



Hegewald & Peschke
Meß- und Prüftechnik GmbH



Component- AND Furniture Testing

Functionality and/or life
cycle fatigue testing



- i. Introduction of H&P
- ii. Furniture and Component Testing at H&P
- iii. The Choice of Control and Operation System
 - i. Calmar pro – software-based
 - ii. Calmar one – PLC-based
- iv. Electromechanical or Pneumatic Test Axis
- v. Application
 - i. Office Chair Testing
 - ii. Table Testing
 - iii. Doors, Drawers, Hinges, Components, etc.
 - i. Further Application
- vi. Accessories





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The Company

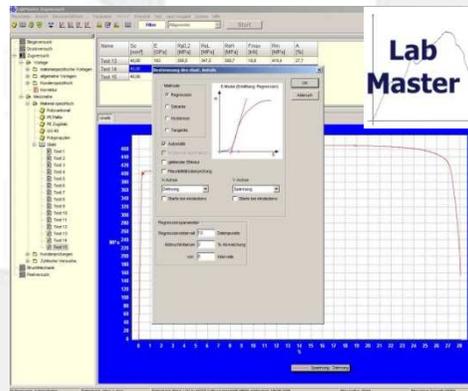


Mechanical and electronical
construction

Software development

Manufacturing and service

„engineering office“ with attached production
... by thinking to success
... all from one hand
... great flexibility and high quality





Competency generates Results

- Universal testing machines
- Static and portable hardness testers
- Component and furniture testing systems
- Special testing machines and fully automated solutions
- Dimension measurement equipment
- Retrofit of hardness testers and universal testing machines





- Standard conform testing acc. DIN EN ISO, BIFMA, BS, NEN, GB, etc.
 - Modular flexible setup – „from single test rigs to the universal all-in-one system“
 - Handy operation for all user groups (test operator, development engineer, etc.)
 - Free parametrization of testing procedures
 - Customer specific results and parameter
 - Extreme versatility of accessories
 - Various test axis can be combined and synchronized respectively to realize one test job – only limitation is hardware in terms of max. stroke and max. load capacity
 - Various control concepts depending on test demand
 - Different drive concepts depending on required stroke, speed and accuracy
- Static load application
- Dynamic load application
- Load controlled / position controlled or both
- **Durability / Functionality / Life Cycle / Fatigue**



Calmar pro Test Systems

load- & position
controlled

Load
controlled

Calmar one Test systems

load- & position
controlled

Load
controlled

pressure
controlled

Comfort, Data, Possibilities, Price

- Standard conform testing (database with preconfigured test templates)
 - Central supply terminal for closed-loop control and operation of up to 5 test axis simultaneously – i.e. up to 5 test jobs
 - Test axis can be operated single or combined to a test job
 - Test software with Windows based surface
 - Free parametrization
 - Customer specific parameter, results, test procedures
 - Testing report
 - SQL database
 - Online-visualization
 - Modular & flexible – single test rigs and universal test structures
 - Highly precise closed-loop control
- PLC-based with operator optimized user surface
 - Reduced noise level
 - Precise closed-loop control
 - New developed controller to enhance cycle time retaining control quality
 - Fast and simple test setup
 - Test rig specific innovative touch panel
 - Up to 6 test axis and 3 test jobs can be performed simultaneously
 - Preconfigured standard conform test templates
 - Free parametrization and generation of customer specific test procedures
 - Data export of log files
 - Option: customer specific report layout generation



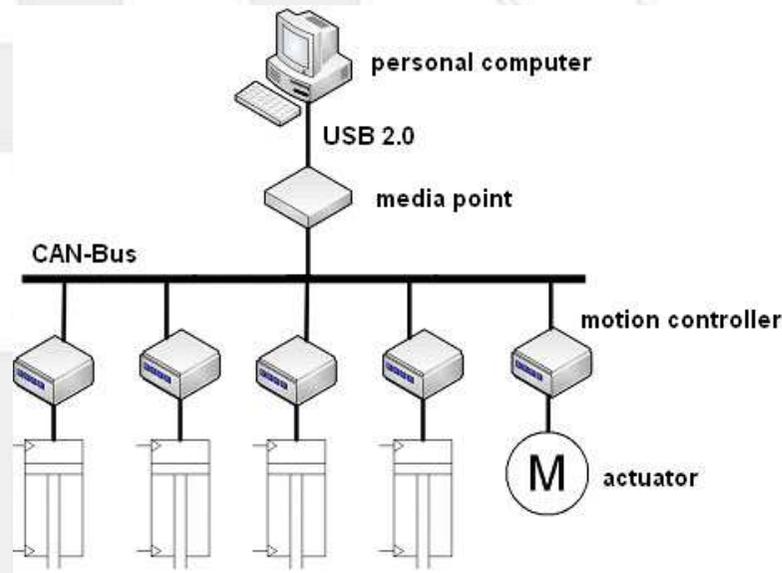
- Supply terminal: up to 5 test axis simultaneously; CAN-BUS
- De-central, modular control enables total flexibility to perform individual single axis tests and synchronized multiaxial testing at the same time

Following test modul:

- Alternating bending
- Swivel test
- Drop test
- Linear test

Following types of test axes:

- Pneumatic test axis
- Electromotive rotating axis
- Electromotive linear axis
- Drop tester
- Customer-specific solutions





- Universal and user-friendly and operation optimized testing software
- SQL database
- Structured user surface (explorer with test templates and test data, real-time graphic, testing procedure)
- Standard conform pre-configured testing procedures
- Free definable test procedures
- Free definable parameter and results
- Documentation and report function
- Intuitive setup of test jobs – simple and complicated block programs
- User management
- Free of charge software support

