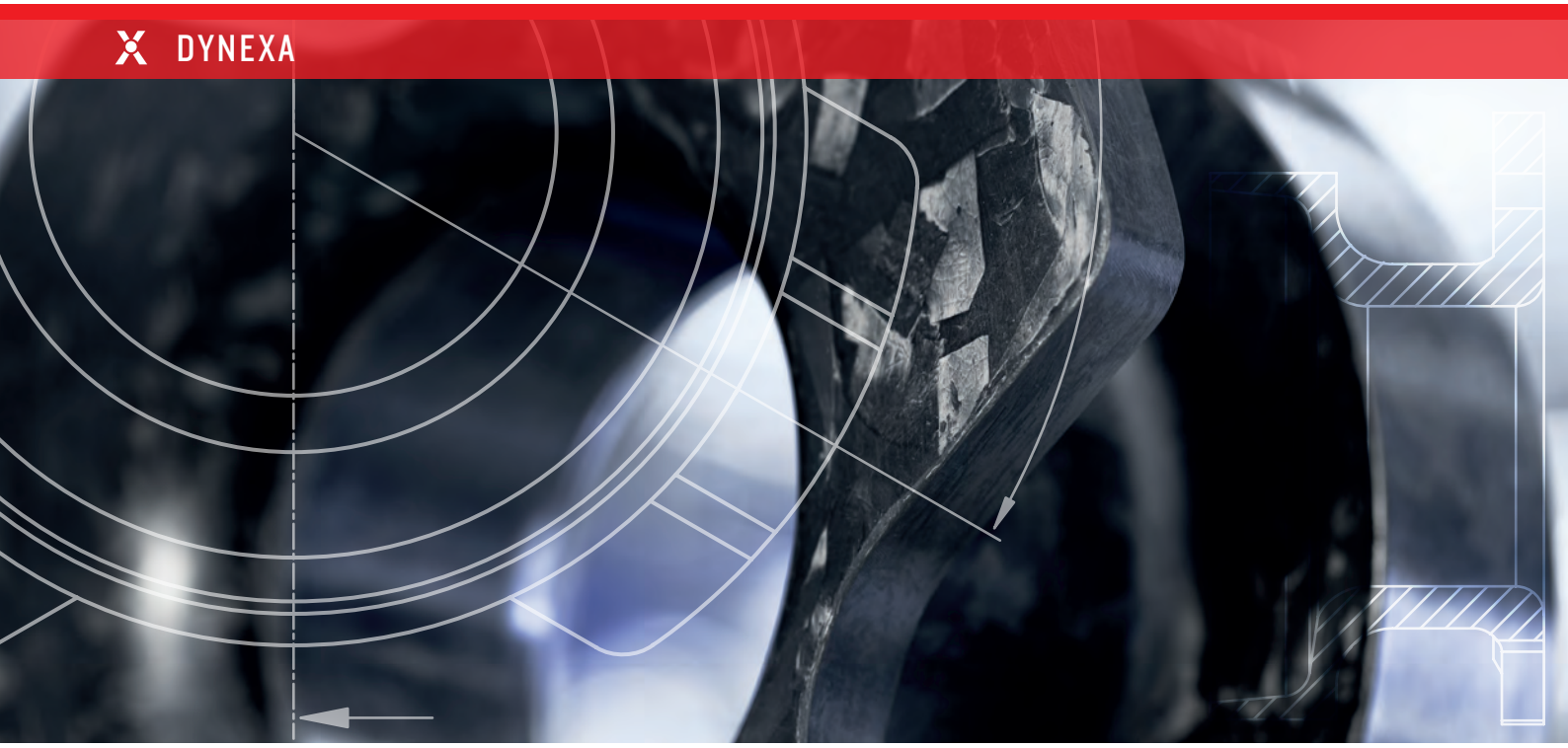
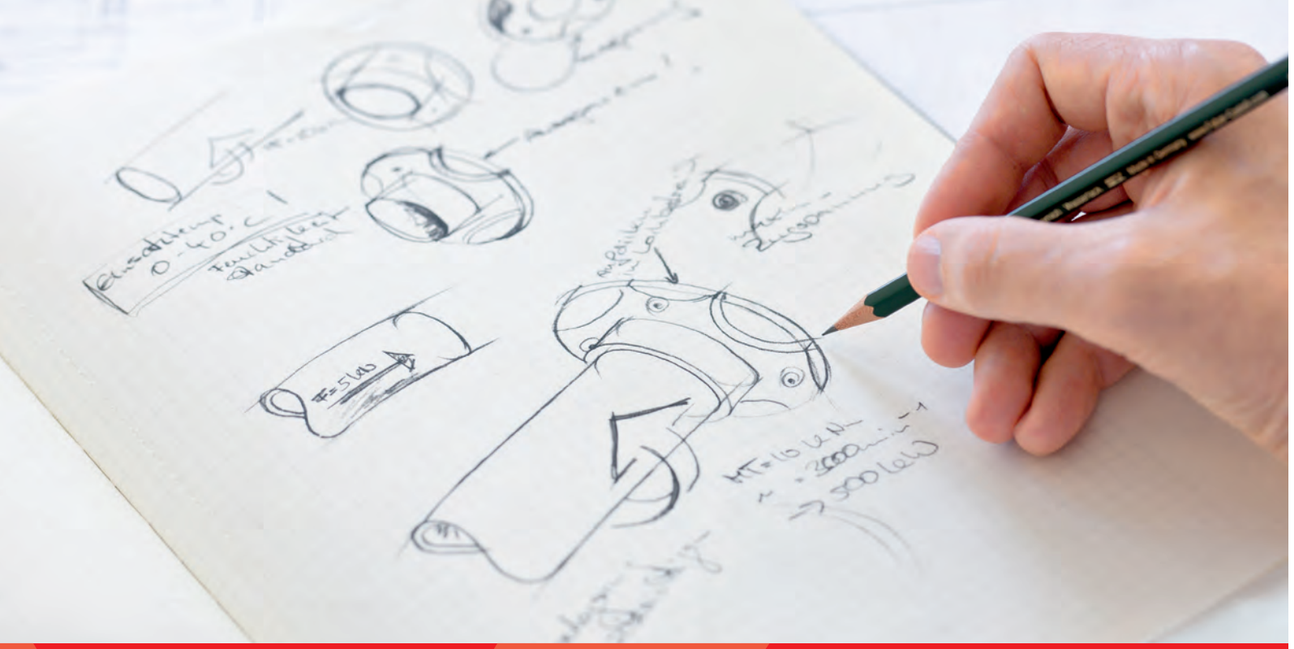
DYNEXA



