



SOUTH AFRICAN STONE FRUIT INDUSTRY PACKAGING MATERIAL GUIDELINES 2023/2024

IMPORTANT POINTS TO REMEMBER

- Only source cartons and other packaging material from **reliable/accredited suppliers/manufacturers**. Ensure that you receive what you have ordered.
- Insist that cartons must have adequate **horizontal and vertical ventilation** capabilities.
- Cartons must have sufficient **compression strength** that can withstand pressure on bottom layers of hi-cube loads in high humidity (90%) conditions
- Do not exceed the **total pallet height** of 2.4m for containerised consignments (keep below the top of the 'Red Load Line').
- Wooden pallet bases of good quality and **sound palletisation methods** are essential for cargo to withstand the numerous forklift handlings in the logistics chain. In the case of shipments in specialised reefer vessels, pallets are subjected to many more handlings than containerised shipments.
- **SOPP fungicide** may not be used for the treatment of wooden pallet bases as fruit and cartons can be contaminated above the allowed MRL's.
- Correct **width of slats and spaces between slats** are vital to ensure that carton ends rest on slats and not in gaps.
- Pallet corner blocks must be clearly marked (not stamped) with the **ISPM15 mark** to indicate the treatment method.
- Use temperature management tools (**thermocouples & temperature recorders**) to manage the all-important cold chain.
- Check that all plastic trays are correctly punched to allow moisture to drain.
- Take note of Food Safety Issues (Annexure 2).
- Strong action is taken by certain supermarkets and countries to prohibit the use of specific plastics. Check the latest situation regularly.
- **Please note that it is the responsibility of the purchaser to specify the standards of packaging material and to check that the specification is applied. Although Hortgro may provide guidelines, it will not be liable for deviations.**

STONEFRUIT PACKAGING MATERIAL GUIDELINES

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STONEFRUIT PACKAGING MATERIAL GUIDELINES

1. CARTONS

1.1 General

Cartons are specifically designed and manufactured for the following purposes:

- Unitisation
- Protection
- Conditioning
- Promotion
- Functionality
- Circular environment

It is therefore very important that when ordering cartons, cognizance be taken of these properties to ensure that cartons comply with specifications and that the fruit is handled and presented in the best possible manner.

Cartons are mainly constructed from kraft or white corrugated paper board. This corrugated board consists of three components namely liner sheets, corrugated sheet (fluting) and adhesive. The combination and properties of these components determine the strength of the carton.

Plastic lugs can be used instead of cartons. The same design requirements as for cartons would be necessary.

1.2 Ventilation

Sufficient ventilation of cartons is crucial to ensure that fruit is effectively pre-cooled and that the cold chain is maintained throughout the handling process.

Airflow consists of both a horizontal and a vertical component. Sufficient horizontal airflow is required for pre-cooling in forced air cooling tunnels where air direction is horizontal. In integral reefer containers and specialized reefer vessels the air flow is vertical and therefore cartons should provide for vertical airflow. Often vertical cooling is neglected and results in costly breaks in the cold chain.

Air holes at the bottom of the carton are important for vertical cooling. The amount and spacing of these air holes are a function of paper combination, type of inside packaging and type of wooden pallet used. It is recommended that at least 5% of the surface area on each surface be open for air flow. There are also some "Super Vent" carton designs available to the industry and these should be seriously considered (See drawing in Annexure 1). This carton type will shorten the pre-cooling times, which will benefit fruit quality in certain incidences, as well as reducing energy costs and time needed during the peak usage periods.

Inner packing material in most cases unfortunately blocks off ventilation holes. The physical vertical air flow could be compromised. Keep this in mind when deciding on final pre-cooling practices or temperature regime within containers.

1.3 Target Market

The carton type and carton design are functions of the specific target markets. For example, the UK market is less exporter trademark orientated as supermarkets want to promote their own trademarks. The UK market is therefore more focused on generic black and green cartons. Bulk packed product is

also sometimes preferred so that fruit can be used for prepacking into different sales formats at an UK packing facility. As a result the carton used for exporting the fruit is then disposed of.

1.4 Marking Requirements

This is an extremely important aspect as all fruit presented for export needs to adhere to the correct marking requirements as set out by DACRAD for the particular commodity. The BUSINESS PANEL (also called the Information Panel) of any carton (including printed carton labels) should comply with the requirements as established by DACRAD or to any other regulations that are specified by a target market. Present your design to PPECB before you order any cartons from a manufacturer. The following is normally required:

- The expression "Extra Class", "Class 1", "Cat 1", "Category 1", "Class I", "Cat I", "Category I", "Class 2", "Cat 2", "Category 2", "Class II", "Cat II" or "Category II."
- Fruit Type
- Carton Depth
- Country of Origin: "Produce of South Africa"
- The name and physical or postal address of the producer, exporter or owner of the contents of container.
- Name of Variety as set out by DACRAD
- Minimum and Maximum diameter in mm with Diameter Code
- Content of Carton if it contains a number of prepacked units: eg "14 x punnets or bags"
- PUC or PHC Code: Registered Producer – or Pack House Code with DACRAD
- Date Code
- Orchard name or number
- Food Safety Accreditation Number: Global Gap, Nature's Choice registration number etc.

Note: The following descriptive words are not allowed:

- Super quality
- Select
- Excellent
- Quality selected
- Best of South Africa
- Pride of South Africa'
- Special for juice
- Superior quality
- Extra Special
- Special
- Supafruit
- Premium
- Superior
- Quality guaranteed

1.5 Carton Specification

Cartons should only be sourced from reputable/accredited manufacturers. The purchaser should insist that a 1 in 1000 sample of each lot be held by the manufacturer until the end of the season in case of claims.