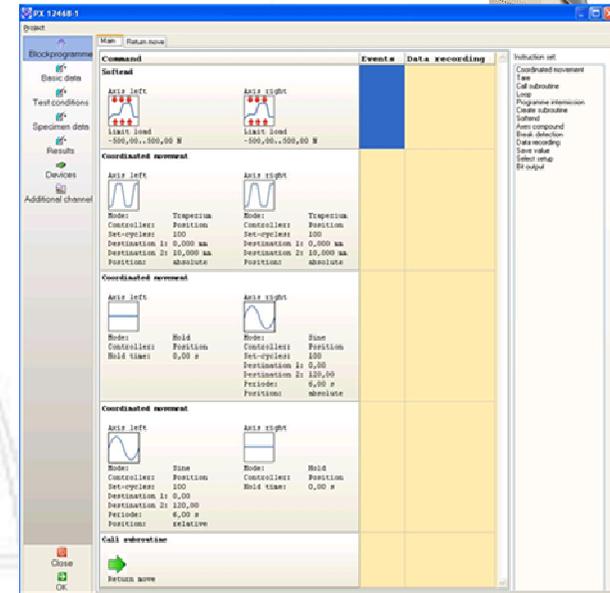
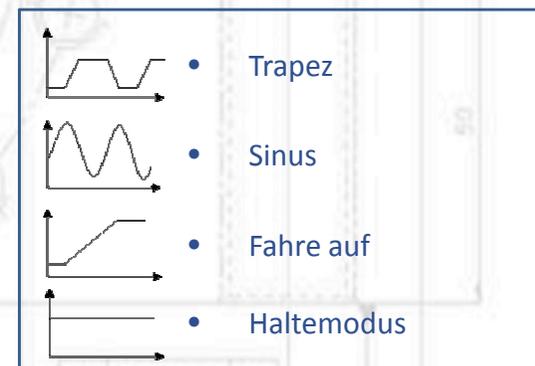
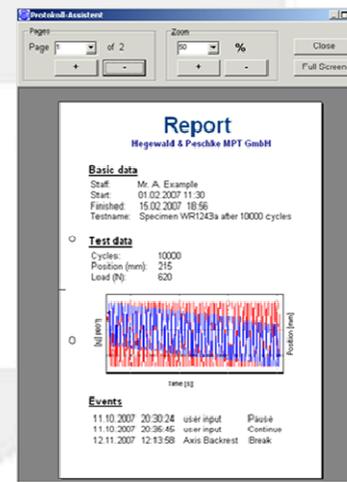
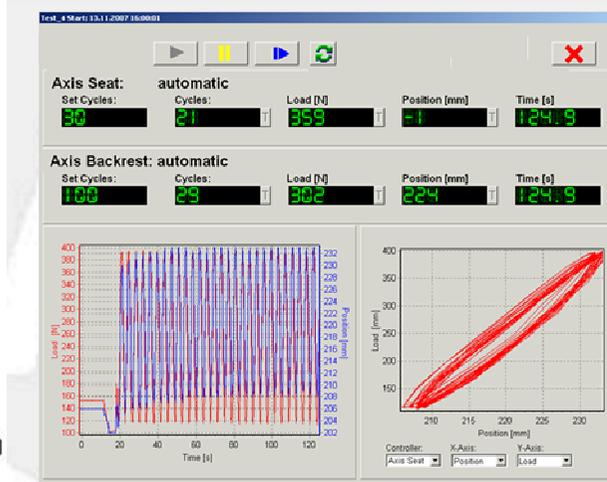
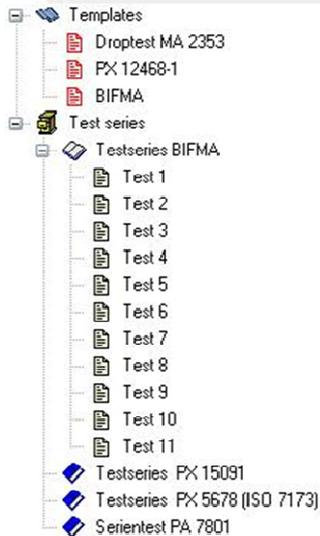


Abb. oben: 2 Prüffachsen kombiniert





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Calmar pro – software-based test
system VIDEO



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<https://www.youtube.com/watch?v=YhfvLT24GWs>



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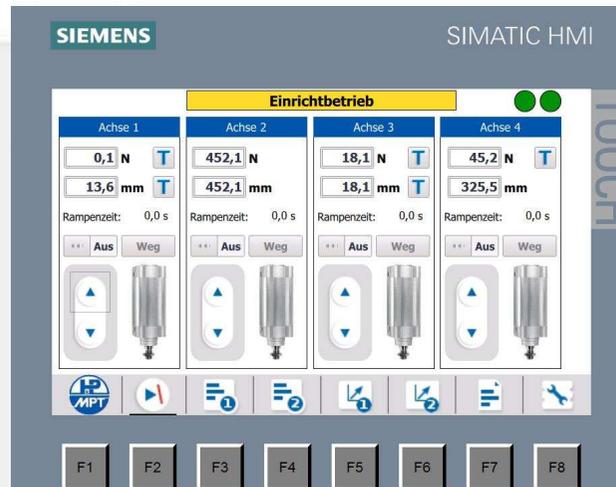
Calmar one test system – PLC-based



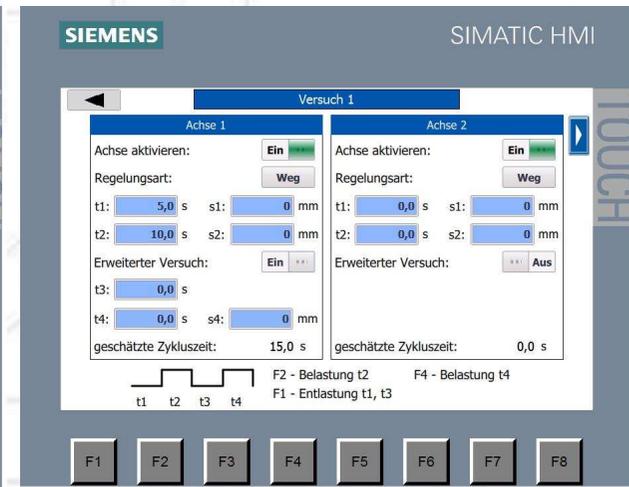
- Optimized user surface operation via touch panel
- Preconfigured standard conform test procedures
- Customer specific modification of test procedures and generation of new test procedures
- On-line visualization
- Integrated controller optimization to reduce cycle time retaining control quality (e.g. for soft or hard specimen)
- Pressure, load or position control possible
- Data logging and export (*.csv)
- Optional: report generator for user defined layout



organized view/ with user-management



manual and automatized control of up to 6 test axis and 3 test jobs



preconfigured standard conform test procedures, free parametrization



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Calmar one – PLC-based test
system VIDEO