DRIVE TECHNOLOGY

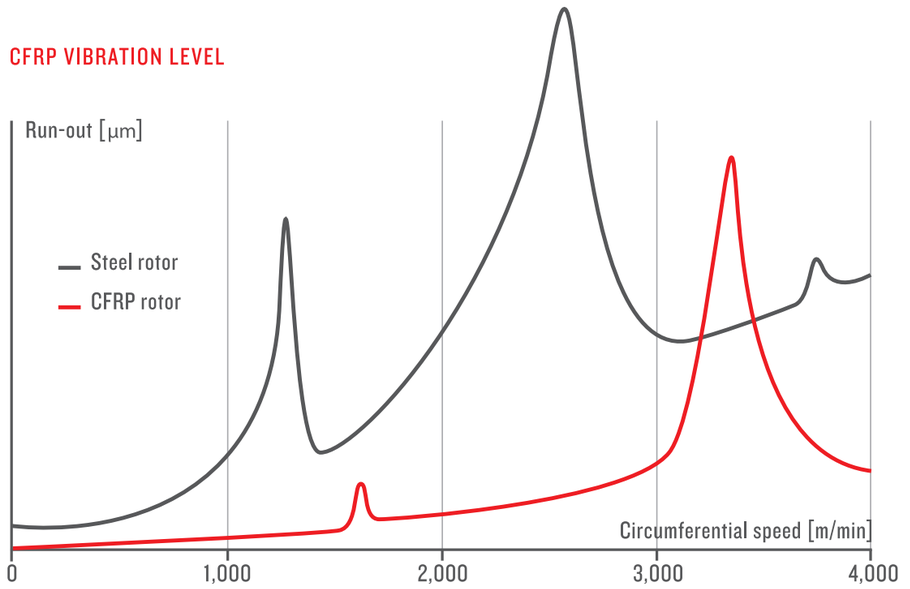
CFRP DRIVE SHAFTS



TRANSFERRING POWER

DYNEXA

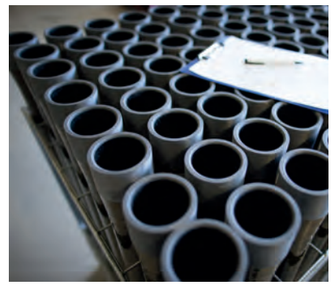
We transmit power with ease, with precision, with Carbon Fiber Reinforced Plastics (CFRP). Modern materials for traditional drive transmision application fields



More Performance

The secret to high-performance, economical drive systems is high-performance, efficient components. As a component supplier to the drive technology sector we are not only confronted with different service environments, but also with very different application branches. This resulting requirements on the drive shafts, such as speed, strength, precision, torsional stiffness, chemical resistance, etc become innumerable. At the same time the market demand for cost reduction is increasing.

