

Modular pallet project

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Project Description

The scope of this Project is to find a new sustainable logistic solution for the accumulation and storage of cartoned meat products which will allow improved efficiencies for mechanical loading for transportation.

The finished item will be manufactured from nonporous materials and assembled in modular format. The modular component will allow for any damage to be replaced minimising replacement costs.

Project Content

The Project consisted of;

- ◆ Construction of a full size prototype unit to ensure the design would be successful,
- ◆ Engineer design drawings,
- ◆ “Tooling” of extrusion units,
- ◆ Supply of trial components,
- ◆ Trailing of units assembled from trial components,
- ◆ Adjustments made to the design and composition of the man made materials.

Project Outcome

The initial prototype was trialed successfully in the storage racking, the movement from storage to marshalling area and the removal of the cartons for mechanical loading.

From here the design of the various parts was completed and a trial pallet was assembled for testing.

As a result of the tests a number of changes were sought;

1. It was found that the space between the 2 outside bottom rails were too narrow and did not allow the pallet to set correctly onto the racking without precise positioning by the forklift driver.
2. It was also requested if the dimensions could be adjusted to accommodate the pallets being able to be used for storage in refrigerated containers. Standard pallets cannot be placed side by side in a container. This required the width to be reduced to 1130mm and the length left at 1160mm.
3. It was also found after strength testing that the required weight of 2500kgs at static could not be supported with 3 “stringer” rails so a 4th rail was introduced to the design. The 2500kgs has been determined by calculating 42 cartons @ 27.2kgs per pallet and in the preloading area it is quite often seen where 1 pallet is placed on top of another.
4. Another trial pallet was produced with the above changes and using a nylon “pin” to hold components in place. This method was found to be unsuccessful as the “pins” were not strong enough.
5. The best method of securing the components was then determined to be a 90mm wood screw which would not rust.
6. It was also found that the compound of material used was more brittle than originally sought as pieces broke off the edges and a stringer was broken without any knowledge of how it occurred.
7. In view of this, a request was made to the manufacturer to reduce the brittleness by adjusting the additives. This was done and a further 2 trial pallets were sent to the plant for testing. One pallet was of the revised

compound and the other was the original compound. It was found that the revised compound performed better than the original mix.

8. In view of the above changes, the final design was settled and 100 pallets were manufactured and delivered to the plant.
9. Environmentally, this Project is sound as it is a man-made material using Rice husks, rubber compound and polystyrene.

Benefit for Industry

It was agreed that the concept in principle is workable, it will be time efficient and a benefit to the process of storing, conveying and depalletizing frozen cartons. It will also have benefits for storing and conveying cartons of chilled product by changing the formatting of the pallet by removing the 4 “top rails” and inserting a total of 5 “cross rails” on the “stringers”. This will give added support to the centre of the chilled cartons.

The change in dimensions also has an added benefit in that the pallets are able to be stored in refrigerated containers side by side. This is a practice at times when cold storage capacity is limited.

It is clear that the concept, design and assembly of the pallets for this Project has proved to be workable. The savings in time, monetary value, ROI and general improved standards have been demonstrated. The benefits to the Industry would be wide spread.

A cost benefit analysis is attached to the Final Report which shows a ROI can be within 2 years.

A second Project of this nature using all the knowledge gained to date could deliver an even better outcome. It is a matter of determining if the Industry deems it necessary.