

Óbuda University

Bánki Donát Faculty of Mechanical and Safety

Engineering

*Institute of Material Science and Manufacturing
Engineering*

Wear resistance control of the surface coated pieces

<http://www.bgk.uni-obuda.hu/~aat/>

The wear resistance properties knowledge of the tools and pieces is very important for industry. It's known that the friction and wear properties of metals and alloys show a strong correlation with their chemical composition, hardness and microstructure. The wear behavior is not well understood yet. Determination or measurement of the wear resistance is also very difficult usually it can do some comparative tests. Coatings are very thin hard layers or multilayers on the surface which can improve the lifetime much more than traditional heat treating technologies or surface treatments.

We use for the experiments a ball-cratering tribometer when the ball has stochastic movement affected by the friction force such way that the multiaxial variation of that force leads to random turnings of the ball. The advantage of the stochastic movement of the ball is that an automatically renewed, shape defect free surface can be obtained, the wear uniformly distributed on the whole surface of the ball and the surface roughness has spatial homogeneity.

We use also for our test a CSM micro-hardness tester what provides over three decades of normal force range and thus is ideally suited to the mechanical characterization of hard coatings, thick soft coatings and bulk materials. It provides accurate and reproducible values for the hardness and elastic modulus of a variety of materials and coatings of greatly varying thickness and hardness values.

Infrastructure

- CSM Micro-hardness tester
- Scanning Electron Microscope
- Optic Microscope
- Ball-cratering tribometer
- Surface roughness tester

Related projects

- Project works

Coated samples wear resistance tests

High energy hardened surface wear resistance tests

Heat treated samples wear resistance tests

The effect of microstructure on the local wear behavior of dual phase steels

Nano-mechanical and surface morphological properties of TiN coating produced by PVD on tool steel

- Diploma works for B.Sc.

Lifetime increasing of railway frog by explosive surface hardening
Comparative tests of different coatings wear resistances
Different dual phase microstructure steel wear resistance

- Student Scientific Works and task (TDK)

Wear resistance behavior of explosive hardened austenitic stainless steel
Relationship between steel microstructure and wear behavior

Partners

University of Miskolc, Faculty of Mechanical Engineering and Informatics, Hungary
Sapientia Hungarian University of Transylvania, Romania

