

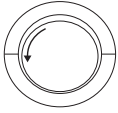
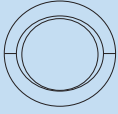
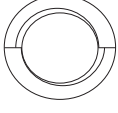
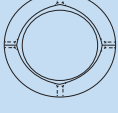
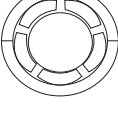
Osborne Engineering Limited

## E series journal bearings



## Description

OEL now offer our E range of fixed geometry journal bearings, in addition to our existing tilting pad bearings. These bearings are designed for pressure fed oil lubrication which can be used in many types of rotating equipment such as turbines, gearboxes and pumps. These bearings are designed to operate with surface speeds of up to 90m/sec and cover a range of sizes up to 630mm in diameter. Our in house design team can also offer full customisation to these products taking into account non standard shaft or housing sizes or provide instrumentation provisions to suit specific requirements. The standard bore profile is concentric however multi lobe bores can be utilised if requested when ordered to improve the rotor dynamic performance of each unit. For low speed conditions or high start up loads high pressure jacking provisions can be included within the design.

	TYPE	PERIPHERAL SPEED	SURFACE PRESSURE	STIFFNESS / DAMPENING	RELATIVE COSTS	NOTES
	PLAIN JOURNAL BEARING	0 – 30 m/sec	0.2 – 4.0 MPa	x xxxxx	x	SIMPLE, LOW SPEED, NOT SUITABLE FOR LIGHT LOADS
	LEMON BORED BEARING	25 – 70 m/sec	0.2 – 3.5 MPa	xx xxxx	xx	IMPROVED SPEED / LOAD. LOW HORIZONTAL STIFFNESS
	OFFSET BORED BEARING	20 – 90 m/sec	0.2 – 3.5 MPa	xxx xxxx	xx	IMPROVED STABILITY OVER LEMON PROFILE SINGLE ROTATION ONLY
	FOUR LOBED JOURNAL BEARING	30 – 90 m/sec	0.1 – 1.5 MPa	xxx x	xxx	HIGH SPEED, LIGHT LOADS, TIGHTER CLEARANCE AT LIGHT LOADS
	TILTING JOURNAL PAD BEARING	30 – 100 m/sec	0 – 3.0 MPa	xxxxx xxxx	xxxxx	GOOD FOR HIGH SPEED, HIGH LOADS GOOD STABILITY, LOW TEMPERATURES

## Lubrication

For most applications the recommended oil grades are ISO VG 32,46 or 68 typically supplied at 45°C – 60°C which must be filtered to at least 25 microns. Delivery pressure must be at least 0.25 bar however pressures of up to 2.0 bar are commonly used. OEL will provide a custom performance calculation for every bearing ordered showing film thicknesses, operating temperature, stiffness and dampening characteristics based around the specified machine duty.

## Material

Our standard materials consist of a mild steel backing to BS970 070M20 or equivalent combined with a white metal layer to BS3332 grade C, alternative grades of materials can be used upon request.

## Clearances

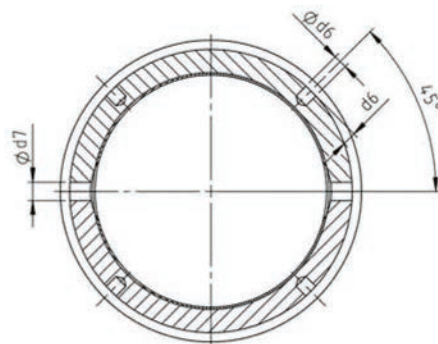
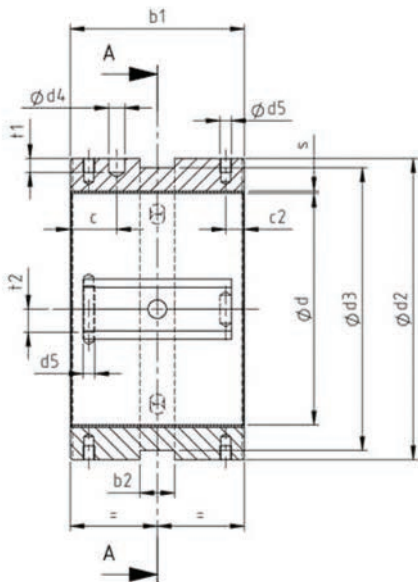
Plain bore profile =  $0.0015 \times \text{bearing bore}$  (above 300mm this can be reduced to 0.0012)

Example =  $0.0015 \times 120 = 0.18\text{mm}$   
 Shaft =  $120 - 0.18 = 119.82\text{h6}$

For all other bore profiles reduce to 0.0012. Any variation required from this standard will be given by OEL when calculations are supplied.

