Farrat
ENGINEERS ON A MISSION

Data Sheet

Farrat Squaregrip (SG)

High stiffness vibration and shock damping material, produced from high grade fibre reinforced nitrile rubber.

Farrat SG Materials Range

- SG9002PP
- SG9005PP
- SG9008TT
- SG9010PP
- SG9015PP
- SG9015TT

S	G	9	0	0	2	P	P
COMPOUND		HARDNESS (IRHD)		THICKNESS (MM)		TREAD SIDE A	TREAD SIDE B
BR = Nitrile (NBR) IS = Isofoam NR = Natural Rubber VR = Verlimber VM = Vidam SG = Squargrip						T = Square Tread I = Isomat P = Plain	

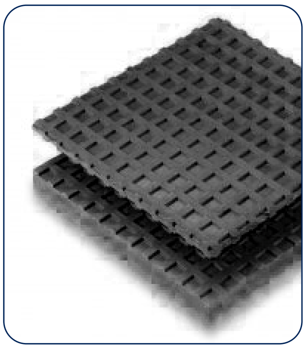
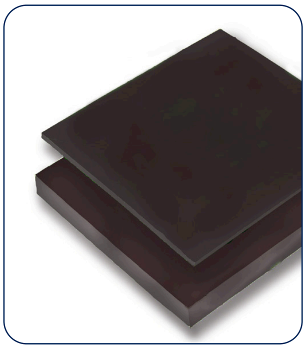
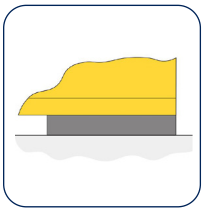
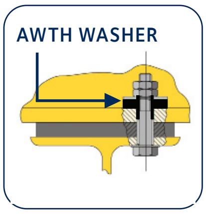
Why Choose SG?

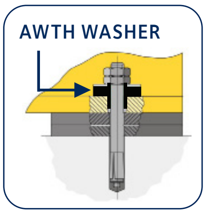
- High stiffness vibration and shock damping
- Tread Pattern
- Used extensively in Farrat machine mounts
- Manufactured in the UK by Farrat using high quality compounds
- Can be supplied as full sheets (1000x500 mm), cut to size pads and strips (including holes and slots if required) according to the customer's requirements.
- Operating temperature range: -10 °C to +80 °C
- High resistance to oils & chemicals

Applications

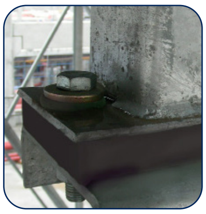
Farrat SG materials can be used as anti-vibration & damping pads for a wide range of industrial applications.

- Impact machinery (e.g. PowerPress Elastomer Bearings for mechanical and hydraulic presses, turret punch presses, guillotines, etc.)
- General use for industrial machinery and hydraulic equipment
- Metal, timber and concrete production machinery
- Printing & packaging machinery
- Textile machinery
- Measuring, test and electronic equipment
- Mining equipment
- High-speed industrial doors
- Components, modules and systems in elevator industry
- Damping pads on Farrat Wedgemounts & Jackmounts








Let us help you choose the right material for your application.

Designing a resilient support or connection, and selecting a suitable material, can be complex. Without the correct consideration it is possible to adversely affect the performance of plant or machinery when incorporating a flexible support.

Farrat offer a wide range of design and consultancy services, so please contact us with your requirements and we will work with you to find the right solution.

Note: These applications are a guide. The most suitable material will depend on the specific characteristics and constraints of your application

Farrat Anti-Vibration Materials Summary Sheet

Farrat Anti-Vibration Materials for Industrial Applications

To be used in conjunction with Farrat's individual material Technical Data Sheets.

Materials referenced in this datasheet are highlighted green.

S	G	9	0	0	2	P	P
COMPOUND		HARDNESS (IRHD)		THICKNESS (MM)		TREAD SIDE A	TREAD SIDE B
BR = Nitrile (NBR) IS = Isofoam NR = Natural Rubber VR = Verlimber VM = Vidam SG = Squargrip						T = Square Tread I = Isomat P = Plain	

Performance in order of pressure from lowest to highest:

MATERIAL CODE	THICKNESS (mm)	OPTIMUM WORKING PRESSURE [P_O] (N/mm²)	NATURAL FREQUENCY [f_n] @ P_O (HZ)	PEAK OPERATING PRESSURE [P_{US}] (N/mm²)	AVERAGE DAMPING RATIO [ζ] (%)
VR1613PP	12.5	0.035	17.9	0.05	10.1
VR1625PP	25	0.035	12.0	0.05	11.6
VR1650PP	50	0.035	6.7	0.05	17.2
VR2713PP	12.5	0.10	12.9	0.14	7.1
VR2725PP	25	0.10	8.7	0.14	4.9
VR2750PP	50	0.10	5.3	0.14	6.5
FV1013PP	12.5	0.18	22.8	0.25	11.4
FV1025PP	25	0.18	15.5	0.25	12.0
NR4450II	50	0.20	6.0	0.40	1.8
VR3825PP	25	0.26	8.2	0.35	5.3
VR3850PP	50	0.26	5.8	0.35	7.1
VR3813PP	12.5	0.28	10.8	0.35	6.2
BR4050II	50	0.30	9.0	0.4	8.5
BR5050II	50	0.30	10.2	0.5	8.8
NR4425IT	25	0.30	9.0	0.5	1.8
BR4008TT	8	0.35	26.9	0.5	10.8
NR5050II	50	0.40	7.0	0.6	2.3
BR5025IT	25	0.40	13.9	0.6	8.8
NR5025IT	25	0.40	9.5	0.7	2.3
BR5015TT	14.5	0.50	26.0	1.1	11.2
BR5008TT	7	0.55	28.6	0.8	10.3
BR4015TT	14.5	0.55	23.2	0.9	9.8
NR6225IT	25	0.60	11.5	1.0	3.0
NR6250II	50	0.60	8.0	1.0	3.0
SG9002PP	2	0.70	44.3	2.0	2.1
BR7025IT	25	0.90	20.6	1.4	10.0
BR7050II	50	0.90	15.6	1.4	10.0
SG9005PP	5.5	1.0	42.2	2.5	3.3
VM7006PP	6	1.0	40.0	1.5	12.3
VM7010PP	10	1.0	34.3	1.5	15.2
VM7013PP	12.5	1.0	30.7	1.5	16.1
BR7015TT	15	1.0	29.6	2.0	12.2
VM7025PP	25	1.0	22.5	1.5	13.8
VM7020PP	20	1.0	25.3	1.5	15.3
BR7008TT	7.5	1.1	36.9	1.8	12.4
BR7025TT	24.5	1.2	27.0	2.0	12.1
SG9008TT	8	1.7	35.9	3.0	14.5
SG9015TT	15.5	1.8	33.1	3.4	16.5
SG9010PP	10	2.5	41.2	5.0	7.4
SG9015PP	15	3.0	39.6	6.0	8.0