Due to the fact that problems are experienced annually with cartons of which certain layers, especially the bottom layers, cave in after pallets are placed in cooling facilities or after arrival overseas, the Stone Fruit Packaging Material Workgroup thought that it would be prudent to supply producers/packers with a set of suggested minimum compression strengths.

Producers/packers should ensure that they receive the specific product that they ordered and for which they paid. It is of extreme importance to receive test samples of each batch of cartons and to keep it in a storeroom for testing / verification purposes by SABS, should problems be encountered

with carton strengths. This is the only way to finalise a claim successfully, since the principle of authentication should be practiced at all times. Authentication is not just applicable on fruit but also on packaging material.

Specifications:

- Liners and fluting must comply with SABS 431-1985 stipulations.
- Minimum flat crush after printing must be 329kPa.

In practice machine erected cartons seem to be more sturdy than hand folded cartons provided the correct glue is used and close supervision is applied in the assembly process.

The use of below standard packaging material must be strongly discouraged by all parties involved, due to the negative impact it has on fruit quality and also the harmful influence on the overseas image of SA stone fruit. Manufacturers are sometimes unjustly blamed for cartons that cave in due to weak palletizing actions.

The PAPER COMBINATION should not be observed in isolation and is a function of carton type and carton design. Please note carefully the fluting (BE or BC) of paper. This determines the strength of the carton and is also a stipulating price factor.

Compression strength minimum is recommended based on following calculation basis. Number of cartons per pallet column multiplied by gross mass of carton. This figure is then given a safety factor of 5.6 and the result would be the minimum crush strength recommended.

Eg 300 x 400 *118 plum carton

Gross mass 5.6kg

Quantity per column 18 but work on 19 as low profile pallet allows 19.

Minimum recommended crush strength 595kg.

CARTON TYPE/ PALLET	RECOMMENDED CARTON QUANTITY	Ctn's per Colum	Gross mass per Ctn in kg	Minimum recommended crush strength
	FOR "HI CUBE"			
600 x 400 x 130 mm	80	16	13	1,165
600 x 400 x 115 mm	90	18	11	1,109
600 x 400 x 110 mm	95	19	11	1,170
600 x 400 x 90 mm	115	23	12	1,546
600 x 400 x 85 mm	120	24	12	1,613
600 x 400 x 76 mm	130	26	6	874
400 x 300 x 150 mm	140	14	10	784
400 x 300 x 118 mm	180	18	6	605
400 x 300 x 104 mm	200	20	6	672
400 x 300 x 82 mm	240	24	6	806
400 x 300 x 76 mm	260	26	6	874
400 x 300 x 70 mm	280	28	6	941

1.6 Pallet Heights

The height of a pallet, when palletisation is completed, is of critical importance in the handling and shipping process.

Pallet heights are determined by:

- Type of carton and carton strength;
- Racking in cold stores
- Pack house / Cooling facility loading ramps;
- Type of shipping and container; and
- Road transport.

Sufficient clearance should be provided between the top of the pallet and the transport mode's roof to ensure that forklifts can operate efficiently without damaging the pallet and its contents. This is particularly important when a forklift is negotiating loading ramps.

A maximum pallet height of 2,14 m can be rated as a good industry standard in the case of conventional shipping. It leaves enough room for airflow and workspace and will be sufficient in most cases. In the case of hi-cube integral containers, the maximum pallet height is set at 2,40 m. There is a specific **"Red Loading Line"** marked in the container that indicates the maximum height pallets can be stacked to ensure that airflow in the container is not restricted.

VERY IMPORTANT: Please remember the wooden pallet base height: The standard wooden pallet base is +/- 155 mm high and the CHEP pallets are +/- 176 mm high.

The following **RECOMMENDED PALLET HEIGHTS** are based on standard wooden pallet base and are as follows:

CARTON TYPE/ PALLET	RECOMMENDED CARTON QUANTITY FOR "HI CUBE"	CTNS per COLUMN	RECOMMENDED CARTON QUANTITY FOR "HI CUBE"	CTNS per COLUMN
Pallet Base Height	154mm (Standard)		134mm*	
600 x 400 x 130 mm	80	16	85	17
600 x 400 x 115 mm	90	18	95	19
600 x 400 x 110 mm	95	19	100	20
600 x 400 x 90 mm	115	23	125	25
600 x 400 x 85 mm	120	24	125	26
600 x 400 x 76 mm	130	26	145	29
400 x 300 x 150 mm	140	14	150	15
400 x 300 x 118 mm	180	18	190	19

CARTON TYPE/ PALLET	RECOMMENDED CARTON QUANTITY FOR "HI CUBE"	CTNS per COLUMN	RECOMMENDED CARTON QUANTITY FOR "HI CUBE"	CTNS per COLUMN
400 x 300 x 104 mm	200	20	210	21
400 x 300 x 82 mm	240	24	270	27
400 x 300 x 76 mm	260	26	290	29
400 x 300 x 70 mm	280	28	320	32

(*NB: This 134mm pallet is a special low profile pallet but not suited for pallet jack handling)

*Please note:

- Trials are being conducted with a 1190x990x154mm pallet to allow the stacking of 21 pallets in a container. This pallet has a smaller base and cartons dimensions have to be adjusted to fit the palletbase. There are several criteria that have to be considered to avoid damages and losses.
- The level of container loading docks directly influences the number of cartons that can be stacked safely on a pallet. A too sharp incline or decline can lead to cartons being damaged at the door of the container.

CARTON DIMENSIONS are specified as the following: eg **600 X 400 X 85 mm**.

600 = Length of carton = Outside dimensions
 400 = Width of carton = Outside dimensions
 85 = Depth of carton = Inside dimensions

Note pallets are racked and the quality is important as failure, due to sub-standard pallets, can result in legal issues. Remember terms "reasonable man" and "due diligence". If your pallet is sub-standard and someone is injured the claim is against you.

