

## A crate or protective packaging ?

Gallery owners and collectors : you want to have a crate made that will only be used once - how much are you prepared to spend ? Exhibition organizers : will the packing standards laid down by the lending museums be compatible with your exhibition budget ?

How can you find the best and cheapest form of packing to transport a particular work ?

If you have crates made, how can you limit the costs ?

In practice, the type of packing depends on :

- the payer's budget and instructions
- the lender's requirements, if considered as acceptable
- the technical proposal made during the packer's visit

It is not always easy to make the right packing choice as the range of technical solutions is very wide.

As there is no magic formula, we offer you an analysis grid to help you decide.

# Packing techniques and materials

## THE « THREE LAYERS » THEORY

Complete packing, whether for a crate or for protective packaging, requires three layers :

**The first**, in contact with the work of art, protects the surface from dust, scratches and finger marks.

**The second**, like an intermediate cushion, reduces vibration, absorbs impacts, and attenuates temperature and hygrometric variations,

**The third**, a sort of rigid shell, is designed to be impact-resistant and facilitate handling.

Depending on the work and the type of transport, we will see below whether these three layers are always necessary.

## MATERIALS USED

**For the first layer** (the one providing surface protection), the materials in contact with the work must be chemically and physically neutral. For example, a medium-quality tissue paper will be acid and, in addition, once crumpled will no longer be as silky. The transparency of the material is also appreciated, to enable the work to be seen under this first layer. Depending on the case and the budget, we can use tissue paper, glassine, Melinex or polyester fiber based compounds such as Tyvek.

**For the second layer** (acting as a cushion), the most important product is polyethylene foam or polyurethane in all its forms, thicknesses and densities. This foam is especially used to line crates. The other protective packaging materials used in France are essentially Bullpack, Bullkraft and Bulkamousse, as well as Elastok and netting paper (e.g. to pack furniture).



*Bulkamousse and Bullkraft.*



*Polyurethane foam, aglocel, etafoam, waterproofing seal.*



*Bullpack and polyethylene foam.*

# Packing techniques and materials

**For the third layer** (the one giving rigidity and penetration resistance), the main material used to manufacture travelling crates and frames is wood, especially plywood. Aluminium and plastic compounds are now also widely used. For soft packing, cardboard is still an unrivalled product to finish the third layer, as it is practical, economical and easy to shape.

## WHAT DO WE MEAN BY SOFT PACKING ?

Soft packing refers to all types of packing and protection used when a crate solution is inappropriate. Soft packing concerns most objects that can be moved manually, and it is often sufficient for truck transport in France and elsewhere in Europe. However, it has to be carefully assembled. In other words, the three layers must be in the right proportions.

A painting, for example, is protectively packaged in the following order :

1. Melinex on the painted surface.
2. Frame wrapped in Bullpack with Bulkamousse strips.
3. Cardboard on the front and rear, plus strapping.

### The LP ART workshop

To make crates to measure, it is necessary to have a complete, efficient carpentry workshop :

- specialized machines: panel saw, bandsaw, jointer, planer, shaper,
- an efficient dust conveying system,
- protective equipment,
- annual inspection to ensure compliance with safety standards.

# LP ART's crates

## WHAT TYPES OF CRATES DO WE MAKE ?

Crates group together the three layers into a single unit for simple, quick packing. Depending on the work of art and its fragility, LP ART can supply different types of crates adapted to the most frequent uses :

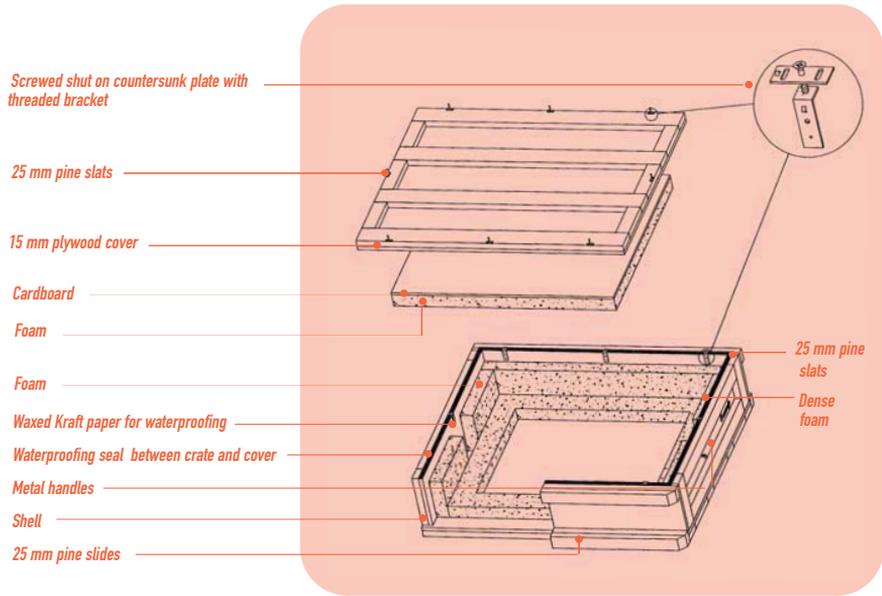
- crates for paintings (with or without tray),
- crates for sculptures (bench packing or case packing),
- crates with slides for framed photographs and drawings,
- crates for objects and small sculptures (with boxes or compartments),
- handcarry for accompanied luggage.

