



## **Citrus Cold Chain Forum**

# **PACKAGING MATERIAL SPECIFICATIONS AND PALLETISATION PROTOCOLS FOR THE 2010 EXPORT CITRUS SEASON**

**COMPILED BY THE CITRUS COLD CHAIN FORUM**

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**Packaging Working Group  
Packhouse and Handling Panel**

**Cold Chain Research Project  
Exporters Technical Panel**

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# 1. CARTON SPECIFICATIONS

## 1.1 Specification for the 146,160 and 170mm Open Display Carton

### SPECIFICATION FOR THE CORRUGATED BOARD 600 X 400 X 146,160 and 170MM OPEN DISPLAY CARTON FOR EXPORT CITRUS

#### 1. LINERS AND FLUTING

##### 1.1 Liners

All 600 x 400 x 146,160 and 170mm open display export citrus cartons must be manufactured with Virgin Kraft Linerboard.

##### 1.2 Fluting

All 600 x 400 x 146,160 and 170mm open display export citrus cartons must be manufactured with Semi – chemical or other approved Hi – performance fluting. The fluting shall be essentially free from abrasive constituents that may induce a high rate of wear of corrugating rolls, and shall be such that it does not crack during the corrugating process.

#### 2. THE CARTON

##### 2.1 Carton Design

Over the past couple of years some carton manufacturers have developed their own open display carton designs. Because of the confidentiality of the various designs it is therefore not possible to include all the designs/die drawings in this specification. Die drawings to be supplied by your carton manufacturer. Under certain conditions and circumstances the use of loose end pieces will be compulsory and exporters/packhouses will be advised by their carton suppliers.

##### 2.2 Corrugated Board

The board shall be double – wall corrugated board of “B” and “C” flute construction. Other corrugated board profiles eg. “B” and “E” flute and any other new designs to be approved by the packaging working group and export organisations first (see section 4 on page 39 – “Newly developed/experimental carton trial procedure”). Graphic designs to be supplied by the various exporters/export organisations. For identification purposes a manufacturer’s code, batch number and date of manufacture must be printed on the bottom of each carton. Details to be supplied by the exporter/export organisations.

3. **TABLE 1****PHYSICAL PROPERTIES OF CORRUGATED BOARD**

<b><u>Property</u></b>	<b><u>Average</u></b>
Caliper unprinted board, mm, minimum – Combined board. (B and C Flute)	6,5
Difference between board calipers of printed and unprinted areas, % maximum	5,0
Ply adhesion (damp) N/metre of length of corrugation, minimum	400
Water absorption of outer/inner facings, g/m <sup>2</sup> per 30 minutes, maximum	120

4. **MASS LOAD AT FAILURE**

In the past the basis mass of the linerboard and the fluting was specified. The carton manufacturers agreed that it is prescriptive and that it must no longer be specified. It was agreed by all the role players that the mass load at failure must in future be specified.

Mass load at failure must be determined under the following conditions:

Conditioning atmosphere:-

a) 32°C ± 1°C and 87% RH ± 1% RH for 24 hours.

<b>Mass Load at Failure : 875 kg</b>
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b) 0,5°C ± 0,5°C and 87% RH ± 1% RH for 24 hours.\*

\* Mainly to test the performance of the glue used during the carton erecting process in packhouses or at carton erecting centres. Samples to be tested in accordance with sub clause 6.22 of S.A.B.S. 456:1973 "Corrugated Board Containers".

## 1.2 Specification for the 220mm Open Display Carton

### SPECIFICATION FOR THE CORRUGATED BOARD 600 X 400 X 220MM OPEN DISPLAY CARTON FOR EXPORT CITRUS

#### 1. LINERS AND FLUTING

##### 1.1 Liners

All 600 x 400 x 220mm open display export citrus cartons must be manufactured with Virgin Kraft Linerboard.

##### 1.2 Fluting

All 600 x 400 x 220mm open display export citrus cartons must be manufactured with Semi – chemical or other approved Hi – performance fluting. The fluting shall be essentially free from abrasive constituents that may induce a high rate of wear of corrugating rolls, and shall be such that it does not crack during the corrugating process.

#### 2. THE CARTON

##### 2.1 Carton Design

Over the past couple of years some carton manufacturers have developed their own open display carton designs. Because of the confidentiality of the various designs it is therefore not possible to include all the designs/die drawings in this specification. Die drawings to be supplied by your carton manufacturer. Under certain conditions and circumstances the use of loose end pieces will be compulsory and exporters/packhouses will be advised by their carton suppliers.

##### 2.2 Corrugated Board

The board shall be double – wall corrugated board of “B” and “C” flute construction. Other corrugated board profiles eg. “B” and “E” flute and any other new designs to be approved by the packaging working group and export organisations first (see section 4 on page 39 – “Newly developed/experimental carton trial procedure”). Graphic designs to be supplied by the various exporters/export organisations. For identification purposes a manufacturer’s code, batch number and date of manufacture must be printed on the bottom of each carton. Details to be supplied by the exporter/export organisations.

3. **TABLE 1****PHYSICAL PROPERTIES OF CORRUGATED BOARD**

<b><u>Property</u></b>	<b><u>Average</u></b>
Caliper unprinted board, mm, minimum – Combined board. (B and C Flute)	6,5
Difference between board calipers of printed and unprinted areas, % maximum	5,0
Ply adhesion (damp) N/metre of length of corrugation, minimum	400
Water absorption of outer/inner facings, g/m <sup>2</sup> per 30 minutes, maximum	120

4. **MASS LOAD AT FAILURE**

In the past the basis mass of the linerboard and the fluting was specified. The carton manufacturers agreed that it is prescriptive and that it must no longer be specified. It was agreed by all the role players that the mass load at failure must in future be specified.

Mass load at failure must be determined under the following conditions:

Conditioning atmosphere:-

- a) 32°C ± 1°C and 87% RH ± 1% RH for 24 hours.

<b>Mass Load at Failure : 800 kg</b>
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- b) 0,5°C ± 0,5°C and 87% RH ± 1% RH for 24 hours.\*

\* Mainly to test the performance of the glue used during the carton erecting process in packhouses or at carton erecting centres.  
Samples to be tested in accordance with sub clause 6.22 of S.A.B.S. 456:1973 "Corrugated Board Containers".

## 1.3 Specification for the E10D Open Display Carton

### **SPECIFICATION FOR THE CORRUGATED BOARD** **500 X 300 X 170MM OPEN DISPLAY CARTON FOR EXPORT CITRUS**

#### 1. **LINERS AND FLUTING**

##### 1.1 Liners

All 500 x 300 x 170mm open display export citrus cartons must be manufactured with Virgin Kraft Linerboard.

##### 1.2 Fluting

All 500 x 300 x 170mm open display export citrus cartons must be manufactured with Semi – chemical or other approved Hi – performance fluting. The fluting shall be essentially free from abrasive constituents that may induce a high rate of wear of corrugating rolls, and shall be such that it does not crack during the corrugating process.

#### 2. **THE CARTON**

##### 2.1 Carton Design

Over the past couple of years some carton manufacturers have developed their own open display carton designs. Because of the confidentiality of the various designs it is therefore not possible to include all the designs/die drawings in this specification. Die drawings to be supplied by your carton manufacturer. Under certain conditions and circumstances the use of loose end pieces will be compulsory and exporters/packhouses will be advised by their carton suppliers.

