



MASON INDUSTRIES, Inc.

Manufacturers of Vibration Control Products

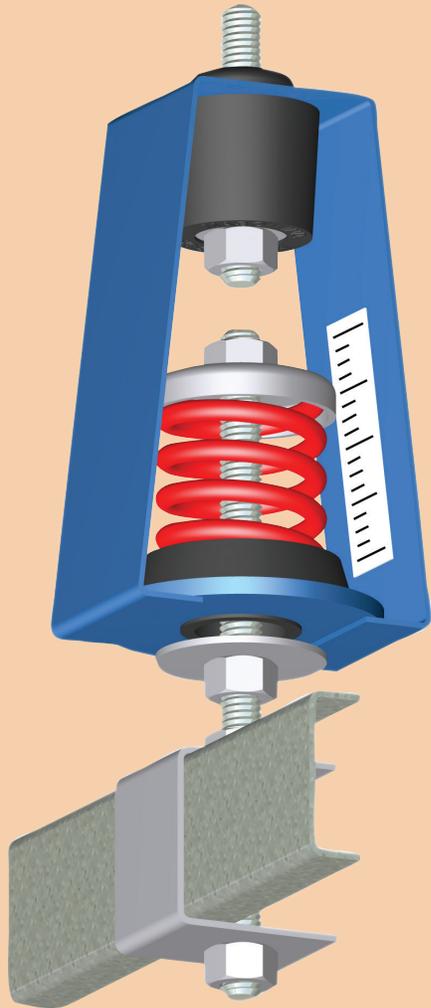
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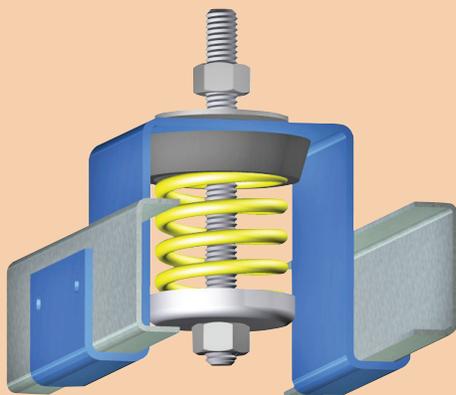
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ARCHITECTURAL CEILING HANGERS

CH-620 BULLETIN



TYPE 30NCC
PRECOMPRESSED
30N HANGER with
CEILING CHANNEL CLAMP



TYPE 30CSCH
COMPACT SPRING
CEILING HANGERS

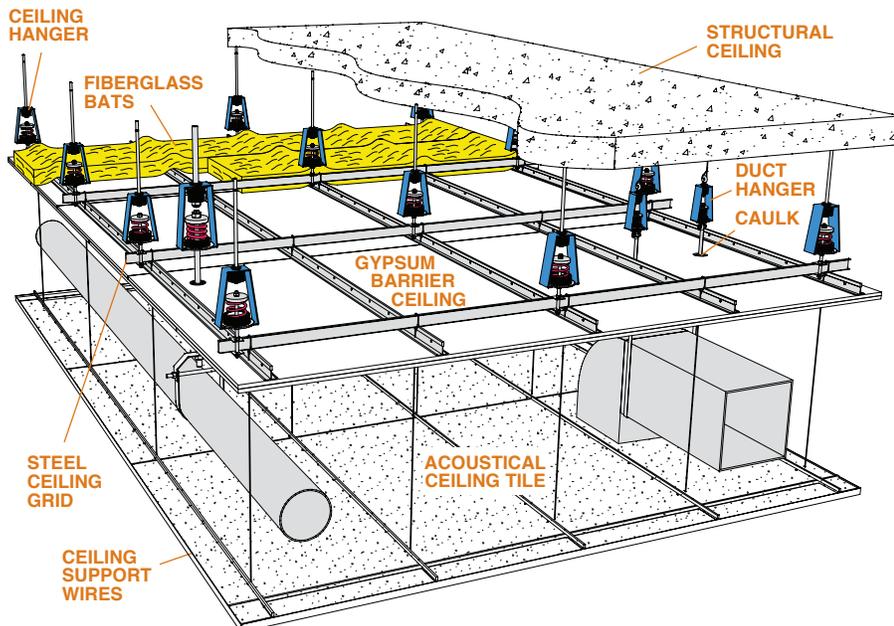
Floating Floors remain the most effective way of reducing sound transmission and vibration from the floor above. However, there are many situations where a floating floor is impractical or not economically feasible, so an isolated ceiling becomes the practical choice.

There are two types of ceilings. There are the simple acoustical tile ceilings that surround the lighting fixtures, duct outlets, etc., and conceal unsightly ductwork, piping and electrical work. The acoustical tile reduces the reflected noise within the room, but does virtually nothing to reduce sound transmission from above. It does not prevent noise within the room traveling upward or over partition walls that are not floor to structural ceiling.

A sound barrier ceiling is entirely different. Originally, they were all plaster on lathe and still are occasionally for curved or artistic finishes. Today two layers of 1/2" (13mm) or 5/8" (16mm) gypsum board are the most common sound barriers. They have significant mass, joints are staggered and all edges and openings are sealed. Fiberglass bats lying on the ceiling help as well. An isolated gypsum barrier ceiling can lower the noises from above by anywhere from 10 to 15db, depending on the air gap, the weight of the ceiling and the quality of the isolation hangers.

In many situations there is a barrier ceiling and a mechanical ceiling below it. Piping, ducting and electrical services are usually located between the two, because it is both costly and difficult to break through the gypsum.

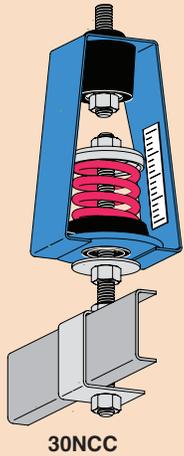
In either case, isolation hangers should be used to suspend the ceilings. The predicted results based on hanger deflections are much more difficult to evaluate compared to spring or rubber equipment mountings that rest on a structural floor. Equipment isolation is far more predictable because the floor is comparatively stiff, and it is very safe to assume that in addition to the stiffness, there is a 16 sq. ft. (1.5 sq. m) mass under the isolator weighing approximately 1200 lbs. (544 kg) when the floor is 6" (152mm) thick.



