

Compression Flexometer

- Defined once – 56 specimens tested fully automated



- **Ultimate Flexometer**

The System

At the time the Goodrich Flexometer was defined, it was hard to imagine, that a load could be controlled electronically. The control was realized via a balance beam and weights. The **Ultimate Flexometer** is a multiprocessor system, which distributes the controlling jobs among the actuators. Since all jobs and controls can be defined via software, manual actions like changing stroke, laying on weights, etc. aren't necessary.



Each specimen (max. 56) in the specimen storage of the **Ultimate Flexometer** can be defined with completely different parameters. Testing as well as specimen handling are fully automatic.

The Specimen

The Standard Flexometer specimen is defined as follows: ASTM 623, ISO 4666/3 with 17,8mm Ø and 25mm height. The JIS K 6265 allows a second specimen with 30mm Ø and 25mm height. Optionally, both specimen types can be served. Each specimen can be defined differently here, too, meaning that the specimen anvils are changed also.

Specimen Storage

Specimen data is transmitted via a Laboratory Information and Management System (LIMS) or entered manually. Now, the specimen is placed into the entrance station (using two different specimen forms, the other bin is automatically inaccessible). The handling arm takes the specimen out of the entrance station and puts it into the specimen storage, which is organized like an automated shelving system. The PC handles the storage administration.

- Flexometer tests following **ASTM 623; ISO 4666; JIS K 6265**
- **Fully automatic testing of up to 56 specimen with different test parameters**
- **Height measurement integrated**
- **Latest actuator technique, 3-phase-linear motor**
- **High dynamic, suitable even for other tasks**
- **Environmental friendly and low noise**
- **On-line Service via Modem**
- **Extensions via Software**



- **Would you like to see the Flexometer in action? - Order your CD!**

info@qualitest-inc.com

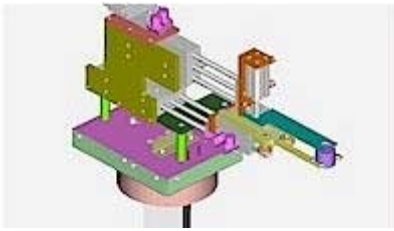
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Compression Flexometer

All parameters adjustable via Software

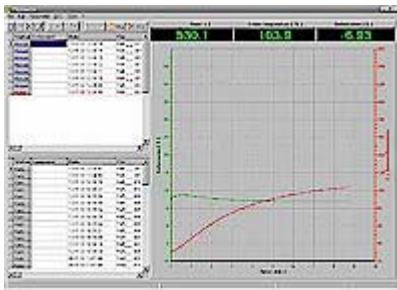
The Handling System

The handling system can be moved in a circle as well as up and down. The handling arm has an additional finger to open the specimen mounting. All stations are served from the handling arm: entrance station, storage position, height measurement position, pre-heat position, test position, output position.



Height Measurement

For the Compression Set, the **Ultimate Flexometer** measures the height h_0 prior to the test and one hour after the test the height h_e . In the meantime the specimen remains at ambient temperature within the storage. The measurement of all specimens within an exact timescale guarantees comparable data.



Temperature Chamber

The temperature chamber was optimised to reach a homogeneous temperature distribution of 135°C. Generally, there is a front door for manual handling as well as a rear door for automatic handling. The test station and the specimen pre-heating station are surrounded by the temperature chamber.

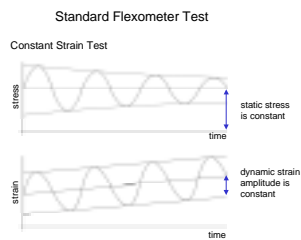
Test Temperature and Puncture Needle

Temperature is measured via the contact temperature in the center of the lower holder.

The center temperature is measured with the puncture needle at the end of the test. Optionally, the needle can be controlled to stay inside the specimen during the test at one half of the average height position. Since 1984 DOLI measures the center temperature with an acicular temperature sensor, the puncture needle.

Output Station

There are two possible outputs: Output directly after the end of the test or output per batch on request.



Software

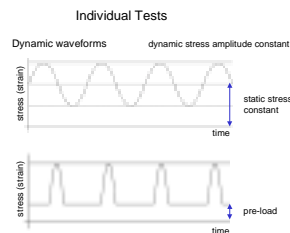
The PC is the user Interface to the Flexometer. In 2002 the **Ultimate Flexometer** Software was designed completely new in a Windows™ environment. Data communication with LIMS-Systems e.g. ECLIPSE has been realized.

The display of the temperature and deformation graphs as well as the equivalent digital values are always available.

Principally, the system is a Flexometer (constant strain) regarding ASTM 623 and ISO 4666. However, as shown already other specimen shapes are possible, also.

Options coming soon: constant stress Flexometer, different curve forms, viscoelastic properties, etc. The key for extending the **Ultimate Flexometer** is the Software.

Updates and services can already be done via the included modem at any place in the world.

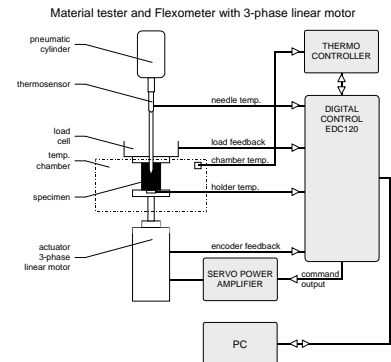


The Actuator

The idea was to develop a position and load controlled system, which would allow definition of all parameters via software and work fully automatic as well as cover the Flexometer properties. We had the following choices:

1. **Eccentric drive**
 - mechanical control
 - + low power
 - + no water cooling
2. **Hydraulic control**
 - high power consumption
 - water cooling
 - oil leakage
 - noisy hydraulic power pack
 - + high dynamic
 - + electronic control
3. **Linear motor**
 - + low power
 - + no water cooling
 - + high dynamic
 - + electronic control
 - + environmental friendly
 - + low noise

Of course the best choice is: the **linear motor** with its high acceleration. The load is selected to reach the maximum Flexometer standards with 30Hz and 6,4mm stroke. (3,2mm amplitude). For further applications a maximum of 50Hz is possible with 1mm amplitude.



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