

POT BEARINGS

K

BS5400-9



Description

K series is a range of structural bearings which meets the full requirements of BS5400 Sections 9.1 & 9.2. The bearings are proven for this standard by their design and operation for the last 25 years.

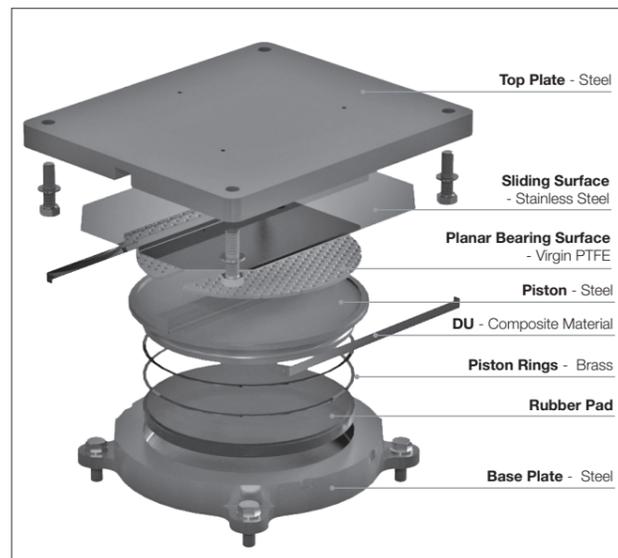
The standard range comprises multi-axis rotation bearings in Fixed, Constrained and Free configurations to support loads up to 30,000 kN. Current design practice has demonstrated the need for a range of bearings with higher horizontal load capacity.

Bearing Types

The K range of bearings are available in three types: -

- 30K** Fixed
- 31K** Guided - Free to move in one horizontal direction
- 22K** Free to move in any horizontal direction

Typical 31K Details - Exploded View



Attachment

Fixing holes are provided in the top and base members of the bearings. This enables a variety of fixing methods to be used. Standard fixings are designed to ensure the bearings can be removed as simply as possible. See page 10.

Support and Installation

Important - See pages 11 - 13 for Installation and Maintenance.

Concrete Stress

Where suitable reinforcement of the concrete has been provided the allowable concrete stress is dependent on the relative dimensions of the bearing/structure interface, the total support area and the characteristic strength of the concrete. The stress on the structure should therefore be checked to ensure that it is acceptable.

At the **Nominal Rating** capacity tabulated the mean stress approaches 20N/mm².

Design Loads

The designation of loadings varies depending on the design code employed. The tabulated load capacities list Nominal rating, at which load the base concrete stress is 20N/mm² maximum. **The working stress / serviceability limit state** maximum loads are determined by the allowable PTFE stresses. The **ultimate limit state** maximum load characteristics are determined by the strength characteristics of the bearing and incorporate the material and partial safety factors γ_m and γ_{f3} as required by BS5400.

The practice of stating working loads, or nominal loads is inappropriate for limit state designs. The SLS and ULS capacities represent design load effects, i.e. nominal loads to which ALL the appropriate factors have been applied. Factored loads must be provided to ensure correct bearing selection.

Rotation

All the bearings can rotate at least 0.01 radians about any horizontal axis. The maximum for each bearing is shown in the tables.

Translations

The dimensions for the 31K (Constrained) and 22K (Free) bearings are shown in the tables for the following movements -

Longitudinal	
31K	100mm total
22K	100mm total

Transverse

31K	NIL (see page 6 & 7)
22K	20mm total

Movements in increments of 50mm total can be supplied. The top plate dimensions and the top plate fixing centres should be increased accordingly.

N.B. 31K bearings should not be used where movement is required at right angles to the constraints.

The required movements should be specified in the part number as described below.

The clearance between the constraints must not be used to accommodate any structural movement.

Fig. 1 K Pot Bearing - Guided

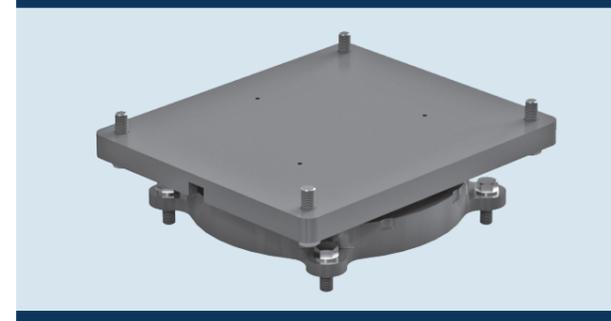
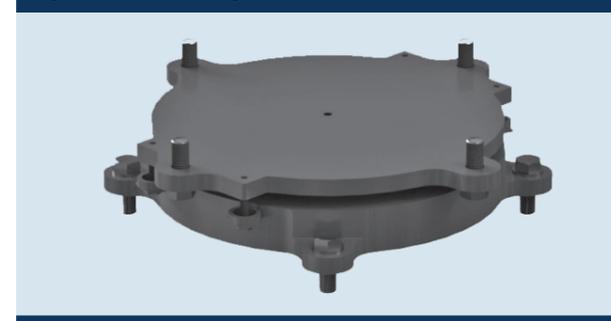


Fig. 2 K Pot Bearing - Free



Fig. 3 K Pot Bearing - Fixed



Designation of Part No.

