

Rimtec's Innovative Backlash-Free Mechanical Torque-Limiting Couplings

Rimtec backlash-free safety couplings were specially developed for today's highly dynamic drives operating under constantly changing directions of rotation and under high acceleration.

The safety couplings are uniquely designed as spring-loaded positive couplings with a special roller that guarantees a totally backlash-free transmission of torque in both directions of rotation. Uniform loading of the rollers guarantees high system stiffness, which is crucial for dynamic drives under closed-loop control. The roller achieves high switching frequencies with exceptionally high reliability.

In the event of an overload, the rollers move out of the guides (Figure 1). This results in an axial movement, which activates a proximity switch or limit switch that immediately makes contact to switch off the drive. To avoid damage to the safety coupling, the drive must be switched off immediately after an overload.

Figure 1A – High system stiffness is guaranteed by two long lines of contact using Rimtec's roller system.

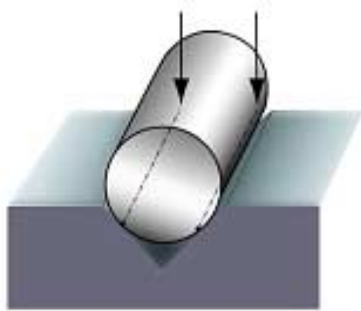
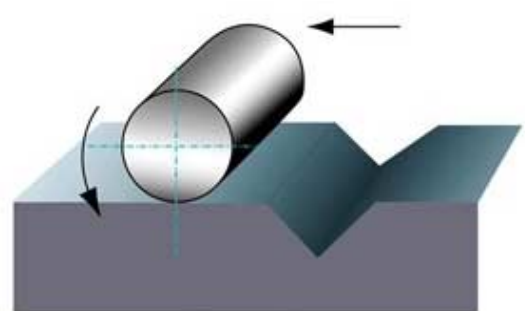
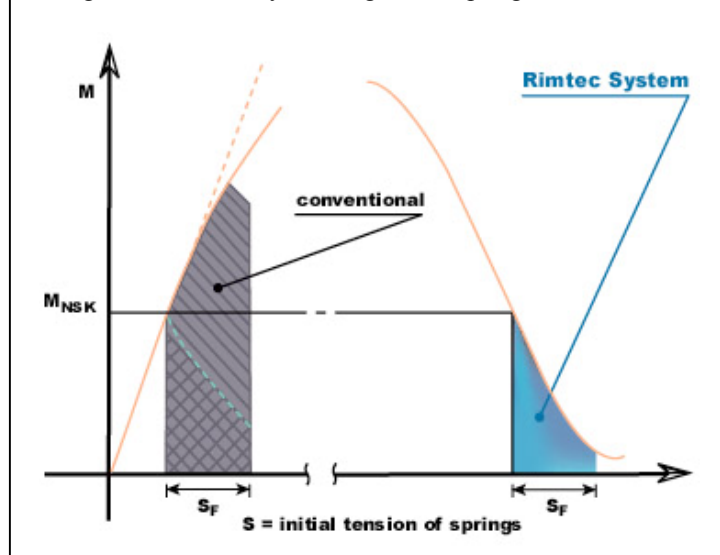


Figure 1B – Disengaged.



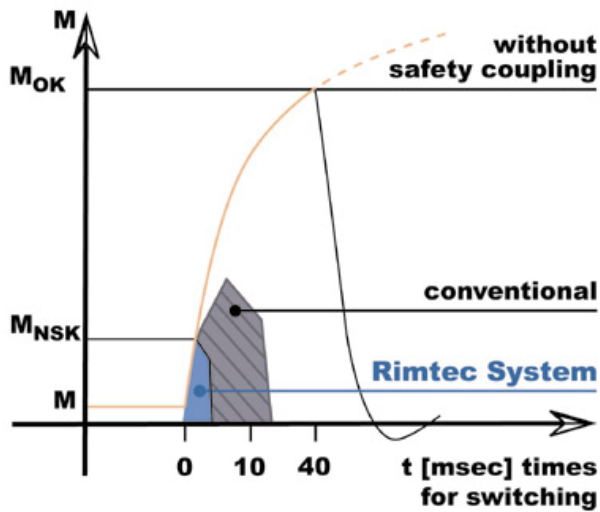
Rimtec's special disk springs have a pronounced degressive characteristic (Figure 2) which enables not only a 7-lb.in. torque, but also a 14,160-lb.in. torque to disengage in 2-4 ms. -- the fastest possible switching time available in industry today! The torque drops immediately to a small residual value of 2-5% in this disengaged state.

Figure 2 – Rimtec system degressive spring characteristic.



The switching energy required to disengage Rimtec safety couplings at set torque is much lower than that of conventional safety couplings with a progressive spring characteristic. This is a decisive advantage since even ultra-short surges in speed are rendered harmless by the safety coupling (Figure 3).

Figure 3 – Switching times.



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