

ABSTRACT

ERGONOMICS STUDY ON THE USE OF A RACK-TYPE *HYBRID* DRYER

By

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Ergonomics is a multi- and interdisciplinary approach that seeks to harmonize tools, methods and work environment with the capabilities, abilities and limitations of operators so as to create healthy, safe, safe, comfortable and efficient working conditions. The analysis of ergonomic aspects of a machine and the adjustment of machine size to the dimensions of the operator's body is called anthropometry. In anthropometry, there are several measurements that can be made to determine the shape and size of the human body. The measurement results will get a ratio number that can monitor the proportion of operators in the use of a machine or tool, one of which is a rack-type hybrid dryer. The rack-type hybrid dryer is an agricultural post-harvest tool that has been manufactured and tested for its performance in such a way that it is designed to facilitate the work of farmers in the drying process. Ergonomics tests on rack-type hybrid dryers need to be carried out to help the operator feel comfortable with the appropriate size of the tool in its operation so as not to have a bad impact on the operator. The purpose of this study was to determine the ergonomics of the rack-type hybrid dryer in terms of anthropometry, work fatigue, heavy load biomechanics, and work environment design. This study uses a quantitative method supported by literature study about the dimensions of the ergonomic rack type hybrid dryer or according to the size of the human body. The variables measured and data were taken in the form of anthropometry (static), recommended workload limits, work fatigue, and the physical work environment. The results showed that the ergonomic dimensions of the tool were in accordance with the dimensions of the

operator's body in the form of a hook for the bottom of the machine door, the MCB (Miniature Circuit Breaker) button, and the dryer door handle. The operator's work fatigue level is classified as ergonomic because the CVL (Cardiovascular Load) percentage value obtained is $\leq 30\%$ so that there is no fatigue in operating the tool. The recommended workload of the destination area is not yet ergonomic and it is necessary to reduce the load lifted on each drying machine rack. Temperature measurement is classified as ergonomic because it is at or below the threshold value. Lighting measurement is not yet ergonomic because the average obtained is less or more than 100 lux.

Keywords : anthropometry, ergonomic, rack-type hybrid dryer

ABSTRAK

KAJIAN ERGONOMIKA PADA PENGGUNAAN MESIN PENERING *HYBRID* TIPE RAK

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Ergonomi merupakan pendekatan multi dan interdisiplin yang berupaya menyetarakan alat, cara dan lingkungan kerja terhadap kemampuan, kebolehan dan batasan operator sehingga tercipta kondisi kerja yang sehat, selamat, aman, nyaman dan efisien. Analisis aspek ergonomi dari suatu mesin dan penyesuaian ukuran mesin terhadap dimensi tubuh operator disebut antropometri. Dalam ilmu antropometri terdapat beberapa pengukuran yang dapat dilakukan untuk mengetahui bagaimana bentuk dan ukuran tubuh pada manusia. Hasil pengukuran akan mendapatkan angka rasio yang bisa memantau proporsi operator dalam penggunaan suatu mesin atau alat, salah satunya adalah alat penering *hybrid* tipe rak. Alat penering *hybrid* tipe rak merupakan alat pasca panen pertanian yang telah dibuat dan diuji kinerjanya sedemikian rupa didesain untuk mempermudah pekerjaan para petani dalam proses peneringan. Uji ergonomi terhadap alat penering *hybrid* tipe rak perlu dilakukan untuk membantu dalam kenyamanan operator terhadap ukuran alat yang sesuai dalam pengoperasiannya agar tidak memberikan dampak buruk bagi operator. Tujuan penelitian ini adalah mengetahui keergonomisan mesin penering *hybrid* tipe rak ditinjau dari segi antropometri, kelelahan kerja, biomekanika berat beban, dan perancangan lingkungan kerja. Penelitian ini menggunakan metode kuantitatif didukung studi literatur tentang ukuran dimensi alat penering *hybrid* tipe rak yang ergonomis atau sesuai dengan ukuran tubuh manusia. Variabel yang diukur dan diambil data berupa antropometri (statis), batas beban kerja rekomendasi, kelelahan kerja, dan lingkungan fisik kerja. Hasil penelitian menunjukkan bahwa dimensi alat yang

ergonomis sesuai dengan dimensi tubuh operator berupa pengait pintu mesin bagian bawah, tombol *MCB (Miniatur Circuit Breaker)*, dan *handle* pintu pengering. Tingkat kelelahan kerja operator tergolong ergonomis karena nilai persentase *CVL (Cardiovascular Load)* yang didapatkan $\leq 30\%$ sehingga tidak terjadinya kelelahan dalam pengoperasian alat. Beban kerja rekomendasi daerah tujuan belum tergolong ergonomis dan perlu adanya penurunan beban yang diangkat pada tiap rak mesin pengering. Pengukuran suhu tergolong ergonomis karena berada pada atau dibawah nilai ambang batas. Pengukuran pencahayaan belum ergonomis karena rata-rata yang didapatkan kurang atau lebih dari 100 lux.

Kata kunci : antropometri, ergonomi, mesin pengering *hybrid* tipe rak