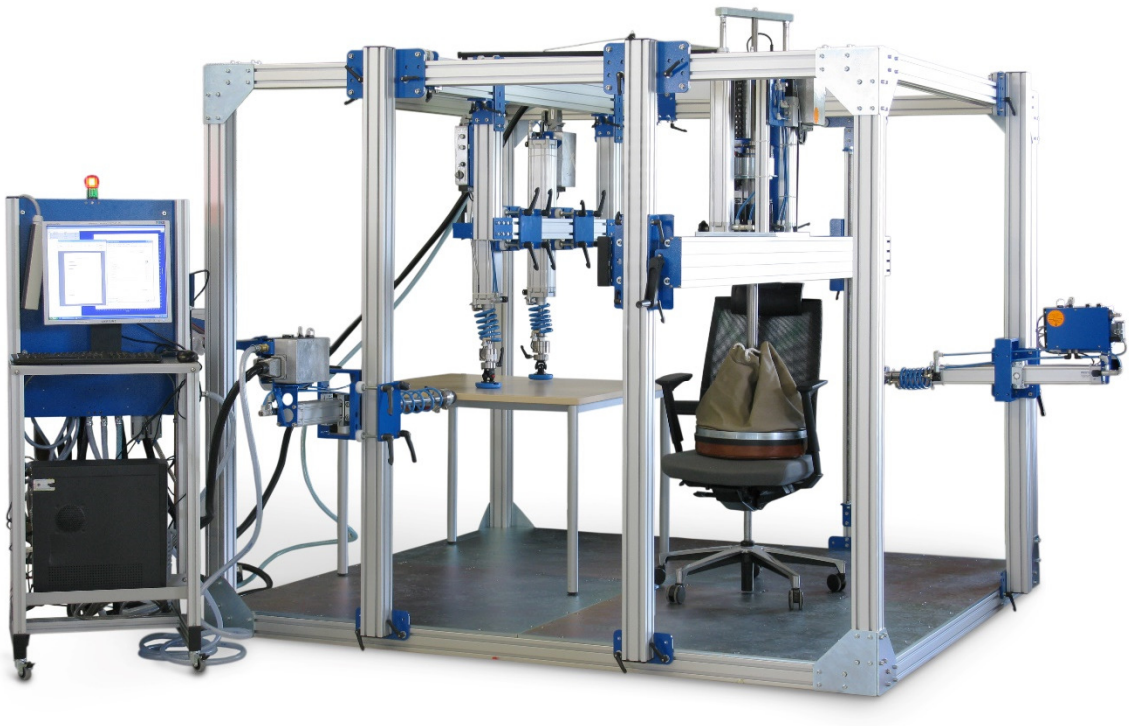
Hegewald & Peschke
Meß- und Prüftechnik GmbH

Product information

Universal test rigs for furniture and component testing with Calmar pro

The software-based control concept for flexible and complex test tasks



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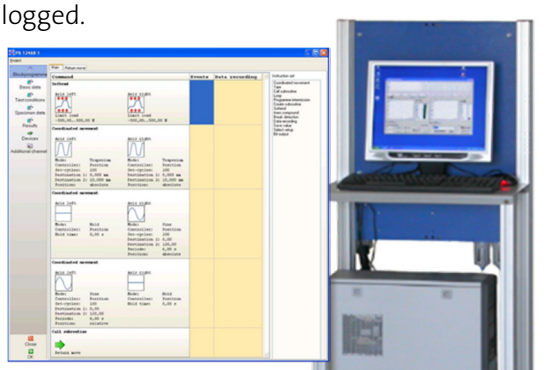
General product description

The universal test rig concept of the Calmar pro series by Hegewald & Peschke is designed for flexible furniture and component testing. In addition to durability tests, dynamic and static load tests, functional tests as well as standard-compliant simulations of the product life cycle according to DIN EN ISO, BIFMA, BS, NEN, GB, GOST, etc. can be carried out. On the basis of this tool box your individual "all-rounder" can be configured, depending on the test object and test task.

