

**WASTE MINIMIZATION IN PACKING BAG  
PRODUCTION PROCESS IN PACKING BAG PLANT  
OF PT. SEMEN PADANG**

**FINAL PROJECT REPORT**



**DEPARTMENT OF INDUSTRIAL ENGINEERING  
FACULTY OF ENGINEERING  
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2020**

# **WASTE MINIMIZATION IN PACKING BAG PRODUCTION PROCESS IN PACKING BAG PLANT OF PT. SEMEN PADANG**

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*A report submitted in fulfillment of the requirement for the award of the degree of  
Bachelor in Department of Industrial Engineering, Faculty of Engineering,  
Andalas University*



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## ABSTRACT

The competition in the manufacturing industry sector requires every company to do continuous improvements and develop its performance. One of the competitive manufacturing industries is cement industry. PT. Semen Padang is cement company located in Padang that produces seven types of cement that use two types of packing bags which are pasted bag and sewing bag. Packing bag plant unit of PT. Semen Padang has an important role to produce the pasted bag. In order to enhance productivity and improve product quality, the company has to know which activity increases value-added-activity to the product.

There are some methods can be used to minimize the wastes in packing bag production process. Waste identification began with the identification of Current State Value Stream Mapping with weighting the waste by using Waste Relationship Matrix and Waste Assessment Questionnaire in order to understand the root of the problem within the production process. Based on the WRM and WAQ result, the most dominant wastes are defect (24,4%), inventory (16,3%) and waiting waste (15,2%). The detail mapping selection was using Value Stream Analysis Tools (VALSAT) with Process Activity Mapping (PAM) as the selected tool. It is obtained 42 activities in production line III with 9,6% non-value-added activities and 43 activities in production line IV with 9,3% non-value-added activities. Fishbone diagram is used to analyse the root cause to understand the root of problem for production process and followed by FMEA with 33 potential failures is found. The highest score of Risk Priority Number (RPN) is the potential failure because of defect waste which is unavailability of spare parts with RPN of 172,8. Proposed recommendations are given to minimize the existing waste and prevent waste in the future by applying Lean Manufacturing concept.

**Keywords:** Cement Packing Bag, Fishbone Diagram, FMEA, Lean Manufacturing, Waste Minimization

## **ABSTRAK**

*Persaingan di sector industri manufaktur menuntut setiap perusahaan untuk terus melakukan perbaikan dan mengembangkan kinerjanya. Salah industri manufaktur yang kompetitif ialah industri semen. PT. Semen Padang adalah perusahaan yang memproduksi semen berlokasi di Kota Padang. PT. Semen Padang memproduksi tujuh jenis semen dengan menggunakan dua jenis kantong semen, yaitu sewing bag dan pasted bag. Unit Pabrik Kantong PT. Semen Padang memiliki peran penting dalam memproduksi kantong dengan jenis pasted. Untuk meningkatkan produktivitas dan meningkatkan kualitas produk, perusahaan harus mengetahui aktivitas apa saja yang bernilai tambah bagi produk.*

*Terdapat beberapa metode yang dapat digunakan untuk meminimasi waste yang ada dalam produksi kantong semen. Identifikasi terhadap waste dimulai dengan pembuatan Value Stream Mapping dengan melakukan penilaian terhadap waste menggunakan Waste Relationship Questionnaire (WRM) dan Waste Assessment Questionnaire (WAQ). Berdasarkan hasil WRM dan WAQ, waste yang dominan ialah waste defect (24,4%), inventori (16,3%) dan waiting (15,2%). Hasil VSM dan identifikasi waste dianalisis menggunakan Value Stream Analysis Tools (VALSAT) dengan tools yang terpilih yakni Process Activity Mapping (PAM). Berdasarkan PAM, didapatkan 9,6% kegiatan yang tidak mempunyai nilai tambah dari 42 aktivitas di lini produksi III, dan 9,3% kegiatan yang tidak mempunyai nilai tambah dari 43 aktivitas di lini produksi IV. Analisis terhadap akar masalah dari tiga jenis waste yang didapatkan menggunakan diagram tulang ikan dan diikuti oleh Failure Mode and Effect Analysis (FMEA) dengan ditemukan 33 potensi kegagalan dari proses produksi kantong semen. Nilai Risk Priority Number (RPN) tertinggi yaitu pada potensi kegagalan yang disebabkan oleh tidak tersedianya spare part mesin dengan skor RPN yaitu 172,8. Sehingga, rekomendasi diberikan untuk mengatasi waste yang terjadi dan mencegah terjadinya waste di masa yang akan datang.*

**Kata Kunci :** *Diagram Tulang Ikan, FMEA, Kantong Semen, Lean Manufacturing, Waste Minimization*