COMMON CEILING WEIGHTS

Thickness (in) (mm)	Material	(lbs/ft ²) (kg/m ²)
1/2 13	One Layer Gypsum Board	2.1 10
5/8 16		2.7 13
3/4 19		3.2 16
1 25	Cement Plaster	10.0 50
1 25	Gypsum Plaster	5.0 25

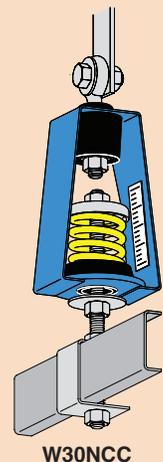
30N SERIES CEILING HANGERS



30NCC

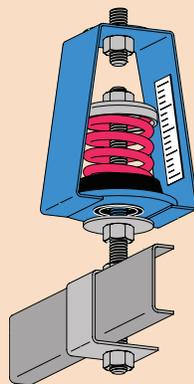


W30N

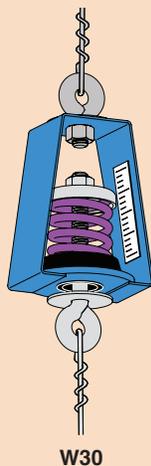


W30NCC

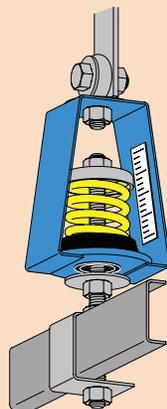
30 SERIES CEILING HANGERS



30CC



W30



W30CC

Ceiling hangers face different conditions. If the barrier ceiling is constructed of two 5/8" (16mm) gypsum boards, it would weigh about 5.4 lbs. per sq. ft. (26.4 kgs. per sq. m.) Hangers are normally on 4 foot (1.2m) centers each way so each hanger supports only 86 lbs. (39 kg.) As compared to a concrete floor, a ceiling is like a rubber diaphragm so it is not a concentrated rigid 86 lbs. (39 kg.), but something far more flexible. Because of this, one of our leading acousticians had us manufacture hangers attached to a 20 lb. steel billet, so he knew the springs were acting against the inertia of this 20 lb. (9 kg.) concentrated weight and not just pulling on a diaphragm. While we can still make this hanger, space and cost limit its use.

Our recommendations are always based on our best spring products because the additional cost is low as compared to the risk of poor performance. Hanger cost is a small percentage of an acoustical ceiling and it is most important that these sensitive systems are installed with the very best chance of success.

Primitive Spring hangers have been around for as long as I can remember (60 years) but oddly enough, rubber hangers for a much shorter period because the industry had to get past using cork, combination cork and rubber, and fiberglass before we had a better understanding of Low Dynamic Stiffness rubber elements.

The 30N configurations on page 4 are the most efficient we know. The rubber element and the rubber cup under the spring are both molded from Low Dynamic Stiffness rubber (LDS). As compared with other rubber compounds, this rubber has a dynamic stiffness ranging from 1.17 to 1.30 in 40 to 60 Duro. Cheaper materials have numbers as high as 2. Our lower frequency hangers, after dynamic stiffness correction, have the best chance of stopping noise.

The spring design is ours, but not a new concept. What is unusual is the very large diameter. We set the spring in a Low Dynamic Stiffness rubber cup molded with a bushing through the lower hole in the steel hanger box. These springs are so large in diameter, compared to the deflected height that the hanger rod can swing 15° in any direction before contacting the rubber bushing. It is very important that this lower rod has that swing capability, because a contractor putting up hangers on 4 ft. (1.2 m) centers finds it almost impossible to keep all of them perfectly plumb. If the hanger rods contact the steel box supplied by many of our competitors, it short-circuits and becomes ineffective.

None of our products are patented. By not providing this 30° capability, our competition is just unwilling to provide the better product.

We offer three variations on page 4. The CC is provided with a clamp on the bottom to accept the 1 1/2" (38mm) primary channel that is used on so

many projects. All of our spring hangers are pre-compressed 70% of the anticipated load, so as the ceiling weight is added, a 1" (25mm) deflection design descends only 0.3" (7.6mm) when fully loaded.

This is ever so much better than putting up a hanger that is not precompressed so the contractor has to deal with constant elevation changes until the 1" (25mm) deflection is reached at full load.

The W30N has the same 30° features, but as the illustration shows, there is an eyebolt top and bottom so the hanger can be connected using 12 gauge wire, top and bottom or bolted to a flat ceiling strap-on top.

The W30NCC provides for wiring or bolting on top with the 1 1/2" (38mm) channel clamp on the bottom.

As mentioned earlier, the average loading of the hanger using two 5/8" (16mm) gypsum boards as a barrier ceiling is 86 lbs. (39 kgs.) When a mechanical ceiling is added, this might increase to 108 lbs. (49 kgs.) Therefore, the capacities listed are adequate for almost all ceilings. Should the weight go over 210 lbs. (95 kgs.), we can manufacture to any capacity.

The series 30 hangers on page 5 omit the rubber element which lowers cost at the expense of somewhat poorer sound attenuation.

The page 6 designs are entirely new. On job after job when the space is tight, there is a need for a short profile hanger. The 30CSCH is about as short as possible because the ceiling channels are on the sides rather than below.

Some companies place a rubber element on top of the spring to reduce sound transmission. Spring stability depends on the nut against a hard surface to keep the top and bottom coils parallel. Any rubber element on top would have to be rock hard or it would not provide that stability. A hard mounting serves no purpose so we depend on the LDS rubber spring cup and it keeps the profile shorter.

The W30SM and 30SMCC allow for side mounting and provide height saving solutions, primarily in wooden structures.

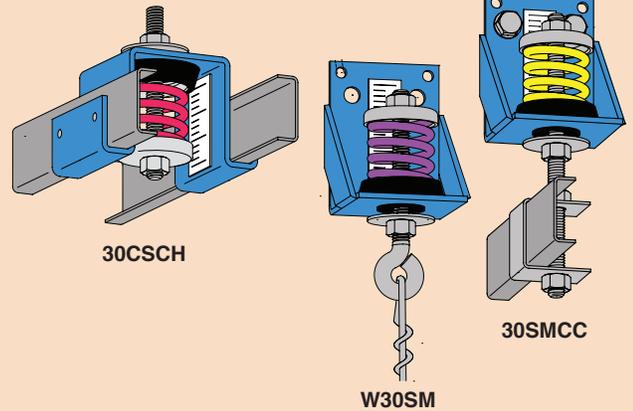
Pages 7 and 8 continue with rubber elements only, in the same configurations. Rubber works quite well acoustically if there is no mechanical vibration or walking induced motion from the floor above. As a product grouping, they are high quality because of the Low Dynamic Stiffness Rubber, but all rubber hangers are used primarily as a cost saving.

We hope this new range of products proves helpful. Please call whenever we can be of assistance.

