



The SNFA Group

The SNFA Group has specialised in the manufacture of high precision **ball and roller bearings** ever since its inception in 1952 and has invested continually resources in research and product technology.

As activities expanded, SNFA gradually implemented an organisational structure based on two major product groups with the objective of reaching the highest levels of specialisation in:

- **cylindrical roller and ball bearings for the Aerospace industry**
- **high precision ball bearings for machine tool and other special applications**

PRODUCTION UNITS

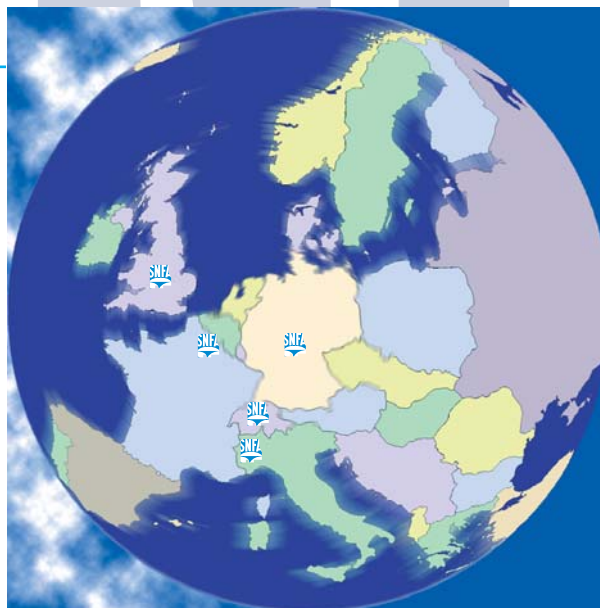
Aerospace bearings

SNFA S.A.S
FRANCE

Precision ball bearings

SNFA BEARINGS LTD
UNITED KINGDOM

SOMECAT S.p.A.
ITALY



MARKETING UNITS

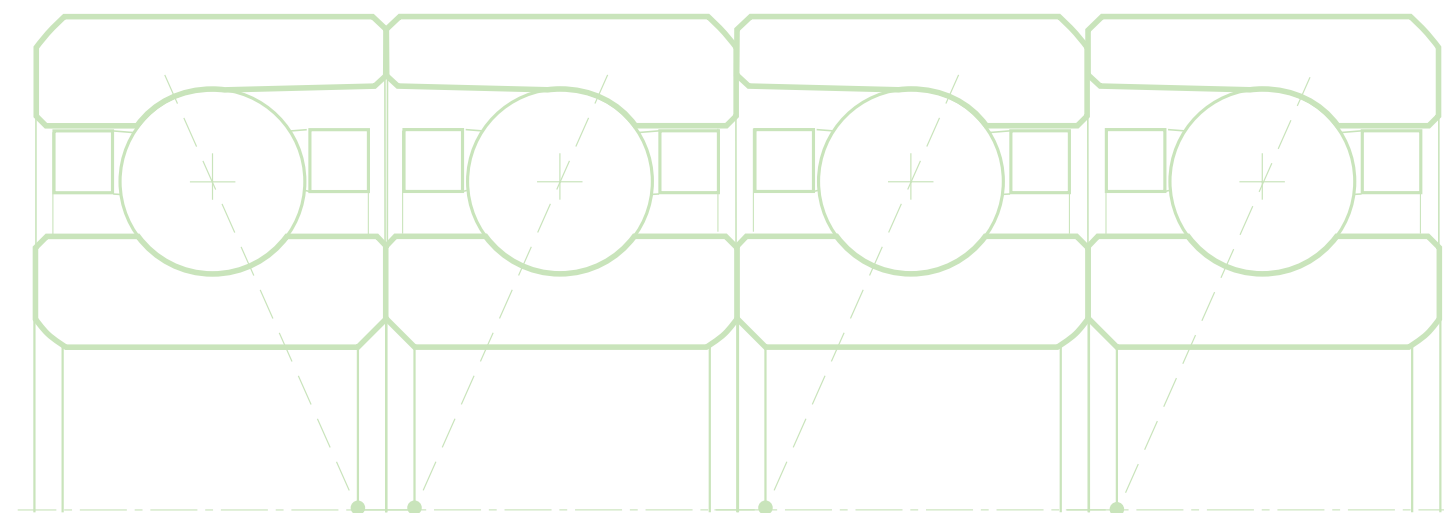
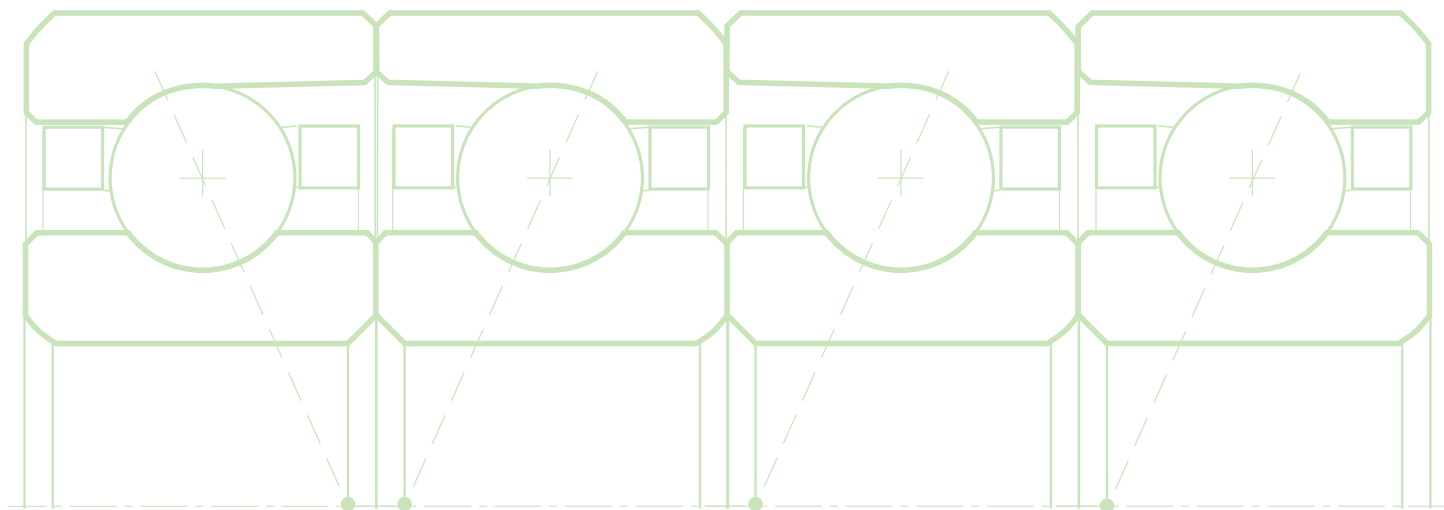
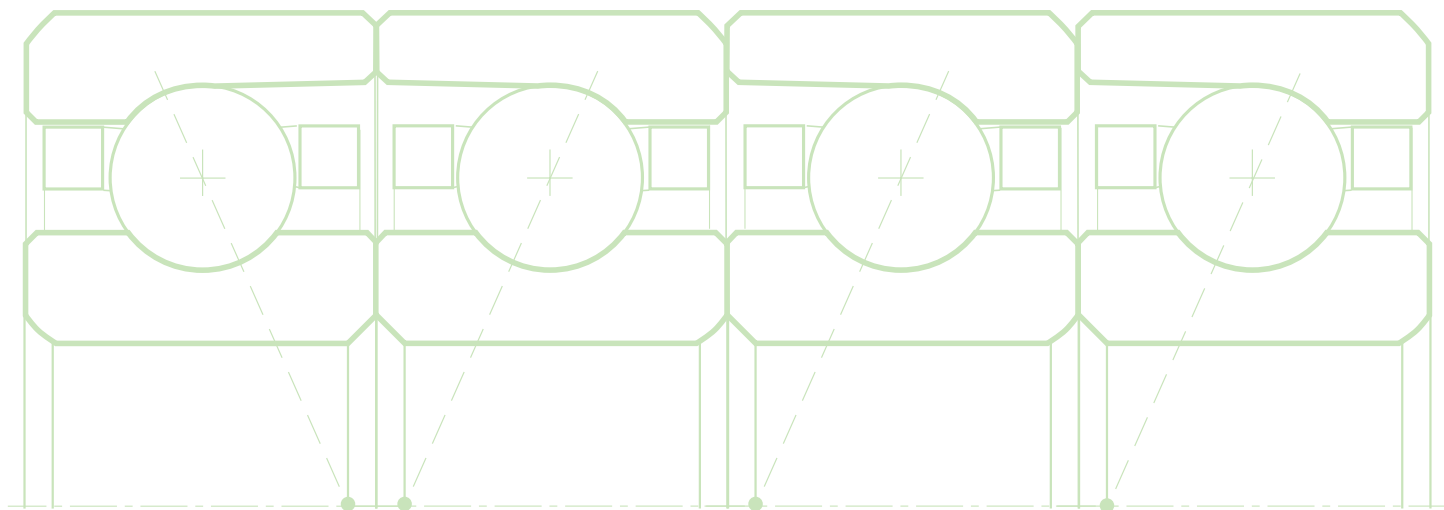
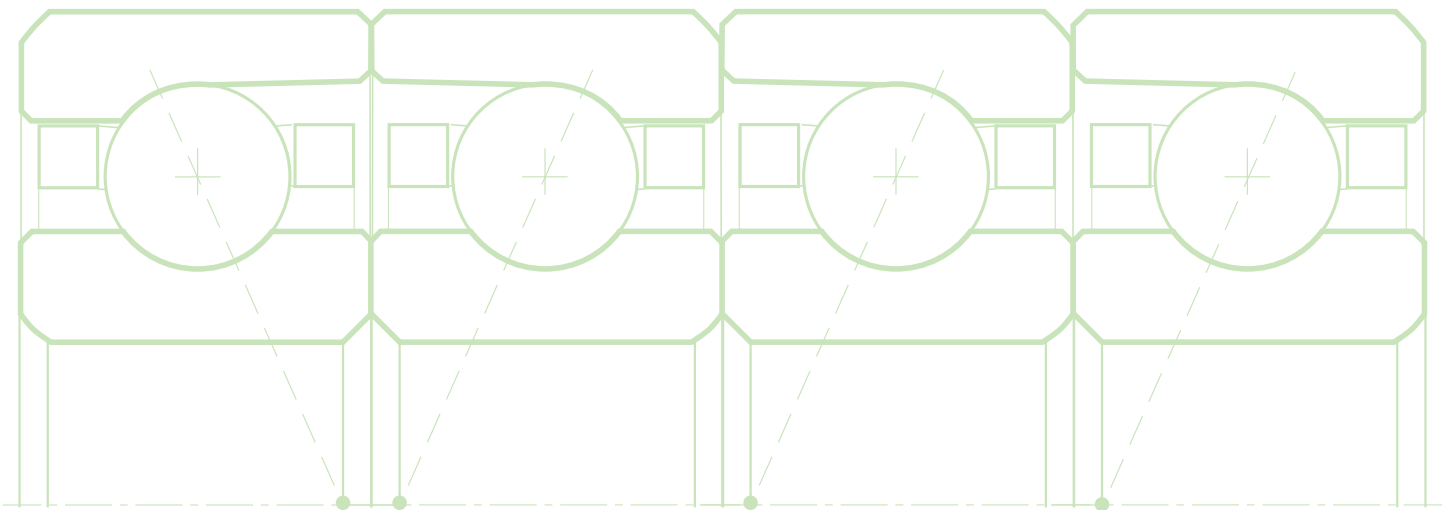
SNFA S.A.S
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SNFA BEARINGS LTD
UNITED KINGDOM

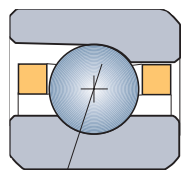
SOMECAT S.p.A.
ITALY

SNFA
Präzisions – Wälzlager Vertrieb GmbH
GERMANY

SNFA S.A.
SWITZERLAND



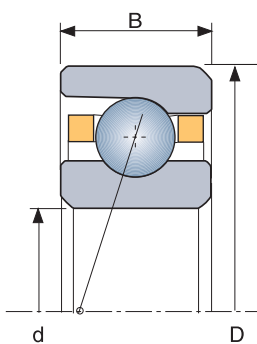
SEB
ISO 19



series **SEB** ISO 19

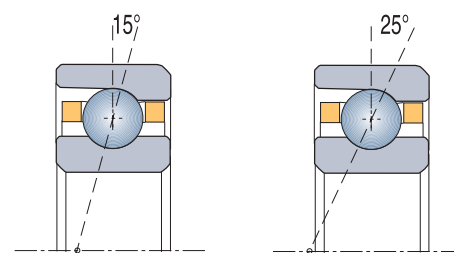
SEB

ISO 19



SNFA	d	D	B	z	Ø	15°		25°		Weight
						C33	C0	C33	C0	
* EB 10 * EB 12 * EB 15 SEB 17	17	30	7	13	3.97	510	370	485	350	0.016
* EB 10 - EB 12 - EB 15 bearings have been replaced by VEB 10 - VEB 12 - VEB 15										
SEB 20	20	37	9	14	4.76	745	580	705	550	0.036
SEB 25	25	42	9	15	4.76	765	650	735	620	0.042
SEB 30	30	47	9	17	4.76	815	750	765	720	0.049
SEB 35	35	55	10	18	5.55	1 115	1 090	1 050	1 030	0.075
SEB 40	40	62	12	18	6.35	1 420	1 420	1 340	1 350	0.110
SEB 45	45	68	12	20	6.35	1 495	1 600	1 415	1 520	0.130
SEB 50	50	72	12	21	7.14	1 925	2 110	1 820	2 010	0.130
SEB 55	55	80	13	22	7.94	2 415	2 730	2 280	2 590	0.178
SEB 60	60	85	13	24	7.94	2 520	3 020	2 375	2 860	0.192
SEB 65	65	90	13	25	7.94	2 550	3 180	2 400	3 010	0.202
SEB 70	70	100	16	24	9.52	3 515	4 330	3 315	4 110	0.338
SEB 75	75	105	16	25	9.52	3 570	4 560	3 360	4 320	0.357
SEB 80	80	110	16	26	9.52	3 620	4 780	3 410	4 520	0.376
SEB 85	85	120	18	25	11.11	4 735	6 200	4 460	5 900	0.532
SEB 90	90	125	18	26	11.11	4 810	6 500	4 530	6 100	0.558
SEB 95	95	130	18	27	11.11	4 880	6 800	4 595	6 400	0.584
SEB 100	100	140	20	26	12.70	6 145	8 400	5 795	8 000	0.801
SEB 110	110	150	20	28	12.70	6 340	9 200	5 970	8 700	0.861
SEB 120	120	165	22	26	14.28	7 515	10 700	7 100	10 200	1.193
SEB 130	130	180	24	28	14.28	7 750	11 700	7 280	11 100	1.628
SEB 140	140	190	24	30	14.28	7 995	12 600	7 540	12 000	1.730
SEB 150	150	210	28	24	19.05	12 080	17 500	11 400	16 600	2.555
SEB 160	160	220	28	26	19.05	12 610	19 100	11 895	18 100	2.713
SEB 170	170	230	28	27	19.05	12 790	20 000	12 050	18 900	2.848
SEB 180	180	250	33	25	22.22	16 315	24 900	15 340	23 600	4.225
SEB 190	190	260	33	26	22.22	16 560	26 100	15 600	24 700	4.410
SEB 200	200	280	38	24	25.40	20 255	31 100	19 160	29 400	5.100
SEB 220	220	300	38	26	25.40	20 695	34 100	19 825	32 300	6.500
SEB 240	240	320	38	29	25.40	22 200	38 400	20 900	36 300	7.500
SEB 260	260	360	46	26	31.75	29 050	52 900	27 360	50 100	12.000
SEB 280	280	380	46	27	31.75	29 300	55 400	27 600	52 500	13.000

For larger sizes consult our Technical Department



Maximum reference speed (Vh)

(for oil-lubricated bearing, ABEC 7, contact angle = 15°)

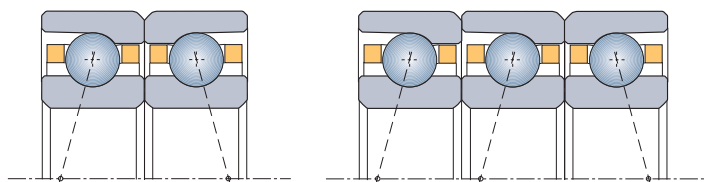
SNFA	Spring preload	Solid preload					
		Light L		Medium M		Heavy F	
		Single	Pairs	Triplex	Pairs	Triplex	Pairs
* EB 10 * EB 12 * EB 15 SEB 17	66 500	* EB 10 - EB 12 - EB 15 bearings have been replaced by VEB 10 - VEB 12 - VEB 15					
SEB 20	54 500	43 000	39 200	35 500	32 000	22 000	19 800
SEB 25	46 000	37 000	33 300	30 000	27 000	18 500	16 700
SEB 30	40 000	32 000	28 800	26 000	23 400	16 000	14 400
SEB 35	34 000	27 000	24 300	22 500	20 300	13 500	12 200
SEB 40	30 000	23 500	21 200	19 500	17 600	12 000	10 800
SEB 45	27 000	21 500	19 400	17 500	15 800	10 500	9 500
SEB 50	24 500	19 500	17 600	16 000	14 400	9 500	8 600
SEB 55	22 000	17 500	15 800	14 500	13 100	8 500	7 700
SEB 60	20 500	16 500	14 900	13 500	12 200	8 000	7 200
SEB 65	19 000	15 500	14 000	12 500	11 300	7 500	6 800
SEB 70	17 500	14 000	12 600	11 500	10 400	7 000	6 300
SEB 75	16 000	13 000	11 700	10 500	9 500	6 500	5 900
SEB 80	15 000	12 000	10 800	10 000	9 000	6 000	5 400
SEB 85	14 000	11 000	9 900	9 000	8 100	5 500	5 000
SEB 90	13 000	10 500	9 500	8 500	7 700	5 300	4 800
SEB 95	12 500	10 000	9 000	8 000	7 200	5 000	4 500
SEB 100	12 000	9 500	8 600	7 500	6 800	4 700	4 300
SEB 110	11 000	8 500	7 700	7 000	6 300	4 300	3 900
SEB 120	10 000	7 500	6 800	6 500	5 900	3 800	3 500
SEB 130	9 000	7 000	6 300	5 500	4 950	3 500	3 150
SEB 140	8 000	6 500	5 900	5 300	4 800	3 200	2 900
SEB 150	7 500	6 000	5 400	4 800	4 400	2 900	2 650
SEB 160	7 000	5 500	5 000	4 500	4 100	2 700	2 450
SEB 170	6 500	5 200	4 700	4 200	3 800	2 600	2 350
SEB 180	6 000	4 700	4 300	3 800	3 450	2 300	2 100
SEB 190	5 500	4 400	4 000	3 600	3 250	2 200	2 000
SEB 200	5 000	4 100	3 700	3 300	3 000	2 000	1 800
SEB 220	4 500	3 700	3 350	3 000	2 700	1 800	1 650
SEB 240	4 300	3 500	3 150	2 800	2 550	1 750	1 550
SEB 260	3 850	3 150	2 850	2 550	2 300	1 550	1 400
SEB 280	3 500	2 800	2 500	2 300	2 000	1 400	1 250

With grease = Vh · 0,65 - With 25° contact angle = Vh · 0,9

ABEC 9 = Vh · 1,1 - ABEC 5 = Vh · 0,9

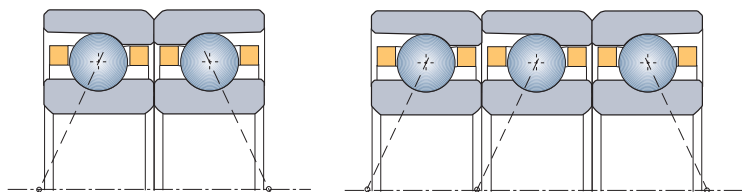
Tandem = Vh single · 0,9

Values of preload and rigidity
(Bearings rigidly preloaded)
contact angle = 15°

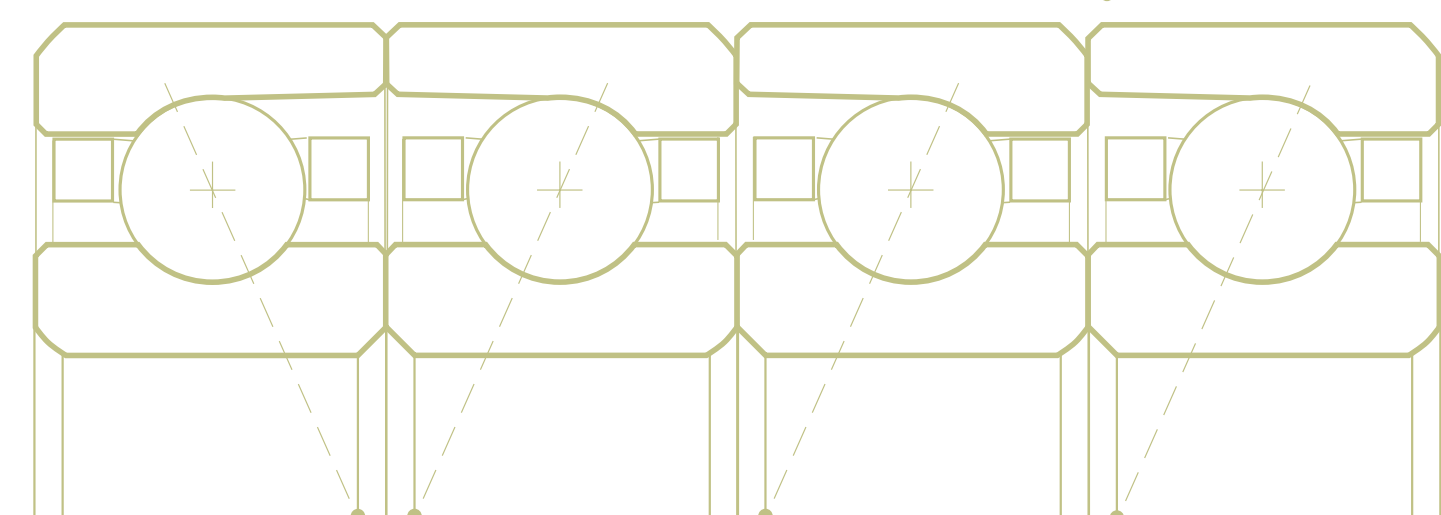
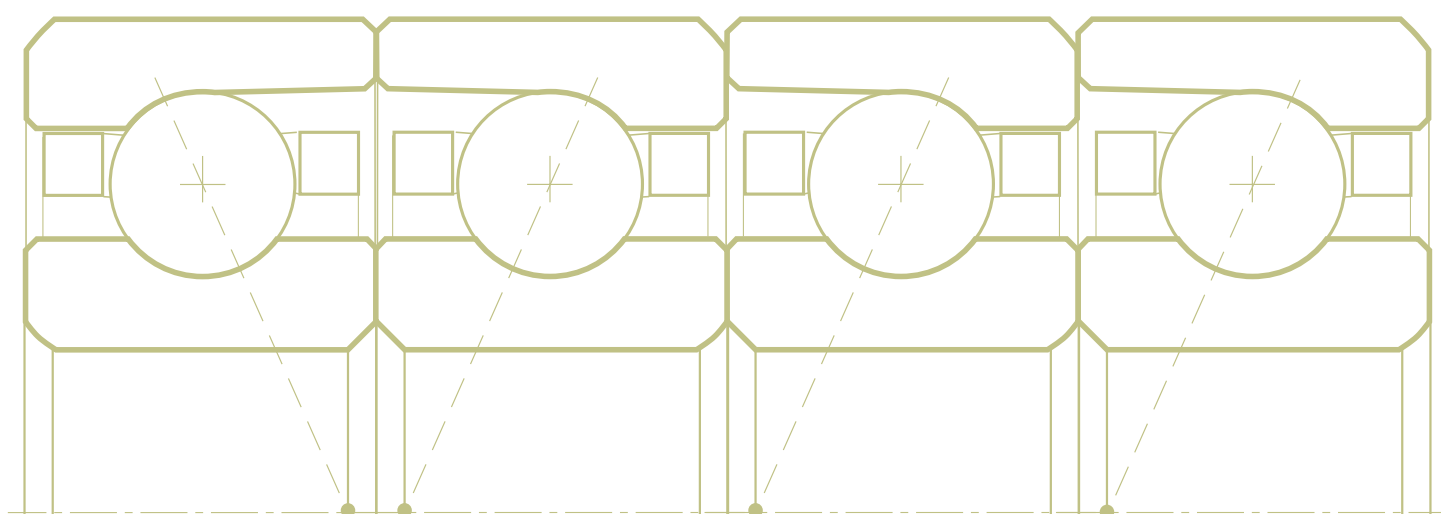
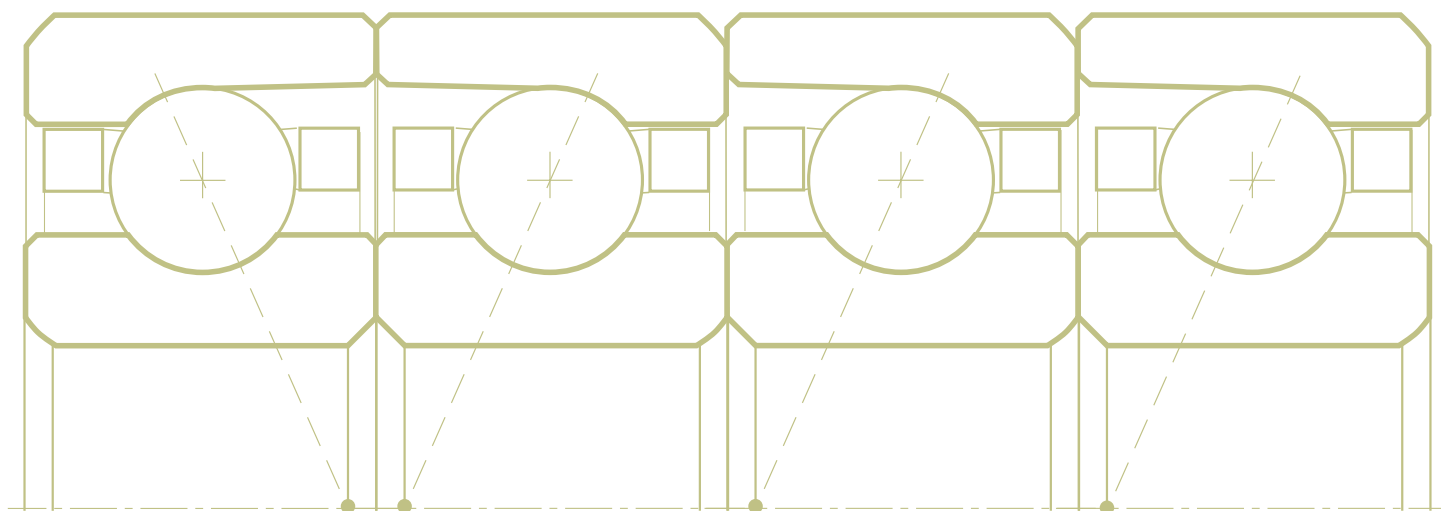
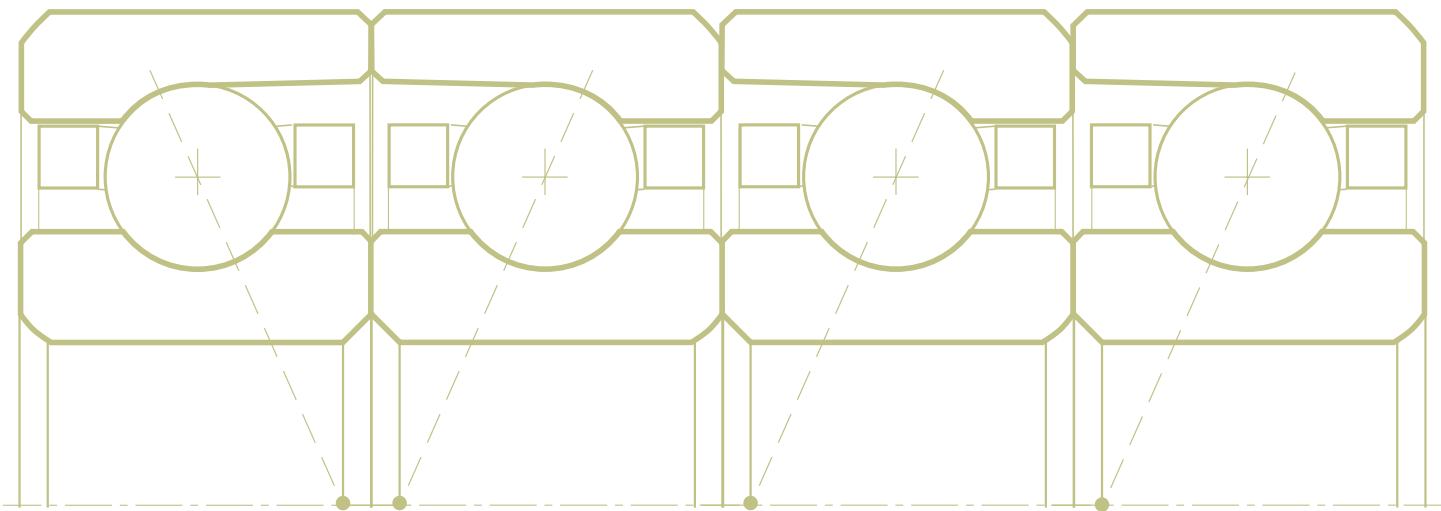


