Introduction

Welcome to the *Pneuride* range of air bellows. These bellows are used in a wide variety of applications:

Primary Application:

Suspension media in all sorts of vehicles (buses, trucks, trailers, semi trailers, demountable systems, container handling systems, coaches, ambulances, etc).

Secondary Application:

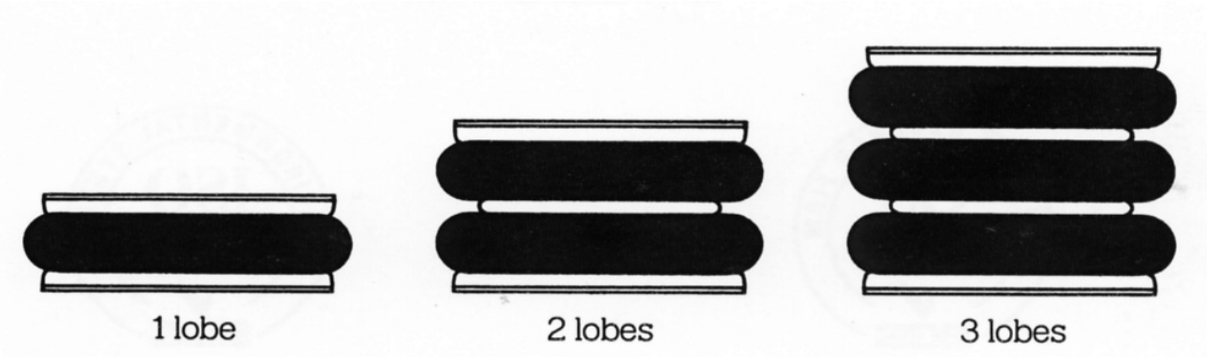
Pneuride Bellows, whilst originally designed for vehicle applications, have a range of unique characteristics which make them extremely attractive for industrial applications such as pneumatic/hydraulic actuation, isolation mounts, height and level control devices.

Furthermore, although not specifically designed as a noise insulator, Pneuride Bellows do reduce noise transmission.

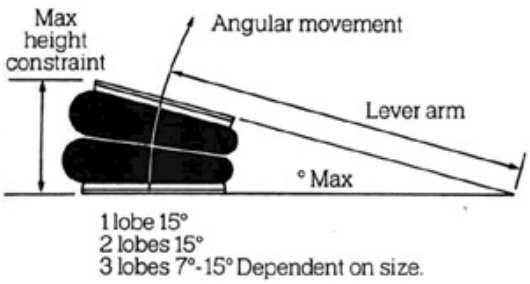
Bellows are produced in a range of sizes from 4½ x 1 up to 21½ x 2.

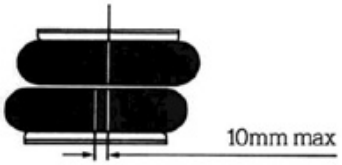
Lobes

Pneuride Bellows are manufactured using a mixture of elastomers and textile reinforcement which produces a high quality, high performance product. They are frictionless, economical and virtually maintenance free and come packaged in one of three forms: 1, 2, or 3 lobes...



Angular & axial displacement





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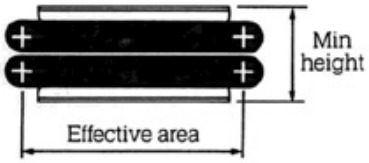
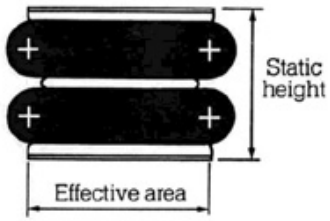
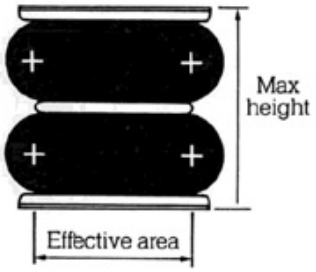






Conditions of Use

Maximum Working Pressure	8bar
Burst Pressure	25-50bar
Maximum Angle between Top and Bottom Plates, dependent upon size	7°-15°
Maximum Axial Offset	10mm

Precautions to Observe

Do not exceed stated stroke.

Do not inflate assembly when it is unrestricted.

Do not inflate beyond pressures stated without prior consultation.

Respect maximum and minimum heights.

The bellows must be securely fixed.

Do not use without air pressure.