1.7 Weight of Packs

There is often confusion surrounding the NETT and the GROSS WEIGHTS of the different packaging types per fruit kind. It is also important to make provision for moisture loss from the time of packing until point of sale. Moisture loss may differ between commodities / varieties / packaging types and maturities of fruit. See below the accepted industry weight norms for standard equivalent packs per fruit kind.

STANDARD EQUVALENT PACKS PER FRUIT KIND	GROSS FRUIT WEIGHT AT PACKING *** (Fruit + packaging)	NETT WEIGHT OF FRUIT AT PACKING (without packaging)	NETT WEIGHT OF FRUIT AT SELLING (without packaging)
APRICOTS: (104/ 118 mm)	5,5 kg	5.0 kg	4.75 kg
PLUMS: (104/ 118 mm)	6.0 kg	5.5 kg	5,25kg
PEACHES/NECTARINES: (70/76/82 mm) - n/a – based on count / diameter group			

** Gross weight at packing is a function of the variance in weight of different carton types and/or inner packaging – the above gross weights only serve as guidelines.(It is important to note that if your

packaging guideline has gross mass greater than the standard, you need to advise your manufacturer accordingly.)

For other packtypes such as punnets, it is important to verify with clients / receivers what the required nett weight needs to be. Incorrect nett fruit weights in the market can lead to rejections with serious financial implications.

As a general guideline for punnets, add an additional **10%** nett weight at packing to make provision for moisture loss during the subsequent cooling and shipping of the product. For example: For a required nett selling weight of 500 g, add an additional 50 g to the packing weight – thus 550 g at packing.

1.8 Sizing - EU Size Groups

(Refer to Export Standards for allowable sizes per cultivar)

Apricots		Peaches and Nectarines			Plums	
Mark	Diameter	Mark	Diameter	Count	Mark	Diameter
XXXL	60 – 65 mm	AAAA	≥ 90mm		AAA	60 – 65 mm
XXL	55 – 60 mm	AAA	80 – 90 mm	13	AA	55 – 60 mm
XL	50 – 55 mm	AA	73 – 80 mm	15	A	50 – 55 mm
L	45 – 50 mm	A	67 – 73 mm	18	B	45 – 50 mm
M	40 – 45 mm	B	61 – 67 mm	20, 23	C	40 – 45 mm
S	38 – 40 mm	C	56 – 61 mm	25, 28		
		D	51 – 56 mm	30		

2. Internal Packaging

2.1 Punnets

Punnets are manufactured from two types of materials namely Polypropylene (PP) with a milky appearance and Polyethylene-terephthalate (PET) that is transparent. PET is increasingly required

by supermarkets. **VERY IMPORTANT: WHEN ORDERING PUNNETS, PLEASE INSIST ON R-PET (RECYCLED PET).**

A considerable number of punnets are available. Ensure they have the correct food safety standards, recycled content and migration reports.

The stone fruit industry mainly uses two weight formats of punnets:

- 500g Punnet
- 750g Punnet

The main two pack formats in use are:

- 10 x prepacks
- 13 x prepacks

From a cooling and fruit quality perspective it could lead to catastrophic results if the optimal guidelines of Punnet & Carton are not followed. Make sure that the punnets fit into the carton and that the airflow is optimal.

Punnets can accommodate different kinds of lids. If the program requires lids, ensure that it is of the correct specification. Make sure that the lid fits firmly onto the punnet, as it may “jump off” during transportation and damage the fruit. An alternative to using separate, loose lids are clamshell punnets. Ensure that the lid of the clamshell is properly clipped in during packing to ensure that punnets remain closed during handling and storage.

There are pulp/corrugated punnets being produced as alternatives to single use plastic packaging and it would be prudent of the SASFA to do tests on these alternatives.

2.2 Trays

It is very important to order trays long before the start of the season due to the fact that imported (sea transport) trays could be subject to delays in the logistics chain.

Before fruit is placed into the tray, make sure that the hole in the bottom of each cup is open.

Pulp trays still reigning supreme in the stone fruit industry, especially with most of the 400 x 300 mm packings. No pulp is used in the 600 x 400 mm packing unit at present since it does not compliment the presentation.

Growers are strongly encouraged to keep record of all lot numbers per batch pulp trays purchased. This information is of vital importance in the event of a recall.

2.3 Shrivel Sheets

Shrivel sheets play a very important role and the science surrounding this packing material item is far more complex than we realize. It plays a major role in the fight against excessive moisture loss of fruit during the cooling and logistical processes. Due to the gas interchanging effects it brings forward, it retards the physiological processes that take place in the fruit during cooling and shipping. The sheet thus impacts significantly in the improvement of the fruit quality.

No benefits are gained when shrivel sheets are used during airfreight.

Do not expect that the shrivel sheet will prevent the appearance of shriveling with “abused” fruit, i.e. picked fruit that was subjected to the sun in the orchard or stood on pack house floors with high temperatures. This is critical for both nectarines and plums.

There are mainly two types of Generic shrivel sheets in use:

- Paper sheet

- High Density sheets with 6mm perforations – mainly used for plums – can also be used for nectarines

These sheets are locally produced with a number of different measurements and a number of perforations. The most common sizes are 600x400 mm and 800x500mm.

The Standard Perforated Grape Plastic Bag can also be used as an inner in punnet as well as other carton packaging to minimize the development of shrivelling on plums. It works well and is cost effective, just ensure the grape liner has the correct ventilation.

Ensure that sheets purchased have all perforations correctly punched out. Also ensure that the sheet is placed correctly in the carton and that it is adequately enfolded when the fruit is packed. For the top layer of a pallet it is advisable that after the sheet is enfolded, to place a white or kraft ruffled sheet on top before the carton (open display) is palletised. This will prevent that shrivel sheets are “sucked” out of cartons during the cooling processes.

