



— Garlock GUARDIAN®

labyrinth seals, the perfect solution for mechanical engineering applications, such as machine tools and milling machines, to avoid bearing oil leakage and debris inclusions.



Lubricant contamination is a common issue in mechanical engineering applications. Labyrinth seals offer good possibilities to avoid these problems.

A major advantage of labyrinth seals is that they are mostly wear-free and thus particularly durable. They also function safely and reliably: Moisture, dirt and dust get caught in the zigzag labyrinth paths of the seal due to flow resistance. Leaks, which can become a hazard to employees and the environment, are avoided.

The labyrinth profile consists of radial and axial spaces that give a recirculating effect during rotation, resulting in reliable protection. The labyrinth is constructed to give a non-contact seal without wear parts - for long service life and with reduced drag on the shaft.

Machine builders are often on the lookout for a suitable solution for their specific applications. In the process, many aspects must be considered.

To give an example: A company, that develops, designs and sells 3-spindle Machine Tools was looking for sealing solutions to avoid bearing oil leakage and debris inclusions. They offer over 3 times greater productivity with a single robot and its 3-spindle system ensures much lower running costs, saving on space, energy and specialist intervention. These are unique machines with a high degree of specialization and specific requirements. Garlock GUARDIAN® labyrinth seals have been installed between the housings and their spindles. Bearing oil leakage and debris inclusions were eliminated. The company specified GUARDIAN® in all machines of a special model replacing the original labyrinth seals. The introduction of GUARDIAN® simplified the overall design and related installations. Machine reliability increased reducing the total cost of production.



As a second example, consider the following case: A company, that offers milling solutions designed for the most demanding production environments, such as the power generation, automotive, aerospace, and railway industries, introduced new milling heads in their 5-axis machines and were looking for a specially designed bearing isolator. By offering the widest range of milling solutions on the market, including bed machines, gantry machines, floor type machines and machines with a T-shaped configuration, the demands were high. As it was a 5-axis machine, orientation of the head was constantly changing. Additionally, it is critical that the bearing isolator does not increase temperature in the bearing chamber as this could impact in the performance of the bearings. Garlock GUARDIAN® bearing isolators have been selected for the ability to provide a specially designed isolator, adapted to the customer's new heads and for its great performance after intensive testing. GUARDIAN® protects a high speed 6000 rpm / 80 mm diameter shaft (25 m/s) of their new milling heads, avoiding turbulent air-oil mist flow to get into the grease-lubricated bearings. GUARDIAN® mastered the requirements of the 5-axis machines and their heads and did not increase temperature in the bearing chamber. Prototypes were successfully tested in their test heads for several months. The customer has specified GUARDIAN® for their new head design, which is being introduced in all their new machines.

Garlock GUARDIAN® labyrinth seals are general-purpose seals designed to reduce downtime. The bi-directional seal provides both inlet and outlet protection. GUARDIAN® applications include auxiliary equipment in dirty, dusty, and wet environments. Split GUARDIAN® are fitted without

dismantling the equipment. When uptime and mean time between repairs (MTTR) are critical, split seals are the right choice.

About Garlock

Garlock, an Enpro Company, is one of the leading international companies in the field of sealing technology and is regarded as a specialist for the sealing of critical and demanding media in innovative mechanical and plant engineering. More than 1,500 employees work for the company worldwide, of which around 240 work in Europe. Garlock is also represented by sales partners and specialist dealers in over 90 countries. Garlock supports a wide range of industries with an integrated range of services. In addition to standard seals, Garlock primarily develops and produces special solutions for customer-specific applications. More information about Garlock solution can be found at www.garlock.com or by contacting garlockgmbh@garlock.com

