Micro Materials
Excellence in Nanomechanics

NanoTest Impact Publications

Introduction

Micro Materials developed the unique, patented, nano-impact test back in 1999. Expanding the range of nanomechanical testing it enables materials properties to be studied at strain rates much higher than in quasi-static nanoindentation tests. The technique has subsequently been developed to include the possibilities of producing much higher energy impacts with the high load head, and to enable testing under different environmental conditions. In the NanoTest Vantage and NanoTest Xtreme systems the Impact Module can be used for single and repetitive (cyclic) nano- and micro-impact tests which can also be performed at elevated temperatures or under liquids.

Typically taking only a few minutes, cyclic nano- and micro-impact tests are much quicker than conventional cyclic fatigue tests and have shown excellent correlation to actual performance in applications. Popular applications of the tests are in developing hard nitride coatings for high performance metal cutting applications, DLC coatings for automotive applications and ceramic coatings for erosion resistance. With the small contact sizes tests can be performed at the microstructural level, or alternatively be designed to place high stresses at a coating-substrate interface to study adhesion. Another novel development has been the statistically distributed impact test, designed to closely replicate an erosion test where individual impacts occur at different locations on a surface. A list of publications illustrating the range of possibilities is given below.

Cyclic nano- and micro-impact testing of hard nitride coatings

1. K.-D. Bouzakis, F. Flocke, G. Skordaris, E. Bouzakis, S. Geradis, G. Katirtzoglou and S. Makrimallakis, Influence of dry micro-blasting grain quality on wear behaviour of TiAlN coated tools, Wear 271 (2011) 783-791.
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Cyclic nano- and micro-impact testing of DLC coatings

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Cyclic nano- and micro-impact testing of other materials

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Fundamental studies, single impacts, modelling, other applications

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