

## **prof. Ing. Bohumil Bumbálek, CSc.**

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### **Education and academic qualification**

- 1946, Leaving examination, gymnazium. 1951 Dipl Eng.(MSc)VUT Brno, Technological specialization, 1961 CSc (PhD), Ass.Prof.1965, Univ.Prof.1993.

### **Career overview**

- 1951-1953 assistant VUT Brno, 1954-1958 prof.Assistant, 1959-60 research worker VÚVL Brno, 1961-62 ass.prof. on MTC Cairo Egypt, 1962-63 ass.prof. VAAZ Brno, 1963-65 Chief of Chair on MTC Cairo Egypt, 1965-70 ass.Prof. VAAZ Brno 1970-73 Ass.Prof.and Chief of Chair on MTC Cairo Egypt, 1974-1989 Research worker VÚ 070 Brno and chief of the professional group of Machining Technology, 1990 -92
- Ass.Prof. VAAZ Brno, 1993 till now Professor VUT Brno, Institute of Prod.technology

### **Pedagogical activities**

- Pedagogical activities in abroad
- Teaching of Machining Technology subject, of metrology, of tools design and problems of working quality on MTC Cairo Egypt.
- Teaching of Aircraft production and exploitation VUT Brno
- Taught the subject as Technology of engine manufacturing, aircraft frames, exploitation of aircrafts. Teaching the subject of tools design, measuring devices, jigs and fixtures for specialization of aircraft and armament production

### **Scientific activities**

- In scientific work is the professional orientation directed to the questions of material deformation behaviour during cutting. In the first period there were solved the problems of material machinability, later on the questions of material deformation behaviour under extreme conditions of loading, first of all under high rates of strain.
- With the material behaviour corresponds also the problems of new surface creation and the influence on the functional surface properties and also of all the product. The main orientation is directed to the properties of surface layer and its behaviour during surface function and on surface integrity. The surface plays the important role during loading. One of the characteristics is also the surface roughness. The roughness characteristics contain the important informations, which help not only for evaluation of real surface, but also simplify also the prediction of his behaviour. The present works realised in this direction are orientated for use of mathematical and statistical tools as probability curve of coordinates, ACF, PSD.
- All these activities are directed for acquisition of informations for prediction of service life and reliability of machined components. Tendencies in technology are

directed to miniaturization of component and to use the informations from nanotechnology

### University activities

- 1993 till now, professor of the specialization machining technology
- The member of committee for defence od scientific works
- The member for closing examinations

### Non-University activities

- The member of scientific council on VAAZ durin 3 years period
- The member of the committee 101 Grand Agency of CR in the period of 3 years

### Prizing by scientific community

- Plaque to the 100.jubilee of FSI VUT
- Plaque to the 50. jubilee of VAAZ Brno
- Plaque to the appretiation of research activities on VU 070 Brno
- Plaque for appretiation of professional and pedagogical activities on MTC Cairo Egypt.

### Projects

- Cooperator of grand project Deformation behaviour of materials during cutting orientated on very accurate machining. 2002-03
- Cooperator of grand project Properties of surface layer and its influence on fatigue. 2002-04, GACR 101/02/0802.
- Cooperator of Research project on The institute of production technology directed on Very high accurate methods of machining. Perion of solution 5 years.
- Cooperator of grand project Surface roughness, 2006

### Supervised courses:

- Special technology of machining (HO1-K)
- Special technology of machining (HO1)

### Publications:

- LIŠKUTÍN, P.; MAZAL, P.; BUMBÁLEK, L.; BUMBÁLEK, B.:  
**Analýza únavového porušení a morfologie lomových ploch vzorků slitiny AlCu4Mg1 dokončených různými metodami obrábění,**  
Transaction of the Universities of Košice, Vol.2009, (2009), No.4, pp.168-174, ISSN 1335-2334, Univerzita Košice  
*journal article*
- BUMBÁLEK, B.; BUMBÁLEK, L.; MAZAL, P.; LIŠKUTÍN, P.:  
**Vliv deformačního zpevnění na vlastnosti povrchové vrstvy hliníkové slitiny AlCu4Mg1,**  
Transaction of the Universities of Košice, Vol.2009, (2009), No.4, pp.111-119, ISSN