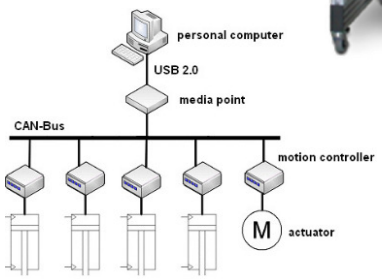
The decentralized, modular control concept enables test configurations with up to five axes. The tool box principle is designed to equip the test rigs with pneumatic axes and drop testers. Besides the test rigs can also be equipped with electromotive rotary drives (for door and roller testing), electromechanical linear axes and customer-specific special solutions.

The test software CalMaster allows tests to be processed on the basis of test templates (norm-conform or customer-specific) as well as free programming of test sequences. The test axes required for testing are selected via the user-friendly base program. The test parameters are set and the axes are synchronized with each other in terms of time.

Customer information, specimen parameters or results, which should be available for convenient evaluation, can also be used and generated in addition to the tests. Thus, test results and real-time data can be reliably archived, processed and logged.



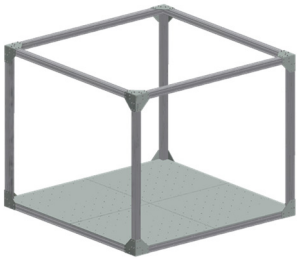
left: test software *CalMaster*: base program, 2 test axes
right: control/supply terminal



Decentralized and modulare control concept
Calmar pro

Calmar pro test systems – essential features and particularities

- Modular & flexible test systems – single and universal test rigs
- Universal tool box system – customer-specific equipment (also special systems)
- Durable and robust in harsh industrial environments or test laboratories
- High ease of use due to roller-guided, freely positionable profiles, thread grid in 12mm thick magnetic base plate, quick-clamping systems, etc.
- Very high variety of accessories
- High-precision control electronics with high resolution in a wide load/position measuring range
- Simple handling and software-based operation for all user groups
- Various test modules possible: alternating bending, rotation test, drop test, linear motion
- Free use with test software CalMaster with Windows interface
- Standard-compliant testing (database with adapted test specifications)
- Central supply terminal for control/regulation of up to 5 test axes simultaneously - up to 5 test tasks can be processed simultaneously
- Test axes can be operated individually or combined to test tasks as desired
- Free parameterization of test sequences
- Customer-specific data/results/test sequences
- Test report
- SQL database
- Online visualization (real-time graphics/values)



Example for a test frame
(2400mm x 2400mm x 2000mm)

Test frame

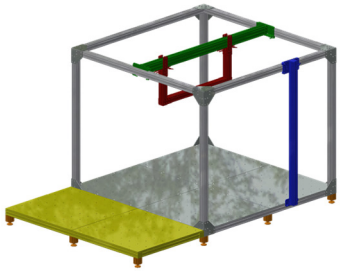
The size of the test frame depends on the customer requirements and on the specifications of the standard(s) according to which the respective testing task must be fulfilled.

We offer various sizes for this purpose. If the test rig exceeds the specified sizes, special designs with horizontal or vertical additional modules are also possible. Additional roller-guided profiles can be used to fix the test axes and mount accessories and specimens.

The upper profiles of the test frame are available in 2 heights. The profile selection is designed in such a way that on the one hand a high stiffness and on the other hand a certain elasticity is guaranteed. The design of the profiles ensures that, taking into account the area moment of inertia and the modulus of resistance, the profiles can bend only slightly and above all reversibly under the loads to be applied.

Item no.	Upper profiles (in mm)	Length (in mm)	Width (in mm)	Height (in mm)
40-005-000-BG04	80x80	1200	1200	2000
40-005-000-BG03	80x80	2400	1200	2000
40-005-000-BG68	80x120	2400	1200	2000
40-005-000-BG01	80x80	2400	2400	2000
40-005-000-BG09	80x80	2400	2400	2300
40-005-000-BG73	80x80	2400	2400	2500
40-005-000-BG76	80x120	3600	2400	2000
40-005-000-BG66	80x120	4800	2400	2000
40-005-000-BG30	Pedestal on uneven ground, recommended for smaller and obligatory for test rigs larger than 3000mm			

Pedestal



Drawing of a test rig with additional:
- roller-guided vertical profiles (blue)
- roller-guided horizontal profiles (green)
- roller-guided cross girders (red)
- base plate extensions (yellow)