SNFA	Light preload L			Medium preload M			Heavy preload F		
	Pr	Ra		Pr	Ra		Pr	Ra	
		Pairs	Triplex		Pairs	Triplex		Pairs	Triplex
* EB 10 * EB 12 * EB 15 SEB 17	2.6	1.8	2.6	8.0	2.6	3.8	16.0	3.3	4.8
	* EB 10 - EB 12 - EB 15 bearings have been replaced by VEB 10 - VEB 12 - VEB 15								
SEB 20	3.9	2.3	3.4	11.5	3.3	4.8	23.0	4.1	6.1
SEB 25	4.0	2.4	3.6	12.0	3.5	5.1	24.0	4.4	6.5
SEB 30	4.2	2.7	3.9	12.5	3.8	5.6	25.0	4.8	7.1
SEB 35	5.8	3.3	4.8	17.5	4.7	6.9	35.0	5.9	8.7
SEB 40	7.4	3.7	5.4	22.3	5.3	7.8	44.5	6.7	9.9
SEB 45	8.0	4.3	6.0	24.0	6.2	8.6	48.0	7.8	10.8
SEB 50	10.0	4.7	6.9	30.0	6.8	10.0	60.0	8.5	12.5
SEB 55	12.5	5.4	7.9	38.0	7.8	11.5	76.0	9.8	14.5
SEB 60	13.0	5.8	8.5	39.0	8.3	12.3	78.0	10.5	15.5
SEB 65	13.5	6.0	8.8	40.0	8.6	12.8	80.0	10.9	16.0
SEB 70	18.5	6.8	10.1	55.0	9.8	14.7	110.0	12.5	18.5
SEB 75	18.5	7.1	10.5	56.0	10.2	15.1	112.0	12.9	19.0
SEB 80	19.0	7.4	10.8	57.0	10.6	15.7	114.0	13.4	19.7
SEB 85	24.5	8.3	12.2	74.0	11.8	17.6	148.0	15.0	22.1
SEB 90	25.0	8.5	12.5	75.0	12.1	18.1	150.0	15.4	22.7
SEB 95	25.5	8.7	12.9	76.5	12.5	18.7	153.0	15.9	23.4
SEB 100	32.0	9.6	14.2	96.0	13.8	20.5	192.0	17.5	25.8
SEB 110	33.0	10.2	15.1	99.0	14.7	21.8	198.0	18.6	27.4
SEB 120	39.3	10.8	15.8	118.0	15.5	22.8	236.0	19.6	28.8
SEB 130	40.5	11.4	16.8	122.0	16.5	24.3	244.0	20.8	30.6
SEB 140	41.8	12.0	17.8	125.5	17.4	25.6	251.0	22.0	32.3
SEB 150	63.2	13.1	19.4	189.5	19.0	27.9	379.0	23.9	35.2
SEB 160	66.0	14.0	20.7	198.0	20.3	29.9	396.0	25.6	37.6
SEB 170	67.0	14.5	21.3	201.0	20.9	30.8	402.0	26.4	38.8
SEB 180	85.4	15.7	23.1	256.0	22.7	33.4	512.0	28.6	42.0
SEB 190	87.0	16.2	23.9	260.0	23.4	34.4	520.0	29.5	43.4
SEB 200	106.0	17.2	26.1	318.0	24.8	37.2	636.0	31.2	47.0
SEB 220	108.0	18.2	26.9	325.0	26.3	38.8	650.0	33.2	48.9
SEB 240	115.0	20.0	29.5	350.0	29.0	42.7	700.0	36.6	53.8
SEB 260	152.0	22.0	32.4	456.0	31.7	46.7	912.0	40.0	58.9
SEB 280	154.0	22.7	33.4	460.0	32.7	48.1	920.0	41.2	60.6

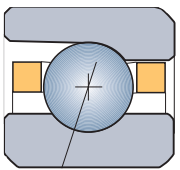
Values of preload and rigidity
(Bearings rigidly preloaded)
contact angle = 25°



SNFA	Light preload L			Medium preload M			Heavy preload F		
	Pr	Ra		Pr	Ra		Pr	Ra	
		Pairs	Triplex		Pairs	Triplex		Pairs	triplex
* EB 10 * EB 12 * EB 15 SEB 17	4.3	4.8	7.0	13.0	6.9	10.2	26.0	8.7	12.8
	EB 10 - EB 12 - EB 15 bearings have been replaced by VEB 10 - VEB 12 - VEB 15								
SEB 20	6.2	6.0	8.9	18.5	8.7	12.8	37.0	11.0	16.1
SEB 25	6.4	6.5	9.4	19.0	9.2	13.5	38.0	11.5	17.0
SEB 30	6.7	7.0	10.4	20.0	9.8	14.9	40.0	12.7	18.8
SEB 35	9.3	8.7	12.7	28.0	12.5	18.3	56.0	15.6	23.0
SEB 40	12.0	10.0	14.4	36.0	14.1	20.8	72.0	17.8	26.2
SEB 45	12.5	10.4	15.7	37.5	16.0	22.6	75.0	19.5	28.5
SEB 50	16.0	12.6	18.3	48.0	17.8	26.4	96.0	22.5	33.2
SEB 55	20.0	14.3	21.1	60.0	20.5	30.5	120.0	26.0	38.3
SEB 60	21.0	15.4	22.7	63.0	22.1	32.9	126.0	28.0	41.3
SEB 65	21.0	15.8	23.4	63.5	22.8	33.8	127.0	28.8	42.5
SEB 70	29.0	18.3	26.9	88.0	26.2	39.0	176.0	33.2	48.9
SEB 75	30.0	18.9	27.8	89.0	27.1	40.3	178.0	34.3	50.6
SEB 80	30.0	19.4	28.7	90.0	27.9	41.5	180.0	35.3	52.0
SEB 85	39.5	21.8	32.2	118.0	31.3	46.5	236.0	39.6	58.4
SEB 90	40.0	22.5	33.2	120.0	32.3	48.1	240.0	40.9	60.3
SEB 95	40.5	23.2	34.3	122.0	33.4	49.6	244.0	42.2	62.2
SEB 100	51.0	25.5	37.7	153.0	36.7	54.6	306.0	46.4	68.4
SEB 110	53.0	27.1	40.0	158.0	39.0	58.0	316.0	49.3	72.7
SEB 120	62.8	28.5	41.9	188.0	41.0	60.4	376.0	51.7	76.1
SEB 130	64.4	30.2	44.4	193.0	43.5	64.0	386.0	54.8	80.6
SEB 140	66.7	32.0	47.0	200.0	46.1	67.8	400.0	58.1	85.5
SEB 150	100.8	34.8	51.2	302.0	50.2	73.8	604.0	63.2	93.0
SEB 160	105.0	37.2	54.7	315.0	53.7	79.0	630.0	67.6	99.5
SEB 170	107.0	38.4	56.5	320.0	55.3	81.4	640.0	69.7	102.5
SEB 180	135.6	41.5	61.1	407.0	60.0	88.2	814.0	75.5	111.1
SEB 190	138.0	43.0	63.1	414.0	61.9	91.0	828.0	78.0	114.7
SEB 200	169.0	45.5	71.0	508.0	65.7	99.5	1 016.0	82.7	127.8
SEB 220	175.0	48.5	71.4	526.0	70.0	103.1	1 052.0	88.3	129.9
SEB 240	185.0	53.2	78.3	555.0	76.7	112.9	1 110.0	96.6	142.2
SEB 260	242.0	58.2	85.7	726.0	84.0	123.7	1 452.0	105.8	155.8
SEB 280	244.0	59.9	88.2	732.0	86.4	127.0	1 460.0	109.0	160.0

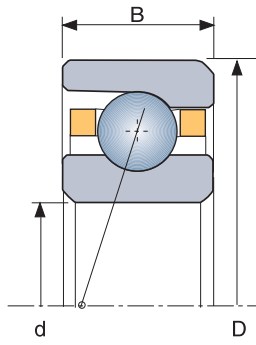


EX
ISO 10



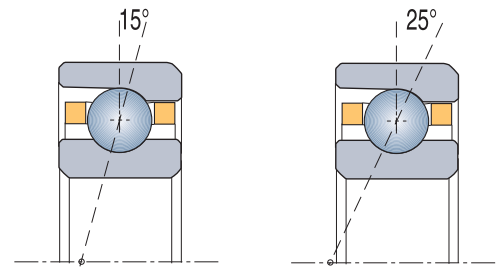
series **EX** ISO 10

EX ISO 10



SNFA	d	D	B	z	Ø	15°		25°		Weight
						C33	C0	C33	C0	
EX 6	6	17	6	8	3.17	160	61	155	59	0.006
EX 7	7	19	6	8	3.57	198	77	191	75	0.008
EX 8	8	22	7	8	3.97	311	150	300	145	0.011
EX 9	9	24	7	9	3.97	341	176	328	169	0.014
EX 10	10	26	8	10	4.37	433	240	416	230	0.018
EX 12	12	28	8	10	4.76	507	280	488	270	0.019
EX 15	15	32	9	12	4.76	576	360	550	350	0.028
EX 17	17	35	10	12	5.55	761	480	728	460	0.037
EX 20	20	42	12	12	6.35	967	640	924	610	0.064
EX 25	25	47	12	13	7.14	1 261	890	1 203	850	0.075
EX 30	30	55	13	13	7.94	1 520	1 110	1 450	1 060	0.108
EX 35	35	62	14	15	7.94	1 950	1 730	1 846	1 650	0.135
EX 40	40	68	15	16	7.94	2 015	1 900	1 885	1 810	0.190
EX 45	45	75	16	15	9.52	2 770	2 510	2 630	2 400	0.228
EX 50	50	80	16	16	9.52	2 860	2 730	2 700	2 600	0.246
EX 55	55	90	18	16	11.11	3 720	3 680	3 520	3 510	0.360
EX 60	60	95	18	17	11.11	3 835	3 980	3 630	3 780	0.384
EX 65	65	100	18	18	11.11	3 940	4 270	3 740	4 060	0.408
EX 70	70	110	20	18	12.70	5 160	5 500	4 880	5 200	0.580
EX 75	75	115	20	19	12.70	5 290	5 900	5 000	5 600	0.613
EX 80	80	125	22	18	14.28	6 360	7 000	6 010	6 700	0.826
EX 85	85	130	22	19	14.28	6 540	7 500	6 180	7 100	0.868
EX 90	90	140	24	21	14.28	6 790	8 400	6 400	7 900	1.145
EX 95	95	145	24	20	15.87	8 020	9 700	7 590	9 200	1.160
EX 100	100	150	24	21	15.87	8 255	10 300	7 760	9 800	1.211
EX 105	105	160	26	20	17.46	9 700	11 800	9 150	11 200	1.535
EX 110	110	170	28	20	19.05	11 400	13 900	10 780	13 200	1.942
EX 120	120	180	28	21	19.05	11 620	14 800	10 970	14 100	2.055
EX 130	130	200	33	20	22.22	15 020	19 000	14 180	18 000	3.080
EX 140	140	210	33	21	22.22	15 340	20 200	14 480	19 100	3.280
EX 150	150	225	35	21	23.81	17 370	23 100	16 390	22 000	4.030
EX 160	160	240	38	21	25.40	19 500	26 300	18 400	25 000	5.000
EX 170	170	260	42	21	26.99	21 190	29 800	19 990	28 300	6.650
EX 180	180	280	46	22	28.57	23 630	35 000	22 290	33 300	9.000
EX 190	190	290	46	23	28.57	24 120	36 900	22 750	35 100	9.460
EX 200	200	310	51	20	34.92	30 290	46 600	28 600	44 400	12.200
EX 220	220	340	56	20	38.10	34 140	55 600	32 240	52 900	15.600
EX 240	240	360	56	22	38.10	35 930	62 000	33 930	58 900	17.250

For larger sizes consult our Technical Department



Maximum reference speed (Vh)

(for oil-lubricated bearing, ABEC 7, contact angle = 15°)

SNFA	Spring preload	Solid preload					
		Light L		Medium M		Heavy F	
		Single	Pairs	Triplex	Pairs	Triplex	Pairs
EX 6	160 000	127 900	115 000	104 000	93 500	64 000	57 500
EX 7	141 500	113 200	101 800	92 000	82 700	56 600	50 900
EX 8	121 000	96 500	87 000	78 500	70 600	48 300	43 500
EX 9	109 500	87 400	78 700	71 000	63 900	43 700	39 300
EX 10	100 500	80 500	72 500	65 400	58 900	40 300	36 200
EX 12	90 500	72 200	65 000	58 700	52 800	36 100	32 500
EX 15	76 500	61 200	55 000	49 700	44 700	30 600	27 500
EX 17	69 000	55 200	49 700	44 900	40 400	27 600	24 800
EX 20	58 000	46 400	41 800	37 700	33 950	23 200	20 900
EX 25	50 000	40 000	36 000	32 500	29 250	20 000	18 000
EX 30	42 500	34 000	30 600	27 650	24 900	17 000	15 300
EX 35	31 500	25 200	22 700	20 500	18 500	12 600	11 400
EX 40	28 000	22 600	20 400	18 400	16 600	11 300	10 200
EX 45	25 000	20 200	18 200	16 400	14 800	10 100	9 100
EX 50	23 000	18 500	16 700	15 100	13 600	9 300	8 400
EX 55	20 500	16 500	14 900	13 400	12 100	8 300	7 500
EX 60	19 000	15 400	13 900	12 500	11 300	7 700	7 000
EX 65	18 000	14 300	12 900	11 700	10 600	7 200	6 500
EX 70	16 500	13 100	11 800	10 600	9 600	6 500	5 900
EX 75	15 500	12 300	11 100	10 000	9 000	6 200	5 600
EX 80	14 000	11 300	10 200	9 200	8 300	5 700	5 200
EX 85	13 500	10 700	9 700	8 700	7 900	5 400	4 900
EX 90	12 500	10 000	9 000	8 100	7 300	5 000	4 500
EX 95	12 000	9 500	8 600	7 800	7 100	4 800	4 400
EX 100	11 500	9 100	8 200	7 400	6 700	4 600	4 200
EX 105	10 500	8 500	7 700	6 900	6 300	4 300	3 900
EX 110	10 000	8 000	7 200	6 500	5 900	4 000	3 600
EX 120	9 000	7 400	6 700	6 000	5 400	3 700	3 400
EX 130	8 500	6 600	6 000	5 400	4 900	3 300	3 000
EX 140	7 500	6 200	5 600	5 000	4 500	3 100	2 800
EX 150	7 000	5 700	5 200	4 600	4 200	2 900	2 650
EX 160	6 500	5 300	4 800	4 300	3 900	2 600	2 350
EX 170	6 000	4 800	4 400	3 900	3 600	2 400	2 200
EX 180	5 500	4 400	4 000	3 600	3 300	2 200	2 000
EX 190	5 200	4 200	3 800	3 400	3 100	2 100	1 900
EX 200	4 800	3 800	3 500	3 200	2 900	1 900	1 750
EX 220	4 250	3 400	3 100	2 800	2 600	1 700	1 550
EX 240	3 900	3 100	2 800	2 500	2 300	1 600	1 450

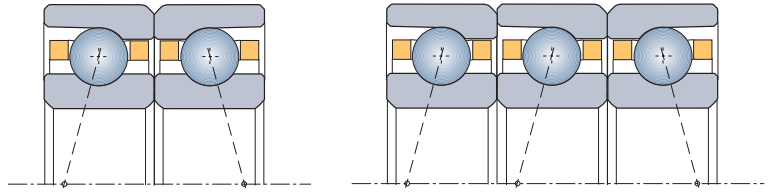
With grease = Vh · 0,65 - With 25° contact angle = Vh · 0,9
Tandem = Vh single · 0,9

ABEC 9 = Vh · 1,1 - ABEC 5 = Vh · 0,9

EX

ISO 10

Values of preload and rigidity
(Bearings rigidly preloaded)
contact angle = 15°

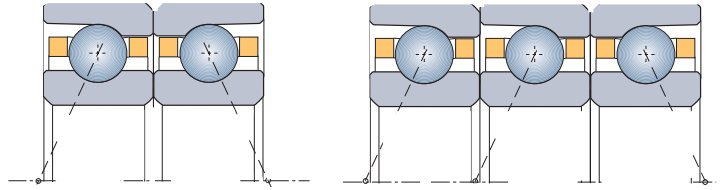


SNFA	Light preload L			Medium preload M			Heavy preload F		
	Pr	Ra		Pr	Ra		Pr	Ra	
		Pairs	Triplex		Pairs	Triplex		Pairs	Triplex
EX 6	0.8	0.8	1.1	2.5	1.2	1.7	5.0	1.5	2.1
EX 7	1.0	0.9	1.3	3.0	1.3	1.9	6.0	1.6	2.4
EX 8	1.6	1.1	1.6	5.0	1.6	2.3	10.0	2.0	2.9
EX 9	1.8	1.2	1.7	5.5	1.7	2.4	11.0	2.1	3.0
EX 10	2.3	1.5	2.1	7.0	2.1	3.1	14.0	2.7	3.9
EX 12	2.7	1.5	2.2	8.0	2.2	3.2	16.0	2.8	4.0
EX 15	3.0	1.9	2.7	9.0	2.7	4.0	18.0	3.4	5.0
EX 17	4.0	2.2	3.2	12.0	3.2	4.6	24.0	4.0	5.8
EX 20	5.0	2.3	3.3	15.0	3.3	4.8	30.0	4.2	6.0
EX 25	6.5	3.0	4.3	19.5	4.2	6.2	39.0	5.3	7.8
EX 30	8.0	3.3	4.8	24.0	4.7	6.9	48.0	6.0	8.7
EX 35	10.0	3.8	5.8	30.5	5.6	8.3	61.0	7.1	10.4
EX 40	10.5	4.1	6.1	32.0	5.9	8.7	63.5	7.4	11.0
EX 45	14.0	4.6	6.8	42.5	6.7	9.8	85.0	8.4	12.3
EX 50	14.5	4.8	7.3	44.0	6.9	10.5	88.0	8.8	13.2
EX 55	19.5	5.6	8.3	58.5	8.2	12.0	117.0	10.2	15.1
EX 60	20.0	5.9	8.8	60.5	8.6	12.6	120.5	10.8	15.9
EX 65	21.0	6.3	9.2	62.0	9.1	13.3	124.0	11.4	16.8
EX 70	27.0	7.1	10.4	80.0	10.2	15.0	160.0	12.8	18.9
EX 75	27.5	7.4	10.9	82.0	10.7	15.7	164.0	13.5	19.8
EX 80	33.0	7.9	11.7	98.5	11.5	16.9	197.0	14.4	21.2
EX 85	34.0	8.3	12.2	101.0	12.0	17.7	202.0	15.1	22.2
EX 90	36.0	9.0	13.3	107.0	13.0	19.1	214.0	16.8	24.1
EX 95	42.0	9.6	14.1	127.0	13.8	20.3	253.0	17.4	25.6
EX 100	43.0	10.0	14.7	130.0	14.4	21.1	259.0	18.1	26.6
EX 105	50.0	10.5	15.7	150.0	15.1	22.2	300.0	19.0	28.0
EX 110	59.0	11.4	16.7	177.0	16.4	23.9	354.0	20.7	30.4
EX 120	60.0	11.8	17.4	180.0	17.1	25.1	360.0	21.5	31.6
EX 130	78.0	13.2	19.4	234.0	19.0	27.9	468.0	23.9	35.2
EX 140	80.0	13.7	20.2	240.0	19.8	29.1	480.0	24.9	36.6
EX 150	90.0	14.6	21.5	270.0	21.0	30.9	540.0	26.5	39.0
EX 160	102.0	15.5	22.9	306.0	22.4	33.0	612.0	28.2	41.5
EX 170	110.0	16.3	23.9	330.0	24.5	34.5	660.0	29.6	43.5
EX 180	123.0	17.7	26.1	369.0	25.6	37.6	738.0	32.2	47.4
EX 190	126.0	18.4	27.1	378.0	26.6	39.1	756.0	33.5	49.2
EX 200	160.0	19.4	28.6	480.0	28.0	41.2	960.0	35.3	51.9
EX 220	180.0	20.8	30.6	540.0	30.0	44.1	1 080.0	37.8	55.6
EX 240	190.0	22.6	33.2	570.0	32.5	47.9	1 140.0	41.0	60.3