The part number of a bearing is simply built up as below -

Examples:

Type	Maximum Working Load (kN)	Movement		Fixings	
		Longitudinal (mm)	Transverse (mm)	Top	Base
a 30K	5000			S	S
b 31K	5000	100		B	S
c 22K	5000	100	20	N	B

e.g. For

a above the full part number is **30K 500/SS**

b above the full part number is **31K 500/100/BS**

c above the full part number is **22K 500/100/20/NB**

Suffix Letters

By adding a two letter suffix to the bearing part number the type of fixing may be designated -
First letter - Top plate fixing
Second letter - Base plate fixing

N - No fixings

B - Bolts and washers only

S - Bolts, washers & sockets

e.g. /BS signifies -

B (top plate fixing) Bolts & washers

S (base plate fixing) Bolts, washers & sockets

N.B. If standard K series fixings are not used, care should be taken to ensure that bolts can be fitted without dismantling the bearing.

Bolts are hexagon head to BS 3692 grade 8.8

'c' denotes a free K series Pot Bearing of -

Working load capacity: 5000kN maximum

Movement: Longitudinal - 100mm total

Transverse - 20mm total

Fixing method: No fixings in top plate. Bolts in base plate.

K - Series

30K - Fixed Pot Bearing

Bearing Design Loads

Bearings should be selected to suit the appropriate design code. The maximum vertical and horizontal loads shown in the tables may be taken in combination.

Horizontal Loading

The 30K fixed bearing will resist a horizontal force acting in any direction.

In order for the bearing to support the maximum horizontal loads stated in the tables, a minimum concurrent vertical load of 0.33 x the Nominal Vertical rating must be present.

At ULS, the actual load combination may permit the use on a load higher than that shown in the table.

We will be pleased to advise.

Concrete Stress

Where suitable reinforcement of the concrete has been provided the allowable concrete stress is dependent on the relative dimensions of the bearing/structure interface, the total support area, and the characteristic strength of the concrete. The stress on the structure should therefore be checked to ensure that it is acceptable.

At the **Nominal Rating** capacity tabulated the mean stress approaches 20N/mm².

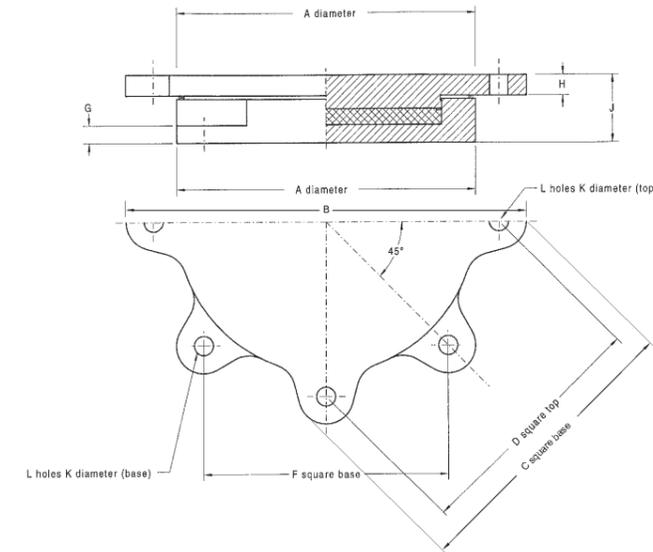
Calculation of Combined Loads

Combined Horizontal Load =

$$\sqrt{(\text{Transverse load}^2 + \text{Longitudinal load}^2)}$$

K - Series

30K - Fixed Pot Bearing



Bearing No.	Nominal Vertical Rating Maximum (kN)	Working/Serviceability Limit State Loads		Ultimate Limit State Loads		
		Vertical All (kN)	Horizontal (kN)	Vertical (kN)	Horizontal (kN)	Rotation (Radians)
30K0050	500	706	105	917	136	0.025
30K0075	750	1017	150	1322	195	0.021
30K0100	1000	1385	200	1800	260	0.022
30K0130	1300	1734	260	2254	338	0.020
30K0160	1600	2206	315	2867	409	0.021
30K0200	2000	2733	390	3552	507	0.022
30K0250	2500	3421	485	4447	630	0.020
30K0300	3000	4071	575	5292	747	0.021
30K0350	3500	4778	665	6211	864	0.022
30K0400	4000	5410	755	7033	981	0.020
30K0450	4500	6082	840	7906	1092	0.021
30K0500	5000	6792	925	8829	1202	0.013
30K0550	5500	7389	1010	9605	1313	0.012
30K0600	6000	8011	1090	10414	1417	0.011
30K0700	7000	9503	1250	12353	1625	0.010
30K0800	8000	10751	1400	13976	1820	0.012
30K0900	9000	12076	1545	15698	2008	0.011
30K1000	10000	13478	1680	17521	2184	0.010
30K1200	12000	16060	1935	20878	2515	0.011
30K1400	14000	18869	2160	24529	2808	0.010
30K1600	16000	21382	2360	27796	3068	0.011
30K1800	18000	24052	2535	31267	3295	0.010
30K2000	20000	26880	2680	34944	3484	0.011
30K2250	22500	30171	2825	39222	3672	0.010
30K2500	25000	33653	2925	43748	3802	0.011
30K3000	30000	40115	3000	52149	3900	0.010