Additional roller-guided profiles & cross girders

Vertical profile Item no.	Suitable for...
40-005-000-BG10	2000mm test rig height & mounting on 80mm x 80mm profile
40-005-000-BG11	2000mm test rig height & mounting on 80mm x 120mm profile
40-005-000-BG15	2300mm test rig height & mounting on 80mm x 80mm profile
40-005-000-BG17	2500mm test rig height & mounting on 80mm x 80mm profile

Horizontal profile Item no.	Suitable for...
40-005-000-BG20	2400mm test rig width & 80mm x 80mm profile
40-005-000-BG23	2400mm test rig width & 80mm x 120mm profile
40-005-000-BG57[1]	Manually height-adjustable profile set for 2400mm test rig depth & mounting on 80mm x 80mm profile
40-005-000-BG48[1]	Manually height-adjustable profile set for drop test for 2400mm test rig depth & mounting on 80mm x 80mm profile
40-005-000-BG49[1]	Manually height-adjustable profile set for drop test for 1200mm test rig depth & mounting on 80mm x 80mm profile

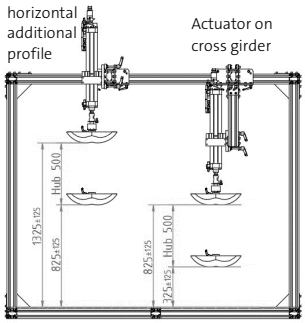
Cross girder Item no.	Suitable for...
40-005-000-BG25	Specimen height up to 500mm lower, for test rig width 2400mm, on 80mm profile
40-005-000-BG26	Specimen height up to 500mm lower, for test rig width 1200mm, on 80mm profile
40-005-000-BG37	Specimen height up to 500mm lower, for test rig width 2400mm, on 120mm profile
40-005-000-BG27	specimen height up to 850mm lower, for test rig width 2400mm, width 1400mm, horizontal 80mm profile required

Base plate extension Item no.	Dimensions
40-005-000-BG95	1200mm x 2400mm (if applicable 3 pedestals necessary)

[1] two vertical profiles required for installation

Actuator on horizontal additional profile

Actuator on cross girder

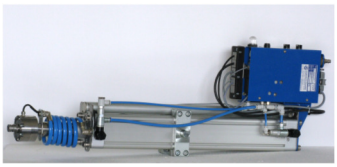


Possible min. specimen heights using the test axis with 500mm stroke and horizontal profiles as well as bearings

Pillar of 80x80 profile

Special profiles

Item no.	
40-005-080-BG86	Pillar of 80x80 profile for mounting accessories such as test axes, fixation to test rig structure or floor anchoring *Application example: Adaptation of horizontal test axes for testing smaller tables or children's furniture*

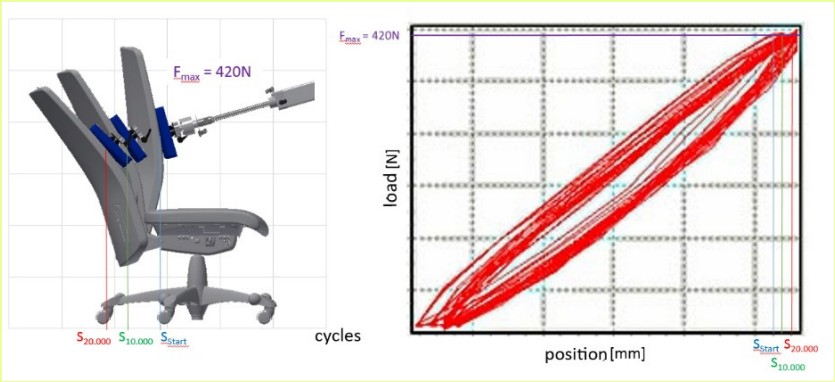


Pneumatic test axis

Test axes (selection)

The control board and the proportional valve are located directly on the test axis. This reduces compressed air consumption. A further advantage of this design is the resulting precise and fast control behaviour due to the shorter distances between the control valve and the point of impact. The test axis contains a manual operation for setup and a key switch for manual on/off switching of the axis. Each axis needs 1 mounting bracket.

