



EagleBurgmann®

Vibraflex®

Rubber Expansion Joints

The Name for Sealing Technology...

Vibraflex Flexible Rubber Joints have been supplied to every sector of industry. They are designed to compensate for axial, lateral, angular movements and vibrations in piping systems and equipment, which operate at varying conditions of pressure and temperature.

Engineers specify **Vibraflex** flexible rubber joints to:

- take up pipe expansion and contraction
- reduce vibration, noise and shock
- accommodate misalignment
- line up flange bolt holes
- adapt from one flange to another
- take stress off pump casings
- make it easy to remove and replace valves for inspection and repair

Elastomer Options

Vibraflex Rubber Expansion Joints are available in a variety of elastomers to give the best possible performance for any set of operating conditions. The table compares their capabilities on the following scale:

- 1 OUTSTANDING
- 2 VERY GOOD
- 3 GOOD
- 4 FAIR
- 5 POOR

Characteristic	Natural R	EPDM E	Neoprene N	Nitrile Ni	Hypalon H	Butyl B	T-Max
Maximum Temperature	80° C	120° C	105° C	105° C	105° C	110° C	150° C
Gas permeability	3-4	4	3	3	2	1	1
Resistance to:							
oxidation	3	2	2	3	2	2	1
sunlight	5	1	2	5	1	2	1
heat ageing	4	1	3	3	2	2	2
ozone	4	1	2	4	1	2	1
flame	5	4-5	3	5	3	5	4-5
abrasion	2	2-3	2	3	2	3	4
dilute acids	3-4	2-3	2-3	3	2	2	1
concentrated acids	4	3	3-4	3-4	3	3-4	1
petroleum products	5	5	3	1-2	3	5	1
low temperatures	2	1-2	3	3-4	3-4	2	1-2

Applications

- **Natural Rubber** - Suitable for water, air, most moderate chemicals, dilute acids and alkalis. Good for abrasion. NOT suitable for exposure to strong sunlight, ozone, oil or petroleum fuel.
- **EPDM** - First choice for hot water, steam, oxidising chemicals, animal and vegetable oils. Excellent for sunlight and ozone. Good for high and low temperature applications.
- **Neoprene** - Suitable for water, sewage, oxidising chemicals and non-aromatic hydrocarbons. Good for oil resistance and weathering.
- **Nitrile** - Suitable for most hydrocarbons, oils and petroleum fuels and hydraulic fluids. NOT good for sunlight ageing, ozone or flame.
- **Hypalon** - Suitable for many acids, alkalis, industrial chemicals and aliphatic hydrocarbons. Very good resistance to ozone, sunlight, weathering and abrasion.
- **Butyl** - Suitable for animal and vegetable oils, water and many oxidising chemicals. Particularly good for low gas permeability. NOT for petroleum fuels or oils.
- **T-Max** - Suitable in the petro-chemical industry, refineries, pulp and paper where the pH values are critical and where demands are for high chemical resistance and high burst strength. Additional applications in the pharmaceutical industry, foodstuffs, medical industry etc. where demands are for sterile transportation and FDA approval. T-Max is suitable where operational safety is a must.

Performance Features

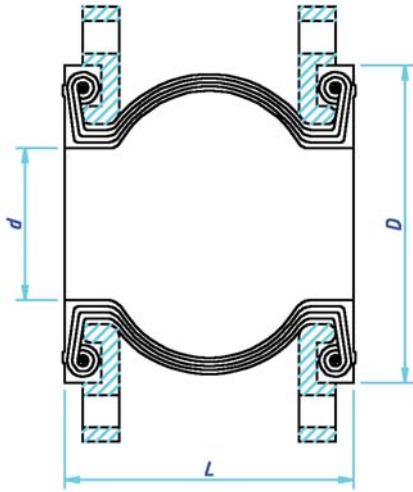
- Standard sizes from 32mm to 600mm NB
- Range of fact-to-face installation lengths
- Temperatures up to 120°C
- Operating pressures up to 1,600 kPa
- High Pressure Range with pressures up to 2,000 kPa
- Minimum 3.5 to 1 safety factor at rated pressure
- Vacuum rating of up to 750mm Hg
- Choice of 6 elastomers for resistance to abrasion, oxidation and chemical attack
- Light weight
- Hand built joints available to virtually any size, length or shape
- Choice of flange finishes for corrosion protection or colour identification

Elastomer Identification

The popular combinations of lining and cover elastomers are shown below. All of the cover options offer outstanding to very good resistance to sunlight and oxidation. One of these linings will stand up to most chemicals or hydrocarbons or to abrasion.

Letter Code	Lining	Cover	Colour Code
EE	EPDM	EPDM	Red
RE	Natural	EPDM	White
NiN	Nitrile	Neoprene	Yellow
HH	Hypalon	Hypalon	Green

DIMENSIONS & SPECIFICATIONS



NOMINAL BORE		DIMENSIONS			ALLOWABLE DISPLACEMENTS				Maximum Operating Pressure @ 75° C kPa	Vacuum Rating mm Hg
					Axial		Lateral	Angular		
mm	inch	L mm	d mm	D mm	-x mm	+x mm	±y mm	° degrees		

Vibraflex S - Standard Installation Lengths

50	2	130	50	86	13	9	13	15	1550	660
65	2 1/2	130	65	106	13	9	13	15	1550	660
80	3	130	80	116	13	9	13	15	1550	660
100	4	130	100	150	13	9	13	15	1550	660
125	5	130	125	180	13	9	13	15	1550	660
150	6	130	150	209	13	9	13	15	1550	660
200	8	130	200	260	13	9	13	15	1550	660
250	10	130	250	320	13	9	13	15	1550	660
300	12	130	300	367	13	9	13	15	1550	660
350	14	203	350	408	25	16	19	15	1000	660
400	16	203	400	472	25	16	19	15	860	660
450	18	203	450	522	25	16	19	15	860	660
500	20	203	500	570	25	16	19	15	860	660

T-Max



DN Ø (NB)		Length		Working pressure bar
mm	inch	mm/inch	mm/inch	
20	3/4	130/5	150/6	16
25	1	130/5	150/6	16
32	1 1/4	130/5	150/6	16
40	1 1/2	130/5	150/6	16
50	2	130/5	150/6	16
65	2 1/2	130/5	150/6	16
80	3	130/5	150/6	16
100	4	130/5	150/6	16
125	5	130/5	150/6	16
150	6	130/5	150/6	16
200	8	130/5	200/8	16
250	10	130/5	200/8	16
300	12	130/5	200/8	16

Vibraflex A - Unified Range

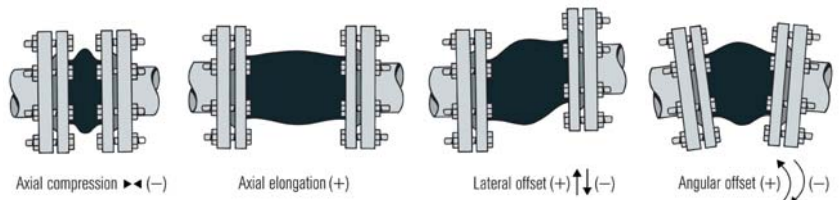
32	1 1/4	97	33	70	8	5	8	22	1550	750
40	1 1/2	97	33	70	8	5	8	14	1550	750
50	2	105	47	85	8	5	8	14	1550	750
65	2 1/2	115	60	105	12	6	10	6	1550	750
80	3	135	70	115	12	6	10	6	1550	750
100	4	135	96	150	18	10	12	6	1550	750
125	5	175	122	180	18	10	12	6	1550	750
150	6	185	145	210	18	10	12	6	1550	750
200	8	210	186	260	25	14	18	6	1550	750
250	10	240	242	320	25	14	18	3	1250	500
300	12	265	290	370	25	14	18	3	1250	500
350	14	265	320	410	28	16	22	3	1250	500
400	16	265	365	470	28	16	22	3	1250	500
450	18	265	410	525	28	16	22	3	1250	500
500	20	265	465	580	28	16	22	3	1250	500

