

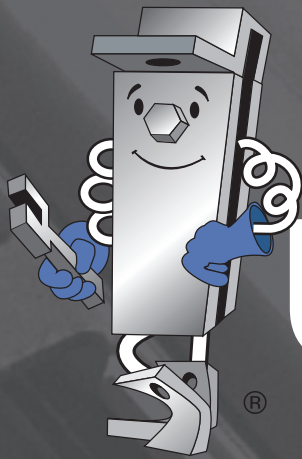
CATALOG

UNISTRUT®

GENERAL ENGINEERING CATALOG – NO. 17

A PART OF





UNISTRUT®

A PART OF  **atkore**
INTERNATIONAL

Unistrut is the original metal framing system featuring a unique weldless connection. The Unistrut system eliminates welding and drilling, and is easily adjustable and reusable for infinite configurations. Over time, our brand has evolved from a simple connection concept to a comprehensive engineered building and support system featuring a robust line of channels, fittings, fasteners, hangers, pipe clamps, and accessories. Backed by our worldwide network of engineering and distribution centers, we provide customers with total-resource capability, making Unistrut the brand everyone asks for by name.



UNISTRUT®

**The Unistrut World of Support
starts with our network of Unistrut
Service Centers across the nation.**

The Unistrut World of Support starts with our network of Unistrut Service Centers across North America. They go far beyond providing local product inventories... by offering complete application solutions, based on experience gained from thousands of projects worldwide.

It's the kind of knowledgeable assistance that can help save time and cost now, and simplify change in the future.

Technical help? No one knows the engineering side of Unistrut support systems like your local Unistrut team. And if it's special fabrication, cutting or custom finishing you want, the pros at your local Unistrut Service Center will make it happen...quickly, efficiently, economically.

So when it's help you need, call your Unistrut Service Center—the quickest way to unlock Unistrut's World of Support.

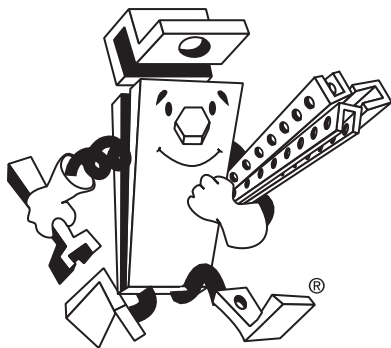




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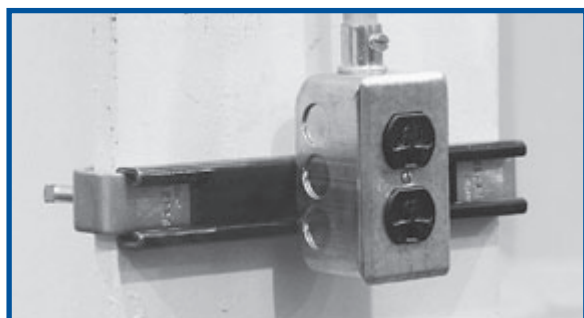
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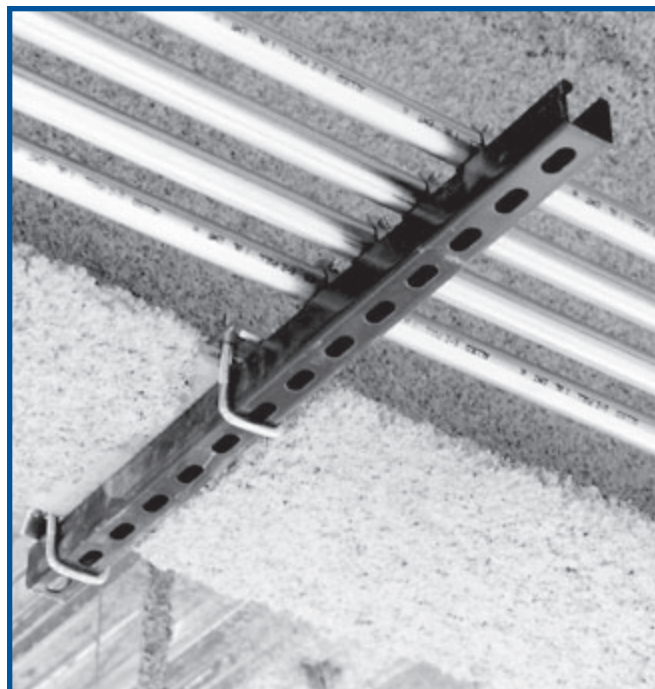
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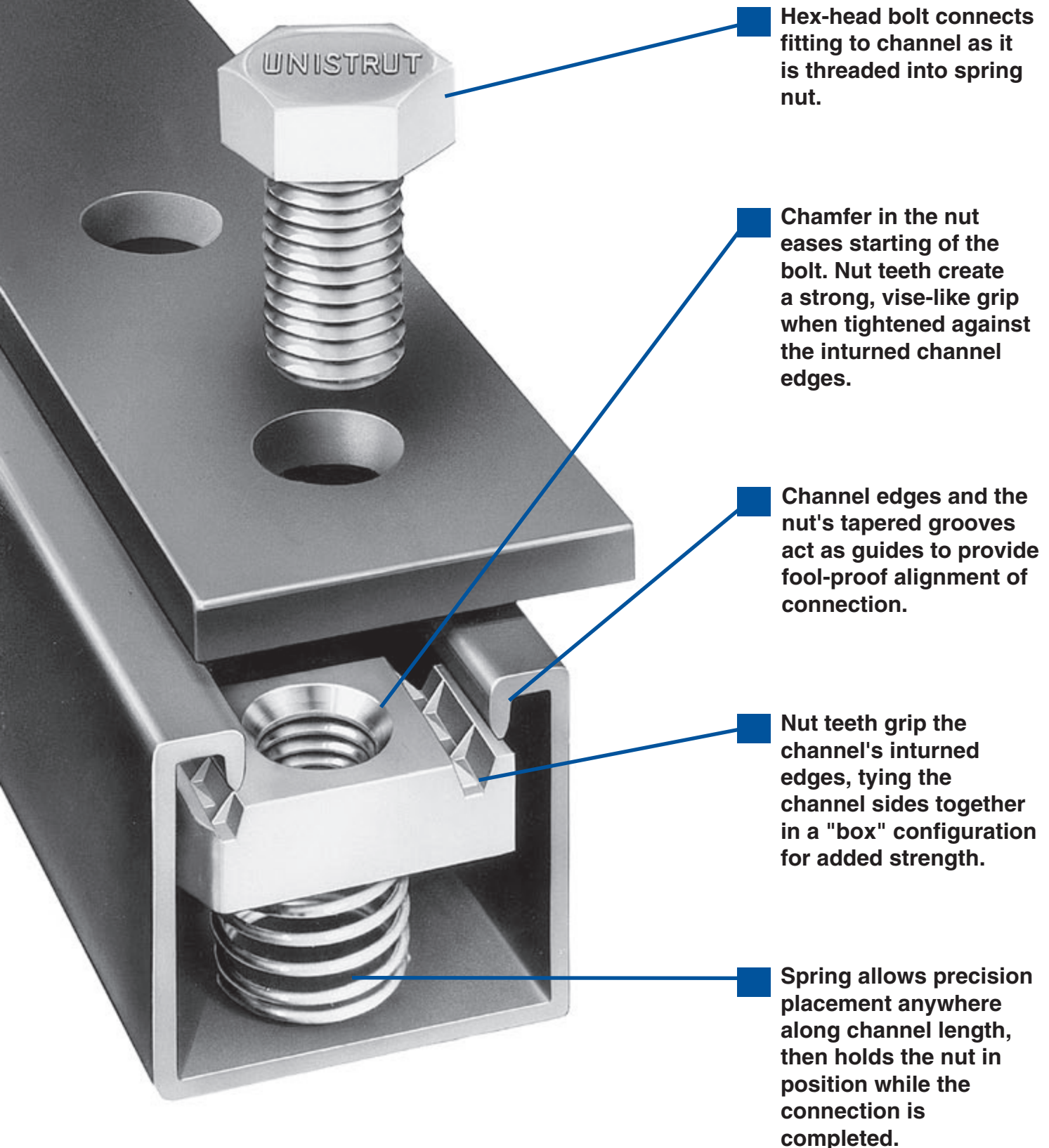
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Featuring The Unique Weldless Connection



Hex-head bolt connects fitting to channel as it is threaded into spring nut.

Chamfer in the nut eases starting of the bolt. Nut teeth create a strong, vise-like grip when tightened against the inturned channel edges.

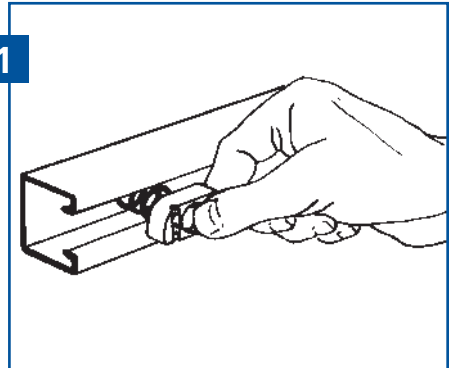
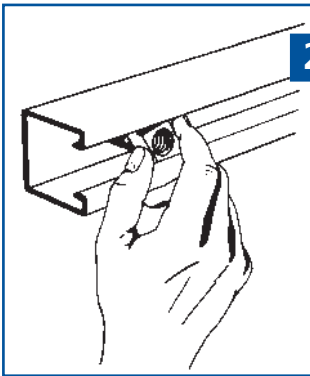
Channel edges and the nut's tapered grooves act as guides to provide fool-proof alignment of connection.

Nut teeth grip the channel's inturned edges, tying the channel sides together in a "box" configuration for added strength.

Spring allows precision placement anywhere along channel length, then holds the nut in position while the connection is completed.

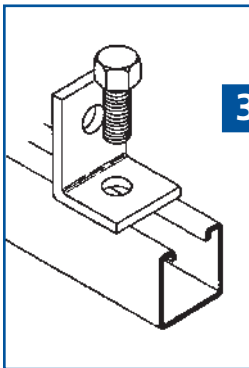
Strong, Fast, Economical and Adjustable

Insert the spring nut anywhere along the continuous slotted channel. The rounded nut ends permit easy insertion.

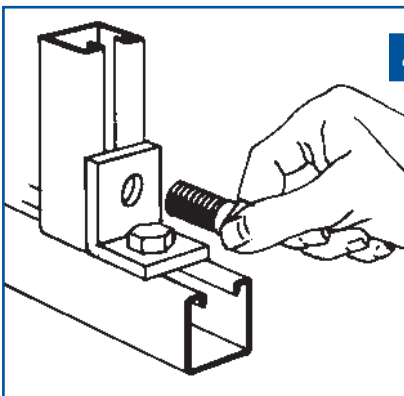
1**2**

A 90° clockwise turn aligns the grooves in the nut with the inturned edges of the channel.

Fittings can be placed anywhere along the channel opening, permitting complete freedom of adjustment. The need for drilling holes is eliminated.

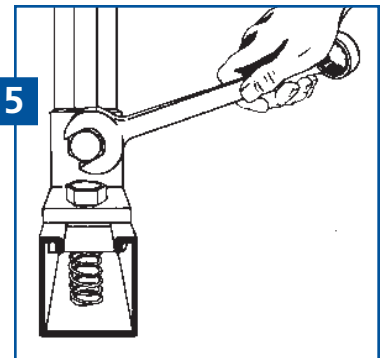
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Insert the bolt through the fitting and into the spring nut. (See illustration 5 for end view showing the nut in place)

4

Additional channel sections can now be bolted to the fitting already in place by following procedure described in steps 1–3.