Test axis Item no.	Control	F_{max} (in N)	Axis (ø)	Traverse path (in mm)
41-041-110	Load-controlled	1000	50	500
41-041-120	Load-controlled	1500	63	500
41-041-128	Load-controlled	1500	63	800
41-041-130	Load-controlled	2500	80	500
41-041-140	Load-controlled	4500	100	500
41-041-111	Load-/position-controlled	1000	50	500
41-041-121	Load-/position-controlled	1500	63	500
41-041-123	Load-/position-controlled	1500	63	800
41-041-131	Load-/position-controlled	2500	80	500
41-041-141	Load-/position-controlled	4500	100	500

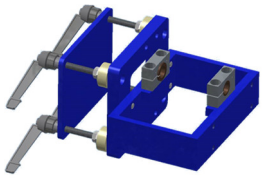


The advantage of position-controlled systems over purely load-controlled test axes lies not only in the fact that the travel distance can be used as a control channel, which is indispensable for drawer tests, for example, but also in the additional information on ageing effects.
Only the recording of the position channel as a function of the load signal allows specific statements on fatigue phenomena, i.e. which displacement is required in cycle x with constant load application (see S_{Start} compared to $S_{10,000\ cycles}$ and $S_{20,000\ cycles}$). These findings can be used for the development and design of the furniture beyond quality assurance.

Fig. left: Hysteresis curve with cyclic backrest bending alternating load

Drop tester

Item no.	
41-013-222v2	Drop tester for the mounting in a test rig; 40-005-000-BG48 or 40-005-000-BG49 und 2 vertical profiles necessary

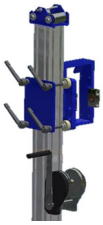


Mounting bracket for the assembly of the test axis at the profile construction

Installation accessories

Mounting bracket Item no.	Axis (ø)
40-001-419	50
40-001-429	63
40-001-439	80
40-001-449	100

The easy adjustment of the angle as well as the flexible or rigid bearing are an advantage of the mounting brackets. In addition, the fixing elements allow free positioning of the test axes over the profile length in height or width. The actuator or swivel axis can be arranged parallel or perpendicular to the profile.



Lifting device for adjusting the height of actuators

Further accessories Item no.	
40-001-401	Lifting device for height adjustment of actuators via self-locking manual winch

Control/supply terminal

Control/supply terminal and software

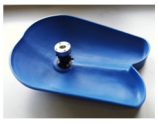
The supply terminal is used to connect either up to 2 or up to 5 test axes. It converts the CAN protocol to USB and simultaneously establishes the connection from the test axes to the PC.
The supply terminal consists of the control electronics (closed-loop control), the switch cabinet housing and the pneumatic maintenance unit and is mounted on a separate rack. The central connections for the compressed air and power supply are also located here.

Item no.	Number of axis
40-001-154	Rack for supply terminal Calmar pro
41-041-052	Supply terminal Calmar pro for up to 2 test axis
41-041-055	Supply terminal Calmar pro for up to 5 test axis
18-005-052	Component and furniture testing software CalMaster

Accessories

We will be pleased to provide you with our separate accessory brochures on drop weights, load pads (round and special shapes) and fixing elements on request. Below you will find some examples.

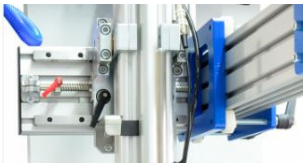
Seat impactor
(41-006-730)



Seat shape
(41-006-220)

Load pad for backrest
incl. rotation lock
(41-006-305)

Load pad
for armrests
(41-006-521)



Upgrade kit for seat cylinder *(40-001-123-BG18)*

Accessories for chair testing (selection)

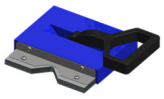
Item no.	Description	Relevant test standards
41-006-730	Seat impactor for drop tester 25kg, incl. calibration protocol	BIFMA X5.1 EN 1728, EN 1730
40-001-123-BG18	Upgrade kit for spring balanced positioning of seat cylinder	EN ISO 1335, BIFMA X5.1, EN ISO1728
41-006-220	Seat shape, clamping connection, moulded part of GF-UP *Special edition:* colour nature: Item no. 41-006-220v1 *Further accessories:* for crossing axes, check use of load introduction frame 41-006-060 to 063 and rotation lock 41-012-011 to 023!	EN 581, EN 1335, EN 1728
41-006-305	Load pad, rectangular for testing the backrest 250x200-R450/R12; clamping connection ø20 cardanic; with rotation lock for backrest *Special edition:* colour nature: Item no. 41-006-305v1 Connection shortened, only tiltable: Item no. 41-006-308	DIN 1728, EN 1335
41-012-013	Rotation lock for pneumatic cylinder for tests with load introduction frame e.g. for seat/backrest testing	
41-006-060	Load introduction frame for alternating bending test seat/backrest with clamping connection	
41-006-101	Load pad ø200mm-R300/R12; clamping connection ø20 cardanic	EN 1022, EN 1335 prEN 1728, ISO 7173
41-006-521	Load pad 100mm wide for permanent loading of the arm rests; variable load application and angle, clamping connection ø20	EN 1335-3:2009, EN 1728:2012 EN 581-2

