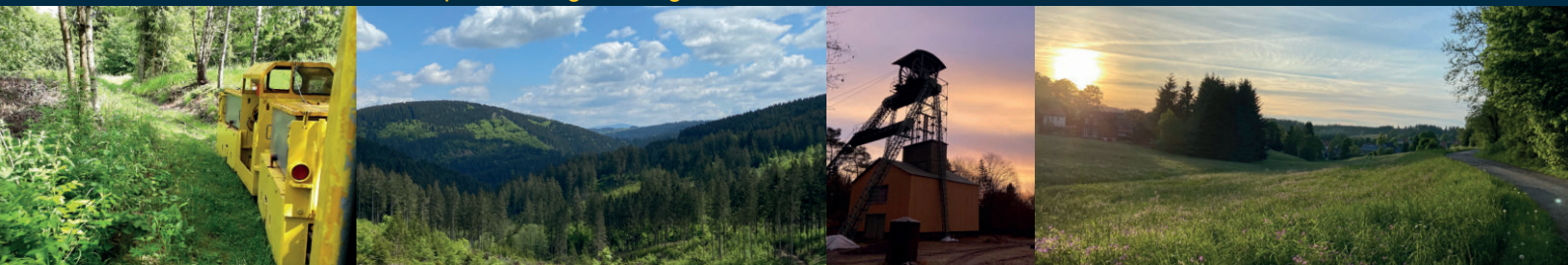


Sincotec NEWS

RANTEC improved
Approximated-operating load testing on resonance test systems

Our newly developed actuator DRIVE ACT high performance
Flexibility redefined

Dynamic testing of e-mobility drives
Our burst and speed change test rigs for e-machine rotors



Dear SincoTec friends,
Dear SincoTec customers,

in these dynamic and challenging times, in which especially the Ukraine war, supply bottlenecks, rising energy prices and still the pandemic influence our daily activities, one thing remains steady - the field of Fatigue. After all, you can't do without safe components. We hope that safety and peace will soon return to Ukraine.

We are pleased to present our latest developments and testing services in this SincoTec News and look forward to welcoming you personally at the Automotive Testing Expo 2022 in Stuttgart.

Stay well!
Together we make the world safer!



On Behalf of the SincoTec-Team

Your Dr.-Ing. Joachim Hug,
Dipl.-Ing. (FH) Sven Henze
Dipl.-Ing. Steffen Krause and
Sabrina Hug-Lohmüller, M. Sc.

Steffen Krause appointed managing director of SincoTec Test & Engineering GmbH



The previous head of SincoTec Test & Engineering GmbH Dipl.-Ing. Steffen Krause has taken over the position of managing director as of 01.01.2022. Mr. Krause is thus responsible for the accredited test laboratory of SincoTec together with the managing partner Sven Henze. Steffen Krause takes over areas of responsibility from Dr.-Ing. Joachim Hug. He concentrates on managing director activities in SincoTec Holding GmbH. Mr. Krause started his professional career in the

field of development of drilling tools for oil and gas production. As a native of Clausthal, however, he was drawn back home after about a decade. Since then, Mr. Krause has been a part of the SincoTec family and is still enthusiastic about the many great projects that we have the pleasure of bringing to success together with our customers.

SincoTec at the Automotive Testing Expo 2022

We will exhibit from 21.06.-23.06.2022 in Stuttgart!

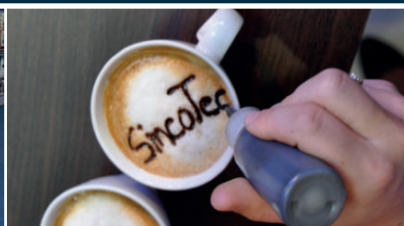


Visit us in **hall 8 booth 8114** at the trade fair in Stuttgart. We will present our latest products and testing services and will be happy to advise you on site.

Please make an appointment with our technical experts today at:

info@sincotec.de
or 05323 / 9692 - 121

We are looking forward to meeting you!



