



QUALITY STANDARDS

QUALITY REGULATION AND QUALITY MANUAL





CARDBOARD QUALITY GUARANTEE





TABLE OF CONTENTS

INTRODUCTION

I1 - Structure of the document	pag. 5
I2 - Summary of contents	pag. 6
I3 - Box types	pag. 8
I4 - Explanation of typical outer dimensions	pag. 13



UNIQ QUALITY REGULATION

R1	- List of boxes authorized to bear the UNIQ seal	pag. 14
R2	- Outer dimensions of boxes and tolerances	pag. 16
R3	- Classes by duration of use of palletized load	pag. 17
R4	- Maximum number of layers to stack on pallet	pag. 18
R5	- Official model for the UNIQ seal	pag. 19
R6	- Technical quality controls	pag. 22
R7	- Certified laboratories	pag. 22
R8	- Description of performance control tests	pag. 22
	A) Preparation of the packaging	pag. 22
	B) Compression test (BCT)	pag. 23
	C) Static bending test of the base	pag. 24
	D) Cardboard water absorption test (COBB)	pag. 25
	E) Vibration test	pag. 27
R9	- Conditions for using boxes with the UNIQ quality seal	pag. 29
R10	- Assembly, palletizing and loading instructions	pag. 30
	A) The importance of proper palletization	pag. 30
	B) Pallets to use	pag. 30
	C) Machine assembly of boxes	pag. 33
	D) Palletizing	pag. 38
	E) Recommendations for loading on trucks	pag. 46



UNIQ QUALITY MANUAL

M1 - Notice regarding the making of holes in UNIQ boxes	pag. 48
M2 - Standardization of ventilation holes in Type T boxes	pag. 49
M3 - UNIQ Design Database	pag. 54
M4 - Checklist for tracking the quality of packing and palletizing with UNIQ boxes	pag. 55
M5 - FEFCO CFQ International Standard	pag. 58



ANNEXES

ANNEX 1 - List of boxes authorized to bear the UNIQ seal _____ pag. 59



INTRODUCTION

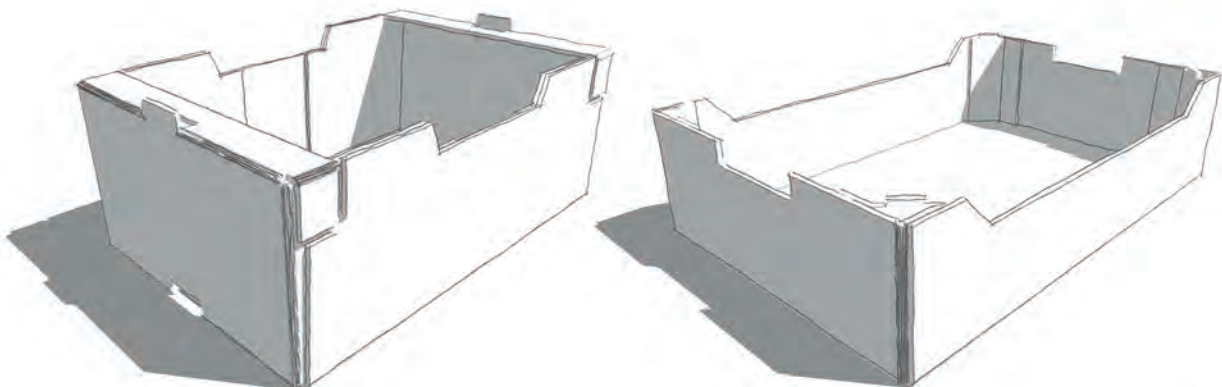
11 - DOCUMENT STRUCTURE

This UNIQ Quality Standard contains:

- **The UNIQ QUALITY REGULATION:** These standards must be observed for corrugated cardboard boxes for fruit and vegetable use that are authorized to bear the UNIQ Agricultural Quality Mark and Seal.

Included are the conditions for use (storage, assembly, palletization, transportation, etc.) that users of UNIQ boxes must adhere to in order to preserve the performance guarantee of the packaging.

- **THE UNIQ QUALITY MANUAL:** These are **technical recommendations** for the manufacturer to design the box so as to provide the performance required for UNIQ agricultural packaging. It is recommended that they be applied, though adherence to them is not required.





I2 - SUMMARY OF CONTENTS

This document contains the manufacturing standards that ensure the quality of corrugated boxes for fruit and vegetable use bearing the UNIQ seal.

UNIQ boxes can be manufactured in Spain or abroad by companies with the certified technical means necessary and that have signed the relevant license agreement with AFCO.

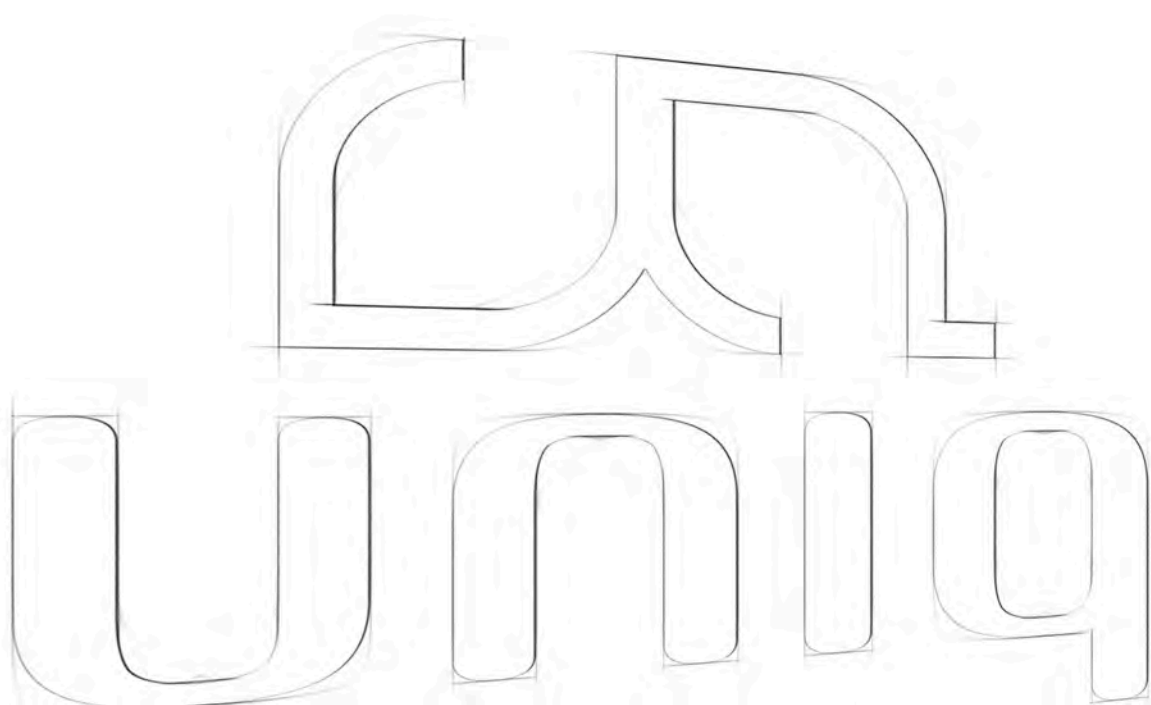
Companies licensed to manufacture UNIQ-brand boxes (UNIQ Group) agree at all times to:

- Use the UNIQ seal only on those boxes that comply with the UNIQ QUALITY REGULATION, and in particular with the tests and other manufacturing standards stipulated in this document.
- Undergo unannounced quality audits and inspections and provide production, storage or client samples to AFCO personnel or to personnel from external quality audit companies hired by AFCO, facilitating their tasks and providing all the information they require.



The manufacturer of the box is solely responsible for the quality of UNIQ boxes supplied to their clients, as well as for complying with the performance standards required in this regulation. The reports issued by the officially designated laboratories shall be decisive when settling any dispute with the user of the box.

A UNIQ box is transport packaging. Boxes bearing the UNIQ seal that are not stored in cold rooms for abnormally long periods, and that have been properly set up and palletized, as per the instructions in section R10, as per the Conditions of Use specified in section R9, shall exhibit adequate performance in their intended needs, depending on the various UNIQ box types and the requirements of the transit chain for which they were designed (Class E, Class L or Class U).





13 - BOX TYPES

This UNIQ Quality Standard groups corrugated cardboard boxes for agricultural use into two main families of boxes based on their basic structural design:

Boxes with Tejadillo (Type T) and with Columns (Type C). Below are just some examples of both families:

Examples of Tejadillo-Type Boxes (Type T)

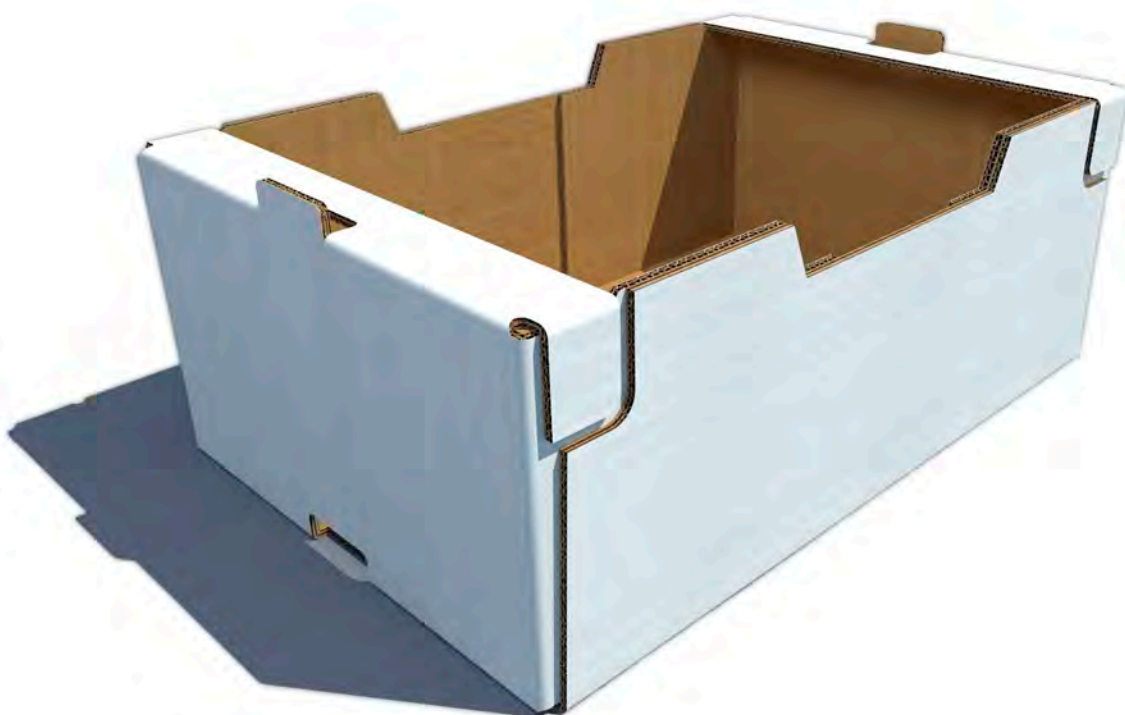


Figure 1 T-type tejadillo box



Examples of Tejadillo -Type Boxes (Type T)

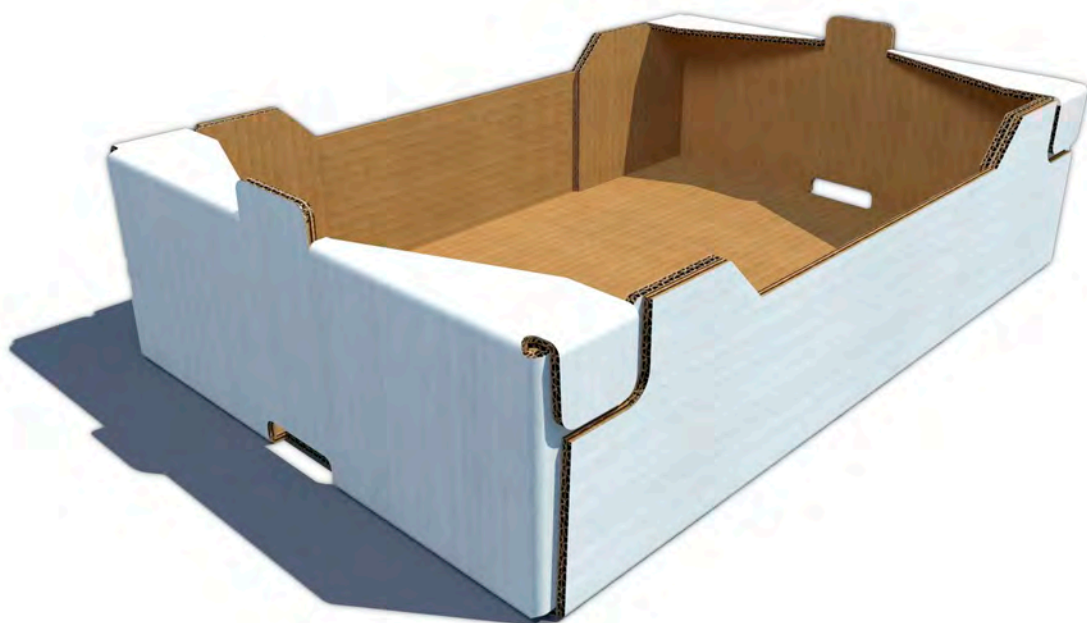


Figure 2 T-type tejadillo box

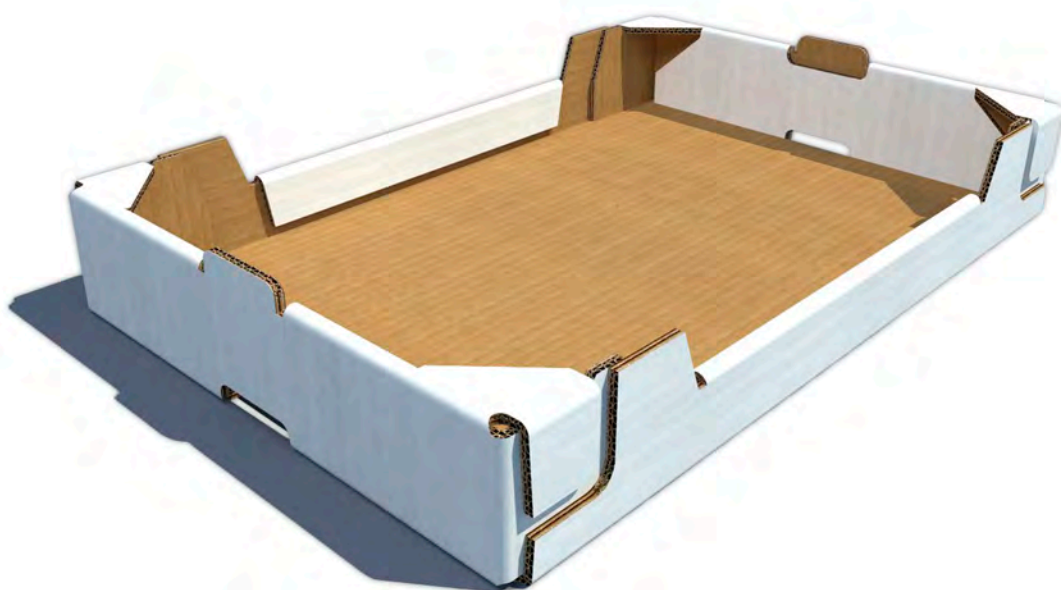


Figure 3 T-type tejadillo box



Examples of Column-Type Boxes (Type C)

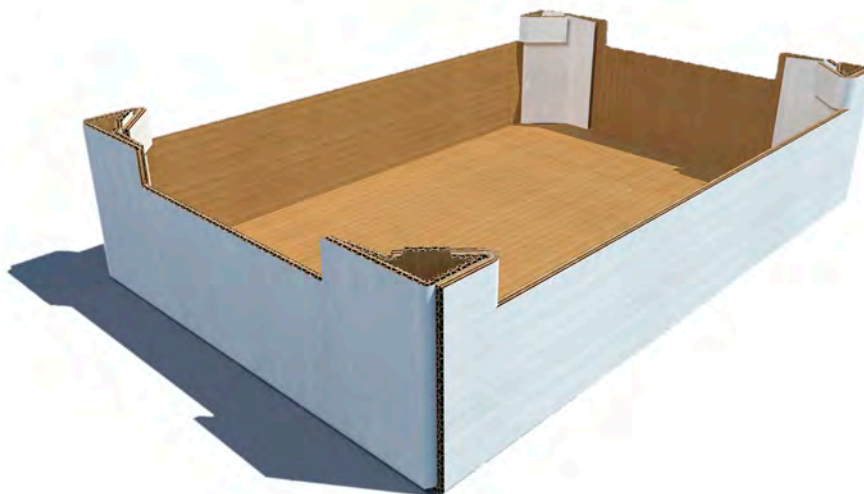


Figure 4: Column (C-type) box

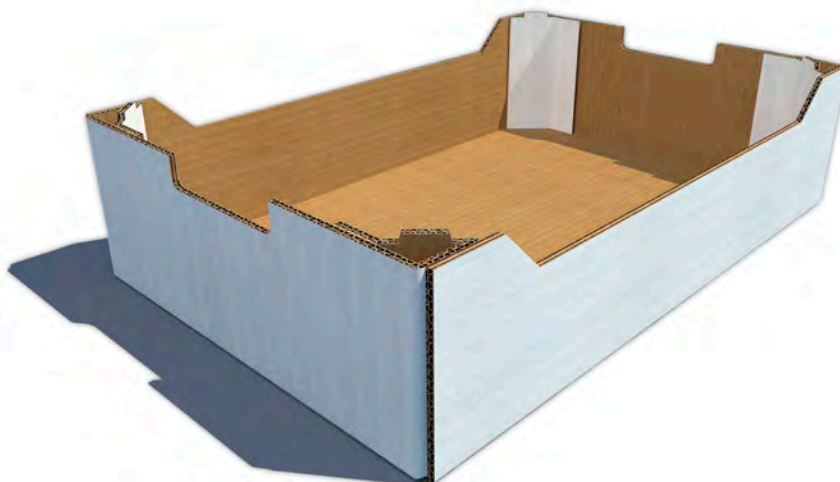


Figure 5: Column (C-type) box

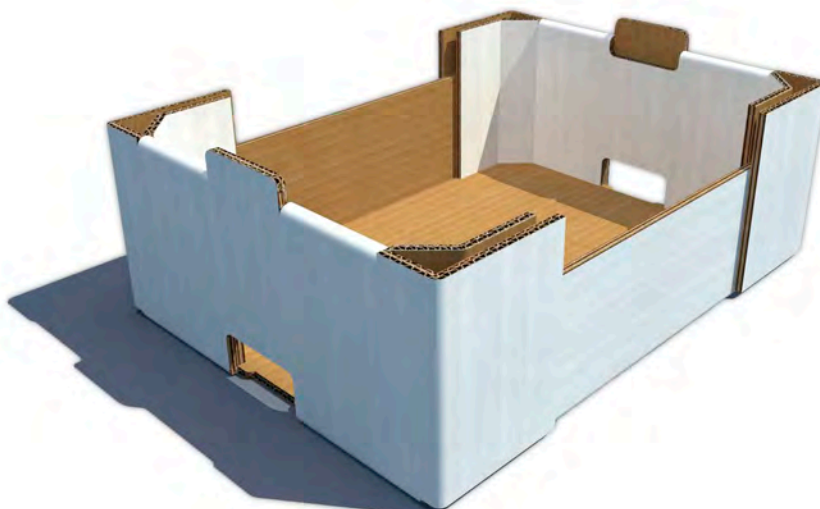


Figure 6: Column (C-type) box

Examples of Column-Type Boxes (Type C)



