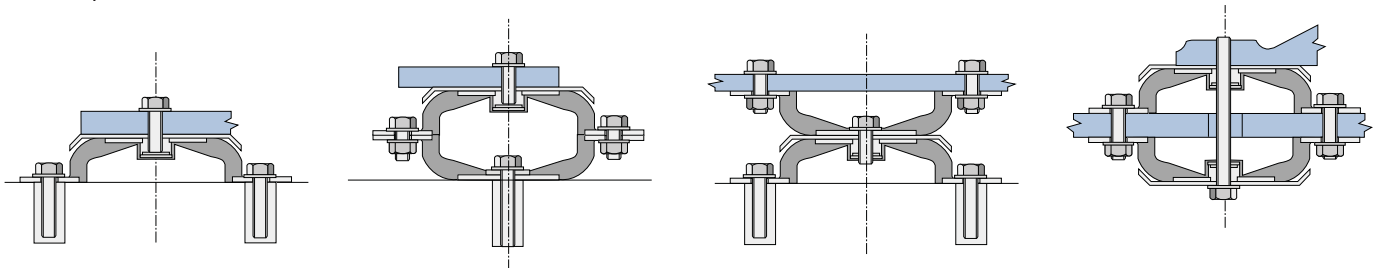
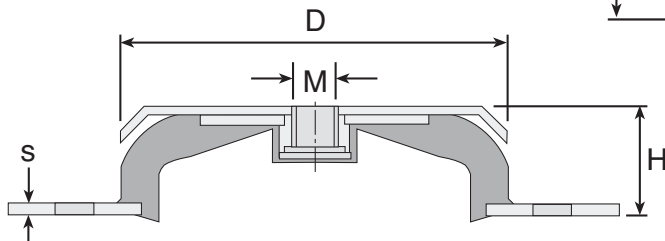
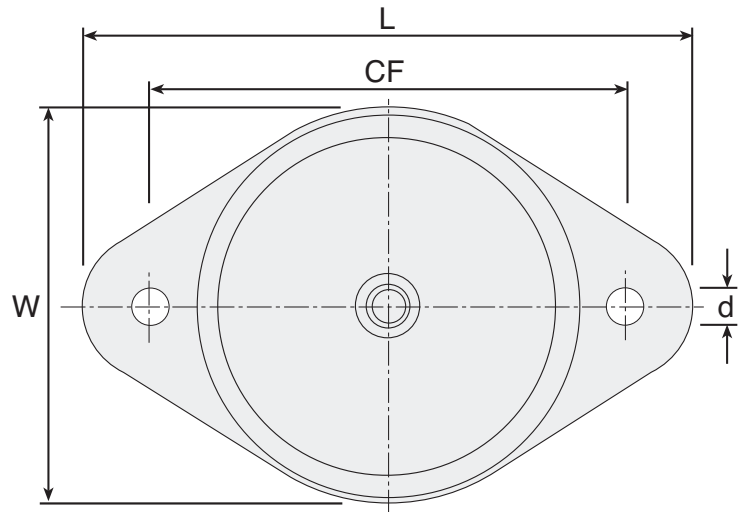


ANTI-VIBRATION & SPRINGS

RTS

Anti-Vibration Mounts

Elastic Vibration Isolator



Part Number	ØD	CF	L	Ød	H Unloaded	M Thread	Thread Depth	S Plate Thickness	Rubber Grade	Hardness Sh.A	Max. load N	Vertical Spring Rate N/mm	Deflection at Max Load mm	Price Each
RTS-040-N4	40	52	64	6.2	20	M6	6	2	NR	45	60	20	3.00	£P.O.A
RTS-040-N6	40	52	64	6.2	20	M6	6	2	NR	60	75	30	2.50	£P.O.A
RTS-060-N4	60	76	64	6.2	24	M6	6	3	NR	45	180	60	3.00	£P.O.A
RTS-060-N6	60	76	90	6.2	24	M6	6	3	NR	60	250	83	3.00	£P.O.A
RTS-060-N7	60	76	90	6.2	24	M6	6	3	NR	75	400	160	2.50	£P.O.A
RTS-080-N4	80	100	120	8.2	27	M8	8	3	NR	45	480	96	5.00	£P.O.A
RTS-080-N6	80	100	120	8.2	27	M8	8	3	NR	60	800	200	4.00	£P.O.A
RTS-080-N7	80	100	120	8.2	27	M8	8	3	NR	75	1100	367	3.00	£P.O.A
RTS-100-N4	100	124	148	10.2	28	M10	10	3	NR	45	750	188	4.00	£P.O.A
RTS-100-N6	100	124	148	10.2	28	M10	10	3	NR	60	1500	375	4.00	£P.O.A
RTS-100-N7	100	124	148	10.2	28	M10	10	3	NR	75	2080	520	4.00	£P.O.A
RTS-150-N4	150	182	214	12.2	39	M14	14	3	NR	45	1420	200	7.10	£P.O.A
RTS-150-N6	150	182	214	12.2	39	M14	14	3	NR	60	2300	354	6.50	£P.O.A
RTS-150-N7	150	182	214	12.2	39	M14	14	3	NR	75	3640	639	5.70	£P.O.A
RTS-200-N4	200	240	280	14.5	44	M18	18	3	NR	45	5000	714	7.00	£P.O.A
RTS-200-N6	200	240	280	14.5	44	M18	18	3	NR	60	7400	1104	6.70	£P.O.A
RTS-200-N7	200	240	280	14.5	44	M18	18	3	NR	75	12000	2182	5.50	£P.O.A

Material

Bright zinc plated mild steel & natural rubber.

Other Info.

The RTS element is designed to be used as an 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.

+44 (0)1246 455500
+44 (0)1246 455522

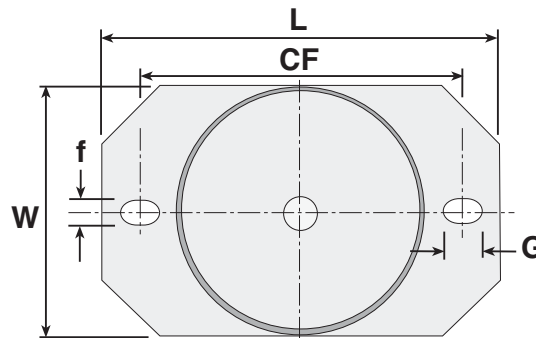
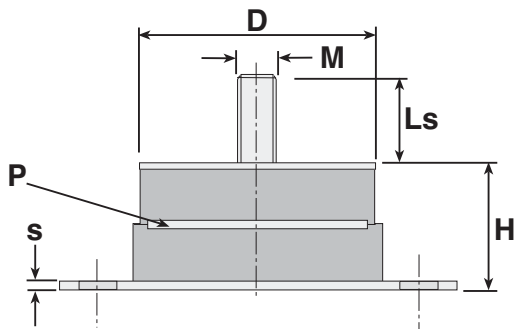
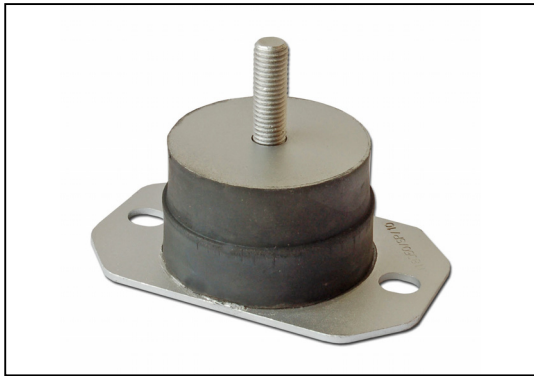
ondrives

sales@ondrives.com
www.ondrives.com

Product information updated 1st April 2011 and subject to change. Please contact Sales for the latest prices and availability.

