 x 300 x 16.0 | All | 10.0 & 12.0 | 6.0 - 15.3 | + 150-0 |
| 500 x 300 x 20.0 | All | 12.0 - 12.7 subject to availability | – | – |

(uti - up to and including)

## Celsius® 420 Circular Hollow Sections – length and tolerances

| Outside diameter | Thickness | Standard mill lengths | Special mill lengths | Tolerance |
|---|---|---|---|---|
| mm | mm | m | m** | mm |
| 21.3 - 33.7 | All | 6.0, 6.4 & 7.5 | 5.4 - 7.0 | + 150-0 |
| *42.4 | All | 6.0, 6.4, 7.5, 10.0 & 12.0 | 5.4 - 12.0 | + 150-0 |
| *48.3 - 114.3 | All | 6.0, 6.4, 7.5, 10.0 & 12.0 | 5.4 - 14.6 | + 150-0 |
| 139.7 | All | 6.0, 7.5, 10.0 & 12.0 | 6.0 - 14.5 | + 150-0 |
| 168.3 | All | 6.0, 7.5, 10.0 & 12.0 | 6.0 - 14.6 | + 150-0 |
| 193.7 | All | 6.0, 7.5, 10.0 & 12.0 | 6.0 - 14.6 | + 150-0 |
| 219.1 - 508.0 | All | 10.0 & 12.0 | 6.0 - 14.6 | + 150-0 |

## Celsius® 420 Elliptical Hollow Sections – length and tolerances

| Size | Thickness | Standard mill lengths | Special mill lengths | Tolerance |
|---|---|---|---|---|
| mm | mm | m | m** | mm |
| 150 x 75 | All | 7.5, 10.0 & 12.0 | 6.0 - 14.5 | + 150-0 |
| 200 x 100 | All | 7.5, 10.0 & 12.0 | 6.0 - 14.5 | + 150-0 |
| 250 x 125 | All | 7.5, 10.0 & 12.0 | 6.0 - 14.5 | + 150-0 |
| 300 x 150 | All | 10.0 & 12.0 | 9.0 - 14.5 | + 150-0 |
| 400 x 200 | All | 10.0 & 12.0 | 9.0 - 14.5 | + 150-0 |
| 500 x 250 | All | 10.0 & 12.0 | 9.0 - 14.5 | + 150-0 |

* For thinner gauge material, check standard lengths

** Lengths available in 100mm increments

# AVAILABILITY CHARTS

## Celsius® 420 Circular Hollow Sections

| Outside Diameter (mm) | Thickness (mm) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 2.6 | 2.9 | 3.2 | 3.6 | 4.0 | 4.5 | 5.0 | 6.3 | 8.0 | 10.0 |
| 21.3 | ■ | ■ | ■ | | | | | | | |
| 26.9 | ■ | ■ | ■ | ■ | | | | | | |
| 33.7 | ■ | ■ | ■ | ■ | ■ | ■ | | | | |
| 42.4 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | | | |
| 48.3 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | | |
| 60.3 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | | |
| 76.1 | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | |
| 88.9 | | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | |
| 101.6 | | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | |
| 114.3 | | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | |
| 139.7 | | | | | ■ | ■ | ■ | ■ | ■ | |
| 168.3 | | | | | | | ■ | ■ | ■ | ■ |
| 193.7 | | | | | | | ■ | ■ | ■ | ■ |
| 219.1 | | | | | | | ■ | ■ | | |
| 244.5 | | | | | | | ■ | ■ | | |
| 273.0 | | | | | | | ■ | ■ | | |

For minimum order quantities, please contact your account manager.

## Celsius® 420 Elliptical Hollow Sections

| Size (mm) | Thickness (mm) | | | | |
|---|---|---|---|---|---|
| | 4.0 | 5.0 | 6.3 | 8.0 | 10.0 |
| 150 x 75 | | | | | |
| 200 x 100 | | | | | |
| 250 x 125 | | | | | |
| 300 x 150 | | | | | |
| 400 x 200 | | | | | |
| 500 x 250 | | | | | |

## Celsius® 420 Square Hollow Sections

| Size (mm) | Thickness (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 3.0 | 3.2 | 3.6 | 4.0 | 5.0 | 6.3 | 8.0 | 10.0 |
| 40 x 40 | | | | | | | | |
| 50 x 50 | | | | | | | | |
| 60 x 60 | | | | | | | | |
| 70 x 70 | | | | | | | | |
| 80 x 80 | | | | | | | | |
| 90 x 90 | | | | | | | | |
| 100 x 100 | | | | | | | | |
| 120 x 120 | | | | | | | | |
| 140 x 140 | | | | | | | | |
| 150 x 150 | | | | | | | | |
| 160 x 160 | | | | | | | | |
| 180 x 180 | | | | | | | | |
| 200 x 200 | | | | | | | | |
| 220 x 220 | | | | | | | | |
| 250 x 250 | | | | | | | | |
| 260 x 260 | | | | | | | | |
| 300 x 300 | | | | | | | | |
| 400 x 400 | | | | | | | | |

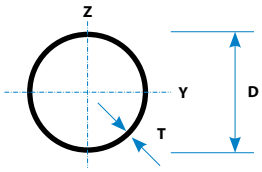
For minimum order quantities, please contact your account manager.

## Celsius® 420 Rectangular Hollow Sections

| Size (mm) | Thickness (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 3.0 | 3.2 | 3.6 | 4.0 | 5.0 | 6.3 | 8.0 | 10.0 |
| 50 x 30 | ■ | ■ | ■ | ■ | ■ | | | |
| 60 x 40 | ■ | ■ | ■ | ■ | ■ | ■ | | |
| 80 x 40 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | |
| 90 x 50 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | |
| 100 x 50 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | |
| 100 x 60 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | |
| 120 x 60 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | |
| 120 x 80 | | | ■ | ■ | ■ | ■ | ■ | |
| 150 x 100 | | | | ■ | ■ | ■ | ■ | ■ |
| 160 x 80 | | | | ■ | ■ | ■ | ■ | ■ |
| 180 x 60 | | | | ■ | ■ | ■ | ■ | ■ |
| 180 x 100 | | | | ■ | ■ | ■ | ■ | ■ |
| 200 x 100 | | | | ■ | ■ | ■ | ■ | ■ |
| 200 x 120 | | | | | ■ | ■ | ■ | ■ |
| 200 x 150 | | | | | ■ | ■ | ■ | ■ |
| 220 x 120 | | | | | ■ | ■ | ■ | ■ |
| 250 x 100 | | | | | ■ | ■ | ■ | ■ |
| 250 x 150 | | | | | ■ | ■ | ■ | ■ |
| 250 x 200 | | | | | | | | ■ |
| 260 x 140 | | | | | ■ | ■ | ■ | ■ |
| 260 x 180 | | | | | | | ■ | ■ |
| 300 x 100 | | | | | ■ | ■ | ■ | ■ |
| 300 x 150 | | | | | | | ■ | ■ |
| 300 x 200 | | | | | ■ | | | |
| 350 x 150 | | | | | ■ | | | |
| 350 x 250 | | | | | | | | ■ |
| 400 x 120 | | | | | | ■ | ■ | ■ |
| 400 x 200 | | | | | | | | ■ |
| 500 x 300 | | | | | | | ■ | ■ |

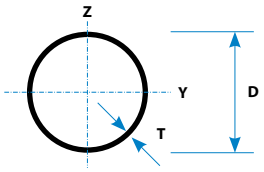
For minimum order quantities, please contact your account manager.