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<https://www.youtube.com/watch?v=z0jbCgMOaT8&feature=youtu.be>

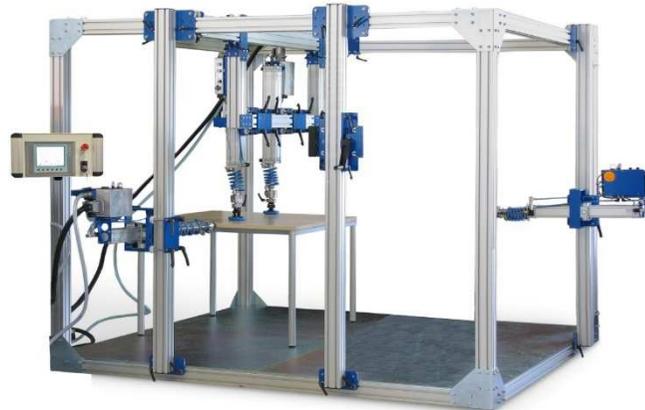
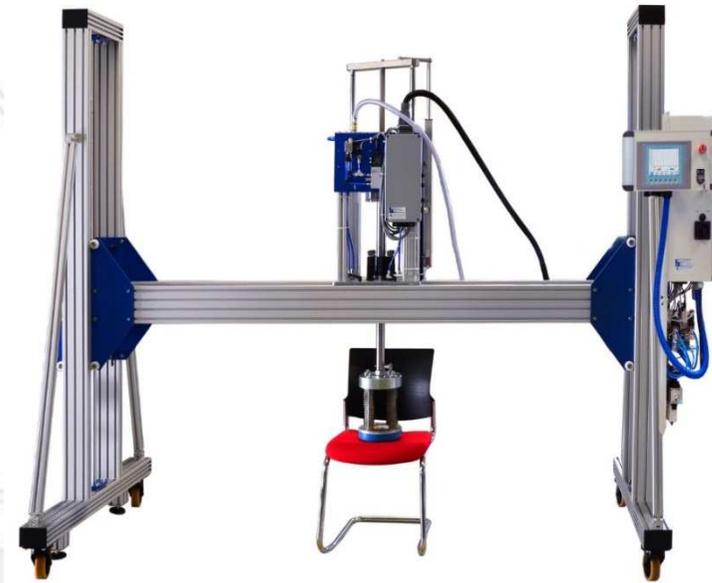


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Calmar one test system – Technical Data



- Internal sampling rate: 10-20ms real time
- Fixed control frequency of 100ms
- Control accuracy up to ± 2 digits
- Analog digital transformer with 13 bit resolution (smallest digit of 0.6N at 2kN load cell)
- 20 test templates recordable
- Up to 3 simultaneous tests at one test rig with multiaxial testing systems
- 1-, 2-, 4- and 6-test axis systems available





Choice of Actuator Type



i) Pneumatic Test Axis

- Fatigue / Life Cycle Test
- Speeds up to max. 0.3m/s
- Stroke up to max. 800mm
- Load/position controlled
- Cost efficient in terms of purchase and maintenance
- Less wear effects
- Disadvantage in control precision in load range below 5% of nominal load

→ Efficient for production and assembling facilities; especially if pneumatic is anyway available

...control concept:

i) Calmar one, Calmar pro

ii) Electromechanical Test Axis

- Beyond Life Cycle and Fatigue also Functionality Testing
- Load accuracy between 1-100% of nominal load, position accuracy better 1mm, resolution better 1µm
- Speeds up to 1.6m/s (other parameter upon request)
- Strokes upon request
- Load/position/speed controlled
- Highly precise closed-loop controlled processes

→ Various simple and complicated test programs can be freely configured and append with special function (door opening, etc.)

e.g. (Tip-on or soft close mechanism)

ii) Calmar pro or EDC

...the choice of control concept depends on test demand and testing program!



...standard conform alternating bending testing at seat/backrest of office chair

40-920-020/021

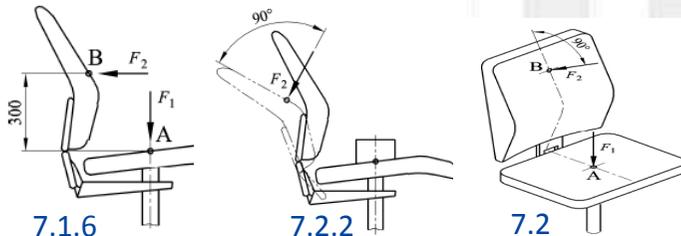


e.g. acc. EN1728, EN581-2

40-930-032



e.g. acc. EN1728, EN581-2, BS5459, BIFMA X5.1:2011, EN1335-3:2009, etc.



Quelle: EN1335-3:2009

- Spring balanced seat loading pad to allow standard conform load application during entire test, angle remains 90°
- Defined positioning of seat loading pad at one or two points to acc. EN and BS standard
- Flexible and lockable angular backrest cylinder adjustment, depending on standard and chair
- Extreme variability of backrest cylinder movement to allow 90° load application even at flexible office chairs



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Application



...alternating bending tests at arm rest and side-to-side (front edge)



40-930-039



40-920-034

For chairs (indoor+outdoor), office furniture, upholstery, raw seater, children furniture, etc.

Optional: At 40-930-039 the cross girder can be motorically height adjusted at both test stations independent from each other to test also different chair heights at same time.

