



# BEARINGS FOR STONE-PROCESSING INDUSTRY

## *VIBRATING SCREENS*



IKL is a modern enterprise of professionals working in the Bearings production / development / trade and has a long experience and development in this market. Our specialists undertaking R&D, scientific, technical work in the research centers around the world. We work only with the best suppliers of materials/components that were audited by our specialists and has the highest standards in production line and transportation.

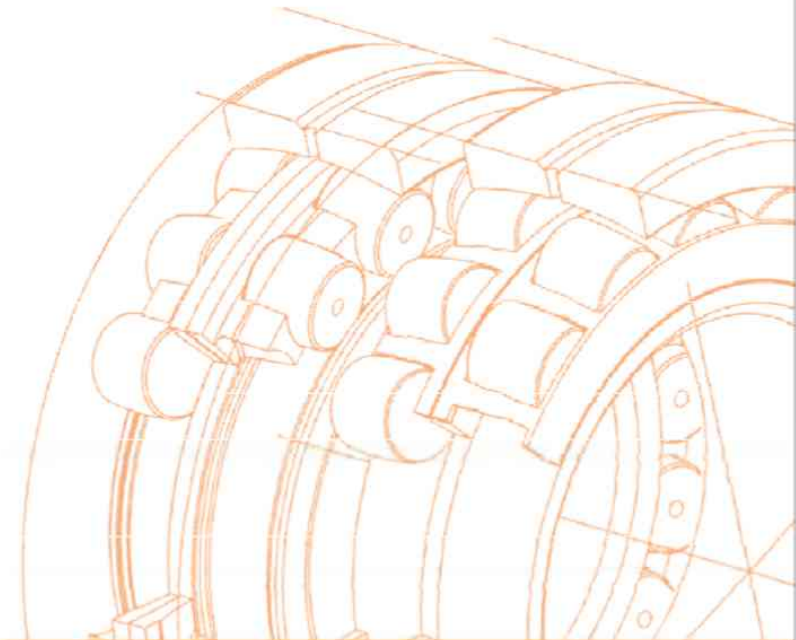
We are happy to share our experience and knowledge about our quality products with our customers.

The advantages of IKL Bearings are increased reliability and favorable price



IKL was founded in 1948 by the government of Yugoslavia (SFRY) as a state producer of bearings. The factory became one of the leading manufacturers of bearings in East Europe till the breakup of Yugoslavia

Since 2008 the restructuring process has started and IKL was bought. To save the technological and HR potential the production line was transferred to BULGARIA (Plovdiv) and INDIA (Hayderabad state and Bangalor)





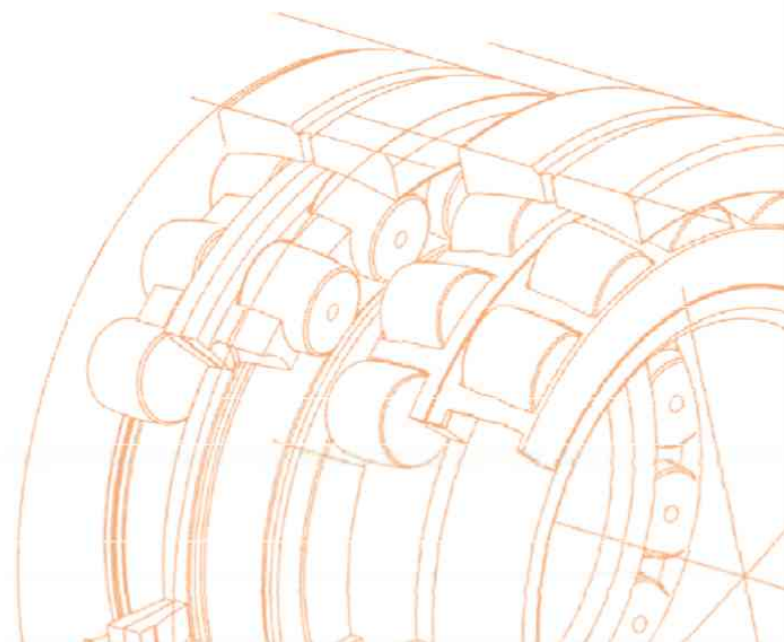
**Since 2010 the next companies operate under IKL Brand**