Bearing No.	Installation Dimensions (mm)										Approx Weight* (kg)
	A	B	C	D	F	G	H	J	K	L	
30K0050	210	291	220	170	170	15	16	58	14	4	14
30K0075	240	343	260	200	200	25	20	62	18	4	21
30K0100	280	386	290	230	230	15	18	65	18	4	28
30K0130	310	448	340	260	250	20	26	79	22	4	43
30K0160	350	476	360	280	280	20	24	83	22	4	55
30K0200	390	543	410	320	320	25	27	96	26	4	81
30K0250	430	585	440	350	340	30	26	95	26	4	97
30K0300	470	638	480	380	380	25	33	113	32	4	138
30K0350	510	680	510	410	410	35	36	121	32	4	175
30K0400	540	709	530	430	430	25	35	130	32	4	209
30K0450	580	785	590	470	470	35	38	133	38	4	248
30K0500	600	813	610	490	490	35	41	134	38	4	268
30K0550	630	842	630	510	510	40	41	142	38	4	312
30K0600	650	856	640	520	520	40	41	142	38	4	330
30K0700	710	947	710	570	570	30	45	156	44	4	430
30K0800	750	989	740	600	600	35	44	155	44	4	471
30K0900	800	1031	770	630	630	45	53	174	44	4	608
30K1000	840	1074	800	660	660	40	53	174	44	4	664
30K1200	910	1193	890	730	720	45	51	182	50	4	809
30K1400	980	1264	940	780	770	55	59	201	50	4	1036
30K1600	1040	1320	980	820	810	60	57	209	50	4	1206
30K1800	1100	1377	1020	860	860	35	55	218	50	4	1379
30K2000	1160	1433	1060	900	900	35	54	217	50	4	1509
30K2250	1220	1504	1110	950	940	45	53	226	50	4	1736
30K2500	1280	1512	1110	970	970	55	52	235	44	4	1976
30K3000	1390	1591	1160	1040	1040	60	53	247	38	4	2407

* Excluding fixings

K - Series

31K - Sliding Pot Bearing

Bearing Design Loads

Bearings should be selected to suit the appropriate design code. The maximum vertical and horizontal loads shown in the tables may be taken in combination.

Horizontal Loading

The 31K guided bearing will resist a horizontal force acting at right angles to the main direction of movement. In order for the bearing to support the maximum horizontal loads stated in the tables, a minimum concurrent vertical load of 0.33 x the Nominal Vertical rating must be present. At ULS, the actual load combination may permit the use on a load higher than that shown in the table.

We will be pleased to advise.

Transverse Movement

31K Bearings are designed to accommodate in one direction only. Movement transverse to the constraint is nominally zero. In practice the transverse movement is 1mm maximum. Standard 31K bearings should not be used where movement is required at right angles to the constraint. Special bearings can be offered for such requirements.

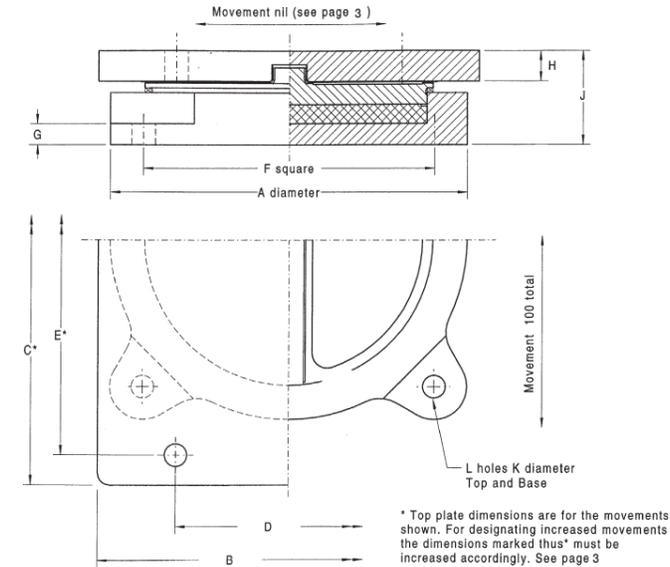
Concrete Stress

Where suitable reinforcement of the concrete has been provided the allowable concrete stress is dependent on the relative dimensions of the bearing/structure interface, the total support area, and the characteristic strength of the concrete. The stress on the structure should therefore be checked to ensure that it is acceptable. At the **Nominal Rating** capacity tabulated the mean stress approaches 20N/mm².

Bearing No.	Nominal Vertical Rating Maximum (kN)	Working/Serviceability Limit State Loads			Ultimate Limit State Loads			Rotation (Radians)
		Vertical Permanent (kN)	All (kN)	Horizontal (kN)	Vertical (kN)	Horizontal (kN)	Rotation (Radians)	
31K0050	500	493	706	105	917	136	0.025	
31K0075	750	723	1017	150	1322	195	0.021	
31K0100	1000	920	1380	200	1794	260	0.022	
31K0130	1300	1140	1710	260	2223	338	0.020	
31K0160	1600	1359	2039	315	2650	409	0.021	
31K0200	2000	1724	2586	390	3361	507	0.022	
31K0250	2500	2029	3044	485	3957	630	0.020	
31K0300	3000	2470	3705	575	4816	747	0.021	
31K0350	3500	2787	4181	665	5435	864	0.022	
31K0400	4000	3123	4685	755	6090	981	0.020	
31K0450	4500	3478	5218	840	6783	1092	0.021	
31K0500	5000	3690	5536	925	7196	1202	0.013	
31K0550	5500	4076	6114	1010	7948	1313	0.012	
31K0600	6000	4275	6413	1090	8336	1417	0.011	
31K0700	7000	5122	7683	1250	9987	1625	0.010	
31K0800	8000	5806	8709	1400	11321	1820	0.012	
31K0900	9000	6784	10177	1545	13230	2008	0.011	
31K1000	10000	7568	11352	1680	14757	2184	0.010	
31K1200	12000	9057	13586	1935	17661	2515	0.011	
31K1400	14000	10902	16354	2160	21260	2808	0.010	
31K1600	16000	12570	18855	2360	24511	3068	0.011	
31K1800	18000	14355	21532	2535	27991	3295	0.010	
31K2000	20000	16258	24387	2680	31703	3484	0.011	
31K2250	22500	18696	28045	2825	36458	3672	0.010	
31K2500	25000	20859	31288	2925	40674	3802	0.011	
31K3000	30000	25866	38799	3000	50438	3900	0.010	

