

# INNOVATION

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## WARNER ELECTRIC BRAKE FRICTION MATERIAL IMPROVES PERFORMANCE IN COLD AND WET ENVIRONMENTS

Increasing consumer demand for frozen food items continues to generate significant growth in cold storage capacity around the world. Harsh environmental conditions in these facilities are challenging for both workers and equipment, including forklifts. Besides exposure to the extreme cold temperatures, forklifts are also subjected to damaging condensation that occurs as the trucks move in and out of refrigerated areas.

Since cold storage facilities are costly to operate compared to typical warehouses, facility managers are constantly focused on maintaining high productivity levels. In response, many forklift truck manufacturers offer special feature packages designed for forklifts that need to perform in cold and wet conditions such as cold rooms and outdoor yard environments.

These features might include special wiring harnesses and battery enclosures.

### ELIMINATING A STICKY SITUATION

To provide reliable service braking as well as parking brake functionality in these vehicles, spring-applied motor brakes are positioned inline with the forklift's motor or between the motor and the gearbox.

The problem is that in cold environments with high moisture levels standard friction materials can, in some conditions, stick. This phenomenon often appears after parking for a few hours. The friction material becomes bonded to the counter-friction surface, locking up the brake, which blocks the motor and prevents the truck from moving. If this occurs, maintenance is required to unblock the brake. To eliminate the problem, Warner Electric engineers have developed a proprietary friction material specifically designed for cold room and outdoor environments with high moisture levels and wide temperature differentials.



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## ADVANCED FRICTION MATERIAL TECHNOLOGY MEETS THE APPLICATION CHALLENGE

Warner Electric is well recognized as the world leader in advanced forklift braking solutions. In this application, the challenge was to design a new friction material that would retain stable torque in between static parking and high-energy service and emergency stopping in tough cold and wet environments.

The Warner engineering team was able to draw on its extensive brake technology knowledge, combined with vast forklift application experience, to develop the new friction material.

The new material was put through a rigorous battery of in-house testing, including extreme temperature changes in a climate chamber, endurance testing and spline strength testing. Cold environment field tests were also performed with the new material installed on a forklift truck.

Both the lab and field test results confirmed that there was virtually no sticking, not even a tenth of a Nm drag torque.

The new material is currently available on all Warner Electric PK motor brakes in different arrangements/ configurations depending on the application.



*PK enclosed design models are offered for applications where the brakes may be exposed to excessive water, debris or dust. IP67-rated models are also available.*

## NEW FRICTION MATERIAL HELPS FORKLIFT OEM IMPROVE RELIABILITY

A major global forklift truck OEM was looking for a more reliable braking solution for its cold storage/outdoor option package. Warner Electric supplied lab test reports along with a sample PK brake with the new friction material installed. After completing its own field testing, the OEM specified the Warner Electric solution.



*Warner Electric PK motor brakes with the new friction material are also ideal for use on other vehicles that operate in cold and/or wet environments, including aerial lifts and golf carts.*

\* Source: Grand View Research