Tightening with a wrench locks the serrated teeth of the nut into the inturned edges of the channel, to complete a strong, vise-like connection.

5

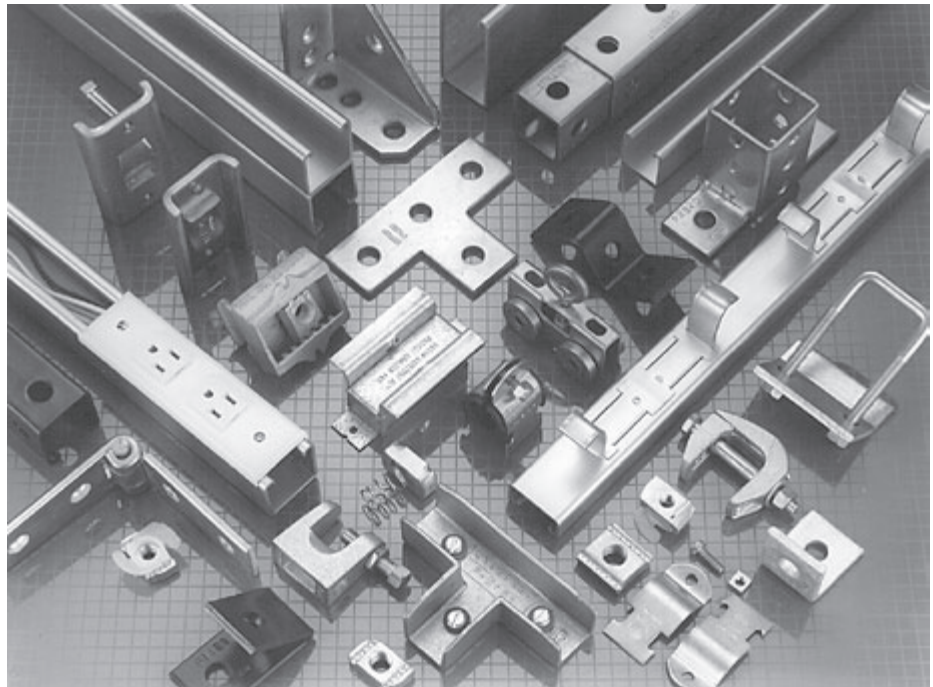
- 100% Adjustable
- 100% Reusable
- No Welding
- No Drilling
- No Special Tools



Serving Design Professionals for Over 85 Years

Unistrut products have been helping to build a better world since 1924. Used extensively in nuclear, industrial and commercial construction markets for over 85 years, Unistrut Metal Framing has set the standard for product design, quality and performance.

The initial Unistrut concept — a simple spring nut and bolt connecting a fitting to a continuous slotted channel — has evolved into a comprehensive engineered building and support system.

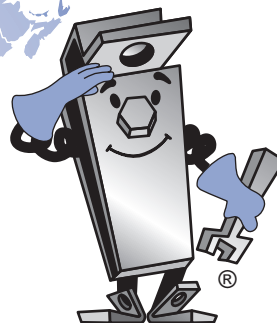
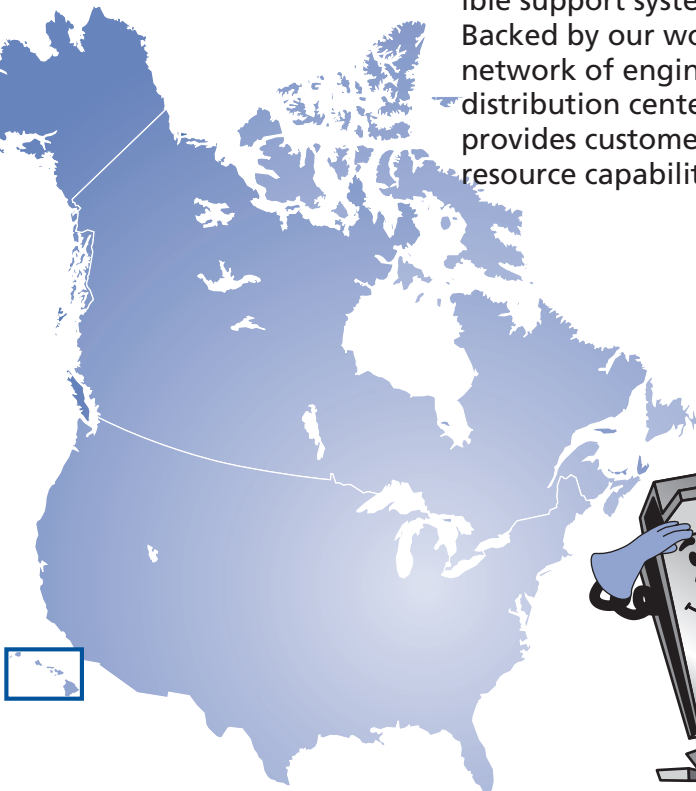


Unistrut® — The Original Metal Framing System

There is only one Unistrut Metal Framing System. It incorporates the innovative product improvements that our research and development group has created to give you the most complete and flexible support system available. Backed by our worldwide network of engineering and distribution centers, Unistrut provides customers with total-resource capability.

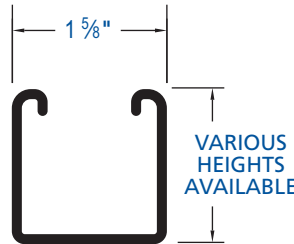
A North American network of Unistrut Service Centers — stocking standard Unistrut components — are located in principal cities to serve you quickly and directly. Many Service Centers are equipped to design and supply drawings for any type of metal framing application and also offer fabrication and installation services.

This catalog is a comprehensive presentation of Unistrut Metal Framing components plus technical data required by design, specification and construction professionals.

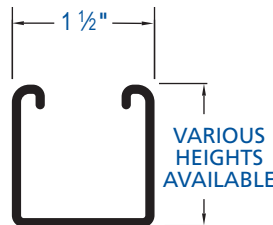


THE MOST COMPLETE METAL FRAMING SYSTEM — FOUR CHANNEL-WIDTH OPTIONS

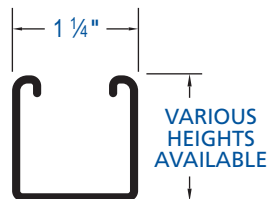
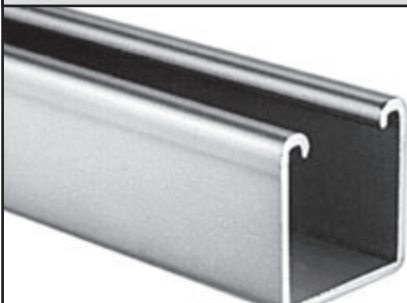
Adjustability, demountability and reusability are engineered into each of the four Unistrut channel series. Each series offers channels of varying depth and gage plus a complete line of fittings and accessories.

1 $\frac{5}{8}$ " width Series Channel**1 $\frac{5}{8}$ " (41.3 mm) width**

Designed to carry the heaviest loads and provide the widest variety of applications, the 1 $\frac{5}{8}$ " series has become the accepted standard for use in mechanical, electrical and general construction applications where supports and attachments must meet the highest strength requirements.

1 $\frac{1}{2}$ " width Series Channel**1 $\frac{1}{2}$ " (38.1 mm) width**

A framing system designed for medium to heavy loads, the 1 $\frac{1}{2}$ " series offers hole spacing and fittings where all parts fit together, no matter where they're used, or at what angle.

1 $\frac{1}{4}$ " width Series Channel**1 $\frac{1}{4}$ " (31.8 mm) width**

A framing system designed for medium loads, the 1 $\frac{1}{4}$ " series is especially suitable for use in the OEM, commercial and display markets. It maintains a lightness in scale and a clean line that makes it aesthetically pleasing as well as functional.

1 $\frac{3}{16}$ " width Series Channel**1 $\frac{3}{16}$ " (20.6 mm) width**

A unique half-size reduction of the 1 $\frac{5}{8}$ " channel-width series, this smaller channel size can be used to carry light loads economically in applications such as instrumentation, retail displays and light-duty laboratory supports. It also provides the flexibility found in all Unistrut framing systems.



PRODUCT LOAD TESTING

Product testing is an important part of Unistrut's Quality Assurance Program. We utilize our own testing facilities, as well as those of independent testing laboratories, to determine design loads with proper and adequate safety factors. These design loads are indicated, where applicable, throughout the catalog. Loads are based on AISI Specification For The Design Of Cold-Formed Steel Structural Members, 2007 Edition.

Destructive and non-destructive testing procedures are used to test for variables such as corrosion, conductivity, electro-static dissipation, ultra-violet resistance, wind resistance, dimensional accuracy, material integrity and slip resistance.

In short, if there's a specification to meet, Unistrut will develop a test to quantify and verify it. Using design properties of the Unistrut framing members, load data

given in this catalog, and/or design procedures of the American Iron & Steel Institute Specification For The Design Of Cold-Formed Steel Structural Members, 2007 Edition, it is possible to design any type of structure within the capabilities of the system.

Assemblies or connections that cannot be calculated using provisions of the AISI specifications must be established by application-specific tests.

QUALITY PROGRAM

Unistrut is committed to being the "best" in the metal framing industry. In order to meet this goal, Unistrut has adopted the philosophy of "Zero Defects and Continuous Improvement". This means on-going reviews of our manufacturing processes,

operating procedures and quality systems to find ways of improving efficiency, productivity and quality. It means establishing process controls and problem-prevention techniques to ensure that superior quality is built into every Unistrut product.

Our drive to be the best includes not just quality products, but on-time delivery and prompt resolution of customer needs and concerns. At Unistrut, quality is number one.

TRACEABILITY

Unistrut channel is stamped with a numeric code that allows traceability to the origin of the steel



MATERIAL

Framing Members

Unistrut channels and continuous inserts are accurately and carefully cold-formed to size from low carbon strip steel. One side of the channel has a continuous slot with inturned edges. Secure attachments may be made to the framing member with the use of hardened, toothed, slotted nuts which engage the inturned edges.

Raw steel shall conform to the following ASTM specifications:

GAGE	FINISH	ASTM NO.
12	GR & HG	A1011 SS GR 33
	PG	A653 GR 33
14	GR & HG	A1011 SS GR 33
	PG	A653 GR 33
16	GR & HG	A1011 SS GR 33
	PG	A653 GR 33
19	GR	A1008

WEIGHTS AND DIMENSIONS

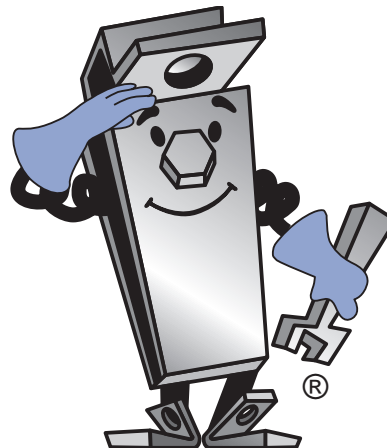
Weights given for all materials are approximate shipping weights. All dimensions are subject to commercial tolerance within published specifications.

Nuts and Bolts

Unistrut nuts are made from steel bars. After all machining operations are complete, they are thoroughly case hardened. Nuts are rectangular with ends shaped to permit a quarter turn clockwise in the framing member after insertion through the slotted opening in the channel. Two toothed grooves in the top of the nut engage the inturned edges of the channel and, after bolting operations are completed, will prevent any movement of the bolt and nut within the framing member. All bolts and nuts have Unified coarse screw threads. The standard framing nut is ½" and conforms to ASTM Specification A1011 SS GR 33 (material only). Screws conform to SAE J429 GR 2.