RANTEC improved

Approximated-operating load testing on resonance test systems

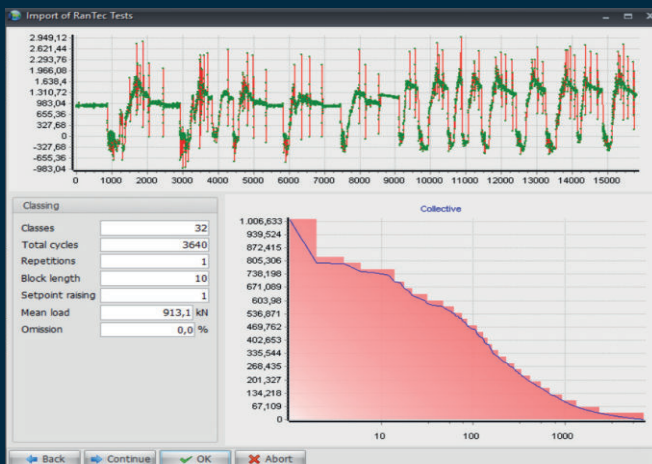
A meaningful proof of the operational strength of components is usually provided in the form of so-called operating load tests on hydraulic systems. Here, load time histories can be realistically reproduced in order to ensure that a component is operationally stable over a defined mileage. These systems are investment-intensive and consume a lot of energy.

Pseudo-Random operational load tests on resonance test systems called RANTEC (SincoTec name) offer an alternative. Here, standardized or freely defined amplitude collectives with appropriate mixing are run randomly on a resonance test system. The advantage in these systems is the low energy consumption. They require only 1 - 4 % of the energy of commercially available hydraulic systems with at least the same or usually significantly higher test frequency.

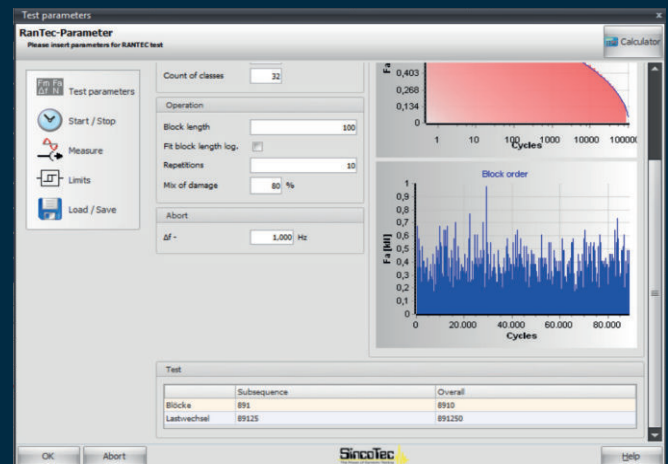
A further development took place primarily in a faster mean load control, in order to be able to reproduce tests with changing mean loads as well. Limitations for a RANTEC test only exist for damped and non-linear systems.

In the case of continuously changing mean loads, which can only be taken into account to a limited extent in the RANTEC tests, a verification test can be run for the hydraulics. If different lifetimes occur, these can simply be taken into account by calibration.

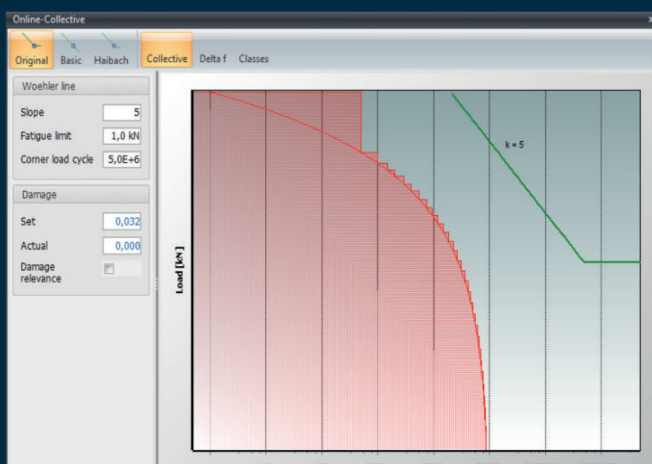
RANTEC tests are a very good alternative to the hydraulic tests, especially in times of extremely high energy costs and CO₂ reduction.