##### 2.2 Corrugated Board

The board shall be double – wall corrugated board of “B” and “C” flute construction. Other corrugated board profiles eg. “B” and “E” flute and any other new designs to be approved by the packaging working group and export organisations first (see section 4 on page 39 – “Newly developed/experimental carton trial procedure”). Graphic designs to be supplied by the various exporters/export organisations. For identification purposes a manufacturer’s code, batch number and date of manufacture must be printed on the bottom of each carton. Details to be supplied by the exporter/export organisations.

3. **TABLE 1****PHYSICAL PROPERTIES OF CORRUGATED BOARD**

<b><u>Property</u></b>	<b><u>Average</u></b>
Caliper unprinted board, mm, minimum – Combined board. (B and C Flute)	6,5
Difference between board calipers of printed and unprinted areas, % maximum	5,0
Ply adhesion (damp) N/metre of length of corrugation, minimum	400
Water absorption of outer/inner facings, g/m <sup>2</sup> per 30 minutes, maximum	120

4. **MASS LOAD AT FAILURE**

In the past the basis mass of the linerboard and the fluting was specified. The carton manufacturers agreed that it is prescriptive and that it must no longer be specified. It was agreed by all the role players that the mass load at failure must in future be specified.

Mass load at failure must be determined under the following conditions:

Conditioning atmosphere:-

- a) 32°C ± 1°C and 87% RH ± 1% RH for 24 hours.

<b>Mass Load at Failure : 750 kg</b>
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- b) 0,5°C ± 0,5°C and 87% RH ± 1% RH for 24 hours.\*

\* Mainly to test the performance of the glue used during the carton erecting process in packhouses or at carton erecting centres.  
Samples to be tested in accordance with sub clause 6.22 of S.A.B.S. 456:1973 "Corrugated Board Containers".

## 1.4 Specification for the A02D Open Display Carton

### SPECIFICATION FOR THE CORRUGATED BOARD 300 X 200 X 110MM OPEN DISPLAY CARTON FOR EXPORT CITRUS

#### 1. LINERS AND FLUTING

##### 1.1 Liners

All 300 x 200 x 110mm open display export citrus cartons must be manufactured with Virgin Kraft Linerboard.

##### 1.2 Fluting

All 300 x 200 x 110mm open display export citrus cartons must be manufactured with Semi – chemical or other approved Hi – performance fluting. The fluting shall be essentially free from abrasive constituents that may induce a high rate of wear of corrugating rolls, and shall be such that it does not crack during the corrugating process.

#### 2. THE CARTON

##### 2.1 Carton Design

In the case of the A02D (300x200x110mm) open display carton, the carton manufacturers have also developed their own designs.

Because of the confidentiality of the various designs it is therefore not possible to include all the designs/die drawings in this specification. Die drawings to be supplied by your carton manufacturer.

##### 2.2 Corrugated Board

The board shall be double – wall corrugated board of “B” and “E” flute construction. Any other new designs to be approved by the packaging working group and export organisations first (see section 4 on page 39 – “Newly developed/experimental carton trial procedure”). Graphic designs to be supplied by the various exporters/export organisations. For identification purposes a manufacturer’s code, batch number and date of manufacture must be printed on the bottom of each carton. Details to be supplied by the exporter/export organisations.

3. **TABLE 1****PHYSICAL PROPERTIES OF CORRUGATED BOARD**

<b><u>Property</u></b>	<b><u>Average</u></b>
Caliper unprinted board, mm, minimum – Combined board. (B and E Flute)	5,1
Difference between board calipers of printed and unprinted areas, % maximum	5,0
Ply adhesion (damp) N/metre of length of corrugation, minimum	400
Water absorption of outer/inner facings, g/m <sup>2</sup> per 30 minutes, maximum	120

4. **MASS LOAD AT FAILURE**

In the past the basis mass of the linerboard and the fluting was specified. The carton manufacturers agreed that it is prescriptive and that it must no longer be specified. It was agreed by all the role players that the mass load at failure must in future be specified.

Mass load at failure must be determined under the following conditions:

Conditioning atmosphere:-

- a) 32°C ± 1°C and 87% RH ± 1% RH for 24 hours.

<b>Mass Load at Failure : 260 kg</b>
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- b) 0,5°C ± 0,5°C and 87% RH ± 1% RH for 24 hours.\*

\* Mainly to test the performance of the glue used during the carton erecting process in packhouses or at carton erecting centres.  
Samples to be tested in accordance with sub clause 6.22 of S.A.B.S. 456:1973 "Corrugated Board Containers".

## 1.5 Specification for the T64, 170mm Carton

### **SPECIFICATION FOR THE FULL TELESCOPIC 600 x 400 x 170mm CARTON FOR EXPORT CITRUS**

#### **1. LINERS AND FLUTING**

##### 1.1 Liners

All 600 x 400 x 170mm full telescopic export citrus cartons must be manufactured with Virgin Kraft Linerboard.

##### 1.2 Fluting

All 600 x 400 x 170mm full telescopic export citrus cartons must be manufactured with Semi – chemical or other approved Hi – performance fluting. The fluting shall be essentially free from abrasive constituents that may induce a high rate of wear of corrugating rolls, and shall be such that it does not crack during the corrugating process.

#### **2. OUTER COMPONENTS**

##### 2.1 Corrugated Board

The board shall be single – wall simplex board of “C” flute construction. For dimensions (die drawing) please consult with your carton supplier. For identification purposes a manufacturer’s code, batch number and date of manufacture must be printed on one of the outer top flaps. Details to be supplied by the exporter/export organisations.

#### **3. INNER COMPONENTS**

##### 3.1 Corrugated Board

The board shall be double – wall corrugated board of “B” and “C” flute construction. Other corrugated board profiles eg. “B” and “E” flute and any other new designs to be approved by the packaging working group and export organisations first (see section 4 on page 39 – “Newly developed/experimental carton trial procedure”). For dimensions (die drawing) please consult with your carton supplier. As with outer components above, all inner components to be printed with a manufacturer’s code, batch number and date of manufacture.

4. **TABLE 1****PHYSICAL PROPERTIES OF CORRUGATED BOARD**

<b><u>Property</u></b>	<b><u>Average</u></b>
<b>Outer Component</b>	
Caliper unprinted board, mm, minimum - C Flute.	3,9
Difference between board calipers of printed and unprinted areas, % maximum	5,0
Ply adhesion (damp) N/ metre of length of corrugation, minimum	400
Flat crush resistance of printed board, KPa, minimum (not on flaps) - C Flute	250
Water absorption of outer/inner facings, g/m <sup>2</sup> per 30 minutes, maximum	120

<b><u>Property</u></b>	<b><u>Average</u></b>
<b>Inner Component</b>	
Caliper unprinted board, mm, minimum. Combined board (B and C Flute.)	6.2
Ply adhesion (damp) N/ metre of length of corrugation, minimum	400
Water absorption of outer/inner facings, g/m <sup>2</sup> per 30 minutes, maximum	120

## 5. MASS LOAD AT FAILURE

In the past the basis mass of the linerboard and the fluting was specified. The carton manufacturers agreed that it is prescriptive and that it must no longer be specified. It was agreed by all the role players that the mass load at failure must in future be specified.

