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FATIGUE TESTS OF STENTS BY ULTRASONIC WAVE

BACKGROUND

State of the art are mechanical and hydraulic strain testers. They can generate load cycles in the frequency range of 100 to 300 Hz. The number of load cycles that can be achieved within a reasonable time span is limited. The novel device is working at 20 kHz and can generate up to 50.000 load cycles per second.

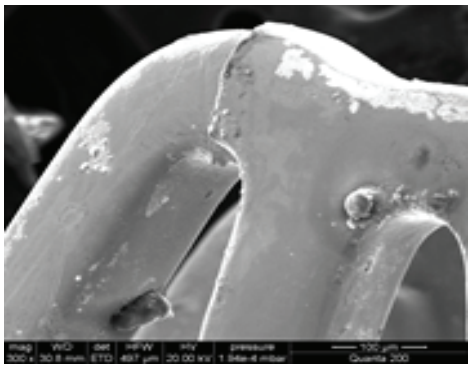

Figure 1: Fatigue feature of a stent

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The bore in a solid body which resonates in a standing wave is subjected to cyclic form changes. Having the bore oblique to the standing wave offers the opportunity to subject the stent to changing radial deformations.

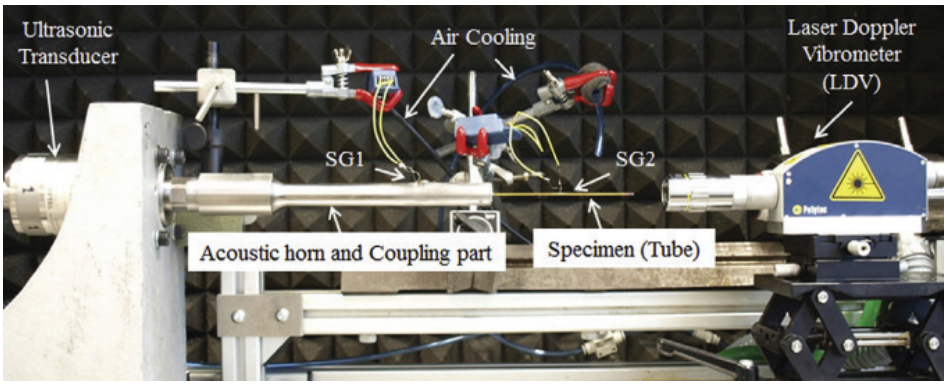

Figure 2: Ultrasonic resonance fatigue testing system (with a stent tube as sample)

BENEFITS

- reduction of test time from weeks to hours
- suited for stents in all applications, especially where clinical and regulatory requirements apply, like in coronary, urethral and vascular chirurgy
- suited for stents in different forms and fabrics, like metals or synthetics and even for grafts or drug eluting stents

FURTHER READING

G. Khatibi, M. Lederer, A. Betzwar Kotas, M. Frotscher, A. Krause, S. Poehlmann, „High-cycle fatigue behavior of thin-walled CoCr tubes“, International Journal of Fatigue 80 (2015) 103-112

KEYWORDS:
fatigue test / metallic and synthetic stent, expandable mesh structure / sonic wave

DEVELOPMENT STATUS:
Lab prototype and tests available

Planned next steps:
- in-vivo scenario with hea ted fluid passing the stent
- adaption for curved and branched stents

OPTIONS:
- Stent tests at TU Wien
- License Agreement
- Research Cooperation
- Development Cooperation

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IPR:
WO 2011/060458, granted in DE, CH

REFERENCE:
M002/15

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