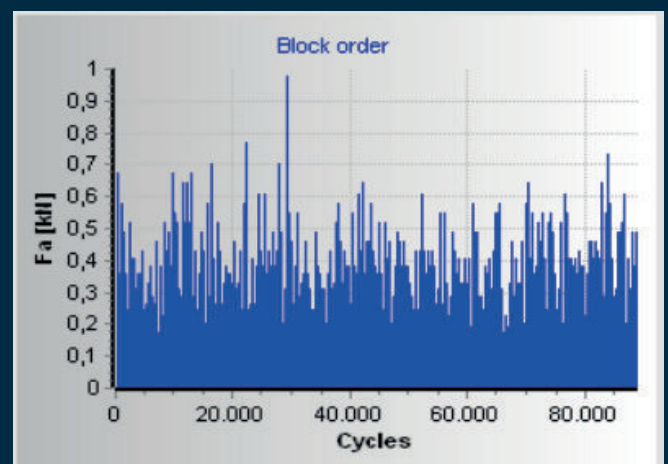
Import and classification of a load signal



Input of a mathematical amplitude collective



Online classification and online damage calculation against a Wöhler line



Parameterizable randomization



Did you know, that ...

... we have positioned ourselves even more flexibly and can calibrate force transducers up to 150 kN at your site with a new mobile calibration frame?

Our newly developed actuator DRIVE ACT high performance - flexibility redefined

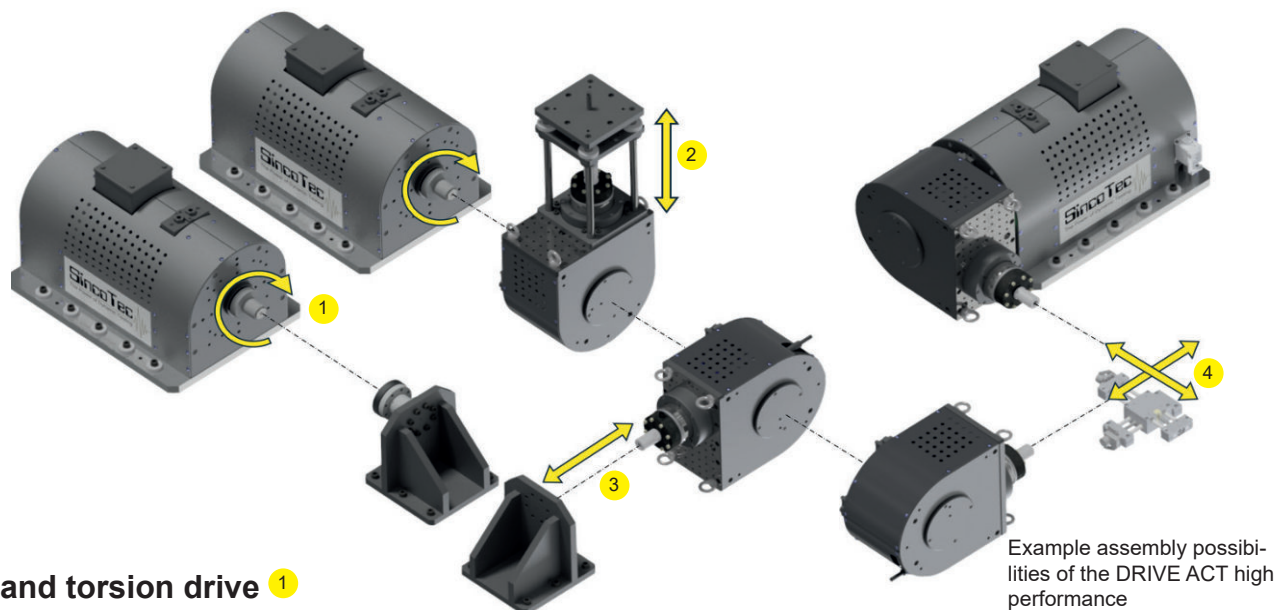
A wide variety of actuator designs are available for applied testing technology and test bench construction. With regard to media independence and simple system integration as central advantages, servo-electric actuators are impressive in comparison to pneumatics or hydraulics. In addition to the various designs, for example as a spindle actuator or torque motor, is always faced with the question of the load it has to apply to its test part: Is it tension, compression, bending or torsion and which actuator is suitable for which purposes?

We at SincoTec have set ourselves the goal of covering as many of the application cases as possible with a single, flexible system - and have thus rethought the subject of modular systems for servo-electric test setups.

You have a torsion test today and want to perform a linear test tomorrow? The **DRIVE ACT high performance** combines precisely this flexibility with a modular design and a wide range of expansion options.

