



Hegewald & Peschke
Meß- und Prüftechnik GmbH



Calmar

Universal component and furniture testing equipment

Competency generates results

Flexibility in testing.

Furniture and components are exposed to a wide variety of stresses in daily use. At the same time, they must meet high demands in regard to safety, quality and durability. To ensure that furniture and components can meet these demands, testing of individual components and also the finished product is important. This applies to the development phase and just as much quality assurance in production. Last but not least, furniture and components must comply with the specification of numerous national and international

standards or certifications (e.g. the GS symbol in Germany) to be able to succeed on the market. The Calmar furniture and component testing equipment from Hegewald & Peschke provides the right instruments to meet all these testing tasks.

Calmar works with pneumatic and electrical test axes in performing dynamic endurance tests, ageing and function tests. The unusual freedom in the arrangement of these test axes the system offers is reflected in its name.

If necessary, Calmar features many freely movable arms – just like a calamary. In this manner, furniture and components can be subjected to widely differing loads, load accelerations and directions of stress. This allows close to reality simulation of the stresses the product must withstand in its intended use.

A glance of the diversity of the Calmar furniture and component testing equipment

Complementing Calmar, the universal testing machines of the Inspekt series from Hegewald & Peschke allow conducting destructive tests to determine the mechanical failure of the products. Thus the complete bandwidth of tests – from static material testing to dynamic testing of components and finished products (e.g. furniture) – is offered from a single source. Another system advantage: Users can process all test sequences using a single testing software concept.



Any desired number and directions.

Test fields and test rigs of the Calmar series can be equipped with different test axes to apply the required loads on the test specimen, thus using actuators that carry out the corresponding movements.

Not only is the number of possible test axes unusual at this. The axes can be arranged nearly freely in space and are able to carry out different movements in very different directions. It is possible, for example, to pull, push, bend and rotate the test specimen at the same time.

Different types of actuators are available for different test tasks. Electrical and pneumatic

actuators are distinguished according to the manner in which they are powered. Each of the two types has its own benefits with specific testing tasks. Some complex tests therefore require both, electrical and pneumatic actuators.

Overview of types of test axes:

- » Pneumatic axes
- » Electric motor driven rotation axes
- » Electric motor driven linear axes
- » Drop testers
- » Special custom solutions



Demonstration of possible movement and load directions of the test axes in a universal test field

Overview of electrical and pneumatic actuators

Electrical actuators



Very versatile; especially suitable for:

- » Fatigue and long-term tests
- » Test velocities up to 2 m/s
- » Traveling distance from 0 m to 4 m, if necessary also larger stroke possible
- » Control parameters force, position and speed
- » High precision and control even of complicated motion sequences (e.g. testing of soft-close and tip-on mechanism in the context of drawer and door testing)

Pneumatic actuators



Low-maintenance and cost efficient in purchase and operation, especially suitable for:

- » Long-term and durability tests
- » Test velocities up to 0.3 m/s
- » Traveling distance from 0 m up to 1 m
- » Control parameters force and, optionally, position

Alternative control concepts.

Depending on the amount of testing tasks to be carried out and the degree of variability required for the test sequences, the Calmar series offers both, single test rigs and universal test fields. Both versions are attuned in detail to different customer groups and their needs.

Companies manufacturing furniture often prefer, for example, various single test rigs for product development and quality assurance.

Testing laboratories with little available space for test equipment, by contrast, in most cases favour a complex test field, in which diverse testing tasks can be flexibly performed at the same time.

Depending on the requirement and complexity of the testing tasks, both types of test equipment can be optionally operated with the control concepts Calmar one or Calmar pro.

The right selection ensures that the system optimally matches the customer's needs. Calmar pro, the software-based control concept, basically allows for all conceivable test sequences: For example, it can be used to combine and freely position several test axes for executing a complex testing task. Also several independent tests can be carried out in a test field and allow the maximum efficiency of the test system. The user is restricted in its possibilities only by the load and stroke values of the hardware components.

