

SSP-02

The Stick-Slip testing stand - Upgrade for the stick-slip risk evaluation of material pairs made of deformable supplies

Especially made for elastomers, foams and material compounds

The stick-slip testing stand SSP-01 for the evaluation of the stick-slip risk of material pairs is already established as approved measuring device. The correlation to real noise phenomena is almost 90%. The VDA has published the standard VDA 230-206, that explicitly recommends the stick-slip testing machine as objective measurement method for leather. Test procedures for further materials, that are relevant for vehicle interiors are in preparation. In the last years our customers and us have built up important knowledge about materials and their surface structures by testing practice, that made it possible to find out and develop stick-slip optimised material pairs.

Based on these experiences with the stick-slip testing machine we have developed an upgrade, with which deformable materials and material compounding can be tested with a defined interference. Therefore an additional force sensor and a displacement sensor were installed. Also the testing software was adjusted.

When starting a measurement first of all a point of contact between both material partners is determined

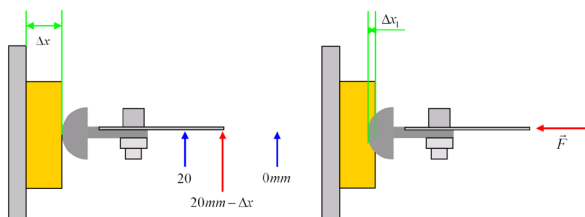


Fig. 2: Function principle of the elastomere upgrade

(cylinder head minus thickness of moving table specimen s. fig. 2). This is done automatically at the push of a button. Afterwards a defined ingressing displacement is selected. During the measurement the normal force proportional to the ingressing displacement is kept constant. Additionally the spring constant of the material is determined by the ingressing displacement in relationship to the measured normal force.

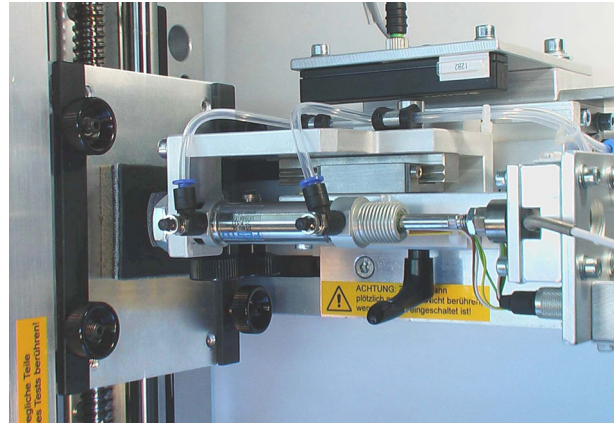


Fig 1: Probe head of the elastomere upgrade of the stick-slip testing stand

This testing stand upgrade serves to test both, deformable materials and not deformable materials. A simple mouse click enables to switch between actuating variable normal force and actuating variable ingressing displacement. To activate the elastomer functionality the control box "Elastomer" (Fig. 3) is checked and the window "Elastomere Parameter" is opened.

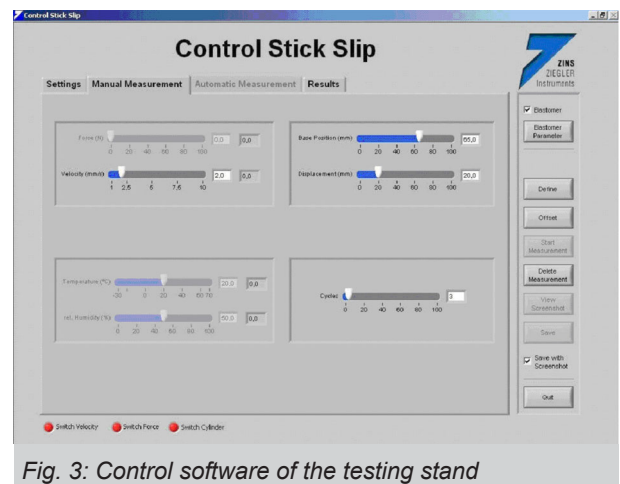


Fig. 3: Control software of the testing stand

After finishing this procedure and after setting-up further stick-slip relevant parameters the actual measurement can be performed in the window "Control Sick-Slip". The measurement results are stored with a testing report in the optional available database.

