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SOKOLOV LEV NIKOLAEVICH
(for 100th anniversary)

Sokolov Lev Nikolaevich,
Doctor of Technical Sciences,
Professor

February 23, 2022 highlights the 100th anniversary of the birth of a remarkable scientist - blacksmith, Doctor of Technical Sciences, Honored Worker of Higher Education, Professor Lev Nikolaevich Sokolov.

Prof Sokolov is known to the scientific community as a scientist who fruitfully worked on solving the accute problems of increasing the efficiency of forging production and enriching science with significant works in the field of metal forming.

Lev Nikolaevich Sokolov was born in Yukhnov, Kaluga Region.

In 1939 Sokolov L. N enrolled into the Moscow Institute of Steel. From 1941 to 1944 he was the member of the Red Army. After graduating from the 2nd Tomsk Artillery School, he took part in fights on the Southwestern and Voronezh fronts. In the military rank of lieutenant, he was demobilized after being seriously wounded.

He completed studies at the Moscow Institute of Steel with specialization in Metal Forming in 1947. After graduating from the institute, he worked in the city of Kirov at the aircraft factory named after Lepse as an engineer, senior engineer, and deputy shop manager.

In 1950 he entered the graduate school of the Moscow Institute of Steel. His supervisor was Professor, Corresponding Member of the USSR Academy of Sciences V. P. Eliutin. Sokolov L. N. was among first in the country to develop and to publish the results of studies on hot forming modes and technical plasticity diagrams for titanium. In 1953 he defended candidate dissertation on the topic "Investigation of the technical plasticity of titanium ".

The entire following life of Sokolov L.N. is linked to the Donbass region.

After the graduate school, he was sent to Zhdanov Metallurgical Institute (Priazovskyi State Technical University in Mariupol now) where over the course of 22 years he evolved from assistant to associate professor and the head of the Forging and Stamping Department, and then to professor and vice-rector for scientific work at the institute. In 1970, Sokolov L. N. defended his doctoral dissertation on the topic "Forging ingots".

In 1975, Professor Sokolov L. N. became appointed the Rector of the Kramatorsk Industrial Institute (KII, now Donbass State Engineering Academy - DSEA). Concurrently, he became the head of the Metal Forming Department, which was recreated by him in 1976.

His name is associated with the formation and development of the scientific school of DSEA in the field of metal forming, which made a significant contribution to the development of theory, technology, and equipment for forging and stamping production (FSP). For 12 years of L. N. Sokolov's work as a rector at the institute, the scientific and the methodological levels of education process, and the effectiveness of research work significantly increased. The volume of scientific research at the institute doubled, economic effect from the implementation of developments into production increased almost 3 times, and the number of copyright certificates received for new technical developments increased 5 times.

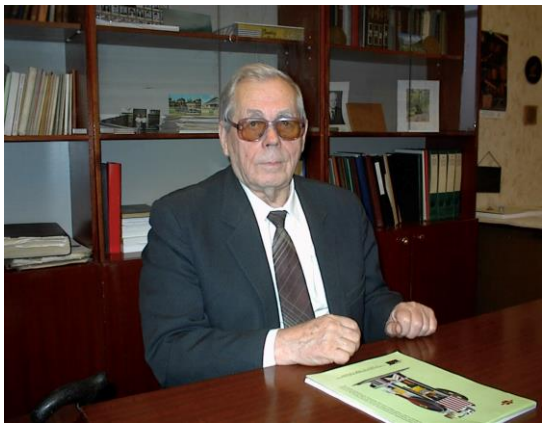
Department Council
(from left to right : Efimov V.N., Aliiev I.S., Kulishov A.A., Sokolov L.N.), 1984 year

The staff of Metal Forming Department, 1999 year

Metal Forming Department turned into a major center for the development of forming processes – a kind of creative laboratory, in which the scientific team of like-minded people carried out research and development work in various directions.

Working at the DSEA, Professor Sokolov L. N. used and improved his rich experience in scientific, pedagogical and methodological work. He read special courses: "Theory of Metal Forming", "Forging Technology", "Hot Die Forging", "Technological Equipment for Die Forging", "New Materials in Mechanical Engineering", supervised course and diploma designing, research work of students and masters (RWS), graduate students and doctoral students.

Professor Sokolov L. N. launched a scientific direction at the department related to the study of hot plastic deformation processes. The main scientific works were devoted to the study of metals and alloys softening in the process of hot deformation, forging of large products and extrusion of secondary aluminum alloys. Together with collaborators, he carried out deep theoretical and experimental studies of the hardening and softening of most common steels and alloys in the range of forging temperatures. The significant effect of hardening and softening on the power modes of forging and stamping have been proved. The theory of hardening-softening developed by him and the analytical dependencies of deformation resistance derived from it formed the basis for calculating automatic control systems for hydraulic forging presses. New methods have been developed for determining the yield strength of metals in a hot state. In particular, the staged cooling method, which allows one sample to obtain the dependence of the yield strength on temperature immediately. The study of the eighty most common steel grades and alloys hardening-softening allowed establishing that for hot-worked austenite, the relative hardening under given temperature-speed deformation conditions is a constant value. This law made it possible to develop a simple and reliable method for determining the resistance to metal forming in a wide range of changes in temperature and rate parameters for processes. Considering softening in the processes of hot metal forming, Sokolov L. N. proposed a method for calculating equivalent strain rate, which allows developing technological modes of forging and stamping with minimal energy consumption.