Figure 7: Column (C-type) box

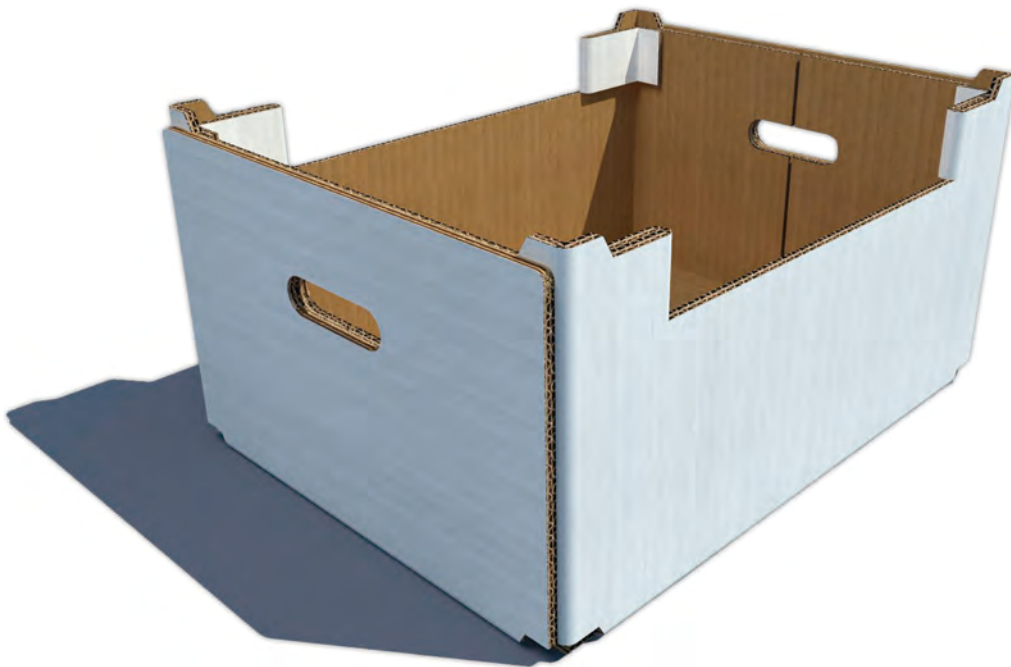


Figure 8: Column (C-type) box



Examples of Column-Type Boxes (Type C)

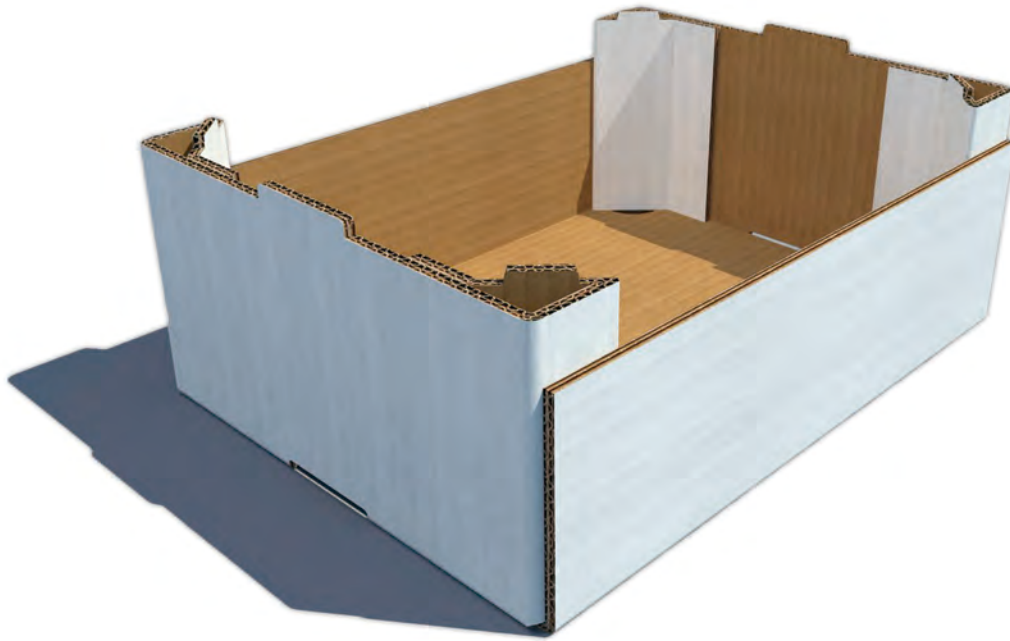


Figure 9: Column (C-type) box

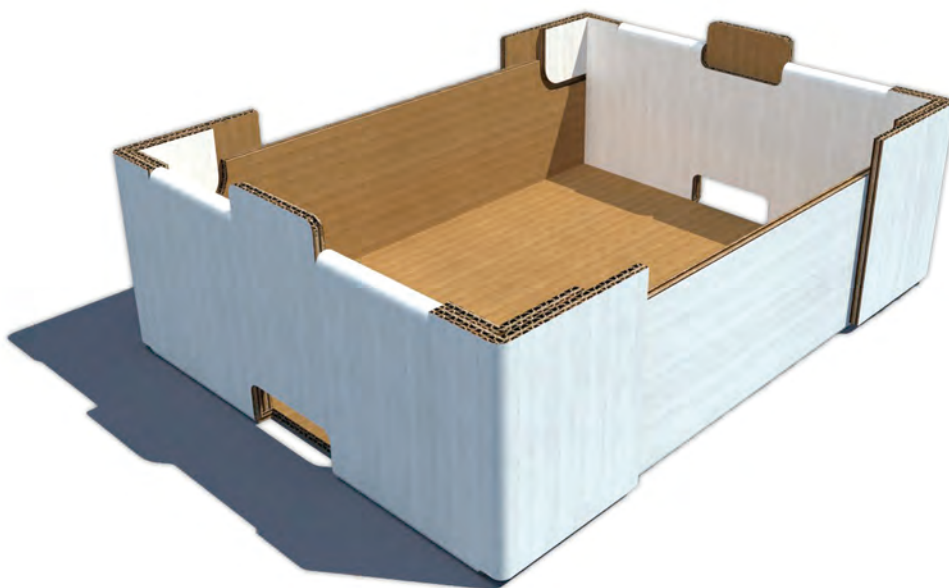


Figure 10: Column (C-type) box

14 - EXPLANATION OF TYPICAL OUTER DIMENSIONS

Outer dimensions for T-type boxes

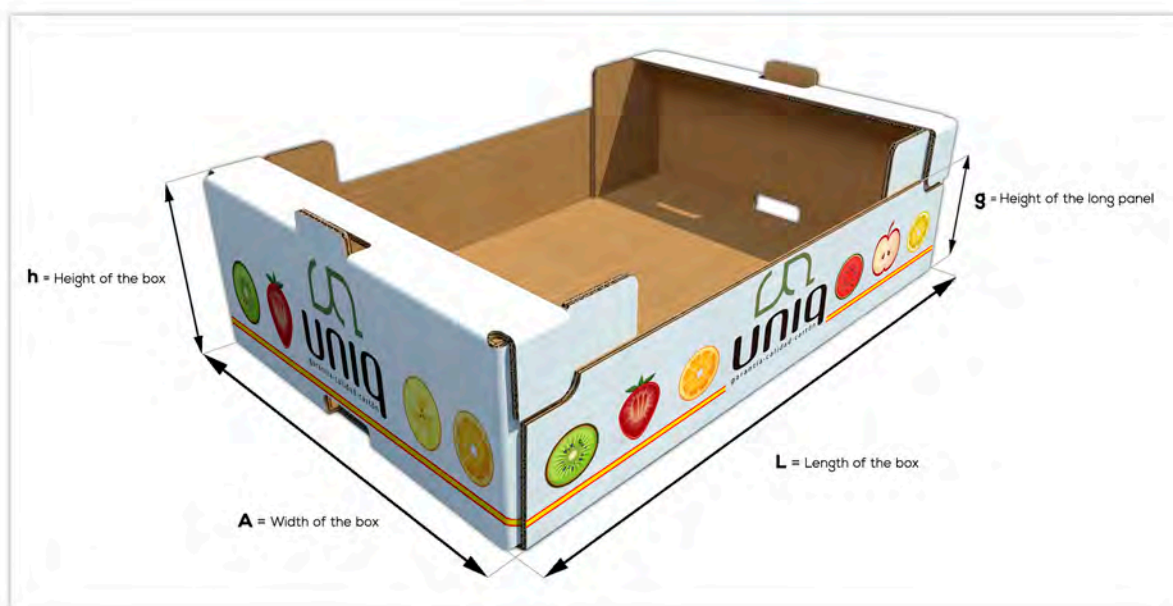


Figure 11: Figure 1 T-type tejadillo box

Outer dimensions for C-type boxes



Figure 12: Dimensions of column (C-type) box



UNIQ QUALITY REGULATION

These rules must be observed by the manufacturing companies that belong to the AFCO "UNIQ" Specialty Group.

R1 - LIST OF BOXES AUTHORIZED TO BEAR THE UNIQ SEAL

(see list of boxes in Annex I)

The box list includes the following columns:

- Product or products to box and maximum weight of contents in Kg
- Certification number of the box by its model (Type T or Type C)
- Length-Width-Height
- Minimum wet BCT value required at point of origin for Type T and Type C new (unused) boxes depending on the class or duration of the palletized load (Class E, Class L or Class U)
- Maximum number of box layer to be stacked on the pallet (must be calculated based on the real height of the box)
- Type of corrugated cardboard: DD=Double wall or DC=Single wall



The list was made based on the standard palletizable footprints, 800x1200 (europallet) and 1000x1200 mm (pallet).

STANDARD BOXES

The following footprints are used: 300x200, 400x300, 500x300, 500x330 and 600x400 mm.

The boxes are categorized by kg in increasing height. For each standard height (h) on the list, the same certification number can be used for the interval between $h-10$ mm and $h+15$ mm.

R2 - OUTER DIMENSIONS OF BOXES AND TOLERANCES

The outer dimensions of the base of the boxes (length x width) must be standardized as required by the FEFCO international standard for the CF (Common Footprint), namely:

Theoretical dimension (for orders) in mm Length x Width (outside)	Real dimension (for manufacture) in mm Length x Width (outside)
600 x 400	597 x 398
600 x 200	597 x 198
500 x 330	497 x 328
500 x 300	497 x 298
400 x 300	398 x 298
300 x 200	298 x 198

The tolerance, based on the FEFCO CF Standard, is ± 1 mm.

The boxes with a central interlocking tab also require adapting the dimensions of said tab to the FEFCO CF Standard (64-mm tab).

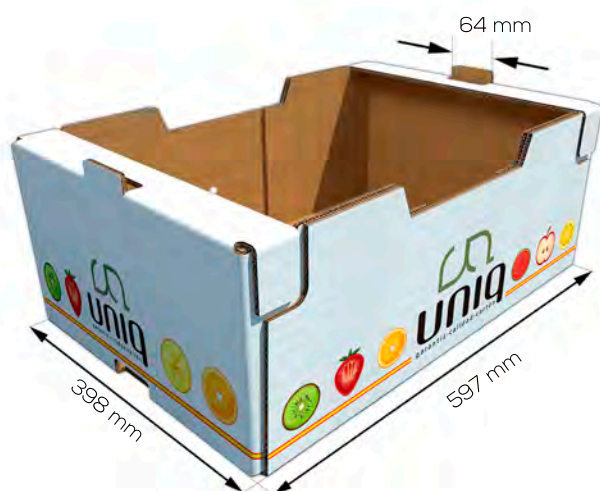


Figure 13: Sample real outside footprint size for Type T

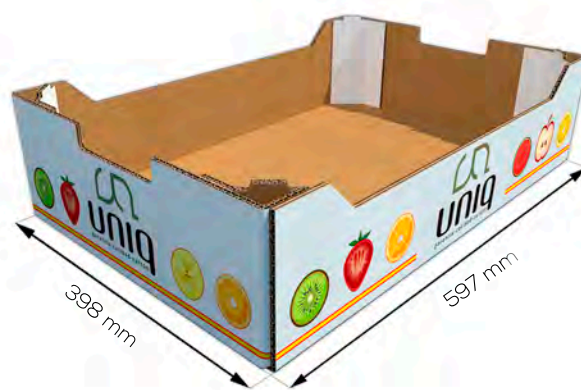


Figure 14 Sample real outside footprint size for Type C



R3 - CLASSES BY DURATION OF USE OF PALLETIZED LOAD

There are three classes, based on the logistical requirements, specifically, on the approximate number of days that will elapse between packaging and arrival at the destination:

The shipping class the box is intended for is identified on the quality seal with the letters E, L or U.

► **Class E = Export.** Class designed for domestic transport and for export to Central Europe, in other words, for a typical shipment from Spain to Germany. Recommended for **approximate times of up to 4 days between packaging and arrival at destination, excluding any maritime shipping.**

► **Class L = Long Distance.** Class designed for a typical shipment from Spain to the UK, Scandinavian countries, Eastern Europe, etc.. Recommended for **approximate times of more than 4 and up to 8 days between packaging and arrival at destination.**

► **Class U = Overseas.** Class designed for shipments to Russia, China, overseas countries. Recommended for **approximate times in excess of 8 days between packaging and arrival at destination.**

U-class boxes require a case-by-case study so that the proper solution can be offered based on the destination country, the total duration of the palletization and the mode of transport. The palletization method may require reinforcement.



Class E (Export), up to 4 days ●
Class L (Long Distance), more than 4 and up to 8 days ●
Class U (Overseas), more than 8 days ●



R4 - MAXIMUM NUMBER OF LAYERS TO STACK ON PALLET

Printed on the bottom of the box must be the standard outer base dimensions of the box, in mm, the maximum rated weight it can hold in kg, and the maximum number of layers of boxes that can be stacked (n).

- Select manually or using formula for value of "n": Below is the formula for calculating the value of "n", but the manual value chosen by the user, which may not match that resulting from the formula, will always take precedence. Calculation for the maximum number of layers of boxes to stack on a pallet:

$$n = \text{ROUNDDOWN}(2300/h, 0)$$

n = maximum number of layers to be stacked atop pallet

h=outside real height of the boxes in millimeters

- The total stack height, including the pallet (which is 150 mm high), deemed ideal for optimizing the loading space is 2.45 m; however, some arrangements may slightly exceed this height in order to better use the available loading and transport space.
- Example 1: box with outside dimensions 600x400x145mm
 $2,300\text{mm}/145\text{mm}=15.86$, rounded down to 15 boxes, therefore n=15 layers of boxes.
- Example 2: box with outside dimensions 600x400x160mm
 $2,300\text{mm}/160\text{mm}=14.38$, rounded down to 14 boxes, therefore n=14 layers of boxes.
- Example 3 box with external dimensions of 600x400x230 mm
 $2,300\text{mm}:230\text{mm}=10$. Even though the formula gives a value of 10, the user can manually specify 9 layers for reasons such as the maximum weight limit of the pallet. The manual choice will always take precedence, regardless of the result of the formula.
n=9 layers of boxes

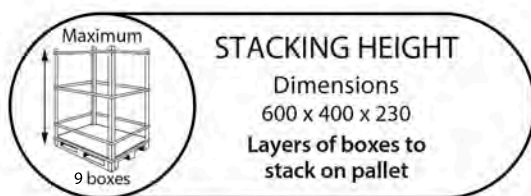


Figure 15: Printed seal



Figure 16: Explanatory drawing



R5 - OFFICIAL MODEL FOR THE UNIQ SEAL

Seal no. 1: UNIQ QUALITY SEAL (required to be printed)

Information to be shown:

- UNIQ logo and "cardboard quality guarantee" text
- Box certification number under "Satisfies technical specifications".
(The text "SATISFIES TECHNICAL SPECIFICATIONS" may be omitted only if the printer cannot guarantee its legibility).
- Class based on the duration of use of the palletized load (Class E, Class L or Class U).
(The text "DURATION PALLETIZED LOAD USE" may be omitted only if the printer cannot guarantee its legibility).
- Maximum weight of the contents in kg.
(The text "MAXIMUM CONTENT WEIGHT" may be omitted only if the printer cannot guarantee its legibility).
- AFCO manufacturer: registration number assigned by AFCO that identifies the manufacturer of the UNIQ box. (The text "AFCO MANUFACTURER" may be omitted only if the printer cannot guarantee its legibility).



