OCCASION

This publication has been made available to the public on the occasion of the 50th anniversary of the United Nations Industrial Development Organisation.

DISCLAIMER

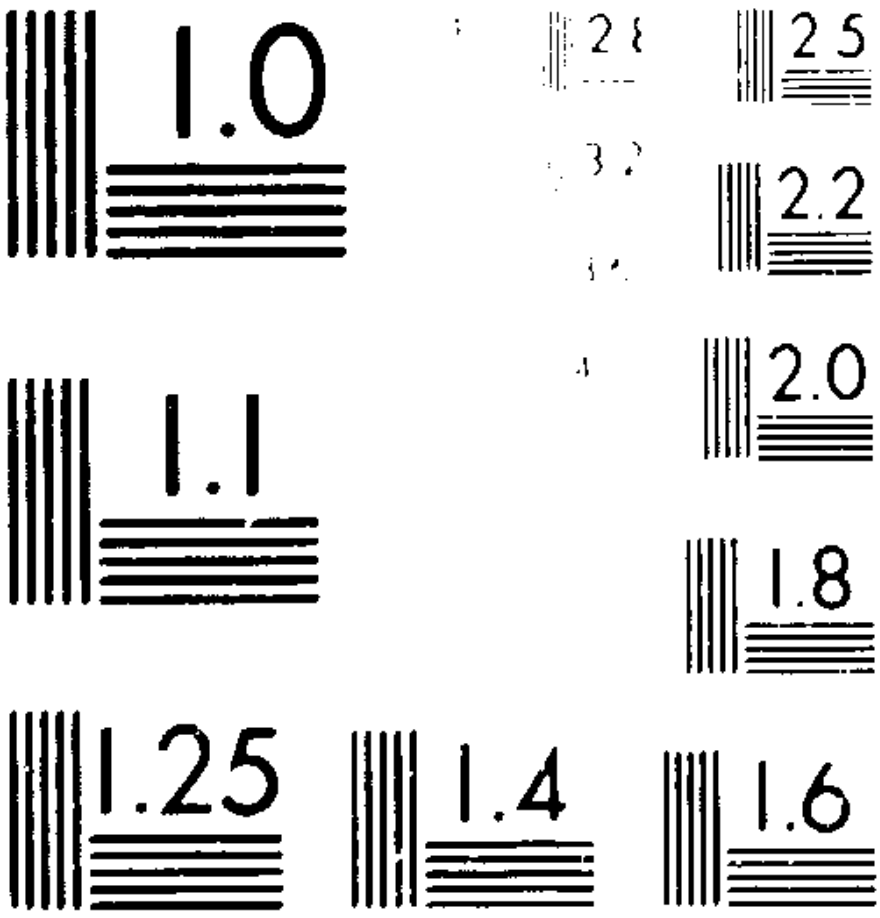
FAIR USE POLICY

CONTACT

Please contact publications@unido.org for further information concerning UNIDO publications.

For more information about UNIDO, please visit us at www.unido.org

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION
Vienna International Centre, P.O. Box 300, 1400 Vienna, Austria
Tel: (+43-1) 26026-0 · www.unido.org · unido@unido.org



12754

Distr.
LIMITED

ID/WG.378/3
29 June 1983

ENGLISH

United Nations Industrial Development Organization

Seminar on Furniture and Joinery Industries
Lahti, Finland, 9 to 28 August 1982

SOME ASPECTS OF EXPORT PACKAGING OF FURNITURE[1/]

by

Johan Selin[2/]

1/ The views expressed in this paper are those of the author and do not necessarily reflect the views of the secretariat of UNIDO. This document has been reproduced without formal editing.

2/ Senior Adviser, Export Packaging, International Trade Centre UNCTAD/GATT.

V.83-57780

TABLE OF CONTENTS

A. Introduction

The packaging of furniture for export is one of the most difficult problems in packaging technology. There are several different reasons for this:

1. Furniture is an expensive commodity.
2. Furniture is very fragile and even small defects, caused by damage during transport or handling, will make it difficult to sell.
3. Unless shipped in a knock-down form, furniture has a big shipping volume, resulting in high freight and packaging costs.
4. Furniture is often irregular in shape making the construction of the package difficult.
5. Furniture is often heavy, requiring sturdy, good quality and expensive packaging materials.
6. Furniture packages are often difficult to handle due to their volume, shape and weight.

There are three main reasons for damage to furniture during distribution:

1. Inadequate handling:

Most of the damage to furniture during transport and storage occurs because of incompetent and rough handling. Lorry drivers, longshoremen and warehouse workers seldom receive any specific training in how to handle furniture. Because of their low weight per volume, furniture packages make the problem even worse. Markings, such as "this side up" or "fragile - do not drop" have little effect in this context. Because of their awkward shapes and, sometimes, heavy weights, furniture packages are dropped, rolled and mishandled in other ways during all phases of the distribution cycle. When choosing the mode and route of transport, maximum effort should be made to avoid reloading in order to bring down the number of handling operations as much as possible. Export shipments in freight containers, particularly if they are used "from door to door", have brought about considerable improvements in this context, simply by reducing the number of times of handling the furniture packages on the way from the manufacturer to the buyer. If it is not feasible to dispatch a full container load to one customer (or even city or country), which is the best way to minimize damage, it might be possible to

arrange for a pooled shipment, combining deliveries from several exporters through joint arrangements by the national export promotion agency or by a national furniture manufacturers' association, etc. There are several things a furniture manufacturer can do to minimize the risk of damage due to bad handling methods. Some of them are:

- making sure that the furniture is not damaged in the producing factory itself during storage in an unpacked condition, during the packing process or during storage in a packed condition in the factory's own warehouse.

- training the factory's own personnel in correct handling methods when taking out the furniture packages from the warehouse and loading them into trucks or containers.

- supervising in one way or another the reloading process, eg. from the truck to the freight container or directly into the ship, from the truck to the railway car, etc. In most cases, the mere presence of an "inspector" results in more careful handling.

