

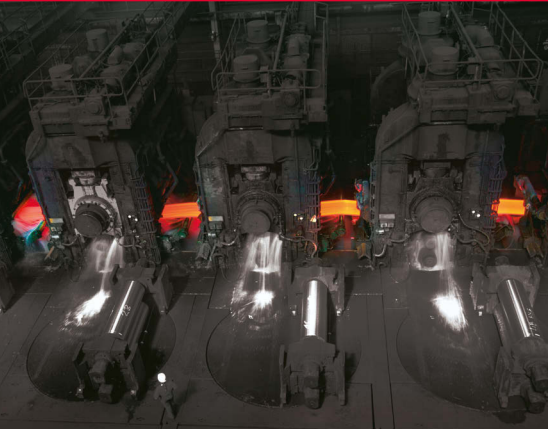
# NSK

## NUB SERIES CYLINDRICAL ROLLER BEARINGS

LONG-LIFE SOLUTIONS FOR CONTINUOUS CASTING MACHINES



STAY IN MOTION. STAY IN CONTROL.



## MADE WITH METTLE

### BEARINGS FOR STEEL AND METALS MACHINERY

Massive loads. Intense heat. Ultra low speeds. Staggering shock loads, misalignment, and contamination from mill scale and water vapor.

From iron and steel making through rolling and forming mills, the operating conditions of the entire process are severe. The reliable, uninterrupted performance of rolling components is critical for accelerated production.

For NSK, our product development and design is focused squarely on withstanding the manifold operating stresses of these applications with:

- › increasing capacities for high loads and high speeds
- › advanced materials for durability, wear resistance and longer life
- › lubrication and seal technology for smooth and clean running

Our product solutions are designed to optimize the performance of machinery and equipment, to assure predictable reliability and to deliver total cost-efficiency.



## OUTSTANDING PERFORMANCE. ENGINEERED IN.

While contending with high heat, heavy loads, low speed and water exposure, the bearings used in continuous casting machinery must operate with reliability to ensure that yield, productivity and cost-efficiency is maximized. NSK's new NUB series cylindrical roller bearings are designed to be particularly effective for the free end of strand guide rolls, accommodating roll shaft bending and expansion while running with reduced sliding friction and wear for a longer, reliable operating life.

