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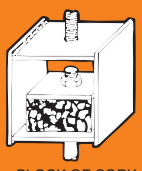
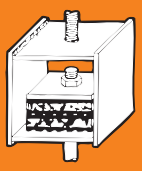
SPRING, NEOPRENE and COMBINATION HANGERS

HANGERS

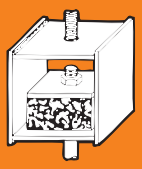
H-610-6 BULLETIN



BLOCK OF CORK



LAYERS OF RUBBER PADS



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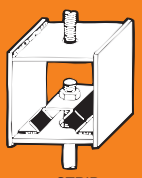
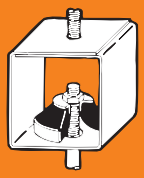
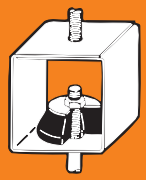


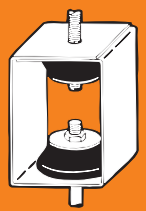
STRIP RUBBER-IN-SHEAR



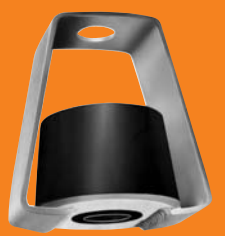
ROUND RUBBER-IN-SHEAR



SINGLE COMPRESSION ELEMENT



2 SINGLE COMPRESSION ELEMENTS



HD DOUBLE DEFLECTION NEOPRENE HANGER

HANGER DEVELOPMENT – PAST TO PRESENT

Over fifty years ago, vibration control hangers were in their infancy and it was not uncommon to use isolation materials such as a block of cork with a hole drilled through the center, two or three layers of rubber and cork pads or felt within the hanger frame. These products all gave way to the lower frequency bonded steel strip rubber-in-shear elements and then to round rubber-in-shear designs which were lower in cost and higher in capacity. The next step was equivalent deflection in compression.

The compression elements were designed with straight line deflection curves, so that for a given deflection the frequency would be about the same as the rubber-in-shear. The advantages were greater capacity for the same size and a fail safe feature. The upper steel washer in the rubber element is still made larger than the hole in the hanger box, so that if the rubber burns or fails, the piping, equipment, or suspended ceiling remains captive.

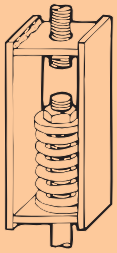
Both the round rubber-in-shear and the round compression hangers were also merchandised with a single deflection element in the top and bottom of the box to provide twice the deflection and lower the frequency. Our company went on to develop a larger taller double deflection element capable of providing this same deflection in one piece.

Up until 1965 we manufactured a complete range of 0.2”(5mm) single deflection hangers. They were in the same frequency range as fiberglass and very competitive but we found their performance so limited that we no longer wished to manufacture them although others still do. The only exception to this is the WHR which is still offered for ceiling suspension as a fiberglass substitute or improvement when fiberglass is specified by others.

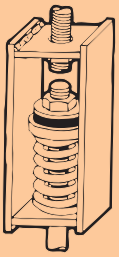
HD Hangers are double deflection units with average static deflections of 0.4”(10mm). They are molded in Neoprene or EPDM compounds because of their excellent aging characteristics. If you wish to isolate primary vibration, they should only be considered for smaller equipment running above 800 RPM in non-critical areas. The principle function of HD Hangers is noise isolation.

TYPE 30 SPRING HANGER

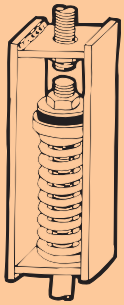
TYPE 30N COMBINATION SPRING and DOUBLE DEFLECTION NEOPRENE HANGER



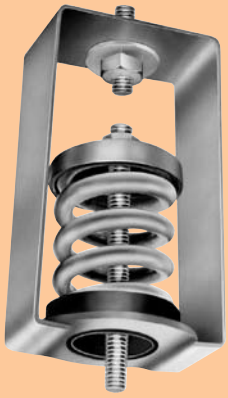
Early Spring Hanger with Stiff Unstable Spring



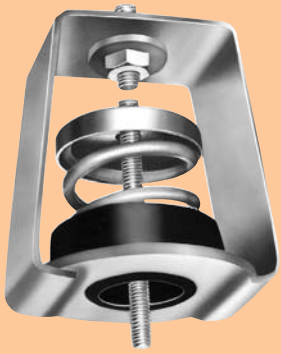
Introduction Of Rubber Washer



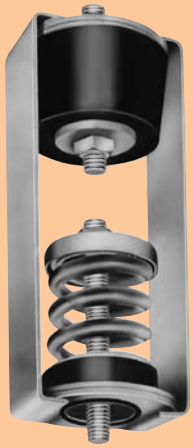
Rubber Washer plus Higher Deflection Unstable Spring



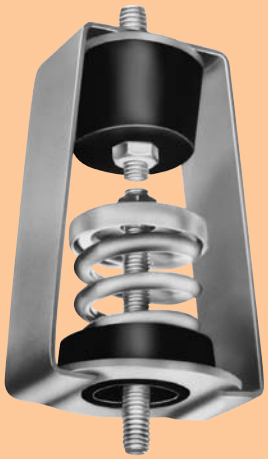
HS Hanger



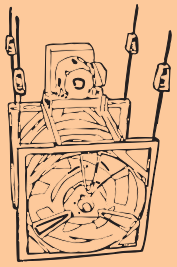
Series 30 Hanger

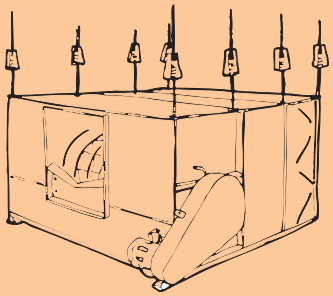


DNHS Hanger



Series 30N Hanger





Spring Hangers followed their own evolution. As in the case of mountings, early spring hangers had very stiff, tall, unstable springs and it was not unusual to sell hangers with 0.375”(10mm) deflection. Spring Hangers contained no rubber for high frequencies and the first improvement was the introduction of a rubber washer. This was normally located under the top of the box, or later on against the spring cup on top of the spring. A steel washer over the rubber washer spread the load to the outside of the steel spring so a cheaper steel cup could be used. When the rubber washer was located under the top of the box or over the steel spring, the design was still extremely poor as there was nothing to keep the rubber washer centered on the steel cup. Thus, the steel hanger rod would rub the steel cup or the steel hanger box and short circuit the action of the rubber. This was not recognized as a worry in that era, so the next step was to increase the deflection. Since spring stability was not clearly understood increased deflection was accomplished by making the springs taller, but not necessarily larger in diameter. The springs could not collapse or fall over because the lower hole in the box continued to be conveniently small. When the spring tended to topple, the rod would hit the side of the box and stop. Of course, the rubber continued to be short circuited and often the rods would lock vertically (especially if they were fully threaded) so that the springs were bypassed as well.

We reduced these problems by writing specifications and manufacturing hangers with the hole in the bottom of the hanger box as large as the I.D. of the spring. The HS Spring Hangers evolved using our standard A, B and C Springs and seating them in neoprene or EPDM cups with projecting bushings to line the hole in the lower end of the box. A, B and C Springs are designed for horizontal stiffness as described on Page 1, 4, 5 and 8 of Bulletin SLF-200-3, so they do not fall over or buckle. Centering the spring in the acoustical cup made steel-to-steel contact of the rod and the top steel cup unimportant and put the rubber in the right location on the leaving end of the spring.

The Series 30 was designed in recognition of a consultant’s field criticism that he was tired of walking job sites and seeing the hanger rods rubbing on the neoprene bushings. This happened because standard hangers allow for only limited rod angularity. The only way to solve the problem was to design a whole new series of springs which would be larger in diameter and shorter. To the best of our knowledge this was the first time that a group of hangers were designed to provide a specific angular capability. The designation 30 means the rod can swing through an arc of 30 degrees from side to side in any direction before contacting the neoprene bushing. The photographs show HS and series 30 hangers. The difference in the proportion of the springs and the angular capability is quite apparent. Spring hangers provide good vibration isolation where there is very little high frequency noise. They are generally recommended for applications like ductwork suspension or for suspending pipe lines where twin-sphere rubber connectors were used to take out the high frequencies first.

The Series 30 design solved the short circuiting problem, but we were still dealing with a design having poor high frequency control. The elastomeric cup is a much improved washer that cannot short circuit, but still a washer. The idea of placing a steel spring in series with a neoprene or EPDM hanger element started about 1957. Our DNHS Series was the first improvement on early designs, and the 30N configuration was the obvious advance on the DNHS as they incorporate the 30 degree swing capacity. Series 30N are the top-of-the-line and recommended for all highly critical locations where it is equally important to isolate both noise and vibration.

HS and DNHS designs using our standard A, B, C and multiple C designs are nominal 1”(25mm) and 1.35”(34mm) deflection hangers respectively. The Series 30 and 30N are grouped out with similar deflections, but then go on to our Series 30N-100 utilizing the 2”(50mm), 3”(76mm) , 4”(102mm) and 5”(127mm) deflection springs used in the SLF-100 Mountings. The 3”(76mm) & 4”(102mm) Series 30N-1000 were introduced to satisfy lighter capacity needs. The newer B2 and C2 designs are nominal 2”(50mm) and 2.35”(60mm) deflection hangers meeting lower cost competitive criteria.

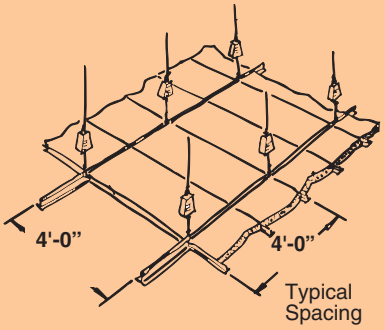
While most problems are addressed by the hangers listed above, we have need for one more variation. This is a precompressed PCHS, PCDNHS, PC-30 and PC-30N. When these hangers are released, they have the same vibration isolation characteristics as the standard versions. They have the advantage, however, of being preloaded in our shop by means of the washer and adjustment nut on the bottom. The spring deflection is shown on a scale inside the box so you know both the rated load and the deflection. A precompressed 1000 pound hanger acts as a rigid connection during installation unless the load exceeds the 1000 pounds(454kgs). Therefore, the installation may proceed in much the same manner as one with solid rods. This is particularly important when installing large diameter (6”(152mm) and over) pipe where the changes in elevation that would occur with ordinary spring hangers have forced contractors to install the piping systems solidly and then cut the rods and install the spring hangers later.

When the PC designs are used the whole run is completed and then the nuts below the lower washer are released to allow the spring to act freely. Any minor errors in load assignment results in negligible elevation changes and any major error would be noticed on the deflection scale and corrected by adjustment. In addition to installations as described above these hangers are recommended for the first three suspension points near the equipment so loads can be accurately determined to eliminate the effects of the piping weight and stress on the equipment flanges. They are also recommended for seismic applications where the precompression washers act as upward limit stops when cable restraints are used. Hanger housings must be strong enough to accept the compressive force.

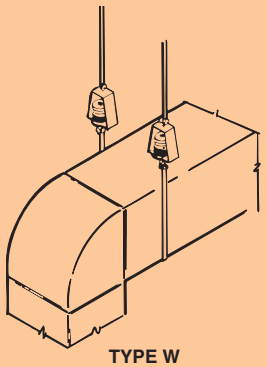
With the exception of a few very low capacity hangers and welded high-capacity and multiple-spring designs all of our hanger boxes are made by bending steel flats into an inverted U shape with return bends on the bottom, and arc welding them to thick American Standard or special steel washers. We believe that this construction is far better in appearance and safer than the more common spot welded, overlapped sheet metal designs favored by our competitors. That is why we continue to use this more expensive construction.

Most of the hanger types mentioned above are furnished in W designs. The designation W is an arbitrary letter standing for wire. It means that the hangers are furnished with eyes so they may be wired in place. In many cases rather than using wire the Series W hangers are fastened by means of a horizontal bolt as shown in the illustrations. The W designs are used primarily for ceiling suspension and ductwork systems. Spring ceiling hangers are normally precompressed 60% of the assigned load so that as ceiling weight is added they will only descend 40% of the designed deflection. Thus a 1”(25mm) deflection hanger will only descend 0.40”(10mm) under load rather than the full 1”(25mm). This simplifies ceiling installations as it is much easier for the ceiling contractor to install and level his grillwork from hangers that have no initial give and then have the ceiling descend minimally as gypsum board, ceiling tile or plaster is added.

The following pages detail all of our current designs. Please call us when special designs are needed.