K - Series

31K - Sliding Pot Bearing



Bearing No.	Installation Dimensions (mm)											Approx Weight* (kg) WT
	A	B	C	D	E	F	G	H	J	K	L	
31K0050	210	260	390	120	350	170	15	32	91	14	4	38
31K0075	240	290	440	140	390	200	25	32	94	18	4	51
31K0100	280	320	460	170	410	230	15	37	101	18	4	67
31K0130	310	350	510	180	450	250	20	37	104	22	4	84
31K0160	350	390	540	210	480	280	20	37	106	22	4	102
31K0200	390	430	590	240	520	320	25	37	118	26	4	135
31K0250	430	470	630	260	560	340	30	42	126	26	4	173
31K0300	470	510	690	280	610	380	25	47	137	32	4	229
31K0350	510	550	720	310	640	410	35	47	144	32	4	272
31K0400	540	580	740	330	660	430	25	47	157	32	4	317
31K0450	580	620	810	360	710	470	35	47	153	38	4	363
31K0500	600	640	820	380	720	490	35	52	158	38	4	404
31K0550	630	670	840	400	740	510	40	57	169	38	4	475
31K0600	650	690	860	410	760	520	40	57	168	38	4	500
31K0700	710	750	920	450	810	570	30	57	175	44	4	604
31K0800	750	790	950	480	840	600	35	57	177	44	4	664
31K0900	800	840	990	510	880	630	45	57	186	44	4	780
31K1000	840	880	1020	540	910	660	40	62	190	44	4	877
31K1200	910	950	1110	580	990	720	45	62	204	50	4	1080
31K1400	980	1020	1160	630	1040	770	55	62	212	50	4	1276
31K1600	1040	1080	1210	670	1090	810	60	67	224	50	4	1517
31K1800	1100	1140	1250	720	1130	860	35	67	233	50	4	1713
31K2000	1160	1200	1290	760	1170	900	35	67	232	50	4	1863
31K2250	1220	1260	1340	800	1220	940	45	67	251	50	4	2178
31K2500	1280	1320	1380	850	1270	970	55	62	257	44	4	2382
31K3000	1390	1430	1490	930	1390	1040	60	62	259	38	4	2804

* Excluding fixings

K - Series

22K - Sliding Pot Bearing

Bearing Design Loads

Bearings should be selected to suit the appropriate design code. If in doubt seek our advice.

Concrete Stress

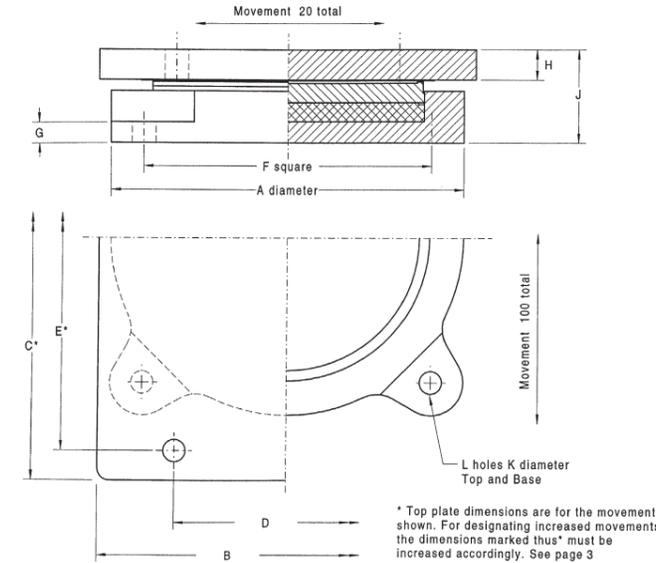
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At the **Nominal Rating** capacity tabulated the mean stress approaches 20N/mm².

Bearing No.	Nominal Vertical Rating Maximum (kN)	Working/Serviceability Limit State Loads		Ultimate Limit State Loads	
		Permanent (kN)	All (kN)	Vertical (kN)	Rotation (Radians)
22K0050	500	339	508	660	0.025
22K0075	750	530	795	1033	0.021
22K0100	1000	763	1144	1487	0.022
22K0130	1300	990	1485	1930	0.020
22K0160	1600	1301	1951	2536	0.021
22K0200	2000	1654	2481	3225	0.022
22K0250	2500	2120	3180	4134	0.020
22K0300	3000	2565	3848	5002	0.021
22K0350	3500	3053	4579	5952	0.022
22K0400	4000	3492	5238	6809	0.020
22K0450	4500	3960	5940	7722	0.021
22K0500	5000	4458	6686	8891	0.020
22K0550	5500	4877	7315	9509	0.020
22K0600	6000	5316	7973	10364	0.020
22K0700	7000	6371	9503	12353	0.020
22K0800	8000	7257	10751	13976	0.021
22K0900	9000	8201	12076	15698	0.020
22K1000	10000	9203	13478	17521	0.020
22K1200	12000	11055	16060	20878	0.021
22K1400	14000	13077	18869	24529	0.020
22K1600	16000	14891	21382	27796	0.020
22K1800	18000	16823	24052	31267	0.020
22K2000	20000	18873	26880	34944	0.020
22K2250	22500	21264	30171	39222	0.020
22K2500	25000	23798	33653	43748	0.020
22K3000	30000	28510	40115	52149	0.020

