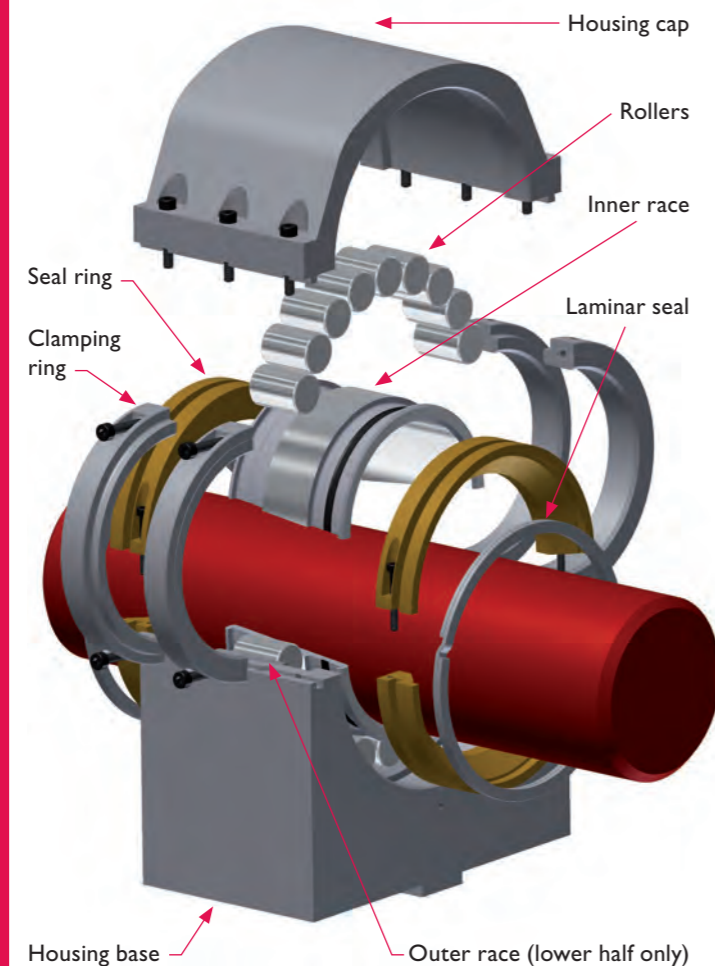


## COOPER ROLLER BEARINGS: HELPING TO KEEP THE STEEL INDUSTRY MOVING

Cooper has been working closely with steel-producing OEMs and end-users across the world and for many decades. Companies that we have co-operated with include the following famous names and their antecedents: Arcelor Mittal, Tata Steel, Danieli, OAO TMK, ThyssenKrupp, Posco, Sandvik, SMS Group, Siemens VAI and many others. Original inventor of the split roller bearing, Cooper continues to invest in its development to keep pace with the changing needs of the steel industry. We believe that split bearings enable designers to create better machinery, by liberating them from solid bearing maintenance constraints from the start. We also believe that replacement of existing solid bearings by split ones at any point can save future time and labour, particularly where such bearings are in any way 'trapped'.



### Easy-to-fit, easy to disassemble: the logic that underpins the cost benefits

Cooper roller bearings are completely split to the shaft, yet designed and engineered to be extremely fast and easy to assemble into robust, reliable units that give exceptional service under the harshest conditions.

The bearing shown here is a special watercooled model used widely in continuous slab casters.



### A wide range of mounting options

Available in a range of materials such as iron, nodular iron or steel, the variety of Cooper mountings reflects the wide spectrum of tasks which split roller bearings can perform. There is a full range of SN-, SAF- and SD-compatible pedestals. Watercooled bearings are supplied in special low-profile housings in cast or fabricated steel.