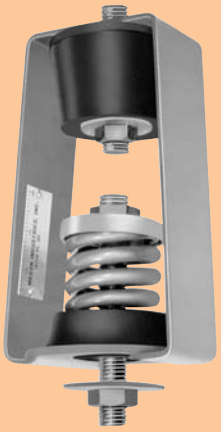


TYPE W as Ceiling Hangers

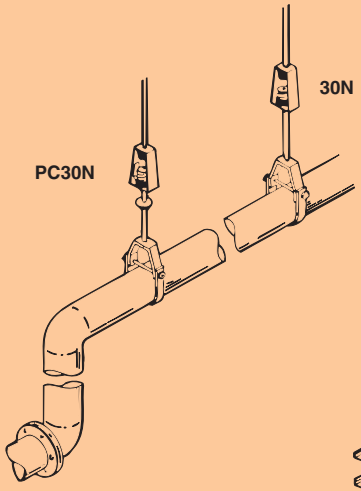


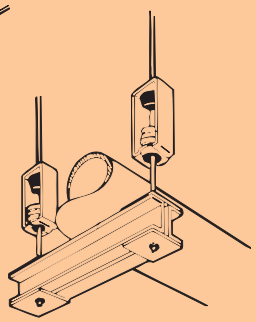
**TYPE W
As Duct Hangers**

PC30 Hanger

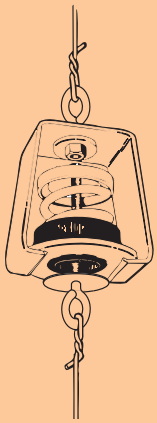


PC30N Hanger

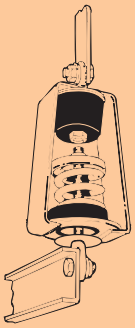




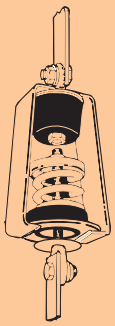
Trapeze Hung Pipe



**TYPE W30
Secured by Wire**



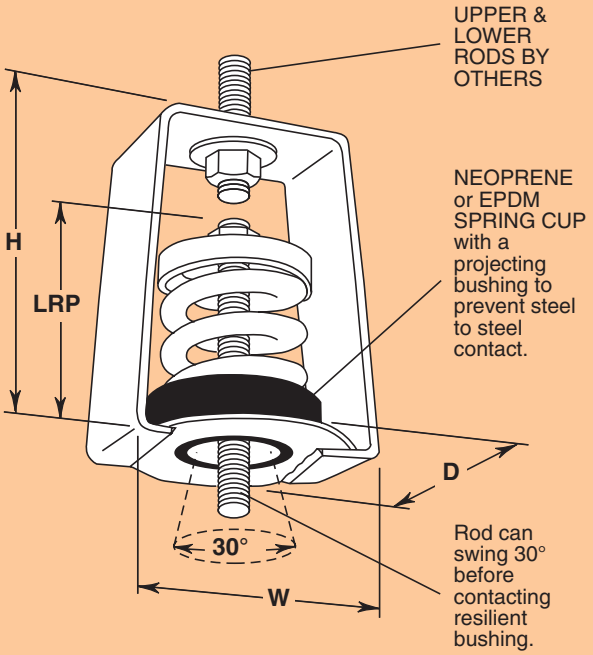
**TYPE W30N
Bolted to
Ceiling Channel**



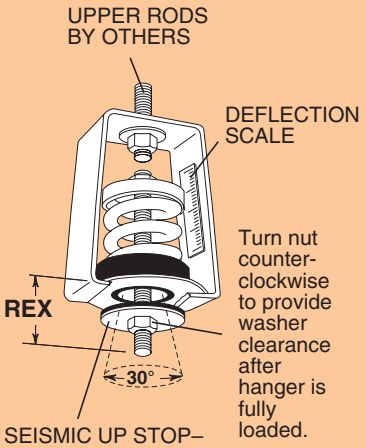
**TYPE W30N
Bolted to Straps**

1"(25mm) DEFLECTION 30° SWING – X, A, B, C, D & F SPRING HANGERS

30 FOR ROD ATTACHMENT

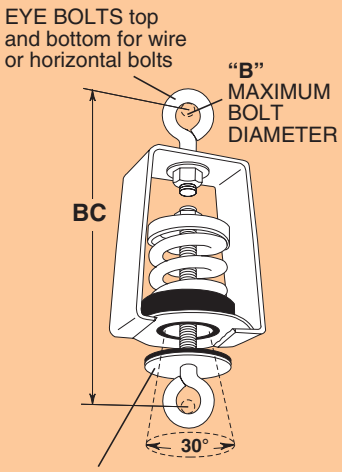


PC30
TYPE 30 PRECOMPRESSED



SEISMIC UP STOP– Precompression plate and neoprene washer. Hangers are precompressed to rated load or assigned load as required.

W30
TYPE 30 PRECOMPRESSED FOR WIRE OR HORIZONTAL BOLT ATTACHMENT



SEISMIC UP STOP– Precompression plate and neoprene washer. Hangers are precompressed to 60% of rated load. Washer disengages when full load is applied.

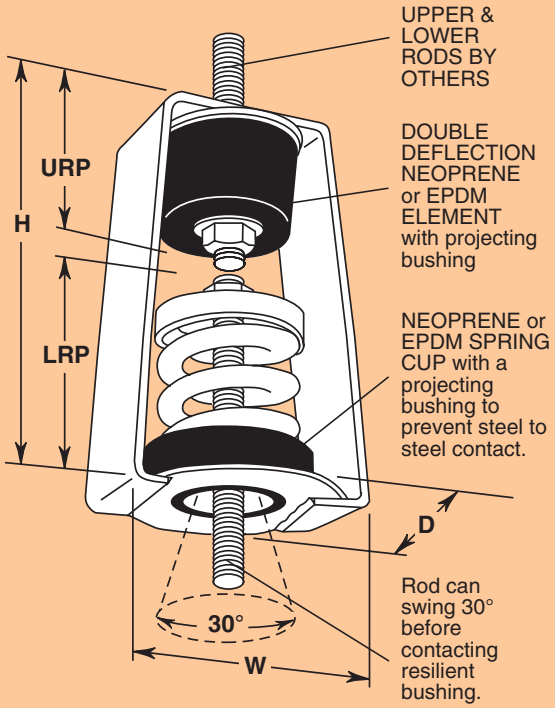
Ratings & Dimensions for 1"(25mm) Deflection Spring Hangers (inches millimeters)

Type	Size	Rated Capacity (lbs) (kg)	Rated Defl.† (in) (mm)	Spring Constant (lbs/in) (kg/cm)	Spring Color/ Stripe	Spring Only Spring OD	Spring Only Free Height	B	D	H	W	Bolt Centers BC	Lower Rod Penetration LRP	Max. Rod Dia. MRD	Rod Extension REX
30-	X-23	23 10	1.30 33	18 0.30	Brown										
	X-33	33 15	1.10 28	30 0.54	Copper										
	X-54	54 24	1.20 30	45 0.80	White										
	X-76	76 34	1.02 25	73 1.36	Black	1 1/2	2 1/2	1/4	2 1/2	4 1/4	2 7/8	5 7/8	3 1/2	3/8	1 3/4
	X-113	113 51	1.00 25	113 2.04	Brass	38	64	6	64	108	73	149	89	10	44
	X-130	130 59	1.00 25	130 2.36	Purple										
	X-175	175 79	1.00 25	175 3.16	Silver										
	X-210	210 95	1.00 25	210 3.80	Blue										
PC30-	A-12	12 5	1.00 25	12 0.20	Copper										
	A-18	18 8	1.00 25	18 0.32	Gray	1 3/4	1 7/8	3/8	2 3/4	5 3/4	3 1/4	7 1/8	3 1/2	5/8	2 1/4
	A-25	25 11	1.00 25	25 0.44	Orange	44	48	10	70	146	83	181	89	16	57
W30-	A-41	41 19	1.18 30	35 0.63	Pink										
	A-56	56 25	1.14 30	49 0.83	Black	1 3/4	2 1/4	3/8	2 3/4	5 3/4	3 1/4	7 1/8	4	5/8	2 1/4
	A-73	73 33	1.06 27	69 1.22	Tan	44	57	10	70	146	83	181	102	16	57
	A-95	95 43	1.01 26	94 1.65	Green										
	B-138	138 63	1.32 34	105 1.85	White										
	B-222	222 101	1.16 29	191 3.48	Blue										
	B-278	278 126	1.09 28	255 4.50	Purple	2 3/8	2 7/8	1/2	4	7 1/4	4 3/4	8 1/2	4 1/4	5/8	2 1/4
	B-336	336 152	1.00 25	336 6.08	Silver	60	73	13	102	184	121	216	108	16	57
	B-410	410 186	1.07 27	385 6.89	Black										
	B-540	540 245	1.00 25	540 9.80	Yellow										
30-	C-630	630 286	1.13 29	558 9.86	Gray										
	C-800	800 363	1.00 25	800 14.52	Orange	2 7/8	3 5/8	—	4	8 3/4	5 1/4	—	5	3/4	2 1/4
	C-1010	1010 458	1.10 28	920 16.36	Green	73	92	—	102	222	132	—	127	19	70
	C-1265	1265 574	1.00 25	1265 22.96	Red										
PC30-	D-1575	1575 714	1.23 31	1280 23.03	Pink	3 3/4	4 7/8	—	4 3/4	12 1/2	5 3/4	—	7	7/8	2 1/2
	D-2150	2150 975	1.03 26	2095 37.50	Purple	95	124	—	121	318	146	—	178	22	69
	F-2760	2760 1252	1.00 25	2760 50.08	Silver	4 1/2	5 1/8	—	6	12	6 1/4	—	7	7/8	2 1/2
						114	130	—	152	305	159	—	178	22	64

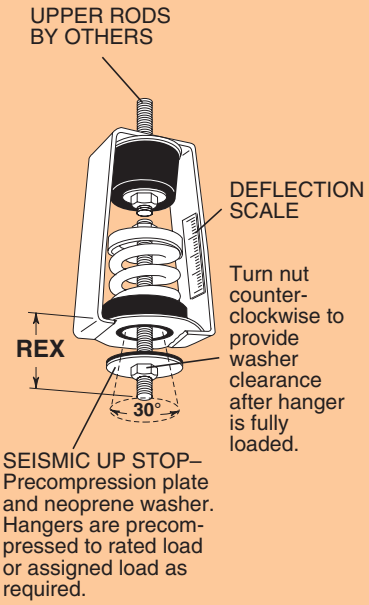
†All springs have additional travel to solid equal to 50% of Rated Deflection.

1"(25mm) DEFLECTION 30° SWING – X, A, B, C, D & F SPRING and DOUBLE DEFLECTION NEOPRENE HANGERS

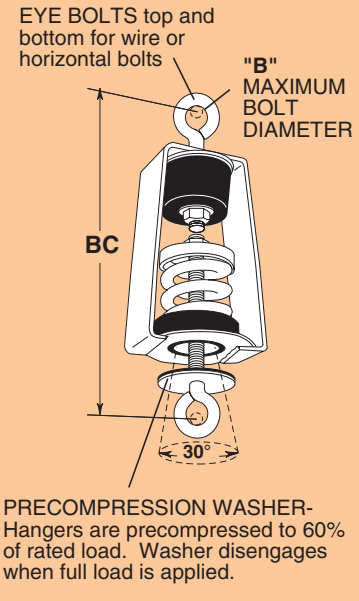
30N FOR ROD ATTACHMENT



PC30N
TYPE 30N PRECOMPRESSED



W30N
TYPE 30N PRECOMPRESSED FOR WIRE OR HORIZONTAL BOLT ATTACHMENT



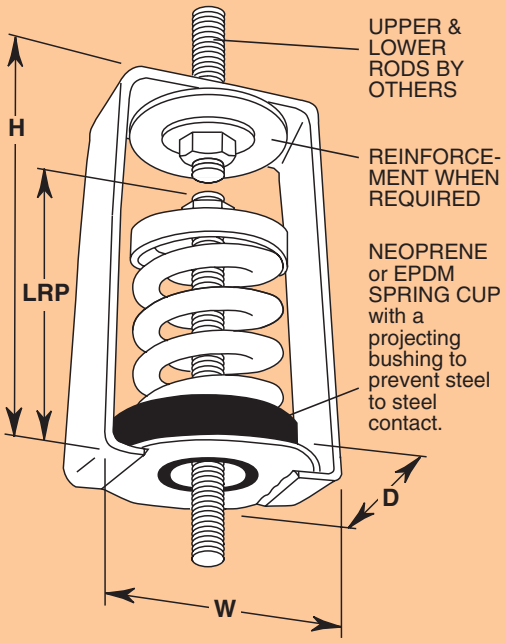
Ratings & Dimensions for 1"(25mm) Deflection Spring and Double Deflection Neoprene Hangers (inches mm)