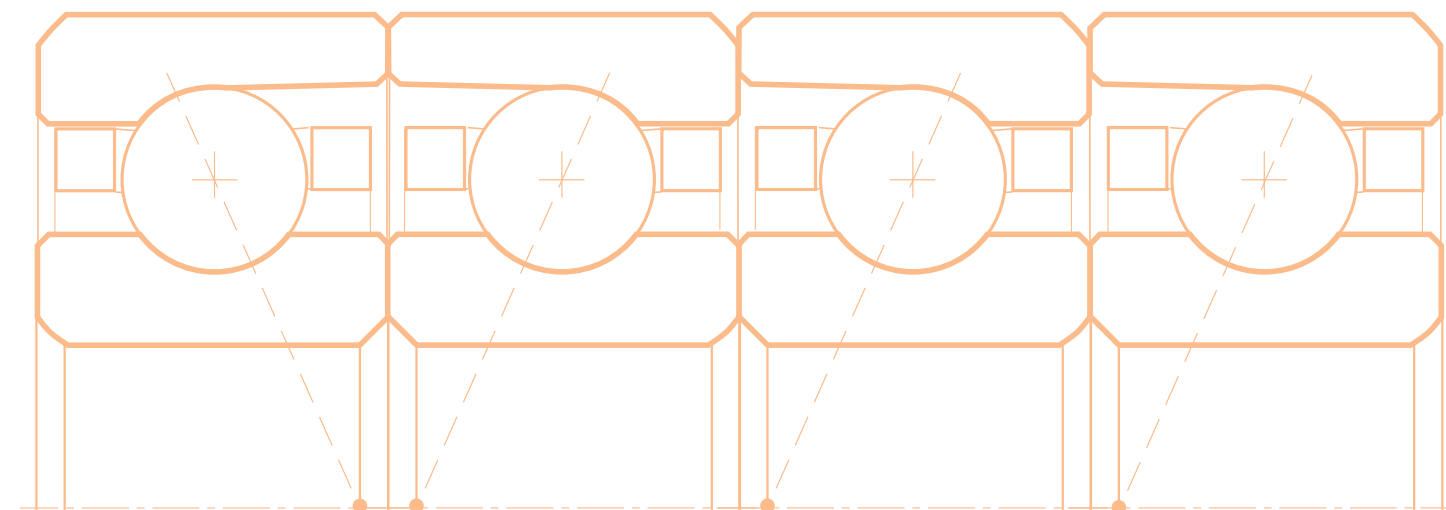
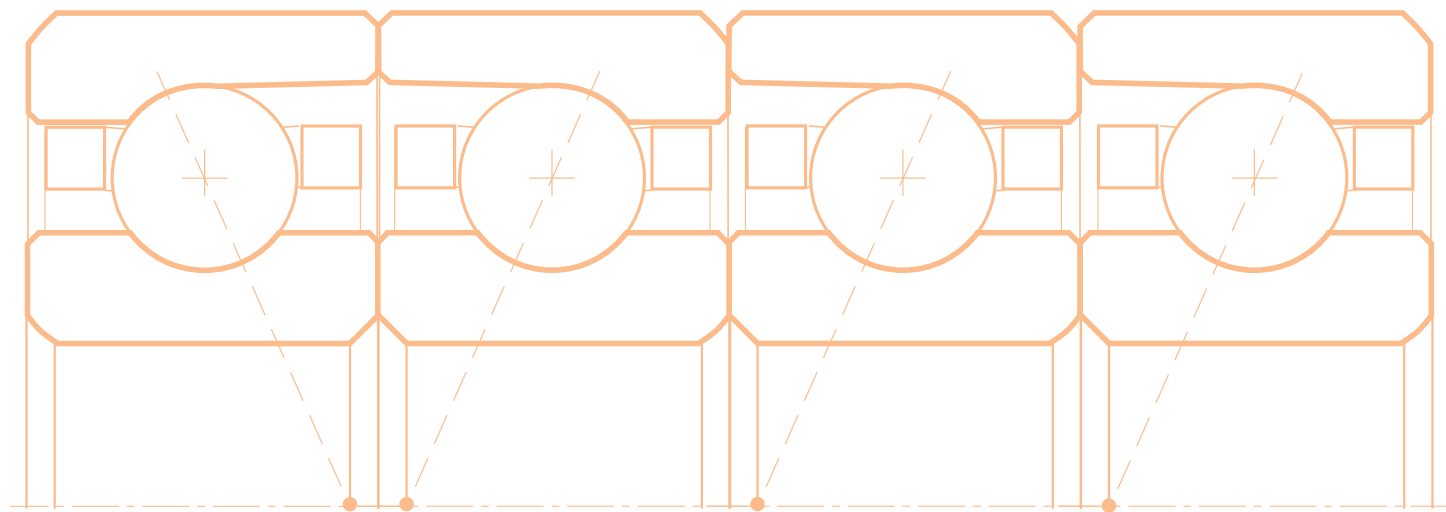
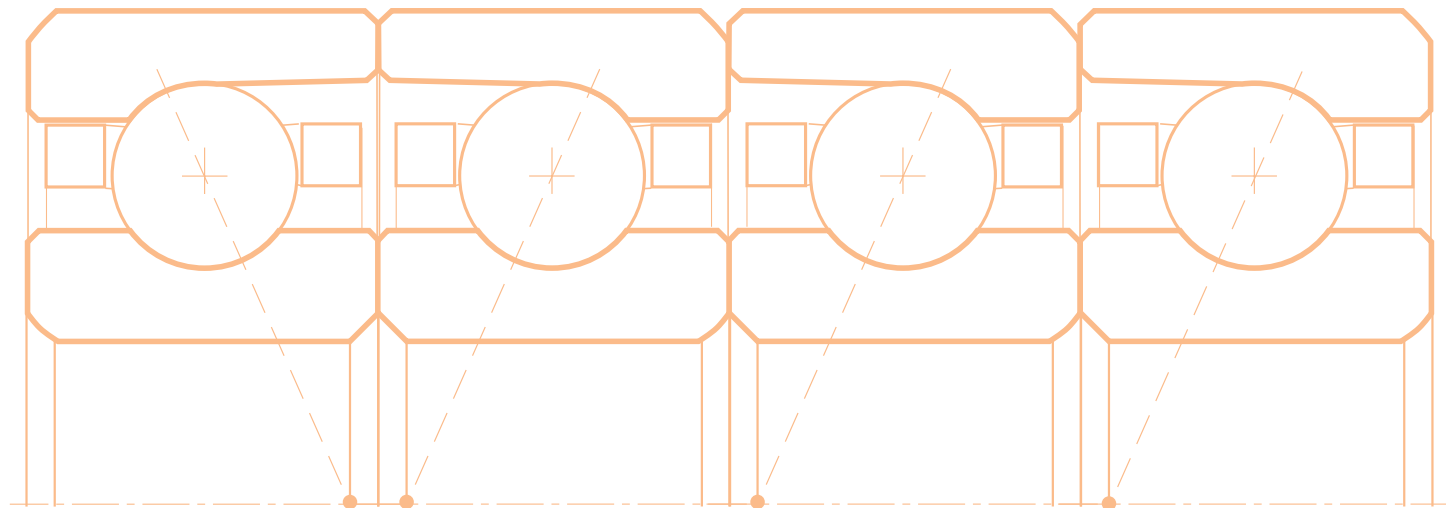
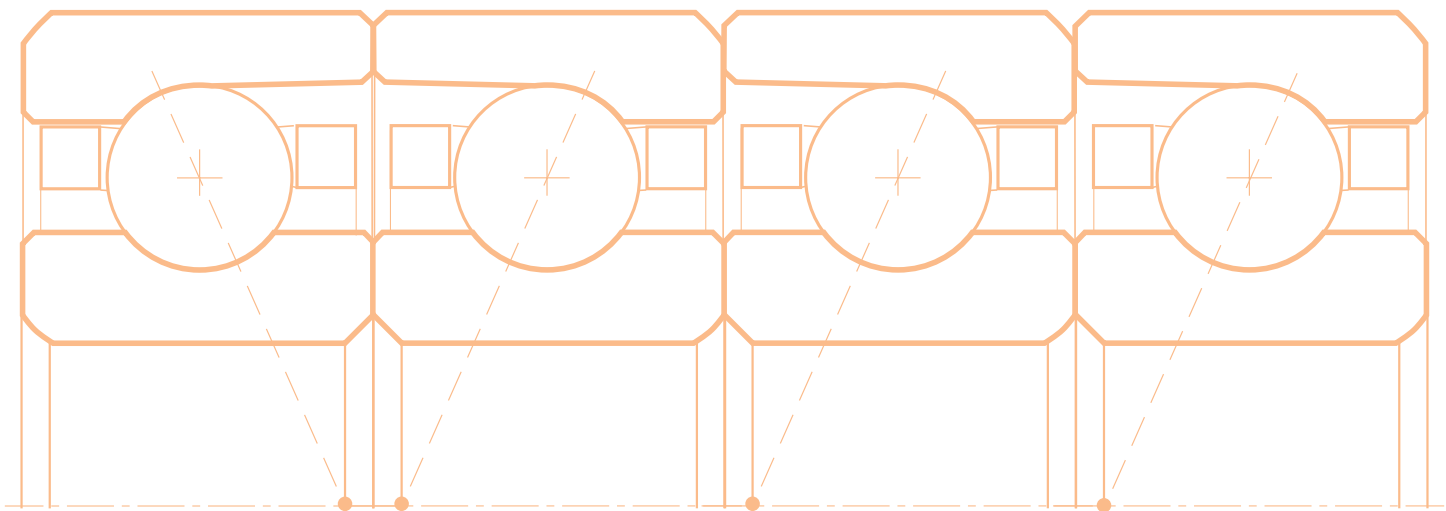
EX

ISO 10

Values of preload and rigidity
(Bearings rigidly preloaded)
contact angle = 25°

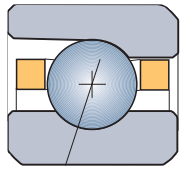


SNFA	Light preload L			Medium preload M			Heavy preload F		
	Pr	Ra		Pr	Ra		Pr	Ra	
		Pairs	Triplex		Pairs	Triplex		Pairs	Triplex
EX 6	1.5	2.2	3.3	4.0	3.2	4.6	8.0	4.0	5.8
EX 7	1.7	2.5	3.6	5.0	3.5	5.1	10.0	4.5	6.5
EX 8	2.5	2.9	4.2	8.0	4.3	6.2	16.0	5.4	7.9
EX 9	3.0	3.0	4.5	9.0	4.4	6.5	18.0	5.5	8.2
EX 10	3.5	3.9	5.7	11.0	5.7	8.3	22.0	7.1	10.5
EX 12	4.5	4.0	5.9	13.0	5.8	8.4	26.0	7.2	10.6
EX 15	5.0	5.0	7.4	15.0	7.3	10.7	30.0	9.1	13.5
EX 17	6.5	5.8	8.5	19.5	8.4	12.3	39.0	10.6	15.5
EX 20	8.0	6.0	8.8	24.0	8.7	12.7	48.0	11.0	16.0
EX 25	10.5	7.9	11.5	32.0	11.4	16.7	64.0	14.3	21.0
EX 30	13.0	8.7	12.8	38.5	12.5	18.4	77.0	15.8	23.2
EX 35	16.5	10.4	15.2	49.0	14.8	22.0	98.0	18.6	27.7
EX 40	17.0	10.9	16.1	51.0	15.8	23.3	102.0	19.9	29.3
EX 45	23.0	12.3	18.1	69.0	17.8	26.2	137.0	22.4	33.0
EX 50	23.5	13.1	19.1	70.5	18.8	27.7	141.0	23.7	34.9
EX 55	31.5	14.9	22.1	94.0	21.6	31.8	188.0	27.2	40.1
EX 60	32.5	15.9	23.4	97.0	23.0	33.8	194.0	28.9	42.6
EX 65	33.0	16.7	24.6	99.0	24.1	35.5	199.0	30.4	44.7
EX 70	42.5	18.9	27.8	128.0	27.3	40.1	255.0	34.3	50.5
EX 75	43.5	19.7	29.0	131.0	28.5	41.9	262.0	35.9	52.8
EX 80	52.5	21.1	30.1	157.5	30.4	44.7	315.0	38.3	56.3
EX 85	54.0	22.0	32.3	162.0	31.7	46.6	323.0	40.0	58.7
EX 90	57.0	23.8	35.3	171.0	34.4	50.6	341.0	43.1	63.8
EX 95	67.0	25.2	37.2	202.0	36.5	53.7	404.0	45.7	67.7
EX 100	69.0	26.4	38.8	207.0	38.1	56.0	415.0	48.0	70.6
EX 105	80.0	27.7	40.8	240.0	40.0	58.0	480.0	50.4	74.1
EX 110	95.0	30.2	44.4	285.0	43.6	64.1	570.0	54.9	80.8
EX 120	97.0	31.4	46.2	291.0	45.3	66.7	582.0	57.1	84.0
EX 130	125.0	34.9	51.3	375.0	50.3	74.0	750.0	63.4	93.2
EX 140	128.0	36.3	53.4	384.0	52.4	77.0	768.0	66.0	97.0
EX 150	144.0	38.6	56.8	432.0	55.7	82.0	864.0	70.2	103.3
EX 160	162.0	41.0	60.4	486.0	59.2	87.1	972.0	74.6	109.7
EX 170	176.0	43.1	63.3	528.0	62.1	91.4	1 056.0	78.3	115.1
EX 180	197.0	47.0	69.1	591.0	67.8	99.7	1 182.0	85.4	125.6
EX 190	200.0	48.7	71.8	600.0	70.2	103.2	1 200.0	88.4	130.1
EX 200	250.0	51.0	75.1	750.0	73.6	108.3	1 500.0	92.8	136.5
EX 220	280.0	54.6	80.3	840.0	78.7	115.8	1 680.0	99.2	145.9
EX 240	300.0	59.5	87.6	900.0	85.9	126.3	1 800.0	108.2	159.1



E 200

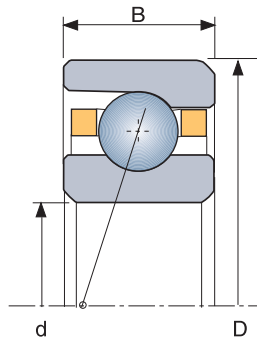
ISO 02



series **E 200** ISO 02

E 200

ISO 02

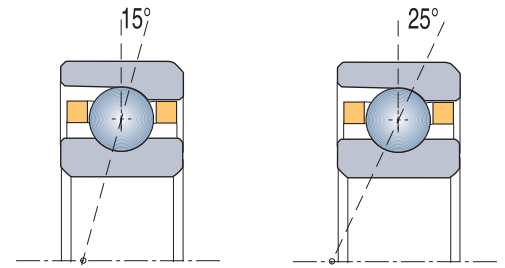


SNFA	d	D	B	z	Ø	15°		25°		Weight
						C33	C0	C33	C0	
						E 207	7	22	7	
E 208	8	24	8	7	4.76	455	230	440	220	0.016
E 209	9	26	8	9	4.76	550	320	530	300	0.021
E 210	10	30	9	8	5.55	655	370	640	360	0.029
E 212	12	32	10	9	5.55	720	440	695	420	0.035
E 215	15	35	11	9	6.35	915	570	885	550	0.042
E 217	17	40	12	9	7.14	1 140	720	1 090	700	0.060
E 220	20	47	14	11	7.14	1 315	940	1 260	910	0.105
E 225	25	52	15	12	7.94	1 720	1 290	1 640	1 230	0.125
E 230	30	62	16	12	9.52	2 350	1 850	2 250	1 770	0.194
E 235	35	72	17	14	9.52	2 600	2 270	2 480	2 170	0.300
E 240	40	80	18	14	11.11	3 430	3 050	3 280	2 920	0.359
E 245	45	85	19	15	11.11	3 590	3 350	3 410	3 200	0.414
E 250	50	90	20	14	12.70	4 370	4 010	4 150	3 830	0.442
E 255	55	100	21	14	14.28	5 560	5 000	5 300	4 830	0.591
E 260	60	110	22	15	14.28	5 770	5 600	5 490	5 300	0.782
E 265	65	120	23	15	15.87	6 800	6 800	6 490	6 500	0.980
E 270	70	125	24	16	15.87	7 085	7 400	6 730	7 100	1.084
E 275	75	130	25	17	15.87	7 345	8 000	6 980	7 600	1.188
E 280	80	140	26	17	17.46	8 960	9 600	8 490	9 100	1.417
E 285	85	150	28	16	19.05	9 830	10 700	9 330	10 200	1.755
E 290	90	160	30	15	22.22	12 490	13 200	11 920	12 700	2.212
E 295	95	170	32	17	20.64	11 780	13 400	11 190	12 800	2.720
E 200/100	100	180	34	16	23.81	14 740	16 400	14 050	15 700	3.267
E 200/105	105	190	36	16	25.40	17 030	18 600	16 190	17 800	4.000
E 200/110	110	200	38	17	25.40	17 670	20 100	16 760	19 100	4.630
E 200/120	120	215	40	18	25.40	17 900	21 700	16 900	20 700	5.600
E 200/130	130	230	40	17	28.57	20 400	25 600	19 400	24 400	6.300
E 200/140	140	250	42	18	30.16	23 140	30 400	21 900	29 000	8.260

For larger sizes consult our Technical Department

E 200

ISO 02



Maximum reference speed (V_h)

(for oil-lubricated bearing, ABEC 7, contact angle = 15°)

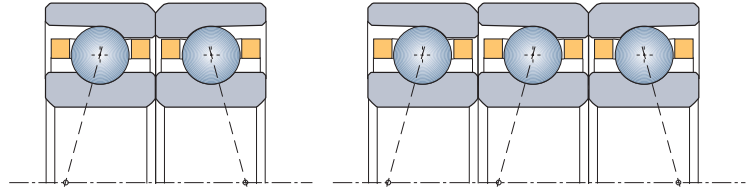
SNFA	Spring preload	Solid preload					
		Light L		Medium M		Heavy F	
		Single	Pairs	Triplex	Pairs	Triplex	Pairs
E 207	109 000	87 000	78 300	71 000	63 900	44 000	39 600
E 208	98 500	78 800	71 000	64 600	58 200	39 400	35 500
E 209	90 000	72 000	64 800	59 000	53 100	36 000	32 400
E 210	78 500	63 000	56 700	51 000	45 900	31 000	27 900
E 212	71 500	57 000	51 300	46 000	41 400	28 500	25 700
E 215	62 500	50 000	45 000	40 000	36 000	25 000	22 500
E 217	55 000	44 000	39 600	35 500	32 000	22 000	19 800
E 220	46 500	37 000	33 300	30 000	27 000	18 500	16 700
E 225	40 000	32 000	28 800	26 000	23 400	16 000	14 400
E 230	33 500	27 000	24 300	21 500	19 400	13 500	12 200
E 235	28 500	23 000	20 700	18 500	16 700	11 500	10 400
E 240	25 500	20 000	18 000	16 500	14 900	10 000	9 000
E 245	23 000	18 500	16 700	15 000	13 500	9 000	8 100
E 250	21 500	17 000	15 300	14 000	12 600	8 500	7 700
E 255	19 000	15 000	13 500	12 500	11 300	7 500	6 800
E 260	17 500	14 000	12 600	11 000	9 900	7 000	6 300
E 265	16 000	12 500	11 300	10 000	9 000	6 300	5 700
E 270	15 000	12 000	10 800	9 500	8 600	6 000	5 400
E 275	14 000	11 000	9 900	9 000	8 100	5 500	5 000
E 280	13 000	10 500	9 500	8 500	7 700	5 200	4 700
E 285	12 000	10 000	9 000	8 000	7 200	4 800	4 400
E 290	11 500	9 000	8 100	7 500	6 800	4 500	4 100
E 295	10 500	8 500	7 700	7 000	6 300	4 200	3 800
E 200/100	10 000	8 000	7 200	6 500	5 900	4 000	3 600
E 200/105	9 300	7 500	6 800	6 100	5 500	3 700	3 400
E 200/110	9 000	7 000	6 300	5 500	5 000	3 600	3 200
E 200/120	8 200	6 600	5 900	5 300	4 700	3 200	2 900
E 200/130	7 500	6 000	5 400	4 800	4 400	3 000	2 700
E 200/140	6 700	5 300	4 800	4 400	4 000	2 700	2 400

With grease = V_h · 0,65 - With 25° contact angle = V_h · 0,9
 ABEC 9 = V_h · 1,1 - ABEC 5 = V_h · 0,9
 Tandem = V_h single · 0,9

E 200

ISO 02

Values of preload and rigidity
(Bearings rigidly preloaded)
contact angle = 15°



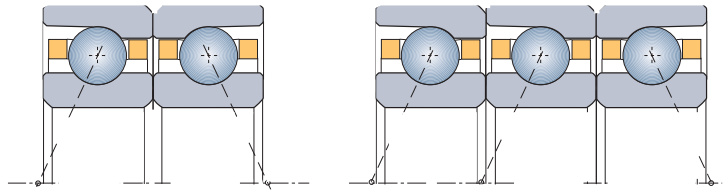
SNFA	Light preload L			Medium preload M			Heavy preload F		
	Pr	Ra		Pr	Ra		Pr	Ra	
		Pairs	Triplex		Pairs	Triplex		Pairs	Triplex
E 207	2.0	1.2	1.7	6.0	1.7	2.5	12.0	2.2	3.2
E 208	2.3	1.2	1.8	7.0	1.8	2.6	14.0	2.2	3.2
E 209	2.9	1.5	2.3	8.7	2.2	3.3	17.0	2.8	4.1
E 210	3.5	1.6	2.4	10.5	2.3	3.4	21.0	2.9	4.3
E 212	3.5	1.8	2.6	11.5	2.5	3.7	23.0	3.2	4.7
E 215	4.8	2.0	2.9	14.4	2.8	4.2	28.8	3.6	5.3
E 217	6.0	2.3	3.3	18.0	3.2	4.8	36.0	4.0	6.0
E 220	7.0	2.7	4.0	21.0	3.9	5.7	42.0	4.9	7.2
E 225	9.0	3.2	4.8	27.0	4.7	6.9	54.0	5.9	8.6
E 230	12.0	3.8	5.6	36.5	5.5	8.1	73.0	6.9	10.1
E 235	13.5	4.4	6.4	41.0	6.3	9.2	82.0	7.9	11.6
E 240	18.0	5.0	7.4	54.5	7.2	10.7	109.0	9.2	13.5
E 245	18.7	5.3	7.9	56.0	7.7	11.4	112.0	9.7	14.3
E 250	22.8	5.7	8.4	68.5	8.2	12.1	137.0	10.4	15.3
E 255	29.0	6.4	9.5	87.0	9.3	13.7	174.0	11.7	17.2
E 260	30.5	6.9	10.1	92.0	9.9	14.6	184.0	12.5	18.4
E 265	35.5	7.5	11.0	107.0	10.8	15.9	214.0	13.5	20.0
E 270	37.0	7.9	11.6	111.0	11.4	16.8	222.0	14.3	21.1
E 275	38.5	8.3	12.3	115.0	12.0	17.7	230.0	15.0	22.3
E 280	46.0	9.1	13.4	138.0	13.2	19.4	276.0	16.6	24.4
E 285	51.5	9.3	13.8	154.5	13.5	19.9	309.0	17.0	25.1
E 290	65.5	10.2	15.1	196.0	14.7	21.7	392.0	18.6	27.4
E 295	61.5	10.7	15.7	185.0	15.6	22.6	370.0	19.3	28.5
E 200/100	77.0	11.5	17.0	231.0	16.5	24.5	462.0	21.0	30.9
E 200/105	89.0	12.4	18.2	267.0	17.9	26.3	534.0	22.5	33.1
E 200/110	92.0	13.0	19.2	276.0	18.8	27.7	552.0	23.7	34.9
E 200/120	95.0	13.7	20.2	280.0	19.6	28.9	560.0	24.7	36.4
E 200/130	107.0	14.3	21.0	320.0	20.6	30.2	641.0	25.9	38.1
E 200/140	121.0	15.7	23.1	363.0	22.7	33.3	726.0	28.6	42.0

