

INTEGRATED STAND FOR VIBRATION AND ERGONOMIC INVESTIGATIONS OF HAND-HELD IMPACT TOOLS

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SUMMARY

This paper presents an integrated test stand for hand-held impact tools (rnu) enabling complex vibration and ergonomic investigations according to the standards ISO 8662, EN 28662 and EU directives. The stand testing range has been established basing on the system investigations (1) concerning all the factors harmful to the operator's health existing on the work stands equipped with rnu. The parameters of rnu supply which should be monitored and recorded during investigations have been also established. Course of investigations is controlled by a computer provided with the original SYS-DEA program (7). The integrated stand is equipped with a Quality Assurance System of investigations making impossible measurement and recording of erroneous signals. Simultaneous acquisition, measurement and recording of fourteen signals are done during the course of investigations.

This paper contains a short description of stand design and the results of comparative investigations conducted with use of new generation of pneumatic hammers as a source adapted for man-operator requirements (5). Comparative investigations showed that the mechanical part of the stand simulates dynamic conditions of a man-operator and rnu investigations without presence of operators are possible. Moreover, the stand makes possible very good repeatability of tool fastening and supplying. Vibration spectrum correlation coefficient for particular fastening in the stand is in the range: 0.967-0.994 and is decidedly higher than the operator's pushing force.

Vibration investigations revealed design drawbacks of the impact energy absorber made according to the standards ISO 8662 and EN 28662 that should be eliminated.

Results of the rnu investigations attained in the integrated stand make possible a complex evaluation of tested tools not only in the range of vibration and noise but also in the range of the most important ergonomic parameters connected with for example operator's physical overload and issue of certificates by certifying units.

Key words: vibration, ergonomics, investigations, hand-held impact tools

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