

The work and discoveries of Dr. Eng. Petar Bodurov - The Inventor of RELO GRINDING BODIES



RELO

**ENERGY EFFICIENT
GRINDING BODIES**

Professional development and Scientific Research activities

The world-famous Bulgarian researcher and inventor, Dr. Eng. Peter Stoilov Bodurov, was born in 1945 in the city of Ruse, Bulgaria.

His technical education and the beginning of his research experience, Dr. Bodurov received at the Technical University in Ruse, followed by the Institute for Forging-Press Machines in Pleven, the Institute for Metal Cutting Machines, the Central Mechanical Engineering Institute and the Higher Institute for Mechanical and Electrotechnical Engineering "V. I. Lenin" in Sofia.

His scientific ranks include Machine Engineer - Master of Science in Mechanical Engineering Technologies, Multiple Ph.D. Research Associate – 2nd and 1st Degree, Candidate of the Technical Sciences with a PhD and Upcoming Professor - Honorary Member of the Mining and Geological Institute - Bulgaria.



For more than half a century Dr. Bodurov has devoted himself to technology and innovations

in the field of machine building and engineering, construction and research of non-standard equipment, metal products for computer equipment, development of forging machines and stamping hammers driven by rocket engines, and research and development of innovative grinding bodies for the needs of the mining industry - Eng. Bodurov has an enormous experience in scientific research activities and is a world-renowned expert in his fields.



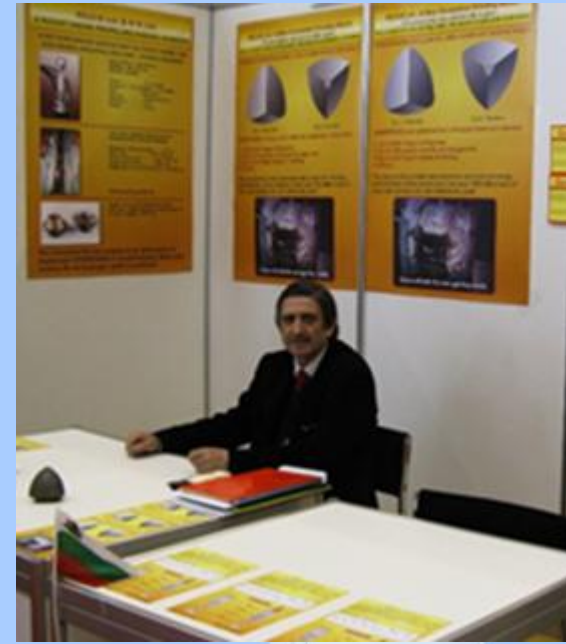
Scientific Achievements, Patented Innovations and Research papers

Dr. Bodurov is a prominent and recognized researcher and expert of international importance in the field of machine building, metal processing, metal products and grinding bodies for the ore and materials processing. He owns more than 300 patents, copyrights and models of industrial designs in more than 65 countries.

As of present date, he has over 65 author's publications in reputed international scientific journals, numerous awards and international prizes, as well as numerous articles and documentaries about him and his inventions. Some of his most recent publications are:

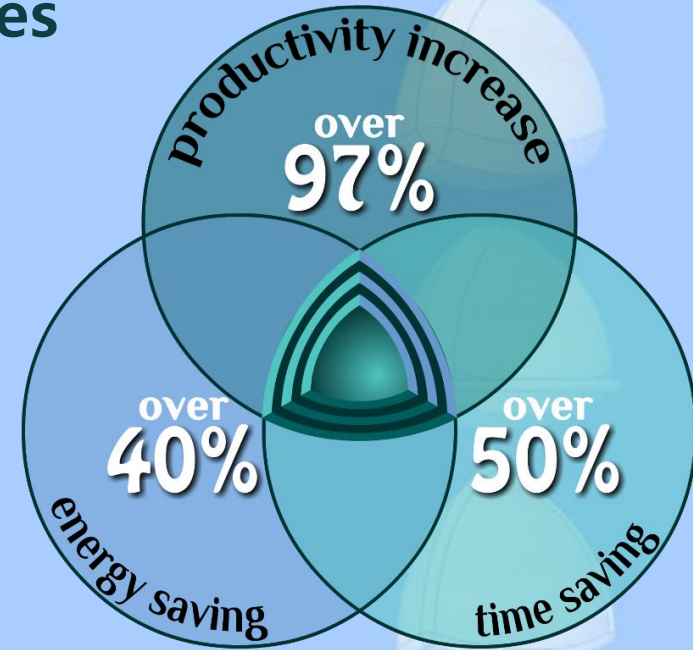
Scientific publications by Dr. Bodurov in the international engineering journal Multidisciplinary Engineering Science and Technology (JMEST) (most recent being from January 2017), the international scientific journal KSI Transactions on Knowledge Society, the international conferences - International Conference on Mining, Material, and Metallurgical Engineering (MMME), International Mineral Processing Conference – Procemin and International Mineral Processing Council (IMPC), scientific publications of the University of Mining and Geology in St. Petersburg, Russia, the University of Mining and Geology - Bulgaria, AusIMM Minerals Institute, the Ukrainian Scientific Research Institute, the University of Alexandria, Egypt, the Institute of Informatics, Bulgarian Academy of Sciences (BAN), and others.

