



HMPE ENDLESS GROMMET SLINGS

HMPE endless grommet slings offer greater strength than eye and eye slings without increasing rope diameter and can be made shorter since no extra material is needed for eyes. Their minimum breaking load depends on the pin diameter they are mounted on.



WARNING

See page 49 for removal criteria

Dia. (in.)	Vert	Choker	90°	60°	45°	30°	Circ. (in.)	MBL (lbs.)
1/4 (6 mm)	2,640	1,120	4,750	4,110	3,360	2,370	3/4	13,200
5/16 (8 mm)	3,860	1,630	6,940	6,010	4,910	3,470	15/16	19,305
3/8 (9 mm)	5,770	2,450	10,300	9,000	7,350	5,190	1-1/8	28,875
7/16 (11 mm)	6,930	2,940	12,400	10,800	8,820	6,230	1-1/4	34,650
1/2 (12 mm)	10,300	4,380	18,500	16,100	13,100	9,290	1-1/2	51,645
9/16 (14 mm)	12,500	5,300	22,500	19,400	15,900	11,200	1-3/4	62,535
5/8 (16 mm)	16,900	7,190	30,500	26,400	21,500	15,200	2	84,810
3/4 (18 mm)	22,600	9,590	40,600	35,200	28,700	20,300	2-1/4	113,025
13/16 (20 mm)	24,400	10,300	43,900	38,000	31,000	21,900	2-1/2	122,100
7/8 (22 mm)	30,500	12,900	55,000	47,600	38,800	27,500	2-3/4	152,790
1 (24 mm)	36,300	15,400	65,300	56,500	46,200	32,600	3	181,500
1-1/16 (26 mm)	42,600	18,000	76,700	66,400	54,200	38,300	3-1/4	213,180
1-1/8 (28 mm)	48,500	20,500	87,300	75,600	61,700	43,600	3-1/2	242,550
1-1/4 (30 mm)	54,400	23,100	98,000	84,800	69,300	49,000	3-3/4	272,250
1-5/16 (32 mm)	64,600	27,400	116,400	100,800	82,300	58,200	4	323,400
1-1/2 (36 mm)	72,900	30,900	131,200	113,600	92,800	65,600	4-1/2	364,650
1-5/8 (40 mm)	96,000	40,700	172,800	149,600	122,200	86,400	5	480,150
1-3/4 (44 mm)	103,600	43,900	186,500	161,500	131,800	93,200	5-1/2	518,100
2 (48 mm)	117,100	49,700	210,800	182,600	149,100	105,400	6	585,750
2-1/8 (52 mm)	141,200	59,900	254,200	220,100	179,700	127,100	6-1/2	706,200
2-1/4 (56 mm)	158,700	67,300	285,700	247,400	202,000	142,800	7	793,650
2-1/2 (60 mm)	174,900	74,200	314,800	272,600	222,600	157,400	7-1/2	874,500
2-5/8 (64 mm)	196,600	83,400	354,000	306,500	250,300	177,000	8	983,400
2-3/4 (68 mm)	217,800	92,400	392,000	339,500	277,200	196,000	8-1/2	1,089,000
3 (72 mm)	257,400	109,200	463,300	401,200	327,600	231,600	9	1,287,000
3-1/8 (76 mm)	280,500	119,000	504,000	437,200	357,000	252,400	9-1/2	1,402,500
3-1/4 (80 mm)	310,200	131,600	558,000	483,500	394,800	279,100	10	1,551,000
3-1/2 (84 mm)	365,600	155,100	658,000	569,000	465,300	329,000	10-1/2	1,828,200
3-5/8 (88 mm)	412,500	175,000	742,000	643,000	525,000	371,200	11	2,062,500
3-3/4 (92 mm)	434,600	184,300	782,000	677,000	553,000	391,100	11-1/2	2,173,050

One splice in one leg vertical, choker and basket hitches. Basket hitch at varying angles.

