

Shear Testing Device according EN 15340



w+b

Shear Testing Machines Series STM

according to the new European Standard EN 15340

**for the Determination of Shear Load Resistance
of Thermally Sprayed Coatings.**

**Standard was developed within a European
Joint Research Project together with:**

- Fraunhofer Institut IFAM, Bremen
- EMPA - Materials Science & Technology
- *walter+bai ag* Testing Machines



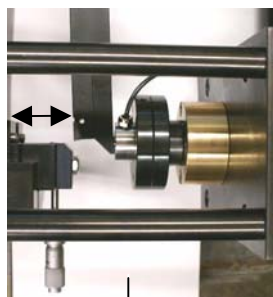
Fraunhofer
Institut
Fertigungstechnik
Materialforschung



Materials Science & Technology

The test is conducted to determine the strength of the bond between the spray deposit and the parent material (adhesive strength) and/or the strength of the coating (cohesive strength). It is qualified for coating thickness over 150 μm .

The test is used to evaluate the effects of parent material and spray material, surface preparation of the work piece before spraying, and the spraying conditions on the adhesive strength of thermally sprayed coatings, or for quality control and routine supervision of the spray works.



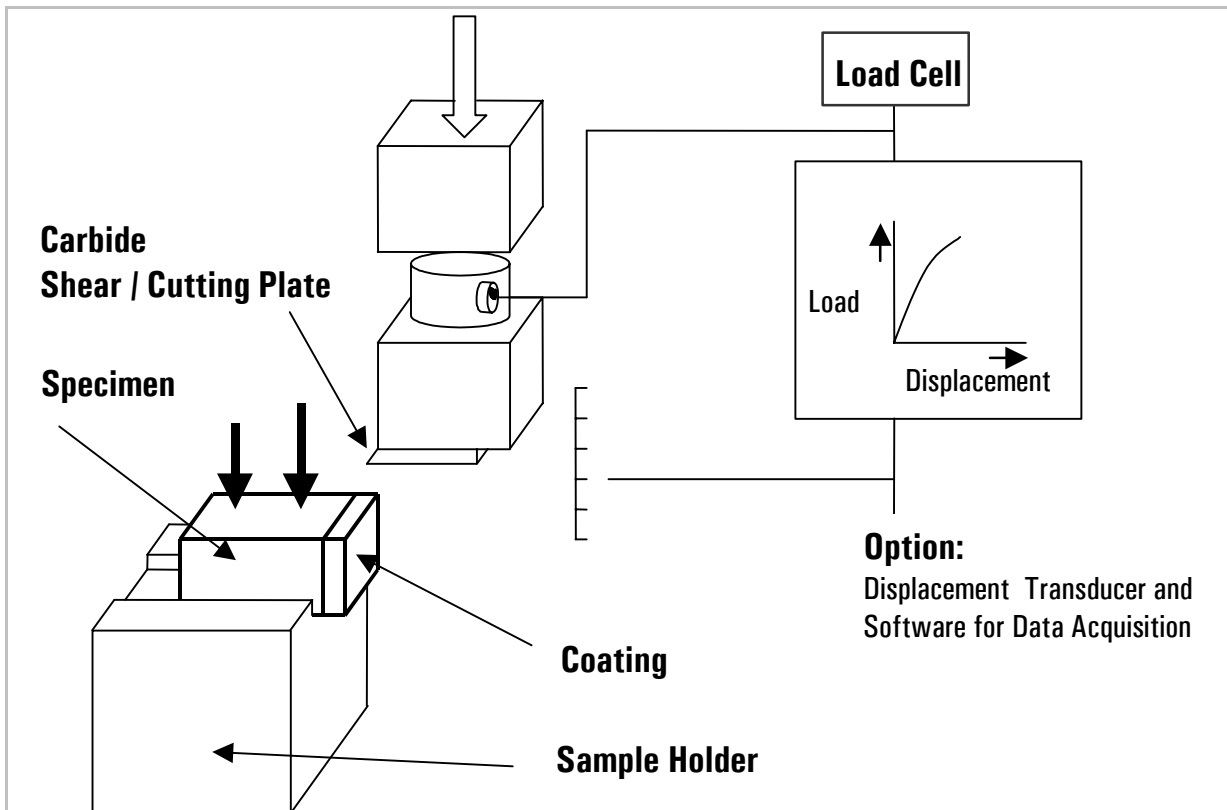
walter+bai ag Testing Machines

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E-Mail: info@walterbai.com / Internet: <http://www.walterbai.com>

Testing Device:

The Shear Testing Machine Series STM in accordance with ISO 7500-1 allows tests corresponding to new standard EN 15340 with the required accuracy and reproducibility. The principle of the testing set up is demonstrated in the figure below. The high precision sample holder guarantees an exact fixation and alignment of the specimen without any movement of the sample during the shear test. The shear plate is made of carbide and fixed close to the high precision load cell for best results. It allows a movement during loading in the guide ways without deviations or friction that affects the measured shear force. The edge of the shear plate is parallel to the interface coating/substrate and parallel to the upper face of the sample. Thus a uniform loading of the coating is ensured. Worn out carbide cutting plates can be changed very easy.