We are one of the largest producers of CFRP industrial drive shafts worldwide. We have developed a flexible line of composite drive shafts under the brand name X-SHAFT which can be configured to meet all of your individual requirements



CONTINUE ON WHERE OTHERS DROP OUT

Vibrations, inertia, loading cycles – new possibilities for fiber composites are created in the areas where steel has to admit defeat. You know steel's weaknesses, we know the strengths of carbon fiber. Together we can create the technology for your technological leadership.

TAKING ADVANTAGE OF THE ADVANTAGES

Slenderness and Acceleration

While some branches focus on a higher number of revolutions per minute with the same dimensions, other markets concentrate on maintaining the speed while fitting into tighter spaces. The problem, however, is exactly the same: the ratio of slenderness is increasing, and at some point a vibration-free steel construction will no longer be possible. CFRP is the distinctly superior alternative in such cases. The combination of the typically high material damping properties as well as the adjustability of the natural frequency leads to lower level of vibration. This results in a dynamic whip in fiber composite shafts and rolls that is much lower than that of its steel counterparts. Thus with the same vibrational allowance as a metal shaft, the CFRP shaft can turn much faster, or it can run more smoothly at the same speed

Bottom Line Price

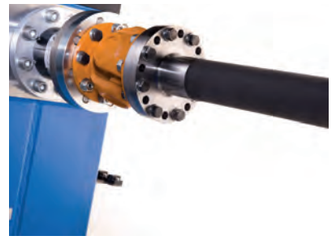
The possibility to significantly increase a shaft length while maintaining the same diameter through the substitution of the material has become standard practice in some industries. Often a segmented steel shaft can be replaced with a single CFRP shaft. Through the elimination of expensive parts like flanges and intermediate bearings, costs and maintenance requirements can be reduced. After taking these savings into account, the allegedly expensive carbon fiber turns out to be cheaper at the bottom line.

Long Service Life

Due to the long service cycles and often high loading conditions that drive shafts face, a certain robustness is required. Properly designed carbon fiber components have surprisingly long service lives, even under dynamic loads. Carbon composite shafts can perform for significantly more load cycles than their metal counterparts before fatigue sets in. In dynamic load testing we have often experienced a failure in the metal load transmission parts prior to any failure or even signs of fatigue stress in the composite structure have appeared.

On the Test Bench

The strength of fiber composites can be explained by Griffith's material strength equation (the fiber paradox): the thinner the fiber, the stronger the material. The high number of intersecting surfaces enable arising microcracks to be stopped again and again before the damage becomes more serious. The high static strength and fatigue strength of the material yield long service lives and offer enormous design freedom in high-dynamic applications, such as drive shafts. The fatigue strength tests of CFRP show Wöhler curves without the characteristic sudden drops in the remaining static strength as seen in metal. Based on these unique properties, the use of CFRP shafts in test benches in the field is widespread.



A MATERIAL YOU CAN DEPEND ON

CFRP offers new possibilities for drive shafts components. Its robustness and chemical resistance help make this material what it is - comprehensive, flexible and stable.

Resistance

Through the fine-tuning of the matrix composition different chemical and temperature resistance properties can be created to fit different application requirements. Dry ambient temperatures of 120°C are as insignificant as a service under corrosive conditions.

Corrosion – No Problem

Unlike steel, CFRP doesn't rust. And it can do much more. The fibers themselves are inert. The resins, however, can be chemically dissolved. With knowledge of the strengths and weaknesses of the individual matrix ingredients, a matching resin system can be chosen from the wide array of available materials to best suit any application environment.
A very common field of application for composite drive shafts is in cooling towers where corrosive conditions often exist. Only high-grade stainless steels are suitable in this situation. The high material costs and the time-consuming machining necessary make the stainless steel version economically unattractive. The carbon drive shaft, on the other hand, offers an application specific solution which not only costs less, but also consumes less energy during use, thus sinking the TCO even further.

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