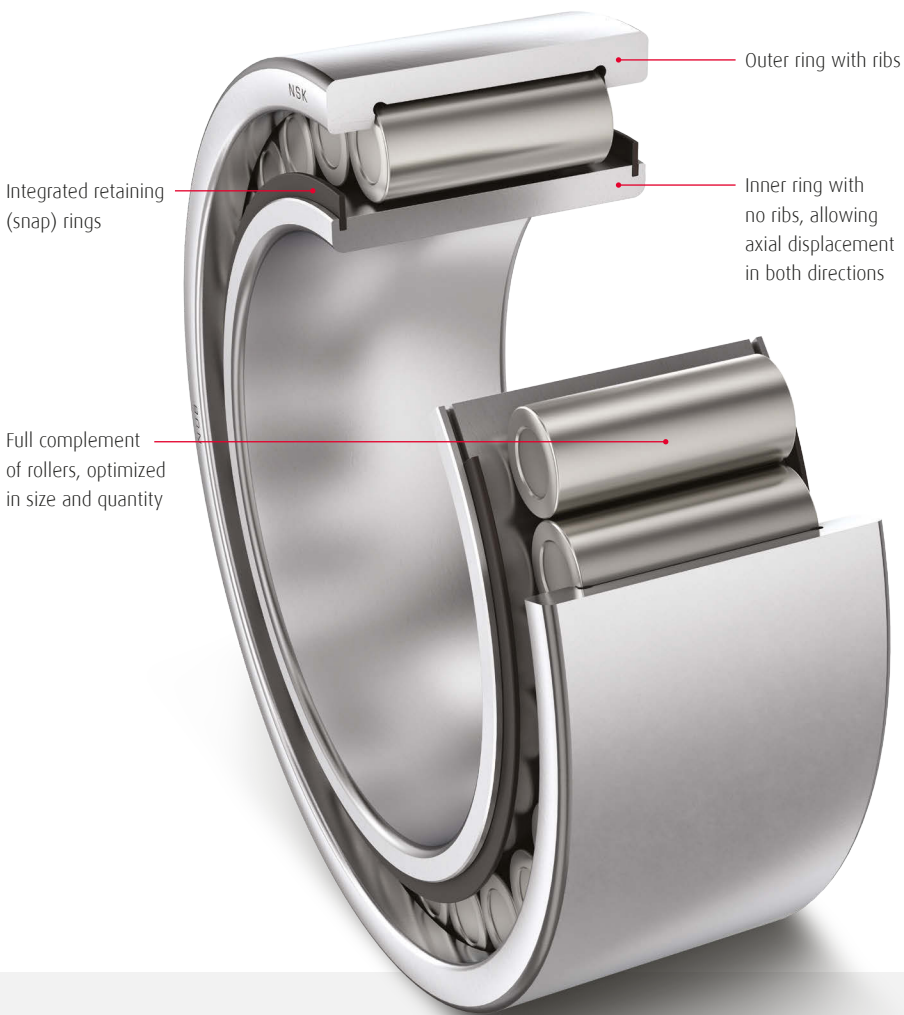
### PROVEN ADVANTAGES

- › Extended operating life – as much as 3 times that of alternative solutions
- › Reduced internal differential sliding friction and wear
- › Accommodates roll shaft bending / misalignment
  - › Smoothly absorbs roll expansion resulting from high operating temperatures
  - › Easy installation with non-separable design



# DESIGN AND OPERATING ADVANTAGES

NSK's NUB series cylindrical roller bearings are designed specifically - and ideally - to deliver optimal performance under heavy loads, low speeds, roll bending and roll expansion in continuous casting guide rolls.



High capacity is achieved in optimized design, with even load distribution across the roller length - even during roll-bending



Free floating capability enables smooth roll expansion movement between the rollers and inner ring

## DESIGNATION SYSTEM



## ISO Dimensions

NUB cylindrical roller bearings are dimensionally interchangeable with conventional bearing types.



## DESIGN FEATURES

- › Single row, full complement cylindrical roller bearing
- › Extremely high capacity internal design parameters, with optimal size and number of rollers
- › Optimized roller crowning reduces internal sliding friction and wear while absorbing roll bending
- › Non-separable, with outer ring ribs and inner ring retaining rings for ease of installation
- › Rib-free inner ring permits axial displacement in both directions
- › Relative movement characteristics of inner and outer raceways smoothly absorb roll expansion
- › Dimensionally interchangeable with conventional bearing types
- › Radial internal clearance C4 is standard



The NUB design allows the assembled housing to easily slide on and off the shaft, improving efficiency and safety in installation procedures.

# PROVEN PERFORMANCE

## BENCH AND FIELD TESTING

### BENCH TESTING

As part of the development process, NSK's innovative design was benchmarked against a competitive float side bearing design. Subjected to the same detrimental conditions (high load, low speed, misalignment and axial flotation), NSK's NUB bearings achieved more than 3 times the lifetime of the competitor's bearings.

