



## THE INFLUENCE OF CUTTING SPEED ON CHIP REDUCTION COEFFICIENT AT TURNING WITH VIBRATIONS

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A chip reduction coefficient  $K_L$  – is one of the main parameters of cutting process, which characterizes the conditions of chip formation. The method of determining a chip reduction coefficient [1] is used for estimate the influence of cutting speed on value of  $K_L$  parameter. The experiments were conducted using a device [2] on next cutting conditions:  $t = 2$  mm,  $S_o = 0,15$  mm/rev,  $n = 630$  rev/min,  $D = 28...100$  mm. By changing diameter of workpiece, the cutting speed was changed in range  $55...200$  m/min. The parameters of cutting tools:  $\gamma = 0^\circ$ ,  $\alpha = 10^\circ$ ,  $\varphi = 90^\circ$ ,  $\varphi_1 = 15^\circ$ ,  $r = 0,4$  mm, material of cutter – VC8. In experiment the amplitude of cutter oscillations in horizontal direction  $A_x$  and chip reduction coefficient  $K_L$  were estimated (fig. 1).

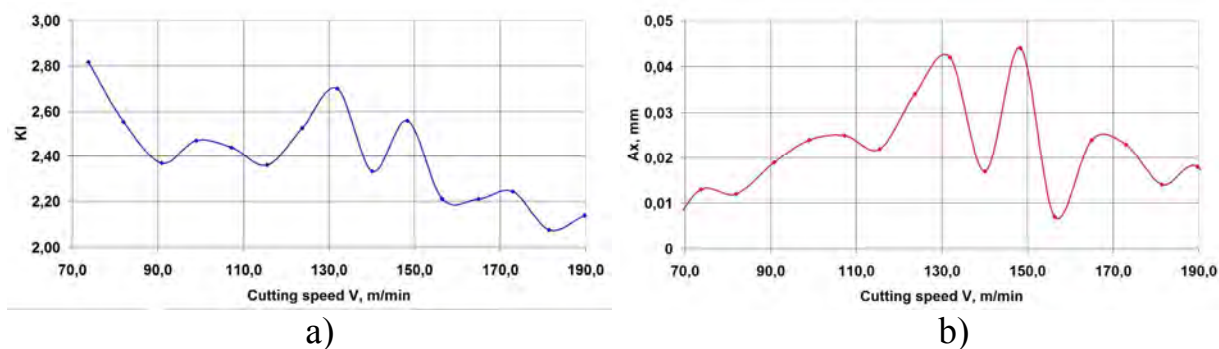


Figure 1 – The parameters of cutting process: a) chip reduction coefficient  $K_L$ ; b) amplitude of cutter oscillation in horizontal direction  $A_x$

Preliminary test results showed that the actual value of chip reduction coefficient depends on dynamic phenomena that occur in the cutting zone. With the change of cutting speed the value of  $K_L$  parameter is proportional to the amplitude of oscillations of tool in horizontal direction.

### References:

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2. Vnukov Y., Kuchugurov M., Dyadya S., Zinchenko R., Gonchar J. Method and device for research the regenerative self-excited vibrations when turning. Cutting and tools in technological systems: International science and technology collection, Kharkov: NTU "KPI", 2013, 83: 42-54.