# CELSIUS® 420 CIRCULAR




## Celsius® 420 EN10210: S420NH Hot finished circular hollow section

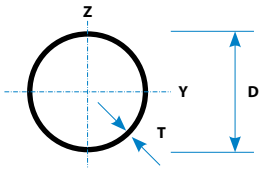
| Outside Diameter D | Thickness T | Mass M | Sectional area A | Moment of inertia I | Radius of gyration i | Elastic modulus $W_{el}$ | Plastic modulus $W_{pl}$ | Torsional constants $I_t$ | Torsional constants $C_t$ | Superficial area/m $A_s$ | Approx. length /tonne |
|---|---|---|---|---|---|---|---|---|---|---|---|
| mm | mm | kg/m | $cm^2$ | $cm^4$ | cm | $cm^3$ | $cm^3$ | $cm^4$ | $cm^3$ | $m^2/m$ | m/t |
| 21.3 | 2.6 | 1.20 | 1.53 | 0.681 | 0.668 | 0.639 | 0.915 | 1.36 | 1.28 | 0.067 | 834 |
| | 2.9 | 1.32 | 1.68 | 0.727 | 0.659 | 0.683 | 0.990 | 1.45 | 1.37 | 0.067 | 760 |
| | 3.2 | 1.43 | 1.82 | 0.768 | 0.650 | 0.722 | 1.06 | 1.54 | 1.44 | 0.067 | 700 |
| 26.9 | 2.6 | 1.56 | 1.98 | 1.48 | 0.864 | 1.10 | 1.54 | 2.96 | 2.20 | 0.085 | 642 |
| | 2.9 | 1.72 | 2.19 | 1.60 | 0.855 | 1.19 | 1.68 | 3.19 | 2.38 | 0.085 | 583 |
| | 3.2 | 1.87 | 2.38 | 1.70 | 0.846 | 1.27 | 1.81 | 3.41 | 2.53 | 0.085 | 535 |
| | 3.6 | 2.07 | 2.64 | 1.83 | 0.834 | 1.36 | 1.97 | 3.66 | 2.72 | 0.085 | 483 |
| 33.7 | 2.6 | 1.99 | 2.54 | 3.09 | 1.10 | 1.84 | 2.52 | 6.19 | 3.67 | 0.106 | 501 |
| | 2.9 | 2.20 | 2.81 | 3.36 | 1.09 | 1.99 | 2.76 | 6.71 | 3.98 | 0.106 | 454 |
| | 3.2 | 2.41 | 3.07 | 3.60 | 1.08 | 2.14 | 2.99 | 7.21 | 4.28 | 0.106 | 415 |
| | 3.6 | 2.67 | 3.40 | 3.91 | 1.07 | 2.32 | 3.28 | 7.82 | 4.64 | 0.106 | 374 |
| | 4.0 | 2.93 | 3.73 | 4.19 | 1.06 | 2.49 | 3.55 | 8.38 | 4.97 | 0.106 | 341 |
| | 4.5 | 3.24 | 4.13 | 4.50 | 1.04 | 2.67 | 3.87 | 9.01 | 5.35 | 0.106 | 309 |
| 42.4 | 2.6 | 2.55 | 3.25 | 6.46 | 1.41 | 3.05 | 4.12 | 12.9 | 6.10 | 0.133 | 392 |
| | 2.9 | 2.82 | 3.60 | 7.06 | 1.40 | 3.33 | 4.53 | 14.1 | 6.66 | 0.133 | 354 |
| | 3.2 | 3.09 | 3.94 | 7.62 | 1.39 | 3.59 | 4.93 | 15.2 | 7.19 | 0.133 | 323 |
| | 3.6 | 3.44 | 4.39 | 8.33 | 1.38 | 3.93 | 5.44 | 16.7 | 7.86 | 0.133 | 290 |
| | 4.0 | 3.79 | 4.83 | 8.99 | 1.36 | 4.24 | 5.92 | 18.0 | 8.48 | 0.133 | 264 |
| | 4.5 | 4.21 | 5.36 | 9.76 | 1.35 | 4.60 | 6.49 | 19.5 | 9.20 | 0.133 | 238 |
| | 5.0 | 4.61 | 5.87 | 10.5 | 1.33 | 4.93 | 7.04 | 20.9 | 9.86 | 0.133 | 217 |
| 48.3 | 2.6 | 2.93 | 3.73 | 9.78 | 1.62 | 4.05 | 5.44 | 19.6 | 8.10 | 0.152 | 341 |
| | 2.9 | 3.25 | 4.14 | 10.7 | 1.61 | 4.43 | 5.99 | 21.4 | 8.86 | 0.152 | 308 |
| | 3.2 | 3.56 | 4.53 | 11.6 | 1.60 | 4.80 | 6.52 | 23.2 | 9.59 | 0.152 | 281 |
| | 3.6 | 3.97 | 5.06 | 12.7 | 1.59 | 5.26 | 7.21 | 25.4 | 10.5 | 0.152 | 252 |
| | 4.0 | 4.37 | 5.57 | 13.8 | 1.57 | 5.70 | 7.87 | 27.5 | 11.4 | 0.152 | 229 |
| | 4.5 | 4.86 | 6.19 | 15.0 | 1.56 | 6.21 | 8.66 | 30.0 | 12.4 | 0.152 | 206 |
| | 5.0 | 5.34 | 6.80 | 16.2 | 1.54 | 6.69 | 9.42 | 32.3 | 13.4 | 0.152 | 187 |
| | 6.3 | 6.53 | 8.31 | 18.7 | 1.50 | 7.76 | 11.2 | 37.5 | 15.5 | 0.152 | 153 |
| 60.3 | 2.6 | 3.70 | 4.71 | 19.7 | 2.04 | 6.52 | 8.66 | 39.3 | 13.0 | 0.189 | 270 |
| | 2.9 | 4.11 | 5.23 | 21.6 | 2.03 | 7.16 | 9.56 | 43.2 | 14.3 | 0.189 | 244 |
| | 3.2 | 4.51 | 5.74 | 23.5 | 2.02 | 7.78 | 10.4 | 46.9 | 15.6 | 0.189 | 222 |
| | 3.6 | 5.03 | 6.41 | 25.9 | 2.01 | 8.58 | 11.6 | 51.7 | 17.2 | 0.189 | 199 |
| | 4.0 | 5.55 | 7.07 | 28.2 | 2.00 | 9.34 | 12.7 | 56.3 | 18.7 | 0.189 | 180 |
| | 4.5 | 6.19 | 7.89 | 30.9 | 1.98 | 10.2 | 14.0 | 61.8 | 20.5 | 0.189 | 161 |
| | 5.0 | 6.82 | 8.69 | 33.5 | 1.96 | 11.1 | 15.3 | 67.0 | 22.2 | 0.189 | 147 |
| | 6.3 | 8.39 | 10.7 | 39.5 | 1.92 | 13.1 | 18.5 | 79.0 | 26.2 | 0.189 | 119 |




## **Celsius® 420 EN10210: S420NH** Hot finished circular hollow section (continued)

| Outside Diameter D mm | Thickness T mm | Mass M kg/m | Sectional area A $cm^2$ | Moment of inertia I $cm^4$ | Radius of gyration i cm | Elastic modulus $W_{el}$ $cm^3$ | Plastic modulus $W_{pl}$ $cm^3$ | Torsional constants $I_t$ $cm^4$ | Torsional constants $C_t$ $cm^3$ | Superficial area/m $A_s$ $m^2/m$ | Approx. length /tonne m/t |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 76.1 | 2.9 | 5.24 | 6.67 | 44.7 | 2.59 | 11.8 | 15.5 | 89.5 | 23.5 | 0.239 | 191 |
| | 3.2 | 5.75 | 7.33 | 48.8 | 2.58 | 12.8 | 17.0 | 97.6 | 25.6 | 0.239 | 174 |
| | 3.6 | 6.44 | 8.20 | 54.0 | 2.57 | 14.2 | 18.9 | 108 | 28.4 | 0.239 | 155 |
| | 4.0 | 7.11 | 9.06 | 59.1 | 2.55 | 15.5 | 20.8 | 118 | 31.0 | 0.239 | 141 |
| | 4.5 | 7.95 | 10.1 | 65.1 | 2.54 | 17.1 | 23.1 | 130 | 34.2 | 0.239 | 126 |
| | 5.0 | 8.77 | 11.2 | 70.9 | 2.52 | 18.6 | 25.3 | 142 | 37.3 | 0.239 | 114 |
| | 6.3 | 10.8 | 13.8 | 84.8 | 2.48 | 22.3 | 30.8 | 170 | 44.6 | 0.239 | 92.2 |
| | 8.0 | 13.4 | 17.1 | 101 | 2.42 | 26.4 | 37.3 | 201 | 52.9 | 0.239 | 74.4 |
| 88.9 | 3.2 | 6.76 | 8.62 | 79.2 | 3.03 | 17.8 | 23.5 | 158 | 35.6 | 0.279 | 148 |
| | 3.6 | 7.57 | 9.65 | 87.9 | 3.02 | 19.8 | 26.2 | 176 | 39.5 | 0.279 | 132 |
| | 4.0 | 8.38 | 10.7 | 96.3 | 3.00 | 21.7 | 28.9 | 193 | 43.3 | 0.279 | 119 |
| | 4.5 | 9.37 | 11.9 | 107 | 2.99 | 24.0 | 32.1 | 213 | 47.9 | 0.279 | 107 |
| | 5.0 | 10.3 | 13.2 | 116 | 2.97 | 26.2 | 35.2 | 233 | 52.4 | 0.279 | 96.7 |
| | 6.3 | 12.8 | 16.3 | 140 | 2.93 | 31.5 | 43.1 | 280 | 63.1 | 0.279 | 77.9 |
| | 8.0 | 16.0 | 20.3 | 168 | 2.87 | 37.8 | 52.5 | 336 | 75.6 | 0.279 | 62.7 |
| 101.6 | 3.2 | 7.77 | 9.89 | 120 | 3.48 | 23.6 | 31.0 | 240 | 47.2 | 0.319 | 129 |
| | 3.6 | 8.70 | 11.1 | 133 | 3.47 | 26.2 | 34.6 | 266 | 52.5 | 0.319 | 115 |
| | 4.0 | 9.63 | 12.3 | 146 | 3.45 | 28.8 | 38.1 | 293 | 57.6 | 0.319 | 104 |
| | 4.5 | 10.8 | 13.7 | 162 | 3.44 | 31.9 | 42.5 | 324 | 63.8 | 0.319 | 92.8 |
| | 5.0 | 11.9 | 15.2 | 177 | 3.42 | 34.9 | 46.7 | 355 | 69.9 | 0.319 | 84.0 |
| | 6.3 | 14.8 | 18.9 | 215 | 3.38 | 42.3 | 57.3 | 430 | 84.7 | 0.319 | 67.5 |
| | 8.0 | 18.5 | 23.5 | 260 | 3.32 | 51.1 | 70.3 | 519 | 102 | 0.319 | 54.2 |
| 114.3 | 3.2 | 8.77 | 11.2 | 172 | 3.93 | 30.2 | 39.5 | 345 | 60.4 | 0.359 | 114 |
| | 3.6 | 9.83 | 12.5 | 192 | 3.92 | 33.6 | 44.1 | 384 | 67.2 | 0.359 | 102 |
| | 4.0 | 10.9 | 13.9 | 211 | 3.90 | 36.9 | 48.7 | 422 | 73.9 | 0.359 | 91.9 |
| | 4.5 | 12.2 | 15.5 | 234 | 3.89 | 41.0 | 54.3 | 469 | 82.0 | 0.359 | 82.1 |
| | 5.0 | 13.5 | 17.2 | 257 | 3.87 | 45.0 | 59.8 | 514 | 89.9 | 0.359 | 74.2 |
| | 6.3 | 16.8 | 21.4 | 313 | 3.82 | 54.7 | 73.6 | 625 | 109 | 0.359 | 59.6 |
| | 8.0 | 21.0 | 26.7 | 379 | 3.77 | 66.4 | 90.6 | 759 | 133 | 0.359 | 47.7 |
| 139.7 | 4.0 | 13.4 | 17.1 | 393 | 4.80 | 56.2 | 73.7 | 786 | 112 | 0.439 | 74.7 |
| | 4.5 | 15.0 | 19.1 | 437 | 4.78 | 62.6 | 82.3 | 874 | 125 | 0.439 | 66.6 |
| | 5.0 | 16.6 | 21.2 | 481 | 4.77 | 68.8 | 90.8 | 961 | 138 | 0.439 | 60.2 |
| | 6.3 | 20.7 | 26.4 | 589 | 4.72 | 84.3 | 112 | 1177 | 169 | 0.439 | 48.2 |
| | 8.0 | 26.0 | 33.1 | 720 | 4.66 | 103 | 139 | 1441 | 206 | 0.439 | 38.5 |