Figure 17: Seal no. 1



Seal no. 2: PALLETIZING SEAL (required to be printed)

- Nominal outside dimensions of the box (length x width x height) in mm
- Layers of boxes to stack on pallet
- Maximum number of layers of boxes to stack on pallet

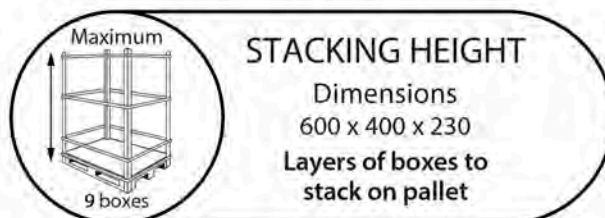


Figure 18: Seal no. 2

Seal no. 3: SEAL WITH INFORMATION ON USE AND RECYCLABILITY (required to be printed)

- RECIPAP seal: "Naturally recyclable" (or equivalent recyclability seal)
- Legend ROYAL DECREE 888/1988 "Non-reusable food container"



Figure 19: Seal no. 3

Seal no. 4: EUROPEAN FEFCO CFQ SEAL (printing optional. See section M5)



Figure 20: Seal no. 4

OTHER INFORMATION THAT SHOULD BE PRINTED (printing optional)

- Name and address of plant where box was manufactured
- Month and year of manufacture
- Traceability

Area of box where text should be printed:

The seal should be printed on the bottom of the box toward the short panel to minimize the risk of contact between the product and the printed area.



Below is an example of where to place the printed text at the bottom of a UNIQ box.

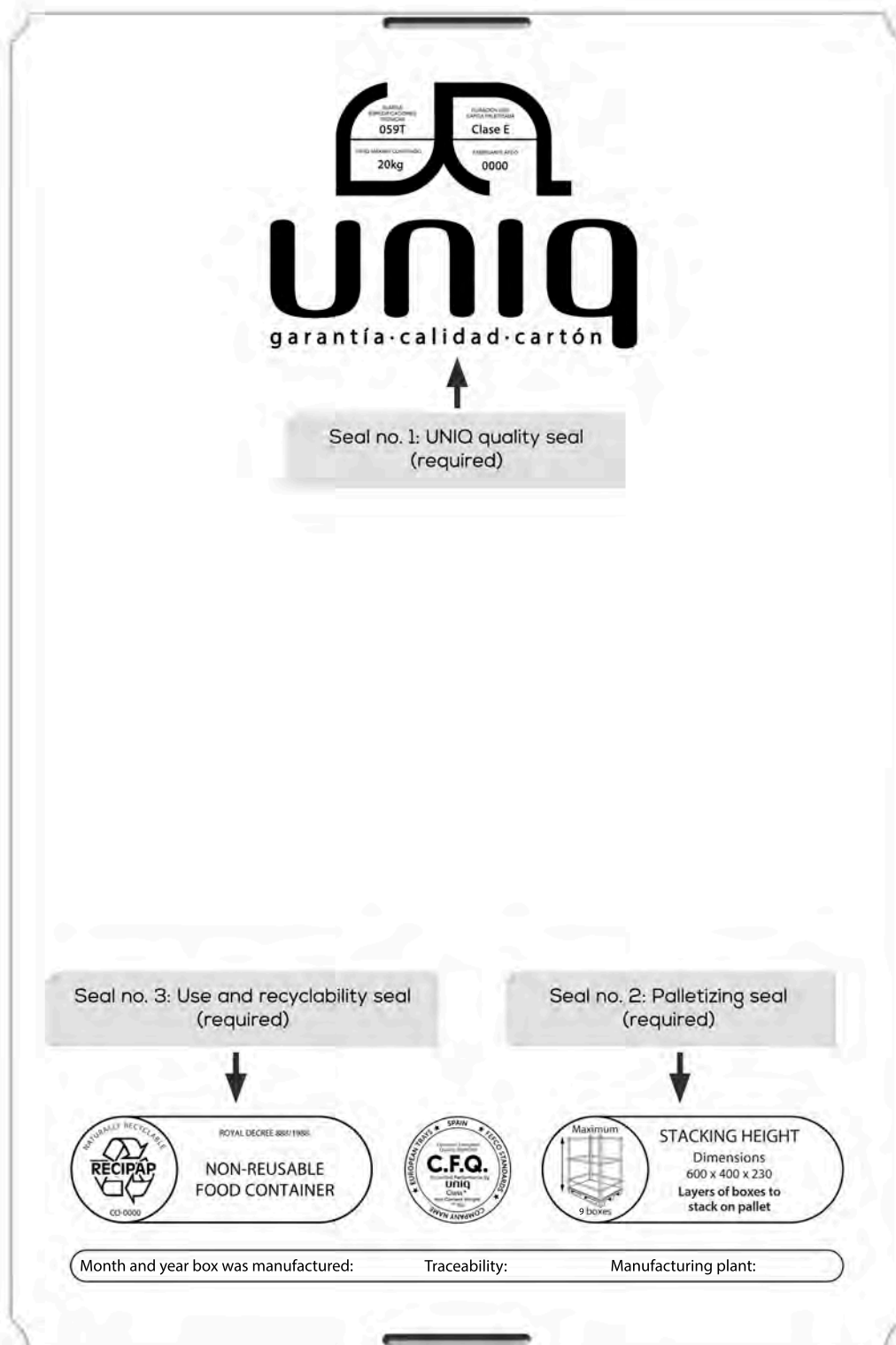


Figure 21: Printing on boxes



R6 - TECHNICAL QUALITY CONTROLS

A Technical Committee from the UNIQ Group will supervise and update the tests and technical parameters required for UNIQ boxes.

► AFCO, through approved external laboratories, will conduct the quality checks at every plant where UNIQ boxes are manufactured. Each manufacturing plant will be visited on a random, regular basis by external auditors from the laboratories, who will take three different models of sealed boxes on each visit, as per a procedure approved by the UNIQ Technical Committee.

R7 - CERTIFIED LABORATORIES

In order to conduct the quality checks of UNIQ boxes, AFCO relies on a network of certified independent laboratories. There is a procedure for certifying those laboratories interested in conducting the external audits used to verify compliance with the UNIQ Quality Standards.

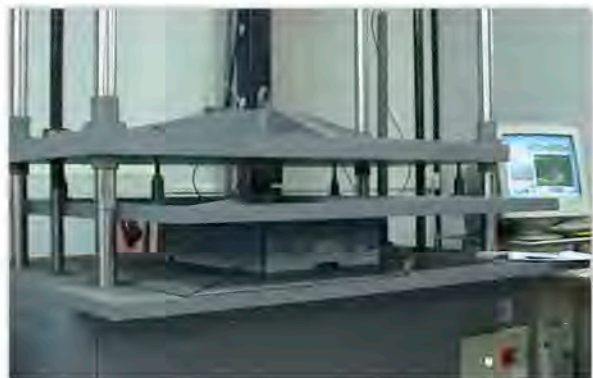


Figure 22: Compression test

R8 - DESCRIPTION OF PERFORMANCE CONTROL TESTS

The performance control tests will only be conducted on new (unused) boxes taken from the manufacturing centers, as per a specific procedure approved by the UNIQ Technical Committee

The boxes to be tested will be taken from the top of the pallet, properly protected and transported to the laboratory, where they will be glued and assembled by hand, as per a specific procedure approved by said Committee

After their high-humidity conditioning, boxes bearing the UNIQ mark must satisfactorily pass tests for dynamic vertical compression and static bending of the base. In addition, it is also recommended that the box complies with the cardboard water absorption test (COBB) and the vibration test. All of the tests are described below:

A) PREPARATION OF THE BOXES

In the 48 hours immediately preceding the compression, static bending and vibration tests, the boxes will be kept in an atmosphere with a relative humidity of $90 \pm 5\%$ and a temperature of $20 \pm 2^\circ \text{C}$, as per the UNE EN ISO 2233 Standard. The test will be performed immediately after their removal from the conditioning room. The time between their removal from the room and the start of the test shall be minimized and shall not exceed 5 minutes. This rule is applicable to all of the tests described in this document.



B) BOX COMPRESSION TEST (BCT)

This test is carried out according to the method described in the UNE137001 standard, and meeting the following requirements:

The empty box, with the interlocking tabs removed, is placed in its normal position on the lower platform of the compression machine. The relative speed of the platforms is adjusted to 10 mm/min and the resistance to dynamic vertical compression (BCT) is measured. The resistance to vertical compression is calculated using the following formula:

$$\text{BCT} = K \times (n-1) \times P, \text{ where}$$

$n = \text{ROUNDDOWN}(2300/h,0)$, or manually set:

$n = \text{value chosen manually by the user:}$

prevails over that calculated using the formula

Where:

n = maximum number of box layers to be stacked on the pallet (see section R4 also)

h = outer height of box, in millimeters

P = net weight of box content, in kilograms

K = safety constant. The K value specific to each box. It depends on the box design (type T or C), the type of transit chain where it will be used (Class E, L or U), its outer height (h), the net weight of the contents (P) and other factors. The UNIQ Standard specifies the safety constant K for the new box sample taken from the UNIQ manufacturing plant.

Minimum wet BCT required and maximum deformation under the minimum required load

The result of the test will be considered satisfactory if after conducting the test on five empty boxes, the arithmetic mean obtained for the compression, in kilograms-force, is greater than or equal to the result as per the formula given above, and also does not cause, at the minimum load required by UNIQ, a deformation in excess of 10% of the outer height of the box, if said deformation may not exceed 25 mm.

Both the UNIQ manufacturing plants and certified external laboratories will **calculate the minimum required compression values** for each box on an individual basis using the **UNIQ software** program, which will automatically generate the UNIQ seal that is to be printed on the bottom of each box.



Figure 23: Compression test



C) STATIC BENDING TEST OF THE BASE

UNIQ boxes with a footprint equal to or larger than 500 x 300 mm must also comply with the following requirement, as per the UNE 49706 standard.

Purpose:

The purpose of this rule is to establish a method for testing resistance to bending under load offered by the base of the UNIQ box under normal stacking conditions.

This test is performed on 5 samples.

Procedure:

The previously conditioned box is placed in the normal stacking conditions to which it is subjected. The two supports on which the box is placed must offer 45 mm of contact area. A flexible load weighing 1.5 times the weight normally held by the box is placed uniformly inside the box, and after 10 minutes the maximum sag of the box's base is measured.

Maximum allowable sag

For boxes with a footprint equal to or larger than 500 x 300 mm and a content weight up to 15 kg, the maximum allowable sag is 10 mm; for contents in excess of 15 kg, the maximum allowable sag is 12 mm.

For watermelon boxes, the maximum allowable sag is 12 mm, regardless of the weight they contain.



Figure 24: Bending test



D) CARDBOARD WATER ABSORPTION TEST (COBB)

This test is carried out as per the method described in the UNE EN ISO 535 Standard

Definition:

Water absorptiveness (COBB value) is the amount of water, expressed in grams per square meter, absorbed by one side of corrugated cardboard in 30 minutes under a 10-mm high water column at a temperature of $23 \pm 2^{\circ}\text{C}$.

Description of method:

A sample is weighed immediately before and after one of its sides is exposed to water for 30 minutes after blotting the water on the surface with drying paper. The resulting increase in mass is expressed in grams per square meter (g/m^2).

Preparation:

The samples must be conditioned as per the UNE EN ISO 2233 Standard for 48 hours at a temperature of $23 \pm 2^{\circ}\text{C}$ and a relative humidity of $50 \pm 5\%$.

Procedure:

The individual sheets taken from the lot must be sufficiently large to provide 130×130 mm samples, or to have at least one dimension that exceeds the diameter of the cylinder by 10 mm in every direction.

The specimens must be selected from a sample of boxes, from an area that is free from any marks made by machines and any irregularities such as folds, wrinkles, holes or any other defect. Whenever possible, they must also not contain any printed text. The laboratory report must indicate if the test involved an area that was completely or partially printed on.



Individual tests:

The tests must be carried out in the same atmosphere used to condition the specimens. The specimen is weighed to within 1 milligram. After the specimen is placed in the device and the watertight integrity of the assembly is assured, it is placed in a cylinder with 100 ± 5 ml of distilled water at a temperature of 23 ± 2° C.



Figure 25: COBB test

After 30 minutes the water is quickly drained and the specimen removed from the device. Any water remaining on the specimen is blotted with drying paper. A roller is then passed over the paper, once forward and once back, with the centerline of the roller parallel to the flutes, avoiding the presence of excess surface water on the specimen.

Where corrugated cardboard is indented by the cylinder edge or which exhibits "washboarding" it may not be possible for the blotting paper to contact the entire wet area of the specimen. In such cases it is recommended that instead of using the roller, the back of the blotting paper is gently rubbed by hand. The specimen is then weighed again.

Number of tests:

At least five tests shall be conducted, with the results of each noted separately.

The amount of water absorbed, which is the difference in the specimen weights before and after the test, is used to calculate the water absorption index in grams per m².

Maximum water absorption recommended

The test result is considered satisfactory if the mean increase in weight of the brown face does not exceed 125 grams/m². For the white face, the maximum water absorption recommended is 150 grams/m².



E) VIBRATION TEST

This test is carried out as per the method described in the UNE 137003 Standard and the following requirements:

The tests are carried out on three conditioned boxes, which shall be filled with one of the following products:

- a) The actual product for which the box is intended.
- b) Failing this, a product whose specific weight is approximately 0.5, the box being filled to the maximum allowable with bags containing this product.
- c) Alternatively, potatoes may be used.

They are placed one atop the other in the normal position of use on the vibrating table. On top of the top box are placed a rigid tray and an additional load whose weight is determined as follows:

$$P = ((220/h) - 3) p$$

Where:

P = additional weight in kilograms

h = height of a box in **centimeters**;

p = gross weight of a full box in kg.

Boxes without an interlocking mechanism shall be kept stacked using suitable means. The vibrations are determined as follows:

Movement of the table: 9 mm horizontally, 9 mm vertically.

Frequency: 4 Hertz.

Duration: Twice for ten minutes.

The boxes are arranged such that first their length and then their width are parallel to the direction of the horizontal vibrations.

Three series will be performed (each one consists, as stated above, of two runs, with the three stacked boxes placed in different perpendicular orientations).



Performance required:

The results are satisfactory if the boxes exhibit no permanent visible bending and they do not break through the other boxes in any of the three series.

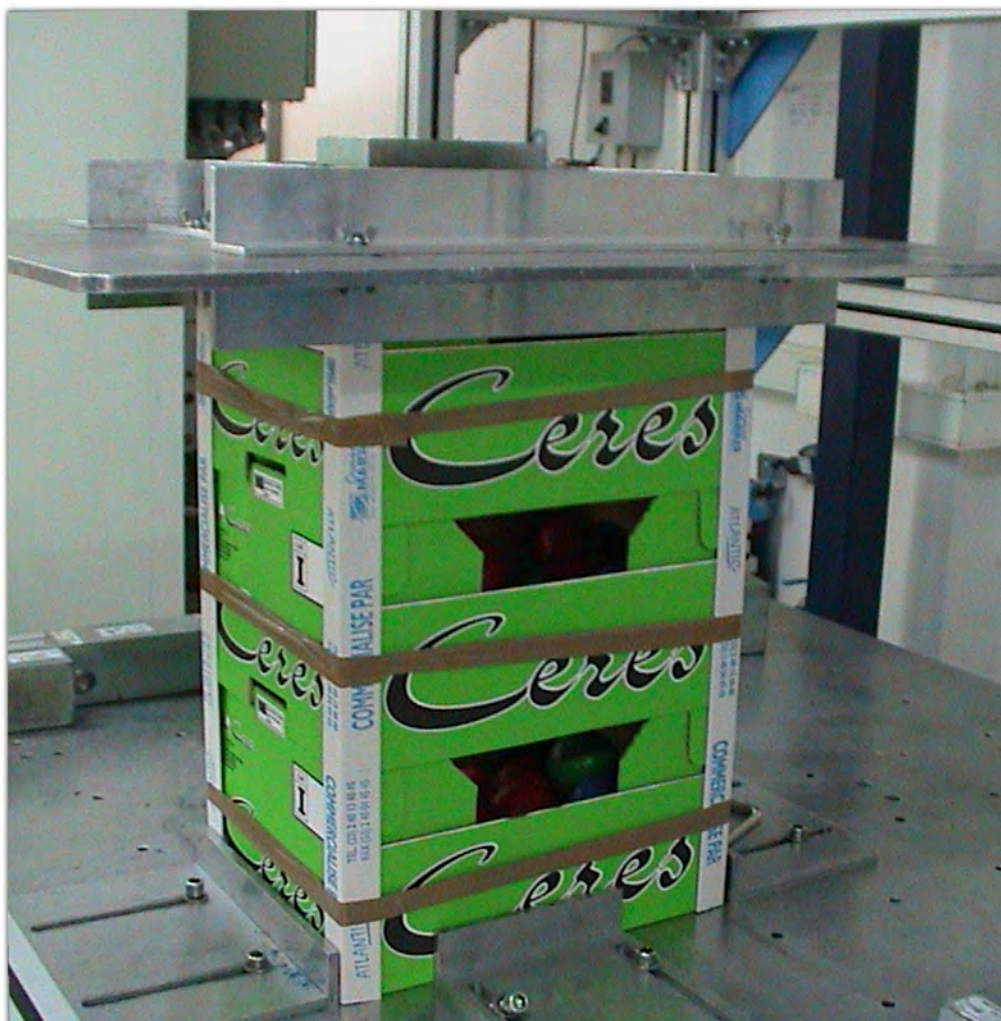


Figure 26: Vibration test



R9 - CONDITIONS FOR USING BOXES WITH THE UNIQ QUALITY SEAL

The manufacturer of the UNIQ box guarantees their performance as long as the following conditions of use are observed:

- *The box must comply with the UNIQ Quality Regulation.*
- *Before use, the boxes shall be stored at temperatures between 0 and 30° C and a relative humidity between 30-70%.*
- *The box must not be damaged during handling.*
- *Only the hot melt adhesives recommended by the maker of the UNIQ box are used.*
- *The assembly, palletizing and loading instructions described herein are observed.*
- *The maximum product weight per package shown on the UNIQ seal is not exceeded.*
- *The maximum number of boxes to be stacked on the pallet specified by UNIQ is not exceeded.*
- *UNIQ is a transport container. Boxes with product must not be stored for unusually long periods in cold rooms.*
- *The time that boxes are palletized from packaging until arrival must correspond to the class shown on the UNIQ quality seal (Class E, L or U).*
- *Proper humidity and temperature conditions as required by each product should be maintained throughout the storage and transport phases. Breaking the cold chain, or any other circumstance that leads to water condensation, must be avoided.*



R10 - ASSEMBLY, PALLETIZING AND LOADING INSTRUCTIONS

A) THE IMPORTANCE OF PROPER PALLETIZATION

Proper palletization is as important as selecting the correct box.

