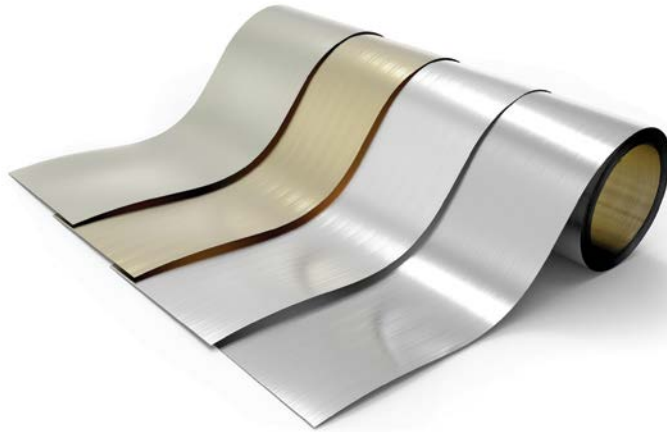


CASE STUDY

Automatic Tension Control Boosts Manufacturing for Aluminium Tape Producer



As seen in
Design World
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Lamiflex Couplings

Marland Clutch

Matrix

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TB Wood's

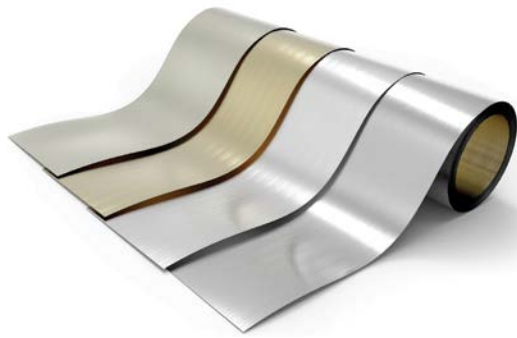
Twiflex

Warner Electric

Warner Linear

Wichita Clutch

Automatic Tension Control Boosts Manufacturing for Aluminium Tape Producer



One of the main challenges in tape manufacturing is round-the-clock regulation of web tension according to tape width and roll diameter. By applying an automated solution that continuously adapts to changing conditions, an aluminium tape manufacturer was able to upgrade its tension control system, increasing productivity and product quality.

Unwinding operations are indispensable in tape manufacturing. However, these can be extremely sensitive processes that can affect the quality of the final product. For example, too much tension applied to the tape can damage the web structure, causing it to snap or stretch. More precisely, as the roll diameter decreases roll speed will increase to maintain a constant line speed, but brake force must adjust so that tension on the web remains consistent. Therefore, tension control is an essential quality assurance tool.

In an effort to improve its existing tension control system, a Southeast Asian aluminium tape manufacturer wanted to shift from a manual procedure to a more automatic tension control system. The original system was a Warner Electric MTB 10-0-2 modular electromagnetic disc brake equipped with two twin magnets, so the first step was to contact the manufacturer to see what options were available.

Warner Electric, which is part of Altra Industrial Motion Corporation, is well known for its proven track record of developing and supplying state-of-the-art electromagnetic clutch and brake solutions. With the original, manual system, the tension in the tape making machine used to be adjusted by an operator through a manual control that would adjust the brake system.

By working closely with the aluminium tape manufacturer, Warner Electric found that quality consistency issues arose when the tape making machine was operating at lower tensions and with thinner webs. In fact, beside variations in roll diameters, tape width also determined the tension to be applied.

Therefore, improving the tension control system required the ability to manage the wide performance range of the tape making machine and provide a solution that would adapt to the changing conditions. In this case, the tape webs manufactured on one single machine ranged from approximately 2.5 to 7.5 centimeters, with a 10:1 range of tension.

Building a strong customer relationship, with daily interaction between the teams, was crucial and allowed Warner Electric to discuss this issue and provide a suitable solution in a timely manner, minimizing any machine downtime.

The ultimate solution combined the pre-installed Warner Electric brake with a new sensor communicating with a control. The Warner Electric UT30 analog ultrasonic sensor now sends a signal to the control, reporting in real-time the diameter of the roll while it unwinds. The control (TCS 200-1) receives the signal and adjusts the brake tension automatically, without the need of any external input.

By shifting from a manual tension control system to an automated solution, it was possible to free up the machine operator, who could then focus on other tasks. This ultimately improved both productivity and throughput of the entire system. Also, the automated system solved the quality consistency issues that had been experienced in the past.

In addition, an examination of the new application's performance revealed that it was not always necessary to use two brake magnets to adjust the tension: one single magnet was sufficient for thinner webs. Therefore, it was possible to further optimize the system by introducing a switch that could disable or activate one brake magnet, based on the presence of thin or heavier webs. In this way, the energy and resource consumption for the machine were lowered.

Greg Cober, from Warner Electric, commented: "A local salesperson from Warner Electric in Southeast Asia facilitated the communications between the customer and our U.S. team. Despite the time difference, we managed to complete the project in a single week, to the great satisfaction of the customer."



The solution combined the pre-installed Warner Electric brake with a new sensor communicating with a control.

About Altra Industrial Motion

Altra is a leading global designer and manufacturer of quality power transmission and motion control products utilized on a wide variety of industrial drivetrain applications. Altra clutches and brakes, couplings, gearing and PT component product lines are marketed under the industries' most well known manufacturing brands. Each brand is committed to the guiding principles of operational excellence, continuous improvement and customer satisfaction. Highly engineered Altra solutions are sold in over 70 countries and utilized in a variety of major industrial markets, including food processing, material handling, packaging machinery, mining, energy, automotive, primary metals, turf and garden and many others.

Altra's leading brands include Ameridrives, Bauer Gear Motor, Bibby Turboflex, Boston Gear, Delroyd Worm Gear, Formsprag Clutch, Guardian Couplings, Huco, Industrial Clutch, Inertia Dynamics, Kilian, Lamiflex Couplings, Marland Clutch, Matrix, Nuttall Gear, Stieber, Stromag, Svendborg Brakes, TB Wood's, Twiflex, Warner Electric, Warner Linear and Wichita Clutch.



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