Both test application arm rest and side-to-side testing respectively can be realized in single test rigs (40-930-44/-046) and universal test rigs.

e.g. acc. EN 1335-3:2009, EN1728, EN581-2, BIFMA X5.1, BIFMA X5.4, BIFMA X6.5, BS 5459



...swivel test for x-base and castor testing

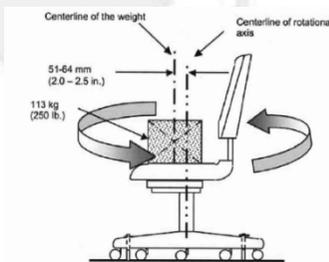


40-920-060



40-930-060

e.g. acc. EN 1335, EN1728, and BIFMA X5.1



The swivel test rig allows the roller/castor testing (unidirectional or in alternating direction) and the testing of x-base and base frame of office seat. Either the x-base or the seat can be fixed in center or off center position. Beyond the chair can be loaded with weights or optionally periodically with a pneumatic axis, which can in this way be used to test the base frame including it's gas spring but also the wear of seat surface (textile).

Quelle: BIFMA X5.1:2011



Hegewald & Peschke Drop test of chairs, table, beds, mattress,
Meß- und Prüftechnik GmbH cushion frames, upholstery, etc.



40-930-059



40-920-056

The drop tester allows to setup any cycle number between a single drop and 999,999 cycles. The drop position can be defined as fixed drop position or as fixed drop height. Setting the drop height one can define, whether the drop height is readjusted after each test to keep a homogeneous drop height. A tolerance level can be set as break criteria. For that a highly precise position measurement system is employed. For safety issues the drop weight is released applying a current to the permanent magnet.

Optional: A contact matt can be applied to detect the contact point between chair and drop weight.

Hegewald & Peschke offers a huge variety of drop loads and weights as well as weight bags. Beyond the seat impactor is delivered in standard with a calibration certificate.

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e.g. acc. EN 1335, EN 1728, EN 1729, EN 581-2, EN 13761 and DIN 4551



40-910-010: measurement
device e.g. for distance
measurement of seat
depth, seat and arm rest,
arm rest to arm rest.



40-910-012: 3D-measurement station for swivel chair, chair, stool, easy chair, comfortable chair, cantilever chair in acc. to EN 1335, EN 1728, EN 1729, EN 581-2-3, EN 13761, DIN 68878 and BIFMA X5.1. The test rig is equipped with a pneumatic axis to lift the 64kg seat weight. The portal can be driven in any direction x,y and z and is equipped accordingly with three digital measurement system. The test finger is flexible with an one sided tip. Accordingly any test point in acc. to the standards can be determined at office chair. The finger is positioned, the measurement system is reset to zero in the relevant direction and the portal is moved so that the finger touches the second relevant point and the distance can easily be read from the display. Optionally the value can be exported.



Further Chair tests



40-930-080 Test rig for tilting drop testing of fourfeeter indoor and office chair as well as outdoor furniture stool and cantilever chair (freeswinger chair) in acc. to DIN 68878.



40-910-090 Stability test on chair and seating furniture acc. to EN 1022, EN 1729, EN 581-2-3, EN 1335, DIN 68878 and BIFMA X 5.1

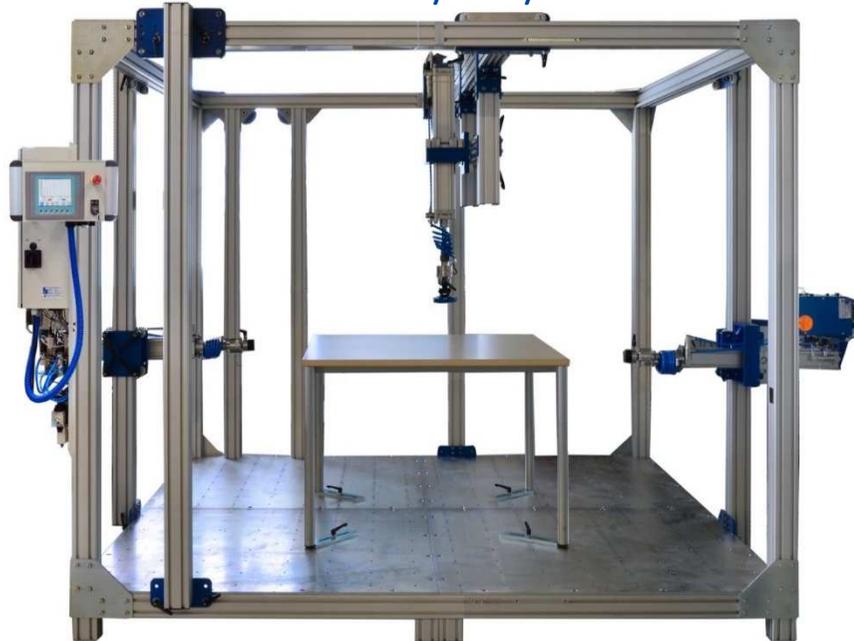


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Table testing



40-93x-071/070/177



40-920-179



Universal test rigs with a static optimized and solid test frame and strong galvanized base plates with a thread pattern for easy and flexible fixation of specimen.

The test rigs can be equipped with one or up to 6 test axis depending on control type. Only one central standard pneumatic connection is necessary to provide free of oil and dry pressurized air with approx. 6 bar. In addition only a standard current of 230V/50Hz is needed to run the versatile test rigs.

The test frame is enhanced by roller guided cross girder and vertical carrier which allow the easy setup according table dimension and test condition bringing the pneumatic or electromotorical piston in perfect test position.

Beyond table test different test jobs on chair, cupboards, cabinets, etc. can be carried out with the test rigs. Auxiliary an especially developed mounting bracket for the pistons allows to lock the testing angle or to remain flexible in angle during the test application.

The test axis can be equipped with load cells and position measurement system depending on demands and requirements. These sensors can hence be used to detect the measurement channel or even to control the test job. Beyond the test rigs can be equipped with swivel tests or drop test.