BTH/IKL BULGARIA Trade House operating in European region, a central hub where production, testing, certification and depot united with modern Laboratory testing center approved according to EU standards for quality tests of bearings

IKL Bearings INDIA Pvt Ltd for marketing of IKL Brand bearings in India and further manufacturing hub for IKL Vheavy® bearings in India

IKL Global FZE UAE hub for supply of IKL Brand bearings for Middle East / Asia  
Store and executive center responsible for promotion of bearings, insulated bearings, IKL Vheavy® bearings

IKL Innovations BELARUS Main research and development center in Eastern Europe for standart / custom bearings, insulated bearings, IKL Vheavy® bearings for vibrating screens / Heavy Duty industrial bearings



IKL produce special series of bearings designed for Heavy Duty conditions that provides the highest level of reliability and performance of the equipment. In our research centers we work purposefully not only on the development of new technologies, but also over the constant improvement of quality, based on an integrated technology platform, including tribology, materials science, analysis systems and experience, from the design and laboratory tests till the test in a Heavy Duty conditions.

IKL Vheavy® bearings provide energy efficiency, lower costs as for materials and for the maintenance. This offers a greater advantages for sustainable production and environmental benefits.

The conditions of the bearings in machinery operating in Stone-processed industry are usually highly contaminated, with high temperatures and stress

IKL Vheavy® bearings offer reliable and modern solutions for machinery used in stone processing i.e. gravel production, marble and granite extraction / cutting / refining, mining and output industry



**IKL produce bearings for the Stone-processing machinery that meets all the requirements placed on the products of this type**



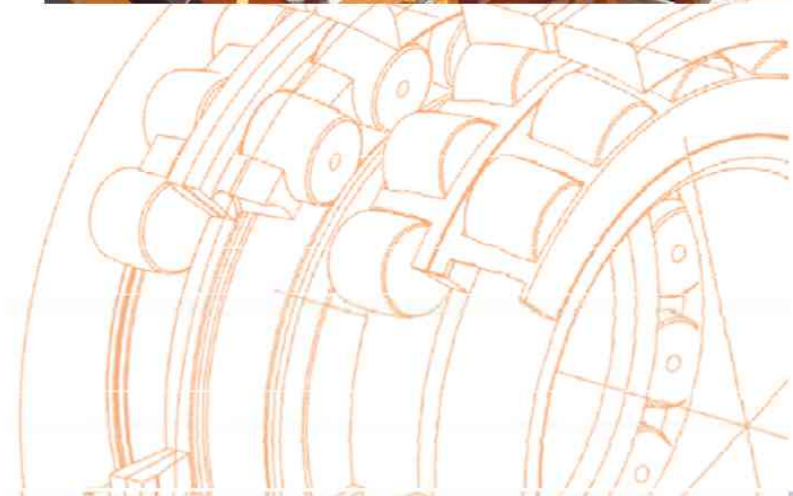
### IKL Vheavy® solutions for Vibrating screens

Vibrating screens, also known as shaker screens, are used to separate bulk materials in a mixture of different sized particles such as: sand, gravel, river rock and crushed rock, and other aggregates that often separated by size.

