



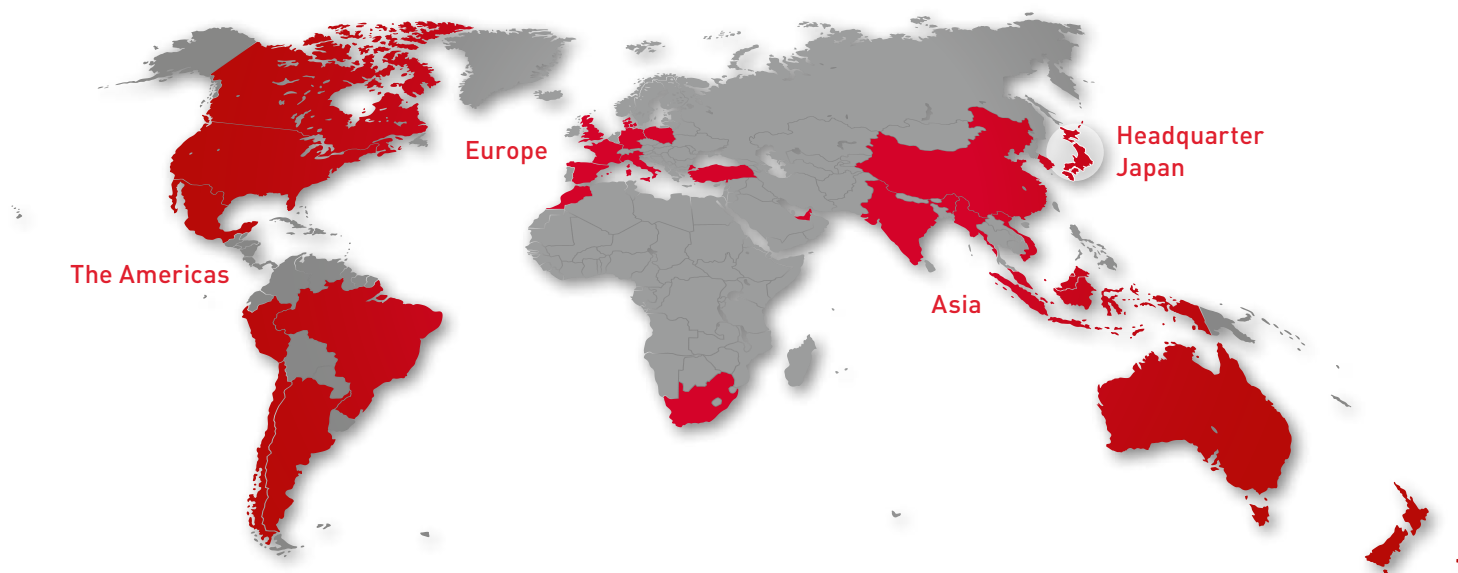
ROLLING BEARINGS FOR THE CEMENT INDUSTRY



STAY IN MOTION. STAY IN CONTROL.

SETTING THE FUTURE IN MOTION

We are among the leading manufacturers for rolling bearings, linear technology components and steering systems worldwide. We can be found on almost every continent – with production facilities, sales offices and technology centres – because our customers appreciate short decision-making channels, prompt deliveries and local service.



The NSK company

NSK commenced operations as the first Japanese manufacturer of rolling bearings back in 1916. Ever since, we have been continuously expanding and improving not only our product portfolio but also our range of services for various industrial sectors. In this context our worldwide research and production facilities are linked together in a global network. Here we concentrate not only on the

development of new technologies, but also on the continuous optimisation of quality – at every process stage. Among other things, our research activities include product design, simulation applications using a variety of analytical systems and the development of different steels and lubricants for rolling bearings.

Trademarks: All NSK product and service names listed in this catalogue are trademarks or registered trademarks of NSK Ltd.

OUR MOST IMPORTANT PRODUCT: OUR CUSTOMERS' SATISFACTION

One thing keeps us moving: we want to help you increase the reliability of your vehicles and equipment, not only with excellent products, but above all with excellent service. Our experienced engineers have a deep understanding of systems – together with you, they work to optimise products and processes and develop solutions for the future. The goal that we are dedicated to every day is ensuring that you remain competitive over the long run.

More about NSK on www.nskeurope.com



CEMENT INDUSTRY

Leaders in our field, we are not content simply to supply a range of products to meet the needs of today. At NSK we go much further: constantly challenging accepted thinking, exploring new and better methods of design and manufacture and, above all, looking beyond the needs of today to meet customers' requirements in the future.

