

# Elastomeric Antivibration Mountings



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Form D, page 9



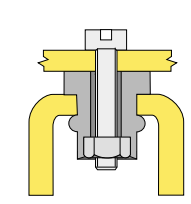
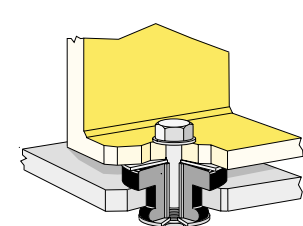
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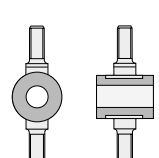
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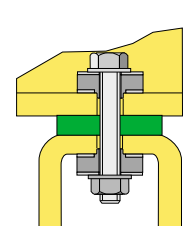
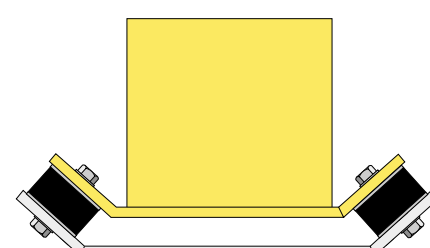
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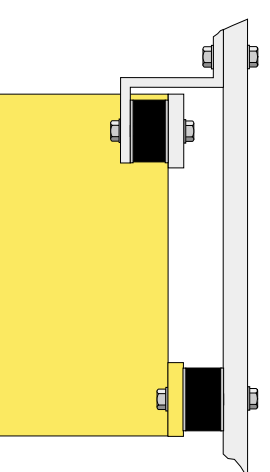
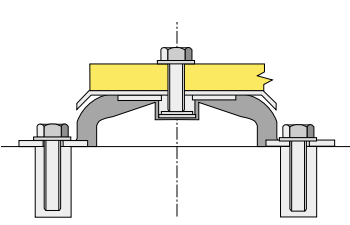
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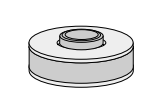
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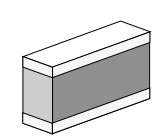
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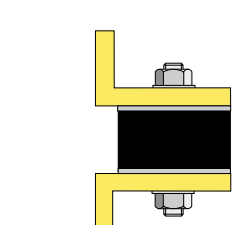
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**Vibration Isolation**

Isolator Natural frequencies **fn**

**Undamped**

$$fn = \frac{1}{2} \sqrt{\frac{K}{M}}$$

**Damped**

$$fn = \frac{1}{2} \sqrt{\frac{K(1-\zeta^2)}{M}}$$

$\zeta$ = Damping Ratio C/Cc

**K**= Spring Constant N/m

**M**= Supported Mass kg

For effective vibration isolation the isolator natural frequency **fn** should be less than 50% the lowest disturbing frequency **fe**

Elastomeric rubber-metal isolators are used to prevent transmission of vibration from (active) or to (passive) supported equipment.

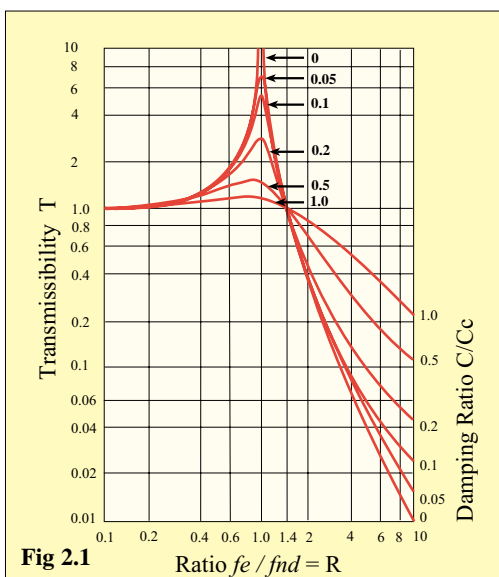
Rubber based anti vibration mounts offer good isolation of disturbing frequencies **fe** of 12 Hz and above at reasonable cost.

To isolate frequencies below 12 Hz low frequency isolators should be used.

**Examples**

Natural Frequency <b>fn</b> Hz	Isolate above Disturbing Frequency <b>fe</b> Hz
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Air systems	1.5+	3+
Helical Coil spring systems	2.5+	5+
Compare		
Rubber Metal AV Mounts	6.0+	12+



**Fig 2.1** Ratio  $fe / fnd = R$

**Vibration transmissibility**

Vibration transmissibility **T** (i.e. % or fraction) of the vibration which the isolators transmit to the supported equipment (passive) or from the supported equipment (active) is calculated using the formula

$$\text{Transmissibility } T = \frac{1}{1 - R^2}$$

**Damped systems:**

$$\text{Transmissibility } T = \frac{1 + \frac{R^2}{Q^2}}{\sqrt{(1 - R^2)^2 + \frac{R^2}{Q^2}}}$$

$$R = \frac{fe}{fn} \quad Q = \frac{1}{2 C/Cc}$$

**fe** - disturbing frequency can be determined by measurement. The isolator natural frequency **fnd** is given by:

$$fnd = \frac{1}{2} \sqrt{\frac{Ktd}{M}} \text{ Hz}$$

**Ktd** = Sum of Isolator Dynamic Spring Constants ( $K_1 + K_2 + K_3 \dots$ ) N/m

**M** = Supported system mass kg

For natural rubber and coil spring isolators static and dynamic spring constants are the same.

Sources of vibration in rotating machines	
Source	Disturbing Frequency <b>fe</b> Hz
Primary out of balance	1 x rpm x 0.0167
Secondary out of balance	2 x rpm x 0.0167
Shaft misalignment	2 x rpm x 0.0167
Bent Shaft	1 & 2 x rpm x 0.0167
Gears(N=number of teeth)	N x rpm x 0.0167
Drive Belts (N=belt rpm)	N,2N,3N,4N x 0.0167
Aerodynamic or hydraulic forces	(N=blades on rotor) N x rpm x 0.0167
Electrical (N=synchronous frequency)	N x rpm x 0.0167

Significant problems occur when the disturbing frequency **fe** is near to or coincident with the natural frequency of the supporting structure (floor, foundation or subsoil).

Damping Factor C/Cc	frequency ratio $R = fe/fn$							
	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0
<b>0.05</b>	20	66	80	87	91	93	94	95
<b>0.10</b>	19	64	79	85	89	91	93	94
<b>0.15</b>	17	62	76	83	87	90	91	93
<b>0.20</b>	16	59	74	81	85	87	89	91
<b>0.30</b>	12	52	67	75	80	83	85	87
Percentage Isolation Efficiency								

**Vibration Isolators Undamped**

**Force equation**

$$M A + Kz = F(t)$$

M = Mass Kg

A = Acceleration m/s<sup>2</sup>

K = Spring Constant N/m

F = Applied force N

z = Deflection m

$$\omega = 2 f$$

			Units
<b>Displacement response:</b>	$S_r =$	$\frac{F}{K-M \omega^2}$	m
<b>Velocity response</b>	$V_r =$	$\frac{F \omega}{K-M \omega^2}$	m/s
<b>Acceleration response</b>	$A_r =$	$\frac{F \omega^2}{K-M \omega^2}$	m/s <sup>2</sup>
<b>Force transmitted</b>	$F_r = K S_r =$	$\frac{KF}{K-M \omega^2}$	N

**Vibration Isolators with damping**

**Force equation**

$$MA + CV + Kz = F(t)$$

Inertia force + damping force+ spring force= applied force

M = Mass Kg

A = acceleration m/s<sup>2</sup>

V = Velocity m/s

C = Damping coefficient Ns/m

K = Spring Constant N/m

F = Applied force N

z = Deflection m

ζ = Damping ratio C/Cc

$$C_c = 2 \sqrt{KM}$$

			Units
<b>Displacement response:</b>	$S_r =$	$\frac{F}{K \sqrt{(1+(2 \zeta)^2)}}$	m
<b>Velocity response</b>	$V_r =$	$\frac{F \sqrt{(K/M)*(1-\zeta^2)}}{K \sqrt{(1+(2 \zeta)^2)}}$	m/s
<b>Acceleration response</b>	$A_r =$	$\frac{F(1-\zeta^2)}{M \sqrt{(1+(2 \zeta)^2)}}$	m/s <sup>2</sup>
<b>Force transmitted</b>	$F_r = K S_r =$	$\frac{F}{\sqrt{(1+(2 \zeta)^2)}}$	N

Damping is expressed as a ratio C/Cc (ζ) which is a fractional measure of vibration energy absorbed by the isolator and not given back to the isolated equipment but dissipated into heat within the isolator.

Rubber metal anti vibration mountings are generally made using **NR** Natural Rubber which has low damping.

**This is to**

- a) Provide efficient vibration isolation
- b) Avoid excessive heat build up when isolating active vibration sources.

Where oil and other contamination is present the anti vibration mount must be designed so as to prevent the contaminants coming in contact with the rubber. Alternatively **NBR** (Nitrile) rubber isolators can be used, which have high oil and chemical resistance.

**Phase lag (angle)**

When a damped isolator is subject to an input vibration the reactive response lags behind the input which can be expressed as a phase lag (angle). The greater the phase lag, the greater the damping and dissipated energy.

Phase Lag between response and excitation is given by:

$$\text{Phase lag (angle)} \phi = \tan^{-1} (1/Q(\omega / \omega_0 - \omega_0 / \omega))$$

$$\omega_0 = \sqrt{\frac{K}{M}}$$

$$\omega = 2 f e$$

K = Isolator Spring Constant N/m

M = Supported Mass kg

f e = disturbing frequency Hz

Damping is required where movement of the supported equipment must be minimised especially at resonance. Damping is also required when shock is to be absorbed.

Isolators with	C/Cc	Product
No damping	0	Helical Springs
Low damping	0.01	NR Natural Rubbers
Moderate damping	0.05	CR Neoprene / Chloroprene Rubbers
Good damping	0.1	NBR Nitrile Rubbers
High damping	0.2- 0.3	Helical spring with viscous damping

Against receipt of full information free advice and proposals will be given for the use of all Farrat products.  
A charge may be made where a detailed site survey is required involving vibration measurements.



Farrat are certified to TUC UKQA ISO 9001/2000

- A** = acceleration m/s<sup>2</sup>
- V** = velocity m/s
- D** = displacement m
- C** = damping coefficient Ns/m
- K** = spring constant N/m
- P** = Peak vibration force N
- f** = frequency Hz

Relationships between vibration units

RMS = 0.707 \* (Peak)

$\omega = 2\pi f$

**A** =  $\omega V$

**V** =  $A/\omega = A/2\pi f$

**V** =  $\omega D$

**D** =  $V/\omega$

The above formula are valid for both vertical and horizontal vibrations

Vertical Axis **Z**

Longitudinal Axis **Y**

Transverse Axis **X**

**Distribution of Load on unsymmetrical supported mass**

**Total Load Lt**

- L.A** Lt\*((b-c)/b)\*(d/a)
- L.B** Lt\*(c/b)\*(d/a)
- L.C** Lt\*(c/b)\*((a-d)/a)
- L.D** Lt\*((b-c)/b)\*((a-d)/a)

It is important to aim for as near as possible the same static deflection for each isolator by selecting suitable sizes and stiffnesses to match loads at each point.

Static deflection at **A** mm = **L.A/K.A** etc.

**K.A**= Vertical Spring Constant of isolator at **A** N/mm

**L.A**= Static Load **N** at **A**

Vertical Natural Frequency

$$f_{nv} = \frac{1}{2} \sqrt{\frac{K_t * 1000}{M}}$$

**M**= total equipment mass kg

**K.T** = **K.A** + **K.B** + **K.C** + **K.D** N/mm

When specifying Isolators it is important to ensure that the vertical and horizontal isolator natural frequencies are less than 50% of the lowest significant disturbing frequencies (determined by rotating speeds) or by measurement.

