

# EFFECT OF ION NITRIDING REGIMES ON THE STABILITY OF THE CUTTING TOOL

Pronin A.I.<sup>1</sup>, Mylnikov V.V.<sup>2</sup>, Kondrashkin O.B.<sup>2</sup>, Romanov A.D.<sup>3</sup>, Chernyshov E.A.<sup>3</sup>  
(Komsomolsk-on-Amur State Technical University)<sup>1</sup>

[mdsov@knastu.ru](mailto:mdsov@knastu.ru)

(Nizhny Novgorod State University of Architecture and Civil Engineering)<sup>2</sup>,

[mrmylnikov@mail.ru](mailto:mrmylnikov@mail.ru)

(Nizhny Novgorod State Technical University n.a. R.E. Alekseev)<sup>3</sup>

The problem of machinability of titanium alloys attracted the attention of a sufficiently large number of researchers, both in our country and abroad [1-6]. Suffice it to say that the wide use of titanium alloys instead of aluminum and magnesium alloys has led to an increase in the labor intensity of machining in the aviation industry by about 10 times, and the need for a cutting tool has increased by 10 ... 15 times. The problem of machinability of titanium alloys is even more acute due to the extensive use for their processing of machines with numerical control.

The purpose of this work is to study the influence of the parameters of the ion nitriding regimes applied on the end mills from high-speed steel on their resistance to the treatment of the titanium alloy VT20.

The parameters of ion nitriding regimes and their effect on the resistance of the cutting tool are given in Table 1.

Table 1.

Regimes of ion nitriding and their effect on the durability of end mills

the mode of hardening, №	Current fed to the substrate $I_n$ , A	Current supplied to the anode $I_a$ , A	The temperature of the tool $t$ , °C	Tool life $T$ , min.	Coefficient of resistance increase
base				36	1
1	80	100	450	46	1.3
2	60	80	450	55	1.5
3	50	70	450	38	1.05
4	70	90	300	24	0.66
5	70	90	400	46	1.3
6	70	90	500	67	1.86
7	70	90	550	45	1.25

The results of the durability test made it possible to establish that the best mode for processing the titanium alloy VT20 is the tool hardening mode by ion nitriding No. 6. In this mode, the relative resistance of the tool in comparison with the basic (in the state of delivery) increased by 1.86 times (Table 1).

References:

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