

## **GABBIE A RULLINI PER IMBIELLAGGI**

*NEEDLE ROLLER AND CAGE ASSEMBLIES FOR  
CONNECTING ROD BEARINGS ARRANGEMENTS*





Le gabbie a rullini per imbiellaggi vengono solitamente utilizzate nei manovellismi dei motori a combustione interna. Sono state appositamente progettate per esigenze specifiche, come ad esempio forze centrifughe e numero di giri elevati. Esistono due diversi tipi di gabbie a rullini per imbiellaggi, una viene montata sull'albero a motore e prende il nome di KZK, mentre l'altra viene montata sulla testa di biella e prende il nome di KBK.

**Gabbie a rullini (serie KZK)**

Sono utilizzate principalmente quando si è in presenza di forze centrifughe molto elevate. La gabbia viene guidata sul foro di biella per limitarne il giuoco ed il movimento. Le gabbie a rullini per imbiellaggi sono trattate in modo particolare per avere un'alta resistenza ed una minima usura, hanno dimensioni ridotte perciò riescono a raggiungere notevoli velocità.

**Gabbie a rullini (serie KBK)**

Sono utilizzate principalmente quando si è in presenza di carichi oscillanti, vengono guidate sullo spinotto con un giuoco radiale molto limitato. Hanno in linea di massima le medesime caratteristiche delle KZK.

*The needle roller and cage assemblies for connecting rod, are particularly studied and employed in case of high number of revolutions or centrifugal forces: they are mounted in cranks of internal combustion engines.*

*They are subdivided in two series: KZK for big end of the connecting rod, and KBK for connecting rod small ends.*

**Needle roller and cage assemblies (KZK series)**

*Utilised when very high centrifugal forces are present, cage is guided on crank pin's bore of connecting rod in order to avoid clearance and movement.*

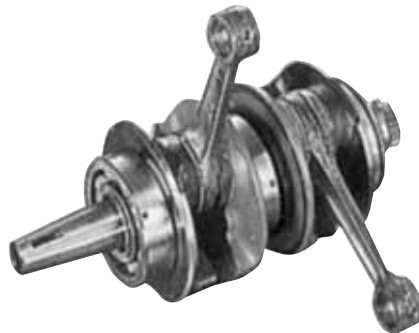
*These cages are treated in a particular way to obtain highest resistance and lowest wear; thanks to their small dimensions are able to reach high speeds.*

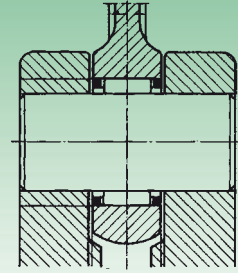
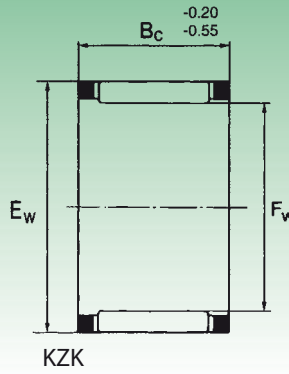
**Needle roller and cages assemblies (KBK series)**

*Mainly requested in presence of oscillating loads and guided on piston pin, that have a very small radial clearance.*

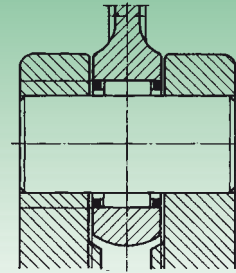
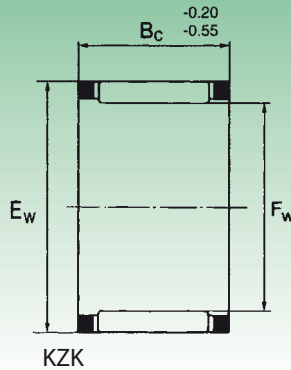
*For other characteristics, see KZK cages.*

Esempio di montaggio  
Mounting example



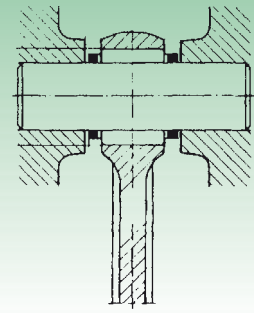
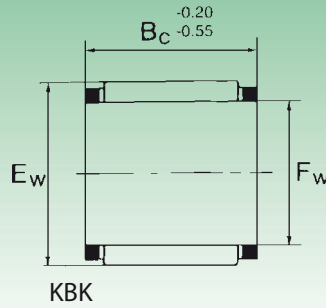


