

Technical Article

Optimal Protection With A Solid Housing:

Timken Pedestal Roller Bearing Housing
Units Have Proven Their Value in the
Timber Industry



Table of Contents:

| | |
|--|---|
| Case Study | 2 |
| Examples | 3 |
| Advantages Of The Timken Pedestal Roller Bearing Housing Units | 5 |

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Abstract

Industrial operations under challenging conditions and in highly contaminated environments place maximum demands on bearing installation units. They have to be robust enough to withstand these conditions and, at the same time, produce the best performance. Many installation units with a cast-iron housing are unable to hold up to such requirements and have to be replaced frequently – the result is huge costs for the purchase of spare parts and the repair itself as well as for the downtime of the machine. Bearings that are protected in solid-steel housings have proven themselves for such applications. This article describes the Timken high-performance pedestal roller bearings in precision-machined solid housings and shows their advantages over units in cast-iron housings, using various case studies from the timber industry.

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The Timken bearing units were developed for the most difficult operating conditions and, because of their solid-steel housings, they can withstand blows and falls and accommodate any misalignment of up to ± 1.5 degrees. They are designed for 40- to 180-mm shafts and, depending on the requirement, are available in various types of housings (two-bolt pillow blocks, four-bolt pillow blocks, flange blocks, piloted flanges, take-up blocks and cartridge blocks). For the seal, the user can select between labyrinth seals (Dupont Teflon) for high-speed applications and triple-lip seals (nitrile or urethane) and thus decide on the specific optimal protection. This is further improved by the fillable lubrication cavity between the primary and the secondary seals. Machined feet, threaded puller bores, black oxide inner rings and numerous shaft locking options ensure problem-free mounting of these high-performance units. In addition, optional steel covers with a black-oxide coating protect the roller bearings against heavy contamination from the fine dust that is typical of many industries, including the timber industry.

Case Study

At the moment, the still relatively new housing units are used primarily as a replacement for conventional units with cast-iron housings. They have already proven themselves to be invaluable in various sawmills in Europe, as the following case studies show.

Example 1:

Bearings in units installed in a sawdust-producing machine suddenly exploded. The reason was that the production of sawdust, which is normally 0.5 mm in size, sometimes is converted to 0.3 mm. Furthermore, the peeling rate is increased to 4,600 RPM every two to three weeks for two to three days – a speed for which the previous bearings were not designed. For that reason, the housings had to be replaced at least ten

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times a year. To reduce the costs, the machine operator decided to use Timken bearing units on a trial basis. He is more than satisfied with their performance and service life, for they have to be replaced only two to three times a year.

Example 2:

A Romanian manufacturer of laminate floor products and wall panels used conventional housing units in a panel press. The problems in this application are the heavy contamination and high axial loads, which is why the bearings had to be replaced every two to three months. After a check of the equipment, the technicians from the authorized distributor recommended a test with the solid housing units, which meanwhile have continued to run without a problem for more than a year. Now the press roller conveyors are also going to be changed over to Timken bearings.

Example 3:

In a debarking plant of a Swedish hygiene paper manufacturer, the bearing units failed every three to six months. After converting the plant to Timken solid housing units with steel covers, the problem was eliminated. In the meantime, the bearings have achieved a service life lasting more than one year.

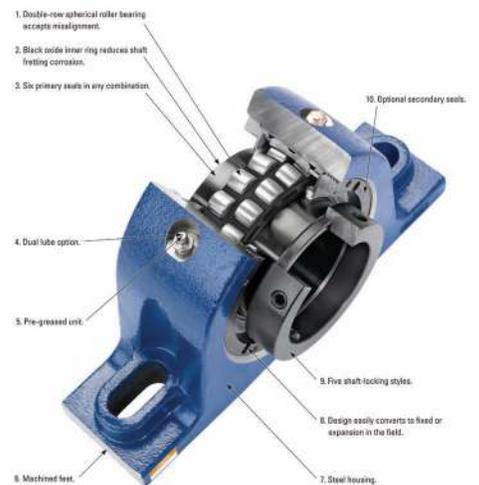
Example 4:

Derome Timber in Sweden had problems in the past with the bearings installed at the end of a chain conveyor system in one of its sawmills. The transport system is part of a machine that rotates logs for further processing. At the same time, the very heavy logs fall from a height of 50 cm onto the conveyor belt and cause severe shock loads upon impact. Combined with the climatic conditions (the machines are outdoors) and significant contamination, this represents a real test for the bearings. The cast-iron bearings used before withstood these loads for three to four months at the most. By then their housings were damaged or broken, and dirt had gotten into the interior, so the pedestal

Figure 1:
Timken pedestal bearings with a solid housing were developed for the harshest working conditions, which often prevail in the timber industry.



SRB SOLID-BLOCK RHU – KEY FEATURES



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*Figure 2:
In a Derome Timber sawmill in Sweden,
Timken pedestal roller bearings with
a solid housing achieved a service life
more than four times longer than that
of previously used bearings units with
a cast iron housing.*

Image: Nomo Kullager

bearings had to be replaced. Meanwhile, the first solid-housing Timken bearing units designed especially for the demands of the Derome sawmill have been in operation for more than one and a half years – during this time they have performed flawlessly. The Timken bearings have achieved a service life there that is four times longer than that of the previously used bearings from another manufacturer. Furthermore, now the replacements costs for defective bearings are definitely lower, which is why the company is gradually replacing all the bearing units previously in use with the extremely resistant Timken pedestal bearings.

Further examples:

After a series of tests, a Finnish manufacturer of sawmills also changed over to Timken completely and, in one of its latest projects, it installed more than 490 bearings. A German sawmill operator was also able to solve the problems that it had had with its previous housing units because of heavy contamination by converting to the solid housing units with their highly efficient labyrinth seals.

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*Figure 3:
Steel covers available as an option
protect the bearings against heavy
contamination.*



*Figure 4:
Broken baseplate of a cast-iron
pedestal bearing.*



Advantages of the Timken Pedestal Roller Bearing Housing Units

- **Wide range of sizes to accommodate shafts from 40 to 180 mm:** allows the replacement of almost all roller bearing units with solid housings.
- **Quick assembly:** Due to machined feet, threaded puller bores, black oxide inner rings and numerous shaft locking options.
- **Extended operating time:** Due to the robust steel housing.
- **Multi-directional alignment of the shaft:** Housings with a double nut allow a changeover from fixed to floating in any direction.
- **Fewer misalignment problems:** The bearings tolerate a misalignment of up to ± 1.5 degrees.
- **Various seal styles:** They optimize the performance in environments with heavy contamination.
- **Protection against excessive lubrication:** Units with seals that cannot be cleaned are equipped with pressure relief valves as a standard feature.
- **Increased shaft grip:** The series with eccentric locking offers a more secure grip during reversing applications with precision-ground shafts.