**Natural frequencies and Coupled Modes**

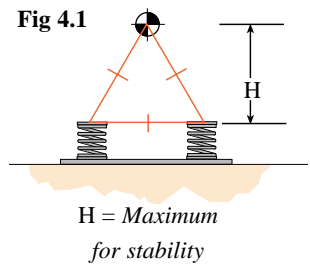
In most applications the vertical natural frequency of an isolation system is considered to be the most important. However the position of the isolators in relation to the equipment Centre of Gravity (C/g) should be taken into account.

**Uncoupled Modes**

Isolators are in the same horizontal plane as the C/g. Vertical, horizontal and rotational modes are uncoupled.

**Coupled Modes**

Isolators below the C/g  
The motion of the system is a combination of vertical, horizontal and rotational motion coupled with rocking about a lower or upper rocking centre.



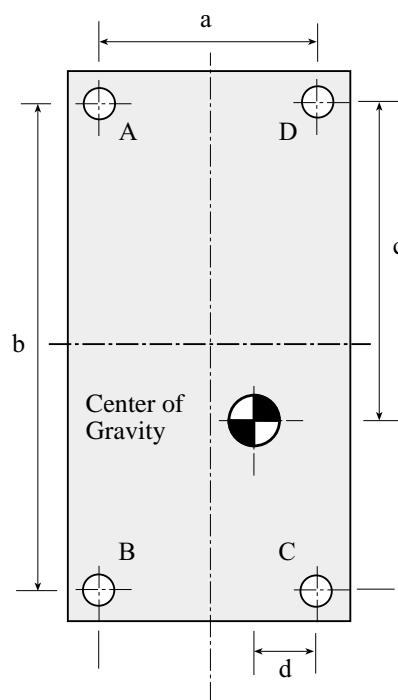
**Stability limit**

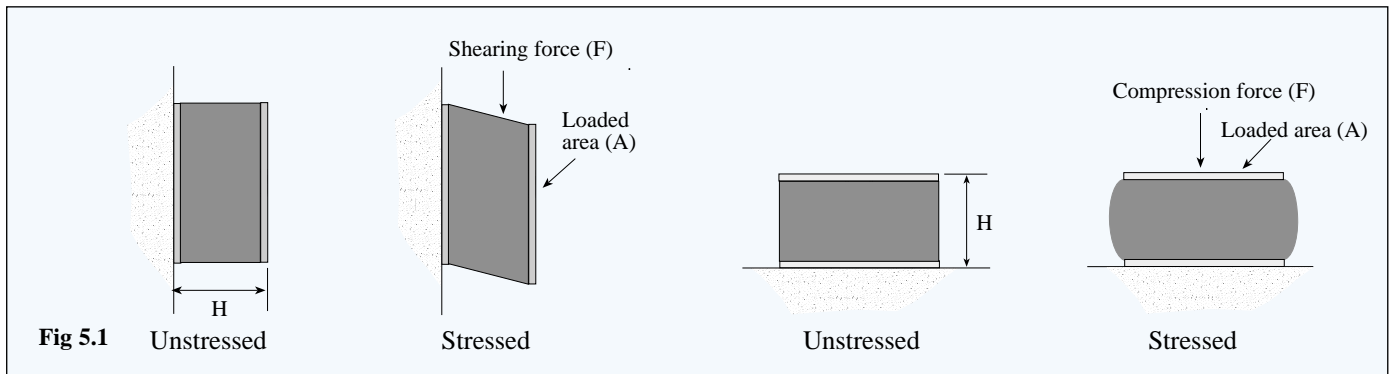
The maximum distance **H** of isolators below the C/g is given by an equilateral triangle connecting isolators to each other and the C/g.

Determination of undamped Vertical Natural Frequency from static vertical deflection

$$f_n = 15.76 \sqrt{\frac{1}{\delta}}$$

$\delta$  = static deflection (mm)





**Rubber is produced in Natural, Synthetic or Thermoplastic forms**

**NR Natural.**

Very high resilience  
 Low damping for maximum vibration isolation efficiency.  
 Very low creep.  
 Low chemical and oil resistance

**Typical Applications**

Low frequency anti vibration mountings  
 Structural bearings

**NBR Nitrile.**

Moderate resilience  
 Damping ratio  $C/C_c = \zeta = ca 0.10$   
 Low creep  
 High oil and chemical resistance

**Typical Applications**

Anti vibration mountings in hydraulic and other chemical environments.  
 Shock absorption pads  
 Anti vibration pads for plant and machinery

**CR Chloroprene / Neoprene**

High resilience  
 Damping ratio  $C/C_c = \zeta = ca 0.05$   
 Low creep  
 Moderate oil and chemical resistance  
 Fire retardant properties

**Typical Applications**

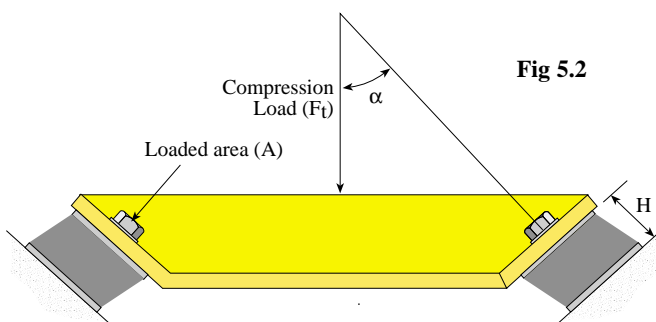
Acoustic damping pads  
 Floating floors  
 Structural bearings  
 Anti vibration pads  
 Sensitive equipment isolation

**Synthetic rubbers**

Synthetic rubbers come in many formulations depending on application requirements.

Commonly used for anti vibration mountings requiring damping and or good oil and chemical resistance.

**Optimum support design for Rubber Isolators**



For maximum elastically supported stability, positioning rubber metal isolators at an angle to the vertical loads the rubber in a combination of shear and compression. Ideally the shear and compression deflection should be almost the same. To achieve this the angle should be 30°.

To calculate vertical deflection  $\delta_t$  (mm):

$$\delta_t = \frac{F_t * H}{2 * A * (G \sin^2 \alpha + E_c \cos^2 \alpha)}$$

**G** = Shear Modulus (N/mm<sup>2</sup>)

**E<sub>c</sub>** = Compression Modulus (N/mm<sup>2</sup>)

**H** = Rubber height (mm)

**A** = Loaded rubber area (mm<sup>2</sup>)

**F<sub>t</sub>** = Load (N)

The information contained in this brochure is intended to be a guide only. We suggest product samples be tested and approved based on your intended applications. We reserve the right to alter specifications or withdraw products with or without prior notice.

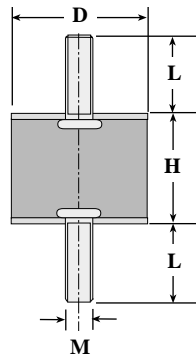


Fig 6.1

**Stock Availability** (subject to change)

- 1) Generally ex stock
- 2) 2-3 days
- 3) Subject to quotation

Order Examples: **R05045AN6**  
**R05045ANB6 (NBR)**

\* **CR** (Neoprene) and **NBR** (Nitrile) versions available on request.

Rubber Metal Isolators, Form A, Natural Rubber (NR)											
Farrat Code	D mm	H mm	Screw		Stock	Rubber		Max. Load N	Vert. Spring Rate N/mm	Defl. at Max. Load mm	Horiz. Spring Rate N/mm
			M Thread mm	L Length mm		Grade	Hardness Ihrd Sh.A				
R00808 AN4	8	8	3	6	1	NR	45	16	20	0.80	4
R01010 AN4	10	10	4	10	1	NR	45	25	25	1.00	5
R01010 A N6					3	NR	60	60	60	1.00	9
R01010 AN7					1	NR	70	100	100	1.00	14
R01515 AN4	15	15	4	13	1	NR	45	50	33	1.50	6
R01515 AN6					3	NR	60	117	78	1.50	9
R01515 AN7					3	NR	70	203	135	1.50	12
R02015 AN4	20	15	6	16	1	NR	45	125	83	1.50	11
R02015 AN6					2	NR	60	279	186	1.50	17
R02015 AN7					3	NR	70	450	300	1.50	24
R02020 AN4	20	20	6	16	2	NR/NBR	45	96	48	2.00	8
R02020 AN6					2	NR	60	220	110	2.00	12
R02020 AN7					3	NR	70	380	190	2.00	17
R02025 AN4	20	25	6	18	2	NR/NBR	45	88	35	2.50	7
R02025 AN6					2	NR	60	200	80	2.50	10
R02025 AN7					3	NR	70	350	140	2.50	14
R02530 AN4	25	30	6	18	1	NR	45	129	43	3.00	9
R02530 AN6					2	NR	60	300	100	3.00	13
R02530 AN7					3	NR	70	525	175	3.00	18
R03030 AN4	30	30	8	20	1	NR/NBR	45	192	64	3.00	13
R03030 AN6					1	NR	60	450	150	3.00	19
R03030 AN7					3	NR	70	780	260	3.00	26
R04030 AN4	40	30	8	23	2	NR/NBR	45	384	128	3.00	23
R04030 AN6					2	NR	60	870	290	3.00	34
R04030 AN7					2	NR	70	1479	493	3.00	48
R05030 AN4	50	30	10	28	1	NR	45	768	256	3.00	35
R05030 AN6					3	NR	60	1695	565	3.00	53
R05030 AN7					3	NR/NBR	70	2853	951	3.00	74
R05045 AN4	50	45	10	28	1	NR/NBR	45	544	123	4.50	23
R05045 AN6					3	NR	60	1278	284	4.50	35
R05045 AN7					3	NR	70	2205	490	4.50	49
R06035 AN4	60	35	10	28	3	NR	45	1071	306	3.50	44
R06035 AN6					3	NR	60	2335	667	3.50	65
R06035 AN7					3	NR	70	3938	1125	3.50	91
R07550 AN4	75	50	12	37	3	NR	45	1385	277	5.00	48
R07550 AN6					2	NR	60	3130	626	5.00	71
R07550 AN7					2	NR	70	5300	1060	5.00	100
R07555 AN4	75	55	12	37	2	NR/NBR	45	1309	238	5.50	43
R07555 AN6					3	NR	60	2970	540	5.50	65
R07555 AN7					3	NR	70	5049	918	5.50	91
R10055 AN4	100	55	16	45	2	NR	45	2932	533	5.50	77
R10055 AN6					1	NR	60	6380	1160	5.50	106
R10055 AN7					1	NR	70	10725	1950	5.50	150
R10075 AN6	100	75	16	45	1	NR	60	5213	695	8.50	646
R12555 AN4	125	55	16	45	3	NR	45	6050	1100	5.50	976
R12555 AN6					3	NR	60	12650	2300	5.50	2065
R12555 AN7					3	NR	70	20680	3760	5.50	3458
R15055 AN4	150	55	16	45	3	NR	45	10423	1895	5.50	1677
R15055 AN6					1	NR	60	21285	3870	5.50	3471
R15055 AN7					3	NR	70	345134	6275	5.50	5744

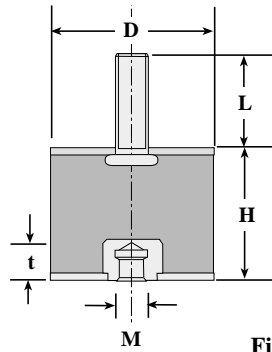


Fig 7.1

**Stock Availability** (subject to change)

- 1) Generally ex stock
- 2) 2-3 days
- 3) Subject to quotation

Order Examples: **R05045BN6**  
**R05045BNB6 (NBR)**

\* **CR** (Neoprene) and **NBR** (Nitrile) versions available on request.