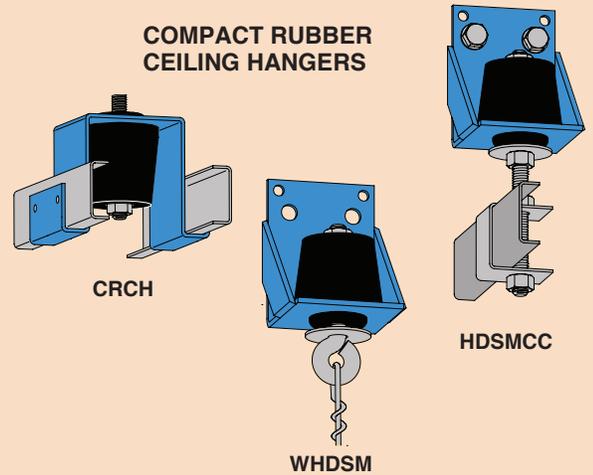


Norm Mason

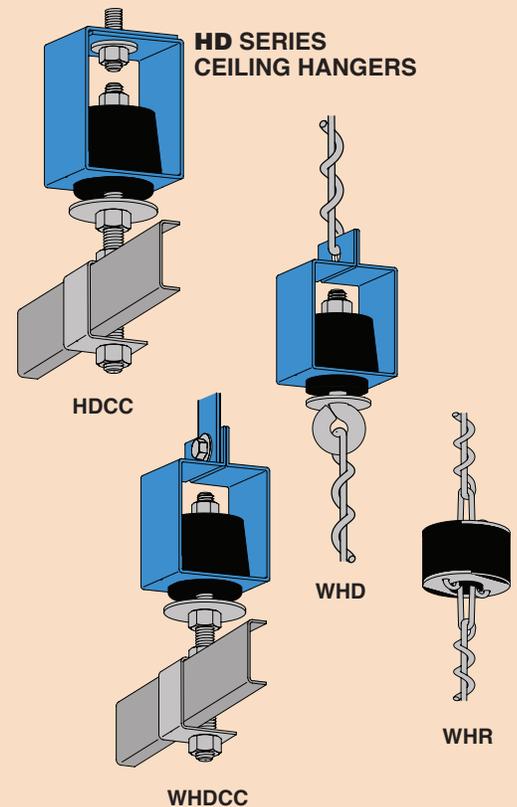
COMPACT SPRING CEILING HANGERS



COMPACT RUBBER CEILING HANGERS

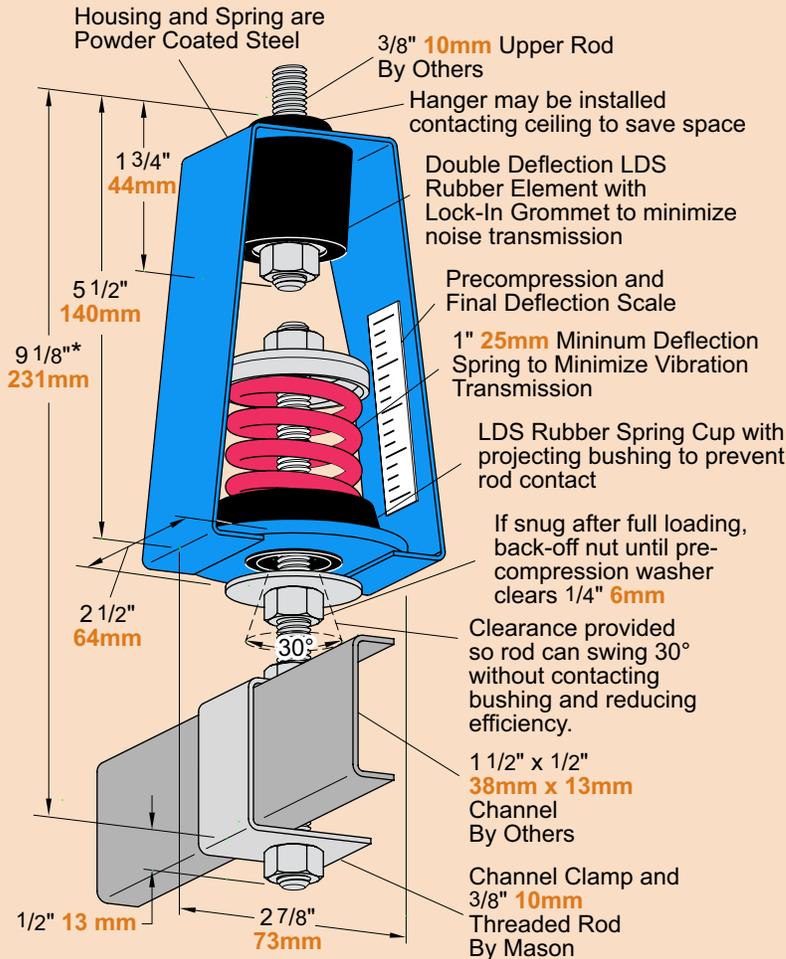


HD SERIES CEILING HANGERS



30NCC

Precompressed 30N Hanger with Ceiling Channel Clamp



* Hangers are precompressed to 70% of assigned load. When full load is applied, gap opens between pre-compression washer and housing. These dimensions are overall heights when fully loaded. For longer lengths, consult factory.

LDS stands for **Low Dynamic Stiffness**
 AASHTO Bridge Bearing Natural Rubber to minimize noise and vibration transmission.
 Maximum Dynamic Stiffness is 1.4.

AASHTO BRIDGE BEARING NATURAL RUBBER SPECIFICATIONS

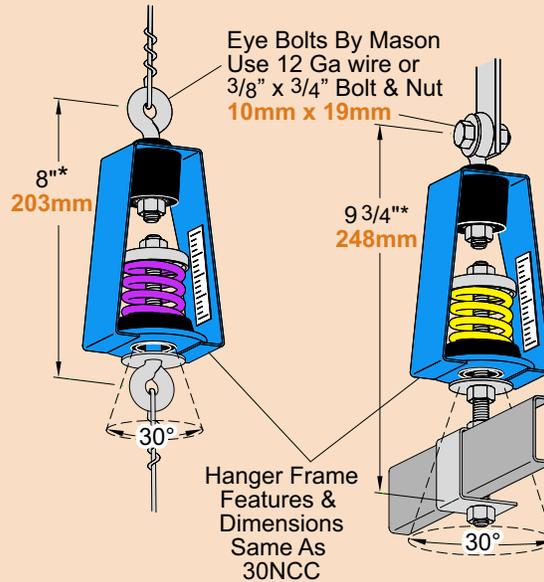
ORIGINAL PHYSICAL PROPERTIES	TESTED FOR AGING			COMPRES-SION SET	LONG TERM CREEP			
	OVEN AGING(70hrs/158°F)	OZONE						
Tests: ASTM D-2240 & D-412	ASTM D-573	ASTM D-1149		ASTM D-395	ISO8013			
Duro-meter	Tensile Strength	Elongat. at Break	Hard-ness	Tensile Strength	Elongat. at Break	25 pphm in air by Vol. 20% Strain 100°F	22hrs/158°F Method B	168hrs
40±5	2000 psi	500%	+10%	-25%	-25%	No Cracks	25%(max)	5%(max)
50±5	2250 psi	450%	+10%	-25%	-25%	No Cracks	25%(max)	5%(max)
60±5	2250 psi	400%	+10%	-25%	-25%	No Cracks	25%(max)	5%(max)
70±5	2250 psi	300%	+10%	-25%	-25%	No Cracks	25%(max)	5%(max)

SPECIFICATION

Ceiling Hangers shall be fail safe and include a steel frame containing an AASHTO Bridge Bearing Quality LDS Rubber Element at the top and a nominal 1" deflection steel spring at the bottom. Springs shall be seated in an LDS cup with a rubber bushing extending through the box to prevent metal to metal contact between the steel suspension rod and the frame.