Fittings

Unistrut fittings, unless noted otherwise, are punch-press made from hot rolled, pickled and oiled steel plates, strip or coil, and conform to ASTM specifications A575, A576, A635 or A36. The fitting steel also meets the physical requirement of ASTM A1011 SS GR 33. The pickling of the steel produces a smooth surface free from scale.



WE RESERVE THE RIGHT TO MAKE SPECIFICATION CHANGES WITHOUT NOTICE.

WHILE EVERY EFFORT HAS BEEN MADE TO ASSURE THE ACCURACY OF INFORMATION CONTAINED IN THIS CATALOG AT THE TIME OF PUBLICATION, WE CANNOT ACCEPT RESPONSIBILITY FOR INACCURACIES RESULTING FROM UNDETECTED ERRORS OR OMISSIONS.

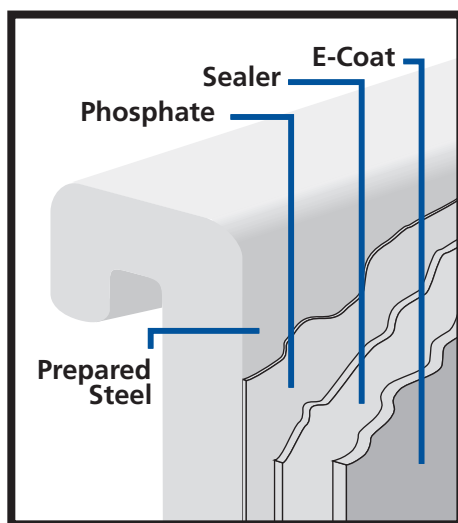
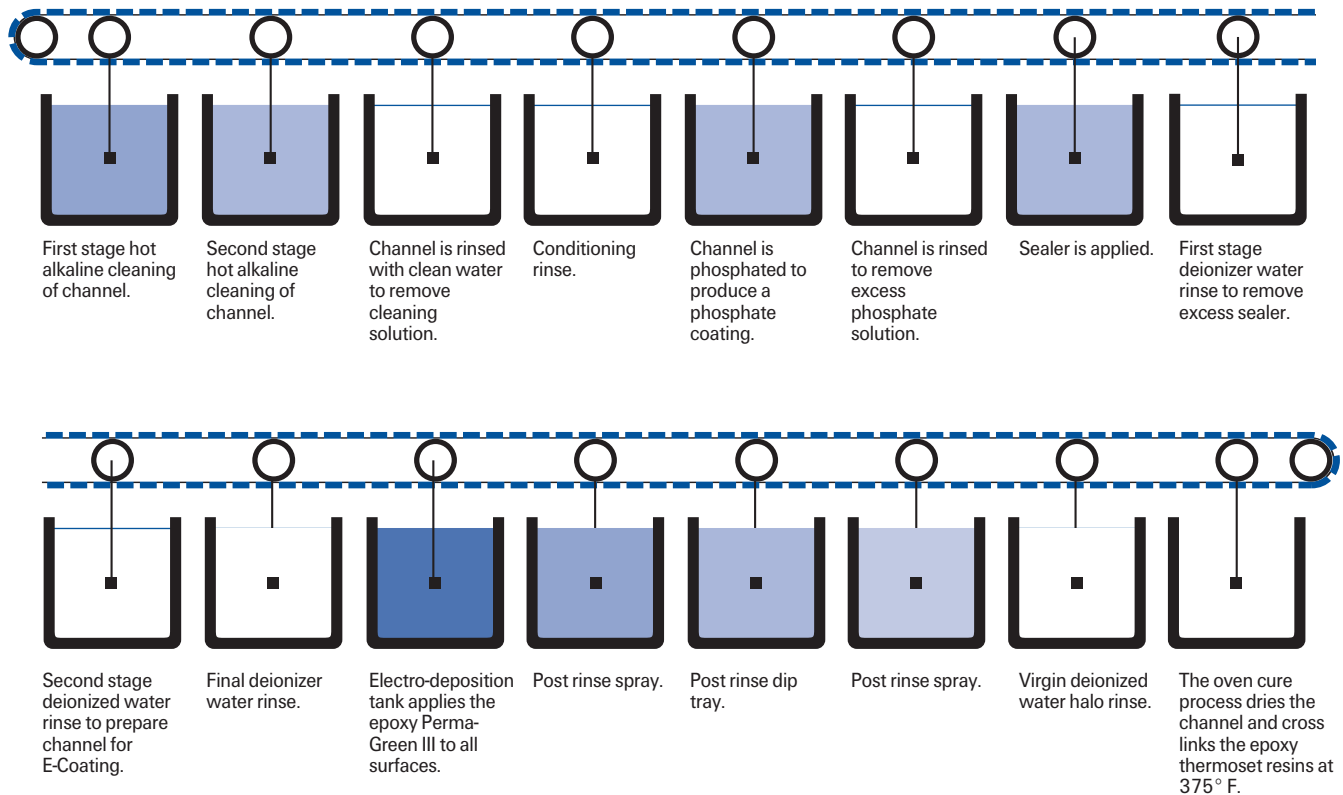
THE BLUE COLOR USED ON UNISTRUT COMPONENTS ILLUSTRATED IN THIS CATALOG IS FOR GRAPHIC ENHANCEMENT ONLY, AND DOES NOT REPRESENT ACTUAL PRODUCT COLOR.



Perma-Green® III

The performance of Unistrut's Perma-Green III far exceeds that of conventional finishes. And compared to competitive "high-performance" coatings, Perma-Green III provides superior resistance to chalking, checking and fading and is far less vulnerable to common acidic atmospheres, solvents and alkalis.

Just as important, Perma-Green III is the result of an environmentally neutral process that virtually eliminates the toxic metals commonly found in competitive paint-based finishes.



PERMA-GREEN® III (GR) TECHNICAL DATA

STEEL SUBSTRATE PREPARATION

Ten stage continuous cleaning, phosphate process.
Substrate after "prep": sealed phosphate conversion coating.

COATING

Thermoset epoxy
Color:
Federal Highway Green
Color Tolerance Chart
PR Color No. 4
Hardness: 2H.
Coating Process:
Cathodic Electrodeposition.

PERFORMANCE

Salt Spray:
Scribed: exceeds 400 hours per ASTM B117. ($\frac{1}{8}$ " creep)
Unscribed: exceeds 600 hours per ASTM B117. (6% red rust)
Chalk:
Nominal at 1,000 hours per weatherometer G-23 test.
Checking:
None at 1,000 hours per weatherometer G-23 test.
Fade:
Less than 50% compared to standard epoxy E.C. coatings.

ENVIRONMENTAL ISSUES

Formulated as a "heavy metal"-free coating (trace elements only).
Outgassing in service: essentially none at 350°F for 24 hours.

PLAIN (PL)

Plain finish designation means that the channel retains the oiled surface applied to the raw steel during the rolling process. The fittings have the original oiled surface of the bar-stock material.

Pregalvanized Zinc (PG) ASTM A653

Pregalvanized steel is zinc coated by a hot dip process. Steel strip from a coil is fed through a continuous zinc coater which cleans, fluxes and coats the steel with molten zinc. After cooling, the steel is recoiled.

The pregalvanized zinc coating conforms to a G-90 thickness designation per ASTM A653. The zinc thickness is .75 MIL or .45 oz./sq. ft. of surface area.

This coating is offered on Unistrut channel and tubing and is a well-proven, time-tested performer for indoor and outdoor applications. For severe corrosion applications, hot dip galvanizing, as described below, is a good alternative.

HOT DIP GALVANIZED (HG) ASTM A123 OR A153

In hot dip galvanizing, the finished part is immersed in a bath of molten zinc. This method results in complete zinc coverage and a thicker coating than pregalvanized or plated zinc.

The zinc coating is typically 2.6 MIL or 1.5 oz./sq. ft. of surface area.

This is the coating of choice for applications where severe corrosion is a design factor.

SPECIAL COATING

When specific applications require other than standard available finishes, special finishes can be supplied per customer requirements.

Electroplated Zinc (EG) ASTM B633, Type III SC1 or SC3

In the electroplating process, the part to be zinc coated is immersed in a solution of zinc ions. An electric current causes the zinc to be deposited on the part.

SC1 (Mild) has a Zinc coating of 0.2 and is recommended for dry indoor use. SC1 is the standard finish thickness.

SC3 (Severe) has a Zinc coating of 0.5 mill and is the standard finish thickness only on UL Listed raceway products.

Perma-Gold (ZD) ASTM B633, Type II SC3

Similar to the EG process except in a yellow color.

SC3 (Severe) has a Zinc coating of 0.5 mill and is the standard finish thickness only on UL Listed raceway products.

Zinc Coating

Unistrut products are available in four types of zinc coatings:

- Electroplated (EG)
- Perma-Gold (ZD)
- Pregalvanized (PG)
- Hot Dip Galvanized (HG).

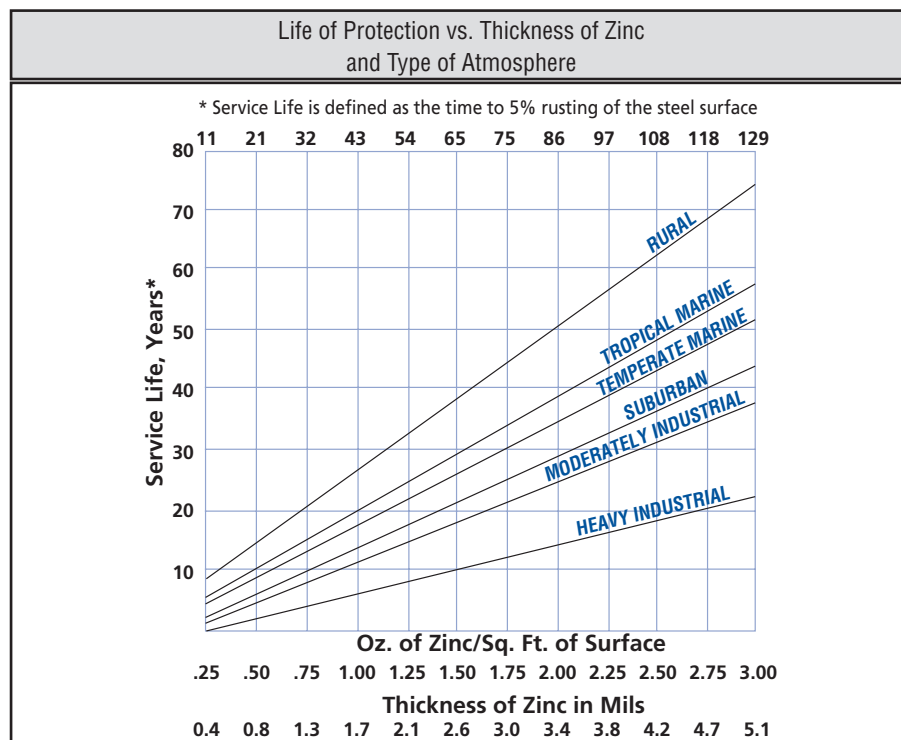
Zinc offer two types of protection:

- **Barrier:** The zinc coating protects the steel substrate from direct contact with the environment.
- **Sacrificial:** The zinc coating will protect scratches, cut edges, etc. through an anodic sacrificial process.

The service life of zinc coating is directly related to the zinc coating thickness as shown below.

Comparison of Zinc Finishes	
Finish	Zinc Thickness
Hot Dip Galvanized	2.6 MIL
Pre-galvanized	0.75 MIL
Electro-Galvanized (SC1)	0.2 MIL
Electro-Galvanized (SC3)	0.5 MIL
Perma-Gold (SC3)	0.5 MIL

As shown in the graph, when the zinc coating is double, the service life is double under most conditions.

