

**FMS CONTAINER PROTOCOL**  
**ALL CITRUS INCLUDING ORANGES**

**Background**

This protocol prescribes requirements and procedures for shipping **all citrus fruit including oranges** to the EU under the Citrus FMS in integral refrigerated containers. The protocol applies to shipments from all ports. Note that there is another FMS CONTAINER PROTOCOL that applies to citrus excluding oranges.

**Table 1. Container shipping regime codes.**

Option	Shipping regime code	Cold Room Load-out temperature (°C)	Set point (°C)	Treatment days	Packaging allowed*
A, B & C	EOY2	≤ 2.0	2.0	20	Only A15C-S2**
	EOY1	≤ 1.0	1.0	20	Open tops, bulk bins, crates & A15C-S2
	EOY0	≤ 0.0	0.0	20	Open tops, bulk bins, crates & A15C-S2
	EOY01	≤ minus 1.0	minus 1.0	20	Open tops, bulk bins, crates & A15C-S2
	SC1	≤ minus 0.5	minus 1.5	16	Open tops, bulk bins, crates & A15C-S2

\*Cartons must comply with the “Packaging material specifications and palletisation protocols for 2023 citrus export season”.

\*\* A15C-S2: The new Supervent carton as introduced in 2022 season.

**Content:**

1. Packaging
2. Loading Points and Loading practices
3. Cold stores
4. Temperature Monitoring
5. Cooling duration
6. Procedure

## 1. Packaging

- a. Cartons must comply with the **“Packaging Material Specifications and Palletisation Protocols for the 2023 Citrus Export Season”**.
- b. The following cartons/packaging types are allowed:
  - Telescopic cartons: only the new A15C SuperVent carton.
  - Open display cartons with adequate ventilation. Open display cartons may not be used under the code EOY2.
  - No fruit wrapping is allowed, except alternating rows on the top layer for display purposes.
  - Ventilated trays may be used as internal packaging.
  - IFCO plastic crates are allowed. However, if internal packaging (trays) are used, the trays must be ventilated.
  - Bulk bins, with ventilated sheets placed at the bottom of the bin.
  - The 9-slat pallet design is recommended to allow alignment of pallet slat spacings with the carton ventholes.
- c. The following additional specifications apply to palletising:
  - Ventilation in securing sheets must align with the vent holes at the bottom of the cartons.

## 2. Loading Points and Loading Practices

- a. All Loading Points must annually register with PPECB and DALRRD (PhytClean).
- b. A Loading Point can only be a cold store facility.
- c. All containers must be fitted with void plugs placed per the following requirements. Failure to do so will result in PPECB not authorising the container for export under the FMS.
  - Void plugs to be supplied by the exporter/agent/cold store.
  - Void plugs to be fitted by the cold store operator
  - No portion of the void plug protrude beyond the T-bars floor.
  - Void plug must cover the exposed base of pallets.
  - Void plug must cover the exposed T-bar floor area.
  - Void plug must be undamaged and not at a risk of being shifted by airflow.
- d. Only the following airflow improvement equipment/devices (supplied and fitted by the exporter/agent) may be used:
  - Pallet spacers (Figure 2).
  - T-floor cover at refrigeration wall (Figure 2).
    - To improve the cooling efficiency of open display cartons, it is recommended to use these devices. Exporters are requested to inform the FMS Steering Committee when these devices are used to allow for an analysis of the efficiency in the commercial cold chain. Please contact Tarl Berry ([tarl@sun.ac.za](mailto:tarl@sun.ac.za)) and Bernardus Henning ([bernardush@ppecb.com](mailto:bernardush@ppecb.com)) to provide details of shipments.



Figure 1: Example of correction installation of void plug.