Mass load at failure must be determined under the following conditions:

Conditioning atmosphere:-

a)  $32^{\circ}\text{C} \pm 1^{\circ}\text{C}$  and  $87\% \text{RH} \pm 1\% \text{RH}$  for 24 hours.

<b>Mass Load at Failure : 875 kg</b>
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b)  $0,5^{\circ}\text{C} \pm 0,5^{\circ}\text{C}$  and  $87\% \text{RH} \pm 1\% \text{RH}$  for 24 hours.\*

\* Mainly to test the performance of the glue used during the carton erecting process in packhouses.

Samples to be tested in accordance with sub clause 6.22 of S.A.B.S. 456:1973 "Corrugated Board Containers".

## 1.6 Specification for the T64, 215mm Carton

### **SPECIFICATION FOR THE FULL TELESCOPIC 600 x 400 x 215MM CARTON FOR EXPORT CITRUS**

#### **1. LINERS AND FLUTING**

##### 1.1 Liners

All 600 x 400 x 215mm full telescopic export citrus cartons must be manufactured with Virgin Kraft Linerboard.

##### 1.2 Fluting

All 600 x 400 x 215mm full telescopic export citrus cartons must be manufactured with Semi – chemical or other approved Hi – performance fluting. The fluting shall be essentially free from abrasive constituents that may induce a high rate of wear of corrugating rolls, and shall be such that it does not crack during the corrugating process.

#### **2. OUTER COMPONENTS**

##### 2.1 Corrugated Board

The board shall be single – wall simplex board of “C” flute construction. For dimensions (die drawing) please consult with your carton supplier. For identification purposes a manufacturer’s code, batch number and date of manufacture must be printed on one of the outer top flaps. Details to be supplied by the exporter/export organisations.

#### **3. INNER COMPONENTS**

##### 3.1 Corrugated Board

The board shall be double – wall corrugated board of “B” and “C” flute construction. Other corrugated board profiles eg. “B” and “E” flute and any other new designs to be approved by the packaging working group and export organisations first (see section 4 on page 39 – “Newly developed/experimental carton trial procedure”). For dimensions (die drawings) please consult with your carton supplier. As with outer components above, all inner components to be printed with a manufacturer’s code, batch number and date of manufacture.

4. **TABLE 1****PHYSICAL PROPERTIES OF CORRUGATED BOARD**

<b><u>Property</u></b>	<b><u>Average</u></b>
<b>Outer Component</b>	
Caliper unprinted board, mm, minimum - C Flute.	3,9
Difference between board calipers of printed and unprinted areas, % maximum	5,0
Ply adhesion (damp) N/ metre of length of corrugation, minimum	400
Flat crush resistance of printed board, KPa, minimum (not on flaps) - C Flute	250
Water absorption of outer/inner facings, g/m <sup>2</sup> per 30 minutes, maximum	120

<b><u>Property</u></b>	<b><u>Average</u></b>
<b>Inner Component</b>	
Caliper unprinted board, mm, minimum. Combined board (B and C Flute.)	6.2
Ply adhesion (damp) N/ metre of length of corrugation, minimum	400
Water absorption of outer/inner facings, g/m <sup>2</sup> per 30 minutes, maximum	120

## 5. MASS LOAD AT FAILURE

In the past the basis mass of the linerboard and the fluting was specified. The carton manufacturers agreed that it is prescriptive and that it must no longer be specified. It was agreed by all the role players that the mass load at failure must in future be specified.

Mass load at failure must be determined under the following conditions:

Conditioning atmosphere:-

a)  $32^{\circ}\text{C} \pm 1^{\circ}\text{C}$  and  $87\% \text{RH} \pm 1\% \text{RH}$  for 24 hours.

<b>Mass Load at Failure : 800 kg</b>
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b)  $0,5^{\circ}\text{C} \pm 0,5^{\circ}\text{C}$  and  $87\% \text{RH} \pm 1\% \text{RH}$  for 24 hours.\*

\* Mainly to test the performance of the glue used during the carton erecting process in packhouses.

Samples to be tested in accordance with sub clause 6.22 of S.A.B.S. 456:1973 "Corrugated Board Containers".

## 1.7 Specification for Standard A15C Carton

### SPECIFICATION FOR THE STANDARD A15C FULL TELESCOPIC CARTON FOR EXPORT CITRUS

#### 1. LINERS AND FLUTING

##### 1.1 Liners

All A15C full telescopic export citrus cartons must be manufactured with Virgin Kraft Linerboard.

##### 1.2 Fluting

All A15C full telescopic export citrus cartons must be manufactured with Semi chemical or other approved Hi – performance fluting. The fluting shall be essentially free from abrasive constituents that may induce a high rate of wear of corrugating rolls, and shall be such that it does not crack during the corrugating process.

#### 2. OUTER COMPONENTS

##### 2.1 Corrugated Board

The board shall be single – wall simplex board of “C” flute construction. For dimensions (die drawing) please consult with your carton supplier. For identification purposes a manufacturer’s code, batch number and date of manufacture must be printed on one of the outer top flaps. Details to be supplied by the exporter/export organisations.

#### 3. INNER COMPONENTS

##### 3.1 Corrugated Board

The board shall be double – wall corrugated board of “B” and “C” flute construction. Other corrugated board profiles eg. “B” and “E” flute and any other new designs to be approved by the packaging working group and export organisations first (see section 4 on page 39 – “Newly developed/experimental carton trial procedure”). For dimensions (die drawing) please consult with your carton supplier. As with outer components above, all inner components to be printed with a manufacturer’s code, batch number and date of manufacture.

4. TABLE 1PHYSICAL PROPERTIES OF CORRUGATED BOARD

<u>Property</u>	<u>Average</u>
<b>Outer Component</b>	
Caliper unprinted board, mm, minimum - C Flute.	3,9
Difference between board calipers of printed and unprinted areas, % maximum	5,0
Ply adhesion (damp) N/ metre of length of corrugation, minimum	400
Flat crush resistance of printed board, KPa, minimum (not on flaps) - C Flute	250
Water absorption of outer/inner facings, g/m <sup>2</sup> per 30 minutes, maximum	120

<u>Property</u>	<u>Average</u>
<b>Inner Component</b>	
Caliper unprinted board, mm, minimum. Combined board (B and C Flute.)	6.2
Ply adhesion (damp) N/ metre of length of corrugation, minimum	400
Water absorption of outer/inner facings, g/m <sup>2</sup> per 30 minutes, maximum	120

## 5. MASS LOAD AT FAILURE

In the past the basis mass of the linerboard and the fluting was specified. The carton manufacturers agreed that it is prescriptive and that it must no longer be specified. It was agreed by all the role players that the mass load at failure must in future be specified.

Mass load at failure must be determined under the following conditions:

Conditioning atmosphere:-

a)  $32^{\circ}\text{C} \pm 1^{\circ}\text{C}$  and  $87\% \text{RH} \pm 1\% \text{RH}$  for 24 hours.