The quality of these crates depends on the needs of our customers, who can request isothermal crates.

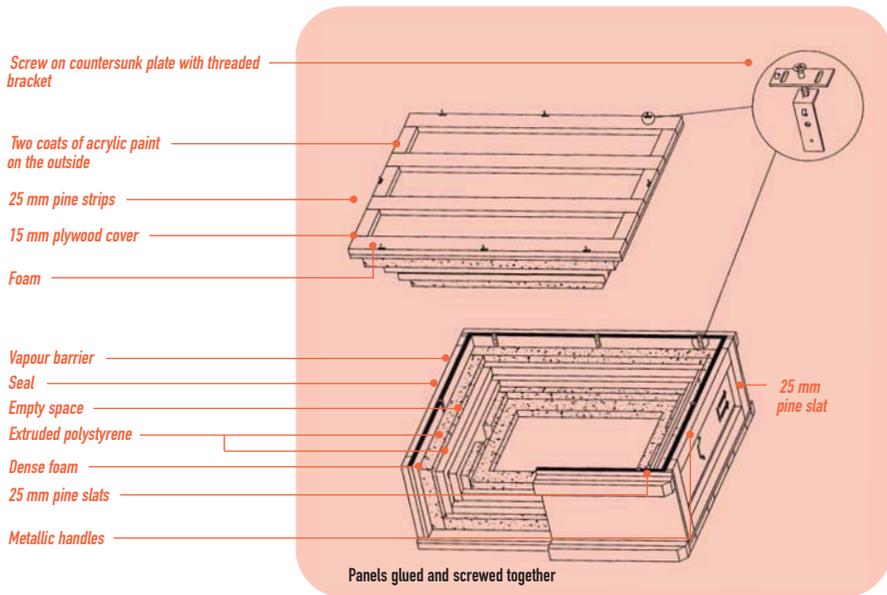


# LP Art's crates

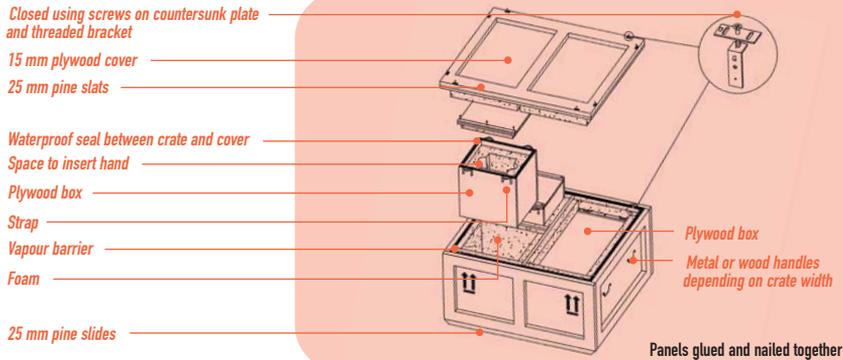
## Standard museum crate



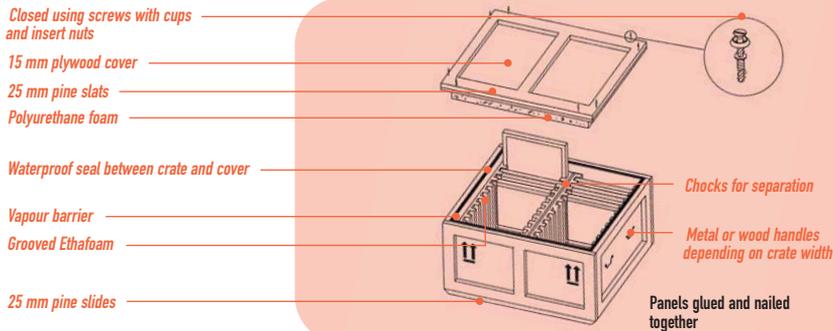
## Super-isothermal crate



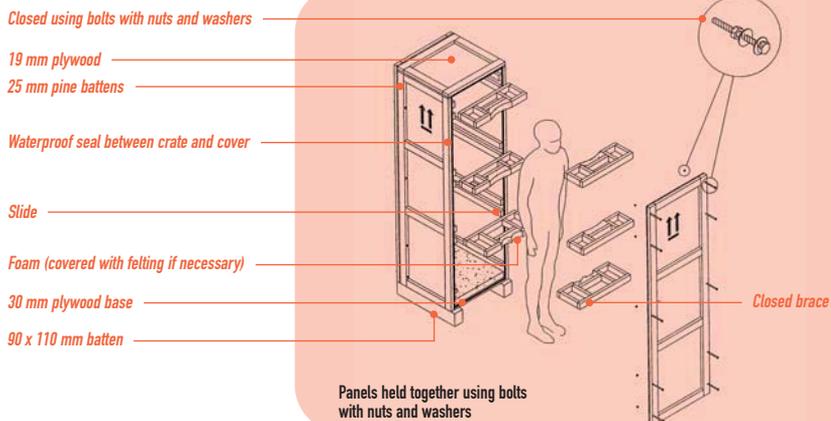
## Foam crate with 3 boxes



## Slot crate



## Sculpture crate



## LP Art's crates

### What about adjustable for-hire crates ?

Several suppliers provide adjustable crates (designed to be adapted to suit works of different sizes) :

- one has a strapping system that can be used to adapt the packing easily to suit the size of the work,
- another has a metallic frame whose four corners can be adjusted to suit the size of the work using a rack system,
- a third type uses a system of chocks with adjustable thicknesses whose position in the crate can be changed using Velcro pads.

Taking into account their high cost, these crates do not seem to us to be competitively priced at the moment, except in certain very specific cases. Nonetheless, we have included them in the guide to cover all available solutions.

# How do our crates stand up?

## IMPACT, TEMPERATURE, HYGROMETRY : HOW DO OUR CRATES STAND UP ?

### A test carried out by LP ART

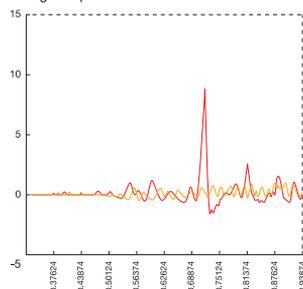
We designed our first super-isothermal crate for a 15<sup>th</sup> century limewood sculpture. Given the cost of the crate, we thought it was important to check how it behaved during transport.

In the winter of 1996, we tested the performances of three LP ART crates under real conditions : a standard museum crate, a Carrousel crate (an improved crate designed to Louvre specifications) and the super-isothermal crate.

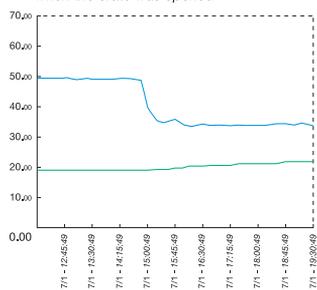