For minimum order quantities, please contact your account manager.

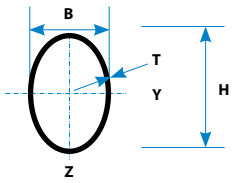



## Celsius® 420 EN10210: S420NH Hot finished circular hollow section (continued)

| Outside Diameter D | Thickness T | Mass M | Sectional area A | Moment of inertia I | Radius of gyration i | Elastic modulus $W_{el}$ | Plastic modulus $W_{pl}$ | Torsional constants $I_t$ | $C_t$ | Superficial area/m $A_s$ | Approx. length /tonne |
|---|---|---|---|---|---|---|---|---|---|---|---|
| mm | mm | kg/m | $cm^2$ | $cm^4$ | cm | $cm^3$ | $cm^3$ | $cm^4$ | $cm^3$ | $m^2/m$ | m/t |
| 168.3 | 5.0 | 20.1 | 25.7 | 856 | 5.78 | 102 | 133 | 1712 | 203 | 0.529 | 49.7 |
| | 6.3 | 25.2 | 32.1 | 1053 | 5.73 | 125 | 165 | 2107 | 250 | 0.529 | 39.7 |
| | 8.0 | 31.6 | 40.3 | 1297 | 5.67 | 154 | 206 | 2595 | 308 | 0.529 | 31.6 |
| | 10.0 | 39.0 | 49.7 | 1564 | 5.61 | 186 | 251 | 3128 | 372 | 0.529 | 25.6 |
| 193.7 | 5.0 | 23.3 | 29.6 | 1320 | 6.67 | 136 | 178 | 2640 | 273 | 0.609 | 43.0 |
| | 6.3 | 29.1 | 37.1 | 1630 | 6.63 | 168 | 221 | 3260 | 337 | 0.609 | 34.3 |
| | 8.0 | 36.6 | 46.7 | 2016 | 6.57 | 208 | 276 | 4031 | 416 | 0.609 | 27.3 |
| | 10.0 | 45.3 | 57.7 | 2442 | 6.50 | 252 | 338 | 4883 | 504 | 0.609 | 22.1 |
| 219.1 | 5.0 | 26.4 | 33.6 | 1928 | 7.57 | 176 | 229 | 3856 | 352 | 0.688 | 37.9 |
| | 6.3 | 33.1 | 42.1 | 2386 | 7.53 | 218 | 285 | 4772 | 436 | 0.688 | 30.2 |
| 244.5 | 5.0 | 29.5 | 37.6 | 2699 | 8.47 | 221 | 287 | 5397 | 441 | 0.768 | 33.9 |
| | 6.3 | 37.0 | 47.1 | 3346 | 8.42 | 274 | 358 | 6692 | 547 | 0.768 | 27.0 |
| 273.0 | 5.0 | 33.0 | 42.1 | 3781 | 9.48 | 277 | 359 | 7562 | 554 | 0.858 | 30.3 |
| | 6.3 | 41.4 | 52.8 | 4696 | 9.43 | 344 | 448 | 9392 | 688 | 0.858 | 24.1 |

For minimum order quantities, please contact your account manager.

# CELSIUS® 420 ELLIPTICAL

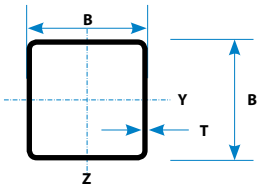



**Celsius® 420 EN10210: S420NH** Hot finished elliptical hollow section

| Size | Thickness | Mass | Sectional area | Moment of inertia | | Radius of gyration | | Elastic modulus | | Plastic modulus | | Torsional constants | | Superficial area/m | Approx length /tonne |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| H x B | T | M | A | $I_{yy}$ | $I_{zz}$ | $i_{yy}$ | $i_{zz}$ | $W_{el,yy}$ | $W_{el,zz}$ | $W_{pl,yy}$ | $W_{pl,zz}$ | $I_t$ | $C_t$ | $A_s$ | |
| mm | mm | kg/m | $cm^2$ | $cm^4$ | $cm^4$ | cm | cm | $cm^3$ | $cm^3$ | $cm^3$ | $cm^3$ | $cm^4$ | $cm^3$ | $m^2/m$ | m/t |
| 150 x 75 | 4.0 | 10.7 | 13.6 | 301 | 101 | 4.70 | 2.72 | 40.1 | 26.9 | 56.1 | 34.4 | 303 | 60.1 | 0.363 | 93.4 |
| | 5.0 | 13.3 | 16.9 | 367 | 122 | 4.66 | 2.69 | 48.9 | 32.5 | 68.9 | 42.0 | 367 | 72.2 | 0.363 | 75.4 |
| | 6.3 | 16.5 | 21.0 | 448 | 147 | 4.62 | 2.64 | 59.7 | 39.1 | 84.9 | 51.5 | 443 | 86.3 | 0.363 | 60.6 |
| 200 x 100 | 5.0 | 17.9 | 22.8 | 897 | 302 | 6.27 | 3.64 | 89.7 | 60.4 | 125 | 76.8 | 905 | 135 | 0.484 | 55.9 |
| | 6.3 | 22.3 | 28.4 | 1103 | 368 | 6.23 | 3.60 | 110 | 73.5 | 155 | 94.7 | 1105 | 163 | 0.484 | 44.8 |
| | 8.0 | 28.0 | 35.7 | 1358 | 446 | 6.17 | 3.54 | 136 | 89.3 | 193 | 117 | 1347 | 197 | 0.484 | 35.7 |
| | 10.0 | 34.5 | 44.0 | 1637 | 529 | 6.10 | 3.47 | 164 | 106 | 235 | 141 | 1605 | 232 | 0.484 | 29.0 |
| 250 x 125 | 6.3 | 28.2 | 35.9 | 2205 | 742 | 7.84 | 4.55 | 176 | 119 | 246 | 151 | 2224 | 265 | 0.605 | 35.5 |
| | 8.0 | 35.4 | 45.1 | 2732 | 909 | 7.78 | 4.49 | 219 | 145 | 307 | 188 | 2734 | 323 | 0.605 | 28.2 |
| | 10.0 | 43.8 | 55.8 | 3316 | 1090 | 7.71 | 4.42 | 265 | 174 | 376 | 228 | 3288 | 385 | 0.605 | 22.8 |
| 300 x 150 | 8.0 | 42.8 | 54.5 | 4813 | 1616 | 9.39 | 5.44 | 321 | 215 | 449 | 275 | 4846 | 481 | 0.726 | 23.4 |
| | 10.0 | 53.0 | 67.5 | 5872 | 1950 | 9.32 | 5.37 | 391 | 260 | 551 | 336 | 5867 | 577 | 0.726 | 18.9 |
| 400 x 200 | 8.0 | 57.6 | 73.4 | 11689 | 3966 | 12.6 | 7.35 | 584 | 397 | 811 | 500 | 11858 | 890 | 0.969 | 17.4 |
| | 10.0 | 71.5 | 91.1 | 14348 | 4829 | 12.5 | 7.28 | 717 | 483 | 1001 | 615 | 14473 | 1079 | 0.969 | 14.0 |
| 500 x 250 | 10.0 | 90.0 | 115 | 28539 | 9682 | 15.8 | 9.19 | 1142 | 775 | 1585 | 976 | 28950 | 1739 | 1.21 | 11.1 |

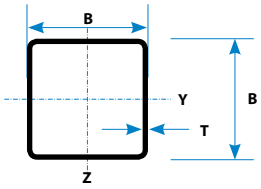
For minimum order quantities, please contact your account manager.