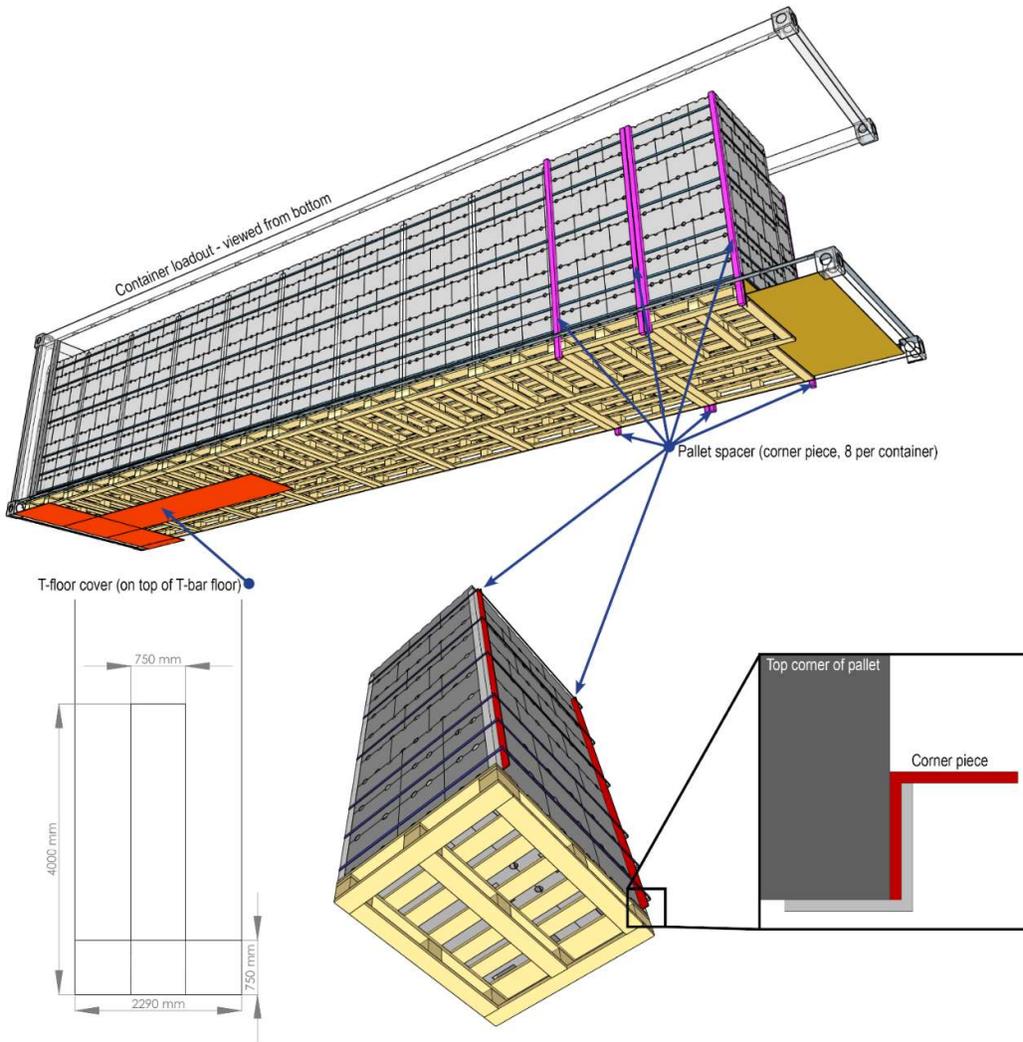


Figure 2: Illustrations of the T-floor cover and pallet spacers.

- e. A 21-pallet loading configuration is allowed in accordance with the following:
- The exporter must ensure that the chimney-type **(C-type)** void plugs are installed in both chimney locations (see the areas to cover in blue - Figure 3).
  - The C-type void plug should obstruct the T-bar floor and the exposed pallet bases so that no airflow can bypass the pallets.
  - The C-type void plugs can be manufactured from cardboard or a non-permeable sponge, as used in other export markets e.g., Israel - Table grapes; contact Bernard Henning [bernardush@ppecb.com](mailto:bernardush@ppecb.com)) at PPECB for more information.
  - Pallets may not extend beyond the red load line and the T-bar floor end at the door.