Calmar one, the PLC-based control concept, is designed for test system-defined sequences with the option of varying target values such as force and position as well as cycle times. The dynamic controller, specially developed for this concept, responds adaptively to environmental influences such as friction effects, compressed air and temperature changes, hard or soft specimen, etc. This allows precise movement sequences, shortened cycle times and a faster processing of the test task.

| Calmar pro | | Calmar one | | |
|-----------------------------------|------------------|-------------------------------|------------------|---------------------|
| Force and position-controlled | Force-controlled | Force and position-controlled | Force-controlled | Pressure-controlled |
| Convenience. Data. Options. Price | | | | |

- » Standard-conforming test
- » Central media point for the control of max. 5 axes simultaneously
- » Test software with Windows user interface and SQL database
- » Visualization of the test data of individual test modules and several independent tests
- » Freely programmable test sequences
- » Test axes can be combined freely into a test sequence or can be operated individually depending on the test
- » Modular flexible set-up

Special benefits:

- » Several different test rigs can be operated from a central control and regulating unit
- » Customer-specific parameters and results can be generated and calculated
- » Data storage, data export and logging
- » Central media point



Central media point

- » Standard-conforming test
- » PLC-based system
- » Specifically developed controller allows precise accessing of the target values and increased test speeds
- » Low-noise through optimised construction and control
- » Simple set-up and operation based on predefined standard-conforming test programs (individual expansion possible)
- » Free input of test parameters
- » Log output function and automatic report function

Special benefits:

- » Simple and convenient operating concept to perform both standard-conforming and customer-specific tests
- » Intuitive coloured 6" touch panel
- » Visualization of the real-time data
- » Option for data export (*.csv)



Intuitive coloured 6" touch panel

Control concepts Calmar pro and Calmar one at a glance

The component and furniture testing software CalMaster.

CalMaster is the universal component and furniture testing software for the Calmar test equipment series. It allows realising both simple and complex testing tasks in an uncomplicated and user-friendly manner.

The standards-based test templates stored in the system facilitate parametrisation of the tests with little configuration effort. Because all necessary parameters are preset, the test can start immediately after loading the template.

The test sequence can be freely configured using a block program for more complex or special tests. On the one hand, the modular concept of the test system allows allocating specific test axes to different testing tasks. On the other hand, several axes can be combined into one test sequence. Thus, the system can be flexibly adapted to a wide range of changing testing tasks and customer-specific preferences.

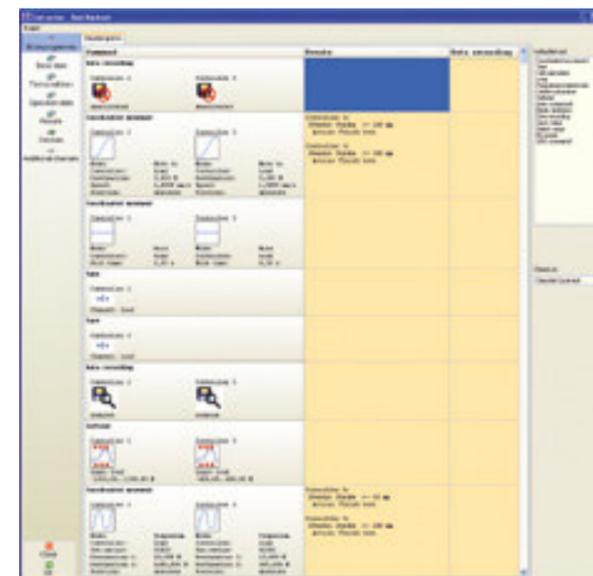
The actual state of the test is presented in a visualisation window while the test is run. Relevant statuses and actual values are thereby displayed as instantaneous value displays or real-time graphics.

CalMaster offers major benefits for research and development. For example, the software permits recording controlled load-displace-

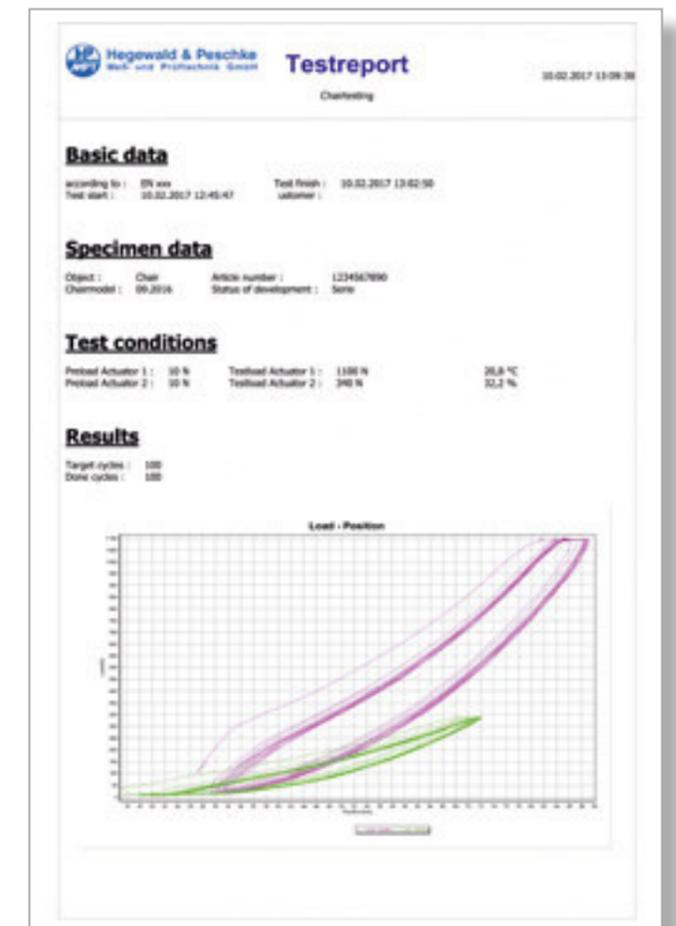
ment hysteresis curves during the test. Ageing effects and fatigue processes can thus be detected – valuable information for dimensioning the construction.