**Rated capacities (in pounds) are based on a Design Factor of 5:1 and a D:d of 8:1. Ratings are determined with the sling angle calculated from the vertical.*

Chart continued on next page



Dia. (in.)	Vert	Choker	90°	60°	45°	30°	Circ. (in.)	MBL (lbs.)
4 (96 mm)	501,000	212,800	902,000	781,000	638,000	451,400	12	2,508,000
4-1/8 (100 mm)	535,000	227,000	963,000	834,000	681,000	481,700	12-1/2	2,676,300
4-1/4 (104 mm)	560,000	237,500	1,008,000	872,000	712,000	504,000	13	2,800,050
4-1/2 (108 mm)	602,000	255,700	1,085,000	939,000	767,000	542,000	13-1/2	3,014,550
4-5/8 (112 mm)	620,000	263,200	1,116,000	967,000	789,000	558,000	14	3,102,000
4-3/4 (116 mm)	635,000	269,700	1,144,000	991,000	809,000	572,000	14-1/2	3,179,550
5 (120 mm)	682,000	289,700	1,229,000	1,064,000	869,000	614,000	15	3,414,675
5-1/8 (124 mm)	729,000	309,600	1,313,000	1,137,000	929,000	656,000	15-1/2	3,649,800
5-1/4 (128 mm)	777,000	329,700	1,398,000	1,211,000	989,000	699,000	16	3,885,750
5-1/2 (132 mm)	824,000	349,600	1,483,000	1,284,000	1,049,000	741,000	16-1/2	4,120,875
5-5/8 (136 mm)	871,000	369,600	1,568,000	1,358,000	1,108,000	784,000	17	4,356,000
5-3/4 (140 mm)	918,000	389,500	1,652,000	1,431,000	1,168,000	826,000	17-1/2	4,591,125

This MBL includes a 10% reduction due to 55:45% load sharing. Minimum Break Load (MBL) in pounds is determined using spliced test samples in accordance with Cordage Institute 1500-02 - Test Method for Fiber Ropes.

Specifications for endless loop (grommet) HMPE rope slings assume one end-to-end splice. The length of splice determines the minimum length of a grommet sling.

The recommended design factor (DF) of 5:1 on this chart is based on several existing sling standards including ASME B30.9. This design factor takes into account various factors including the use of Ultra High Molecular Weight Polyethylene (HMPE) fiber which is extremely durable and resistant to repeated high loads. HMPE rope slings have and can be used with different DF ratios; however, this is a decision which must be made by a qualified person in conjunction with the rope manufacturer.

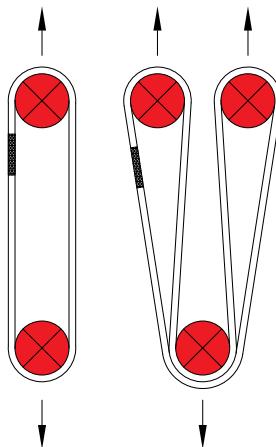
Please consult KWRS if you require the use of our fiber rope slings in a choker hitch at a lifting angle of less than 120°, following ASME B30.9 guidelines.

Bending Guidance for Endless Grommet Slings

In theory, a sling used in a basket configuration could have twice the working load as a sling in a vertical configuration because there are double the number of supporting strands. However, the decrease in tensile stress is partially offset by an increase in bending stress. The magnitude of this bending stress is dependent on the size and shape of the contact surface. Users must account for the bending strength loss with an efficiency factor as shown below in the reduced basket capacity calculation.

The bending efficiency reduces as the D:d ratio is reduced. Example: a 5:1 D:d ratio provides 97% efficiency.

Reduced Basket Capacity Calculation
 $C = B \times e$
C = Reduced Basket Capacity due to bending efficiency reduction
B = Rated Basket Capacity with consideration of horizontal sling fleet angle
e = Bending efficiency percentage



Represents a contact surface with a D:d ratio of one or greater. Refer to the Efficiency Table for deductions as needed.

Efficiency Table	
D:d Ratio	eff % (e)
8:1	100.0%
5:1	97.0%
3:1	91.0%
2:1	88.0%
1:1	79.0%