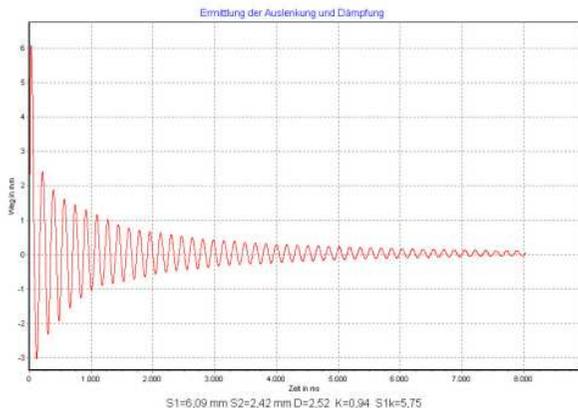
Hegewald & Peschke Pendulum impact on table, bench, etc.

Meß- und Prüftechnik GmbH Basketball test at cabinets



LEFT: 41-002-200 Pendulum impact test station, e.g. acc. EN 581, EN 716, EN 1130, EN 1153, prEN 518, EN 1728, EN 12221, EN 12227, EN 12727, ENV1178 incl. A set of three impact hammer:

- 1 impact hammer 6,4kg x 1000mm
- 1 impact hammer 5,0kg x 1000mm
- 1 impact hammer 2,0kg x 300mm



Important: The complete test rig includes a contactless, digital measurement system and the developed impact test software Bertpro. The latter allows the direct visualization of measurement data in a graphic displaying the stroke vs time and the automated calculation of oscillation period, damping constant D, spring stiffness k as well as further results such as S1, S2 und S1k.

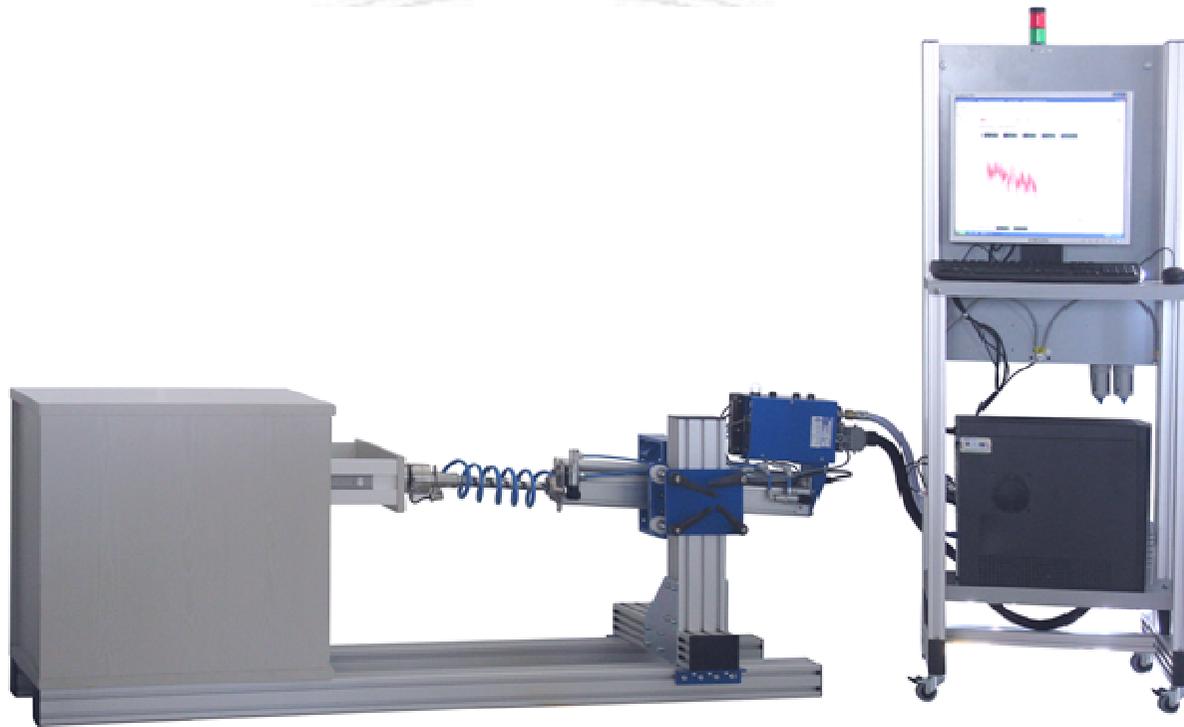
RIGHT: 41-002-168 Basketball test (pressure 73,5 +/- 5kPa) for horizontal impact testing in acc. to BS 4875-8 and EN 13150





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Linear axis for testing drawer,
slides, hinges & fittings, doors, etc.



40-920-092

The pneumatic test axis is suited for long term loading, life cycle testing and fatigue testing on drawers, drawer components and slides e.g. in acc. to EN 15338, EN 1727 and DIN 68898.

Utilizing a height adjustable load and position controlled test axis various tests can be envisaged for the determination of mechanical parameter.

To test the complete portfolio of drawer and slides a special test cylinder with a stroke of 800mm is available. The stroke can be varied upon request.

By the aid of the self designed and operation optimized testing and evaluation software customized and standard conform test programs can easily be setup and stored as test programs for reproducible and closed loop controlled testing. Beyond the software allows the evaluation and reporting of test results.



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Linear axis for testing drawer,
sliding systems, fittings, doors, etc.



41-019-315



40-920-227 + 228

Electromotorical test axis with piston rod of up to 1m or carrier with lateral guiding (stroke on request).

The test systems are distinguished by a highly precise positioning and enhanced speeds up to 1.6m/s.

The load area can be adapted to the request. Indeed, also the configuration of linear axis as single test stand or combined into a test structure is decided upon test demand and specimen dimension. A electromotorical height adjustment is optional for frequent testing at different heights.

Beyond the coupling of external sensor is possible, for example noise sensor as criteria for the performance of drawer and fitting test in respect to wear and friction effects.

The software allows to define critical parameter for evaluation and free configuration of test programs.