For short-term or longterm testing setups the compact actuator is an alternative to load frame assemblies short- or long-term installations on a clamping field, because the modules can be individually adapted to the test tasks and can also be attached directly to the actuator with minimal space and material requirements. The option of integrating the actuator into a load frame is of course still possible. The **DRIVE ACT high performance** is part of the servo-electric actuator series **DRIVE ACT** and is available for the load range up to 350 Nm torsional moment or 5.0 kN axial force.

The central feature is the torque motor used as the drive motor, which makes it possible to generate not only high torsional torques but also equally high axial forces in combination with the linear module extension. It thus keeps its promise of being a flexible and practical drive for all types of load: tension, compression, bending and torsion. Acceleration-controlled tests can so be carried out using a vertical table or horizontal sliding carriage.



Rotary and torsion drive 1

- + The rotary motion of the powerful servo motor can be used directly as a rotary actuator or to provide a torsional moment
- + The rotary motion provides the power for the modules
- + Any angle can precisely be actuated

Load frame 2

- + Small load frames allow testing without complex test setups
- + Individuallized solutions with integrated fixtures possible

Linear module 3

- + Integrated guidance system to absorb lateral forces
- + Integrated displacement and force transducer
- + Horizontally or vertically alignable

Gliding carriage/ swinging 4

- + Vertical vibration table for acceleration-controlled tests
- + Horizontal sliding carriage for acceleration-controlled tests

Dynamic testing of e-mobility drives

Our burst and speed change test rigs for e-machine rotors

Since the development and commissioning of the speed test benches in the fatigue strength laboratory of SincoTec Test & Engineering in 2018, the speed change, spin and burst tests have evolved from exotic and novel tests to an established standard.

The main focus is on speed change tests, spin tests with expansion measurements and burst tests.

Speed change and burst tests can be carried out up to speeds of 45,000 rpm. Very valuable information is provided by an optional expansion measurement in three planes during the tests - with a resolution of 1 μm related to the radius of the test part - even under temperatures of up to 200°C.

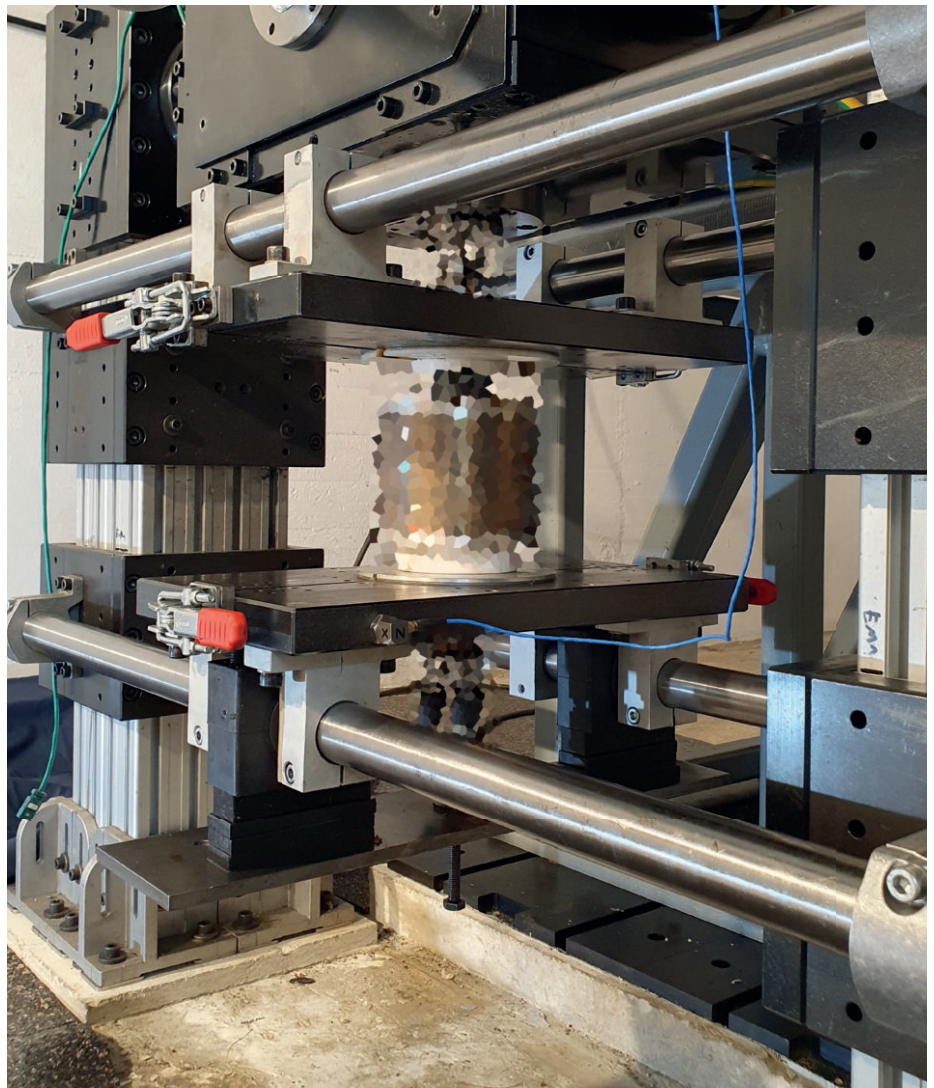
Now that normal daily driver electric are already part of everydaylife (in some cases with components freely tested on the test rigs described above), developments are focusing on commercial vehicles and sports cars. This also increases the requirements for the necessary test rigs.