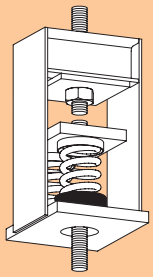
Type	Size	Rated Capacity (lbs)	(kg)	Rated Defl.† (in)	(mm)	Spring Constant†† (lbs/in)	(kg/mm)	Average Defl. Neo-prene	Spring Color/ Stripe	Spring Only Spring OD	Free Height	B	D	H	W	Bolt Centers BC	Lower Rod Penetration LRP	Max. Rod Dia. MRD	Rod Exten-sion REX	Upper Rod Penetration URP
	X-23	23	10	1.50	38	18	0.26		Brown											
	X-33	33	15	1.30	33	30	0.45		Copper											
	X-54	54	24	1.40	36	45	0.67		White											
	X-76	76	34	1.22	31	73	1.10	0.20	Black	1 1/2	2 1/2	3/8	2 1/2	5 1/2	2 7/8	10	3 1/4	3/8	2 1/4	1 3/4
	X-113	113	51	1.20	30	113	1.70	5	Brass	38	64	10	64	140	73	254	83	10	57	44
	X-130	130	59	1.20	30	130	1.97		Purple											
30N-	X-175	175	79	1.20	30	175	2.63		Silver											
	X-210	210	95	1.20	30	210	3.17		Blue											
	A-12	12	5	1.35	34	12	0.15	0.35	Copper	1 3/4	1 7/8	3/8	2 3/4	6 3/4	3 1/4	11 1/4	3 1/4	5/8	2 1/4	2 1/4
	A-18	18	8	1.35	34	18	0.24		Gray											
PC30N-	A-25	25	11	1.35	34	25	0.32	9	Orange	44	48	10	70	171	82	284	83	16	57	57
	A-41	41	19	1.53	39	35	0.49		Pink											
	A-56	56	25	1.49	38	49	0.66	0.35	Black	1 3/4	2c	3/8	2 3/4	6 3/4	3 1/4	11 1/4	3 5/8	5/8	2 1/4	2 1/4
W30N-	A-73	73	33	1.41	36	69	0.92	9	Tan	44	57	10	70	171	82	284	92	16	57	57
	A-95	95	43	1.36	35	94	1.23		Green											
	B-138	138	63	1.67	42	105	1.50		White											
	B-222	222	101	1.51	38	191	2.66		Blue											
	B-278	278	126	1.44	37	255	3.41	0.35	Purple	2 3/8	2 7/8	3/8	4	6 3/4	4 3/4	11 3/4	3 3/4	5/8	2 1/4	2 3/4
	B-336	336	152	1.35	34	336	4.47	9	Silver	60	73	10	102	171	121	298	95	16	57	70
	B-410	410	186	1.42	36	385	5.17		Black											
	B-540	540	245	1.35	34	540	7.21		Yellow											
	C-630	630	286	1.53	39	558	7.33		Gray											
	C-800	800	363	1.40	36	800	10.08	0.40	Orange	2 7/8	3 5/8	—	4 3/4	9	5 1/4	—	5	3/4	2 1/2	3
30N-	C-1010	1010	458	1.50	38	20	12.05	10	Green	73	92	—	121	229	133	—	127	19	64	76
	C-1265	1265	574	1.40	36	1265	15.94		Red											
	D-1575	1575	714	1.63	41	1280	17.41	0.40	Pink	3 3/4	4 7/8	—	4 3/4	12 1/2	5 3/4	—	7	7/8	2 1/2	4 1/4
PC30N-	D-2150	2150	975	1.43	36	2095	27.08	10	Purple	95	124	—	121	318	146	—	178	22	64	108
	F-2760	2760	1252	1.40	36	2760	34.78	0.40	Silver	4 1/2	5 1/8	—	6	14 1/2	6 1/4	—	7	7/8	2 1/2	5
								10		114	130	—	152	368	159	—	178	22	64	127

All springs have additional travel to solid equal to 50% of Rated Deflection. Hanger elements have straight line deflection curves.
†includes double deflection neoprene element. ††applies to spring only.

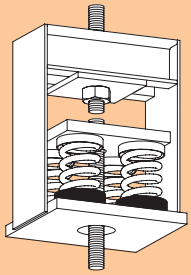
1"(25mm) Deflection X, A & B SPRING HANGERS

HS FOR ROD ATTACHMENT



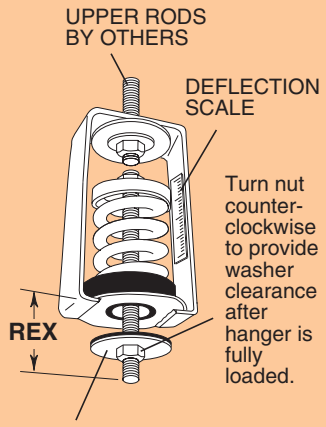


HS-2 with 2 Springs



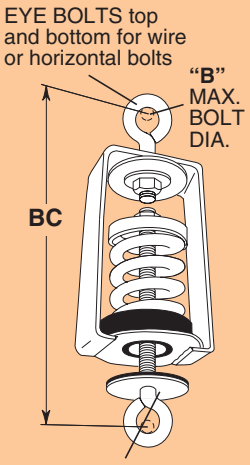
HS-4 with 4 Springs

PCHS
TYPE HS PRECOMPRESSED



SEISMIC UP STOP– Precompression plate and neoprene washer. Hangers are precom-pressed to rated load or assigned load as required.

WHS
TYPE HS PRECOMPRESSED FOR WIRE OR HORIZONTAL BOLT ATTACHMENT



SEISMIC UP STOP– Precompression plate and neoprene washer. Hangers are precompressed to 60% of rated load. Washer disengages when full load is applied.

Ratings & Dimensions for 1"(25mm) Deflection Spring Hangers (inches millimeters)

Type	Size	Rated Capacity (lbs)	(kg)	Rated Defl.† (in)	(mm)	Spring Constant (lbs/in)	(kg/mm)	Spring Color/ Stripe	Spring OD	Only Free Height	B	D	H	W	Bolt Centers BC	Lower Rod Penetration LRP	Max. Rod Dia. MRD	Rod Extension REX
	X-23	23	10	1.30	33	18	0.30	Brown										
	X-33	33	15	1.10	28	30	0.54	Copper										
	X-54	54	24	1.20	30	45	0.80	White										
	X-76	76	34	1.02	25	73	1.36	Black	1 1/2	2 1/2	1/4	2 1/2	4 1/4	2 7/8	5 7/8	3 1/2	3/8	1 3/4
	X-113	113	51	1.00	25	113	2.04	Brass	38	64	6	64	108	73	149	89	10	44
	X-130	130	59	1.00	25	130	2.36	Purple										
	X-175	175	79	1.00	25	175	3.16	Silver										
	X-210	210	95	1.00	25	210	3.80	Blue										
1"	A-12	12	5	1.00	25	12	0.20	Copper										
25mm	A-18	18	8	1.00	25	18	0.32	Gray	1 3/4	1 7/8	3/8	2 3/4	5 3/4	3 1/4	6 1/2	3 1/2	5/8	2 1/4
Defl.	A-25	25	11	1.00	25	25	0.44	Orange	44	48	10	70	146	83	165	89	16	57
	A-41	41	19	1.18	30	35	0.63	Pink										
HS-	A-56	56	25	1.14	30	49	0.83	Black	1 3/4	2 1/4	3/8	2 3/4	5 3/4	3 1/4	6 1/2	4	5/8	2 1/4
	A-73	73	33	1.06	27	69	1.22	Tan	44	57	10	70	146	83	165	102	16	57
	A-95	95	43	1.01	26	94	1.65	Green										
PCHS-	A-45	45	20	1.60	41	28	0.49	Blue										
	A-75	75	34	1.50	38	50	0.89	Orange										
	A-125	125	57	1.33	34	94	1.68	Brown	1 3/4	3	3/8	2 3/4	5 3/4	3 1/4	6 5/8	4	5/8	2 1/2
WHS-	A-200	200	91	1.15	29	174	3.14	Black	44	76	10	70	146	83	168	102	16	64
	A-310	310	141	1.00	25	310	5.64	Yellow										
	A-400	400	181	1.00	25	400	7.24	Green										
	A-510	510	231	1.00	25	510	9.24	Red	1 3/4	3 1/8	3/8	2 3/4	5 3/4	3 1/4	6 5/8	4	5/8	2 1/2
									44	79	10	70	146	83	168	102	16	64
	A-625	625	283	1.00	25	625	11.32	White	1 3/4	3 3/8	3/8	2 3/4	5 3/4	3 1/4	6 5/8	4	5/8	2 1/2
									44	86	10	70	146	83	168	102	16	64
	B-65	65	29	2.10	53	31	0.55	Brown										
	B-85	85	39	2.10	53	40	0.74	White/Black										
	B-115	115	52	2.00	51	57	1.02	Silver										
	B-150	150	68	2.00	51	75	1.33	Orange	2 3/8	4	1/2	4	7 1/4	4 3/4	10	4 1/4	3/4	2 1/4
	B-280	280	127	1.60	41	174	3.10	Green	60	102	13	102	184	121	254	108	19	57
	B-450	450	204	1.31	33	344	6.18	Red										
	B-750	750	340	1.12	28	670	12.14	White										
HS- PCHS-	B-1000	1000	454	1.00	25	1000	18.16	Blue	2 3/8	4	—	4	7 1/4	4 3/4	—	4 1/4	3/4	2 1/4
									60	102	—	102	184	121	—	108	14	57

All springs have additional travel to solid equal to 50% of the rated deflection.

1"(25mm) DEFLECTION C AND MULTIPLE C SPRING HANGERS

Ratings & Dimensions for 1"(25mm) Deflection Spring Hangers (inches millimeters)

Type	Size	Rated Capacity (lbs) (kg)	Rated Defl.† (in) (mm)	Spring Constant (lbs/in)(kg/mm)	Spring Color/ Stripe	Spring Only Spring OD	Spring Only Free Height	B	D	H	W	Bolt Centers BC	Lower Rod Penetration LRP	Max. Rod Dia. MRD	Rod Extension REX
1" 25mm Defl. HS- PCHS-	1-1000	1000 454	1.00 25	1000 18.16	Black	27/8 73	41/8 105	— —	4 102	83/4 222	51/4 133	— —	5 127	7/8 22	21/4 57
	1-1350	1350 612	1.00 25	1350 24.48	Yellow										
	1-1750	1750 794	1.00 25	1750 31.76	Black*										
	1-2100	2100 953	1.00 25	2100 38.12	Yellow*										
	1-2385	2385 1082	1.00 25	2385 43.28	Yellow**										
	1-2650	2650 1202	1.00 25	2650 48.08	Red*										
	1-2935	2935 1331	1.00 25	2935 53.24	Red**										
	2-2700	2700 1225	1.00 25	2700 49.00	Yellow	27/8 73	41/8 105	— —	9 229	10 254	51/4 133	— —	7 178	1 25	41/4 108
	2-3500	3500 1588	1.00 25	3500 63.52	Black*										
	2-4200	4200 1905	1.00 25	4200 76.20	Yellow*										
	4-5400	5400 2449	1.00 25	5400 97.96	Yellow	27/8 73	41/8 105	— —	7 178	13 330	87/8 225	— —	7 178	11/4 32	41/2 114
	4-7000	7000 3175	1.00 25	7000 127.00	Black*										
	4-8400	8400 3810	1.00 25	8400 152.40	Yellow*										
	4-9540	9540 4327	1.00 25	9540 173.08	Yellow**	27/8 73	41/8 105	— —	7 178	13 330	87/8 225	— —	7 178	11/4 32	41/2 114
	4-10600	10600 4808	1.00 25	10600 192.32	Red*										
	4-11740	11740 5325	1.00 25	11740 213.00	Red**										

†All springs have additional travel to solid equal to 50% of the rated deflection.
*with Red inner spring **with Green inner spring

2"(51mm) DEFLECTION B, B2, C2 AND MULTIPLE C2 SPRING HANGERS

Ratings & Dimensions for 2"(51mm) Deflection Spring Hangers (inches millimeters)

