

## THE DOLAV GUIDE TO HEAVY DUTY PALLET BOXES

### INTRODUCTION

Pallet Boxes are used for Bulk Handling of Fruit, Vegetables, Food Products, Liquids, Engineering Products, Chemicals, Waste and Recyclables.

Use of Pallet Boxes improves efficiency in Production, in Storage and in the Supply Chain.

There are wide variations of performance and cost.

### DEVELOPING A SPECIFICATION

- One Trip or Multi Trip?
- Dry or All Weather Use?
- Weight Loadings Static and Dynamic?
- Hygiene Standards?
- Constant Tare Weight?
- Easily Cleanable?
- Recyclable?
- Easily Repaired?
- Size?
- Stack only, Foldable, Demountable?
- Solid or Ventilated?
- Number of Runners or Feet?
- Doors?
- Lid if required to be loose, lockable or act just as a dust cover?
- Owner Identity through Colour, Branding, labelling, RFID Chip?
- Discharge Method?
- Fitted with Valves?
- Controlled close circuit use or more robust usage?
- Radiused corners?
- Chemical Resistance?
- Operating Temperatures?
- Performance guarantee?
- Too many questions?

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### STEEL

- Good for heavy products.
- High static and dynamic loading.
- High tare weight reduced payload on vehicles.
- Good for all weather use.
- Wide safe performance working temperature range.
- Repairable, easily repainted but heavy impact can distort and require extensive maintenance.
- Only moved mechanically.

### PLYWOOD

- 5 Plywood hardwood sheet made into boxes where edges are joined by riveted steel strip form volume efficient, high performance shipping containers which are ideal for export shipping. Generally not suitable for clean room applications, not designed for reuse and difficult to recycle.

### WOOD—SOLID BOX

- Easy to build.
- Easy to repair.
- Heavy
- Can be steel reinforced.
- Weight varies with humidity.
- Difficult to clean.
- Concerns about contamination, insect infestation and hazards to users.
- Cheap.

### WOOD + PALLET + MODULAR COLLARS + LID

- Robust returnable system where components are returned separately.
- Collars are made from 10mm Softwood Plywood or Softwood.
- The wood or plywood planks are joined with steel corner hinges to make 4 hinge collars. When centre hinges are added to the short sides of a rectangular collar it becomes a 6 hinge collar folding to the length of the long sides, making for easy return within the perimeter of its pallet.
- Collars are typically 200 and 400mm high.
- Widely used for transporting components to the assembly Industries.
- Wooden components are typically 40% heavier when wet than dry.
- Hygiene, weight and separate elements to return concern some potential users.

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### **CORRUGATED BOARD**

- Wide range of thickness and fluting.
- Range of performances available.
- Best for dry usage although some moisture protection is available which then limits recyclability.
- Performance can be improved with reinforcement.
- Easily printable.
- Generally one trip usage.
- Available on wood, plastic and corrugated paper board pallets.

### **PLASTICS—ROTATIONAL MOULDING**

- A slow process employing less expensive tooling than Injection Moulding.
- A Medium or Low Density Polyethylene Pallet box takes about 30 minutes to manufacture.
- The process of spinning a heated mould forming a twin skinned product which can be improved by filling the cavity within the skins with foam.
- Excellent stacking pallet boxes can be made by this method.
- They are significantly more expensive than products with similar performance made by other plastic forming methods.

### **PLASTICS—VACUUM FORMING**

- Strong pallets and lids, components of Sleeve Pack type Pallet Boxes are made using twin skin vacuum forming usually from HDPE sheet.
- A Sleeve Pack has 3 components; a pallet base onto which locks a sleeve, made from corrugated paper board or its stronger long life plastic equivalent, and a vacuum formed single or twin skin lid. The lid locks onto the sleeve.
- Ideal for shipping light weight items the Twin Skin Vacuum Formed Sleeve Pack is well proven as a durable easily returnable system.
- All elements are ultimately recyclable with lid and pallet typically enjoying longer service lives than the sleeves.

### **PLASTICS—HIGH PRESSURE INJECTION MOULDING**

- Stacking boxes, folding boxes, demountable boxes and sleeve packs are widely made using High Pressure Injection Moulding.
- This sophisticated, precise process employs expensive machines with clamping pressures of 5000 t and more.
- Specific Pallet Box Tooling to withstand the fast cycling high pressure process requires major bespoke investment justified by potential sales of tens of thousands of boxes.

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### PLASTICS—HIGH PRESSURE INJECTION MOULDED PALLET BOXES

- Designed for reuse over several years.
- Equipped with locks, card holders, RFID chips, doors, runners and other elements. Fully recyclable.
- Light weight.
- Easily cleaned.
- Of even wall thickness to allow even cooling of the moulding when it is formed to reduce in built stress as much as possible.
- More Plastic Pallet Boxes produced worldwide have been High Pressure Injection Moulded than those produced using other plastics forming methods.
- These pallet boxes are modestly priced and satisfy thousands of customers. However the inevitable built in stress in the mouldings will be relieved by prolonged heavy use and abuse leading to splits which tend to spread and make repair somewhat difficult.
- The surface can be easily abraded in daily use making cleaning harder.

### PLASTICS—INJECTION MOULDED STRUCTURAL FOAM

- Foaming within the injection moulding process.
- Allows sections to be thicker and stronger.
- Allows pressure to be greatly reduced and builds in much less stress using special low mfi HDPE allows robust products to be produced where severe impact damage stays local and can be easily repaired.
- The desirable heavy sections can easily be “cut and shut” to customise pallet boxes of almost any size.
- Produces much longer life pallet box.
- The surface of a structural foam pallet box is smooth but characterised by swirl patterns which are normal and not detrimental when cleaning.

For nearly 40years the core business of DOLAV has been producing plastic pallet boxes. We use High Pressure Injection Moulding to make some products such as lids. We make them fit the boxes but also very flexible with a built in memory that returns them to their moulded form even after a Fork Truck has driven over them. However, most of our pallet boxes are made using low mfi HDPE in our specially built Injection Moulding Structural Foam Machines. They have stood the test of time in all climates from Desert Sands to Arctic Tundra. Our aim is to offer low life time cost. We look at specifications, think about the abuse that pallet boxes can suffer and try to build in reserves of strength.



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