



History of cemented carbides in the Soviet Union



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ABSTRACT

The history of the Soviet cemented carbide industry, which was presumably one of the biggest carbide industries worldwide in former times with 10 huge plants, the total annual production of over 7000 t of cemented carbides and nearly 25,000 employees, is almost unknown in the West. The first Soviet WC–10%Co carbide grade was developed and implemented by G.A. Meerson at the Moscow Electro-Plant in 1929 and had the brand name “POBEDIT”, the word originated from the Russian word POBEDA – victory. The brand name POBEDIT became a common noun soon, and even now many people use it to designate cemented carbide in Russia instead of the technically correct terms “hard alloy” or “hardmetal”. Nearly 16 t of POBEDIT were fabricated in 1931, which was more than the total estimated production of cemented carbides in the Western countries in the early 1930's. Later on, the carbide production was transferred to the Moscow Plant of Rare Chemical Elements and the full-scale production – from the fabrication of tungsten anhydride to sintered carbide articles – was started there in the beginning of the 1930's. In the late 30's the Plant was renamed as the Moscow Cemented Carbide Plant (MKTC) and is now part of Sandvik. The second Soviet carbide plant, Kirovgrad Hardmetal Plant (KZTS), was founded in the small town of Kirovgrad in the Ural region on the basis of equipment evacuated from Moscow in the beginning of the Second World War. The further growth of the cemented carbide industry in the Soviet Union and the foundation of a number of new carbide plants after the Second World War are described. The carbide research and development is also described with an emphasis on pioneering technologies and materials developed and implemented in the Soviet Union heralding those being presently state-of-the-art in the cemented carbide industry.

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1. Introduction

The Soviet Union, which was in former times a powerful and influential country, one of the two global superpowers, collapsed in 1991 and the country with this name disappeared from the map. It is still a matter of discussion in Russia and other independent states of the former Soviet Union as well as the rest of the world whether this event was positive or negative. Nevertheless, many aspects of the Soviet history are yet unknown in the West. In particular, the history of many branches of the Soviet industry related to the military-and-industrial complex remains almost unknown outside Russia mainly as a result of the great rate of secrecy in Soviet times. In some cases this secrecy was reasonable, but in many cases it was excessive. This led to the fact that many important discoveries and inventions made in the Soviet Union were unknown worldwide and were “re-invented” in the West after many years, so that the pioneering role of the Soviet

Union in many fields was lost. Also, the names of many outstanding scientists and engineers working in the Soviet Union are unknown in the West. Legend has it that, after the launch of the first artificial Earth satellite in 1957, the Nobel Prize Committee sent a letter to Nikita Khrushchev, the Soviet leader at that time, asking who was the author of this revolutionary achievement in order to award him the Nobel Prize. Khrushchev's answer was: “The author is the whole Soviet nation”. As a result, Sergey Korolyov, the father of the first artificial Earth satellite and manned spacecraft, did not receive the Nobel Prize, as his name was kept secret at that time.

The history of the Soviet cemented carbide industry, which was presumably one of the biggest carbide industries worldwide in former Soviet times, is almost unknown in the West. It comprised 10 huge plants with the total annual production of over 7000 t of cemented carbides, a large research center with a number of R&D nodes at each carbide plant and a Production-and-Technological Bureau for the implementation of new carbide grades in the Soviet industry with 10 branches in all the Soviet regions; its staff was over 25,000 employees including nearly 3000 engineers and scientists. The history of the Soviet carbide industry is unknown in the West partially because all the information about its

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annual production, capacities, etc. was kept secret in Soviet times. Another reason is that there is only one work on this issue [1] published in a Russian journal and, of course, in Russian.

2. POBEDIT – the first Soviet carbide grade

The production of cemented carbides in the Soviet Union started in the late 1920's and was based on the tungsten metal manufacture at the Moscow Bulb Plant, which was re-named as the “Moscow Electro-Plant” later on (Fig. 1). The tungsten metal manufacture was launched by G A Meerson, who was also the father of the Soviet cemented carbide industry, in 1922. The picture of G A Meerson, who became later one of the leading Soviet scientists in the field of refractory and rare metals, as well as cemented carbides, is shown in Fig. 2. G A Meerson and L P Malkov developed the first Soviet WC–10%Co carbide grade at the