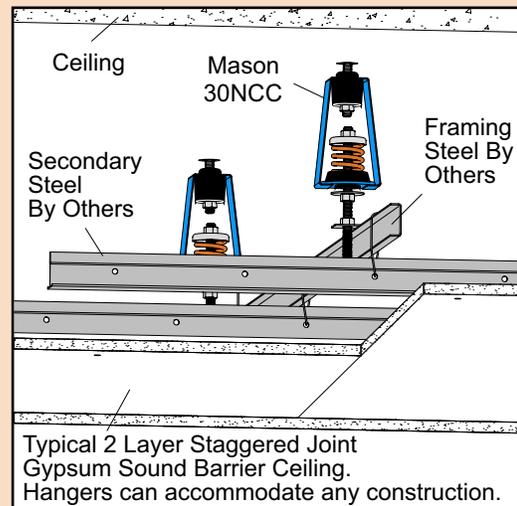
W30N

Precompressed 30N Hanger with Eye Bolts



W30NCC

Precompressed 30N Hanger with Top Eye Bolt and Ceiling Channel Clamp



RATINGS

Standard sizes shown. For heavier capacities, consult factory.

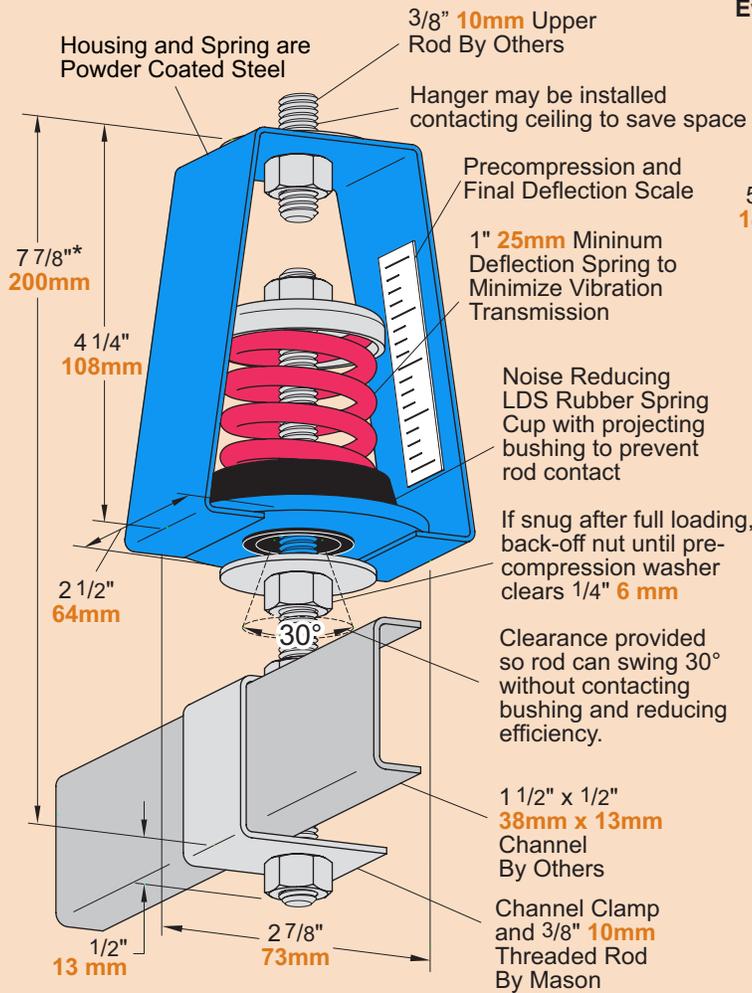
Type	Size	Rated Capacity	Rated Defl. [†]	Spring Constant ^{††}	LDS Defl.	Spring Color/Stripe			
		lbs	kg	in	mm	lbs/in	kg/mm	in	mm
30NCC-	12	12	5	1.45	37	10	0.18		Orange
	23	23	10	1.50	38	18	0.30		Brown
	33	33	15	1.30	33	30	0.54		Red
W30N-	54	54	24	1.40	36	45	0.80		White
	76	76	34	1.22	31	73	1.36	0.20	5
W30NCC-	113	113	51	1.20	30	113	2.04		Yellow
	130	130	59	1.20	30	130	2.36		Purple
	175	175	79	1.20	30	175	3.16		Silver
	210	210	95	1.20	30	210	3.80		Blue

[†]includes double deflection LDS element. ^{††}applies to spring only.
 All springs have additional travel to solid equal to 50% of Rated Deflection.

Dynamic Stiffness of Cup and Element shall not exceed 1.4. The ID of the bushing must allow a 30° swing from side to side before rod contact. Springs shall be factory precompressed to 70% of the assigned deflection. Hangers shall be Mason Industries 30NCC for 1 1/2 x 1/2 channel, W30N for wire, or W30NCC for wire and channel. Submittals shall confirm AASHTO Quality and Dynamic Stiffness in addition to deflection.

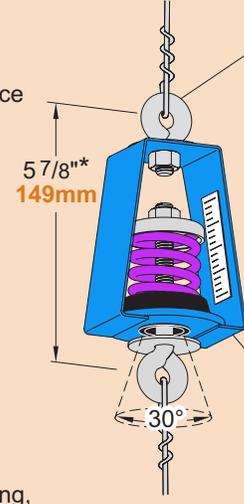
30CC

Precompressed 30 Hanger with Ceiling Channel Clamp



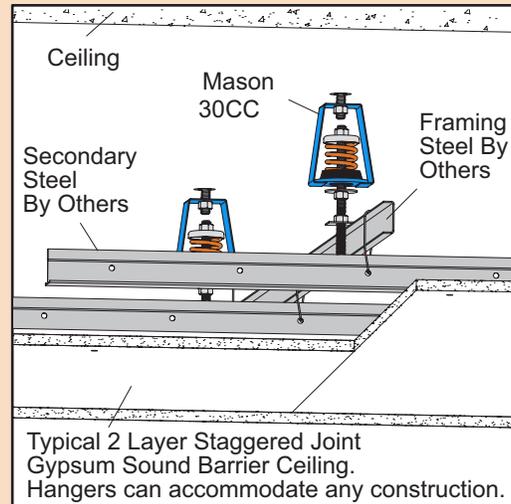
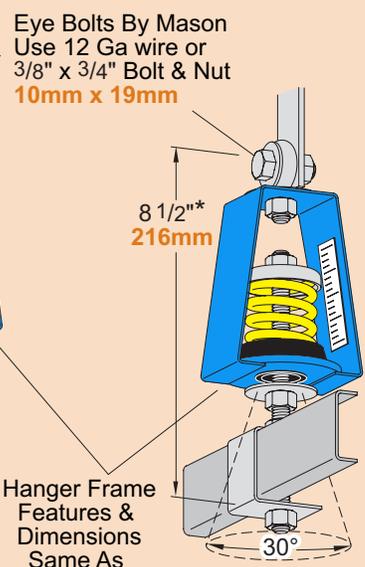
W30

Precompressed 30 Hanger with Eye Bolts



W30CC

Precompressed 30 Hanger with Eye Bolt and Ceiling Channel Clamp



* Hangers are precompressed to 70% of assigned load. When full load is applied, gap opens between pre-compression washer and housing. These dimensions are overall heights when fully loaded. For longer lengths, consult factory.

