



Standard Hillside Washers	Box Qty	Compression Strength in Lbs.	Lbs/M	Tengco P/N
Cast Grey Iron Per ASTM F-541				
3/8 Plain	350	7400	244.00	SWH38-P
1/2 Plain	125	13,500	328.94	SWH12-P
5/8 Plain	100	21,500	426.05	SWH58-P
3/4 Plain	75	32,000	451.09	SWH34-P
7/8 Plain	50	44,000	828.29	SWH78-P
1" Plain	30	58,000	1242.40	SWH1-P
1-1/8-1-1/4 Plain	15	92,000	3084.20	SWH11814-P

Flanged Hillside Washer	Box Qty	Lbs/M	Tengco P/N Import	Tengco P/N Made in USA
Cast Ductile Iron Patented				
1/2-5/8 Hot Dip Galv	40	1169.50	SWH1258.1-H	SWH1258.1-H (D)
1/2-5/8 Grey Paint	40	1169.50	SWH1258.1-GP	SWH1258.1-GP (D)
1/2-5/8 Red Paint	40	1169.50	SWH1258.1-RP	SWH1258.1-RP (D)
3/4-7/8 Hot Dip Galv	40	1267.80	SWH3478.1-H	SWH3478.1-H (D)
3/4-7/8 Grey Paint	40	1267.80	SWH3478.1-GP	SWH3478.1-GP (D)
3/4-7/8 Red Paint	40	1267.80	SWH3478.1-RP	SWH3478.1-RP (D)
1"-1-1/8" Hot Dip Galv	25	1752.40	SWH1118.1-H	SWH1118.1-H (D)
1"-1-1/8" Grey Paint	25	1752.40	SWH1118.1-GP	SWH1118.1-GP (D)
1"-1-1/8" Red Paint	25	1752.40	SWH1118.1-RP	SWH1118.1-RP (D)
1-1/4" Hot Dip Galv	20	2420.00	SWH114.1H	SWH114.1H (D)
1-1/4" Grey Paint	20	2420.00	SWH114.1GP	SWH114.1GP (D)
1-1/4" Red Paint	20	2420.00	SWH114.1RP	SWH114.1RP (D)
1-1/2" Red Paint	20	2900.00	SWH112.1-RP	US made part not available

Tengco's Flanged Hillside Washers have been tested & approved by R. Ralph Sinno, PH.D.; Professional Engineer & Professor of Civil Engineering at Mississippi State University. Dr. Sinno concluded from the testing that ordinary standard Flat Washers can be used in the application, in lieu of any special washers recommended to be necessary with other product lines. Documents will be supplied upon request.

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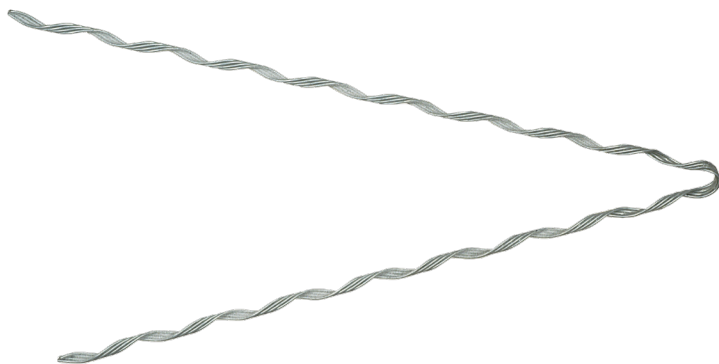
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Cumming, GA 30028
(770) 844-1515

All items must be purchased in even box quantities



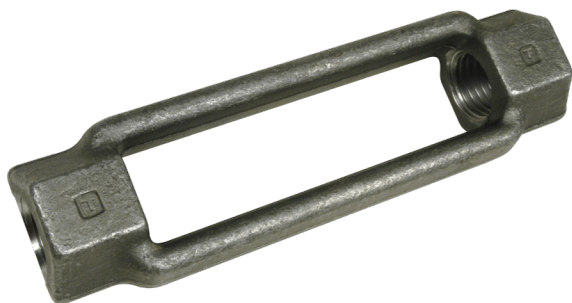
Welded Eye Bolts

Size	Box Qty	Lbs/M	Tengco P/N
1/2-13 x 9	75	627.9	EBE129.6-C
5/8-11 X 9	40	1076	EBE589.6-C
3/4-10 X 9	25	1707	EBE349.6-C
7/8-9 X 9	15	2552	EBE789.6-C



Brace Grips Galvanized per ASTM A475-98

Size	Length	Color	Load Lbs	Box Qty	Lbs/M	Tengco P/N
1/4	19"	Yellow	6650	125	374	SBG1419-G
3/8	28"	Orange	15,400	50	990	SBG3828-G
1/2	37"	Blue	26,900	15	2860	SBG1237-G



Forged Turnbuckles Plain C1035 Steel ASTM F1145-92

Size	Min Break Strength	Lbs/M	Tengco P/N
1/2-13 x 12"	11000	1036	STB1212-P
5/8-11 x 12"	17,500	1697	STB5812-P
3/4-10 x 12"	26000	2336	STB3412-P
7/8-9 x 12"	36000	3108	STB7812-P
1-8 x 12"	50000	5070	STB112-P
1-1/8-7 x 12"	57500	6834	STB11812-P
1-1/4-7 x 12"	76000	6834	STB11412-P