Vibraflex B- Imperial Length Range

50	2	110	52	95	13	10	10	14	1600	700
65	2 1/2	110	67	114	13	10	10	6	1600	700
80	3	152	75	123	20	13	13	6	1600	700
100	4	152	103	150	20	13	13	6	1600	700
125	5	152	128	180	20	13	13	6	1600	700
150	6	152	153	215	20	13	13	6	1600	700
200	8	152	205	265	20	13	13	6	1600	700
250	10	203	255	325	25	16	18	3	1300	600
300	12	203	305	375	25	16	18	3	1300	600
350	14	228	340	435	25	16	18	3	1300	450
400	16	228	390	485	30	20	22	3	1300	450
450	18	228	430	525	30	20	22	3	1300	450
500	20	228	485	585	30	20	22	3	1300	450
600	24	254	585	695	35	22	24	2	1300	450

Movements					
Axial mm				Lateral mm	Angular °
Compression	Elongation				
30	35	15	20	20	15
30	35	15	20	20	15
30	35	15	20	20	15
30	35	15	20	20	15
30	35	15	20	20	15
30	35	15	20	20	15
30	35	15	20	20	15
30	35	15	20	20	15
30	35	15	20	20	15
30	35	15	20	20	15
30	35	15	20	20	15
30	35	15	20	20	15
30	35	15	20	20	15
30	40	15	20	20	15
30	40	15	20	20	15
30	40	15	20	20	15

Movements Possible



Axial compression ▶◀(-)

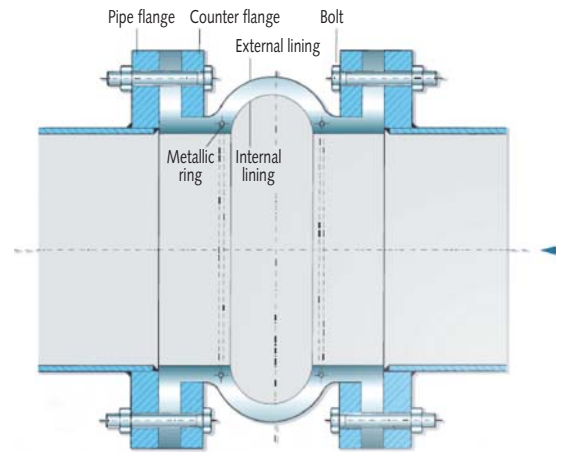
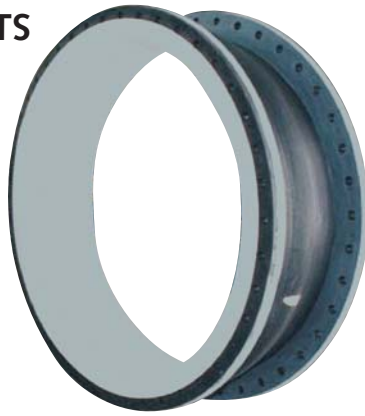
Axial elongation (+)

Lateral offset (+)↑(-)↓

Angular offset (+)↻(-)↻

SERIES 500 RUBBER JOINTS

The Series 500 rubber joints are high quality customised expansion joints handmade 'spool arch' moulded types available in dimensions ranging from 12mm to 3650mm. Supplied with split flanges in carbon steel as standard. Also available in Teflon lined – Series 700



SERIES 500 OPEN ARCH DIMENSIONS, ALLOWABLE MOVEMENTS & PRESSURES

Pipe Size (mm)	Pipe Size (in)	Face to Face (mm)	Axial Compression (mm)	Axial Extension (mm)	Lateral Deflection (mm)	Degrees Angular (degrees)	Degrees Torsional (degrees)	Rated Working Pressure (psi)	Min. Burst Pressure (psi)	Vacuum (mm)
12	1/2	152	19	12.7	12.7	20.0	3	250	750	30
25	1	152	19	12.7	12.7	20.0	3	250	750	30
32	1 1/4	152	19	12.7	12.7	19.0	3	250	750	30
40	1 1/2	152	19	12.7	12.7	18.5	3	250	750	30
50	2	152	19	12.7	12.7	14.5	3	250	750	30
65	2 1/2	152	19	12.7	12.7	11.5	3	250	750	30
80	3	152	19	12.7	12.7	10.0	3	250	750	30
100	4	152	19	12.7	12.7	7.5	3	250	750	30
125	5	152	19	12.7	12.7	6.0	3	250	750	30
150	6	152	19	12.7	12.7	5.5	3	250	750	30
200	8	152	19	12.7	12.7	5.0	3	250	750	30
250	10	203	25.4	15.9	15.9	4.5	3	250	750	30
300	12	203	25.4	15.9	15.9	3.8	3	250	750	30
350	14	203	25.4	15.9	15.9	3.3	2	250	750	30
400	16	203	25.4	15.9	15.9	2.8	2	250	750	30
450	18	203	25.4	15.9	15.9	2.5	1	250	750	30
500	20	203	25.4	15.9	15.9	2.5	1	250	750	30
550	22	254	31.75	19	15.9	2.3	1	250	750	30
600	24	254	31.75	19	15.9	2.0	1	250	750	30
650	26	254	31.75	19	15.9	2.0	1	250	750	30
700	28	254	31.75	19	15.9	2.0	1	250	750	30
750	30	254	31.75	19	15.9	2.0	1	250	750	30
850	34	254	31.75	19	15.9	1.8	1	250	750	30
900	36	254	31.75	19	15.9	1.5	1	250	750	30
1000	40	254	31.75	19	15.9	1.5	1	175	525	30
1050	42	304.8	38.1	22	19	1.5	1	175	525	30
1100	44	304.8	38.1	22	19	1.5	1	175	525	30
1200	48	304.8	38.1	22	19	1.5	1	175	525	30
1250	50	304.8	38.1	22	19	1.3	1	150	450	30
1350	54	304.8	38.1	22	19	1.3	1	150	450	30
1400	56	304.8	38.1	22	19	1.3	1	100	300	30
1500	60	304.8	38.1	22	19	1.0	1	100	300	30
1550	62	304.8	38.1	22	19	1.0	1	100	300	30
1650	66	304.8	38.1	22	19	1.0	1	100	300	30
1800	72	304.8	38.1	22	19	0.9	1	100	300	30
1900	78	304.8	38.1	22	19	0.9	1	100	300	30
2100	84	304.8	38.1	22	19	0.8	1	100	300	30
2250	90	304.8	38.1	22	19	0.8	1	75	225	30
2400	96	304.8	38.1	22	19	0.7	1	75	225	30
2500	98	304.8	57	25.4	28.5	0.6	1	50	150	30
2550	100	304.8	57	25.4	28.5	0.6	1	35	105	30
2600	102	304.8	57	25.4	28.5	0.6	1	35	105	30
2750	108	304.8	57	25.4	28.5	0.4	1	35	105	30
3050	120	304.8	57	25.4	28.5	0.4	1	25	75	30
3350	132	304.8	57	25.4	28.5	0.3	1	25	75	30
3650	144	304.8	57	25.4	28.5	0.1	1	25	75	30

CORRECT INSTALLATION, MAINTENANCE & STORAGE

Pre-Installation

- Check that the **Vibraflex** joint you are installing is compatible with acid or oil or any other aggressive material it might have to handle.
- Check that the rubber joint's rated temperature, pressure and allowable movement will not be exceeded. If the operating temperature is above 75°C, apply the recommended pressure derating.

Type	Size	De-Rated Pressure (kPa)				
		80°C	90°C	100°C	110°C	120°C
Vibraflex	32-300	1550	1287	1039	930	853
'S' Series	350-500	860	714	576	516	473
Vibraflex	32-200	1425	1275	1125	975	825
'A' Series	250-500	1190	1060	940	815	690
Vibraflex	50-200	1520	1360	1200	1040	880
'B' Series	250-600	1235	1101	975	845	715
Vibraflex	50-200	1950	1740	1540	1330	1130
'HP' Series	250-600	1475	1330	1160	1000	850

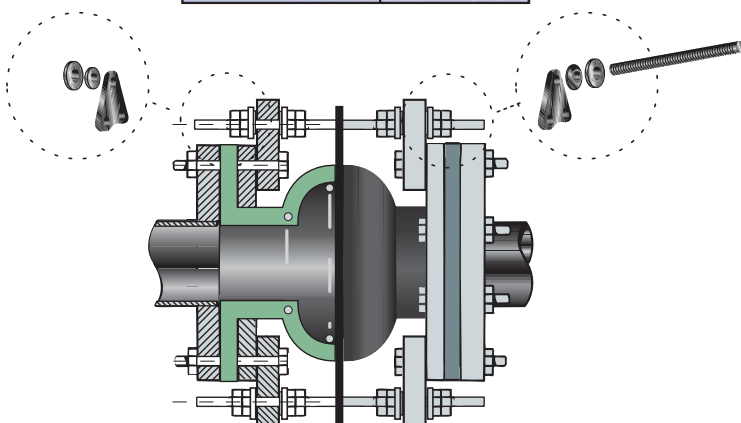
Location

- Ensure that the system is supported so that the joint does not carry the weight of the piping.
- Rubber Joints should be located as close to anchors as possible. If unanchored, check if control rods are required.
- If the joint is working against a significant static head, then there should be a non-return valve fitted close to the joint.

