PPI

Processing & Product Innovation

Fibreboard Cartons for Chilled Meat

Successful outturn of chilled meat on the export or domestic market depends to a large extent on the carton quality.

Carton requirements

Performance

High compression strength is essential to protect meat from damage due to crushing in stacks in chillers, cold stores and freight containers. The carton strength must be retained under the cold, moist conditions experienced throughout the distribution chain.

There are a number of styles of chilled meat cartons available, some with higher compression strengths than others. Wet strength performance can be enhanced by paper type selection, e.g. kraft liners, heavier papers, or specially coated papers.

Appearance

Cartons must present the meat attractively to satisfy the demands of discriminating customers. They can be made in white corrugated board and can be attractively printed and varnished if required.

Australian Standards

Export Meat Orders require that chilled meat cartons used for export must conform to Australian Standard AS3724-1994 – "Fibreboard Boxes for the Export of Meat, Meat Products and Offal". This standard specifies many items regarding cartons for chilled and frozen meat. The requirements relevant to chilled meat cartons include the following –

Clause 1.5 Box Style

1.5.1 was amended in 1997 so that air holes may now be incorporated in the box (i.e. carton) design. Clause 1.5.1 now reads – "Boxes shall not contain air holes unless used for vacuum packaged meat. In other instances non-stripped hand holes are acceptable provided that they are not stripped prior to export".

Clause 1.9 Marking

This clause requires that cartons be marked on the bottom with the following items –

(i) the name or registered mark of the box manufacturer

(ii) the production batch identification

(iii) reference to the Australian Standard, i.e. AS3724

(iv) the words "For Export"

(v) the recommended gross mass of the box and its contents

(vi) when a box requires a stacking collar, an indication that a collar is required

(vii) when a box does not require a separate plastic liner, an indication that a plastic liner is not required.

Note 2 requires that each integral part of the box (i.e. both base and lid for two-piece cartons) bear the number of the standard, i.e. AS3724.

Clause 4.3 Specifications

The standard requires that boxes meet the following performance criteria –

4.3.1 minimum compression resistance of 40 kN/m^2 of top surface area

4.3.2 maximum Cobb water absorption of the outside and inside surfaces of the box of 170g/m^2

4.3.4 water resistance of the glue lines

4.3.5 no rupture along the carton fold lines.

Carton base styles

Bases must be made in styles that provide high stacking strength to ensure that the meat does not suffer compressive damage. These styles commonly use double-thickness, corrugated board for the carton walls (Figures 1,2,3, & 4). Cartons incorporating corner posts built into the four corners can provide increased compression strength. In addition, corner

AMPC

MEAT & LIVESTOCK AUSTRALIA

posts provide stacking protection against mis-alignment in carton stacks (Figures 2 & 4).

These styles of carton bases can be supplied suitable for hand assembly (Figures 1 & 2) at the abattoir or they can be erected on automatic carton forming machines (Figures 3 & 4).

Base styles that are partially leakproof in design at their corners can be supplied so that, when used in conjunction with special papers, there is no need for loose poly-liners in the chilled cartons (Figure 5).

Figure 1 Hand-assembled chilled base

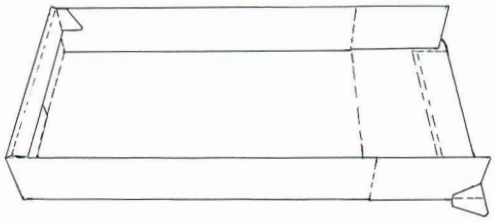


Figure 2 Hand-assembled cornerpost chilled base

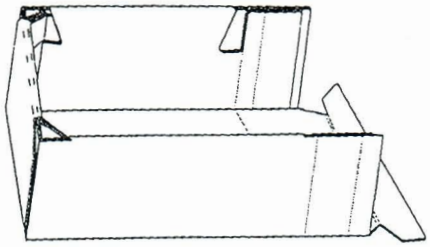


Figure 3 Machine-erected chilled base

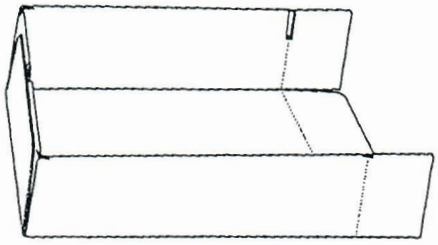


Figure 4 Machine-erected cornerpost chilled base

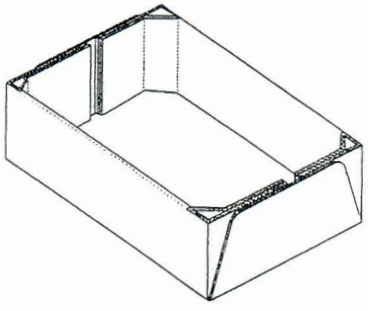
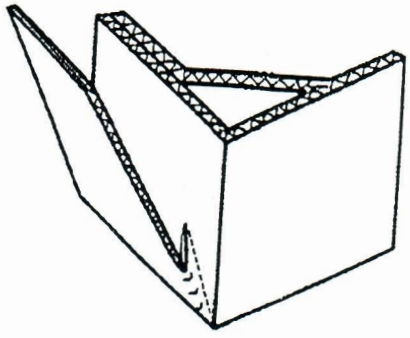