<b>Mass Load at Failure : 600 kg</b>
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b)  $0,5^{\circ}\text{C} \pm 0,5^{\circ}\text{C}$  and  $87\% \text{RH} \pm 1\% \text{RH}$  for 24 hours.\*

\* Mainly to test the performance of the glue used during the carton erecting process in packhouses.

Samples to be tested in accordance with sub clause 6.22 of S.A.B.S. 456:1973 "Corrugated Board Containers".

## 1.8 Specification for A15C Supervent Carton

### SPECIFICATION FOR THE A15C SUPERVENT FULL TELESCOPIC CARTON FOR EXPORT CITRUS

#### 1. LINERS AND FLUTING

##### 1.1 Liners

All A15C Supervent full telescopic export citrus cartons must be manufactured with Virgin Kraft Linerboard.

##### 1.2 Fluting

All A15C Supervent full telescopic export citrus cartons must be manufactured with Semi – chemical or other approved Hi – performance fluting. The fluting shall be essentially free from abrasive constituents that may induce a high rate of wear of corrugating rolls, and shall be such that it does not crack during the corrugating process.

#### 2. OUTER COMPONENTS

##### 2.1 Corrugated Board

The board shall be single – wall simplex board of “C” flute construction. The die drawing was issued by the packaging working group. For identification purposes a manufacturer’s code, batch number and date of manufacture must be printed on one of the outer top flaps. Details to be supplied by the exporter/export organisations.

#### 3. INNER COMPONENTS

##### 3.1 Corrugated Board

The board shall be double – wall corrugated board of “B” and “C” flute construction. The die drawing was issued by the packaging working group. Other corrugated board profiles eg. “B” and “E” flute and any other new designs to be approved by the packaging working group and export organisations first (see section 4 on page 39 – “Newly developed/experimental carton trial procedure”). As with outer components above, all inner components to be printed with a manufacturer’s code, batch number and date of manufacture.

4. **TABLE 1****PHYSICAL PROPERTIES OF CORRUGATED BOARD**

<b><u>Property</u></b>	<b><u>Average</u></b>
<b>Outer Component</b>	
Caliper unprinted board, mm, minimum - C Flute.	3,9
Difference between board calipers of printed and unprinted areas, % maximum	5,0
Ply adhesion (damp) N/ metre of length of corrugation, minimum	400
Flat crush resistance of printed board, KPa, minimum (not on flaps) - C Flute	250
Water absorption of outer/inner facings, g/m <sup>2</sup> per 30 minutes, maximum	120

<b><u>Property</u></b>	<b><u>Average</u></b>
<b>Inner Component</b>	
Caliper unprinted board, mm, minimum. Combined board (B and C Flute.)	6.2
Ply adhesion (damp) N/ metre of length of corrugation, minimum	400
Water absorption of outer/inner facings, g/m <sup>2</sup> per 30 minutes, maximum	120

## 5. MASS LOAD AT FAILURE

In the past the basis mass of the linerboard and the fluting was specified. The carton manufacturers agreed that it is prescriptive and that it must no longer be specified. It was agreed by all the role players that the mass load at failure must in future be specified.

Mass load at failure must be determined under the following conditions:

Conditioning atmosphere:-

a)  $32^{\circ}\text{C} \pm 1^{\circ}\text{C}$  and  $87\% \text{RH} \pm 1\% \text{RH}$  for 24 hours.

<b>Mass Load at Failure : 600 kg</b>
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b)  $0,5^{\circ}\text{C} \pm 0,5^{\circ}\text{C}$  and  $87\% \text{RH} \pm 1\% \text{RH}$  for 24 hours.\*

\* Mainly to test the performance of the glue used during the carton erecting process in packhouses.

Samples to be tested in accordance with sub clause 6.22 of S.A.B.S. 456:1973 "Corrugated Board Containers".

## 2. PALLET SPECIFICATION

### SPECIFICATION FOR THE 1210 X 1010MM PALLET FOR EXPORT CITRUS

#### OPTION 1

##### 1. DESCRIPTION

Type: Non-reversible, perimeter base, four-way entry disposable pallet.  
Size: 1210mm x 1010mm x 153mm

##### 2. MATERIAL

All bearer blocks must be made of SA Pine timber. The remainder of the pallet must be constructed of SA Pine or Saligna. The density of SA Pine and Saligna must be at least 400kg/m<sup>3</sup> at a moisture content of 12%. For SA Pine, no wood may have a moisture content of more than 20% when used in constructing the pallet.

##### 3. COMPONENTS

###### Overall dimensions of Pallet

<b>Dimensions (mm)</b>	<b>Tolerances (mm)</b>
Length 1210	+ 0 - 2
Width 1010	+ 0 - 2
Height 153	+ 2 - 2

The overall dimensions and tolerances for the pallet as a whole are critical and overriding irrespective of the tolerances permitted for individual components below.

###### Timber components

	<b>Number</b>	<b>Length (mm)</b>	<b>Width (mm)</b>	<b>Height/Thickness (mm)</b>
Top slats	5	1010	100	19
	*2	1010	150	19
Bearers	3	1210	100	25
Bottom stringers	5	1010	100	19
Blocks	6	150	100	90
	3	100	100	90

\*Note: Two 75mm wide top slats can be used to replace the 150mm wide top slats

#### Tolerances

	<b>Length (mm)</b>	<b>Width (mm)</b>	<b>Height/Thickness (mm)</b>
Slats, stringers and bearers	+ 0 - 2	+ 3 - 2	+ 2 - 0
Blocks	+ 2 - 2	+ 2 - 2	+ 1 - 1

The variation in thickness on top deck planks next to each other must not be more than 2mm.

#### Squareness

Ends of slats to be cut square: Two (2) mm over width.

The diagonal dimensions of a complete pallet must not differ by more than 8mm from each other.

#### 4. **FINISH**

All components to be finely sawn.

#### 5. **DISCOLORATION**

No discoloration by paint, lacquer, pitch or any other substance which may taint fruit is permissible.

#### 6. **SAWN LUMBER DEFECTS**

No bark allowed on wood.

Permissible wane on slats:

Wane can be up to 25% of the total surface area of any one side of the top or bottom slats, provided that the opposite side has full-face area. The full face area must always be on top.

Presence of wood beetles or sign of wood beetles will be a reason for rejection.

Twist must not exceed 4 degrees.

Splitting is not permitted.

#### 7. **KNOTS AND KNOTHOLES**

The permissible size of knots shall not be in excess of 35% of the width of any timber used.

The following type of knots shall not be permitted:

Knots and knotholes interfering with nails.

Split splay (spike) knots and knotholes having sharp edges which could damage cartons on pallets.

Knots on edges of any timber not to exceed 25% of the width.

#### 8. **GRAIN**

The grain of the timber must run along the length of the blocks and slats.

**9. FASTENERS (See Annexure 1 and 2)**

All nails to be annular – ringed (ring-shank) type nails.  
Nails to be positioned as shown on the drawings.

Tops slats to bearers: 54 of 42mm x 2,5mm.  
Top deck to blocks: 18 of 75mm x 3,15mm.  
Bottom slats to blocks: 30 of 60mm x 2,5mm.

Nail guns must be set so that nails are not driven more than 2mm below the surface of the plank to prevent cracking.

On blocks the nailing area must not be reduced by more than 15mm.

