



Extending the Life of Components in Ankle Prosthetics

Application: Ball Screw

Location: USA

Challenge

We were contacted by a leader in the field of prosthetic devices. The company was working on designing powered “smart” prostheses, in particular an ankle prosthetic. Their design used a small precision ball screw to continually adjust the angle of the prosthetic foot relative to the lower leg. The ball screw is actuated by a battery powered electric motor. They needed our help in maximizing the life of the ball screw while keeping the battery size small. Initial wear tests run by the customer showed better results from 2 mm ceramic balls than 2 mm steel balls.

- Which low friction lubricant can help minimize the amount of energy needed to actuate the ball screw while prolonging the operation time of the battery?

Solution

RHEOLUBE® 300 SERIES

A lithium soap thickened, medium viscosity synthetic hydrocarbon grease

- Rust-inhibited
- Excellent performance under high shock loads
- Superior corrosion performance

Results

Using an SRV®4 simulation, our engineers were able to screen several greases with the provided dimensional values for the ball screw components, as well as the range of speeds and forces that the screw would see. Based on our recommendation, and after some of their own testing, the customer finalized their ball screw design using steel balls and a product from the RHEOLUBE® 300 Series in their ankle prosthetic.

Advantages

Excellent performance under high shock loads

Superior corrosion performance

Eliminate premature bearing failures