Control Rods

When a rubber joint is installed in a piping system that is anchored on both sides of the joint, control rods are not required. If one side is unanchored, the joint must be prevented from extending, either by control rods or some other method, if the pressure is higher than:

Size mm	Pressure kPa
50 to 100	1400
125 to 250	1050
300 to 350	700
400 to 600	350



Installation

- Make sure that the sealing faces of the joint bear against mating flanges that are flat and clean over the whole width of the joint.
- Do not use raised face flanges.
- Insert flange bolts with the bolt heads facing the rubber body and nuts on the pipe side.
- Tighten the bolts crosswise, taking up the tension gradually until all the nuts are evenly tightened.
- Do not over tighten which could damage the sealing face.
- Check that the tightness allows no leakage after the joint has been brought up to pressure.
- Do not paint over the rubber body.

Tightening Torque

The table below shows the recommended torque required to seal the rubber joint at 10 bar. A practical indication of correct tightness is to measure the gap between mating flanges.

Normal Size mm	TORQUE*		FLANGE GAP*	
	kg-m	ft-lbs	mm	inches
32-50	3	21.7	4	5/32
65-100	3	21.7	4	5/32
125-200	3	21.7	5	13/64
250-350	4	28.9	6	15/64
400-600	5	36.2	7	9/32

*These figures are to be used as a guideline only.

Maintenance

- Rubber relaxes over a period of time, so it is correct practice to re-check the tightness after a few days, and if necessary, at further intervals until no leakage occurs.
- Unless the service conditions are particularly severe, a **Vibraflex** rubber joint will last for many years. However, joints should be inspected for hardening, cracking and swelling at intervals appropriate to the severity of the application, but never longer than one year.

Storage

Rubber joints purchased as spares should be stored in a fairly cool, dry place, protected from direct sunlight. They should be stored flat on the flange face with no weight on top of them.

FLANGE DIMENSIONS & BOLT SPECIFICATIONS

32mm Nominal Bore Pipe (OD 42.4mm)							
Table	Flange OD	Holes		Bolt		Est. Mass kg	
		No	Dia	Size	PCD		
BS 4504	6/3	120.0	4	14.0	M12	90.0	1.10
	10/3	140.0	4	18.0	M16	100.0	1.50
	16/3	140.0	4	18.0	M16	100.0	1.50
	25/3	140.0	4	18.0	M16	100.0	1.70
	40/3	140.0	4	18.0	M16	100.0	1.70
SABS 1123	600/3	120.0	4	14.0	M12	90.0	0.69
	1 000/3	140.0	4	18.0	M16	100.0	0.94
	1 600/3	140.0	4	18.0	M16	100.0	0.94
	2 500/3	140.0	4	18.0	M16	100.0	1.70
	4 000/3	140.0	4	18.0	M16	100.0	1.70
BS 10	T/D	120.7	4	14.2	12.7	87.3	0.98
	T/E	120.7	4	14.2	12.7	87.3	0.98
	T/F	133.3	4	17.5	15.9	98.4	1.21
ANSI B 16,5	150 lb	117.5	4	15.9	12.7	88.9	1.11

40mm Nominal Bore Pipe (OD 48.3mm)							
Table	Flange OD	Holes		Bolt		Est. Mass kg	
		No	Dia	Size	PCD		
BS 4504	6/3	130.0	4	14.0	M12	100.0	1.20
	10/3	150.0	4	18.0	M16	110.0	1.60
	16/3	150.0	4	18.0	M16	110.0	1.60
	25/3	150.0	4	18.0	M16	110.0	2.10
	40/3	150.0	4	18.0	M16	110.0	2.10
SABS 1123	600/3	130.0	4	14.0	M12	100.0	0.75
	1 000/3	150.0	4	18.0	M16	110.0	1.00
	1 600/3	150.0	4	18.0	M16	110.0	1.00
	2 500/3	150.0	4	18.0	M16	110.0	2.10
	4 000/3	150.0	4	18.0	M16	110.0	2.10
BS 10	T/D	133.4	4	14.2	12.7	98.4	1.16
	T/E	133.4	4	14.2	12.7	98.4	1.16
	T/F	139.7	4	17.5	15.9	104.8	1.29
ANSI B 16,5	150 lb	127.0	4	15.9	12.7	98.4	1.34

50mm Nominal Bore Pipe (OD 60.3mm)							
Table	Flange OD	Holes		Bolt		Est. Mass kg	
		No	Dia	Size	PCD		
BS 4504	6/3	140.0	4	14.0	M12	110.0	1.30
	10/3	165.0	4	18.0	M16	125.0	2.20
	16/3	165.0	4	18.0	M16	125.0	2.20
	25/3	165.0	4	18.0	M16	125.0	2.50
	40/3	165.0	4	18.0	M16	125.0	2.50
SABS 1123	600/3	140.0	4	14.0	M12	110.0	0.81
	1 000/3	165.0	4	18.0	M16	125.0	1.22
	1 600/3	165.0	4	18.0	M16	125.0	1.47
	2 500/3	165.0	4	18.0	M16	125.0	2.50
	4 000/3	165.0	4	18.0	M16	125.0	2.50
BS 10	T/D	152.4	4	17.5	15.9	114.3	1.47
	T/E	152.4	4	17.5	15.9	114.3	1.47
	T/F	165.1	4	17.5	15.9	127.0	2.23
ANSI B 16,5	150 lb	152.4	4	19.0	15.9	120.6	2.23

65mm Nominal Bore Pipe (OD 76.1mm)							
Table	Flange OD	Holes		Bolt		Est. Mass kg	
		No	Dia	Size	PCD		
BS 4504	6/3	160.0	4	14.0	M12	130.0	1.60
	10/3	185.0	4	18.0	M16	145.0	2.70
	16/3	185.0	4	18.0	M16	145.0	2.70
	25/3	185.0	8	18.0	M16	145.0	3.20
	40/3	185.0	8	18.0	M16	145.0	3.20
SABS 1123	600/3	160.0	4	14.0	M12	130.0	1.00
	1 000/3	185.0	4	18.0	M16	145.0	1.80
	1 600/3	185.0	4	18.0	M16	145.0	1.80
	2 500/3	185.0	8	18.0	M16	145.0	3.20
	4 000/3	185.0	8	18.0	M16	145.0	3.20
BS 10	T/D	165.1	4	17.5	15.9	127.0	1.65
	T/E	165.1	4	17.5	15.9	127.0	1.65
	T/F	184.1	8	17.5	15.9	146.0	2.68
ANSI B 16,5	150 lb	177.8	4	19.0	15.9	139.7	3.57

80mm Nominal Bore Pipe (OD 88.9mm)							
Table	Flange OD	Holes		Bolt		Est. Mass kg	
		No	Dia	Size	PCD		
BS 4504	6/3	190.0	4	18.0	M12	150.0	2.60
	10/3	200.0	8	18.0	M16	160.0	3.30
	16/3	200.0	8	18.0	M16	160.0	3.30
	25/3	200.0	8	18.0	M16	160.0	4.00
	40/3	200.0	8	18.0	M16	160.0	4.00
SABS 1123	600/3	190.0	4	18.0	M16	150.0	1.44
	1 000/3	200.0	8	18.0	M16	160.0	1.98
	1 600/3	200.0	8	18.0	M16	160.0	2.31
	2 500/3	200.0	8	18.0	M16	160.0	3.67
	4 000/3	200.0	8	18.0	M16	160.0	3.67
BS 10	T/D	184.1	4	17.5	15.9	146.0	1.96
	T/E	184.1	4	17.5	15.9	146.0	1.96
	T/F	203.2	8	17.5	15.9	165.1	3.17
ANSI B 16,5	150 lb	190.5	4	19.0	15.9	152.4	4.02