The machines due to constant acceleration and impact from material on the surface require bearings with extra capacity and robust cages. Extremely high loads cause deflection of the shafts and housings so the bearings must accommodate misalignment in operation

Bearings are using with a high speeds and highly contaminated conditions so the bearings must operate smoothly and have minimal friction even in harsh conditions

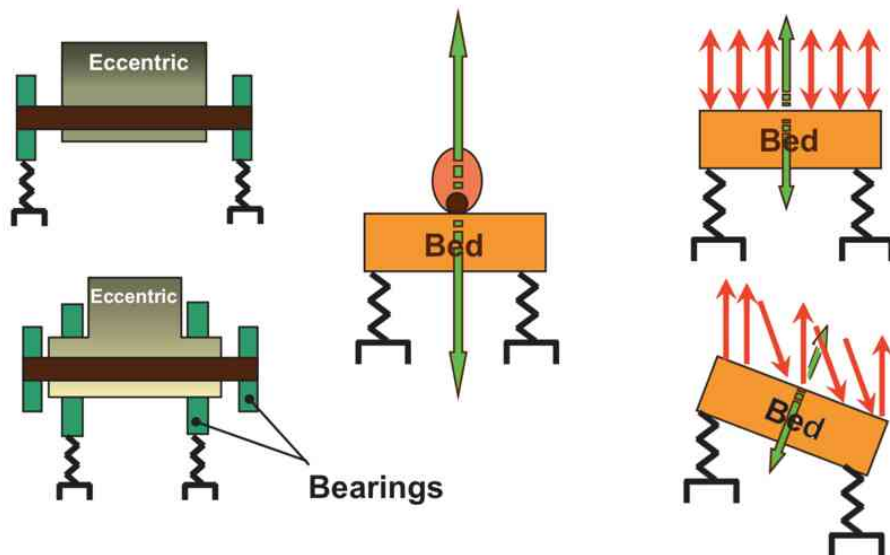
These bearings are used in the machinery for mining, construction, aggregate, asphalt recycling, steel manufacturing, and general industrial equipment where heavy loads, vibration, and impact loads are common.