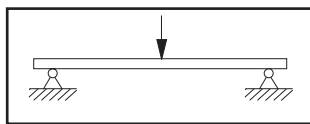




BEAMS

Beams are structural members loaded at right angles (perpendicular) to their length. Most beams are horizontal and subjected to gravity or vertical loads, e.g. a shelf support. However a vertical member can act as a beam under certain conditions, such as a curtain wall mullion subjected to wind loading. The bending moment developed in a beam is dependent on:

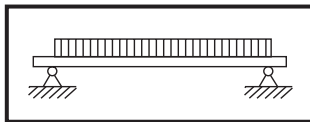
- The amount of load applied,
- The type of loading applied, and
- The support conditions



BEAM LOADING - POINT LOAD

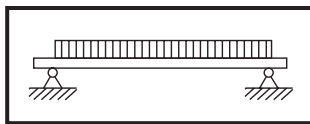
A load concentrated onto a very small length of the beam is a point load.

BEAM LOADING - UNIFORM LOAD



A load spread evenly over a relatively long length of the beam is a uniform load.

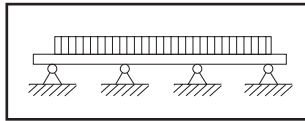
Point and uniform loads can be placed on a beam in any combination. A series of point loads can approximate a uniform loading. The load charts and tables are based on a uniform load unless identified otherwise.



SUPPORT CONDITIONS - SIMPLE BEAM

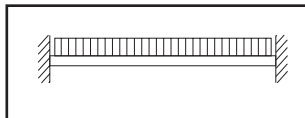
A simple beam has supports that prevent movement left and right, or up and down, but do not restrain the beam from rotating at the supports into a natural deflected curve. Most Unistrut Metal Framing connections produce simple beams. The load charts and tables are based on simple beams unless identified otherwise.

SUPPORT CONDITIONS - CONTINUOUS BEAM



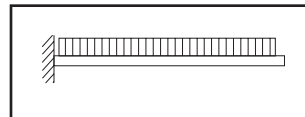
Any simple beam that is supported at one or more intermediate points is a continuous beam. A mezzanine joist that passes over three or more columns is an example of a continuous beam.

SUPPORT CONDITIONS - FIXED-END BEAM



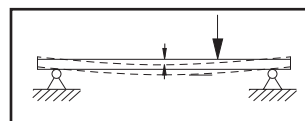
Supports that prevent the beam from rotating into a natural deflected curve produce a fixed-end beam. A welded end connection to very rigid support produces a fixed-end beam.

SUPPORT CONDITIONS - CANTILEVER BEAM



A cantilever beam is a fixed-end beam that is supported at one end only, while the other end is unsupported. Unistrut brackets are examples of cantilever beams.

DEFLECTION



All beams deflect under load. The amount of deflection is dependent on

- the amount of load,
- the support conditions,
- the stiffness of the beam's cross-sectional shape, and
- the stiffness of the beam material.

The stiffness of the beam's cross-sectional shape is measured by its "Moment Of Inertia" or "I". The larger a beam's "I", the stiffer it is and the less it will deflect. A beam's "I" can change for each major axis. The "I" of both major axes (I 1-1 and I 2-2) are provided.

The stiffness of a beam's material is measured by its "Modulus of Elasticity" or "E". The larger a material's "E", the stiffer it is and the less it deflects. For example, steel is about three times stiffer than aluminum and as a result, deflects only one-third as much. Do not confuse stiffness with strength. Two materials may have identical strengths yet still have different "E's". A high-strength aluminum may be as strong as steel and still deflect three times as much.

The load charts and tables give calculated deflections for the loads shown. In many cases, a final design will be determined by the maximum deflection, not the maximum load.

BENDING MOMENT

Is it strong enough? This is the final consideration for any beam. A beam must not only hold up the anticipated loads, but must also have sufficient additional capacity to safely hold unforeseen variations in applied loads and material strengths. This additional capacity is called a safety factor and is usually regulated by the various design codes and standards. A beam's strength is usually measured by an allowable bending moment or an allowable stress. The traditional approach is the allowable stress method, where a beam is determined to have a maximum allowable stress (in pounds per square inch) which is not to be exceeded.

The approach of the current AISI "Specification For The Design Of Cold-Formed Steel Structural Members" is to use a maximum allowable bending moment (in inch-pounds) which is not to be exceeded. Bending moment divided by a beam's section modulus or "S" equals stress.

COLUMNS

Columns are structural members that are loaded parallel to their length. Most columns are vertical and are used to carry loads from a higher level to a lower level. However any member subjected to compression loads, such as a diagonal or prop brace, is a column.

A column fails by “buckling”, which is a sudden loss of straightness and subsequent collapse. Allowable column load is dependent on:

- the length of column,
- the type of loading,
- the support conditions, and
- the column's cross-sectional shape and material.

COLUMN LENGTH

The column length is measured from braced point to braced point. A braced point is where the column is restrained from lateral movement (translation) in all directions.

COLUMN LOADING –
CONCENTRIC LOADING

Loads applied to the center of gravity of the column cross-section are considered concentric. A beam that passes over and rests on the top of a column is an example of concentric loading.

COLUMN LOADING –
ECCENTRIC LOADING

Any load which is not concentric is eccentric. The amount of eccentricity (in inches) has a major effect on the load-carrying capacity of any particular column. A load that is transmitted to a Unistrut Metal Framing column using a standard fitting bolted to the slot face is considered eccentric.

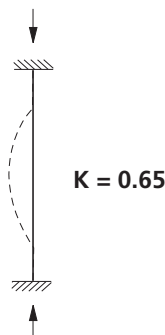
The load tables give allowable loads for both concentric (loaded at C.G.) and certain eccentric (loaded at slot face) loading. Allowable loads for other eccentric loading must be determined by a qualified design professional.

SUPPORT CONDITIONS

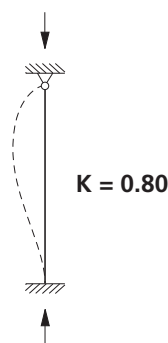
Based on the support conditions, an appropriate “K” value is selected. This “K” value, which mathematically describes the column end conditions, is used in the column design equations. The most common support condition combinations are as follows:

SUPPORT CONDITIONS –
FIXED TOP – FIXED BOTTOM

Both ends are restrained against rotation and lateral movement (translation).

SUPPORT CONDITIONS –
PINNED TOP – FIXED BOTTOM

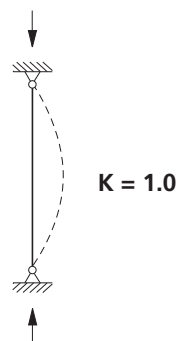
The top is restrained against lateral movement (translation) but is allowed to rotate. The bottom is restrained against rotation and lateral movement.



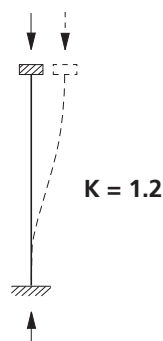
This is a common support condition and is used to construct the allowable column load applied at the Slot Face tables.

SUPPORT CONDITIONS –
PINNED TOP –
PINNED BOTTOM

Both ends are restrained against lateral movement (translation) but are allowed to rotate.

SUPPORT CONDITIONS –
FIXED / FREE TOP – FIXED BOTTOM

The top is restrained against rotation but is allowed to move laterally. The bottom is restrained against rotation and lateral movement (translation).



CROSS-SECTIONAL SHAPE

The cross-sectional shape of a column member determines the value of its “Radius of Gyration” or “r”. In general, a member with a large “r” makes a better column than a member with a small “r”. Each axis of a column has a different “r”. Typically the axis with the smallest “r” determines the final design.

BOLT TORQUE

Bolt torque values are given to ensure the proper connection between Unistrut Metal Framing components. It is important to understand that there is a direct, but not necessarily consistent, relationship between bolt torque and tension in the bolt. Too much tension in the bolt can cause it to break or crush the component parts. Too little tension in the bolt can prevent the connection from developing its full load capacity. The torque values given have been developed over many years of experience and testing.

BOLT SIZE	Bolt Torque					
	1/4" -20	5/16" -18	3/8" -16	1/2" -13	5/8" -11	3/4" -10
Rec. Torque Ft/Lbs (N·m)	6 (8)	11 (15)	19 (26)	50 (68)	100 (136)	125 (170)
Max Torque Ft/Lbs (N·m)	7 (9)	15 (20)	25 (34)	70 (95)	125 (170)	135 (183)

These are based on using a properly calibrated torque wrench with a clean dry (non-lubricated) Unistrut fitting, bolt and nut. A lubricated bolt or nut can cause extremely high tension in the connection and may lead to bolt failure. It must be noted that the accuracy of commercial torque wrenches varies widely and it is the responsibility of the installer to ensure that proper bolt torque has been achieved.



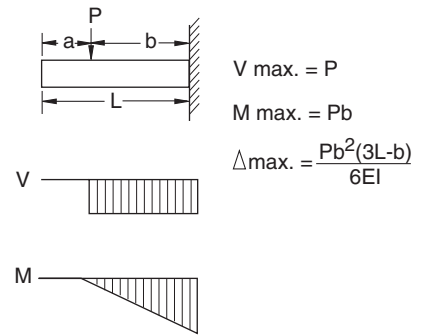
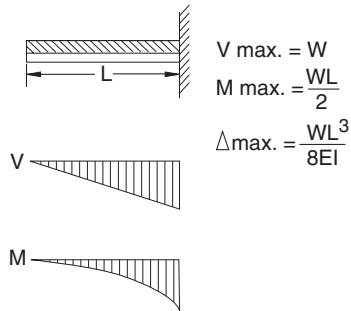
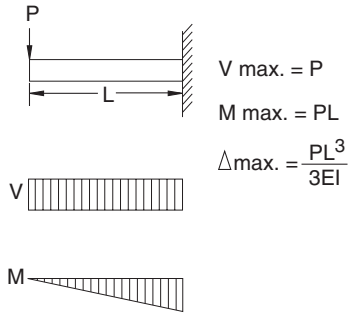
UNIT CONVERSIONS

To Convert From	English To Metric To	Multiply By
Length		
Inch [in]	Millimeter [mm]	25.400 000
Foot [ft]	Meter [m]	0.304 800
Yard [yd]	Meter [m]	0.914 400
Mile [mi] (U.S. Statute)	Kilometer [km]	1.609 347
Area		
Square Inch [in ²]	Square Millimeter [mm ²]	645.16
Square Foot [ft ²]	Square Meter [m ²]	0.092 903
Square Yard [yd ²]	Square Meter [m ²]	0.836 127
Square Mile [mi ²] (U.S. Statute)	Square Kilometer [km ²]	2.589 998
Acre	Square Meter [m ²]	4046.873
Acre	Hectare	0.404 687
Volume		
Cubic Inch [in ³]	Cubic Millimeter [mm ³]	16387.06
Cubic Foot [ft ³]	Cubic Meter [m ³]	0.028 317
Cubic Yard [yd ³]	Cubic Meter [m ³]	0.764 555
Gallon [gal] (U.S. Liquid)	Litre [l]	3.785 412
Quart [qt] (U.S. Liquid)	Litre [l]	0.946 353
Mass		
Ounce (Avoirdupois) [oz]	Gram [g]	28.349 520
Pound (Avoirdupois) [lb]	Kilogram [kg]	0.453 592
Short Ton	Kilogram [kg]	907.185
Force		
Ounce-Force	Newton [N]	0.278 014
Pound-Force [lbf]	Newton [N]	4.448 222
Bending Moment		
Pound-Force-Inch [lbf-in]	Newton-Meter [N-m]	0.112 985
Pound-Force-Foot [lbf-ft]	Newton-Meter [N-m]	1.355 818
Pressure, Stress		
Pound-Force per Square Inch [lbf/in ²]	Kilopascal [kPa]	6.894 757
Foot of Water (39.2 F)	Kilopascal [kPa]	2.988 980
Inch of Mercury (32 F)	Kilopascal [kPa]	3.386 380
Energy, Work, Heat		
Foot-Pound-Force [ft-lbf]	Joule [J]	1.355 818
British Thermal Unit [Btu]	Joule [J]	1055.056
Calorie [cal]	Joule [J]	4.186 800
Kilowatt Hour [kW-h]	Joule [J]	3,600,000
Power		
Foot-Pound-Force /Second [ft-lbs/s]	Watt [W]	1.355 818
British Thermal Unit /Hour [Btu/h]	Watt [W]	0.293 071
Horsepower [hp] (550 Ft. Lbf/s)	Kilowatt [kW]	0.745 700
Angle		
Degree	Radian [rad]	0.017 453
Temperature		
Degree Fahrenheit [°F]	Degree Celsius [°C]	(F° -32)/1.8