Anti-Vibration Mounts

Male Isolators



Load Capacities and Characteristics

Part Number	Hardness Sh.A	Damping C/Cc	Vertical Spring Constant kN/mm	Max. Vertical Load kN	Deflection at Max. Vertical Load mm
RPA-080**-N35	35	0.01	0.20	1.00	5.00
RPA-080**-N35P	35	0.01	0.40	2.00	5.00
RPA-080**-N70	70	0.01	0.60	3.00	5.00
RPA-080**-N50P	50	0.01	0.80	4.00	5.00
RPA-080**-N60P	60	0.01	1.00	5.00	5.00
RPA-100**-N70	70	0.01	1.00	6.00	6.00
RPA-15020-N70	70	0.01	2.33	14.00	6.00

Part Number	M	Ls	L	W	H	D	Base Thickness s	Width f	Length g	Centres CF	Price Each
RPA-08012-NR35	M12x1.75	37	130	80	50	80	3	12	20	106	£P.O.A
RPA-08012-NR35P	M12x1.75	37	130	80	50	80	3	12	20	106	£P.O.A
RPA-08012-NR50P	M12x1.75	37	130	80	50	80	3	12	20	106	£P.O.A
RPA-08012-NR60P	M12x1.75	37	130	80	50	80	3	12	20	106	£P.O.A
RPA-08012-NR70	M12x1.75	37	130	80	50	80	3	12	20	106	£P.O.A
RPA-08020-NR35	M20x2.5	37	130	80	50	80	3	12	20	106	£P.O.A
RPA-08020-NR35P	M20x2.5	37	130	80	50	80	3	12	20	106	£P.O.A
RPA-08020-NR50P	M20x2.5	37	130	80	50	80	3	12	20	106	£P.O.A
RPA-08020-NR60P	M20x2.5	37	130	80	50	80	3	12	20	106	£P.O.A
RPA-08020-NR70	M20x2.5	37	130	80	50	80	3	12	20	106	£P.O.A
RPA-10012-NR70	M12x1.75	37	150	110	80	100	5	17	-	140	£P.O.A
RPA-10020-NR70	M20x2.5	37	150	110	80	100	5	17	-	140	£P.O.A
RPA-15020-NR70	M20x2.5	35	240	170	80	150	5	20	-	200	£P.O.A

Material

Metal parts are sherardised steel with bright zinc plated threaded parts and natural rubber. Part numbers with a P suffix indicate the part has a steel reinforcing plate.

Options

Stainless steel parts and neoprene rubber are available on request. Please ask sales for details.

Features

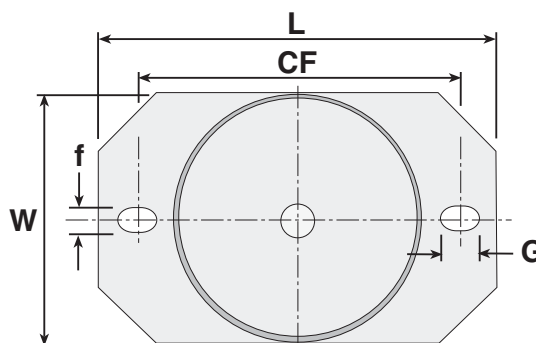
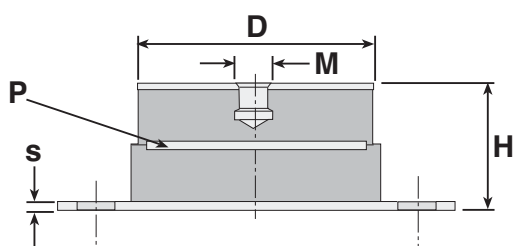
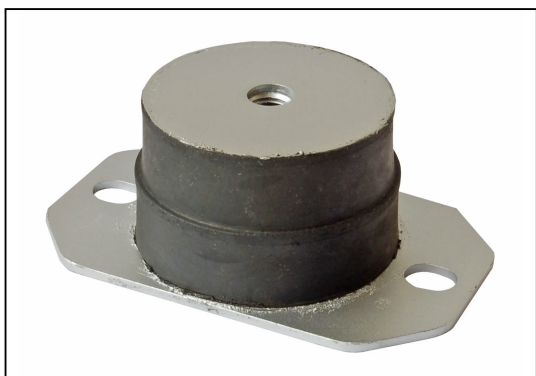
RP isolators provide the facility to bolt onto supported equipment and, if required, the support surface. Applications include; pump sets, generators, HVAC and other passive and active applications.

ANTI-VIBRATION & SPRINGS

RPC

Anti-Vibration Mounts

Female Isolators



Load Capacities and Characteristics

Part Number	Hardness Sh.A	Damping C/Cc	Vertical Spring Constant kN/mm	Max. Vertical Load kN Deflection	at Max. Vertical Load mm
RPC-080**-N35	35	0.01	0.20	1.00	5.00
RPC-080**-N35P	35	0.01	0.40	2.00	5.00
RPC-080**-N70	70	0.01	0.60	3.00	5.00
RPC-080**-N50P	50	0.01	0.80	4.00	5.00
RPC-080**-N60P	60	0.01	1.00	5.00	5.00
RPC-100**-N70	70	0.01	1.00	6.00	6.00
RPC-15020-N70	70	0.01	2.33	14.00	6.00

Part Number	M	L	W	H	D	Base Thickness s	Width f	Length g	Centres CF	Price Each
RPC-08012-NR35	M12x1.75	130	80	50	80	3	12	20	106	£P.O.A
RPC-08012-NR35P	M12x1.75	130	80	50	80	3	12	20	106	£P.O.A
RPC-08012-NR50P	M12x1.75	130	80	50	80	3	12	20	106	£P.O.A
RPC-08012-NR60P	M12x1.75	130	80	50	80	3	12	20	106	£P.O.A
RPC-08012-NR70	M12x1.75	130	80	50	80	3	12	20	106	£P.O.A
RPC-08020-NR35	M20x2.5	130	80	50	80	3	12	20	106	£P.O.A
RPC-08020-NR35P	M20x2.5	130	80	50	80	3	12	20	106	£P.O.A
RPC-08020-NR50P	M20x2.5	130	80	50	80	3	12	20	106	£P.O.A
RPC-08020-NR60P	M20x2.5	130	80	50	80	3	12	20	106	£P.O.A
RPC-08020-NR70	M20x2.5	130	80	50	80	3	12	20	106	£P.O.A
RPC-10012-NR70	M12x1.75	150	110	80	100	5	17	-	140	£P.O.A
RPC-10020-NR70	M20x2.5	150	110	80	100	5	17	-	140	£P.O.A
RPC-15020-NR70	M20x2.5	240	170	80	150	5	20	-	200	£P.O.A

Material

Metal parts are sherardised steel with bright zinc plated threaded parts and natural rubber. Part numbers with a P suffix indicate the part has a steel reinforcing plate.

Options

Stainless steel parts and neoprene rubber are available on request. Please ask sales for details.

Features

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

+44 (0)1246 455500

+44 (0)1246 455522

ondrives

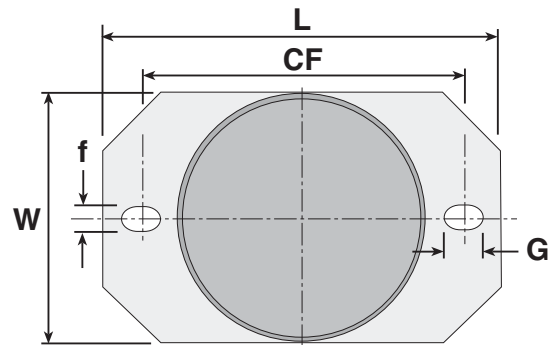
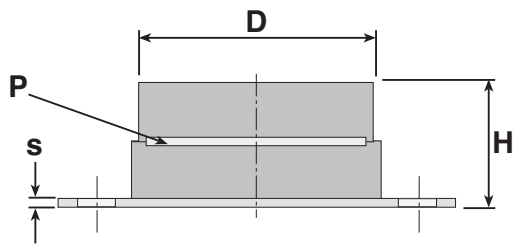
sales@ondrives.com

www.ondrives.com

Product information updated 1st April 2011 and subject to change. Please contact Sales for the latest prices and availability.