K - Series

22K - Sliding Pot Bearing



Bearing No.	Installation Dimensions (mm)											Approx Weight* (kg)
	A	B	C	D	E	F	G	H	J	K	L	
22K0050	190	240	300	200	260	160	15	22	71	14	4	21
22K0075	230	270	330	230	290	180	20	22	76	14	4	29
22K0100	260	300	360	260	320	210	15	27	85	14	4	41
22K0130	290	330	390	290	350	230	15	27	85	14	4	50
22K0160	330	370	430	330	390	260	15	27	90	14	4	65
22K0200	360	390	460	350	420	280	20	32	99	14	4	84
22K0250	400	430	500	390	460	310	20	32	103	14	4	106
22K0300	440	470	540	430	500	330	20	32	107	14	4	130
22K0350	480	500	580	460	540	360	25	32	112	14	4	156
22K0400	510	530	610	490	570	390	25	37	117	14	4	188
22K0450	540	560	640	520	600	410	30	37	127	14	4	223
22K0500	570	590	670	540	620	430	25	37	126	18	4	246
22K0550	600	620	700	570	650	450	35	37	141	18	4	299
22K0600	620	640	720	590	670	470	30	37	137	18	4	309
22K0700	670	690	770	640	720	500	35	42	152	18	4	401
22K0800	720	740	820	690	770	530	40	42	161	18	4	487
22K0900	760	780	860	720	800	560	35	42	160	22	4	532
22K1000	800	820	900	760	840	600	35	42	160	22	4	585
22K1200	880	900	980	840	920	640	45	47	184	22	4	816
22K1400	950	970	1050	900	980	700	45	47	188	26	4	955
22K1600	1010	1030	1110	960	1040	740	50	52	202	26	4	1168
22K1800	1080	1100	1180	1030	1110	790	55	52	212	26	4	1390
22K2000	1130	1150	1230	1070	1150	830	55	52	226	32	4	1603
22K2250	1200	1220	1300	1140	1220	870	55	52	225	32	4	1782
22K2500	1270	1290	1370	1210	1290	910	60	57	239	32	4	2137
22K3000	1390	1410	1490	1330	1410	990	65	57	253	32	4	2656

* Excluding fixings

K - Series

Standard K Bearing Fixings

Standard K Bearing Fixings

By adding a two letter suffix to the bearing part number the type of fixing may be designated -

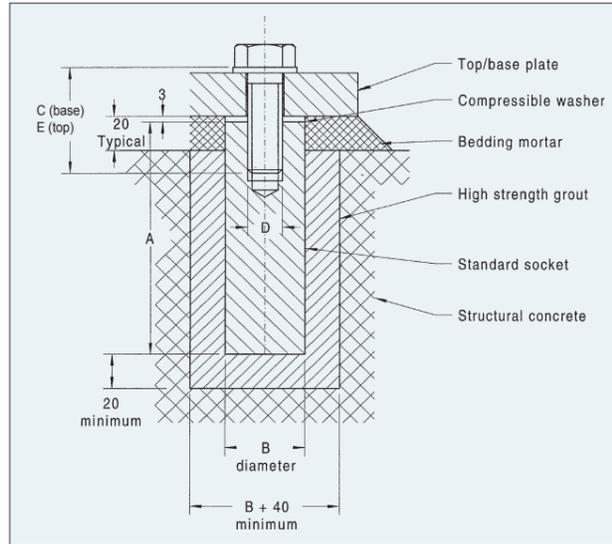
First letter - Top plate fixing
Second letter - Base plate fixing

N - No fixings
B - Bolts and washers only
S - Bolts, washers & sockets

e.g. /BS signifies -
B (top plate fixing) Bolts & washers
S (base plate fixing) Bolts, washers & sockets

N.B. If standard K series fixings are not used, care should be taken to ensure that bolts can be fitted without dismantling the bearing.

Bolts are Hexagon Head to BS 3692 grade 8.8



Bearing Size	Bearing Type														
	30K			31K			22K								
	Socket	Bolt		Socket	Bolt		Socket	Bolt		Socket	Bolt				
	B	A	D	C	E	B	A	D	C	E	B	A	D	C	E
0050	35	110	12	35	35	35	110	12	35	50	35	110	12	35	40
0075	40	140	16	50	45	40	140	16	50	55	35	110	12	40	40
0100	40	140	16	40	40	40	140	16	40	60	35	110	12	35	45
0130	50	170	20	50	55	50	170	20	50	65	35	110	12	35	45
0160	50	170	20	50	50	50	170	20	50	65	35	110	12	35	45
0200	55	200	24	60	60	55	200	24	60	70	35	110	12	40	50
0250	55	200	24	65	60	55	200	24	65	75	35	110	12	40	50
0300	70	240	30	65	70	70	240	30	65	85	35	110	12	40	50
0350	70	240	30	75	75	70	240	30	75	85	35	110	12	45	50
0400	70	240	30	65	75	70	240	30	65	85	35	110	12	45	55
0450	80	300	36	80	85	80	300	36	80	95	35	110	12	50	55
0500	80	300	36	80	85	80	300	36	80	100	40	140	16	50	60
0550	80	300	36	85	85	80	300	36	85	105	40	140	16	60	60
0600	80	300	36	85	85	80	300	36	85	105	40	140	16	55	60
0700	105	360	42	85	100	105	360	42	85	110	40	140	16	60	65
0800	105	360	42	90	100	105	360	42	90	110	40	140	16	65	65
0900	105	360	42	100	105	105	360	42	100	110	50	170	20	65	70
1000	105	360	42	95	105	105	360	42	95	115	50	170	20	65	70
1200	120	410	48	105	110	120	410	48	105	125	50	170	20	75	75
1400	120	410	48	115	120	120	410	48	115	125	55	200	24	80	80
1600	120	410	48	120	120	120	410	48	120	130	55	200	24	85	85
1800	120	410	48	95	115	120	410	48	95	130	55	200	24	90	85
2000	120	410	48	95	115	120	410	48	95	130	70	240	30	95	90
2250	120	410	48	105	115	120	410	48	105	130	70	240	30	95	90
2500	105	360	42	110	105	105	360	42	110	115	70	240	30	100	95
3000	80	300	36	105	100	80	300	36	105	110	70	240	30	105	95

