



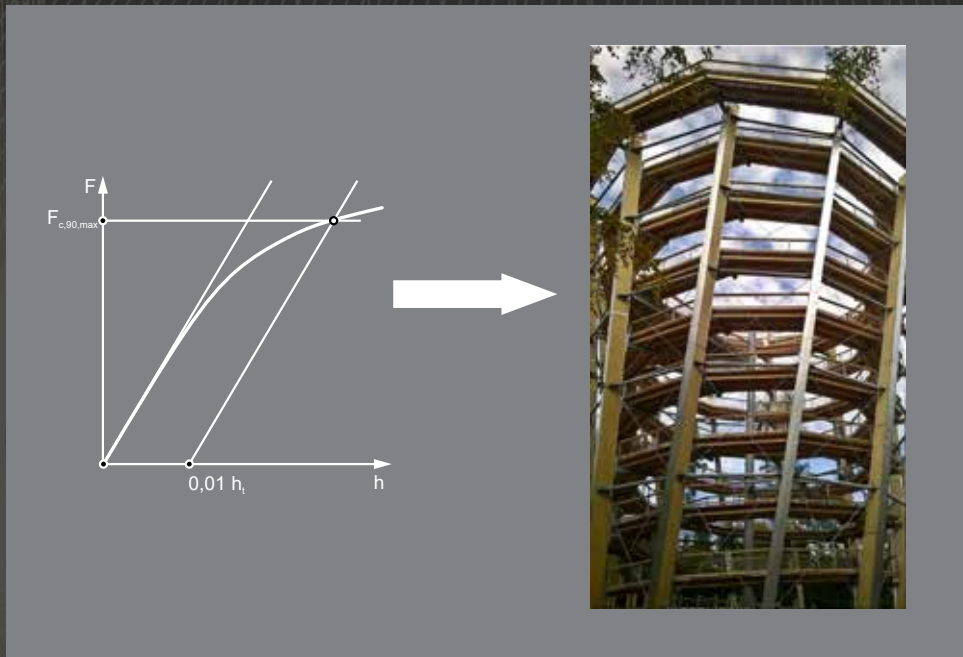
Do not touch on
wood – rather
test it



New challenges have grown....

Wood not only is a traditional resource, but is becoming increasingly important as a building material of the future. When used as a structural material, wood offers many advantages over steel and concrete buildings. For example, its specific strength is very high. The material also can be processed well and easily in different products. This ensures an increasing demand for this sustainable and renewable resource in the construction industry. Sustainability and the positive effects on the CO₂ balance in particular are attractive benefits in times when climate change is becoming increasingly important.

For use as a structural material, however, the material behaviour must be available for the design and calculation of the components used.



The determination of suitable material and design parameters is stipulated in various standards. The basic tests include tensile and compression tests as well as bending tests with 3-point or 4-point bending. The mapping of shear and torsional stress can also be required.

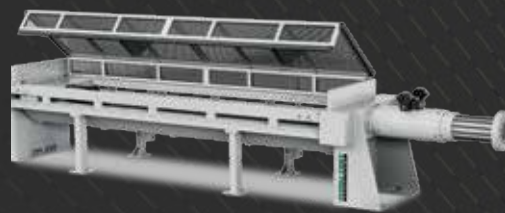
For these tests, FORM+TEST already has all the necessary components available to determine reliable and resilient material parameters for your component design. Some examples from the bending and tensile/compression tests are shown on the following page. For detailed advice, please contact our staff in the Projects Department.

What distinguishes FORM+TEST machines for the wood testing?

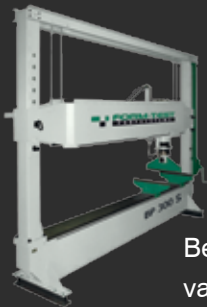
The strength of FORM+TEST having the answer for all requirements with flexible structures and solutions. At the same time, tests in accordance with standards can be represented with high accuracy.