## 21 pallet load-out - with C-type void plug

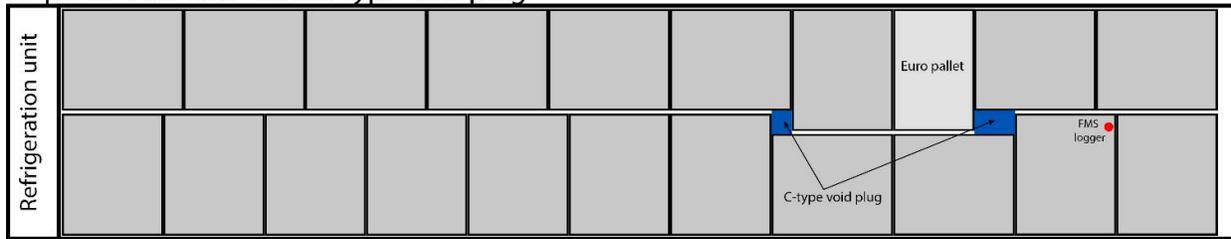


Figure 3: Placement position of C-type void plugs (blue) and the temperature loggers (red).

### 3. Cold stores precooling and temperature monitoring

- a. Cold store must have the functionality of digital measuring and recording of delivery air (DAT) and return air (RAT) temperatures in rooms where FMS fruit are stored. *No handwritten temperature records are accepted.*
- b. Digital traceability of pallet movement in the cold room/loading facility must be recorded and made available on request.

#### 3.1 EOY regime codes

- a. Cold stores handling citrus fruit exported under the FMS for EOY must maintain a set point (air temperature) of 2.0°C or lower.
  - i. FAC rooms may use a higher initial DAT setpoint to allow step-down cooling to reach a pulp temperature of 2.0°C or below.
- b. See Table 1 for details per code.

#### 3.2 SC1 regime code

- a. Cold stores handling citrus fruit exported under the FMS for SC1 must maintain a set point (air temperature) of minus 1.5°C or lower.
  - i. Forced air cooling (FAC) rooms may use a higher initial DAT setpoint to allow step-down cooling to reach a pulp temperature of minus 0.5°C or below.
- b. See Table 1 for details per code.

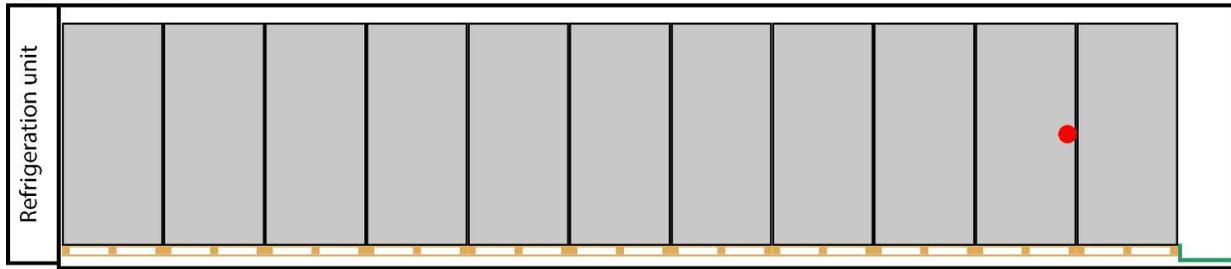
### 4. Temperature monitoring during shipment