With the commissioning of additional speed testing machines, SincoTec Test & Engineering GmbH can meet these requirements. With a nearly 100% higher drive torque, especially speed change tests can be performed with a significantly reduced cycle time. New approaches are hereby also pursued in measurement technology. Up to now, centrifugal tests were usually carried out with an expansion measurement up to about 75 % of the expected bursting speed. The reason for this is to protect the very complex measurement technology from spontaneously occurring bursting.

In the future, a new type of shielded measurement technology will make it possible to carry out expansion measurements up to the actual bursting point. Furthermore, the measurement of the change in the radius of a test part will also be carried out in a spatially resolved manner in the future. In this way, the expansion, which varies over the circumference in most E-machine rotors, will be displayed.

This is all done while maintaining the extremely high resolution of the displacement measurement.

For further information please contact our technical sales department of SincoTec Test & Engineering (05323 9692 129).



Safety in aviation sports

Aviation sport-carabiners tested in the accredited test laboratory

In almost all areas of the use of safety-relevant parts and components in the automotive and aviation industry, a time or fatigue strength test according to applicable standards is prescribed in order to be allowed to be used in operation.

In the field of recreational aviation sports, these regulations are missing - with sometimes drastic consequences! Thus it came already several times to dramatic and fatal accidents of hangglider and/or paraglider pilots due to abruptly failing (breaking) flight sport carabines.



Test set-up of a carabiner test with „closed catch“

Usually, aviation sport carabiners with a so-called snap-lock are used.

The resulting form closure is intended to reduce the critical stresses that occur due to the dynamic loads. Due to a remaining catch play, there is a risk of material fatigue during operation and a resulting sudden breakage. Depending on the geometry of the carabiner, the material used and the size of the catch play, the positive locking of the catches occurs at different loads.

When designing a carabiner, two different load cases must therefore be taken into account: „open catch“ and „closed catch“. In the „open gate“ load case, the lever arm of the carabiner's strap support increases the stresses compared to the „closed ring“ load case, depending on its width. Furthermore, a distinction must be made between a solo and a tandem flight.

In SincoTec's accredited test laboratory, precisely this catch play was examined on aviation sport karabiners from various manufacturers. In some cases, serious differences were found. Based on the findings, SincoTec and the DHV (German Hanggliding Association) developed a test guideline for the time- and fatigue-resistant design of aviation sport carabiners.

This includes the definition of a fatigue-proof design for an unlimited



Broken aviation-sport carabiner after performed test

period of use of the aviation sport carabiners (test with open catch). Furthermore, time-resistant designs are also defined for a period of use of 5 years. Here, a distinction is made between the limitation of the catch play (testing with closed catch, the manufacturer must ensure that a maximum value of the catch play is not exceeded) and the freedom of the catch play (testing with open catch).

Together with our customers we make the world safer!



Did you know, that ...

... SincoTec also develops test specifications for its customers from a wide range of industrial sectors?

The spectrum ranges from single-stage tests to determine the mean value of the fatigue strength with specifications for the design of the test fixtures to the derivation of load collectives for the performance of operational load post-run tests.

Many years of experience from a large number of tests carried out go into the updating and extension of existing test specifications!

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