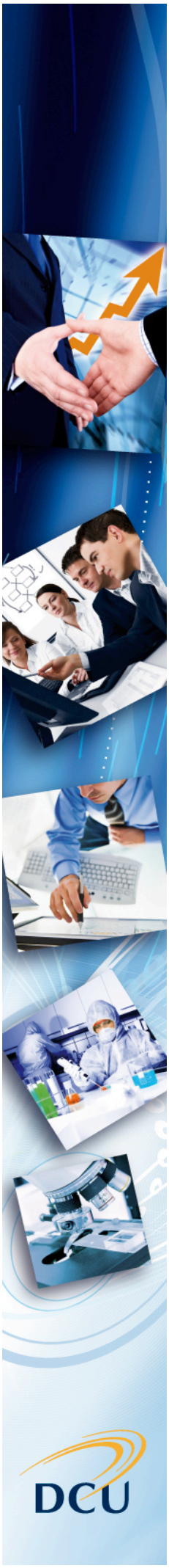

invent DCU
INNOVATION & ENTERPRISE

Dublin City University Licensing Opportunity

Laser-textured Interference-fit Fasteners with Highly Controlled Bond Strength

BACKGROUND

Interference-fit fasteners are a popular method of joining, due to relative ease of manufacture and simplicity in design. These fasteners are widely used in a range of industrial sectors including aerospace, automotive, biomedical and ICT hardware. The interference joint can be achieved *via* a press or shrink fit connetion. Shrink fitting is achieved by heating of the hole section or cooling of the pin section during bonding and allowing subsequent cooling to make the bond. Associated problems with these methods include the requirement of longer times for bonding, need of additional equipment, the creation of excessive plastic deformation effectively weaking the joint region, the initiation of defects in the material surrounding the joint and the resultant lower achievable life times.

TECHNOLOGY DESCRIPTION

The invention is a novel, rapid laser micro-profiling technique for producing interference fit fasteners. In this technique, a high powered laser is used to alter the surface texture of a metal pin, to produce an interference-fit fastener that will have a more highly defined bond strength and result in more secure interference joints. Control of the laser parameters allows exacting control of the surface texture, giving a high degree of control over the strength of the fastening.

APPLICATIONS

The technology is scalable for a variety of industrial applications:

- Fasteners in aerospace products
- Fasteners in automobile applictions
- Fasteners in heavy industrial products
- Fasteners in biomedical components

ADVANTAGES

- Control of insertion/removal forces by adjustment of the laser parameters
- Longer life time of joints
- No heating/cooling required
- No welding required
- Access only required from one side

Example of laser textured stainless steel pin of (a) 10 mm diameter and (b) at high magnification

RESEARCH AND IP STATUS

Pending patent application number: GB1517875.9

Prototypes have been produced. Further on-going research is investigating the insertion and removal forces, fatigue and the twisting torque.

OPPORTUNITY SOUGHT

DCU is seeking licensing & development partners for this technology

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