E 200

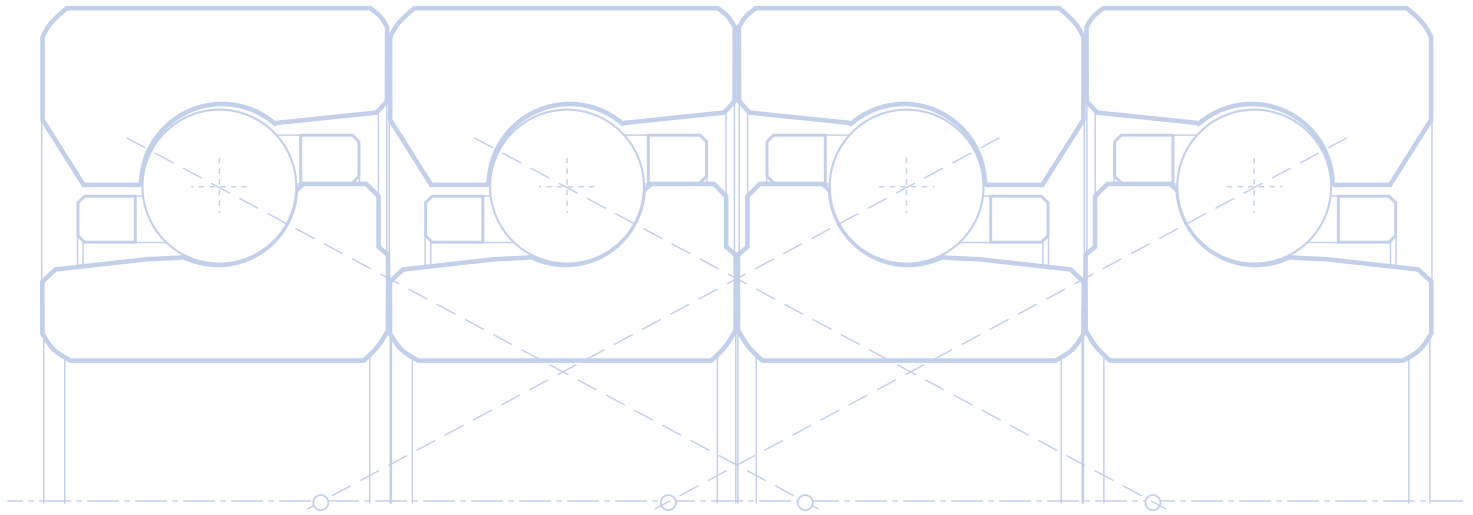
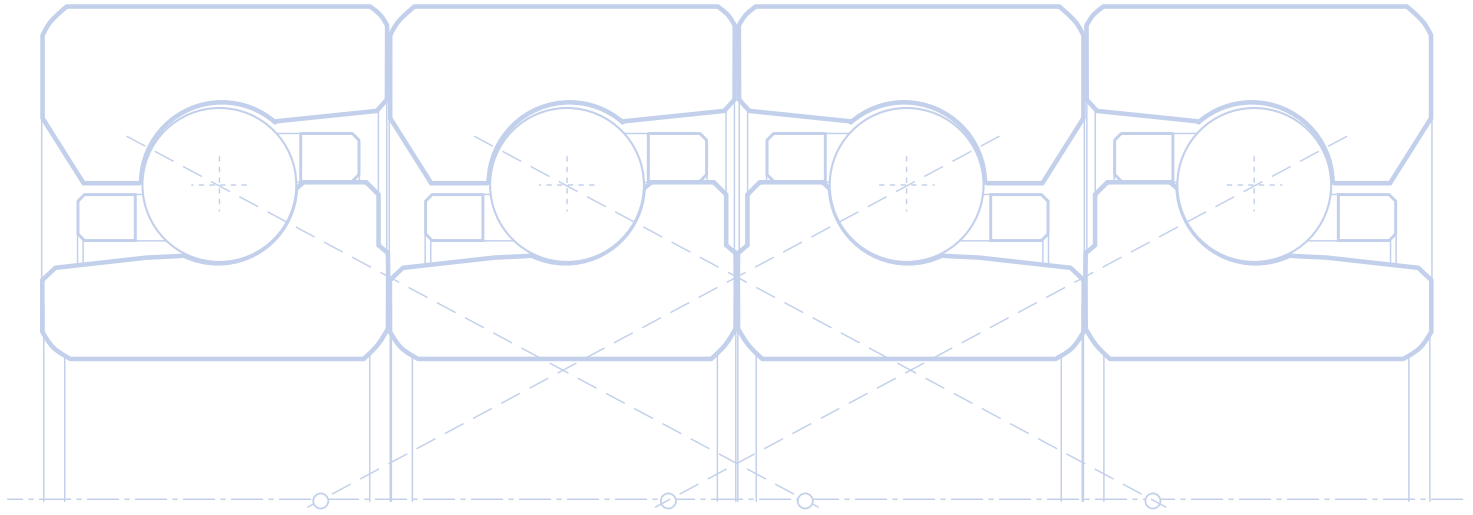
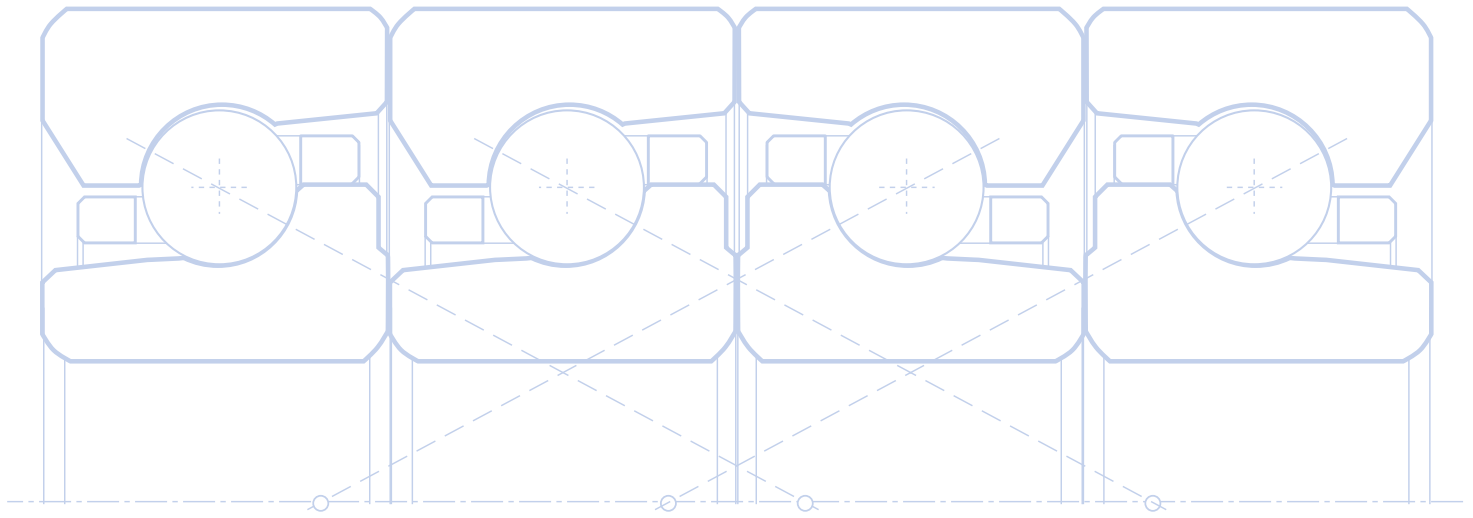
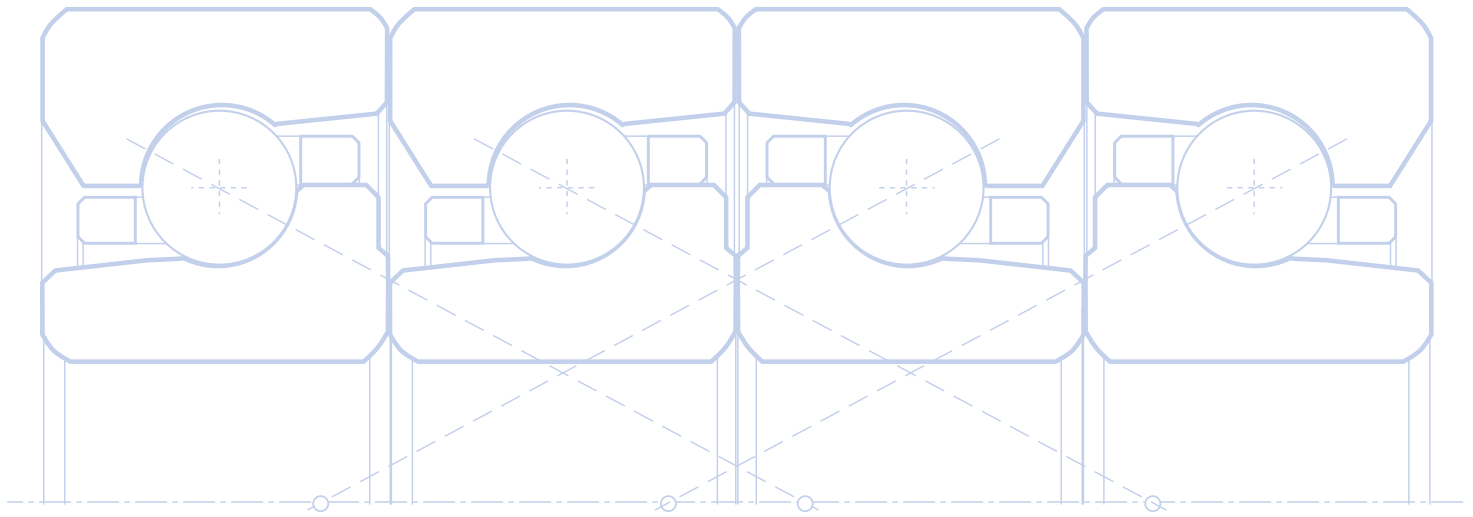
ISO 02



Values of preload and rigidity
(Bearings rigidly preloaded)
contact angle = 25°



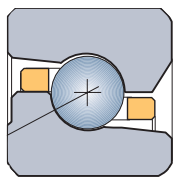
SNFA	Light preload L			Medium preload M			Heavy preload F		
	Pr	Ra		Pr	Ra		Pr	Ra	
		Pairs	Triplex		Pairs	Triplex		Pairs	Triplex
E 207	3.0	3.1	4.5	9.0	4.4	6.5	18.0	5.6	8.2
E 208	3.5	3.1	4.6	10.5	4.5	6.7	21.0	5.7	8.4
E 209	4.7	4.1	6.0	14.0	5.9	8.7	28.0	7.4	10.9
E 210	5.6	4.3	6.2	17.0	6.6	9.0	34.0	7.6	11.4
E 212	6.0	4.8	6.9	18.5	6.8	10.0	37.0	8.6	12.6
E 215	8.0	5.4	7.9	23.7	7.7	11.4	47.4	9.7	14.3
E 217	9.6	6.0	8.8	29.0	8.6	12.7	58.0	10.9	16.0
E 220	11.5	7.2	10.6	34.0	10.3	15.0	68.0	13.0	19.2
E 225	15.0	8.7	12.8	44.0	12.4	18.3	87.0	15.6	23.0
E 230	20.0	10.1	14.9	60.0	14.6	21.5	120.0	18.3	27.1
E 235	22.0	11.7	17.1	66.5	16.7	24.6	132.5	21.0	31.0
E 240	29.5	13.4	19.7	88.0	19.3	28.4	176.0	24.3	35.0
E 245	30.0	14.1	20.9	90.0	20.4	30.1	180.0	25.8	37.9
E 250	36.7	15.3	22.3	110.0	21.8	32.1	220.0	27.5	40.5
E 255	46.0	17.0	25.0	138.0	24.5	36.1	276.0	30.9	45.4
E 260	48.0	18.0	26.6	144.0	26.0	38.3	288.0	32.8	48.2
E 265	57.3	20.0	29.2	172.0	28.6	42.1	344.0	36.0	53.0
E 270	59.5	21.2	30.8	178.5	30.1	44.5	357.0	38.0	56.0
E 275	61.7	22.0	32.5	185.0	31.8	46.9	370.0	39.3	59.1
E 280	75.0	24.3	35.8	225.0	35.1	51.6	450.0	44.2	65.1
E 285	82.5	24.8	36.5	247.5	35.8	52.7	495.0	45.0	66.4
E 290	105.3	27.2	40.0	316.0	38.9	57.7	632.0	49.3	72.6
E 295	99.0	27.9	41.5	297.0	40.6	59.9	594.0	51.2	75.5
E 200/100	124.2	30.7	45.1	372.5	44.2	65.1	745.0	55.7	82.0
E 200/105	143.0	32.8	48.3	429.0	47.4	69.7	858.0	59.7	87.8
E 200/110	148.0	34.6	50.9	444.0	49.9	73.4	888.0	62.9	92.5
E 200/120	150.0	36.1	53.1	450.0	52.1	76.6	900.0	65.6	96.5
E 200/130	171.0	37.8	55.6	513.0	54.5	80.1	1 027.0	68.6	101.0
E 200/140	194.0	41.6	61.3	582.0	60.0	88.4	1 164.0	75.7	111.3



BS 200 - BS

ISO 02

SPECIAL



series **BS 200** ISO 02 - **BS** SPECIAL

Ball Screw Support Bearings

BS200 (ISO 02) and BS Special Size bearings are particularly suitable for precision applications with predominantly axial loads, due to their high axial rigidity and load capacity.

BS bearings are manufactured to class ABEC 7 with reduced axial runout error of 2.5 mm.

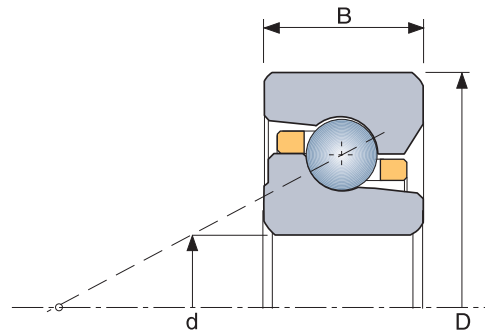
This high degree of precision translates into

- constant torque and uniform rotation even at high pre-load
- limited axial position error
- low operating temperature.

Similarly to the precision angular contact ball bearings described so far, BS bearings are supplied either individually or in sets to better satisfy a wide range of different applications.

BS 200

ISO 02

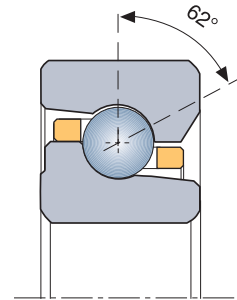


SNFA	d	D	B	z	Ø	C33	C0	Vh		Weight
								Pairs	Quads	
BS 212	12	32	10	10	4.76	945	1 440	9 000	7 600	0.037
BS 215	15	35	11	12	4.76	1 025	1 760	8 000	6 800	0.047
BS 217*	17	40	12	12	5.55	1 365	2 380	7 000	6 000	0.069
BS 220	20	47	14	13	6.35	1 820	3 380	6 000	5 000	0.111
BS 225	25	52	15	15	6.35	1 937	3 970	5 200	4 400	0.138
BS 230	30	62	16	16	7.14	2 460	5 400	4 400	3 700	0.220
BS 235	35	72	17	17	7.94	3 055	7 100	3 800	3 200	0.320
BS 240	40	80	18	18	8.73	3 745	9 100	3 400	2 900	0.400
BS 245	45	85	19	19	8.73	3 785	9 700	3 100	2 600	0.460
BS 250	50	90	20	20	8.73	3 835	10 300	2 900	2 400	0.520
BS 260	60	110	22	19	11.11	5 805	15 800	2 400	2 000	0.860
BS 275	75	130	25	24	11.11	6 400	20 200	2 000	1 700	1.500

* Made on request

BS

(special)

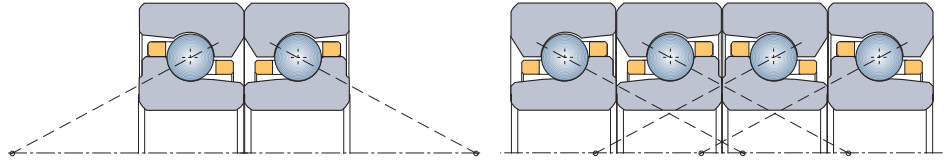


SNFA	d	D	B	z	Ø	C33	C0	Vh		Weight
								Pairs	Quads	
BS 20/47	20	47	15	13	6.35	1 820	3 380	6 000	5 000	0.128
BS 25/62	25	62	15	16	7.14	2 460	5 400	4 400	3 700	0.242
BS 30/62	30	62	15	16	7.14	2 460	5 400	4 400	3 700	0.217
BS 35/72	35	72	15	17	7.94	3 055	7 100	3 800	3 200	0.282

Maximum speed with grease = Vh • 0,65

BS 200

ISO 02

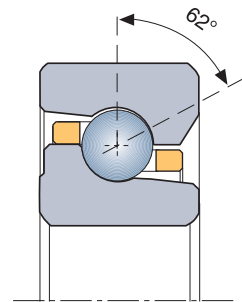


SNFA	PAIRS				QUADS				Maximum axial runout (µm)
	Pr	Ra	La	Cr	Pr	Ra	La	Cr	
BS 212	100	42	625	2.8	200	84	1 250	5.6	2.5
BS 215	120	50	755	4	240	100	1 510	8	2.5
BS 217*	165	58	1 030	6	330	116	2 060	12	2.5
BS 220	230	72	1 450	10	460	144	2 900	20	2.5
BS 225	270	83	1 670	12	540	166	3 340	23	2.5
BS 230	360	100	2 260	19	720	200	4 520	37	2.5
BS 235	475	118	2 960	33	950	236	5 920	67	2.5
BS 240	600	137	3 790	41	1 200	274	7 580	81	2.5
BS 245	640	145	4 020	47	1 280	290	8 040	92	2.5
BS 250	680	153	4 220	53	1 360	306	8 440	106	2.5
BS 260	1 040	185	6 500	88	2 080	370	13 000	176	2.5
BS 275	1 310	233	7 600	169	2 620	466	15 200	338	2.5

* Made on request

BS

(special)



SNFA	PAIRS				QUADS				Maximum axial runout (µm)
	Pr	Ra	La	Cr	Pr	Ra	La	Cr	
BS 20/47	230	72	1 450	10	460	144	2 900	20	2.5
BS 25/62	360	100	2 260	19	720	200	4 520	37	2.5
BS 30/62	360	100	2 260	19	720	200	4 520	37	2.5
BS 35/72	475	118	2 960	33	950	236	5 920	67	2.5

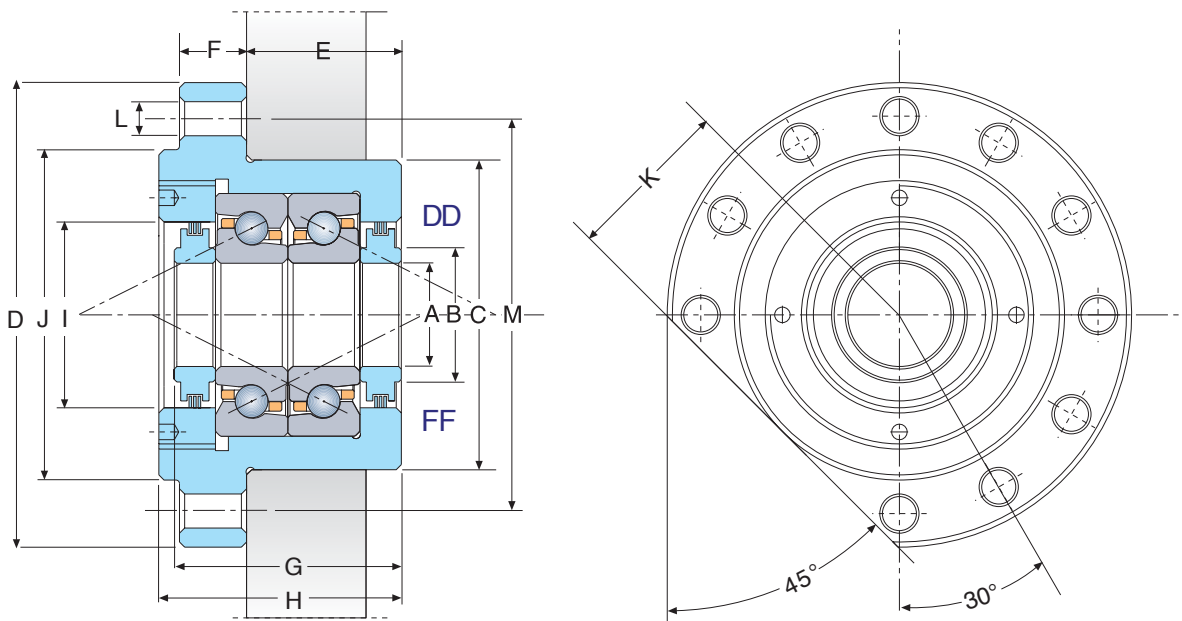
BSDU, BSQU and BSQU / 1 Cartridge Units

Another effective solution for ballscrews is the use of **BSDU** and **BSQU** cartridges, containing two and four BS200 bearings respectively, with different arrangements, as shown in this catalogue, or to specific requirements.

Cartridges can be easily assembled, and allow high precision and rigidity. They are well sealed and lubricated for a long life.

BSQU/1 cartridges, supplied on request, differ from standard BSQUs in the position of the clamping flange. In this case they contain four BS 200 bearings in any combination.

Ball screw bearing cartridge units, series BSDU

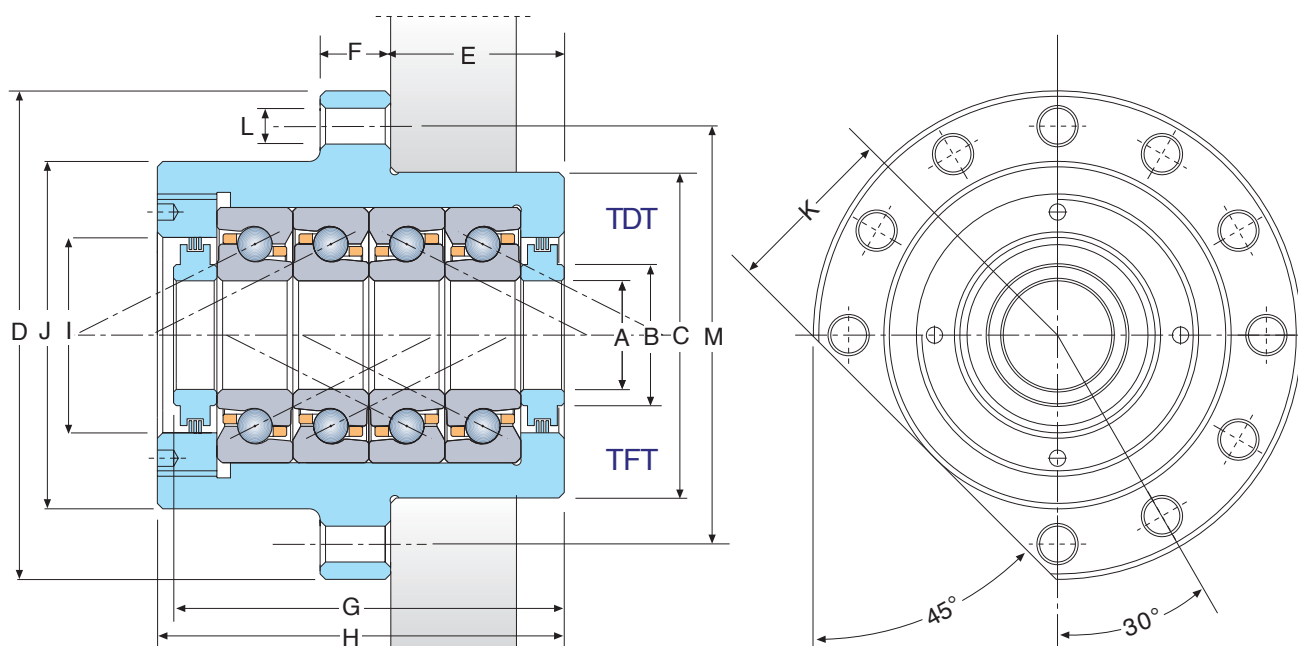


Shaft Dia.. mm	SNFA	Dimensions: ± 0,13 mm														C ₃₃	C _o	C _r	R _a	Axial Runout μm	Weight	Vg*
		A	B	C	D	E	F	G	H	I	J	K	L	M								
20	BSDU 220 DD 230	20.000	26.0	60.000	90.0	32.0	13.0	44.260	47.0	36.0	64.0	32.0	6.6	76.0	1820	3380	10	72	2.5	1.1	3900	
	BSDU 220 FF 230	19.996		59.987				43.240														
25	BSDU 225 DD 270	25.000	34.0	80.000	120.0	32.0	15.0	50.260	52.0	36.0	88.0	44.0	9.2	102.0	1937	3970	12	83	2.5	2.3	3400	
	BSDU 225 FF 270	24.996		79.987				49.240														
30	BSDU 230 DD 360	30.000	41.0	80.000	120.0	32.0	15.0	50.260	52.0	50.0	88.0	44.0	9.2	102.0	2460	5400	19	100	2.5	2.3	2850	
	BSDU 230 FF 360	29.996		79.987				49.240														
35	BSDU 235 DD 475	35.000	46.0	90.000	130.0	32.0	15.0	50.260	52.0	60.0	98.0	49.0	9.2	113.0	3055	7100	33	118	2.5	3.2	2500	
	BSDU 235 FF 475	34.995		89.987				49.240														
40	BSDU 240 DD 600	40.000	55.0	124.000	165.0	43.5	17.0	64.260	66.0	66.0	128.0	64.0	11.4	146.0	3745	9100	41	137	2.5	6.1	2200	
	BSDU 240 FF 600	39.995		123.982				63.240														
45	BSDU 245 DD 640	45.000	66.0	124.000	165.0	43.5	17.0	64.260	66.0	76.0	128.0	64.0	11.4	146.0	3785	9700	47	145	2.5	5.9	2000	
	BSDU 245 FF 640	44.995		123.982				63.240														
50	BSDU 250 DD 680	50.000	66.0	124.000	165.0	43.5	17.0	64.260	66.0	76.0	128.0	64.0	11.4	146.0	3835	10300	53	153	2.5	5.7	1900	
	BSDU 250 FF 680	49.995		123.982				63.240														

Final number in reference is the bearing set preload value in daN (1 daN = 10 N). Special preload values are available on request.

* Grease lubrication - cartridge units will be supplied greased with high quality synthetic grease.

