

# INTRODUCTION OF RECYCLED PLASTIC PALLET AND ITS MECHANICAL PROPERTIES

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## Abstract

This paper introduces the production of re-birth pallet system (mechanical recycling system) and also the measurement of its mechanical properties. Waste plastics go through different stages in the production of this pallet. Pellets used for the production of this pallet was subjected to a temperature above the melting point of the plastics pellets using a mini press test machine; to form a shape that can be used for the tensile strength test. This test was carried out and the average percentage of elongation was less than 1. Because there can be a sudden crack in this pallet, there is need to remove the material debris. To reduce the material debris associated with it, we therefore propose a new sorting system (sink float) in this paper.

**Keywords:** re-birth pallet, mechanical properties, sorting system, waste plastics, material debris

## 1. Introduction

Recently TOYAMA KANKYO SEIBI CO.,LTD. has been involved in the production of recycled plastic pallet called re-birth pallet. This pallet is widely applied in logistics and construction industries. This study introduces the production of pallet and measurement of its quality. To reduce the material debris in this pallet we are proposing a new sorting system<sup>①</sup>. This new sorting system is expected to have a lot of economic and environmental advantages.

## 2. Materials and Methods

The materials used in this experiments are tensile strength machine, mini press machine and plastics pellets. Some pellets were subjected to a high temperature using the mini press machine to form a shape that can be used for tensile strength test.



Fig. 1 Plastics pellets      Fig. 2 Tensile strength specimen

## 3. Results and Discussion

Table 1 shows the results of the tensile strength for different specimen (A-E). And also the result of the fracture surface when viewed with a microscope.

Table 1 Results of the tensile strength test

Specimen number	maximum shearing area (mm <sup>2</sup> )	percentage of elongation(%)	Maximum tensile strength(MPa)	Tensile strength at Breaking Point (MPa)
A	12.83	0.6	10.3	10.3
B	12.73	0.6	8.77	8.77
C	12.5	0.6	10.2	10.2
D	12.73	0.8	9.61	9.61
E	12.75	0.4	9.48	9.48
Average	12.71	0.6	9.48	9.48



Fig. 3 Sectional view of fracture surface (×50)

## 4. Conclusions

From the results of the tensile strength, percentage of elongation is less than 1, and this can result to a sudden crack due to the material debris. It is concluded that a new sorting system of waste plastics is necessary to improve the quality of re-birth pallet.

## References

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