The instructions below describe correct palletization practices, since even the best box can fail if handled improperly.

B) PALLETS TO USE

Reusable pallets

The use of European pallets, measuring 800 x 1200 mm, as per the UNE EN 13698-1 Standard, is **recommended**. Their use is also recommended by the Spanish Association of Commercial Codes (AECOC).

It has a modular surface area and allows placing UNIQ boxes in such a way as to provide for ideal ventilation of the product.

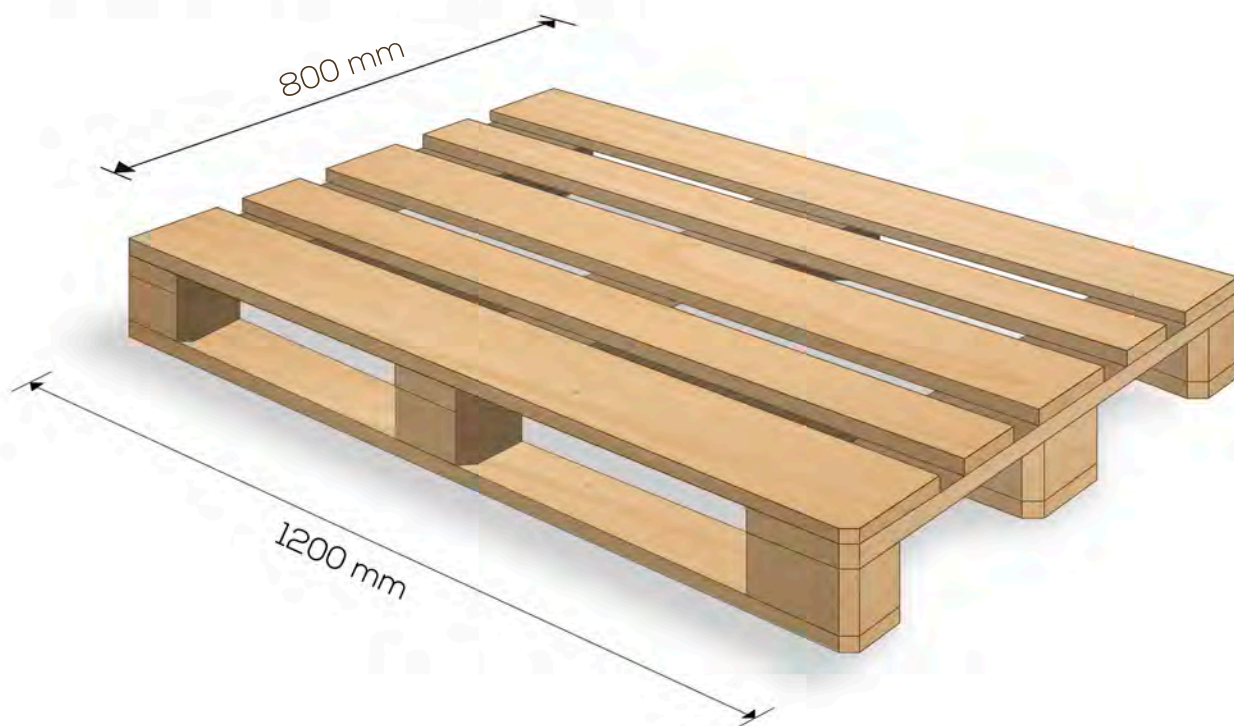


Figure 27: European pallet



Due to their use, especially in maritime transportation, pallets measuring 1000 x 1200 mm, as per the UNE EN 13698-2 Standard are also recommended.

Defective pallets must not be used. A pallet is defective when: It has missing or broken boards or is missing blocks.

There are protruding or missing nails.

It is splintering due to heavy use, even if otherwise intact.

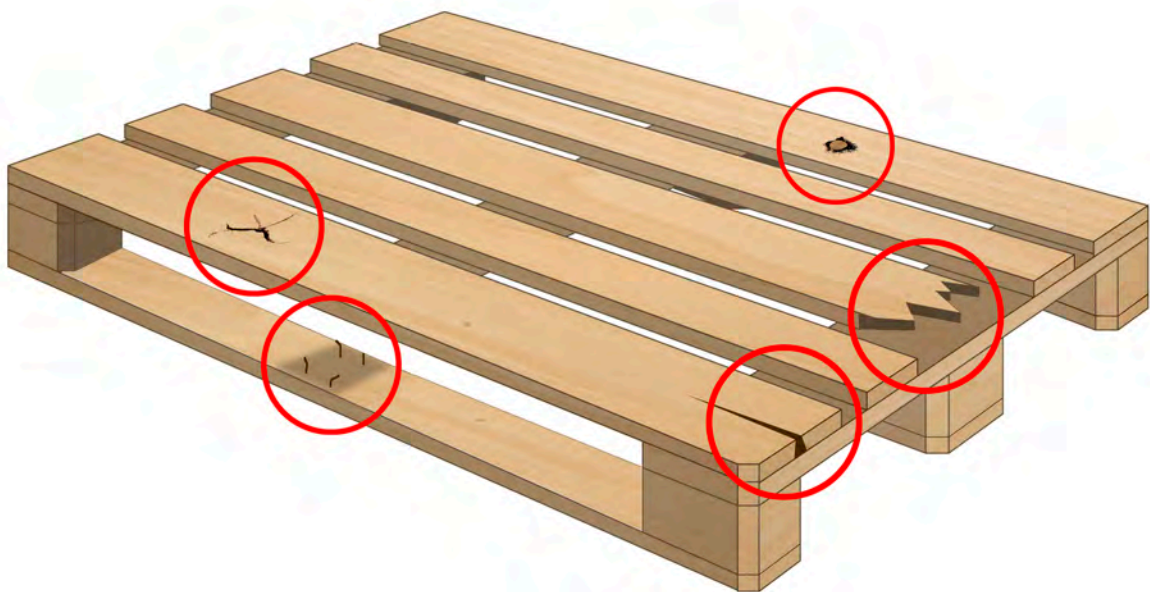


Figure 28: Defective pallet.



Single-use pallets

Single-use pallets must have the following dimensions:

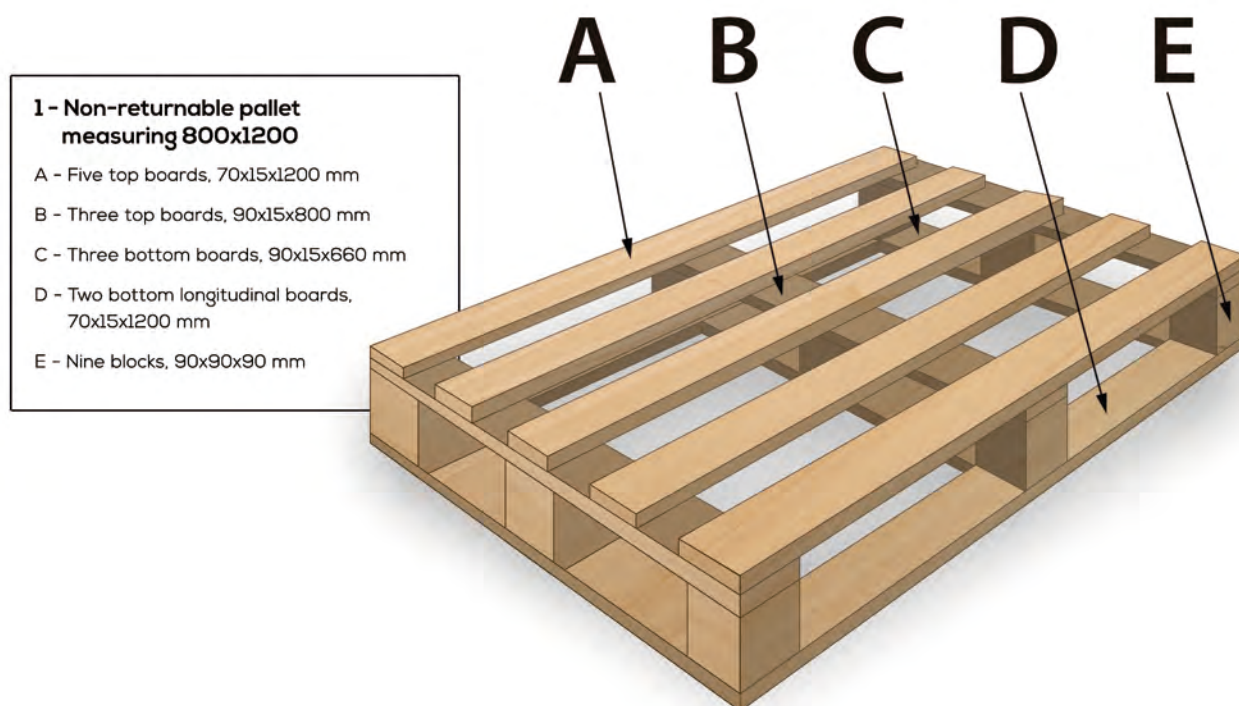


Figure 29: Non-returnable 800x1200 mm pallet

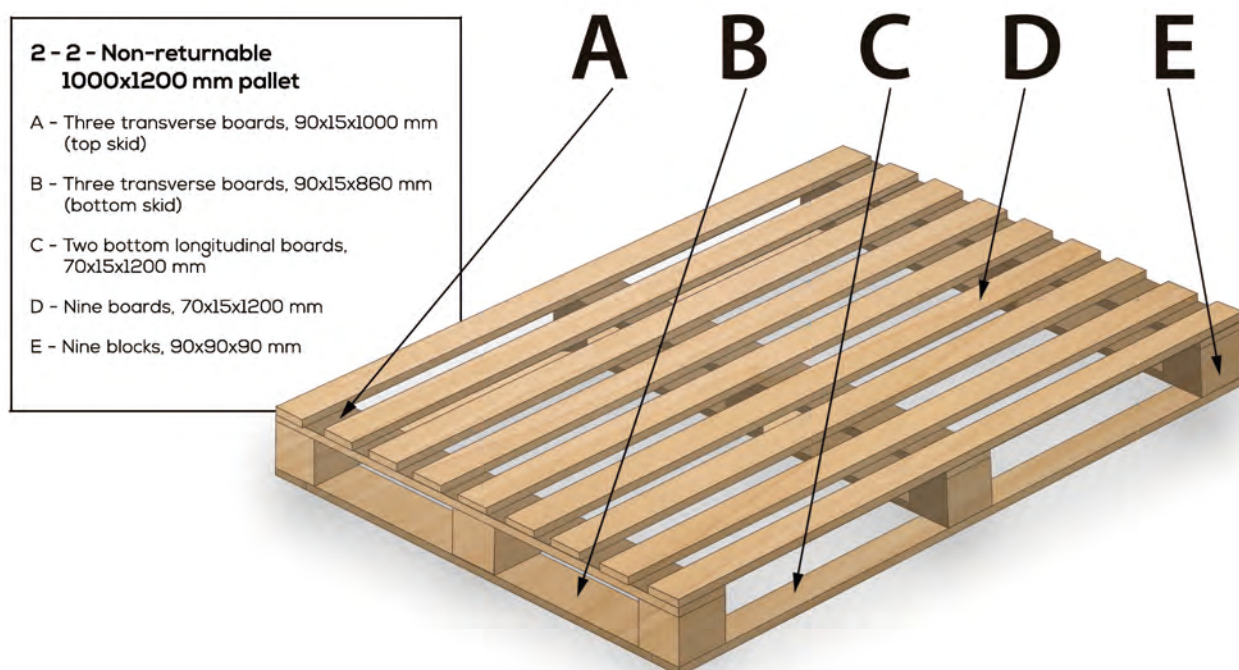


Figure 30: Non-returnable 1000x1200 mm pallet



C) MACHINE ASSEMBLY OF BOXES

Squaring

All four sides of the box must be at a 90° angle.



Figure 31: View of long panel with short panels squared correctly

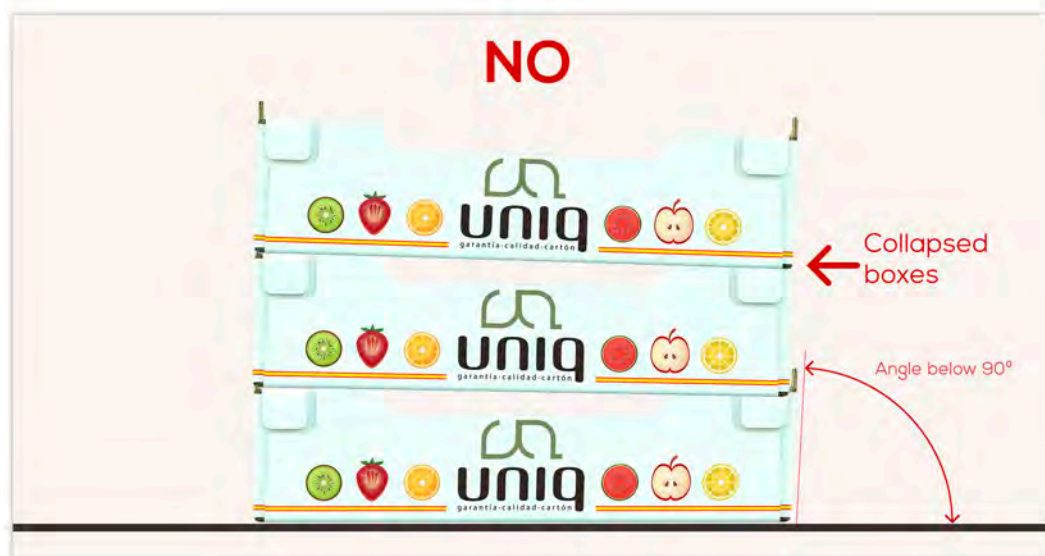


Figure 32: View of long panel with short panels squared incorrectly

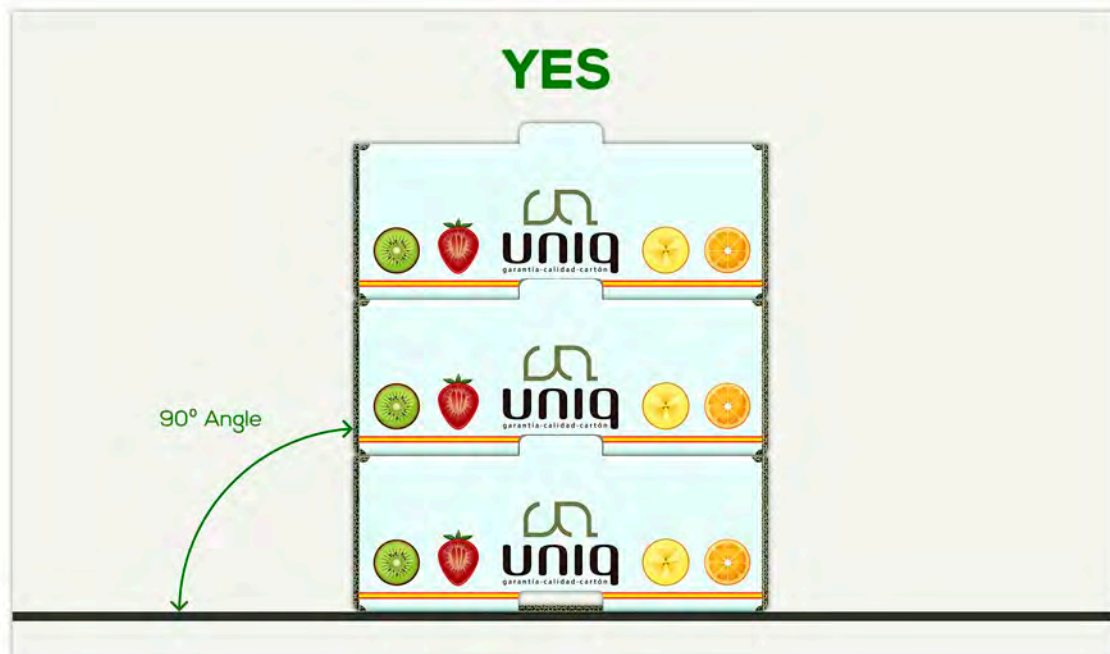


Figure 33: View of short panel with long panels squared correctly.