Rubber Metal Isolators, Form B, Natural Rubber (NR)													
Farrat Code	D mm	H mm	Screw			Stock	Rubber		Max. Load N	Vert. Spring. Rate N/mm	Defl. at Max. Load mm		
			M Thread mm	L Length mm	t Depth mm		Grade	Hardness Ihrd Sh.A					
R01010 BN4	10	10	4	10	3	1	NR	45	25	25	1.00		
R01010 BN6						3	NR	60	60	60	1.00		
R01010 BN7						3	NR	70	100	100	1.00		
R01515 BN4	15	15	4	13	4	1	NR	45	50	33	1.50		
R01515 BN6						3	NR	60	117	78	1.50		
R01515 BN7						3	NR	70	203	135	1.50		
R02015 BN4	20	15	6	15	5	2	NR	45	125	83	1.50		
R02015 BN6				15		2	NR	60	279	186	1.50		
R02015 BN7				18		3	NR	70	450	300	1.50		
R02020 BN4	20	20	6	15	6	3	NR	45	96	48	2.00		
R02020 BN6				18		1	NR	60	220	110	2.00		
R02020 BN7				15		3	NR	70	380	190	2.00		
R02025 BN4	20	25	6	18	6	2	NR	45	88	35	2.50		
R02025 BN6						2	NR	60	200	80	2.50		
R02025 BN7						3	NR	70	350	140	2.50		
R02530 BN4	25	30	6	18	6	1	NR	45	129	43	3.00		
R02530 BN6			8			2	NR	60	300	100	3.00		
R02530 BN7			6			3	NR	70	525	175	3.00		
R03030 BN4	30	30	8	20	8	2	NR	45	192	64	3.00		
R03030 BN6						2	NR	60	450	150	3.00		
R03030 BN7						3	NR	70	780	260	3.00		
R04030 BN4	40	30	8	23	8	2	NR	45	384	128	3.00		
R04030 BN6						2	NR	60	870	290	3.00		
R04030 BN7						3	NR	70	1479	493	3.00		
R05045 BN4	50	45	10	25	10	2	NR	45	554	123	4.50		
R05045 BN6				25		2	NR	60	1278	284	4.50		
R05045 BN7				28		3	NR	70	2205	490	4.50		
R06035 BN4	60	35	10	27	10	3	NR	45	1071	306	3.50		
R06035 BN6		36		12		37	10	2	NR	60	2335	667	3.50
R06035 BN7		35		10		27	10	3	NR	70	3938	1125	3.50
R07525 BN7	75	25	12	27	12	1	NR	70	8000	4000	2.00		
R07550 BN4	75	50	12	25	12	2	NR	45	1385	277	5.00		
R07550 BN6						2	NR	60	3130	626	5.00		
R07550 BN7						3	NR	70	5300	1060	5.00		
R10055 BN4	100	55	16	45	16	3	NR	45	2650	530	5.00		
R10055 BN6				45		3	NR	60	5850	1170	5.00		
R10055 BN7				44		1	NR	70	10000	2000	5.00		

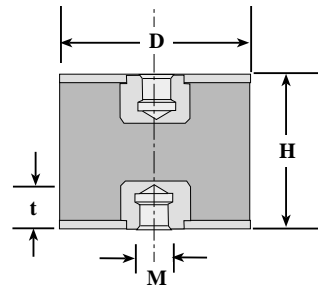
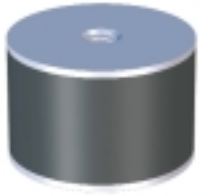


Fig 8.1

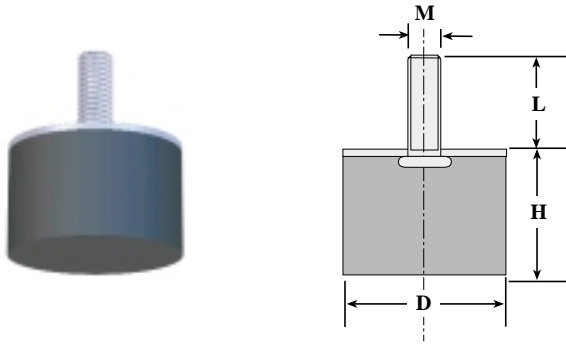
Stock Availability (subject to change)

- 1) Generally ex stock
- 2) 2-3 days
- 3) Subject to quotation

Order Examples: **R05045CN6, R05045CNB6 (NBR)**

\* **CR** (Neoprene) and **NBR** (Nitrile) versions available on request.

Form C, Natural Rubber (NR)										
Farrat Code	D mm	H mm	Screw		Stock	Rubber		Max. Load N	Vert. Spring Rate N/mm	Defl.T at Max. Load mm
			M Thread mm	t Depth mm		Grade	Hardness Ihrd Sh.A			
R01010 CN4	10	10	4	3	1	NR	45	25	25	1.00
R01010 CN6					3	NR	60	60	1.00	
R01010 CN7					3	NR	70	100	100	1.00
R01515 CN4	15	15	4	4	1	NR	45	50	33	1.50
R01515 CN6					3	NR	60	117	78	1.50
R01515 CN7					3	NR	70	203	135	1.50
R02015 CN4	20	15	6	6	3	NR	45	125	83	1.50
R02015 CN6					3	NR	60	279	186	1.50
R02015 CN7					3	NR	70	450	300	1.50
R02020 CN4	20	20	6	6	2	NR/NBR	45	96	48	2.00
R02020 CN6					2	NR	60	220	110	2.00
R02020 CN7					3	NR	70	380	190	2.00
R02025 CN4	20	25	6	6	1	NR	45	88	35	2.50
R02025 CN6					2	NR/NBR	60	200	80	2.50
R02025 CN7					3	NR	70	350	140	2.50
R02530 CN4	25	30	6	6	3	NR	45	129	43	3.00
R02530 CN6					3	NR	60	300	100	3.00
R02530 CN7					2	NR/NBR	70	525	175	3.00
R03030 CN4	30	30	8	8	2	NR/NBR	45	192	64	3.00
R03030 CN6					2	NR	60	450	150	3.00
R03030 CN7					2	NR	70	780	260	3.00
R04030 CN4	40	30	8	8	2	NR/NBR	45	384	128	3.00
R04030 CN6					2	NR	60	870	290	3.00
R04030 CN7					3	NR	70	1479	493	3.00
R05045 CN4	50	45	10	10	2	NR/NBR	45	554	123	4.50
R05045 CN6					2	NR/NBR	60	1278	284	4.50
R05045 CN7					2	NR	70	2205	490	4.50
R06030 CN4	60	30	10	10	3	NR	45	1145	382	3.00
R06030 CN6					3	NR	60	2479	826	3.00
R06030 CN7					3	NR	70	4186	1395	3.00
R06035 CN4	60	35	10	10	3	NR	45	1071	306	3.50
R06035 CN6		36			2	NR	60	2335	667	3.50
R06035 CN7		35			3	NR	70	3938	1125	3.50
R07550 CN4	75	50	12	12	1	NR	45	1385	277	5.00
R07550 CN6					3	NR	60	3130	626	5.00
R07550 CN7					3	NR	70	5300	1060	5.00
R07555 CN4	75	55	12	12	2	NR/NBR	45	1309	238	5.50
R07555 CN6					3	NR	60	2970	540	5.50
R07555 CN7					3	NR	70	5049	918	5.50
R10045 CNB4	100	45	16	16	1	NBR	45	5300	1240	4.30
R10055 CN4	100	55	16	16	3	NR	45	2932	533	5.50
R10055 CN6					2	NR	60	6380	1160	5.50
R10055 CN7					3	NR	70	10725	1950	5.50
R10075 CN4	100	75	16	16	3	NR	60	5213	695	7.50
R12555 CN4	125	55	16	16	3	NR	45	6050	1100	5.50
R12555 CN6					3	NR	60	12650	2300	5.50
R12555 CN7					1	NR	70	20680	3760	5.50
R15055 CN4	150	55	16	16	3	NR	45	10423	1895	5.50
R15055 CN6					3	NR	60	21285	3870	5.50
R15055 CN7					3	NR/NBR	70	34513	6275	5.50
R200100CN4	200	100	16	16	3	NR	45	10330	1033	10.00



**Stock Availability** (subject to change)

- 1) Generally ex stock
- 2) 2-3 days
- 3) Subject to quotation

Order Example: **RD02020 N6, RD02020 NB6 (NBR)**

\* **CR** (Neoprene) and **NBR** (Nitrile) versions available on request.

**Fig 9.1**

Form D, Natural Rubber (NR)										
Farrat Code	D mm	H mm	Screw		Stock	Rubber		Max. Load N	Vert. Spring Rate N/mm	Defl. at Max. Load mm
			M Thread mm	L Length mm		Grade	Hardness Ihrd Sh.A			
RD01010 N4	10	10	4	10	3	NR	45	24	24	1.00
RD01010 N6					3	NR	60	55	55	1.00
RD01010 N7					3	NR	70	94	94	1.00
RD01515 N4	15	15	4	14	3	NR	45	46	31	1.50
RD01515 N6					3	NR	60	110	73	1.50
RD01515 N7					3	NR	70	188	125	1.50
RD02015 N4	20	15	6	16	3	NR	45	113	75	1.50
RD02015 N6					3	NR	60	250	167	1.50
RD02015 N7					3	NR	70	436	291	1.50
RD02020 N4	20	20	6	18	3	NR	45	88	44	2.00
RD02020 N6					2	NR	60	206	103	2.00
RD02020 N7					3	NR	70	356	178	2.00
RD02025 N4	20	25	6	18	3	NR	45	78	31	2.50
RD02025 N6					3	NR	60	188	75	2.50
RD02025 N7					3	NR	70	324	130	2.50
RD02525 N4	25	25	6	18	2	NR	45	119	40	3.00
RD02525 N6		25	6	18	2	NR	60	285	95	3.00
RD03030 N4	30	30	8	20	2	NR	45	178	59	3.00
RD03030 N6					2	NR	60	422	141	3.00
RD03030 N7					2	NR	70	728	243	3.00
RD04030 N4	40	30	8	25	2	NR	45	351	117	3.00
RD04030 N6		30	8	25	2	NR	60	808	269	3.00
RD05020 N4	50	20	10	25	1	NR	45	1364	649	2.10
RD05020 N6					2	NR	60	2790	1329	2.10
RD05020 N7					3	NR	70	4565	2174	2.10
RD07525 N4	75	25	12	37	1	NR	45	544	218	2.50
RD07525 N6					2	NR	60	1255	502	2.50
RD07525 N7					3	NR	70	2148	859	2.50
RD10050 N4	100	50	16	45	3	NR	45	2404	481	5.00
RD10050 N6					2	NR	60	5319	1064	5.00
RD10050 N7					3	NR	70	9049	1810	5.00

Load in Compression

Load in Shear

Arrangement for optimum effect

**DO NOT** Load in tension

Calculation for the Natural Frequency loaded in compression or shear:

**For ISOLATORS RM in Natural Rubber NR**

$$f_n \text{ (Hz)} = 15.76 \sqrt{\frac{K \text{ (N/mm)}}{\text{Load (N)}}}$$

**For ISOLATORS RM in Nitrile Rubber NBR**

$$f_n \text{ (Hz)} = 24.27 \sqrt{\frac{K \text{ (N/mm)}}{\text{Load (N)}}}$$

**Fig 9.2**

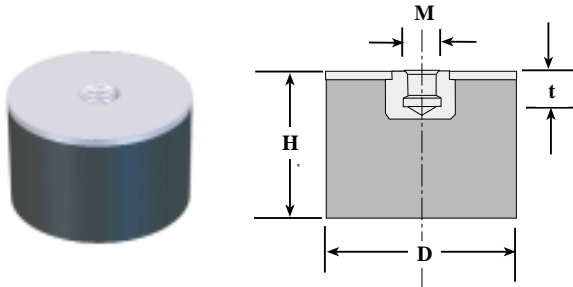


Fig 10.1

**Stock Availability** (subject to change)

- 1) Generally ex stock
- 2) 2-3 days
- 3) Subject to quotation

Order Example: **RE02020N6, RE02020NB6 (NBR)**

\* **CR** (Neoprene) and **NBR** (Nitrile) versions available on request.