100mm Nominal Bore Pipe (OD 114.3mm)							
Table	Flange OD	Holes		Bolt		Est. Mass kg	
		No	Dia	Size	PCD		
BS 4504	6/3	210.0	4	18.0	M16	170.0	2.90
	10/3	220.0	8	18.0	M16	180.0	3.60
	16/3	220.0	8	18.0	M16	180.0	3.60
	25/3	235.0	8	22.0	M20	190.0	5.70
	40/3	235.0	8	22.0	M20	190.0	5.70
SABS 1123	600/3	210.0	4	18.0	M16	170.0	1.61
	1 000/3	220.0	8	18.0	M16	180.0	2.16
	1 600/3	220.0	8	18.0	M16	180.0	2.52
	2 500/3	235.0	8	22.0	M20	190.0	5.48
	4 000/3	235.0	8	22.0	M20	190.0	5.48
BS 10	T/D	215.9	4	17.5	15.9	177.8	2.25
	T/E	215.9	8	17.5	15.9	177.8	2.25
	T/F	228.6	8	17.5	15.9	190.5	4.46
ANSI B 16,5	150 lb	228.6	8	19.0	15.9	190.5	5.80

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125mm Nominal Bore Pipe (OD 139.7mm)							
Table	Flange OD	Holes		Bolt		Est. Mass kg	
		No	Dia	Size	PCD		
BS 4504	6/3	240.0	8	18.0	M16	200.0	3.90
	10/3	250.0	8	18.0	M16	210.0	5.00
	16/3	250.0	8	18.0	M16	210.0	5.00
	25/3	270.0	8	26.0	M24	220.0	7.70
	40/3	270.0	8	26.0	M24	220.0	7.70
SABS 1123	600/3	240.0	8	18.0	M16	200.0	2.34
	1 000/3	250.0	8	18.0	M16	210.0	3.18
	1 600/3	250.0	8	18.0	M16	210.0	3.64
	2 500/3	270.0	8	26.0	M24	220.0	7.70
	4 000/3	270.0	8	26.0	M24	220.0	7.70
BS 10	T/D	254.0	8	17.5	15.9	209.6	3.48
	T/E	254.0	8	17.5	15.9	209.6	3.84
	T/F	279.4	8	22.2	19.0	234.9	7.81
ANSI B 16,5	150 lb	254.0	8	22.2	19.0	215.9	6.25

150mm Nominal Bore Pipe (OD 165.1mm)							
Table	Flange OD	Holes		Bolt		Est. Mass kg	
		No	Dia	Size	PCD		
BS 4504	6/3	265.0	8	18.0	M16	225.0	4.40
	10/3	285.0	8	22.0	M20	240.0	6.00
	16/3	285.0	8	22.0	M20	240.0	6.00
	25/3	300.0	8	26.0	M24	250.0	9.70
	40/3	300.0	8	26.0	M24	250.0	9.70
SABS 1123	600/3	265.0	8	18.0	M16	225.0	2.64
	1 000/3	285.0	8	22.0	M20	240.0	4.36
	1 600/3	285.0	8	22.0	M20	240.0	4.90
	2 500/3	300.0	8	26.0	M24	250.0	9.70
	4 000/3	300.0	8	26.0	M24	250.0	9.70
BS 10	T/D	279.4	8	17.5	15.9	235.0	3.88
	T/E	279.4	8	22.2	19.0	235.0	5.36
	T/F	304.8	12	22.2	19.0	260.4	8.71
ANSI B 16,5	150 lb	279.4	8	22.2	19.0	241.3	8.04

200mm Nominal Bore Pipe (OD 219.4mm)							
Table	Flange OD	Holes		Bolt		Est. Mass kg	
		No	Dia	Size	PCD		
BS 4504	6/3	320.0	8	18.0	M16	280.0	6.40
	10/3	340.0	8	22.0	M20	295.0	8.70
	16/3	340.0	12	22.0	M20	295.0	8.40
	25/3	360.0	12	26.0	M24	310.0	12.00
	40/3	375.0	12	30.0	M27	320.0	16.00
SABS 1123	600/3	320.0	8	18.0	M16	280.0	6.21
	1 000/3	340.0	8	22.0	M20	295.0	6.53
	1 600/3	340.0	12	22.0	M20	295.0	7.70
	2 500/3	360.0	12	26.0	M24	310.0	12.00
	4 000/3	375.0	12	26.0	M24	320.0	15.06
BS 10	T/D	336.6	8	17.5	15.9	292.1	4.91
	T/E	336.6	8	22.2	19.0	292.1	7.59
	T/F	368.3	12	22.2	19.0	323.9	13.39
ANSI B 16,5	150 lb	342.9	8	22.2	19.0	298.4	12.05

250mm Nominal Bore Pipe (OD 273mm)							
Table	Flange OD	Holes		Bolt		Est. Mass kg	
		No	Dia	Size	PCD		
BS 4504	6/3	375.0	12	18.0	M16	335.0	8.50
	10/3	395.0	12	22.0	M20	350.0	11.00
	16/3	405.0	12	26.0	M24	355.0	12.00
	25/3	425.0	12	30.0	M27	370.0	17.50
	40/3	450.0	12	33.0	M30	385.0	28.50
SABS 1123	600/3	375.0	12	18.0	M16	335.0	5.67
	1 000/3	395.0	12	22.0	M20	350.0	8.46
	1 600/3	405.0	12	26.0	M24	355.0	11.54
	2 500/3	425.0	12	26.0	M24	370.0	16.41
	4 000/3	450.0	12	33.0	M30	385.0	25.79
BS 10	T/D	406.4	8	22.2	19.0	355.6	8.70
	T/E	406.4	12	22.2	19.0	355.6	12.05
	T/F	431.8	12	25.4	22.2	381.0	19.20
ANSI B 16,5	150 lb	406.4	12	25.4	22.2	361.9	16.52

300mm Nominal Bore Pipe (OD 323.9mm)							
Table	Flange OD	Holes		Bolt		Est. Mass kg	
		No	Dia	Size	PCD		
BS 4504	6/3	440.0	12	22.0	M20	395.0	11.00
	10/3	445.0	12	22.0	M20	400.0	12.50
	16/3	460.0	12	26.0	M24	410.0	15.50
	25/3	485.0	16	30.0	M27	430.0	25.50
	40/3	515.0	16	33.0	M30	450.0	42.00
SABS 1123	600/3	440.0	12	22.0	M20	395.0	9.17
	1 000/3	445.0	12	22.0	M20	400.0	10.58
	1 600/3	460.0	12	26.0	M24	410.0	15.50
	2 500/3	485.0	16	26.0	M24	430.0	21.47
	4 000/3	515.0	16	33.0	M30	450.0	33.60
BS 10	T/D	457.2	12	22.2	19.0	406.4	12.50
	T/E	457.2	12	25.4	22.2	406.4	16.07
	T/F	489.0	16	25.4	22.2	438.2	25.45
ANSI B 16,5	150 lb	482.6	12	25.4	22.2	431.8	26.34

350mm Nominal Bore Pipe (OD 355.6mm)							
Table	Flange OD	Holes		Bolt		Est. Mass kg	
		No	Dia	Size	PCD		
BS 4504	6/3	490.0	12	22.0	M20	445.0	15.50
	10/3	505.0	16	22.0	M20	460.0	19.50
	16/3	520.0	16	26.0	M24	470.0	24.50
	25/3	555.0	16	33.0	M30	490.0	40.50
	40/3	580.0	16	36.0	M33	510.0	63.00
SABS 1123	600/3	490.0	12	22.0	M20	445.0	13.12
	1 000/3	505.0	16	22.0	M20	460.0	17.41
	1 600/3	520.0	16	26.0	M24	470.0	22.97
	2 500/3	555.0	16	33.0	M30	490.0	33.75
	4 000/3	580.0	16	33.0	M30	510.0	50.62
BS 10	T/D	527.1	12	25.4	22.2	469.9	18.75
	T/E	527.1	12	25.4	22.2	469.9	25.89
	T/F	552.5	16	28.6	25.4	495.3	36.16
ANSI B 16,5	150 lb	533.4	12	28.6	25.4	476.2	35.71

