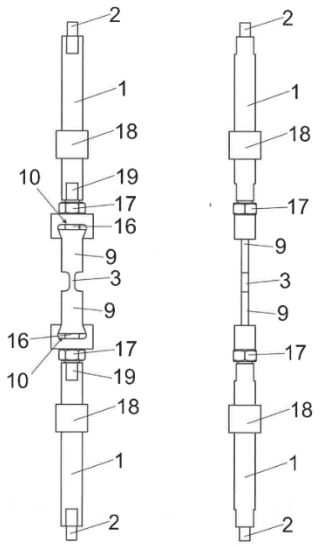
Coupling Element

Universal coupling element for ultrasonic resonance testing systems

Invention

Testing material samples involves clamping the samples into the test device in a reliably reproducible manner. But high-frequency tests are necessary for large numbers of endurance test cycles. For ultrasonic resonance testing systems, a newly invented coupling element clamps the sample into the testing system, with longitudinal samples generally parallel to the ultrasonic wave (not orthogonal to it as is otherwise usual). The reusable coupling element also allows a stimulation wave to be applied to the front of the sample for more targeted, flexible load application than that of a conventional attachment system. This greatly simplifies handling, allowing an efficient endurance test.



Coupling element design sketch with clamped sample (3)

Photos of an actual test set-up

Commercial Opportunities

The coupling element can be used with many materials and geometries. This allows analysis of samples such as ceramics that would not be accessible to conventional procedures. The testing procedure can also be adapted to general and external conditions (pressure, temperature, humidity).

Current Status

TU Dortmund submitted a German patent application for the invention in early 2023. A subsequent international application was submitted a year later. Foreign applications in all PCT countries can therefore be submitted. There is a functional prototype.

An invention from the Technical University of Dortmund.

Competitive Advantages

- Optimized sample holder
- for VHCF testing systems
- Accelerated testing procedure
- Affordable application
- Universally deployable

Technology Readiness Level

1 2 3 **4** 5 6 7 8 9

Technology validated in lab

Industries

- Construction industry
- Automotive
- Aerospace
- Aerospace
- Mechanical engineering
- Tool technology

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