**10. CONSTRUCTION**

Slats to be positioned as shown on the drawings.  
All tolerances shall be met. The bottom stringers must be flush against each other, leaving no gaps where they are joined.

**11. TREATMENT OF PALLETS**

Wood used when manufacturing wooden pallets for Export Citrus must be treated to prevent fungal growth. For full details regarding treatment of wooden pallets see the DAFF website [www.doa.agric.za](http://www.doa.agric.za).

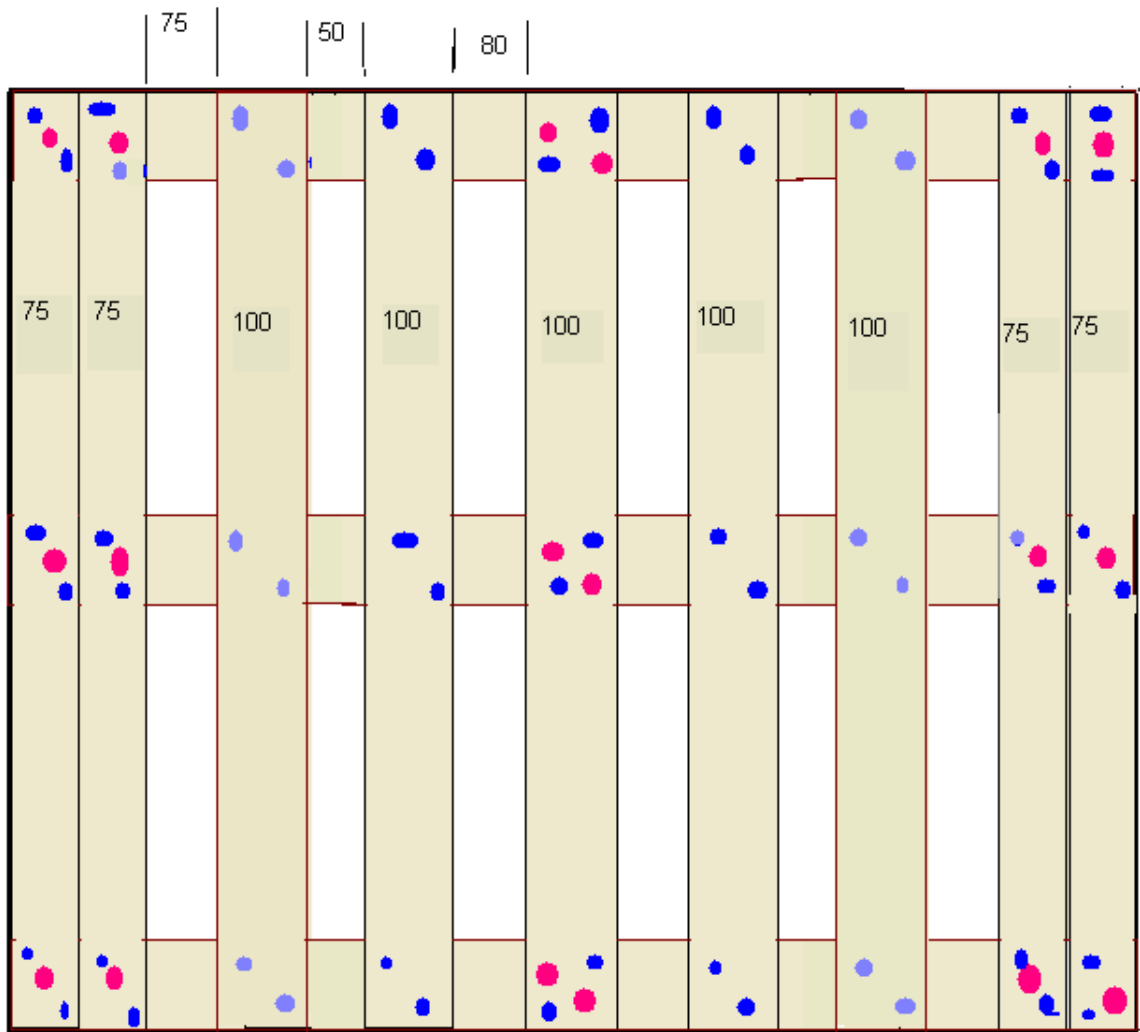
**12. MARKING**

Pallets to be clearly marked according to ISPM 15. If not legible the pallets will be rejected. The mark must be:- legible, durable and not transferable, placed in a location that is visible. For full detail see the DAFF website Annex 2. [www.doa.agric.za](http://www.doa.agric.za).

**13. TEST AND ACCEPTANCE PROCEDURE**

13.1 See Annexure 3.

**ANNEXURE 1**

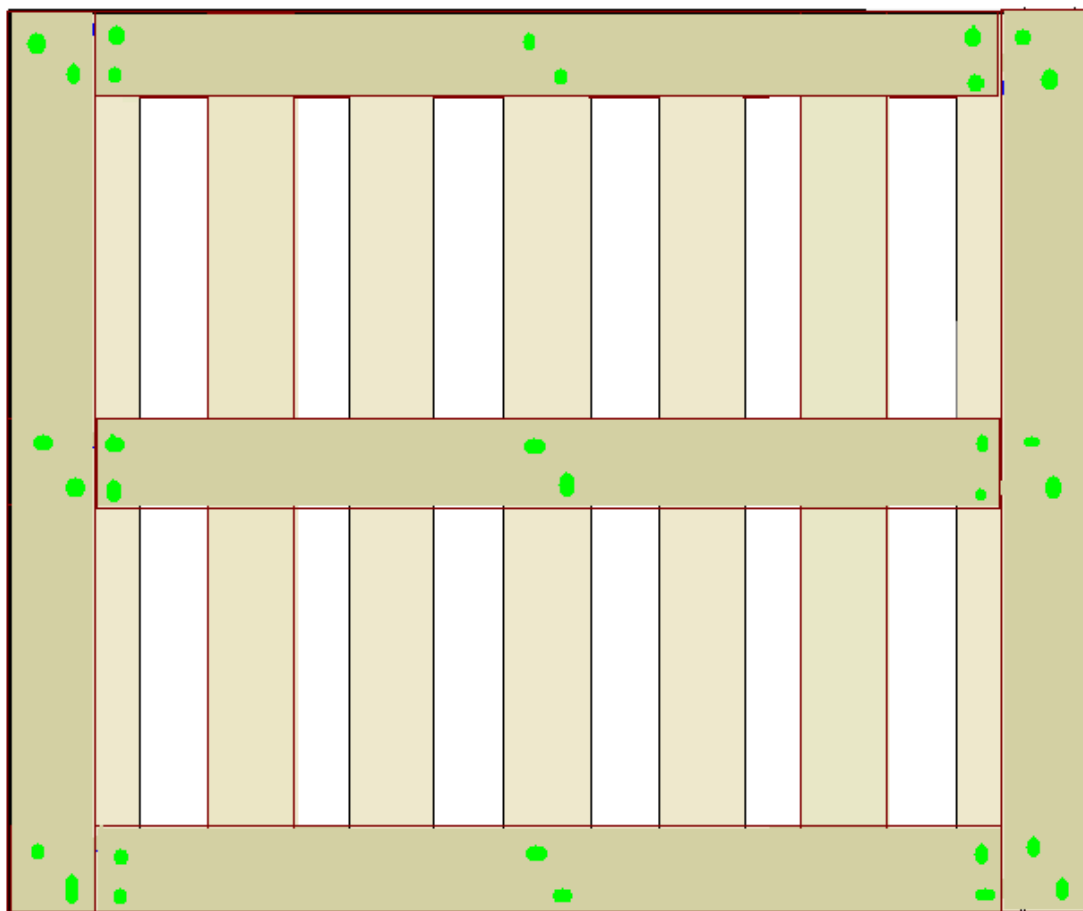


**Standard 1210 x 1010mm Pallet For Citrus Export Pallet**

**Option 1**

Nails:  
 Top to Blocks            18 of 75 mm x 3.15mm  
 Top planks to Bearers   54 of 42mm x 2.5mm