LDS stands for Low Dynamic Stiffness AASHTO Bridge Bearing Natural Rubber to minimize noise and vibration transmission. Maximum Dynamic Stiffness is 1.4.

AASHTO BRIDGE BEARING NATURAL RUBBER SPECIFICATIONS

ORIGINAL PHYSICAL PROPERTIES	TESTED FOR AGING			COMPRES-SION SET	LONG TERM CREEP
	OVEN AGING(70hrs/158°F)	OZONE			
Tests: ASTM D-2240 & D-412	ASTM D-573	ASTM D-1149	ASTM D-395	ISO8013	
Duro-meter	Tensile Strength	Elongat. at Break	Hard-ness	Tensile Strength	Elongat. at Break
Shore A	(min)	(min)	(max)	(max)	(max)
40±5	2000 psi	500%	+10%	-25%	-25%
50±5	2250 psi	450%	+10%	-25%	-25%
60±5	2250 psi	400%	+10%	-25%	-25%
70±5	2250 psi	300%	+10%	-25%	-25%
			No Cracks	25ppm in air by Vol. 20% Strain 100°F	25% (max) Method B
			No Cracks	22hrs/158°F	5% (max)
			No Cracks	168hrs	5% (max)
			No Cracks	25% (max)	5% (max)

RATINGS Standard sizes shown. For heavier capacities, consult factory.

Type	Size	Rated Capacity lbs	Rated Capacity kg	Rated Defl.† in	Rated Defl.† mm	Spring Constant lbs/in	Spring Constant kg/mm	Spring Color/Stripe
30CC-	12	12	5	1.25	32	10	0.18	Orange
	23	23	10	1.30	33	18	0.30	Brown
	33	33	15	1.10	28	30	0.54	Red
	54	54	24	1.20	30	45	0.80	White
W30-	76	76	34	1.02	25	73	1.36	Black
	113	113	51	1.00	25	113	2.04	Yellow
W30CC-	130	130	59	1.00	25	130	2.36	Purple
	175	175	79	1.00	25	175	3.16	Silver
	210	210	95	1.00	25	210	3.80	Blue

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

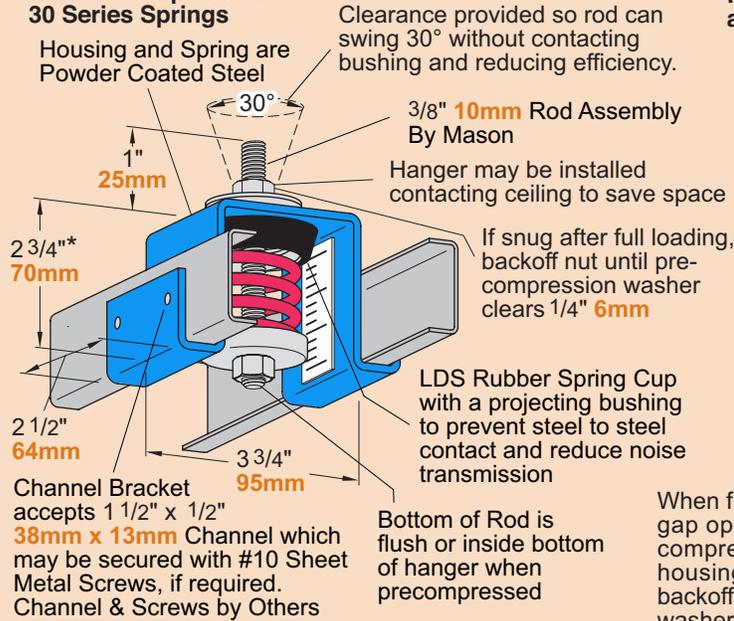
SPECIFICATION

Ceiling Hangers shall be fail safe and include a steel frame containing a nominal 1" deflection steel spring seated in an AASHTO Bridge Bearing Quality Low Dynamic Stiffness Rubber Cup with a rubber bushing extending through the box to prevent metal to metal contact between the steel suspension rod and the frame. Dynamic Stiffness of the cup shall not exceed 1.4.

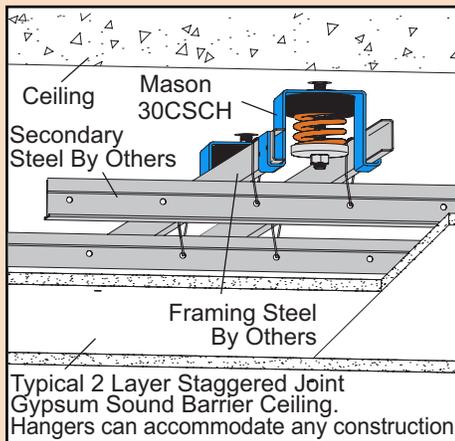
The ID of the bushing must allow a 30° swing from side to side before rod contact. Springs shall be factory precompressed to 70% of the assigned deflection. Hangers shall be Mason Industries 30CC for 1 1/2 x 1/2 channel, W30 for wire, W30CC for wire and 1 1/2 x 1/2 channel. Submittals shall confirm AASHTO Quality and Dynamic Stiffness in addition to deflection.

30CSCH

Compact Spring Ceiling Hanger with Precompressed 30 Series Springs



* Hangers are precompressed to 70% of assigned load. These overall heights are when fully loaded. For longer lengths, consult factory.



LDS stands for Low Dynamic Stiffness AASHTO Bridge Bearing Natural Rubber to minimize noise and vibration transmission. Maximum Dynamic Stiffness is 1.4.