Operating Temperature

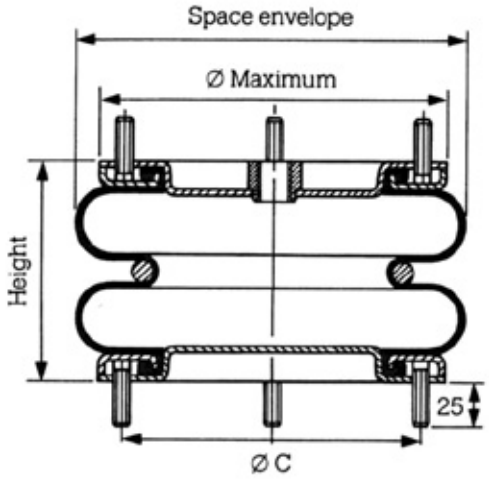
Minimum –30°C (-40°C Static)
Maximum +70°C (+90°C Static)

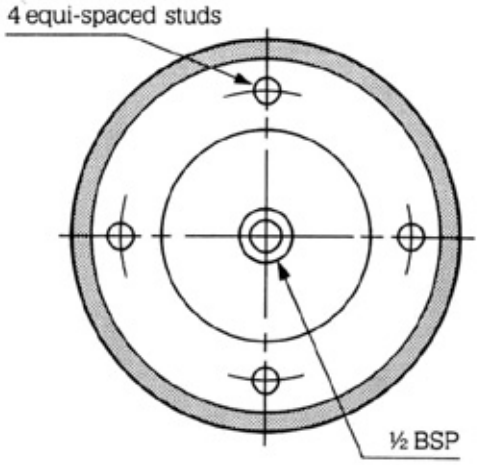
Materials

- **Bellows :** Manufactured from various rubbers
- **Metal Parts :** Mild steel protected by zinc passivate and yellow chromate, or cast aluminium