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Performance in order of natural frequency from lowest to highest:

MATERIAL CODE	THICKNESS (mm)	OPTIMUM WORKING PRESSURE $[P_O]$ (N/mm²)	NATURAL FREQUENCY $[f_n]$ @ P_O (HZ)	PEAK OPERATING PRESSURE $[P_{US}]$ (N/mm²)	AVERAGE DAMPING RATIO [ζ] (%)
VR2750PP	50	0.10	5.3	0.14	6.5
VR3850PP	50	0.26	5.8	0.35	7.1
NR4450II	50	0.20	6.0	0.40	1.8
VR1650PP	50	0.035	6.7	0.05	17.2
NR5050II	50	0.40	7.0	0.6	2.3
NR6250II	50	0.60	8.0	1.0	3.0
VR3825PP	25	0.26	8.2	0.35	5.3
VR2725PP	25	0.10	8.7	0.14	4.9
BR4050II	50	0.30	9.0	0.4	8.5
NR4425IT	25	0.30	9.0	0.5	1.8
NR5025IT	25	0.40	9.5	0.7	2.3
BR5050II	50	0.30	10.2	0.5	8.8
VR3813PP	12.5	0.28	10.8	0.35	6.2
NR6225IT	25	0.60	11.5	1.0	3.0
VR1625PP	25	0.035	12.0	0.05	11.6
VR2713PP	12.5	0.10	12.9	0.14	7.1
BR5025IT	25	0.40	13.9	0.6	8.8
FV1025PP	25	0.18	15.5	0.25	12.0
BR7050II	50	0.90	15.6	1.4	10.0
VR1613PP	12.5	0.035	17.9	0.05	10.1
BR7025IT	25	0.90	20.6	1.4	10.0
VM7025PP	25	1.0	22.5	1.5	13.8
FV1013PP	12.5	0.18	22.8	0.25	11.4
BR4015TT	14.5	0.55	23.2	0.9	9.8
VM7020PP	20	1.0	25.3	1.5	15.3
BR5015TT	14.5	0.50	26.0	1.1	11.2
BR4008TT	8	0.35	26.9	0.5	10.8
BR7025TT	24.5	1.2	27.0	2.0	12.1
BR5008TT	7	0.55	28.6	0.8	10.3
BR7015TT	15	1.0	29.6	2.0	12.2
VM7013PP	12.5	1.0	30.7	1.5	16.1
SG9015TT	15.5	1.8	33.1	3.4	16.5
VM7010PP	10	1.0	34.3	1.5	15.2
SG9008TT	8	1.7	35.9	3.0	14.5
BR7008TT	7.5	1.1	36.9	1.8	12.4
SG9015PP	15	3.0	39.6	6.0	8.0
VM7006PP	6	1.0	40.0	1.5	12.3
SG9010PP	10	2.5	41.2	5.0	7.4
SG9005PP	5.5	1.0	42.2	2.5	3.3
SG9002PP	2	0.70	44.3	2.0	2.1

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SG9002PP

CHARACTERISTICS	PROPERTIES	UNIT	TOLERANCE
Thickness (hp)	2.0	mm	±10%
Hardness	87	IRHD	±5
Compression Chord Modulus @ 10% Strain (Ech)	2.5	N/mm^2	±10%
Static Stiffness @ 10% Strain (Kch) of pad size 150x150 mm	30.5	N/mm^2	±10%
Optimum Working Pressure (Po)	0.7	N/mm^2	±10%
Peak Operating Pressure (Pus)	2.0	N/mm^2	±10%
Minimum Natural Frequency (fn)	44	Hz	±10%
Average Damping Ratio (ζ)	2.1	%	±10%

Notes

1.1 The static and dynamic tests were in accordance with international standards: ISO 7743:2011 (E) and ISO 4664-1:2011 (E) although some factors were adapted to better suit typical applications of our customers. Please contact us if would like specific data or tests to be undertaken.

1.2 Optimum working pressure, (Po), is the pressure point where the natural frequency of the system, fn, starts to increase. Peak operating pressure, (PUS), is the pressure point from where the strain change would be much lower than the pressure change (dε<<dσ). Farrat's elastomeric materials are adaptable to different operating conditions, so please contact us to check if a material is suitable for specific operating conditions and if not we can help select a suitable solution.

1.3 Natural Frequency, (fn), is based on an average output from tests undertaken at various frequencies and amplitudes. Please contact us if you need performance characteristics for a specific scenario.