Figure 5 Leakproof base corner



Carton lid styles

Lids can also be supplied in styles to suit hand assembly (Figures 6, 7 & 8) or machine erection (Figure 9). Lid styles include cap lids (Figures 8 & 9) and full depth lids (Figures 6 & 7) as well as styles that have the four corners pre-glued (Figures 7 & 8).

Full depth lids offer additional stacking strength to the package but necessitate stocks of lids for each size of carton, i.e. commonly large, medium and small sizes. Cap lids have the advantage of one common lid fitting several carton sizes provided the bases have the same length and width.

Strong lids are necessary to assist in preventing carton base sag in stacks, which would put pressure onto the meat, causing damage. Strong lids are commonly made with corrugated board which contains two lots of corrugations such as duo arch board or one of the double wall board constructions. (Figures 10 & 11).

Chilled meat carton lids are commonly strapped to the bases but automatic glueing machines are available so that lids can be glued on if required to provide additional strength and bulge resistance.

Figure 6 Hand-assembled full depth lid

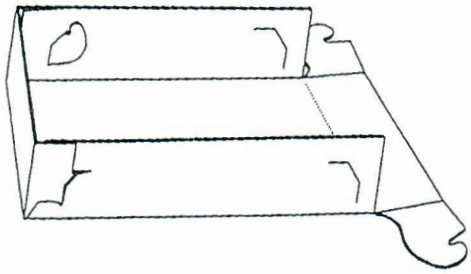


Figure 7 Pre-glued full depth lid

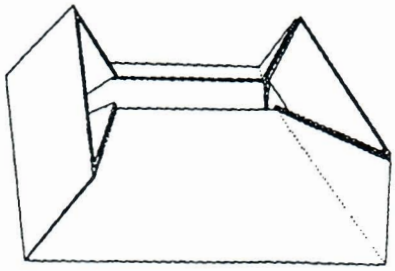


Figure 8 Pre-glued cap lid

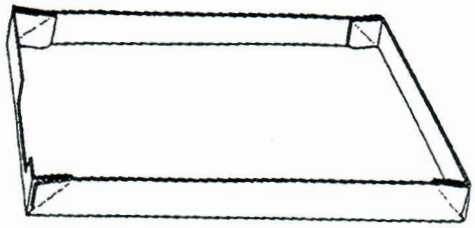


Figure 9 Machine-erected cap lid

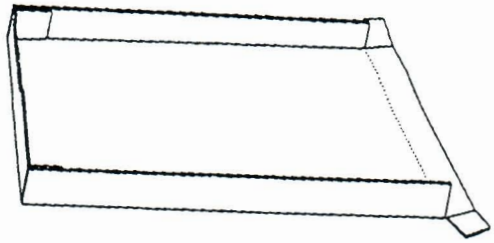


Figure 10 Duo arch board

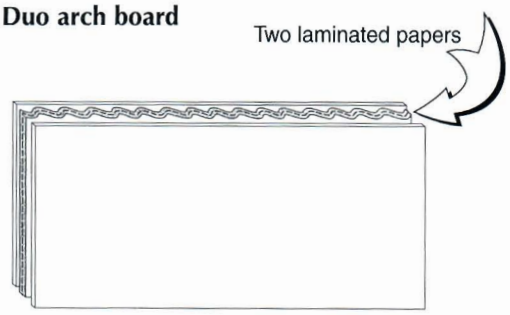
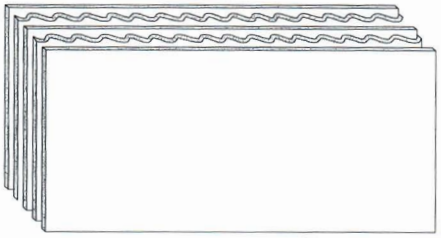


Figure 11 Double wall board



Appearance

In comparison with the appearance of brown, frozen meat cartons, that of most chilled meat cartons is enhanced by the use of white-lined board. Attractive prints in one, two and three colours are readily available, with printing inks of an almost unlimited range of colours.

