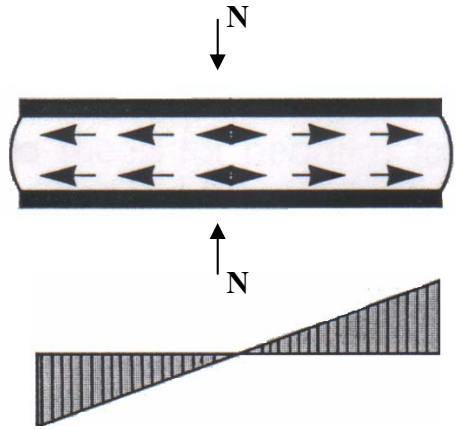
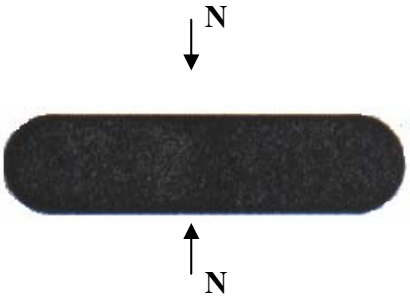
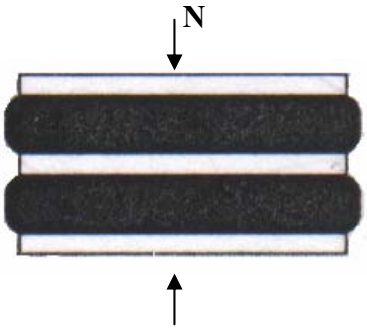
FUNCTION OF ELASTOMERIC BEARING PADS

1) Vertical load resisted





For (PP)

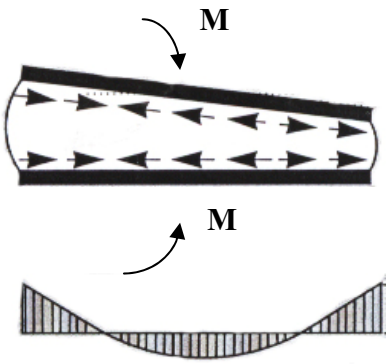


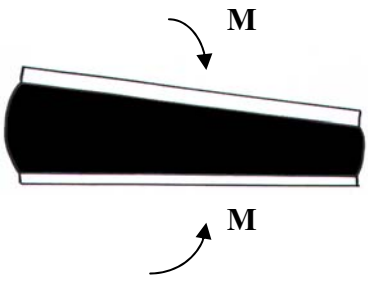
For (LB)