1.4 Damping ratio, (ζ), in a viscously damped system is a reduction in the vibration amplitude as a result of energy being dissipated as heat (converting of mechanical energy to heat). The ζ is the ratio of the damping of the existing system to a damping necessary to make the system critically damped (ζ = C/Cc) and describes how vibration decays in the system after a disturbance. In a hysteretically damped system (such as rubber), the equivalent viscous damping ratio at resonance is given by ζ=0.5η where η is the ratio of the dissipated energy to the stored energy (loss factor). Damping can be introduced into the system to control its response when resonance is not avoidable.

1.5 Transmissibility, (Tr), is defined as the ratio of the amplitude of the force transmitted to that of the exciting force. It varies depending on the disturbing frequency, dynamic amplitude and the strain of the AV material under the imposed load. If you would like to have transmissibility data for your specific application please contact us and we would be happy to provide this as well as supporting you in selecting the right material for your application.

Fig 1.0 Quasi-Static Deflection vs. Pressure

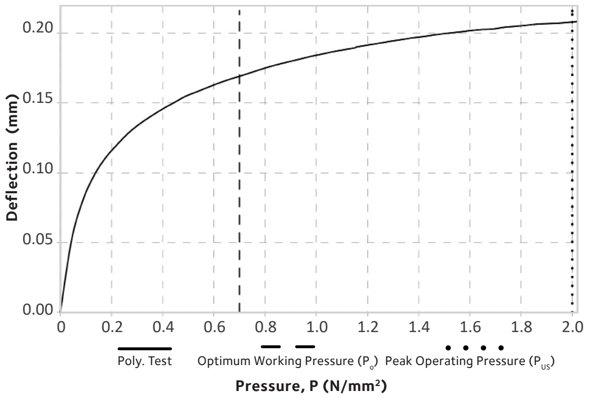


Fig 2.0 Natural Frequency vs. Pressure

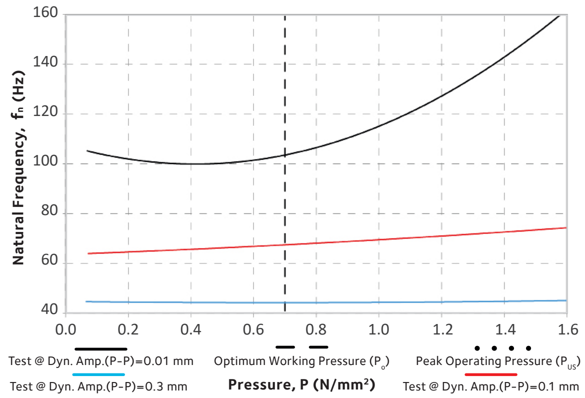


Fig 3.0 Damping Ratio at Resonance vs. Pressure

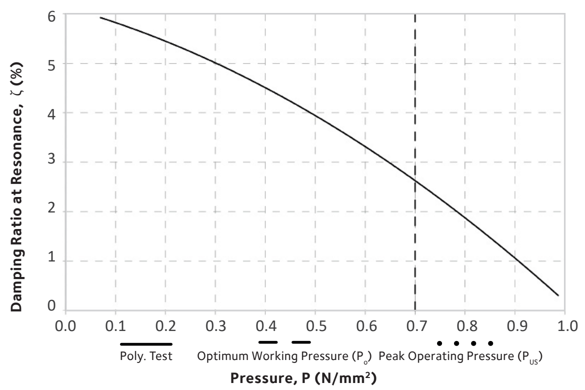


Fig 4.0 Damping Ratio at different Pressure (P) and different Peak-to-Peak Dynamic Amplitudes (X)

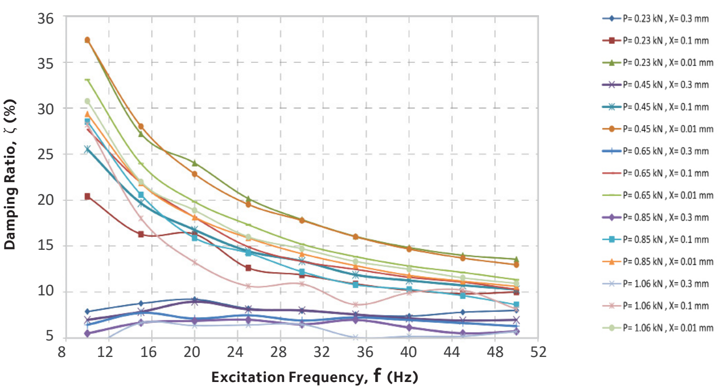
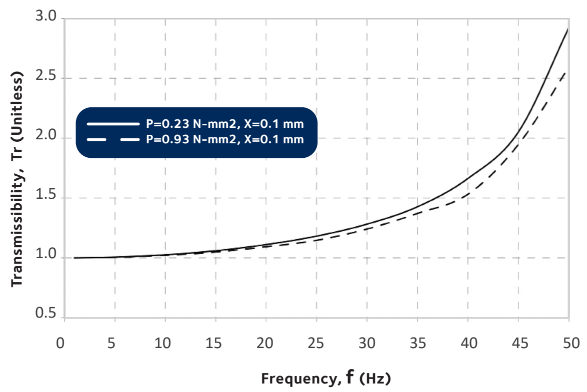


Fig 5.0 Transmissibility at Min and Max working Pressure (P) and Peak-to-Peak Dynamic Amplitudes (X)



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SG9005PP

CHARACTERISTICS	PROPERTIES	UNIT	TOLERANCE
Thickness (hp)	5.5	mm	±10%
Hardness	87	IRHD	±5
Compression Chord Modulus @ 10% Strain (Ech)	10.9	N/mm^2	±10%
Static Stiffness @ 10% Strain (Kch) of pad size 150x150 mm	46.0	N/mm^2	±10%
Optimum Working Pressure (Po)	1.0	N/mm^2	±10%
Peak Operating Pressure (Pus)	2.5	N/mm^2	±10%
Minimum Natural Frequency (fn)	42	Hz	±10%
Average Damping Ratio (ζ)	3.3	%	±10%

Notes

1.1 The static and dynamic tests were in accordance with international standards: ISO 7743:2011 (E) and ISO 4664-1:2011 (E) although some factors were adapted to better suit typical applications of our customers. Please contact us if would like specific data or tests to be undertaken.

