

Engineering solution for specific segments

BEARINGS EUROPE | **NBI**<sup>®</sup>



## Spherical Roller Bearings *for vibrating applications*



MANUFACTURING AND ENGINEERING | *A reliable choice*



HEAT TREATMENT

FULL TRACEABILITY

R&D+I. LABORATORIES

INTERNAL STANDARDS

SOFTWARES

# our solutions

## Application requirements

### Application concerns

- Severe working conditions (heavy loads, vibrations, shocks)
- High rotational speeds
- Accelerations
- High temperatures
- Severe misalignment
- Contamination
- Problematic lubrication

### Working conditions

- Environment / Contamination
- Operating regime (speed, stroke, frequency)
- Feed rate / Capacity limitation
- Processed material (particles shape / size)
- Quality of maintenance
- Quality of the spare parts
- Quality of lubricants, re-lubrication

### Customer requirements

- Long service life and high reliability
- Full operability under extreme environmental conditions
- Low maintenance costs
- Maximum productivity
- Low energy use

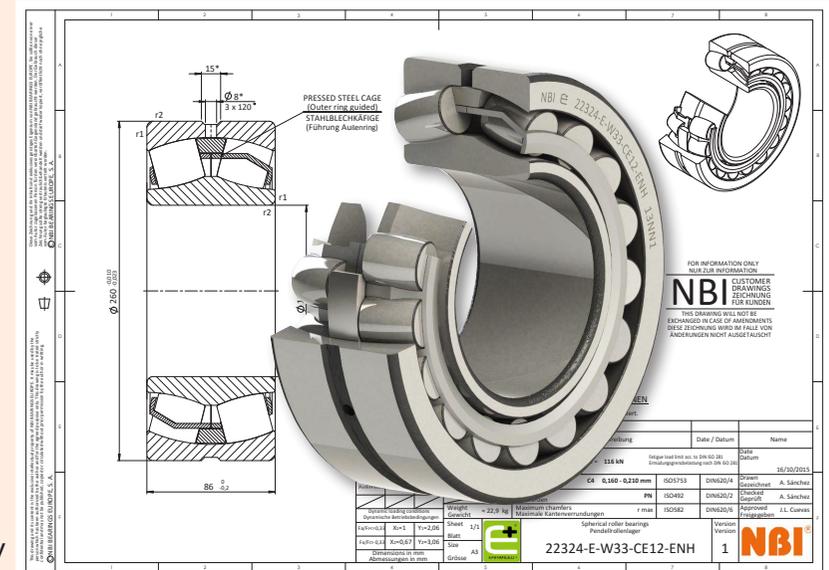


Providing correct bearing support for screen excitation mechanism is one of the most challenging tasks for screen designers and bearing providers. Bearings must be able to tolerate the misalignment created by shaft bending and frame deflections, to cope satisfactory with intense rotating acceleration fields generated by the vibrating motions, to accommodate shaft thermal expansion, and to support the dynamic loads from the eccentric movement as well as the shock loads from material processing.

## Solutions for vibrating applications: NBI CE12 Spherical Roller Bearings

### Product Highlights

- Optimal design: maximum capacity
- Optimized osculation ratios
- Quality steel with high purity and optimized microstructure, bainitic hardening
- Dimensionally stabilized to operating temperature of +200°C
- Restricted bore and outer diameter tolerances
- Standard C4 clearance or customized for special conditions
- Two-pieces cage (stamped steel or machined brass) outer ring guided
- Superfinished rollers and inner ring raceways, enhanced ground finish on the outer ring raceway



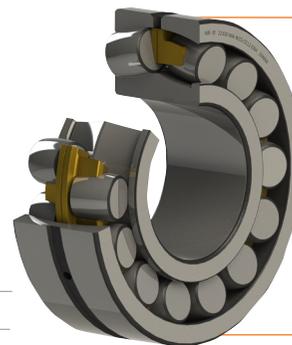
flexibility



Enhanced bearing Line

### Spherical Roller Bearings for vibrating applications

	<b>NBI</b>	<b>SKF</b>	<b>Shaeffler</b>	<b>Timken</b>	<b>NSK</b>	<b>NTN-SNR</b>
Suffix	<b>CE12</b>	<b>VA405</b>	<b>T41A</b>	<b>W800</b>	<b>VS4</b>	<b>EF800</b>



Bearing Code  
**22324**

NBI brass cage proprietary design  
**MA**

Lubrication Features  
**W33**

Suffix for vibrating Screen Bearings  
**CE12**

E+ Enhanced Line  
**ENH**



Bearing Code  
**22324**

NBI steel cage proprietary E-design  
**E**

Lubrication Features  
**W33**

Suffix for vibrating Screen Bearings  
**CE12**

E+ Enhanced Line  
**ENH**

# engineering

## NBI CE12 Spherical Roller Bearing

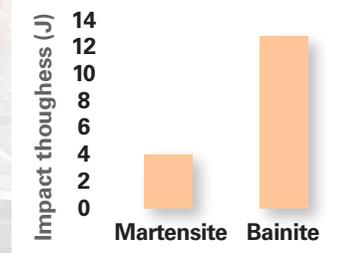
### Bearing Features Explained

#### Bainitic Hardening of bearing rings

Toughness is much better, compressive residual stresses obtained in rolling surface, low level of retained austenite which provides higher dimensional stability.