Form E, Natural Rubber (NR)										
Farrat Code	D mm	H mm	Screw		Stock	Rubber		Max. Load N	Vert. Spring Rate N/mm	Defl. at Max. Load mm
			M Thread mm	t Depth mm		Grade	Hardness Ihrd Sh.A			
RE01010 N6	10	10	4	4	3	NR	60	55	55	1.00
RE01515 N6	15	15	4	4	3	NR	60	110	73	1.50
RE02015 N6	20	15	6	6	3	NR	60	250	167	1.50
RE02020 N6	20	20	6	6	2	NR	60	206	103	2.00
RE02025 N6	20	25	6	6	3	NR	60	188	75	2.50
RE03015 N6	30	15	8	8	2	NR	60	211	141	1.50
RE03030 N6	30	30	8	8	2	NR	60	422	141	3.00
RE05021 N6	50	21	10	10	2	NR	60	2790	1329	2.10
RE07525 N6	75	25	12	12	3	NR	60	1255	502	2.50
RE10040 N6	100	40	16	16	3	NR	60	4255	1064	4.00

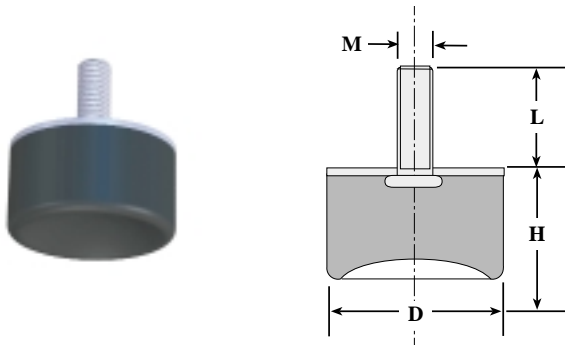


Fig 13.1

**Stock Availability** (subject to change)

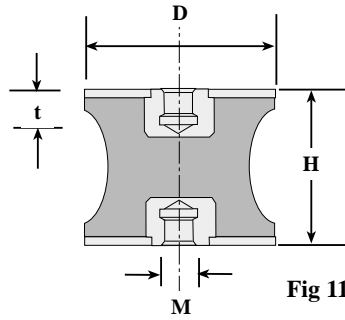
- 1) Generally ex stock
- 2) 2-3 days
- 3) Subject to quotation

Order Example: **RDS02017N6**

\* **CR** (Neoprene) and **NBR** (Nitrile) versions available on request.

Form DS Natural Rubber (NR)										
Farrat Code	D mm	H mm	Screw		Stock	Rubber		Max. Load N	Vert. Spring Load N/mm	Defl. at Max. Load mm
			M Thread mm	L mm		Grade	Hardness Ihrd Sh.A			
RDS02518 N6	25	18.5	6	18	3	NR	60	206	103	2.00
RDS04028 N6	40	28.5	8	23	3	NR	60	754	269	2.80
RDS05028 N6	50	28	10	33	3	NR	60	3720	1329	2.80

CT mounts are designed for shear and light tensile loads only. **Do not use in compression**



**Stock Availability** (subject to change)

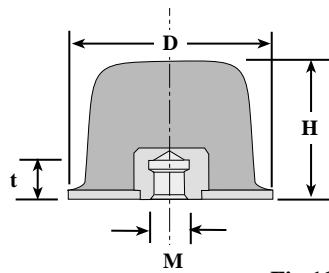
- 1) Generally ex stock
- 2) 2-3 days
- 3) Subject to quotation

Order Example: **RCT05030N6**

\* **CR** (Neoprene) and **NBR** (Nitrile) versions available on request.

Form CT, Natural Rubber (NR)							
Farrat code	D mm	H mm	Screw		Stock	Rubber	
			M Thread mm	t Depth mm		Grade	Hardness Ihrd Sh.A
RCT03020 N6	30	20	8	8	3	NR	60
RCT04048 N6	40	48	8	8	3	NR	60
RCT05030 N6	50	30	10	10	3	NR	60
RCT07540 N6	75	40	12	12	3	NR	60
RCT10055 N6	100	55	16	16	3	NR	60

KE mounts are designed primarily for use as bump stops



**Stock Availability** (subject to change)

- 1) Generally ex stock
- 2) 2-3 days
- 3) Subject to quotation

Order Example: **RKE08060N6**

\* **CR** (Neoprene) and **NBR** (Nitrile) versions available on request..

Form KE, Natural Rubber (NR)										
Farrat Code	D mm	H mm	Screw		Stock	Rubber		Max. Load N	Vert. Spring Rate N/mm	Defl. at Max. Load mm
			M Thread mm	t Depth mm		Grade	Hardness Ihrd Sh.A			
RKE05035 N6	50	35	10	10	3	NR	60	942	269	3.50
RKE08060 N6	80	60	12	12	3	NR	60	3474	579	6.00
RKE12590 N6	125	90	16	16	3	NR	60	9574	1064	9.00

AT Mounts are used in a variety of anti-vibration applications. Due to their large bonded surface, relative to the rubber centre diameter, these mounts can be used in both shear and light tensile loadings. **Never use with compression loads**

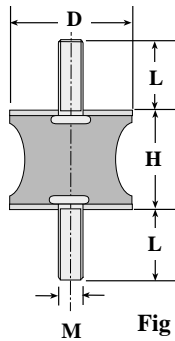


Fig 12.1

**Stock Availability** (subject to change)

- 1) Generally ex stock
- 2) 2-3 days
- 3) Subject to quotation

Order Example: **RAT05030N6**

\* **CR** (Neoprene) and **NBR** (Nitrile) versions available on request.

Form CT, Natural Rubber (NR)							
Farrat Code	D mm	H mm	Screw		Stock	Rubber	
			M Thread mm	L Depth mm		Grade	Hardness Ihrd Sh.A
RAT 02015 N6	20	15	6	18	3	NR	60
RAT 03020 N6	30	20	8	20	3	NR	60
RAT 04048 N6	40	48	8	23	3	NR	60
RAT 05030 N6	50	30	10	33	3	NR	60
RAT 07540 N6	75	40	12	37	3	NR	60
RAT 10055 N6	100	55	16	45	3	NR	60

KP buffers have a distinctive form that has a progressive buffering characteristic. These buffers are used to limit vibration, deflections, impact and shock. Two or more buffers can be used in parallel to prevent overloading in high load applications.

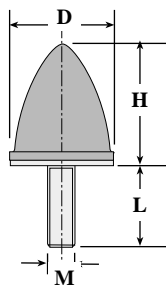


Fig 12.2

**Stock Availability** (subject to change)

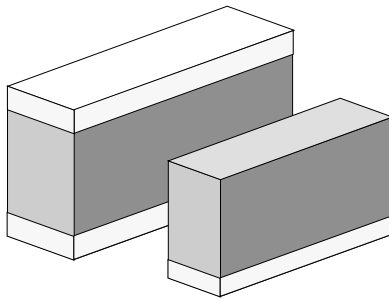
- 1) Generally ex stock
- 2) 2-3 days
- 3) Subject to quotation

Order Example: **RKP07589N6**

\* **CR** (Neoprene) and **NBR** (Nitrile) versions available on request.

Form KP, Natural Rubber (NR)										
Farrat Code	D mm	H mm	Screw		Stock	Rubber		Max. Rate N	Vert. Spring Rate N/mm	Defl. at Max. Load mm
			M Thread mm	L Length mm		Grade	Hardness Ihrd Sh.A			
RKP02024 N6	20	24	6	18	3	NR	60	420	35	12.00
RKP03036 N6	30	36	8	20	3	NR	60	1200	67	18.00
RKP05058 N6	50	58	10	28	3	NR	60	3300	94	35.00
RKP07589 N6	75	89	12	37	3	NR	60	7000	156	45.00
RKP115136N6	115	136	16	43	3	NR	60	13000	186	70.00

RMR Rubber metal rails are used in a variety of anti-vibration applications in the machine, building, general engineering, and automotive industries. They are intended to protect sensitive machinery and equipment from unwanted shock and vibration. They also allow relative movement thereby reducing forces and tensions. Typical applications include mounting of heavy units, motors, hoists, lifts and conveyor systems.



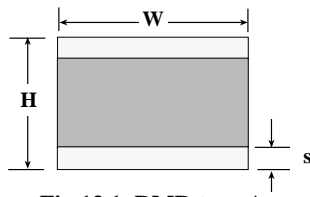
**RMR Range includes;**

- A** type - Top and bottom steel plate edges are flush with the rubber edge.
- B** type - Top and bottom steel plate widths is greater than rubber width.
- C** type - Bottom steel plate is rubber free at each end and longer than top plate.
- D** type - Single steel length is longer than rubber length and rubber free at each end.
- F** type - Single bottom steel plate edge is flush with rubber.

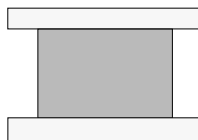
**Stock Availability** (subject to change)

- 1) Generally ex stock
- 2) 2-3 days
- 3) Subject to quotation

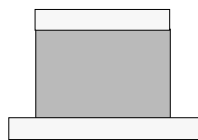
Order Example: **RMR 04035 A**



**Fig 13.1, RMR type A**



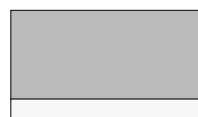
**Fig 13.2, RMR type B**



**Fig 13.3, RMR type C**



**Fig 13.4, RMR type D**



**Fig 13.5, RMR type F**

RMR Rubber metal rails (Standard type other size on request)					
Farrat Code	W mm	H mm	L mm	s mm	Stock
RMR 04035 *	40	35	2000	10	3
RMR 05035 *	50	35	2000	10	3
RMR 05040 *	50	40	2000	10	3
RMR 05045 *	50	45	2000	10	3
RMR 05050 *	50	50	2000	10	3
RMR 05070 *	50	70	2000	10	3
RMR 07050 *	70	50	2000	10	3
RMR 07060 *	70	60	2000	10	3
RMR 08045 *	80	45	2000	10	3
RMR 08080 *	80	80	2000	10	3
RMR 10060 *	100	60	2000	15	3
RMR 10080 *	100	80	2000	15	3
RMR 12045 *	120	45	2000	15	3
RMR 12060 *	120	60	2000	15	3
RMR 15060 *	150	60	2000	15	3
RMR 15080 *	150	80	2000	15	3

\* Specify A, B, C, D, or F  
Standard Rubber NR IRHD 60, other grades and sizes available on request.

The **RTS** element is designed to be used as elastic vibration isolator. RTS Mounts can be used on their own or two mounts can be stacked to increase the isolation efficiency. All mounts are supplied with a load spreading top plate. When installed the mount traps a pocket of air between the mount and the supporting surface. This gives a highly elastic support that is capable of achieving very low natural frequencies.