Diametro albero (mm) Shaft diameter (mm)	Sigla Designation	Peso (g) Weight (g)	Dimensioni (mm) Dimensions (mm)			Coefficienti di carico (N) Basic load ratings (N)	
			F <sub>w</sub>	E <sub>w</sub>	B <sub>c</sub>	Dinamico C Dynamic C	Statico C <sub>0</sub> Static C <sub>0</sub>
<b>8</b>	<b>KZK 8x12x8</b>	1.9	8	12	8	4 700	4 580
<b>10</b>	<b>KZK 10x14x10</b>	3.3	10	14	10	5 000	5 160
<b>12</b>	<b>KZK 12x15x13</b>	3.6	12	15	13	5 300	7 400
	<b>KZK 12x16x10</b>	3.5	12	16	10	6 100	6 900
	<b>KZK 12x16x11</b>	3.7	12	16	11	6 200	7 100
	<b>KZK 12x17x10</b>	5	12	17	10	7 020	7 020
<b>14</b>	<b>KZK 12x18x10</b>	7.8	12	18	10	7 400	7 200
	<b>KZK 14x18x10</b>	4	14	18	10	7 100	8 500
	<b>KZK 14x19x10</b>	5.5	14	19	10	7 300	7 600
	<b>KZK 14x19x12</b>	7.5	14	19	12	7 460	7 950
<b>15</b>	<b>KZK 14.4x20.4x10</b>	6.5	14.4	20.4	10	8 100	7 800
	<b>KZK 15x19x9</b>	5	15	19	9	6 800	7 100
	<b>KZK 15x19x10</b>	6	15	19	10	7 200	8 400
	<b>KZK 15x20x10</b>	7.5	15	20	10	7 800	9 100
	<b>KZK 15x21x10</b>	8.5	15	21	10	8 400	10 500
	<b>KZK 15x21x11</b>	9.5	15	21	11	8 500	10 700
<b>16</b>	<b>KZK 15.2x22.2x12</b>	11.5	15.2	22.2	12	8 600	11 100
	<b>KZK 16x20x10</b>	5.8	16	20	10	8 200	9 200
	<b>KZK 16x20x24</b>	6.3	16	20	24	8 700	9 400
	<b>KZK 16x21x10</b>	5.8	16	21	10	8 800	9 800
	<b>KZK 16x22x12</b>	9.5	16	22	12	11 000	11 900
<b>17</b>	<b>KZK 16x22x14</b>	11	16	22	14	13 200	13 930
	<b>KZK 17x21x10</b>	6.7	17	21	10	7 600	9 000
	<b>KZK 17x23x11</b>	9.5	17	23	11	8 100	11 300
<b>18</b>	<b>KZK 18x22x10</b>	6.9	18	22	10	7 600	9 800
	<b>KZK 18x22x24</b>	7.2	18	22	24	10 100	17 200
	<b>KZK 18x24x11.6</b>	10	18	24	11.6	11 600	13 100
	<b>KZK 18x24x12</b>	10	18	24	12	11 600	13 100
	<b>KZK 18x24x13.3</b>	12.4	18	24	13.3	9 000	10 700
	<b>KZK 18x24x13.5</b>	12.4	18	24	13.5	9 000	10 700
	<b>KZK 18x24x15</b>	14	18	24	15	13 200	15 500
<b>19</b>	<b>KZK 19x25x16</b>	13.9	19	25	16	12 100	15 500
	<b>KZK 19x28x14</b>	20	19	28	14	12 100	15 000
<b>20</b>	<b>KZK 20x25x16</b>	12	20	25	16	9 900	12 300
	<b>KZK 20x26x12</b>	9.6	20	26	12	10 100	12 500
	<b>KZK 20x26x14</b>	12	20	26	14	12 600	16 700
	<b>KZK 20x26x17</b>	17	20	26	17	14 535	18 145
<b>22</b>	<b>KZK 22x28x13</b>	15	22	28	13	13 205	16 500
	<b>KZK 22x28x14</b>	16	22	28	14	12 600	16 800
	<b>KZK 22x28x15</b>	16.7	22	28	15	13 500	18 500



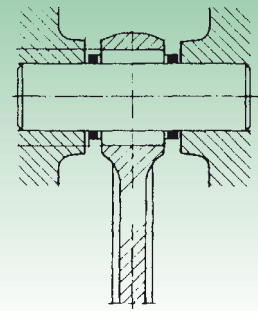
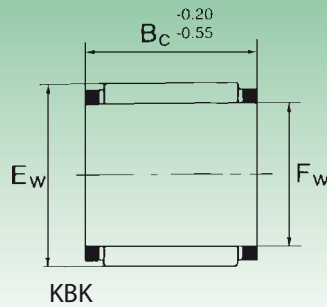
KZK