#### ▪ Customer benefits

Improved bearing performance for shock loads, better resistance to debris contamination, extended bearing life.



#### 2-pieces cage guided on outer ring

Independent rows improve bearing behavior in vibratory conditions. At high rotational speed combined with centrifugal forces from screen exciter, guiding of cage on the outer ring is more effective.



Lightweight steel cage with high stiffness and impact resilience, nitrocarburized for superior toughness and wear resistance. Guiding ring improves rollers trajectory on the raceways, mitigating the skewing.

#### ▪ Customer benefits

Improved load sharing between rollers especially on floating position, full bearing operability in vibratory conditions.



Brass cage with optimized pocket design for improved guidance of rollers out of load zone, reduced friction with rollers and good lubricant flow.

#### Restricted tolerances of inner/outer diameters

Assure a consistent uniform fit of the bearing with the shaft and housing, hence using the full load carrying capacity of the bearing and contributing to better resistance to heavy impact loads; prevents creeping and reduce fretting corrosion.

#### ▪ Customer benefits

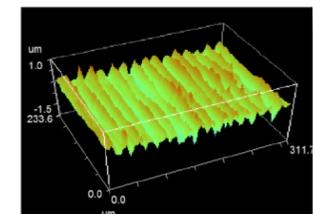
Maintain bearing operability, less machine service time and maintenance operations.

#### Improved surface finishes

Superfinishing generates constant surface characteristics, favorable lubricant distribution and lube film, reduced bearing torque and rollers skewing tendency.

#### ▪ Customer benefits

Reduced friction and roller skewing in intense dynamic regimes, less frequent bearing replacements are necessary.



# application

## Engineering applications



With more than 35 years of experience in industrial field, our **Application Engineering team** is fully committed to provide best-in-class engineering assistance to our customers, both OEMs and end-users from a large array of processing industries.

Thanks to our industrial applications know-how and technical capabilities, backed by advanced computer tools, we are fully able to assist you in any aspects related to bearings and bearing applications.

### NBI Value Proposal

#### Application Engineering

#### and Customer Technical Support

##### ▪ Bearing selection

Recomendation for bearing selection:

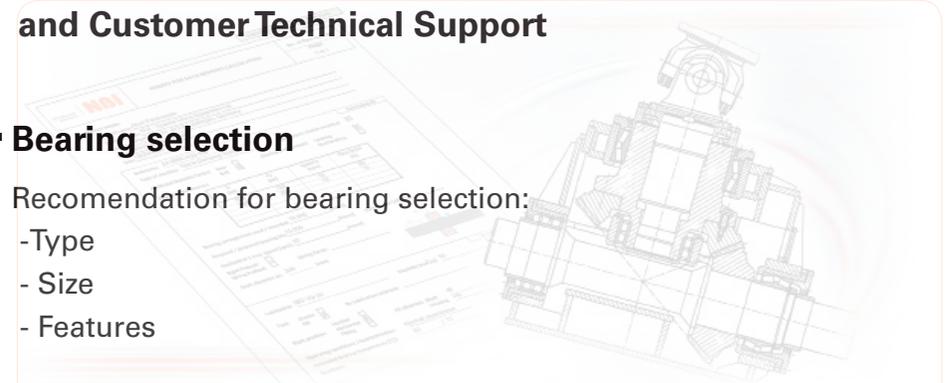
- Type
- Size
- Features

##### ▪ Technical assistance

- Fit selection
- Lubricant recommendations
- Design and bearing locations
- Operating bearing clearance calculations
- Advice in handing mounting and dismounting
- Bearing damage examination and root cause analysis
- Bearing performance evaluation: life, calculations, stresses
- Training course for difent audiences

##### ▪ Tailor made solutions

NBI is able to offer optimized designs that will satisfy our clients needs.



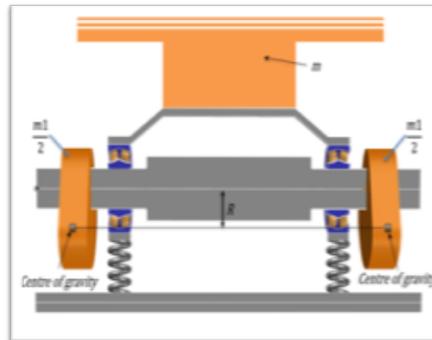
# application

## NBI Value Proposal

### Application Engineering and Customer Technical Support

NBI's calculation capabilities include advanced computer modelling tools for application analysis and bearing performance predictions, able to simulate with accuracy all the operating parameters, system deflections, environmental factors, and bearing micro-geometry details.