The experiment covered impact and vibration absorption, resistance to temperature variations and resistance to hygrometric variations.

The black box used was parameterized and adjusted to measure the temperature and the hygrometry every fifteen minutes and record all impacts with an intensity greater than 1.5 g in - three directions (vertical, horizontal and lateral). We chose three standard round - trips with opening and closing of the crates on arrival : a Paris-New York flight, a Paris-London truck journey and a Paris-Tokyo flight.

*Slight impacts recorded*



*Sudden drop in hygrometry noted when the crate was opened*



Results : For the three factors analysed, the experiment confirmed that the resistance of a crate is proportional to its degree of sophistication : the isothermal crate outperforms the Carrousel crate which itself outperforms the standard crate.

## How do our crates stand up ?



« Super-Isothermal » crate.



« Carrousel » crate.

The conclusions of the recordings analysis are more interesting :

- neither the aircraft nor the cross-Channel Shuttle produced any impact of more than 1.5 g (even during takeoff and landing),
- the only impacts recorded were low in intensity and occurred during loading/unloading operations and truck movements,
- waiting in a non-air-conditioned area at the airport, for departure or on arrival, can cause a rapid fall in temperature inside the crate depending on the outside temperature (except for the super-isothermal crate),
- to our surprise, more significant and sudden hygrometric variations than we expected occurred when the crates were opened, with condensation or evaporation due to the temperature difference inside and outside the crate - hence the need to allow the crates to acclimatize for at least 48 hours and more for isothermal crates !