Balls screw bearing cartridge units, series BSQU

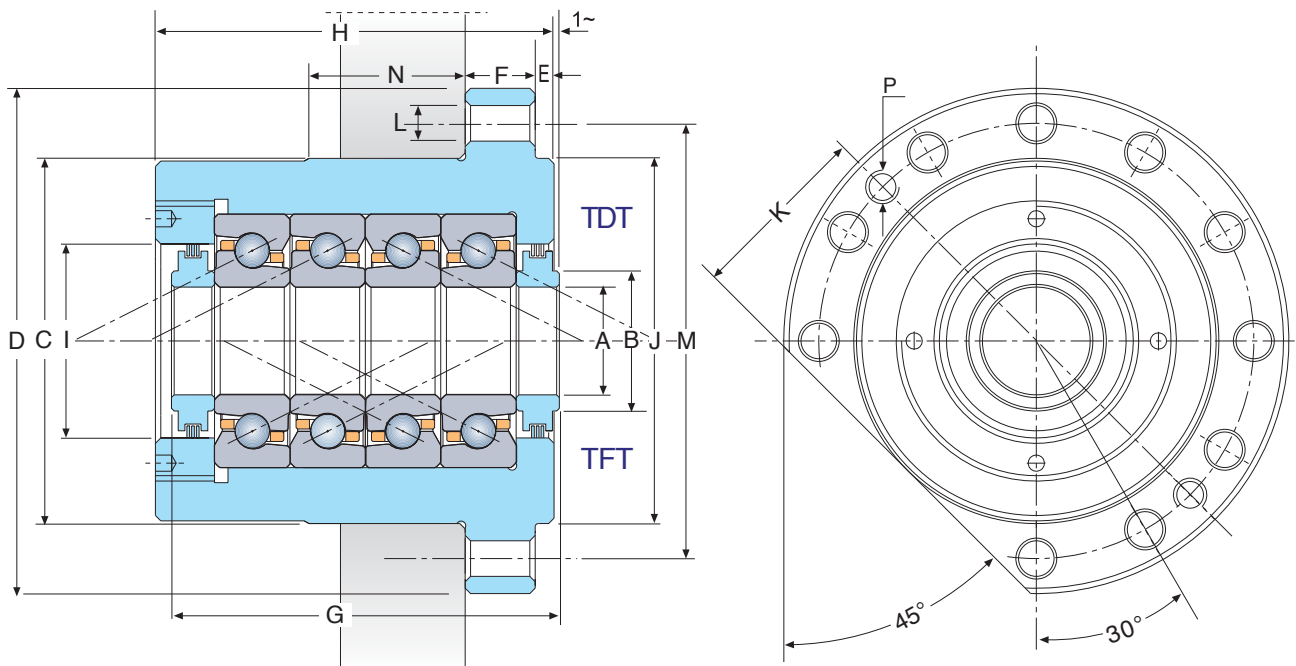


Shaft Diam. mm	SNFA	Dimensions: ± 0,13 mm													C ₃₃	C _o	C _r	R _a	Axial Runout µm	Weight	Vg*
		A	B	C	D	E	F	G	H	I	J	K	L	M							
20	BSQU 220 TDT 460	20.000	26.0	60.000	90.0	32.0	13.0	74.260	77.0	36.0	64.0	32.0	6.6	76.0	2950	6760	20	144	2.5	1.7	3250
	BSQU 220 TFT 460	19.996		59.987				72.740													
25	BSQU 225 TDT 540	25.000	34.0	80.000	120.0	32.0	15.0	80.260	82.0	40.0	88.0	44.0	9.2	102.0	3140	7940	23	166	2.5	3.5	2850
	BSQU 225 TFT 540	24.996		79.987				78.740													
30	BSQU 230 TDT 720	30.000	41.0	80.000	120.0	32.0	15.0	82.260	84.0	50.0	88.0	44.0	9.2	102.0	3985	10800	37	200	2.5	3.5	2400
	BSQU 230 TFT 720	29.996		79.987				80.740													
35	BSQU 235 TDT 950	35.000	46.0	90.000	130.0	32.0	15.0	84.260	86.0	60.0	98.0	49.0	9.2	113.0	4950	14200	67	236	2.5	4.6	2100
	BSQU 235 TFT 950	34.995		89.987				82.740													
40	BSQU 240 TDT 1200	40.000	55.0	124.000	165.0	43.5	17.0	104.260	106.0	66.0	128.0	64.0	11.4	146.0	6070	18200	81	274	2.5	9.7	1900
	BSQU 240 TFT 1200	39.995		123.982				102.740													
45	BSQU 245 TDT 1280	45.000	66.0	124.000	165.0	43.5	17.0	104.260	106.0	76.0	128.0	64.0	11.4	146.0	6130	19400	92	290	2.5	9.4	1700
	BSQU 245 TFT 1280	44.995		123.982				102.740													
50	BSQU 250 TDT 1360	50.000	66.0	124.000	165.0	43.5	17.0	104.260	106.0	76.0	128.0	64.0	11.4	146.0	6210	20600	106	306	2.5	9.1	1550
	BSQU 250 TFT 1360	49.995		123.982				102.740													

Final number in reference is the bearing set preload value in daN (1 daN = 10 N). Special preload values are available on request.

* Grease lubrication - cartridge units will be supplied greased with high quality synthetic grease.

Ball screw bearing cartridge units, series BSQU/1



Shaft Diam. mm	SNFA	Dimensions: ± 0,13 mm															C ₃₃	C ₀	C _r	R _a	Axial Runout µm	Weight	Vg*
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	P							
30	BSQU 230/1 TDT 720	30.000	41.0	88.000	120.0	3.5	15.0	86.260	86.0	50.0	88.0	45.0	9.2	102.0	35.0	M8x 1.25	3985	10800	37	200	2.5	3.7	2400
	BSQU 230/1 TFT 720	29.996		87.985				84.740															
40	BSQU 240/1 TDT 1200	40.000	55.0	128.000	165.0	4.0	24.0	106.260	106.0	66.0	128.0	65.5	11.4	146.0	35.0	M10x 1.5	6070	18200	81	274	2.5	10.0	1900
	BSQU 240/1 TFT 1200	39.995		127.982				104.740															
50	BSQU 250/1 TDT 1360	50.000	66.0	128.000	165.0	4.0	24.0	106.260	106.0	76.0	128.0	65.5	11.4	146.0	35.0	M10x 1.5	6210	20600	106	306	2.5	9.3	1550
	BSQU 250/1 TFT 1360	49.995		127.982				104.740															
60	BSQU 260/1 TDT 2080	60.000	80.0	145.000	185.0	20.5	25.0	114.260	114.0	92.0	145.0	74.5	11.4	165.0	40.0	M10x 1.5	9400	31600	176	370	2.5	12.3	1300
	BSQU 260/1 TFT 2080	59.993		144.982				112.740															

Final number in reference is the bearing set preload value in daN (1 daN = 10 N). Special preload values are available on request.

* Grease lubrication - cartridge units will be supplied greased with high quality synthetic grease.



Series VEB-VEX very high speed bearings

SNFA Series **VEB (ISO 19)** and **VEX (ISO 10)** have been developed to offer outstanding performance even in very demanding and advanced applications.

The different issues affecting high speed applications have been analysed when designing and producing these series. Particular attention has been paid to dynamic and heat effects and lubrication problems without neglecting other features such as the load capacity and rigidity.

VEB and VEX bearings offer a wide range of application possibilities both with grease and oil lubrication.

The speeds indicated in the Tables are valid for optimum operating conditions.

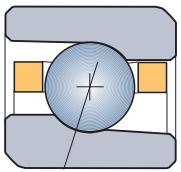
The values given for rigidly preloaded bearings are valid as long as operating conditions do not involve marked heat-induced preload increase. In some applications, such as electrospindles for instance, the electric motor generated heat thermally increases bearing preload and reduces the speed obtainable.

In such cases a lower than indicated catalogue value of preload should be used so that at operating temperature the correct preload is obtained.

H1/NS version VEB and VEX bearings (with ceramic balls and air-oil lubrication feed holes in the outer ring) are the ideal solution for reaching maximum speed.

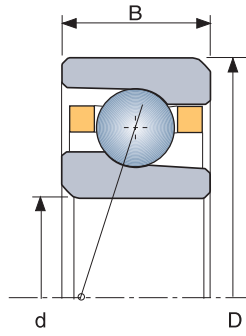
Minimum air-oil lubrication, controlled constant preload, accurate bearing mounting and good spindle balance are necessary for obtaining satisfactory results with VEB and VEX bearings.

VEB
ISO 19



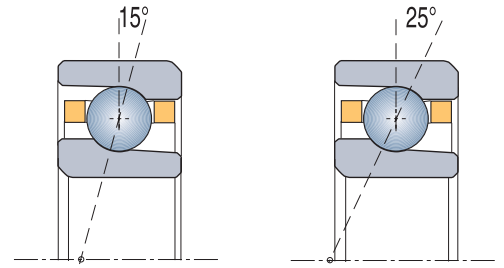
series **VEB** ISO 19





SNFA	d	D	B	z	Ø	15°		25°		Weight
						C33	C0	C33	C0	
VEB 8	8	19	6	9	3.17	178	73			0.007
VEB 10	10	22	6	11	3.17	210	95	198	91	0.009
VEB 12	12	24	6	12	3.17	220	107	210	102	0.010
VEB 15	15	28	7	12	3.97	330	166	310	158	0.015
VEB 17	17	30	7	13	3.97	340	184	330	175	0.016
VEB 20	20	37	9	14	4.76	500	290	480	270	0.036
VEB 25	25	42	9	16	4.76	540	340	510	320	0.040
VEB 30	30	47	9	18	4.76	580	390	540	370	0.050
VEB 35	35	55	10	19	5.55	790	560	750	540	0.075
VEB 40	40	62	12	19	6.35	1 000	740	950	700	0.100
VEB 45	45	68	12	21	6.35	1 050	830	1 000	780	0.130
VEB 50	50	72	12	21	7.14	1 310	1040	1 240	980	0.130
VEB 55	55	80	13	21	7.94	1 590	1 280	1 500	1 220	0.170
VEB 60	60	85	13	23	7.94	1 670	1 420	1 580	1 340	0.190
VEB 65	65	90	13	24	7.94	1 690	1 500	1 600	1 420	0.200
VEB 70	70	100	16	22	9.52	2 260	1 950	2 130	1 850	0.320
VEB 75	75	105	16	23	9.52	2 300	2 050	2 170	1 950	0.340
VEB 80	80	110	16	24	9.52	2 340	2 160	2 210	2 040	0.360
VEB 85	85	120	18	23	11.11	3 050	2 790	2 880	2 640	0.500
VEB 90	90	125	18	24	11.11	3 110	2 930	2 940	2 770	0.540
VEB 95	95	130	18	25	11.11	3 170	3 070	2 990	2 900	0.560
VEB 100	100	140	20	24	12.70	3 970	3 810	3 760	3 610	0.770

For larger sizes consult our Technical Department



Maximum reference speed (V_h)

(for oil-lubricated bearing, ABEC 7, contact angle = 15°)

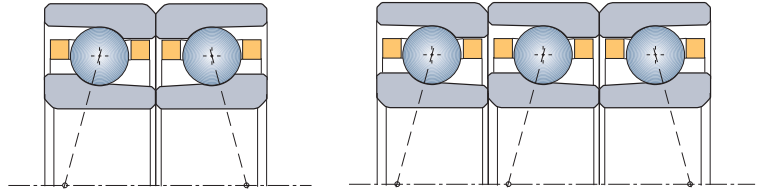
SNFA	Spring preload	Solid preload					
		Light L		Medium M		Heavy F	
	Single	Pairs	Triplex	Pairs	Triplex	Pairs	Triplex
VEB 8	184 000	147 000	132 000	119 000	107 000	72 700	65 500
VEB 10	155 000	124 000	112 000	100 000	90 300	61 300	55 200
VEB 12	137 000	110 000	99 000	89 000	80 100	54 400	49 000
VEB 15	115 000	91 900	82 700	74 400	66 900	45 500	40 900
VEB 17	105 000	84 000	75 600	68 000	61 200	41 500	37 400
VEB 20	86 200	69 100	62 200	55 900	50 300	34 100	30 700
VEB 25	73 100	58 600	52 700	47 400	42 600	29 000	26 100
VEB 30	63 400	50 800	45 700	41 100	37 000	25 100	22 600
VEB 35	54 100	43 300	39 000	35 000	31 500	21 400	19 300
VEB 40	47 500	38 100	34 300	30 800	27 700	18 800	16 900
VEB 45	42 700	34 200	30 800	27 700	24 900	16 900	15 200
VEB 50	39 500	31 600	28 500	25 600	23 000	15 600	14 100
VEB 55	35 500	28 500	25 600	23 000	20 700	14 100	12 700
VEB 60	33 000	26 400	23 800	21 400	19 200	13 100	11 800
VEB 65	30 800	24 600	22 200	19 900	17 900	12 200	11 000
VEB 70	27 900	22 400	20 100	18 100	16 300	11 100	9 900
VEB 75	26 300	21 000	18 900	17 000	15 300	10 400	9 400
VEB 80	24 800	19 900	17 900	16 100	14 500	9 800	8 800
VEB 85	22 900	18 300	16 500	14 800	13 300	9 100	8 200
VEB 90	21 800	17 400	15 700	14 100	12 700	8 600	7 800
VEB 95	20 700	16 600	14 900	13 400	12 100	8 200	7 400
VEB 100	19 300	15 500	13 900	12 500	11 300	7 700	6 900

With grease = V_h · 0,65 - With 25° contact angle = V_h · 0,9

ABEC 9 = V_h · 1,1 - ABEC 5 = V_h · 0,9

Tandem = V_h single · 0,9

Values of preload and rigidity
(Bearings rigidly preloaded)
contact angle = 15°



SNFA	Light preload L			Medium preload M			Heavy preload F		
	Pr	Ra		Pr	Ra		Pr	Ra	
		Pairs	Triplex		Pairs	Triplex		Pairs	Triplex
VEB 8	0.9	0.8	1.2	2.7	1.3	1.8	5.5	1.8	2.5
VEB 10	1.1	1.0	1.4	3.2	1.5	2.2	6.5	2.1	3.1
VEB 12	1.1	1.0	1.5	3.4	1.7	2.4	6.8	2.3	3.3
VEB 15	1.7	1.3	1.9	5.1	2.0	2.9	10.2	2.8	4.0
VEB 17	1.8	1.4	2.0	5.4	2.2	3.1	10.8	3.0	4.3
VEB 20	2.6	1.7	2.5	7.9	2.8	4.0	15.7	3.8	5.4
VEB 25	2.8	1.9	2.8	8.5	3.1	4.4	17.0	4.2	6.0
VEB 30	3.0	2.1	3.1	9.0	3.4	4.8	18.0	4.6	6.6
VEB 35	4.1	2.6	3.8	12.5	4.1	5.9	25.0	5.5	7.9
VEB 40	5.2	2.9	4.3	15.7	4.6	6.6	31.5	6.3	9.0
VEB 45	5.5	3.2	4.6	16.6	5.0	7.2	33.1	6.8	9.7
VEB 50	6.9	3.6	5.2	21.0	5.5	8.0	41.0	7.6	10.8
VEB 55	8.3	3.9	5.7	25.0	6.1	8.8	50.0	8.3	11.9
VEB 60	8.7	4.2	6.2	26.2	6.6	9.5	52.3	8.9	12.8
VEB 65	8.9	4.4	6.4	26.6	6.8	9.8	53.2	9.2	13.2
VEB 70	12.0	4.8	7.1	36.0	7.5	10.8	71.0	10.2	14.6
VEB 75	12.0	5.0	7.3	36.1	7.7	11.2	72.2	10.5	15.1
VEB 80	12.3	5.2	7.5	37.0	8.0	11.6	74.0	10.8	15.6
VEB 85	16.0	5.8	8.4	47.9	8.9	12.9	95.7	12.1	17.4
VEB 90	16.3	6.0	8.7	48.8	9.2	13.3	97.7	12.5	17.9
VEB 95	16.6	6.2	9.0	50.0	9.5	13.8	99.5	12.9	18.5
VEB 100	20.8	6.8	9.8	62.4	10.5	15.1	125.0	14.1	20.3

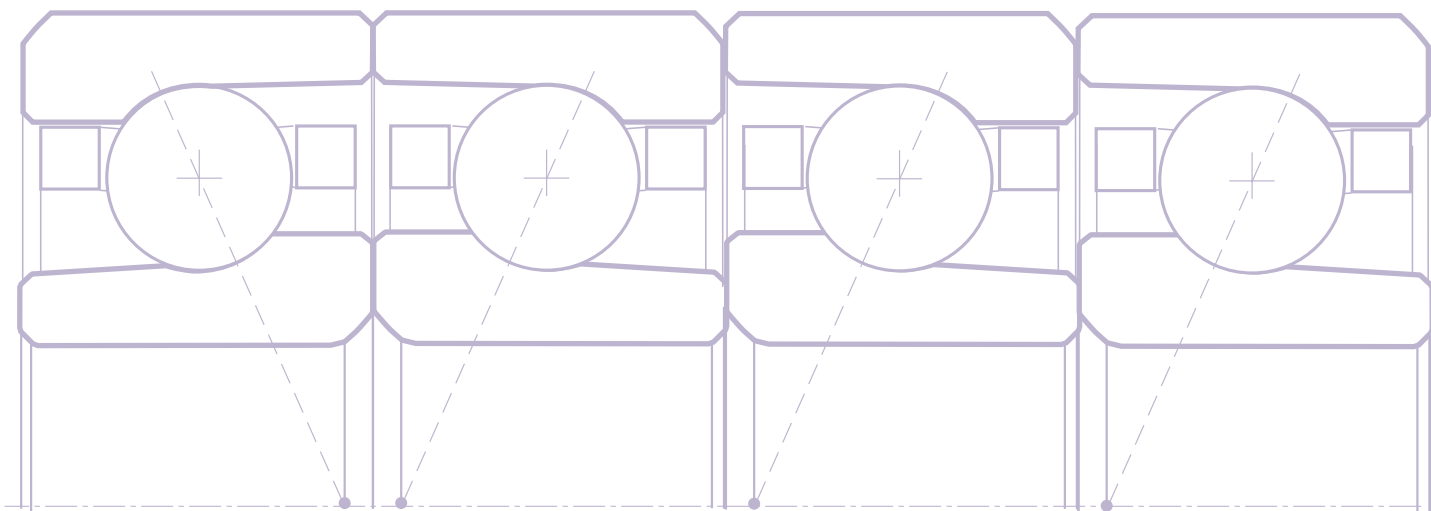
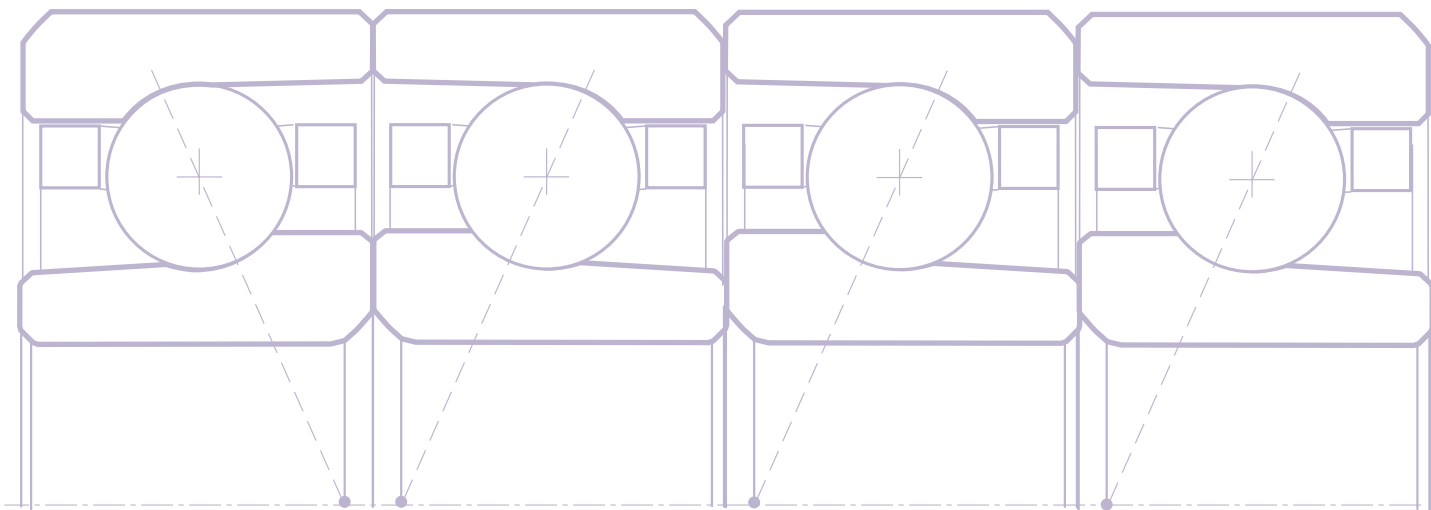
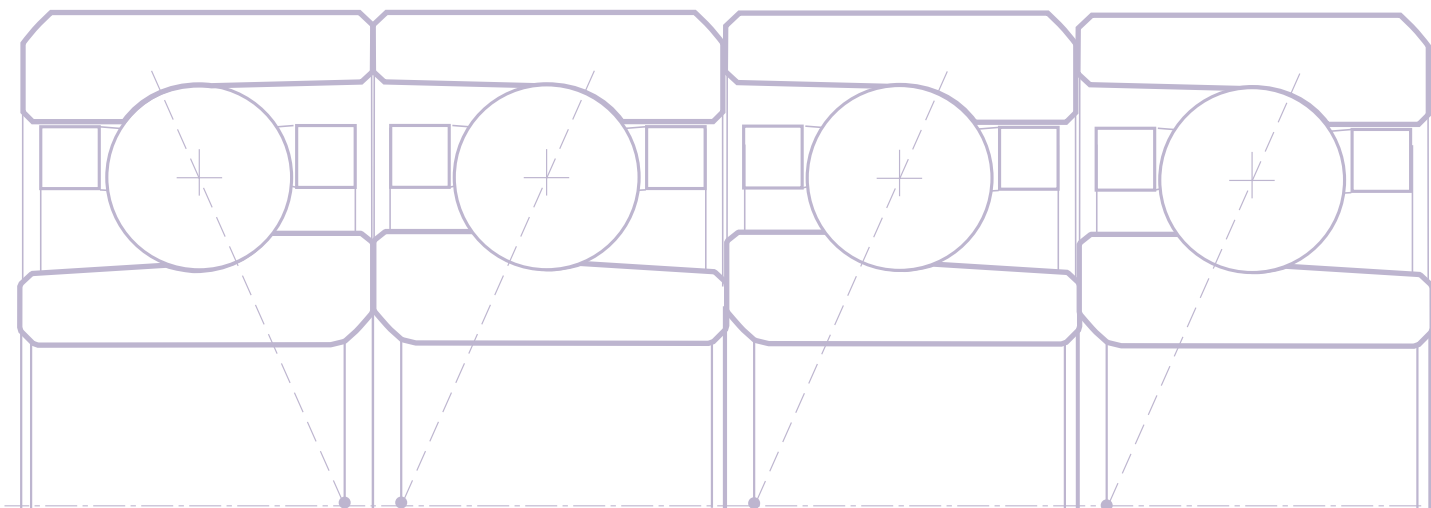
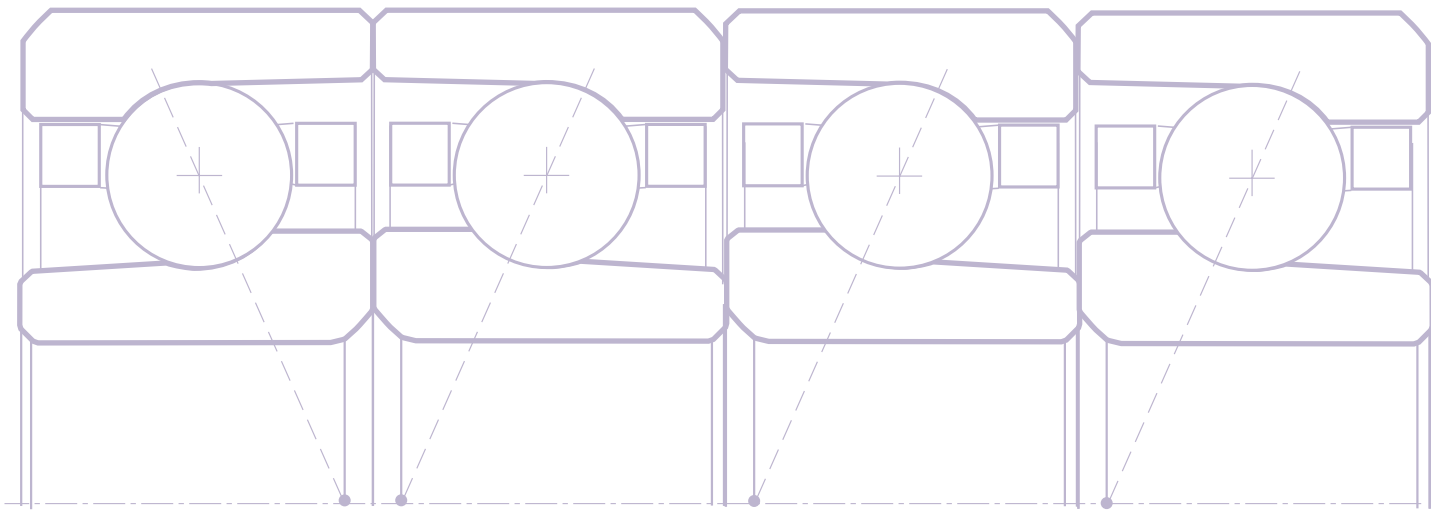
VEB