Deformable materials, such as all kinds of foams, tissues, knitted fabrics and elastomers in plane format or as parts from original components, like sealing, are suited for testing with the elastomer testing stand.

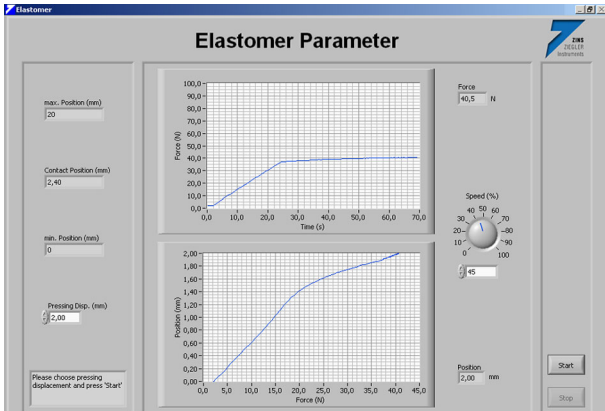


Fig. 4: Window for Set-up and display of the measurement values

Application examples:

Figure 5 shows an example, that demonstrates the essential influence of the ingressing behaviour to the stick-slip effect. It was determined that, though the same surfaces were used, the substructure of the material specimen influences the stick-slip behaviour.

A further example (fig. 6) demonstrates the popular problem of squeaking noise between sealing to glass or varnished sheet. Extensive investigations showed, that the position of the sealing lips to the glass plate have influence on the noise behaviour. For objective and reproducible evaluation of the stick-slip effect of the contact areas, it is necessary to test the sealing lips separately with different interferences.

PU-foam (fig. 7) is a further material, which is often used in car interior. It produces annoying noise based on stick-slip in contact with powder-coated seat pans or in contact with the insides of seat covers. Investigations showed that the ingressing displacement has essential influence on stick-slip.

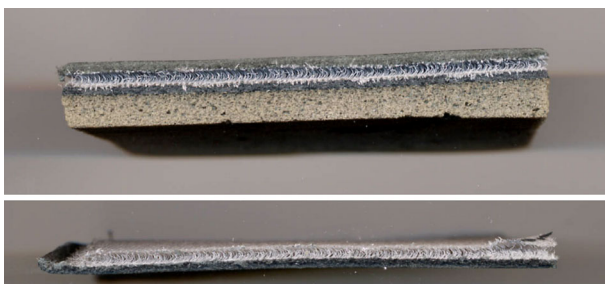


Fig. 5: Material compounding of leather, pulp and PU-foam



Fig. 6: critical contact glass plate to door sealing

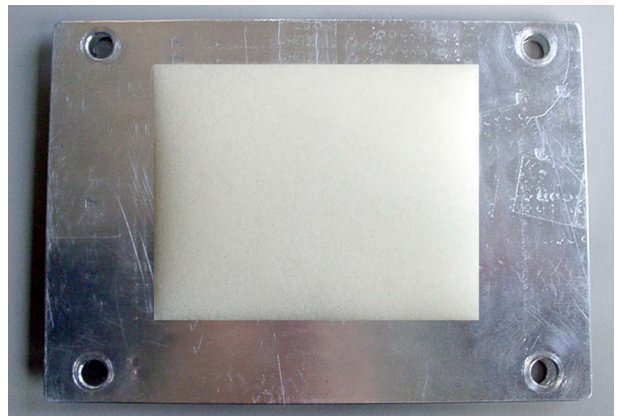


Fig. 7: PU-foam

Technical data SSP-01

Mechanical data:

Dimensions control unit (WxHxD): 650 x 340 x 650 mm

Weight control unit: ~ 28 kg

Dimensions testing unit (WxHxD): 500 x 360 x 400 mm

Weight testing unit: ~ 22 kg

Supply data

Electric supply 230 V AC, 50 Hz, 250 VA

Compressed air (Standard outlet Festo): 6 bar not oiled

Testing-stand parameter

Pressing force: 1 .. 80 N

Moving table velocity: 1 .. 10 mm/s

Temperature range: -30 °C .. +80 °C

Additional options

SSP-DB

Database for storing and evaluation of the measurement results

SSP-CAL

Calibration equipment to test and calibrate the test stand

SSP-Clima

Climatic chamber to simulate extremely climatic conditions