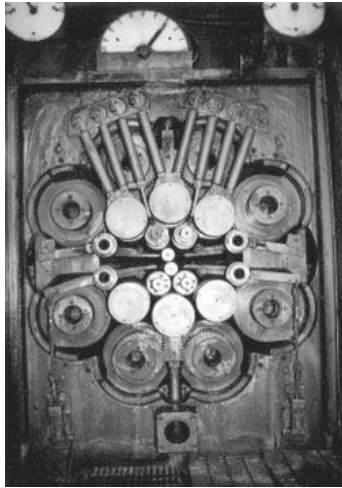
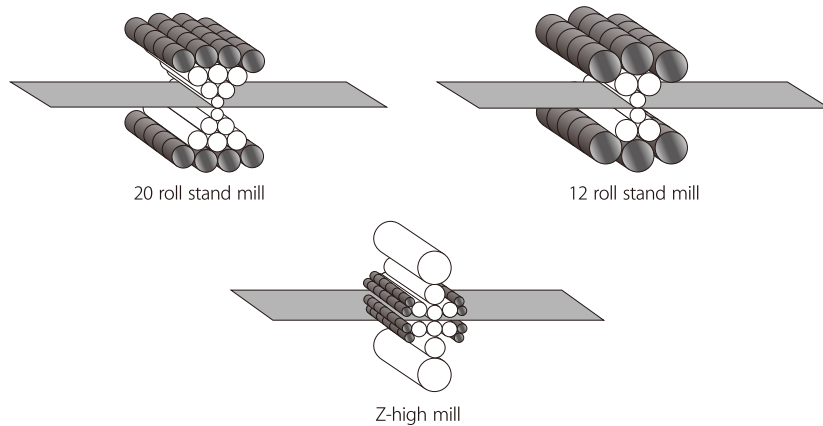


Back-up roller – ZB series (For Backing shaft of cluster mill)

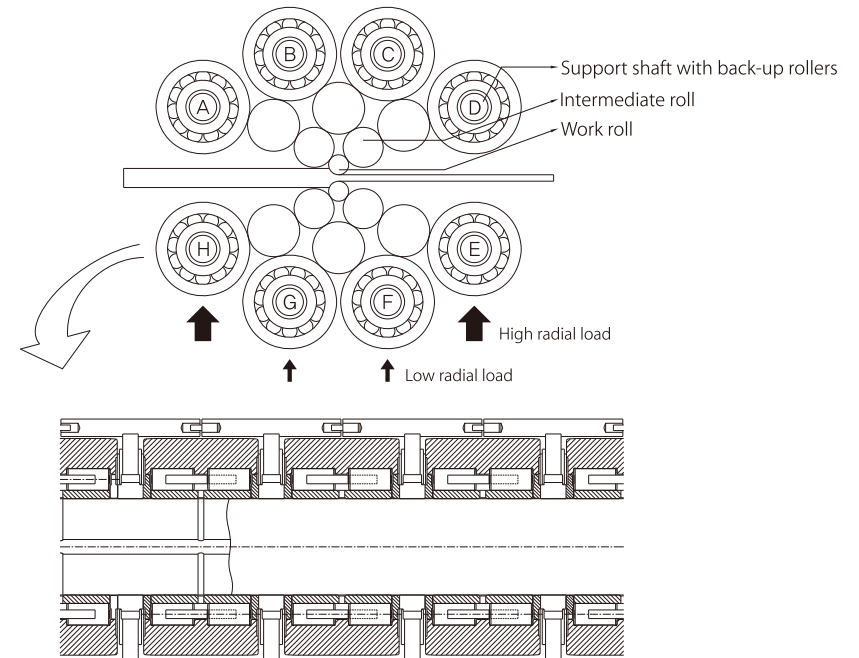


HKT has been supplying back-up roller for various type of multi roll cold mill stands. Depends on their type and manufacturer, roll stands are described in 12 roll stand mill, 20 roll stand mill, Z-high mill, and so on. The demands for rolled product with high quality in thickness and flatness is going to wide needs for back-roller bearing with high running accuracy, and HKT meets their requirements.

Various types of muti-roll cold mill stands (Cluster mill)



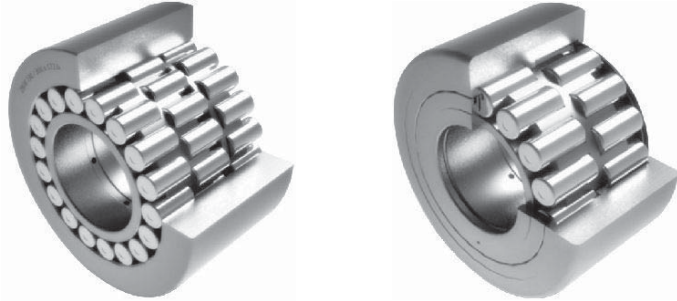
20-high mill



The work rolls are supported by intermediate rolls, which are supported by back-up rollers subsequently. A few back-up rollers are arranged in one shaft and ensure from high radial shock load.