1335-2334, TU Košice

*journal article*

- BUMBÁLEK, B.; BUMBÁLEK, L.:  
**Surface Layer Properties of Titanium Alloys Ti6Al4V, Ti7Al3,5Mo0,33Si after Milling and Grinding Operations and Their Influence on the Fatigue.**,  
Manufacturing TECHNOLOGY, Vol.8, (2008), No.2, pp.40-45, ISSN 1213-2489,  
FVT UJEP Ústí n.Labem  
*journal article*
- BUMBÁLEK, L.; BUMBÁLEK, B.; ŠIKULA, J.; KRUŽÍK, M.; MAJZNER, J.:  
**Textura povrchu a funkce součásti**,  
Závěrečná zpráva grantového projektu GAČR 101/ 06/ 0490, pp.90, ISBN 978-80-720-4613-3, (2008), Akademické nakladatelství CERM, s. r. o., Brno  
*book*
- BUMBÁLEK, B.; MAZAL, P.; LIŠKUTÍN, I.:  
**Vlastnosti povrchové vrstvy slitiny AlCu4Mg1 a jejich vliv na únavu**,  
Sborník 5. mezinárodní konference ALUMINIUM 2007, pp.325-332, (2007),  
konference ALUMINIUM 2007  
*conference paper*  
*akce: Aluminium 2007, Staré Splavy, 10.10.2007-12.10.2007*
- BUMBÁLEK, B.; BUMBÁLEK, L.:  
**Size effect and its importance in nanomanufacturing**,  
Proceedings NANO 07, pp.57-57, ISBN 80-214-3085-0, (2007), Proceedings NANO 07  
*conference paper*  
*akce: Nanosciences, Nanotechnologies and Nanomaterials - Nano '07, Brno, 08.10.2007-10.10.2007*
- BUMBÁLEK, B.:  
**Význam integrity povrchu funkčních ploch dokončených frézováním**,  
Frézování IV, pp.131-138, ISBN 80-214-3239-X, (2007), FSI VUT v Brně  
*conference paper*  
*akce: Frézování IV, FSI VUT v Brně, 31.01.2007-31.01.2007*

#### **Abstracts of most important papers:**

- [BUMBÁLEK, B.; BUMBÁLEK, L.:](#)  
[Surface Layer Properties of Titanium Alloys Ti6Al4V, Ti7Al3,5Mo0,33Si after Milling and Grinding Operations and Their Influence on the Fatigue.](#),  
Manufacturing TECHNOLOGY, Vol.8, (2008), No.2, pp.40-45, ISSN 1213-2489,  
FVT UJEP Ústí n.Labem  
*journal article*  
There are introduced the results when evaluating the influence of surface layer properties of titanium alloys after technological machining operations on the fatigue. The tests were realised on the samples finished by milling and grinding which were cycling during pure band.
- [BUMBÁLEK, B.; BUMBÁLEK, L.:](#)  
[Size effect and its importance in nanomanufacturing](#),  
Proceedings NANO 07, pp.57-57, ISBN 80-214-3085-0, (2007), Proceedings NANO 07

*conference paper*

*akce: Nanosciences, Nanotechnologies and Nanomaterials - Nano '07, Brno, 08.10.2007-10.10.2007*

there are discussed the problems of size effect influence on the process of cutting and on the quality of the machined surface

- **BUMBÁLEK, L.; BUMBÁLEK, B.; MAZAL, P.:**  
**Surface Texture Transformation During Fatigue Tests,**  
ICPM 2005 Proceedings, pp.73-79, ISBN 3-901-888-31-4, (2005), Abteilung Austauschbau und Messtechnik Austria

*conference paper*

*akce: 3rd International Congress of PRECISION MACHINING 2005, Vídeň, 18.10.2005-19.10.2005*

The new created surface plays very important role during component function. In the contribution there are presented the results of surface texture study during fatigue tests.