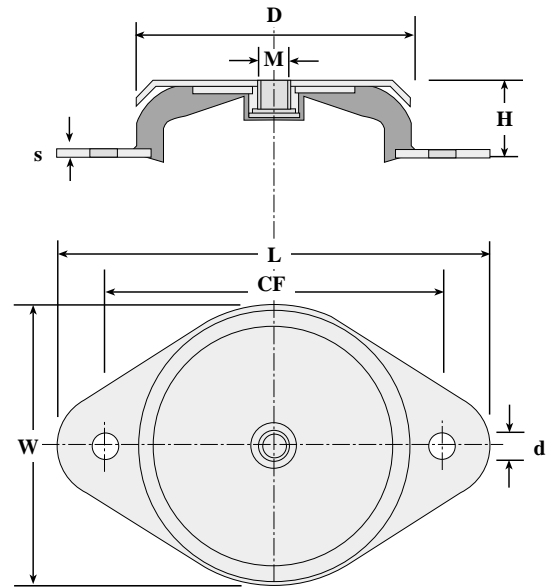


Fig 14.1

**Stock Availability** (subject to change)

- 1) Generally ex stock
- 2) 2-3 days
- 3) Subject to quotation

All metal parts bright zinc plated mild steel

Order Example: **RTS060N6**

**Bolt through add suffix BT**

Order Example: **RTS060NBT8**

Farrat Code	D Diam. mm	CF Hole Centres mm	L Base Length mm	d Hole diam. mm	H Height Unloaded mm	M Thread mm	Thread depth mm	S Plate Thick mm	Stock	Rubber		Max. Load N	Vert. Spring Rate N/mm	Defl. at Max. Load mm
										Grade	Hardness Ihrd Sh.A			
RTS 040 N4	40	52	64	6.2	20	M6	6	2	1	NR	45	60	20	3.00
RTS 040 N6	40	52	64	6.2	20	M6	6	2	1	NR	60	75	30	2.50
RTS 060 N4	60	76	64	6.2	24	M6	6	3	1	NR	45	180	60	3.00
RTS 060 N6	60	76	90	6.2	24	M6	6	3	1	NR	60	250	83	3.00
RTS 060 N7	60	76	90	6.2	24	M6	6	3	3	NR	75	400	160	2.50
RTS 080 N4	80	100	120	8.2	27	M8	8	3	1	NR	45	480	96	5.00
RTS 080 N6	80	100	120	8.2	27	M8	8	3	1	NR	60	800	200	4.00
RTS 080 N7	80	100	120	8.2	27	M8	8	3	3	NR	75	1100	367	3.00
RTS 100 N4	100	124	148	10.2	28	M10	10	3	1	NR	45	750	188	4.00
RTS 100 N6	100	124	148	10.2	28	M10	10	3	1	NR	60	1500	375	4.00
RTS 100 N7	100	124	148	10.2	28	M10	10	3	3	NR	75	2080	520	4.00
RTS 150 N4	150	182	214	12.2	39	M14	14	3	1	NR	45	1420	200	7.10
RTS 150 N6	150	182	214	12.2	39	M14	14	3	1	NR	60	2300	354	6.50
RTS 150 N7	150	182	214	12.2	39	M14	14	3	3	NR	75	3640	639	5.70
RTS 200 N4	200	240	280	14.5	44	M18	18	3	1	NR	45	5000	714	7.00
RTS 200 N6	200	240	280	14.5	44	M18	18	3	1	NR	60	7400	1104	6.70
RTS 200 N7	200	240	280	14.5	44	M18	18	3	3	NR	75	12000	2182	5.50

All metal parts bright zinc plated mild steel

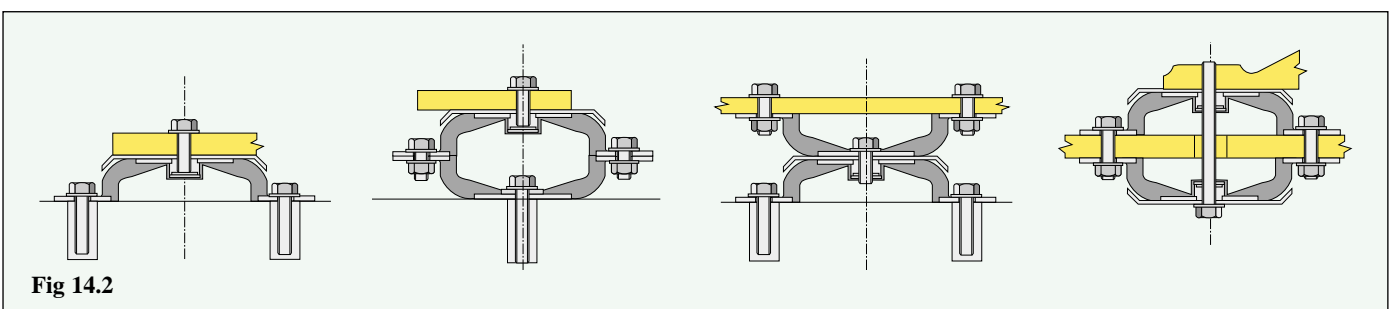


Fig 14.2

RP isolators provide facility to bolt onto supported equipment and if required the support surface.  
**Applications include:** pump sets, generators, HVAC and other passive and active applications.

**Stock Availability:** Subject to quotation  
**Order Examples:** RPA15020N60  
 RPC15020N60  
 RPE15020N60

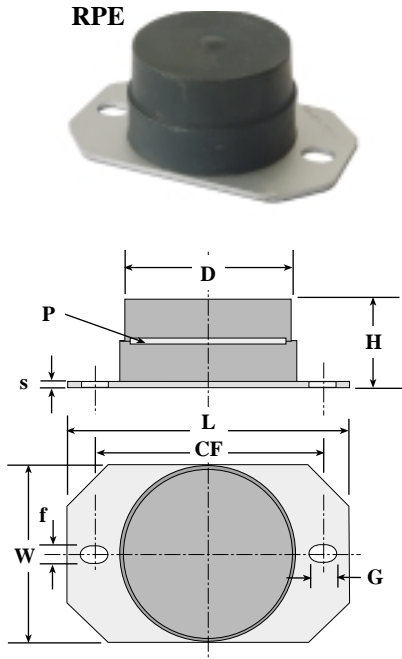


Fig 15.1

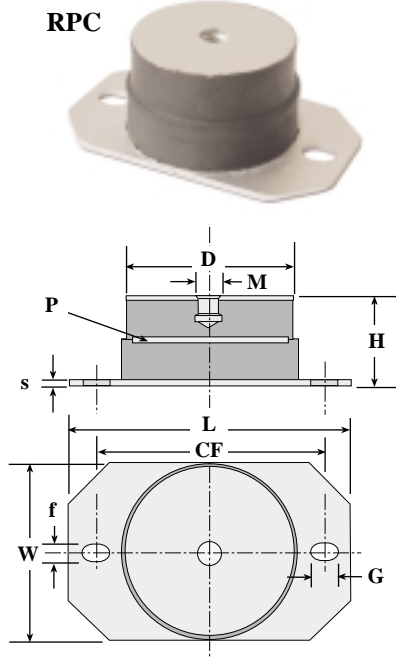


Fig 15.2

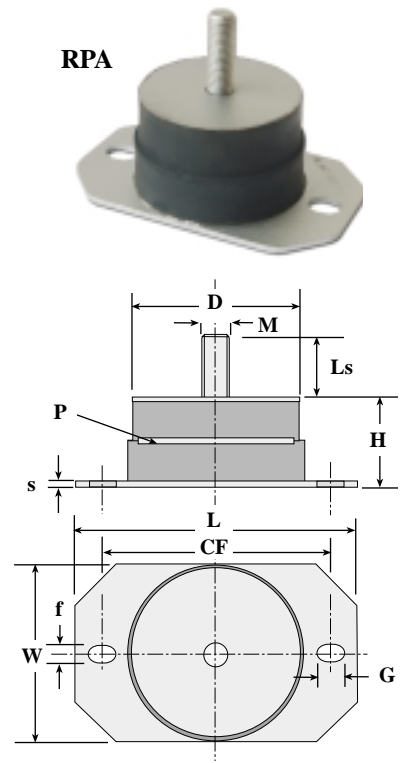


Fig 15.3

RP Natural Rubber (NR)										
Type For Size	RPA/C M	RPA Ls	Dimensions mm				Base thickness s	Fixing holes		
			L	W	H	D		Width f	Length g	Centres CF
RP* 08012	M12x1.75	37	130	80	50	80	3	12	20	106
RP* 08020	M20x2.5	37	130	80	50	80	3	12	20	106
RP* 10012	M12x1.75	37	150	110	80	100	5	17	-	140
RP* 10020	M20x2.5	37	150	110	80	100	5	17	-	140
RP* 15020	M20x2.5	35	240	170	80	150	5	20	-	200

RP* Load capacities and characteristics						
Farrat Code	Rubber Grade	Hardness Ihrd Sh.A	Damping C/Cc	Vertical		
				Spring constant kN/mm	Max. Load kN	Deflection at Max. Load mm
RP* 080**N35	NR	35	0.01	0.2	1.00	5.00
RP* 080**N35P	NR	35	0.01	0.4	2.00	5.00
RP* 080**N70	NR	70	0.01	0.6	3.00	5.00
RP* 080**N50P	NR	50	0.01	0.8	4.00	5.00
RP* 080**N60P	NR	60	0.01	1.0	5.00	5.00
RP* 100**N70	NR	70	0.01	1.0	6.00	6.00
RP* 15020N70	NR	70	0.01	2.33	14.00	6.00

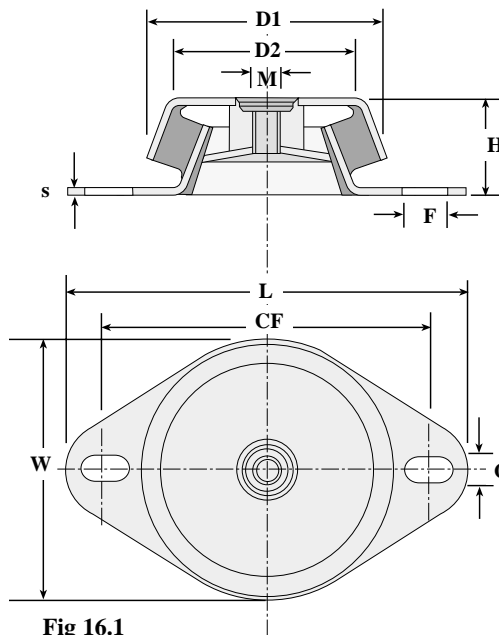
\* RP Mounts with Neoprene Rubber (CR) available on request  
 Order Example: RPA15020CR50

P: Steel reinforcing plate,  
 applicable to codes with suffix P

Metal parts Sherardised steel, bright zinc plated threaded parts.  
 Stainless steel on request.

REM equipment and machine vibration isolation mounts with rebound control

**Applications include:** compressors, gensets, motors, pumps and other rotating machinery, electronic, hydraulic equipment, scientific and other equipment.