# CELSIUS® 420 SQUARE




## Celsius® 420 EN10210: S420NH Hot finished square hollow section

| Size | Thickness | Mass | Sectional area | Moment of inertia | Radius of gyration | Elastic modulus | Plastic modulus | Torsional constants | | Superficial area/m | Approx. length |
|---|---|---|---|---|---|---|---|---|---|---|---|
| B x B | T | M | A | I | i | $W_{el}$ | $W_{pl}$ | $I_t$ | $C_t$ | $A_s$ | /tonne |
| mm | mm | kg/m | $cm^2$ | $cm^4$ | cm | $cm^3$ | $cm^3$ | $cm^4$ | $cm^3$ | $m^2/m$ | m/t |
| 40 x 40 | 3.0 | 3.41 | 4.34 | 9.78 | 1.50 | 4.89 | 5.97 | 15.7 | 7.10 | 0.152 | 293 |
| | 3.2 | 3.61 | 4.60 | 10.2 | 1.49 | 5.11 | 6.28 | 16.5 | 7.42 | 0.152 | 277 |
| | 3.6 | 4.01 | 5.10 | 11.1 | 1.47 | 5.54 | 6.88 | 18.1 | 8.01 | 0.151 | 250 |
| | 4.0 | 4.39 | 5.59 | 11.8 | 1.45 | 5.91 | 7.44 | 19.5 | 8.54 | 0.150 | 228 |
| | 5.0 | 5.28 | 6.73 | 13.4 | 1.41 | 6.68 | 8.66 | 22.5 | 9.60 | 0.147 | 189 |
| 50 x 50 | 3.0 | 4.35 | 5.54 | 20.2 | 1.91 | 8.08 | 9.70 | 32.1 | 11.8 | 0.192 | 230 |
| | 3.2 | 4.62 | 5.88 | 21.2 | 1.90 | 8.49 | 10.2 | 33.8 | 12.4 | 0.192 | 217 |
| | 3.6 | 5.14 | 6.54 | 23.2 | 1.88 | 9.27 | 11.3 | 37.2 | 13.5 | 0.191 | 195 |
| | 4.0 | 5.64 | 7.19 | 25.0 | 1.86 | 9.99 | 12.3 | 40.4 | 14.5 | 0.190 | 177 |
| | 5.0 | 6.85 | 8.73 | 28.9 | 1.82 | 11.6 | 14.5 | 47.6 | 16.7 | 0.187 | 146 |
| | 6.3 | 8.31 | 10.6 | 32.8 | 1.76 | 13.1 | 17.0 | 55.2 | 18.8 | 0.184 | 120 |
| | 8.0 | 10.0 | 12.8 | 36.0 | 1.68 | 14.4 | 19.5 | 62.3 | 20.6 | 0.179 | 99.9 |
| 60 x 60 | 3.0 | 5.29 | 6.74 | 36.2 | 2.32 | 12.1 | 14.3 | 56.9 | 17.7 | 0.232 | 189 |
| | 3.2 | 5.62 | 7.16 | 38.2 | 2.31 | 12.7 | 15.2 | 60.2 | 18.6 | 0.232 | 178 |
| | 3.6 | 6.27 | 7.98 | 41.9 | 2.29 | 14.0 | 16.8 | 66.5 | 20.4 | 0.231 | 160 |
| | 4.0 | 6.90 | 8.79 | 45.4 | 2.27 | 15.1 | 18.3 | 72.5 | 22.0 | 0.230 | 145 |
| | 5.0 | 8.42 | 10.7 | 53.3 | 2.23 | 17.8 | 21.9 | 86.4 | 25.7 | 0.227 | 119 |
| | 6.3 | 10.3 | 13.1 | 61.6 | 2.17 | 20.5 | 26.0 | 102 | 29.6 | 0.224 | 97.2 |
| | 8.0 | 12.5 | 16.0 | 69.7 | 2.09 | 23.2 | 30.4 | 118 | 33.4 | 0.219 | 79.9 |
| 70 x 70 | 3.0 | 6.24 | 7.94 | 59.0 | 2.73 | 16.9 | 19.9 | 92.2 | 24.8 | 0.272 | 160 |
| | 3.2 | 6.63 | 8.44 | 62.3 | 2.72 | 17.8 | 21.0 | 97.6 | 26.1 | 0.272 | 151 |
| | 3.6 | 7.40 | 9.42 | 68.6 | 2.70 | 19.6 | 23.3 | 108 | 28.7 | 0.271 | 135 |
| | 4.0 | 8.15 | 10.4 | 74.7 | 2.68 | 21.3 | 25.5 | 118 | 31.2 | 0.270 | 123 |
| | 5.0 | 9.99 | 12.7 | 88.5 | 2.64 | 25.3 | 30.8 | 142 | 36.8 | 0.267 | 100 |
| | 6.3 | 12.3 | 15.6 | 104 | 2.58 | 29.7 | 36.9 | 169 | 42.9 | 0.264 | 81.5 |
| | 8.0 | 15.0 | 19.2 | 120 | 2.50 | 34.2 | 43.8 | 200 | 49.2 | 0.259 | 66.5 |
| 80 x 80 | 3.0 | 7.18 | 9.14 | 89.8 | 3.13 | 22.5 | 26.3 | 140 | 33.0 | 0.312 | 139 |
| | 3.2 | 7.63 | 9.72 | 95.0 | 3.13 | 23.7 | 27.9 | 148 | 34.9 | 0.312 | 131 |
| | 3.6 | 8.53 | 10.9 | 105 | 3.11 | 26.2 | 31.0 | 164 | 38.5 | 0.311 | 117 |
| | 4.0 | 9.41 | 12.0 | 114 | 3.09 | 28.6 | 34.0 | 180 | 41.9 | 0.310 | 106 |
| | 5.0 | 11.6 | 14.7 | 137 | 3.05 | 34.2 | 41.1 | 217 | 49.8 | 0.307 | 86.5 |
| | 6.3 | 14.2 | 18.1 | 162 | 2.99 | 40.5 | 49.7 | 262 | 58.7 | 0.304 | 70.2 |
| | 8.0 | 17.5 | 22.4 | 189 | 2.91 | 47.3 | 59.5 | 312 | 68.3 | 0.299 | 57.0 |
| 90 x 90 | 3.6 | 9.66 | 12.3 | 152 | 3.52 | 33.8 | 39.7 | 237 | 49.7 | 0.351 | 104 |
| | 4.0 | 10.7 | 13.6 | 166 | 3.50 | 37.0 | 43.6 | 260 | 54.2 | 0.350 | 93.7 |
| | 5.0 | 13.1 | 16.7 | 200 | 3.45 | 44.4 | 53.0 | 316 | 64.8 | 0.347 | 76.1 |
| | 6.3 | 16.2 | 20.7 | 238 | 3.40 | 53.0 | 64.3 | 382 | 77.0 | 0.344 | 61.6 |
| | 8.0 | 20.1 | 25.6 | 281 | 3.32 | 62.6 | 77.6 | 459 | 90.5 | 0.339 | 49.9 |
| 100 x 100 | 3.6 | 10.8 | 13.7 | 212 | 3.92 | 42.3 | 49.5 | 328 | 62.3 | 0.391 | 92.7 |
| | 4.0 | 11.9 | 15.2 | 232 | 3.91 | 46.4 | 54.4 | 361 | 68.2 | 0.390 | 83.9 |
| | 5.0 | 14.7 | 18.7 | 279 | 3.86 | 55.9 | 66.4 | 439 | 81.8 | 0.387 | 68.0 |
| | 6.3 | 18.2 | 23.2 | 336 | 3.80 | 67.1 | 80.9 | 534 | 97.8 | 0.384 | 54.9 |
| | 8.0 | 22.6 | 28.8 | 400 | 3.73 | 79.9 | 98.2 | 646 | 116 | 0.379 | 44.3 |