#### Shipments using EOY regime codes

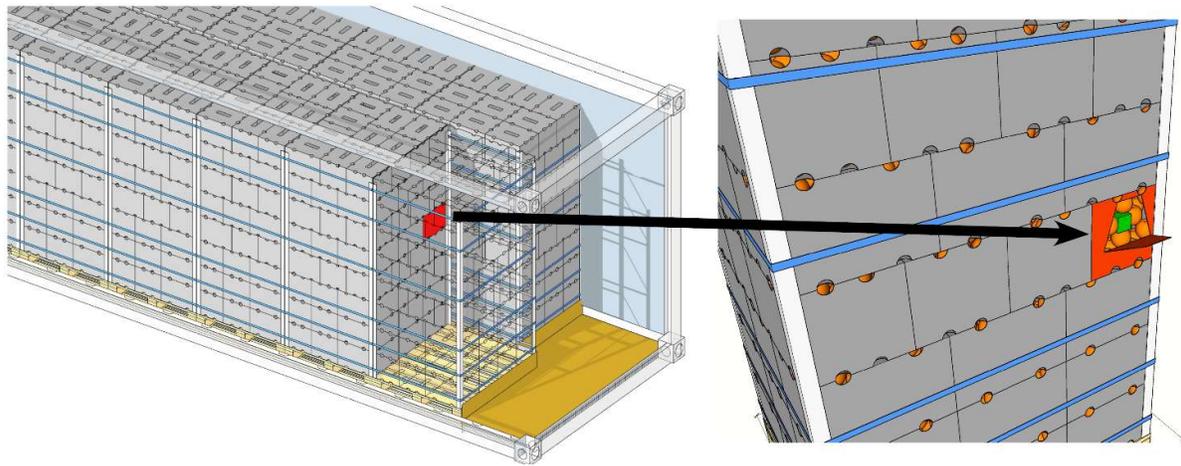
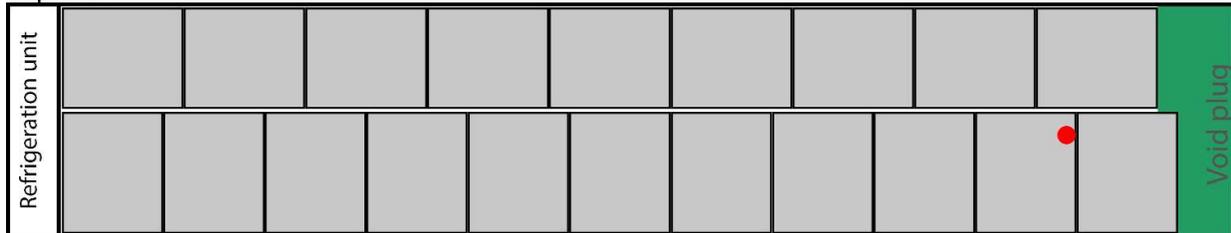
All containers shall be fitted with an **air or pulp temperature cellular monitoring and logging device (logger)** that complies with the following (see section 6.1 for details of logger installation).

- a. Only PPECB approved loggers may be utilised, which are **compatible with PhytClean in supplying data** in the correct format. Find the list of approved loggers in the “PPECB Approved List of Instruments”.
- b. PPECB to record the serial ID of the logger on Q08.
- c. The exporters/agent’s responsibility is to arrange for the logger/s to be at the loading point.
- d. It is compulsory for the exporters/agents to arrange for the logger/s to be downloaded and data to be uploaded on PhytClean, within 7 days after arrival in port of discharge.
- e. Placement during loading of the logger must be in the **required position**. Failure to do so will result in PPECB not authorising the container for export under the FMS (Figure 4):
  - Refer to Figure 4 for logger position - second last pallet, at the midline of the container, half the height of the pallet.
  - Loggers must be placed inside the carton, between the fruit and against the carton wall which was cut.

Side view



Top view



**Figure 4: Illustration of cellular logger position. Red carton indicates where the temperature must be monitored (inside red carton).**

#### **Shipments using the SC1 regime code**

- a. Probes must be calibrated and inserted by PPECB as per PPECB protocol (USDA layout).
- b. Monitoring of temperature requires three PPECB certified pulp probes per container.
- c. The probes must be inserted by PPECB as per PPECB protocol (see PPECB handling protocol; "USDA layout"; Table 2).
  - a. On-board probe: Probes must be calibrated as per PPECB protocols.
  - b. Cellular loggers: Only PPECB Approved loggers with probes may be used and the calibration certificate must be presented at time of loading. The logger bodies must be positioned as per PPECB protocols.
- d. Prior to commencement of treatment, PPECB must confirm all three probes are at or below target temperature (minus 0.5°C, commencement of treatment).
- e. The pre-cooling certificate will be issued by PPECB indicating the start date and time of the treatment prior to loading on the vessel. The following process is applicable:
  - a. In the case on on-board probes: The temperature probe data will be supplied by the respective shipping line to PPECB (see PPECB handling protocol).
  - b. In the case of cellular logger probes: The temperature probe data will be supplied by the exporter/agent, via the logger online dashboard, to PPECB (see PPECB handling protocol).