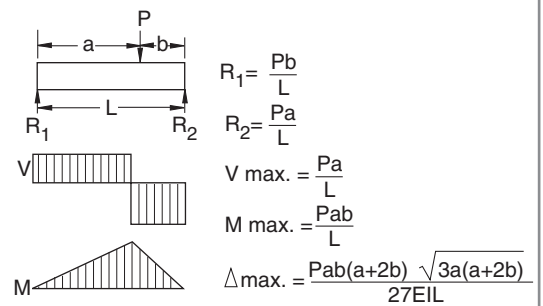
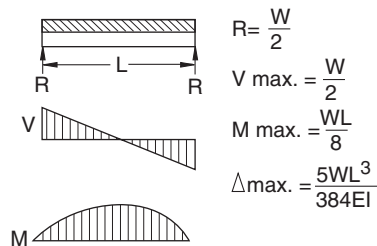
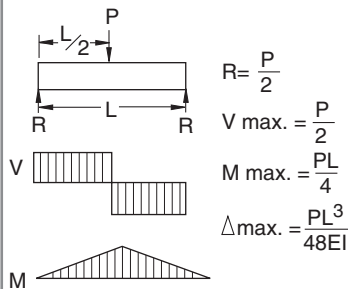
To Convert From	Metric to English To	Multiply By
Length		
Millimeter [mm]	Inch [in]	0.039 370
Meter [m]	Foot [ft]	3.280 840
Meter [m]	Yard [yd]	1.093 613
Kilometer [km]	Mile [mi] (U.S. Statute)	0.621 370
Area		
Square Millimeter [mm ²]	Square Inch [in ²]	0.001550
Square Meter [m ²]	Square Foot [ft ²]	10.763 915
Square Meter [m ²]	Square Yard [yd ²]	1.195 991
Square Kilometer [km ²]	Square Mile [mi ²] (U.S. Statute)	0.386 101
Square Meter [m ²]	Acre	0.000 247
Hectare	Acre	2.471 046
Volume		
Cubic Millimeter [mm ³]	Cubic Inch [in ³]	0.000061
Cubic Meter [m ³]	Cubic Foot [ft ³]	35.314 662
Cubic Meter [m ³]	Cubic Yard [yd ³]	1.307 950
Litre [l]	Gallon [gal] (U.S. Liquid)	0.264 172
Litre [l]	Quart [qt] (U.S. Liquid)	1.056 688
Mass		
Gram [g]	Ounce (Avoirdupois) [oz]	0.035 274
Kilogram [kg]	Pound (Avoirdupois) [lb]	2.204 624
Kilogram [kg]	Short Ton	0.00110
Force		
Newton [N]	Ounce-Force	3.596 941
Newton [N]	Pound-Force [lbf]	0.224 809
Bending Moment		
Newton-Meter [N-m]	Pound-Force-Inch [lbf-in]	8.850 732
Newton-Meter [N-m]	Pound-Force-Foot [lbf-ft]	0.737 562
Pressure, Stress		
Kilopascal [kPa]	Pound-Force per Square Inch [lbf/in ²]	0.145 038
Kilopascal [kPa]	Foot of Water (39.2 F)	0.334 562
Kilopascal [kPa]	Inch of Mercury (32 F)	0.295 301
Energy, Work, Heat		
Joule [J]	Foot-Pound-Force [ft-lbf]	0.737 562
Joule [J]	British Thermal Unit [Btu]	0.000948
Joule [J]	Calorie [cal]	0.238 846
Joule [J]	Kilowatt Hour [kW-h]	2.78 ⁻⁷
Power		
Watt [W]	Foot-Pound-Force /Second [ft-lbs/s]	0.737 562
Watt [W]	British Thermal Unit /Hour [Btu/h]	3.412 142
Kilowatt [kW]	Horsepower (550 Ft. Lbf/s) [hp]	1.341 022
Angle		
Radian [rad]	Degree	57.295 788
Temperature		
Degree Celsius [°C]	Degree Fahrenheit [°F]	1.8xC°+32

BEAM SUPPORT CONDITIONS

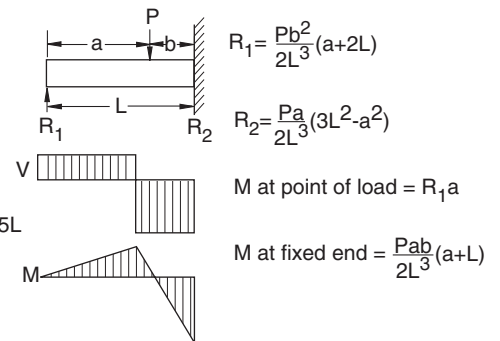
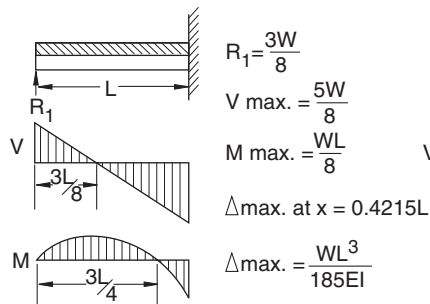
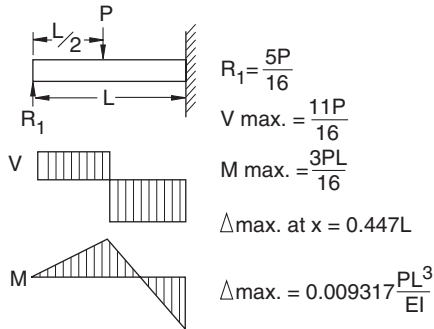
Cantilever Beams



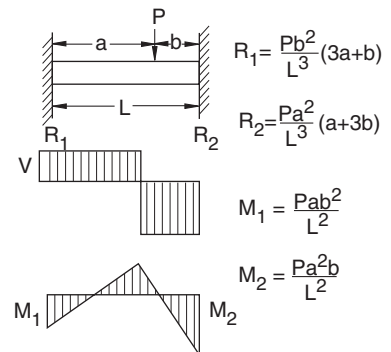
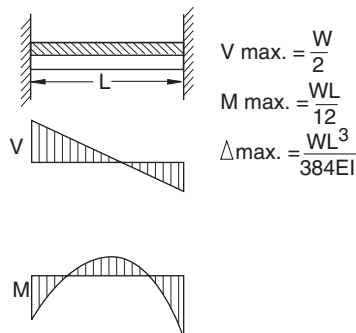
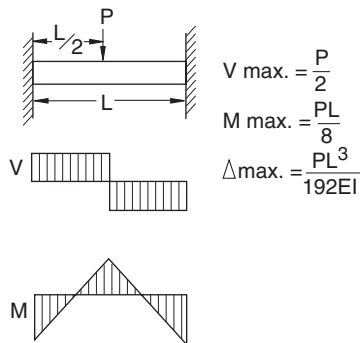
Simple Beams



Beams Fixed At One End & Supported At The Other



Beams Fixed At Both Ends



R – Reaction
M – Moment
P – Concentrated Load

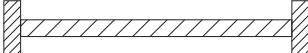
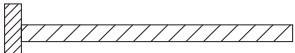
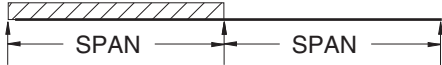
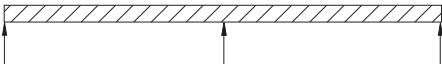
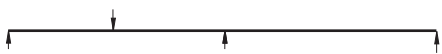
W – Total Uniform Load
V – Shear
L – Length

Δ – Deflection
E – Modulus of Elasticity
I – Moment of Inertia



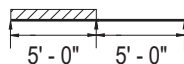
CONVERSION FACTORS FOR BEAMS WITH VARIOUS STATIC LOADING CONDITIONS

All Beam Load tables are for single-span (simple) beams supported at the ends. These can be used in the majority of the cases. However, there are times when it is necessary to know what happens with other loading and support conditions. Some common arrangements are shown below. Simply multiply the values from the Beam Load tables by factors given below

Load and Support Condition		Load Factor	Deflection Factor
1. Simple Beam, Uniform Load		1.00	1.00
2. Simple Beam, Concentrated Load at Center		.50	.80
3. Simple Beam, Two Equal Concentrated Loads at 1/4 pts		1.00	1.10
4. Beam Fixed at Both Ends, Uniform Load		1.50	.30
5. Beam Fixed at Both Ends, Concentrated Load at Center		1.00	.40
6. Cantilever Beam, Uniform Load		.25	2.40
7. Cantilever Beam, Concentrated Load at End		.12	3.20
8. Continuous Beam, Two Equal Spans, Uniform Load on One Span		1.30	.92
9. Continuous Beam, Two Equal Spans, Uniform Load on Both Ends		1.00	.42
10. Continuous Beam, Two Equal Spans, Concentrated Load at Center of One Span		.62	.71
11. Continuous Beam, Two Equal Spans, Concentrated Load at Center of Each Span		.67	.48

EXAMPLE I:

Determine load and deflection of a P 1000 beam continuous over one support and loaded uniformly on one span.

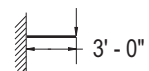


SOLUTION:

- From load table for P1000 on page 25 load for a 5'-0" span is 680# and deflection is .35".
- Multiply by factors from Table above.
Load = 680# x 1.30 = 884#
Deflection = .35" x .92 = .32"

EXAMPLE II

Determine load and deflection of a P 5500 cantilever beam with a concentrated load on the end.



SOLUTION:

- From load table P5500 on page 52 load for a 3'-0" span is 2180# and deflection is .09".
- Multiply by factors from Table above.
Load = 2180# x .12 = 262#
Deflection = .09" x 3.20 = .29"

PART I - GENERAL**1.01 SCOPE OF WORK**

- A. Provide all Unistrut Metal Framing material, fittings and related accessories (Strut System) as indicated on the Contract Drawings.
- B. Provide all labor, supervision, engineering, and fabrication required for installation of the Strut System in accordance with the Contract Drawings and as specified herein.
- C. Related work specified elsewhere.

1.02 QUALITY ASSURANCE

- A. Manufacturer's qualifications:
 - 1. The manufacturer shall not have had less than 10 year's experience in manufacturing Strut Systems.
 - 2. The manufacturer must certify in writing all components supplied have been produced in accordance with an established quality assurance program.
- B. Installer's qualifications:
 - 1. Installer must be a Unistrut trained manufacturer's authorized representative/installer with not less than 5 years experience in the installation of Strut Systems of this size and conformation.
 - 2. All Strut System components must be supplied by a single manufacturer.
- C. Standards:
 - 1. Work shall meet the requirements of the following standards:
 - a. Federal, State and Local codes.
 - b. American Iron and Steel Institute (AIS) Specification for the Design of Cold-Formed Steel Structural Members 2007 Edition.
 - c. American Society for Testing And Materials (ASTM).