ISO 19

Values of preload and rigidity
(Bearings rigidly preloaded)
contact angle = 25°

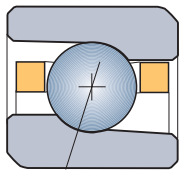


SNFA	Light preload L			Medium preload M			Heavy preload F		
	Pr	Ra		Pr	Ra		Pr	Ra	
		Pairs	Triplex		Pairs	Triplex		Pairs	Triplex
VEB 10	1.7	2.4	3.5	5.0	3.5	5.2	10.0	4.6	6.7
VEB 12	1.8	2.6	3.8	5.5	3.9	5.7	11.0	5.1	7.4
VEB 15	2.8	3.2	4.7	8.4	4.8	7.0	17.0	6.3	9.2
VEB 17	2.9	3.4	5.0	8.7	5.1	7.5	17.5	6.7	9.8
VEB 20	4.2	4.3	6.3	13.0	6.5	9.5	25.0	8.4	12.2
VEB 25	4.5	4.8	7.1	14.0	7.3	10.7	27.0	9.4	13.7
VEB 30	4.8	5.4	7.8	14.5	8.0	11.6	29.0	10.4	15.1
VEB 35	6.6	6.5	9.5	20.0	9.6	14.1	40.0	12.5	18.2
VEB 40	8.4	7.3	10.8	25.0	10.9	15.9	50.5	14.2	20.6
VEB 45	8.8	8.0	11.7	26.5	11.8	17.3	52.9	15.4	22.4
VEB 50	11.0	8.9	13.1	33.0	13.2	19.3	66.0	17.2	25.0
VEB 55	13.3	9.8	14.4	40.0	14.6	21.3	80.0	18.9	27.6
VEB 60	13.9	10.6	15.6	41.8	15.7	23.0	83.6	20.4	29.7
VEB 65	14.2	11.0	16.1	42.5	16.3	23.8	85.0	21.1	30.7
VEB 70	19.0	12.1	17.8	57.0	17.9	26.2	113.0	23.3	33.9
VEB 75	19.2	12.5	18.4	57.7	18.6	27.2	115.0	24.1	35.1
VEB 80	19.5	13.0	19.0	59.0	19.2	28.1	117.0	24.9	36.3
VEB 85	25.5	14.5	21.3	76.5	21.5	31.4	153.0	27.8	40.5
VEB 90	26.0	15.0	22.0	78.0	22.2	32.5	156.0	28.8	41.9
VEB 95	26.5	15.5	22.8	79.5	23.0	33.6	159.0	29.7	43.3
VEB 100	33.2	17.0	25.0	99.6	25.2	36.8	199.0	32.6	47.5



VEX

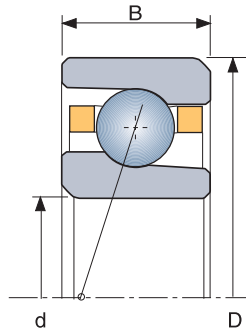
ISO 10



series **VEX** ISO 10

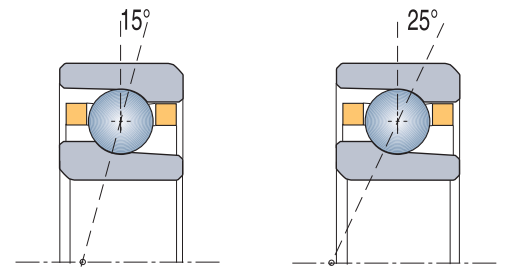
VEX

ISO 10



SNFA	d	D	B	z	Ø	15°		25°		Weight
						C33	C0	C33	C0	
						VEX 6	6	17	6	
VEX 7	7	19	6	8	3.57	198	77		0.008	
VEX 8	8	22	7	8	3.97	240	97		0.012	
VEX 9	9	24	7	9	3.97	260	113		0.015	
VEX 10	10	26	8	10	4.37	340	152		0.019	
VEX 12	12	28	8	10	4.76	390	182		0.021	
VEX 15	15	32	9	12	4.76	450	230		0.028	
VEX 17	17	35	10	12	5.55	600	310		0.035	
VEX 20	20	42	12	12	6.35	760	410		0.065	
VEX 25	25	47	12	14	6.35	840	500	800	480	0.078
VEX 30	30	55	13	17	6.35	950	630	900	600	0.110
VEX 35	35	62	14	17	7.14	1170	800	1110	770	0.150
VEX 40	40	68	15	19	7.14	1250	920	1180	870	0.190
VEX 45	45	75	16	21	7.14	1310	1040	1250	980	0.240
VEX 50	50	80	16	21	7.94	1600	1270	1510	1210	0.250
VEX 55	55	90	18	24	7.94	1710	1480	1620	1400	0.400
VEX 60	60	95	18	25	7.94	1740	1560	1650	1480	0.420
VEX 65	65	100	18	25	8.73	2080	1880	1970	1780	0.450
VEX 70	70	110	20	25	9.52	2430	2230	2300	2110	0.640
VEX 75	75	115	20	26	9.52	2670	2630	2520	2490	0.670
VEX 80	80	125	22	25	11.11	3470	3400	3290	3220	0.850
VEX 85	85	130	22	26	11.11	3540	3560	3340	3370	0.900
VEX 90	90	140	24	28	11.11	3670	3870	3470	3660	1.200
VEX 95	95	145	24	26	12.70	4520	4630	4270	4390	1.250
VEX 100	100	150	24	27	12.70	4600	4840	4350	4580	1.300
VEX 110	110	170	28	30	12.70	4830	5500	4560	5200	2.100
VEX 120	120	180	28	29	14.28	5900	6600	5600	6300	2.200

For larger sizes consult our Technical Department

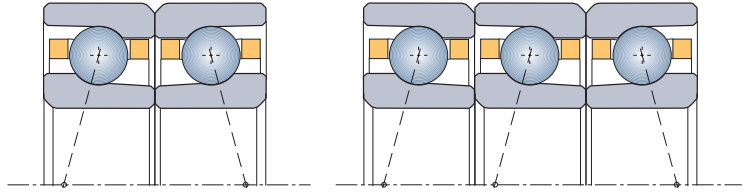


Maximum reference speed (V_h) (for oil-lubricated bearing, ABEC 7, contact angle = 15°)

SNFA	Spring preload	Solid preload					
		Light L		Medium M		Heavy F	
	Single	Pairs	Triplex	Pairs	Triplex	Pairs	Triplex
VEX 6	210 000	168 000	151 200	136 500	122 900	84 000	75 600
VEX 7	190 000	152 000	136 800	123 500	111 200	76 000	68 400
VEX 8	165 000	132 000	118 800	107 200	96 300	66 000	58 400
VEX 9	150 000	120 000	108 000	97 500	87 800	60 000	54 000
VEX 10	140 000	112 000	100 800	91 000	81 900	56 000	50 400
VEX 12	125 000	100 000	90 000	81 300	73 100	50 000	45 000
VEX 15	105 000	84 000	75 600	68 300	61 400	42 000	37 800
VEX 17	95 000	76 000	68 400	62 000	55 800	38 000	34 200
VEX 20	80 000	64 000	57 600	52 000	46 800	32 000	28 800
VEX 25	70 000	56 000	50 400	45 500	41 000	28 000	25 200
VEX 30	60 000	48 100	43 300	39 100	35 200	24 100	21 700
VEX 35	50 000	40 100	36 100	32 600	29 400	20 100	18 100
VEX 40	45 000	36 000	32 400	29 300	26 300	18 000	16 200
VEX 45	41 000	32 800	29 300	26 700	24 000	16 400	14 800
VEX 50	38 000	30 400	27 400	24 700	22 200	15 200	13 700
VEX 55	32 000	25 600	23 000	20 700	18 600	12 700	11 400
VEX 60	30 000	24 000	21 600	19 400	17 400	11 900	10 700
VEX 65	28 000	22 400	20 200	18 100	16 200	11 100	10 000
VEX 70	26 000	20 800	18 700	16 800	15 100	10 300	9 300
VEX 75	24 000	19 200	17 300	15 500	13 900	9 500	8 500
VEX 80	21 600	17 300	15 500	14 000	12 600	8 600	7 700
VEX 85	21 000	16 800	15 100	13 600	12 200	8 300	7 500
VEX 90	19 400	15 500	14 000	12 600	11 300	7 700	6 900
VEX 95	18 600	14 900	13 400	12 100	10 800	7 400	6 600
VEX 100	17 900	14 300	12 900	11 600	10 400	7 100	6 400
VEX 110	15 500	12 400	11 200	10 000	9 000	6 100	5 500
VEX 120	14 000	11 200	10 100	9 100	8 200	5 500	5 000

With grease = V_h · 0,65 - With 25° contact angle = V_h · 0,9
 ABEC 9 = V_h · 1,1 - ABEC 5 = V_h · 0,9
 Tandem = V_h single · 0,9

Values of preload and rigidity
(Bearings rigidly preloaded)
contact angle = 15°

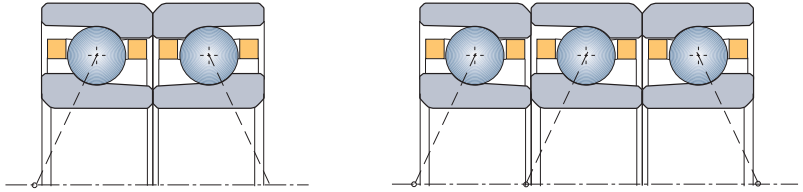


SNFA	Light preload L			Medium preload M			Heavy preload F		
	Pr	Ra		Pr	Ra		Pr	Ra	
		Pairs	Triplex		Pairs	Triplex		Pairs	Triplex
VEX 6	1.0	0.9	1.3	2.5	1.2	1.7	5.0	1.5	2.2
VEX 7	1.0	0.9	1.3	3.0	1.3	1.9	6.0	1.7	2.4
VEX 8	1.5	1.1	1.6	3.5	1.4	2.1	7.5	1.8	2.7
VEX 9	1.5	1.2	1.7	4.0	1.6	2.4	8.0	2.0	3.0
VEX 10	1.5	1.3	1.9	5.0	1.9	2.8	10.0	2.4	3.6
VEX 12	2.0	1.5	2.2	6.0	2.1	3.1	12.0	2.7	3.9
VEX 15	2.5	1.8	2.6	7.0	2.5	3.7	14.0	3.2	4.6
VEX 17	3.0	2.0	2.9	9.0	2.9	4.2	18.5	3.6	5.4
VEX 20	4.0	2.3	3.4	12.0	3.3	4.9	23.5	4.1	6.1
VEX 25	4.5	2.7	3.9	13.0	3.9	5.5	26.0	4.9	7.0
VEX 30	5.0	3.1	4.6	15.0	4.5	6.6	30.0	5.7	8.3
VEX 35	6.0	3.5	5.1	18.0	5.0	7.3	37.0	6.3	9.3
VEX 40	6.5	3.8	5.6	20.0	5.5	8.1	39.0	6.9	10.2
VEX 45	7.0	4.2	6.1	21.0	6.0	8.8	41.0	7.5	11.1
VEX 50	8.5	4.6	6.8	25.0	6.6	9.7	50.0	8.3	12.2
VEX 55	9.0	5.1	7.6	27.0	7.4	10.9	54.0	9.3	13.7
VEX 60	9.2	5.3	7.8	27.5	7.7	11.3	55.0	9.6	14.2
VEX 65	11.0	5.8	8.6	33.0	8.4	12.4	65.0	10.5	15.5
VEX 70	13.0	6.3	9.3	38.0	9.1	13.3	76.0	11.4	16.8
VEX 75	14.0	6.7	9.8	42.0	9.6	14.1	84.0	12.1	17.8
VEX 80	18.0	7.4	10.9	55.0	10.8	15.9	109.0	13.5	19.9
VEX 85	18.5	7.7	11.3	56.0	11.1	16.4	111.0	14.0	20.6
VEX 90	19.0	8.2	12.0	58.0	11.8	17.4	115.0	14.9	21.9
VEX 95	23.0	8.7	12.7	70.0	12.5	18.5	140.0	15.8	23.3
VEX 100	24.0	9.0	13.2	72.0	13.0	19.1	144.0	16.4	24.1
VEX 110	25.0	9.8	14.4	76.0	14.2	20.9	152.0	17.9	26.3
VEX 120	31.0	10.7	15.7	93.0	15.4	22.7	185.0	19.4	28.5

VEX

ISO 10

Values of preload and rigidity
(Bearings rigidly preloaded)
contact angle = 15°



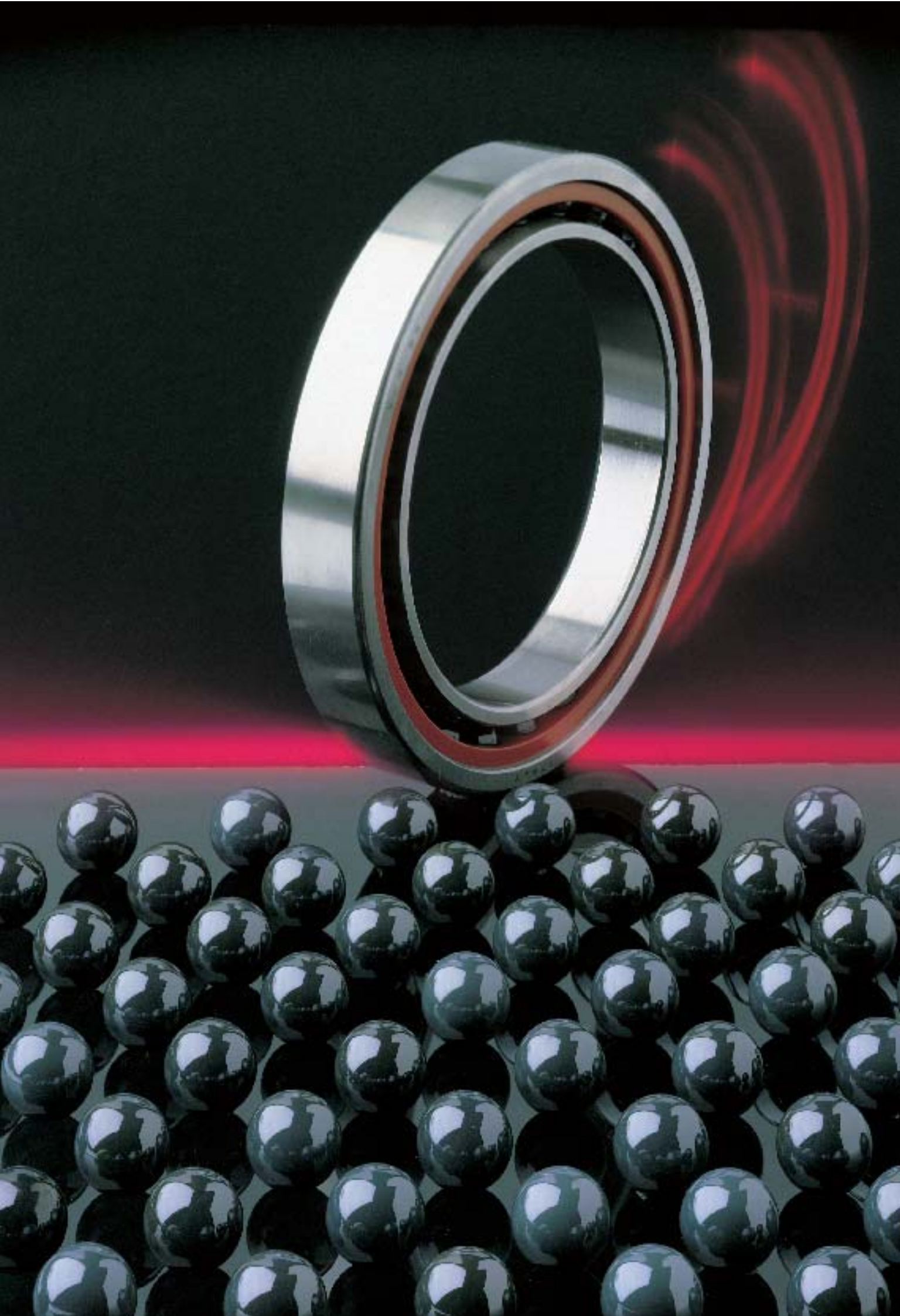
SNFA	Light preload L			Medium preload M			Heavy preload F		
	Pr	Ra		Pr	Ra		Pr	Ra	
		Pairs	Triplex		Pairs	Triplex		Pairs	Triplex
VEX 25	7.0	6.9	10.2	21.0	10.0	14.7	43.0	12.7	18.7
VEX 30	8.0	8.2	12.1	24.0	11.9	17.5	48.0	15.0	22.0
VEX 35	10.0	9.2	13.6	30.0	13.3	19.6	59.0	16.7	24.6
VEX 40	10.5	10.1	14.9	31.0	14.5	21.3	63.0	18.4	27.0
VEX 45	11.0	11.0	16.1	33.0	15.8	23.3	66.0	19.9	29.3
VEX 50	13.0	12.0	17.7	40.0	17.5	25.7	80.0	22.0	32.4
VEX 55	14.0	13.5	19.8	43.0	19.6	28.8	86.0	24.7	36.3
VEX 60	15.0	14.2	20.8	44.0	20.3	29.8	87.0	25.4	37.4
VEX 65	17.0	15.2	22.4	52.0	22.1	32.5	104.0	27.9	41.0
VEX 70	20.0	16.6	24.4	61.0	24.0	35.3	122.0	30.3	44.5
VEX 75	22.0	17.5	25.8	67.0	25.4	37.4	134.0	32.0	47.2
VEX 80	28.0	19.5	28.7	85.0	28.2	41.5	170.0	35.6	52.3
VEX 85	29.0	20.3	29.8	89.0	29.4	43.3	178.0	37.1	54.6
VEX 90	30.0	21.5	31.7	92.0	31.3	46.0	184.0	39.4	58.0
VEX 95	38.0	23.2	34.1	113.0	33.3	49.0	227.0	42.0	61.9
VEX 100	39.0	24.0	35.3	115.0	34.4	50.6	231.0	43.4	63.8
VEX 110	40.0	25.9	38.2	121.0	37.5	55.2	242.0	47.2	69.5
VEX 120	49.0	28.2	41.5	148.0	40.8	60.0	295.0	51.3	75.5

ED (Separable)

ISO -10

These bearings are produced on special request as spare parts

SNFA	d	D	B	z	Ø	Contact angle = 15°			Weight
						C33	C0	Vh (ABEC7)	
ED 12	12	28	8	9	4.76	345	150	88 000	0.020
ED 15	15	32	9	11	4.76	395	190	74 500	0.029
ED 17	17	35	10	11	5.55	520	255	67 500	0.037
ED 20	20	42	12	10	7.14	765	375	56 000	0.063
ED 25	25	47	12	11	7.14	819	430	48 000	0.073



NS Bearings with Ceramic Balls

SNFA has extensive experience in the manufacture and supply of these bearings commonly known as "Hybrid".

They are usually used in particularly arduous applications to give low temperature operation at high speeds.

The successful use of this product in a range of applications has greatly increased the demand for it.

The ceramic ball material most commonly used is Silicon Nitride Si₃N₄.

Balls made of this material combine its excellent mechanical and physical properties with high technology machining processes.

They feature good material homogeneity, high precision, reduced mass (40% of steel), high hardness and good fatigue resistance.

Comparative table (Silicon Nitride/Bearing Steel)

Material characteristics data				Silicon nitride	Bearing steel
Density	δ	[g/cm ³]		3,19	7,80
Linear thermal expansion	α	[10 ⁻⁶ /°C]	20 - 1000 °C 20 - 300 °C	3,20 -	- 11
Modulus of elasticity	E	[kN/mm ²]	20 °C	315	210
Poisson's ratio	μ			0,26	0,30
HV10 Hardness			20 °C	1700	700
Impact strength	K _{IC}	[MN/m ^{1.5}]	20 °C	6 - 8	25
Thermal conductivity	λ	[W/m °C]	20 °C	30-40	40-50
Limiting Temperature		[°C]		ca. 1000	ca. 300
Hardness in hot condition				good	bad
Dimensional stability				good	good
Corrosion resistance				good	bad
Magnetism				absent	present
Electrical insulation				good	bad

Compared with steel ball bearings, NS bearings offer the following advantages:

- longer life, even at higher load
- higher resistance to seizure in critical lubrication situations
- lower power dissipation (Figure 14)
- lower operating temperature (Figure 5)
- higher speed both with oil and grease lubrication
- higher acceleration and deceleration limits
- greater static and dynamic rigidity (Figure 16)
- lower wear (Figure 17)

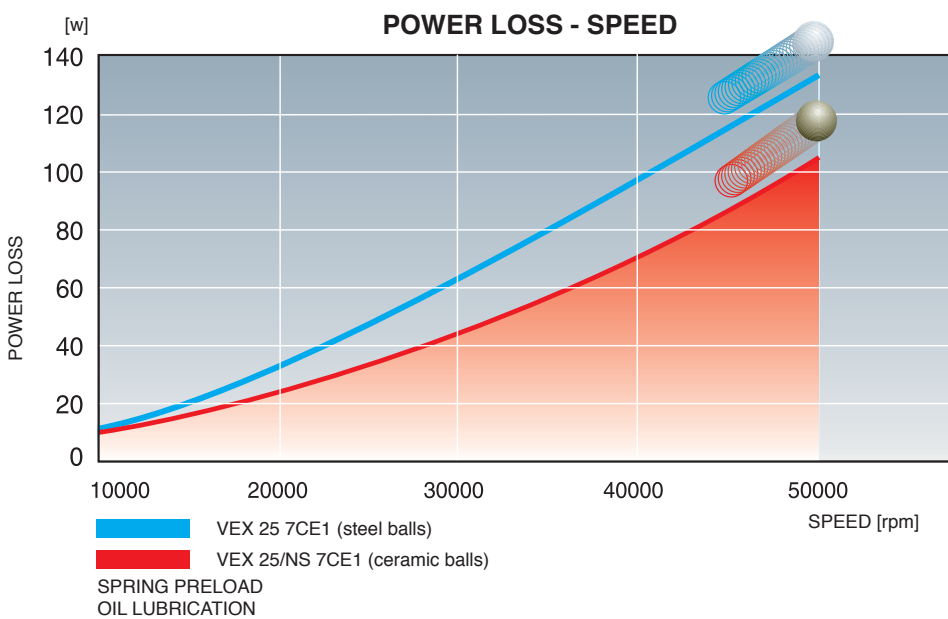


Fig. 14

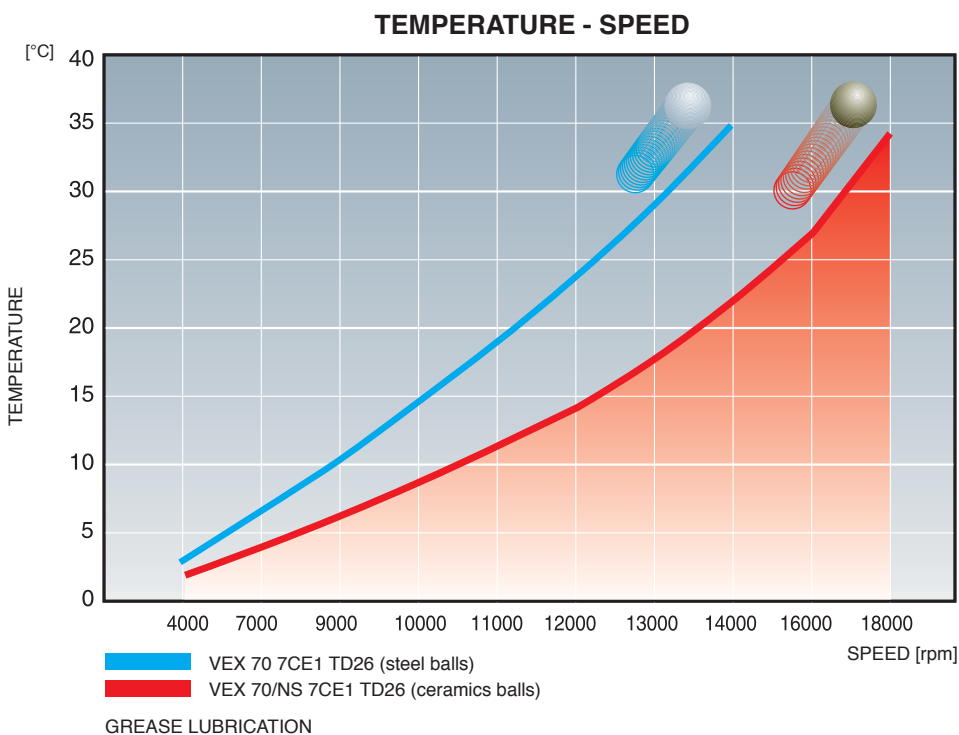


Fig. 15

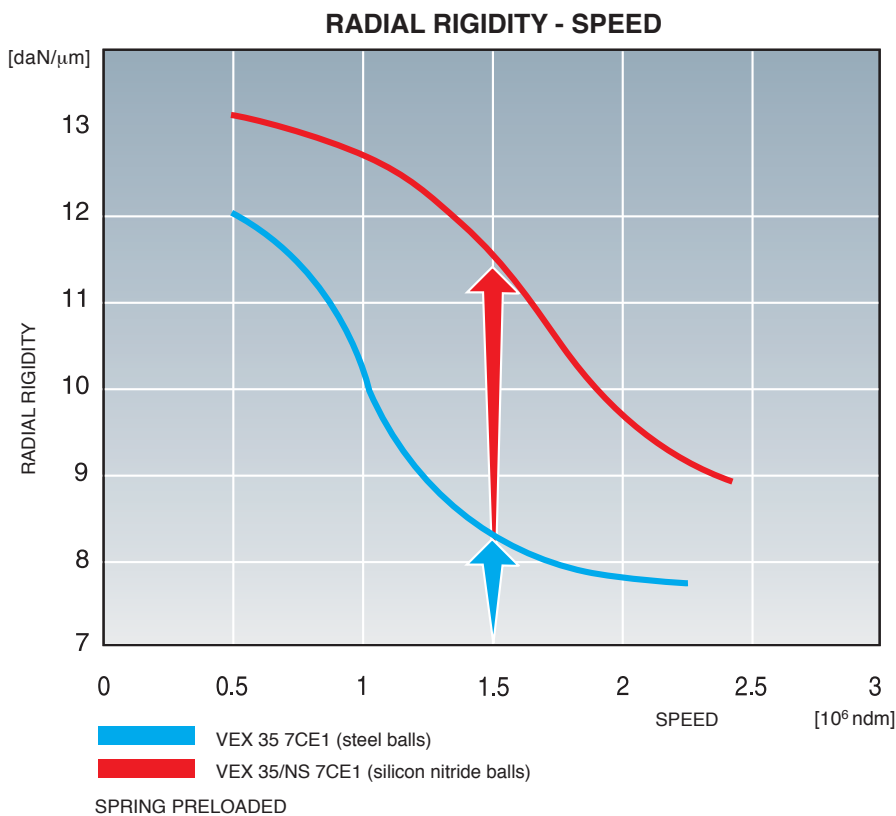


Fig. 16

Field experience and laboratory tests have proven that maximum speed achievable by hybrid bearings can be 15 to 30% more than conventional bearings.