AASHTO BRIDGE BEARING NATURAL RUBBER SPECIFICATIONS

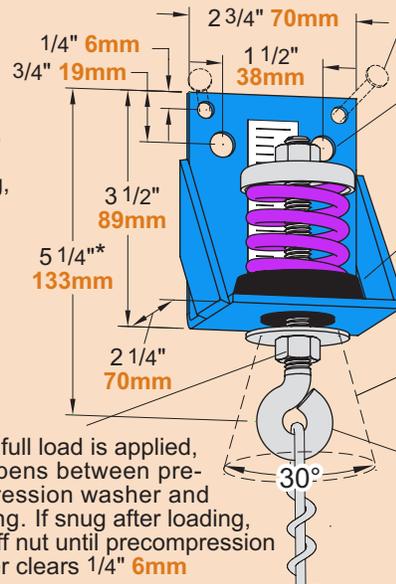
ORIGINAL PHYSICAL PROPERTIES	TESTED FOR AGING			COMPRESSION SET	LONG TERM CREEP
	OVEN AGING (70hrs/158°F)	OZONE			
Tests: ASTM D-2240 & D-412	ASTM D-573	ASTM D-1149		ASTM D-395	ISO8013
Duro-meter	Hardness	Tensile Strength	Elongat. at Break	25 pphm in air by Vol. 20% Strain 100°F	22hrs/158°F Method B
Shore A (min)	(min)	(max)	(max)	(max)	168hrs
40±5	2000 psi	500%	+10% -25% -25%	No Cracks	25%(max) 5%(max)
50±5	2250 psi	450%	+10% -25% -25%	No Cracks	25%(max) 5%(max)
60±5	2250 psi	400%	+10% -25% -25%	No Cracks	25%(max) 5%(max)
70±5	2250 psi	300%	+10% -25% -25%	No Cracks	25%(max) 5%(max)

30CSCH SPECIFICATION

Ceiling Hangers shall have a steel frame formed to minimize height by supporting 1 1/2 x 1/2 ceiling channels on either side of a 1" nominal deflection centered spring. The spring shall be seated in an AASHTO Bridge Bearing Quality LDS Rubber Cup with a rubber bushing extending through the frame to prevent metal to metal contact between the steel suspension rod and the frame. Rubber Dynamic Stiffness shall not exceed 1.4. The ID of the bushing must allow a 30° swing from side to side before rod contact. Springs shall be factory precompressed to 70% of the assigned deflection. Hangers shall be Mason Industries 30CSCH. Submittals shall confirm AASHTO Quality and Dynamic Stiffness in addition to deflection.

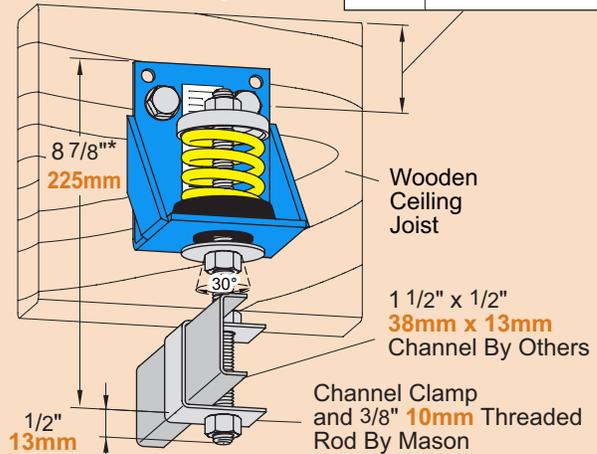
W30SM

Side of Joist, or Wall, Hanger with Precompressed 30 Series Spring and Eye Bolt



30SMCC

Side of Joist, or Wall, Hanger with Precompressed 30 Series Springs and Ceiling Channel Clamp



RATINGS Standard sizes shown. For heavier capacities, consult factory.

Type	Size	Rated Capacity lbs	kg	Rated Defl. [†] in	mm	Spring Constant lbs/in	kg/mm	Spring Color/Stripe
30CSCH-	12	12	5	1.25	32	10	0.18	Orange
	23	23	10	1.30	33	18	0.30	Brown
	33	33	15	1.10	28	30	0.54	Red
W30SM-	54	54	24	1.20	30	45	0.80	White
	76	76	34	1.02	25	73	1.36	Black
30SMCC-	113	113	51	1.00	25	113	2.04	Yellow
	130	130	59	1.00	25	130	2.36	Purple
	175	175	79	1.00	25	175	3.16	Silver
	210	210	95	1.00	25	210	3.80	Blue

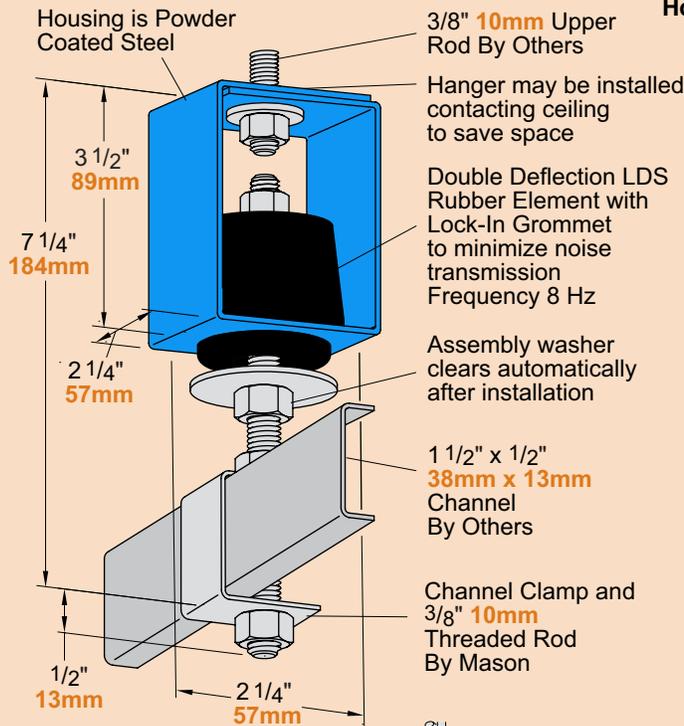
[†]All springs have additional travel to solid equal to 50% of Rated Deflection.

W30SM or 30SMCC SPECIFICATION

Ceiling Hangers shall consist of a side attachment steel angle gusseted on each side to prevent bending. The gussets shall protect a 1" nominal deflection steel spring seated in a Bridge Bearing Quality LDS Rubber Cup with a rubber bushing extending through the horizontal leg to prevent metal to metal contact between the steel suspension rod and the frame. Rubber Dynamic Stiffness shall not exceed 1.4. The ID of the bushing must allow a 30° swing from side to side before rod contact. Springs shall be factory precompressed to 70% of the assigned deflection. Hangers shall be Mason Industries W30SM for ceiling wire attachment or 30SMCC if 1 1/2 x 1/2 ceiling channels are used. Submittals shall confirm AASHTO Quality and Dynamic Stiffness in addition to spring deflection.