Vertical load resisted

Rotation Permitted

2) Rotation Permitted

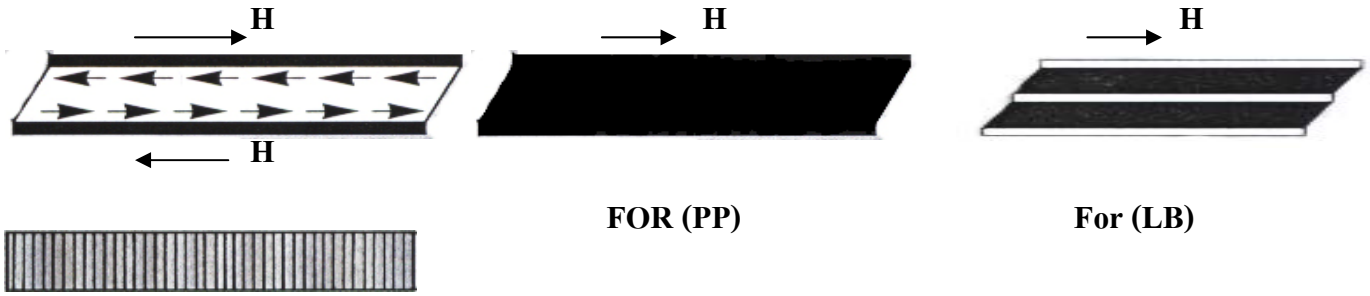




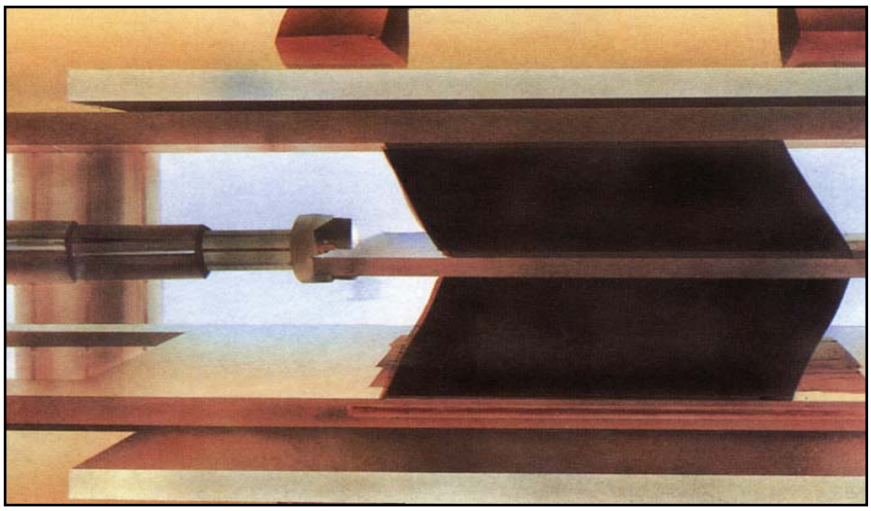
For (PP)

For (LB)

3) Horizontal load resisted or Translation permitted



FOR (PP) **For (LB)**



DESIGN CONIDERATION

Performance data have been calculated using the following properties:-

Nominal Hardness (IRHD)	Shear modulus, G (N/mm^2)	Bulk Modulus, Eb (N/mm^2)
50	0.6	2,000
60	0.9	2,000
70	1.2	2,000

Note : Values of hardness in the above table are in accordance with BS 903 : Part A26

These parameters refer to the use of Natural Rubber (Polyisoprene) and Neoprene (100% Virgin Chloroprene). The loadings are calculated to the serviceability limit states as required by BS5400 Section 9.1 Clause 10.1.4. Where dowel holes are used, load must be reduced accordingly.

We will be pleased to study your enquiries and recommend alternative bearing of suitable dimensional construction. To design the bearings the following data is required :

- **Maximum and minimum Vertical loads.**
- **Maximum positive and negative movements is longitudinal and transverse directions.**
- **Longitudinal and transverse Horizontal Loads.**
- **Angular Rotations in longitudinal and transverse directions.**
- **Available plan dimension.**

The Physical Properties of the Elastomer

1) BS5400 : Section 9.2 : 1983

Physical Properties	Natural Rubber	Chloroprene
Tensile Strength, Minimum (see 3.7.3.2)	15.5 N/mm^2	15.5 N/mm^2
Elongation at break, Minimum (see 3.7.3.2)		
45 IRHD TO 55 IRHD	450%	400%
56 IRHD TO 65 IRHD	400%	350%
66 IRHD TO 75 IRHD	300%	300%
Aging resistance (see 3.7.3.3) Maximum change from initial values :		
Hardness	10 IRHD	15 IRHD
Tensile Stength	15%	15%
Elongation at break	20%	40%
Compression set maximum (see 3.7.3.4)	30%	35%

2) AASHTO Standard 1992

AASHTO Standard Specification for Highway Bridges. Fifteen Edition 1996

ASTM Standard	Physical Properties	Table 18.2.3.1A Neoprene			Table 18.2.3.1B Natural Rubber		
D2240	Hardness (Shore A Durometer)	50±5	60±5	70±5	50±5	60±5	70±5
D412	Tensile Strength, Min psi.	2250	2250	2250	2250	2250	2250
	Ultimate Elongation Min %	400	350	300	450	400	300
	Heat Resistance						
	CR 70 hours at 212^{0}F						
	NR 70 hours at 158^{0}F						
D573	Change in Durmeter Hardness, max points	15	15	15	10	10	10
	Change in Tensile Strength, Max %	-15	-15	-15	-25	-25	-25
	Change in Ultimate Elongation, Max.%	-40	-40	-40	-25	-25	-25
D395 Method B	Compression Set	35	35	35	25	25	25
	CR 22 hours at 212^{0}F						
	NR 22 hours at 158^{0}F						
D1149 Mounting Procedure D518, Procedure A	Ozone CR 100 pphm, 20% Strain, 100^{0}F±2^{0}F, 100 hours NR 25 pphm, 20% Strain, 100^{0}F±2^{0}F, 48 hours	No Cracks	No Cracks	No Cracks	No Cracks	No Cracks	No Cracks
D429 Method B	Adhesion Bond made during vulcanization lbs/inch.	40	40	40	40	40	40

PLAIN BEARING PAD AND STRIP BEARING (PP)

Unreinforced elastomeric bearing pad and strips are designed and manufactured in 60 IRHD elastomer to BS 5400 Part 9 : 1983 (the hear modulus "G" = 0.9 N/mm^2)