Diametro albero (mm) Shaft diameter (mm)	Sigla Designation	Peso (g) Weight (g)	Dimensioni (mm) Dimensions (mm)			Coefficienti di carico (N) Basic load ratings (N)	
			F <sub>w</sub>	E <sub>w</sub>	B <sub>c</sub>	Dinamico C Dynamic C	Statico C <sub>0</sub> Static C <sub>0</sub>
22	KZK 22x28x13	15	22	28	13	13 205	16 625
	KZK 22x28x16	18	22	28	16	14 400	20 100
	KZK 22x29x15	15.2	22	29	15	17 800	21 800
	KZK 22x29x16	19	22	29	16	17 800	21 800
	KZK 22x30x16	25.7	22	30	16	18 700	22 300
23	KZK 23x29x13	12	23	29	13	10 000	11 300
	KZK 23x30x14	19.4	23	30	14	9 350	10 100
	KZK 23x30x16	22	23	30	16	9 780	11 800
23.1	KZK 23.1x28.1x14	12.9	23.1	28.1	14	10 600	15 800
24	KZK 24x30x15	17	24	30	15	11 200	13 700
	KZK 24x30x16	18	24	30	16	11 200	13 700
25	KZK 25x30x28	24	25	30	28	13 300	15 200
	KZK 25x31x12	16	25	31	12	8 700	8 800
	KZK 25x31x17	23	25	31	17	9 200	9 750
	KZK 25x31x20	26	25	31	20	9 700	10 600
	KZK 25x32x16	22.7	25	32	16	18 200	23 100
25.1	KZK 25.1x30.1x14	14.1	25.1	30.1	14	13 700	19 000
26	KZK 26x34x16	25	26	34	16	11 700	17 500
28	KZK 28x33x14	15.7	28	33	14	13 200	21 900
	KZK 28x34x14	20	28	34	14	16 500	20 700
	KZK 28x35x15	25	28	35	15	18 000	22 000
	KZK 28x35x16	27	28	35	16	18 900	23 000
	KZK 28x36x16	29.1	28	36	16	19 500	27 000
	KZK 28x38x13.6	40	28	38	13.6	17 300	20 300
30	KZK 30x36x16	28.5	30	36	16	18 900	22 800
	KZK 30x37x16	29	30	37	16	21 500	30 500
	KZK 30x38x16	34.4	30	38	16	22 700	32 600
	KZK 30x38x18	38.8	30	38	18	26 200	39 600
32	KZK 32x40x22	50	32	40	22	27 800	39 300
	KZK 32x42x20	54	32	42	20	29 000	41 000
35	KZK 35x42x20	40	35	42	20	26 000	40 500
38	KZK 38x46x20	50	38	46	20	31 100	43 000
40	KZK 40x48x17	50	40	48	17	29 000	39 000
	KZK 40x48x20	54	40	48	20	32 500	51 000



Diametro albero (mm) Shaft diameter (mm)	Sigla Designation	Peso (g) Weight (g)	Dimensioni (mm) Dimensions (mm)			Coefficienti di carico (N) Basic load ratings (N)	
			F <sub>w</sub>	E <sub>w</sub>	B <sub>c</sub>	Dinamico C Dynamic C	Statico C <sub>0</sub> Static C <sub>0</sub>
8	KBK 8x11x10	1.85	8	11	10	3 500	4 000
	KBK 8x12x10	2	8	12	10	3 700	4 100
9	KBK 9x12x11.5	2.4	9	12	11.5	4 200	4 800
	KBK 9x12x13	2.75	9	12	13	4 600	5 800
	KBK 9x12x14	3.5	9	12	14	4 700	5 900
	KBK 9x13x12	4.1	9	13	12	5 300	5 700
	KBK 9x13x12.5	4.9	9	13	12.5	5 300	5 700
	KBK 9x13x13	5.1	9	13	13	5 350	5 600
10	KBK 10x13x8	2	10	13	8	4 000	5 000
	KBK 10x13x10	2.4	10	13	10	4 200	5 200
	KBK 10x13x14.5	5.1	10	13	14.5	5 400	6 600
	KBK 10x13x16	5.7	10	13	16	6 800	7 700
	KBK 10x14x10	3.4	10	14	10	4 400	4 600
	KBK 10x14x11	4	10	14	11	5 200	5 700
	KBK 10x14x12	4.5	10	14	12	5 400	6 000
	KBK 10x14x12.5	4.85	10	14	12.5	5 600	6 200
11	KBK 10x14x13	5.4	10	14	13	5 600	6 200
	KBK 11x15x17	5	11	15	17	5 200	7 000
12	KBK 12x15x13	4.6	12	15	13	5 500	7 300
	KBK 12x15x14.3	5.4	12	15	14.3	5 800	7 700
	KBK 12x15x15	5.6	12	15	15	5 900	7 800
	KBK 12x15x16.6	6.2	12	15	16.6	6 800	9 900
	KBK 12x15x17	6.3	12	15	17	7 000	10 000
	KBK 12x15x17.5	6.5	12	15	17.5	7 000	10 000
	KBK 12x16x13	6.7	12	16	13	6 300	7 600
	KBK 12x16x15	7.9	12	16	15	7 500	9 000
	KBK 12x16x15.5	8.3	12	16	15.5	7 600	10 000
	KBK 12x16x16	8.5	12	16	16	7 800	9 300
	KBK 12x16x17	9.2	12	16	17	7 900	9 400
	KBK 12x17x14	8	12	17	14	8 000	9 500
	KBK 12x17x14.3	8.4	12	17	14.3	8 000	9 500
	KBK 12x17x14.8	8.8	12	17	14.8	8 300	9 800
13	KBK 13x17x14.5	7.1	13	17	14.5	8 300	10 200
	KBK 13x17x17.5	8.6	13	17	17.5	9 500	12 100
14	KBK 14x18x10	4.6	14	18	10	6 260	7 400
	KBK 14x18x12	6.6	14	18	12	6 380	7 570
	KBK 14x18x13	7.6	14	18	13	7 300	8 700
	KBK 14x18x14	6.33	14	18	14	7 400	8 800
	KBK 14x18x14.5	8	14	18	14.5	7 400	8 800
	KBK 14x18x15	8.3	14	18	15	7 600	8 990