1.2 Optimum working pressure, (Po), is the pressure point where the natural frequency of the system, fn, starts to increase. Peak operating pressure, (PUS), is the pressure point from where the strain change would be much lower than the pressure change (dε<<dσ). Farrat's elastomeric materials are adaptable to different operating conditions, so please contact us to check if a material is suitable for specific operating conditions and if not we can help select a suitable solution.

1.3 Natural Frequency, (fn), is based on an average output from tests undertaken at various frequencies and amplitudes. Please contact us if you need performance characteristics for a specific scenario.

1.4 Damping ratio, (ζ), in a viscously damped system is a reduction in the vibration amplitude as a result of energy being dissipated as heat (converting of mechanical energy to heat). The ζ is the ratio of the damping of the existing system to a damping necessary to make the system critically damped (ζ = C/Cc) and describes how vibration decays in the system after a disturbance. In a hysteretically damped system (such as rubber), the equivalent viscous damping ratio at resonance is given by ζ=0.5η where η is the ratio of the dissipated energy to the stored energy (loss factor). Damping can be introduced into the system to control its response when resonance is not avoidable.

1.5 Transmissibility, (Tr), is defined as the ratio of the amplitude of the force transmitted to that of the exciting force. It varies depending on the disturbing frequency, dynamic amplitude and the strain of the AV material under the imposed load. If you would like to have transmissibility data for your specific application please contact us and we would be happy to provide this as well as supporting you in selecting the right material for your application.

Fig 1.0 Quasi-Static Deflection vs. Pressure

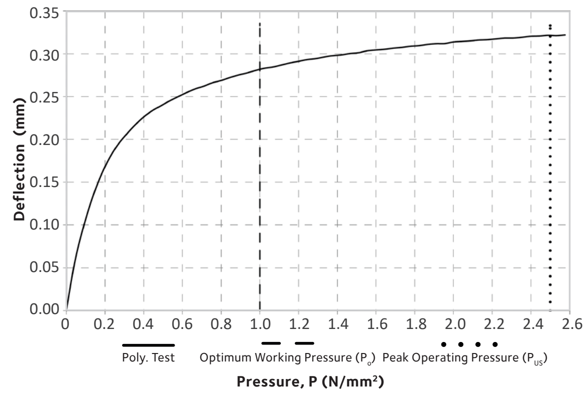


Fig 2.0 Natural Frequency vs. Pressure

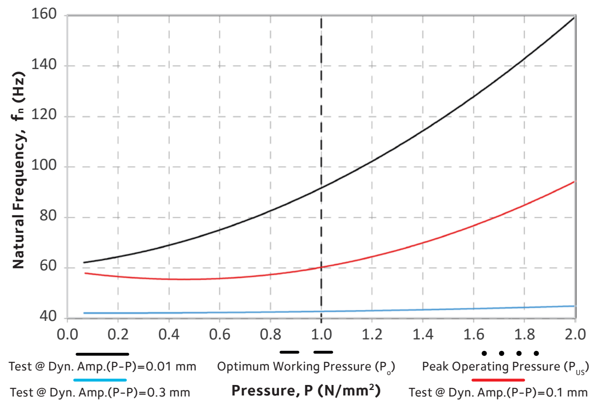


Fig 3.0 Damping Ratio at Resonance vs. Pressure

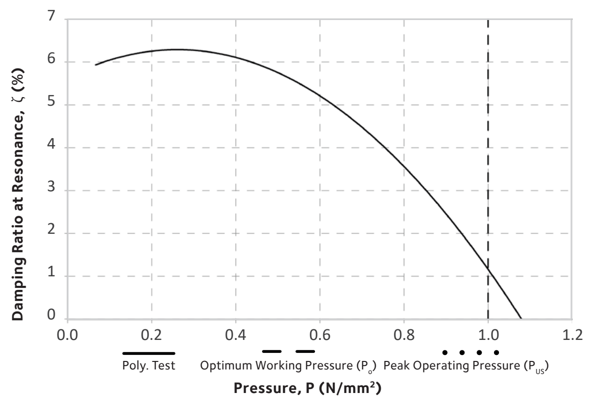


Fig 4.0 Damping Ratio at different Pressure (P) and different Peak-to-Peak Dynamic Amplitudes (X)

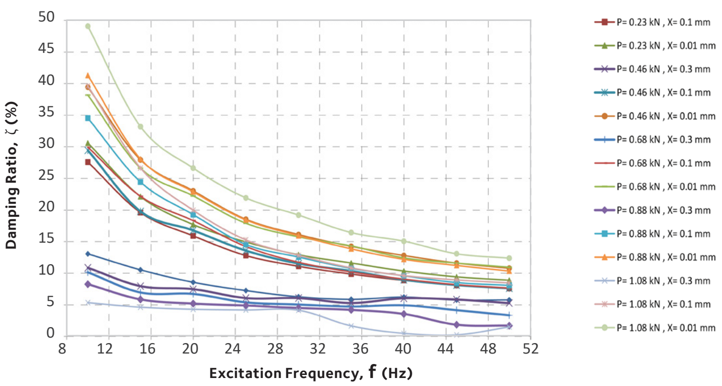
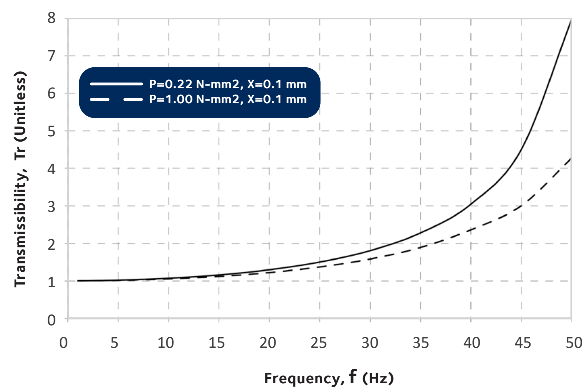