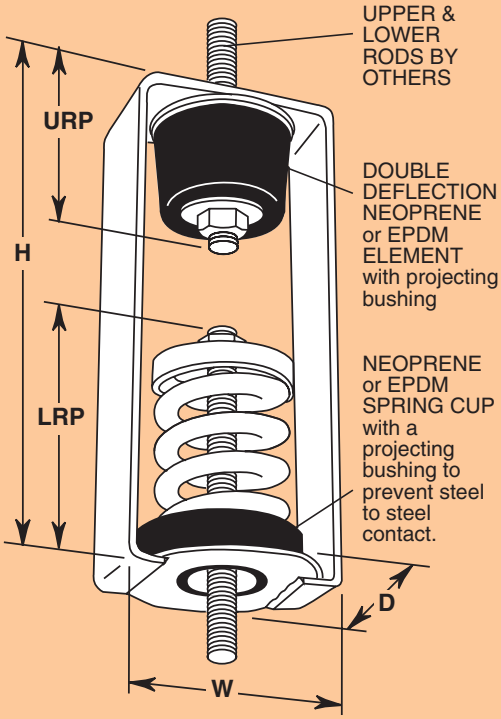
Type	Size	Rated Capacity (lbs) (kg)	Rated Defl.† (in) (mm)	Spring Constant (lbs/in) (kg/mm)	Spring Color/ Stripe	Spring Only Spring OD	Spring Only Free Height	B	D	H	W	Bolt Centers BC	Lower Rod Penetration LRP	Max. Rod Dia. MRD	Rod Extension REX
2" 51mm Defl. HS- PCHS-	B-20	20 9	2.40 61	8 0.15	Tan	23/8 60	4 102	1/2 13	4 102	71/4 184	43/4 121	10 254	51/8 130	3/4 19	21/4 57
	B-26	26 12	2.18 55	12 0.22	White/Blue										
	B-35	35 16	2.20 56	16 0.29	Purple										
	B-50	50 23	2.20 56	24 0.41	White/Red										
	B-65	65 29	2.10 53	31 0.55	Brown										
	B-85	85 39	2.10 53	40 0.74	White/Black										
	B-115	115 52	2.00 51	57 1.02	Silver										
	B-150	150 68	2.00 51	75 1.33	Orange										
WHS-	B2-210	210 95	2.12 54	99 1.76	Silver	23/8 60	41/2 114	1/2 13	4 102	71/4 184	43/4 121	10 254	51/8 130	3/4 19	21/4 57
	B2-290	290 132	2.00 51	144 2.59	Blue										
	B2-450‡	450 204	2.00 51	224 4.00	Tan										
	B2-680‡	680 308	2.00 51	340 6.04	Gray										
HS- PCHS-	C2-125	125 57	2.50 64	50 0.89	Purple	27/8 73	5 127	— —	4 102	83/4 222	51/4 133	— —	51/4 133	7/8 22	21/4 57
	C2-170	170 77	2.40 61	70 1.26	Brown										
	C2-210	210 95	2.30 58	90 1.64	Red										
	C2-260	260 118	2.20 56	120 2.11	White										
	C2-330	330 150	2.00 51	165 2.94	Black										
	C2-460	460 209	2.00 51	230 4.10	Blue										
	C2-610	610 277	2.00 51	305 5.43	Green										
	C2-880‡	880 399	2.00 51	440 7.82	Gray										
	C2-1210‡	1210 549	2.00 51	605 10.76	Silver										
	C2-1540‡	1540 699	2.00 51	770 13.71	Gray*										
	C2-1870‡	1870 848	2.00 51	935 16.63	Silver*										
	2-C2-2420‡	2420 1098	2.00 51	605 21.53	Silver	27/8 73	5 127	— —	9 229	10 254	51/4 133	— —	6 152	1 25	41/4 108
	2-C2-3080‡	3080 1397	2.00 51	770 27.39	Gray*										
	2-C2-3740‡	3740 1696	2.00 51	935 33.25	Silver*										
	4-C2-3520‡	3520 1597	2.00 51	440 31.31	Gray	27/8 73	5 127	— —	7 178	13 330	87/8 225	— —	8 203	11/4 32	41/2 114
	4-C2-4840‡	4840 2195	2.00 51	605 43.04	Silver										
	4-C2-6160‡	6160 2794	2.00 51	770 54.78	Gray*										
	4-C2-7480‡	7480 3393	2.00 51	935 66.53	Silver*										

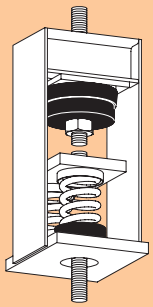
All springs without "‡" have additional travel to solid equal to 50% of the rated deflection.
*with Red inner spring
‡Published ratings allow minimum 25% additional travel to solid. For a full 50% specified minimum use the following ratings:

Size	Derated Capacity (lbs) (kg)	Defl. (in) (mm)	Size	Derated Capacity (lbs) (kg)	Defl. (in) (mm)	Size	Derated Capacity (lbs) (kg)	Defl. (in) (mm)
B2-450	410 186	1.83 46	C2-1870	1560 708	1.67 42	2-C2-3740	3120 1415	1.67 42
B2-680	565 256	1.66 42	2-C2-1760	1600 726	1.82 46	4-C2-4840	4040 1833	1.67 42
C2-880	800 363	1.82 46	2-C2-2420	2020 916	1.67 42	4-C2-6160	5145 2334	1.67 42
C2-1210	1010 458	1.67 42	2-C2-3080	2570 1166	1.67 42	4-C2-7480	6245 2833	1.67 42
C2-1540	1285 583	1.67 42						

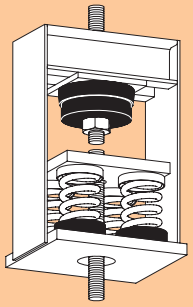
1"(25mm) DEFLECTION X, A & B SPRING and DOUBLE DEFLECTION NEOPRENE HANGERS

DNHS FOR ROD ATTACHMENT



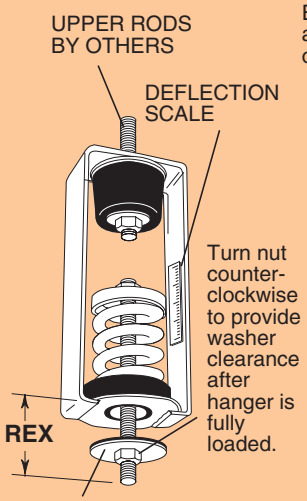


DNHS-2 with 2 Springs



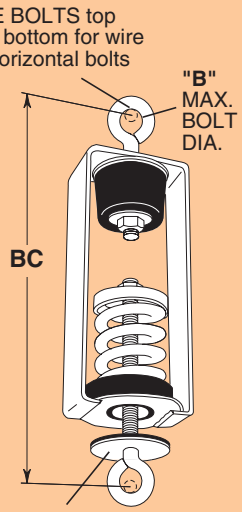
DNHS-4 with 4 Springs

PCDNHS
TYPE DNHS PRECOMPRESSED



PRECOMPRESSION WASHER- Hangers are precompressed to rated load or assigned load as required.

WDNHS
TYPE DNHS PRECOMPRESSED FOR WIRE OR HORIZONTAL BOLT ATTACHMENT



PRECOMPRESSION WASHER- Hangers are pre-compressed to 60% of rated load. Washer disengages when full load is applied.

Ratings & Dimensions for 1"(25mm) Deflection Spring and Double Deflection Neoprene Hangers (inches mm)

Type	Size	Rated Capacity (lbs)	(kg)	Rated Defl.† (in)	(mm)	Spring Constant†† (lbs/in)	(kg/mm)	Average Defl. Neo-prene	Spring Color/ Stripe	Spring Only Spring OD	Free Height	B	D	H	W	Bolt Centers BC	Lower Rod Penetration LRP	Max. Rod Dia. MRD	Rod Exten-sion REX	Upper Rod Penetration URP
1" 25mm Defl. DNHS- PCDNHS- WDNHS-	X-23	23	10	1.50	38	18	0.26	0.20	Brown	11/2	21/2	3/8	21/2	51/2	27/8	71/4	31/4	3/8	13/4	13/4
	X-33	33	15	1.30	33	30	0.45		Copper											
	X-54	54	24	1.40	36	45	0.67		White											
	X-76	76	34	1.22	31	73	1.10		Black											
	X-113	113	51	1.20	30	113	1.70	5	Brass	25	64	10	64	140	73	184	83	10	44	44
	X-130	130	59	1.20	30	130	1.97		Purple											
	X-175	175	79	1.20	30	175	2.63		Silver											
	X-210	210	95	1.20	30	210	3.17		Blue											
	A-12	12	5	1.35	34	12	0.15	0.35	Copper	13/4	17/8	3/8	23/4	63/4	31/4	91/4	31/2	fi/•	21/4	21/4
	A-18	18	8	1.35	34	18	0.24		Gray											
	A-25	25	11	1.35	34	25	0.32	9	Orange	44	48	10	70	171	83	235	89	16	57	57
	A-41	41	19	1.53	39	35	0.49		Pink											
	A-56	56	25	1.49	38	49	0.66	0.35	Black	13/4	21/4	3/8	23/4	63/4	31/4	91/4	4	5/8	21/4	21/4
	A-73	73	33	1.41	36	69	0.92	9	Tan	44	57	10	70	171	83	235	102	16	57	57
	A-95	95	43	1.36	35	94	1.23		Green											
	A-45	45	20	1.95	50	28	0.40		Blue											
	A-75	75	34	1.85	47	50	0.72		Orange											
	A-125	125	57	1.68	43	94	1.33	0.35	Brown	13/4	3	3/8	23/4	63/4	31/4	91/4	4	5/8	21/2	21/4
	A-200	200	91	1.50	38	174	2.39	9	Black	44	76	10	70	171	83	235	102	16	64	57
	A-310	310	141	1.35	34	310	4.15		Yellow											
	A-400	400	181	1.35	34	400	5.32		Green											
	A-510	510	231	1.35	34	510	6.79	0.35	Red	13/4	31/8	3/8	23/4	63/4	31/4	91/4	4	5/8	21/2	21/4
								9		44	79	10	70	171	83	235	102	16	64	57
	A-625	625	283	1.35	34	625	8.32	0.35	White	13/4	33/8	3/8	23/4	63/4	31/4	91/4	4	5/8	21/2	21/4
								9		44	86	10	70	171	83	235	102	16	64	57
	B-65	65	29	2.45	62	31	0.47		Brown*											
	B-85	85	39	2.45	62	40	0.63		White*											
	B-115	115	52	2.35	60	57	0.87	0.35	Silver	23/8	4	1/2	4	9	43/4	11	41/4	3/4	21/4	3
	B-150	150	68	2.35	60	75	1.13		Orange											
	B-280	280	127	1.95	50	174	2.54	9	Green	60	102	13	102	229	121	279	108	19	57	76
	B-450	450	204	1.66	42	344	4.86		Red											
	B-750	750	340	1.47	37	670	9.19		White											
DNHS- PCDNHS-	B-1000	1000	454	1.35	34	1000	13.35	0.35	Blue	23/8	4	—	4	9	43/4	—	41/4	3/4	21/4	3
								9		60	102	—	102	229	121	—	108	19	57	76

All springs have additional travel to solid equal to 50% of Rated Deflection. Neoprene elements have straight line deflection curves.
†includes double deflection neoprene element. ††applies to spring only. *with Black Color Stripe

1"(25mm) DEFLECTION C & MULTIPLE C SPRING and DOUBLE DEFLECTION NEOPRENE HANGERS

Ratings & Dimensions for 1" (25mm) Deflection Spring and Double Deflection Neoprene Hangers

Type	Size	Rated Capacity (lbs)	(kg)	Rated Defl.† (in)	(mm)	Spring Constant†† (lbs/in)	(kg/mm)	Average Defl. Neo-prene	Spring Color/ Stripe	Spring Only Spring OD	Free Height	B	D	H	W	Bolt Centers BC	Lower Rod Penetration LRP	Max. Rod Dia. MRD	Rod Exten-sion REX	Upper Rod Penetration URP
1" 25mm Defl.	1-1000	1000	454	1.40	36	1000	12.61	0.40 10	Black	27/8 73	41/8 105	— —	4 102	11 279	51/4 133	— —	5 127	7/8 22	21/4 57	31/4 83
	1-1350	1350	612	1.40	36	1350	17.00		Yellow											
	1-1750	1750	794	1.40	36	1750	22.06		Black*											
	1-2100	2100	953	1.40	36	2100	26.47		Yellow*											
	1-2385	2385	1082	1.40	36	2385	30.06		Yellow**											
	1-2650	2650	1202	1.40	36	2650	33.30		Red*											
	1-2935	2935	1331	1.40	36	2935	36.97		Red**											
DNHS- PCDNHS-	2-2700	2700	1225	1.40	36	2700	34.03	0.40 10	Yellow	27/8 73	41/8 105	— —	9 229	12 305	51/4 133	— —	7 178	1 25	41/4 108	33/4 95
	2-3500	3500	1588	1.40	36	3500	44.11		Black*											
	2-4200	4200	1905	1.40	36	4200	52.92		Yellow*											
	4-5400	5400	2449	1.40	36	5400	68.03	0.40 10	Yellow	27/8 73	41/8 105	— —	7 178	15 381	87/8 225	— —	7 178	11/4 32	41/2 114	6 152
	4-7000	7000	3175	1.40	36	7000	88.19		Black*											
	4-8400	8400	3810	1.40	36	8400	105.83		Yellow*											
	4-9540	9540	4327	1.40	36	9540	20.19	0.40 10	Yellow**	27/8 73	41/8 105	— —	7 178	15 381	87/8 225	— —	7 178	11/4 32	41/2 114	6 152
	4-10600	10600	4808	1.40	36	10600	133.56		Red*											
	4-11740	11740	5325	1.40	36	11740	147.92		Red**											

All springs have additional travel to solid equal to 50% of Rated Deflection. Neoprene elements have straight line deflection curves.
*with Red inner spring **with Green inner spring †includes double deflection neoprene element. ††applies to spring only.

