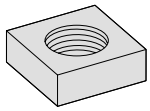
HN
HEX NUTS
•Standard finish: Zinc-Plated, Stainless Steel

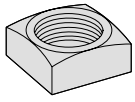
Part No.	Wt./C Lbs.	kg
1/4" HN	.7	(.32)
5/16" HN	1.0	(.45)
3/8" HN	1.5	(.68)
1/2" HN	3.6	(1.63)
5/8" HN	7.2	(3.26)
3/4" HN	11.1	(5.03)
7/8" HN	17.9	(8.12)
1" HN	27.2	(12.34)

MSQN
MACHINE SQUARE NUT
•For use with B755 Beam Clamp
•Standard finish: Zinc-Plated



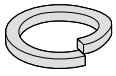
Part No.	Wt./C Lbs.	kg
MSQN 1/4"	.6	(.27)
MSQN 5/16"	1.2	(.54)
MSQN 3/8"	1.8	(.81)

SQN
SQUARE NUTS
•Standard finish: Zinc-Plated



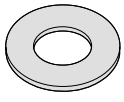
Part No.	Wt./C Lbs.	kg
1/2" SQN	5.7	(2.58)
5/8" SQN	10.1	(4.58)

LW
LOCK WASHERS
•Standard finish: Zinc-Plated, Stainless Steel



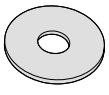
Part No.	Wt./C Lbs.	kg
1/4" LW	.3	(.13)
5/16" LW	.4	(.18)
3/8" LW	.6	(.27)
1/2" LW	1.3	(.59)
5/8" LW	2.4	(1.09)
3/4" LW	3.8	(1.72)
7/8" LW	5.9	(2.67)
1" LW	8.8	(3.99)

FW
FLAT WASHERS
•Standard finish: Zinc-Plated, Stainless Steel



Part No.	Wt./C Lbs.	kg
1/4" FW	.7	(.32)
5/16" FW	1.4	(.63)
3/8" FW	1.7	(.77)
1/2" FW	3.9	(1.77)
5/8" FW	6.4	(2.90)
3/4" FW	10.9	(4.94)
7/8" FW	13.4	(6.08)
1" FW	18.8	(8.53)

FFW
FLAT FENDER WASHERS
•Standard finish: Zinc-Plated



Part No.	Wt./C Lbs.	kg
1/4" x 1 1/4" FFW	2.2	(1.00)
1/4" x 1 1/2" FFW	3.1	(1.40)
3/8" x 1 1/4" FFW	2.0	(.91)
3/8" x 1 1/2" FFW	3.0	(1.36)
1/2" x 2" FFW	5.4	(2.45)

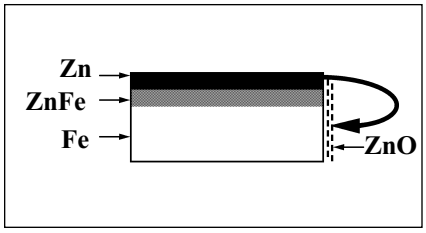
Reference page 44 for general fitting and standard finish specifications.

FINISHES

Zinc Coatings

Zinc protects steel in two ways. First it protects the steel as a coating and second as a sacrificial anode to repair bare areas such as cut edges, scratches, and gouges. The corrosion protection of zinc is directly related to its thickness and the environment. This means a .2 mil coating will last twice as long as a .1 mil coating in the same environment.

Galvanizing also protects cut and drilled edges.



Electrogalvanized Zinc

Electrogalvanized Zinc (also known as zinc plated or electroplated) is the process by which a coating of zinc is deposited on the steel by electrolysis from a bath of zinc salts.

A rating of SC3, B-Line's standard, provides a minimum zinc coating thickness of .5 mils (excluding hardware, which is SC1 = .2 mils).

When exposed to air and moisture, zinc forms a tough, adherent, protective film consisting of a mixture of zinc oxides, hydroxides, and carbonates. This film is in itself a barrier coating which slows subsequent corrosive attack on the zinc. This coating is usually recommended for indoor use in relatively dry areas, as it provides ninety-six hours protection in salt spray testing per ASTM B117.