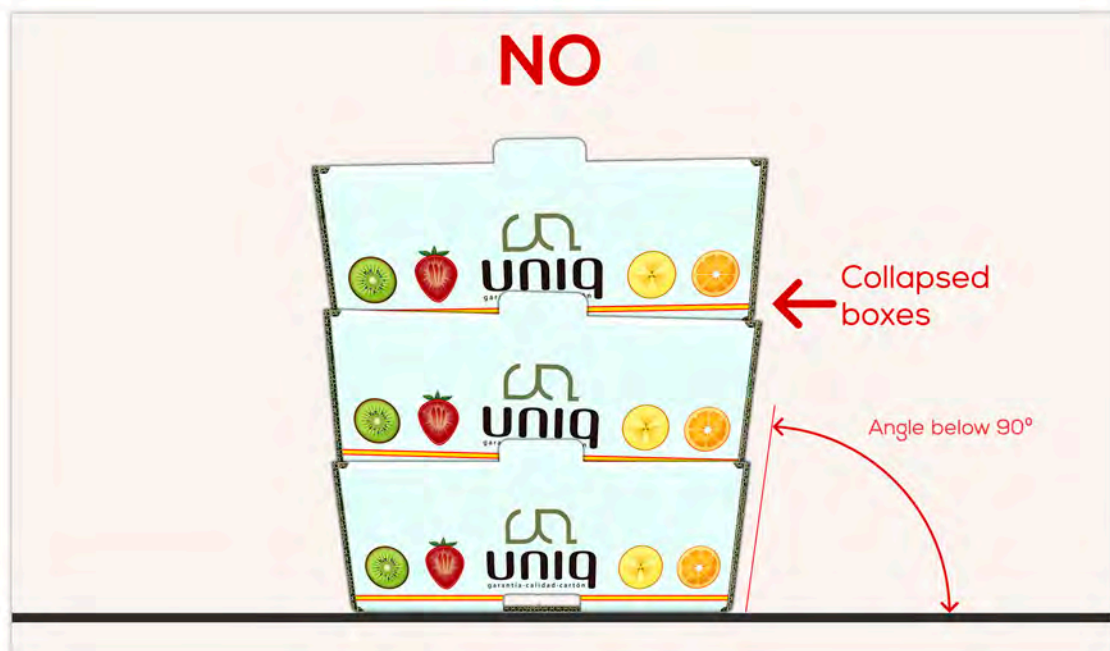


Figure 34: View of short panel with long panels squared incorrectly



Adhesives recommended for machine assembly

Users of UNIQ boxes should follow their box supplier's recommendation in this regard. It is very dangerous to use cheap adhesives. Any claim based on using an improper adhesive must be rejected.

Gluing type-T boxes

Adhesive types must be selected that are suitable to the time of year and the adhesive must be properly applied, both in keeping with the recommendations of the box manufacturer. This is so as to keep tabs or flaps from coming unglued, causing the box to bend and stacks to tip over on the pallet.

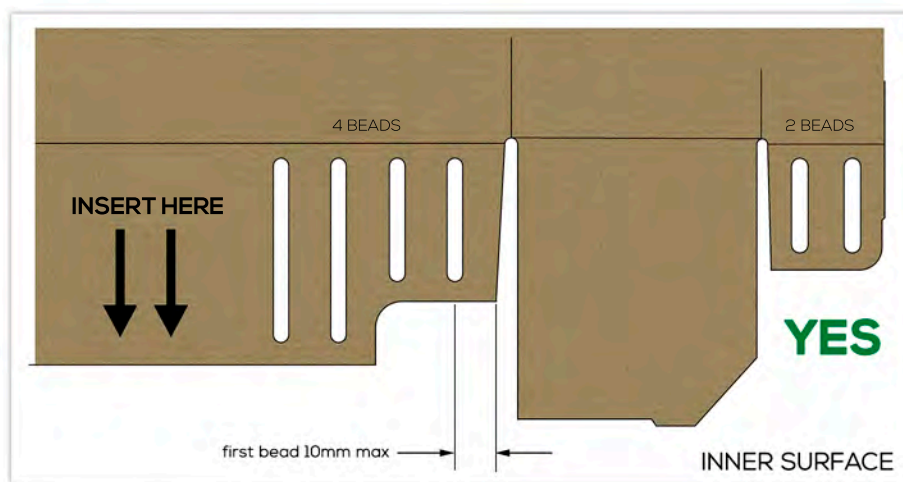


Figure 35: Type T gluing

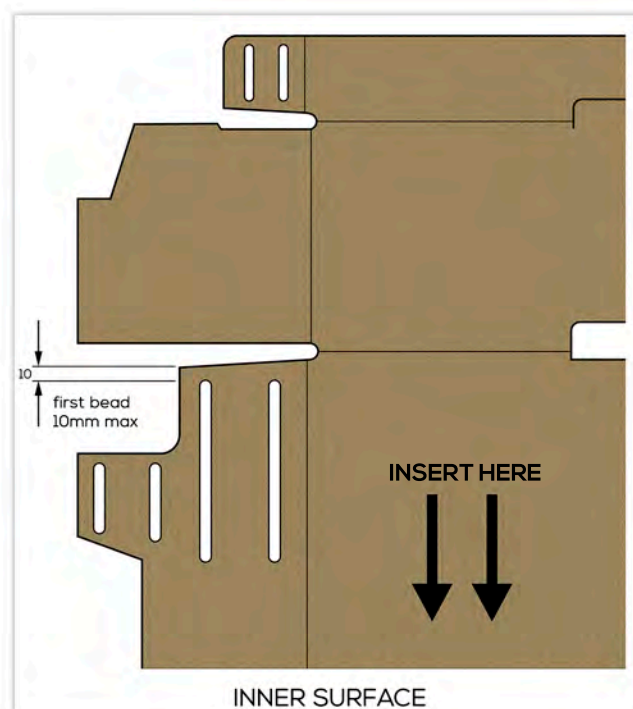


Figure 36: Type T gluing

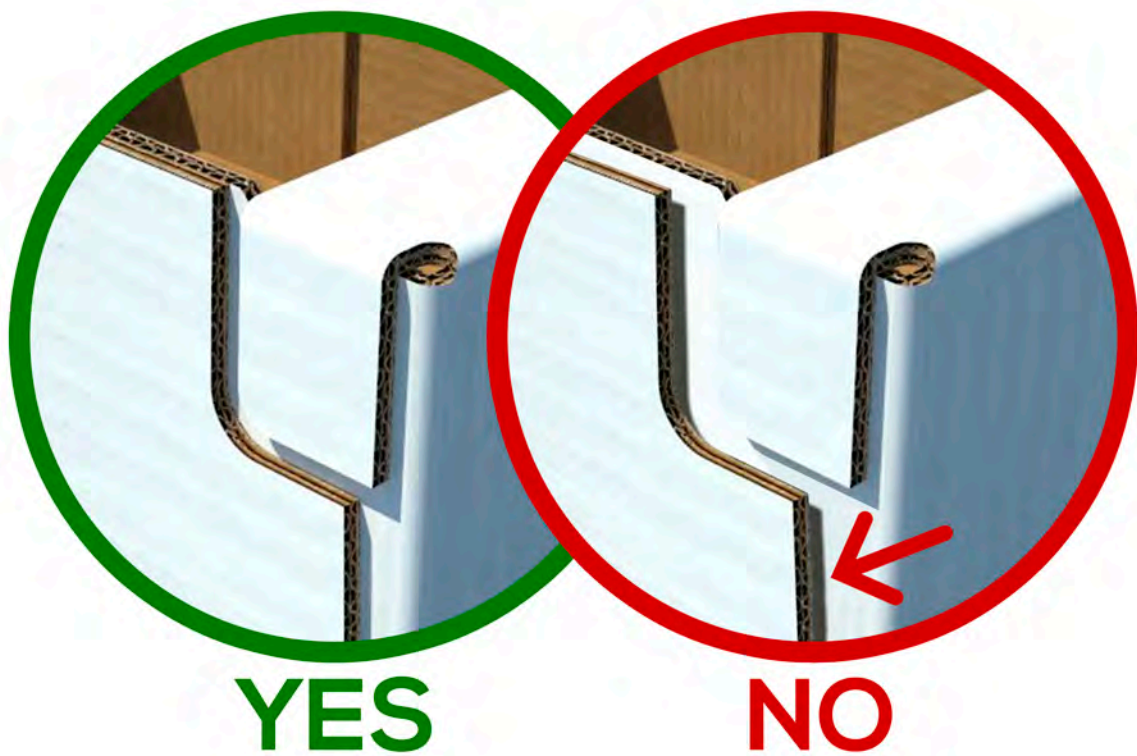


Figure 37: Type T gluing

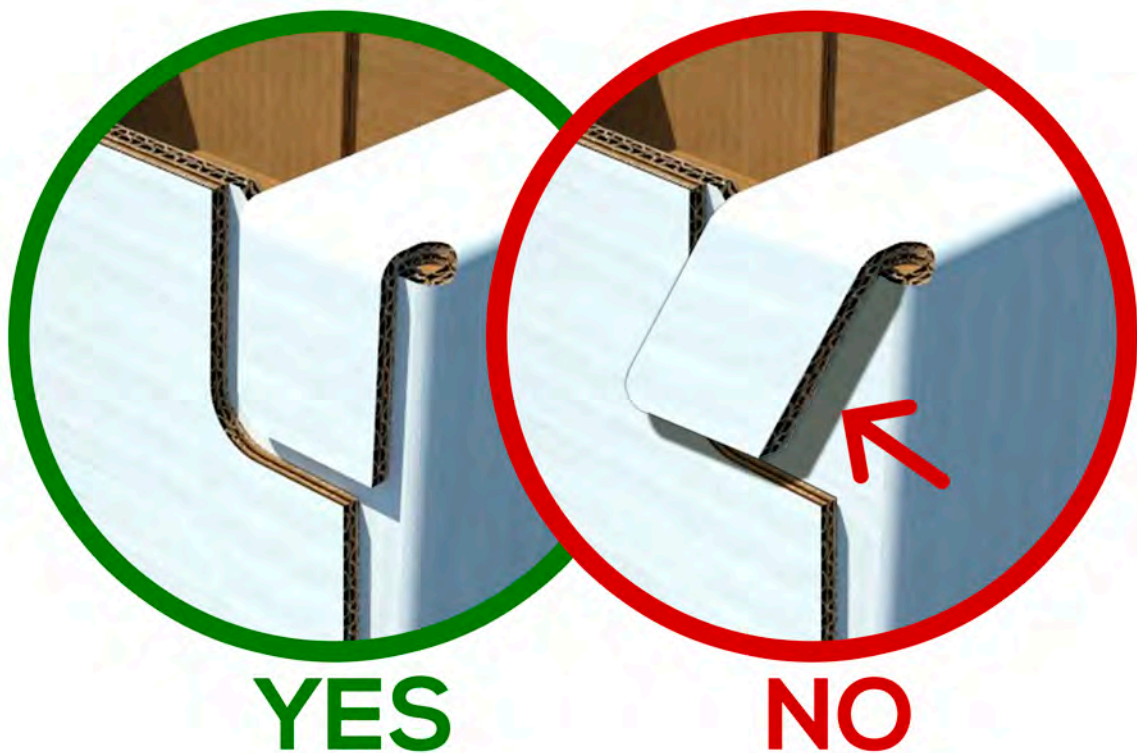


Figure 38: Type T gluing



Gluing type-C boxes

The lines of adhesive should be applied as shown in the figures below:

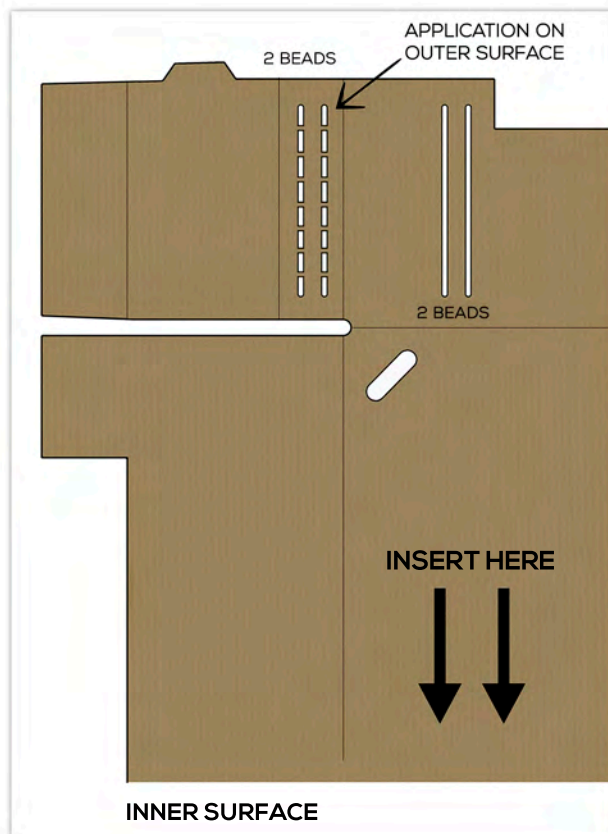


Figure 39: Type-C gluing

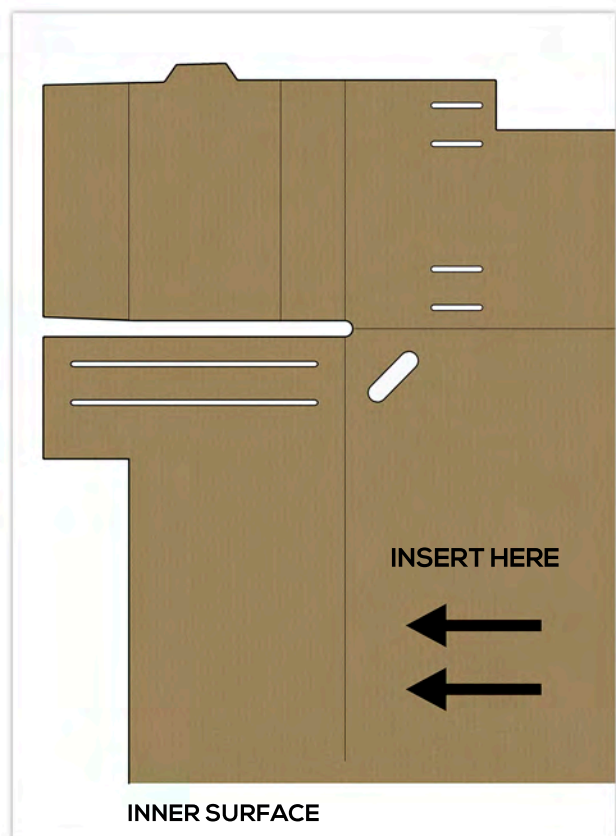


Figure 40: Type-C gluing



D) PALLETIZING

Placing boxes on a pallet

It is important that **no boxes overhang** on the second layer of boxes. The pallet must offer as large a support base as possible to the sides of the boxes. If the boxes overhang, they will bend and cause the pallet to tip over.

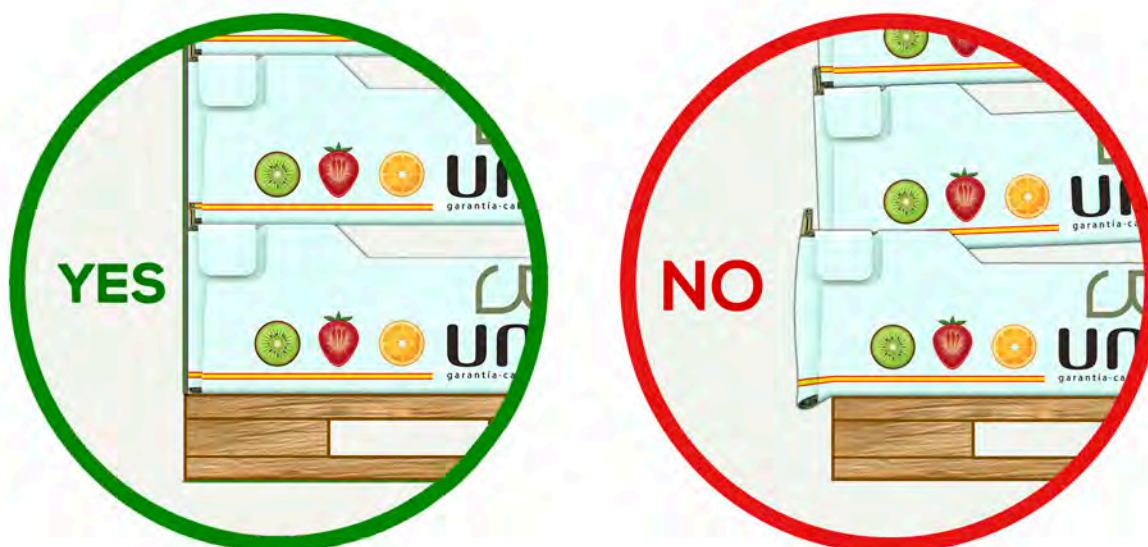


Figure 41: Box placement on the pallet



Stacking boxes

The stack must be completely straight. Any misalignment will cause the pallet to tip.