2.4 Plastic Bags

The 500g plastic bag for plums has gained acceptance during the past few years. Various grades of perforation are available and transparent plastic is normally used. Bags are also cost effective. MAP and “Long Life” bags or pallet covers are new technologies in which the UK supermarkets specifically take interest, and exporters are encouraged to do research in this regard. This technology concentrates mainly on mature fruit that is exported by sea. Ensure the service providers supply the bag atmosphere modification specifications and the bag is suitable for the temperature ranges experienced throughout the cold chain.

2.5 Riffled Paper

White riffled/corrugated sheets (58g) are very prominent in our industry. Should it not be required, kraft (brown) 60g ppu sheets may be used as a substitute for the white sheets. Kraft riffled sheets are also of good quality, serves the same purpose and are more cost effective.

Two sizes are available:

- 400 x 300 mm
- 600 x 400 mm.

2.6 Sponge/ “Bubble Pack”

Sponge/foam sheets are very handy in pack houses and have many applications and usages. They are mainly used for 400 x 300 mm packs but not for 600 x 400 mm packs. A 3 mm thickness with a density of 20 m³/m² is normally used. Ensure that you purchase the correctly specified product, since products of poor quality are in circulation. Sponge sheets are normally used in combination with white or kraft riffled sheets. Migration certificate is absolutely vital from supplier.

Bubble Pack protects the fruit very well and is cost effective. It is available in 400 x 300 mm and 600 x 400 mm sizes.

2.7 Paper Inter-Leaves

White/purple paper inter-leaves are still widely in use with 5kg plum loose packs. Sponge sheets may be used instead of this sheet, especially with apricots. White inter-leaves are supplied in sizes of 400 x 300 mm and will probably be around for some time because it is more cost effective than sponge sheets.

3. Palletisation

3.1 Wooden Pallet Base

The content of this document should be considered as a guideline and the application thereof may differ for every unique situation. The Stone Fruit Packaging Work Group can not be held responsible for the use and application of the above mentioned information or any actions and consequences arising from the use of the information. Any application of information taken from this document is done so at the users own risk.

Chep pallets are demanded by some supermarkets. Although it is a very sturdy high quality pallet and can be cost effective, it has the following disadvantages:

- Due to the fact that it operates on a basis of an “exchange system”, a very accurate and intensive administration system is required for it to be effectively managed
- Being ± 21 mm higher than a standard pallet, it could reduce the number of layers that can be stacked on the pallet and still fit into the container under the “Red Load Line”
- Vertical airflow may be less than of standard pallets
- It is advisable to put a sheet of cardboard on pallet base when using a Chep pallet as the carton edges do not always fall on a top slat.

The Standard White Block pallet is the recommended pallet base for stone fruit. Many manufacturers are active in this area and this unfortunately leads to big variations in quality and deviations in dimensions. This contributes to the preference of some supermarkets for the expensive Chep pallet. A well-manufactured standard wooden pallet is more than adequate and it is a pity that a negative sentiment, due to poor craftsmanship is becoming increasingly prominent. The standard locally produced wooden pallet must be 1200 x 1000 x 155mm (**See Annexure 3 for the White Block Pallet specification**)

Make sure that the pallet is square as the secret of a stable pallet is to get the first layer of cartons square!

Very Important! Kiln dried pallet are recommended. All pallets must be treated or treated to ISPM15 standards and currently DALRAD accredited supplier/manufacturer. Pallets may be treated with a suitable fungicide (NOT SOPP) provided it does not contaminate the fruit. Pack houses must ensure that suppliers do not supply pallets that can lead to MRL's on fruit exceeding limits set by the different markets. A clear and legible **ISPM15 mark** with the relevant information must be stamped/stenciled on at least 2 of the 4 corner blocks.

Racking systems are increasingly used in cold stores. Ensure that the pallet base is strong enough to prevent excessive sagging in the racks as this will not only lead to fruit damage but also holds a safety risk to cold store operators.

21 Pallets in a Container

There is a trend in the industry to try and ship 21 pallets per container. There are, however, specific challenges that need to be resolved.

The dimensions of the White Block pallet does not allow 21 pallet loads to be placed in a 12 m container. Should the pallet dimensions be adjusted to allow 21 pallet loads, it will have a large cost saving and can also address the open floor space at the door-end that presently has to be covered with a void plug.

BUT KEEP THE FOLLOWING IN MIND!!

1. The dimensions of the pallet base must be less than that of the White Block pallet
2. If the pallet base dimensions are changed, the carton footprint must be adjusted accordingly
3. This impacts on the the tray and internal packaging sizes
4. Any change in the carton's internal packaging may effect the airflow or fruit quality
5. Pallet slat positions must be adjusted to support cartons properly to avoid bottom sag and/or blockage of vertical ventilation
6. Should the changed carton dimensions result in a pallet height exceeding the Red Load Line in the container, a low profile pallet needs to be used
7. A low profile pallet should still provide for pallets to be handled with pallet jacks in the distribution overseas

3.2 Pallet Purchasing Strategy and Storage

The selection of supplier, the quality control and the storage of pallets are critical in ensuring a secured supply of good quality pallets throughout the packing season (Refer to Annexure 4 for guidelines).

Check pallets for potential wood borer presence if the timber source is potentially from a forested area where there was a fire. This especially applies to timber three months after the fire. The best place to check is where the bark has been removed.

3.3 Pallet Sheets (“Deck Boards”)

A practice that is strongly discouraged is when pallet sheets are placed on pallet bases to restrict bottom sag of cartons when gaps between pallet slats are too big. These pallet sheets are expensive and severely limit vertical airflow in pallet loads. It is impossible to save a below standard carton with a pallet sheet. The same applies in cases of poor palletising.

3.4 Sidepieces (PVC and paper)

It is strongly recommended that sidepieces be used to ensure stable pallet loads.

PVC = 500x25x20x2/3mm. Paper = 500x30x30x3mm.