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Exemplary application for
electromechanical linear axis



Life cycle and long term testing or functionality tests e.g. acc. DIN EN 1727, EN 1335-2/3, EN14074, EN68885, EN15338, BIFMA/ANSI X5.1, ES1058

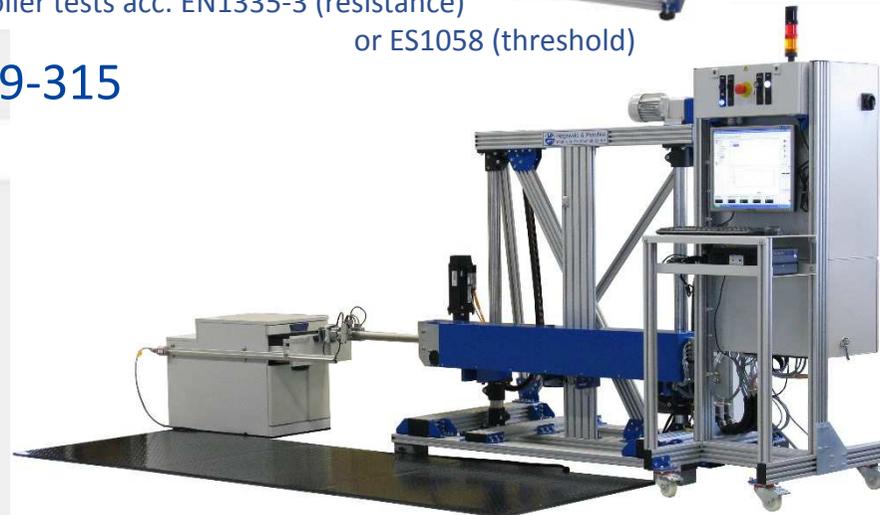


Roller tests acc. EN1335-3 (resistance)
or ES1058 (threshold)

41-019-315



Drawer test on tool trolleys



Life cycle fatigue test on drawer



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Special electromechanical unit for testing revolving doors, sliding doors, drawer cabinets



e.g. acc. EN 1725, DIN EN 1727, EN 1335-2/3, EN14074, EN68885, EN15338, BIFMA/ANSI X5.1, ES1058

- Absolutely flexible
- Two test station (simultaneous operation possible)
- EDC control of swivel drive and linear drive can be synchronized to one test job
- LabMaster testing software

Electromotorical linear axis:

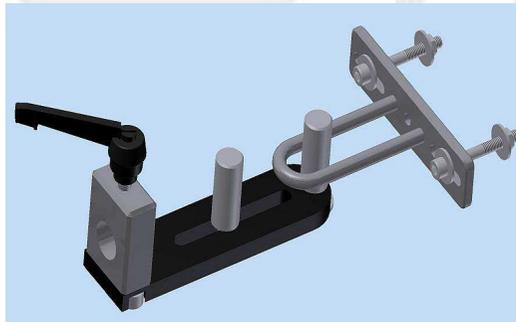
- Height adjustable between 200 and 1000mm
- Load, position- and speed control

Swivel drive:

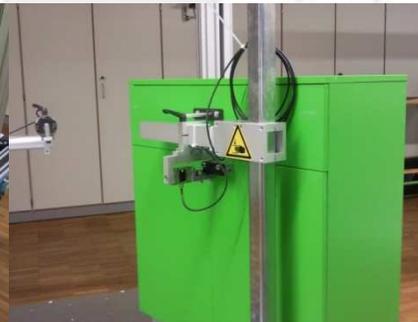
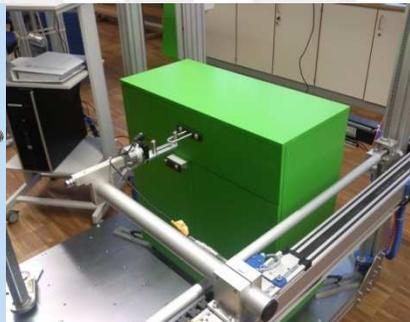
- Height adjustable coupling to specimen
- Load / angle controlled
- Max. torque of 100 Nm; max. revolving angle 140°; v max. 60°/s

40-920-227

40-920-228



41-006-810 for drawer system with soft-closing – optional with pneumatic gripper



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Cupboard door testing



Combined test rig for revolving and sliding doors as well as for drawer

Electromotorical axis:

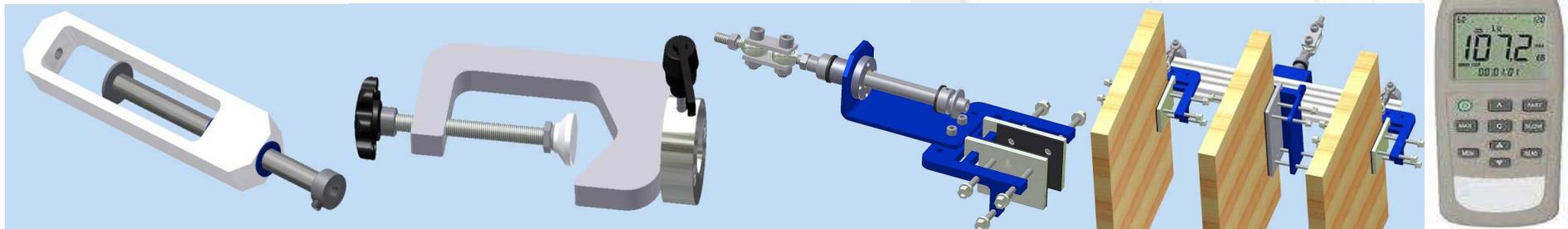
- 2 linear axis synchronized for door heights of 4m
- Load application axis into the specimen height adjustable
- Strokes up to 3m
- Speeds up to 500mm/s
- Loads up to 1kN

Pneumatic axis:

- Height adjustable
- Displacement up to 800mm
- Speed up to 0.3m/s
- Loads up to 1kN

Options:

- Noise sensor integrated as measuring channel
- Connection to outlook for failure or stop alerts