### Classification of Mechanical Screens

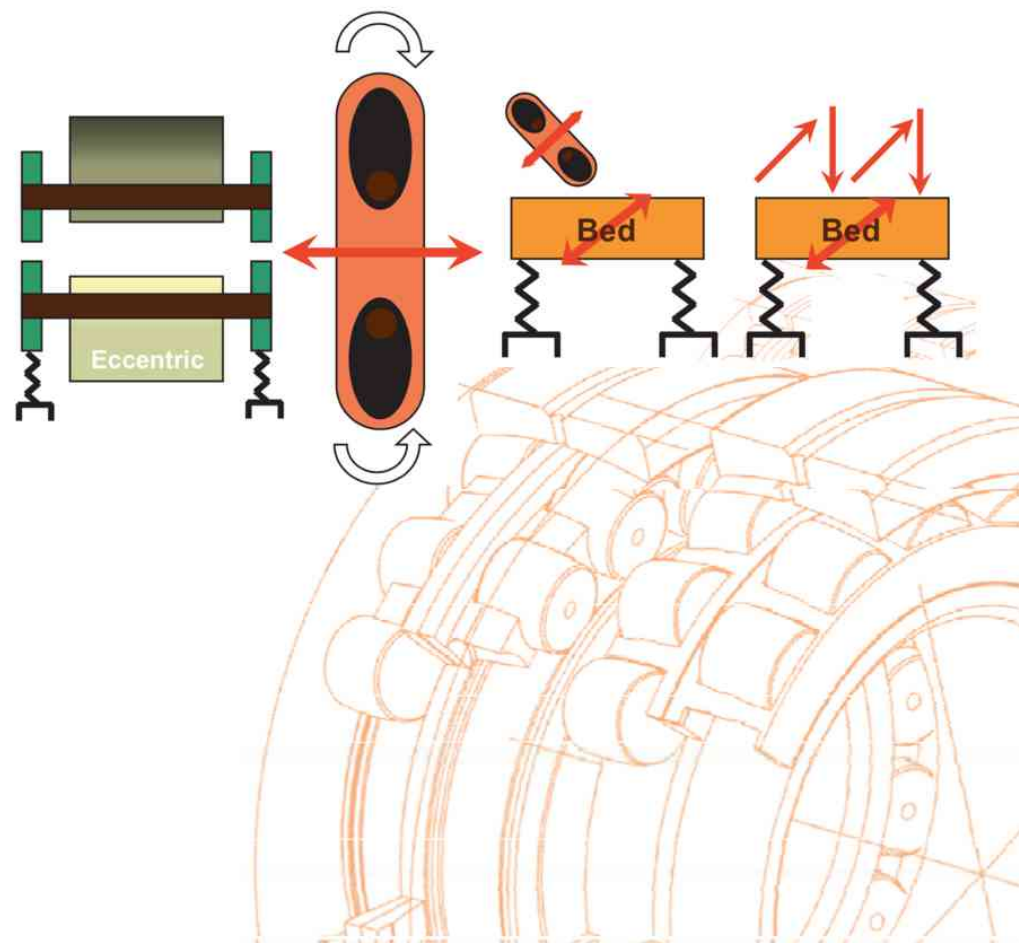
#### Inclined screens

- Have a circular action
- Use a two-bearing single shaft unit and four bearing single shaft unit
- Typically stationary screens



#### Horizontal screens

- Have a reciprocation action
- Use multiple shafts, two bearings per shaft
- Typically portable screens



Type of bearings mostly used in Vibrating screens:

Spherical roller bearings series 23 (type 223xx)



### Problems encountered in vibrating screens:

- High radial and impact loads
- High rotational speeds
- High temperatures
- Severe misalignment

### Major damage to the bearings:

- breaking of the cage
- fretting / Fretting corrosion
- abrasive wear and debris denting

### Associated problems caused by bearings failure:

- time out in machine exploitation
- urgent search of broken components
- unscheduled expenses
- material losses

### The most common types of bearing damages are often caused by:

- improper design and quality of the bearing
- poor quality of the steel
- weakness of the cage
- radial internal clearance of the bearing
- tolerance class of bore and outer diameter of the bearing
- insufficient maintenance / unqualified personnel
- improper installation and adjustment practices
- inadequate lubrication / use of ineligible oil or grease



CORROSION



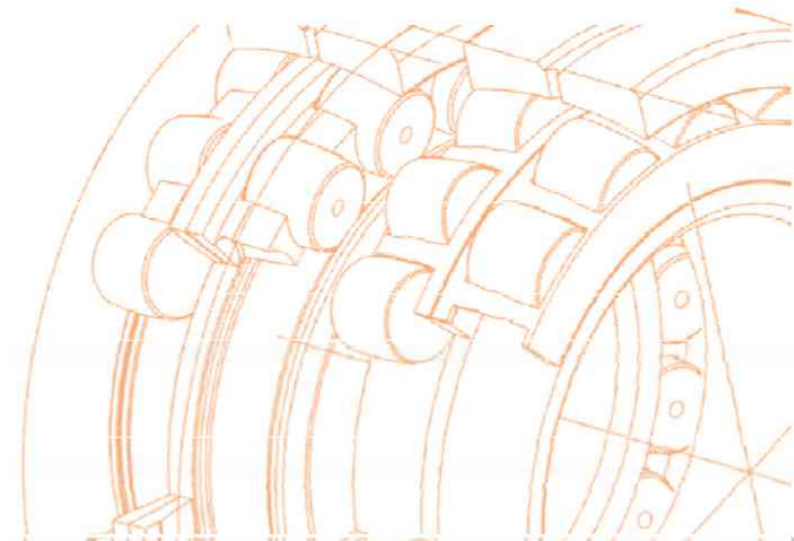
ABRASIVE WEAR



FRETTING, FRETTING CORROSION,  
FRICTION OXIDATION



LUBE FAILURE



### IKL SOLUTIONS FOR VIBRATING SCREEN BEARINGS

IKL is operating a lot in the market of Industrial bearings, working under severe conditions. We developed and later tested for several years our patented technology Vheavy®.