- designing the packages from the start with the objective of facilitating handling, eg. adapting package dimensions to the dimensions of available shipping space (freight containers, trucks, pallets, etc.), incorporating features in the construction of packages which make them easier to handle by fork lifts, hand holes for manual handling, etc. If reinforcement with plastic or steel straps is used, this will often serve as a means for grabbing and handling the packages and should consequently be protected from cutting into and damaging the furniture inside the package. When furniture is exported to highly developed, industrialized countries, the packages, in most cases, will be handled by mechanical means and should, therefore, lend themselves to being stacked on standard size pallets, or to being picked up direcly by fork lift trucks.

2. Inadequate packaging:

In most cases, the main reason for damage to furniture packed for export is given as the result of the inferior quality of the packaging material

available. This might often be true, but before drawing that conclusion, a thorough investigation should be made. Better material might be available; maybe more expensive but having a more efficient cost-to-performance ratio. In many cases, the maximum strength of available materials has not been achieved due to inadequate constructions, sloppy workmanship or simply due to ignorance about how the material should be applied and correctly used. In order to fully understand the protective capacity of available export packaging raw materials, the furniture manufacturer himself has to acquire a basic knowledge of technology for packaging raw materials, their protective properties, package constructions, etc. A certain amount of service in this respect can be expected from the package supplier but only on the condition that the furniture manufacturer himself knows what he is talking about and can conduct a meaningful dialogue with his package supplier. If a certain type of material or accessory is not available on the local market, it might be necessary to import it or, in rare cases, it might be possible to find a substitute through the development of an alternative, indigenous solution. Some of the most important points in furniture package design are discussed in further detail in section "F".

3. Inadequate warehouse facilities:

Both furniture manufacturers and furniture dealers often have inadequate warehouse facilities. Usually the space itself is insufficient, which leads to high, and/or improper stacking of the goods. The warehouse should be effectively ventilated and as dry as possible. In this context, it is also important to note that corrugated boxes lose most of their stacking strength, sometimes up to 80 percent, in climates with high humidity. It is therefore important not only to protect the furniture against excessive moisture but also to protect the package itself in order to get the most out of its protective strength, eg. through the use of surface treatment or overwrapping.

B. Furniture design/export package design

A frequently heard statement is that package design should be started simultaneously with product design, and that this is particularly important in the furniture industry. This statement has to be stressed even more when furniture has to be packed and exported over great distances at expensive

freight rates that are based upon volume rather than on the weight of the goods. Figure 1 shows the volume advantage of knocked-down furniture. The box in front contains all the necessary parts to assemble the four chairs shown. In order to be competitive on the market, it is, therefore, essential for the furniture designer to take this into consideration before he starts work on the design of the furnture itself. If the construction cannot be K/D (knocked-down), to be asssembled by the buyer, at least it should be possible to place two or several pieces of furniture in a nested position in the same package. Protruding ornaments, knobs, legs, etc., should be made detachable to save costly shipping space. Some types of furniture, eg. rattan products, do not readily lend themselves to delivery in a K/D form.

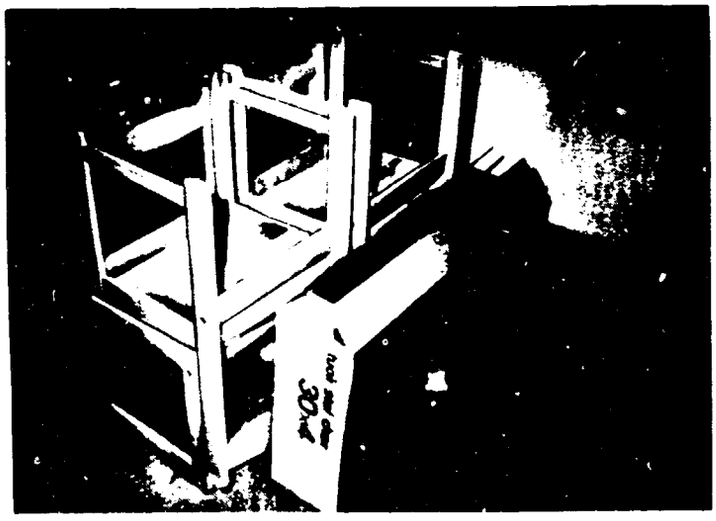


Fig.1. Volume advantage of knock-down furniture.

However, modern metal/plastic fittings can provide solutions to many difficult cases, and the furniture manufacturer/designer therefore needs to keep himself well informed about the available accessories in this field. The assembly of dismantled and K/D furniture in the consumer's home has become much more acceptable today due to the increased interest in, and capacity for, do-it-yourself techniques that are greatly facilitated by the large variety of simple tools, accessories and materials that are available on the market. The whole furniture trade is turning into more of a self-service operation - purchases are made more and more on impulse and the consumer transports the furniture himself in the trunk or on the roof of his personal car. All these trends call for a new approach to furniture packaging - it should be convenient to handle, easy to transport, and provided with clear and promotional

information about its contents. The well-known Swedish furniture dealer IKEA has been a pioneer in this context, and the same distribution principles are now being followed by an increasing number of furniture dealers/distributors in all parts of the world.

C. Containerization

A freight container is not a substitute for packaging. Only in rare cases, when a container load of furniture is delivered door-to-door from the manufacturer direcly to the final retail outlet, would it be possible to reduce, to a certain degree, the amount and strength of the packaging used. In most cases, however, the furniture packages will be taken out of the container, put into a central warehouse, and only later reloaded into a truck, a rail car or another container for transport to its final destination. This means that the package will be subjected to several manipulations during storage and transport, during which the package is handled individually.

When talking about containerized shipments, many people also seem to disregard the fact that the stresses on the goods inside the container can still be considerable. A container ship is subject to the same forces as a conventional general cargo ship - at sea it may move violently in as many as six different directions simultaneously (surge, roll, sway, pitch, heave and yaw). The movement of a freight container stowed on deck, for instance, might be as much as 40°C in both directions, travelling a distance of seventy feet (20 metres) with each complete roll of the ship and as often as 7 to 10 times each minute. Heat and moisture problems might also be more severe in containers than in break-bulk shipments. Movement of the cargo, constant vibrations and sudden shocks are also common when the container is transported by road, by railway or by air. The use of freight containers for furniture shipments is rapidly increasing. Even inside a container, the furniture needs to be well-protected. Movements of cargo in containers in connection with road transports are created as results of the vehicle's acceleration, braking or turning.