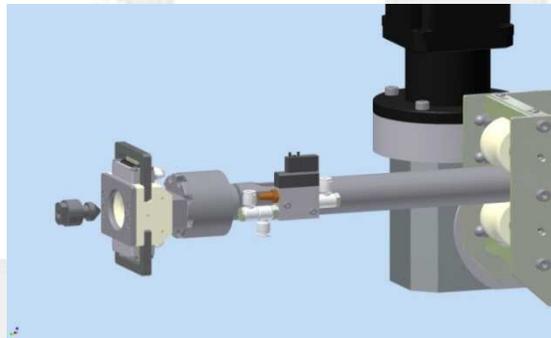
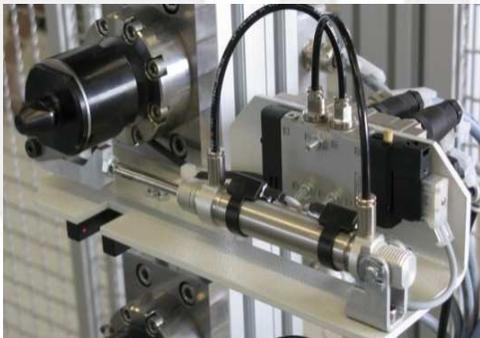
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Drawer testing Testing of fittings and linear guidings



System configuration

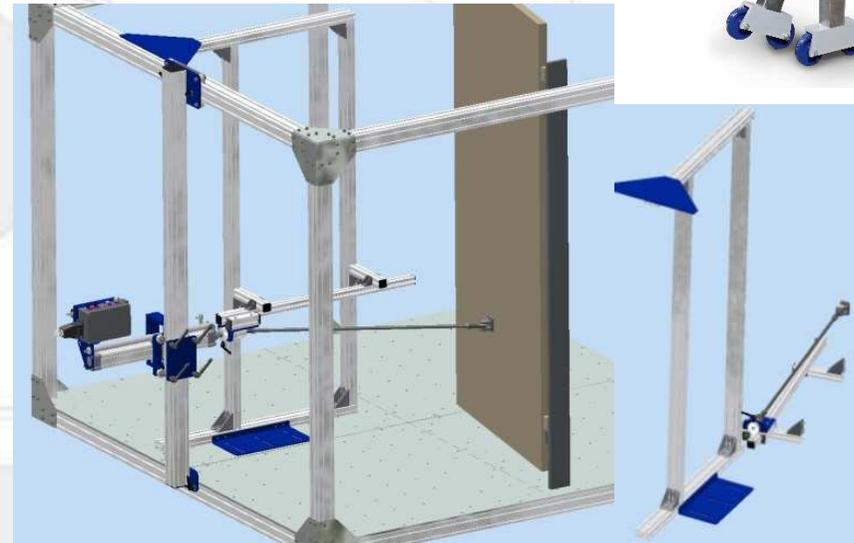
- Up to 3 drawer systems can be tested simultaneously
- 3 load sensor
- Position measurement system
- Pneumatic revolver for controlled testing incl. tip-on or soft-close mechanism
- Data log can be filtered
- Free definable test programs





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Further test solutions for door testing



Long term testing on doors in acc. to EN1725 or EN 14727: The door is mounted on the frame and opened over the revolving axis utilizing a linear cylinder. An additional small test cylinder operates the opening of door handle.

Alternatively Hegewald & Peschke offers pneumatic cylinder with stroke of 800mm and components, which allow the integration of such a door test in any test rig structure. Opening angle up to 90° can be realized (41-007-130 + 40-005-000-BG42).



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Special test rigs for testing hinges
and fittings



„One for All“: With that special test structure all mechanism on a cushion frame are tested. The head rest of sofa frames is rotated and arrested in different lock positions as well as the head rest of bed frames. Additionally the unit contains a drop tester.

Technical data:

- Drop test unit: 136kg / 500mm
- Pneumatic axis: 2500N / 600mm
- Revolving unit for sofa head rest: 1000Nm / $\pm 90^\circ$



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Combined test station for mattress



40-830-153

The automated test station combines the hardness and roller application in acc. to EN1957. Thus the mattress does not need to be transported during the test manipulating tests results, but after placing the mattress at the test fixture the operator only needs to choose test program (can be customized) and the complete test runs automated. All hardness results will be recorded in reference to the cycle number and can be evaluated per mattress. A statistic evaluation is available.

Technical data:

Roller: $1400 \pm 7N$

Stroke of roller: $\pm 250\text{mm}$ (optional other strokes)

Speed: sinusoidal

Cycle number: $16 \pm 2 / \text{min}$ (others adjustable)

Load measurement: $0 - 2\text{kN}$

Position measurement: resolution better $1\mu\text{m}$

Position range: 500mm (optional others)

Speed: $0.05 - 1000\text{mm/min}$



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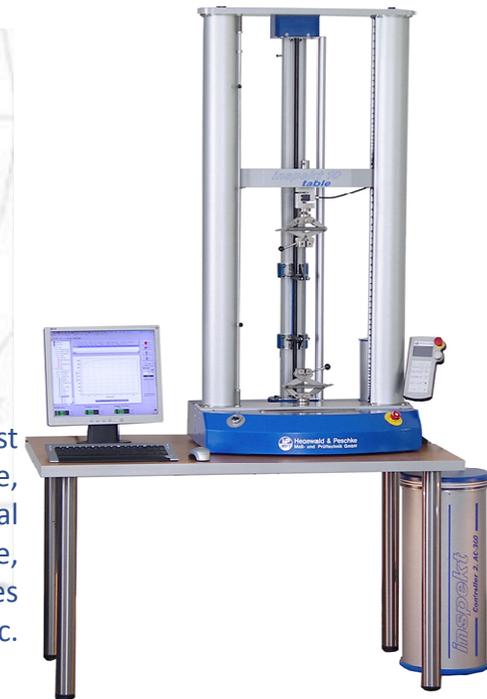
Special test stations Foam testing



10-012-907 Special test machine for foam compression test e.g. in acc. to DIN 53579 and ISO 2439 (hardness evaluation on foam products and fabricates), ASTM D 3574-B1 (firm hardness) and EN ISO 3386-1 (determination of deformation properties)



41-026-023 fatigue testing of foams in acc. to DIN EN ISO 3385 (constant rate of compressions, 70 hits a minute up to 750N, 80,000 cycles – can be varied)



10-030-005 Universal test machine for tensile, compression and flexural testing e.g. of textile, foams and springs, hinges and fittings, etc.