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400mm Nominal Bore Pipe (OD 406.4mm)							
Table	Flange OD	Holes		Bolt		Est. Mass kg	
		No	Dia	Size	PCD		
BS 4504	6/3	540.0	16	22.0	M20	495.0	19.00
	10/3	565.0	16	26.0	M24	515.0	26.50
	16/3	580.0	16	30.0	M27	525.0	33.00
	25/3	620.0	16	36.0	M33	550.0	54.00
	40/3	660.0	16	39.0	M36	585.0	94.00
SABS 1123	600/3	540.0	16	22.0	M20	495.0	14.92
	1 000/3	565.0	16	26.0	M24	515.0	20.70
	1 600/3	580.0	16	26.0	M24	525.0	32.08
	2 500/3	620.0	16	33.0	M30	550.0	46.96
	4 000/3	660.0	16	39.0	M36	585.0	73.44
BS 10	T/D	577.9	12	25.4	22.2	520.7	22.32
	T/E	577.9	12	25.4	22.2	520.7	32.59
	T/F	609.6	20	28.6	25.4	552.5	51.34
ANSI B 16,5	150 lb	596.9	16	28.6	25.4	539.7	45.09

450mm Nominal Bore Pipe (OD 457.2mm)							
Table	Flange OD	Holes		Bolt		Est. Mass kg	
		No	Dia	Size	PCD		
BS 4504	6/3	595.0	16	22.0	M20	550.0	-
	10/3	615.0	20	26.0	M24	565.0	-
	16/3	640.0	20	30.0	M27	585.0	-
	25/3	670.0	20	36.0	M33	600.0	-
	40/3	685.0	20	39.0	M36	610.0	-
SABS 1123	600/3	595.0	16	22.0	M20	550.0	-
	1 000/3	615.0	20	26.0	M24	565.0	-
	1 600/3	640.0	20	26.0	M24	585.0	-
	2 500/3	670.0	20	33.0	M30	600.0	-
	4 000/3	685.0	20	39.0	M36	610.0	-
BS 10	T/D	641.5	12	25.4	22.2	584.2	30.80
	T/E	641.5	16	25.4	22.2	584.2	42.86
	T/F	673.1	20	31.8	28.6	609.6	64.73
ANSI B 16,5	150 lb	635.0	16	31.7	28.6	577.8	50.00

500mm Nominal Bore Pipe (OD 508mm)							
Table	Flange OD	Holes		Bolt		Est. Mass kg	
		No	Dia	Size	PCD		
BS 4504	6/3	645.0	20	22.0	M20	600.0	25.50
	10/3	670.0	20	26.0	M24	620.0	39.00
	16/3	715.0	20	33.0	M30	650.0	60.00
	25/3	730.0	20	36.0	M33	660.0	86.00
	40/3	755.0	20	42.0	M39	670.0	120.00
SABS 1123	600/3	645.0	20	22.0	M20	600.0	21.25
	1 000/3	670.0	20	26.0	M24	620.0	32.84
	1 600/3	715.0	20	33.0	M30	650.0	54.55
	2 500/3	730.0	20	33.0	M30	660.0	74.14
	4 000/3	755.0	20	39.0	M36	670.0	116.67
BS 10	T/D	704.9	16	25.4	22.2	641.4	41.07
	T/E	704.9	16	25.4	22.2	641.4	55.80
	T/F	736.0	24	31.7	28.6	673.1	87.05
ANSI B 16,5	150 lb	698.5	20	31.7	28.6	635.0	62.94

600mm Nominal Bore Pipe (OD 609.6mm)							
Table	Flange OD	Holes		Bolt		Est. Mass kg	
		No	Dia	Size	PCD		
BS 4504	6/3	755.0	20	26.0	M24	705.0	33.00
	10/3	780.0	20	30.0	M27	725.0	53.00
	16/3	840.0	20	36.0	M33	770.0	94.00
	25/3	845.0	20	39.0	M36	770.0	120.00
	40/3	-	-	-	-	-	-
SABS 1123	600/3	755.0	20	26.0	M24	705.0	30.94
	1 000/3	780.0	20	26.0	M24	725.0	47.95
	1 600/3	840.0	20	33.0	M30	770.0	90.38
	2 500/3	845.0	20	39.0	M36	770.0	109.09
	4 000/3	-	-	-	-	-	-
BS 10	T/D	825.5	16	28.6	25.4	755.7	60.27
	T/E	825.5	16	31.8	28.6	755.7	89.29
	T/F	850.9	24	35.0	31.8	781.1	122.76
ANSI B 16,5	150 lb	812.8	20	34.9	31.7	749.3	87.94

CHEMICAL COMPATIBILITY RATINGS

Improper selection of tube and/or cover material can result in decreased service life, or complete failure of the expansion joint.

This guide has been compiled as an aid in selecting **Vibraflex** elastomers used to conduct some of many chemicals found in industry. The elastomers have been rated as follows:

- A** Excellent : suitable for continuous service
- B** Good : generally suitable for continuous or intermittent service
- C** Caution : not recommended for continuous service
- X** Do Not Use
- N** No Information

The information in this selection guide was extracted from published literature from a number of sources (which frequently disagree on the resistance of a particular elastomer to a chemical, in which case we have generally used the more conservative rating), but not necessarily the experience of Burgmann.

Therefore, this guide is intended only as an aid in selecting the proper elastomer and Burgmann cannot be held responsible should your specific experience disagree with these generalizations.

To keep this guide to a reasonable length, we have listed about 500 chemicals. Our library of information extends to over 2000 chemicals, so please contact us if your specific requirements are not listed.

	Natural	EPDM	Neoprene	Nitrile	Hypalon	Butyl		Natural	EPDM	Neoprene	Nitrile	Hypalon	Butyl
Acetaldehyde	C	A	C	X	C	A	Barium Carbonate	A	A	A	A	A	A
Acetamide	C	A	B	B	B	A	Barium Chloride	A	A	A	A	A	A
Acetate Solvents	C	C	X	X	X	N	Barium Hydroxide	A	A	A	A	A	A
Acetic Acid, 10%	B	B	C	C	C	B	Barium Sulphate	A	A	A	A	A	A
Acetic Acid, 30%	C	B	C	C	B	B	Barium Sulphide	A	A	A	A	A	A
Acetic Acid, 50%	C	B	C	C	B	B	Beet Sugar Liquors	A	A	A	A	A	A
Acetic Acid, Glacial	X	B	C	X	C	B	Benzaldehyde	X	B	X	X	X	B
Acetic Oxide (Acetic Anhydride)	C	B	C	C	B	B	Benzene (Benzol)	X	X	C	C	X	X
Acetone	B	A	C	X	B	A	Benzene Sulphonic Acid	X	C	A	C	A	X
Acetyl Acetone	C	B	X	X	X	B	Benzine Solvent	X	X	B	A	C	X
Acetyl Chloride	X	C	X	X	X	C	Benzoic Acid	C	B	B	X	B	B
Acetylene	A	A	B	A	B	A	Benzyl Alcohol	C	C	C	X	B	A
Acrylonitrile	B	X	B	X	C	C	Benzyl Benzoate	C	B	X	X	N	A
Alcohols, Aliphatic	A	A	A	A	A	A	Benzyl Chloride	C	X	X	X	X	C
Alcohols Aromatic	C	X	C	C	X	X	Bismuth Carbonate	A	A	A	A	A	A
Allyl Alcohol	A	A	A	A	A	A	Black Sulphate Liquor	A	A	A	B	A	A
Allyl Bromide	X	X	X	X	X	X	Blast Furnace Gas	C	C	A	C	B	C
Allyl Chloride	X	X	X	X	X	C	Bleach Liquor	X	B	X	X	C	B
Alum	A	A	A	A	A	A	Borax	B	A	A	B	A	A
Aluminium Acetate	C	A	C	C	B	A	Bordeaux Mixture	B	A	A	A	A	A
Aluminium Chloride	A	A	A	A	A	A	Boric Acid	A	A	A	A	A	A
Aluminium Nitrate	A	A	A	A	A	A	Brine	A	A	A	A	A	A
Aluminium Phosphate	A	A	A	A	A	A	Bromine Gas	X	X	X	X	C	X
Aluminium Sulphate	A	A	A	A	A	A	Bromine Water	X	B	B	C	A	B
Ammonia, Liquid	B	A	A	A	A	A	Butadiene	X	C	B	A	A	X
Ammonia, in water	B	A	B	B	B	A	Butane	X	C	B	A	A	X
Ammonia Gas - cold	A	C	A	A	A	A	Butanol (Butyl Alcohol)	A	A	A	B	A	A
Ammonia Gas - hot	C	C	B	C	C	C	Butyl Acetate	X	C	X	X	X	B
Ammonium Carbonate	A	A	B	C	B	A	Butyl Amine	C	C	X	C	C	C
Ammonium Chloride	A	A	A	A	A	A	Butal Carbitol	X	A	B	A	B	A
Ammonium Hydroxide	B	B	B	B	A	A	Butal Chloride	X	X	X	X	X	C
Ammonium Nitrate	B	A	A	A	A	A	Butyl Ether	X	C	B	A	B	C
Ammonium Nitrite	B	A	A	A	A	A							
Ammonium Phosphate	A	A	A	A	A	A	Cadium Cyanide	N	N	A	N	N	A
Ammonium Sulphate	A	A	A	A	A	A	Calcium Acetate	B	A	B	B	B	A
Ammonium Sulphide	A	A	A	A	A	A	Calcium Bisulphate	A	A	A	A	A	A
Ammonium Sulphite	A	A	A	A	A	A	Calcium Bisulphite	B	B	A	A	A	A
Amyl Acetate	C	B	X	X	X	B	Calcium Carbonate	A	A	A	A	A	A
Amyl Acetone	X	B	X	X	X	B	Calcium Chlorate	A	A	A	A	A	A
Amyl Alcohol	A	A	A	B	A	A	Calcium Chloride	A	A	A	A	A	A
Amyl Borate	X	X	A	A	C	X	Calcium Hydroxide (Lime)	A	A	A	A	B	A
Amyl Chloride	X	X	X	X	X	C	Calcium Nitrate	A	A	A	A	A	A
Aniline Oil	X	B	C	X	C	B	Calcium Sulphate	A	A	A	A	A	A
Aniline Dyes	B	A	B	C	B	A	Calcium Sulphide	A	A	B	A	A	A
Animal Fats	X	B	B	A	B	B	Calcium Sulphite	A	A	A	A	A	A
Animal Grease	X	B	B	B	C	C	Caliche Liquor	A	A	A	B	A	A
Animal Oils	X	N	N	A	X	B	(Crude Sodium Nitrate)						
Antimony Chloride	N	A	N	B	N	A	Cane Sugar Liquors	A	A	A	A	A	A
Antimony Trichloride	X	B	B	B	B	A	Carbitol	C	B	A	B	B	A
Aqua Regia	X	C	X	X	C	C	Carbolic Acid (Phenol)	X	C	C	X	C	B
Asphalt	C	X	B	A	C	X	Carbon Dioxide	A	A	A	A	A	A
Aviation Gasoline	X	X	C	A	X	X	Carbon Monoxide	A	A	A	A	A	A