Fig 5.0 Transmissibility at Min and Max working Pressure (P) and Peak-to-Peak Dynamic Amplitudes (X)



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BR9008TT

CHARACTERISTICS	PROPERTIES	UNIT	TOLERANCE
Thickness (hp)	8.0	mm	±10%
Hardness	87	IRHD	±5
Compression Chord Modulus @ 10% Strain (Ech)	6.1	N/mm²	±10%
Static Stiffness @ 10% Strain (Kch) of pad size 150x150 mm	17.7	N/mm²	±10%
Optimum Working Pressure (Po)	1.7	N/mm²	±10%
Peak Operating Pressure (Pus)	3.0	N/mm²	±10%
Minimum Natural Frequency (fn)	36	Hz	±10%
Average Damping Ratio (ζ)	14.5	%	±10%

Notes

1.1 The static and dynamic tests were in accordance with international standards: ISO 7743:2011 (E) and ISO 4664-1:2011 (E) although some factors were adapted to better suit typical applications of our customers. Please contact us if would like specific data or tests to be undertaken.

1.2 Optimum working pressure, (Po), is the pressure point where the natural frequency of the system, fn, starts to increase. Peak operating pressure, (PUS), is the pressure point from where the strain change would be much lower than the pressure change (dε<<dσ). Farrat's elastomeric materials are adaptable to different operating conditions, so please contact us to check if a material is suitable for specific operating conditions and if not we can help select a suitable solution.

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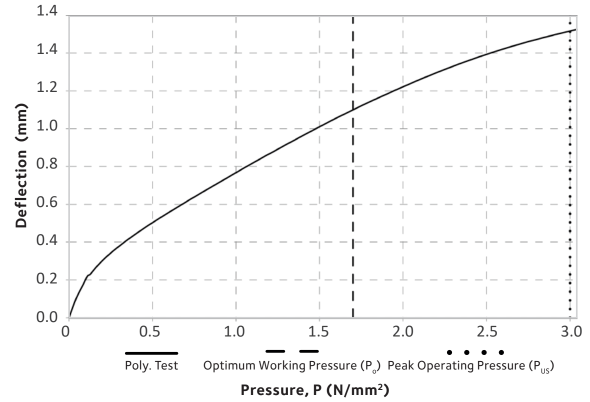


Fig 2.0 Natural Frequency vs. Pressure

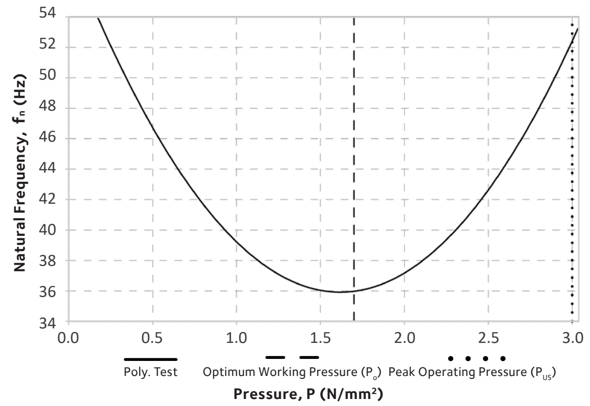


Fig 3.0 Damping Ratio at Resonance vs. Pressure

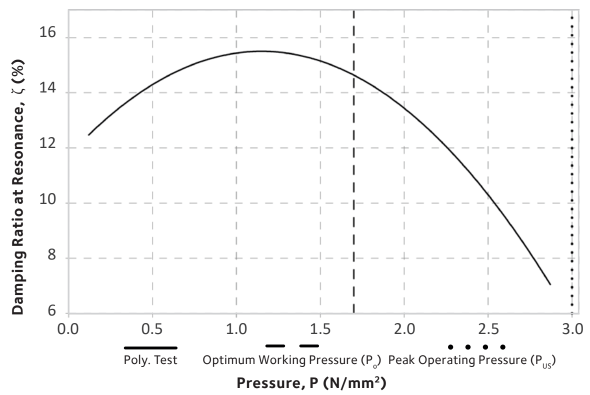


Fig 4.0 Damping Ratio at different Pressure (P) and different Peak-to-Peak Dynamic Amplitudes (X)

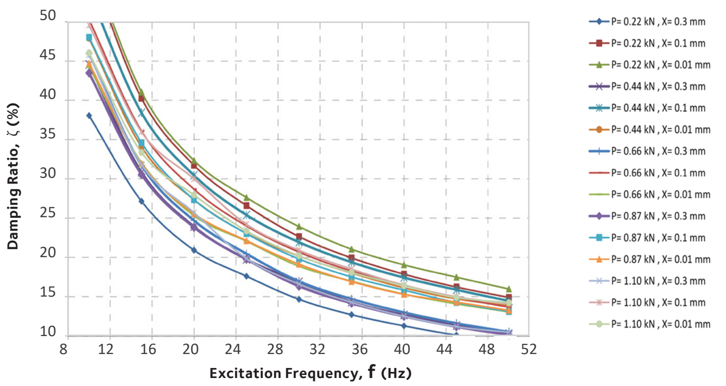
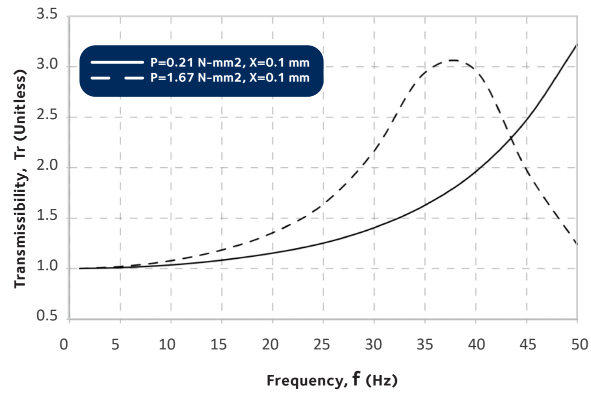