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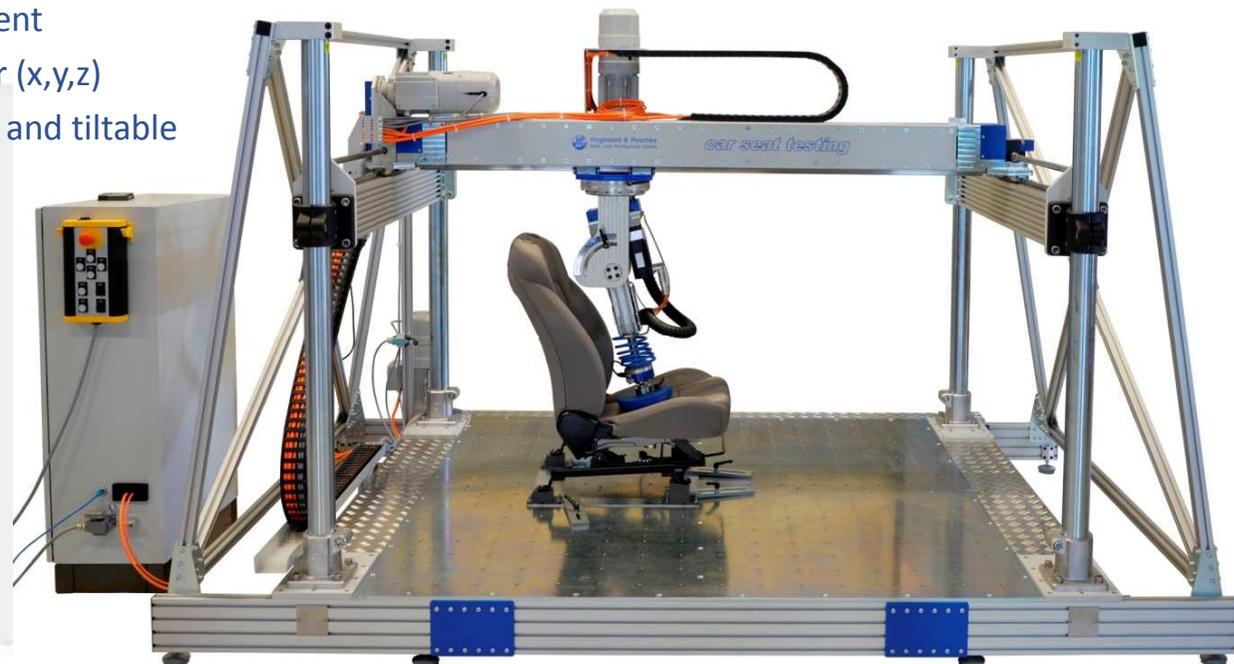
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Special test rig for automotive
seat and seat base frames
41-046-280



Technical data:

- 5kN load/position controlled
- 200mm stroke
- Horizontal & vertical
- Load application between 0 - 90°
- Adjustable cross girder
- Adjustable test axis over entire length of cross girder
- Electromech. height adjustment
- 3 incremental position sensor (x,y,z)
- Manual adjustable rotational and tiltable axis
- Free definition of testing programs via LabMaster

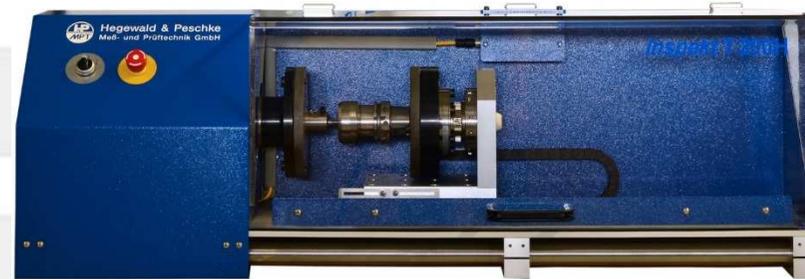




Exemplary further special test stations



41-029-100
multifunctional test
unit for fatigue
testing and shock
absorption
evaluation at shoes
in acc. to ASTM
F1614 procedure A



41-031-50x Torsion test stand T200, e.g. for twist testing
at wire in acc. to DIN ISO 7800 and ASTM A938 as well as
for transition twist testing at wires in acc. to DIN ISO 9649



10-012-050 Testing of adhesion
and bonding strength between the
coated surface and the rigid carrier.
Beyond a 90°-peel test can be
conducted at the composite
material e.g. acc. to DIN EN ISO
8510-1; exemplary solar module

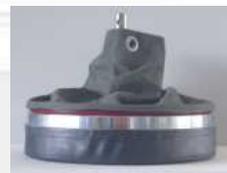
41-036-000 Test stand
allows the test at 4
(optional 5) gas springs
simultaneously in
accordance to
DIN EN 1335-3





Accessories

- Electromotorical and pneumatic test axis
- Load cells and position measurement systems
- Loading pads
- Fixture elements
- Drop weights
- Pendulum impact hammer
- Accessories for child care testing
- weights, etc.





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LIEFERANTENALLIANZ
*KOMPETENZ FÜR OBJEKT-
UND BÜROSITZMÖBEL*

SUPPLIERALLIANCE
COMPETENCE IN OFFICE-
AND LOUNGESEATING



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We are supplier to the furniture manufacturing industry active in different segments. The supplier alliance provides us and our customers the opportunity to benefit from the interdisciplinary knowledge. That competence and expertise is introduced into our products and services.





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