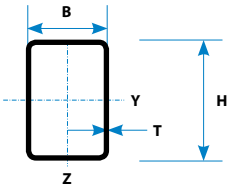

## Celsius® 420 EN10210: S420NH Hot finished square hollow section (continued)

| Size | Thickness | Mass | Sectional area | Moment of inertia | Radius of gyration | Elastic modulus | Plastic modulus | Torsional constants | | Superficial area/m | Approx. length |
|---|---|---|---|---|---|---|---|---|---|---|---|
| B x B | T | M | A | I | i | $W_{el}$ | $W_{pl}$ | $I_t$ | $C_t$ | $A_s$ | /tonne |
| mm | mm | kg/m | $cm^2$ | $cm^4$ | cm | $cm^3$ | $cm^3$ | $cm^4$ | $cm^3$ | $m^2/m$ | m/t |
| 120 x 120 | 4.0 | 14.4 | 18.4 | 410 | 4.72 | 68.4 | 79.7 | 635 | 101 | 0.470 | 69.3 |
| | 5.0 | 17.8 | 22.7 | 498 | 4.68 | 83.0 | 97.6 | 777 | 122 | 0.467 | 56.0 |
| | 6.3 | 22.2 | 28.2 | 603 | 4.62 | 100 | 120 | 950 | 147 | 0.464 | 45.1 |
| | 8.0 | 27.6 | 35.2 | 726 | 4.55 | 121 | 146 | 1160 | 176 | 0.459 | 36.2 |
| | 10.0 | 33.7 | 42.9 | 852 | 4.46 | 142 | 175 | 1382 | 206 | 0.454 | 29.7 |
| 140 x 140 | 5.0 | 21.0 | 26.7 | 807 | 5.50 | 115 | 135 | 1253 | 170 | 0.547 | 47.7 |
| | 6.3 | 26.1 | 33.3 | 984 | 5.44 | 141 | 166 | 1540 | 206 | 0.544 | 38.3 |
| | 8.0 | 32.6 | 41.6 | 1195 | 5.36 | 171 | 204 | 1892 | 249 | 0.539 | 30.7 |
| | 10.0 | 40.0 | 50.9 | 1416 | 5.27 | 202 | 246 | 2272 | 294 | 0.534 | 25.0 |
| 150 x 150 | 5.0 | 22.6 | 28.7 | 1002 | 5.90 | 134 | 156 | 1550 | 197 | 0.587 | 44.3 |
| | 6.3 | 28.1 | 35.8 | 1223 | 5.85 | 163 | 192 | 1909 | 240 | 0.584 | 35.6 |
| | 8.0 | 35.1 | 44.8 | 1491 | 5.77 | 199 | 237 | 2351 | 291 | 0.579 | 28.5 |
| | 10.0 | 43.1 | 54.9 | 1773 | 5.68 | 236 | 286 | 2832 | 344 | 0.574 | 23.2 |
| 160 x 160 | 5.0 | 24.1 | 30.7 | 1225 | 6.31 | 153 | 178 | 1892 | 226 | 0.627 | 41.5 |
| | 6.3 | 30.1 | 38.3 | 1499 | 6.26 | 187 | 220 | 2333 | 275 | 0.624 | 33.3 |
| | 8.0 | 37.6 | 48.0 | 1831 | 6.18 | 229 | 272 | 2880 | 335 | 0.619 | 26.6 |
| | 10.0 | 46.3 | 58.9 | 2186 | 6.09 | 273 | 329 | 3478 | 398 | 0.614 | 21.6 |
| 180 x 180 | 5.0 r | 27.3 | 34.7 | 1765 | 7.13 | 196 | 227 | 2718 | 290 | 0.707 | 36.7 |
| | 6.3 r | 34.0 | 43.3 | 2168 | 7.07 | 241 | 281 | 3361 | 355 | 0.704 | 29.4 |
| | 8.0 | 42.7 | 54.4 | 2661 | 7.00 | 296 | 349 | 4162 | 434 | 0.699 | 23.4 |
| | 10.0 | 52.5 | 66.9 | 3193 | 6.91 | 355 | 424 | 5048 | 518 | 0.694 | 19.0 |
| 200 x 200 | 5.0 | 30.4 | 38.7 | 2445 | 7.95 | 245 | 283 | 3756 | 362 | 0.787 | 32.9 |
| | 6.3 | 38.0 | 48.4 | 3011 | 7.89 | 301 | 350 | 4653 | 444 | 0.784 | 26.3 |
| | 8.0 | 47.7 | 60.8 | 3709 | 7.81 | 371 | 436 | 5778 | 545 | 0.779 | 21.0 |
| | 10.0 | 58.8 | 74.9 | 4471 | 7.72 | 447 | 531 | 7031 | 655 | 0.774 | 17.0 |
| 220 x 220 | 8.0 | 52.7 | 67.2 | 5002 | 8.63 | 455 | 532 | 7765 | 669 | 0.859 | 19.0 |
| | 10.0 | 65.1 | 82.9 | 6050 | 8.54 | 550 | 650 | 9473 | 807 | 0.854 | 15.4 |
| 250 x 250 | 5.0 | 38.3 | 48.7 | 4861 | 9.99 | 389 | 447 | 7430 | 577 | 0.987 | 26.1 |
| 260 x 260 | 6.3 r | 49.9 | 63.5 | 6788 | 10.3 | 522 | 603 | 10417 | 773 | 1.02 | 20.1 |
| | 8.0 r | 62.8 | 80.0 | 8423 | 10.3 | 648 | 753 | 13006 | 956 | 1.02 | 15.9 |
| | 10.0 | 77.7 | 98.9 | 10242 | 10.2 | 788 | 924 | 15932 | 1159 | 1.01 | 12.9 |
| 300 x 300 | 10.0 | 90.2 | 115 | 16026 | 11.8 | 1068 | 1246 | 24807 | 1575 | 1.17 | 11.1 |
| 400 x 400 | 8.0 | 97.9 | 125 | 31857 | 16.0 | 1593 | 1830 | 48695 | 2363 | 1.58 | 10.2 |
| | 10.0 | 122 | 155 | 39128 | 15.9 | 1956 | 2260 | 60092 | 2895 | 1.57 | 8.22 |

r External corner radius >2T but ≤3T

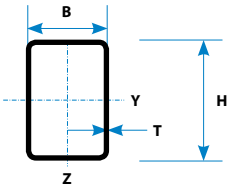
For minimum order quantities, please contact your account manager.