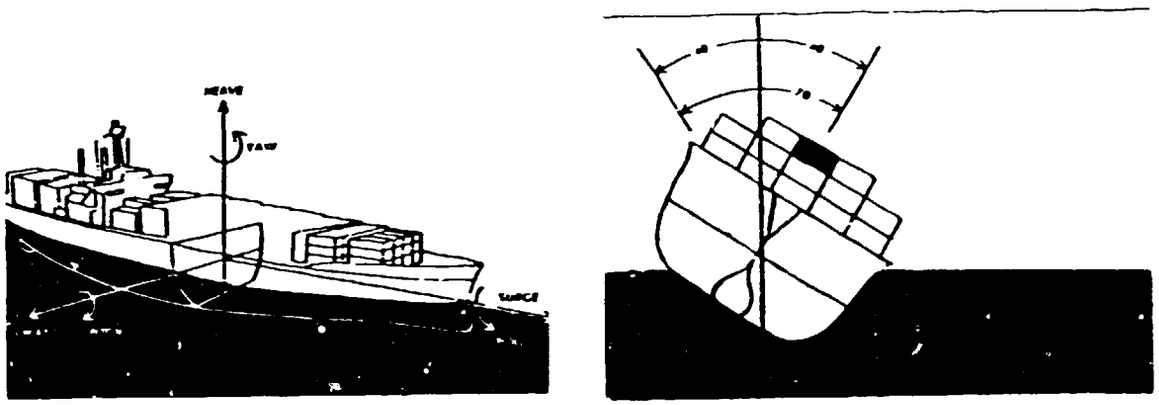


Fig. 2: Possible movement of a container ship at sea in six different directions simultaneously (as often as 7 to 10 times per minute).

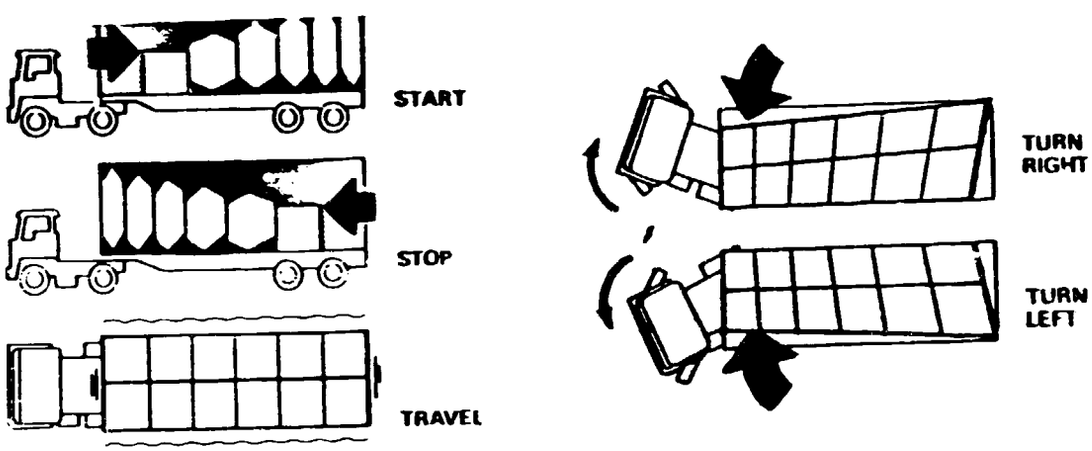


Fig. 3: Movement of cargo containers in connection with road tranport.

However, there are certain definite advantages with containerized transports. The most important ones, in connection with furniture, are:

- the number of handling times during reloading is reduced and thereby the risk, eg. of drops and other shocks;

- stowage of the container can be done or, at least, supervised by the exporter/furniture manufacturer's own personnel;

- other, maybe excessively heavy, goods are not placed on top of the furniture packages, and it is not likely that somebody will step on the packages, which is almost always the case in connection with the loading and unloading of general cargo in a ship's hold;

- if the packages are correclty dimensioned to fit into the containers, they are likely to be placed in the correct and most resistant position;

- marking and documentation procedures are simplified.

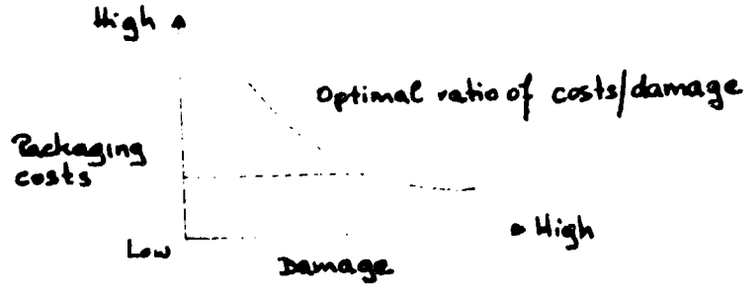
D. Furniture packaging costs

For any product to be packed, it is possible to give only very general indications about the normal, average cost of packaging in relation to the sales price of the product. The differences are often big, especially for furniture, where the unit price (same weight and volume) of the product itself varies greatly. As a matter of fact, more expensive, and, therefore, often more solidly constructed furniture might need less packaging protection (i.e. less costs) than cheaper and more easily damaged furniure. Some indicative figure in this context could be, for instance:

- for domestic shipments: 0.5 - 3 percent of ex-factory sales price.
- for export shipments: 2 - 8 percent of ex-factory sales price.

Delivery in knocked-down form results not ony in substantital savings in freight and warehousing but also in packaging, particularly in material costs. This is easily understood when considering that K/D furniture usually only takes one third to one fourth of the space required for assembled furniture.

Packaging has to provide adequate protection at minimum cost. The difficulty in this context is to avoid overpackaging and, respectively, underpackaging. A package which has a zero-damage ratio will certainly be too expensive. A compromise must therefore be found. This can be illustrated by a simple graph:



The objective is to find the optimal ratio of cost in relation to damage, or, in other words, a reasonable packaging cost for an acceptable rate of damage.