Cement is one of the World's most important building materials – and its production one of the most severe processing environments, and so demands outstanding performance. NSK bearings provide the Cement and related industries with the reliability, sustainability and toughness required to withstand the critical processing factors of water, dust and grit, extreme temperatures, vibration and huge loads. Like other extreme processing and extraction industries, Cement machinery must continuously operate under these challenging conditions. NSK understands your production environments and maintenance issues, and that the solution to sustainable productivity lies in new technology.

As such our bearings are based on proprietary state-of-the-art technology, combined with the experience and knowledge from working with industry leaders. We have designed bearings to ensure your processes continue to run smoothly. NSK bearings exceed the limits of conventional bearings in terms of long operating life and high limiting speed to give you the toughness you require.

NSK Reliability helping you maintain your production momentum

NSK bearings offer the Cement industry plant operators and equipment manufacturers longer service life under some of the most challenging operating conditions. Maximising uptime and reducing maintenance costs for improved productivity at Cement plants. Durability and reliability are of paramount importance where failure of a single component can impact the entire Cement manufacturing process. Our superior bearings offer high performance with robust design, helping you improve profitability and productivity.

We continue to deliver the reliability required by Cement plants around the world.

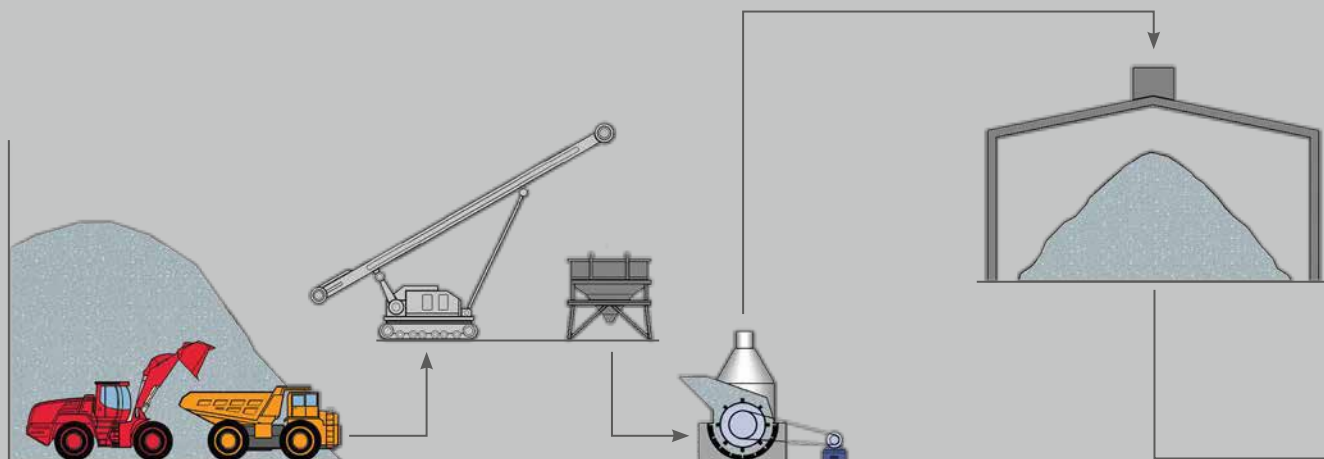


CEMENT INDUSTRY PROCESS

STEP 1

A Quarrying & Extraction

B Crushing, Grinding, Blending



A Quarrying & Extraction

B Crushing, Grinding, Blending



Spherical Roller Bearings
-NSKHPS Series
-ECAM/CAM Series
-VS/EVB Series (vibrating applications)