# Which should you choose, protective packing or crates ?

To choose the right form of packing, two sets of factors must be considered : on the one hand, the characteristics of the work and its fragility in its location, and on the other hand, the characteristics of the types of transport that could be used.

How can these factors be synthesized ? As there is no magic formula, we provide an analysis grid with a marking system.

## A PRACTICAL ASSESSMENT GRID

The aim of the practical assessment model is to examine and measure the effect of the main parameters on which the choice of packing depends. While it is difficult, if not impossible, to take a completely rational approach, it is still possible to achieve a minimum amount of coherence. To do so, you must ask the right questions and try to take an overall view.

This is what we propose you do using a questionnaire and an analysis graph.

## WE SUGGEST THE FOLLOWING PROCEDURE :

- imagine a real situation of your choice : you have to send a work of art somewhere and you want to choose the appropriate type of packing,
- analyze your case using the two sets of questions that we have defined : ten parameters for fragility, and ten parameters concerning transportation and handling,
- mark each parameter in each set from 1 to 10,
- add up the ten marks in each set,
- refer to the graph: the horizontal and vertical scales, graduated from 0 to 100, represent the fragility of the work and the transport risk respectively,
- the intersection point shows a level or type of packing.



« Centaure mourant », Antoine Bourdelle.



# What packing should you use ?



« Serapeum lion », Louvre.  
Egyptian antiquities.

## ANALYZE AND MARK « THE FRAGILITY » PARAMETERS

(from 1 : not very fragile, to 10 : extremely fragile)

### 1. Type of object and technique

Is it a painting or a sculpture? A medal or a manuscript? Everyone would agree that a Calder sculpture requires different treatment from a Degas pastel.

### 2. Materials

You must know what materials have been used for the work and how they react. Alabaster is more fragile than marble, which is less fragile than granite. Limewood is more fragile than oak. Sixteenth century wooden panels may be less fragile than certain works by Tapiés.

### 3. Age of the work

In general, the older the object, the more fragile it is considered to be : over time, humidity, frost, light and pollution make works exposed to the open air more fragile. Moreover, the dry heat of a municipal library makes a piece of walnut furniture more fragile, however well made it is.

### 4. Physical and climatic environment of the work

Cannonballs from the wreck of the San Diego, a Spanish galleon, in perfect condition after spending four hundred years several dozen meters below the sea off the Philippines, turned out to be extremely fragile once they were removed from the water. On the other hand, perfect preservation conditions (in terms of humidity, temperature and luminosity) can also be a factor in making the work more fragile when it is transferred to another location. Sometimes loans are refused for this reason.

### 5. Political and cultural environment

This parameter should not be underestimated. The work suddenly becomes fragile and a reason for concern even if it is not necessarily so in physical terms. An unbaked clay object, of limited museological interest and in good condition, can certainly be considered fragile once it leaves a museum in an African capital. Similarly, a modest painting by David, hanging behind the desk of a local official, can become as valuable as the Mona Lisa.



# What packing should you use ?

## 6. Transport history

How did previous trips go ? Some pictures seem to spend more time in the air than on the wall and apparently do not suffer. Other works are not so lucky : one or two problems and they are classified as fragile, even if this is not otherwise justified by their state of preservation.



## 7. State of preservation

This is the main parameter taken into account, but assessing it is not easy. How fragile is this recently restored picture ? Might the crackling area spread ? Should this detachment be treated ? Without a precise, quick answer, attitudes to transporting the work may harden and it may never travel at all.

## 8. Financial value

A certified work, or one valued at several hundred thousand dollars, may be seen as « fragile ». Is a crate absolutely necessary ? Is it required by the insurance company ?

## 9. Heritage value

World, national, regional heritage... Whether it is the Nike of Samothrace or a parish reliquary in Corrèze, this additional value given to the work must be taken into account.

## 10. Sentimental value

A personal affection for a work of art can lead to one of two extremes : wanting to share one's enthusiasm or jealously keeping it to oneself, irrespective of the objective condition of the work.

It is up to the organizer or the packer to assess this.

Total

# What packing should you use ?

## ANALYZE AND MARK THE TEN TRANSPORTATION AND HANDLING PARAMETERS

(from 1 : transport very easy, to 10 : extremely complex operation)

### 1. Manual or mechanical handling

If a particular sculpture can be transported on a trolley pushed along at walking pace by four men, good covered protection will probably be enough. However, if it is heavy enough to require a forklift truck or a crane, a crate will be recommended. A large picture may be taken down the staircase with just a protective covering. If a crane is needed to take it out through a window, a crate or at least a protective frame will be needed.

