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INDUSTRIAL CASE STUDY

ROLLING MILL COILING MANDRELS: COMPOSITE WEAR PADS & LINERS

SAINT-GOBAIN

HYCOMP™ COMPOSITES OMNISEAL® METALS

ROLLING MILL COILING MANDRELS: COMPOSITE WEAR PADS & LINERS

Patrick McSweeney August 2025

INDUSTRIAL SELF-LUBRICATION EXTENDED LIFE HIGH TEMPERATURE

Environment

What is a key component in the steel and metals industry? Industrial rolling mill applications, where cold rolled aluminum and steel coils are created and used to make everything from spaceships to household appliances. With strip lengths ranging up to 2,000 meters and widths up to 2,500 mm, it would be impossible to transfer the material around the mill and to the consumer without rolling it up to save space. How is this rolling process done?

1. The material is wrapped around a coiling mandrel or tension reel, which has external segments that expand by sliding up ramps to hold the strip in place while it spins and wraps metal around the mandrel.
2. Once the metal has been coiled on the expanded mandrel the segments slide down the ramps to reduce the mandrel diameter and allow space to offload the coil, which is very challenging due to building pressure and increasing internal temperatures (up to 700°F).
3. Bronze wear plates are traditionally mounted to the wedge surfaces because it is a softer metal, that can handle high temperatures and distribute the load evenly.

Challenge

Bronze and other non-ferrous bearing grade metals require lubrication to ensure the segments do not stick in the open position – this could lead to costly delays. With mating surfaces requiring grease but located in impossible to reach areas, the tendency is to over-grease the equipment. Due to the high metal finish in the final stages of processing, the coil must be protected from defects. One drop of grease may ruin the entire roll! Therefore, the dependence on external lubricants needs to be reduced or eliminated. Customers are searching for reliable solutions to manage scrap risk and returns.

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Solution

Hycomp™ composite wear plates have been used as an alternative to bronze for many years. These engineered composites are highly reinforced with carbon fiber resulting in very high strength and zero deformation under load.

- The resin system used can operate continuously at 600°F and handle thermal cycles up to 1,000°F, so they are not phased by the internal mandrel temperatures.
- The self-lubricating characteristics eliminate dependence on grease and ensure that scrap risk is reduced.

From a cost and performance analysis perspective, Hycomp™ composite materials have been wear tested against bronze and proven to last anywhere from 4 to 10 times longer, leading to an overall lower total cost of ownership. The initial investment made with the higher part price has proven to yield higher returns in terms of reliability, extended performance, and lower overall operating costs..

Keep Your Rolling Mills Running With Hycomp™ Composites That Last 4 To 10 Times Longer Than Standard Bronze Parts

Benefits

- By using Hycomp™ composite wear pads and liners in coiling applications, the efficiency and productivity of the mandrel is maximized, giving customers more time to focus on other key areas.
- Due to zero creep of Hycomp materials, the loaded segments stay parallel to the inner shaft and strip, reducing stick slip risk and improving coil continuity.
- Elimination of grease leads to higher strip quality and improved business profitability
- The implementation of our materials is a process improvement initiative that will quickly and affordably upgrade your equipment and can be treated as a sustainably smart solution due to the extended service life, elimination of grease, and utilization of PFAS Free* materials.

** PFAS-Free here means we do not intentionally add PFAS material in the product, but does not exclude the possibility of traces, as these materials are common in the environment.*

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Design Expertise & Tailor-made Solutions for Your Critical Applications

Omniseal Solutions is a global engineering leader with over 65 years of historical legacy, relentlessly dedicated to the design and manufacture of precision sealing and wear control solutions that protect critical applications in the most demanding environments and passionately driven to push *Beyond the Boundaries of Possible*.

Contact Our Expert

Patrick McSweeney

Business Development Specialist

Cleveland, Ohio, USA

Tel. 216-849-3210

patrick.mcsweeney@saint-gobain.com

Omniseal Solutions
help@omniseal-solutions.com
www.omniseal-solutions.com