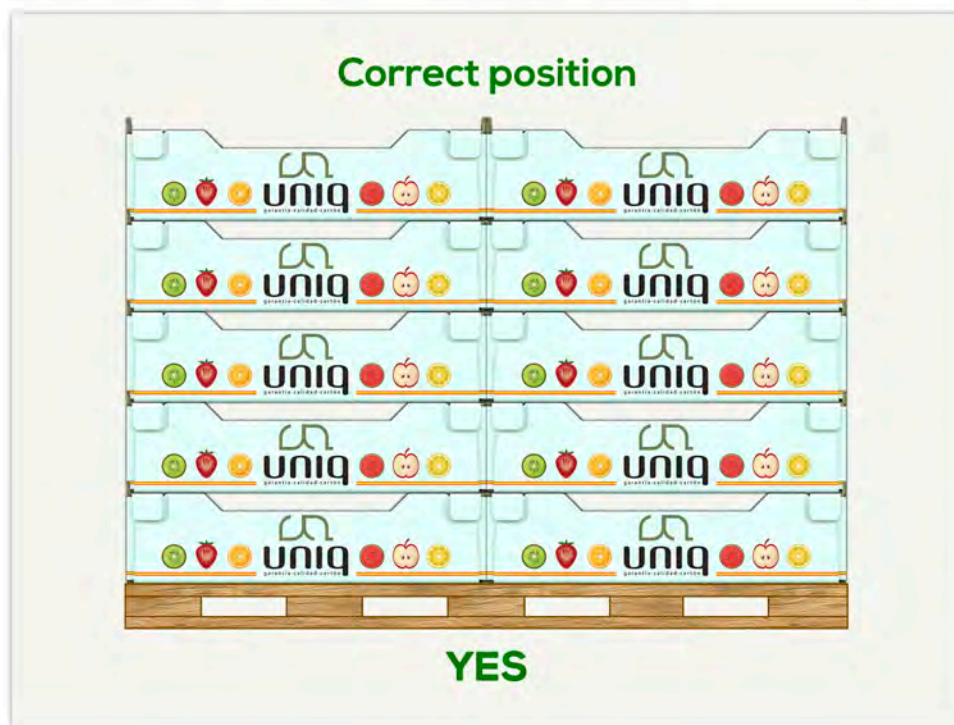


Figure 42: Properly stacked boxes

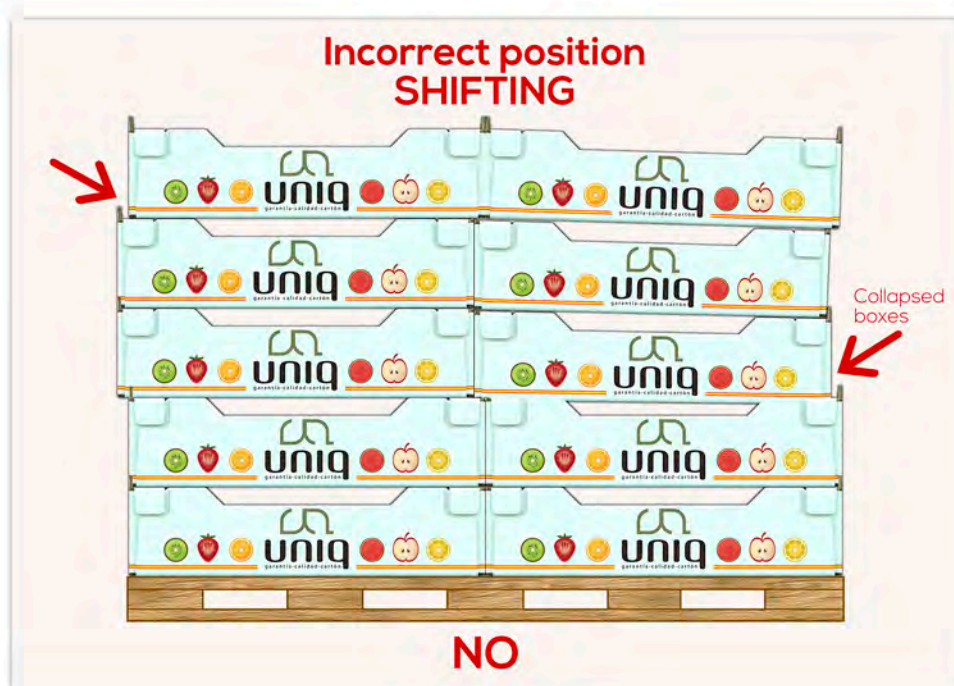


Figure 43: Improperly stacked boxes



Types of palletization

Palletization must be done using corner posts and straps, and not on mesh.



Palletization with corner posts and straps: YES

Figure 44: Correct palletization with corner posts and straps



Palletization with mesh: NO

Figure 45: Incorrect palletization with mesh



Calibrating the product

It is important that the product be properly calibrated. Internal pressure causes the boxes to bulge and the pallet to lean over.

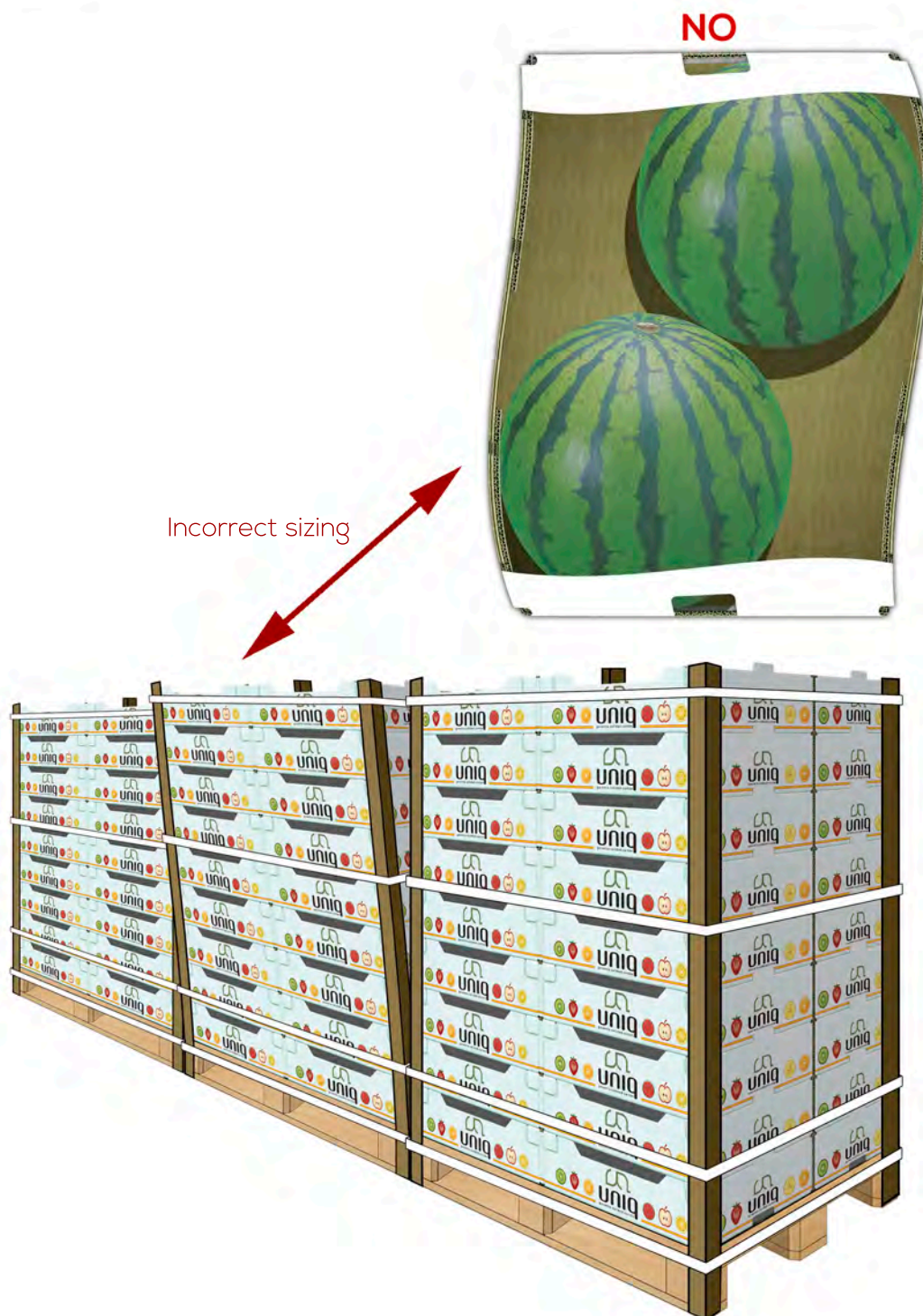


Figure 46: Calibrating the product



Correct position of corner posts and straps

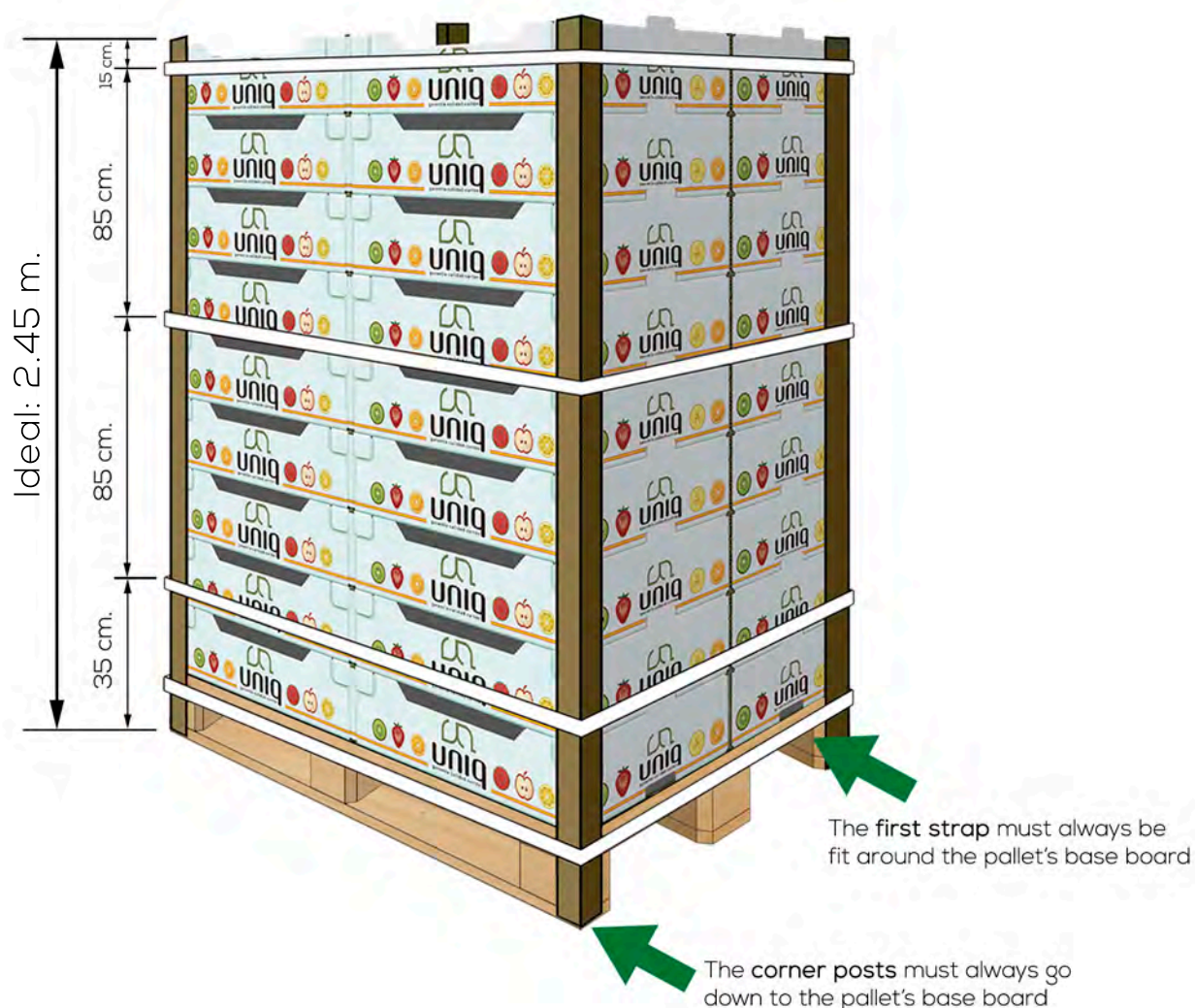


Figure 47: Correct position of corner posts and straps



Proper material and dimensions of corner posts

The corner posts must be made of a **very rigid material**, such as compact board, and have the following minimum dimensions:

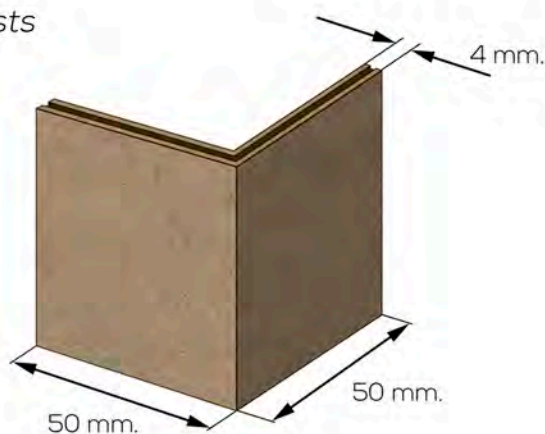
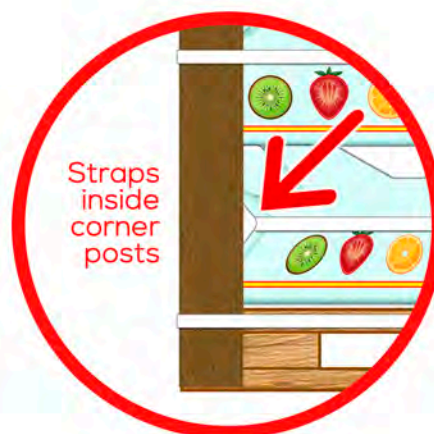


Figure 48: Corner post

Proper placement and tension of straps

To keep the boxes from bending, properly sized and tensioned straps must be used.

It is very important that the first strap be attached to the board on the pallet.



NO

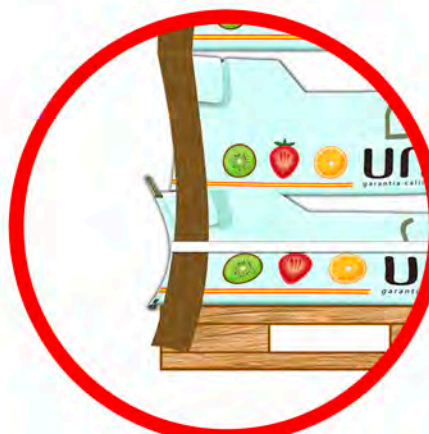
Excessive tension on the strap can warp the boxes and cause the pallet to tilt.

The first strap must always be fit around the pallet's base board



YES

Figure 49: Properly attached first strap



NO

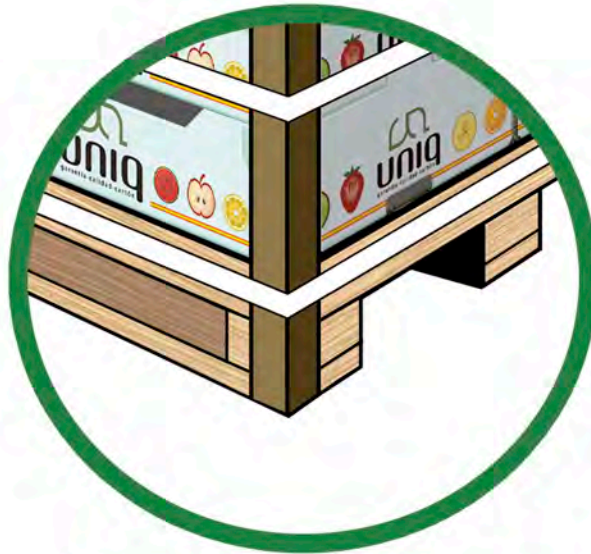
Figure 50: Improperly attached first strap with excessive tension



Proper placement of corner posts

The posts must be placed at the four corners and reach the base of the pallet.

YES



The corner posts must always go down to the pallet's base board

Figure 51: Proper placement of corner posts

NO

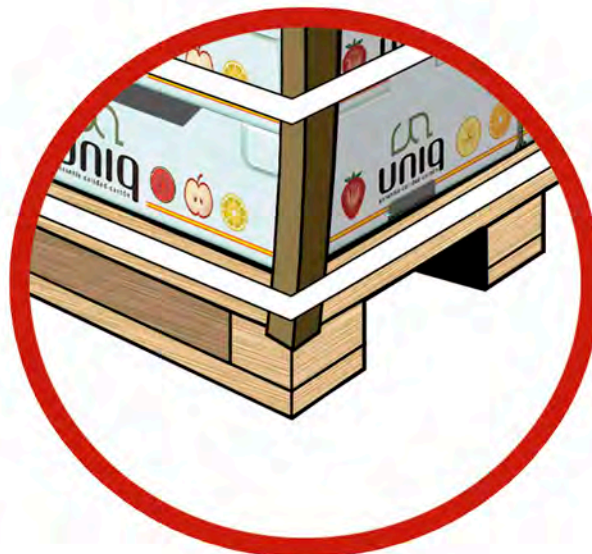


Figure 52: Improper placement of corner posts



YES



Always place
posts at all 4 corners

Figure 53: Proper placement of corner posts

E) RECOMMENDATIONS FOR LOADING ON TRUCKS

Placement inside the truck

Trucks should be fully loaded. Lateral braces should be placed between the palletized load and the sides of the truck to keep the load stable.

Temperature conditions

The levels of humidity and temperature required by the product should be maintained at all times. Breaking the cold chain, or any other circumstance that leads to water condensation, must be avoided.

Improved ventilation

The pallets should be arranged such that the ventilation flows perpendicular to the side windows on the boxes.