HANDLING, STORAGE, INSTALLATION & MAINTENANCE

Installation

CONSIDER THE EFFECTS IF BEARINGS ARE NOT CORRECTLY INSTALLED

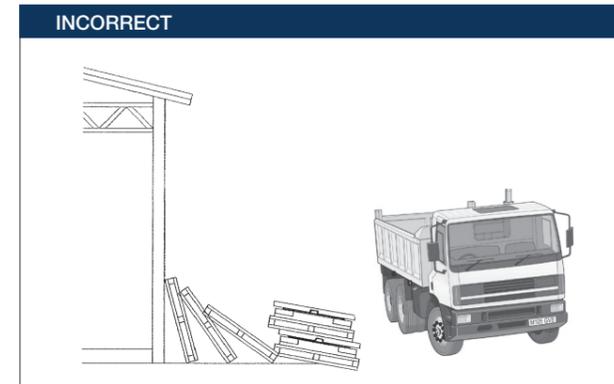
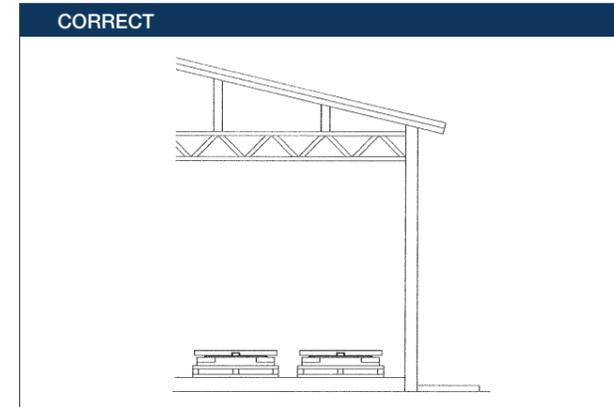
Our structural bearings are manufactured to close tolerances by skilled technicians working in clean conditions. To obtain the requisite performance from bearings it is imperative that they are properly handled at the work site and installed with the same care as when they were assembled in the factory. The following notes will assist those responsible for specifying and supervising the installation of structural bearings.

Please note that Ekspan are able to provide installation and supervision.

Bearings must be installed with precision to meet the bridge and bearing design criteria.

Storage

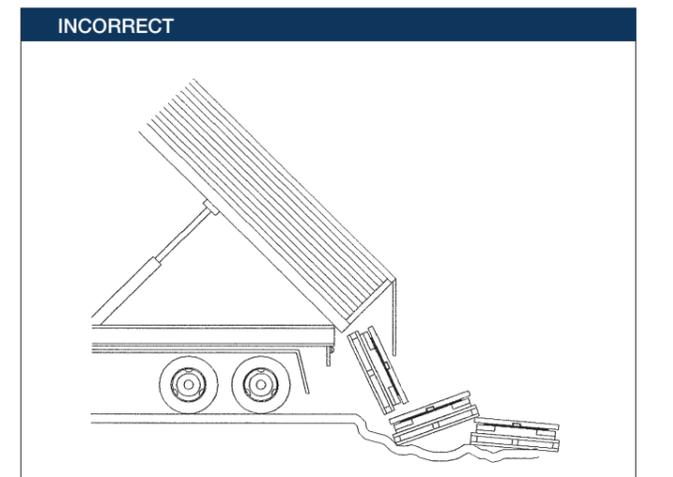
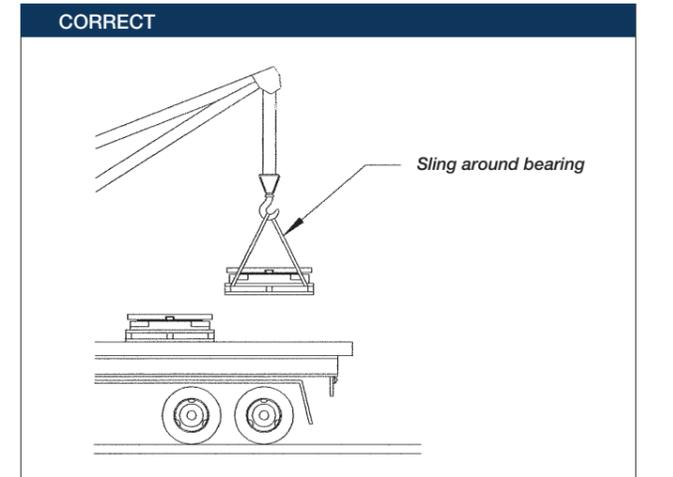
Our structural bearings are protected from contamination under normal working conditions by an efficient sealing system. Care should be taken in storage to prevent contamination and damage to the working surfaces.



Handling

Robust transportation devices are fitted to all bearings to ensure that the components are maintained in their correct relative positions before and during installation. The devices are normally finished in red paint. Unless special devices have been specified, they should not be used for slinging or suspending the bearings beneath beams.

Due to unpredictable conditions, which may occur during transportation or handling on site, the alignment and presetting (if applicable) of the assembled bearing should be checked against the drawing. Do not endeavour to rectify any discrepancies on site. The bearing should either be returned to Ekspan or, where practical, an Ekspan engineer should be called in to inspect and reassemble. Bearings too heavy to be lifted by hand should be properly slung using lifting equipment.