Load pads, round, clamping connection

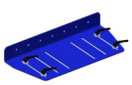
Load pads for table testing (selection)

Item no.	Description	Relevant test standards
41-006-110	ø 100mm for table testing, clamping connection *Special edition:* colour nature: Item no. 41-006-110v1	EN 527, EN 581, EN 1730
41-006-120	ø 50mm for table testing, clamping connection *Special edition:* elastic spacer: 41-006-121	EN 527, EN 581, EN 1730

Fixation element set
for table test rigs



Fixation element set
for furniture test rigs



Stop element for
office swivel chairs

Clamping bridge for
office swivel chairs

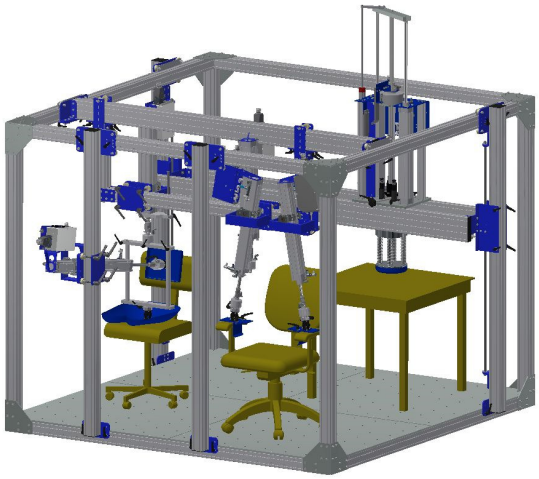
Fixation elements (selection)

Item no.	Description
40-001-060	Fixation element set for furniture test rigs, 4 magnets with 12 mm high stop edge
40-001-117	Fixation element set for table test rigs
40-001-056	Stop element for office swivel chairs
40-001-050	Clamping bridge for office swivel chairs

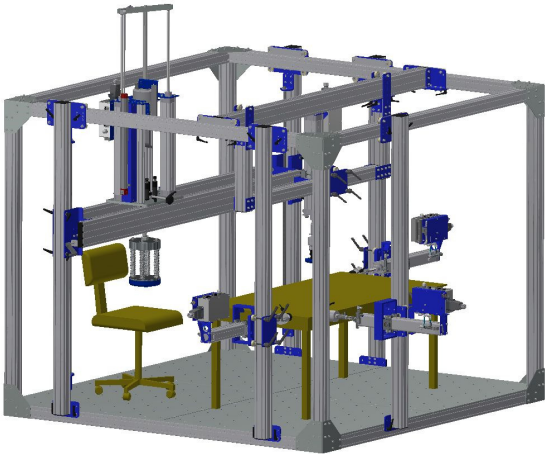
One configuration - many possibilities

The universal tool box system enables the realization of many applications with only one test rig. Depending on customer requirements, the test rig can be individually equipped and configured.

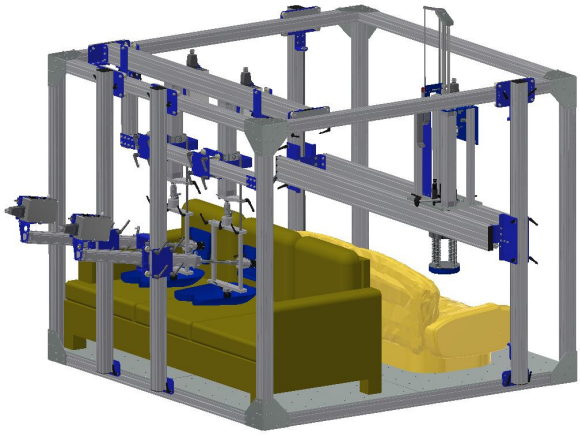
The pictures below show the same test rig with 3 different application possibilities. In all three cases it consists of a test frame, 4 test axes and a drop tester. The test axes are used for different testing tasks depending on the application.