Sidepieces are nailed/stapled onto both the long and the short sides of the pallet base with 20 mm nails before palletising commences.. It contributes substantially to stabilise pallets and prevents that cartons slide from the pallet, especially when pallet sheets are used.

Standard 20 mm nails are used to nail down the PVC sidepieces onto the wooden pallet base. Four nails per sidepiece are adequate. Care should be taken that no loose nails are allowed inside the packing areas. Pallets must be prepared outside the packing area.

3.5 Securing Strips/Sheets

Not using a securing strip/sheet is a guarantee for pallet failure!

Sometimes it happens that a large consignment of cartons is delivered at a producer/supplier without the matching securing strips/sheets. Each particular carton type or design requires a unique set of securing strips/sheets. Without adequate securing strips/sheets proper palletising is impossible, as the pallet will turn diagonal during handling, lean over and later collapse. In many instances the bottom layers are also compressed. Securing strips/sheets fasten and stabilise the pallet internally and acts as a “skeleton”. It is very important to place the correct number of securing strips/sheets on the specified layers. A minimum of five sets of securing strips/sheets per pallet, of which 2 sets are placed on layer number one and two, will ensure a stable pallet.

If a securing sheet is used, ensure that it has adequate holes to provide for vertical air flow.

Note: Carton manufacturers supply specific packing instructions with cartons, including securing sheet requirements. If these standards are not met and carton failure occurs, the cost of failure is for the Packers account.

Important: Note that 300mm x 400mm cartons can be stacked either 3/4/4 or 4/3/4 configuration on a 1000 x 1200 mm palletbase. Your securing strips/sheets must be ordered according to your choice of configuration, or you have to change your configuration according to the strip/sheets you have received.

3.6 Buckles

The standard metal buckles that allow for re-tensioning of straps are recommended for securing of pallet straps.

3.7 Corner Pieces

Although there are cheaper plastic angle pieces available, barrier-coated angle pieces are normally used. From a food safety point of view, certain target markets may have a problem with the plastic

angle pieces. The 40x40mm is the most common size but the packer must consider the overall trip and transport method. The longer the trip and with more handling the thicker the size recommended. The length must match the pallet height so that the top layer of cartons is secured without the angle pieces protruding.

The implications of wrapping of pallets with plastic netting must be carefully considered before it is accepted as a standard practice. Restriction of air flow, drawing of samples for inspection and QC, pollution, etc. must be kept in mind.

3.8 Top Frames

Top frames (short corner pieces) are used on the horizontal edges of the top layers on the pallet to prevent vertical straps cutting into the cartons and damaging cartons/fruit.

Top frames are barrier-coated and a set consists of four parts:

- 2 x Long side: 40 x 40 x 1206 mm.
- 2 x Short side: 40 x 40 x 580 mm.

Proper palletising is impossible in the absence of top frames.

3.9 Pallet Cap

The protection of the top of the pallets is especially important to protect exposed fruit against physical damage, exposure to pollution (especially dust) and contamination. It also assists in holding the cartons columns on the pallet in place.

The specially designed pallet cap can be used, but the 1000 x 1200 mm "AB Board" type can be used as a substitute. The "AB Board" is not only more cost effective but also more durable. The pallet cap must be strapped down to ensure that it does not increase the height of the pallet. Keep in mind that the pallet cap may restrict vertical airflow.

3.10 Wooden Top Frames

Wooden top frames are especially used with apricots and sensitive plum cultivars that are transported over long distances and dirt roads. It prevents rub marks on the top layers of the pallets. Only one type of standard wooden top frame is used in the industry.

Top frames also have to comply with the ISPM 15 standard and must contain the ISPM 15 mark.

N.B. Wooden top decks are not allowed for UK markets and should be removed before containerizing.

4. Thermocouples

It is essential to use a thermo couple to maintain the integrity of the cold chain. The ends should be heat welded together so that penetration of the fruit and temperature measurement can take place more accurately. Place the heat welded end of the wire **into a fruit** in a carton in the center of the pallet (at a position more or less halfway of the pallet height) or at a comfortable working height. The other end of the wire is placed on the outside on one of the short sides (1000 mm side) of the pallet. Refer to the PPECB document on "Guidelines for the use of thermocouples."

Ensure that a thermocouple identification sticker is placed on each pallet where the thermocouple ends protrudes from the pallet. (As well as the specific box where the thermocouple is put in). **This yellow sticker must have the wording to indicate that it is a thermocouple for temperature measuring purposes.**

5. Temperature Recorders

Several temperature recorders are available to the industry. Before deciding on a specific one, please make sure that your overseas receivers have the necessary software to download information. Make sure that specific cartons and pallets are marked accordingly so that overseas QC personnel can retrieve recorders easily. Manufacturers will issue recorders with specific stickers so that cartons and pallets can be marked clearly.

(A comprehensive guide for selection and use of temperature recorders can be found in Hortgro's Stone Fruit Handling Protocol Guidelines)

6. Traceability Registration

All commodities, varieties, packs/cartons/sizes, classes, brands, target markets, inventory codes and PUC/farm codes used for the export of fruit must be registered according to DALRAD standards and requirements.



It should be noted that if a consignment is delivered at an industry facility without the required registration, intake may be delayed and additional costs incurred. Therefore, please make sure that all packs are registered before a season commences.