HANDLING, STORAGE, INSTALLATION & MAINTENANCE

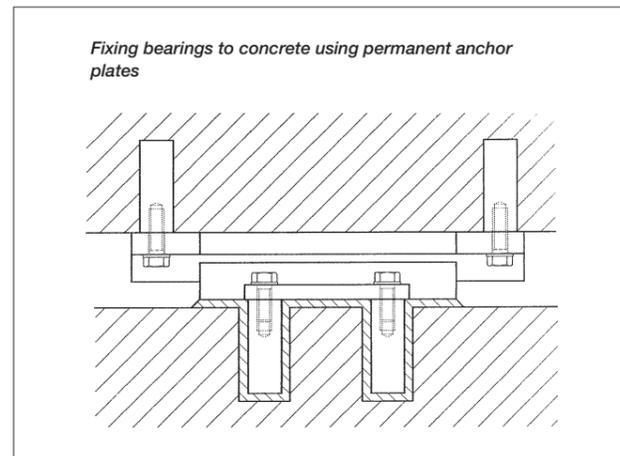
Presetting

If bearings are required to be preset eg where once only large movements may occur during stressing operations, this should be specified as a requirement and should only be carried out in our works prior to despatch. Do not attempt this operation on site.

Bedding

Bearings must be supported on a flat rigid bed. Steel spreader plates must be machined flat and smooth to mate exactly with the bearings' upper and lower faces. Bearings may also be bedded on epoxy or cement mortar or by dry packing. Whichever system is preferred for the particular structure it is of extreme importance that the final bedding is free from high or hard spots, shrinkage, voids, etc.

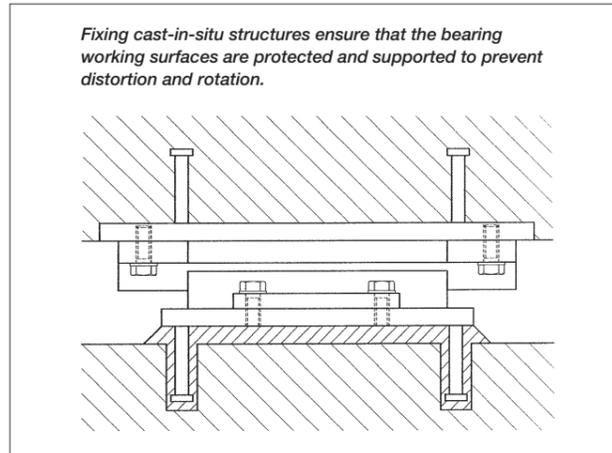
Unless there is a specific design requirement, the planar surfaces must be installed in a horizontal plane. The correct installation of bearings is vital for the bearing performance. Costly repairs become necessary all too often due to inadequate specification or poor site supervision. The bearings should not be loaded until the bedding mortar has cured.



Cast-In-Situ Structures

Care must be taken to ensure that the bearings are not damaged by the formwork or contaminated by concrete seepage. The interface between the top plate and the formwork should be protected and sealed.

Owing to the loading effects of a wet concrete mass, the top plates should be propped to prevent rotation and plate distortion.



Bearing Removability

Where possible, bearings should be fixed in such a manner as to facilitate removal. Our bearings have generally been designed with this in mind. However, when selecting the bearing type preferred, the removability feature should be highlighted in your enquiry.

Removal of Transport Brackets

These brackets, normally painted red should only be removed once the bearing is properly installed and ready for operation.

Bearing Installation Check List

DO -

1. Handle carefully and where necessary with adequate craneage.
2. Store in a clean dry place.
3. Ensure that the bearings are installed in the correct location and orientation.
4. Ensure that the bearings are installed on a flat rigid bed before the design loads are applied.
5. Ensure that the fixings are uniformly tightened.
6. Complete any site coatings and make good paint damaged during handling and installation.
7. Protect working surfaces during the placing of in-situ concrete.
8. Keep the bearings and surrounding areas clean.
9. Remove any temporary transit clamps etc. before the bearings are required to operate.
10. Take special care to support top plates when casting in-situ concrete.

HANDLING, STORAGE, INSTALLATION & MAINTENANCE

DO NOT -

1. Dismantle the bearing on site.
2. Leave bearings uncovered.
3. Attempt to modify without our approval.
4. Install without qualified supervision.

Site Coating

Care should be taken to ensure that working surfaces are not damaged in any site coating operation. After installation damaged coatings must be repaired irrespective of any call for site coatings. Exposed fixing bolts should be protected after final tightening. Any tapped holes exposed after removal of transportation brackets etc. (coloured red) should be sealed with self-vulcanizing silicone sealant.

Routine Maintenance of Bearings

1. Immediately following installation bearings shall be inspected to ensure that all aspects of 'Installation of bearings' have been adhered to and bearings shall subsequently be re-inspected not less frequently than every two years after their installation.
2. Paint and /or other specified protective coatings must be maintained in good and efficient condition and free from scratches or chips. Any areas of the protective coating showing damage or distress must be rectified.
3. Areas surrounding the bearings must be kept clean and dry and free from the adverse effects of external influences such as airborne debris or water/salt (for example emanating from leaking joints).
4. The wearing surfaces of the bearing must be checked to ensure that they are continuing to operate efficiently.
5. Fixing bolts must be checked for tightness.
6. Any bedding material showing signs of distress or ineffectiveness must be replaced and the reason for its failure investigated and corrected.
7. Routine inspections shall include a check that translational and rotational capacities of the bearing have not been exceeded and show no sign of being likely to exceed the requirements specified at the design stage.