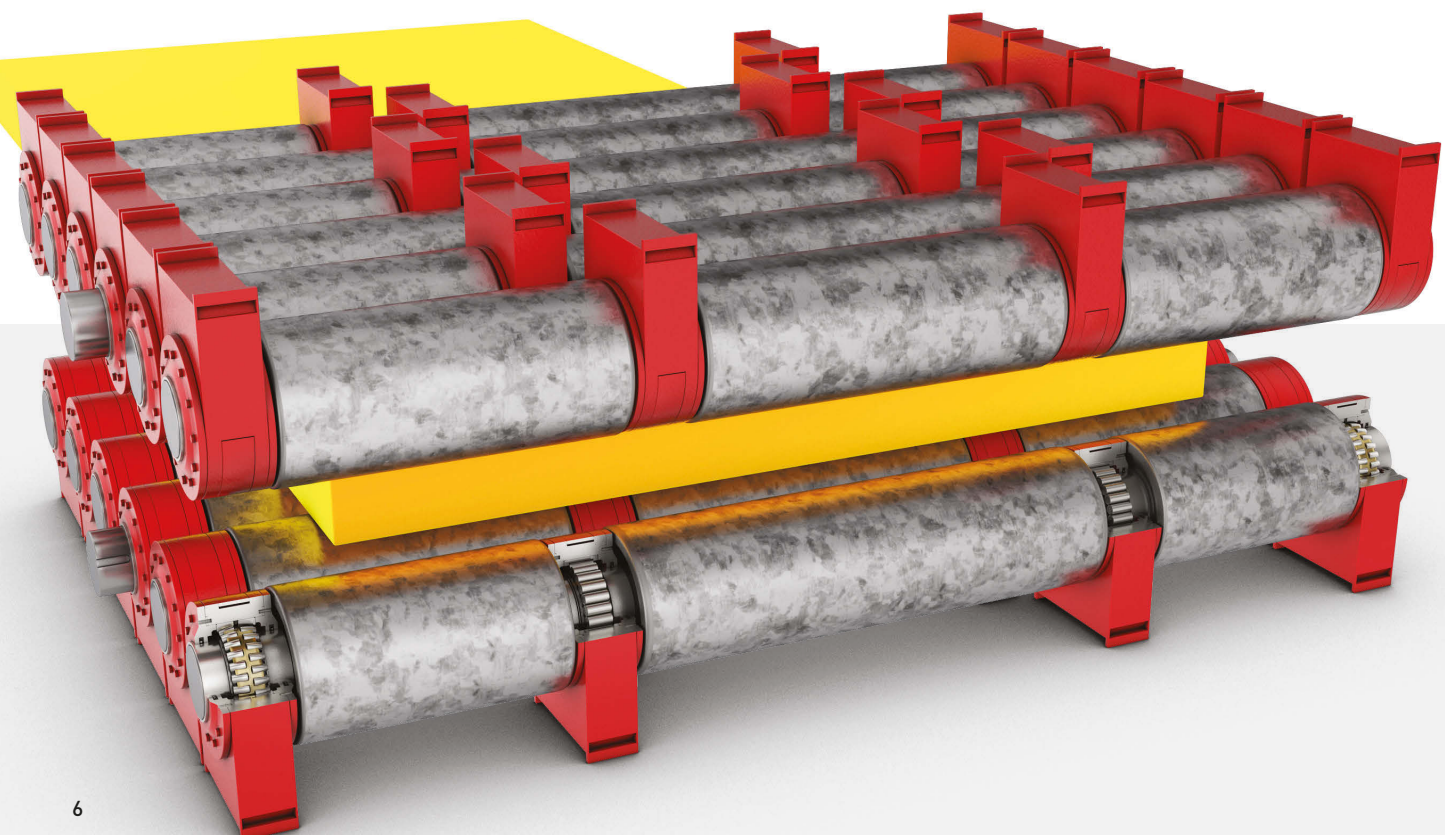
NSK NUB Bearings		Test Stop: minimal wear	
Competitor Bearings	Test Stop: bearing failure, significant wear, cracking		
Test Life Ratio	1	2	3

### FIELD TESTING

NSK field-trialed these bearings on customer sites in continuous casting machines. They achieved the expected long-life results with no premature failures, assuring a stable operation and reliable output.

#### Testing Results

Bearing number:..... 160NUB40VC4  
 Test period:..... 9 months  
 Production amount:..... Approx. 1 million tons  
 Results ..... No abnormalities or defects detected;  
 suitable condition for continued operation







## IMPROVEMENT PAYS

## END-TO-END SERVICE DELIVERS CUSTOMER SUCCESS

Improvement never ends. And we never stop looking for better ways to support our customers in a complete, collaborative and continuous way. The focus of NSK isn't simply on a quick fix for immediate gain – it's about incremental and sustainable improvement to deliver long-term benefits.

When NSK is on-site, we're there to understand our customers' challenges and identify problems contributing to frequent bearing replacement, breakdowns caused by poor specification, high energy costs from inefficient product selection and lost production because of downtime. We collaborate with our customers to institute an **Asset Improvement Program (AIP)** that encompasses process and maintenance management, diagnostic and educational support to deliver measurable gains in output and cost-efficiency.

With NSK, our customers embark on a critical path to realizing improvements in equipment, productivity, people and financial performance.







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