7. Closing

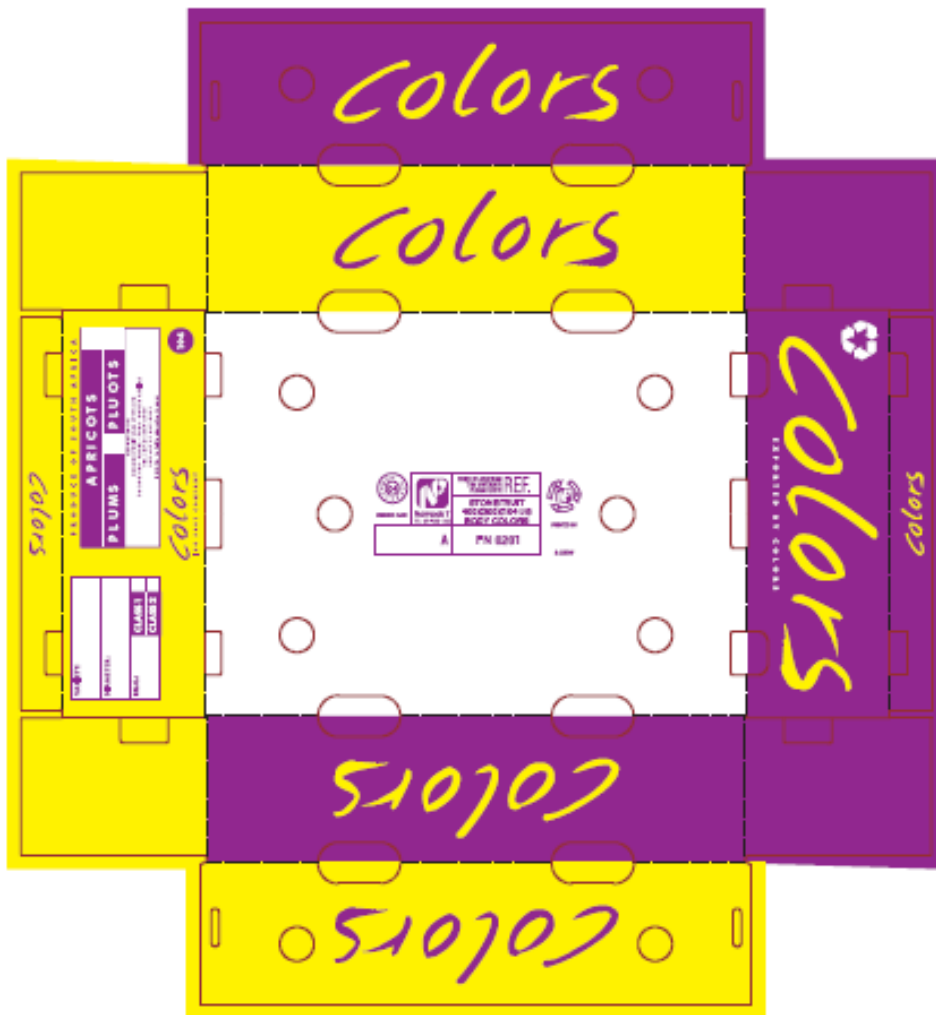
The above document will be revised and amended on a regular basis. Any proposals regarding the development or amendments of this document will be appreciated. This is a trade document that was originally composed by members of the Stone Fruit Packing Material Work Group. Thanks to all those who have made time and effort available to update this document in order to address packing material concerns and to set a guideline for the stone fruit industry.

ANNEXURE 1

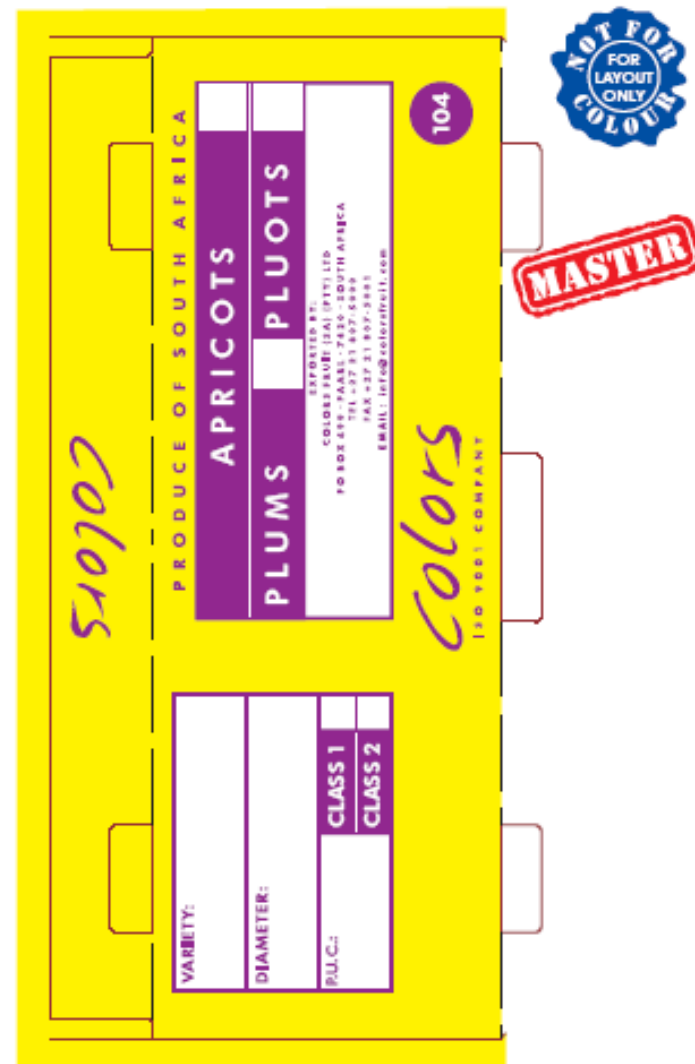
ILLUSTRATION INDICATING THE POSITIONING OF HOLES IN THE CARTON TO ENSURE HORIZONTAL AND VERTICAL AIRFLOW