**Gabbie a rullini per imbiellaggi, per supporto spinotto (serie KBK)**  
**Needle roller and cage assemblies for piston pin of connecting rod (KBK series)**



Diametro albero (mm) Shaft diameter (mm)	Sigla Designation	Peso (g) Weight (g)	Dimensioni (mm) Dimensions (mm)			Coefficienti di carico (N) Basic load ratings (N)	
			F <sub>w</sub>	E <sub>w</sub>	B <sub>c</sub>	Dinamico C Dynamic C	Statico C <sub>0</sub> Static C <sub>0</sub>
<b>14</b>	<b>KBK 14x18x16.5</b>	9.6	14	18	16.5	8 800	9 700
	<b>KBK 14x18x17</b>	10.1	14	18	17	9 120	11 780
	<b>KBK 14x18x20</b>	12	14	18	20	9 000	10 100
	<b>KBK 14x18x21</b>	13	14	18	21	11 875	16 530
	<b>KBK 14x18x22</b>	14	14	18	22	11 100	13 100
<b>15</b>	<b>KBK 14x19x17</b>	10.3	14	19	17	11 100	13 100
	<b>KBK 15x19x10</b>	5	15	19	10	6 500	8 600
	<b>KBK 15x19x18</b>	11	15	19	18	9 900	11 300
	<b>KBK 15x19x19</b>	12	15	19	19	10 100	12 800
	<b>KBK 15x19x20</b>	12.9	15	19	20	11 300	15 500
<b>16</b>	<b>KBK 15x20x24</b>	18.6	15	20	24	14 100	20 000
	<b>KBK 16x20x19</b>	12	16	20	19	11 700	16 800
	<b>KBK 16x20x20</b>	13.4	16	20	20	12 900	17 600
	<b>KBK 16x20x21</b>	14	16	20	21	12 900	17 600
	<b>KBK 16x20x22</b>	15	16	20	22	13 000	18 700
<b>17.5</b>	<b>KBK 16x21x19</b>	16	16	21	19	13 000	18 700
	<b>KBK 17.5x22x16</b>	9.3	17.5	22	16	11 000	16 300
<b>18</b>	<b>KBK 18x22x22</b>	16.9	18	22	22	12 825	19 665
	<b>KBK 18x22x23.5</b>	18	18	22	23.5	11 900	19 000
	<b>KBK 18x22x24</b>	18.4	18	22	24	13 395	20 900
	<b>KBK 18x22x25</b>	19.1	18	22	25	12 700	20 100
	<b>KBK 18x23x21</b>	18	18	23	21	9 900	10 100
	<b>KBK 18x23x23</b>	20	18	23	23	10 500	12 000
	<b>KBK 18x24x20</b>	20	18	24	20	20 000	25 000
<b>20</b>	<b>KBK 20x24x30</b>	22.1	20	24	30	14 900	25 500
	<b>KBK 20x25x22</b>	19.5	20	25	22	15 200	22 300
	<b>KBK 20x25x25</b>	23	20	25	25	17 100	24 000