Anti-Vibration Mounts

Female Isolators



Load Capacities and Characteristics

Part Number	Hardness Sh.A	Damping C/Cc	Vertical Spring Constant kN/mm	Max. Vertical Load kN	Deflection at Max. Vertical Load mm
RPE-080**-N35	35	0.01	0.20	1.00	5.00
RPE-080**-N35P	35	0.01	0.40	2.00	5.00
RPE-080**-N70	70	0.01	0.60	3.00	5.00
RPE-080**-N50P	50	0.01	0.80	4.00	5.00
RPE-080**-N60P	60	0.01	1.00	5.00	5.00
RPE-100**-N70	70	0.01	1.00	6.00	6.00
RPE-15020-N70	70	0.01	2.33	14.00	6.00

Part Number	L	W	H	D	Base Thickness s	Width f	Length g	Centres CF	Price Each
RPE-08012-NR35	130	80	50	80	3	12	20	106	£P.O.A
RPE-08012-NR35P	130	80	50	80	3	12	20	106	£P.O.A
RPE-08012-NR50P	130	80	50	80	3	12	20	106	£P.O.A
RPE-08012-NR60P	130	80	50	80	3	12	20	106	£P.O.A
RPE-08012-NR70	130	80	50	80	3	12	20	106	£P.O.A
RPE-08020-NR35	130	80	50	80	3	12	20	106	£P.O.A
RPE-08020-NR35P	130	80	50	80	3	12	20	106	£P.O.A
RPE-08020-NR50P	130	80	50	80	3	12	20	106	£P.O.A
RPE-08020-NR60P	130	80	50	80	3	12	20	106	£P.O.A
RPE-08020-NR70	130	80	50	80	3	12	20	106	£P.O.A
RPE-10012-NR70	150	110	80	100	5	17	-	140	£P.O.A
RPE-10020-NR70	150	110	80	100	5	17	-	140	£P.O.A
RPE-15020-NR70	240	170	80	150	5	20	-	200	£P.O.A

Material

Metal parts are sherardised steel with bright zinc plated threaded parts and natural rubber. Part numbers with a P suffix indicate the part has a steel reinforcing plate.

Options

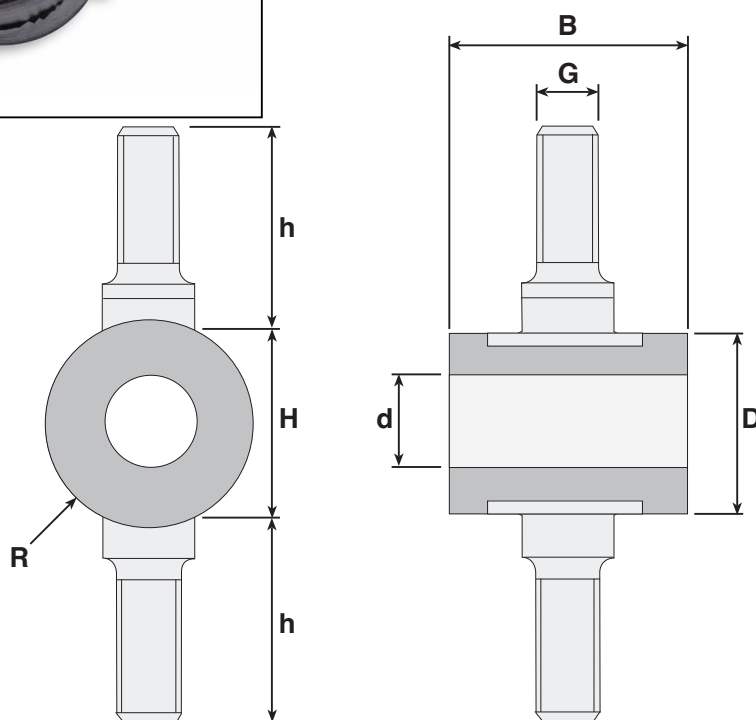
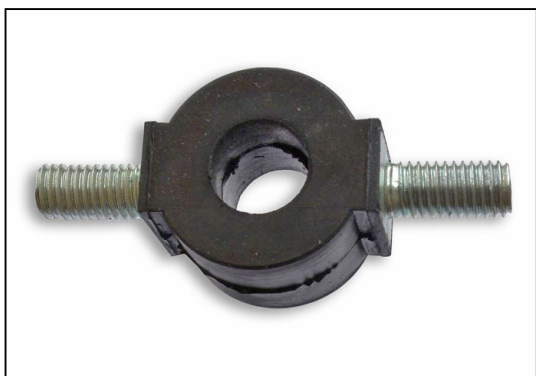
Stainless steel parts and neoprene rubber are available on request. Please ask sales for details.

Features

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

Anti-Vibration Mounts

for Large Deflections



Load Capacities and Characteristics

Part Number	Rubber Load Sh.A	Max. Vertical Load N	Vertical Deflection at Rate	Vertical Spring Rate
ROM-1260	60	20	4	4
ROM-1760	60	25	5	5
ROM-2560	60	40	12	3
ROM-3660	60	160	14	11

Part Number	D	H	B	d	G	h	R	Price Each
ROM-1260	12.5	12.5	9.5	5.6	M4	10	5.25	£P.O.A
ROM-1760	17.0	14.0	13.0	6.0	M4	10	7.00	£P.O.A
ROM-2560	25.0	30.0	20.0	12.0	M5	14	7.00	£P.O.A
ROM-3660	36.0	40.0	26.0	17.0	M10	20	7.00	£P.O.A

Material

Metal parts are bright zinc plated mild steel.

Options

Stainless steel parts are available on request. Please ask sales for details.

Features

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 for 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.

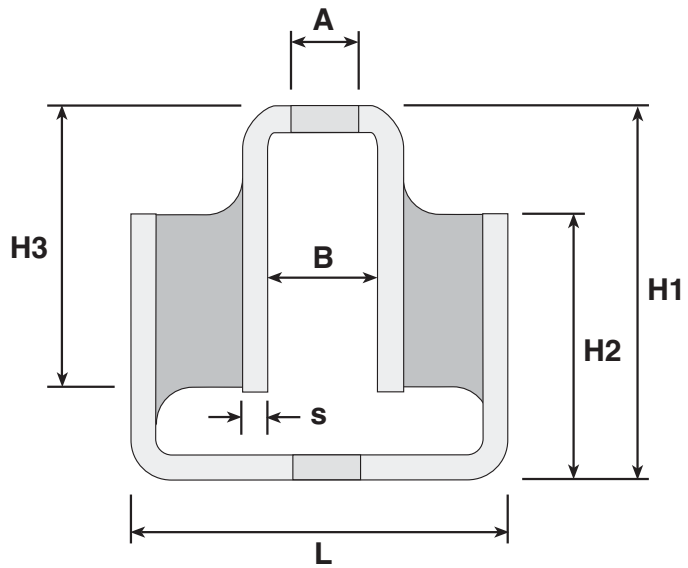
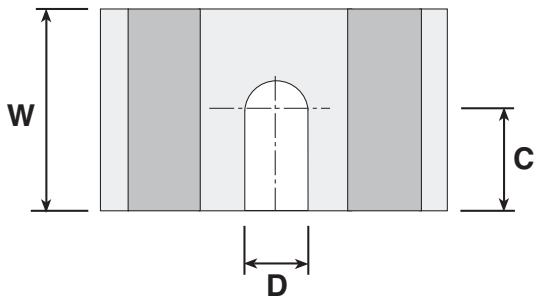
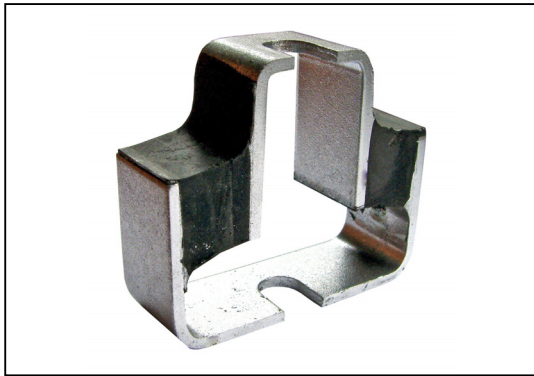
Applications include; slow speed fans, pumps, reciprocating mechanisms or shock protection for delicate instruments.

RU

ANTI-VIBRATION & SPRINGS

Anti-Vibration Mounts

Shock and Vibration Isolators



Part Number	Rubber Load Sh.A	Max. Load N	Deflection at Max. Load mm	Vertical Spring Rate N/mm
RU-6145	45	120	6.1	20
RU-6160	60	150	5.6	27
RU-6170	70	160	4.3	37
RU-7145	45	220	7.0	31
RU-7160	60	300	5.2	60
RU-7170	70	300	3.3	95
RU-7945	45	550	7.0	120
RU-7960	60	850	4.2	205
RU-7970	70	980	3.0	325
RU-8745	45	2000	7.0	285
RU-8760	60	2000	3.5	570
RU-8770	70	2000	2.8	715

The information given above is based on a 'compressive' vertical load.