It is estimated that the overall, global damage of furniture in overseas shipments is on an average 15 percent, which can be considered as much too high and unacceptable. The Furniture Industry Research Association (FIRA) in the United Kingdom has estimated that damages in the domestic shipments of furniture represents about four and a half percent of the sales value, representing a yearly loss to the industry of about £4 million at 1978 prices. In 1967, the Canadian Government estimated that the annual damage rate for furniture in transit was of the order of 10 percent.

A reasonable objective for export shipments might perhaps be an average damage rate of 4 to 5 percent . However, IKEA of Sweden reports an average damage of only one percent for all shipments of furniture, of which a major part is packed, stored and transported in K/D form. The whole materials handling process is closely supervised by IKEA itself.

E. Export package development

The development of furniture packaging for export, that gives sufficiently effective protection at a reasonable price, is a long and difficult process, particularly since there are very few simple and unconditional guidelines or rules to rely upon. Most of the time, development must be based on "trial and error", and a theoretical knowledge of packaging technology can only partly substitute a long practical experience in good furniture package design. However, there are certain background facts that help in the development work. The furniture manufacturer/exporter needs to have:

1. Basic knowledge about the types of mechanical forces, stresses, shocks and climatic conditions to which the packaged furniture might be submitted to during all the varioys phases of the complete distribution cycle. This might include some basic physics in order to better understand the impact of various types of shocks, the shock-absorbing properties of cushioning materials, etc. It also includes practical data on the

frequency and heights of the drops which the package will be subjected to, as well as what happens inside a ship's hold or in a freight container in rough weather, when the container is placed on deck, etc.

2. Practical knowledge about storage, distribution and consumer requirements in the target markets. In industrialized target markets this means high stacking heights in warehouses, extensive use of mechanical handling equipment, such as fork lifts for goods on pallets. It also includes an appreciation of the fact that the retailing system for furniture has turned more and more into a self-service operation, with a do-it-yourself assembly of knocked-down furniture, which is transported home by the consumer himself in the trunk or on the roof of his own car.

3. Detailed practical knowledge, based upon long practical experience, of the types of damages to the furniture which have occured in the past together with the likely reasons for such damages. FIRA in the United Kingdom has found out that very few furniture manufacturers keep detailed records of the types of damages and their causes. It goes without saying that no claim for damages should be accepted and paid, unless a detailed report is filed on the exact nature of the damage - if possible, with photographs. This is probably the easiest way for a furniture manufacturer to correct what should be corrected in his packaging methods. Close monitoring through the "trial and error" method gives more valuable background data for the improvement of packaging than any tests carried out by a professional packaging laboratory - a service which, in any case, is not available to the majority of the furniture exporters in developing countries.

4. Basic knowledge about the most important packaging materials, their properties, limitations, funtions, costs and availability. It is essential for the furniture manufacturer to know enough about packaging materials, and the way they are manufactured, in order to be able to conduct a meaningful dialogue with the supplier of such materials. This is seldom the case with the users of packaging in developing countries - most of them are at the mercy of their suppliers simply because they do not know how to specify their needs and are not aware of what services they can demand

from their suppliers. In order to stay up-to-date on new materials and methods, the person responsible for export packaging also needs to be informed about new developments. Even if a new packaging material is not yet available on the local market, it might be advantageous to import such materials if they can contribute substantially to the reduced damage of exported furnture and, perhaps, help to increase the total export business.

Corrugated paperboard provides good possibilities for the construction of tailor-made interior fitments, edge protectors, etc., for all kinds of furniture packages. Wood is still an important raw material for the packaging of furniture, particularly for heavy items. Figure 5 shows a corner construction called the "three-way corner" gives the best possible strength to wooden boxes and crates. For wooden crates, maximum strength with a minimum amount of raw material is achieved by the application of diagonal reinforcements to the sides of the crate. Figure 6 shows a crate made throughout with "three-way corners" with diagonal reinforcements of its sides.

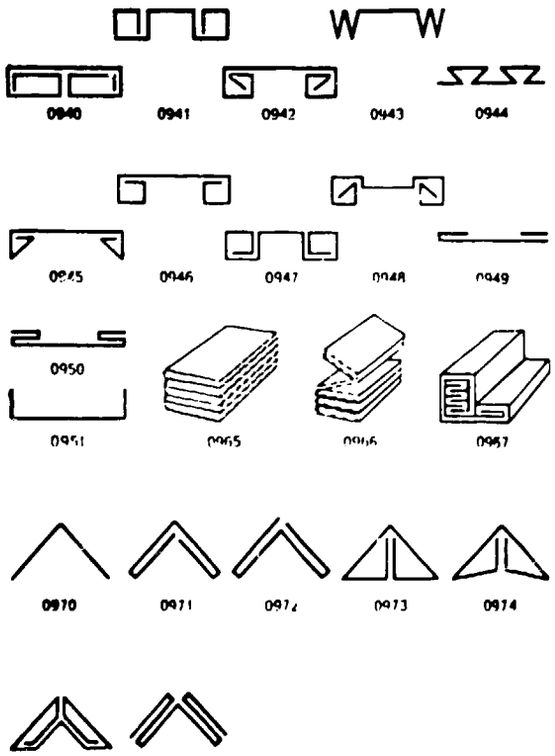


Fig. 4: Tailor-made corrugated paperboard interior fitments, edge protectors, etc. for furniture packages.

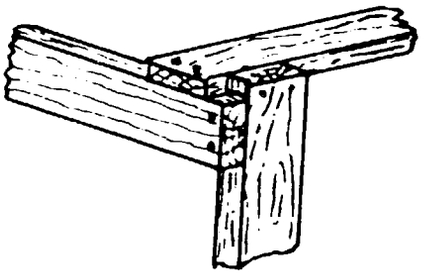


Fig. 5: "Three-way" corner construction in wooden boxes and crates

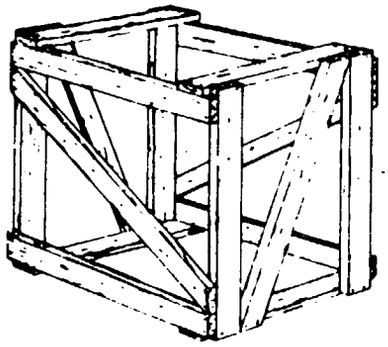


Fig. 6: Crate with diagonal reinforcements and "three-way" corners.