# E131 series

d (H6)	d2	d3	d4	d5	d6	d7	b1	b2	c	c2	t1	t2	s	Weight (kg)
25	40m6	36	2		2.5	2.5	20	5	6		2		1	0.1
28	44m6	38					22	6	6					0.14
32	48m6	42			3	3	25		7.5					0.18
36	52m6	46	3				28	7	8		3			0.22
40	56m6	50			3.5	3.5	32	8	10					0.27
45	60m6	54					35	9	9					0.3
50	65m6	59	4		4	4	35	10	10					0.33
56	70m6	64			5	5	40							0.39
63	80m6	74					45	12			4			0.61
70	90m6	84	5		6	6	50		12					0.91
80	105m6	97					60	15	15		5			1.65
90	115m6	107	6		8	8	65							1.97
100	130m6	122	7				75		20		6		1.5	3.1
110	140k6	130					80	20						3.5
125	160k6	150	9				95				8			5.6
140	180k6	170					105		25					8.1
160	205k6	193	11	M8	12	12	120	25	32	10	10	15		11.7
180	230k6	218					135							16.5
200	260k6	248	13				150		40		15			25
225	290k6	274		M10			170	32		12		20		33.3
235	305k6	290					175							39
250	325k6	309	15				190		50		18			49.5
260														43.5
265	345j6	329			15	15	200							58.5
280	360j6	344					210		60		20			65.2
285														61.5
300										15		23	2	50.2
300	390j6	370	18	M12			225							84
310														75.5
315	410j6	390					235	40						97
335	435j6	415					250		70					114
355	460j6	440		M16			265			18		30		136
375					20	20								112
375	485j6	465	22				280				25			163
400	515j6	495					300		85					191
425	550j6	524	27	M20			320	50		22	30	33		239
450	580j6	554					340		110					275
475	610j6	584	32				355							315
500	645j6	619					375							377
530	685j6	659		M24			400	60		25		39		465
560	720j6	690	42		26	26	420		120		40			520
600	770j6	740					450							636
630	810j6	780	52	M30	28	28	470	70	150	33	50	48		740

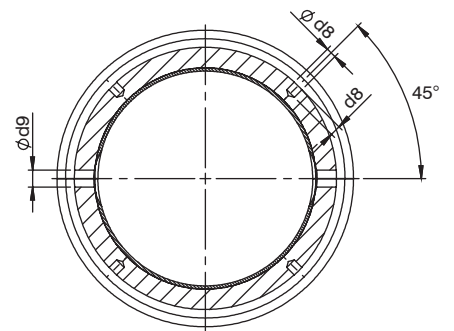
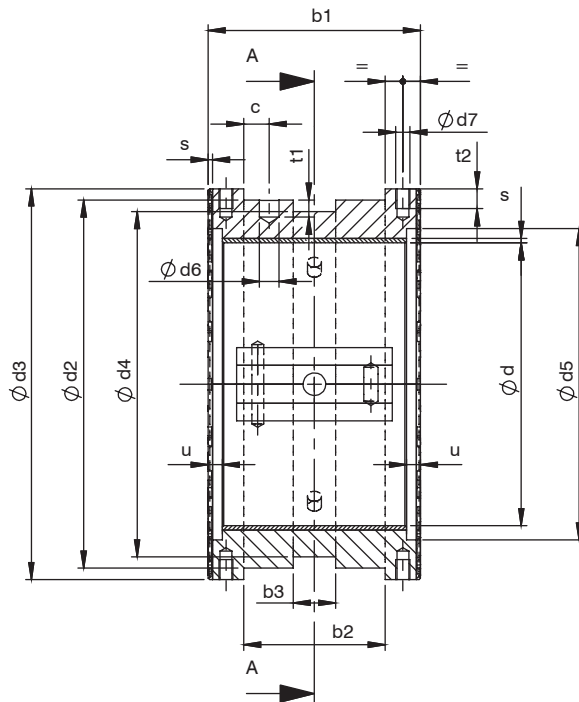
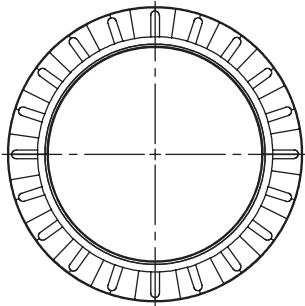


