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Cutting Tools Nitriding in Plasma Produced by a Fast Neutral Molecule Beam ALEXANDER METEL, SERGEI GRIGORIEV, YURIY MELNIK, VITALIY PANIN, Moscow State University of Technology "Stankin" — Nitrogen plasma produced by a broad beam of fast neutral nitrogen molecules has been studied and used for cutting tools nitriding. The study results prove that fast molecules play a leading role in gas ionization in working vacuum chamber and current of ions produced by the molecules may be several times higher than the beam current. After 1-hour-long treatment microhardness of HSS cutting inserts rotating in reactive plasma and heated by 4-keV beam up to 500 °C increased from 950HV to 1400HV and the mean radius of cutting edges decreased from ~ 20 μm down to ~ 17 μm.

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