F. Some practical hints in furniture package design

Each type of furniture has its own particular requirements as to the details of the most effective construction of the package. There are big variations in packaging techniques for a rattan chair, an upholstered sofa or a knocked-down kitchen cupboard. It is, consequently, very difficult to give detailed guidelines for how each type of furniture should best be packaged, but certain common principles can be summarized as follows:

1. The package should be tightly fitting in order to prevent any movement of the furniture item, or its parts, inside the package. This will give maximum stacking strength and minimize the risk of abrasion and scuffing/scratching. Remember, however, that one of the most important functions of the package is to absorb shocks, which it cannot do if the whole

unit is compressed into a solid block. Some packaging materials, such as corrugated paperboard, shredded paper, woodwool and cellulose wad- ding, have poor resiliancy characteristics and a package, which has ori- ginally been tightly packed, might become loose after being submitted to long storage time, stacking or shocks during handling and transport.

2. All furniture, such as doors, shelves, drawers, etc., should be fully secured and immobilized during transit. For instance, it is not enough just to lock cabinet doors - there might be damage both to the lock or to the hinges if the doors are not fixed in position or removed and wrapped separately. Detached legs, glass/mirrors, ornaments, fittings, hardware, etc., should also be separately packed and firmly attached to the furni- ture, or otherwise, inside the package to prevent any movement, whatever the position the package might be put into. Figure 7 shows the packaging of a filing cabinet, providing clearance at top, bottom and front (to pro- tect the drawer handles). If furniture legs cannot be detached during transport, it is necessary to secure the furniture item inside the crate in a suspended position. The supporting piece of wood is nailed to the underside of the furniture and fastened to the sides of the crate. The correct way of nailing is shown in the picture (see figure 8). The inside of the package should also be checked for any loose nails, screws or other foreign matter which could damage the finish of the furniture, eg. by rubbing into the surface.

3. Corners, edges, legs and protruding parts of furniture must be adequately protected against mechanical shocks by the proper use of cushioning materials in the form of pads, supports, interior fitments, etc. When using edge and/or corner protection pads, they should be placed correctly and securely fastened so that they cannot work themselves loose. Expanded polystyrene is becoming more and more popular for corner and edge protection. These are delivered in standard sizes and easily cut to fit individual furniture items (see figure 9). Shrink or stretch wrap- ping is ideal for this purpose. Shrink-wrapping can be done with a low cost, hand-held shrink-gun, much like an over-sized hair drier. These are usually heated by gas (see figure 10). An alternative to shrink-wrapping is stretch-wrapping, using a stretchable plastic film which is wrapped

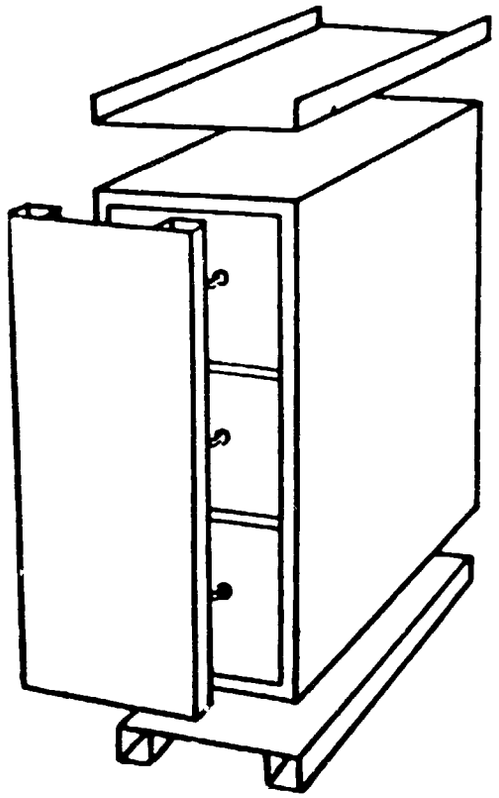


Fig. 7: Packaging of a filing cabinet, providing clearance at top, bottom and front (to protect the drawer handles).

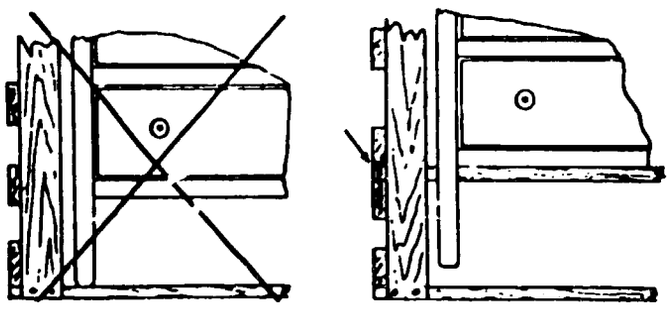


Fig.8: Suspending furniture in a crate to secure it.

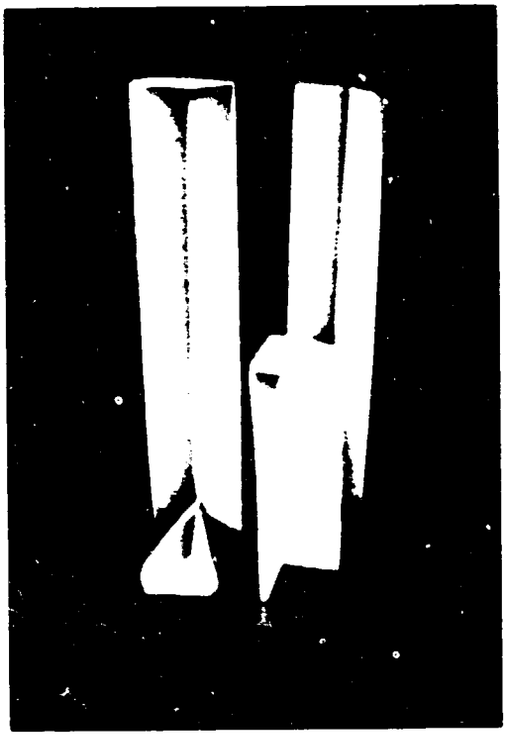


Fig. 9: Expanded polysterene used for corner and edge protection.

