

Floor Cleaning Machine

Doubling Product Life and Performance Through Testing

The Challenge

This application had a high torque requirement in a harsh commercial cleaning application that involved heat, water, dirt and physical handling. The armature shafts were failing, and the overall product life was not optimum.

The Solution

PM Motor Components Kit and UM Parts designed to fit the existing gearbox design

Testing that revealed a weak controller, which was replaced for "cleaner" DC control, more efficient operation and longer overall system life

Resolution of the customer-supplied gear failure issues through testing, design recommendations and materials replacements

A quieter operating system with twice the life

"We solved not only the identified shaft problem they originally brought to us, but also control and overheating problems that they didn't even realize they had. The end result was that we were able to help RotoVac improve the performance, durability and life of their product. I'm proud to say that we continued to help them improve their product design even after they purchased our product."

- Mike Vander Zwaag, Regional Account Manager

This is an excellent tool for carpet cleaning, and tile and grout cleaning in one effortless, self propelled motion. The company promotes their high torque DC motor, and the products adjustable 100 to 200 RPM rotation. *

There was a high torque requirement for a motor to be used in this harsh scrubber environment of hot water, high speeds, dirt, detergent and physical handling. They had designed their own gearbox, but had started to experience some failures on the motor's armature shaft.

Groschopp went to work on the design, changing the armature shaft steel composition, and applying heat-treating. This change alone began to double the motor life during testing, which gave Groschopp the needed performance data to prove the design.

"We were also able to improve the gearbox design," added Vander Zwaag. "We tested the existing gearbox to failure, and then optimized it in redesign and performed life testing with a hardened shaft." Groschopp also recommended replacing grease with a synthetic oil for improved performance and life.

Additionally, Groschopp had acquired several of the previously used motors for evaluation, and through MOTORTEC™ testing detected that the failures were possibly caused by the control. They determined that the motor was being "overrun", or operated at excessively high temperatures due to the poor form factor of the control. By specifying a better control that provided "cleaner" DC power, the motor operated more efficiently and solved the overheating problem. The end result of the testing and design recommendations was a revised motor and control specification – with a whole new torque rating –and optimized performance.