All test data and settings are stored individually in a database. The entire data stock is managed via an explorer. Finally, test logs and certificates can be generated from the stored measured values and settings as well as parameters that can be freely supplemented.

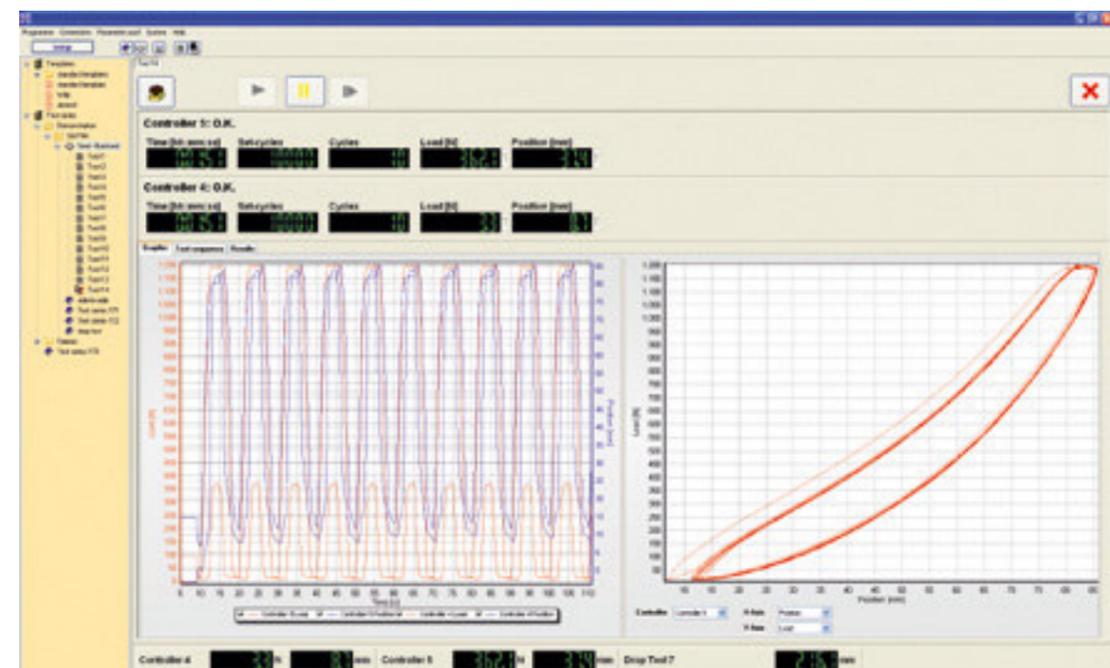
CalMaster is a comprehensive yet easy to understand and intuitive instrument for furniture and component testing. Nonetheless, questions may surface in daily handling. Free software support from Hegewald & Peschke is available to offer consultation, not only on functions of test equipment and operating software. The company also assists customers with expert knowledge when it comes to solving application problems or configuring the test system according to customer-specific requirements.



Selection menu for test configuration with two coordinated test axes in a block program



Individually configurable test protocol



Monitoring of the test sequence in real time

For standardised individual tests.