The 800x1200 mm dimensions of a europallet allows for the following layout inside a truck:

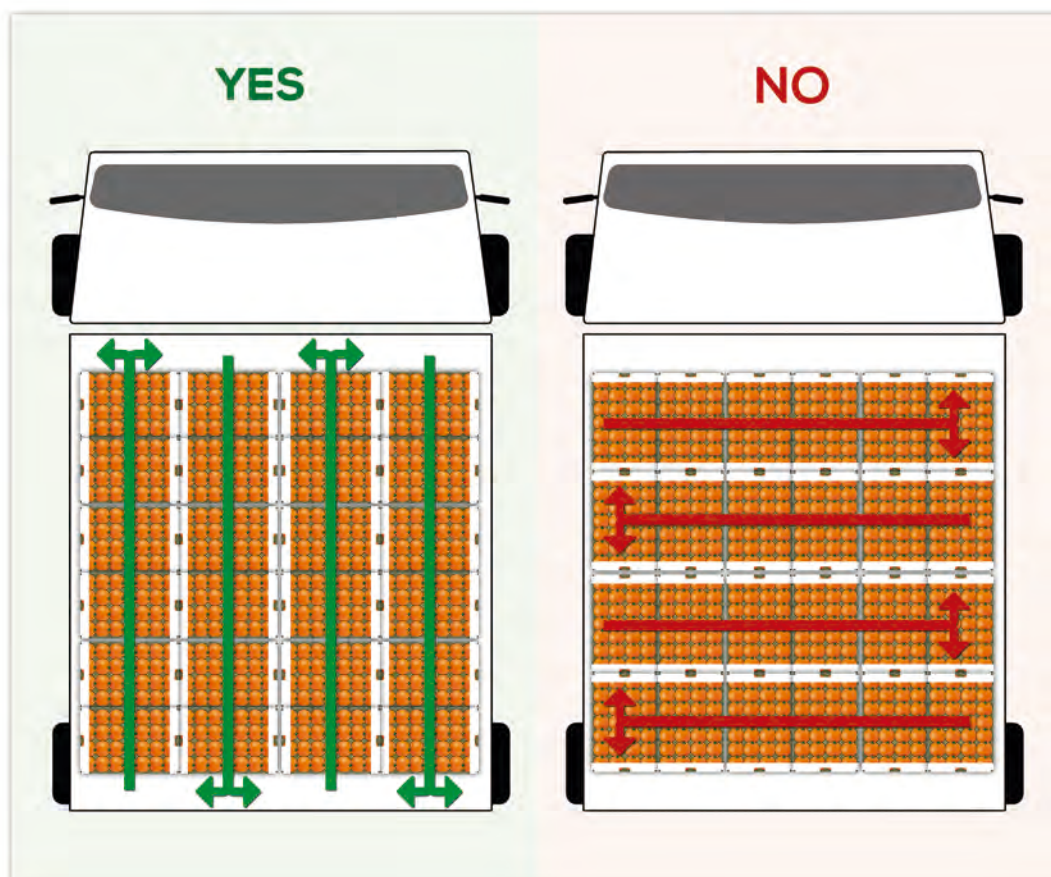


Figure 54: Ventilation inside the truck

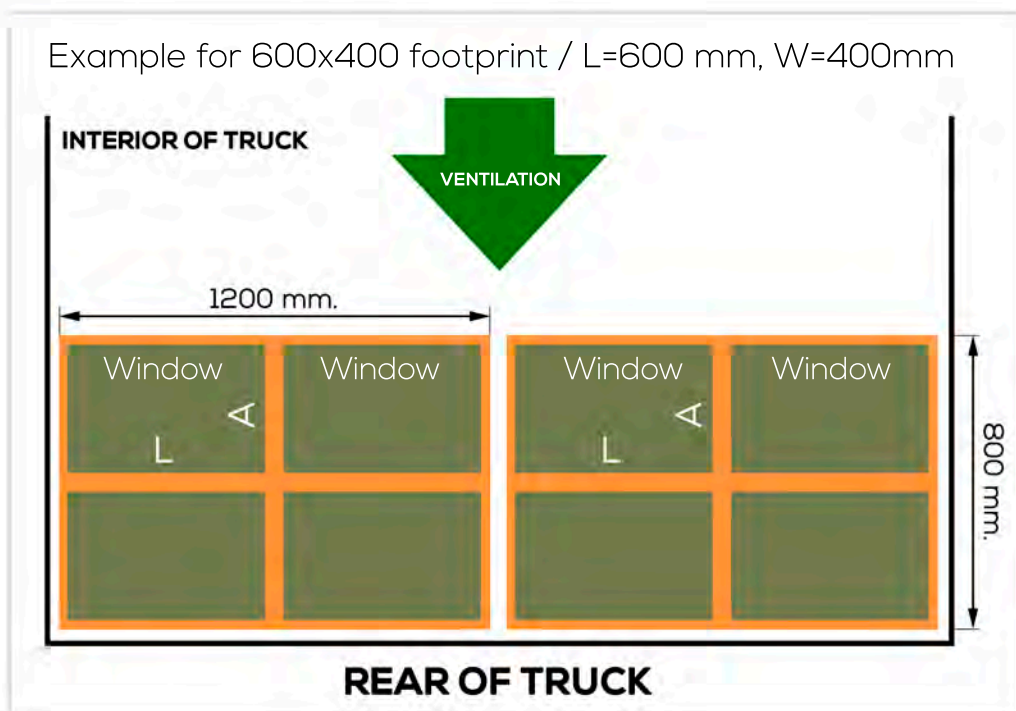


Figure 55: Ventilation inside the truck

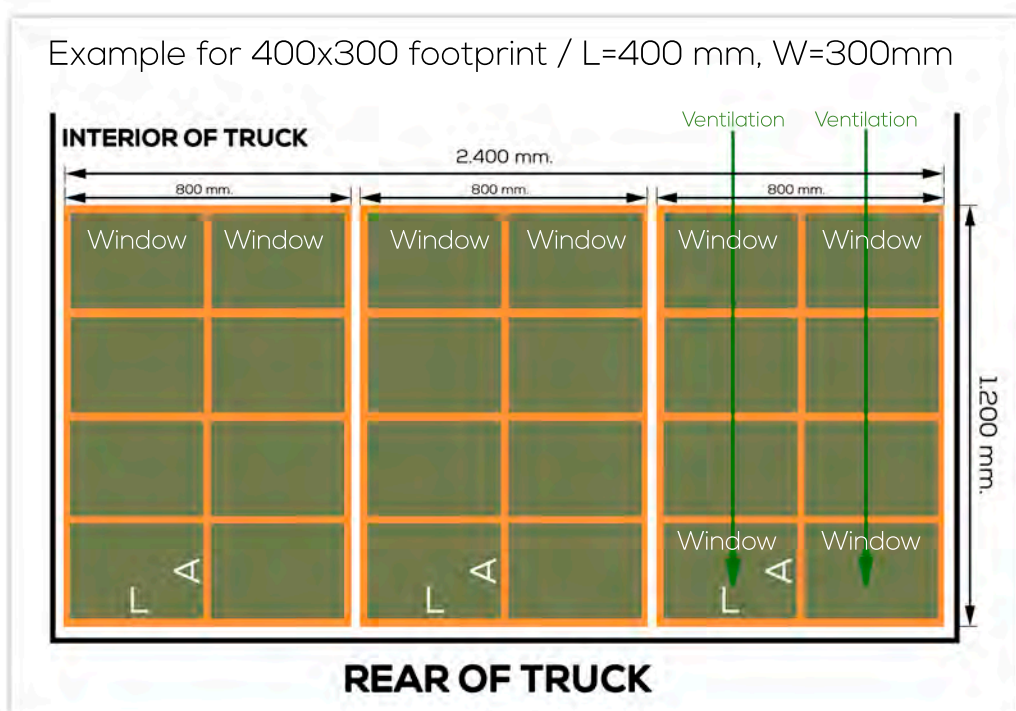


Figure 56: Ventilation inside the truck

The maximum number of boxes stacked on the pallet must not exceed the number printed on the UNIQ quality seal.

The ideal total stack height (including the pallet) is 2.45 m, the goal being to fully utilize the loading space and not block air flow at the top of the pallet.



UNIQ QUALITY MANUAL

These guidelines and recommendations are provided so the manufacturer can design the box so as to obtain the performance required of UNIQ fruit and vegetable boxes. As a result, even though these guidelines are not required, we recommend that manufacturers adopt them.

M1 - NOTICE REGARDING THE MAKING OF HOLES IN UNIQ BOXES

Making holes to provide ventilation and places to hold the box could degrade a box's compression resistance up to 20%, depending on the size and location of the holes. Users of UNIQ boxes should make the fewest number of holes possible and always seek advice from the UNIQ manufacturer.

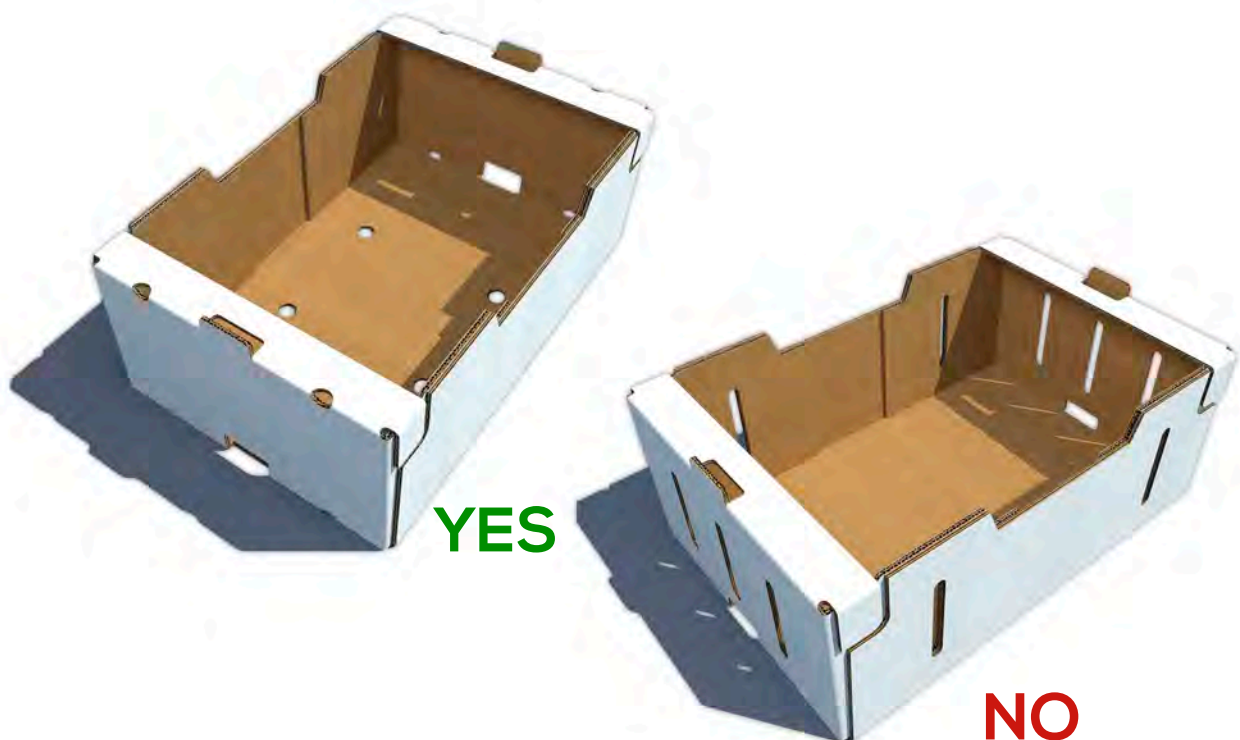


Figure 57: Holes



M2 - STANDARDIZATION OF VENTILATION HOLES IN TYPE T BOXES

Ventilation holes must only be made in very specific locations so as not to compromise the box's structural integrity. This section shows the exact dimension, shape and position of these holes based on the results of a study conducted by experts from a certified corrugated cardboard laboratory, an exporter of fruits and vegetables and several manufacturers of corrugated cardboard.

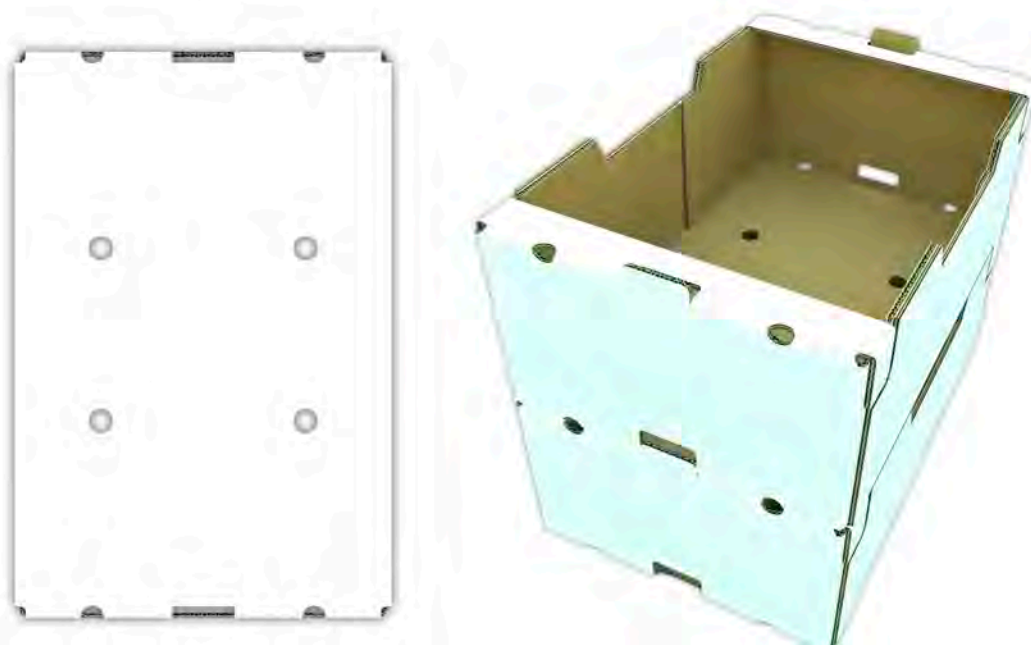


Figure 58: Ventilation holes

The table below shows the results of the study expressed as the average percent reduction in the pre-cooling times for fruits in both forced ventilation rooms and in conventional rooms belonging to the participating exporter.

Improvement in fruit pre-cooling times in UNIQ boxes	% improvement in pre-cooling
20-kg box of citrus fruits 600x400x240 mm	35%
15-kg box of citrus fruits 600x400x170 mm	25%
6-kg box of tomatoes 400x300x140 mm	40%
5-kg box of peppers 400x300x200 mm	21%



The holes to improve circulation must be made as shown in the following diagrams:

