High speed, high strength microwelding of Si/glass using ps-laser pulses

A novel microwelding procedure to join Si-to-glass using ps-laser pulses with high repetition rates is presented. The procedure provides weld joint with mechanical strength as high as 85 MPa and 45 MPa in sample pairs of Si/aluminosilicate (Si/SW-Y) and Si/borosilicate (Si/Borofloat 33), respectively, which are higher than anodic bonding, at high spatial resolution (< 20 μm) and very high throughput without pre- and post-heating. Laser-matter interaction analysis indicates that excellent weld joint of Si/glass is obtained by avoiding violent evaporation of Si substrate using ps-laser pulses. Laser welded Si/glass samples can be singulated along the weld lines by standard blade dicer without defects, demonstrating welding by ps-laser pulses is applicable to wafer-level packaging.

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Authors: Miyamoto, I., Okamoto, Y., Hansen, A., Vihinen, J., Amberla, T., Kangastupa, J.
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Scopus rating (2011): SJR 2.579 SNIP 2.606 CiteScore 4.04
Scopus rating (2010): SJR 2.943 SNIP 2.466
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Scopus rating (2006): SJR 3.233 SNIP 2.326
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Scopus rating (2004): SJR 2.833 SNIP 2.499
Scopus rating (2003): SJR 2.688 SNIP 2.193
Scopus rating (2002): SJR 1.547 SNIP 1.673
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Scopus rating (2000): SJR 1.246 SNIP 0.714
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Analysis of the aircraft operational reliability research series: From statistical models to avionics data monitoring

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Authors: Karvinen, R., Mikkonen, A.
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Hydraulic Cylinder Models for Flexible Multibody System Simulation

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State: Published
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CFD based on-line process analysis - applied to circulating and bubbling fluidized bed processes
High Performance Particle Tracking Velocimetry for Fluidized Beds

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Organisations: Department of Mechanical Engineering and Industrial Systems
Authors: Elfvengren, J., Kolehmainen, J., Saarenrinne, P.
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Image based measurement techniques for particulate flows

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Ministry of Education publication type: G5 Doctoral dissertation (article)
Organisations: Department of Mechanical Engineering and Industrial Systems
Authors: Kolehmainen, J.
Number of pages: 98
Publication date: 2014
Interference-based overlapping particle tracking velocimetry for fluidized beds

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Scopus rating (2013): SJR 1.425 SNIP 1.927 CiteScore 2.41
Scopus rating (2012): SJR 1.114 SNIP 1.82 CiteScore 1.96
Scopus rating (2011): SJR 1.167 SNIP 1.938 CiteScore 1.93
Scopus rating (2010): SJR 1.016 SNIP 1.635
Scopus rating (2009): SJR 1.531 SNIP 1.881
Scopus rating (2008): SJR 1.658 SNIP 1.903
Scopus rating (2007): SJR 1.258 SNIP 1.511
Scopus rating (2006): SJR 1.311 SNIP 1.443
Scopus rating (2005): SJR 1.334 SNIP 1.398
Scopus rating (2004): SJR 0.765 SNIP 1.365
Scopus rating (2003): SJR 1.51 SNIP 1.353
Scopus rating (2002): SJR 1.462 SNIP 1.609
Scopus rating (2001): SJR 1.417 SNIP 2.187
Scopus rating (2000): SJR 2.008 SNIP 1.647
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Authors: Kolehmainen, J., Elfvengren, J., Ylönen, M., Saarenrinne, P., Kallio, S., Peltola, J.
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