SECTION A-A

# E133 series

d (H6)	d2	d3	d4	d5	d6	d7	d8	d9	b1	b2	b3	c	t1	t2	s	u	Weight (kg)
50	65m6	70	59	56	4		4	4	35	25	10	5	3		1	3	0.34
56	70m6	75	64	63			5	5	40	30		6				3.5	0.39
63	80m6	85	74	70					45	30	12		4				0.64
70	90m6	95	84	78	5		6	6	50	35						4	0.91
80	105m6	112	97	88					60	40	15	6.5	5				1.68
90	115m6	123	107	99	6		8	8	65	45		8				4.5	2.03
100	130m6	138	122	110	7				75	50		9	6		1.5	5	3.21
110	140k6	150	130	121					80	55	20					5.5	3.65
125	160k6	170	150	137	9				95	65		12	8			6	5.85
140	180k6	190	170	152					105	75		14					8.29
160	205k6	215	193	174	11	M8	12	12	120	85	25	15	10	15		7	11.9
180	230k6	245	218	196					135	95		18				8	17.4
200	260k6	275	248	216	13				150	105		20	15				26.2
225	290k6	305	274	243		M10			170	120	32			20		9	35.2
250	325k6	345	309	270	15				190	130		25	18			10	52.3
265	345j6	365	329	285			15	15	200	140							59.2
280	360j6	380	344	300					210	145		28	20				68.7
300	390j6	415	374	320	18	M12			225	155		30		23	2		84.2
315	410j6	435	390	337					235	165	40					11	103
335	435j6	460	415	357					250	175		35					117
355	460j6	485	440	379		M16			265	185				30		12	145
400	515j6	545	495	428	22		20	20	300	210		40	25			14	204
425	550j6	575	526	449	27	M20			320	220	50	50	30	33			242
450	580j6	610	558	480			25	25	340	235		60				15	290
475	610j6	645	588	506	32				355	245							343
500	645j6	680	619	532					375	260						16	400
530	685j6	720	657	567		M24			400	275	60			39			498
560	725j6	760	694	600	42				420	290		65	40				580
600	775j6	815	744	642					450	315		70				18	682
630	815j6	860	780	672	52	M30	28	28	475	330	70		50	48			784

Taper land face are handed to suit single direction of rotation or both direction if single direction face nearest pin hole will suit clockwise rotation, please specify when ordering

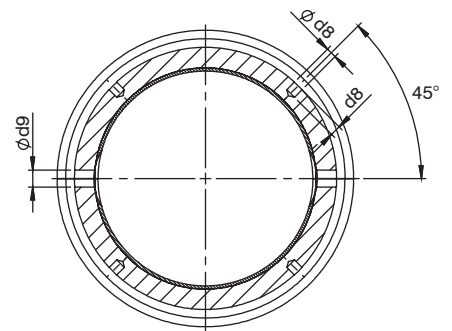
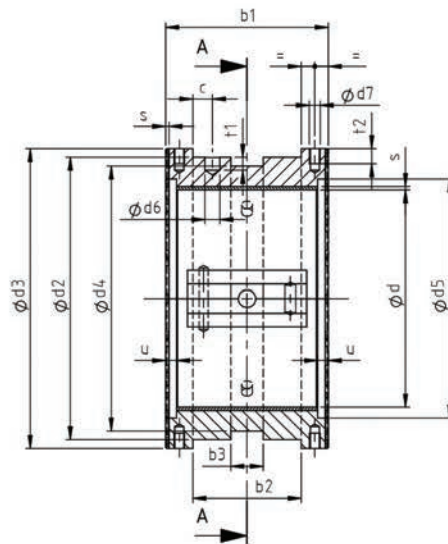
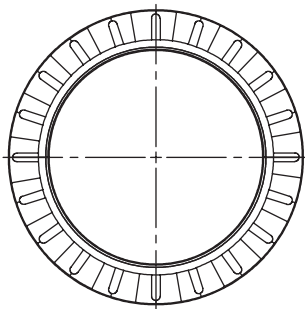