Part Number	L	W	H1	H2	H3	A	B	C	D	Price Each
RU-6145	61	20	43	27	25	6.6	20.4	10.0	Hole	£P.O.A
RU-6160	61	20	43	27	25	6.6	20.4	10.0	Hole	£P.O.A
RU-6170	61	20	43	27	25	6.6	20.4	10.0	Hole	£P.O.A
RU-7145	71	25	62	43	38	11.0	25.0	12.5	Slot	£P.O.A
RU-7160	71	25	62	43	38	11.0	26.4	12.5	Slot	£P.O.A
RU-7170	71	25	62	43	38	11.0	26.4	12.5	Slot	£P.O.A
RU-7945	79	50	78	56	50	13.6	30.0	25.0	Slot	£P.O.A
RU-7960	79	50	78	56	50	13.6	32.4	25.0	Slot	£P.O.A
RU-7970	79	50	78	56	50	13.6	32.4	25.0	Slot	£P.O.A
RU-8745	86	64	108	82	76	16.0	38.0	32.5	Slot	£P.O.A
RU-8760	86	64	108	82	76	16.0	38.0	32.5	Slot	£P.O.A
RU-8770	86	64	108	82	76	16.0	38.0	32.5	Slot	£P.O.A

Material

Metal parts are bright zinc plated mild steel.

Options

Stainless steel parts are available on request. Ask sales for further details.

Other Info.

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.

+44 (0)1246 455500
+44 (0)1246 455522

ondrives

sales@ondrives.com
www.ondrives.com

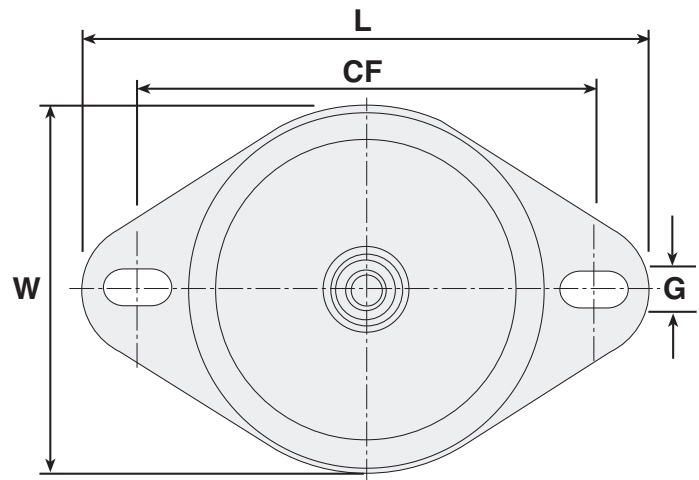
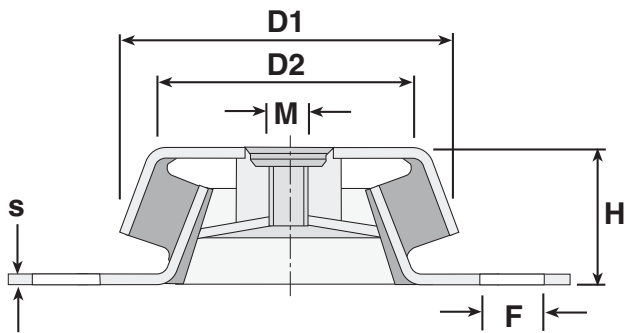
Product information updated 1st April 2011 and subject to change. Please contact Sales for the latest prices and availability.

REM

ANTI-VIBRATION & SPRINGS

Anti-Vibration Mounts

with Rebound Control



Part Number	D1	D2	L	W	H	M	G	F	CF Fixing Centres	S	Hardness Sh.A	Max. Load N	Vertical Spring Rate N/mm	Deflection at Max. Load mm	Price Each
REM-0601045	60	38.0	106	60	35	M10x1.5	8.3	16.0	75-90	2.0	45	950	297	3.20	£P.O.A
REM-0601060	60	38.0	106	60	35	M10x1.5	8.3	16.0	75-90	2.0	60	1700	567	3.00	£P.O.A
REM-0601245	60	38.0	106	60	35	M12x1.75	8.3	16.0	75-90	2.0	45	950	297	3.20	£P.O.A
REM-0601260	60	38.0	106	60	35	M12x1.75	8.3	16.0	75-90	2.0	60	1700	567	3.00	£P.O.A
REM-0621245	60	50.0	106	60	31	M12x1.5	8.3	16.0	75-90	3.0	45	1600	533	3.00	£P.O.A
REM-0621260	60	50.0	106	60	31	M12x1.5	8.3	16.0	75-90	3.0	60	3000	1111	2.70	£P.O.A
REM-0771045	77	59.0	128	77	30	M10x1.5	9.0	9.0	110	2.0	45	1200	387	3.10	£P.O.A
REM-0771060	77	59.0	128	77	30	M10x1.5	9.0	9.0	110	2.0	60	2800	933	3.00	£P.O.A
REM-0921245	92	73.5	128	92	45	M12x1.75	10.5	10.5	110	3.0	45	3500	921	3.80	£P.O.A
REM-0921260	92	73.5	128	92	45	M12x1.75	10.5	10.5	110	3.0	60	6000	1818	3.30	£P.O.A
REM-0931045	93	70.0	144	93	35	M10x1.5	10.0	10.0	124	2.5	45	1800	581	3.10	£P.O.A
REM-0931060	93	70.0	144	93	35	M10x1.5	10.0	10.0	124	2.5	60	4000	1333	3.00	£P.O.A
REM-1061245	106	81.0	172	106	38	M12x1.75	14.0	18.0	138-146	3.0	45	2750	809	3.40	£P.O.A
REM-1061260	106	81.0	172	106	38	M12x1.75	14.0	18.0	138-146	3.0	60	5100	1759	2.90	£P.O.A
REM-1061645	106	81.0	172	106	38	M16x2	14.0	18.0	138-146	3.0	45	2750	809	3.40	£P.O.A
REM-1061660	106	81.0	172	106	38	M16x2	14.0	18.0	138-146	3.0	60	5100	1759	2.90	£P.O.A
REM-1061670	106	81.0	172	106	38	M16x2	14.0	18.0	138-146	3.0	70	10000	3448	2.90	£P.O.A
REM-1081645	108	83.0	190	108	50	M16x2	16.5	16.5	160	5.0	45	4000	1212	3.30	£P.O.A
REM-1081660	108	83.0	190	108	50	M16x2	16.5	16.5	160	5.0	60	8500	2833	3.00	£P.O.A
REM-1081670	108	83.0	190	108	50	M16x2	16.5	16.5	160	5.0	70	14000	5385	2.60	£P.O.A
REM-1211645	121	92.0	188	121	42	M16x2	14.0	14.0	158	3.0	45	4250	1063	4.00	£P.O.A
REM-1211660	121	92.0	188	121	42	M16x2	14.0	14.0	158	3.0	60	6800	1943	3.50	£P.O.A
REM-1441645	144	121.0	216	144	48	M16x2	14.0	18.0	186	4.0	45	8000	1000	8.00	£P.O.A
REM-1441660	144	121.0	216	144	48	M16x2	14.0	18.0	186	4.0	60	14000	1944	7.20	£P.O.A

Material

Metal parts are bright zinc plated mild steel.

Other Info.

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.

+44 (0)1246 455500
+44 (0)1246 455522

ondrives

sales@ondrives.com
www.ondrives.com

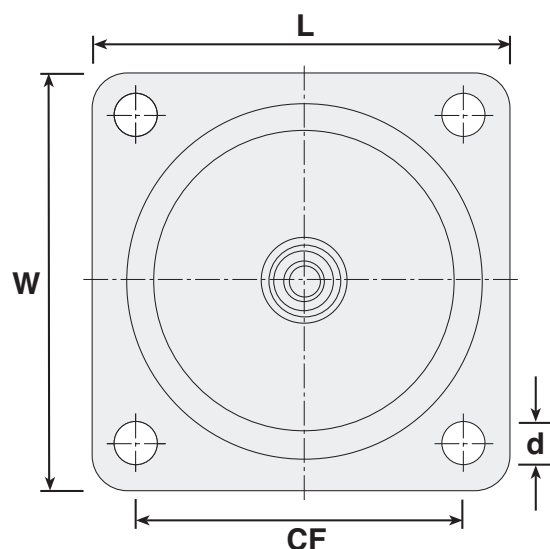
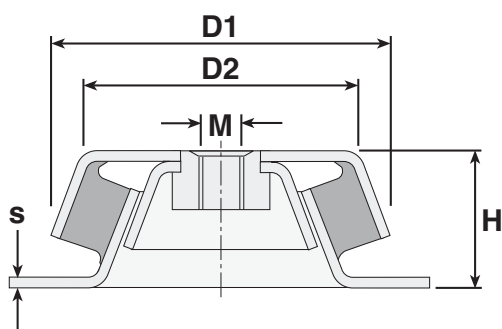
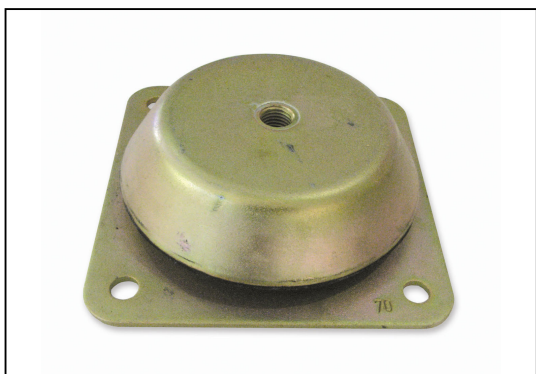
Product information updated 1st April 2011 and subject to change. Please contact Sales for the latest prices and availability.