# CELSIUS® 420 RECTANGULAR




## Celsius® 420 EN10210: S420NH Hot finished rectangular hollow section

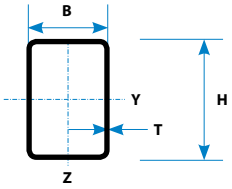
| Size | Thickness | Mass | Sectional area | Moment of inertia | | Radius of gyration | | Elastic modulus | | Plastic modulus | | Torsional constants | | Superficial area/m | Approx length /tonne |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| H x B | T | M | A | $I_{yy}$ | $I_{zz}$ | $i_{yy}$ | $i_{zz}$ | $W_{el,yy}$ | $W_{el,zz}$ | $W_{pl,yy}$ | $W_{pl,zz}$ | $I_t$ | $C_t$ | $A_s$ | |
| mm | mm | kg/m | $cm^2$ | $cm^4$ | $cm^4$ | cm | cm | $cm^3$ | $cm^3$ | $cm^3$ | $cm^3$ | $cm^4$ | $cm^3$ | $m^2/m$ | m/t |
| 50 x 30 | 3.0 | 3.41 | 4.34 | 13.6 | 5.94 | 1.77 | 1.17 | 5.43 | 3.96 | 6.88 | 4.76 | 13.5 | 6.51 | 0.152 | 293 |
| | 3.2 | 3.61 | 4.60 | 14.2 | 6.20 | 1.76 | 1.16 | 5.68 | 4.13 | 7.25 | 5.00 | 14.2 | 6.80 | 0.152 | 277 |
| | 3.6 | 4.01 | 5.10 | 15.4 | 6.67 | 1.74 | 1.14 | 6.16 | 4.45 | 7.94 | 5.46 | 15.4 | 7.31 | 0.151 | 250 |
| | 4.0 | 4.39 | 5.59 | 16.5 | 7.08 | 1.72 | 1.13 | 6.60 | 4.72 | 8.59 | 5.88 | 16.6 | 7.77 | 0.150 | 228 |
| | 5.0 | 5.28 | 6.73 | 18.7 | 7.89 | 1.67 | 1.08 | 7.49 | 5.26 | 10.0 | 6.80 | 19.0 | 8.67 | 0.147 | 189 |
| 60 x 40 | 3.0 | 4.35 | 5.54 | 26.5 | 13.9 | 2.18 | 1.58 | 8.82 | 6.95 | 10.9 | 8.19 | 29.2 | 11.2 | 0.192 | 230 |
| | 3.2 | 4.62 | 5.88 | 27.8 | 14.6 | 2.18 | 1.57 | 9.27 | 7.29 | 11.5 | 8.64 | 30.8 | 11.7 | 0.192 | 217 |
| | 3.6 | 5.14 | 6.54 | 30.4 | 15.9 | 2.16 | 1.56 | 10.1 | 7.93 | 12.7 | 9.50 | 33.8 | 12.8 | 0.191 | 195 |
| | 4.0 | 5.64 | 7.19 | 32.8 | 17.0 | 2.14 | 1.54 | 10.9 | 8.52 | 13.8 | 10.3 | 36.7 | 13.7 | 0.190 | 177 |
| | 5.0 | 6.85 | 8.73 | 38.1 | 19.5 | 2.09 | 1.50 | 12.7 | 9.77 | 16.4 | 12.2 | 43.0 | 15.7 | 0.187 | 146 |
| | 6.3 | 8.31 | 10.6 | 43.4 | 21.9 | 2.02 | 1.44 | 14.5 | 11.0 | 19.2 | 14.2 | 49.5 | 17.6 | 0.184 | 120 |
| 80 x 40 | 3.0 | 5.29 | 6.74 | 54.2 | 18.0 | 2.84 | 1.63 | 13.6 | 9.00 | 17.1 | 10.4 | 43.8 | 15.3 | 0.232 | 189 |
| | 3.2 | 5.62 | 7.16 | 57.2 | 18.9 | 2.83 | 1.63 | 14.3 | 9.46 | 18.0 | 11.0 | 46.2 | 16.1 | 0.232 | 178 |
| | 3.6 | 6.27 | 7.98 | 62.8 | 20.6 | 2.81 | 1.61 | 15.7 | 10.3 | 20.0 | 12.1 | 50.8 | 17.5 | 0.231 | 160 |
| | 4.0 | 6.90 | 8.79 | 68.2 | 22.2 | 2.79 | 1.59 | 17.1 | 11.1 | 21.8 | 13.2 | 55.2 | 18.9 | 0.230 | 145 |
| | 5.0 | 8.42 | 10.7 | 80.3 | 25.7 | 2.74 | 1.55 | 20.1 | 12.9 | 26.1 | 15.7 | 65.1 | 21.9 | 0.227 | 119 |
| | 6.3 | 10.3 | 13.1 | 93.3 | 29.2 | 2.67 | 1.49 | 23.3 | 14.6 | 31.1 | 18.4 | 75.6 | 24.8 | 0.224 | 97.2 |
| | 8.0 | 12.5 | 16.0 | 106 | 32.1 | 2.58 | 1.42 | 26.5 | 16.1 | 36.5 | 21.2 | 85.8 | 27.4 | 0.219 | 79.9 |
| 90 x 50 | 3.0 | 6.24 | 7.94 | 84.4 | 33.5 | 3.26 | 2.05 | 18.8 | 13.4 | 23.2 | 15.3 | 76.5 | 22.4 | 0.272 | 160 |
| | 3.2 | 6.63 | 8.44 | 89.1 | 35.3 | 3.25 | 2.04 | 19.8 | 14.1 | 24.6 | 16.2 | 80.9 | 23.6 | 0.272 | 151 |
| | 3.6 | 7.40 | 9.42 | 98.3 | 38.7 | 3.23 | 2.03 | 21.8 | 15.5 | 27.2 | 18.0 | 89.4 | 25.9 | 0.271 | 135 |
| | 4.0 | 8.15 | 10.4 | 107 | 41.9 | 3.21 | 2.01 | 23.8 | 16.8 | 29.8 | 19.6 | 97.5 | 28.0 | 0.270 | 123 |
| | 5.0 | 9.99 | 12.7 | 127 | 49.2 | 3.16 | 1.97 | 28.3 | 19.7 | 36.0 | 23.5 | 116 | 32.9 | 0.267 | 100 |
| | 6.3 | 12.3 | 15.6 | 150 | 57.0 | 3.10 | 1.91 | 33.3 | 22.8 | 43.2 | 28.0 | 138 | 38.1 | 0.264 | 81.5 |
| | 8.0 | 15.0 | 19.2 | 174 | 64.6 | 3.01 | 1.84 | 38.6 | 25.8 | 51.4 | 32.9 | 160 | 43.2 | 0.259 | 66.5 |
| 100 x 50 | 3.0 | 6.71 | 8.54 | 110 | 36.8 | 3.58 | 2.08 | 21.9 | 14.7 | 27.3 | 16.8 | 88.4 | 25.0 | 0.292 | 149 |
| | 3.2 | 7.13 | 9.08 | 116 | 38.8 | 3.57 | 2.07 | 23.2 | 15.5 | 28.9 | 17.7 | 93.4 | 26.4 | 0.292 | 140 |
| | 3.6 | 7.96 | 10.1 | 128 | 42.6 | 3.55 | 2.05 | 25.6 | 17.0 | 32.1 | 19.6 | 103 | 29.0 | 0.291 | 126 |
| | 4.0 | 8.78 | 11.2 | 140 | 46.2 | 3.53 | 2.03 | 27.9 | 18.5 | 35.2 | 21.5 | 113 | 31.4 | 0.290 | 114 |
| | 5.0 | 10.8 | 13.7 | 167 | 54.3 | 3.48 | 1.99 | 33.3 | 21.7 | 42.6 | 25.8 | 135 | 36.9 | 0.287 | 92.8 |
| | 6.3 | 13.3 | 16.9 | 197 | 63.0 | 3.42 | 1.93 | 39.4 | 25.2 | 51.3 | 30.8 | 160 | 42.9 | 0.284 | 75.4 |
| | 8.0 | 16.3 | 20.8 | 230 | 71.7 | 3.33 | 1.86 | 46.0 | 28.7 | 61.4 | 36.3 | 186 | 48.9 | 0.279 | 61.4 |
| 100 x 60 | 3.0 | 7.18 | 9.14 | 124 | 55.7 | 3.68 | 2.47 | 24.7 | 18.6 | 30.2 | 21.2 | 121 | 30.7 | 0.312 | 139 |
| | 3.2 | 7.63 | 9.72 | 131 | 58.8 | 3.67 | 2.46 | 26.2 | 19.6 | 32.0 | 22.4 | 129 | 32.4 | 0.312 | 131 |
| | 3.6 | 8.53 | 10.9 | 145 | 64.8 | 3.65 | 2.44 | 28.9 | 21.6 | 35.6 | 24.9 | 142 | 35.6 | 0.311 | 117 |
| | 4.0 | 9.41 | 12.0 | 158 | 70.5 | 3.63 | 2.43 | 31.6 | 23.5 | 39.1 | 27.3 | 156 | 38.7 | 0.310 | 106 |
| | 5.0 | 11.6 | 14.7 | 189 | 83.6 | 3.58 | 2.38 | 37.8 | 27.9 | 47.4 | 32.9 | 188 | 45.9 | 0.307 | 86.5 |
| | 6.3 | 14.2 | 18.1 | 225 | 98.1 | 3.52 | 2.33 | 45.0 | 32.7 | 57.3 | 39.5 | 224 | 53.8 | 0.304 | 70.2 |
| | 8.0 | 17.5 | 22.4 | 264 | 113 | 3.44 | 2.25 | 52.8 | 37.8 | 68.7 | 47.1 | 265 | 62.2 | 0.299 | 57.0 |