- 2 test axes for the armrest testing
- 1 test axis for the seat testing
- 1 test axis for the backrest testing
- Drop tester for the table testing



- 3 horizontal test axes and 1 vertical test axis for the table testing (displacement test with static load)
- Drop tester for the chair testing



- 2 test axes for the seat testing (long-term durability)
- 2 test axes for the backrest testing
- Drop tester for the testing of upholstered furniture

Application-oriented complete test rigs to choose from and as an example

Item no.	Description
40-920-169	Universal test rig for bed testing, tables and couches, consisting of: 2 pneumatic test axes load-/position-controlled, 1 drop tester Dimensions: LxWxH: 2400x2400x2300 [mm]
40-920-171	Universal test rig for tables, chairs and upholstered furniture, consisting of: 4 pneumatic test axes load-controlled Dimensions: LxWxH: 2400x2400x2000 [mm]
40-920-174	Universal test rig for tables and chairs, consisting of: 4 pneumatic test axes load-/position-controlled Dimensions: LxWxH: 2400x2400x2000 [mm]
40-920-177	Universal test rig for tables and chairs, consisting of: 4 pneumatic test axes load-controlled Dimensions: LxWxH: 2400x2400x2000 [mm]
40-920-179	Universal test rig for bed testing, tables and couches, consisting of: 2 pneumatic test axes load-/position-controlled, 1 drop tester Dimensions: LxWxH: 2400x2400x2000 [mm]
40-920-182	Universal test rig for tables, chairs and upholstered furniture, consisting of: 4 pneumatic test axes load-/position-controlled, 1 drop tester, 1 swivel test rig electro-motoric position-controlled Dimensions: LxWxH: 2400x3600x2000 [mm]
40-920-183	Universal test rig for tables and chairs, reinforced construction, consisting of: 4 pneumatic test axes load-/position-controlled Dimensions: LxWxH: 2400x2400x2000 [mm]
40-920-184	Universal test rig for tables, consisting of: 3 pneumatic test axes load-/position-controlled Dimensions: LxWxH: 2400x3600x2000 [mm]
40-920-189	Universal test rig for tables and chairs, consisting of: 4 pneumatic test axes load-/position-controlled, 1 drop tester Dimensions: LxWxH: 2400x3600x2000 [mm]

Application possibilities:

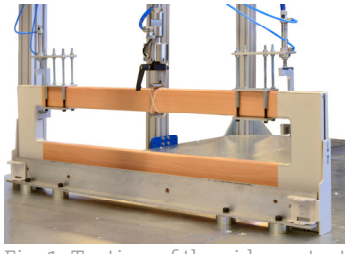


Fig. 1: Testing of the side protection of nursing bed

Fig. 2: Armchair testing

Fig. 3: Side-to-side-testing

Fig. 4: Drawer testing

Fig. 5: Swivel test

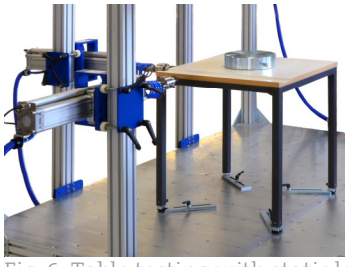


Fig. 6: Table testing with static load

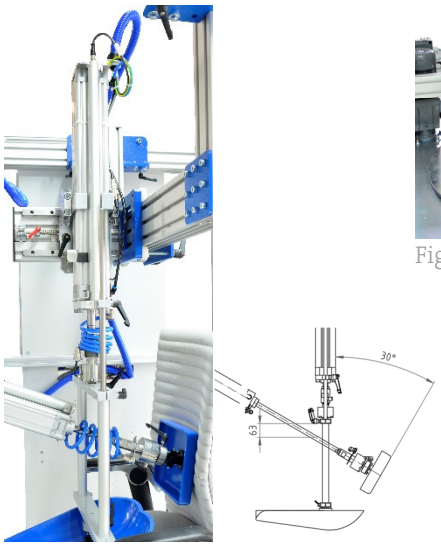


Fig. 7: Seat/backrest testing for living and object furniture in the test rig

Fig. 8: Armrest testing

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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