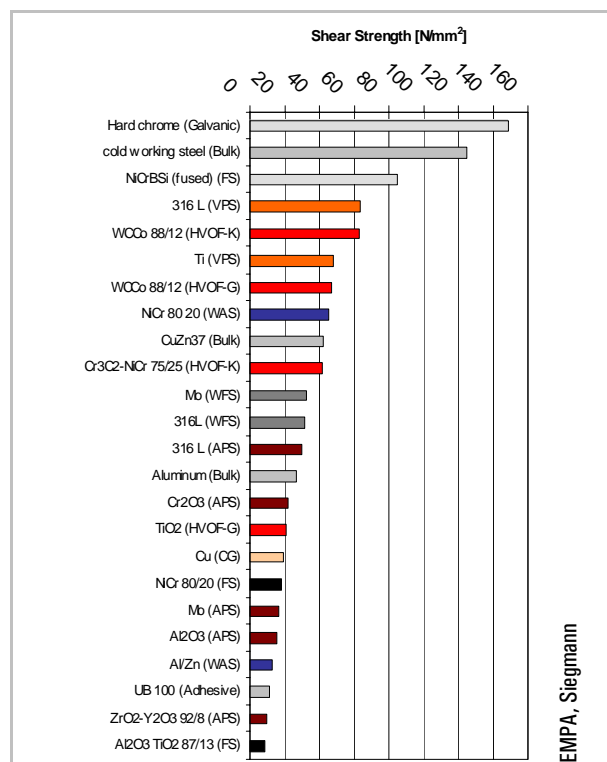
Evaluation:

The shear load resistance is taken from the first maximum of the force displacement curve. To clearly distinguish between cohesive and adhesive fracture of the coating it is advisable to evaluate the fracture interface by means of a stereo microscopy (option). Some results of shear strength are shown in the right figure.

Test Reports:

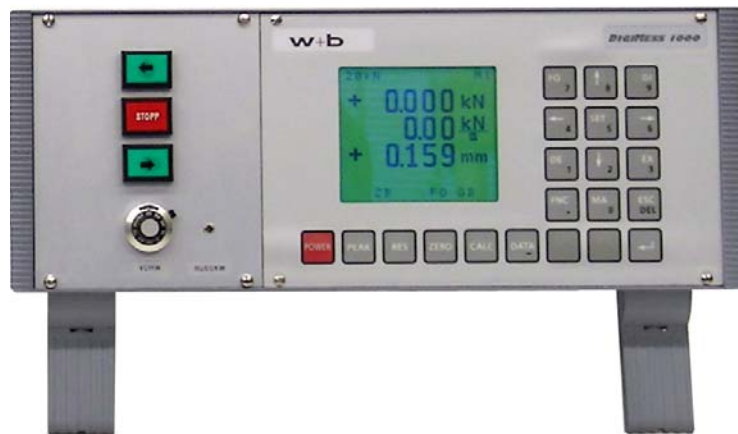
Using of the optional Shear Test Software it allows to print test reports in accordance with standard EN 15340 containing:

- inspection body, inspector, date
- coating thickness
- shear distance
- thrust velocity
- type of fracture
- particularities, remarks etc.



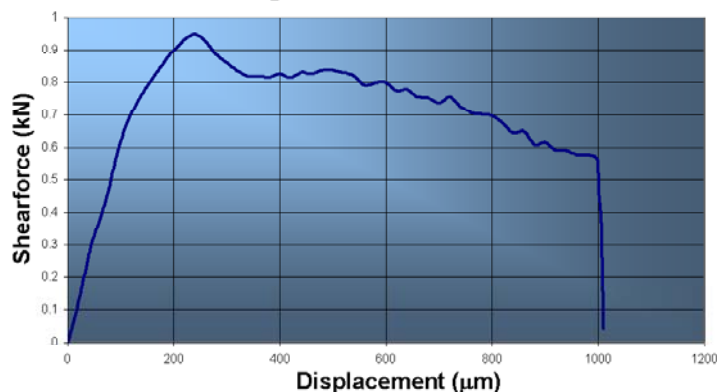
Technical Data

| Type STM | 10 | 20 |
|--|---|-------|
| Force Capacity: | 10 kN | 20 kN |
| Electromechanical Loading System: | with central screw with speed reduction gear and speed controlled DC-Motor and precision load cell. | |
| Force Measuring Accuracy according ISO 7500-1: | Class 1 | |
| Displacement Transducer: | 5 mm | |
| Displacement Accuracy according EN ISO 9513: | Class 0.5 | |
| Loading Speed Range: | 0.01 to 0.1 mm/s | |
| Fixture for Sample Size: | 30 x 10 x 5 mm | |
| Dimensions Machine W x D x H: | 600 x 450 x 210 mm | |
| Dimensions Digital Read Out W x D x H: | 350 x 300 x 150 mm | |
| Net Weight with Display: | 52 kg | |
| Power Supply: | 230 V / 6 A | |



Digital Indicator Type DIGICON 1000 for force and displacement.

Shear Test



Optional Shear Test Software for data acquisition and printout of test reports with your PC.

Literature:

- **Standard EN 15340 / June 2007:** Thermal Spraying - Determination of Shear Load Resistance of Thermally Sprayed Coatings.
- **Hartmann/Deuerler/Grützner:** Interpretation der Ergebnisse des Schertests zur Qualitätsprüfung thermisch gespritzter Schichten.
- **Siegmann/Dvorak/Grützner/Nassenstein/Walter:** Shear Testing for Characterizing the Adhesive and Cohesive Coating Strength without the Need of Adhesives.

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