(18-024) - Obtention of nanostructured ceramic material for use in metal-mechanic industry

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The work reported on here involved the development of several samples of “cBN-TiB2-Al” nanostructured composite produced under sintering pressures of 6.0 GPa at temperatures of the 2000K. The sintering process was carried out in a 6300-ton hydraulic press equipped with an anvil-type high-pressure device having a toroidal work surface and a central concavity diameter of 20mm.We used two types of parameters application scheme: directly and cyclically. The microhardness and fracture toughness of the samples were found to be dependent on the sintering pressure. The experimental results indicated that the maximum microhardness and toughness coefficients of each compact were attained when the time applied during sintering exceeded 3 minutes. Based on the established results, this study served to identify the sintering parameters scheme applicable for the manufacture of composite material inserts for a variety of machining and grinding applications.