The more popular sizes are listed in the following tables together with performance characteristics. If these dimensions do not meet your specific requirements, We are pleased to produce your particular sizes to meet your application:

Unreinforced Elastomeric Strips Bearings

Thickness (mm)	Width (mm)	SLS Vertical Load (kN/m)	Rotational Capacity (Rads/100kN/m)	Theoretical Compressive Stiffness (kN/mm/m)	Maximum Shear Movement (mm)	Theoretical Shear Stiffness (kN/mm/m)
10	100	250	0.00861	347	7.0	9.00
	150	563	0.00169	1,171	7.0	13.50
	200	900	0.00053	2,777	7.0	18.00
	250	1,125	0.00021	5.425	7.0	22.50
	300	1,350	0.00010	9,375	7.0	27.00
12	100	208	0.01490	200	8.4	7.50
	150	469	0.00293	678	8.4	11.25
	200	833	0.00092	1,607	8.4	15.00
	250	1,125	0.00037	3,139	8.4	18.75
	300	1,350	0.00017	5,425	8.4	22.50
15	100	167	0.02913	102	10.5	6.00
	150	375	0.00574	347	10.5	9.00
	200	667	0.00181	823	10.5	12.00
	250	1,042	0.00073	1,607	10.5	15.00
	300	1,350	0.00035	2,777	10.5	18.00
20	100	125	0.06909	43	14.0	4.50
	150	281	0.01363	146	14.0	6.75
	200	500	0.00431	347	14.0	9.00
	250	781	0.00176	678	14.0	11.25
	300	1,125	0.00084	1,171	14.0	13.50
25	100	100	0.13497	22	17.5	3.60
	150	225	0.02665	75	17.5	5.40
	200	400	0.00842	177	17.5	7.20
	250	625	0.00344	347	17.5	9.00
	300	900	0.00166	600	17.5	10.80

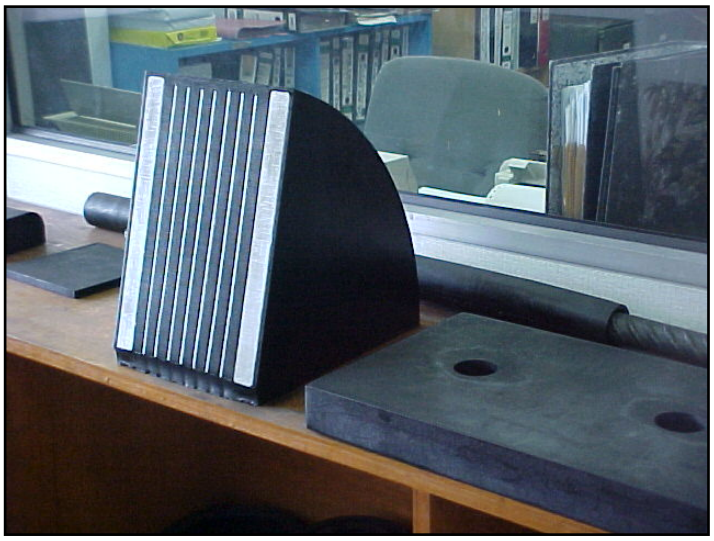
Unreinforced Elastomeric Plain Bearing Pad