ANTI-VIBRATION & SPRINGS

RMF

Anti-Vibration Mounts

with Rebound Control



Part Number	D1	D2	L	W	H	M	d	CF Fixing Centres	S	Rubber Hardness Sh.A	Max. Load kN	Spring Rate N/mm	Deflection at Max. Load N/mm	Price Each
RMF-06545	65	48	73	73	30.0	M10x1.5	8.2	55	3.0	45	0.50	125	4	£P.O.A
RMF-06560	65	48	73	73	30.0	M10x1.5	8.2	55	3.0	60	1.10	275	4	£P.O.A
RMF-09445	94	70	98	98	45.0	M12x1.75	10.2	80	3.0	45	1.40	350	4	£P.O.A
RMF-09460	94	70	98	98	45.0	M12x1.75	10.2	80	3.0	60	3.00	750	4	£P.O.A
RMF-11045	110	82	115	115	39.0	M12x1.75	12.4	100	3.0	45	1.80	450	4	£P.O.A
RMF-11060	110	82	115	115	39.0	M12x1.75	12.4	100	3.0	60	4.50	1125	4	£P.O.A
RMF-15045	150	110	168	168	51.5	M16x2	12.5	132	4.0	45	6.00	1200	5	£P.O.A
RMF-15060	150	110	168	168	51.5	M16x2	12.5	132	4.0	60	8.40	1680	5	£P.O.A
RMF-15070	150	110	168	168	51.5	M16x2	12.5	132	4.0	70	11.00	2200	5	£P.O.A
RMF-16245	162	120	170	170	60.0	M16x2	16.2	145	4.0	45	5.50	1100	5	£P.O.A
RMF-16260	162	120	170	170	60.0	M16x2	16.2	145	4.0	60	9.00	1800	5	£P.O.A
RMF-17545	175	125	184	184	63.0	M20x2.5	13.0	150	4.5	45	15.00	3000	5	£P.O.A
RMF-17560	175	125	184	184	63.0	M20x2.5	13.0	150	4.5	60	25.00	5000	5	£P.O.A
RMF-17570	175	125	184	184	63.0	M20x2.5	13.0	150	4.5	70	35.00	7000	5	£P.O.A

Material

Metal parts are bright zinc plated mild steel.

Other Info.

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

+44 (0)1246 455500
+44 (0)1246 455522

ondrives

sales@ondrives.com
www.ondrives.com

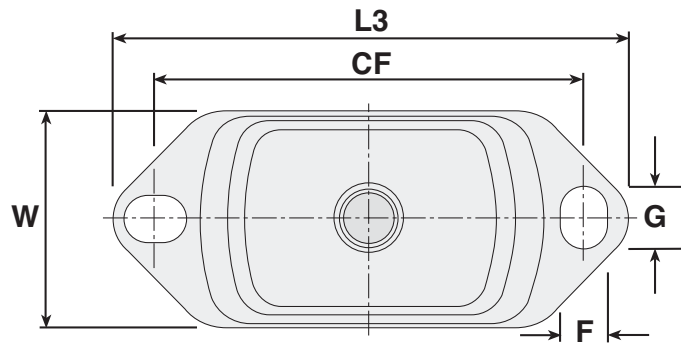
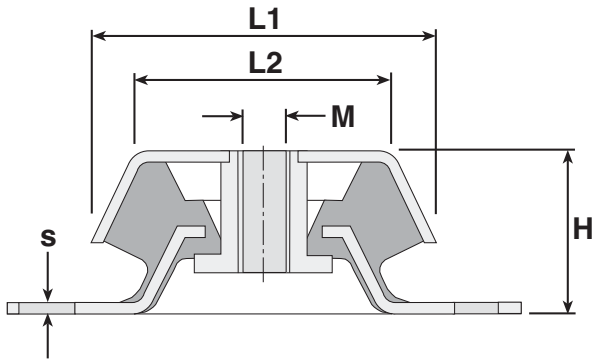
Product information updated 1st April 2011 and subject to change. Please contact Sales for the latest prices and availability.

RMA

ANTI-VIBRATION & SPRINGS

Anti-Vibration Mounts

with Rebound Control



Part Number	L1	L2	L3	W	H	M	F	G	CF Fixing Centres	S	Rubber Hardness Sh.A	Max. Load N	Vertical Spring Rate N/mm	Deflection at Max. Load N/mm	Price Each
RMA-0801245	80	60	120	60	40	M12x1.75	11	14	100	3	45	360	90	4.00	£P.O.A
RMA-0801260	80	60	120	60	40	M12x1.75	11	14	100	3	60	640	160	4.00	£P.O.A
RMA-0801270	80	60	120	60	40	M12x1.75	11	14	100	3	70	960	240	4.00	£P.O.A
RMA-1041645	104	75	183	75	50	M16x2	13	20	140	4	45	1200	240	5.00	£P.O.A
RMA-1041660	104	75	183	75	50	M16x2	13	20	140	4	60	1900	380	5.00	£P.O.A
RMA-1041670	104	75	183	75	50	M16x2	13	20	140	4	70	3000	600	5.00	£P.O.A
RMA-1302045	130	112	230	112	70	M20x2.5	18	26	182	5	45	3300	550	6.00	£P.O.A
RMA-1302060	130	112	230	112	70	M20x2.5	18	26	182	5	60	5400	900	6.00	£P.O.A
RMA-1302070	130	112	230	112	70	M20x2.5	18	26	182	5	70	8100	1350	6.00	£P.O.A

Material

Metal parts are bright zinc plated mild steel.
Stainless steel parts are available on request. Please ask sales for details.

Other Info.

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.

+44 (0)1246 455500
+44 (0)1246 455522

ondrives

sales@ondrives.com
www.ondrives.com

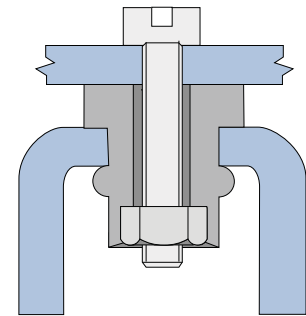
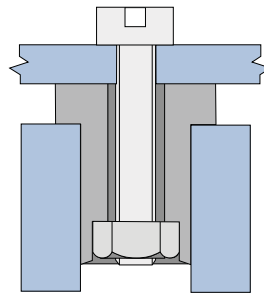
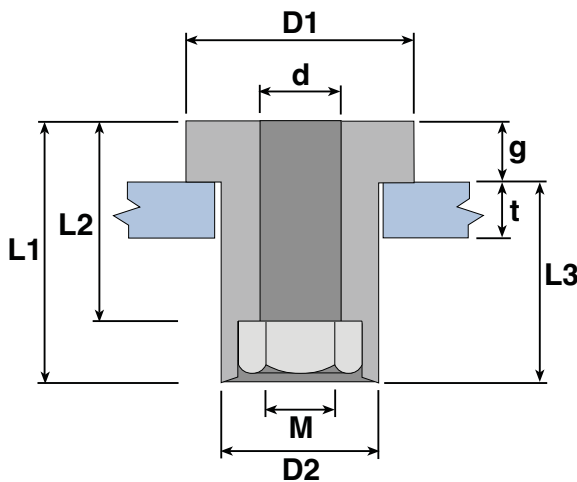
Product information updated 1st April 2011 and subject to change. Please contact Sales for the latest prices and availability.