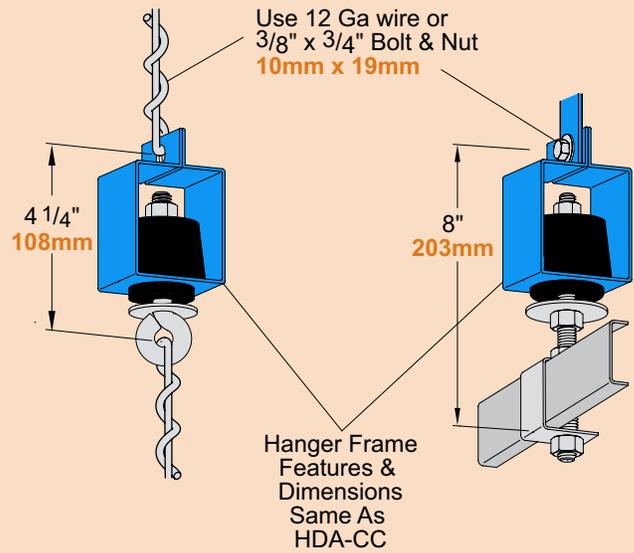
HDCC

Double Deflection LDS Rubber Element with Ceiling Channel Clamp



WHD

Double Deflection LDS Rubber Element with Upper Attachment Hole and Eye Bolt

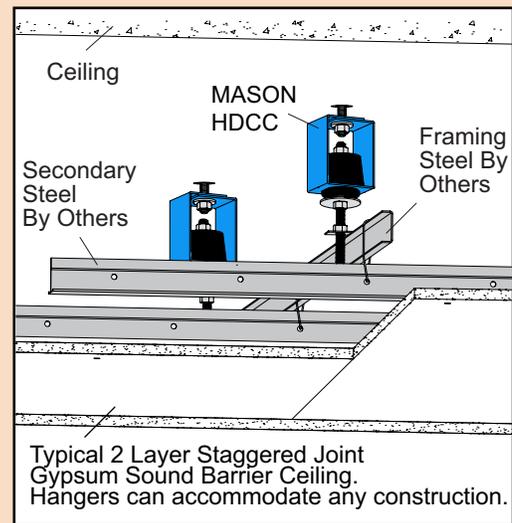
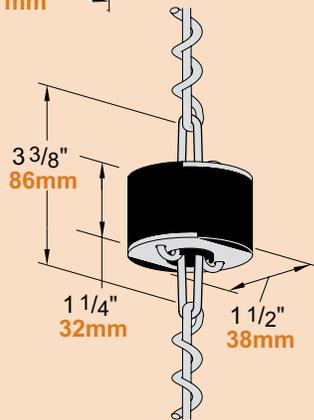


WHDCC

Double Deflection LDS Rubber Element with Upper Attachment Hole and Ceiling Channel Clamp

WHR

Minimal 0.2" 5mm Deflection LDS Hanger for Wire Attachment Freq 12 Hz



LDS stands for Low Dynamic Stiffness AASHTO Bridge Bearing Natural Rubber to minimize noise and vibration transmission. Maximum Dynamic Stiffness is 1.4.

AASHTO BRIDGE BEARING NATURAL RUBBER SPECIFICATIONS

ORIGINAL PHYSICAL PROPERTIES	TESTED FOR AGING			COMPRES-SION SET	LONG TERM CREEP
	OVEN AGING(70hrs/158°F)	OZONE			
Tests: ASTM D-2240 & D-412	ASTM D-573	ASTM D-1149		ASTM D-395	ISO8013
Duro-meter	Hard-ness	Tensile Strength	Elongat. at Break	25 pphm in air by Vol. 20% Strain 100°F	
Strength at Break	ness	Strength	at Break		
Shore A (min)	(max)	(max)	(max)		
40±5	2000 psi	500%	+10% -25%	No Cracks	25%(max) 5%(max)
50±5	2250 psi	450%	+10% -25%	No Cracks	25%(max) 5%(max)
60±5	2250 psi	400%	+10% -25%	No Cracks	25%(max) 5%(max)
70±5	2250 psi	300%	+10% -25%	No Cracks	25%(max) 5%(max)

RATINGS Standard sizes shown. For heavier capacities, consult factory.

Type	Size	Duro-meter	Rated Capacity Range		Max Rated Defl.	
			lbs	kg	in	mm
HDCC-WHD-WHDCC-	A-Green	40	20-50	9-23	0.35	9
	A-Red	50	40-90	18-42		
	A-White	60	80-180	36-82		
WHR-	40-Green	40	Up to 60	Up to 27	0.20	5
	50-Red	50	55-95	25-43		
	60-White	60	90-155	41-70		
	70-Yellow	70	150-220	68-100		

HDCC, WHD or WHDCC SPECIFICATION

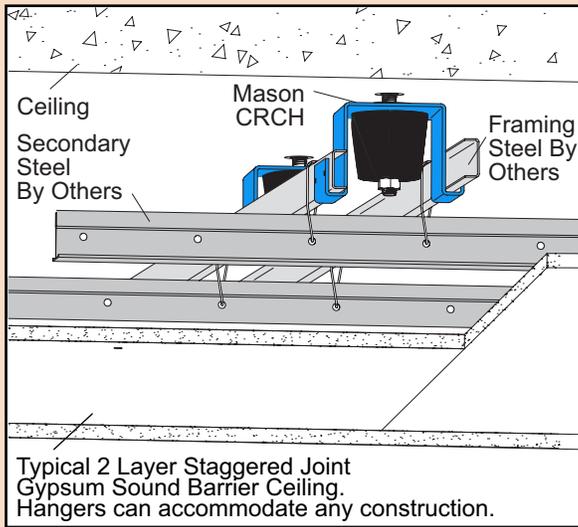
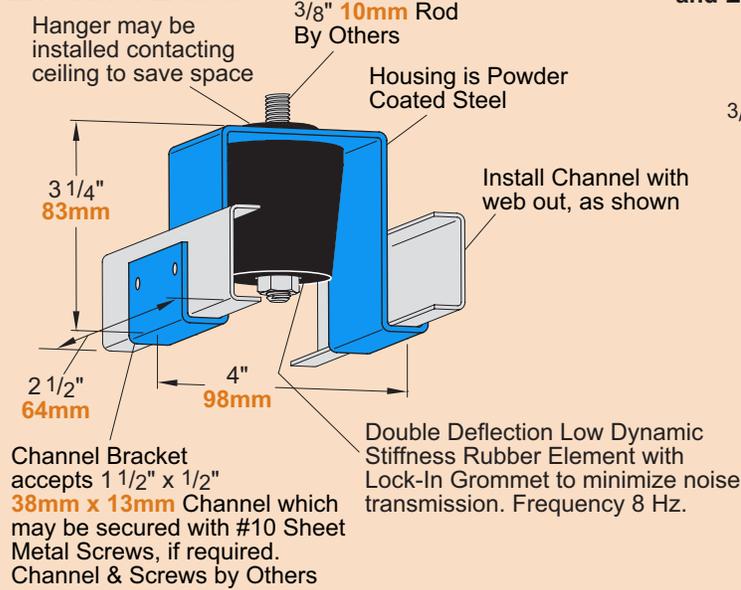
Ceiling Hangers shall be fail safe and include a steel frame containing an AASHTO Bridge Bearing Quality LDS Rubber Element molded with an integral lock in grommet at the bottom to prevent steel rod to housing contact. Dynamic Stiffness shall not exceed 1.4 nor the corrected frequency 8 Hz. Housing configurations shall be offered to accommodate bolting to structure and simple attachment to 1 1/2 x 1/2 channel, 12 gauge wire top and bottom or 12 gauge wire on top and 1 1/2 x 1/2 channel on the bottom. Ceiling hangers shall be Mason Industries type HDCC, WHD or WHDCC as required. Submittals shall confirm AASHTO Quality and Dynamic Stiffness in addition to frequency.