Fig 5.0 Transmissibility at Min and Max working Pressure (P) and Peak-to-Peak Dynamic Amplitudes (X)



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SG9010PP

CHARACTERISTICS	PROPERTIES	UNIT	TOLERANCE
Thickness (hp)	10.0	mm	±10%
Hardness	87	IRHD	±5
Compression Chord Modulus @ 10% Strain (Ech)	33.8	N/mm^2	±10%
Static Stiffness @ 10% Strain (Kch) of pad size 150x150 mm	76.9	N/mm^2	±10%
Optimum Working Pressure (Po)	2.5	N/mm^2	±10%
Peak Operating Pressure (Pus)	5.0	N/mm^2	±10%
Minimum Natural Frequency (fn)	41	Hz	±10%
Average Damping Ratio (ζ)	7.4	%	±10%

Notes

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1.5 Transmissibility, (Tr), is defined as the ratio of the amplitude of the force transmitted to that of the exciting force. It varies depending on the disturbing frequency, dynamic amplitude and the strain of the AV material under the imposed load. If you would like to have transmissibility data for your specific application please contact us and we would be happy to provide this as well as supporting you in selecting the right material for your application.

Fig 1.0 Quasi-Static Deflection vs. Pressure

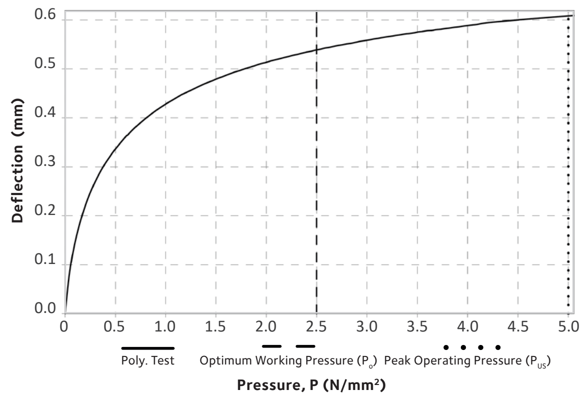


Fig 2.0 Natural Frequency vs. Pressure

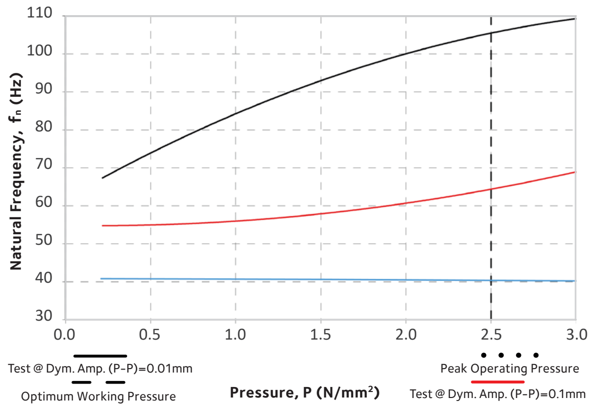


Fig 3.0 Damping Ratio at Resonance vs. Pressure

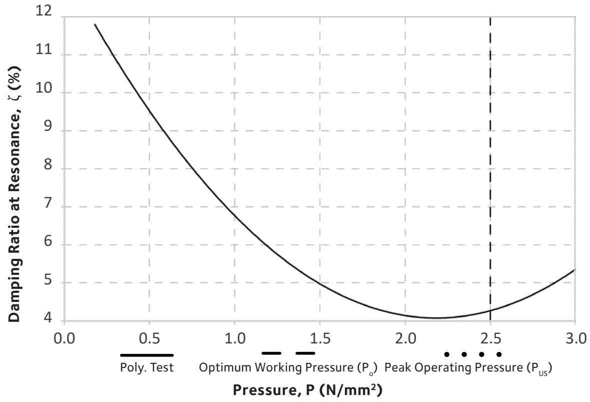


Fig 4.0 Damping Ratio at different Pressure (P) and different Peak-to-Peak Dynamic Amplitudes (X)

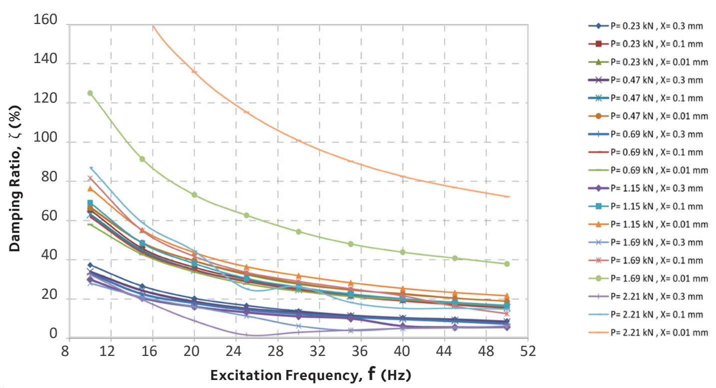
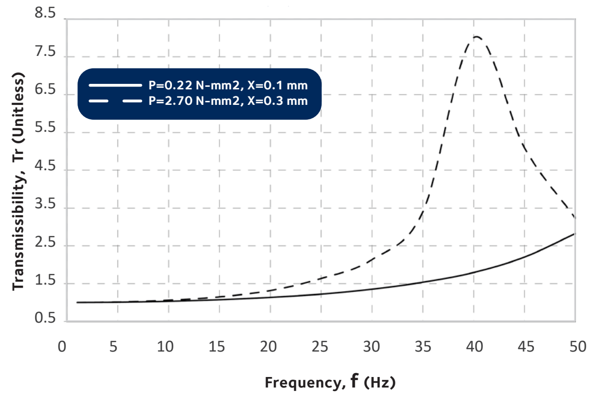