REF

ANTI-VIBRATION & SPRINGS

Anti-Vibration Mounts

Elastic Fixing Inserts



Part Number	Maximum Static Loads		Blind Hole Compression & Shear N
	Compression N	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

Part Number	D1	D2	d	M	L1	L2	L3	g	Clearance Hole Dia.		Plate Thickness t		Tightening Torque Plate		Tightening Torque Hole		Price Each
									Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
REF-09-M3	9	7.2	3.3	M3	11.5	8	9.0	2.5	7.2	7.5	0.6	2.5	0.3	0.4	0.4	0.5	£P.O.A
REF-12-M4	12	9.3	4.5	M4	14.5	10	11.5	3.0	9.3	9.6	1.0	3.0	0.4	0.6	1.0	1.5	£P.O.A
REF-15-M5	15	10.2	6.0	M5	18.0	12	14.5	3.5	10.2	10.5	1.0	4.0	0.6	0.8	1.7	2.5	£P.O.A
REF-16-M6	16	12.7	8.0	M6	21.0	13	17.0	4.0	12.7	13.0	2.0	5.0	0.7	0.9	2.5	3.5	£P.O.A
REF-24-M8	24	16.5	10.0	M8	27.0	17	22.0	5.0	16.5	16.8	2.0	6.5	1.6	1.8	3.0	4.0	£P.O.A

Material

CR Neoprene (70 shore)

Performance

Operating Temperature Range: -30°C to +80°C

Other Info.

REF Elastic Fixing Inserts are used for the protection of light to medium weight equipment against active or passive vibration and structure-borne noise. 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.

+44 (0)1246 455500
+44 (0)1246 455522

ondrives

sales@ondrives.com
www.ondrives.com

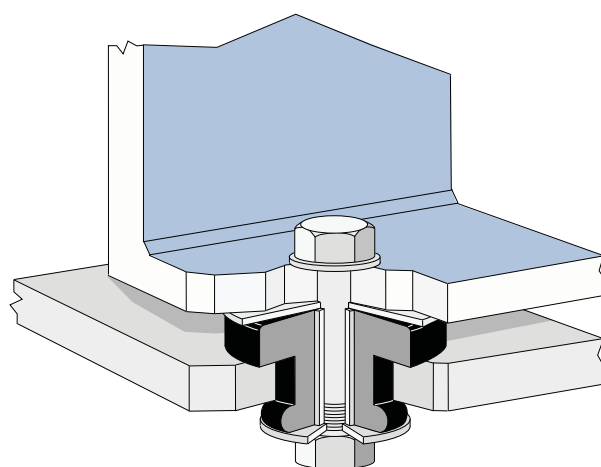
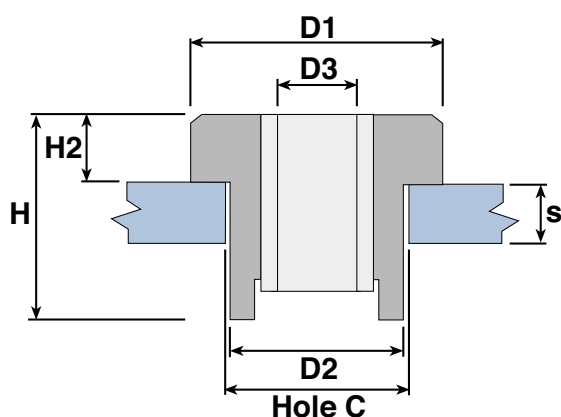
Product information updated 1st April 2011 and subject to change. Please contact Sales for the latest prices and availability.

ANTI-VIBRATION & SPRINGS

STC

Anti-Vibration Mounts

Isolators



Part Number	D1	D2	D3	H1	s	H2	Hole C	Rubber Hardness Sh.A	Max. Load N	Deflection at Max. Load N/mm	Spring Rate N/mm	Price Each
STC-2845	28	20.6	10	17.5	8	5.6	21	45	350	0.7	500	£P.O.A
STC-2860	28	20.6	10	17.5	8	5.6	21	60	500	0.7	715	£P.O.A
STC-4445	45	31.5	13	25.4	10	10.4	32	45	750	1.2	625	£P.O.A
STC-4460	45	31.5	13	25.4	10	10.4	32	60	1000	1.2	833	£P.O.A
STC-5060	50	34.3	13	35.0	16	13.5	35	60	1500	1.2	1250	£P.O.A
STC-5075	50	34.3	13	35.0	16	13.5	35	75	3300	1.2	2750	£P.O.A
STC-6360	64	41.1	16	45.0	19	15.7	42	60	2500	2.0	1250	£P.O.A
STC-6375	64	41.1	16	45.0	19	15.7	42	75	5000	2.0	2500	£P.O.A
STC-9560	95	60.0	20	60.0	23	25.0	57	60	5000	4.0	1250	£P.O.A
STC-9575	95	60.0	20	60.0	23	25.0	57	75	10000	4.0	2500	£P.O.A

Material

One piece cylindrical Natural Rubber moulding for maximum resilience and isolation performance, centrally bonded to a thick wall steel tube.

Other Info.

Generally the top steel washer, lower rebound steel washer and equipment fixing screw are not supplied as standard.

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.

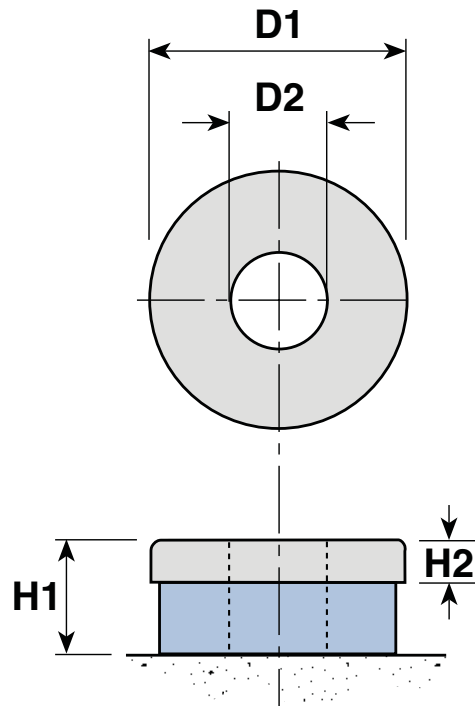
The STC is fitted to a supporting frame or chassis by inserting it into a hole having rounded edges and a smooth bore. The fixing screw is passed through the equipment foot and top washer, through the steel tube and then tightened onto the lower washer with a nut.

AW

ANTI-VIBRATION & SPRINGS

Anti-Vibration Washers

Round



Part Number	D1	D2	H1	H2	Max. Tightening Torque T Nm	Corresponding Bolt Tension F kN	Price Each
AW-10	30	11	11	5	7	4	£P.O.A
AW-12	30	13	11	5	13	6	£P.O.A
AW-14	35	15	12	6	20	8	£P.O.A
AW-16	40	17	12	6	30	10	£P.O.A
AW-20	40	21	12	6	60	13	£P.O.A
AW-24	50	25	14	8	90	18	£P.O.A
AW-30	60	31	14	8	140	24	£P.O.A
AW-36	70	37	16	10	230	33	£P.O.A

Material

SG 6P2 general purpose machine mounting anti-vibration material.

Other Info.

AW anti-vibration washers reduce vibration transmitted to or from holding down bolts. The washers are placed between the hold down nut and machine base or flange.

Tightening torques 'T' relate to dry, unplated, metric coarse threads. If higher tightening torques are required, Contact sales for further details.

+44 (0)1246 455500
+44 (0)1246 455522

ondrives

sales@ondrives.com
www.ondrives.com

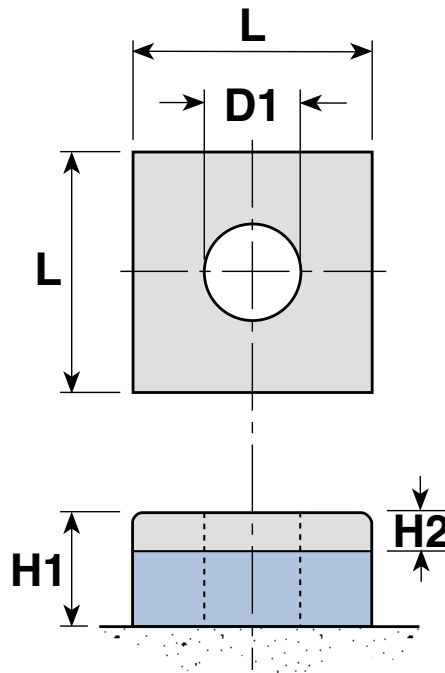
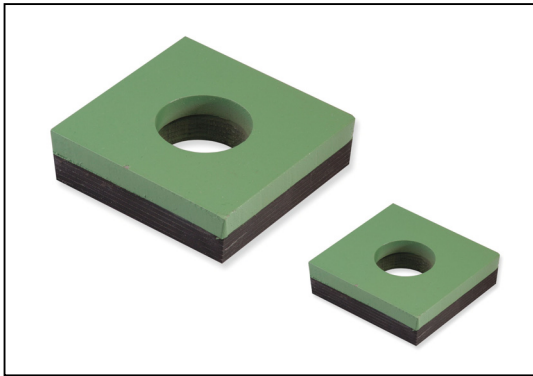
Product information updated 1st April 2011 and subject to change. Please contact Sales for the latest prices and availability.