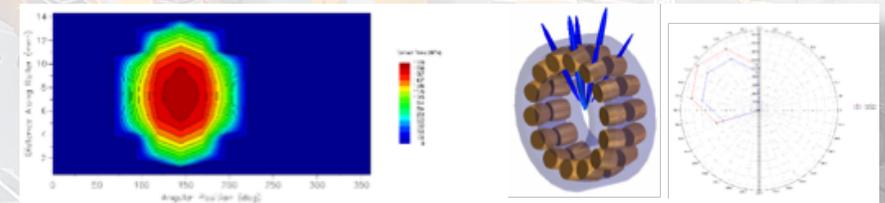
We propose to our customers in the quarrying & mining industry a particularized vibrating screen bearing solution, backed by top level engineering support.



**Application: one shaft-two bearings screen excitation mechanism**

Example shows the computer model of a one shaft-two bearings screen excitation mechanism .

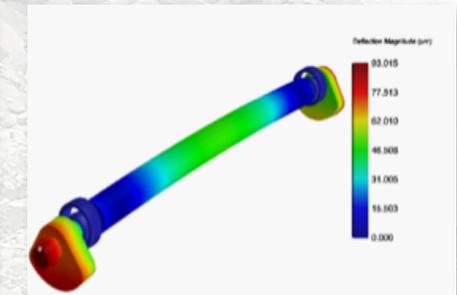
### Advanced application simulation and bearing calculations



**Bearing - Load zone & contact stress distribution**



**System modelling**



**System deflections under loads**

## NBI Bearings Europe

### Company

Dedicated to design & manufacturing  
of **BEARINGS** with own production plant



Production unit in China



Headquarter & production unit in Spain



Wide range available on stock



Experienced engineering application  
department in Spain and in Romania

engineering

## Equipment

Equipped with **high precision machinery**:

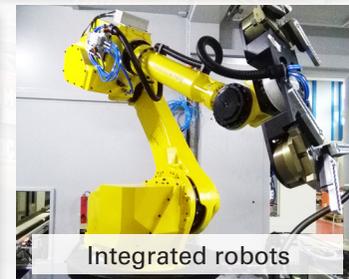
- Soft machining operation, turning
- Grinding and superfinishing machines highly automatized with integrated robots
- Integrated Aichelin Heat Treatment Line
- Fully equipped labs: dimensional, material and lifetime testing centers
- Ultrasonic washing machines
- Magnetic particle inspection equipments
- Grinding burns & cracks inspection equipments
- Full Traceability
- Research & development



Manufacturing plant in Spain



Manufacturing plant



Integrated robots



Aichelin Heat Treatment Line



Production line



Labs & Lifetime testing center



manufacturing

# facilities

## **NBI advantages**

- Own production plant since 2006 performing whole bearing manufacturing process (turning, grinding, superfinishing, heat treatment, assembly).
- Team of application engineers with over 35 years of experience in the sector.
- New production facility in Spain equipped with high-tech CNC machining centers and robots, able to meet the most stringent requirements of mechanical production.
- Modern heat treatment process, including bainitic hardening capability, performed in Aichelin furnace. Case carburizing available upon request.
- Own product design. Skilled engineers and advanced computer tools.
- Flexibility in terms of developing new bearing types with customized features.
- Wide stock program for fast deliveries
- R&D - Collaboration with reputed researching centers in Europe.

# design



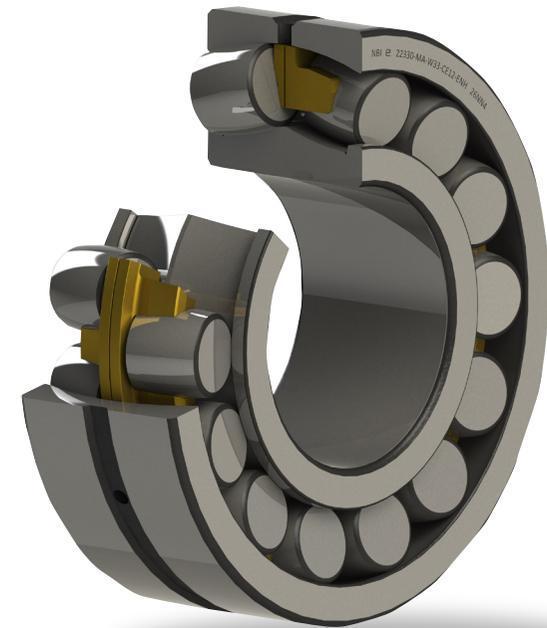
# advantages

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## Double Row Spherical Roller Bearings *for vibrating applications*



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