**Fig 16.1**

**Stock Availability**

(subject to change)

- 1) Generally ex stock
- 2) 2-3 days
- 3) Subject to quotation

Order Example:

**REM 0601045**

REM, Natural Rubber (NR)																
Farrat Code	D1	D2	L	W	H	M	G	F	CF	S	Rubber		Max. Load N	Vert. Spring Rate N/mm	Defl. at Max. Load mm	Stock
	Cover mm	Cover Top mm	Base Length mm	Base Width mm	Height mm	Thread mm	Slot Width mm	Slot Length mm	Fixing Centres	mm	Grade	Hardness Ihrd Sh.A				
REM 0601045	60	38	106	60	35	M10x1.5	8.3	16	75-90	2	NR	45	950	297	3.20	2
REM 0601060	60	38	106	60	35	M10x1.5	8.3	16	75-90	2	NR	60	1700	567	3.00	2
REM 0601245	60	38	106	60	35	M12x1.75	8.3	16	75-90	2	NR	45	950	297	3.20	2
REM 0601260	60	38	106	60	35	M12x1.75	8.3	16	75-90	2	NR	60	1700	567	3.00	2
REM 0621245	60	50	106	60	31	M12x1.5	8.3	16	75-90	3	NR	45	1600	533	3.00	2
REM 0621260	60	50	106	60	31	M12x1.5	8.3	16	75-90	3	NR	60	3000	1111	2.70	2
REM 0771045	77	59	128	77	30	M10x1.5	9	9	110	2	NR	45	1200	387	3.10	3
REM 0771060	77	59	128	77	30	M10x1.5	9	9	110	2	NR	60	2800	933	3.00	2
REM 0921245	92	73.5	128	92	45	M12x1.75	10.5	10.5	110	3	NR	45	3500	921	3.80	2
REM 0921260	92	73.5	128	92	45	M12x1.75	10.5	10.5	110	3	NR	60	6000	1818	3.30	2
REM 0931045	93	70	144	93	35	M10x1.5	10	10	124	2.5	NR	45	1800	581	3.10	2
REM 0931060	93	70	144	93	35	M10x1.5	10	10	124	2.5	NR	60	4000	1333	3.00	2
REM 1061245	106	81	172	106	38	M12x1.75	14	18	138-146	3	NR	45	2750	809	3.40	2
REM 1061260	106	81	172	106	38	M12x1.75	14	18	138-146	3	NR	60	5100	1759	2.90	3
REM 1061645	106	81	172	106	38	M16x2	14	18	138-146	3	NR	45	2750	809	3.40	2
REM 1061660	106	81	172	106	38	M16x2	14	18	138-146	3	NR	60	5100	1759	2.90	2
REM 1061670	106	81	172	106	38	M16x2	14	18	138-146	3	NR	70	10000	3448	2.90	2
REM 1081645	108	83	190	108	50	M16x2	16.5	16.5	160	5	NR	45	4000	1212	3.30	3
REM 1081660	108	83	190	108	50	M16x2	16.5	16.5	160	5	NR	60	8500	2833	3.00	2
REM 1081670	108	83	190	108	50	M16x2	16.5	16.5	160	5	NR	70	14000	5385	2.60	2
REM 1211645	121	92	188	121	42	M16x2	14	14	158	3	NR	45	4250	1063	4.00	2
REM 1211660	121	92	188	121	42	M16x2	14	14	158	3	NR	60	6800	1943	3.50	2
REM 1441645	144	121	216	144	48	M16x2	14	18	186	4	NR	45	8000	1000	8.00	2
REM 1441660	144	121	216	144	48	M16x2	14	18	186	4	NR	60	14000	1944	7.20	3

Previous code prefix: CCF

All metal parts bright zinc plated mild steel

**Mounts for levelling, shock and vibration absorption**

Isomounts provide an efficient and economic method of installation of a wide range of machinery and equipment. Machines can be installed and accurately levelled without bolting down or grouting. Machine performance is improved through effective shock and vibration isolation and damping.

**Typical applications include:**

- Compressors and Pump Sets
- Diecasting machines
- Diesel Generators
- Hydraulic Power Packs
- Injection Moulding Machines
- Packaging Machinery
- Presses: Forging, Hydraulic and Mechanical
- Rubber Machinery
- Testing Machines



Dimensions, Capacities and Characteristics									
Isomount	Unit	0-70	1-80	2-80	3-80	3 HM-80	35-80	4-80	5-80
Diameter D <sub>1</sub>	mm	50	78	120	160	160	200	228	320
Diameter D <sub>2</sub>	mm	36	60	100	135	140	170	200	300
Height, Min.. H <sub>1</sub>	mm	21	32	55	40	55	55	55	70
Height, Max H <sub>2</sub>	mm	30	44	70	55	75	75	75	100
Vertical Adjust	-	9	12	15	16	20	20	20	30
Screw Thread	H or SH	M10x1.50	M10x1.50	M12x1.25	M20x1.50	M20x1.50	M24x1.50	M24x1.50	M30x1.5
Alternative Thread	H or SH	-	M12x1.75	M16x1.5	M16x1.5	M16x1.5	M20x1.50	M20x1.50	M24x1.50
	H	-	-	M16x2	-	-	-	-	M30x2
Standard Rubber	IRHD A	-70	-80	-80	-80	-80	-80	-80	-80
Spring Constant	Standard								
Vertical	kN / mm	1.2	3.3	7	9	17	21	26	55
Horizontal	kN / mm	0.4	1.2	2.5	3	6	7	10	20
Damping Factor	C / Cc	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09
Maximum Load/Mount	daN	150	500	1200	2500	3000	4000	5000	12000
Mass without screw	kg	0.25	0.5	1.5	2.5	2.6	3.9	6.4	19.1

1 daN = 1 kg

Adjusting Screws Size x Lengths available					
H = Hexagon Head, screw zinc plated					
M10 x 1.5	M12 x 1.75	M16 x 2	M20 x 1.5	M24 x 1.5	M30 x 2.0
60 H	80 H	70 H	100 H	130 H	200 H
80 H	100 H	100 H	120 H	150 H	-
-	-	150 H	150 H	180 H	-
-	-	-	180 H	250 H	-
-	-	-	250 H	-	-
17 A/F	19 A/F	24 A/F	30 A/F	36 A/F	46 A/F
SH = Hexagon Head stud, zinc plated					
	M12 x 1.25	M16 x 1.5	M20 x 1.5	M24 x 1.5	M30 x 1.5
	120 SH	120 SH	170 SH	170 SH	170 SH
Spanner	9 A/F	12 A/F	15 A/F	19 A/F	24 A/F

Fig 17.01

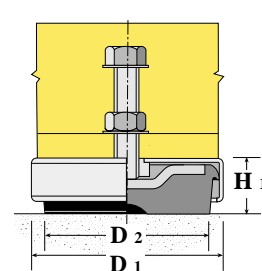
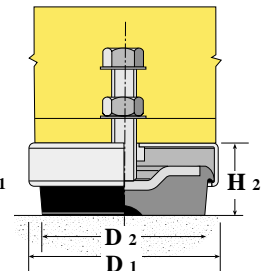


Fig 17.02



**Order examples:**  
**ISO-5-80 + M30 x 2 x 200H**  
 Steel cover normal finish: Bright zinc plated

RMF equipment and machine vibration isolation mounts with rebound control.

**Applications include:** compressors, gensets, motors, pumps and other rotating machinery, electronic, hydraulic equipment, scientific and other equipment

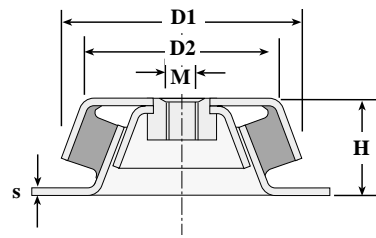


Fig 18.1

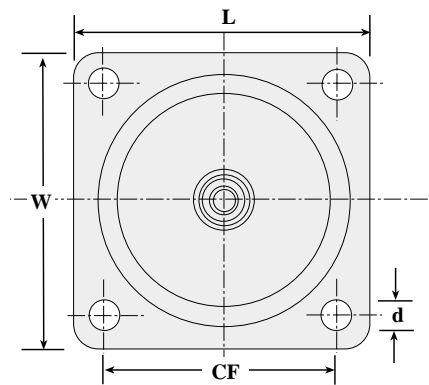


Fig 18.2

**Stock Availability** (subject to change)

- 1) Generally ex stock
- 2) 2-3 days
- 3) Subject to quotation

Order Example: **RMF15045**

Farrat Code	D1 Cover dia. mm	D2 Cover Top mm	L Base Length mm	W Base Width mm	H Height mm	M Thread Size mm	d Fixing hole mm	CF Fixing Centres mm	S mm	Rubber Hardness Ihrd Sh.A	Vertical Z			Stock
											Max. Load kN	Spring Rate N/mm	Defl. at max. Load N/mm	
RMF 06545	65	48	73	73	30	M10x1.5	8.2	55	3	45	0.50	125	4	3
RMF 06560	65	48	73	73	30	M10x1.5	8.2	55	3	60	1.10	275	4	3
RMF 09445	94	70	98	98	45	M12x1.75	10.2	80	3	45	1.40	350	4	3
RMF 09460	94	70	98	98	45	M12x1.75	10.2	80	3	60	3.00	750	4	3
RMF 11045	110	82	115	115	39	M12x1.75	12.4	100	3	45	1.80	450	4	3
RMF 11060	110	82	115	115	39	M12x1.75	12.4	100	3	60	4.50	1125	4	3
RMF 15045	150	110	168	168	51.5	M16x2	12.5	132	4	45	6.00	1200	5	3
RMF 15060	150	110	168	168	51.5	M16x2	12.5	132	4	60	8.40	1680	5	3
RMF 15070	150	110	168	168	51.5	M16x2	12.5	132	4	70	11.00	2200	5	3
RMF 16245	162	120	170	170	60	M16x2	16.2	145	4	45	5.50	1100	5	3
RMF 16260	162	120	170	170	60	M16x2	16.2	145	4	60	9.00	1800	5	3
RMF 17545	175	125	184	184	63	M20x2.5	13	150	4.5	45	15.00	3000	5	3
RMF 17560	175	125	184	184	63	M20x2.5	13	150	4.5	60	25.00	5000	5	3
RMF 17570	175	125	184	184	63	M20x2.5	13	150	4.5	70	35.00	7000	5	3

All metal parts bright zinc plated mild steel

RMA equipment and machine vibration isolation mounts with rebound control

**Applications include:** compressors, engines, gensets, motors, pumps and other rotating machinery, electronic, hydraulic equipment, scientific and other equipment. Particularly suited to marine applications.

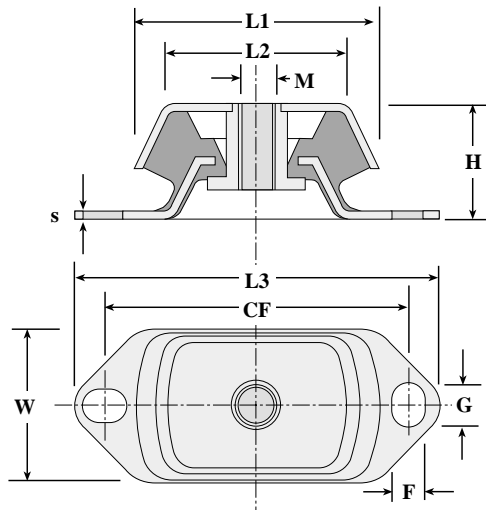


Fig 19.1

**Stock Availability** (subject to change)

- 1) Generally ex stock
- 2) 2-3 days
- 3) Subject to quotation

Order Example: **RMA1041645**

RMA Natural Rubber (NR)															
Farrat code	L1	L2	L3	W	H	M	Slot		CF	S	Rubber	Max.	Vert.	Defl.	Stock
	Cover Bottom mm	Cover Top mm	Base Length mm	Base Width mm	Height mm	Thread mm	F mm	G mm	Fixing Centres mm	mm	Hardness Ihrd Sh.A	Load N	Spring Rate N/mm	at Max. Load mm	
<b>RMA 0801245</b>	80	60	120	60	40	M12x1.75	11	14	100	3	45	360	90	4.00	3
<b>RMA 0801260</b>	80	60	120	60	40	M12x1.75	11	14	100	3	60	640	160	4.00	2
<b>RMA 0801270</b>	80	60	120	60	40	M12x1.75	11	14	100	3	70	960	240	4.00	3
<b>RMA 1041645</b>	104	75	183	75	50	M16x2	13	20	140	4	45	1200	240	5.00	2
<b>RMA 1041660</b>	104	75	183	75	50	M16x2	13	20	140	4	60	1900	380	5.00	2
<b>RMA 1041670</b>	104	75	183	75	50	M16x2	13	20	140	4	70	3000	600	5.00	2
<b>RMA 1302045</b>	130	112	230	112	70	M20x2.5	18	26	182	5	45	3300	550	6.00	2
<b>RMA 1302060</b>	130	112	230	112	70	M20x2.5	18	26	182	5	60	5400	900	6.00	2
<b>RMA 1302070</b>	130	112	230	112	70	M20x2.5	18	26	182	5	70	8100	1350	6.00	3