ANTI-VIBRATION & SPRINGS

AWS

Anti-Vibration Washers

Square



Part Number	L	D2	H1	H2	Max. Tightening Torque T Nm	Corresponding Bolt Tension F kN	Price Each
AWS-30	80	31	21	6	190	34	£P.O.A
AWS-36	90	37	21	6	280	42	£P.O.A
AWS-42	100	43	25	10	390	50	£P.O.A
AWS-48	110	49	25	10	540	60	£P.O.A
AWS-56	125	57	25	10	840	80	£P.O.A

Material

SG 15P2 general purpose machine mounting anti-vibration material.

Other Info.

AWS anti-vibration washers reduce vibration transmitted to or from holding down bolts. The washers are placed between the hold down nut and machine base or flange and are used in high bolt load applications. Tightening torques 'T' relate to dry, unplated, metric coarse threads. If higher tightening torques are required, Contact sales for further details.

+44 (0)1246 455500
+44 (0)1246 455522

ondrives

sales@ondrives.com
www.ondrives.com

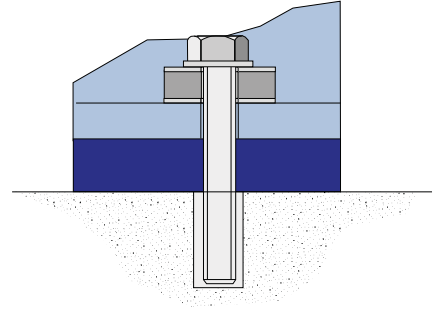
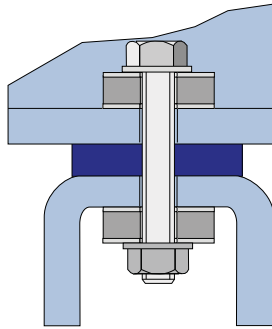
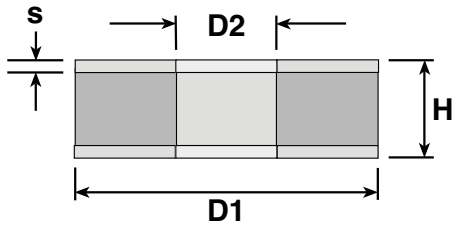
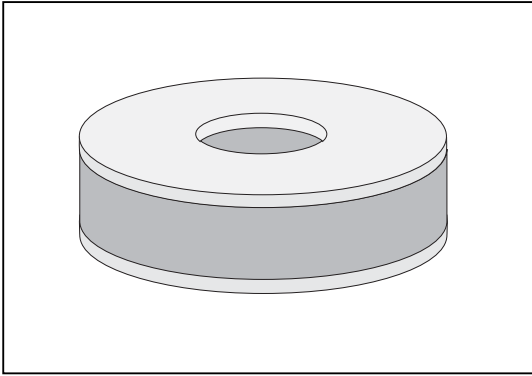
Product information updated 1st April 2011 and subject to change. Please contact Sales for the latest prices and availability.

AWR

ANTI-VIBRATION & SPRINGS

Anti-Vibration Washers

Isowasher



Part Number	D1	D2	H	t	Rubber Sh.A	Spring Constant kN/mm	Max. Load kN	Deflection at Max. Load mm	Max. Torque Nm	Price Each
AWR-10	30	10.5	17	2	80	1.25	1.90	1.5	3	£P.O.A
AWR-12	40	12.5	17	2	80	2.40	3.60	1.5	8	£P.O.A
AWR-14	50	14.5	20	2	80	2.70	4.90	1.8	12	£P.O.A
AWR-16	50	16.5	20	2	80	3.00	5.40	1.8	16	£P.O.A
AWR-20	60	20.5	25	3	80	3.60	8.50	2.3	37	£P.O.A
AWR-24	65	24.5	26	3	80	3.60	9.00	2.3	44	£P.O.A

Material

Rubber and metal components.

+44 (0)1246 455500

+44 (0)1246 455522

ondrives

sales@ondrives.com

www.ondrives.com

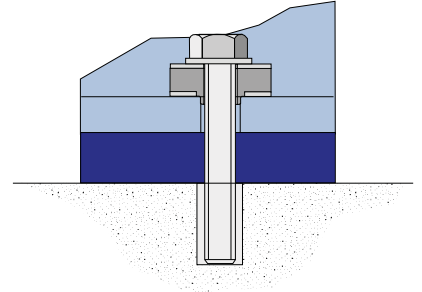
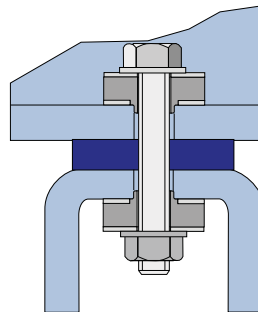
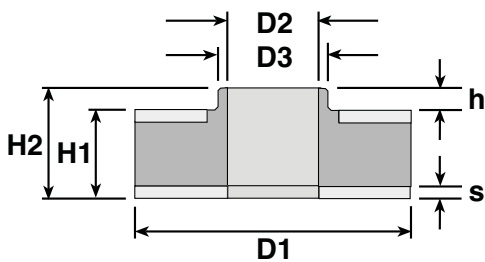
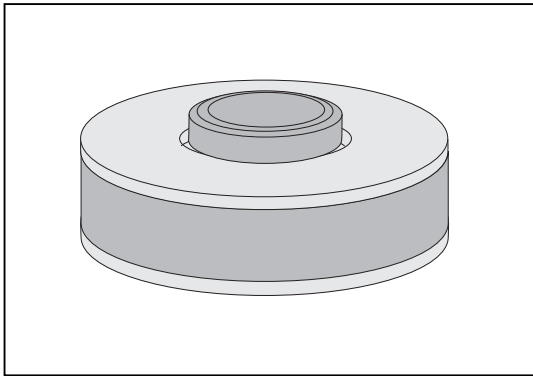
Product information updated 1st April 2011 and subject to change. Please contact Sales for the latest prices and availability.

ANTI-VIBRATION & SPRINGS

AWRP

Anti-Vibration Washers

Isowasher with Spigot



Part Number	D1	D2	D3	H1	H2	h	s	Rubber Sh.A	Spring Constant kN/mm	Max. Load kN	Deflection at Max. Load mm	Max. Torque Nm	Price Each
AWRP-10	30	10.5	14.0	14	17	3	2	80	1.25	1.90	1.5	3	£P.O.A
AWRP-12	40	12.5	16.0	14	17	3	2	80	2.40	3.60	1.5	8	£P.O.A
AWRP-14	50	14.5	18.0	16	19	3	2	80	2.70	4.90	1.8	12	£P.O.A
AWRP-16	50	16.5	20.0	16	20	4	2	80	3.00	5.40	1.8	16	£P.O.A
AWRP-20	60	20.5	24.5	21	25	4	3	80	3.60	8.50	2.3	37	£P.O.A
AWRP-24	65	24.5	29.5	21	26	5	3	80	3.60	9.00	2.3	44	£P.O.A

Material

Rubber and metal components.

+44 (0)1246 455500
+44 (0)1246 455522

ondrives

sales@ondrives.com
www.ondrives.com

Product information updated 1st April 2011 and subject to change. Please contact Sales for the latest prices and availability.