The greatest benefits are obtained in applications with grease lubrication, which have high operating temperature with steel ball bearings.

For bearings operating at high speed where there is significant centrifugal force on the balls it has been shown that bearing life can be markedly increased by the use of ceramic balls.

All SNFA series can be equipped with ceramic material balls. VEB and VEX series bearings designed for high speed operation, use the features of this material to the most effect.

Ceramic material ball bearings are coded with the suffix /NS placed after the bore diameter.
 E.g. VEX 50/**NS** 9 CE1
 N.B. For bearings with balls greater than 14,28 mm diameter check with SNFA for availability.

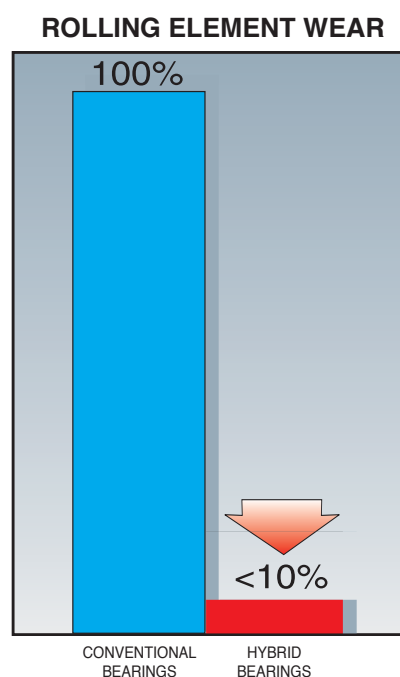


Fig. 17

H1 Bearings

This designation identifies an SNFA bearing with through the outer race holes for minimum oil lubrication.

This type of lubrication is typical of high speed applications; the H1 version is particularly suitable for series VEB and VEX.

The feed holes of H1 bearings cross to a point (Fig. 18) very close to the ball and rolling track contact area.

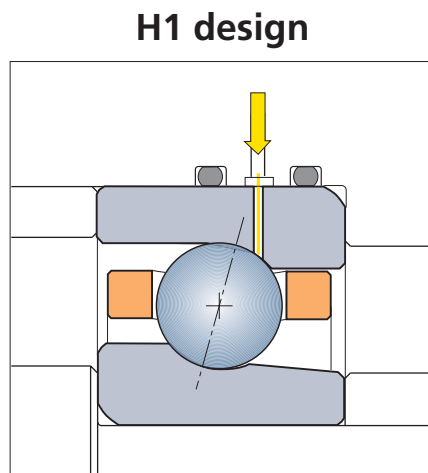


Fig. 18

These holes allow the lubricant to reach directly the ball raceway contacts and so ensure the presence of an oil film even at high speed. All this means a series of advantages which translate into reduced pollution due to low lubricant consumption and improved performance. The most evident advantage is the possibility of **reaching high speeds of over 2,500,00 ndm with a remarkable degree of reliability.**

The oil supply system of H1 bearings does not differ substantially from the conventional system for minimum lubrication. The small amounts of circulating lubricant demand accurate jets that must be simple, direct and of constant cross section. They also require efficient seals to avoid pressure drops and leakage. Each bearing must be provided with its own feed.

SNFA Technical Service can play an important information role during the development stage.

An example of an **H1** designation bearing is:

VEX 70/**H1** 7CE1

HBB Cartridge Units

The HBB cartridge unit is an SNFA product developed for application on spindles and electrospindles where the severe operating conditions (high speed and great temperature difference between the shaft and the bearing outer housing) preclude the use of bearings rigidly preloaded, for the risk of seizure.

The HBB cartridge unit has a special preloading device, prepared and adjusted by SNFA, which allows bearings to operate without slackness assuring, at the same time, good stiffness, rigidity and stability.

In addition to these advantages, HBB cartridge units allow an easy handling and assembling in the spindle.

The compact shape and reduced dimension HBB cartridge unit can be adopted for a wide range of new and old applications. The latter ones without modification of the existing seatings.

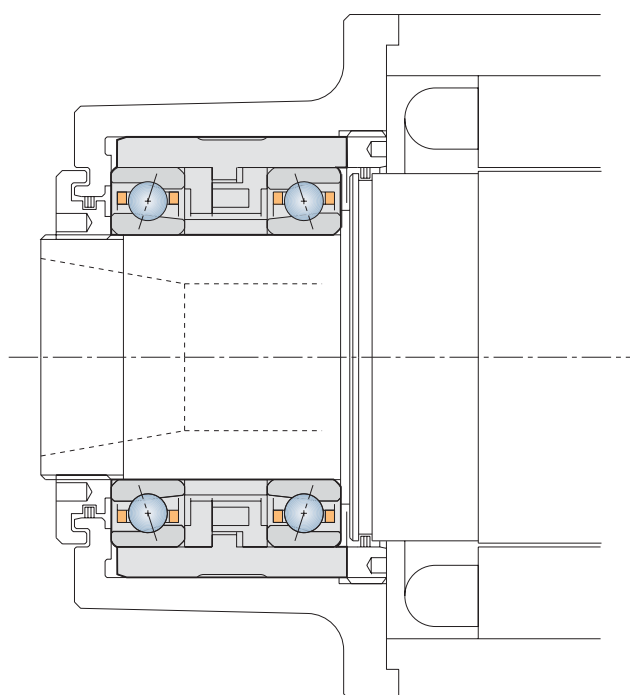
The bearings of HBB cartridges, matched back to back, can be of different types depending on shaft diameter and operating conditions:

HBB../1 and HBB../2.

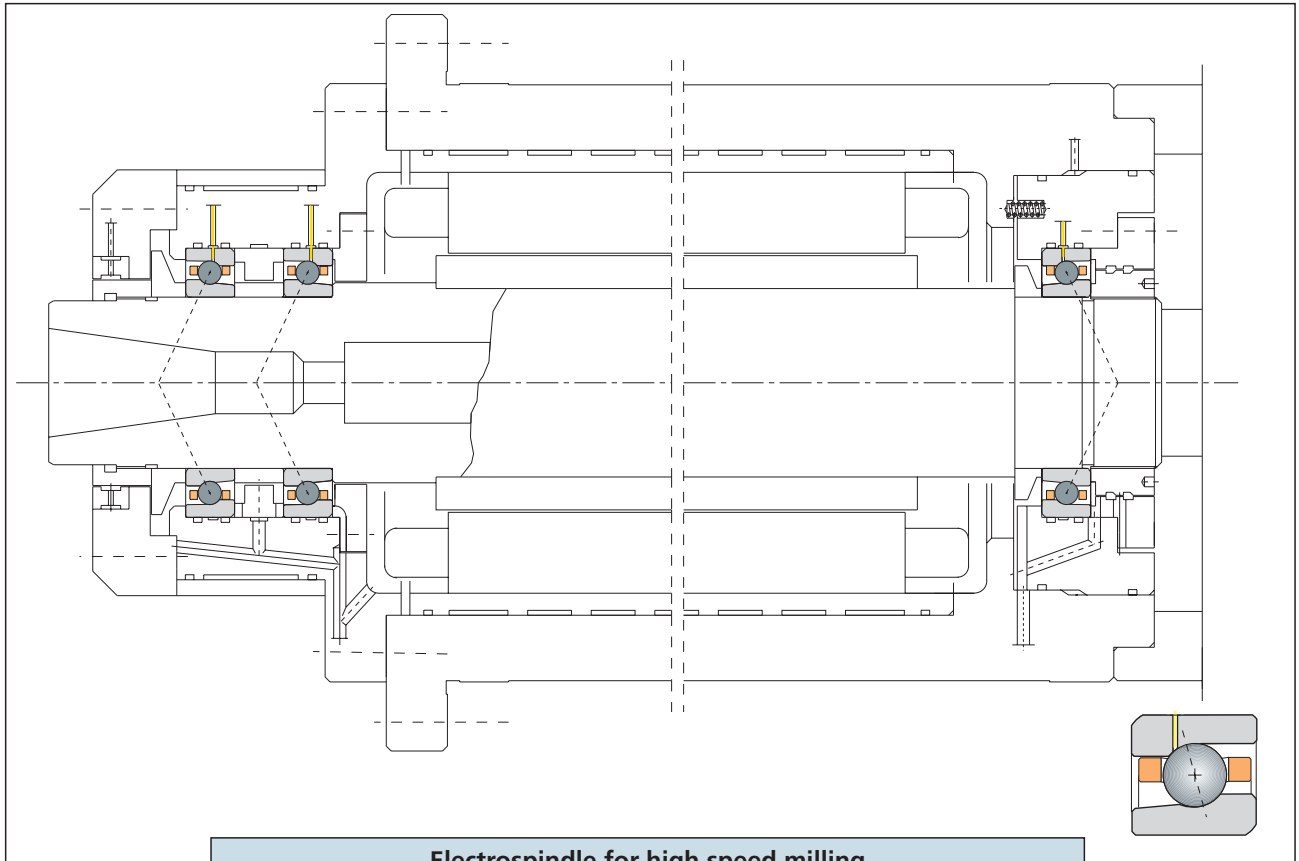
In all cases the bearings can be equipped with ceramic balls.

This special product is only supplied on request

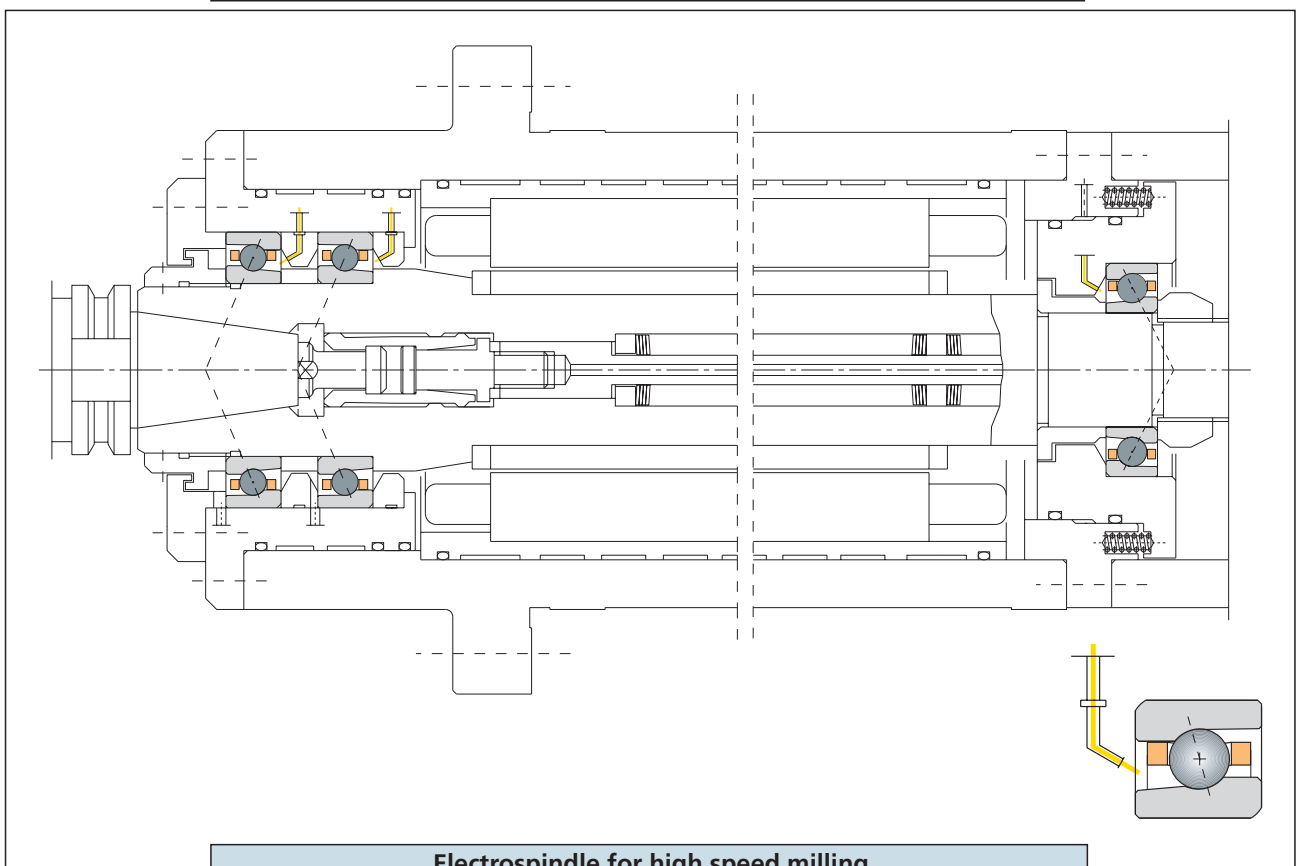
HBB cartridge placed on the front end of an electrospindle



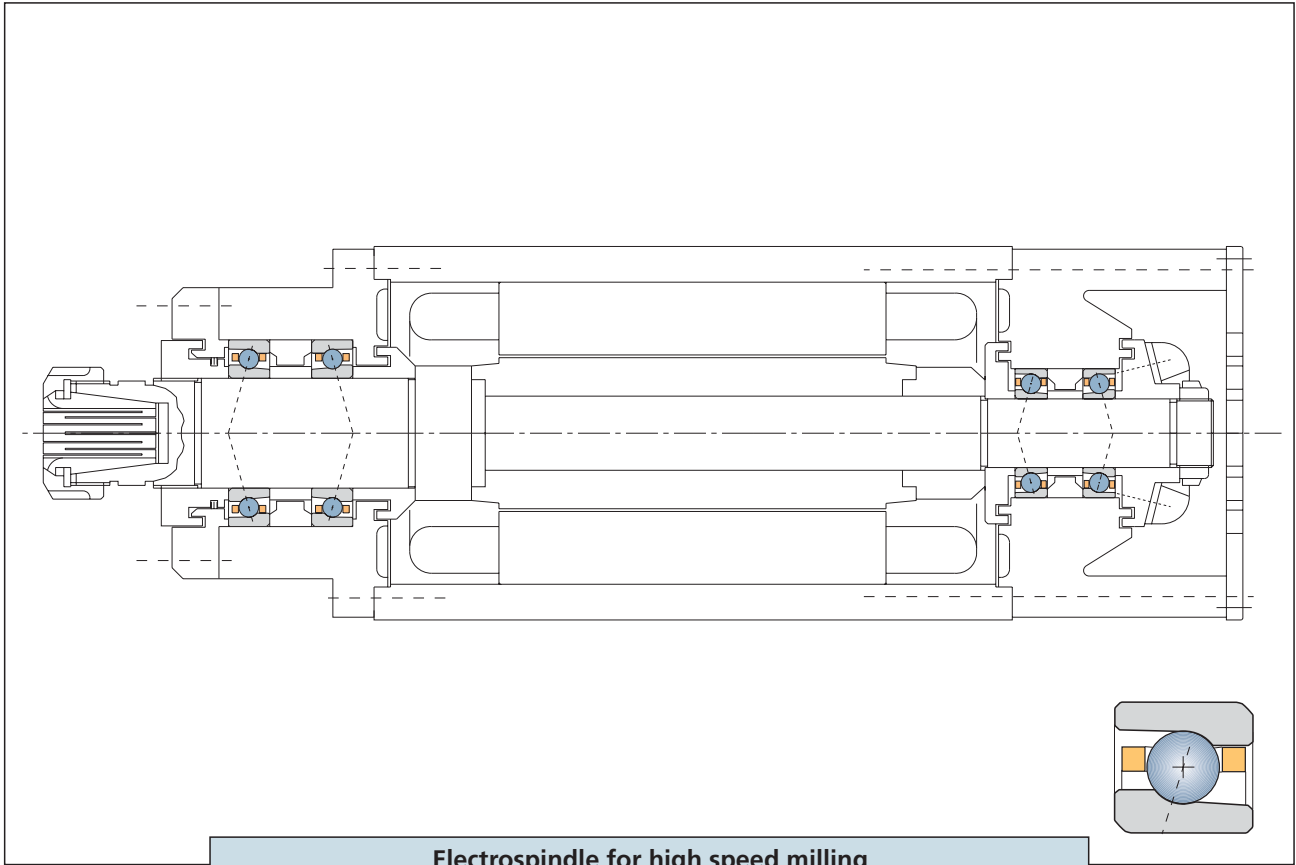
Example of bearing applications



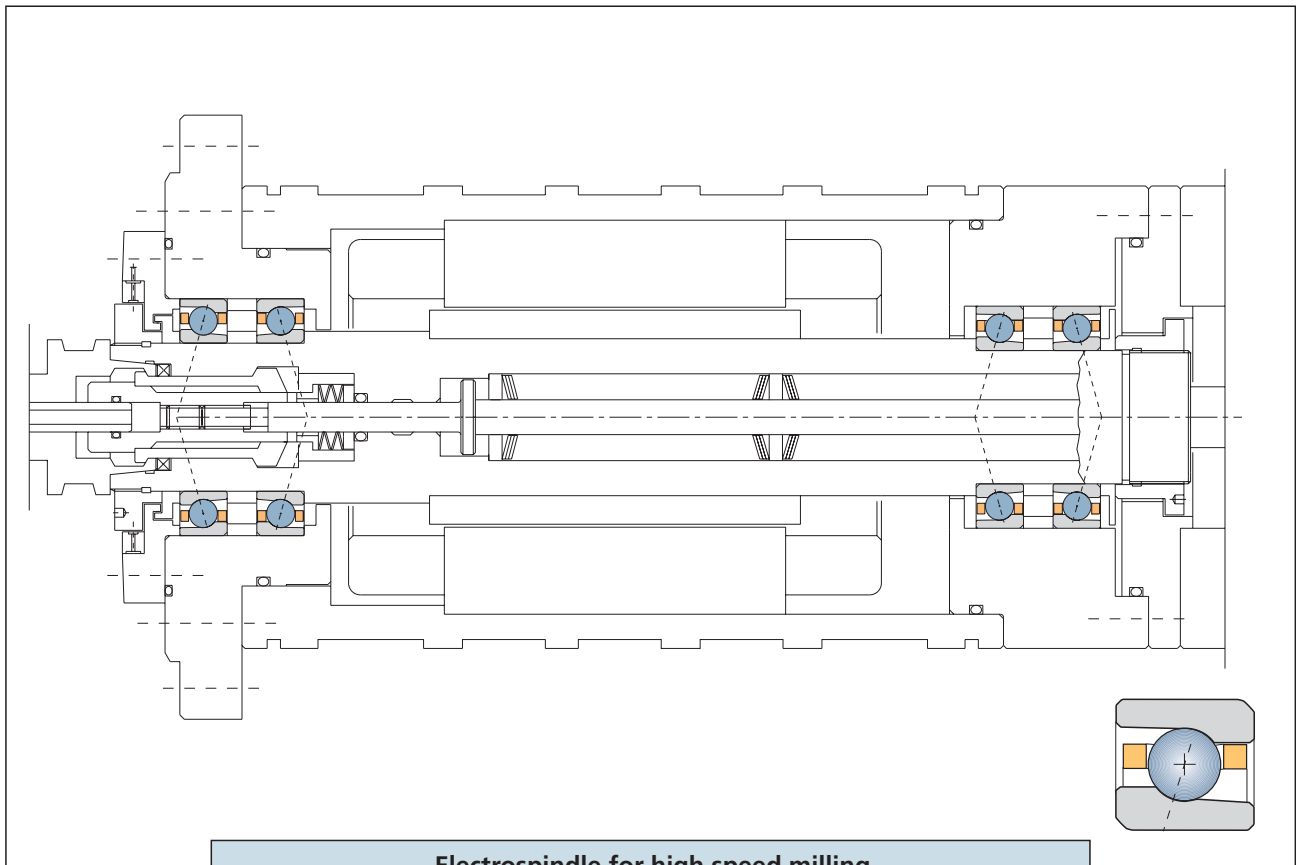
Electrospindle for high speed milling
Bearing series VEX/NS/H1 - variable preload
Air/oil lubrication through the outer ring



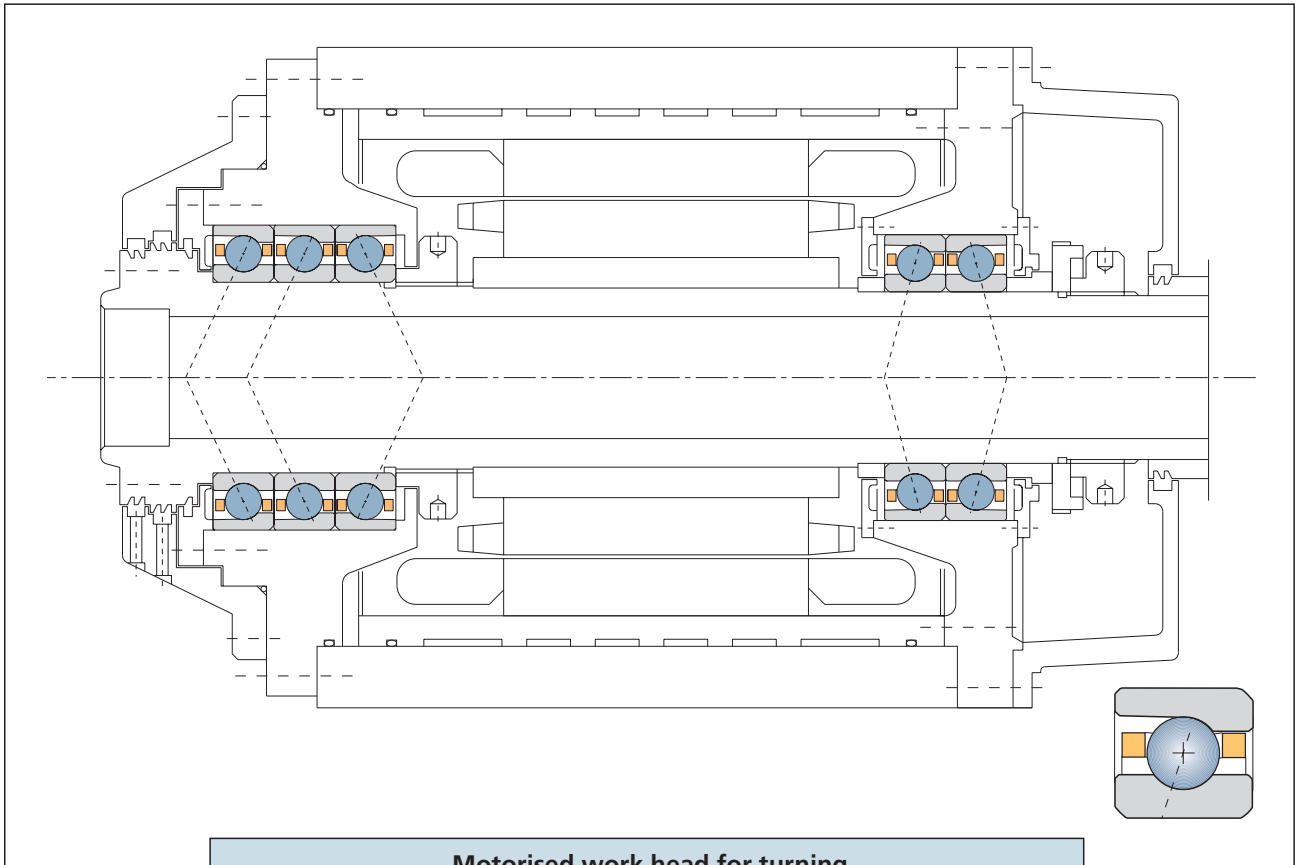
Electrospindle for high speed milling
Bearing series VEX/NS - variable preload
Air/oil lubrication via external nozzles