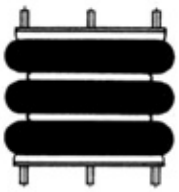
Note

The bellow assemblies can be completely dismantled



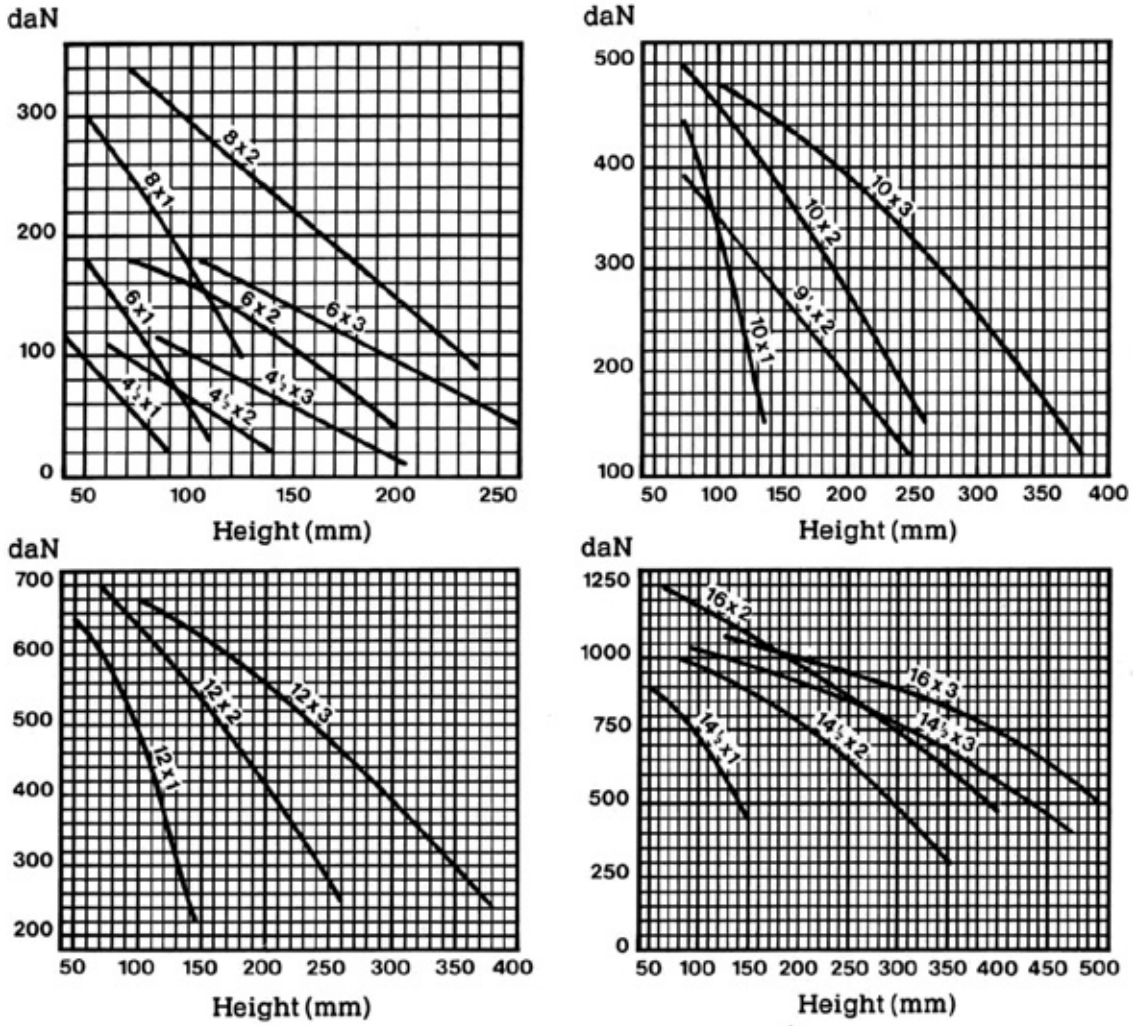


Characteristics

Bellows	Type	Ø Max	Minimum height	Maximum height	Total stroke	Static height	Ø C	Ø Space envelope	Weight in kg
 1 lobe	**4½ × 1**	125	45	90	45	65	93	140	0,75
	6 × 1	168	58	108	50	80	127	180	1,95
	8 × 1	230	47	120	73	90	156	240	3,05
	10 × 1	280	50	135	85	95	181	295	3,8
	12 × 1	330	50	145	95	95	232	345	4,75
	14½ × 1	395	47	165	118	105	283	410	6,9
 2 lobes	**4½ × 2**	125	65	145	80	100	93	140	0,93
	6 × 2	168	73	170	100	120	127	180	2,25
	8 × 2	230	72	225	153	150	156	240	3,75
	9¼ × 2	260	70	240	170	160	168	275	4,5
	10 × 2	280	70	240	170	160	181	295	4,6
	12 × 2	330	74	240	166	160	232	345	5,85
	14½ × 2	395	70	280	210	180	283	410	8,5
	16 × 2	430	77	320	243	180	283	445	8,8
 3 lobes	**4½ × 3**	125	100	200	100	145	93	140	1,15
	6 × 3	168	105	255	150	180	127	180	2,55
	10 × 3	280	100	365	265	235	181	295	5,4
	12 × 3	330	100	430	330	222	232	345	7
	14½ × 3	395	100	476	376	280	283	410	10
	16 × 3	430	125	500	375	280	283	445	16

Force Table

The force developed is a function of the bellows crossectional area. In the tables below the y-axis shows the force produced at one bar pressure for a variety of x-axis height.



Load necessary to obtain the minimum height without air in the bellows

Type	4½" x1	4½" x2	4½" x3	6" x1	6" x2	6" x3	8" x1	8" x2	9¼" x2	10" x1	10" x2	10" x3 4 ply	12" x1	12" x2	12" x3 4 ply	14½" x1	14½" x2	14½" x3 4 ply	16" x2	16" x3 4 ply
Static height (mm)	65	100	145	70	120	180	90	150	160	95	160	235	95	160	222	105	180	280	180	280
Min. height (mm)	45	65	100	58	70	102	47	72	70	50	70	100	47	74	100	147	70	100	77	125
Load in daN	12	15	20	15	20	12	13	14	12	12	11	77	10	10	81	9	9	86	9	65

Isolation

Pneuride Bellows are an excellent solution to vibration isolation problems.
The table opposite shows the natural frequency of the bellows at static height when pressurised at 4 bar (0.4 Mpa).

Dimension	Frequency (Hz) at static height	Static height (mm)	Load in kg at 4 bar at static height
4½ × 1	4,80	65	265
4½ × 2	2,80	100	265
4½ × 3	2,26	145	265
6 × 1	4,25	80	490
6 × 2	2,28	120	522
6 × 3	1,75	180	580
8 × 1	2,98	90	816
8 × 2	1,99	150	897
9¼ × 2	1,95	160	1088
10 × 1	2,84	95	1428
10 × 2	1,88	160	1448
10 × 3	1,65	235	1387
12 × 1	2,81	95	2080
12 × 2	1.66	160	2080
12 × 3	1,54	222	2040
14½ × 1	2,54	105	3060
14½ × 2	1,71	180	3100
14½ × 3	1,44	280	3264
16 × 2	1,45	180	3672
16 × 3	1,21	280	3451

The table below allows the calculation of the percentage isolation at given forcing frequencies and natural air spring frequencies.

Absolute vibration isolation chart for air springs