 Nampak Corrugated Case Town TEL: 021-671467 Fax: 021-64 1628 	CUSTOMER COLORS TRADING	INTERNAL DIMENSIONS 389 X 292 X 104	COLOUR 1 YELLOW NYS10	Cutting Tool No. (PM No.) UW505	REP: M VD HEEVER INTS:	PRODUCT NO. 100346 This artwork is to be considered as the final check for layout and spelling. If considered satisfactory please sign and return otherwise please specify any alteration. SIGNED _____ Date: _____ NAME _____ Date: _____
	REF. No. STONEFRUIT 400X309X104 HS BODY COLORS	BLANK SIZE 4UP 883 X 717	COLOUR 2 PURPLE NPM51	Printing Tool No. (PM) 8281	FILE LOCATION: 100346 CAD: SHW/MS	
	STYLE DIE CUT	BOARD GRADE B FLUTE	COLOUR 3	MACHINE: DRO	DATE: 02/08/04 DESIGNER: E WITBOOI	
	CONTENTS	MANUFACTURERS JOINT Inside <input type="checkbox"/> Outside <input type="checkbox"/>	COLOUR 4	FLUTE DIRECTION VERTICAL	BARCODE:	

717



663



ANNEXURE 2
THE IMPORTANCE OF PACKAGING MATERIAL TO FOOD SAFETY COMPLIANCE

A. From a SA Statutory point of view

1. **R908 under the Foodstuffs, Cosmetics and Disinfectants act - Regulations relating to the application of the hazard analysis and critical control point system (HACCP System) - Section 2:**
“A full description of the product shall be drawn up, including relevant safety information such as: composition, physical-chemical structure (including pH etc.) microbial/static treatments (heat treatment, freezing, brining, smoking, etc.) packaging, durability and storage conditions and method of distribution.”
2. **The Official Food Safety Regulation (R707 of 13 May 2005) and also the EC 852 of 2004 – Hygiene of foodstuffs** looks at both the construction and storage of packaging material in a food handling facility. It is reflected in the official checklists used to audit FBO's.

Extract out of the Official food safety checklist:

2.5	PACKAGING		
2.5.1	Are safety data sheets available for packaging?	MINOR	Packaging design and material should provide adequate protection for products to minimize contamination, prevent damage, and accommodate proper labelling. It must be non-toxic (glue) and not pose a threat to the safety and suitability of food under the specified conditions of storage and use.
2.5.2	Is packing material kept in an area separate to the packing line and free from dust contamination and water?	MINOR	Packaging material comes into contact with the product, and can thus impair the safety of the product if not kept under hygienic conditions.
2.5.3	Is packaging stored above the ground and away from the walls?	MINOR	This will facilitate cleaning and inspection (pest control) and stock taking. Packaging material should be stored on pallets, approximately 30-50 cm away from walls.

B. From a Commercial point of view

1. **SABS 049 – Food hygiene management, Section 6.3.10:**
“Packaging material used in contact with food shall be free from contamination, shall not transmit to the food substances injurious to the health of the consumer, shall not taint the food, shall not impart off-flavours or off-odours to the product, and shall be able to render the protection required by the particular food product.”

To demonstrate this, they would ask for Material safety data sheets from the manufacturer, proving that the packaging can be used safely, i.e. food grade glue etc.

2. **The BRC Global standard for food has a section on product packaging (section 4.4):**
Product packaging shall be appropriate for the intended use and stored under conditions to minimize the risk of contamination and deterioration.
 1. *Procedures shall be in place to confirm that product packaging conforms to specification.*
 2. *Packaging shall comply with relevant food safety legislation and suitability for use.*
 3. *Where appropriate, packaging shall be stored away from raw materials and finished product.*
 4. *Where packaging material pose a product risk, special handling procedures shall be in place to prevent product contamination or spoilage. Records shall be maintained of failures and corrective actions taken.*
 5. *Any part-used packaging materials shall be effectively protected before being returned to storage.*
 6. *Product contact liners (or raw material/work-in-progress contact liners) shall be appropriately coloured to prevent accidental contamination.*

Where staples or other items are used which are likely to cause contamination in packaging, appropriate precautions shall be taken to minimize the risk of product contamination.

ANNEXURE 3

Specification for the 1200 x 1000mm White Block Pallet for the Export of Stone and Pome Fruit Specification W001

1. Introduction

Solid wooden pallets, made and tested to export standards, are a prerequisite to ensure products are handled, delivered and stored in sound marketable condition. Often poor selection of supplier and deviations from prescribed standards lead to product damage and financial losses.

Specifications, set out below, offer basic guidelines to ensure that pallets of good quality are employed in the export supply chain.

The dimensions and spacing of top slats are extremely important as they not only support the cartons in critical positions but specified gaps between slats are vital to ensure adequate vertical air flow for effective cooling.

2. Description

Non-reversible, perimeter base, four way entry disposable wooden pallet with dimensions of 1200mm x 1000mm x 153mm with 9 top slats spaced to support the pallet load securely whilst allowing sufficient vertical ventilation for adequate cooling.

3. Material

3.1 Timber

3.1.1 Material

All bearer blocks must be made of SA Pine. 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/m² 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.

3.1.2 Grain

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

3.1.3 Finish

The finish quality of all components shall be finely sawn or better.

3.1.4 Dimensions

Description	Number	Length (mm)	Width (mm)	Thickness (mm)
Top slats	9	1200	76	19
Top stringers (bearers)	3	1000	76	25
Bottom stringers	3	848	76	19
Bottom stringers	2	1200	76	19
Blocks	3	100	76	90
Blocks	6	125	76	90

3.1.5 Tolerances

Description	Length (mm)	Width (mm)	Thickness (mm)
Slats, stringers and bearers	+0	+3	+2
	-2	-2	-0
Blocks	+2	+2	+1
	-2	-2	-1

The variation in the top deck slats must not be more than 2mm.
Manufacturers must allow for shrinkage when cutting components from wet material.