## ANNEXURE 2

**Standard 1210 x 1010mm Pallet for Export Citrus****Option 1**

Nails:  
Bottom planks to blocks 30 of 60mm x 2.5mm



Wane illustration (see item 6 page 24)

### **ANNEXURE 3**

#### **TEST AND ACCEPTANCE PROCEDURE**

##### **1. SIZE OF SAMPLE**

Five pallets will be chosen at random from a consignment of 200 pallets or part thereof and will be tested by the exporter.

##### **Rejection of consignment**

If in any sample more than one pallet is rejected, the consignment will be rejected entirely. Where only one pallet is found not to comply with specifications a further 5 pallets will be drawn and tested. Should any of these 5 pallets be rejected, the consignment in its entirety will be accepted after removal of pallets which visually show defects.

##### **Acceptance of consignment**

Any consignment which has passed the above sample test will be accepted in its entirety.

##### **2. TEST PROCEDURE**

###### **a. Visual check**

Check all visual aspects and measurements against the requirements of this specification.

### 3. PALLETISATION PROTOCOLS

#### 3.1 PALLETISATION PROTOCOLS FOR CONVENTIONAL VESSEL, STANDARD - AND HI-CUBE SHIPPING CONTAINERS

##### GENERAL INFORMATION

All dimensions in mm.

The stacking and stabilization of the cartons on the pallets are extremely important. The cartons on the first (bottom) layer must be positioned in such a way that the four (4) corners of the cartons are always placed on a top slat of the pallet. (The 4 corners of each carton must always rest squarely on wood).

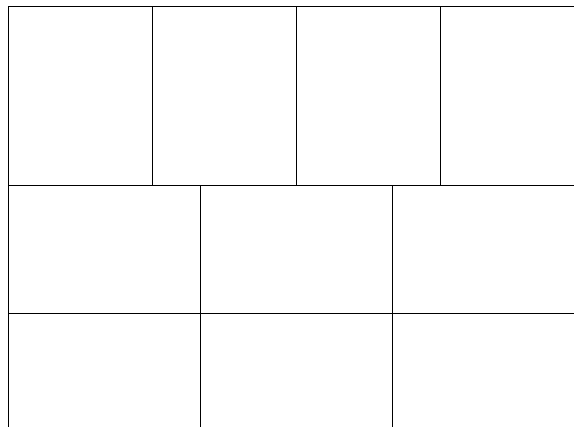
##### STACKING PATTERNS ON 1210 X 1010 MM FOUR WAY ENTRY DISPOSABLE EXPORT PALLETS

#### 1. FULL TELESCOPIC CARTONS – STANDARD CONTAINERS AND CONVENTIONAL VESSELS

##### 1.1 All A15C Cartons (400x300x270)

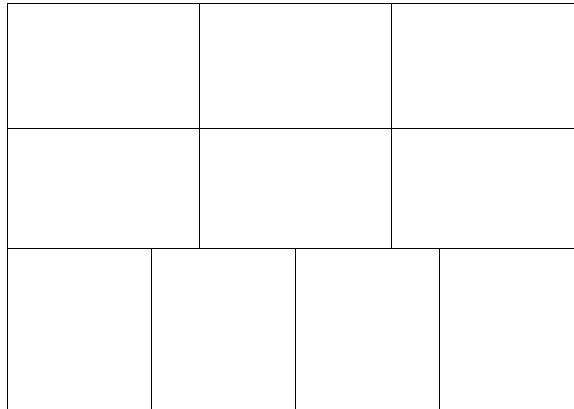
Stacking patterns – Layers 1,2,3,5 and 7.

1210mm



Stacking patterns – Layers 4 and 6.

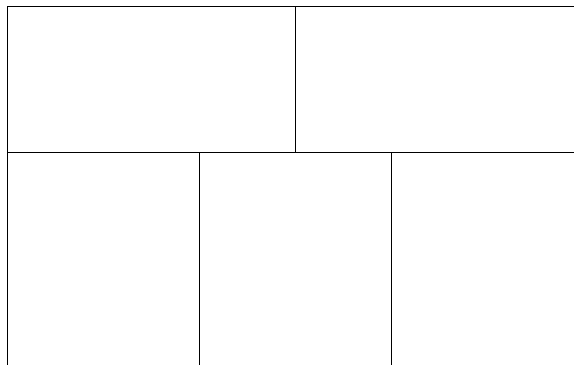
**1210mm**



**1.2 (T64)600 x 400 x 170mm and 600 x 400 x 215mm  
Citrus export cartons**

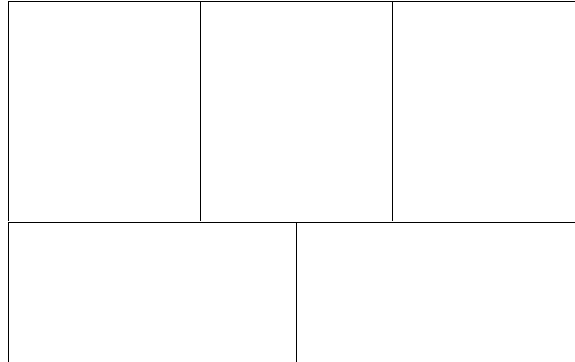
Stacking patterns (170) – Layers 1,2,3,4,6,8 and 10  
Stacking patterns (215) – Layers 1,2,3,4,6 and 8.

**1210mm**



Stacking patterns (170) – Layers 5,7,9 and 11  
Stacking patterns (215) – Layers 5,7 and 9.

**1210mm**

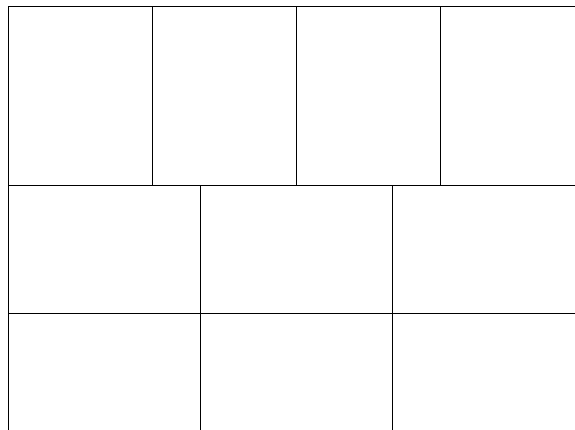


## 2. FULL TELESCOPIC CARTONS – HI-CUBE SHIPPING CONTAINERS

### 2.1 All A15C Cartons (400x300x270)

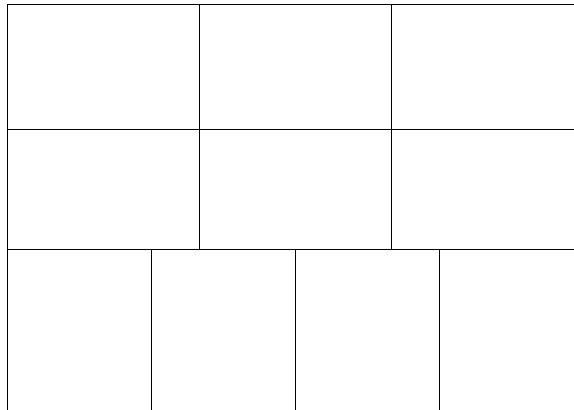
Stacking patterns – Layers 1,2,3,5 and 7.