Chromium/ Zinc

Chromium/ Zinc is a corrosion resistant composition, which was developed to protect fasteners and small bulk items for automotive use. The coating applications have since been extended to larger parts and other markets.

Chromium/Zinc composition is an aqueous coating dispersion containing chromium, proprietary organics, and zinc flake.

This finish provides 1000 hours protection in salt spray testing per ASTM B117.

Pre-Galvanized Zinc

(Mill galvanized, hot dip mill galvanized or continuous hot dip galvanized) Pre-galvanized steel is produced by coating coils of sheet steel with zinc by continuously rolling the material through molten zinc at the mills. This is also known as mill galvanized or hot dip mill galvanized. These coils are then slit to size and fabricated by roll forming, shearing, punching, or forming to produce B-Line pre-galvanized strut products.

The G90 specification calls for a coating of .90 ounces of zinc per square foot of steel. This results in a coating of .45 ounces per square foot on each side of the sheet. This is important when comparing this finish to hot dip galvanized after fabrication.

During fabrication, cut edges and welded areas are not normally zinc coated; however, the zinc near the uncoated metal becomes a sacrificial anode to protect the bare areas after a short period of time.

Hot Dip Galvanized After Fabrication (Hot dip galvanized or batch hot dip galvanized)

Hot dip galvanized strut products are fabricated from steel and then completely immersed in a bath of molten zinc. A metallic bond occurs resulting in a zinc coating that completely coats all surfaces, including edges and welds.

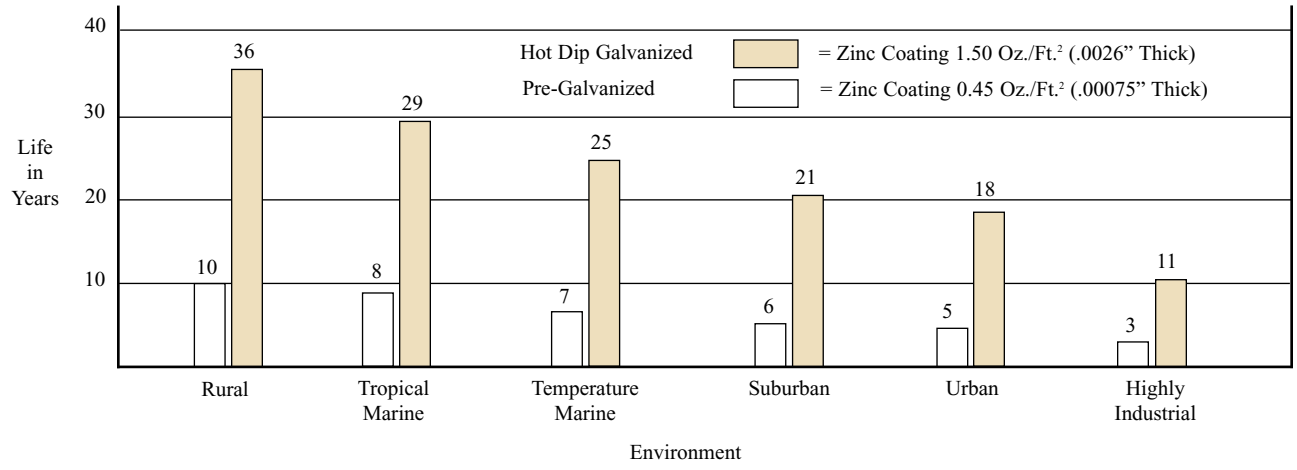
Another advantage of this method is coating thickness. Strut products that are hot dip galvanized after fabrication have a minimum thickness of 1.50 ounces per square foot on each side, or a total 3.0 ounces per square foot of steel, according to ASTM A123.

The zinc thickness is controlled by the amount of time each part is immersed in the molten zinc bath as well as the speed at which it is removed. The term "double dipping" refers to parts too large to fit into the galvanizing kettle and, therefore, must be dipped one end at a time. It does not refer to extra coating thickness.