WHR SPECIFICATION

Ceiling Hangers shall be fail safe and consist of opposed washers sandwiching an AASHTO Bridge Bearing Quality LDS Rubber Element 11/8" thick. Dynamic Stiffness shall not exceed 1.4" nor the corrected frequency 12 Hz. Connections shall be made with 12 gauge wire top and bottom passing through hairpin loops attached to the opposing washers. Ceiling Hangers shall be Mason Industries type WHR. Submittals shall confirm AASHTO Quality and Dynamic Stiffness in addition to frequency.

CRCH

Compact Ceiling Hanger with Double Deflection LDS Rubber Element



LDS stands for Low Dynamic Stiffness AASHTO Bridge Bearing Natural Rubber to minimize noise and vibration transmission. Maximum Dynamic Stiffness is 1.4.

AASHTO BRIDGE BEARING NATURAL RUBBER SPECIFICATIONS

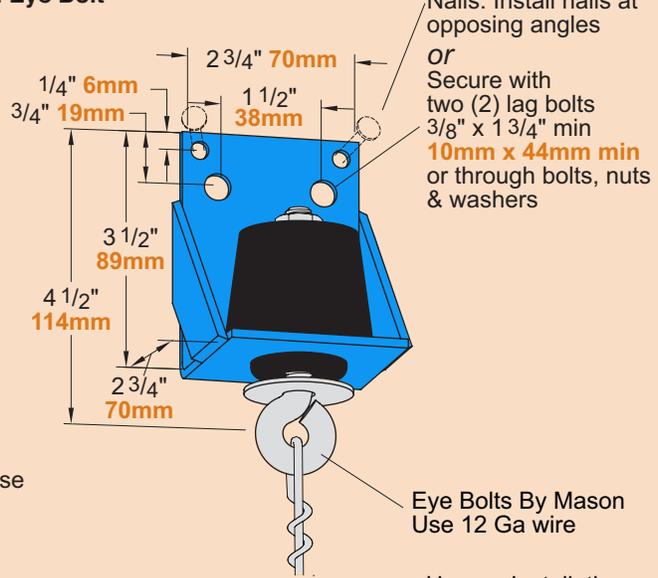
ORIGINAL PHYSICAL PROPERTIES	TESTED FOR AGING			COMPRESSION SET	LONG TERM CREEP	
	OVEN AGING (70hrs/158°F)	OZONE				
Tests: ASTM D-2240 & D-412	ASTM D-573	ASTM D-1149	ASTM D-395	ISO8013		
Duro-meter	Hard-ness	Tensile Strength at Break	Elongat. at Break	25 pphm in air by Vol. 20% Strain 100°F	22hrs/158°F Method B	
Shore A (min)	(max)	(max)	(max)	No Cracks	168hrs	
40±5	2000 psi	500%	+10% -25%	-25%	25%(max)	5%(max)
50±5	2250 psi	450%	+10% -25%	-25%	No Cracks	5%(max)
60±5	2250 psi	400%	+10% -25%	-25%	No Cracks	5%(max)
70±5	2250 psi	300%	+10% -25%	-25%	No Cracks	5%(max)

CRCH SPECIFICATION

Ceiling Hangers shall have a steel frame formed to minimize height by holding an 1 1/2 x 1/2 ceiling channel on either side of an AASHTO Bridge Bearing Quality LDS Rubber Element molded with an integral lock in grommet at the bottom to prevent steel rod to housing contact. Dynamic Stiffness shall not exceed 1.4 nor the corrected frequency 8 Hz. Ceiling Hangers shall be Mason Industries CRCH. Submittals shall confirm AASHTO Quality and Dynamic Stiffness in addition to frequency.

WHDSM

Side of Joist, or Wall, Hanger with Double Deflection LDS Rubber Element and Eye Bolt

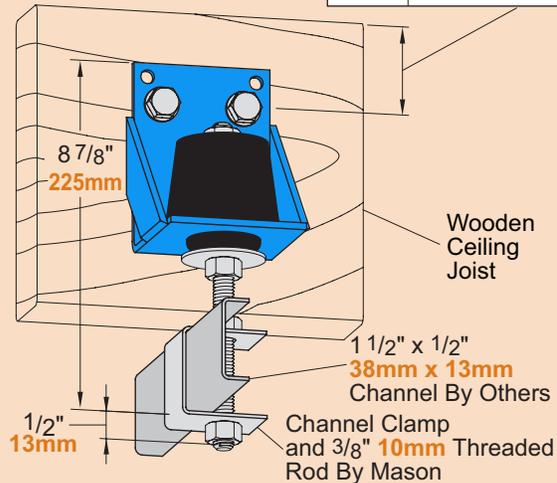


HDSMCC

Side of Joist, or Wall, Hanger with Double Deflection LDS Rubber Element and Ceiling Channel Clamp

Hanger Installation Location based on Dimensional Lumber sizes

6	1 1/4"	32mm
8	1 1/4"	32mm
2 x 10	3 1/4"	83mm
12	5 1/4"	133mm



RATINGS Standard sizes shown. For heavier capacities, consult factory.

Type	Size	Duro-meter	Rated Capacity Range	Max Rated Defl.	
				lbs	kg
CRCH-	A-Green	40	20-50	9-23	
WHDSM-	A-Red	50	40-90	18-42	0.35 9
HDSMCC-	A-White	60	80-180	36-82	

HDSMCC or WHDSM SPECIFICATION

Ceiling Hangers shall consist of a side attachment steel angle gusseted on each side to prevent bending. The gussets shall protect an AASHTO Bridge Bearing Quality LDS Rubber Element molded with an integral lock in grommet at the bottom to prevent steel rod to housing acoustical short circuiting. Dynamic Stiffness shall not exceed 1.4 nor the corrected frequency 8 Hz. Housing configurations shall be offered for simple attachment to 1 1/2 x 1/2 channels or 12 gauge wire. Ceiling Hangers shall be Mason Industries HDSMCC or WHDSM. Submittals shall confirm AASHTO Quality and Dynamic Stiffness in addition to frequency.