

ABSTRAK

PT. RZ merupakan perusahaan yang memproduksi ban bias dengan beberapa tipe, antara lain *Light Truck (LT)*, *Double Bead (DB)*, *Truck Bus (TB)*, dan *Off The Road (OTR)*. Salah satu komponen dalam pembuatan ban yaitu *bead* yang merupakan komponen ban yang menempel dengan *velg* dan berguna sebagai pencengkram *velg* agar ban menempel pada *velg*. Proses pembuatan *bead* ini melalui beberapa tahap, antara lain *Bead Forming*, *Bead Finish* dan *Slittering* yang berada di area *bead grommet*. Pada proses *Bead Forming* terdapat beberapa proses yaitu *let off bobin*, *lap wool*, *wire heater*, *extruder*, *cooling drum*, *accumulator* dan *wind up*.

Proses *bead forming* dimulai pada area *let off bobin*. *Let off bobin* digunakan untuk tempat dudukan *bobin* agar *bobin* berputar dan *wire* dapat di gunakan untuk pembuatan *bead*. Setiap akhir tahun selalu ada monitoring *key performance indicator* (KPI) untuk melihat apakah proses berjalan dengan baik atau terdapat kendala. Pada area *Bead Forming* itu sendiri KPI di tahun 2021 tidak mencapai target dikarenakan produksi turun di setiap akhir bulan. Hal ini terjadi karena mesin *Bead Forming* berhenti total pada pukul 06.00 WIB karena akan dilakukan *stock opname* di area *Bobin* (tempat tatakan kawat). Proses *Stock opname* itu sendiri dilakukan masih dengan metode manual yaitu menggunakan *verniercaliper* dan *rollmeter*, mengukur lebar *bobin* dan jarak antara sisi luar dan *wire* kemudian dimasukkan ke aplikasi sehingga angka yang sudah didapat diolah menggunakan rumus dan menghasilkan angka *stock wire* dengan satuan kilogram. Proses *Stock opname* secara manual ini yang membuat mesin *bead forming* harus berhenti total sehingga produksi menurun.

Oleh sebab itu penulis melakukan analisa terhadap perancangan alat *counting wire* agar penggunaan *wire* dapat dimonitor secara *real time* sehingga dapat mempercepat proses *stock opname* dan membuat mesin tidak perlu berhenti (stop produksi).

Hasil analisa menggunakan *Design of Experiment*, dapat dilihat nilai *error* yang paling kecil dapat diperoleh dengan menggunakan Diameter *roll encoder* 10, dan pulse 20 yang menghasilkan nilai *error* 0,0050 (0,5%). Hasil analisa kelayakan investasi yang telah dilakukan dapat dilihat bahwa biaya investasi yang diperlukan untuk alat bantu *counting wire* sebesar Rp. 81,000,000. Sedangkan kerugian Ketika mesin stop senilai Rp. 131,221,200 selama 1 tahun. Hasil perbandingan sebelum dan sesudah pada proses *stock opname* di area bobin dapat disimpulkan bahwa setelah adanya alat bantu *counting wire* proses *stock opname* semula dilakukan manual oleh team, setelah adanya alat bantu *counting wire* dilakukan secara otomatis dengan melihat monitor.

Kata Kunci : Efektifitas, *Counting Wire*, *Design of Experiment*, Analisa kelayakan, *Stock Opname*

ABSTRACT

PT. RZ is a company that produces bias tires with several types, including Light Truck (LT), Double Bead (DB), Truck Bus (TB), and Off The Road (OTR). One of the components in the manufacture of tires is the bead which is a component of the tire that attaches to the wheel and is useful as a gripper for the wheel so that the tire attaches to the wheel. The process of making this bead goes through several stages, including Bead Forming, Bead Finish and Slittering which are located in the bead grommet area. In the Bead Forming process there are several processes, namely let off bobin, wool cloth, wire heater, extruder, cooling drum, accumulator and wind up.

The bead forming process begins in the let off bobin area. The let off bobin is used for the bobbin holder so that the bobbin rotates and the wire can be used for making beads. At the end of each year there is always a monitoring of key performance indicators (KPI) to see whether the process is running well or there are obstacles. In the Bead Forming area itself, the KPI in 2021 did not reach the target because production fell at the end of every month. This happened because the Bead Forming machine stopped completely at 06.00 WIB because stock taking would be carried out in the Bobin area (where the wire mats are). The stock taking process itself is still carried out manually using a vernier caliper and rollmeter, measuring the width of the bobbin and the distance between the outer side and the wire and then entering the application so that the obtained numbers are processed using a formula and produce stock wire numbers in kilograms. This manual stock taking process makes the bead forming machine have to stop completely so that production decreases.

Therefore, the author analyzes the design of the counting wire tool so that the use of wire can be monitored in real time so that it can speed up the stock taking process and make the machine not need to stop (stop production).

The results of the analysis using the Design of Experiment, it can be seen that the smallest error value can be obtained using Diameter roll encoder 10, and pulse 20

which produces an error value of 0.0050 (0.5%). The results of the investment feasibility analysis that have been carried out can be seen that the investment cost required for the counting wire tool is Rp. 81,000,000. While the loss when the machine stops is Rp. 131,221,200 for 1 year. The results of the before and after comparison on the stock taking process in the bobbin area can be concluded that after the counting wire tool, the stock taking process was originally done manually by the team, after the counting wire tool was available it was done automatically by looking at the monitor.

Keyword: *Effectiveness, Counting Wire, Design of Experiment, Feasibility Analysis, Stock Opname*