Moscow Electro-Plant in 1929 and gave it the brand name “POBEDIT”, the word originating from the Russian word POBEDA – victory. The brand name POBEDIT soon became a common noun and even now many people use it to designate cemented carbides in Russia instead of the technically correct terms “hard alloy” or “hardmetal”. It is interesting to note that the same happened in Germany, where the first brand name of cemented carbide “WIDIA” also became a common noun, so that many people still employ it when they talk of cemented carbides. The development of POBEDIT was presumably a result of disclosure of the Schröter patents on cemented carbides and the first demonstration of “Widia-N” by Friedrich Krupp AG at the Leipzig Spring Fair in 1927, which caused a sensation [2]. The Soviet Union did not need to be granted a license from Friedrich Krupp AG to fabricate WC–Co materials because the Schröter patents were applied only in Germany, Great Britain and the USA and the priority date in other countries was missed.

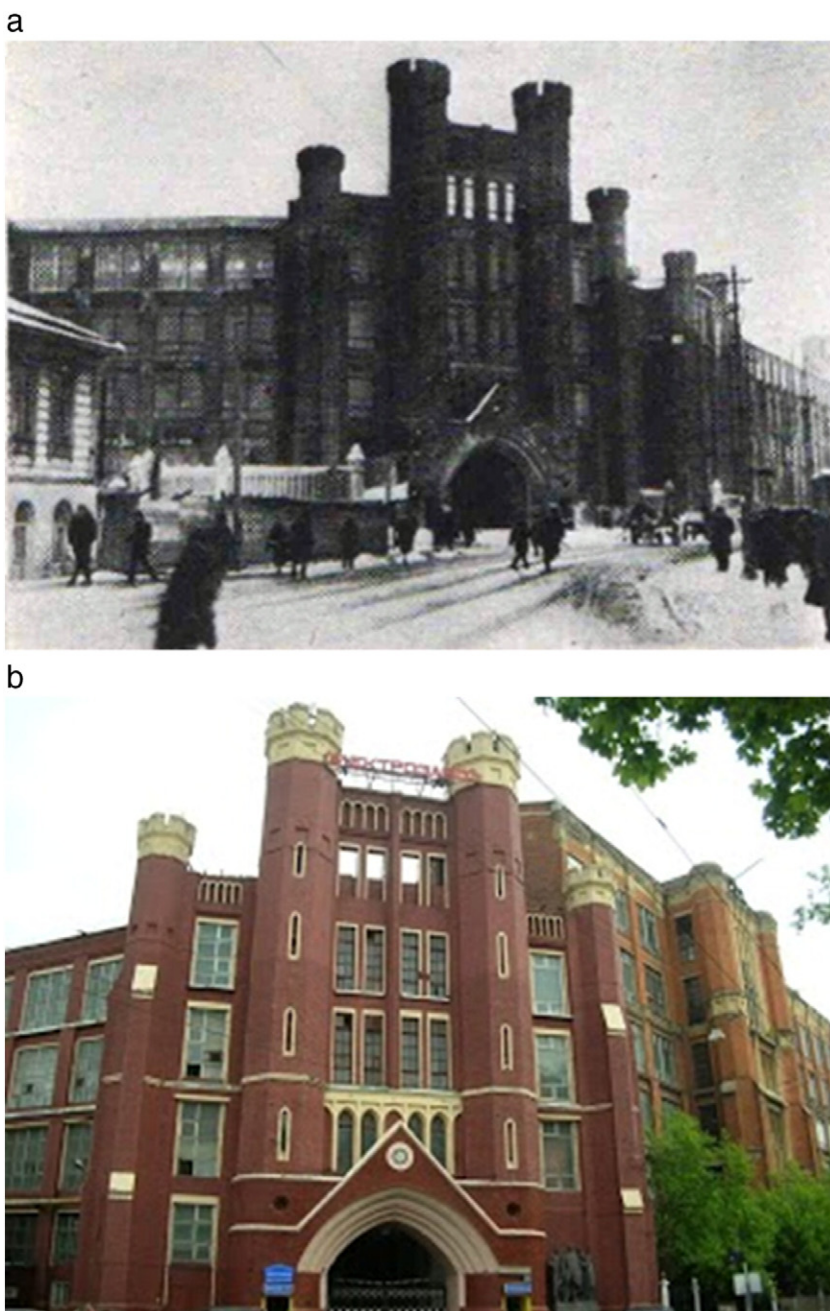


Fig. 1. Moscow Electro-Plant (a) in former times and (b) nowadays.

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