Tensile and compression testing can be extended in many ways



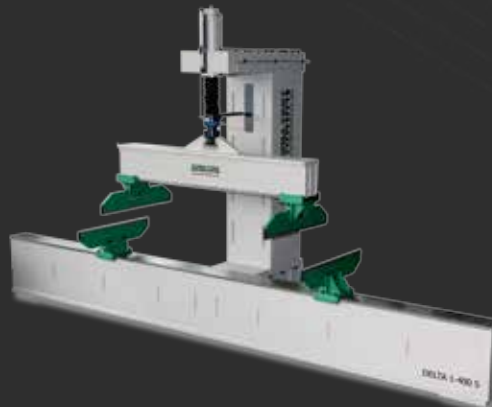
FORM+TEST Solutions



Bending test with variable test area



In the relevant standards - especially for bending tests - very large component lengths in relation to component height are often prescribed. Therefore, in order to test component-near parts such as beam girders in full size, large test space lengths and adapted solutions are necessary.



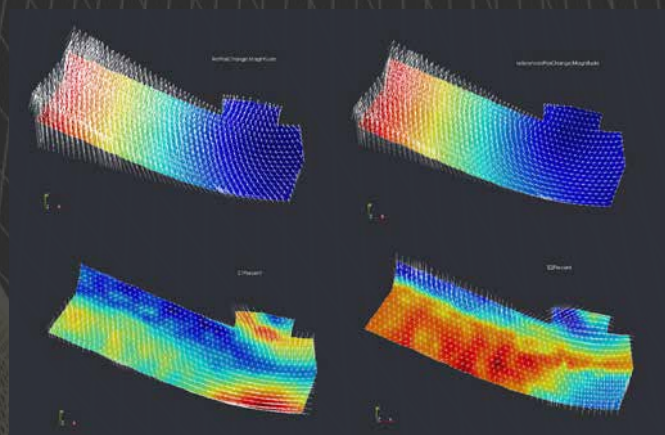
Bending testing machine with open specimen access and large variable bending bearing distance up to over 8 m

Elastic constants from the deformation as well as breaking forces and moments are determined as material properties. For the precise evaluation of the tests, exact measurement sensors are used in combination with high-resolution and fast control electronics. This is the appropriate way to map the complex processes, especially near the specimen failure.

In addition to the test chamber size of the machine, an exact control of the load cylinders, even at the lowest deformation speeds mentioned in standards plays an important role. FORM+TEST has years of experience in the production of high-precision test cylinders for your application - from small to large forces of over 10 MN.

An important aspect is the simple and error-avoiding handling. FORM+TEST also offers special ideas in this area. For example, in lower load range the demand for precision can be increased, which may require the use of different load cells. FORM+TEST testing machines can be equipped with a so-called parking space when using load cells of different capacities. The control electronics checks which load cell is installed in the load train and automatically limits the maximum possible load. This protects the measuring cell and guarantees valid test results.

In addition to load application, deformation measurement is also of decisive importance in testing. Especially with orthotropic or anisotropic materials, not only single values of the deformation are necessary for a better understanding of the material. Using optical measurements and DIC (Digital Image Correlation), the complete distribution of deformation can be displayed in the measuring plane to better identify hot spots. This can also be used for crack evaluation and crack growth analysis.



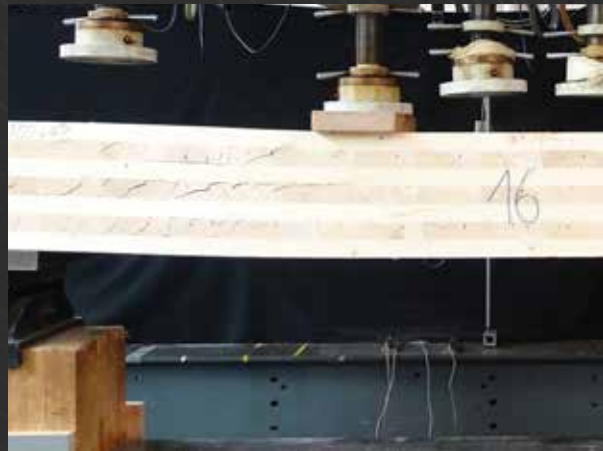
Evaluation of deformations and direction of action by optical measurement

Advantages briefly summarized:

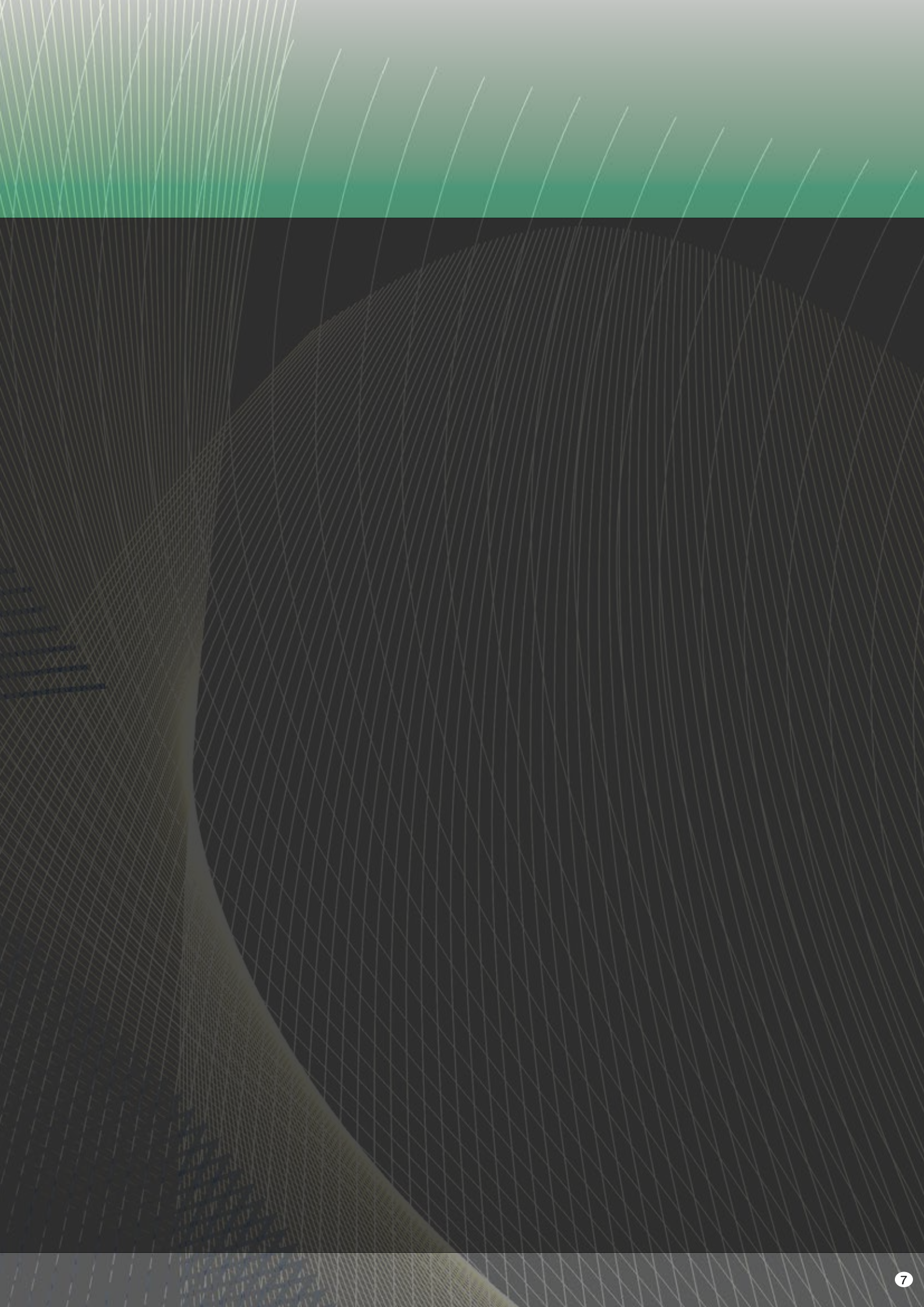
- Test stands manufactured with highest precision
- adapted test areas, even for large components
- high-resolution measurement technology with up to 24 bit at > 5 kHz control and measurement clock
- customer-specific test sequences programmable
- precisely adjustable test cylinders

Currently covered standards:

- DIN EN 310
- DIN EN 408
- DIN EN 789
- DIN EN 26891
- etc.



Pictures from page 6 by courtesy of MPA Stuttgart





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