2"(51mm) DEFLECTION B, B2, C2 & MULTIPLE C2 SPRING and DOUBLE DEFL. NEOPRENE HANGERS

Ratings & Dimensions for 2"(51mm) Deflection Spring and Double Deflection Neoprene Hangers (inches mm)

Type	Size	Rated Capacity (lbs)	(kg)	Rated Defl.† (in)	(mm)	Spring Constant†† (lbs/in)	(kg/mm)	Average Defl. Neo-prene	Spring Color/ Stripe	Spring Only Spring OD	Free Height	B	D	H	W	Bolt Centers BC	Lower Rod Penetration LRP	Max. Rod Dia. MRD	Rod Exten-sion REX	Upper Rod Penetration URP
2" 51mm Defl.	B-20	20	9	2.75	70	8	0.13		Tan	23/8 60	4 102	1/2 13	4 102	9 229	43/4 121	11 279	51/8 130	3/4 19	21/4 57	3 76
	B-26	26	12	2.53	64	12	0.19		White①											
	B-35	35	16	2.55	65	16	0.25		Purple											
	B-50	50	23	2.55	62	24	0.35	0.35 89	White②											
	B-65	65	29	2.45	62	31	0.47		Brown											
	B-85	85	39	2.45	62	40	0.63		White③											
DNHS-	B-115	115	52	2.35	60	57	0.87		Silver											
	B-150	150	68	2.35	60	75	1.13		Orange											
PCDNHS-	B2-210	210	95	2.47	63	99	1.51		Silver	23/8 60	41/2 114	1/2 13	4 102	9 229	43/4 121	131/2 343	51/8 130	3/4 19	21/4 57	3 76
	B2-290	290	132	2.35	60	144	2.20	0.35 89	Blue											
WDNHS-	B2-450‡	450	204	2.35	60	224	3.40		Tan											
	B2-680‡	680	308	2.35	60	340	5.13		Gray											
DNHS-	C2-125	125	57	2.90	74	50	0.77		Purple	27/8 73	5 127	— —	4 102	11 279	51/4 133	— —	51/4 133	7/8 22	21/4 57	31/4 83
	C2-170	170	77	2.80	71	70	1.08		Brown											
	C2-210	210	95	2.70	69	90	1.38		Red											
	C2-260	260	118	2.60	66	120	1.79		White											
	C2-330	330	150	2.40	61	165	2.46	0.40 10	Black											
	C2-460	460	209	2.40	61	230	3.43		Blue											
	C2-610	610	277	2.40	61	305	4.54		Green											
	C2-880‡	880	399	2.40	61	440	6.54		Gray											
	C2-1210‡	1210	349	2.40	61	605	5.72		Silver											
	C2-1540‡	1540	699	2.40	61	770	11.46		Gray*											
	C2-1870‡	1870	848	2.40	61	935	13.90		Silver*											
PCDNHS-	2-C2-2420‡	2420	1098	2.40	61	605	18.00	0.40 10	Silver	27/8 73	5 127	— —	9 229	12 305	51/4 133	— —	6 154	1 25	41/4 108	33/4 95
	2-C2-3080‡	3080	1397	2.40	61	770	22.90		Gray*											
	2-C2-3740‡	3740	1696	2.40	61	935	27.80		Silver*											
	4-C2-3520‡	3520	1597	2.40	61	440	26.18		Gray	27/8 73	5 127	— —	7 178	15 381	87/8 225	— —	8 203	11/4 32	41/2 114	6 152
	4-C2-4840‡	4840	2195	2.40	61	605	35.98	0.40 10	Silver											
	4-C2-6160‡	6160	2794	2.40	61	770	45.80		Gray*											
	4-C2-7480‡	7480	3393	2.40	61	935	55.62		Silver*											

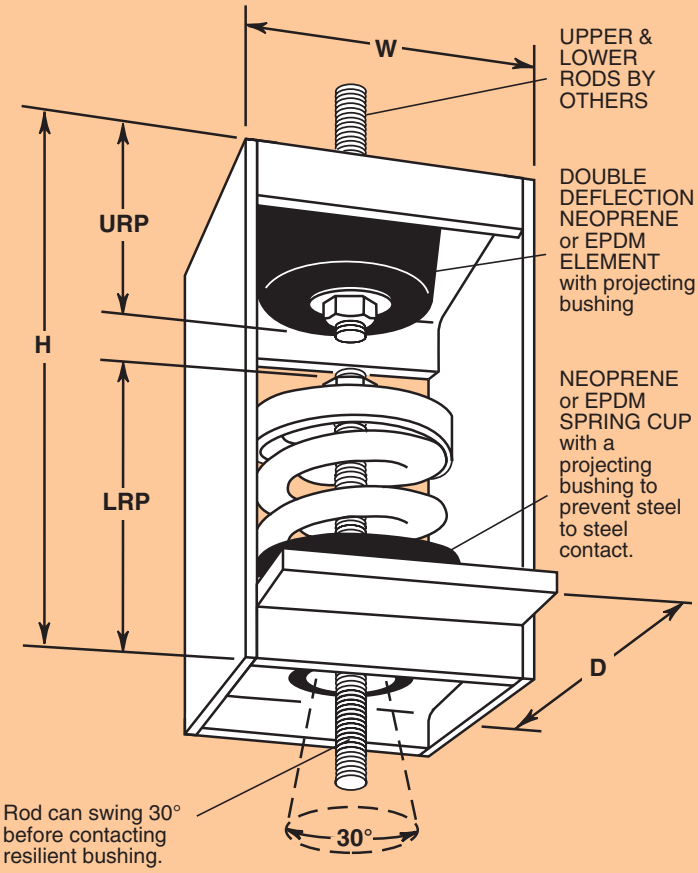
All springs without "‡" have additional travel to solid equal to 50% of Rated Deflection. Neoprene elements have straight line deflection curves.
①with Blue stripe ②with Red stripe ③with Black stripe *with Red inner spring

†includes double deflection neoprene element. ††applies to spring only.
‡Published ratings allow minimum 25% additional travel to solid. For a full 50% specified minimum use the following ratings:

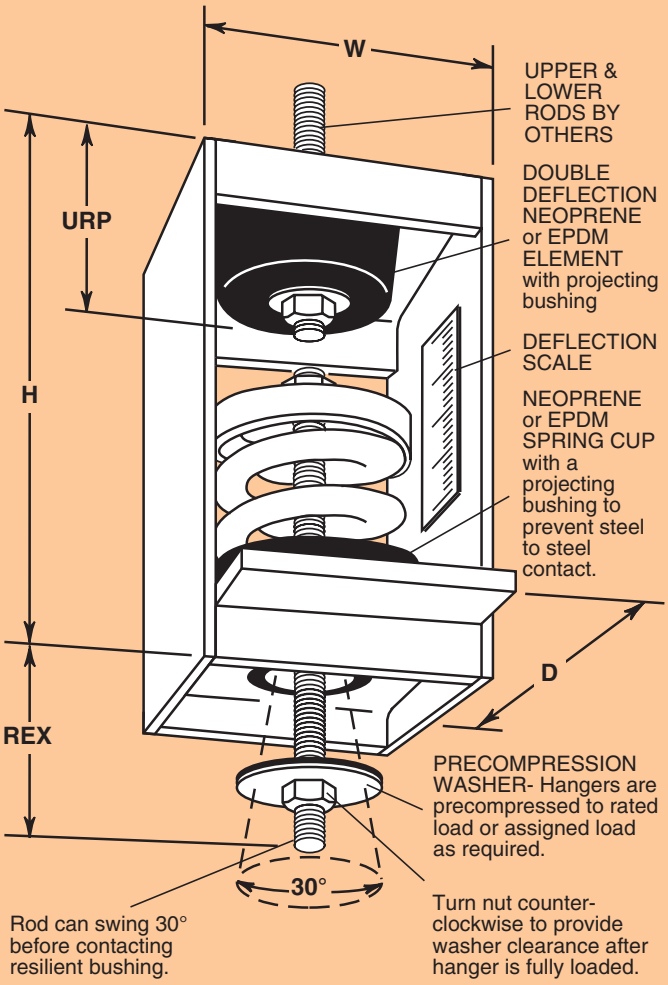
Size	Derated Capacity (lbs)	(kg)	Defl. (in)	(mm)	Size	Derated Capacity (lbs)	(kg)	Defl. (in)	(mm)	Size	Derated Capacity (lbs)	(kg)	Defl. (in)	(mm)
B2-450	410	186	1.83	46	C2-1870	1560	708	1.67	42	2-C2-3740	3120	1415	1.67	42
B2-680	565	256	1.66	42	2-C2-1760	1600	726	1.82	46	4-C2-4840	4040	1833	1.67	42
C2-880	800	363	1.82	46	2-C2-2420	2020	916	1.67	42	4-C2-6160	5145	2334	1.67	42
C2-1210	1010	458	1.67	42	2-C2-3080	2570	1166	1.67	42	4-C2-7480	6245	2833	1.67	42
C2-1540	1285	583	1.67	42										

2"(51mm), 3"(76mm), 4"(102mm) & 5"(127mm) DEFLECTION 30° SWING - 100 SERIES SPRING and DOUBLE DEFLECTION NEOPRENE HANGERS

30N-100 FOR ROD ATTACHMENT



PC30N-100 TYPE 30N PRECOMPRESSED



NOTE – Illustration shows typical construction. Components vary depending on capacity.

SRD is the Smallest (Minimum) Rod Diameter which will maintain spring stability.

Ratings & Dimensions for 2"(51mm) Deflection Spring and Double Deflection Neoprene Hangers (inches mm)

Type	Size	Rated Capacity (lbs) (kg)	Rated Defl.† (in) (mm)	Spring Constant†† (lbs/in)(kg/mm)	Spring Color/ Stripe	Spring Only Spring OD	Spring Only Free Height	D	H	W	Lower Rod Penetration LRP	Max. Rod Dia. MRD	Min. Rod Dia. SRD	Rod Exten-sion REX	Upper Rod Penetration URP
2" 51mm Defl. 30N- PC30N-	101	125 57	2.90 74	50 0.77	Purple	33/4 95	53/4 146	5 127	131/2 343	6 152	71/2 191	7/8 22	5/8 16	41/2 114	31/4 83
	102	200 91	2.90 74	80 1.23	Brown	33/4 95	53/4 146								
	103	310 141	2.90 74	125 1.91	Pink	33/4 95	53/4 146								
	104	500 227	2.90 74	200 3.07	Green	33/4 95	53/4 146								
	105	740 336	2.80 71	310 4.73	Red	33/4 95	53/4 146								
	106	1050 476	2.50 64	500 7.44	White	33/4 95	57/8 149								
	107	1400 635	2.40 61	700 10.41	Blue	33/4 95	57/8 149								
	108	1660 753	2.45 62	810 12.15	Silver	41/2 114	63/4 171	6 152	153/8 391	71/4 184	11 279	7/8 22	5/8 16	5 127	31/4 83
	109	2250 1021	2.40 61	1125 16.74	Orange	41/2 114	71/2 191								
	110	3000 1361	2.40 61	1500 22.31	Gray	5 127	71/2 191	6 152	16 406	71/4 184	111/2 292	7/8 22	3/4 19	5 127	31/4 83
	111	4000 1814	2.40 61	2000 29.74	Tan	5 127	71/2 191								
	112	5300 2404	2.40 61	2665 39.41	Black	51/2 140	81/2 216	7 178	17 432	91/4 235	121/4 311	11/8 29	7/8 22	51/2 140	31/4 83
	113	7100 3221	2.40 61	3550 52.80	Yellow	6 152	83/4 222								
	114	9300 4218	2.40 61	4650 69.15	Blue/Orng	63/4 171	10 254	8 203	22 559	10 254	151/2 394	11/8 29	1 25	51/2 140	61/2 165
	115	12600 5715	2.40 61	6300 93.69	Blue/Red	63/4 171	10 254								

All springs have additional travel to solid equal to 50% of Rated Deflection. Neoprene elements have straight line deflection curves.

†includes double deflection neoprene element.

††applies to spring only.