### The perfect sealing solution for your application

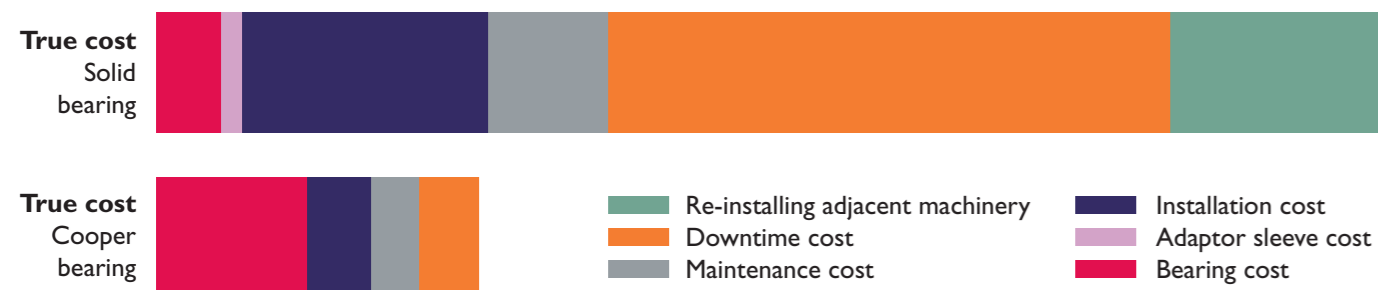
Cooper offers a complete range of seals to ensure long bearing life by meeting the exact needs of a given location and working environment. Here are just four of our seals typically used in the steel industry.

<p><b>Felt (F)</b></p> <p>Standard in UK and Europe for most Cooper bearings in general industrial applications.</p>	<p><b>High temperature packing (HTP)</b></p> <p>A direct replacement for felt in high temperature applications. Silicon-free version available.</p>
<p><b>Triple labyrinth with Viton rubber cord insert (TL HT)</b></p> <p>Suitable for high speed and high temperature applications.</p>	<p><b>Synthetic rubber single lip (SRS)</b></p> <p>Suitable for wet but not submerged conditions. Can be used for improved lubricant retention by mounting lip innermost.</p>

### What you can expect to save for each Cooper bearing installed

The diagram shows the areas in which Cooper bearings can save you money. A simple calculation will often show through-life savings of hundreds of thousands of pounds per bearing.

Please note that these considerations leave out the fast and easy inspection made possible by Cooper split roller bearings, which helps eliminate sudden failure and all its associated costs.



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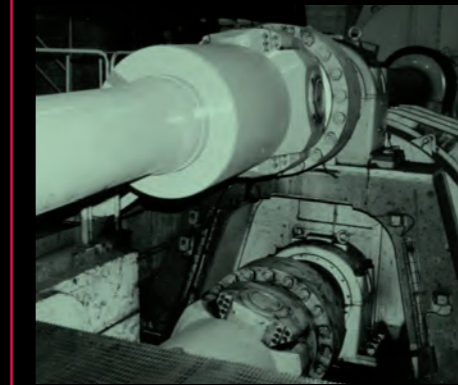
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# From raw materials to finished steel, Cooper bearings can play a part in your profitability

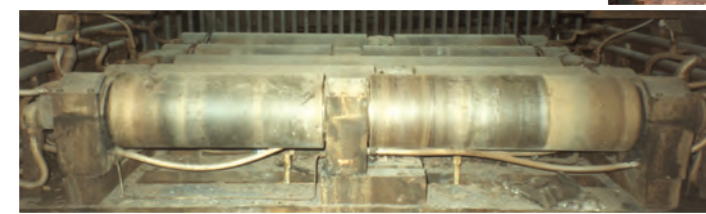
You'll find Cooper split roller bearings at work across the steel industry in the 30 or so applications shown in the table, and in many variations of each.

Raw materials	Smelting	Steelmaking	Steel forming	Across the industry
Stacker reclaimers	Coke ovens	Converters	Cooling banks/beds	Conveyors
Separators	Blast furnaces	Tundish rakers	Transfer tables	Gearboxes
Bucket elevators		Continuous slab casters	Quench tanks	Cranes
Rotary & vertical kilns			Reheat furnaces	Motors & generators
Fans			Breast rolls	Crankshafts
Conveyors			Rolling mill drives	Flywheel/brake sets
Crushers			Link spindles	Fans & blowers
			Skidbanks	
			Crop shears	
			Coilers	
			Pilger mills	



## Cooling beds

Cooper bearings have an important role in keeping hot steel moving, often under wet and dirty conditions.



## Continuous caster

Proven in steelworks worldwide, our watercooled bearings take temperature variations in their stride and deliver typical working lives of 2m tons (upper segments) and 1m tons (lower segments).