Types

Type differs in accordance with design of cluster mill. Depends on type of lubricant and lubrication method, side plates are designed with adequate feature.



Components

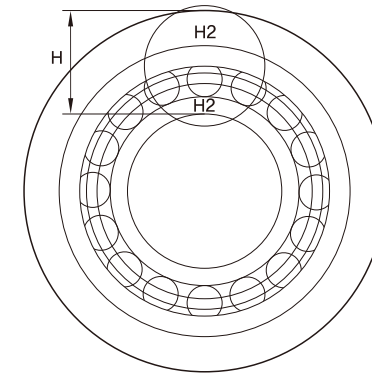
- Outer ring
- Inner ring
- Roller
- Cage
- Internal ring (depends on type)
- Side plate (depends on type)

Advantages and special features

- Outer surface of outer ring have direct contact with the intermediate roll, which carrying certain percentage of rolling forces, hence the outer profile of outer ring has log curve (crowned surface) in order to prevent load concentration at the ends.
- Special section height tolerance

To improve quality of rolled product, not only surface quality of outer ring but also special section height tolerance is required. This is achieved by restricted manufacturing tolerances and grouping each component. Back-up rollers are classified in a few groups, each to 3, 4 or 5 μm tolerance.

Section height group	Section height tolerance μm
H1	0 -0.005
H2	-0.005 -0.010
H3	-0.010 -0.015



Section height group is designated to the position of greatest wall thickness in back-up rollers as above. Group marking must be at the same position on all bearing. The inner ring prefer to be rotated by 90° when maintenance period such that inner ring wear uniformly.

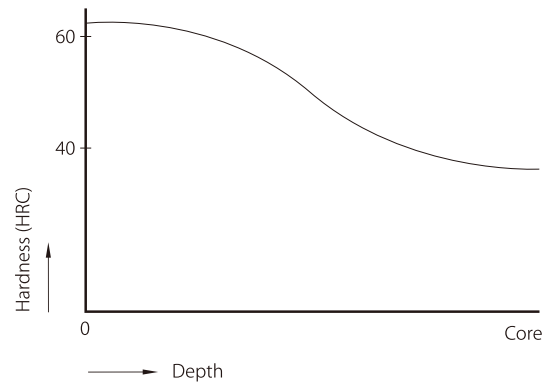
HKT back-up rollers can be supplied in section height groups and every back-up rollers in one supporting shaft must be in one section height group. Therefore, when ordering, please add number of back-up rollers installed in one supporting shaft at the end of designation, for example;

ZB3R 130/300x172.6-**S6**. (means 6 back-up rollers in one shaft)

- High running accuracy with narrow tolerances and runout in each component.

Heat Treatment

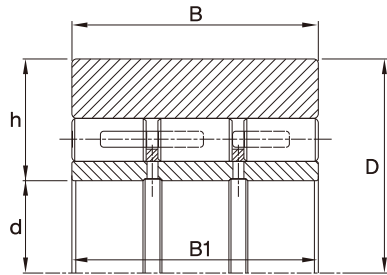
- Outer surface of outer ring have direct contact with the intermediate roll, which carrying certain percentage of rolling forces. Therefore outer ring of back-up roller is required to have adequate rigidity and fatigue strength. the hardness curve of outer ring by means of depth should conform to the below graph;



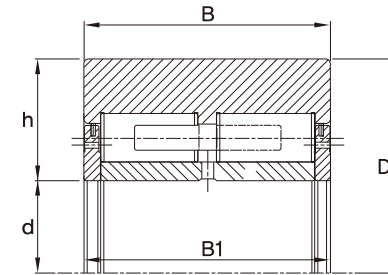
Maintenance

- Sliding fit possible because of point load on inner ring.
- Section height group marking must be at the same position on all bearing. The inner ring prefer to be rotated by 90° when maintenance period such that inner ring wear uniformly.
- As radial load on each back-up roller shaft is different, back-up rollers subject to higher radial load should be interchanged with back-up rollers subject to lower load regularly.
- Outer ring can be reground without loss of hardness. HKT supplies regrinding mandrel, which centers back-up rollers by means of the rolling elements, therefore required run-out of back-up roller set can be achieved.

