TWS Michael Schulthes

Damit man nur Gutes von Ihnen hört!
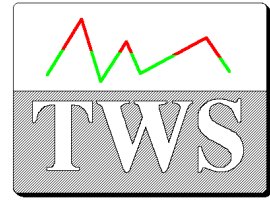
Oberst-Test-System

Data sheet

Software-controlled system for automatic measurement of loss-factor and e-modulus according to DIN 53440, ISO 6721

Applications:

- **Material testing for Research and quality testing**
- **Development of damping materials**
- **Testing of damping materials**

Technical properties:

- **Measurement at max. 15 Oberst Stands simultaneously**
- **Excitation signal Sine sweep or noise choosable**
- **Automatic control of climate chamber**
- **Automatic measurement and test**
- **Automatic storage of curve-fitting pictures for quality control of measurements**
- **Calculation of damping material properties according to DIN 53440, part 3**
- **Calculation of variable Carrier/Damping mass-relations**
- **Manual Re-fitting can fix problems with faulty test strips if necessary**

Principle of operation:

The RVS/PC System is designed for determination of loss-factor and E-modulus according to the method of Dr. Oberst at test strips covered with damping on one side and fixed at one side versus temperature.

To achieve this a maximum of 15 test strips is fixed into Oberst stands and exhibited to certain temperatures in a climate chamber.

Then they are excited to forced vibrations and the transfer function of the vibration is measured. The frequencies and the bandwidths of the resonances then are used to calculate loss-factor and E-modulus. A special routine tests the quality of the frequency responses measured by comparing them to the frequency response gained by synthesising the response using the calculated frequency and damping values of the test strips.

This enables the user to recognise measurement errors caused by faulty test strips or faulty fixing

The results are plotted versus temperature or exported to EXCEL-Files for later processing.

The system uses dialogue technique and is very easy to use.

Hardware requirements:

Calculator:
PC equipped with WINDOWS NT 4.0 SP4 or higher. WINDOWS XP and 256 Mbytes of RAM or more recommended.

Temperature control:
Climate chamber with suitable Interface (RS 232 C or HPIB), i.e. Heräus Vötsch or NEMA. Different Climate chanbers are supported, new ones can be adapted upon request.

Test strip fixture and measurement:
1 to max. 15 Oberst Stands BSS 101 or BSS 202 with magnetic Transducers B&K MM 0002 for vibration measurement and the electronic controlled ESW 202 /204 for vibration excitation.

Signal generation and Measurement:
16-channel A_to_D - Converter with signal processor MICROSTAR DAP 3000/a212 or higher
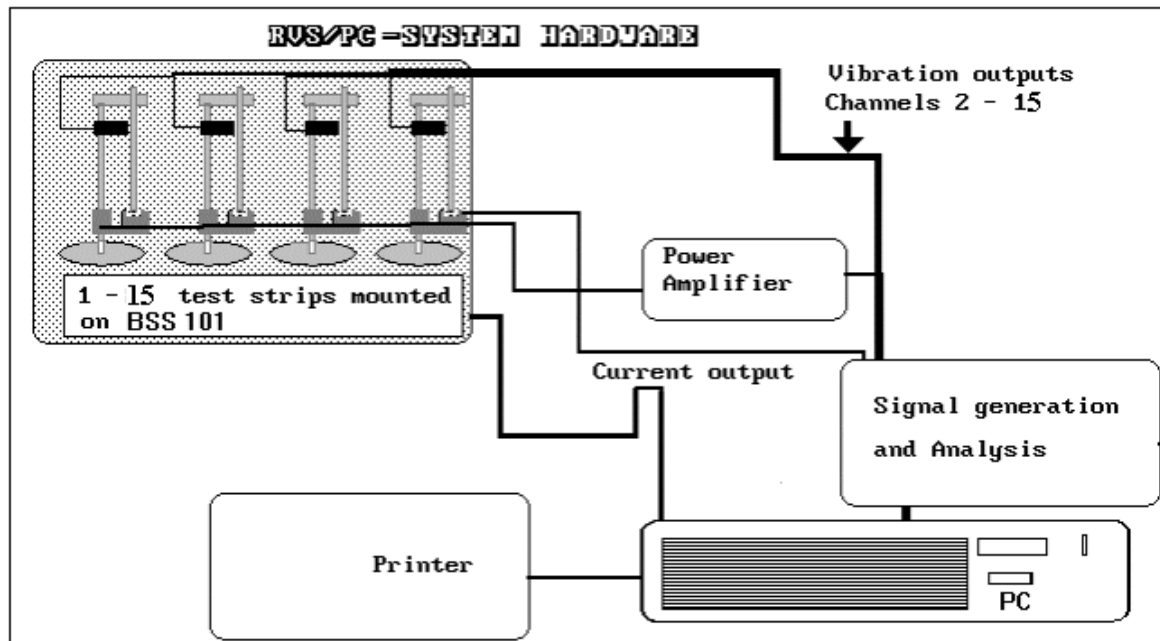
Specifications:

Temperature range:
Depending upon climate chamber. The measurement transducers can be used between -40 and ca. 150 °C . Temperature subranges are set using measurement parameters, up to 70 steps between starting temperature and ending temperature are available.

Mode range:
2 (optional 1) to 9, only weakly damped test strips have modes above 4.

Range of measurable Loss- factor:
Lower limit below loss-factor of steel (ca. 0.0002), upper limit above 0.4 at mode 2 going down with mode number. As long as there is a left -2-dB-point, a loss factor can be determined.

Speed of measurement:
The measurement uses max. 5 minutes per temperature point, regardless of mode number and test strip number. Additionally the time necessary to reach the testing temperature plus the waiting time for thermal equilibrium is needed. To enable fast temperature equilibrium, the program has the feature to choose a temperature overshoot . This means that a temperature point is not set directly, but (if coming from low temperatures) instead for a certain time a higher temperature is used before controlling the climate chamber to set the desired temperature. This shortens the time for thermal equilibrium. The waiting time for temperature equilibrium determines the time needed for the measurement. Normally the waiting time is (depending upon the temperature stepwidth between 5 and 30 Minutes per measurement point.

Data output:

Graphics printer, all printers supported by WINDOWS can be used.

Results calculated:

The software can determine the following results:

- Loss factor system
- Loss factor damping layer
- E-Modulus System
- E-Modulus damping layer
- Loss factor at variable mass relation Carrier/Layer
- Bending Stiffness Ratio

All of these results can be output at the modes measured or at fixed frequencies versus measurement temperature

General:

The System is very easy to use.

It can be tailored to special customers needs on demand.