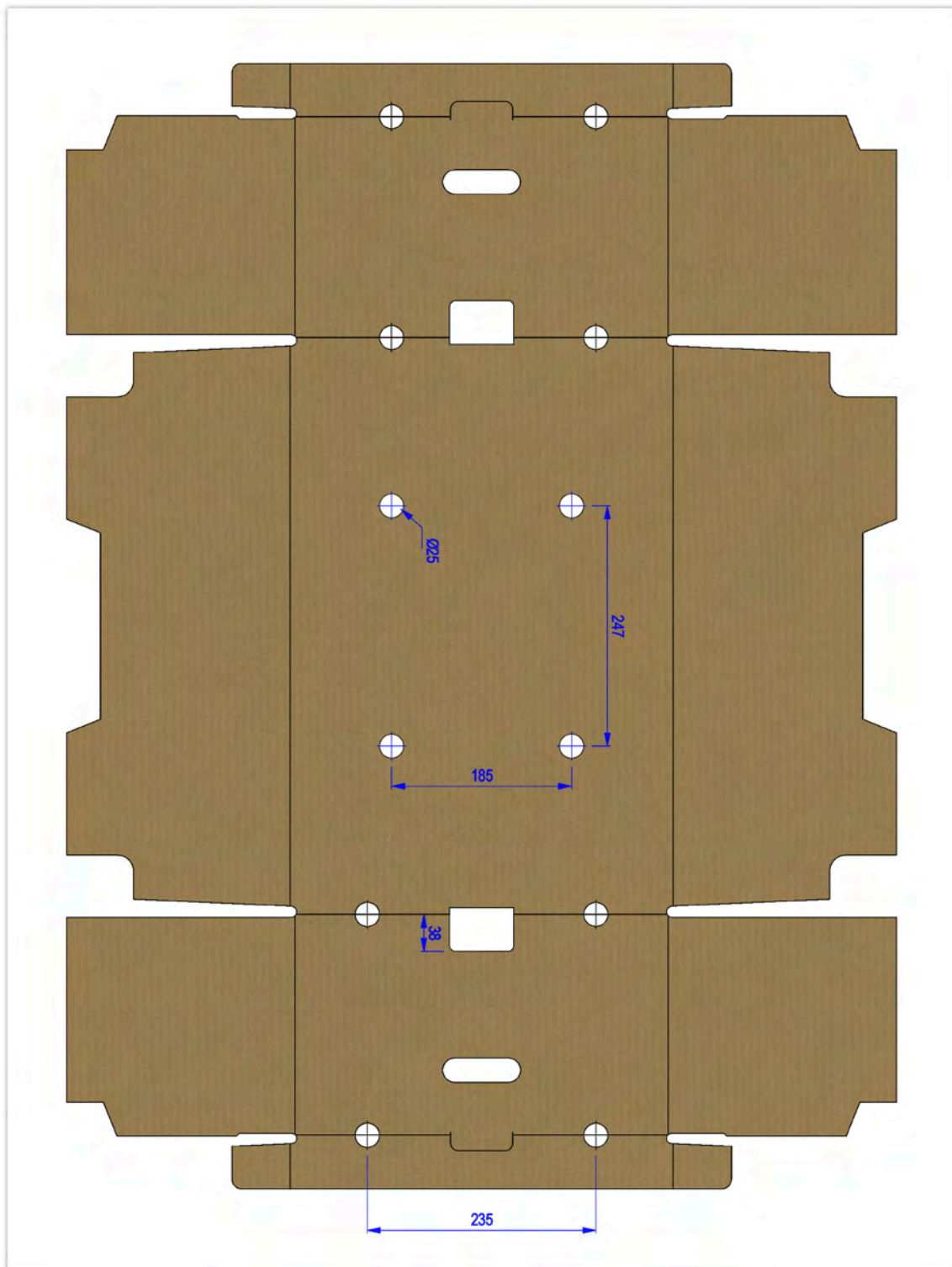


Figure 59: 20-kg box of citrus fruits 600x400x230 mm

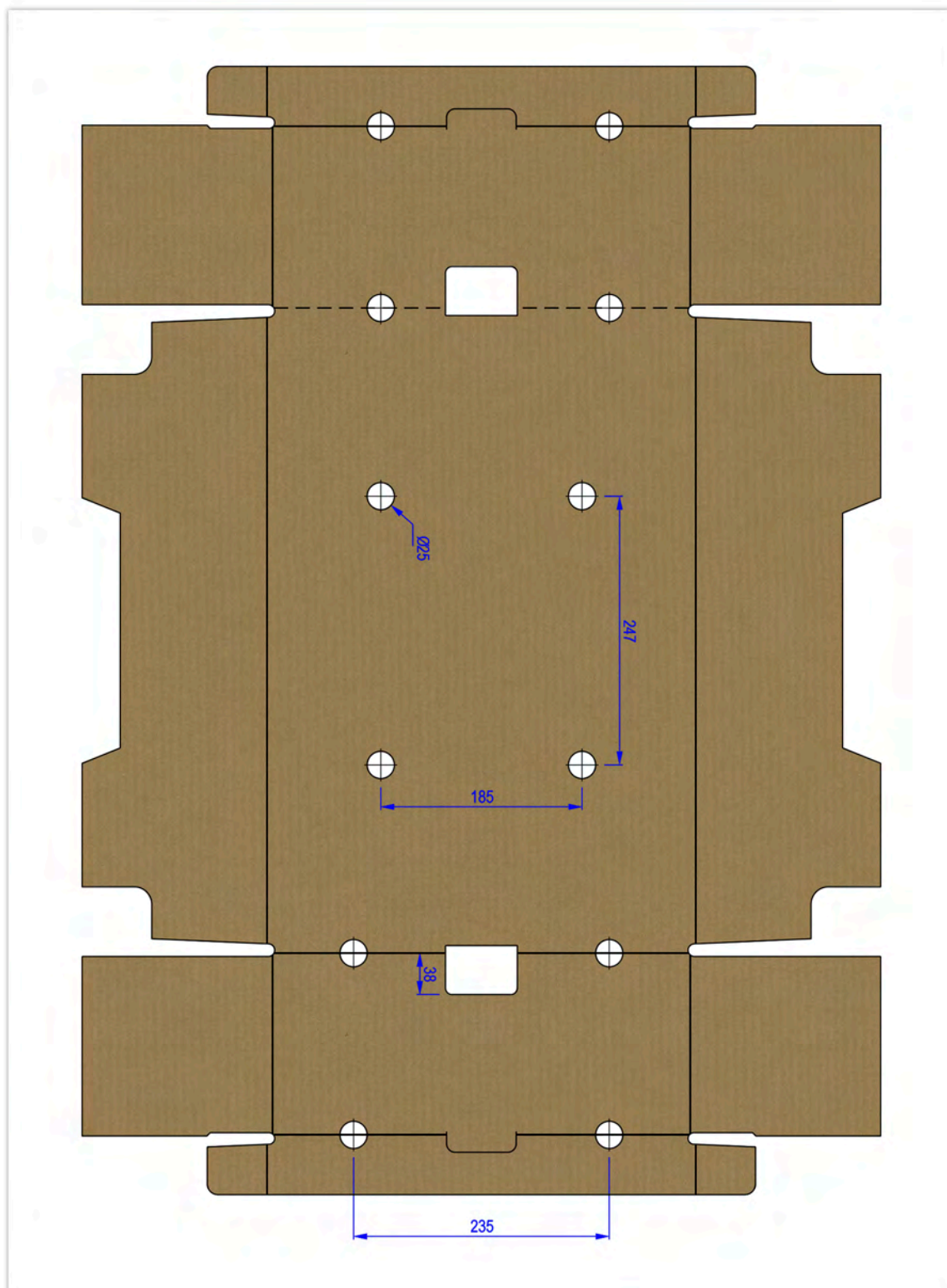


Figure 60: 15-kg box of citrus fruits 600x400x170 mm

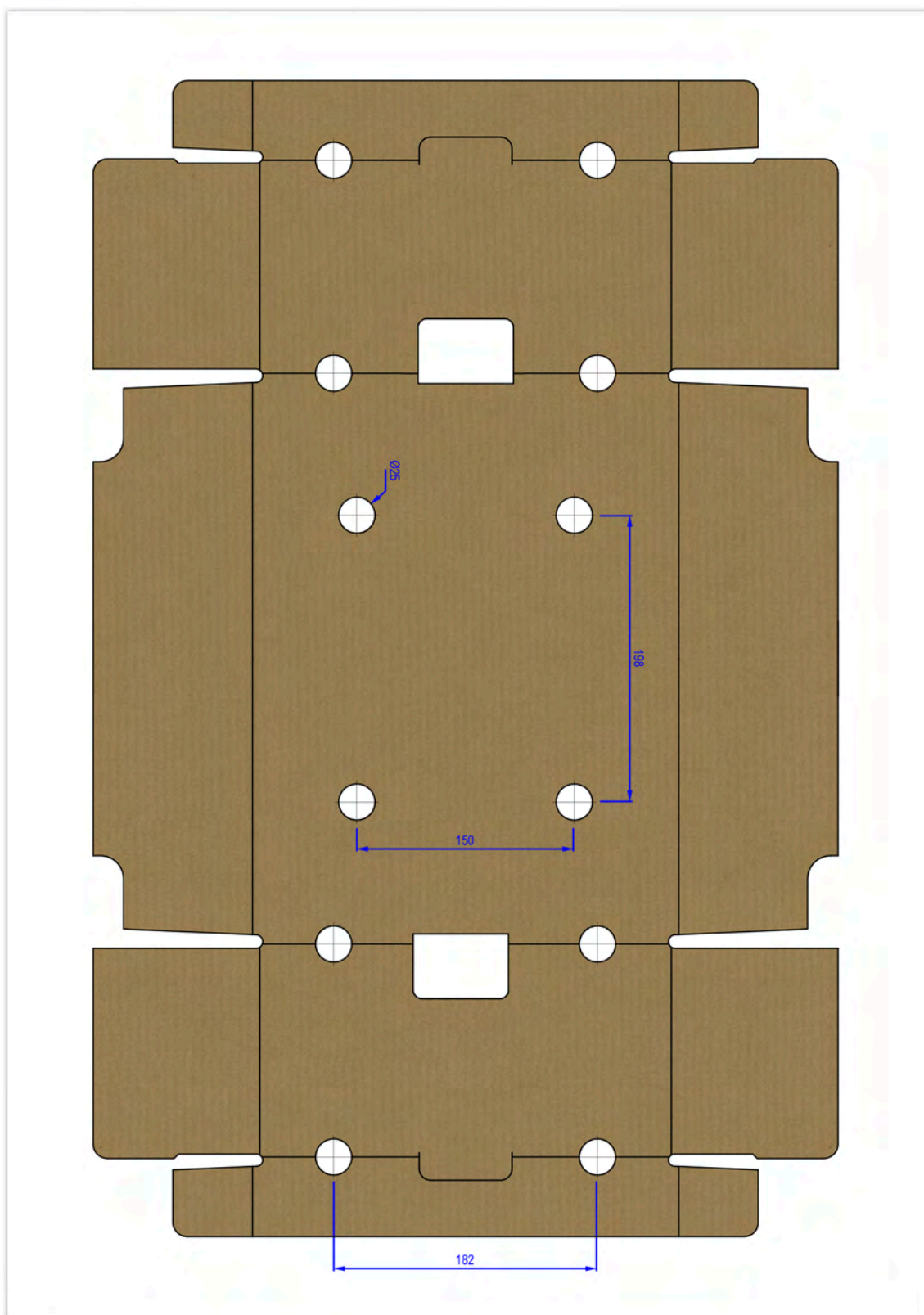


Figure 61: 6-kg box of tomatoes 400x300x150 mm

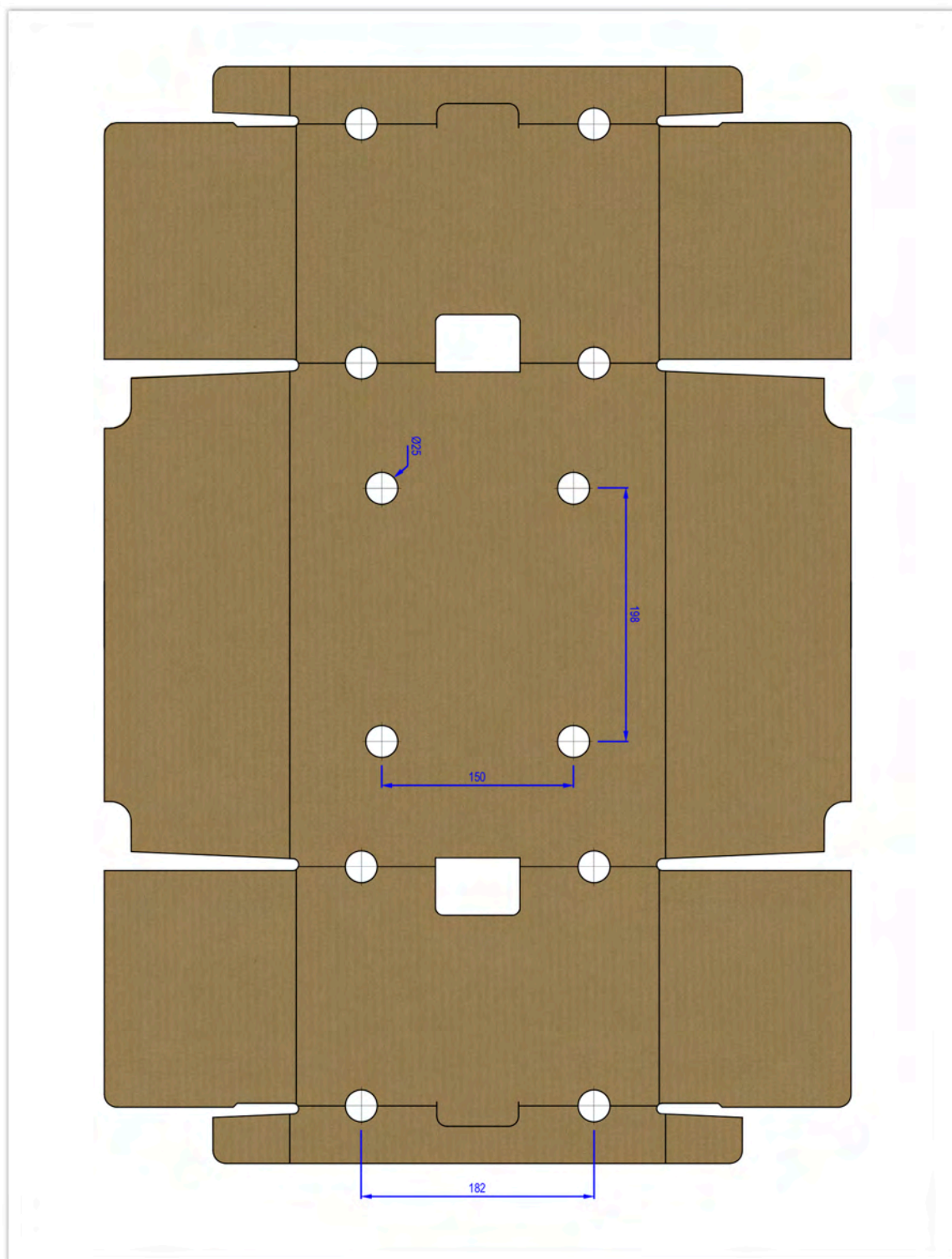


Figure 62: 5-kg box of peppers 400x300x200 mm



M3 - UNIQ DESIGN DATABASE

To aid manufacturers, there is a database of standard UNIQ designs for boxes widely used in the market in both the T and C configurations.

Whenever possible, a box should be designed based on this UNIQ database, since each layout was made taking into account every point in both the UNIQ Quality Regulation and the UNIQ Quality Manual that affects the design.

The designs in the database preserve the critical points in the box's structure, thus ensuring the best response possible against the loads to which it will be subjected over the course of the logistics chain.



M4 - QUALITY CONTROL LIST FOR: PACKING, ASSEMBLY, PACKAGING, PALLETIZING, LOADING AND TRANSPORTING OF UNIQ BOXES

Below is a checklist that may be used to track the QUALITY of the PACKAGING and PALLETIZING with UNIQ boxes, with the key points to monitor in the box assembly, packing, palletizing, loading and transportation processes.

DATE:

BOX MANUFACTURER:

ADDRESS:

A) FULL CONTROL LIST:

1) ITEMS PERTAINING TO THE BOX

Fabricante del envase:

Box manufacturer: Packaged product:

Packing method (bulk, molded trays, mesh, offset, jars, laminated, etc.):

Box certification no.

Kg guaranteed by UNIQ (see UNIQ list)

Actual Kg of contents (must not exceed the guaranteed Kg rating) Box design (indicate type T or type C):

Exterior length (mm): Exterior width (mm): Exterior height (mm):

Height of the outer long panel at its highest part (mm):

Does the long panel have the minimum height specified by UNIQ (YES" or "NO")?

Width of central interlocking tab (mm):

Do the box dimensions comply with the international CF standard (put "YES" or "NO")? Tejadillo dimensions (mm):

Type of tejadillo (state whether straight, shortened, Italian, double).

Is the tejadillo type within the UNIQ recommendations ("YES" or "NO") Length of lug (mm):

Length in mm of vertical flutes cut into each inner flap (must not exceed 20 mm):

Type of slot ("A" or "B"):

UNIQ class stamped:

Type of board and flutes (for example, indicate "double double BC"): Handle in short panel (YES" or "NO"):

Type of handle in short panel (if present, indicate "top" or "bottom"): Ventilation holes (YES" or "NO"):

Other holes ("YES" or "NO" and provide photos):

Readily apparent problems with the box (e.g. unglued sides, wet, etc.)

2) ITEMS PERTAINING TO THE MACHINE ASSEMBLY OF THE BOX

Long and short panels assembled at 90° angle (state if correct/incorrect):

Long and short panels assembled at 90° angle (if incorrect, state if the box is open/closed):

Lines of adhesive as recommended by UNIQ (state if correct/incorrect): Adhesive spread out during assembly (YES" or "NO"):

Are there any detaching flaps or lugs ("YES" or "NO")?



3) ITEMS PERTAINING TO PACKING AND PALLETIZATION

Type of palletization (straps, mesh, etc.):

Type of palletization (whether manual, automatic):

Is the fruit properly calibrated (indicate if correct/incorrect)?

Do the boxes hang over the base of the pallet (YES or NO)?

Bases of boxes supported on pallet crossbeams (indicate if correct/incorrect):

Straight stacks of boxes: Are the lines straight? (indicate correct/incorrect):

Total number of horizontal straps:

Is the lowest strap attached to the pallet as recommended by UNIQ ("YES" or "NO")?

Are any straps tensioned excessively and cutting into boxes (indicate if tension is correct/incorrect)?

Pallet material (indicate if wood, plastic, cardboard, etc.):

Type of pallet (indicate if EUR-PAL, CHEP, disposable, other, etc.):

Pallet length (mm):

Pallet width (mm): Pallet height (mm):

Is any part of the pallet broken (missing or broken boards or blocks... indicate correct/incorrect):

For single-use pallets: Does it have the UNIQ recommended features (no. of boards, dimensions, thicknesses, etc.) (indicate correct/incorrect)?

No. of levels of boxes:

Boxes/level:

Are the 4 corner posts installed ("YES" or "NO")?

Posts installed at the corners (indicate if correct/incorrect):

Do the posts cover the pallet all the way to the bottom? (indicate correct/incorrect):

Post width (mm):

Post thickness (mm):

Is the post made from a sufficiently rigid material ("YES" or "NO")?

Temperature of room where the boxes are (in °C):

RH of room where the boxes are (in %):

Temperature of warehouse where the boxes are (in °C):

RH of warehouse where the boxes are (in %):

4) ITEMS PERTAINING TO LOADING AND TRANSPORT

Is the load properly secured ("YES" or "NO")?

Is it transported on a refrigerated truck ("YES" or "NO")?

Is the cold chain properly maintained ("YES" or "NO")?

Are pallets with 600x400 or 400x300 boxes properly arranged so that air flows perpendicular to the windows on the side of the boxes ("YES" or "NO")?



B) MAIN ASPECTS TO CONSIDER IN CASE OF AN INCIDENT:

- If an incident occurs or a claim is filed, the cardboard manufacturer should verify:
 - That it in fact manufactured the box: check the UNIQ manufacturer's code printed on the UNIQ seal
 - That the actual kg packaged do not exceed the maximum shown on the UNIQ seal
 - That the palletization period corresponds to the Class shown on the UNIQ seal
 - That the number of layers stacked does not exceed the number shown on the palletizing seal on the UNIQ box
 - That boxes are aligned with the pallet
 - That the load-bearing parts of the box are resting atop load-bearing parts on the pallet
 - Request the cold chain records and check that it is suitable for the product packaged and that it was not broken. Do not accept any claims without these records
 - If necessary, use the Expert Service that UNIQ makes available at the destination. We will urgently dispatch a specialist to do an onsite inspection.



M5 - FEFCO CFQ INTERNATIONAL STANDARD

The FEFCO CFQ (Common Footprint Quality) European quality seal should be printed on UNIQ boxes whose design includes a central interlocking tab. This tab should measure 64 mm, as per the UNIQ standard and FEFCO's CFQ Standard.

Information on the requirements of the FEFCO CFQ Standard is available on the FEFCO website:

www.fefco.org



Figure 63: Example of FEFCO CFQ quality seal



ANNEX 1

LIST OF BOXES AUTHORIZED TO BEAR THE UNIQ SEAL

Find them at : <https://tucajauniq.com>

There's much more on our websites!



UniqQuality



@GrupoUniq



Company/Grupo-Uniq



**UNIQ: QUALITY, CORRUGATED BOARD,
GUARANTEED.**

www.grupouniq.com | www.afco.es



AFCO
Cartón ondulado, todo encaja