## **Celsius® 420 EN10210: S420NH** Hot finished rectangular hollow section (continued)

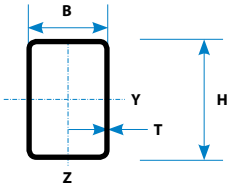
| Size | Thickness | Mass | Sectional area | Moment of inertia | | Radius of gyration | | Elastic modulus | | Plastic modulus | | Torsional constants | | Superficial area/m | Approx length /tonne |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| H x B | T | M | A | $I_{yy}$ | $I_{zz}$ | $i_{yy}$ | $i_{zz}$ | $W_{el,yy}$ | $W_{el,zz}$ | $W_{pl,yy}$ | $W_{pl,zz}$ | $I_t$ | $C_t$ | $A_s$ | |
| mm | mm | kg/m | $cm^2$ | $cm^4$ | $cm^4$ | cm | cm | $cm^3$ | $cm^3$ | $cm^3$ | $cm^3$ | $cm^4$ | $cm^3$ | $m^2/m$ | m/t |
| 120 x 60 | 3.0 | 8.12 | 10.3 | 194 | 65.5 | 4.33 | 2.52 | 32.3 | 21.8 | 40.0 | 24.6 | 156 | 37.2 | 0.352 | 123 |
| | 3.2 | 8.64 | 11.0 | 205 | 69.2 | 4.32 | 2.51 | 34.2 | 23.1 | 42.4 | 26.1 | 165 | 39.2 | 0.352 | 116 |
| | 3.6 | 9.66 | 12.3 | 227 | 76.3 | 4.30 | 2.49 | 37.9 | 25.4 | 47.2 | 28.9 | 183 | 43.3 | 0.351 | 104 |
| | 4.0 | 10.7 | 13.6 | 249 | 83.1 | 4.28 | 2.47 | 41.5 | 27.7 | 51.9 | 31.7 | 201 | 47.1 | 0.350 | 93.7 |
| | 5.0 | 13.1 | 16.7 | 299 | 98.8 | 4.23 | 2.43 | 49.9 | 32.9 | 63.1 | 38.4 | 242 | 56.0 | 0.347 | 76.1 |
| | 6.3 | 16.2 | 20.7 | 358 | 116 | 4.16 | 2.37 | 59.7 | 38.8 | 76.7 | 46.3 | 290 | 65.9 | 0.344 | 61.6 |
| | 8.0 | 20.1 | 25.6 | 425 | 135 | 4.08 | 2.30 | 70.8 | 45.0 | 92.7 | 55.4 | 344 | 76.6 | 0.339 | 49.9 |
| 120 x 80 | 3.6 | 10.8 | 13.7 | 276 | 147 | 4.48 | 3.27 | 46.0 | 36.7 | 55.6 | 42.0 | 301 | 59.5 | 0.391 | 92.7 |
| | 4.0 | 11.9 | 15.2 | 303 | 161 | 4.46 | 3.25 | 50.4 | 40.2 | 61.2 | 46.1 | 330 | 65.0 | 0.390 | 83.9 |
| | 5.0 | 14.7 | 18.7 | 365 | 193 | 4.42 | 3.21 | 60.9 | 48.2 | 74.6 | 56.1 | 401 | 77.9 | 0.387 | 68.0 |
| | 6.3 | 18.2 | 23.2 | 440 | 230 | 4.36 | 3.15 | 73.3 | 57.6 | 91.0 | 68.2 | 487 | 92.9 | 0.384 | 54.9 |
| | 8.0 | 22.6 | 28.8 | 525 | 273 | 4.27 | 3.08 | 87.5 | 68.1 | 111 | 82.6 | 587 | 110 | 0.379 | 44.3 |
| 150 x 100 | 4.0 | 15.1 | 19.2 | 607 | 324 | 5.63 | 4.11 | 81.0 | 64.8 | 97.4 | 73.6 | 660 | 105 | 0.490 | 66.4 |
| | 5.0 | 18.6 | 23.7 | 739 | 392 | 5.58 | 4.07 | 98.5 | 78.5 | 119 | 90.1 | 807 | 127 | 0.487 | 53.7 |
| | 6.3 | 23.1 | 29.5 | 898 | 474 | 5.52 | 4.01 | 120 | 94.8 | 147 | 110 | 986 | 153 | 0.484 | 43.2 |
| | 8.0 | 28.9 | 36.8 | 1087 | 569 | 5.44 | 3.94 | 145 | 114 | 180 | 135 | 1203 | 183 | 0.479 | 34.7 |
| | 10.0 | 35.3 | 44.9 | 1282 | 665 | 5.34 | 3.85 | 171 | 133 | 216 | 161 | 1432 | 214 | 0.474 | 28.4 |
| 160 x 80 | 4.0 | 14.4 | 18.4 | 612 | 207 | 5.77 | 3.35 | 76.5 | 51.7 | 94.7 | 58.3 | 493 | 88.1 | 0.470 | 69.3 |
| | 5.0 | 17.8 | 22.7 | 744 | 249 | 5.72 | 3.31 | 93.0 | 62.3 | 116 | 71.1 | 600 | 106 | 0.467 | 56.0 |
| | 6.3 | 22.2 | 28.2 | 903 | 299 | 5.66 | 3.26 | 113 | 74.8 | 142 | 86.8 | 730 | 127 | 0.464 | 45.1 |
| | 8.0 | 27.6 | 35.2 | 1091 | 356 | 5.57 | 3.18 | 136 | 89.0 | 175 | 106 | 883 | 151 | 0.459 | 36.2 |
| | 10.0 | 33.7 | 42.9 | 1284 | 411 | 5.47 | 3.10 | 161 | 103 | 209 | 125 | 1041 | 175 | 0.454 | 29.7 |
| 180 x 60 | 4.0 | 14.4 | 18.4 | 697 | 121 | 6.16 | 2.56 | 77.4 | 40.3 | 99.8 | 45.2 | 341 | 72.2 | 0.470 | 69.3 |
| | 5.0 | 17.8 | 22.7 | 846 | 144 | 6.10 | 2.52 | 94.0 | 48.1 | 122 | 54.9 | 411 | 86.3 | 0.467 | 56.0 |
| | 6.3 | 22.2 | 28.2 | 1027 | 171 | 6.03 | 2.46 | 114 | 57.0 | 150 | 66.6 | 495 | 102 | 0.464 | 45.1 |
| | 8.0 | 27.6 | 35.2 | 1240 | 201 | 5.94 | 2.39 | 138 | 66.9 | 184 | 80.4 | 590 | 120 | 0.459 | 36.2 |
| | 10.0 | 33.7 | 42.9 | 1457 | 228 | 5.83 | 2.30 | 162 | 75.8 | 220 | 94.4 | 683 | 137 | 0.454 | 29.7 |

For minimum order quantities, please contact your account manager.