Single test rigs from Calmar are specialised for one test application. They are therefore a good choice for furniture manufacturers who would like to test many specimens with identical load directions. Nonetheless, the test rigs can be adapted to different shapes and, in part, also different specimens. The application options and configurations of the test rigs are diverse. Numerous different test set-ups exist especially for testing chairs and are precisely adapted to the requirements of national and international standards. Accordingly, Calmar combines specialisation and flexibility to an unusual degree. Two examples:

Test rig for alternating bending tests on seat and backrest of chairs

The test rig corresponds to the requirements of the standards BIFMA X5.1, EN 581-2, EN 1335, EN 1728 as well as BS 5459. It consists of two axes, which can both be adjusted laterally and vertically. The test cylinder for backrest stresses can be used, depending on the stan-

dards requirement, both for adjusted angles and in the locked condition. The actuator for the seat load unit can be adjusted for off-centre loads, and the compression piece can be moved toward the front or back. This also allows accessing several load points during one test. In addition, the flexibility of the test axes allows testing of diverse shapes of chairs – from children’s chairs to office chairs and outdoor chairs.

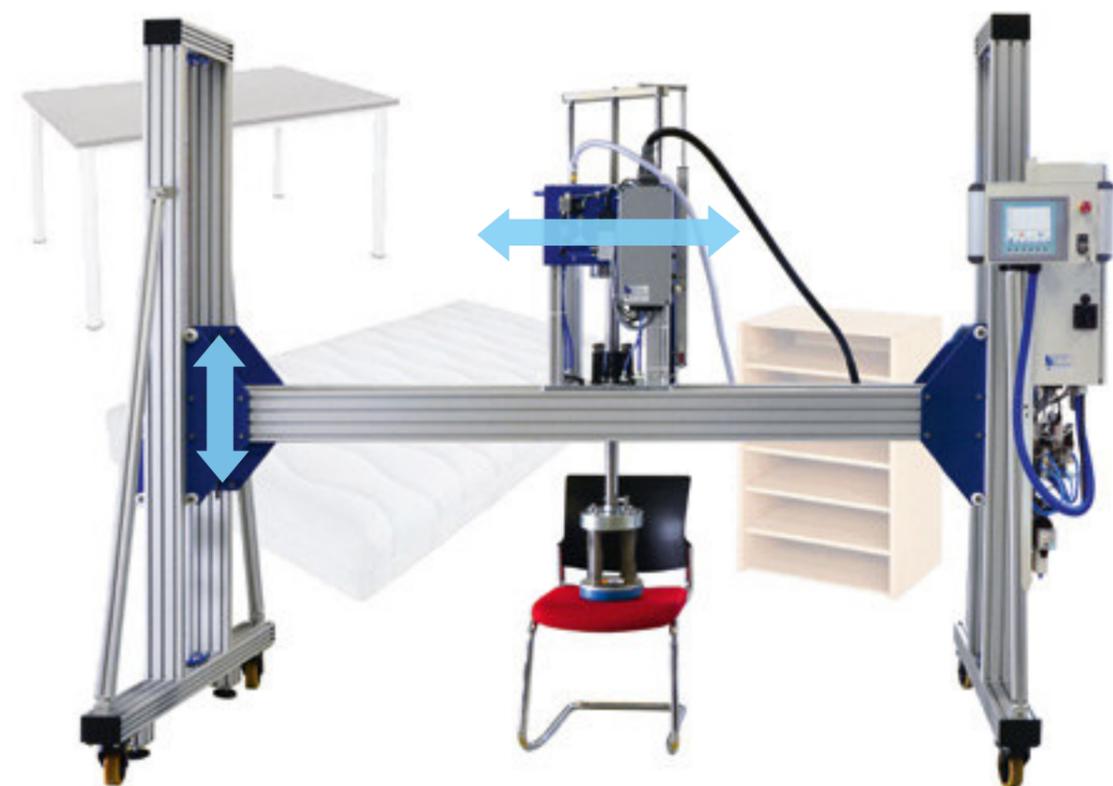


Test rig for alternating bending tests on seat and backrest

Drop tests rig

Drop tests on seats and upholstery furniture, tables, shelves, beds or also mattresses are an important method for testing durability under daily stresses. They shall simulate, for example, persons taking a seat, objects being put down or also stresses during the transport of pieces of furniture. Defined weights from 9.1 kg to 136 kg are dropped onto the specimen for this purpose. Depending on the standard, the drop height or the discharge position can be defined and precisely approached.

The design of the test equipment must be very flexible because of this large bandwidth of stresses and also because comparable test conditions must be established for different pieces of furniture. The portal test rig can therefore be adjusted both horizontally and vertically. It can also be equipped with electrical or pneumatic test axes in addition to the drop tester. Specimens with different sizes can therefore be tested at different points with variable loads.



Drop tests rig according to EN 1728 or BIFMA X5.1

One system, many tests.

A universal Calmar test field allows testing different products simultaneously. At this, the test field can be set up on different specimens from diverse industries, for example, the automotive industry, furniture and toy manufacturing or leather fabrication.