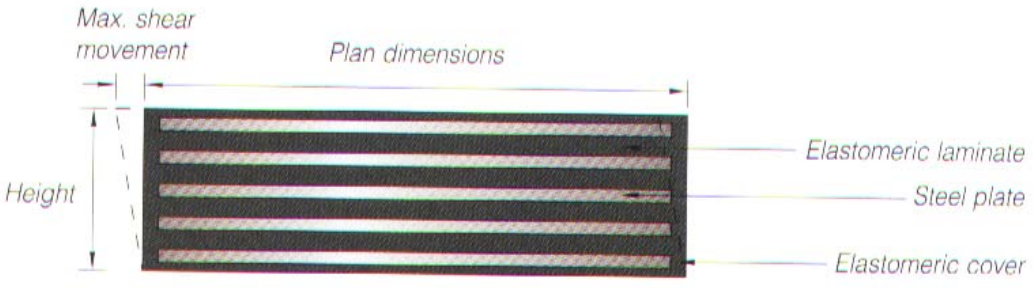
Thickness (mm)	Length (mm)	Breadth (mm)	SLS Vertical Load (kN)	Rotational Capacity (Rads/100kN)	Theoretical Compressive Stiffness (kN/mm)	Maximum Shear Movement (mm)	Theoretical Shear Stiffness (kN/mm)
10	200	150	64	0.02645	75	7.0	2.70
	300	150	113	0.01300	153	7.0	4.05
	300	200	180	0.00511	292	7.0	5.40
	400	200	267	0.00312	479	7.0	7.20
	400	250	385	0.00151	789	7.0	9.00
	500	250	521	0.00103	1,150	7.0	11.25
	500	300	675	0.00057	1,725	7.0	13.50
	600	300	810	0.00042	2,337	7.0	16.20
	600	400	1,080	0.00016	4,363	7.0	21.60
12	200	150	54	0.04554	43	8.4	2.25
	300	150	94	0.02237	89	8.4	3.38
	300	200	150	0.00878	170	8.4	4.50
	400	200	222	0.00535	279	8.4	6.00
	400	250	321	0.00258	462	8.4	7.50
	500	250	434	0.00171	675	8.4	9.38
	500	300	586	0.00097	1,016	8.4	11.25
	600	300	750	0.00071	1,380	8.4	13.50
	600	400	1,080	0.00028	2,597	8.4	18.00
15	200	150	43	0.08868	22	10.5	1.80
	300	150	75	0.04351	45	10.5	2.70
	300	200	120	0.01705	87	10.5	3.60
	400	200	178	0.01038	144	10.5	4.80
	400	250	256	0.00501	239	10.5	6.00
	500	250	347	0.00342	349	10.5	7.50
	500	300	469	0.00118	528	10.5	9.00
	600	300	600	0.00138	718	10.5	10.80
	600	400	960	0.00054	1,361	10.5	14.40
20	200	150	32	0.20971	9	14.0	1.35
	300	150	56	0.01028	19	14.0	2.02
	300	200	90	0.04023	37	14.0	2.70
	400	200	133	0.02447	61	14.0	3.60
	400	250	192	0.01179	101	14.0	4.50
	500	250	260	0.00805	148	14.0	5.63
	500	300	352	0.00443	225	14.0	6.75
	600	300	450	0.00325	307	14.0	8.10
	600	400	720	0.00127	585	14.0	10.80
25	200	150	26	0.40915	4	17.5	1.08
	300	150	45	0.20054	9	17.5	1.62
	300	200	72	0.07842	19	17.5	2.16
	400	200	107	0.04768	31	17.5	2.88
	400	250	154	0.02295	52	17.5	3.60
	500	250	208	0.01566	76	17.5	4.50
	500	300	281	0.00861	116	17.5	5.40
	600	300	360	0.00631	158	17.5	6.48
	600	400	576	0.00247	302	17.5	8.64

LAMINATED ELASTOMERIC BEARING (LB)

Dimension and Properties

Laminated Elastomeric Bearings is designed and manufactured in conformity to following international standards British BS 5400 Part 9 and American AASHTO, depends on project's specification, detailed drawing and Criteria load data. We will serve them in the detailed designs by our technical staff.





Laminated Elastomeric Bearing Design Data Schedule

Table 9. Typical bridge bearing schedule

Bridge name or reference

Bearing indentification mark							
Number off							
Seating material*	Upper surface						
	Lower surface						
Allowable average contact pressure (N/mm^2)	Upper face	Serviceability					
		Ultimate					
	Lower face	Serviceability					
		Ultimate					
Design load effects (kN)	Serviceability limit state	Vertical	max.				
			permanent				
			min.				
		Transverse					
		Longitudinal					
	Ultimate limit state	Vertical					
		Transverse					
		Longitudinal					
Translation (mm)	Serviceability limit state	Irreversible	Transverse				
			Longitudinal				
		Reversible	Transverse				
			Longitudinal				
	Ultimate limit state	Irreversible	Transverse				
			Longitudinal				
		Reversible	Transverse				
			Longitudinal				
Rotation (radians)	Serviceability limit state	Irreversible	Transverse				
			Longitudinal				
		Reversible	Transverse				
			Longitudinal				
	Maximum rate (radians / 100 kN)		Transverse				
			Longitudinal				
Maximum bearing dimensions (mm)	Upper surface		Transverse				
			Longitudinal				
	Lower surface		Transverse				
			Longitudinal				
	Overall height						
Tolerable movement of bearing under transient loads (mm)			Vertical				
			Transverse				
			Longitudinal				
Allowable resistance to translation under serviceability limit state (kN)			Transverse				
			Longitudinal				
Allowable resistance to rotation under serviceability limit state (kN m)			Transverse				
			Longitudinal				
Type of fixing required			Upper face				
			Lower face				

Syare any other requirements on separate sheet.

*For example cement mortar, epoxy mortar, in situ concrete, precast concrete, steel, timber.