Fig. 10: Shrink-wrapping with a hand-held shrink gun.

tightly around the package or packet. This can be done in a simple way by using a hand dispenser as illustrated in figure 11. Some types of protection pads, having an abrasive surface, require an addition of a soft material, eg.

cellulose wadding or tissue paper, between the pad and the surface of the furniture, in order to avoid markings or scratches. Figure 12 shows an example of an interior wooden frame for reinforcement of corrugated boxes. If strings or straps are used for holding protection pads in place, special attention should be given to the prevention of damage at the contact points where tightening pressure is applied.

Fig.11: Stretch wrapping, using a stretchable plastic film.

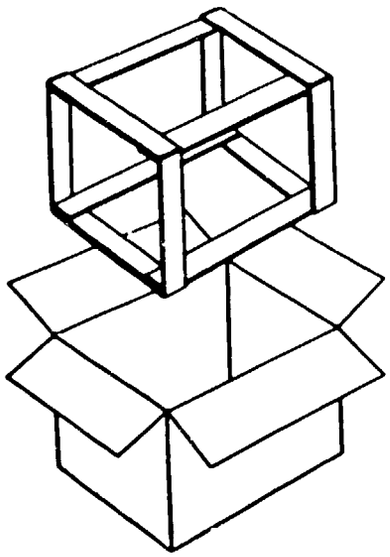


Fig. 12: Example of interior wooden frame for reinforcement of corrugated boxes.

4. Lacquered or painted surfaces should be especially protected against abrasion and scuffing through the use of plastic films, tissue paper, cellulose wadding, soft cotton fabric or similar soft materials with a smooth and even surface. In most cases, even a regular brown wrapping paper is too rough for this purpose, and corrugated fibreboard in direct contact with polished furniture would certainaly leave marks on its surface. When plastic films, waxed paper or similar materials are used in direct contact with furniture, it is essential to make sure that they do not react with the surface of the furniture, getting attached to it or tarnishing it. This is also valid for textile and leather upholstered furniture. In this context, special consideration should be given to the negative behaviour of such packaging materials under high temperatures, and high relative humidity conditions.

5. In most cases, packed furniture should be protected against dust, dirt and excessive moisture during shipping by the use of external or internal wrapping with plastic film, specially treated paper etc. Shrink and stretch wrapping is increasingly used for his purpose in furniture packaging. The package should also be effectively closed, eg. with a good quality paper or plastic adhesive tape. Figure 13 shows an outside wooden tray strapped to the box for the protection of the bottom of the package.

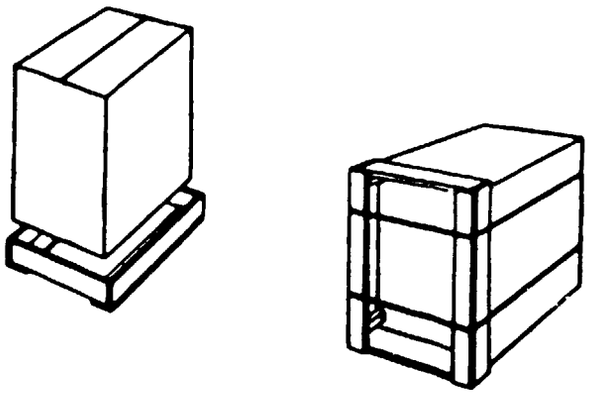


Fig. 13: Outside wooden tray, strapped to the box, for the protection of the bottom of the package.

6. Most furniture packages require a clearance between the outer wall of the package and the surface of the furniture being packed. This clearance is achieved by using protection pads for edges and corners and various types of skids or suspending construction to protect the base of the furniture, the legs, etc. Clearance between the walls of the package and the surface of the furniture item is achieved, eg. by various applications of double-face corrugated boards. Various ways of assembling wooden skids and reinforcements, eg. for corrugated boxes. Use of corner and edge protectors, in this case is made out of corrugated fibreboard, maintaining the required 3/4 inch clearance around the packed furniture. Reinforcement for a large furniture box with an extra frame for clearance at the bottom of the package. Top and bottom corrugated trays, reinforced with collars and light wooden frames to ahieve the 3/4 inch clearance between the furniture item and all six sides of the outside box.

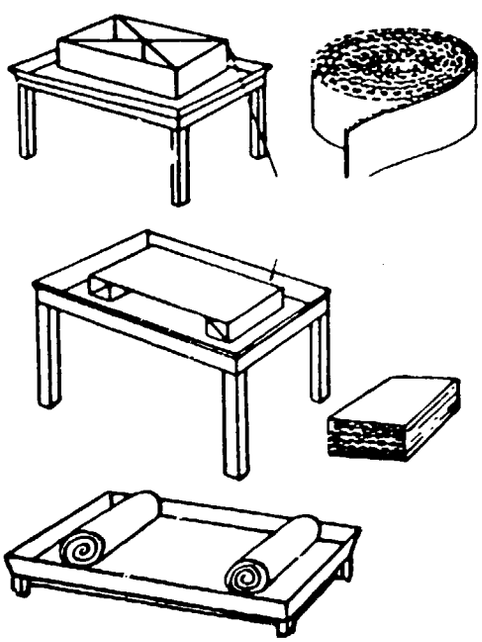


Fig.14: Various applications of single and double-face corrugated board to provide clearance between the wall of the package and the surface of the furniture.