The layer of zinc which bonds to steel provides a dual protection against corrosion. It protects first as an overall barrier coating. If this coating happens to be scratched or gouged, zinc's secondary defense is called upon to protect the steel by galvanic action.

Hot-Dip Galvanized After Fabrication is recommended for prolonged outdoor exposure and will usually protect steel for 20 years or more in most atmospheric environments and in many industrial environments. For best results, a zinc rich paint (available from B-Line) should be applied to field cuts. The zinc rich paint will provide immediate protection for these areas and eliminate the short time period for galvanic action to "heal" the damaged coating.

Anticipated Life of Zinc Coatings In Various Atmospheric Environments



CHANNEL NUTS & HARDWARE

Channel Nuts

B-Line's channel nut is one of the main components of our metal framing system. It is designed to provide essential gripping power and ease during installation. Channel nuts are press formed, machined and hardened from steel which meets the requirements of ASTM A108 or ASTM A36 for our larger sizes.

Bolts, Screws, and Nuts

All bolts, screws and nuts meet the physical and chemical requirements of ASTM A307, SAE J429 or ASTM A563, and have unified inch screw threads (coarse, UNC). ISO metric threads are also available on special request.

Recommended Torque

Bolt Size	1/4-20	5/16-18	3/8-16	1/2-13
Foot/Lbs.	6	11	19	50
Nm	8	15	26	68

Bolt Size	M6x1	M8 x1.5	M10 x 1.5	M12x1.75
NM	12	17	36	62
Foot/Lbs.	9	13	27	46

Materials & Finishes*

Finish Code	Finish	Specification
PLN	Plain	ASTM A108/A307 Gr. A
ZN	Electro-Plated Zinc	ASTM B633 SC1 Type III
CZ	Chromium Zinc	ASTM F1136 Gr. 3
HDG	Hot-Dipped Galvanized	ASTM A153
SS4	Stainless Steel Type 304	ASTM A593
SS6	Stainless Steel Type 316	MPIF 35/ASTM A593
AL	Aluminum	ASTM F468 S4

*Unless otherwise noted.

Metric

Metric dimensions are shown in parentheses. Unless noted, all metric dimensions are in millimeters.

REFERENCE DATA

B-Line

METRIC CONVERSION CHART

To Convert From	To	Multiply By
Angle		
degree	radian (rad)	1.745329×10^{-2}
radian (rad)	degree	$5.729578 \times 10^{+1}$
Area		
foot^2	square meter (m^2)	9.290304×10^{-2}
inch^2	square meter (m^2)	6.451600×10^{-4}
circular mil	square meter (m^2)	5.067075×10^{-10}
sq. centimeter (cm^2)	square inch (in^2)	1.550003×10^{-1}
square meter (m^2)	foot^2	$1.076391 \times 10^{+1}$
square meter (m^2)	inch^2	$1.550003 \times 10^{+3}$
square meter (m^2)	circular mil	$1.973523 \times 10^{+9}$
Temperature		
degree Fahrenheit	degree Celsius	$t^{oC}=(t^{oF}-32)/1.8$
degree Celsius	degree Fahrenheit	$t^{oF}=1.8t^{oC}+32$
Force		
pounds-force (lbf)	newtons (N)	$4.448222 \times 10^{\circ}$