As well as being attractive, printing can offer distinctive brand recognition. Photographic reproductions can be achieved with modern printing techniques and the highest quality preprinted inds are available in up to six-colour reproduction with varnishing, which provides gloss and some water resistance.

White-lined board is normally used for the inside of carton bases to give improved meat appearance and this can be coated or printed to enhance meat presentation.

Brown cartons for export chilled meat can be supplied and, compared to white cartons, these generally provide marginal strength improvement and cost reduction.

Fitments (inserts)

Internal corrugated board fitments can be supplied to protect and support different cuts of meat in the cartons. Dividers have been used to support individual striploins, and separators have been used for cube rolls and tenderloins to give improved meat shape and presentation. These fitments can be supplied in brown, white or printed corrugated board.

Moisture resistance

All corrugated and solid fibreboards lose strength when they become moist; therefore operating conditions in the works should minimise carton exposure to moisture. Wet-strength performance of cartons can be increased by a variety of ways including the use of virgin fibrekraft liners and heavier weight papers. In addition, treatments can be applied to the corrugated board at its time of manufacture to give limited water-shedding properties to the liners. Some treatments offer only temporary resistance to water and can adversely affect printing quality.

Coated papers for corrugated cartons, which offer absolute barriers to moisture migration into the board, are now available (Figures 12 & 13). These synthetic coatings or plastic films can be either applied to the surface of the board to give meat release and barrier properties or laminated within the carton liners. An impermeable water barrier is achieved with the use of these coatings and films without affecting the qualities of the board for printing. Coated boards can be used for lids or bases of cartons when exporting chilled meat to demanding markets.

Figure 12 Laminated corrugated board

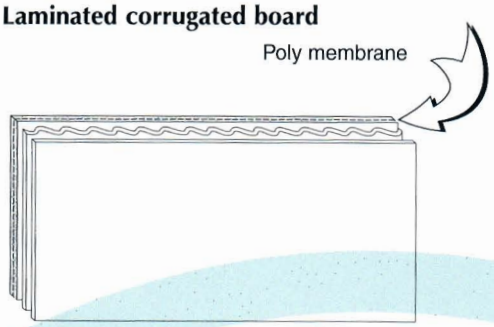
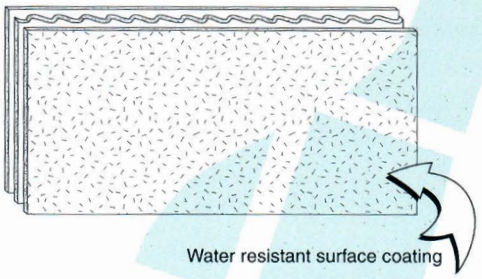


Figure 13 Coated corrugated board



Future

Environmental considerations regarding the recycling or recovering of cartons and other packaging materials will continue to become important issues within the community both in Australia and in importing countries. Corrugated and solid fibreboard cartons are fully recyclable and environmentally friendly. Paper is the only packaging material that is made from a renewable resource. The functionally coated boards that contain a plastic film layer are currently accepted back by the paper mills for fibre recovery, although the plastic layer is not recycled. Synthetic coatings are available which are fully recyclable.

Some countries have legislation that makes industry responsible for the cost of recycling. The German Packaging Ordinance requires manufacturers and distributors to pay all expenses associated with the reuse or recycling of cartons and other transport packaging independently of the public waste system. Japan is implementing its packaging recycling legislation, with similar requirements for industry to pay for the collection, sorting and recycling of paper and plastic packaging. It is anticipated that the cost will be passed back to exporters. Australia has a National Packaging Covenant in which industry has agreed with government to fund initiatives designed to produce a more efficient and market-based kerb-side recycling system. It is expected that in the future other countries will also require manufacturers and importers to directly bear the cost of recycling their packaging.

Machine systems for use with both frozen meat and chilled meat cartons are becoming increasingly common within the meat industry. These systems can offer savings in the cost of cartons, sealing materials and labour. Machines are now available commercially for carton base and lid assembly, packing assistance and the closing and sealing of cartons after packing. In addition to labour and material savings, machine systems offer cartons with improved strength and performance due to reductions in manual handling and to glue bonding of lids and bases. It is expected that the number of carton-machine systems installed in abattoirs will continue to increase.

Acknowledgement

The assistance of Visy Board Pty Ltd, PO Box 113, Inala, Queensland, 4077 in the production of this brochure is gratefully acknowledged.

Contact
Processing and Product Innovation
Meat and Livestock Australia
Tel: (02) 9463 9166 Fax: (02) 9463 9182

MEAT & LIVESTOCK
AUSTRALIA

165 Walker Street, North Sydney NSW 2060
Tel: (02) 9463 9333 Fax: (02) 9463 9393 www.mla.com.au

Published August 2000
ISBN: 1 74036 726 X