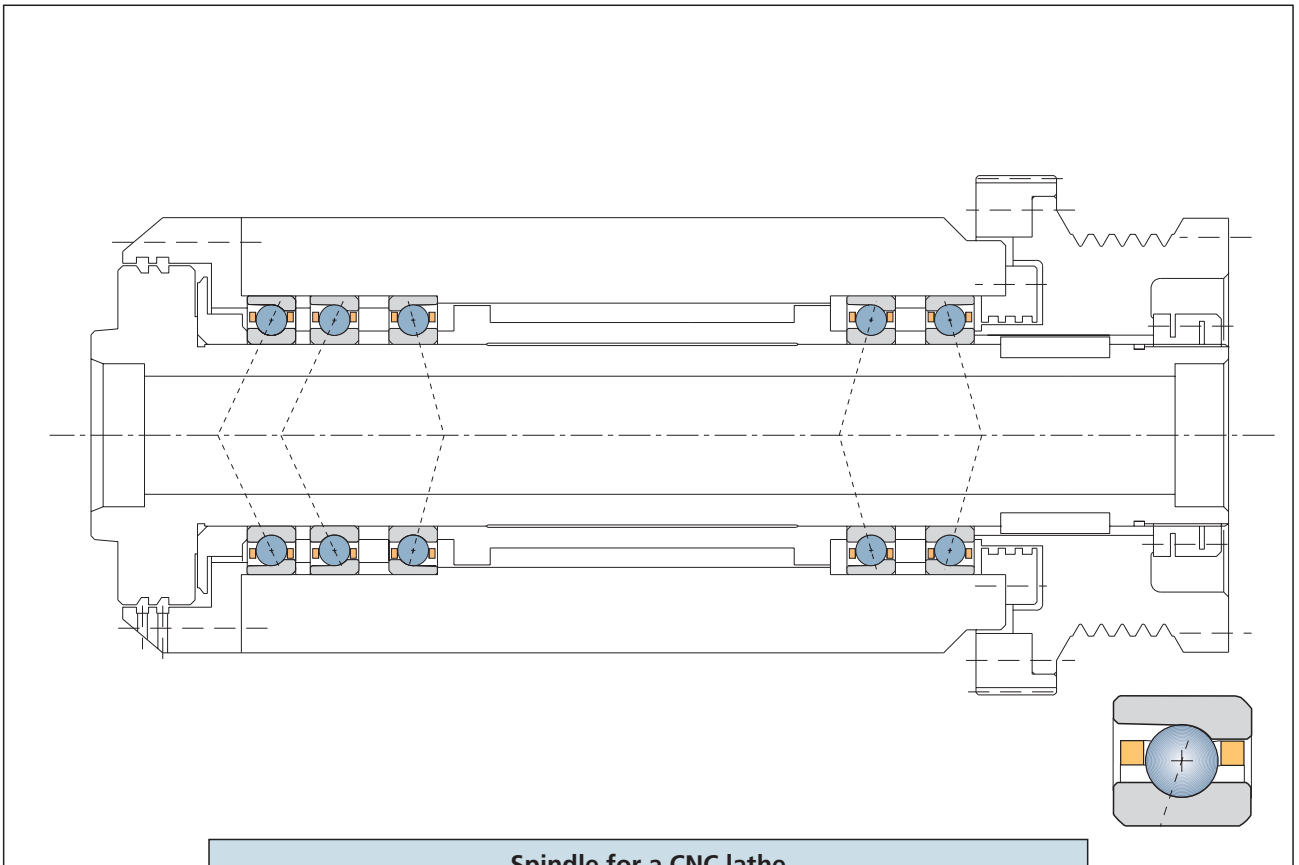
Electrospindle for high speed milling
Bearing series VEX - Grease lubrication



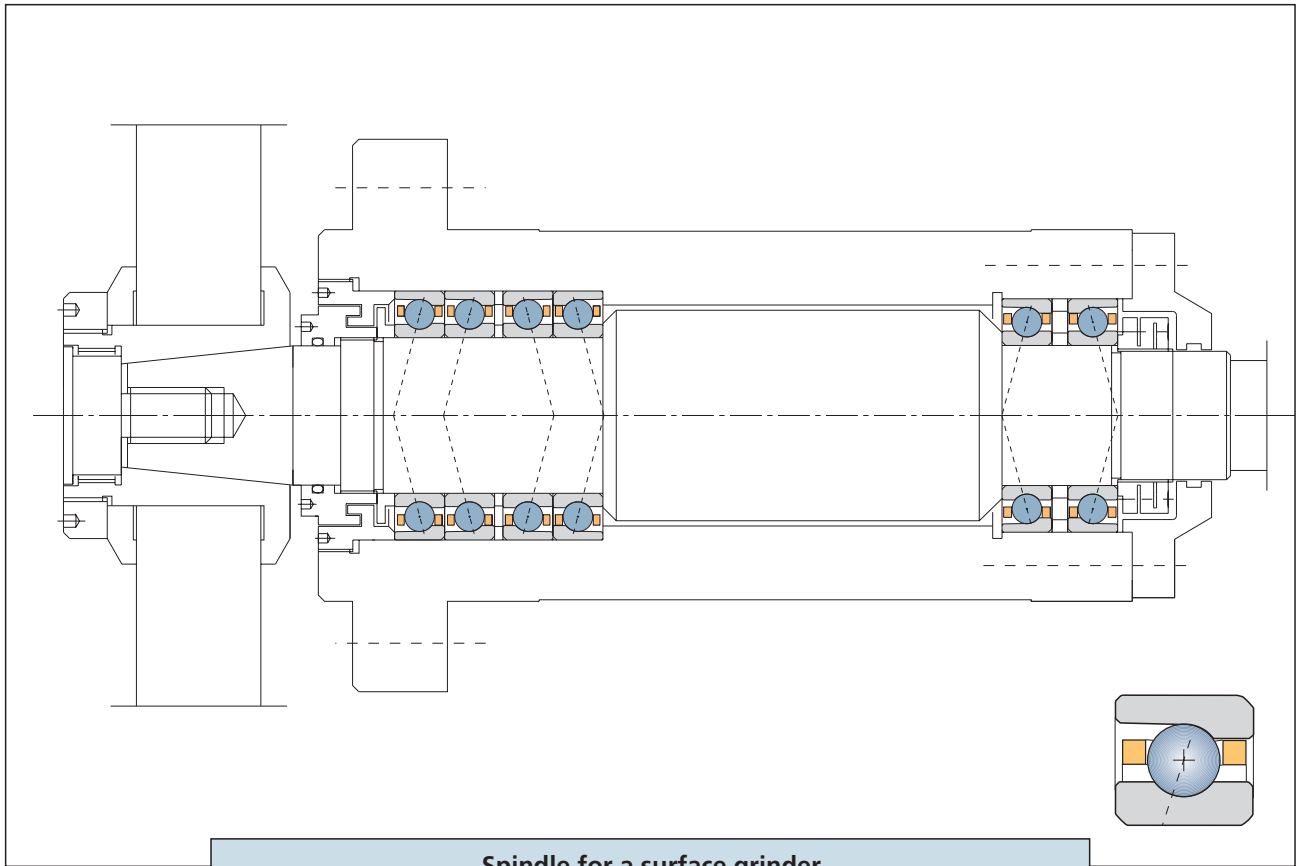
Electrospindle for high speed milling
Bearing series VEX - Grease lubrication



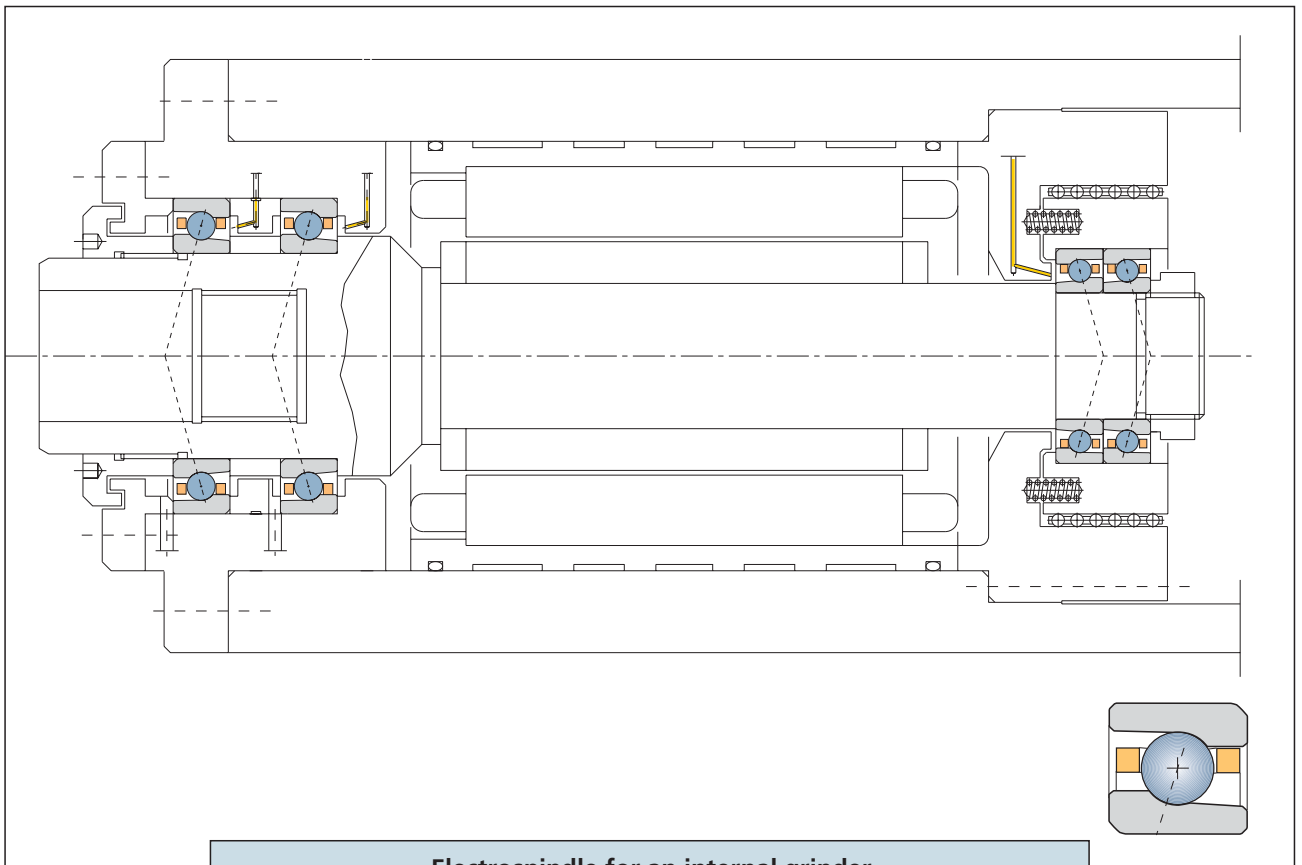
Motorised work head for turning
 Bearing series SEB - EX - Grease lubrication



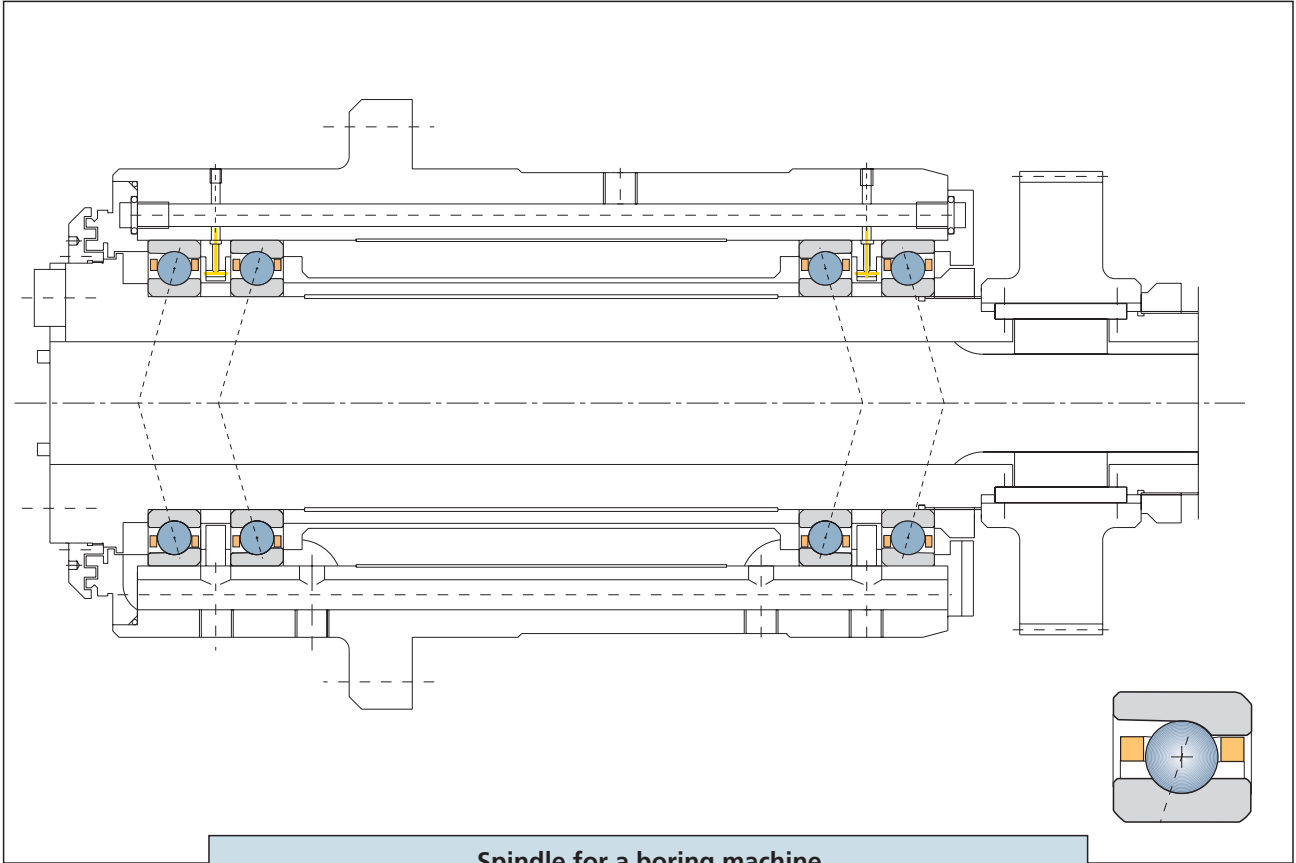
Spindle for a CNC lathe
 Bearing series EX - Grease lubrication



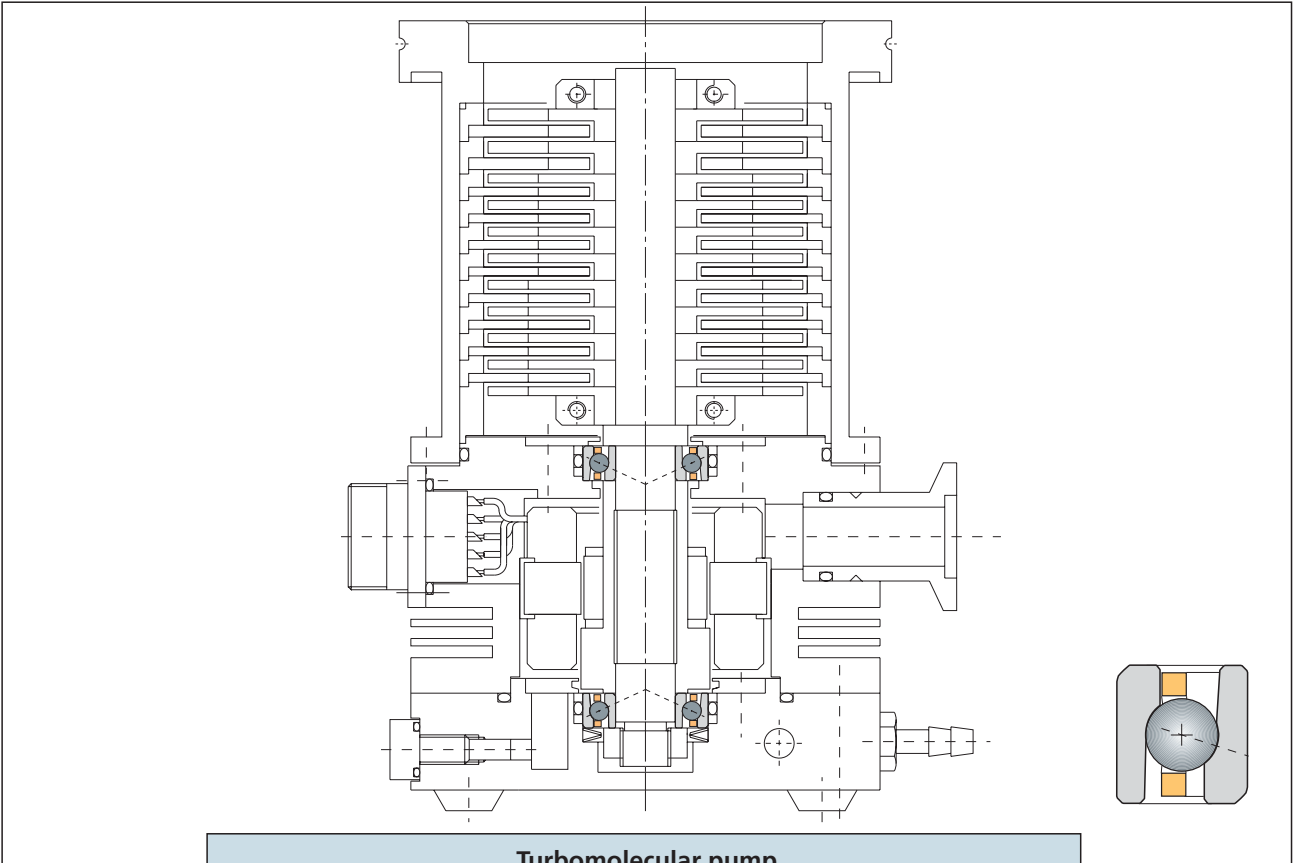
Spindle for a surface grinder
 Bearing series EX - Grease lubrication



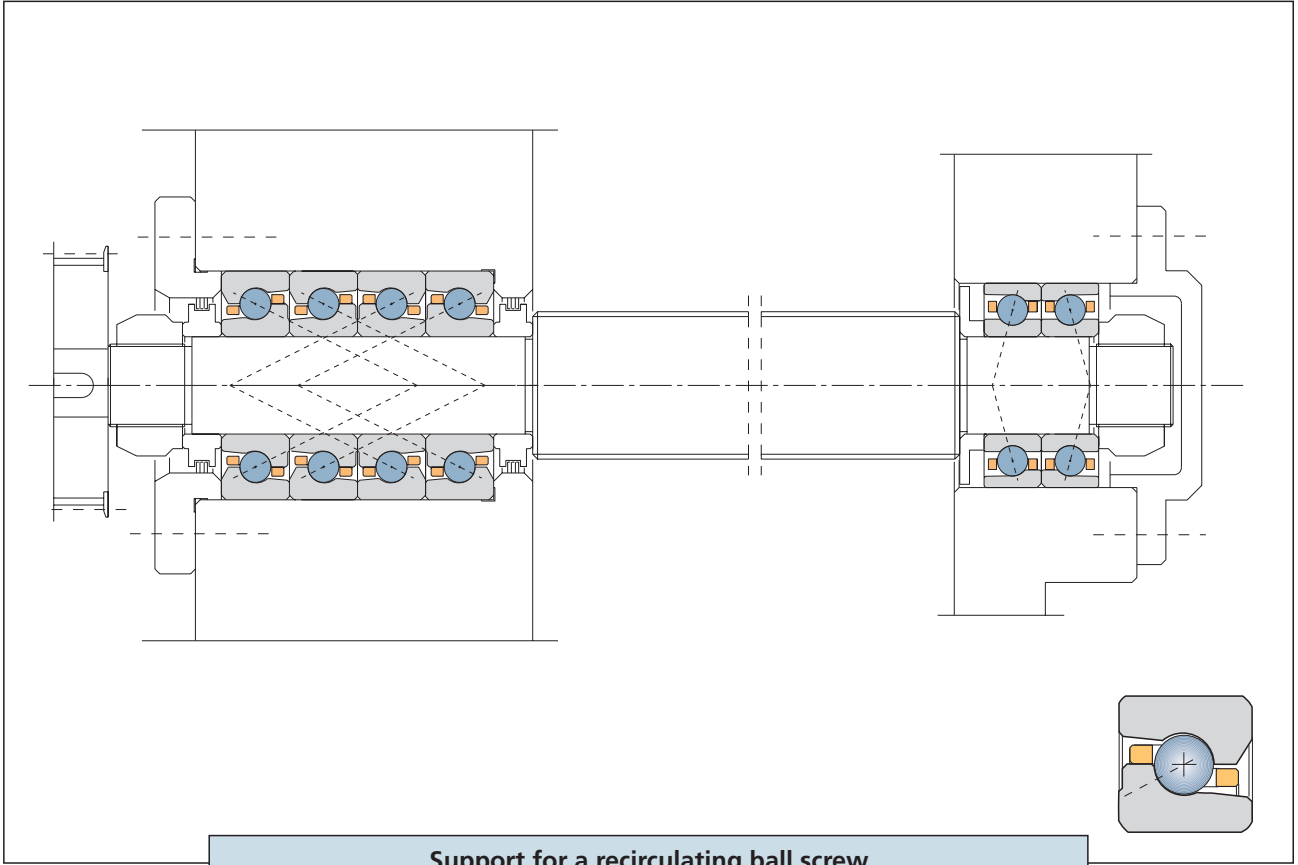
Electrospindle for an internal grinder
 Bearing series VEX - Grease lubrication



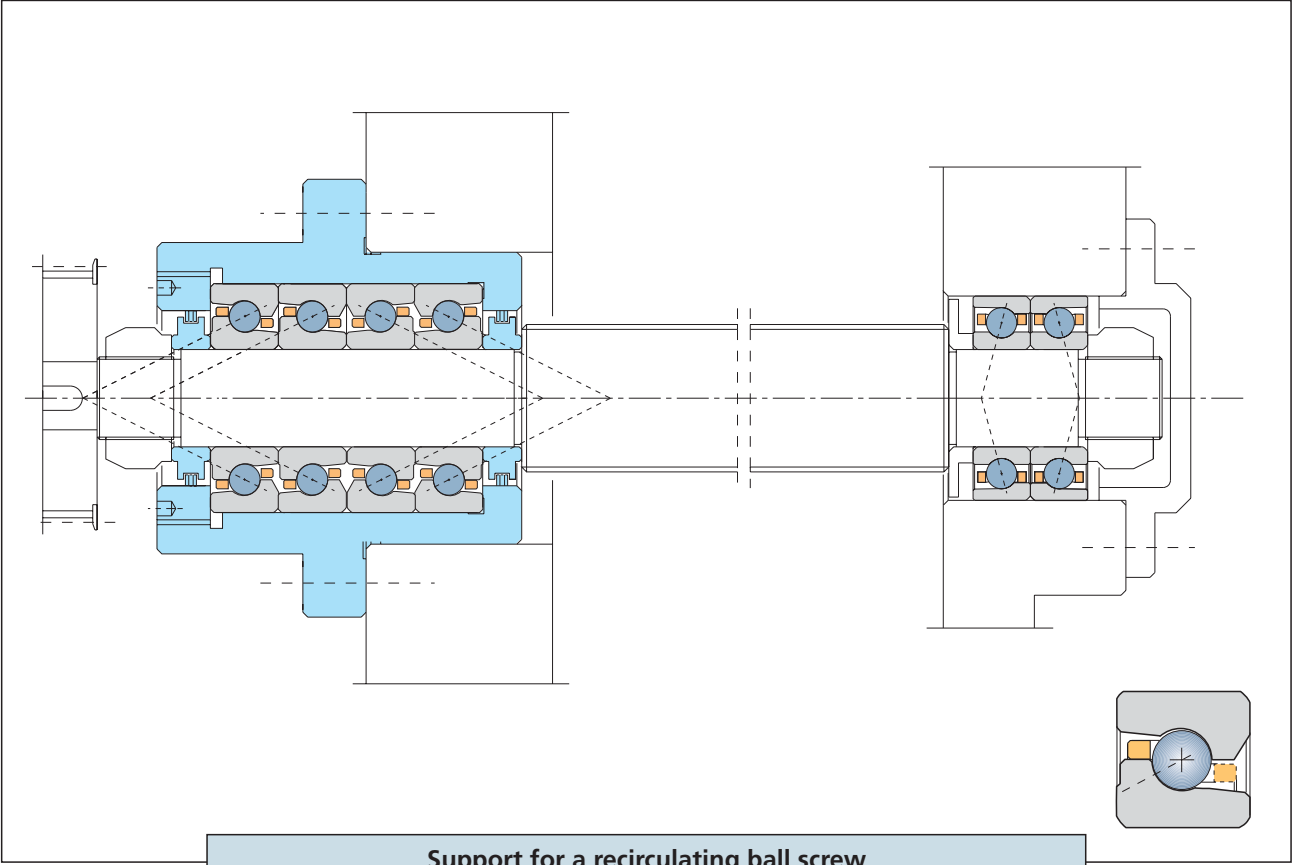
Spindle for a boring machine
Bearing series EX - SEB - Oil injection lubrication



Turbomolecular pump
Bearing series VEX/NS - Grease lubrication



Support for a recirculating ball screw
 Control side bearings: SERIES BS200 - opposite side: SERIES E200



Support for a recirculating ball screw
 Control side bearings a BSQU cartridge unit with series BS200
 Opposite side: bearing series E200

Comparison Table of SNFA Bearings with Other Makes

This table is for information only and does not in any way guarantee that the bearing will achieve the same operating standards.

SERIE	SNFA	FAG BARDEN	FAFNIR	GMN	NSK	RHP	SKF	SNR
ISO 18	SEA							71800
ISO 19	SEB	B 71900	1900 H	9300 WI	S 61900	7900	7900	71900
ISO 19 (AV)	VEB	HS 71900		99300 WN		BNC 19	S 7900	71900 CE
ISO 10	EX	B 7000	100 H	9100 WI	S 6000	7000	7000	7000
ISO 10 (AV)	VEX	HS 7000		99100 WN	SH 6000	BNC 10	S 7000	7000 CC 7000 CE
ISO 02	E 200	B 7200	200 H	200 WI	S 6200	7200	7200	7200
ISO 02	BS 200	76020					BSA 2	

AV = High speed

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This catalogue implies the existence of no constraint whatsoever as to the products illustrated, which can be subject to change at any moment according to SNFA needs and product improvements.



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