**1210mm**



Stacking patterns – Layers 4, 6 and 8.

**1210mm**

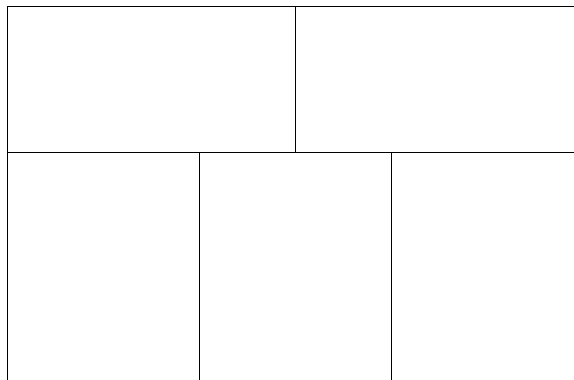


**2.2 (T64)600 x 400 x 170mm and 600 x 400 x 215mm  
Citrus export cartons**

Stacking patterns (170) – Layers 1,2,3,4,6,8,10 and 12

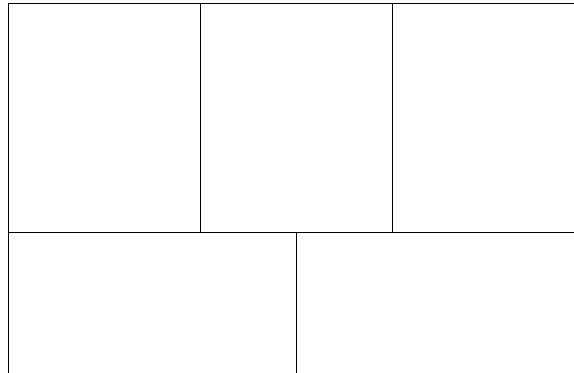
Stacking patterns (215) – Layers 1,2,3,4,6,8 and 10.

**1210mm**



Stacking patterns (170) – Layers 5,7,9,11 and 13  
 Stacking patterns (215) – Layers 5,7 and 9.

**1210mm**



### **3. STABILISATION OF CARTONS ON PALLETS**

#### **3.1 Full Telescopic**

Pallet loads to be stabilised with four (4) laminated paper corner pieces and horizontal plastic straps. The corner pieces to be placed on top of the pallets.

##### **Spot Gluing**

**In cases where spot gluing can be done successfully and the use of corner pieces for certain markets is not compulsory, cartons may be stabilised/secured with spot gluing and horizontal plastic straps. The spot glue must be approved by the export organisations. For the positioning of the horizontal plastic strapping on pallet loads, stabilised with spot gluing, see tables (full telescopic) on pages 37 and 38.**

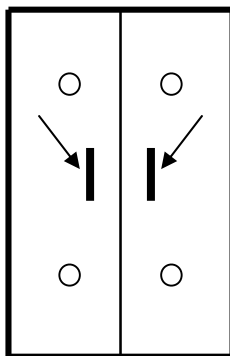
#### **3.2 Corner Pieces**

##### **Standard Containers and Conventional vessels:**

- Length – 1850mm
- Dimensions – 50 x 50 x 5mm
- The water absorption of the outer face of the laminated paper corner pieces: G/m<sup>2</sup> per 30 minutes, 120 maximum.

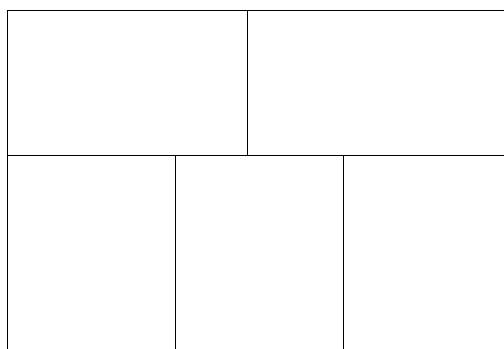
##### **Hi-cube Shipping Containers:**

- Length – 2130mm
- Dimensions – 50 x 50 x 5mm
- The water absorption of the outer face of the laminated paper corner pieces: G/m<sup>2</sup> per 30 minutes, 120 maximum.

**Positioning of Hot Melt Spot Glue****4. OPEN DISPLAY CARTONS CONVENTIONAL VESSELS, STANDARD - AND HI-CUBE SHIPPING CONTAINERS**

- 4.1 Stacking Patterns – 600 x 400 open display cartons. Column stacked all the way up

**1210mm**



- 4.2 Stacking Patterns – 500 x 300 (E10D) open display cartons. Column stacked all the way up.

1210mm


- 4.3 Stacking Patterns – 300 x 200 (A02D) open display cartons. Column stacked all the way up.

1210mm


## 5. STABILISATION OF CARTONS ON PALLETS

### 5.1 Open display cartons

Pallet loads to be stabilised with four (4) laminated paper corner pieces, securing sheets and horizontal plastic straps. The corner pieces to be placed on top of the pallets. All open display cartons to be covered with corrugated board pallet caps. **Under certain conditions and circumstances the use of loose end pieces will be compulsory and exporters/packhouses will be advised by their relevant carton manufacturer.**

## 5.2 Corner Pieces

### Standard Containers and Conventional vessels:

- Length – 1850mm
- Dimensions – 50 x 50 x 5mm
- The water absorption of the outer face of the laminated paper corner pieces: G/m<sup>2</sup> per 30 minutes, 120 maximum.

### Hi-cube Shipping Containers:

- Length – 2130mm
- Dimensions – 50 x 50 x 5mm
- The water absorption of the outer face of the laminated paper corner pieces: G/m<sup>2</sup> per 30 minutes, 120 maximum.