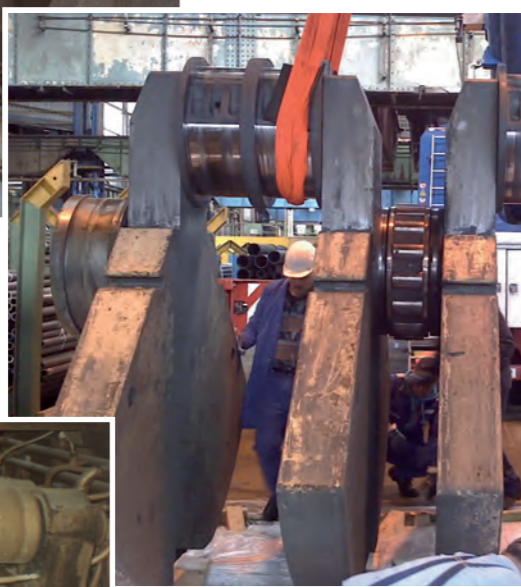


## Conveyors

On all types of conveyor, on headshafts, drive drums and return drums, Cooper roller bearings play an important part in keeping raw materials moving across the industry.

## Transfer tables

Moving ton after ton of heavy steel slabs and products smoothly to where they are needed places considerable demands on bearings. Cooper products are more than up to the task.

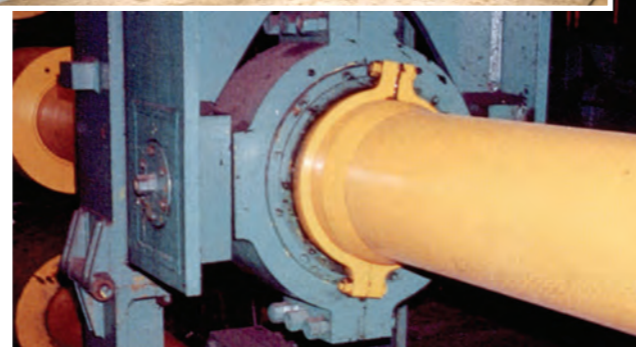


## Pilger mills

Pilger mills large and small around the world benefit from the reliability and easy accessibility for inspection of Cooper roller bearings.

## Motors & generators

Cooper bearings play a key part in electricity generation and in all kinds of motors throughout the steel industry. They are particularly valued in trapped locations, where they drastically reduce maintenance costs.



## Link spindles

Carrying the driving force to the rolling mill is not a job for low grade or untried bearings, which is why Cooper bearings have built a reputation in this application over the years.

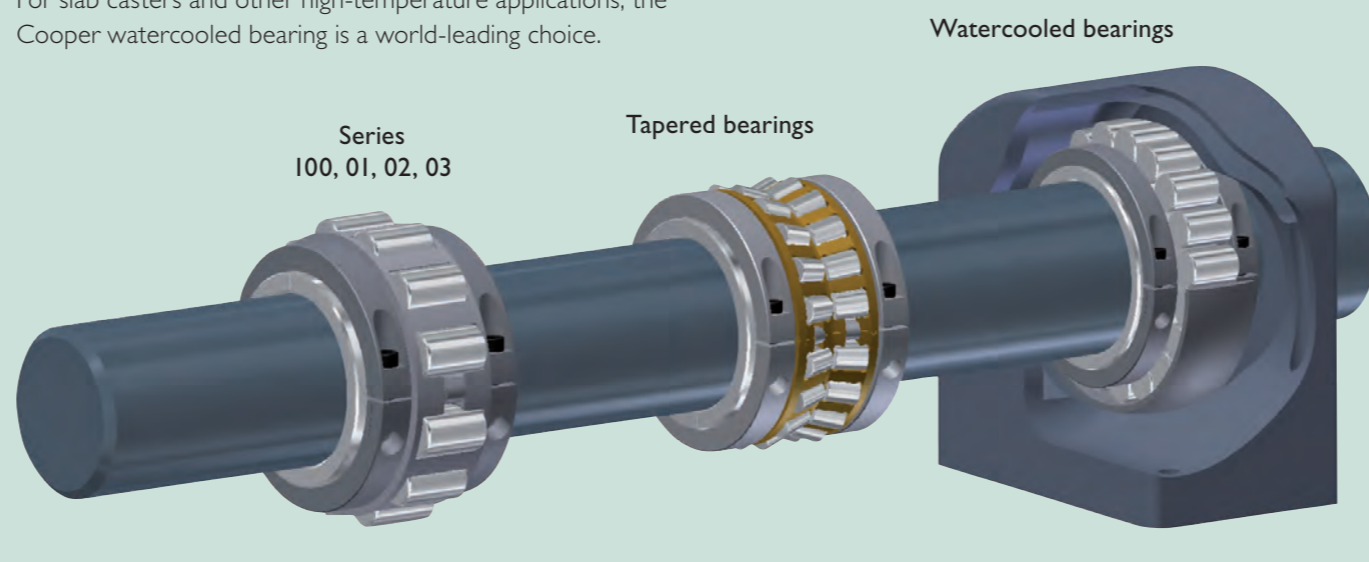
## Fans & blowers

From blast furnaces to dust extraction systems, Cooper bearings are coping with constant speed, rapid acceleration/deceleration or any combination of the two.