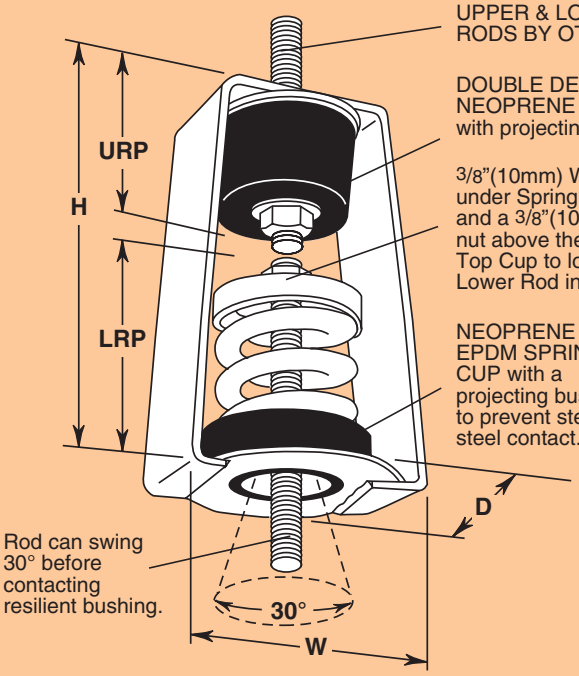
Ratings & Dimensions for 3"(76mm), 4"(102mm) & 5"(127mm) Deflection Spring and Double Deflection Neoprene Hangers (inches/mm)

Type	Size	Rated Capacity (lbs) (kg)	Rated Defl.† (in) (mm)	Spring Constant†† (lbs/in)(kg/mm)	Spring Color/ Stripe	Spring Only Spring OD	Spring Only Free Height	D	H	W	Lower Rod Penetration LRP	Max. Rod Dia. MRD	Min. Rod Dia. SRD	Rod Extension REX	Upper Rod Penetration URP
	See 3" 76mm Low Capacity Hangers Page 12														
3" 76mm Defl. 30N- PC30N-	126	195 88	3.65 93	60 0.95	Purple	3 3/4 95	6 3/8 162	5 127	13 1/2 343	6 152	8 203	7/8 22	5/8 16	4 1/2 114	3 1/4 83
	127	280 127	3.65 93	85 1.37	Brown	3 3/4 95	6 1/2 165								
	128	390 177	3.65 93	120 1.90	Orange	4 102	6 1/2 165								
	129	520 236	3.65 93	160 2.54	Green	4 102	7 178	5 127	13 1/2 343	6 152	8 1/2 203	5/8 22	5/8 16	4 1/2 114	3 1/4 83
	130	710 322	3.65 93	220 3.46	Red	4 1/2 114	7 1/4 184	6 152	15 3/8 391	7 1/4 184	10 1/4 260	7/8 22	5/8 16	4 1/2 114	3 1/4 83
	131	940 426	3.65 93	290 4.58	White	4 1/2 114	7 1/2 191	6 152	15 3/8 391	7 1/4 184	11 279	7/8 22	5/8 16	4 1/2 114	3 1/4 83
	132	1280 581	3.65 93	395 6.25	Blue	5 127	7 7/8 200	6 152	15 3/8 391	7 1/4 184	11 1/4 286	7/8 22	5/8 16	4 1/2 114	3 1/4 83
	133	1770 803	3.65 93	545 8.63	Black	5 1/2 140	9 1/4 235	7 1/2 191	17 1/2 445	8 1/4 210	12 1/4 311	7/8 22	3/4 19	4 1/2 114	3 1/4 83
	134	2490 1129	3.65 93	765 2.14	Yellow	5 1/2 140	9 1/4 235								
	135	3300 1497	3.65 93	1000 16.10	Gray	6 152	9 1/2 241								
	136	4500 2041	3.65 93	1370 21.95	Blue/ Brown	6 3/4 171	9 3/4 235	8 203	20 508	9 229	14 356	7/8 22	7/8 22	5 127	3 1/2 89
	137	6200 281	3.65 93	1900 30.24	Blue/Orng	7 3/4 197	10 7/8 276	9 229	24 610	11 279	16 406	1 1/8 29	1 25	5 1/2 140	6 1/2 165
	138	8300 3765	3.65 93	2560 40.48	Blue/Red	7 3/4 197	11 279								
	139	11400 5171	3.65 93	3500 55.60	Blue/White	7 3/4 197	12 1/4 311	9 229	25 1/2 648	11 279	17 1/2 445	1 1/8 29	1 25	5 1/2 140	6 1/2 165
	See 4" 102mm Low Capacity Hangers Page 12														
4" 102mm Defl. 30N- PC30N-	150	240 109	4.78 121	55 0.16	Purple	5 127	8 3/8 213	6 152	15 3/8 391	7 1/4 184	11 279	7/8 22	5/8 16	5 127	3 1/4 83
	151	330 150	4.78 121	75 1.24	Brown	5 127	8 1/2 213								
	152	420 191	4.78 121	95 1.58	Orange	5 127	8 3/8 213								
	153	530 240	4.78 121	120 1.98	Green	5 127	8 3/8 213								
	154	680 308	4.78 121	155 2.55	Red	6 152	8 7/8 225	7 1/2 181	17 1/2 445	8 1/4 210	13 1/4 337	7/8 22	5/8 16	5 127	3 1/4 83
	155	880 399	4.78 121	200 3.30	White	6 152	9 1/8 232								
	156	1120 508	4.78 121	255 4.20	Blue	6 152	9 7/8 251								
	157	1420 644	4.78 121	325 5.32	Black	6 152	10 254								
	158	1840 835	4.78 121	420 5.32	Yellow	6 3/4 171	10 3/8 264	8 203	20 508	9 229	14 1/4 362	7/8 22	5/8 16	5 127	3 1/4 83
	159	2370 1075	4.78 121	540 6.90	Gray	6 3/4 171	11 1/8 283								
	160	3000 1361	4.78 121	695 11.25	Blue/Brwn	7 3/4 197	10 7/8 276	9 229	24 610	11 279	17 432	1 1/8 29	3/4 19	5 1/2 140	6 1/2 165
	161	3900 1769	4.78 121	895 14.62	Blue/Red	7 3/4 197	11 3/8 289	9 229	24 610	11 279	17 432	1 1/8 29	3/4 19	6 1/2 165	6 1/2 165
	162	5100 2313	4.78 121	1155 19.52	Blue/Orng	8 3/4 222	11 1/2 292	9 1/2 241	26 1/2 673	12 1/4 311	19 483	1 1/8 29	1 25	6 1/2 165	6 1/2 165
	163	6500 2948	4.78 121	1485 24.38	Blue/White	8 3/4 222	13 1/4 337								
	164	8400 3810	4.78 121	1910 31.49	Blue/Silver	8 3/4 222	13 3/8 340								
	165	10800 4899	4.78 121	2455 40.49	Blue/Gray	9 3/8 238	14 1/8 359	10 254	28 711	12 1/4 311	21 533	1 1/8 29	1 1	6 1/2 165	6 1/2 165
5" 127mm Defl. 30N- PC30N-	174	70 122	5.71 145	50 0.84	Purple	6 152	9 7/8 251	7 178	16 406	9 1/4 235	12 1/2 318	3/4 19	5/8 16	5 127	3 1/4 83
	175	320 145	5.71 145	60 1.00	Brown	6 152	10 1/16 256								
	176	370 168	5.71 145	70 1.16	Orange	6 152	10 254								
	177	460 209	5.78 147	85 1.42	Green	6 152	10 1/2 267								
	178	560 254	5.78 147	105 1.73	Red	6 152	10 3/4 273								
	179	670 304	5.78 147	125 2.07	White	6 3/4 171	11 1/16 281	8 203	19 483	10 254	15 381	3/4 19	5/8 16	5 1/2 140	3 1/2 89
	180	830 376	5.78 147	155 2.56	Blue	6 3/4 171	11 3/8 289								
	181	1000 454	5.78 147	185 3.09	Black	6 3/4 171	11 1/8 283								
	182	1240 562	5.77 147	230 3.82	Yellow	6 3/4 171	11 3/8 289								
	183	1500 680	5.77 147	280 4.63	Gray	7 3/4 197	12 7/16 316	9 229	21 533	11 1/4 286	17 432	7/8 22	3/4 19	6 152	3 1/2 89
	184	1830 830	5.77 147	340 5.65	Pink	7 3/4 197	11 7/8 302								
	185	2230 1012	5.77 147	415 6.88	Silver	7 3/4 197	12 305								
	186	2710 1229	5.77 147	505 8.36	Tan	7 3/4 197	12 3/4 324								
	187	3300 1497	5.77 147	615 10.18	Blue/Orng	8 3/4 222	12 3/4 324	9 1/2 241	26 1/2 673	12 1/4 311	19 483	7/8 22	7/8 22	6 152	6 1/2 165
	188	4100 1860	5.77 147	755 12.65	Blue/Red	8 3/4 222	13 3/8 340								
	189	4900 2223	5.77 147	915 15.12	Blue/White	9 1/16 230	13 7/16 341								
	190	6000 1852	5.77 147	1120 18.52	Blue/Yelw	9 1/2 241	14 5/8 371	10 254	28 711	12 1/4 311	21 533	1 1/8 29	1 29	6 1/2 165	6 1/2 165
	191	7300 2252	5.77 147	1365 22.52	Blue/Silvr	9 1/2 241	15 3/16 386								
	192	9000 2777	5.77 147	1670 27.77	Blue/Gray	10 1/4 260	15 5/8 397	10 1/2 267	30 762	13 1/4 337	23 584	1 1/8 29	1 25	6 1/2 165	6 1/2 165
	193	11000 3395	5.77 147	2040 33.95	Blue/Tan	10 1/4 260	16 406								

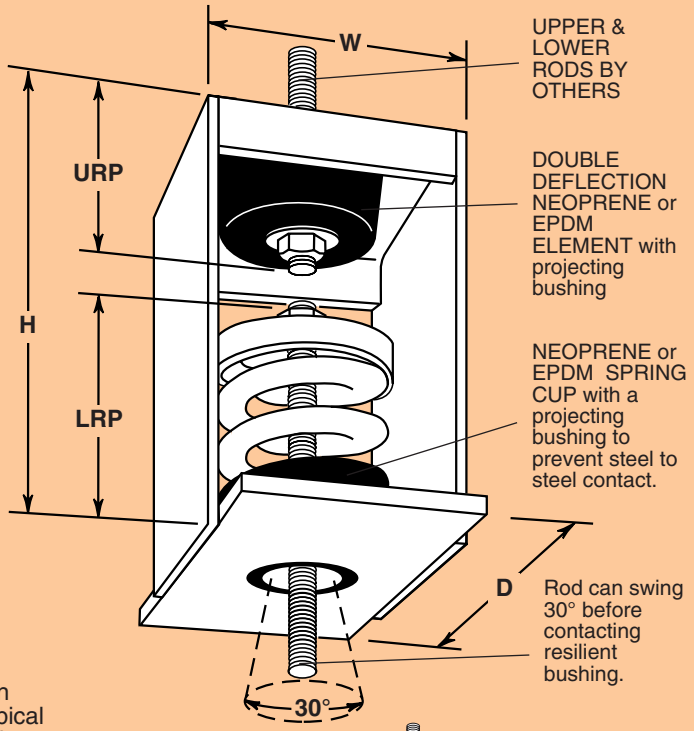
All springs have additional travel to solid equal to 50% of Rated Deflection. Neoprene elements have straight line deflection curves.
†includes double deflection neoprene element.
††applies to spring only.

3”(76mm) & 4”(102mm) DEFLECTION 30° SWING – LOW CAPACITY 1000 SERIES SPRING and DOUBLE DEFLECTION NEOPRENE HANGERS

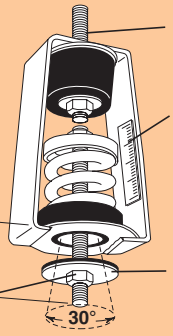
30N-1000 3” FOR ROD ATTACHMENT



30N-1000 4” FOR ROD ATTACHMENT



PC30N-1000
TYPE 30N PRECOMPRESSED

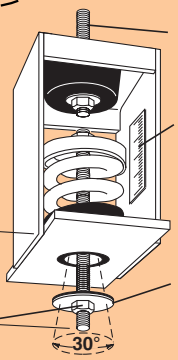


NOTE –

Illustration shows typical construction. Components may vary with deflection and capacity.

SRD is the Smallest (Minimum) Rod Diameter which will maintain spring stability.