	Natural	EPDM	Neoprene	Nitrile	Hypalon	Butyl
Carbon Tetrachloride	X	X	X	C	X	X
Carbon Tetrafluoride	X	C	X	C	X	C
Carbonic Acid	A	A	A	A	A	A
Caster Oil	B	B	A	A	A	A
Caustic Potash (Potassium Hydroxide)	B	B	B	B	A	A
Caustic Sode (Sodium Hydroxide)	A	A	B	B	B	A
Cellosolve (Alcohol ether)	X	B	B	C	B	A
Cellulose Acetate	B	B	C	C	C	B
Chlorine Dioxide	X	C	X	X	B	X
Chlorine (Dry)	C	X	C	C	X	C
Chlorine Gas (Wet)	X	X	X	C	X	C
Chlorine Water (Saturated)	X	C	X	C	B	X
Chlorine Water 3%	B	N	C	B	B	X
Chlorobenzene	X	X	X	X	X	X
Chlorobutane	X	X	X	X	X	C
Chloroform	X	X	X	X	X	X
Chromic Acid	X	C	X	X	A	X
Citric Acid	A	A	B	B	A	A
Coal Oil	X	X	B	A	C	X
Coal Tar, Bituminous	X	X	C	B	B	X
Coal Tar, Naptha	X	X	C	C	X	X
Cobalt Chloride	A	B	A	A	A	A
Coconut Oil	X	A	B	B	B	B
Cod Liver Oil	X	A	B	A	B	A
Coke Oven Gas	X	X	X	X	B	C
Copper Arsenate	A	A	A	A	A	A
Copper Chloride	B	A	A	A	B	A
Copper Cyanide	A	A	A	A	A	A
Copper Nitrate	A	A	A	A	A	A
Copper Nitrite	B	A	A	A	A	A
Copper Sulphate	C	A	A	A	A	A
Copper Sulphide	C	A	A	A	A	A
Cottonseed Oil	X	A	B	A	B	B
Creosote (Coal Tar)	X	X	B	B	B	X
Creosote (Wood Tar)	X	X	C	B	X	X
Cresols	C	X	X	C	C	X
Cresylic Acid	X	X	X	C	C	X
Cupric Carbonate	C	A	B	B	B	A
Cupric Chloride	C	A	B	A	A	A
Cupric Nitrate	B	A	B	A	A	A
Cupric Nitrite	C	A	B	A	A	A
Cupric Sulphate	B	A	A	A	B	A
Cyclohexane	X	C	X	B	X	B
Cyclohexanol	C	C	A	B	C	X
Cyclopentane	X	X	B	C	X	X
Decane	X	C	X	B	X	C
Dextrose	B	A	B	B	A	A
Dibutyl Amine	B	B	B	B	C	B
Dibutyl Ether	X	C	C	C	C	X
Diesel Oil	X	X	B	A	C	X
Diethyl Amine	B	C	A	B	C	A
Diethyl Ether	X	C	C	B	C	C
Diethylene Dioxide	X	B	X	X	X	B
Diethylene Glycol	A	A	A	A	A	A
Dimethyl Amine	B	B	B	B	C	A
Dimethyl Benzene	X	X	X	C	X	X
Dimethyl Ketone (Acetone)	B	A	C	X	B	A
Dimethyl Sulphate	X	X	X	X	X	B
Dinitrobenzene	X	C	C	X	X	C
Dinitrotoluene	X	X	X	X	X	X
Dioxane	X	B	X	X	X	B
Dipropylamine	B	A	B	B	C	A
Dipropylene Glycol	A	A	A	A	A	A
Disodium Phosphate	A	A	A	A	A	A
Dry Cleaning Fluids	X	X	X	C	X	X
Ethanol (Ethyl Alcohol)	A	A	A	A	A	A
Ethers	C	X	C	C	B	C
Ethyl Acetate	C	B	X	X	C	B
Ethyl Benzene	X	X	X	C	X	X
Ethyl Butyl Alcohol	A	A	A	A	A	A
Ethyl Butyl Amine	B	B	B	B	C	A
Ethyl Butyl Ketone	X	B	X	X	X	B
Ethyl Chloride	B	C	B	C	B	B
Ethyl Dichloride	X	C	X	X	X	C
Ethyl Ether	X	X	X	C	C	C
Ethyl Methyl Ketone	C	B	X	X	X	B
Ethyl Oxalate	A	B	X	X	X	A
Ethyl Propyl Ether	X	X	X	C	C	X
Ethyl Silicate	C	A	A	A	A	A