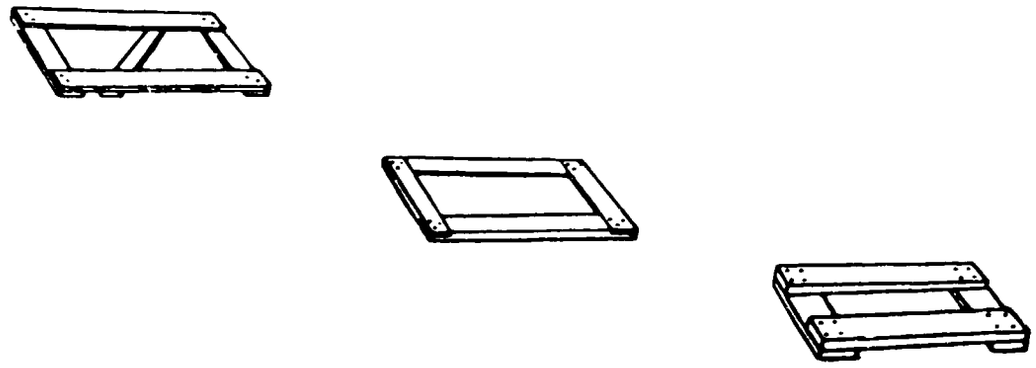


Fig. 15: Various ways of assembling wooden skids and reinforcements for corrugated boxes.

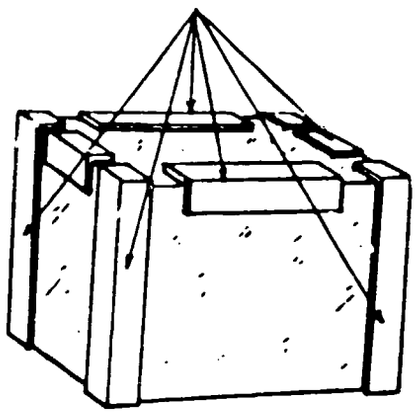


Fig. 16: Use of corrugated fibreboard corner and edge protectors to the 3/4 inch clearance around the packed furniture.

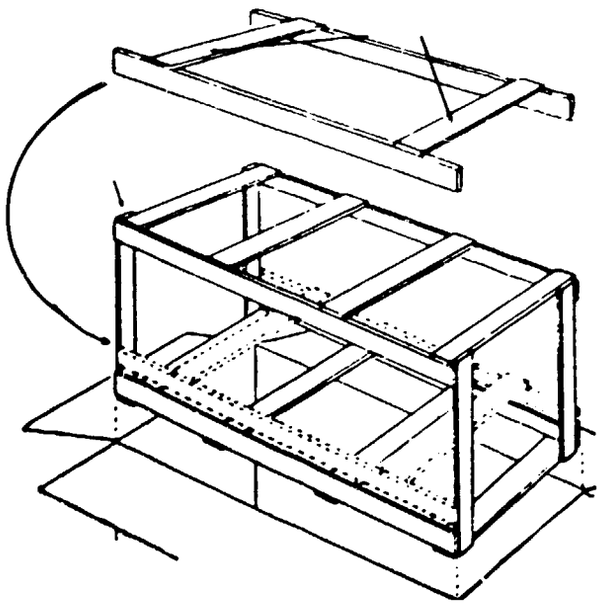


Fig. 17: Reinforcement for a large furniure box with an extra frame for clearance at the bottom of the package.

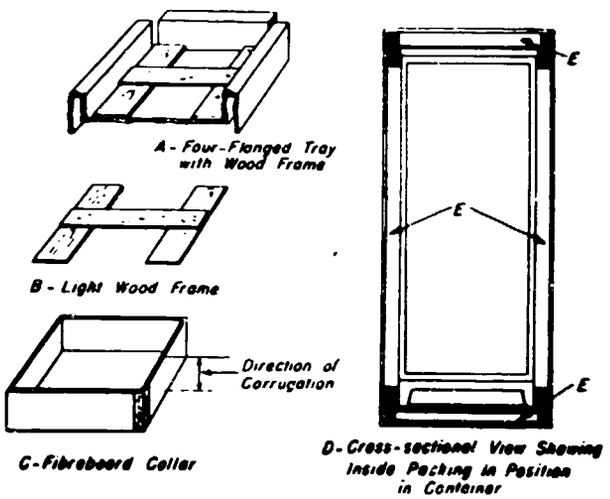


Fig. 18: Top and bottom corrugated trays, reinforced with collars and light wooden frames, to a chieve the 3/4 inch clearance around the packed furniture.

Official requirements for each type of furniture and package for the market in the United States are detailed in the so-called "F-specifications", published in the Uniform Freight Classification (Bibl. ref. No. 10). A commonly used clearance requirement in these specifications is 3/4" (19 mm) or 1 1/2" (28 mm) for especially delicate furniture. Furniture with legs exceeding 8" (203 mm) should be suspended inside the package providing a leg clearance of 3/4" (19 mm). The F-specifications also include detailed requirements for timber dimensions, corrugated board grades and the cushioning pads to be used for each type of furniture Many shippers require a quality stamp to be affixed to the corrugated boxes, certifying the strength of the material used. This stamp is required, for example, by railroad and trucking companies in the United States but it has also found wide use elsewhere (see figure 19). Internationally standardized (ISO) symbols should be used to give information to shipers on handling requirements for transport packages. Note particularly the symbols for where a sling should be attached and where the centre of gravity is located (upper and lower left of figure 20).

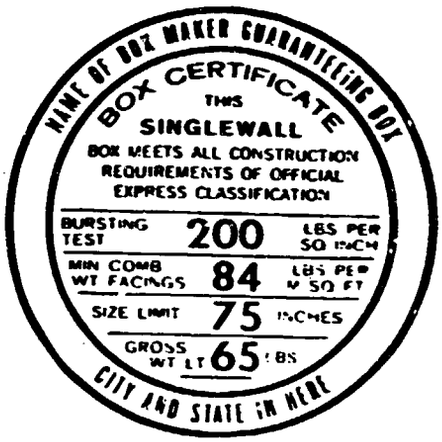


Fig. 19: Quality stamp to be affixed to the corrugated boxes. (This stamp is required by railroad and trucking companies in the United States.