1.03 SUBMITTALS

- A. Structural Calculations and Shop Drawings
 - 1. Submit structural calculations for approval by the project engineer. Calculations may include, but are not limited to:
 - a. Description of design criteria.
 - b. Stress and deflection analysis.
 - c. Selection of Unistrut framing members, fittings, and accessories.
 - 2. Submit all shop/assembly drawings necessary to completely install the Strut System in compliance with the Contract Drawings.
 - 3. Submit all pertinent manufacturers published data.

1.04 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. All material is to be delivered to the work site in original factory packaging to avoid damage to the finish.
- B. Upon delivery to the work site, all components shall be protected from the elements by a shelter or other covering.

1.05 GUARANTEE

- A. Separate guarantees shall be issued from the erector and manufacturer, valid for a period of 1 year, against any defects that may arise from the installation or manufacture of the Strut System components.

PART 2 - PRODUCTS**2.01 ACCEPTABLE MANUFACTURERS**

- A. All Strut System components shall be as manufactured by UNISTRUT CORPORATION or approved equal as determined by the Architect or Engineer of record in writing 10 days prior to bid date.

2.02 MATERIALS

- A. All channel members shall be fabricated from structural grade steel conforming to one of the following ASTM specifications:
A 1011 SS GR 33, A 653 GR 33.
- B. All fittings shall be fabricated from steel conforming to one of the following ASTM specifications:
A 575, A 576, A 36 or A 635.
- C. Substitutions
Any substitutions of product or manufacturer must be approved in writing ten days prior to bid date, by Architect or Engineer of record.

2.03 FINISHES

- A. Strut System components shall be finished in accordance with one of the following standards:
 - 1. PERMA-GREEN® III (GR)
Rust inhibiting epoxy enamel paint applied by electro-deposition, after cleaning and phosphating, and thoroughly baked. Color is per Federal Highway Green, Color Tolerance Chart PR Color No. 4. Finish to withstand minimum 400 hours salt spray when tested in accordance with ASTM B117.
 - 2. ELECTRO-GALVANIZED (EG)
Electrolytically zinc coated per ASTM B 633 Type III SC 1

- 3. PRE-GALVANIZED (PG)
Zinc coated by hot-dipped process prior to roll forming. The zinc weight shall be G90 conforming to ASTM A 653.
- 4. HOT-DIPPED GALVANIZED (HG)
Zinc coated after all manufacturing operations are complete. Coating shall conform to ASTM A 123 or A 153.
- 5. SPECIAL COATING / MATERIAL
(Describe as applicable)

PART 3 - EXECUTION**3.01 EXAMINATION**

- A. The installer shall inspect the work area prior to installation. If work area conditions are unsatisfactory, installation shall not proceed until satisfactory corrections are completed.

3.02 INSTALLATION

- A. Installation shall be accomplished by a fully trained manufacturer authorized installer.
- B. Set Strut System components into final position true to line, level and plumb, in accordance with approved shop drawings.
- C. Anchor material firmly in place. Tighten all connections to their recommended torques.

3.03 CLEANUP

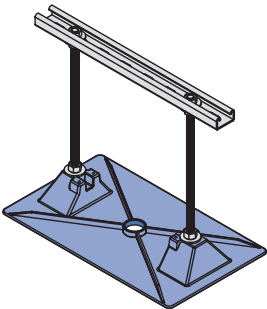
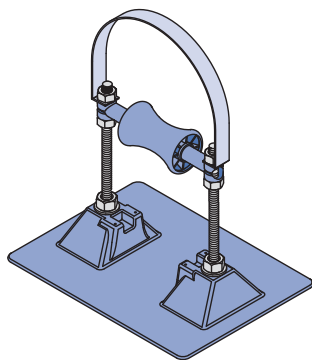
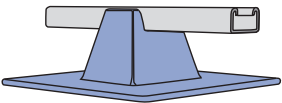
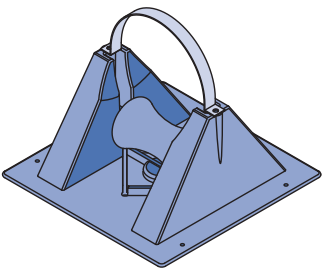
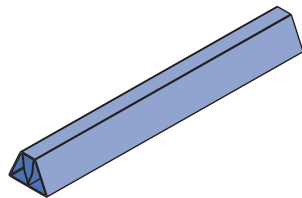
- A. Upon completion of this section of work, remove all protective wraps and debris. Repair any damage due to installation of this section of work.

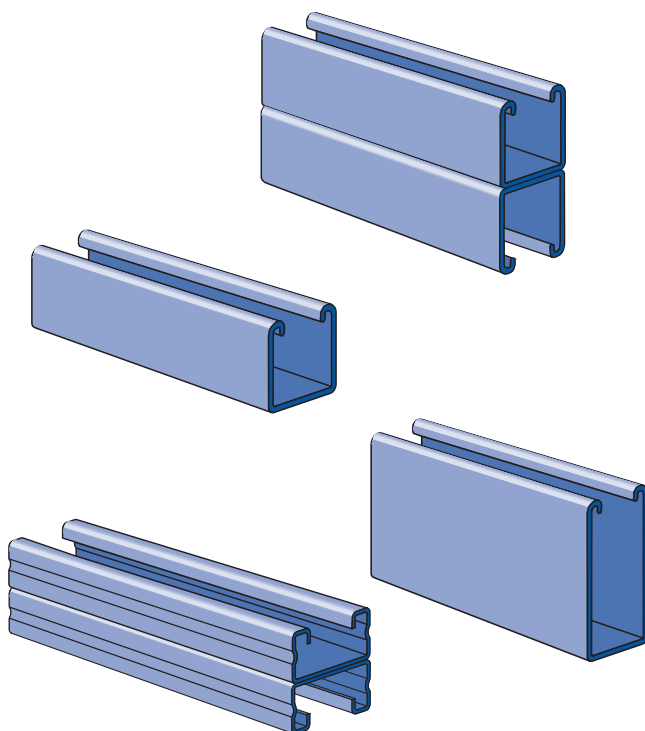
3.04 PROTECTION

- A. During installation, it shall be the responsibility of the installer to protect this work from damage.
- B. Upon completion of this scope of work, it shall become the responsibility of the general contractor to protect this work from damage during the remainder of construction on the project and until substantial completion.

UNIPIER® ROOFTOP PIPE SUPPORT SYSTEM

See Unipier® Section, Page 141





Channel Selection Chart	22
P1000 (12 Gauge)	23
P1100 (14 Gauge)	24-29
P2000 (16 Gauge)	32
P3000 (12 Gauge)	33-35
P3300 (12 Gauge)	36-38
P4000 (16 Gauge)	42-44
P4100 (14 Gauge)	45-47
P5000 (12 Gauge)	48-50
P5500 (12 Gauge)	51-53
Closure Strips	54
End Caps and Frame Caps	55
Lateral Bracing Load Reduction Chart & Bearing Loads.....	56

MATERIAL

Unistrut channels are accurately and carefully cold formed to size from low-carbon strip steel.

All spot-welded combination members, except P1001T, are welded 3" (76 mm) maximum on center.

STEEL: PLAIN

12 Ga. (2.7 mm), 14 Ga.(1.9 mm) and
16 Ga. (1.5 mm) ASTM A1011 SS GR 33.

STEEL: PRE-GALVANIZED

12 Ga. (2.7 mm), 14 Ga. (1.9 mm) and
16 Ga. (1.5mm) ASTM A653 GR 33.

For other materials, see Special Metals or Fiberglass sections.

FINISHES

All channels are available in:

- Perma Green III (GR).
- Pre-galvanized (PG), conforming to ASTM A653 G90.
- Hot-dipped galvanized (HG), conforming to ASTM A123.
- Plain (PL).

DIMENSIONS

Imperial dimensions are illustrated in inches. Metric dimensions are shown in millimeters and rounded to one decimal place.

STANDARD LENGTHS

Standard lengths are 10 feet (3.05m) and 20 feet (6.10m). Tolerances are $\pm\frac{1}{8}$ " (3 mm). Special lengths are available for a small cutting charge with a tolerance of $\pm\frac{1}{8}$ " (3 mm).

CURVED CHANNEL

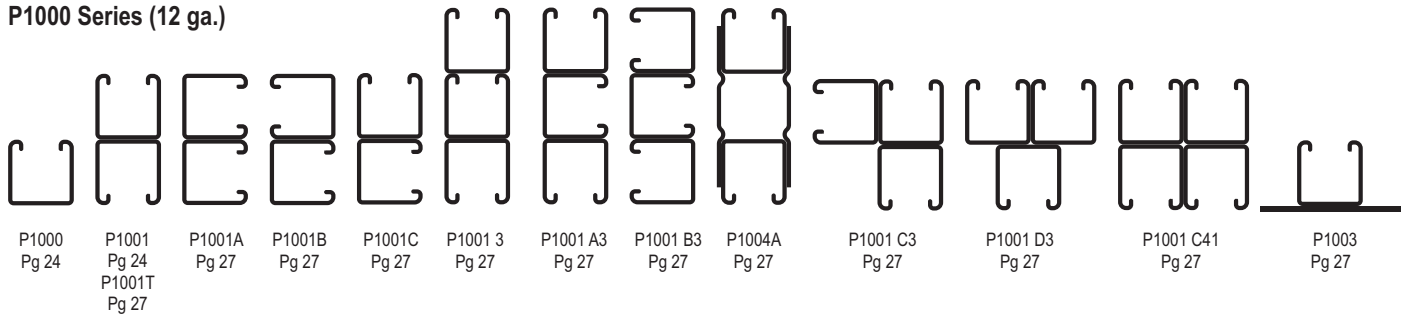
Contact your local Unistrut Service Center or Unistrut Corporation for more information.

LOAD DATA

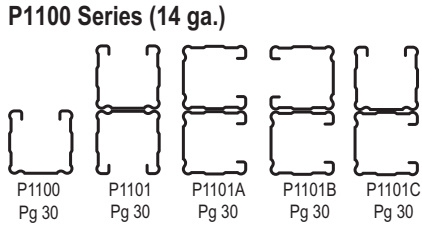
All beam and column load data pertains to carbon steel and stainless steel channels. Load tables and charts are constructed to be in accordance with the SPECIFICATION FOR THE DESIGN OF COLD-FORMED STEEL STRUCTURAL MEMBERS 2007 EDITION published by the AMERICAN IRON AND STEEL INSTITUTE USING ASD METHOD. Loads are based on 33 ksi steel cold formed to 42 ksi.

Type of Load	Safety Factor to Yield Strength	Safety Factor to Ultimate Strength
Beam Loads	1.67	2.0
Column Load	1.80	2.2

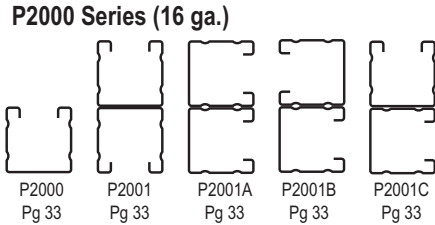
P1000 Series (12 ga.)



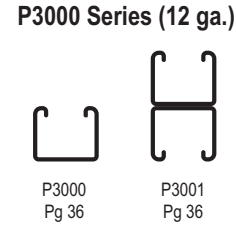
P1100 Series (14 ga.)