	Natural	EPDM	Neoprene	Nitrile	Hypalon	Butyl
Ethylene	X	C	B	B	B	X
Ethylene Bromide	X	C	X	X	X	X
Ethylene Chloride	X	C	X	X	X	C
Ethylene Diamine	B	A	A	B	B	A
Ethylene Dichloride	X	C	X	X	X	C
Ethylene Glycol	A	A	A	A	A	A
Ethylene Trichloride (Trichlorethylene)	X	X	X	C	X	X
Ferric Bromide	A	A	A	A	A	A
Ferric Chloride	A	A	A	A	A	A
Ferric Nitrate	A	A	A	A	A	A
Ferrous Acetate	X	B	X	X	B	A
Ferrous Ammonium Sulphate	A	A	A	A	A	A
Ferrous Chloride	A	A	B	A	A	A
Ferrous Hydroxide	B	A	A	B	B	A
Ferrous Sulphate	A	A	A	A	A	A
Fish Oil	X	A	A	A	A	A
Fluorine	X	C	C	X	X	X
Fluorobenzene	X	X	X	X	X	X
Fluosilicic Acid	A	B	B	B	A	A
Formaldehyde (Formalin)	B	B	B	B	A	A
Formamide	A	A	A	A	A	A
Formic Acid	B	C	C	C	A	A
Freon 11	X	X	B	A	A	X
Freon 12	X	C	B	B	C	C
Freon 22	X	B	B	X	B	B
Freon 502	A	A	A	B	A	A
Fuel Oil, ASTM 1 or A	X	X	B	A	C	X
Fuel Oil, ASTM 2 or B	X	X	B	A	C	X
Fuel Oil, ASTM 3 or G	X	X	B	A	C	X
Furfural	X	B	C	X	B	B
Gallic Acid	A	B	C	X	B	B
Gasoline	X	X	B	A	X	X
Gelatin	A	A	A	A	A	A
Glucose	A	A	A	A	A	A
Glue	B	B	A	A	A	B
Glycerine (Glycerol)	A	A	A	A	A	A
Glycol	A	A	A	A	A	A
Grease	X	X	B	A	C	X
Heptanol (Heptaldehyde)	X	B	X	B	X	X
Heptane (Aliphatic Hydrocarbon)	X	X	A	A	B	X
Hexaldehyde	X	B	B	X	C	B
Hexane	X	X	A	A	B	X
Hexanol (Hexyl Alcohol)	A	B	B	A	A	B
Hexylamine	C	B	B	C	C	B
Hexylene	X	C	B	A	C	X
Hexylene Glycol	A	B	A	A	A	A
Hydraulic Fluid (Petroleum)	X	X	B	A	B	X
Hydraulic Fluid (Phosphate Ester Base)	X	A	X	X	X	A
Hydraulic Fluid (Poly Alkylene Glycol Base)	B	A	A	A	A	A
Hydrazine	N	A	C	C	B	A
Hydrobromic Acid	A	B	C	C	A	B
Hydrocarbons: Aliphatic	X	X	B	A	B	X
Hydrocarbons: Aromatic	X	X	X	C	X	X
Hydrocarbons: Chlorinated	X	X	X	X	X	N
Hydrocarbons: Olefinic	N	N	N	A	N	N
Hydrochloric Acid, 10%	A	A	B	B	A	A
Hydrochloric Acid, 20%	A	A	B	B	A	A
Hydrochloric Acid, 37%	A	B	C	C	A	B
Hydrochloric Acid, 50%	A	C	X	X	B	C
Hydrochloric Acid, 100%	B	C	X	X	B	C
Hydrocyanic Acid	B	B	C	B	A	A
Hydrofluoric Acid - anhydrous	X	C	C	X	A	C
- less than 65% cold	B	B	A	C	A	C
- more than 65% cold	C	C	C	X	A	C
- less than 65% hot	C	C	A	X	A	C
- more than 65% hot	X	X	X	X	A	C
Hydrogen Gas	B	B	A	A	A	A
Hydrogen Peroxide, 3%	B	B	C	B	B	B
Hydrogen Peroxide, 10%	B	B	C	C	B	C
Hydrogen Peroxide, 30%	C	B	X	C	C	C
Hydrogen Peroxide, 90%	X	C	X	X	C	X
Hydrogen Sulphide - wet cold	C	A	B	C	C	A
Hydrogen Sulphide - wet hot	C	A	C	X	C	A
Hydrogen Sulphide - dry (hot or cold)	C	A	C	X	C	A
Hydroquinone	B	B	X	C	B	C

	Natural	EPDM	Neoprene	Nitrile	Hypalon	Butyl
Iodine	X	X	B	X	A	X
Iron Acetate	X	B	X	X	B	A
Iron Hydroxide	C	B	A	B	B	A
Iron Sulphate	A	A	A	A	A	A
Iron Sulphide	A	A	A	A	A	A
Isoamyl Acetate	X	B	X	X	C	B
Isoamyl Alcohol	A	A	A	A	A	A
Isoamyl Bromide	X	X	X	X	X	X
Isoamyl Chloride	X	X	X	X	X	C
Isobutane	X	X	X	A	X	X
Isobutanol (Isobutyl Alcohol)	A	A	A	A	A	A
Isobutyl Acetate	X	C	X	X	C	B
Isobutyl Aldehyde	C	B	C	X	X	B
Isobutyl Amine	C	B	X	X	C	B
Isobutyl Bromide	X	X	X	X	X	X
Isobutyl Carbinol	A	A	B	A	A	A
Isobutyl Chloride	X	X	X	X	X	X
Isobutyl Ether	X	X	X	C	C	X
Isododecane	X	X	A	A	A	C
Isooctane	X	X	A	A	B	C
Isopentane	X	X	A	A	X	X
Isopropyl Acetate	C	B	X	X	C	B
Isopropyl Alcohol (Iso-propanol)	A	B	A	A	A	A
Isopropyl Amine	B	B	A	C	C	B
Jet Fuel (JP 1 to JP 6)	X	X	B	A	C	X
Kerosene	X	X	B	A	C	X
Ketones - Aliphatic saturated	B	A	C	X	B	A
Ketones - Aliphatic unsaturated	X	A	X	X	X	B
Ketones - Aromatic	C	A	X	X	X	A
Lactic Acid - cold	C	B	B	B	A	B
Lactic Acid - hot	C	C	C	C	B	C
Lard	C	C	B	A	C	X
Lauryl Alcohol	A	A	A	A	A	A
Lead Acetate	B	B	A	B	B	A
Lead Nitrate	B	A	B	B	A	A
Lead Sulphate	A	A	A	A	A	A
Ligroin	X	X	B	A	C	X
Lime Sulphur	B	C	A	A	B	C
Linseed Oil	X	B	B	A	B	A
Linoleic Acid	X	X	X	B	C	X
Liquid Soap	A	A	A	A	A	A
Liquified Petroleum Gas	X	X	B	A	C	X
Lubricating Oils	X	X	B	A	C	X
Lye (Sodium Hydroxide)	A	A	B	B	B	A
Magnesium Acetate	X	B	X	X	B	A
Magnesium Ammonium Sulphate	N	A	A	N	N	A
Magnesium Carbonate	A	B	A	A	A	A
Magnesium Chloride	A	B	A	A	A	A
Magnesium Hydroxide	A	B	B	B	A	A
Magnesium Nitrate	A	A	A	A	A	A
Magnesium Oxide	N	N	A	N	N	A
Magnesium Sulphate	A	A	A	A	A	A
Malic Acid	A	X	C	B	B	X
Manganese Sulphate	B	A	A	A	A	A
Manganese Sulphide	C	B	B	A	A	A
Manganese Sulphite	C	B	B	A	A	A
Mercuric Chloride	B	B	C	B	A	B
Mercuric Cyanide	A	A	B	A	A	A
Mercurous Nitrate	A	A	A	A	A	A
Mercury	A	A	A	A	A	A
Methane	X	X	B	A	B	X
Methyl Acetate	C	B	C	X	C	B
Methyl Acrylic Acid	X	B	B	X	C	B
Methyl Alcohol (Methanol)	A	A	A	A	A	A
Methyl Benzene (Toluene)	X	X	X	C	X	X
Methyl Bromide	C	B	X	C	X	B
Methyl Butyl Ketone	X	B	X	X	X	B
Methyl Cellosolve	X	B	A	C	C	B
Methyl Chloride	X	C	X	C	X	C
Methyl Ethyl Ketone	C	B	X	X	X	B
Methyl Formate	C	B	B	X	C	B
Methyl Propyl Ether	X	X	X	X	C	X
Methyl Propyl Ketone	X	B	X	X	X	B
Mineral Spirits	X	X	C	A	C	X
Molasses	A	A	A	A	A	A
Monomethyl Ether	C	A	B	A	C	A
Motor Oil	X	B	A	A	V	B
Muriatic Acid	A	C	C	C	B	C