3.1.6 Squareness

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

3.1.7 Non-permissible Defects of Timber

Components shall be free of:

- i. Pith in solid boards
- ii. Bark
- iii. Knots and knot-holes that interfere with nailing
- iv. Knots that are more than 35% of the width of any timber used
- v. Split splay (spike) knots and knotholes with sharp edges which could damage cartons on the pallet
- vi. Wane that exceeds 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)
- vii. Wood beetles or signs thereof
- viii. Twist that exceeds 4 degrees
- ix. Splitting of individual lengths that exceed 200mm. One at each end of top slats and bottom stringers or two at one end.
- x. Fungal growth or mould

3.1.8 Treatment

All pallets are to be treated according to **ISPM 15**. (Full details are available on the NDA website www.agric.za/NPPOZA/wood.htm.) Ensure your pallet manufacture's registration with DACRAD is current as this changes from time to time. If your manufacture is not registered it could result in rejections.

Preservative treatments *may* be done on wooden pallets.

1. Preservative treatments shall comply with SABS (SANS 1288) requirements.
2. SANS 10 005 recommends preservative treatments, but these *may taint foodstuffs*.
3. Manufacturer must be able to prove that any preservative(s) used will not taint foodstuffs.
4. **Important:** Kiln dried wooden pallets need not be treated with fungicides

3.2 Nails

- All nails to be annular-ringed (ring-shank) type mild or hardened steel
- Nails to be positioned as shown on drawings
- Nail guns to be set so that the nails are not driven more than 2mm below the surface of the slat to prevent cracking
- On blocks the nailing area must not be reduced by more than 15mm
- Top slats to bearers:
 - Minimum length 45mm
 - Minimum diameter 2,5mm
- Top decks to blocks:
 - Minimum length 90mm
 - Shank diameter between 3 and 4 mm
- Bottom slats to blocks:
 - Minimum length 75mm
 - Minimum diameter 2,5mm

4. Construction

- All wooden parts shall be joined with the nails as set out in Point 4 and as shown in the drawings
- All tolerances shall be met, in particular dimension and positioning of top slats
- The bottom stringers must be flush against each other, leaving no gaps where they join
- No nail shall be closer than 15mm from any wooden board or edge
- The centre-to-centre distance between any two nails must not be closer than 50mm (when used along the wood grain) or 25mm (when used across the wood grain)
- Nail heads shall not protrude from any part of the pallet

- Nails that secure top slats to stringer boards shall be clinched (across the wood grain)
- Nails shall not be sunk deeper than a ¼ of the thickness of any part of the pallet
- Nails incorrectly driven or bent shall be removed and replaced (Alternatively such nails may be broken off below the surface of the wood and replaced)
- No splitting of wooden parts after nailing will be allowed
- End-grain nailing shall not be allowed

5. Marking

- All four corner blocks of a pallet shall be painted white on the outside to indicate that the pallet was constructed according to the 'White Block' pallet specification.
- Each pallet shall be legibly and indelibly branded or stencilled (in black) according to ISPM 15 on the outer face of a block (letters and symbols minimum 20mm high) with the following information:
 - The manufacturer's name or trade name or trade mark
 - The last two digits of the manufacturing year
 - The pallet load rating (1 000kg or 1 500kg) as relevant

6. Testing

6.1 Manufacturers

- Manufacturers must be able to supply their test and inspection methods in writing to buyers
- The inspection and test methods must comply with SANS 1386:2005 guidelines

6.2 Pack House

- A sample of 5 pallets is to be chosen randomly from a consignment of 200 pallets or part thereof
- If in any sample more than one pallet is rejected, the consignment will be rejected entirely.
- Where only one pallet in the sample is rejected, 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.

7. Annexure

ANNEXURE 4

Pallet Purchase Strategy

Solid wooden pallets, made and tested to export standards, are a prerequisite to ensure products are handled, delivered and stored in sound marketable condition. Often poor selection of supplier and deviations from prescribed standards lead to product damage and financial losses.

The following strategy is a guideline in acquiring, testing and storing pallets:

1. Plan your seasonal pallet requirements well in advance of the season to ensure that you do not run out of stock during critical periods or are forced to use substandard products.
2. Select a reliable supplier with a good track record of quality and service.
3. Remember price is not the only criteria.
4. Make sure that your supplier is in possession of the correct specification and is equipped to adhere to these specifications. Get a written undertaking from the supplier that the specifications will be adhered to.
5. On receipt of a consignment of pallets, a quality test should be done, preferably whilst the load has not been fully offloaded. The following is advised:

- i. Discretion test: Is the general appearance of the pallets of such a standard that it can be confidently used for export products?
 - ii. Checklist: Ensure that the delivery checklist is complete and that the indications given hold true.
 - iii. Full quality test: Draw samples according to the Quality Control Test as set out in **Annexure A** and follow the guidelines as proposed.
 - iv. Do not accept pallets that do not comply with the specifications given.
6. Store pallets in a safe and suitable area that is not exposed to extreme weather and dust conditions and where insect infestation can be controlled. A well-ventilated undercover area would be recommended.
7. When stockpiling pallets, keep in mind that:
- i. In dry areas (Namibia/Orange River) pallets may dry out to the extent that it will be so brittle by the time it is used, it cannot be handled without damage to the pallet and/or product. Therefore, do not stock too long in advance.
 - ii. When storing in unprotected conditions for extended periods discolouring and mould may result. In moist conditions pallets will be prone to fungal growth and stocks should be limited. The pallet stack must be of such nature that airflow is maximised otherwise a greenhouse effect for mould is created in the centre of the stack.
 - iii. Discolouring may lead to illegible manufacturer stamps and could result in pallet loads being rejected after packing.
 - iv. FIFO (First-In, First Out) usage should be adhered to.
 - v. Pallets left over at the end of the season should be sold off, used for other products or stored undercover where deterioration will be limited.
8. Ensure that the correct pallet is used for the product to be palletised.

4/9/12