Cylindrical Roller Bearings –
EW/EM Series



Molded-Oil Bearings



Angular Contact Ball Bearings –
NSKHPS Series



Tapered Roller Bearings



Deep Groove Ball Bearings – Sealed



Deep Groove Ball Bearings – Sealed



Deep Groove Ball Bearings –
HR Series



Self-Lube® Units



Angular Contact Ball Bearings –
NSKHPS Series



Mounted Units

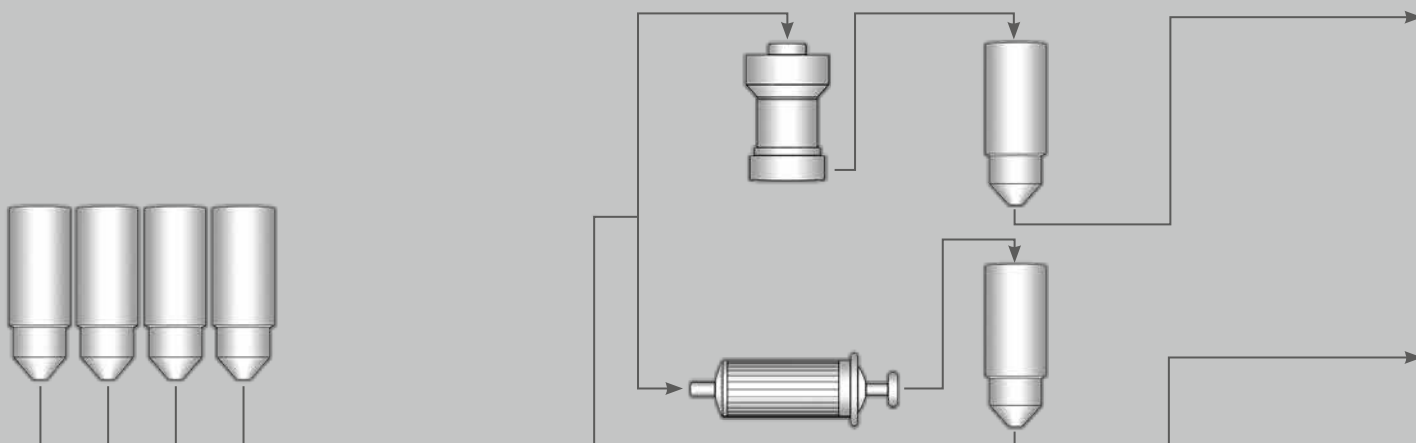


TF Series



Triple Lip Seal

C Material Preparation



C Material Preparation



Spherical Roller Bearings
-NSKHPS Series
-ECAM/CAM Series



Deep Groove Ball Bearings –
HR Series



Spherical Roller Bearings
-NSKHPS Series
-ECAM/CAM Series



Cylindrical Roller Bearings –
EW(EM Series



Angular Contact Ball Bearings –
Double Row



Cylindrical Roller Bearings –
EW(EM Series



Tapered Roller Bearings



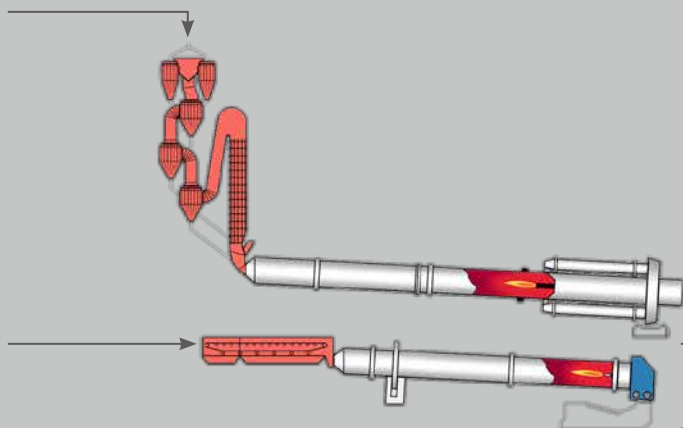
TF Series

D Pre-homogenisation

CEMENT INDUSTRY PROCESS

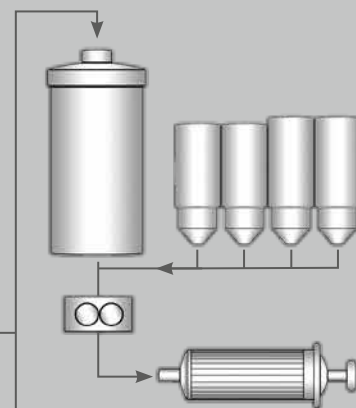
STEP 3

D Pre-Homogenisation



F Clinker Grinding – Mills

E Storage



E Storage



Self-Lube® Units



Plummer Block Housings



Spherical Roller Bearings
-NSKHPS Series
-ECAM/CAM Series

F Clinker Grinding – Mills



Spherical Roller Bearings
-NSKHPS Series
-ECAM/CAM Series



Cylindrical Roller Bearings –
EW/EM Series



Tapered Roller Bearings –
Double-Row



TF Series



Angular Contact
Ball Bearings –
Double Row

G Conveying



Spherical Roller Bearings
-NSKHPS Series
-ECAM/CAM Series



Self-Lube® Units



Mounted Units



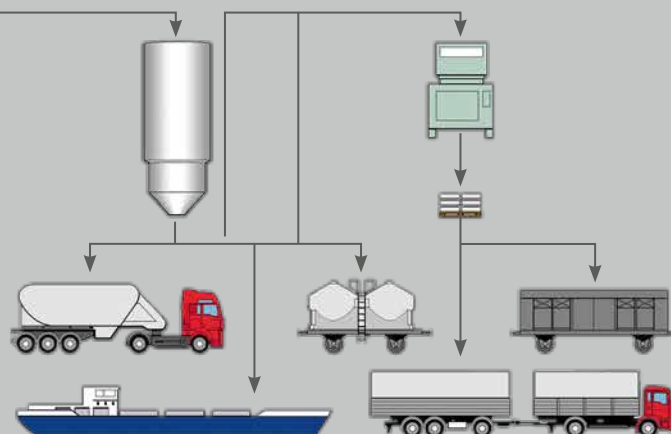
HLT Inserts



Deep Groove
Ball Bearings –
HR Series

G Conveying

H Packing & Shipping



H Packing & Shipping



Angular Contact Ball Bearings – NSKHPS Series



Spherical Roller Bearings
-NSKHPS Series
-ECAM/CAM Series



HLT Inserts



Cylindrical Roller Bearings – EW/EM Series



Molded-Oil Bearings



Mounted Units



Tapered Roller Bearings



TF Series



Triple Lip Seal



TF Series



Deep Groove Ball Bearings – Sealed



Self-Lube® Units

BEARING TYPES



