CHEMNITZ UNIVERSITY OF TECHNOLOGY

Institute of Materials Handling, Conveying and Plastics Engineering
Professorship of Materials Handling & Conveying Engineering
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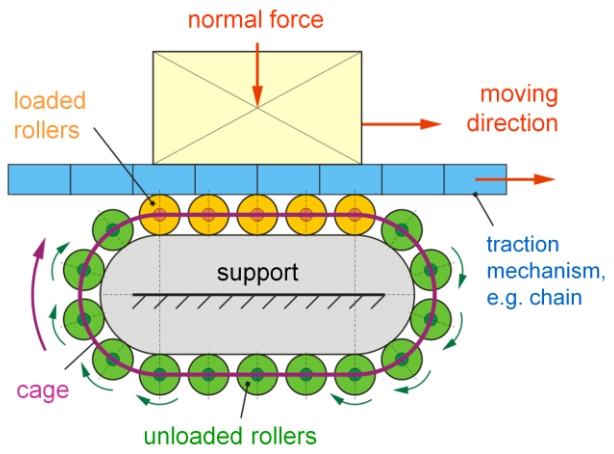
Rolling conveyor technology (RCT)

Energy efficiency with modular rolling elements

In conveyor systems, undesirably high friction can crop up in many places. In particular, this affects the support elements which absorb the weight force of the goods and the centrifugal forces in curves.

According to the current state of the art, mainly plastic gliding elements are deployed which are in direct contact with the drag and carry means, such as plastic chains, straps or tooth belts. In practice, the sliding friction values of the pairings chain and sliding rail are about $\mu = 0.15…0.30$, and with straps and tooth belts even $\mu = 0.30…>0.50$.

The objective of the current research project is to develop innovative components with very low resistance movement and their integration into conveyor technology. The corresponding basic element is based on an oval center part on which circumferential axis-free cylindrical bodies carry the load by rolling.

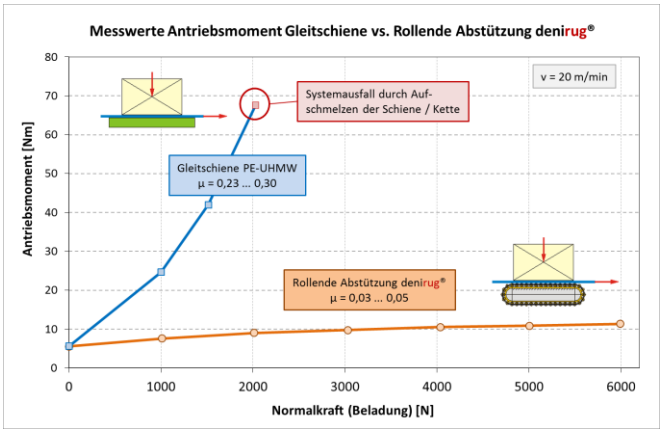


The running behavior of such rolling elements has been analyzed in extensive experimental studies. Thereby, a resistance to movement of $\mu = 0.02…0.05$ was measured which is 10-times less than for non-lubricated sliding pairings. Particularly important for practical use is that these values are practically independent from normal force and speed, and also remain constant under long-term loads. Due to the lack of gliding friction, the wear of the components is extremely low, which means that the user gets an absolutely maintenance-free system.

For the first practical application, RCT-elements for the horizontal and vertical support of mat chains were developed. The project partner Denipro AG sells these elements under the brand name deniroll® and denirug®.

The horizontal curve support deniroll®, which can be installed with minimal effort into existing conveyors, decreases the chain pulling forces especially on conveyors with many curves. This reduces the known practical problems of chain fractures or warming, which can lead to melting of the gliding rails or chains.

By means of deniroll®, the output can be improved and superlatively long and flexible conveyor lines can be realized. The latest development of this type with the brand name deniconda® represents a compact and highly efficient spiral conveyor on the basis of mat chains with currently up to four complete windings. A conveyor of this kind has not been realized before.



The straight RCT-elements of denirug® are vertical supports for chains and straps, especially in heavy load applications. Due to the extremely low resistance, the operating power can be significantly reduced up to 80%. At the same time, the range of application is increased and as a result of the diminished drag force clearly lighter and lower priced mat chains can be used.

www.gleitketten.de

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