**STANDARD CONTAINERS AND CONVENTIONAL VESSELS**

<b>Carton type</b>	<b>No of cartons per layer</b>	<b>No of layers</b>	<b>No of cartons per pallet</b>	<b>Layers to be strapped</b>	<b>Securing sheet layers</b>
<b>Full Telescopic</b>					
A15C 400x 300x270 Std and SV	10	7	70	1,2,3,5 and 7	N/A
T64 600x400x170	5	11	55	1,2,3,4,6,9 and 11	N/A
T64 600x400x215	5	9	45	1,2,3,4,7 and 9	N/A
<b>Open Display Cartons</b>					
600x400x146	5	13	65	1,2,3,7,10 and 13	1,2,3,6 and 10
600x400x160	5	12	60	1,2,3,6,9 and 12	1,2,3,6 and 9
600x400x170	5	11	55	1,2,3,6,8 and 11	1,2,3,6 and 9
600x400x220	5	9	45	1,2,3,6 and 9	1,2,3,6 and 7
E10D 500x300x170	8	11	88	1,2,3,6,8 and 11	1,2,3,6 and 9
A02D 300x200x110	20	18	360	1,2,3,6,9,13, 16 and 18	1,2,3,5,8,12 and 15

**HI-CUBE SHIPPING CONTAINERS**

<b>Carton type</b>	<b>No of cartons per layer</b>	<b>No of layers</b>	<b>No of cartons per pallet</b>	<b>Layers to be strapped</b>	<b>Securing sheet layers</b>
<b>Full Telescopic</b>					
A15C 400x 300x270 Std and SV	10	8	80	1,2,3,6 and 8	N/A
T64 600x400x170	5	13	65	1,2,3,5,8,10 and 13	N/A
T64 600x400x215	5	10	50	1,2,3,5,7 and 10	N/A
<b>Open Display Cartons</b>					
600x400x146	5	15	75	1,2,3,7,10,13 and 15	1,2,3,6,10 and 13
600x400x160	5	14	70	1,2,3,6,10,12 and 14	1,2,3,6,9 and 12
600x400x170	5	13	65	1,2,3,5,8,10 and 13	1,2,3,6,9 and 12
600x400x220	5	10	50	1,2,3,5,7 and 10	1,2,3,5 and 8
E10D 500x300x170	8	13	104	1,2,3,5,8,10 and 13	1,2,3,6,9 and 12
A02D 300x200x110	20	20	400	1,2,3,6,9,12,15 and 20	1,2,3,5,8,12 and 15

## **4. NEWLY DEVELOPED/EXPERIMENTAL CARTON - TRIAL PROCEDURE**

### **1. Phase 1:**

Full laboratory tests.

Test results to be submitted to the packaging working group.

### **2. Phase 2:**

A total of 20 pallets (10 Experimental - and 10 Control cartons) to be shipped in Hi-cube containers to the UK or Europe.

### **3. Phase 3:**

Same as 2 above but shipped to the Middle East.

### **4. Phase 4:**

40 Pallets Hi-cube containers to the UK or Europe.

40 Pallets Hi-cube containers to the Middle East.

32 Pallets in a conventional vessel to the UK or Europe.

32 Pallets in a conventional vessel to the Middle East.

40 Pallets Hi-cube containers to a cold sterilization market.

32 Pallets in conventional vessel to a cold sterilization market.

A minimum of 10% control cartons to be shipped with each experimental shipment above.

### **5. Phase 5: (Semi-commercial phase)**

A total of 1000 pallets. 50% Hi-cube containers and 50% standard pallets in conventional vessels.

Again a minimum of 10% control cartons to be shipped.

Report on all experimental shipments (phase 2 to phase 5) to be submitted to the packaging working group.

As far as possible all trials to be packed at packhouses long distances away from the ports and ideally all trials to be shipped out of Durban. Very high humidity and therefore a severe test for any experimental cartons.

During all stages the carton manufacturer will take full responsibility for any consequential losses.

## 5. COMPLIANCE WITH SPECIFICATIONS – TESTING PROCEDURE FOR EXPORT CITRUS CARTONS

Cartons to be tested by an independent accredited laboratory.

- All tests to be conducted on batches manufactured.
- A batch will consist of 10 000 components.
- The first 5 samples to be tested. If they pass the whole batch will be accepted. If they are rejected for whatever reason the remaining 5 will be tested. If they pass the whole batch will be accepted. If the 2<sup>nd</sup> five samples fail the whole batch will then be rejected.

Sampling procedure:-

- Samples to be drawn at packhouses.
- Samples to be sent to an accredited laboratory by carton manufacturer.
- Samples to be sent to an accredited laboratory by farmers.

### ACTUAL LABORATORY TESTS.

#### 1. Physical Properties of Corrugated Board. (All full telescopic cartons).

##### Outer component

Property	Average
Caliper unprinted board, mm minimum (C flute)	3,9
Difference between board calipers of printed and unprinted areas, % maximum	5,0
Ply adhesion (damp) N/metre of length of corrugation, minimum	400
Flat crush resistance of printed board, KPa, minimum (not on flaps) – C Flute.	250
Water absorption of outer/inner facings, g/m <sup>2</sup> per 30 minutes, maximum.	120

**Inner component**

<b>Property</b>	<b>Average</b>
Caliper unprinted board, mm minimum Combined board (B and C Flute)	6,2
Ply adhesion (damp) N/metre of length of corrugation, minimum	400
Water absorption of outer/inner facings, g/m <sup>2</sup> per 30 minutes, maximum.	120

**2. Physical Properties of Corrugated Board. (All double wall board open display cartons).**

<b>Property</b>	<b>Average</b>
Caliper unprinted board, mm minimum Combined board (B and C Flute)	6,5
Difference between board calipers of printed and unprinted areas, % maximum	5,0
Ply adhesion (damp) N/metre of length of corrugation, minimum	400
Water absorption of outer/inner facings, g/m <sup>2</sup> per 30 minutes, maximum.	120

**3. Linerboard and Fluting.**

Compliance with SABS 431

**4. Mass load at failure.**

Mass load at failure must be determined under the following conditions :-

Conditioning atmosphere :-

- a) 32°C ± 1°C and 87% RH ± 1% for 24 hours.
- b) 0,5°C ± 0,5°C and 87% RH ± 1% for 24 hours. \*

\*Mainly to test the performance of the glue used during the carton erecting process in packhouses or at carton erecting centres.

## **5. Other requirements.**

### **5.1 Dimensions.**

Tolerances on blank sizes :- Length  $\pm$  4 mm and width  $\pm$  3 mm

All other dimensions :-  $\pm$  2 mm.

Manufacturer's joints and squareness of full telescopic cartons.

### **5.2 Printing layout/graphic designs.**

Positioning, lettering style, colour requirements, registering etc. to be shown on the printing layout/graphic design supplied by the exporters/export organisations.

However, with all the current graphic designs, inspection/tests will be difficult.

A penalty point system can also be considered. This will only apply for minor defects that will not have a negative effect on the actual performance of the cartons.

Eg. If the colours are not the correct shade or the positioning of the printing is not according to the printing layouts, penalty points could be allocated and after a certain amount of penalty points the exporters could decide to take the cartons at a discount.

For the exporters to decide.

## 6. CARTON MANUFACTURERS

The Citrus Industry feels strongly about the accreditation of carton manufacturers. It is unnecessary to say that this will be a long and difficult process. In the meantime it has been agreed to list the names of the carton manufacturers who are actively involved and part of the Citrus Cold Chain Forum/packaging working group.

In alphabetical order they are:-

- 6.1 APL Cartons (Pty) Limited
- 6.2 Corroseal Corrugated (Pty) Limited
- 6.3 Houers Co-Operative Limited
- 6.4 Mondi Packaging SA (Pty) Limited
- 6.5 Nampak Corrugated (Pty) Limited
- 6.6 New Era Packaging (Pty) Limited
- 6.7 Sunny Packs Manufacturing (Pty) Limited

### **For any enquiries please contact:**

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