ANTI-VIBRATION & SPRINGS

Anti-Vibration Mounts

Vibration Isolation

T
E
C
H
N
I
C
A
L

Vibration Isolation

Isolator Natural frequencies f_n

Undamped

$$f_n = \frac{1}{2\pi} \sqrt{\frac{K}{M}}$$

Damped

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

ζ = Damping Ratio C/Cc

K = Spring Constant N/m

M = Supported Mass kg

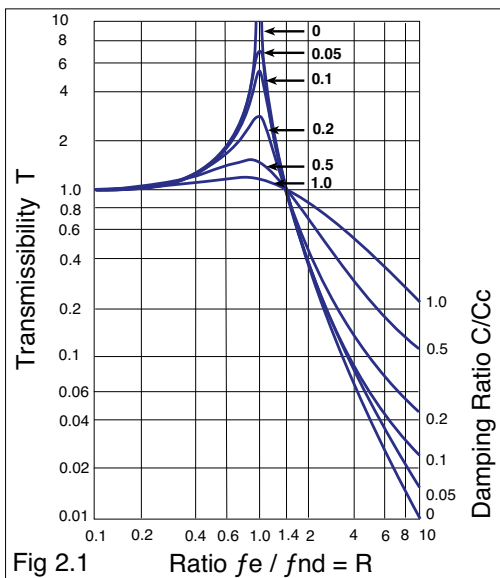
For effective vibration isolation the isolator natural frequency f_n should be less than 50% the lowest disturbing frequency f_e

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 f_e of 12Hz and above at reasonable cost.

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

Examples	Natural Frequency f_n Hz	Isolate above Disturbing Frequency f_e Hz
Air systems	1.5+	3+
Helical Coil spring systems	2.5+	5+
Compare Rubber Metal AV Mounts	6.0+	12+



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:

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

$$R = \frac{f_e}{f_n}$$

$$Q = \frac{1}{2 C/C_c}$$

f_e - disturbing frequency can be determined by measurement.

The isolator natural frequency f_{nd} is given by:

$$f_{nd} = \frac{1}{2\pi} \sqrt{\frac{K_{td}}{M}} \quad \text{Hz}$$

K_{td} = Sum of Isolator Dynamic Spring Constants (K₁+K₂+K₃...) 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 f_e 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 f_e is near to or coincident with the natural frequency of the supporting structure (floor, foundation or subsoil).

ANTI-VIBRATION & SPRINGS

Anti-Vibration Mounts

Vibration Isolation

Damping Factor	frequency ratio R fe/fn								
	C/Cc	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0
0.05	20	66	80	87	91	93	94	95	
0.10	19	64	79	85	89	91	93	94	
0.15	17	62	76	83	87	90	91	93	
0.20	16	59	74	81	85	87	89	91	
0.30	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/s²

K = Spring Constant N/m

F = Applied force N

z = Deflection m

$$\omega = 2\pi f$$

Units

Displacement response: $Sr = \frac{F}{K-M\omega^2}$ m

Velocity response: $Vr = \frac{F\omega}{K-M\omega^2}$ m/s

Acceleration response: $Ar = \frac{F\omega^2}{K-M\omega^2}$ m/s²

Force transmitted: $Fr = KSr = \frac{KF}{K-M\omega^2}$ 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/s²

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

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

Units

Displacement response: $Sr = \frac{F}{K \sqrt{(1+(2\zeta)^2)}} m$

Velocity response: $Vr = \frac{F \sqrt{(K/M)*(1-\zeta^2)}}{K \sqrt{(1+(2\zeta)^2)}} m/s$

Acceleration response: $Ar = \frac{F(1-\zeta^2)}{M \sqrt{(1+(2\zeta)^2)}} m/s^2$

Force transmitted: $Fr = KSr = \frac{F}{\sqrt{(1+(2\zeta)^2)}} N$

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

- Provide efficient vibration isolation
- 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:

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

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

$$\omega = 2\pi fe$$

K = Isolator Spring Constant N/m

M = Supported Mass kg

fe = disturbing frequency Hz

L

A

C

I

N

H

C

E

T

ANTI-VIBRATION & SPRINGS

Anti-Vibration Mounts

Vibration Isolation



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

- A** = acceleration m/s²
 - 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 = $\sqrt{2} \times$ (Peak)
 $\omega = 2\pi f$
A = ωV
V = $A/\omega = A/2\pi f$
V = ωD
D = V/ω

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 = **LA/KA** etc.

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

LA = Static Load N at **A**

Vertical Natural Frequency

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

M = total equipment mass kg

K.T = **KA + KB + KC + KD** 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

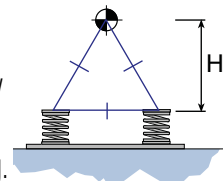
Isolators are in the same horizontal plane as the C/g. Vertical, horizontal and rotational modes are uncoupled.

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.



H = Maximum for stability

Determination of undamped Vertical Natural Frequency from static vertical deflection

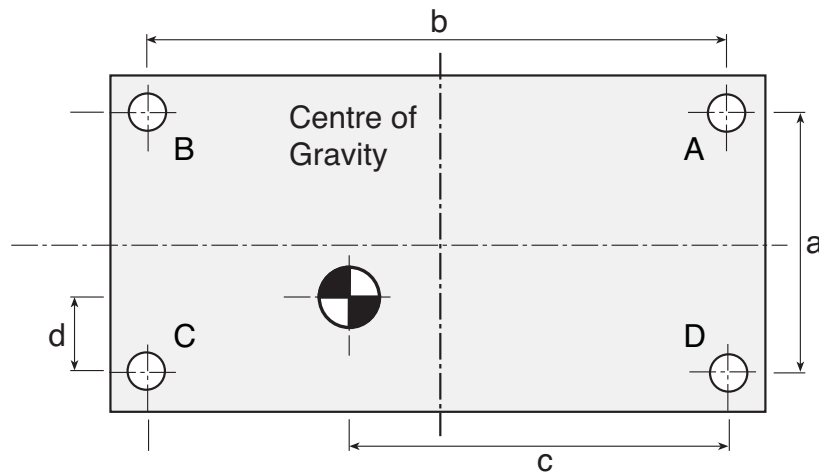
$$f_n = 15.76 \sqrt{\frac{1}{\delta}}$$

δ = static deflection (mm)

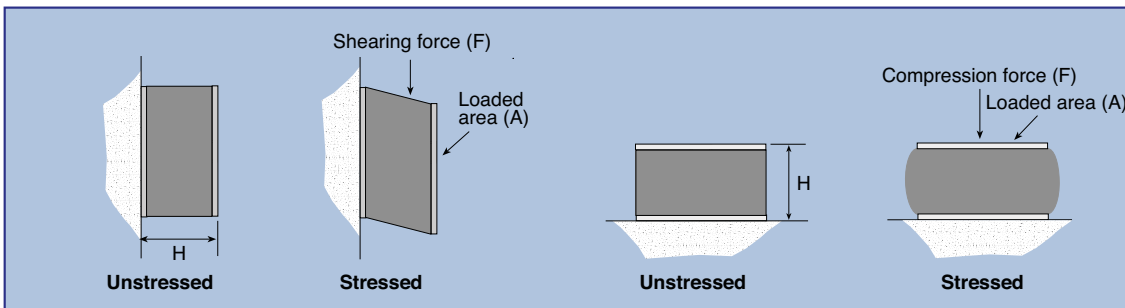
ANTI-VIBRATION & SPRINGS

Anti-Vibration Mounts

Vibration Isolation



Rubber Metal Vibration Isolators



Features (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

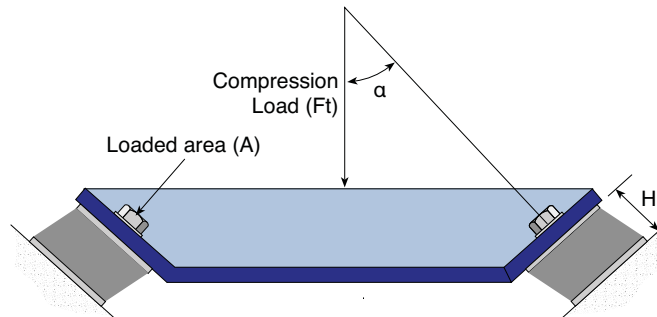
Optimum support design for Rubber Isolators

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 δt (mm):

$$\delta t = \frac{Ft \cdot H}{2 \cdot A(G \sin^2 \alpha + Ec \cos^2 \alpha)}$$

- G** = Shear Modulus (N/mm²)
- Ec** = Compression Modulus (N/mm²)
- H** = Rubber height (mm)
- A** = Loaded rubber area (mm²)
- Ft** = Load (N)



1
A
C
I
N
H
C
E
T