VIBRATION BEHAVIOUR OF A CIRCULAR SAW DISKS

BRATU Ion, PATER Sorin, ABRUDAN Gheorghe, POLOJINTEF CORBU Nicolae
Universitatea din Oradea

Keys: circular saw disks, vibration, frequency, tensions

Axial vibration amplitudes of the axis are lower but with an order of magnitude than the deviation from form, so that they can hardly recognize the fig.1c. Are visible but the high vibration frequency, (the frequency of its own), of a disk saw which sound image appears in the form of sounds, „whistle" very disagreeable. Vibration curve "d" represents the effects of fig.1, critical warp speed.

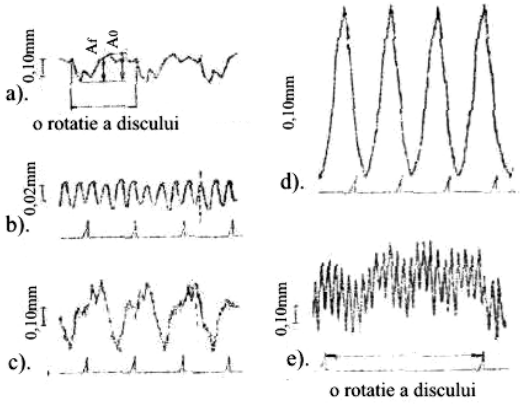

Fig.1 Deviation forms from the disc and saw the characteristic curves of vibration
a) Deviation from the form Af, b). Duplication of the axial axis (n=4800rot/min), c). Own vibration, high frequency, the disk saw, superimposed over the shape deviation (n=4800rot/min), d). Vibrations of the low frequency of disk saw (n=5800rot/min), e). Disk vibration in the saw cut (z = 48, n=4100rot/min, sz = 0.3 mm)

During the cutting process may be caused more vibration due to various forces liabilities. Fig.1 shows a resonance excited by alternative bending of the teeth, with a frequency corresponding to a certain number of groups of teeth (the teeth are formed as a tooth bending right and one left). In this case the number of teeth z=48 being the number of groups of teeth z_g=24, while the number of vibrations, each rotation was only f_u=23 at a speed n=4100 rpm and an advance on the tooth s_z=0.3mm.

If there is a pressing zone located immediately below the teeth, when the disc saw efforts can be eliminated, which means that it presents the same flexural stiffness as a disc that contains saw efforts. This frequency falls below its own values that have a disk saw which was not pretension from the start. Corresponding to a repetition of two discs apparently saw the same, their frequencies can differ by more than 2o%, but it can recognize the value of the flexural rigidity.

Bibliography

1. BARZ, E. - Schwingungs und Arbeitsverhalten von Kreissageblattern fur Holz, I, Forschungsbericht des Wirtschafts und Verkehrsministeriums Nordrhein-Westfalen, Nr.6.1, Koln und Opladen: Westdeutscher Verlag, 1983.
2. PALMGREEN, A., - Grundlager der walzlagertechnik. Stuttgard, 1980, Frankhsche Verlagshandlug.
3. SOUTHWELL. - On the Free Transverse Vibrations of a Uniform Circular Disk Clamped at its Centre, and on the Effects of Rotation. Proceedings of the Royal Society of London, Series A 101, 1962.