- f. The exporter/agent will submit the required documents (Pre-cooling certificate, PPECB export certificate and stamped/signed PPECB addendum) to DALRRD when applying for a phytosanitary certificate within five days of vessel departure:
- g. Master of the Vessel is responsible to maintain the required pulp temperature at 0.0°C or below as per the PPECB instruction letter for the duration of the voyage.
- h. The consignee and/or notifying party in the importing country is responsible to ensure that a container is not presented for inspection prior to the completion of treatment.
- i. It is compulsory for the exporters/agents to arrange with the respective party for the temperatures to be downloaded after completion of the protocol at 0.0 °C for 16 days. The download/s must be supplied to the relevant DALRRD office for record keeping.

**Table 2. Pulp probe layout in containers as per USDA protocols (9/11 loading pattern).**

Probe 1	First pallet at cooler - LHS	Top of the pallet	Centre line of container
Probe 2	Middle of container - LHS	Half the height of the pallet	Centre line of container
Probe 3	Second last pallet row from door - LHS	Half the height of the pallet	Centre line of container

## 5. Cooling duration

- a. Only shipping regimes codes as specified in **Table 1** are allowed.
- b. Exporters to ensure that all consignments exported in containers have a treatment duration of at least 20 or 16 days for EOY and SC1 codes, respectively.
- c. If the voyage duration for containers under power is such that the duration from the gate-in date exceeds the following durations, step up to 4.0°C can be affected thereafter and maintained for the remainder of the voyage: 30 days for EOY regime codes and 20 days for the SC1 regime code.

## 6. Procedures

### 6.1 Loading Point

At the loading point (cold store), the following applies before the commencement of loading

- **Loading point** to generate and provide load-out instruction and PhytClean report (or combination) to PPECB (**Control Point 1**).
- PPECB to **validate** working program/Q67, PhytClean report and load-out instruction:
  - **Verify pallet ID's** with the actual **cargo**
  - Verifying cargo temperatures (minimum four (4) pallets)
  - PhytClean **reference key number** to be recorded on Q08
  - Cellular logger **serial ID** to be recorded on Q08
- Additional requirements for dual loading:
  - Exporter/agent to **provide both loading points** with a complete PhytClean verification report for the full consignment
  - **1<sup>st</sup> loading point** to supply PPECB with PhytClean report for only the number of pallets to be loaded
  - **2<sup>nd</sup> loading point** to supply PPECB with PhytClean report for only the number of pallets to be loaded (balance of consignment)
  - Both PhytClean reference key numbers to be recorded on Q08 as per loading point
  - 2<sup>nd</sup> loading point to supply **cellular logger** and the **serial ID** to be recorded on Q08.
- Loading point to switch on all data loggers at least 120 minutes prior to loading and do status check in the presence of the PPECB assessor to **confirm successful activation during placement** of logger.
- It is recommended that the logger's activation is confirmed online via the logger portal/dashboard.
- Loading point to **correctly insert the void plug** inside the container.
- PPECB to verify **container setpoint** as per PhytClean/PPECB working program at loading (**Control Point 2**)

## 6.2 Exporters

- Exporters to ensure recording of all **pallet durations and temperature exposure** in a cold room (**Control Point 3**)

## 6.3 Changes to regime codes

No change of shipping regime code within 24h before “load out” of fruit into the container, but the exporter/agent can instruct a subsequent reduction in setpoint temperature in accordance with the following:

- Set point temperature reduction will only be allowed after the departure of the vessel.
- Set point temperature changes will only be allowed to be lower than the original set point (lowest denominator).
- Set point changes will only be affected by the Shipping Line with PPECB approval.
- For set point changes, a request must be submitted to PPECB (bernardush@ppecb.com) at least 48 hours prior to the planned change, indicating the reason for the change.
- On approval of the request, the exporter should:
  - Send an amended booking request to PPECB at Bookings@ppecb.com and cto@ppecb.com
  - Request confirmation from the Shipping Line that the set point was changed