Whether personal bags, suitcase sets, air-cushioned aircraft seats, swings for children or bunk beds – a Calmar test field can test all of these.

A test field is normally based on a solid reinforced frame with solid subfloor construction from galvanised steel plates with a hole pattern. It is equipped with electrical and / or pneumatic test axes for applying loads.

There are hardly any limits here to diversity. The test fields can be varied in all dimensions (length, width, height). The test cylinders can be flexibly positioned both horizontally and vertically. For this purpose, all test axes are supported by roller bearings on the movable profile sections thus allowing testing of widely differing pieces of furniture and components at any point of the test field. The hole grid in the base plate of the test field facilitates quick and flexible clamping of the specimens. The test axes can be variably combined and synchronised for one or several testing tasks. This allows testing several specimens simultaneously on the same test field.



Universal test fields for tables and seating furniture



Test of side rails on nursing care beds in the universal test field



Drawer testing in the universal test field



Armchair testing in the universal test field



Table testing in the universal test field

For special tests.

Hegewald & Peschke provides special custom solutions for very specific testing tasks requiring more than simply the adjustment of individual construction parameters. Some examples here:

Universal testing machine for star bases, other furniture parts and materials

Universal testing machines of the Inspekt series: suitable for static and cyclical tensile, compression, peel, shearing and bending tests on components and materials.



Universal testing machine, amongst others, for testing star bases according to BIFMA X5.1

Test rig for cabinet doors and pull-out drawers

For function and continuous tests on revolving and sliding doors; integration of noise sensors for monitoring and as abort criterion possible.



Test rig for cabinet doors and drawers

Combined test rig for function fittings

For testing position adjustments on different fittings according to EN 1725, EN 1727, EN 15338 and DIN 68898



Combined test rig for position adjustment of fittings

Test field for aircraft and car seats

For vertical and horizontal tests on aircraft and car seats



Test field for aircraft and car seats

Test rig for 90° peel tests on solar modules

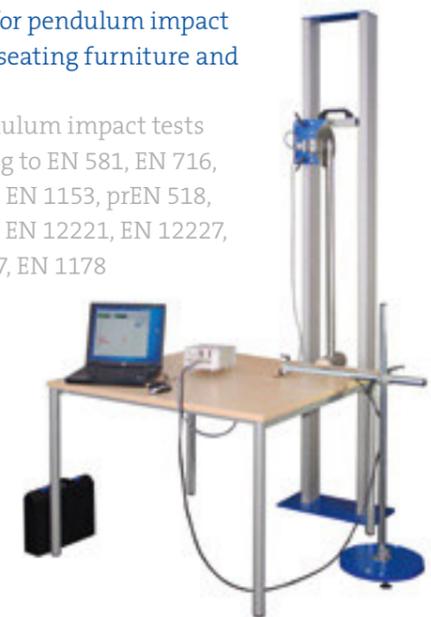
For testing the adhesion and bonding strength between coated surfaces and their rigid support layer as well as different composite materials with a 90° peel test, amongst others, according to DIN EN ISO 8510-1



Test rig for 90° peel tests on solar modules

Test rig for pendulum impact tests on seating furniture and tables

For pendulum impact tests according to EN 581, EN 716, EN 1130, EN 1153, prEN 518, EN 1728, EN 12221, EN 12227, EN 12727, EN 1178



Test rig for pendulum impact tests

Test rig for drawers

Both, stiff slaving of the drawers as well as free entering into the end position or the free rolling out after the reject unit of the test sample has been activated, can be realised.



Test rig for max. three drawers

Service

Hegewald & Peschke offers comprehensive services to its customers. One of the key services is commissioning of the machine on site with calibration and instruction of the operating personnel. Regular calibration of the test equipment guarantees the reliability of measuring results and serves as basis of measuring and test equipment monitoring in quality assurance measures. Different test tools, such as the seat impactor or the biting tester, are supplied as standard with calibration certificate. The calibration laboratory from Hegewald & Peschke is accredited according to DIN EN ISO/IEC 17025 and supplies traceable calibration certificates. DAKkS or factory calibration certificates can be issued depending on the respective measured variables.

Hegewald & Peschke on YouTube

Experience our furniture and component test rigs in action:

www.youtube.com/hegewaldpeschke

Other offerings:

- » Static electromechanical universal testing machines
- » Hydraulic universal testing machines
- » Portable and stationary hardness testers
- » Longitudinal measuring fixtures
- » Maintenance and DAKkS calibration services
- » Special testing systems

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