

# **Influences on lifetime of wire ropes in traction lifts**

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## **Abstract.**

Traction lifts are complex systems with rotatory and translator moved masses, springs and dampers and several system inputs from the lifts and the users. The wire ropes are essential mechanical elements. The mechanical properties of the ropes in use depend on the rope construction, the load situation, nonlinearities and the lift dimensions. The mechanical properties are important for the proper use in lifts and the ride quality. But first of all the wire ropes (for all other suspension means as well) have to satisfy the safety relevant requirements sufficient lifetime, reliable determination of discard and sufficient and limited traction capacity. The lifetime of the wire ropes better the number of trips until rope discard depends on a lot of parameters of the rope and the rope application eg use of plastic deflection sheaves and reverse bending layouts. New challenges for rope lifetime are resulting from the more or less open D/d-ratio limits possible by certificates concerning the examination of conformity by notified bodies. This paper will highlight the basics of wire rope technology, the endurance and lifetime of wire ropes running over sheaves, and the different influences from the ropes and more and more important from the lift application parameters. Very often underestimated are the influences of transport, storage, installation and maintenance. With this background we will lead over to the calculation methods of wire rope lifetime considering the actual findings of wire rope endurance research.