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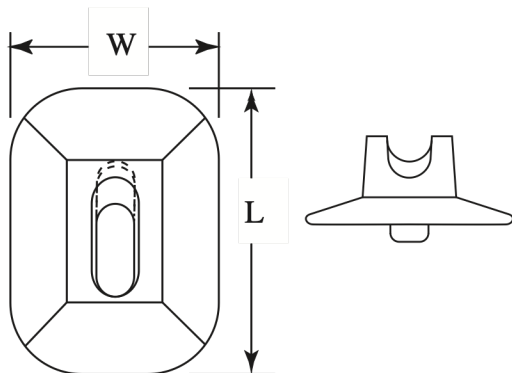
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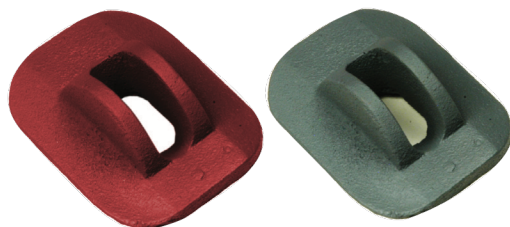
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Flanged Washer Base Dimensions

Washer Size	Max Rod Size	Length	Width
1/2"-5/8"	5/8"	4.00"	3.00"
3/4"-7/8"	7/8"	4.00"	3.00"
1"-1-1/8"	1-1/8"	4.00"	3.00"
1-1/4"	1-1/4"	4.00"	3.08"
1-1/2"	1-1/2"	4.875"	3.687"



Flanged Hillside Washers

Washer Size	Web Thickness	Slot Length	Slot Width	Rod Size	Rod Tensile Strength (lbs)	Load (lbs) Ultimate	Failure Mode
1/2"-5/8"	3/16"	2-5/8"	1-5/16"	1/2"	10,750	16,600	1
1/2"-5/8"	3/16"	2-5/8"	1-5/16"	5/8"	14,500	20,750	1
3/4"-7/8"	3/16"	2-5/8"	1-5/16"	3/4"	20,200	30,000	1
3/4"-7/8"	1/4"	2-5/8"	1-5/16"	3/4"	20,500	30,300	1
3/4"-7/8"	1/4"	2-5/8"	1-5/16"	7/8"	31,300	43,000	1
3/4"-7/8"	5/16"	2-5/8"	1-5/16"	7/8"	31,200	44,450	1
1"-1-1/8"	5/16"	2-5/8"	1-5/16"	1"	43,500	50,500	1,2
1"-1-1/8"	5/16"	2-5/8"	1-5/16"	1-1/8"	64,000	69,000	1,3
1"-1-1/8"*	1/4"	2-5/8"	1-5/16"	1"	39,500	51,100	1,3
1"-1-1/8"*	5/16"	2-5/8"	1-5/16"	1-1/8"	60,000	66,000	1,3

Failure Modes: 1. x-bracing 2. Slight web deformation 3. Web plate reached ultimate strength.
Dr. Sinno's full test report is available upon request.

PATENTED U.S. Patent No. 8740534

Tengco's patented Flanged Hillside Washer achieves complete loading of the web and rod allowing you to eliminate backup plates and welding. They have been tested and approved by R. Ralph Sinno, PH.D.; Professional Engineer & Professor of Civil Engineering at Mississippi State University.

Tengco offers both "Made in USA" and Imported Washers. They are made with Ductile Iron per ASTM 536-84 Grade 65-45-12 with ultimate tensile strength of 65,000 PSI.

Each size is offered in four finishes: Plain, Red Primer, Grey Primer and Hot Dipped Galvanized.

Load Test Data Results (see table below)

Tests were conducted using 30-60 degree angles between the x-bracing rods and the beam/column sections. Certain tests were repeated using hillside washers that can be used for x-bracing at 45°, and the results were the same. Those results are noted by an asterisk. A heavy duty hex nut with a single heavy duty flat washer was used to lock the x-bracing rod against the flanged hillside washer.

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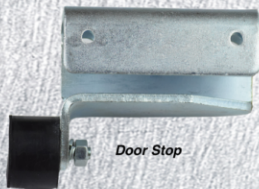


TENGCO

Global Sourcing for Custom Manufactured
Fasteners, Parts & Assemblies

Tengco Knows Metal Buildings & Horse Barns

Our extensive product knowledge helps you reduce in-house inventory and lower product costs. Shown are just a few of the many parts Tengco can custom produce.



Door Stop



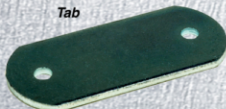
Door Trolley



Staple Plate

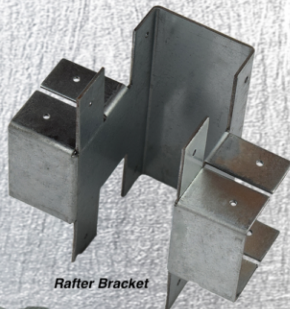


Rail Hitching Loop



Tab

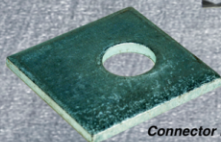
*Flanged
Hillside
Washer*



Rafter Bracket



Brace Grips

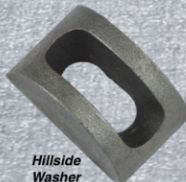


Connector Plate

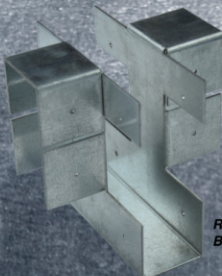
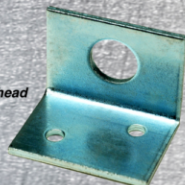
Door Stop



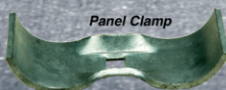
*Hillside
Washer*



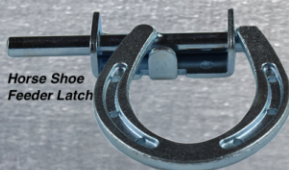
*Redhead
Clip*



*Rafter
Bracket*



Panel Clamp



*Horse Shoe
Feeder Latch*

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