All metal parts bright zinc plated mild steel  
Stainless steel on request

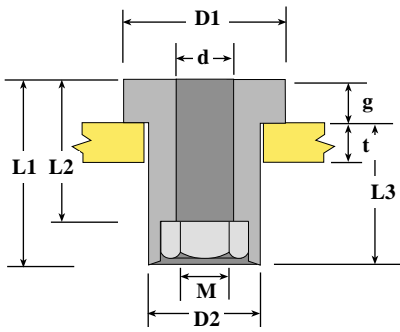


Fig 20.1

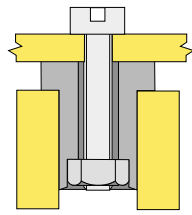


Fig 20.2

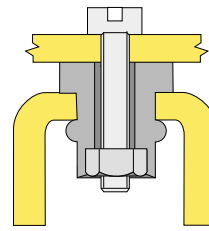


Fig 20.3



REF Elastic Fixing Inserts are used for the protection of light to medium weight equipment against active or passive vibration and structure-borne noise. They are manufactured from CR Neoprene (70 shore) which can operate in temperature ranges of -30 to +80° C.

Main forms of use are as mounts, anchors, bushings or in "blind hole" arrangements.

Applications include: computers, electronic equipment light to medium weight machinery etc.

REF Farrat Code	Dimensions mm							
	D1	D2	d	M	L1	L2	L3	g
REF 09M3	9	7.2	3.3	M3	11.5	8	9	2.5
REF 12M4	12	9.3	4.5	M4	14.5	10	11.5	3
REF 15M5	15	10.2	6	M5	18	12	14.5	3.5
REF 16M6	16	12.7	8	M6	21	13	17	4
REF 24M8	24	16.5	10	M8	27	17	22	5

REF Farrat Code	Maximum Static Loads		Blind Hole
	Compression N	Shear N	Comp. & Shear N
REF 09M3	50	25	10
REF 12M4	66	33	13
REF 15M5	83	42	16
REF 16M6	100	50	20
REF 24M8	280	140	50

Characteristics Farrat Code	Clearance Hole Dia.		Plate thickness t		Tightening Torque Plate		Tightening Torque Blind hole	
	Min. mm	Max. mm	Min. mm	Max. mm	Min. Nm	Max. Nm	Min. Nm	Max. Mmm
REF09M3	7.2	7.5	0.6	2.5	0.3	0.4	0.4	0.5
REF 12M4	9.3	9.6	1	3	0.4	0.6	1	1.5
REF 15M5	10.2	10.5	1	4	0.6	0.8	1.7	2.5
REF 16M6	12.7	13	2	5	0.7	0.9	2.5	3.5
REF 24M8	16.5	16.8	2	6.5	1.6	1.8	3	4

AW, AWS Anti vibration Washers

AW Anti vibration Washers, Round

AWS Anti vibration Washers, Square

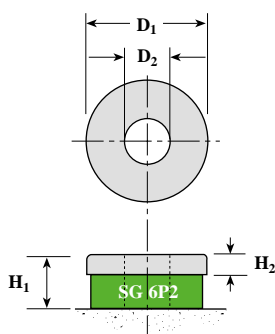
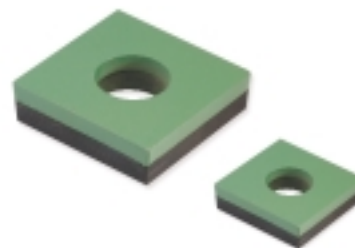


Fig 20.4

AW	D1	D2	H1	H2	T	F
AW 10	30	11	11	5	7	4
AW 12	30	13	11	5	13	6
AW 14	35	15	12	6	20	8
AW 16	40	17	12	6	30	10
AW 20	40	21	12	6	60	13
AW 24	50	25	14	8	90	18
AW 30	60	31	14	8	140	24
AW 36	70	37	16	10	230	33

AWS	L	D2	H1	H2	T	F
AWS 30	80	31	21	6	190	34
AWS 36	90	37	21	6	280	42
AWS 42	100	43	25	10	390	50
AWS 48	110	49	25	10	540	60
AWS 56	125	57	25	10	840	80

Dimensions: mm

T = Max tightening torque Nm

F = Corresponding bolt tension kN

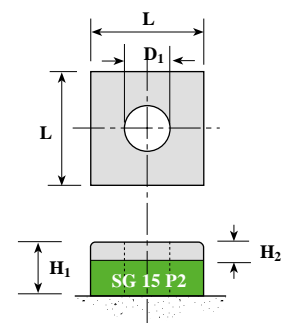


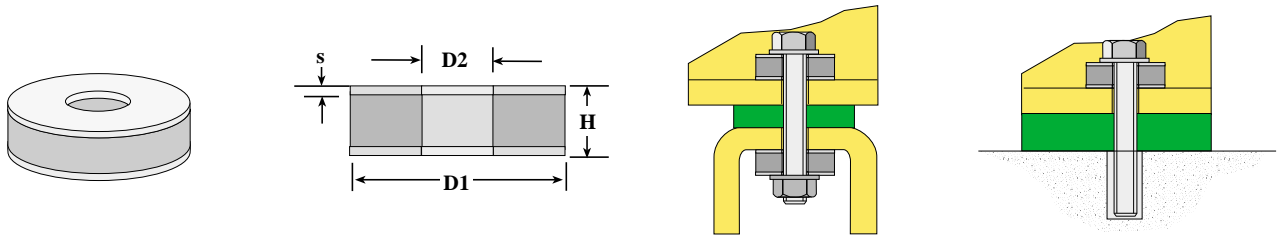
Fig 20.5

Farrat AW - AWS anti vibration washers reduce vibration transmitted to or from holding down bolts. AW - AWS washers are placed between the hold down nut and machine base or flange. AWS for high bolt load applications.

Tightening torques "T" relate to dry, unplated, metric coarse threads. If higher tightening torques (T) are required, consult Farrat for advice.

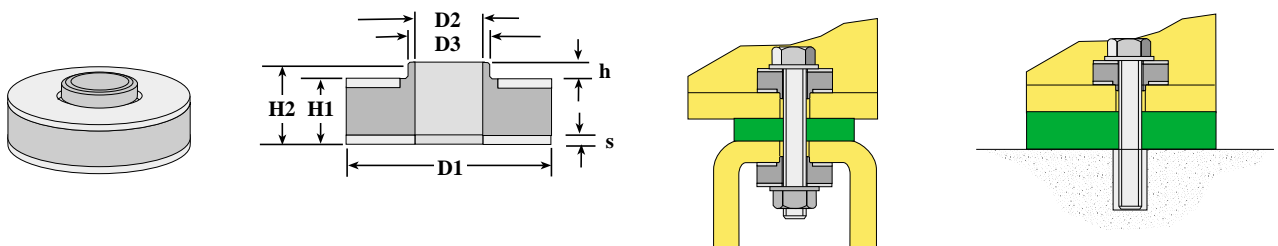
AV Material - AW=SG 6P2 AWS=SG 15 P2

**Isowasher flat rubber metal anti vibration washers.**



Isowasher AWR Farrat Code	Rubber Ihrd Sh.A	Dimensions mm			
		D1	D2	H	t
AWR 10	80	30	10.5	17	2
AWR 12	80	40	12.5	17	2
AWR 14	80	50	14.5	20	2
AWR 16	80	50	16.5	20	2
AWR 20	80	60	20.5	25	3
AWR 24	80	65	24.5	26	3

**Isowasher flat rubber metal anti vibration washers with spigot.**



Isowasher AWRP Farrat Code	Rubber Ihrd Sh.A	Dimensions mm						
		D1	D2	D3	H1	H2	h	S
AWRP 10	80	30	10.5	14	14	17	3	2
AWRP 12	80	40	12.5	16	14	17	3	2
AWRP 14	80	50	14.5	18	16	19	3	2
AWRP 16	80	50	16.5	20	16	20	4	2
AWRP 20	80	60	20.5	24.5	21	25	4	3
AWRP 24	80	65	24.5	29.5	21	26	5	3

**Stock Availability** (subject to change)

- 1) Generally ex stock
- 2) 2-3 days
- 3) Subject to quotation

Order Examples: **AWR 16**  
**AWRP 16**

AWR and AWRP Characteristics Farrat Code	Spring constant kN/mm	Max. Load kN	Deflection at Max. load mm	Max. Torque Nm	Stock
AWR/P 10	1.25	1.90	1.5	3	3
AWR/P 12	2.40	3.60	1.5	8	3
AWR/P 14	2.70	4.90	1.8	12	3
AWR/P 16	3.00	5.40	1.8	16	3
AWR/P 20	3.60	8.50	2.3	37	3
AWR/P 24	3.90	9.00	2.3	44	3

Fig 22.1

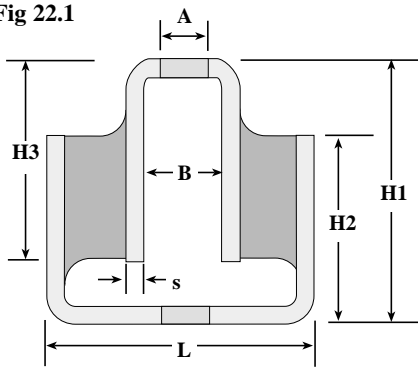
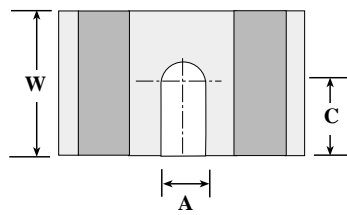


Fig 22.2



**Application**

RU Mounts are intended to protect sensitive machinery from shock and vibration. They are used in a variety of applications in the machine building and general engineering sectors.

Due to their design, they allow relative loadings and movement in three directions, thereby reducing forces and tensions. The information given below is based on a 'compressive' vertical load.

RU											Vertical Load capacities			
Farrat Code	Rubber NR Ihrd Sh.A	Dimensions mm									Max. Load N	Defl. at Max. load mm	Vertical Spring rate N/mm	Stock
		L	W	H1	H2	H3	A	B	C	A				
RU6145	45	61	20	43	27	25	6.6	20.4	10	Hole	120	6.1	20	3
RU6160	60	61	20	43	27	25	6.6	20.4	10	Hole	150	5.6	27	3
RU6170	70	61	20	43	27	25	6.6	20.4	10	Hole	160	4.3	37	3
RU7145	45	71	25	62	43	38	11	25	12.5	Slot	220	7	31	3
RU7160	60	71	25	62	43	38	11	26.4	12.5	Slot	300	5.2	60	3
RU7170	70	71	25	62	43	38	11	26.4	12.5	Slot	300	3.3	95	3
RU7945	45	79	50	78	56	50	13.6	30	25	Slot	550	7	120	3
RU7960	60	79	50	78	56	50	13.6	32.4	25	Slot	850	4.2	205	3
RU7970	70	79	50	78	56	50	13.6	32.4	25	Slot	980	3	325	3
RU8745	45	86	64	108	82	76	16	38	32.5	Slot	2000	7	285	3
RU8760	60	86	64	108	82	76	16	38	32.5	Slot	2000	3.5	570	3
RU8770	70	86	64	108	82	76	16	38	32.5	Slot	2000	2.8	715	3

RO Mount

RO mounts provide for a large deflection under load compared to solid rubber mounts for applications with relatively low disturbing frequencies (down to 12.5Hz) or for shock protection for delicate instruments. By virtue of the design, the deflection for given loads is different in each of the primary axes. The mount is designed for use in compression, shear, torsion or any combination. It is not designed for tensile loading.