Fig 5.0 Transmissibility at Min and Max working Pressure (P) and Peak-to-Peak Dynamic Amplitudes (X)



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SG9015PP

CHARACTERISTICS	PROPERTIES	UNIT	TOLERANCE
Thickness (hp)	15.0	mm	±10%
Hardness	87	IRHD	±5
Compression Chord Modulus @ 10% Strain (Ech)	92.3	N/mm²	±10%
Static Stiffness @ 10% Strain (Kch) of pad size 150x150 mm	139.8	N/mm²	±10%
Optimum Working Pressure (Po)	3.0	N/mm²	±10%
Peak Operating Pressure (Pus)	6.0	N/mm²	±10%
Minimum Natural Frequency (fn)	40	Hz	±10%
Average Damping Ratio (ζ)	8.0	%	±10%

Notes

1.1 The static and dynamic tests were in accordance with international standards: ISO 7743:2011 (E) and ISO 4664-1:2011 (E) although some factors were adapted to better suit typical applications of our customers. Please contact us if would like specific data or tests to be undertaken.

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Fig 1.0 Quasi-Static Deflection vs. Pressure

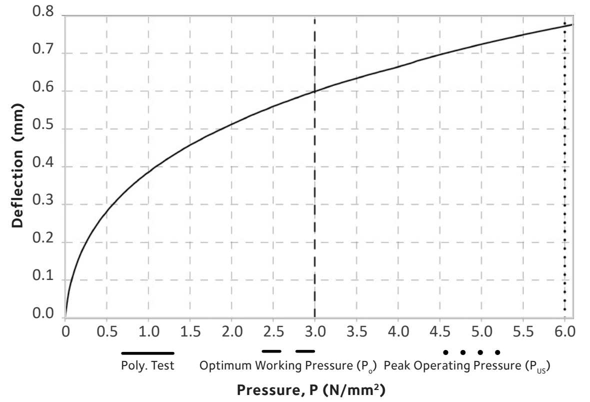


Fig 2.0 Natural Frequency vs. Pressure

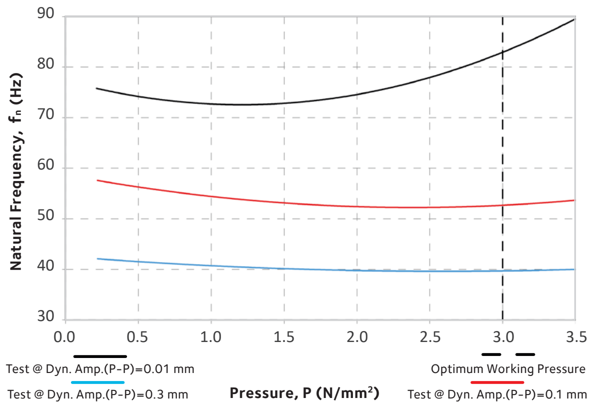


Fig 3.0 Damping Ratio at Resonance vs. Pressure

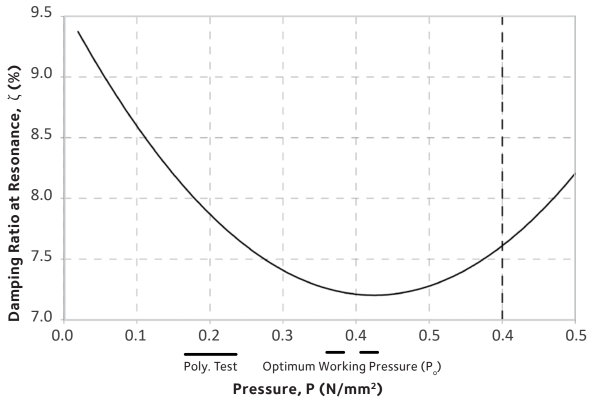


Fig 4.0 Damping Ratio at different Pressure (P) and different Peak-to-Peak Dynamic Amplitudes (X)

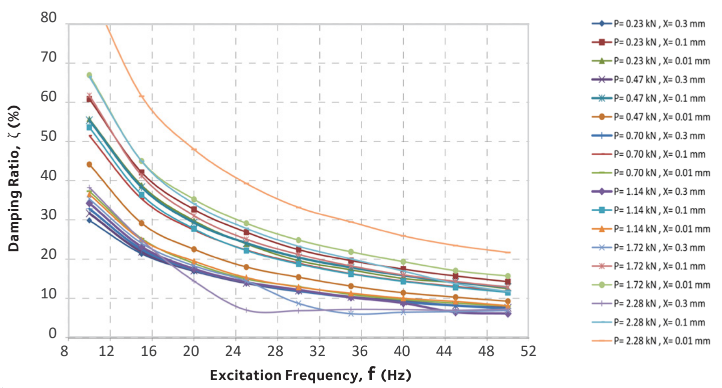
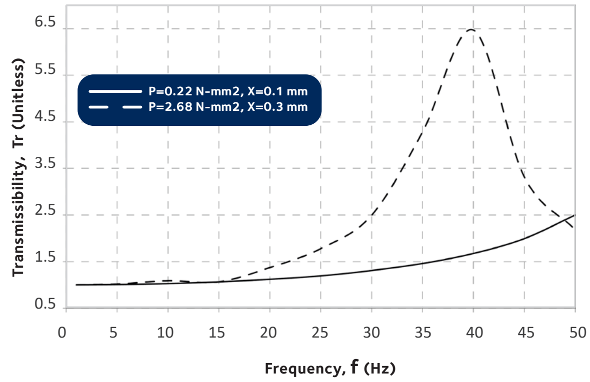