SECTION A-A

# E134 series

d (H6)	d2	d3	d4	d5	d6	d7	d8	d9	b1	b2	b3	c	t1	t2	s	u	Weight (kg)
50	65m6	80	59	56	4		4	4	35	25	10	5	3		1	3	0.34
56	70m6	90	64	63			5	5	40	30		6				3.5	0.39
63	80m6	100	72	70					45	30	12		4				0.64
70	90m6	110	80	78	5		6	6	50	35						4	0.91
80	105m6	125	93	88					60	40	15	6.5	5				1.68
90	115m6	140	103	99	6		8	8	65	45		8				4.5	2.03
100	130m6	155	116	110	7				75	50		9	6		1.5	5	3.21
110	140k6	172	126	121					80	55	20					5.5	3.65
125	160k6	195	144	137	9				95	65		12	8			6	5.85
140	180k6	215	162	152					105	75		14					8.29
160	205k6	245	185	174	11	M8	12	12	120	85	25	15	10	15		7	11.9
180	230k6	280	208	196					135	95		18				8	17.4
200	260k6	305	236	216	13				150	105		20	15				26.2
225	290k6	345	264	243		M10			170	120	32			20		9	35.2
250	325k6	385	297	270	15				190	130		25	18			10	52.3
265	345j6	410	315	285			15	15	200	140							59.2
280	360j6	430	328	300					210	145		28	20				68.7
300	390j6	460	355	320	18	M12			225	155		30		23	2		84.2
315	410j6	480	376	337					235	165	40					11	103
335	435j6	515	395	357					250	175		35					117
355	460j6	540	418	379		M16			265	185				30		12	145
400	515j6	610	475	428	22		20	20	300	210		40	25			14	204
425	550j6	650	505	449	27	M20			320	220	50	50	30	33			242
450	580j6	685	532	480			25	25	340	235		60				15	290
475	610j6	722	560	506	32				355	245							343
500	645j6	760	590	532					375	260						16	400
530	685j6	805	625	567		M24			400	275	60			39			498
560	725j6	850	660	600	42				420	290		65	40				580
600	775j6	915	708	642					450	315		70				18	682
630	815j6	960	743	674	52	M30	28	28	475	330	70		50	48			784

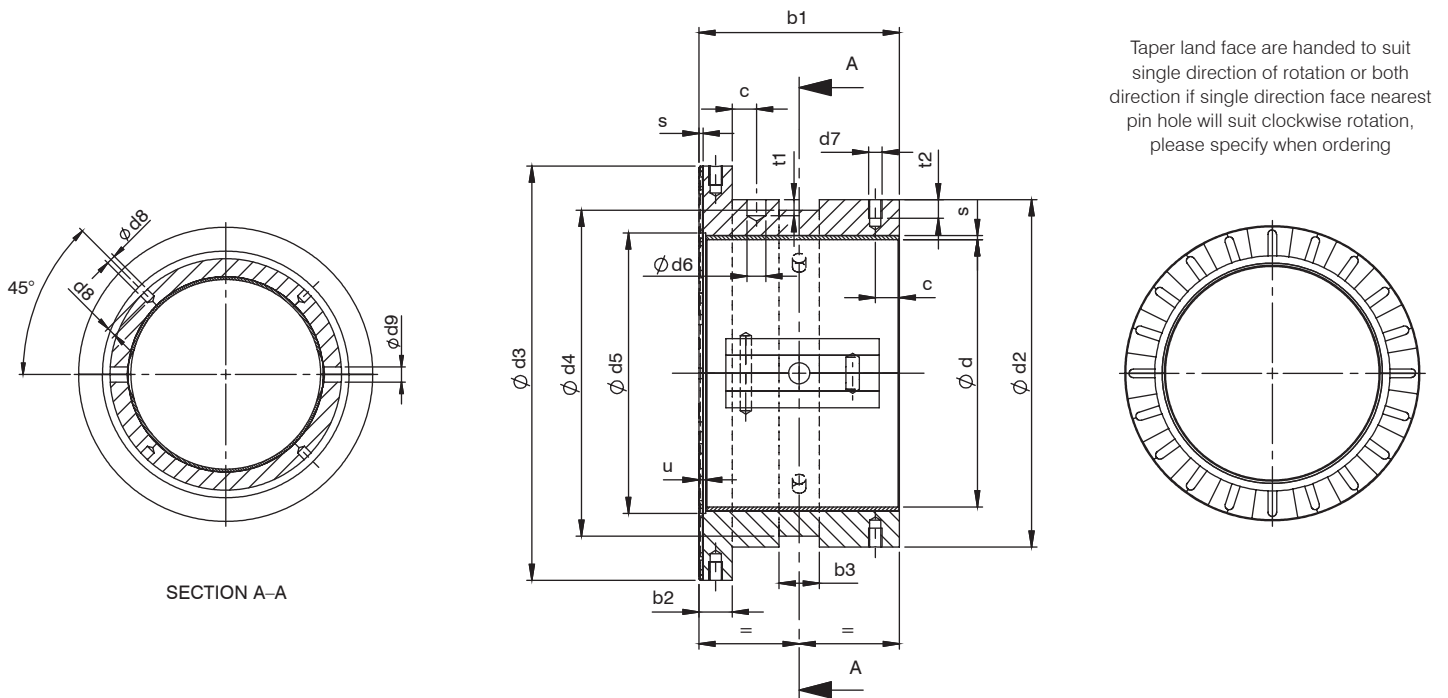
Taper land face are handed to suit single direction of rotation or both direction if single direction face nearest pin hole will suit clockwise rotation, please specify when ordering