**Applications include:** slow speed fans, pumps, reciprocating mechanisms or shock protection for delicate instruments.

RO Farrat Code	Rubber Ihrd Sh.A	Dimensions mm						
		D	H	B	d	G	h	R
ROM 1260	60	12.5	12.5	9.5	5.6	M4	10	5.25
ROM 1760	60	17	14	13	6	M4	10	7
ROM 2560	60	25	30	20	12	M5	14	7
ROM 3660	60	36	40	26	17	M10	20	7

NR Farrat Code	Rubber Load Ihrd Sh.A	Vertical Load Capacities			
		Max. Load N	Defl. at Rate mm	Spring Rate N/mm	Stock
ROM 1260	60	20	4	4	3
ROM 1760	60	25	5	5	3
ROM 2560	60	40	12	3	3
ROM 3660	60	160	14	11	3

All metal parts bright zinc plated mild steel  
Stainless steel on request

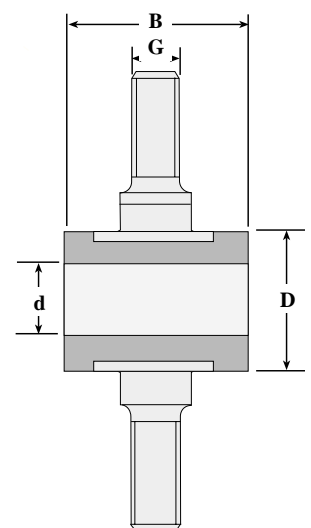
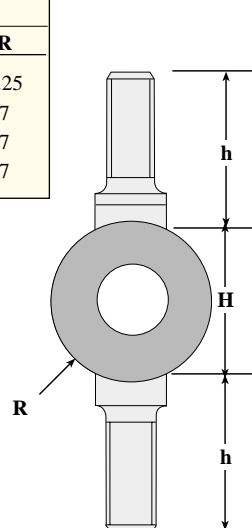


Fig 22.3

Fig 22.4

Fig 23.1

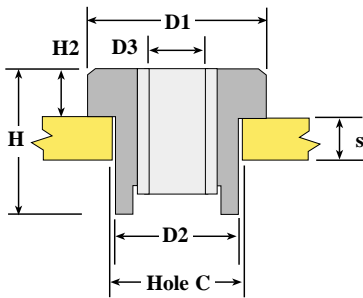
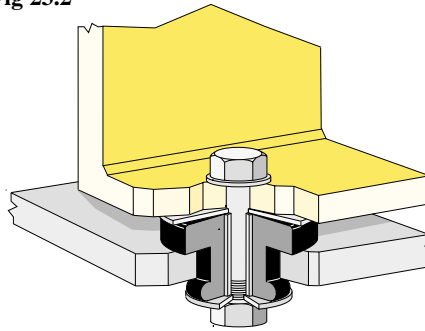


Fig 23.2



STC Farrat Code	Rubber NR Irhd Sh.A	Dimensions mm						
		D1	D2	D3	H1	s	H2	Hole C
STC 2845	45	28	20.6	10	17.5	8	5.6	21
STC 2860	60	28	20.6	10	17.5	8	5.6	21
STC 4445	45	45	31.5	13	25.4	10	10.4	32
STC 4445	60	45	31.5	13	25.4	10	10.4	32
STC 5060	60	50	34.3	13	35	16	13.5	35
STC 5075	75	50	34.3	13	35	16	13.5	35
STC 6360	60	64	41.1	16	45	19	15.7	42
STC 6375	75	64	41.1	16	45	19	15.7	42
STC 9560	60	95	60	20	60	23	25	57
STC 9575	75	95	60	20	60	23	25	57

Farrat Code	Old Code	Rubber NR Irhd Sh.A	Load capacities				Stock
			Max. Load N	Defl. At Max. Load mm	Spring Rate N/mm		
STC 2845	539887-45	45	350	0.7	500	1	
STC 2860	539887-60	60	500	0.7	715	2	
STC 4445	539190-45	45	750	1.2	625	1	
STC 4460	539190-60	60	1000	1.2	833	1	
STC 5060	538886-60	60	1500	1.2	1250	1	
STC 5075	538886-75	75	3300	1.2	2750	1	
STC 6360	539191-60	60	2500	2	1250	1	
STC 6375	539191-75	75	5000	2	2500	1	
STC 9560	-	60	5000	4	1250	1	
STC 9575	-	75	10000	4	2500	3	

**Stock Availability** (subject to change)

- 1) Generally ex stock
- 2) 2-3 days
- 3) Subject to quotation

Order Example: **STC 5060**

STC is a vibration, shock and noise isolator which has been designed for the secure support of equipment installed in any direction.

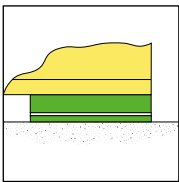
Especially suitable for rugged applications, these isolators are used for the cabins and engines of off-road and agricultural vehicles, for motors, power packs and electrical equipment etc.

Manufactured as a one piece cylindrical Natural Rubber NR moulding for maximum resilience and isolation performance, the STC has a centrally bonded thick wall steel tube

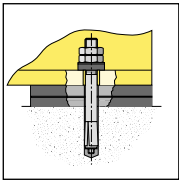
Generally the top steel washer, lower rebound steel washer and equipment fixing screw are not supplied by Farrat, except against special orders.

Installation is very simple. The STC is fitted to a supporting frame or chassis by inserting it into a hole having rounded edges and a smooth bore. The fixing screw is passed through the equipment foot and top washer, through the steel tube and then tightened onto the lower washer with a nut.

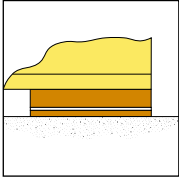
**Farrat reserve the right to alter a specification if it is in the interest of product improvement.**



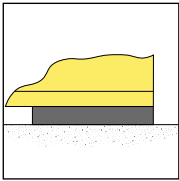
**Squaregrip (SG)**  
High strength vibration damping material for machinery and equipment needing a stiff vibration damped support with minimum machine movement. **Catalogues 1.06, 6.07**



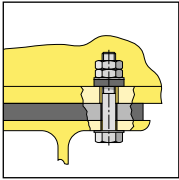
**NBR**  
An elastic vibration isolation material with good shock and vibration isolation properties. **Catalogues 1.06, 6.07**



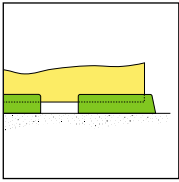
**Vidam (VM)**  
General Purpose, rubber/cork based machine mounting material. **Catalogues 1.06, 6.07**



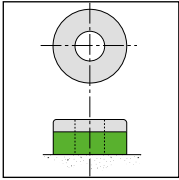
**Isomat (IM)**  
High performance shock and vibration isolation material. Unique design provides increased elasticity and improved isolation efficiency. **Catalogues 1.06, 6.07**



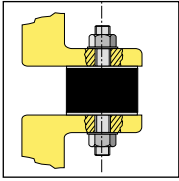
**Hamamat (HM)**  
High impact, high strength and high stiffness shock and vibration absorbing material. **Catalogue 6.07**



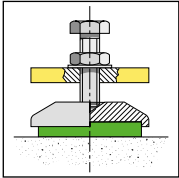
**Corner / Side Foot (CF, SF)**  
General purpose machine mounting pads. **Catalogue 1.06**



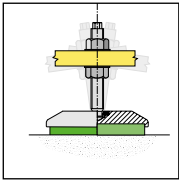
**Anti vibration Washers (AW, AWS, AWR, AWRP)**  
To reduce vibration transmitted to, or from, holding down bolts. **Catalogues 1.06, 7.07**



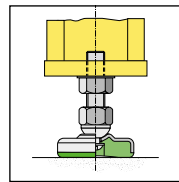
**Rubber to Metal Bobbins (RM)**  
Versatile rubber-to-metal bonded vibration and shock isolators, available in a broad range of fixing configurations. **Catalogue 7.07**



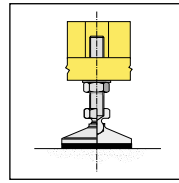
**Jackmounts (JCM, JRM, JSM, JMS)**  
General purpose machine mounts. Different anti vibration versions depending on applications. **Catalogue 1.06**



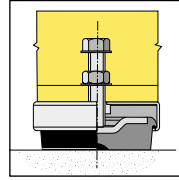
**Captive Jackmounts (JMP, JMSP)**  
Machine mount with captive pendulum levelling screw. Cast iron and stainless steel versions. **Catalogue 1.06**



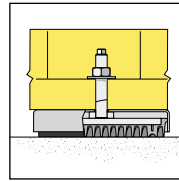
**MF Mounts (MF)**  
Pressed Steel Mount fitted with Nitrile Rubber Pad for lighter applications. MF P: Zinc Plated Steel, MF S: Stainless Steel 304. **Catalogue 1.06**



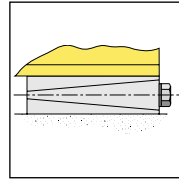
**Levelling Mount (LF)**  
High precision stainless steel (304) levelling mounts with captive ball nosed levelling screws. **Catalogue 1.06**



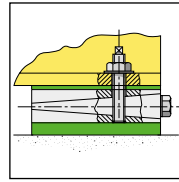
**Isomounts (ISO)**  
Machine mount with vulcanized rubber base and built in levelling screws for height adjustment. **Catalogue 1.06**



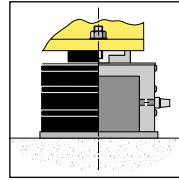
**Isobloc (ISB)**  
High load capacity machine mount with vulcanized rubber base and built in levelling screws for height adjustment. **Catalogue 1.06**



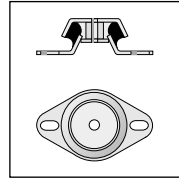
**Wedge Levelling Elements (WLE)**  
Precision Wedge Levelling units for rigid machine support. **Catalogue 1.06**



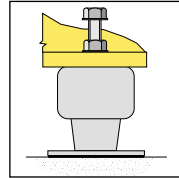
**Wedgemounts (WL, WLF, WLB, WLT)**  
Height adjustable machine mounts based on screw driven three part machined cast iron wedges fitted with various types of vibration damping material. **Catalogue 1.06**



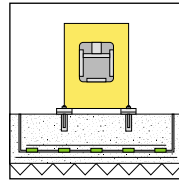
**Air Mount (SLM)**  
Low profile, low frequency air spring suitable for both passive and dynamic applications where a support natural frequency of 3 - 5 Hz is required. **Catalogue 3.07**



**Equipment Mounts (RTS, RPA, REM, RMF, RMA)**  
All purpose vibration & shock isolators for the support of dynamic and rotating machinery. **Catalogue 7.07**



**Spring Mounts (SM)**  
Low frequency anti-vibration mountings with damping control and adjustable levelling for efficient isolation of active and passive machinery. **Catalogue 2.07**



**Isolated Foundations (IF)**  
Shock and vibration isolation for machine foundations and structures. **Catalogue 4.07**