## Cooper bearings used in the steel industry

Cooper split roller bearings include the 100 Series of high-speed compact bearings, the medium duty 01 Series, heavy duty 02 Series and extra heavy duty 03 Series. In addition there is a rapidly developing range of double-row split tapered bearings. We also offer a heavy duty bearing in an SD-compatible heavy duty pedestal. For slab casters and other high-temperature applications, the Cooper watercooled bearing is a world-leading choice.



## The basis of phenomenal through-life cost savings: Cooper roller bearings are split to the shaft

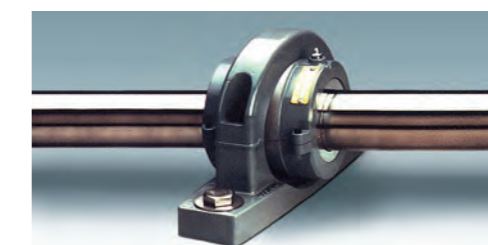
- Bearing installation is fast and easy no matter how 'trapped' the location
- No shaft realignment is required
- Inspection is simple and fast, aiding planned maintenance and reducing both downtime and "unexpected" failure
- Smaller range of operations needed, leading to task and toolbox simplification
- Handling weights are reduced (smaller, lighter pieces). Lifting gear is not required for most Cooper sizes. No lifting of nearby equipment is required

- A better long-term solution: the Cooper inner race protects the shaft and eliminates journal wear
- No cooling system is needed, thanks to low friction

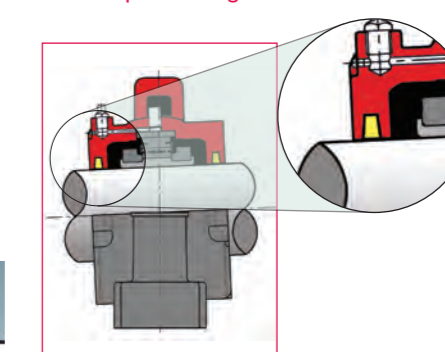


## The secret of long bearing life: a seal that stays aligned with the shaft, even when the shaft is misaligned

- Full seal integrity even if the shaft moves  $\pm 2.5^\circ$
- Reduction of foreign material ingress, even in very dusty environments
- No running-in period needed
- Little lubricant leakage, making lubrication simpler and keeping work surfaces cleaner

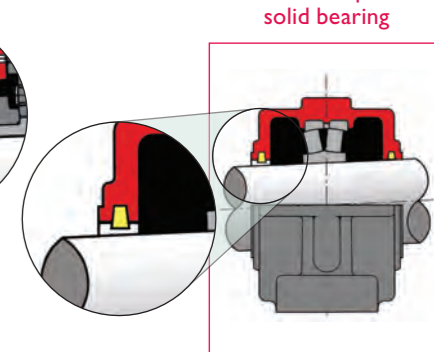


Cooper bearing



Thanks to its unique swivelling cartridge, the Cooper bearing allows the seal to remain concentric with the shaft at all times.

Double row spherical solid bearing



By contrast, the solid bearing arrangement opens up the seal or crushes it.

## Custom-made and tailored products for the steel industry

Cooper Roller Bearings has the skills and equipment to carry out any degree of customisation, from special products built 'from the ground up' to meet your exact need, to minor modifications.

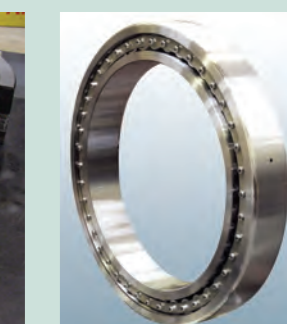
As an example, Cooper designed and manufactured the one-off bearing shown here on the right for a customer's Pilger mill. It features a brass cage, and large, high capacity rollers. There are countless other examples of this service. The bearing of the link spindle pictured in the main spread at left was specially built by Cooper to fit into a housing of the customer's own making.

The 1000mm solid bearing on the far right was specially made by Cooper for a converter gearbox in a US steelworks.

If you would like to use our custom services, please get in touch with your nearest Cooper Customer Service Centre (please see list on back page of this brochure).



03 Series 300mm GR Pilger mill bearing



1000mm solid bearing