SECTION A-A

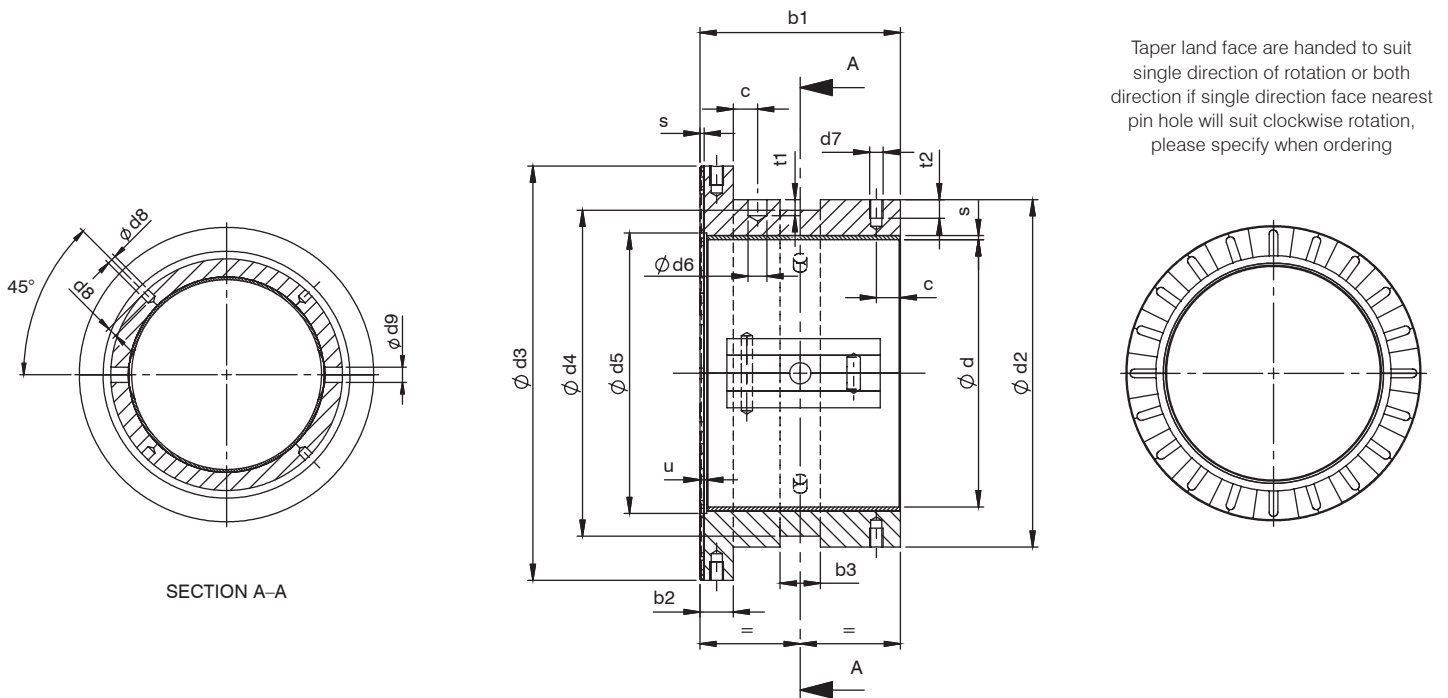
# E136 series

d (H6)	d2	d3	d4	d5	d6	d7	d8	d9	b1	b2	b3	c	c2	t1	t2	s	U
90	115m6	140	107	99	6		4	8	65	10	15	8		5		1	2.5
100	130m6	155	122	105	7		5		75	12.5		9		6		1.5	
110	140k6	172	130	121					80		20						
125	160k6	195	150	137	9		6		95	15		12		8			4
140	180k6	215	170	152		M8	8		105			14	10		15		
160	205k6	245	193	174	11			12	120	17.5	25	15		10			
180	230k6	280	218	196			10		135	20		18					
200	260k6	305	248	216	13		12		150	22.5		20		15			5
225	290k6	345	274	243		M10			170	25	32		12		20		
235	305k6	360	290	253					175	27.5							
250	325k6	385	309	270	15				190	30		25		18			
265	345j6	405	329	285			15	15	200								
280	360j6	430	344	300					210	32.5		28					8
300	390j6	460	370	320	18	M12			225	35		30	15	20	23	2	
315	390j6	480	370	337					225		40						
315	410j6	480	390	337					235								
335	435j6	515	415	357					250	37.5		35					
355	460j6	540	440	379		M16			265	40			18		30		
375	485j6	570	464	399					280	42.5							
400	515js6	610	495	428	22	M20	20	20	300	45		40		25			10
425	550js6	650	524	449	27				320	50	50	50	22	30	33		
450	580js6	685	554	480					340	52.5		60					
500	645js6	760	619	532	32				375	57.5							
530	685js6	805	656	563					400		60						12
560	725js6	850	693	595				26	420	60							
600	775js6	915	742	638	42	M24			450			65	25	40	39		15
630	815js6	960	779	670				28	475	62.5	70						



# E137 series

d (H6)	d2	d3	d4	d5	d6	d7	d8	d9	b1	b2	b3	c	c2	t1	t2	s	U
90	115m6	125	107	95	6		4	8	65	10	15	8		5		1	2.5
100	130m6	142	122	105	7		5		75	12.5		9		6		1.5	
110	140k6	156	130	115					80		20						