K - Series

BS5400 - Sample Quality Bearing Specification Clauses

BS5400 - K Pot Bearings

- 1.01** The bearings should be designed in accordance with BS 5400 part 9 and be constructed from steel grade EN100025 S355 J2 or equivalent . (HIGH QUALITY STEEL GOOD LOADING CAPACITIES)
- 1.02** The sliding surface of the bearing must be fully welded to the top plate of the bearing. This prevents crevice corrosion de-lamination of the stainless steel ensuring bearing longevity. The stainless steel sliding surface should be mirror polished to a minimum of 8/1 P BS1449/ EN10088-2. Paint will be applied to overlap the welded area of the sliding surface so as to protect the area from the risk of corrosion. (REDUCES CORROSION IN UNLOADED AREAS WHICH IS THE CAUSE OF MOST BEARING FAILURES)
- 1.03** PTFE bearing surfaces shall be Virgin material with a dimpled surface and lubricated with silicon grease in accordance with BS 5400 part 9. The PTFE shall be retained in the bearing by a machined recess. (FRICTION IS AT A MINIMUM, LIFE IS EXTENSIVE AND THE PTFE CANNOT "CREEP")
- 1.04** Guide sliding surfaces should also be fully welded and mirror polished. The wear surface of the guide shall be a mechanically restrained high load resistant material DU(B) in accordance with EN1337-2. (THE LIFE OF BEARINGS IS EXTENDED WITH USE OF GOOD WEAR MATERIALS)
- 1.05** Pot bearing pistons are machined with a tightly controlled tolerance between the pot and the piston. (REDUCE EDGE PRESSURE EFFECTS ON RUBBER)
- 1.06** The rubber pad in a pot bearing is to have a minimum of 2 brass rings, which should be sized to meet and fit tight to the pot wall. (THIS IS KEY TO ENSURE THAT THE RUBBER IS RETAINED IN THE POT - IF NOT THEN THE RUBBER MAY EXTRUDE UNDER LOAD)
- 1.07** The rubber pad shall meet BS5400 part 9 and be natural rubber with a hardness of 55 to 65 IRHD. It will be preformed with a recess on the surface which allows the retaining rings to finish flush with the rubber. (THIS MEANS THAT WHEN THE BEARING IS LOADED THERE ARE NO AIR GAPS TO CLOSE ENSURING THAT DATUMS ARE MAINTAINED)
- 1.08** The rubber pad shall fit in the pot without need for deflection. Corners should be moulded in such a way as to ensure that the pad fits to the machined pot base. (THIS ALSO REDUCES AIR ENTRAPMENT)
- 1.09** The outer surfaces of the bearing will be blasted to SA 3 and have the contract specified paint system applied.

USL Ekspan advise that the specification clauses above demonstrate good practice to ensure good quality bearings.

✓ GOOD INSTALLATION



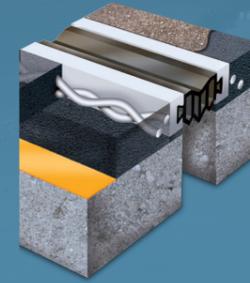
Mechanical guide bearing and upper adaptor plate correctly installed.
All bearing interfacing surfaces are horizontal.
All surfaces are free from contaminants.

✗ BAD INSTALLATION



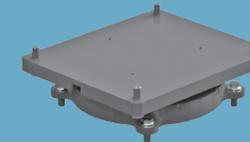
No tapered plate installed inducing additional rotations over maximum allowable.
Incorrect fixings utilised.
Welding completed with bearing in situ.
Dirt and debris in and around bearing slide area.

USL EKSPAN - PRODUCT RANGE



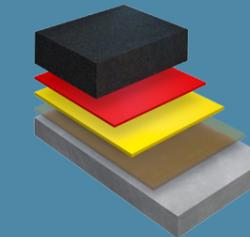
EXPANSION JOINTS - CD 357

- | | | |
|---|--------------------------------|--|
| Uniflex - Buried | T-MAT - Mat | Open Type Joint - Rail Joint |
| BP1 - Buried | Britflex BEJ - Modular | Britflex UCP - Footbridge Joint |
| FEBA - Flexible Plug | Britflex MEJS - Modular | Finger Joint |
| Britflex NJ - Nosing | LJ - Longitudinal Joint | Roller Shutter Joint |
| EC & EW - Joint Seal | ES - Joint Seal | |
| Transflex & Transflex HM - Mat | Aqueduct/Immersed Joint | |



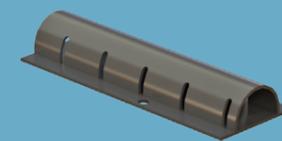
STRUCTURAL BEARINGS

- | | | |
|--|---|---------------------------------|
| EKE - Elastomeric (EN1337-3) | D - Linear Rocker (BS5400-9) | EKR - Rubber Pad & Strip |
| KE - Pot (EN1337-5) | F - Restraint & Guide (BS5400-9) | EQF - Sliding Bearing |
| DE - Linear Rocker (EN1337-6) | G - Spherical (BS5400-9) | Bespoke Bearings |
| GE - Spherical (EN1337-7) | J - Roller (BS5400-9) | |
| FE - Restraint & Guide (EN1337-8) | K - Pot (BS5400-9) | |
| EA - Sliding Bearing | Link Bearing (BS5400-9) | |



STRUCTURAL WATERPROOFING - CD 358

- | | |
|---|--|
| Pitchmastic PmB
Polyurethane (Pu)
Waterproofing System | Britdex CPM Tredseal
Combined Waterproofing and
Anti Skid Surfacing (MMA) |
| Britdex MDP
Methyl Methacrylate (MMA)
Waterproofing System | Uradeck BC
Combined Waterproofing and
Anti Skid Surfacing (Pu) |



SUB-SURFACE BRIDGE DRAINAGE

- Ekspan 325 Channel
- Ekspan 302 System
- ES Seal System
- DriDeck



SURFACE BRIDGE DRAINAGE

- Envirodeck

GROUP BRANDS



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E&OE

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