### 2. Direct trip or transshipment

Should a trip between the Louvre and the Tate Gallery be made door-to-door in an air conditioned truck or else by air with trucks to Roissy and from Heathrow ? The total journey times will be comparable but the transport conditions will not be the same : loading and unloading at the airports, temperature variations, etc. For more remote destinations, you must take the stopovers into account and use crates that can be handled easily.

### 3. Total journey time

The longer the journey, the greater the risk : it will be more difficult to predict temperature and hygrometric variations. For a one-hour European flight, a standard museum crate will probably suffice; for a flight from Brussels to Tokyo, an isothermal crate will be needed.

### 4. Exclusive or consolidated road transport

If the journey is over land from start to finish, will the work be transported exclusively or consolidated ? In certain cases, with excellent packing, you can obtain very advantageous rates from European carriers via consolidation with other works of art or other types of goods. However, bear in mind that a consolidated consignment usually has to be separated in a warehouse which means additional handling is involved.

### 5. Direct or consolidated air freight

If you opt for a direct operation, you will be informed of the flight chosen and the departure and arrival times. However, if you choose a consolidated operation, you will only be given an indication of the arrival time and no information on the itinerary,



# What packing should you use ?

the stopovers and transhipments. You must therefore use the right crate.

## 6. Sea transport

Ships are used almost exclusively to transport large sculptures overseas, if they are not too fragile. You must bear in mind the drawbacks of this form of transport : it is difficult, if not impossible, to check the embarkation and disembarkation of the containers ; rough mechanical handling ; risk of corrosion by the sea air (even in special containers).



## 7. Physical environment during transportation

The state of the roads in Mongolia, the Philippine rains, snow on the road between Vienna and Munich or, quite simply, the temperature in a truck travelling in midsummer on the motorway from Brussels to Marseilles : these are all factors that must be taken into account when choosing the appropriate type of packing.

## 8. Foreign working conditions and regulations

While a crate can be collected from Roissy Airport within three hours, it takes at least eight hours at Lima Airport. While you can accompany a courier and his hand luggage to his plane seat at Roissy, when he arrives in Washington the person meeting him will have to wait like everyone else until he gets through customs.

## 9. Presence of a courier

This is a crucial parameter in limiting the overall risk provided, however, you should be sure that the courier has the discipline and personality required for his job and that the specialized carrier provides him with professional and efficient assistance.

## 10. Itinerary

Does the work have to be packed for a single round trip or for a travelling exhibition stopping off at several cities around the world ? Generally speaking, the greater the number of stops, the greater the risk. This parameter is very important from the technical viewpoint : you must have a system that is appropriate for repeated opening and closing of the crate.

Total

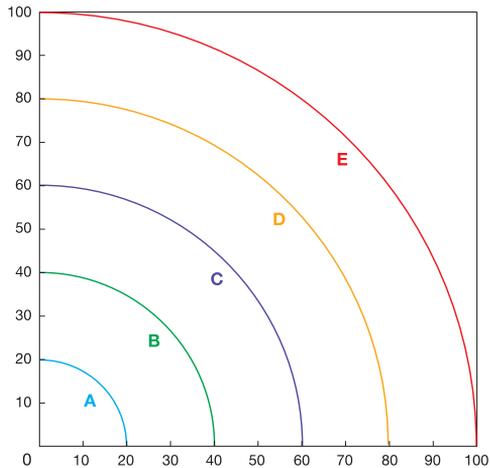
## What packing should you use ?



*Packing a Houdon sculpture.*

### PLOT THE TOTAL MARKS ON THE GRAPH

After analyzing and marking all the parameters in both sets, you can plot the total marks in each set on the graph below :



**Each area (A, B, C, D, and E) corresponds to a level and type of packing :**

- **Area A** : simple protection (e.g. covering or tissue paper and Bullpack).
- **Area B** : special protective packaging (e.g. neutral paper, Melinex or Tyvek for the first layer ; Bullkraft and Bulkamousse for the second layer ; cardboard and strapping for the third layer).
- **Area C** : simple crate (e.g. standard museum crate).
- **Area D** : improved crate (e.g. double standard museum crate or Carrousel crate).
- **Area E** : super-isothermal crate (e.g. climatized double crate with two 8 cm layers of extruded polystyrene, with a one centimeter air space between the two layers).

