

# Efficiency of a timing belt drive

Results of a series of tests performed by the BRECO Technical Centre

## Efficiency of a timing belt drive

It is, of course, impossible to create a so-called "perpetual motion machine of the first kind" with a theoretical efficiency of 100% using a timing belt drive.

As a general rule, however, the efficiency of timing belt drives is extremely high. But how high is the efficiency of these drives really? And can the efficiency be affected by the selected type or version?

BRECO has looked into these questions and has performed a series of special tests to determine more precisely the efficiency of different timing belt drive designs.

These trials prove that timing belt drives are indeed a highly efficient type of drive. All the results indicate a degree of efficiency between 96% and 98%.

Efficiency  $\eta = 97\% \pm 1\%$



## Result

The torque, speed, pre-tension force and friction were far less of an influence than expected. Nevertheless, the achieved degree of efficiency is linked with the required flexing work.

For instance, if the same power transmission is maintained, selecting

- a smaller pitch,
- softer materials and
- a smaller belt width

leads to a higher degree of efficiency  $\eta$ .

These additional advantages can be put to good use, e.g. by selecting an alternative belt.



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# BRECOFLEX<sup>move</sup> - timing belts

More Power. Optimized tooth form. Versatile usable. Efficient.

## BRECOFLEX<sup>move</sup>, that is

- a newly developed tension member for transmission of stronger forces
- a FEM-optimised tooth flank geometry
- minimised wear due to a laminate coating
- a space saver due to the option of choosing a narrower belt width



## BRECOFLEX<sup>move</sup> AT10

The **BRECOFLEX<sup>move</sup>** is a timing belt specifically designed for high-performance drives and traction drives with a particularly high stiffness requirement. A newly developed steel cord tension member increases belt stiffness and tear-resistance, making transmission of stronger forces possible. The tooth flank geometry has been optimised through the Finite Element Method (FEM). This leads to an optimisation of the contact pressure distribution and reduces the work of friction between the timing belts and tooth washer, thus minimising wear. In addition, a friction-optimised laminate coating is applied to the tooth side.

Selecting a narrower **BRECOFLEX<sup>move</sup>** timing belt as an alternative to an endless standard timing belt makes a more compact drive design possible.

Your local BRECO sales partner can provide further information.



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