Spherical Roller Bearings – NSKHPS Series

- High load capacity
- High limiting speed
- High strength cage (steel or brass)
- Low noise and vibration



Spherical Roller Bearings – CAM/ECAM Series

- Tough machined brass cage
- Self-aligning ability with floating ring guide
- Controlled roller skew
- High dynamic and static load ratings
- High speed performance – low operating temperature rise
- High resistance to heavy & shock loading
- High temperature dimensional stability
- High cage strength



Spherical Roller Bearings – Long-life VS

- Improved surface roughness on rollers, inner & outer ring
- Specifically designed for Vibrating Screens
- Load rating increased by 1.25 times
- Dampened vibration
- Better roller guidance & smooth running
- Reduced bearing damage from slippage, surface fatigue, flaking



Spherical Roller Bearings – EVB Series

- Extra capacity vibratory bearings
- Heat stabilised up to 200°C
- One-piece machined brass cage
- Special ring tolerances to withstand vibration, shock loads & misalignment



Cylindrical Roller Bearings – EM Series

- Extra capacity internal design
- High strength brass cage – reduces wear and improves performance in vibrating equipment
- Special cage pocket profiling improves oil / grease flow
- 30% higher load rating than conventional bearings



Cylindrical Roller Bearings – EW Series

- High radial load capacity
- High speed applications
- High strength pressed steel, machined brass or polyamide cage
- Low noise & heat generation



Deep Groove Ball Bearings – Sealed

- Viton®* seals (black); Standard seals (brown)
- High temperature Viton®* seals can run up to 200°C
- Standard seals can run up to 120°C
- Low noise level

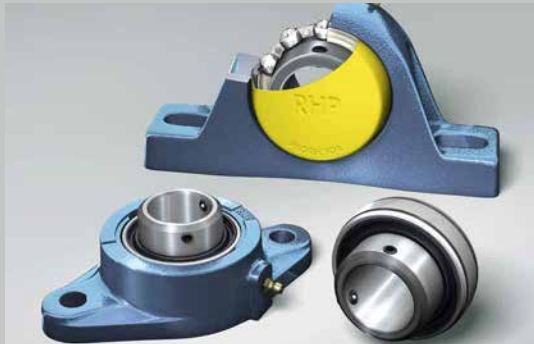
* DuPont Performance Elastomers LLC



Deep Groove Ball Bearings – HR Series

- Special internal design
- Bigger rolling elements
- Increased dynamic load rating
- Increased life in operation
- Interchangeable with the standard range
- Extra clean Z steel as standard