#### Features of IKL Vheavy® bearings that provides a really high quality results

Two-piece machined bronze retainer  
Allows differential speed between roller sets reducing retainer stresses

##### Asymmetrical roller design:

- Reduced sliding friction
- Less tendency for roller to skew during operation
- Fewer internal forces in bearing

##### Forged inner and outer rings

- uniform steel grain structure
- improved fatigue life



##### Outer ring guided

- higher operating speeds
- improved lubrication of guiding surface

Inner and outer ring special heat treatment provides

- improved fatigue life

IKL bearings have patented technology Vheavy® that was engineered for Heavy duty bearings EU pat.N002778001-0001.



The technology used in IKL Vheavy® bearings was patented by IKL and first tests in laboratories showed a serious long-life increase.

When the technology was adopted for a production line, we started to test this bearings with a real equipment to verify that the technology accomplishes its intended requirements

For the test in a real industrial duty we have choosen an Indian market that has one of the most severe conditions in the world:

- extremely high temperatures all-year around
- very high humidity
- usage of old and work-out equipment
- usage of equipment up to 24 hours a day
- other specific conditions

### IKL Vheavy® bearings test results:

The bearings produced with our technology were tested under extremely severe conditions in INDIA in recent years, and showed bearing life extension up to 40% comparing with non-patented bearings with traditional cage design.



Nowadays we can declare that IKL Vheavy® bearings showed a really high results and we recommend to use it to increase equipment productivity and reliability.

We reccomend use IKL Vheavy® bearings to make the machinery exploitation more effective and secure.

Typical range of application of IKL Vheavy® bearings

- Mining and Drilling equipment
- Equipment for Oil and Gas industry (refineries, offshore oil production platform, bearings for oil pumping stations)
- Equipment for the Stone-processed industry (also marble/granite cutting equipment, vibrating screens)
- Steel and Non-Ferrous industry equipment (also Metal Recycling equipment)
- other Heavy Industrial equipment working under severe conditions

Table of typical bearings produced by IKL Vheavy® technology

Dimensions, mm Glavne dimenzije				Calculating factor Koeficijenti F <sub>r</sub> /F <sub>e</sub> < e F <sub>r</sub> /F <sub>e</sub> > e X=0,67 X=0,67							Load ratings, kN Opterećenje		Limiting speed, min <sup>-1</sup> , (lubricant) Maksimalan broj obrtaja u minuti Grease Oil		Mass, kg Masa	GOST designation (National Standard) Oznaka GOST	Designation used by IKL Oznaka DIN
d	D	B	r <sub>amin</sub>	b <sub>i</sub>	d <sub>i</sub>	D <sub>i</sub>	e	Y	Y	Y <sub>0</sub>	C	C <sub>0</sub>					
90	190	64	3	11	119	159,1	0,37	1,83	2,72	1,78	535	695	2400	2880	9,08	3618AHK	22318MAW33
100	215	73	3	11	135	181,5	0,37	1,81	2,7	1,77	652	830	1360	1760	13,41	3620AHK	22320MAW33
110	240	80	3	14	149	201,2	0,37	1,83	2,72	1,79	751	943	1200	1520	19,62	3622AHK	22322MAW33
120	260	86	3	14	158	218,5	0,37	1,82	2,71	1,78	864	1094	1120	1440	24,13	3624AHK	22324MAW33
130	280	93	4	14	184	235,5	0,37	1,84	2,74	1,8	1120	1320	1040	1360	28,58	3626AHK	22326MAW33
140	300	102	4	16	181	247,2	0,38	1,76	2,62	1,72	1100	1444	1040	1360	36,1	3628AHK	22328MAW33
150	320	108	4	16	217	262,9	0,38	1,78	2,64	1,74	1208	1670	880	1200	44,64	3630AHK	22330MAW33
160	340	114	4	16	213	280	0,38	1,8	2,69	1,76	1370	1916	760	1040	52,6	3632AHK	22332MAW33
170	360	120	4	16	224	296,1	0,37	1,81	2,69	1,77	1527	2000	760	1040	61,5	3634AHK	22334MAW33
180	380	126	4	22	238	312,1	0,37	1,83	2,71	1,78	1671	2368	720	960	44,64	3636AHK	22336MAW33
190	400	132	5	22	255	328,5	0,36	1,85	2,75	1,81	1816	2675	680	880	86,6	3638AHK	22338MAW33
200	200	420	5	23,5	277	354,9	0,35	1,86	2,81	1,84	2196	2655	880	1200	44,64	3640AHK	22340MAW33