## Celsius® 420 EN10210: S420NH Hot finished rectangular hollow section (continued)

| Size | Thickness | Mass | Sectional area | Moment of inertia | | Radius of gyration | | Elastic modulus | | Plastic modulus | | Torsional constants | | Superficial area/m | Approx length /tonne |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| H x B | T | M | A | $I_{yy}$ | $I_{zz}$ | $i_{yy}$ | $i_{zz}$ | $W_{el,yy}$ | $W_{el,zz}$ | $W_{pl,yy}$ | $W_{pl,zz}$ | $I_t$ | $C_t$ | $A_s$ | |
| mm | mm | kg/m | $cm^2$ | $cm^4$ | $cm^4$ | cm | cm | $cm^3$ | $cm^3$ | $cm^3$ | $cm^3$ | $cm^4$ | $cm^3$ | $m^2/m$ | m/t |
| 180 x 100 | 4.0 | 16.9 | 21.6 | 945 | 379 | 6.61 | 4.19 | 105 | 75.9 | 128 | 85.2 | 852 | 127 | 0.550 | 59.0 |
| | 5.0 | 21.0 | 26.7 | 1153 | 460 | 6.57 | 4.15 | 128 | 92.0 | 157 | 104 | 1042 | 154 | 0.547 | 47.7 |
| | 6.3 | 26.1 | 33.3 | 1407 | 557 | 6.50 | 4.09 | 156 | 111 | 194 | 128 | 1277 | 186 | 0.544 | 38.3 |
| | 8.0 | 32.6 | 41.6 | 1713 | 671 | 6.42 | 4.02 | 190 | 134 | 239 | 157 | 1560 | 224 | 0.539 | 30.7 |
| | 10.0 | 40.0 | 50.9 | 2036 | 787 | 6.32 | 3.93 | 226 | 157 | 288 | 188 | 1862 | 263 | 0.534 | 25.0 |
| 200 x 100 | 4.0 | 18.2 | 23.2 | 1223 | 416 | 7.26 | 4.24 | 122 | 83.2 | 150 | 92.8 | 983 | 142 | 0.590 | 54.9 |
| | 5.0 | 22.6 | 28.7 | 1495 | 505 | 7.21 | 4.19 | 149 | 101 | 185 | 114 | 1204 | 172 | 0.587 | 44.3 |
| | 6.3 | 28.1 | 35.8 | 1829 | 613 | 7.15 | 4.14 | 183 | 123 | 228 | 140 | 1475 | 208 | 0.584 | 35.6 |
| | 8.0 | 35.1 | 44.8 | 2234 | 739 | 7.06 | 4.06 | 223 | 148 | 282 | 172 | 1804 | 251 | 0.579 | 28.5 |
| | 10.0 | 43.1 | 54.9 | 2664 | 869 | 6.96 | 3.98 | 266 | 174 | 341 | 206 | 2156 | 295 | 0.574 | 23.2 |
| 200 x 120 | 5.0 | 24.1 | 30.7 | 1685 | 762 | 7.40 | 4.98 | 168 | 127 | 205 | 144 | 1648 | 210 | 0.627 | 41.5 |
| | 6.3 | 30.1 | 38.3 | 2065 | 929 | 7.34 | 4.92 | 207 | 155 | 253 | 177 | 2028 | 255 | 0.624 | 33.3 |
| | 8.0 | 37.6 | 48.0 | 2529 | 1128 | 7.26 | 4.85 | 253 | 188 | 313 | 218 | 2495 | 310 | 0.619 | 26.6 |
| | 10.0 | 46.3 | 58.9 | 3026 | 1337 | 7.17 | 4.76 | 303 | 223 | 379 | 263 | 3001 | 367 | 0.614 | 21.6 |
| 200 x 150 | 5.0 | 26.5 | 33.7 | 1970 | 1265 | 7.64 | 6.12 | 197 | 169 | 234 | 192 | 2386 | 267 | 0.687 | 37.8 |
| | 6.3 | 33.0 | 42.1 | 2420 | 1549 | 7.58 | 6.07 | 242 | 207 | 289 | 237 | 2947 | 326 | 0.684 | 30.3 |
| | 8.0 | 41.4 | 52.8 | 2971 | 1894 | 7.50 | 5.99 | 297 | 253 | 359 | 294 | 3643 | 398 | 0.679 | 24.1 |
| | 10.0 | 51.0 | 64.9 | 3568 | 2264 | 7.41 | 5.91 | 357 | 302 | 436 | 356 | 4409 | 475 | 0.674 | 19.6 |
| 220 x 120 | 5.0 r | 25.7 | 32.7 | 2125 | 829 | 8.06 | 5.03 | 193 | 138 | 236 | 155 | 1881 | 232 | 0.667 | 38.9 |
| | 6.3 r | 32.0 | 40.8 | 2610 | 1010 | 8.00 | 4.98 | 237 | 168 | 292 | 191 | 2315 | 283 | 0.664 | 31.2 |
| | 8.0 | 40.2 | 51.2 | 3203 | 1229 | 7.91 | 4.90 | 291 | 205 | 362 | 236 | 2850 | 343 | 0.659 | 24.9 |
| | 10.0 | 49.4 | 62.9 | 3844 | 1459 | 7.82 | 4.81 | 349 | 243 | 440 | 285 | 3431 | 407 | 0.654 | 20.2 |
| 250 x 100 | 5.0 | 26.5 | 33.7 | 2610 | 618 | 8.80 | 4.28 | 209 | 124 | 263 | 138 | 1617 | 217 | 0.687 | 37.8 |
| | 6.3 | 33.0 | 42.1 | 3207 | 751 | 8.73 | 4.22 | 257 | 150 | 326 | 169 | 1983 | 264 | 0.684 | 30.3 |
| | 8.0 | 41.4 | 52.8 | 3940 | 909 | 8.64 | 4.15 | 315 | 182 | 404 | 209 | 2430 | 319 | 0.679 | 24.1 |
| | 10.0 | 51.0 | 64.9 | 4733 | 1072 | 8.54 | 4.06 | 379 | 214 | 491 | 251 | 2908 | 376 | 0.674 | 19.6 |
| 250 x 150 | 5.0 | 30.4 | 38.7 | 3360 | 1527 | 9.31 | 6.28 | 269 | 204 | 324 | 228 | 3278 | 337 | 0.787 | 32.9 |
| | 6.3 | 38.0 | 48.4 | 4143 | 1874 | 9.25 | 6.22 | 331 | 250 | 402 | 283 | 4054 | 413 | 0.784 | 26.3 |
| | 8.0 | 47.7 | 60.8 | 5111 | 2298 | 9.17 | 6.15 | 409 | 306 | 501 | 350 | 5021 | 506 | 0.779 | 21.0 |
| | 10.0 | 58.8 | 74.9 | 6174 | 2755 | 9.08 | 6.06 | 494 | 367 | 611 | 426 | 6090 | 605 | 0.774 | 17.0 |
| 250 x 200 | 10.0 r | 66.7 | 84.9 | 7614 | 5374 | 9.47 | 7.95 | 609 | 537 | 731 | 626 | 9889 | 835 | 0.874 | 15.0 |
| 260 x 140 | 5.0 | 30.4 | 38.7 | 3532 | 1354 | 9.55 | 5.91 | 272 | 193 | 331 | 216 | 3078 | 326 | 0.787 | 32.9 |
| | 6.3 | 38.0 | 48.4 | 4355 | 1660 | 9.49 | 5.86 | 335 | 237 | 411 | 267 | 3803 | 399 | 0.784 | 26.3 |
| | 8.0 | 47.7 | 60.8 | 5373 | 2032 | 9.40 | 5.78 | 413 | 290 | 511 | 331 | 4704 | 488 | 0.779 | 21.0 |
| | 10.0 | 58.8 | 74.9 | 6490 | 2432 | 9.31 | 5.70 | 499 | 347 | 624 | 402 | 5698 | 584 | 0.774 | 17.0 |




## Celsius® 420 EN10210: S420NH Hot finished rectangular hollow section (continued)

| Size | Thickness | Mass | Sectional area | Moment of inertia | | Radius of gyration | | Elastic modulus | | Plastic modulus | | Torsional constants | | Superficial area/m | Approx length /tonne |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| H x B | T | M | A | $I_{yy}$ | $I_{zz}$ | $i_{yy}$ | $i_{zz}$ | $W_{el,yy}$ | $W_{el,zz}$ | $W_{pl,yy}$ | $W_{pl,zz}$ | $I_t$ | $C_t$ | $A_s$ | |
| mm | mm | kg/m | $cm^2$ | $cm^4$ | $cm^4$ | cm | cm | $cm^3$ | $cm^3$ | $cm^3$ | $cm^3$ | $cm^4$ | $cm^3$ | $m^2/m$ | m/t |
| 260 x 180 | 8.0 | 52.7 | 67.2 | 6390 | 3608 | 9.75 | 7.33 | 492 | 401 | 592 | 459 | 7221 | 644 | 0.859 | 19.0 |
| | 10.0 | 65.1 | 82.9 | 7741 | 4351 | 9.66 | 7.24 | 595 | 483 | 724 | 560 | 8798 | 775 | 0.854 | 15.4 |
| 300 x 100 | 5.0 | 30.4 | 38.7 | 4146 | 731 | 10.3 | 4.34 | 276 | 146 | 354 | 161 | 2040 | 262 | 0.787 | 32.9 |
| | 6.3 | 38.0 | 48.4 | 5111 | 890 | 10.3 | 4.29 | 341 | 178 | 439 | 199 | 2504 | 319 | 0.784 | 26.3 |
| | 8.0 | 47.7 | 60.8 | 6305 | 1078 | 10.2 | 4.21 | 420 | 216 | 546 | 245 | 3069 | 387 | 0.779 | 21.0 |
| | 10.0 | 58.8 | 74.9 | 7613 | 1275 | 10.1 | 4.13 | 508 | 255 | 666 | 296 | 3676 | 458 | 0.774 | 17.0 |
| 300 x 150 | 8.0 r | 54.0 | 68.8 | 8011 | 2702 | 10.8 | 6.27 | 534 | 360 | 663 | 407 | 6454 | 613 | 0.879 | 18.5 |
| | 10.0 r | 66.7 | 84.9 | 9716 | 3246 | 10.7 | 6.18 | 648 | 433 | 811 | 496 | 7839 | 736 | 0.874 | 15.0 |
| 300 x 200 | 5.0 | 38.3 | 48.7 | 6322 | 3396 | 11.4 | 8.35 | 421 | 340 | 501 | 380 | 6824 | 552 | 0.987 | 26.1 |
| 350 x 150 | 5.0 | 38.3 | 48.7 | 7655 | 2053 | 12.5 | 6.49 | 437 | 274 | 543 | 301 | 5161 | 477 | 0.987 | 26.1 |
| 350 x 250 | 10.0 | 90.2 | 115 | 20102 | 11937 | 13.2 | 10.2 | 1149 | 955 | 1375 | 1091 | 23354 | 1525 | 1.17 | 11.1 |
| 400 x 120 | 6.3 r | 49.9 | 63.5 | 11790 | 1744 | 13.6 | 5.24 | 590 | 291 | 762 | 320 | 5039 | 527 | 1.02 | 20.1 |
| | 8.0 r | 62.8 | 80.0 | 14644 | 2134 | 13.5 | 5.17 | 732 | 356 | 952 | 397 | 6218 | 645 | 1.02 | 15.9 |
| | 10.0 r | 77.7 | 96.9 | 17829 | 2551 | 13.4 | 5.08 | 891 | 425 | 1168 | 483 | 7509 | 771 | 1.01 | 12.9 |
| 400 x 200 | 10.0 | 90.2 | 115 | 23914 | 8084 | 14.4 | 8.39 | 1196 | 808 | 1480 | 911 | 19259 | 1376 | 1.17 | 11.1 |
| 500 x 300 | 8.0 | 97.9 | 125 | 43728 | 19951 | 18.7 | 12.6 | 1749 | 1330 | 2100 | 1480 | 42563 | 2203 | 1.58 | 10.2 |
| | 10.0 | 122 | 155 | 53762 | 24439 | 18.6 | 12.6 | 2150 | 1629 | 2595 | 1825 | 52450 | 2696 | 1.57 | 8.22 |

r External corner radius >2T but ≤3T

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