Dr. Bodurov was awarded the first prize in the Bulgarian competition "Best Entrepreneur 2001" for a business project "Modernization of Hammers for Drilling of Pilots", a finalist at the competition of the Wharton School of the University of Pennsylvania, USA, with Business Plan "Reactive Technologies", 2002, as well as Honorary Participation at the Fair in Hanover, Germany, with a Rocket Engine for Drill Hammers for Deformation.



Radical World Innovation - RELO Grinding Bodies

One of his latest inventions is the discovery of a revolutionary grinding body. Dr. Eng. Bodurov and his team dedicated more than 15 years of research and experimentation to finding the most suitable form of grinding body for the needs of the processing industry. The idea of a new form arose spontaneously while he was presenting another revolutionary discovery - a Rocket Hammer for Drilling Pilots. After some time exploring what the researches on this topic were, he found the critical need of a new, more effective form of the grinding bodies. "The sphere is the most inappropriate body because of the lack of effective crushing and grinding elements and also - because of the specificity of the sphere being with the smallest total surface, and in the same time with the smallest contact surface," states Eng. Bodurov.



This costs the mining industry enormous losses of profits every year. The team of scientists led by Eng. Bodurov had taken the task of solving this problem.



Radical World Innovation - RELO Grinding Bodies

In 2011, the new form passed a number of successfully certified by SGS (leading world company for inspection, verification, testing and certification) laboratory and industrial tests. Further tests were needed in addition to confirm the endurance, the energy intensity and the efficiency, which ended more than successfully in the beginning of 2017. Today, we can firmly say that “RELO Grinding Bodies are a new industrial design - a global protected innovation recognized with international awards and certifications that radically changes the grinding processes in mills and leads to doubled productivity at lower costs.”

For this discovery, Eng. Bodurov was awarded the Gold Medal and Diploma of the 39th International Exhibition of Inventions - Geneva, 2011, among 785 inventors from 45 countries and over 1,000 inventions. The prize was awarded by an 83-member international jury. Dr. Bodurov also won the Grand Prize of the Union of the Bulgarian inventors (UBI) - "Inventor of the Year" for 2011 at the National Exhibition "Inventions, technologies, innovations“, as well as a Nomination for the Upcoming “Inventor of the Year” for 2016.



SGS

Reference - online accessible academic publications for RELO Grinding Bodies

- Prof. Phd. Dipl. Eng. P. Bodurov, V. Genchev, **Industrial Tests with Innovative Energy Saving Grinding Bodies**, Journal of Multidisciplinary Engineering Science and Technology (JMEST), ISSN: 2458-9403, Vol. 4 Issue 1, 2017, January, Bulgaria ([publication](#));
- Prof. Phd. Dipl. Eng. P. Bodurov, V. Genchev, **New and More Effective Grinding Bodies for Drum Mills – Alternative of the Spherical Grinding Bodies**, JMEST, ISSN: 3159-0040, Vol. 2 Issue 9, 2015, September, Germany ([publication](#));
- Prof. Phd. Dipl. Eng. P. Bodurov, Prof. T. Penchev, Prof. L. Tzotzorkov, Prof. L. Kuzev, **Comparative studies on ball versus spheroidal tetrahedrons working media to ore grinding in an industrial drum mill**, XXV International Mineral Processing Congress (IMPC), 2010, 6-10 September, Brisbane, Australia ([publication](#));
- Prof. Phd. Dipl. Eng. P. Bodurov, Prof. L. Tsotsorkov, Prof. T. Penchev, **Theoretical studies on new spheroidal tetrahedron shaped grinding media**, Proceedings of PROCEMIN, 2012, 25-27 November, Santiago, Chile ([publication](#));
- Prof. Phd. Dipl. Eng. P. Bodurov, Prof. T. Penchev, **Comparative Analysis of the Parameters of Spherical and RELO Body Balls for Drum Mills**, Proceedings of the International Conference on Mining, Material and Metallurgical Engineering, 2014, 11-12 August, Prague, Czech Republic ([publication](#));
- Prof. Phd. Dipl. Eng. P. Bodurov, Prof. T. Penchev, Prof. N. Kemilev, **Investigation of milling balls form influence on their hardness after hardening**, 26th International Scientific Conference “65 years Faculty of machine technology”, 2010, 13-16 September, Sozopol, Bulgaria ([publication](#));
- L.S. Chitalov, A.V. Fadina, E. E. Andreev, V. V. Lvov, **New effective grinding media for drum ball mill**, National Mineral Resources University (Mining University), 2013, Saint Petersburg, Russia ([publication](#)).