IKL Vheavy® technology is also applicable for the custom bearings designed by request. Our engineers and team of mechanics have wide experience working together with our customers to find the best solutions



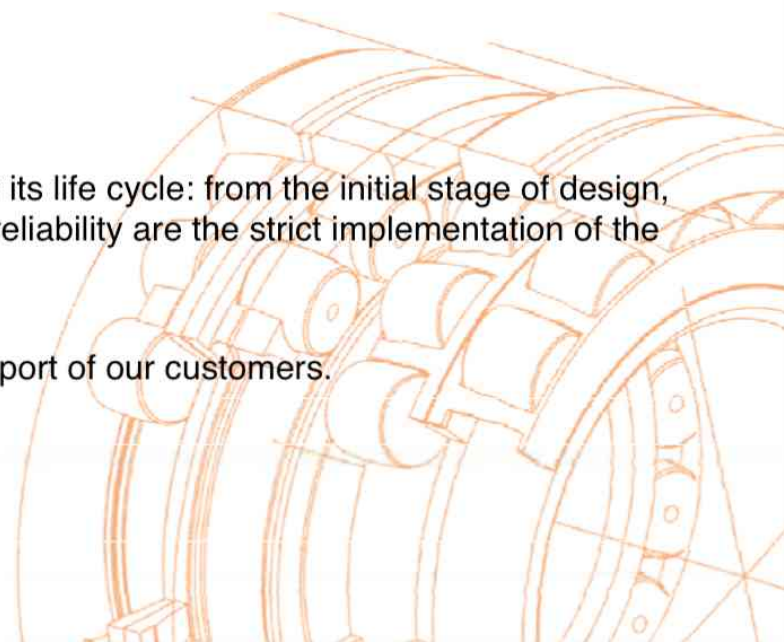
In addition to ensuring the production of high-quality products, our task is also to promote more reliable operation of your equipment by providing a range of technical, advisory, analytical and commercial value-added services.



The reliability of a bearing of any complexity should be ensured at all stages of its life cycle: from the initial stage of design, development to the final stage of operation. The basic conditions for ensuring reliability are the strict implementation of the rules that insist on reliability from the design up to production and installation.

IKL company pay special attention to the post sales services and constant support of our customers.

We do believe that close teamwork inevitably leads to the best results





ISO 9001:2008

# BEARINGS FOR STONE-PROCESSING INDUSTRY

## VIBRATING SCREENS

BTH / IKL Trierra OOD Plovdiv  
Byalo More St 2  
BULGARIA

IKL BEARINGS INDIA PVT  
H N286/1 Ground Floor NTI Layout  
12th Main Vidyaranyapura  
Bangalore 560097

IKL Global (United Arab Emirates)  
SM-Office – C1-1311C, Ajman, UAE

IKL INNOVATIONS  
220113 Minsk Vostochnaya ul 56-77  
BELARUS

PHARAOHS TRADE  
Cairo 12 Lofti Hassouna st  
EGYPT

UNISEL S.r.l.  
Guidonia Montecelio 26/e  
00012 Rome (RM) ITALY



patentend technology Vheavy® engineered for  
Heavy Duty bearings EU pat.N002778001-0001  
<http://www.iklbearings.com>