To Convert From	To	Multiply By
Length		
foot (ft)	meter (m)	3.048000×10^{-1}
inch (in)	meter (m)	2.540000×10^{-2}
mil	meter (m)	2.540000×10^{-5}
inch (in)	micrometer (µm)	$2.540000 \times 10^{+4}$
meter (m)	foot (ft)	3.280840
meter (m)	inch (in)	$3.937008 \times 10^{+1}$
meter (m)	mil	$3.937008 \times 10^{+4}$
micrometer (µm)	inch (in)	3.937008×10^{-5}
Volume		
foot^3	cubic meter (m^3)	2.831685×10^{-2}
inch^3	cubic meter (m^3)	1.638706×10^{-5}
cubic centimeter (cm^2)	cubic inch (in^3)	6.102374×10^{-2}
cubic meter (m^3)	foot^3	$3.531466 \times 10^{+1}$
cubic meter (m^3)	inch^3	$6.102376 \times 10^{+4}$
gallon (U.S. liquid)	cubic meter (m^3)	3.785412×10^{-3}
Section Properties		
section modulus S (in^3)	S (m^3)	1.638706×10^{-5}
moment of inertia I (in^4)	I (m^4)	4.162314×10^{-7}
modulus of elasticity E (psi)	E (Pa)	$6.894757 \times 10^{+3}$
section modulus S (m^3)	S (in^3)	$6.102374 \times 10^{+4}$
moment of inertia I (m^4)	I (in^4)	$2.402510 \times 10^{+6}$
modulus of elasticity E (Pa)	E (psi)	1.450377×10^{-4}

To Convert From	To	Multiply By
Bending Moment or Torque		
lbf • ft	newton meter (N•m)	1.355818
lbf • in	newton meter (N•m)	1.129848×10^{-1}
N•m	lbf • ft	7.375621×10^{-1}
N•m	lbf • in	8.850748
Mass		
ounce (avoirdupois)	kilogram (kg)	2.834952×10^{-2}
pound (avoirdupois)	kilogram (kg)	4.535924×10^{-1}
ton (short, 2000 lb)	kilogram (kg)	$9.071847 \times 10^{+2}$
ton (long, 2240 lb)	kilogram (kg)	$1.016047 \times 10^{+3}$
kilogram (kg)	ounce (avoirdupois)	$3.527396 \times 10^{+1}$
kilogram (kg)	pound (avoirdupois)	2.204622
kilogram (kg)	ton (short, 2000 lb)	1.102311×10^{-3}
kilogram (kg)	ton (long, 2240 lb)	9.842064×10^{-4}
Mass Per Unit Length		
lb/ft	kilogram per meter (kg/m)	1.488164
lb/in	kilogram per meter (kg/m)	$1.785797 \times 10^{+1}$
kg/m	lb/ft	6.719689×10^{-1}
kg/m	lb/in	5.599741×10^{-1}
Mass Per Unit Volume		
lb/ft^3	kilogram per cubic meter (kg/m^3)	$1.601846 \times 10^{+1}$
lb/in^3	kilogram per cubic meter (kg/m^3)	$2.767990 \times 10^{+4}$
kg/m^3	lb/ft^3	6.242797×10^{-2}
kg/m^3	lb/in^3	3.612730×10^{-5}
lbs/ft^3	lbs/in^3	5.787037×10^{-4}
Mass Per Unit Area		
lb/ft^2	kilogram per square meter (kg/m^2)	4.882428
kg/m^2	pound per square foot (lb/ft^2)	2.048161×10^{-1}
Pressure or Stress		
lbf/in^2 (psi)	pascal (Pa)	$6.894757 \times 10^{+3}$
kip/in^2 (ksi)	pascal (Pa)	$6.894757 \times 10^{+6}$
lbf/in^2 (psi)	megapascals (MPa)	6.894757×10^{-3}
pascal (Pa)	pound-force per square inch (psi)	1.450377×10^{-4}
pascal (Pa)	kip per square inch (ksi)	1.450377×10^{-7}
megapascals (MPa)	lbf/in^2 (psi)	$1.450377 \times 10^{+2}$

Abbreviations	
Defl.	= Deflection
S.F.	= Safety Factor
Ft.	= Feet
Pre-galv.	= Pre-galvanized Steel
K Factor	= Deflection Divided by load in Lbs./Ft.
o.c.	= On Center
PVC	= Poly Vinyl Chloride
In.	= Inch
psi	= Pounds per Square Inch
wt./c	= Weight pre 100 pieces

Metric Symbols	
m	= meter
cm	= centimeter
mm	= millimeter
µm	= micrometer
kg	= kilogram
N	= newton
kN	= kilonewton
Pa	= pascal
MPa	= megapascal