BEARING TYPES



Self-Lube® Units

- Range of diverse casting and pressed steel and thermoplastic housings
- 3 main seal options – standard, triple lip, or flinger/standard
- All cast housings supplied with re-greasing facility
- Secure locking shaft for all speed, load and vibration conditions
- Protector caps available



HLT Inserts

- Special internal geometry (cage & internal features) designed to operate at extreme temperatures
- High performance Klüber grease operating at extreme temperatures (-40°C and +180°C)
- Durable silicone rubber seals offer protection at extreme temperatures



J-Line - Mounted Units (JIS)

- Sealed single-row ball bearing in a Pillow block or flanged housing
- RHP units feature “flingers” that keep contaminants away
- Housings available in ductile cast iron, cast steel or stainless steel
- Variety of shaft locking mechanisms



Triple Lip Seal

- Nitrile rubber triple lip seals
- Longer life due to superior seal performance
- Extended lubrication intervals – increases productivity of machines and reduces maintenance costs



Plummer Blocks

- Split housing allows easy mounting and dismounting
- Various sealing options available – V-ring seals, labyrinth or heavy duty taconite
- Multi lubrication points



Tapered Roller Bearings

- Inch & metric sizes
- Standard steel / carburised steel / HTF treatment
- Custom-made sets with spacers



Taper Roller Bearings – Double Row

- Inch & metric sizes
- Standard steel / carburised steel / HTF treatment
- Also available with heavy-duty seals



Molded-Oil Bearings

- Grease-free property with no oil refilling
- Operating life more than twice as long as grease lubrication (in water/dust contaminated environments)
- Extended maintenance-free performance

BEARING TYPES



TF Series

- Innovative materials
- Special heat treatment technology
- Up to 10 times service life in contaminated lubrication
- Up to 4 times service life at 160°C
- 40% improvement on seizure resistance



Angular Contact Ball Bearings – NSKHPS Series

- Optimised internal design
- High strength ball guided cage – available in brass, polyamide or L-PPS
- High running accuracy P5 (ISO Class 5)
- High load ratings
- Universal facing as standard
- 40 degree Contact Angle



Angular Contact Ball Bearings – Double Row

- High quality – Ultra clean steel
- Steel or polyamide cage
- Super finished raceways, minimises noise and improves lubricant distribution
- Open or Shielded (ZZ or 2Z)
- Sealed DDU or 2RS

SUCCESS STORY

Industry: Cement

Application: Slurry Pump

Cost Savings: € 51 476

Introduction

A cement plant was experiencing premature bearing failures due to a contamination in their slurry pumps. Bearings were only lasting two to three months causing frequent downtime and high maintenance costs. NSK was contacted to evaluate the problem and the NSK engineers suggested an improved bearing design together with a recommendation to increase bearing fitting standards. After the implementation bearing life was doubled.

Key Facts

- Slurry pump
- Premature bearing failure
- NSK solution: ACBB with HTF material followed by a training on installation and maintenance of bearings
- Increased lifetime
- Significant cost saving realised

Value Proposals

- NSK experts performed an Application Review
- The review show that the used bearing was failing due to contamination
- NSK recommended to use ACBB with HTF material
- With the new bearing, the lifetime was doubled
- Training was provided on improved installation and maintenance of bearings



Concrete Plant



Angular Contact Ball Bearing with special HTF Steel

Product Features

- Angular Contact Ball Bearing with special HTF steel
- Innovative heat treatment technology
- Outperforming standard bearing steel

Cost Saving Breakdown

Before	Cost p.a.
Total bearing cost	€ 96 916
No formal training	€ 0
Total Costs	€ 96 916

NSK Solution	Cost p.a.
Total bearing cost	€ 42 940
Training for the maintenance team	€ 2 500
Total Costs	€ 45 440



NSK AMERICAS

United States
NSK Corporation
Ann Arbor MI
1.888.446.5675

Canada
NSK Canada Inc.
Brampton ON
1.905.890.9740

Mexico
NSK Rodamientos Mexicana,
S.A. de C.V.
Silao Guanajuato MX
52.472.500.9500

Brazil
NSK Brasil Ltda.
Suzano SP
55.11.4744.2500

Argentina
NSK Argentina SRL
Buenos Aires
54.11.4704.5100

Latin America
NSK Latin America Inc.
Miramar FL
1.305.477.0605

Website: www.nsk.com/am-en
NSK Global: www.nsk.com

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