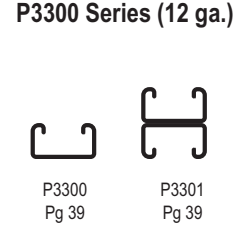
P2000 Series (16 ga.)



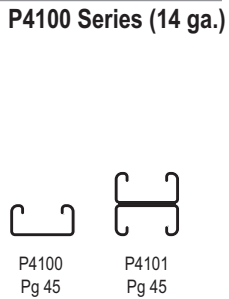
P3000 Series (12 ga.)



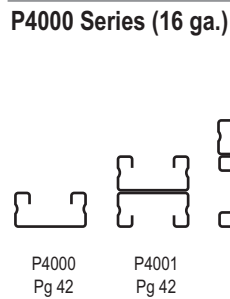
P3300 Series (12 ga.)



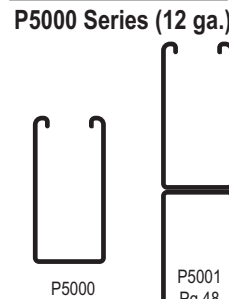
P4100 Series (14 ga.)



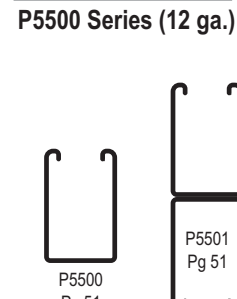
P4000 Series (16 ga.)



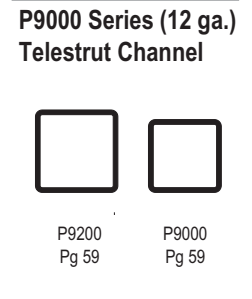
P5000 Series (12 ga.)



P5500 Series (12 ga.)

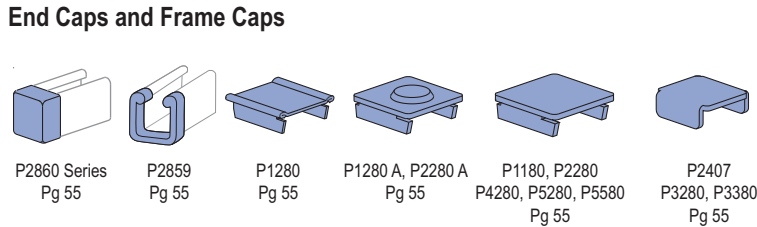


P9000 Series (12 ga.)

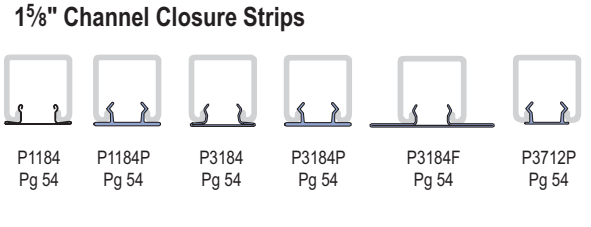


Telestrut Channel

End Caps and Frame Caps

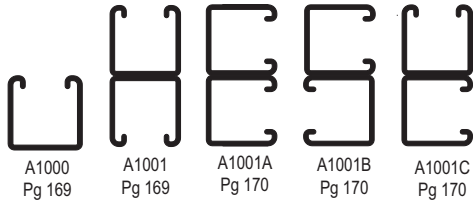


1 5/8" Channel Closure Strips



Alternate Framing Systems

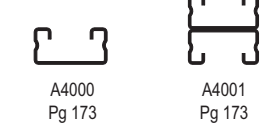
A1000 Series (14 gauge) – 1 1/4" Channel



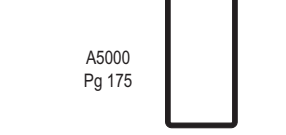
A3300 Series (14 gauge) 1 1/4" Channel



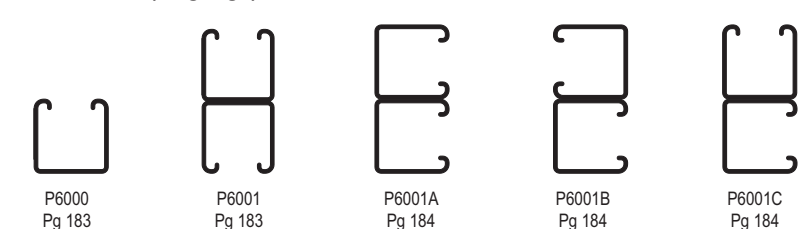
A4000 Series (19 gauge) 1 1/4" Channel



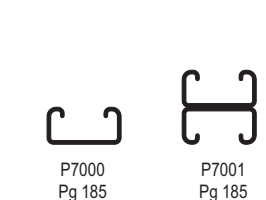
A5000 Series (14 gauge) 1 1/4" Channel



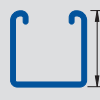
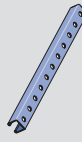
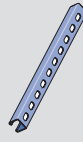
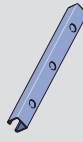
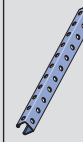
P6000 Series (19 gauge) – 1 3/16" Channel



P7000 Series (19 gauge) 1 3/16" Channel



CHANNEL SELECTION CHART

Channel	Channel Dimensions		Material & Thickness			Hole Pattern Styles					
			Steel	Stainless Steel	Alum.						
	Width	Height				HS	T	KO	SL	DS	H3
	In (mm)	In (mm)				gauge	gauge	In (mm)	Steel Only		
P1000	1½ (41.3)	1½ (41.3)	12 ga	12 ga	0.109 (2.8)	■	■	■	■	■	■
P1100	1½ (41.3)	1½ (41.3)	14 ga	14 ga	—	■	■	■	■	—	—
P2000	1½ (41.3)	1½ (41.3)	16 ga	—	—	■	■	■	■	—	—
P3000	1½ (41.3)	1¾ (34.9)	12 ga	—	—	■	■	■	■	—	—
P3300	1½ (41.3)	7⁄8 (22.2)	12 ga	12 ga	—	■	■	—	■	—	—
P4000	1½ (41.3)	1⅜ (20.6)	16 ga	16 ga	0.078 (2.0)	■	■	—	■	—	—
P4100	1½ (41.3)	1⅜ (20.6)	14 ga	—	—	■	■	—	■	—	—
P5000	1½ (41.3)	3¼ (82.6)	12 ga	12 ga	—	■	■	■	■	—	—
P5500	1½ (41.3)	2⅞ (61.9)	12 ga	—	0.109 (2.8)	■	■	■	■	—	—

CHANNELS & COMBINATIONS IN DESCENDING ORDER OF STRENGTH

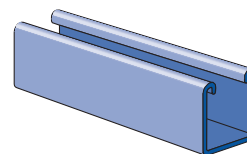
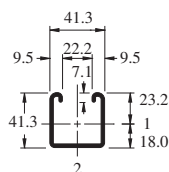
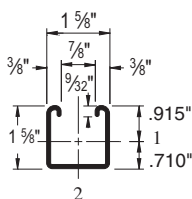
Channel	Area In² (cm²)	Weight lbs/ft (kg/m)	I In⁴ (cm⁴)	s In³ (cm³)	Allow. Moment In-lbs (N•m)
P5001	1.793 11.57	6.10 9.1	6.227 259.2	1.916 31.4	48,180 5,440
P1004A	1.965 12.68	6.68 9.9	4.068 169.3	1.669 27.4	41,980 4,740
P5501	1.452 9.37	4.94 7.3	2.805 116.8	1.151 18.9	28,940 3,270
P1001C41	2.221 14.33	7.55 11.2	1.856 77.2	1.142 18.7	28,720 3,250
P5000	0.897 5.78	3.05 4.5	1.098 45.7	0.627 10.3	15,770 1,780
P1001	1.111 7.16	3.78 5.6	0.928 38.6	0.571 9.4	14,360 1,620
P1101	0.835 5.39	2.84 4.2	0.733 30.5	0.451 7.4	11,340 1,280
P3001	1.000 6.45	3.40 5.1	0.591 24.6	0.430 7.0	10,810 1,220
P5500	0.726 4.68	2.47 3.7	0.522 21.7	0.390 6.4	9,820 1,110
P2001	0.684 4.41	2.32 3.5	0.618 25.7	0.381 6.2	9,570 1,080
P9200	0.489 3.16	2.23 3.3	0.279 11.6	0.297 4.9	7,480 850
A5000	0.492 3.17	1.67 2.5	0.358 14.9	0.265 4.3	6,670 750
A1001	0.609 3.93	2.07 3.1	0.302 12.6	0.242 4.0	6,070 690
P9000	0.387 2.50	1.88 2.8	0.166 6.9	0.205 3.4	5,150 580
P1000	0.555 3.58	1.89 2.8	0.185 7.7	0.202 3.3	5,070 570
P3301	0.790 5.10	2.69 4.0	0.176 7.3	0.201 3.3	5,060 570

Combinations not shown in catalog are available on special order.
Consult factory for more details.

Channel	Area In² (cm²)	Weight lbs/ft (kg/m)	I In⁴ (cm⁴)	s In³ (cm³)	Allow. Moment In-lbs (N•m)
P1100	0.418 2.69	1.42 2.1	0.145 6.0	0.162 2.6	4,060 460
P3000	0.500 3.23	1.70 2.5	0.120 5.0	0.153 2.5	3,850 430
P4101	0.579 3.74	1.97 2.9	0.117 4.9	0.143 2.4	3,610 410
P2000	0.342 2.21	1.16 1.7	0.125 5.2	0.140 2.3	3,520 400
P4001	0.478 3.14	1.66 2.5	0.104 4.3	0.128 2.1	3,210 360
A3301	0.459 2.96	1.56 2.3	0.077 3.2	0.103 1.7	2,590 290
A1000	0.305 1.96	1.04 1.5	0.061 2.5	0.086 1.4	2,170 250
P3300	0.395 2.55	1.34 2.0	0.037 1.5	0.072 1.2	1,800 200
A4001	0.264 1.70	0.90 1.3	0.037 1.5	0.058 1.0	1,470 170
P6001	0.213 1.38	0.73 1.1	0.045 1.9	0.055 0.9	1,400 160
P4100	0.290 1.87	0.98 1.5	0.026 1.1	0.054 0.9	1,360 150
P4000	0.244 1.57	0.83 1.2	0.023 0.9	0.049 0.8	1,230 140
A3300	0.230 1.48	0.78 1.2	0.017 0.7	0.038 0.6	950 110
A4000	0.132 0.85	0.45 0.7	0.008 0.3	0.022 0.4	560 60
P6000	0.107 0.69	0.36 0.5	0.009 0.4	0.020 0.3	510 60
P7001	0.148 0.96	0.50 0.8	0.007 0.3	0.018 0.3	460 50
P7000	0.074 0.48	0.25 0.4	0.002 0.1	0.007 0.1	170 20

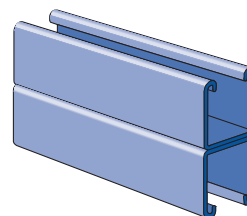
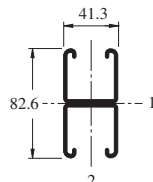
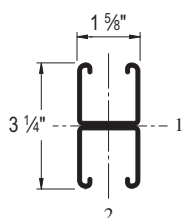


P1000®



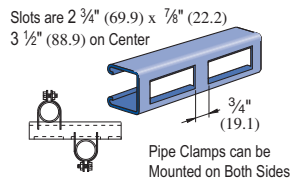
Wt/100 Ft: 189 Lbs (281 kg/100 m)
Allowable Moment 5,070 In-Lbs (570 N•m)
12 Gauge Nominal Thickness .105" (2.7mm)

