TECHNISCHE UNIVERSITÄT WIEN
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technology offer

Method and means for testing the strength of a bonding between two specimen

key words: bonding | micro fluidic device | tensile stress | shear stress | quality control

The technology offers a fast and simple method to quantify the stability of the bonding in regards of tensile and shear stress for microfluidic devices.

Background

Microfluidic devices have to meet certain requirements in relation to stability. One requirement, which has to be met, is for example that the microfluidic devices need to be leakproof at all kinds of loads applied during operation and handling of the microfluidic devices. In this regard, especially the bonding areas, where different parts of the microfluidic devices are bonded by an adhesive, many show leaks when excessive loads are applied. Due to that, it is very important to select the right adhesive to ensure a high quality of bonding of the parts of the microfluidic devices.

Technology

The technical solution includes a 3d printed set of adapters which allows to place a specimen of two orthogonal bonded microscope glass slides in a press. The adapter transfers the applied pressure on the exposed part of the glass slides which results in a tensile force within the adhesive layer. Through the maximum force applied the maximum tensile strength can be measured. To measure the shear strength of a specimen with two glass slides shifted bonded to each other, the specimen is placed in 3d printed adapter to hold it in an upright position and to apply force at both ends of the specimen. This results in a shear stress for the adhesive layer.

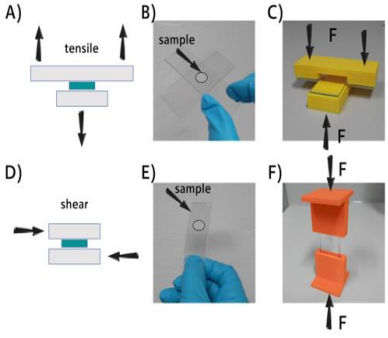

Fig. 1: A) schematic sketch of applied tensile force (sample turquoise,). B) sample for determine tensile strength. C) sample within fixture for measuring tensile force. D) schema of applied shear force (sample turquoise, glass grey) B) sample for determine shear strength. C) sample within fixture for measuring shear force.

Advantages

- Fast
- Simple
- Cheap
- Adaptable
- Suitable for material used in microfluidic technology as glass and polymeres

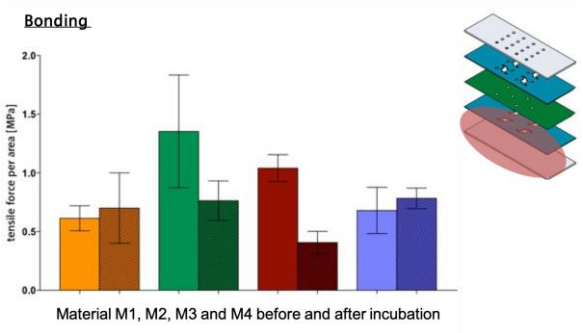

Fig 2: Quantification of tensile bonding strength of four different samples

Possible Application

- Quick and simple assessment of bonding strength for:
- New protocols
- Protocol optimization
- Verification of supplier information

Entwicklungsstatus

lab prototyp

IPR

AT, EP and US pending

Options

F&E – Cooperation, license, patent

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