ZB series - Back up roller



ZB3R



ZB2R

Dimensions					Mass m ≈ kg	Designation	Basic load ratings	
d	D	B	C	Section height h			dyn. C kN	stat. C ₀ kN
50	120	80	80	34.976	5.15	ZB2R 50/120x80	270	380
50	120	85	85	34.984	5.4	ZB2R 50/120x85	300	430
55	120	52.197	52	32.483	3.27	ZB2R 55/120x52.197/52	200	310
60	160	95	95	46.484	11.5	ZB2R 60/160x95	400	590
62	155	90	90	46.484	9.97	ZB2R 62/155x90	360	530
62	155	110	110	46.484	12.2	ZB3R 62/155x110	400	620
65	165	70	70	49.982	8.83	ZB2R 65/165x70	420	590
65	170	100	100	52.48	13.5	ZB2R 65/170x100	400	600
70	160	90	90	44.977	10.1	ZB2R 70/160x90	350	550
70	160.02	90	90	44.971	10.4	ZB3R 70/160.02x90	380	650
70	160.07	90	90	45	10.5	ZB3R 70/160.07x90	380	670
90	220	94	94	65	21.2	ZB2R 90/220x94	690	1000
90	220	96	94	65	21	ZB2R 90/220x96/94	490	700
90	220	95	95	65	20.9	ZB2R 90/220x95	530	800
90	220	130	130	65	28.7	ZB3R 90/220x130	700	1130
90	220.02	94	94	65	21	ZB2R 90/220.02x94	740	1100
90	220.02	96	94	65	22.2	ZB2R 90/220.02x96/94	550	780
90	230	100	100	69.98	24.2	ZB2R 90/230x100	640	980
90	260	125	125	84.97	41.3	ZB2R 90/260x125	920	1520
99.995	225	120	120	62.474	26	ZB2R 99.995/225x120	630	1000
100	225	100	100	62.48	21.7	ZB2R 100/225x100	550	840
100	225	120	119	62.5	26	ZB2R 100/225x120/119	770	1310
100	225	120	119	62.5	26	ZB2R 100/225x120/119	710	1170
100	225	120	120	62.5	27.7	ZB3R 100/225x120	740	1380
100	225.021	80	80	62.474	18.2	ZB2R 100/225.021x80	610	990
100	225.021	100	100	62.474	27.2	ZB3R 100/225.021x100	810	1440
100	260	95	95	79.97	30.2	ZB2R 100/260x95	700	1060

Dimensions					Mass m ≈ kg	Designation	Basic load ratings	
d	D	B	C	Section height h			dyn. C kN	stat. C ₀ kN
100	260	105	105	79.97	33.5	ZB2R 100/260x105	710	790
100	260	130	130	79.97	41.5	ZB2R 100/260x130	950	1580
110	260	98	98	75	31.9	ZB2R 110/260x98	700	1010
110	280	165	165	84.965	60.2	ZB3R 110/280x165	1120	1880
115	260	140	140	72.47	41.9	ZB2R 115/260x140	980	1690
120	280	165	165	79.965	57.7	ZB3R 120/280x165	1100	1940
120	350	165	165	114.965	98.3	ZB3R 120/350x165	1370	2220
130	300	160	159.5	84.9617	64.8	ZB3R 130/300x160/159.5	1330	2340
130	300	172.644	172.644	84.955	72.6	ZB3R 130/300x172.644	1560	2900
130	300.02	130	129	85.01	51.8	ZB2R 130/300.02x130/129	1070	1620
130	300.02	132	129	85.01	53.8	ZB2R 130/300.02x132/129	1140	1830
130	300.02	150	149	85	60	ZB2R 130/300.02x150/149	1200	1860
130	300.02	161.5	160.5	85	67.4	ZB2R 130/300.02x161.5/160.5	1200	1880
130	300.02	172.65	171.6	85.01	73.6	ZB2R 130/300.02x172.65/171.6	1440	2370
130	300.02	172.64	172.6	84.955	74.8	ZB3R 130/300.02x172.64/172.6	1500	2700
130	350	175	175	109.965	101	ZB2R 130/350x175	1400	2300
179.984	406.43	223.96	217	113.155	161	ZB3R 179.984/406.43x223.96/217	2350	4500
179.984	406.43	224.25	220	113.181	150	ZB3R 179.984/406.43x224.25/220	1870	3340
180	406.4	171.04	170	113.2	125	ZB2R 180/406.4x171.04/170	1710	3000
180	406.4	224	220	113.2	174	ZB2R 180/406.4x224/220	1910	3450
180	406.42	171.04	170	113.143	132	ZB2R 180/406.42x171.04/170	1570	2650
180	406.42	171.04	171	113.2	130	ZB3R 180/406.42x171.04/171	2080	3850
180	406.42	171.04	171.04	113.155	130	ZB3R 180/406.42x171.04	2060	3810
180	406.42	176	170	113.2	136	ZB2R 180/406.42x176/170	1710	3000
180	406.42	217	217	113.143	150	ZB3R 180/406.42x217	2500	4900
180	406.42	224	224	113.2	169	ZB3R 180/406.42x224	2600	5100
180	406.42	224.25	224	113.155	162	ZB2R 180/406.42x224.25/224	2290	4230