PC30N-1000
TYPE 30N PRECOMPRESSED

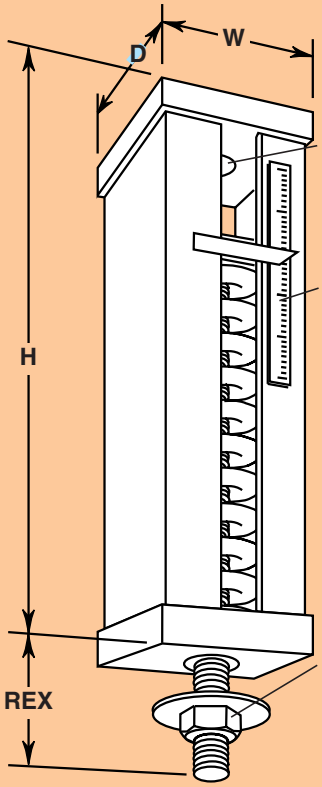


Ratings & Dimensions for 3”(76mm)& 4”(102mm) Deflection Spring and Double Deflection Neoprene Hangers

Type	Size	Rated Capacity (lbs)	(kg)	Rated Defl.† (in)	(mm)	Spring Constant†† (lbs/in)	(kg/mm)	Spring Color/ Stripe	Spring Only Spring OD	Free Height	D	H	W	Lower Rod Penetration LRP	Max. Rod Dia. MRD	Min. Rod Dia. SRD	Rod Exten-sion REX	Upper Rod Penetration URP
	1082	15	7			5	0.09	Silver/Red		5 127								
3”	1083	24	11			8	0.14	Silver/Blue		5 1/8 130								
76mm	1084	33	15			11	0.20	Silver/Green		5 1/8 130								
Defl.	1085	48	22			16	0.29	Black		5 1/8 130								
	1086	60	27	3.40		20	0.35	Grey	2 7/8	5 1/4 133	4 3/4	10	5 1/4	7	3/8	3/8	2 3/4	2
30N-	1087	75	34	86		25	0.45	Blue	73	5 1/4 133	120	254	133	178	10	10	70	51
	1088	111	50			37	0.66	Green		5 1/4 133								
PC30N-	1089	150	68			50	0.90	Purple		5 1/2 140								
	1090	195	89			65	1.17	Tan		5 7/8 149								
	1091	270	123			90	1.62	Yellow		6 152								
4”	1006	50	23			11	0.19	Black/Brown		7 1/4 184								
102mm	1007	65	29			15	0.24	Black/Orange		7 3/8 187								
Defl.	1008	80	36	4.78		18	0.30	Black/Green	4 1/2	7 1/2 191	6	14	7 1/4	10	3/4	5/8	5	3 1/4
	1009	100	45			23	0.37	Black/Red		7 5/8 194								
30N-	1010	130	59	114		30	0.49	Black/White	114	7 3/4 197	152	356	184	254	19	16	127	83
PC30N-	1011	160	73			37	0.60	Black/Yellow		8 203								
	1012	190	86			46	0.71	Black/Silver		8 1/4 210								

All springs have additional travel to solid equal to 50% of Rated Deflection. Neoprene elements have straight line deflection curves.
†includes double deflection neoprene element.
††applies to spring only.

HES PIPE EXPANSION HANGERS (Not suitable for vibration isolation)



HES hangers are designed with A, B or C springs in series.

Ratings & Dimensions for 4"(102mm) Deflection Expansion Hangers (in mm)

Type	Size	Rated Capacity (lbs) (kg)	Rated Defl. (in) (mm)	Spring Constant (lbs/in)(kg/mm)	Spring Color/ Stripe	D	H	W	Rod Extension REX	Required Rod Dia. RRD
HES-	A-45	45 20	6.40 163	7 0.12	Blue					
	A-75	75 34	6.00 152	13 0.22	Orange					
	A-125	125 57	5.32 135	23 0.42	Brown					
	A-200	200 91	4.60 117	43 0.78	Black	3 1/2	15 3/4	4	6	5/8
	A-310	310 141	4.00 102	78 1.38	Yellow	89	400	102	152	16
	A-400	400 181	4.00 102	100 1.77	Green					
	A-510	510 231	4.00 102	128 2.26	Red					
	A-625	625 283	4.00 102	156 2.77	White					
	B-750	750 340	4.50 114	167 2.98	White	4	20 1/2	4 1/2	5 1/2	3/4
	B-1000	1000 454	4.00 102	250 4.45	Blue	102	521	114	140	19
	C-1350	1350 612	4.00 102	338 6.00	Yellow					
	C-1750	1750 794	4.00 102	438 7.78	Black					
	C-2100	2100 953	4.00 102	525 9.34	Yellow*	4	20 1/2	4 1/2	5 1/2	3/4
	C-2385	2385 1082	4.00 102	596 10.61	Yellow**	102	521	114	140	19
	C-2650	2650 1202	4.00 102	663 11.78	Red*					
	C-2935	2935 1331	4.00 102	734 13.05	Red**					

All springs have additional travel to solid equal to 50% of Rated Deflection. Hangers may overtravel rated deflections by 40%. Hangers are preset at factory for specified loads.
*with Red inner spring
**with Green inner spring

HES HANGER SELECTION PROCEDURE

HES Hangers are installed at riser suspension points to control load shifts as the riser expands or contracts. If a 120 foot(37m) steel riser goes through a temperature increase of 150 F(66 C), the piping will expand 1.4"(36mm). If the piping had an anchor point in the basement, the piping bracket at the 60'(18m) elevation and the top bracket would rise 0.7"(18mm) and 1.4"(36mm), respectively. This travel would transfer the entire piping weight to the basement as the piping would lift off non-resilient support points. Standard 1"(25mm) deflection hangers would lose 70% of their load at the 60 foot(18m) point and the complete load at the top of the run. Therefore, HES Hangers are needed because of their higher initial deflection and travel capability. If HES Hangers with 4"(102mm) initial deflection were selected, the hanger at the top would lose only 35% of its load and the intermediate hanger only 18%. This would substantially reduce the load shift to the basement anchor.

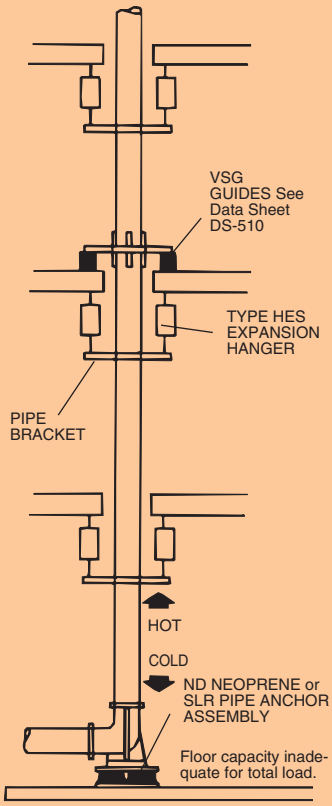
Special larger deflection hangers would be even more effective. In handling this type of problem, it is preferable to anchor the riser at the center of the run. If this had been done in the piping problem described above, each end would have expanded outward only 0.7"(18mm) instead of the 1.4"(36mm). The upper hangers would have lost 18% of their load since the springs would be unloaded the 0.7(18mm) of an inch.

The springs in the hangers on the lower end of the piping would have been compressed 0.7(18mm) of an inch thereby increasing their load by 18%. With this loss and gain situation, the piping always remains balanced at the neutral point.

EXAMPLE-

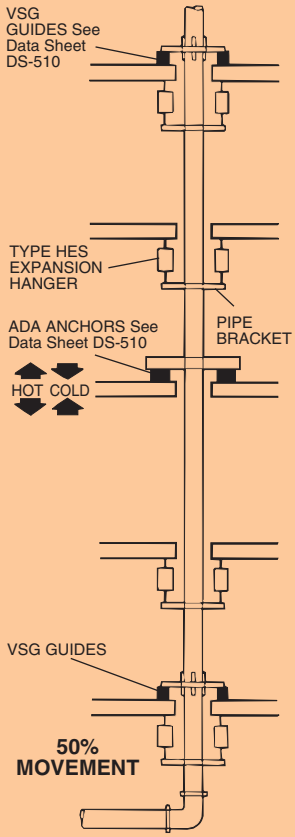
6"(152mm) Schedule 40 piping weighing 36 pound per foot(4.94kg/m) with water. The run of 120 feet(37m) would weight a total of 4320 pounds (1960 kgs). If the piping is anchored at the center we might select support points at the lower end, the 30(9m) and 90 foot(27m) marks and at the top. Therefore, we would have 4 locations or a total of 8 hangers supporting 504 pounds(229kg) each. The preliminary selection would be 8 HESB-750 Hangers. The initial hanger deflection would be 540 pounds(245kg) divided by the spring constant of 167 pound/inch(2.98 kg/mm) which equals 3.23"(82mm). The total spring deflection would be the initial deflection plus the expansion travel or 3.23"(82mm) plus 0.7"(18mm) which equals 3.93"(100mm). The hanger must then be checked to see if this deflection is within the range of the selected hanger. Since the HES Hangers can over travel the rated deflection by 40% the HESB-750 can travel 4.50(114mm) X 1.4(36mm) or 6.30"(160mm). Therefore, the selection is correct. If this number were smaller than the required 3.93(100mm) it would be necessary to use the next larger hanger and check again. (Actually this hanger needed no checking as the 4.50"(114mm) rated deflection already met the conditions).

100% MOVEMENT



PIPE ANCHORED AT ONE END

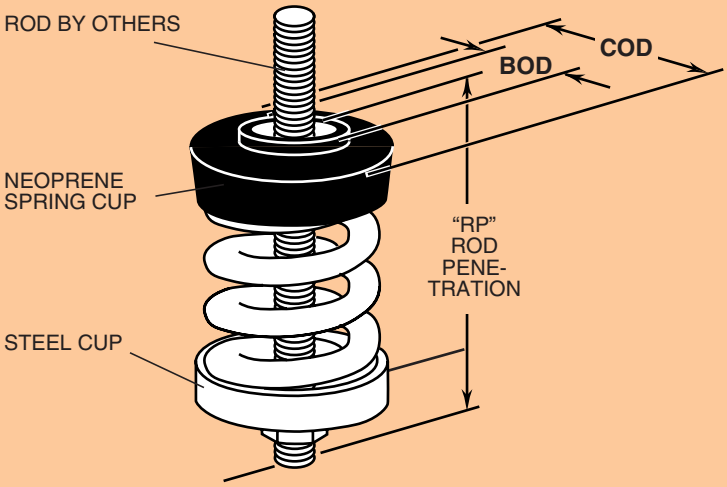
50% MOVEMENT



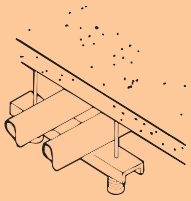
PIPE ANCHORED AT MID POINT

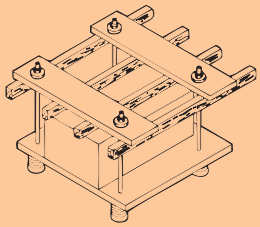
Piping installed at ambient temperature, expansion movement is directed away from the anchor at higher steam or water temperatures and toward the anchor when chilled water is circulated.

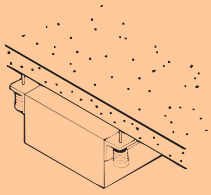
IM 1"(25mm) DEFLECTION SIMPLE SPRING HANGERS

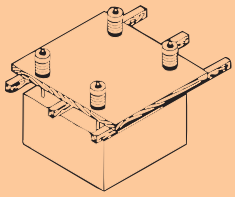


TYPICAL IM EQUIPMENT INSTALLATION AND PIPE HANGER ARRANGEMENTS


Pipe Trapeze


Cradled Unit


Unit with Large Angle Clips


Unit Suspended From Above

Ratings & Dimensions for 1"(25mm) Deflection Simple Spring Hangers (inches mm)