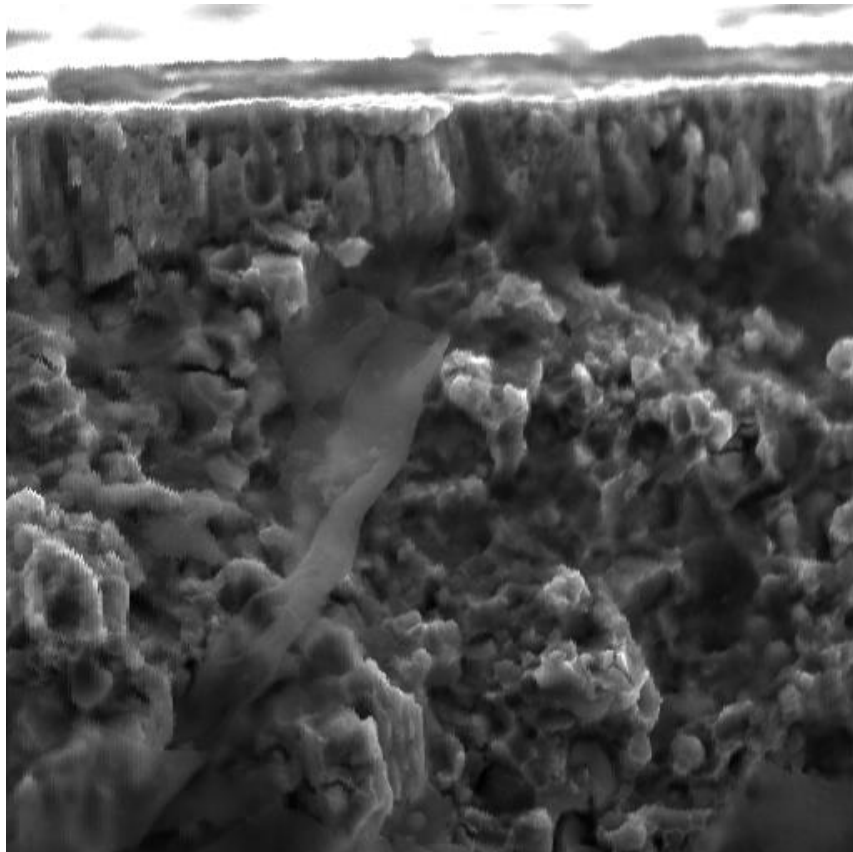
CONTACT

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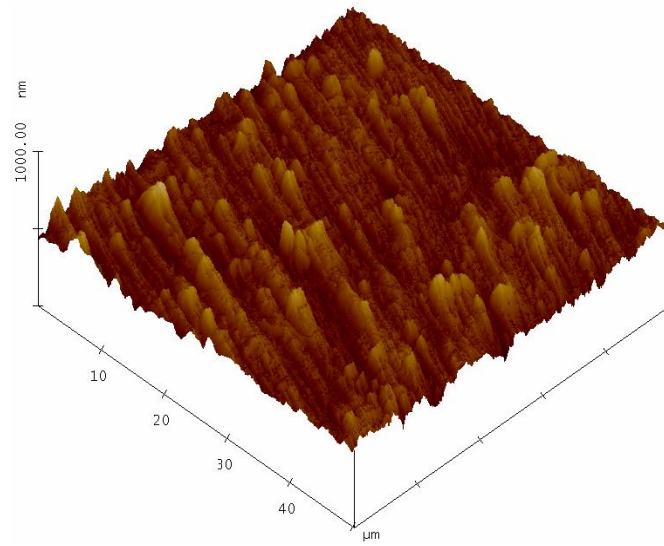
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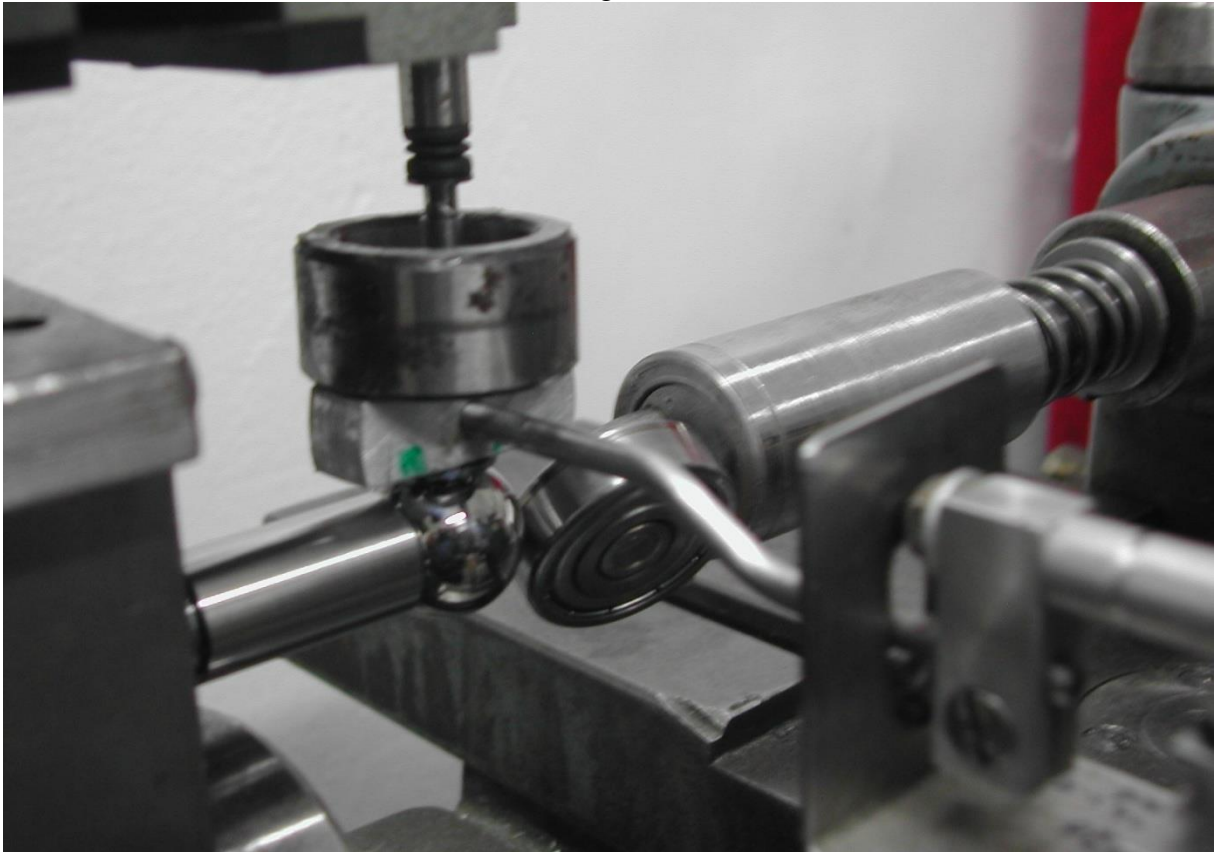
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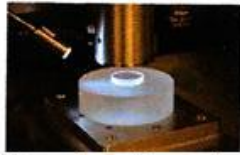
TiN coating cross section SEM X2000 25KV



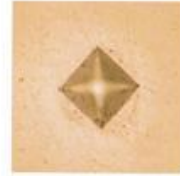
Surface roughness result



Ball-cratering tribometer



Micro hardness head



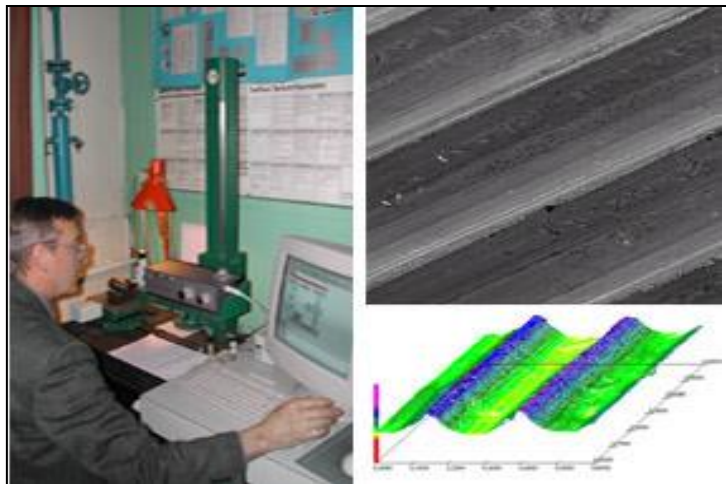
Vickers imprint



**Motor X, Y
Precision up
to micron**

Samples stand

Anti-vibration table



Surface inspection

Electron microscope