Fig 5.0 Transmissibility at Min and Max working Pressure (P) and Peak-to-Peak Dynamic Amplitudes (X)



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SG9015TT

CHARACTERISTICS	PROPERTIES	UNIT	TOLERANCE
Thickness (hp)	15.5	mm	±10%
Hardness	87	IRHD	±5
Compression Chord Modulus @ 10% Strain (Ech)	17.5	N/mm²	±10%
Static Stiffness @ 10% Strain (Kch) of pad size 150x150 mm	25.8	N/mm²	±10%
Optimum Working Pressure (Po)	1.8	N/mm²	±10%
Peak Operating Pressure (Pus)	3.4	N/mm²	±10%
Minimum Natural Frequency (fn)	33	Hz	±10%
Average Damping Ratio (ζ)	17.0	%	±10%

Notes

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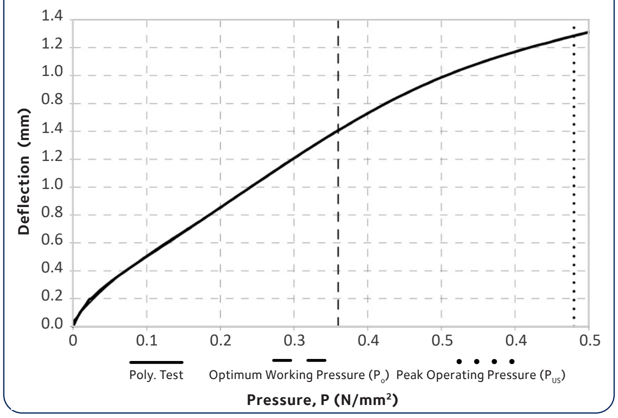


Fig 2.0 Natural Frequency vs. Pressure

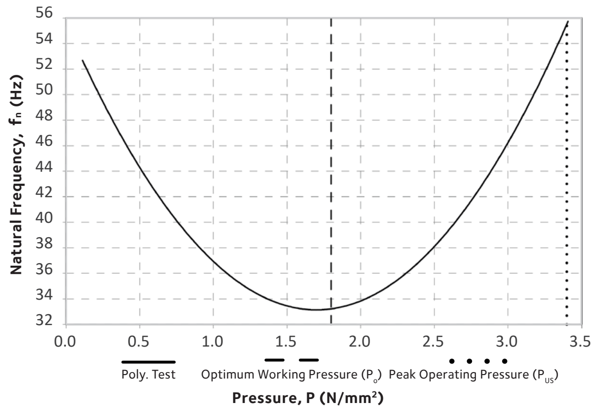


Fig 3.0 Damping Ratio at Resonance vs. Pressure

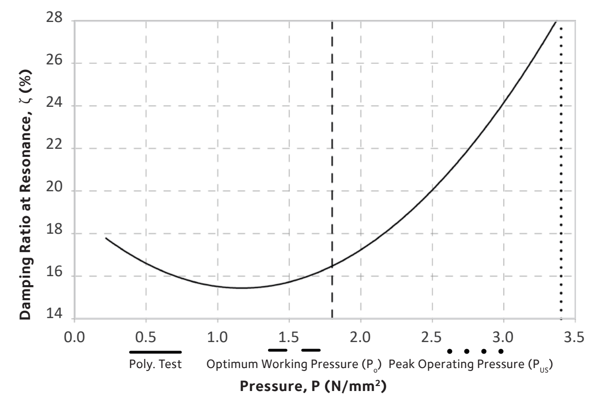


Fig 4.0 Damping Ratio at different Pressure (P) and different Peak-to-Peak Dynamic Amplitudes (X)

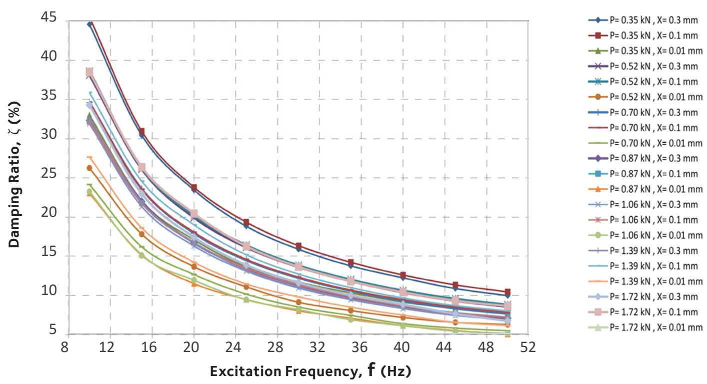
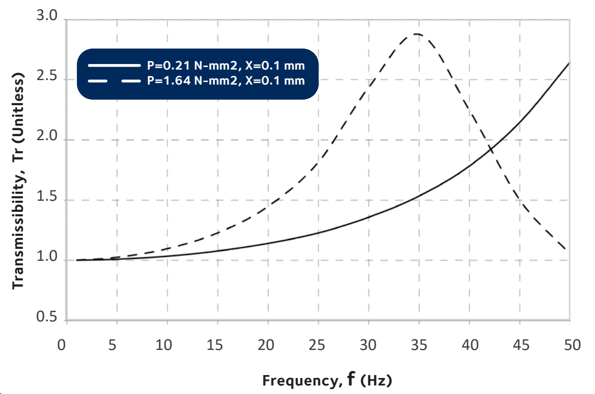


Fig 5.0 Transmissibility at Min and Max working Pressure (P) and Peak-to-Peak Dynamic Amplitudes (X)



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