Sokolov L. N. at the workplace,
2001 year

Extensive research has been carried out to improve the processes of forging large forging products (eliminating the roughing operation, establishing optimal forgings when forging large ingots, new options for forging die blocks, etc.). He developed new types of large unprofitable ingots and energy-saving technological processes for their forging. New technological processes were introduced at various large plants of the ferrous metallurgy and heavy engineering ministries, such as Dneprospetsstal, Illich Iron and Steel Works, New Kramatorsk Machine-Building Factory, etc.

Extensive research has been carried out on the effect of forging upsetting and broaching operations on the mechanical properties of large ingot forgings. Optimal forges have been established for forging ingots, providing a reduction in the number of removals and significant savings in forging time. The effect of billeting operation on the quality of forgings has been studied. Recommendations for reducing forgings during broaching from 4-5 to 2-2.5 are applied at all plants producing large forgings.

The research results are implemented at Azovmash. At this plant, since 1958, the roughing operation has been excluded from all technological processes for forging ingots.

A great achievement in the field of forging is the rational technological process developed by Professor L. N. Sokolov for forging large solid disks from unprofitable ingots.

Dealing with the problems of improvement, durability and reliability of stamps, Professor L. N. Sokolov developed new options for forging stamp blocks.

After the launch of the first converter shop at the Mariupol Illich Iron and Steel Works, as a result of deep and comprehensive studies of the cast metal structure, the possibility of manufacturing large forgings from converter steel was proved.

L.N. Sokolov with graduates and colleagues after graduation ceremony
(left–1985 year; right –2003 year)

The introduction of an intermediate product (granules) in steelmaking has allowed to simplify and reduce significantly the cost of high-alloy steels deoxidation, improve working conditions and contribute to environmental protection. Methods for granulating secondary aluminum alloys have been studied and the possibility of obtaining fundamentally new compositions, such as aluminum alloys with lead, tin, graphite and calcium, have been revealed.

Professor Sokolov L. N. consulted and actively assisted carrying out large-scale work on the creation of fundamentally new designs of hydro-pulse machines with dosed impact energy, as well as machines for cutting bars into dimensional billets during pressing. The developed machines are introduced now into industrial production (Belay Kalitva, Krasnoyarsk, Stupino metallurgical plants). For the development of new forging processes, he was awarded medals of the VDNKh of the USSR and the Ukrainian SSR.

Professor Sokolov L. N. gave a lot of creative energy to the training of scientific staff of the highest qualification. Under his leadership and with direct participation, 10 doctoral and 33 master's dissertations were prepared and defended. He published more than 300 printed works and inventions, including books: the textbook for universities "Theory and technology of forging", "Blacksmith's Handbook", "Forging ingots on presses", the reference manual "For a blacksmith-puncher", "High-temperature hardening and softening of metals and alloys", the textbook "Forging technology". His students and associates, including professors Aliiev I. S., Tarasov A. F., Markov O. E. now continue the glorious scientific traditions at the Metal Forming Department named after prof. Sokolov L. N. and at other departments of the DSEA.

Members of the specialized dissertation council of the DSEA, 2005 year
(from left to right, bottom row: Roganov L. L., Sokolov L. N., Shipilina G. V., Doroshko V.I., Ray R.I., Aliiev I.S.; top row: Beygelzimer Ya. E., Dobronosov Yu. K., Ogorodnikov V A., Tarasov A.F., Satonin A. V., Potapkin V.F., Laptev A.M.)

Professor Sokolov L. N. did a lot of social work. For more than 13 years, he was the Chairman of the specialized council for the defense of doctoral dissertation with specialization in "Processes and Machines of Plastic Working ", organized by him in 1977 at the DSEA. He was a member of the expert council of the USSR Ministry of Higher Education for assessing the level of state budgetary work of universities and their financing in the field of metallurgy, he was a member of the editorial board of the industry-wide all-Union magazine "Forging and Stamping Production" and headed the editorial group of this magazine in Donbass. Professor Sokolov L. N. was the Chairman of the section "Mechanical Engineering" of the Donetsk Scientific Center of the Academy of Sciences of the Ukrainian SSR, a member of the doctoral council at the Donetsk Institute for Physics and Engineering named after O.O. Galkin of the National Academy of Sciences of Ukraine. He was the Chairman of the committee for forging large forgings at the NTO MASHPROM, the deputy Chairman of the section of the Scientific and technical council "Metallurgy" of the Ministry of Education of the Ukrainian SSR, the Chairman of the Donetsk regional council of RWS, Deputy of the Kramatorsk City Council.

L. N. Sokolov with participants of the Patriotic War, 1987 year

In Recreation center "Tishina": Zolotukhin N. M., Rulev V. I., Sokolov L. N., 1979 year

Sokolov L. N. was a participant and invalid of the Great Patriotic War, a labor veteran. He was awarded the Orders of the Patriotic War of the 1st and 2nd degrees, the Order of Bohdan Khmelnitskii and many medals, the Diploma of the Supreme Council of the Ukrainian SSR for the development of higher education and other distinctions of the Ministry of Education of the USSR and Ukraine. He was awarded the honorary title "Honored Worker of the Higher School of Ukraine".

The basis of the successful, multifaceted activity of Professor L. N. Sokolov was his high personal human qualities, exceptional organization and self-discipline, adherence to principles, an even and benevolent attitude towards employees, colleagues and students, and the ability to implement decisions into life.

Celebration of the 85th Anniversary of L. N. Sokolov

In the last years of his life, Sokolov L. N. worked as a Professor at the Metal Forming Department at the Donbass State Engineering Academy. He continued active creative scientific and pedagogical work until the last days of his life.

He lived almost full 90 bright creative years.

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