P1001



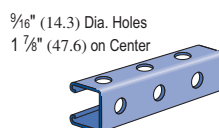
Wt/100 Ft: 378 Lbs (562 kg/100 m)
Allowable Moment 14,360 In-Lbs (1,620 N•m)
12 Gauge Nominal Thickness .105" (2.7mm)

P1000 DS



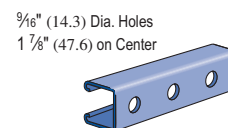
Wt/100 Ft: 173 Lbs (257 kg/100 m)

P1000 H3



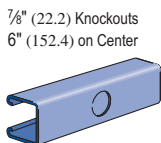
Wt/100 Ft: 175 Lbs (260 kg/100 m)

P1000 HS



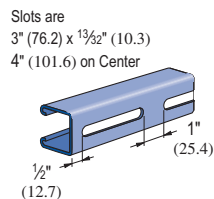
Wt/100 Ft: 185 Lbs (275 kg/100 m)

P1000 KO



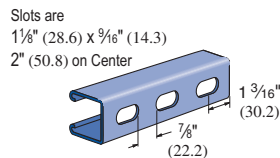
Wt/100 Ft: 190 Lbs (283 kg/100 m)

P1000 SL



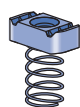
Wt/100 Ft: 185 Lbs (275 kg/100 m)

P1000 T



Wt/100 Ft: 185 Lbs (275 kg/100 m)

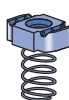
CHANNEL NUTS (REFER TO HARDWARE SECTION FOR DETAILS)



P1006-0832
P1006-1024
P1006-1420
P1007
P1008
P1009
P1010



P1008T
P1006T1420
P1010T



P1024
P1012S
P1023S



P1012
P1023
P1024S



P3006-0832
P3006-1024
P3006-1420
P3007
P3008
P3009
P3010



P3016-0632
P3016-0832
P3016-1024
P3016-1420

Channel Finishes: PL, GR, HG, PG, ZD; Standard Lengths: 10' & 20'

P1000 - BEAM LOADING

Span In	Max. Allowable Uniform Load Lbs	Defl. at Uniform Load In	Uniform Loading at Deflection		
			Span/180 Lbs	Span/240 Lbs	Span/360 Lbs
24	1,690	0.06	1,690	1,690	1,690
36	1,130	0.13	1,130	1,130	900
48	850	0.22	850	760	500
60	680	0.35	650	480	320
72	560	0.50	450	340	220
84	480	0.68	330	250	160
96	420	0.89	250	190	130
108	380	1.14	200	150	100
120	340	1.40	160	120	80
144	280	2.00	110	80	60
168	240	2.72	80	60	40
192	210	3.55	60	50	NR
216	190	4.58	50	40	NR
240	170	5.62	40	NR	NR

P1001 - BEAM LOADING

Span In	Max. Allowable Uniform Load Lbs	Defl. at Uniform Load In	Uniform Loading at Deflection		
			Span/180 Lbs	Span/240 Lbs	Span/360 Lbs
24	3,500*	0.02	3,500*	3,500*	3,500*
36	3,190	0.07	3,190	3,190	3,190
48	2,390	0.13	2,390	2,390	2,390
60	1,910	0.20	1,910	1,910	1,620
72	1,600	0.28	1,600	1,600	1,130
84	1,370	0.39	1,370	1,240	830
96	1,200	0.51	1,200	950	630
108	1,060	0.64	1,000	750	500
120	960	0.79	810	610	410
144	800	1.14	560	420	280
168	680	1.53	410	310	210
192	600	2.02	320	240	160
216	530	2.54	250	190	130
240	480	3.16	200	150	100

P1000 - COLUMN LOADING

Unbraced Height In	Max. Allowable Load at Slot Face Lbs	Maximum Column Load Applied at C.G.			
		K = 0.65 Lbs	K = 0.80 Lbs	K = 1.0 Lbs	K = 1.2 Lbs
24	3,550	10,740	9,890	8,770	7,740
36	3,190	8,910	7,740	6,390	5,310
48	2,770	7,260	6,010	4,690	3,800
60	2,380	5,910	4,690	3,630	2,960
72	2,080	4,840	3,800	2,960	2,400
84	1,860	4,040	3,200	2,480	1,980
96	1,670	3,480	2,750	2,110	1,660
108	1,510	3,050	2,400	1,810	**
120	1,380	2,700	2,110	**	**
144	1,150	2,180	1,660	**	**

P1001 - COLUMN LOADING

Unbraced Height In	Max. Allowable Load at Slot Face Lbs	Maximum Column Load Applied at C.G.			
		K = 0.65 Lbs	K = 0.80 Lbs	K = 1.0 Lbs	K = 1.2 Lbs
24	6,430	24,280	23,610	22,700	21,820
36	6,290	22,810	21,820	20,650	19,670
48	6,160	21,410	20,300	18,670	16,160
60	6,000	20,210	18,670	15,520	12,390
72	5,620	18,970	16,160	12,390	8,950
84	5,170	16,950	13,630	9,470	6,580
96	4,690	14,890	11,190	7,250	5,040
108	4,170	12,850	8,950	5,730	3,980
120	3,690	10,900	7,250	4,640	**
144	2,930	7,630	5,040	**	**

P1000/P1001 - ELEMENTS OF SECTION

Parameter	P1000		P1001	
Area of Section	0.555	In ²	1.111	In ²
Axis 1-1				
Moment of Inertia (I)	0.185	In ⁴	0.928	In ⁴
Section Modulus (S)	0.202	In ³	0.571	In ³
Radius of Gyration (r)	0.577	In	0.914	In
Axis 2-2				
Moment of Inertia (I)	0.236	In ⁴	0.471	In ⁴
Section Modulus (S)	0.290	In ³	0.580	In ³
Radius of Gyration (r)	0.651	In	0.651	In

Notes:

* Load limited by spot weld shear.

** KL/r > 200

NR = Not Recommended.

- Beam loads are given in total uniform load (W Lbs) not uniform load (w lbs/ft or w lbs/in).
- Beam loads are based on a simple span and assumed to be adequately laterally braced. Unbraced spans can reduce beam load carrying capacity. Refer to Page 56 for reduction factors for unbraced lengths.
- For pierced channel, multiply beam loads by the following factor:

"KO" Series.....95%	"T" Series85%
"HS" Series90%	"SL" Series85%
"H3" Series.....90%	"DS" Series.....70%
- Deduct channel weight from the beam loads.
- For concentrated midspan point loads, multiply beam loads by 50% and the corresponding deflection by 80%. For other load conditions refer to page 18.
- All beam loads are for bending about Axis 1-1.



P1000 - BEAM LOADING (METRIC)

Span mm	Max Allowable Uniform Load kN	Defl. at Uniform Load mm	Uniform Loading at Deflection		
			Span/180 kN	Span/240 kN	Span/360 kN
600	7.6	1	7.6	7.6	7.6
750	6.1	2	6.1	6.1	5.9
1,000	4.6	4	4.6	4.6	3.3
1,250	3.6	6	3.6	3.2	2.1
1,500	3.1	9	3.0	2.2	1.5
1,750	2.6	12	2.2	1.6	1.1
2,000	2.3	15	1.6	1.2	0.8
2,500	1.8	24	1.1	0.8	0.5
3,000	1.5	34	0.8	0.5	0.4
3,500	1.3	46	0.5	0.4	0.3
4,000	1.2	62	0.4	0.3	0.2
4,500	1.0	78	0.3	0.3	0.2
5,000	0.9	97	0.3	0.2	NR
6,000	0.8	136	0.2	NR	NR

P1001 - BEAM LOADING (METRIC)

Span mm	Max Allowable Uniform Load kN	Defl. at Uniform Load mm	Uniform Loading at Deflection		
			Span/180 kN	Span/240 kN	Span/360 kN
600	15.6 *	1	15.6 *	15.6 *	15.6 *
750	15.6 *	1	15.6 *	15.6 *	15.6 *
1,000	13.0	2	13.0	13.0	13.0
1,250	10.4	3	10.4	10.4	10.4
1,500	8.7	5	8.7	8.7	7.4
1,750	7.4	7	7.4	7.4	5.5
2,000	6.5	9	6.5	6.3	4.2
2,500	5.2	13	5.2	4.0	2.7
3,000	4.3	19	3.7	2.8	1.9
3,500	3.7	26	2.8	2.0	1.4
4,000	3.2	34	2.1	1.6	1.1
4,500	2.9	44	1.6	1.2	0.8
5,000	2.6	53	1.3	1.0	0.7
6,000	2.2	78	0.9	0.7	0.4

P1000 - COLUMN LOADING (METRIC)

Unbraced Height mm	Maximum Allowable Load at Slot Face kN	Maximum Column Load Applied at C.G.			
		K = 0.65 kN	K = 0.80 kN	K = 1.0 kN	K = 1.2 kN
600	15.8	48.0	44.3	39.4	34.8
750	15.2	44.0	39.4	33.8	28.9
1,000	13.7	37.5	32.0	26.1	21.3
1,250	12.1	31.6	26.1	20.3	16.5
1,500	10.7	26.7	21.3	16.5	13.4
1,750	9.6	22.7	17.8	13.8	11.3
2,000	8.7	19.3	15.3	11.9	9.6
2,250	7.9	16.9	13.4	10.4	8.2
2,500	7.2	15.0	11.9	9.1	**
2,750	6.7	13.5	10.6	8.1	**

P1001 - COLUMN LOADING (METRIC)

Unbraced Height mm	Maximum Allowable Load at Slot Face kN	Maximum Column Load Applied at C.G.			
		K = 0.65 kN	K = 0.80 kN	K = 1.0 kN	K = 1.2 kN
600	28.6	108.2	105.3	101.3	97.4
750	28.3	105.0	101.3	96.5	92.2
1,000	27.8	99.6	95.0	89.7	83.9
1,250	27.3	94.7	89.7	81.7	70.1
1,500	26.8	90.3	83.9	70.1	56.4
1,750	25.4	86.7	74.8	58.6	43.5
2,000	23.9	79.4	65.5	47.7	33.3
2,250	22.2	71.9	56.4	37.9	26.3
2,500	20.4	64.4	47.7	30.7	21.3
2,750	18.5	56.9	39.6	25.4	17.6

P1000/P1001 - ELEMENTS OF SECTION (METRIC)

Parameter	P1000	P1001
Area of Section	3.58 cm ²	7.16 cm ²
Axis 1-1		
Moment of Inertia (I)	7.68 cm ⁴	38.62 cm ⁴
Section Modulus (S)	3.30 cm ³	9.36 cm ³
Radius of Gyration (r)	1.46 cm	2.32 cm
Axis 2-2		
Moment of Inertia (I)	9.80 cm ⁴	19.60 cm ⁴
Section Modulus (S)	4.75 cm ³	9.50 cm ³
Radius of Gyration (r)	1.65 cm	1.65 cm

Notes:

* Load limited by spot weld shear.

** KL/r > 200

NR = Not Recommended.

- Beam loads are given in total uniform load (W Lbs) not uniform load (w lbs/ft or w lbs/in).
- Beam loads are based on a simple span and assumed to be adequately laterally braced. Unbraced spans can reduce beam load carrying capacity. Refer to Page 56 for reduction factors for unbraced lengths.
- For pierced channel, multiply beam loads by the following factor:

"KO" Series.....95%	"T" Series85%
"HS" Series90%	"SL" Series85%
"H3" Series.....90%	"DS" Series.....70%
- Deduct channel weight from the beam loads.
- For concentrated midspan point loads, multiply beam loads by 50% and the corresponding deflection by 80%. For other load conditions refer to page 18.
- All beam loads are for bending about Axis 1-1.