125	160k6	180	150	133	9		6		95	15		12		8			4
140	180k6	200	170	148		M8	8		105			14	10		15		
160	205k6	227	193	168	11			12	120	17.5	25	15		10			
180	230k6	254	218	188			10		135	20		18					
200	260k6	283	248	210	13		12		150	22.5		20		15			5
225	290k6	318	274	235		M10			170	25	32		12		20		
235	305k6	332	290	245					175	27.5							
250	325k6	352	309	260	15				190	30		25		18			
265	345j6	372	329	275			15	15	200								
280	360j6	396	344	295					210	32.5		28					8
300	390j6	422	370	315	18	M12			225	35		30	15	20	23	2	
315	390j6	444	370	330					225		40						
315	410j6	444	390	330					235								
335	435j6	472	415	350					250	37.5		35					
355	460j6	498	440	370		M16			265	40			18		30		
375	485j6	525	464	390					280	42.5							
400	515js6	564	495	420	22	M20	20	20	300	45		40		25			10
425	550js6	598	524	445	27				320	50	50	50	22	30	33		
450	580js6	633	554	470					340	52.5		60					
500	645js6	700	619	520	32				375	57.5							
530	685js6	742	656	550					400		60						12
560	725js6	784	693	580				26	420	60							
600	775js6	840	742	624	42	M24			450			65	25	40	39		15
630	815js6	882	779	655				28	475	62.5	70						



## Ordering code

### E - Series - Bore - O/D - Bore profile - Direction of rotation

P = Plain bore, L = Lemon bore, O = Offset bore, LB = lobed bore, T = Tilting pad  
L = left hand rotation, R = right hand rotation & B = bi-directional

### Example = E - 136 - 180 - 280 - O - R

Example denotes an E136 single thrust and journal bearing with Ø180 offset bore profile, Ø280 O/D to suit right hand rotation.



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