	Natural	EPDM	Neoprene	Nitrile	Hypalon	Butyl
Naptha	X	X	C	A	C	X
Napthalene	X	X	X	X	X	X
Napthenic Acid	X	X	X	C	A	X
Natural Gas	C	C	A	A	A	C
Neetsfoot Oil	X	B	B	A	B	B
Nickel Acetate	B	A	B	B	A	A
Nickel Ammonium Sulphate	N	N	A	N	N	A
Nickel Chloride	A	A	A	A	A	A
Nickel Nitrate	A	A	A	A	A	A
Nickel Sulphate	A	A	A	A	A	A
Niter Cake	A	A	A	A	A	A
Nitric Acid, dilute (10%)	X	B	B	X	A	B
Nitric Acid, concentrated (69%)	X	X	X	X	B	X
Nitric Acid, fuming (over 86%)	X	X	X	X	X	X
Nitrobenzene	X	C	X	X	X	C
Nitrogen Gas	A	A	A	A	A	A
Nitromethane	A	B	C	X	C	B
Nitropropane	C	B	C	X	C	B
Nitrous Oxide	A	A	A	A	A	A
Octane	X	X	B	A	X	X
Octyl Acetate	X	B	X	X	B	A
Octal Amine	C	B	B	C	C	B
Oleic Acid	X	B	C	C	B	B
Oleum (Fuming Sulphuric Acid)	X	X	C	C	C	C
Olive Oil	X	B	B	A	B	B
Oxalic Acid	B	A	B	B	B	A
Oxygen Cold	B	B	B	C	B	A
Oxygen Hot	X	X	X	X	X	X
Ozone	C	A	B	X	A	A
Paint Thinner	X	X	C	B	X	X
Palmitic Acid	C	B	B	A	B	B
Palm Oil	X	B	B	A	B	B
Parafin	X	X	A	A	X	X
Peanut Oil	X	C	B	A	B	C
Pentane	X	X	B	A	B	X
Perchloric Acid	B	B	A	X	A	B
Petrol	X	X	B	A	X	X
Petroleum Ether (Naphtha)	X	X	B	A	X	X
Phenol	X	C	C	X	C	B
Phosphate Esters	X	A	B	X	X	B
Phosphoric Acid, 10%	A	A	B	A	A	A
Phosphoric Acid, 20-85%	C	B	B	C	A	A
Pickling Solution	C	C	C	C	A	C
Picric Acid, molten	C	C	C	C	A	C
Picric Acid, water solution	A	B	B	B	A	A
Pinene	X	X	X	B	X	X
Pine Oil	X	X	X	C	X	X
Pitch	X	X	B	B	C	X
Polyvinyl Acetate Emulsion (PVA)	C	A	B	C	B	A
Polyethylene Glycol	A	A	A	A	A	A
Polypropylene Glycol	A	A	A	A	A	A
Potassium Acetate	B	B	B	B	B	A
Potassium Bicarbonate	A	A	A	A	A	A
Potassium Bisulphate	A	A	A	A	A	A
Potassium Bisulphite	A	A	A	A	A	A
Potassium Borate	A	A	A	A	A	A
Potassium Bromide	A	A	A	A	A	A
Potassium Carbonate	A	A	A	A	A	A
Potassium Chlorate	A	A	A	A	A	A
Potassium Chloride	A	A	A	A	A	A
Potassium Chromate	X	A	C	X	C	B
Potassium Cyanide	A	A	A	A	A	A
Potassium Hydroxide	B	B	B	B	A	A
Potassium Iodide	N	A	A	A	A	A
Potassium Nitrate	A	A	A	A	A	A
Potassium Nitrite	A	A	A	A	A	A
Potassium Permanganate	B	A	C	C	B	A
Potassium Phosphate	N	A	A	N	A	A
Potassium Silicate	A	A	A	A	A	A
Potassium Sulphate	A	N	A	A	A	A
Potassium Sulphide	A	A	A	A	A	A
Potassium Sulphite	A	A	A	A	A	A
Potassium Thiosulphate	A	N	A	A	A	N
Producer Gas	C	C	B	A	B	B
Propane	X	X	B	A	B	X
Propyl Acetate	X	C	X	X	C	B
Propyl Alcohol (Propanol)	A	B	A	A	A	A
Propyl Aldehyde	C	B	B	X	X	B
Propylene Glycol	A	A	A	A	A	A
Pyranol	X	X	X	A	X	X

	Natural	EPDM	Neoprene	Nitrile	Hypalon	Butyl
Rape Seed Oil	X	B	B	B	B	A
Rosin Oil	X	X	A	A	B	X
Sal Ammoniac (Ammonium Chloride)	A	A	A	A	A	A
Salicylic Acid	A	A	X	X	A	A
Salt Water (Sea Water)	A	A	B	B	A	A
Sewage	C	B	B	A	A	C
Silicate Esters	X	X	B	B	A	C
Silicone Greases	B	A	A	A	A	B
Silicone Oils	B	A	B	A	A	B
Silver Nitrate	A	A	A	A	A	A
Soap Solutions	A	A	B	A	A	A
Soda Ash (Sodium Carbonate)	A	A	A	A	A	A
Soda, Lime	A	A	B	B	B	A
Sodium Acetate	B	B	B	B	A	A
Sodium Aluminate	A	A	A	A	A	A
Sodium Bicarbonate	A	A	A	A	A	A
Sodium Bisulphate	A	A	A	A	A	A
Sodium Bisulphite	A	A	A	A	A	A
Sodium Carbonate	A	A	A	A	A	A
Sodium Chloride	A	A	A	A	A	A
Sodium Chromate	N	N	N	N	C	B
Sodium Cyanide	A	A	A	A	A	A
Sodium Fluoride	A	A	A	A	A	A
Sodium Hydroxide	A	A	B	B	B	A
Sodium Nitrate	B	A	B	C	A	A
Sodium Nitrite	A	A	A	A	A	A
Sodium Peroxide	B	B	B	B	A	A
Sodium Phosphate	A	A	B	B	A	A
Sodium Silicate	A	A	A	A	A	A
Sodium Sulphate	A	A	A	A	A	A
Sodium Sulphide	A	A	A	A	A	A
Sodium Sulphite	A	A	A	A	A	A
Soybean Oil	X	B	B	A	A	B
Stannic Chloride	A	B	A	A	A	B
Stannic Sulphide	A	A	A	A	A	A
Stannous Chloride	A	B	A	A	A	A
Stannous Sulphide	A	A	A	A	A	A
Stearic Acid	X	C	B	A	C	B
Sucrose	A	A	A	A	A	A
Sulphite Liquors	B	B	B	B	A	A
Sulphonic Acid	X	X	C	X	C	X
Sulphur - molten (120°C)	X	B	C	C	C	B
Sulphur Chloride	X	X	C	C	A	X
Sulphur Dioxide, dry	C	A	C	C	A	C

	Natural	EPDM	Neoprene	Nitrile	Hypalon	Butyl
Sulphur Dioxide, Liquid	B	B	A	X	A	C
Sulphuric Acid, 10%	A	A	A	B	A	A
Sulphuric Acid, 25-50%	B	B	B	C	A	B
Sulphuric Acid, 60-75%	C	C	X	X	A	B
Sulphuric Acid, fuming	X	X	X	X	C	X
Sulphurous Acid, dilute (10%)	B	B	B	C	A	A
Sulphurous Acid, concentrated (100%)	B	C	X	X	A	B
Tallow	X	B	B	A	C	C
Tannic Acid	A	B	B	C	B	C
Tanning Liquors	N	N	A	A	B	C
Tartaric Acid	A	B	B	A	A	A
Tertiary Butyl Alcohol	A	A	A	A	A	A
Tetraethyl Lead	X	X	C	B	X	X
Tetraethylene Glycol	A	A	A	A	A	A
Tin Chloride	A	B	A	A	A	B
Tin Tetrachloride	A	A	A	A	A	A
Toluene (Toluol)	X	X	X	C	X	X
Transmission Fluid	X	X	C	B	C	X
Tricresyl Phosphate (TCP)	C	B	C	X	C	A
Triethylene Glycol	A	A	A	A	A	A
Trinitrotoluene (TNT)	X	X	A	X	B	X
Tung Oil	X	C	B	A	B	C
Turpentine	X	X	C	B	X	X
Urea	A	A	B	C	B	A
Varnish	X	X	C	B	C	X
Vegetable Oils	C	A	B	A	B	A
Vinegar	B	B	A	C	A	A
Vinyl Acetate	X	C	X	X	C	A
Water, Fresh	A	A	B	A	A	A
Water, Salt	A	B	B	B	A	A
White Oil	X	X	B	A	X	X
Wood Alcohol (Methanol)	A	B	A	A	A	A
Wool Oil	B	N	A	A	N	N
Xylene (Xylol)	X	X	X	C	X	X
Zinc Acetate	B	B	C	C	C	A
Zinc Carbonate	A	A	A	A	A	A
Zinc Chloride	B	A	B	B	A	A
Zinc Chromate	A	A	A	C	C	A
Zinc Sulphate	A	A	A	A	A	A

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