Type	Size	Rated Capacity (lbs) (kg)	Rated Defl. (in) (mm)	Spring Constant (lbs/in) (kg/mm)	Spring Color/ Stripe	Spring Only Spring OD	Spring Only Free Height	Bushing Outside Dia. BOD	Cup Outside Dia. COD	Max. Rod Dia MRD	Rod Penetration RP
1" 25mm Defl. IM-	X-23	23 10	1.30 33	18 0.30	Brown						
	X-33	33 15	1.10 28	30 0.54	Copper						
	X-54	54 24	1.20 30	45 0.80	White						
	X-76	76 34	1.02 25	73 1.36	Black	1 1/2	2 1/2	1 1/8	2	3/8	2 3/4
	X-113	113 51	1.00 25	113 2.04	Brass	25	64	29	51	10	69
	X-130	130 59	1.00 25	130 2.36	Purple						
	X-175	175 79	1.00 25	175 3.16	Silver						
	X-210	210 95	1.00 25	210 3.80	Blue						
	A-12	12 5	1.00 25	12 0.20	Copper	1 3/4	1 7/8	1 1/4	2 1/2	3/8	2 1/4
	A-18	18 8	1.00 25	18 0.32	Gray	44	48	32	38	10	57
	A-25	25 11	1.00 25	25 0.44	Orange						
	A-45	45 20	1.60 41	28 0.49	Blue						
	A-75	75 34	1.50 38	50 0.89	Orange						
	A-125	125 57	1.33 34	94 1.68	Brown	1 3/4	3	1 1/4	2 1/2	1/2	3 3/8
	A-200	200 91	1.15 29	174 3.14	Black	44	76	32	64	13	86
	A-310	310 141	1.00 25	310 5.64	Yellow						
	A-400	400 181	1.00 25	400 7.24	Green						
	A-510	510 231	1.00 25	510 9.24	Red	1 3/4	3 1/8	1 1/4	2 1/2	1/2	3 1/2
						44	79	32	64	13	89
	A-625	625 283	1.00 25	625 11.32	White	1 3/4	3 3/8	1 1/4	2 1/2	1/2	3 3/4
						44	86	32	64	13	95
	B-65	65 29	2.10 53	31 0.55	Brown						
	B-85	85 39	2.10 53	40 0.74	White/Blk						
	B-115	115 52	2.00 51	57 1.02	Silver						
	B-150	150 68	2.00 51	75 1.33	Orange						
	B-280	280 127	1.60 41	174 3.10	Green	2 3/8	4	1 7/8	3 1/8	3/4	5
	B-450	450 204	1.31 33	344 6.18	Red	60	102	48	79	19	127
	B-750	750 340	1.12 28	670 12.14	White						
	B-1000	1000 454	1.00 25	1000 18.16	Blue						
	B-1250	1250 567	1.00 25	1250 22.68	Gray						
	B-1650	1650 748	1.00 25	1650 29.92	Black						
	C-1000	1000 454	1.00 25	1000 18.16	Black						
	C-1350	1350 612	1.00 25	1350 24.48	Yellow						
	C-1750	1750 794	1.00 25	1750 31.76	Black*						
	C-2100	2100 953	1.00 25	2100 38.12	Yellow*	2 3/8	4 1/8	2 3/8	3 5/8	3/4	5
	C-2385	2385 1082	1.00 25	2385 43.28	Yellow**	13	105	60	92	19	127
	C-2650	2650 1202	1.00 25	2650 48.08	Red*						
	C-2935	2935 1331	1.00 25	2935 53.24	Red**						

All springs have additional travel to solid equal to 50% of Rated Deflection.
*with Red inner spring
**with Green inner spring

IM 2"(51mm) DEFLECTION B, B2, C2 & MULTIPLE C2 SIMPLE SPRING HANGERS

Ratings & Dimensions for 2"(51mm) Deflection Simple Spring Hangers (inches millimeters)

Type	Size	Rated Capacity (lbs) (kg)	Rated Defl. (in) (mm)	Spring Constant (lbs/in) (kg/mm)	Spring Color/ Stripe	Spring Only: Spring OD	Spring Only: Free Height	Bushing Outside Dia. BOD	Cup Outside Dia. COD	Max. Rod Dia MRD	Rod Penetration RP
2" 51mm Defl. IM-	B-20	20 9	2.40 61	8 0.15	Tan	2 3/8 60	4 102	1 7/8 48	3 1/8 79	3/4 19	4 7/8 124
	B-26	26 12	2.18 55	12 0.22	White/Blue						
	B-35	35 16	2.20 56	16 0.29	Purple						
	B-50	50 23	2.20 56	24 0.41	White/Red						
	B-65	65 29	2.10 53	31 0.55	Brown						
	B-85	85 39	2.10 53	40 0.74	White/Black						
	B-115	115 52	2.00 51	57 1.02	Silver						
	B-150	150 68	2.00 51	75 1.33	Orange						
	B2-210	210 95	2.12 54	99 1.76	Silver	2 3/8 60	4 1/2 114	1 7/8 48	3 1/8 79	3/4 19	5 3/8 137
	B2-290	290 132	2.00 51	144 2.59	Blue						
	B2-450‡	450 204	2.00 51	224 4.00	Tan						
	B2-680‡	680 308	2.00 51	340 6.04	Gray						
	C2-125	125 57	2.50 64	50 0.89	Purple	2 7/8 73	5 127	2 3/8 60	3 5/8 92	3/4 19	5 7/8 149
	C2-170	170 77	2.40 61	70 1.26	Brown						
	C2-210	210 95	2.30 58	90 1.64	Red						
	C2-260	260 118	2.20 56	120 2.11	White						
	C2-330	330 150	2.00 51	165 2.94	Black						
	C2-460	460 209	2.00 51	230 4.10	Blue						
	C2-610	610 277	2.00 51	305 5.43	Green						
	C2-880‡	880 399	2.00 51	440 7.83	Gray						
	C2-1210‡	1210 549	2.00 51	605 10.76	Silver						
	C2-1540‡	1540 699	2.00 51	770 13.71	Gray*						
	C2-1870‡	1870 848	2.00 51	935 16.63	Silver*						

All springs without "‡" have additional travel to solid equal to 50% of Rated Deflection.
*with Red inner spring

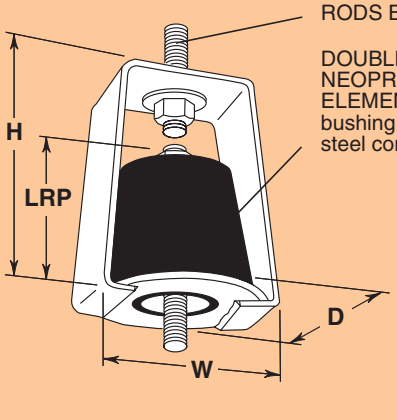
‡Published ratings allow minimum 25% additional travel to solid. For a full 50% specified minimum use the following ratings:

Size	Derated Capacity (lbs)	Defl. (in)
B2-450	410	1.83
B2-680	565	1.66
C2-880	800	1.82
C2-1210	1010	1.67
C2-1540	1285	1.67
C2-1870	1560	1.67

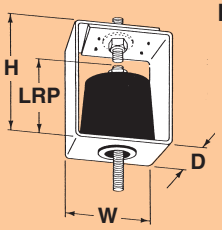
Size	Derated Capacity (kg)	Defl. (mm)
B2-450	186	46
B2-680	256	42
C2-880	363	46
C2-1210	458	42
C2-1540	583	42
C2-1870	708	42

DOUBLE DEFLECTION NEOPRENE HANGERS

HD FOR RODS

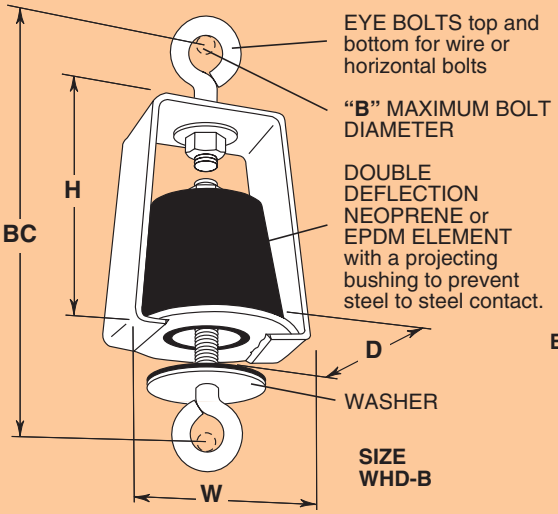


SIZES HD-B thru DS

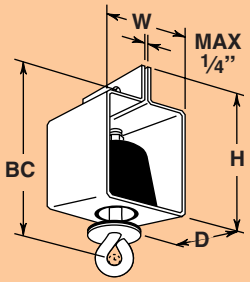


SIZES HD & HD-A

WHD FOR WIRE OR HORIZONTAL BOLTS



SIZE WHD-B



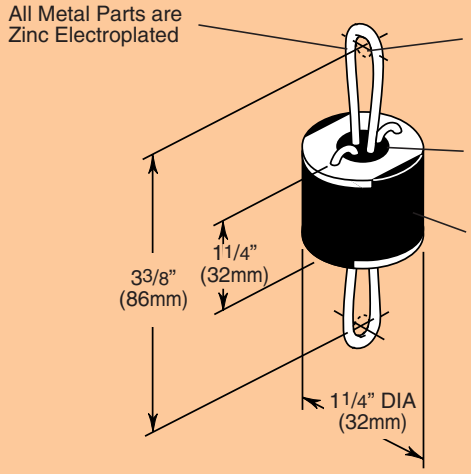
SIZE WHD-A

Ratings & Dimensions for Neoprene Hangers (inches millimeters)

Type	Size (Color Mark)	Duro-meter	Rated Capacity Range (lbs) (mm)	Max Rated Defl† (in) (mm)	B	D	H	W	Bolt Centers BC	Lower Rod Penetration LRP	Max. Rod Dia. MRD
HD- WHD-	Green	40	Up to 35 Up to 16	0.20 5	3/8 10	1 3/4 44	2 1/4 57	1 7/8 48	3 3/8 86	1 1/4 32	3/8 10
	White	60	35-75 16-34	0.20 5							
	A-Black	30	Up to 45 Up to 20	0.35 9	3/8 10	2 51	2 3/4 70	2 1/4 57	3 3/8 86	2 1/4 57	1/2 13
	A-Green	40	30-75 14-34	0.35 9							
	A-Red	50	60-125 27-57	0.35 9							
	B-Red	50	Up to 235 Up to 107	0.40 10	3/8 10	3 1/4 83	4 1/2 114	4 1/4 108	7 178	3 76	3/4 19
	B-White	60	180-380 82-172	0.40 10							
	B-Yellow	70	320-650 145-295	0.40 10							
HD-	BS-Blue	70	500-1000 227-454	0.40 10	—	3 1/4 83	4 1/2 114	4 1/4 108	—	3 76	3/4 19
	CS-Blue	70	1000-2100 454-953	0.40 10	—	3 1/4 83	5 127	4 1/4 108	—	3 1/4 83	7/8 22
	DS-Blue	70	2100-4200 953-1905	0.40 10	—	4 102	6 1/4 159	4 3/4 121	—	3 1/4 83	7/8 22

†includes double deflection neoprene element. Hanger elements have straight line deflection curves.

WHR 0.2"(5mm) DEFLECTION NEOPRENE CEILING HANGERS for Wire or Horizontal Attachment



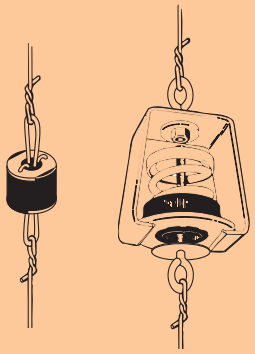
NOTE –
Tested to Failure at 1200 lbs.(544 kgs)

Ratings for Neoprene Ceiling Hangers

Type	Size (Duro-meter)	Rated Capacity Range (lbs) (kgs)	Rated Defl. (in) (mm)	Color Mark
WHR-	40	Up to 60 Up to 27	0.20 5	Green
	50	55-95 25-43	0.20 5	Red
	60	90-155 41-70	0.20 5	White
	70	150-220 68-100	0.20 5	Yellow

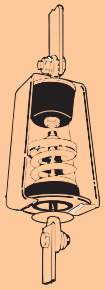
Hanger elements have straight line deflection curves.

W HANGER INSTALLATION METHODS

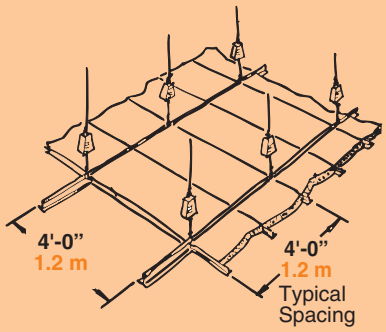


Secured by Wire

Bolted to Ceiling Channel



Bolted to Straps



TYPE W as Ceiling Hangers

W Hanger Selections Based on Ceiling Weight

Ceiling Description	Ceiling Wt. (lbs/ft²) (kg/m²)	Load Per Hanger (48"oc) (lbs) (kgs)	W30 W30N WHS WDNHS	Hanger Selections WHD	WHR
1"(25mm) Acoustical Ceiling Tile	2.5 12	40 18	X54	WHITE or A-BLACK	40
1 1/2"(38mm) Metal Lath and Gypsum Plaster	10.0 49	160 73	X175	B-RED	70
2 Layers 1/2" (13mm) Gypsum Board	5.0 24	80 36	X113	A-RED	50
2 Layers 3/4" (19mm) Gypsum Board	7.5 37	120 54	X130	A-RED	60

PRODUCT FINISHES

All standard products have a painted or powder coated finish unless otherwise indicated. Springs are powder coated or zinc electroplated.

Special finishes include:

- **Zinc Chromate**
- **Neoprene Dipping**
- **Cold Galvanized Paint**
- **Epoxy Finish**
- **Hot Dipped Galvanized Holders with Electro-Galvanized Plated Hardware, depending on size and method of attachment. Springs in these holders will be made rust resistant.**

MASON INDUSTRIES, INC.
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