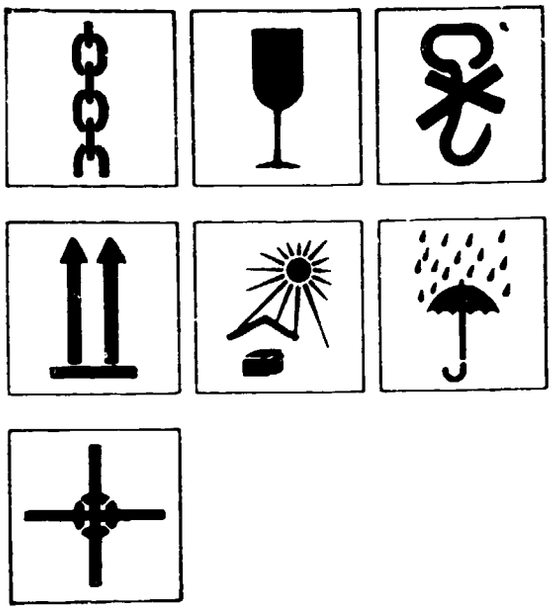


Fig. 20: Internationally standardized (ISO) symbols.

8. Detailed technical information and specifications for the packaging of furniture are available from the following sources:

Bohman Industrial Traffic Consultants Inc.
P.O.Box 889
Gardner, Massachusetts 01440
United States

Forintek Canada
800 Montreal Road
Ottawa, Ontario
Canada

Furniture Industry Research Association (FIRA)
Maxwell Road
Stevenage, Herts. SG1 2EW
Great Britain.

G. Bibliography

General packaging handbooks:

1. "Distribution packaging" by W. F. Freidman and J. J. Kipnees, 1977, 558pp, US$ 27.50.

from: Robert E. Krieger Publishing Company, 645 New York Avenue, Huntington, New York, N.Y. 11743, United States.

A standard reference book covering all materials for shipping containers and their applications.

2. "Fundamentals of packaging" by F.A. Paine, 1974, 330 pp., £ 6,90 as paperback.

From: The Institute of Packaging, Fountain House, 1A Elm Park, Middlesex HA 7 4 BZ, United Kingdom.

A basic textbook, contains chapters on specific packaging principles, such as cushioning, adhesion, permeability, etc.

3. "The Packaging media", editor F.A. Paine, 1974., 554 pp, £22.00

   From: Blackie + Son Ltd., Bishopsbriggs, Glasgow G64 2NZ, United Kingdom, or from the Institute of Packaging (see 2 above).

Corrugated paperboard and boxes:

4. "Fibre Box Handbook", latest edition, free of charge, from Fibre Box Association, 5725 East River Road, Chicago, Ill. 60641, United States.

   Contains descriptions on the manufacture and use of corrugated boxes, definitions of terminology, types of boxes and a section on US carrier regulations.

5. Export Packaging Note No. 19 - "International Fibreboard Case Code", from International Trade Centre UNCTAD/GATT, Palais des Nations, CH-1211 Geneva 10, Switzerland.

   This is a reprint of the Code jointly developed by the European Federation of Corrugated Board Manufacturers (FEFCO) and the European Solid Fibreboard Case Manufacturers Association. It illustrates the most commonly used constructions of paperboard packages, interior fitments, cushioning pads, etc.

6. Export Packaging Note No. 13 - "Technical notes on the use of corrugated paperboard boxes", from International Trade Centre UNCTAD/GATT (see 5 above).

Wooden packages:

7. "A user's guide to wooden packaging" (compiled by P. Hérard, 1982), from International Trade Centre UNCTAD/GATT (see 5 above).

   This publication will be available in 1983 and will give detailed information on the technical aspects of wooden package materials, construction, etc.

3. "The Packaging media", editor F.A. Paine, 1974., 554 pp, £22.00

   From: Blackie + Son Ltd., Bishopsbriggs, Glasgow G64 2NZ, United Kingdom, or from the Institute of Packaging (see 2 above).

Corrugated paperboard and boxes:

4. "Fibre Box Handbook", latest edition, free of charge, from Fibre Box Association, 5725 East River Road, Chicago, Ill. 60641, United States.

   Contains descriptions on the manufacture and use of corrugated boxes, definitions of terminology, types of boxes and a section on US carrier regulations.

5. Export Packaging Note No. 19 - "International Fibreboard Case Code", from International Trade Centre UNCTAD/GATT, Palais des Nations, CH-1211 Geneva 10, Switzerland.

   This is a reprint of the Code jointly developed by the European Federation of Corrugated Board Manufacturers (FEFCO) and the European Solid Fibreboard Case Manufacturers Association. It illustrates the most commonly used constructions of paperboard packages, interior fitments, cushioning pads, etc.

6. Export Packaging Note No. 13 - "Technical notes on the use of corrugated paperboard boxes", from International Trade Centre UNCTAD/GATT (see 5 above).

Wooden packages:

7. "A user's guide to wooden packaging" (compiled by P. Hérard, 1982), from International Trade Centre UNCTAD/GATT (see 5 above).

   This publication will be available in 1983 and will give detailed information on the technical aspects of wooden package materials, construction, etc.

8. Export packaging Note No. 15 - "Technical notes on the use of wooden packaging", from International Trade Centre UNCTAD/GATT (see 5 above).

Furniture packaging:

9. "Furniture Packing Manual", 2nd edition, by C. Langston, 1980, 237 pp. £20.00.

From: Furniture Industry Research Association (FIRA), Maxwell Road, Stevenage, Herts. SG1 2EW, United Kingdom.

A comprehensive collection of information on furniture packing, its problems, and methods of solving them.

10. "Furniture Packaging" 1973, loose-leaf binder, irregularly updated.

From: Bohman Industrial Traffic Consultants Inc., 335 East Broadway, Gardner, Massachusetts 01440, United States.

A comprehensive and detailed guide on furniture packaging, based on the Uniform Freight Classifiction of the US Railroads.

11. "Furniture Packaging Guide: Common Causes of Damage and its Prevention"; "Protective packaging of Furnitue" and other publications, research reports, etc.

From: FORINTEK Canada, (formerly Eastern Forest Products Laboratory), 800 Montreal Road, Ottawa, Ontario, Canada

12. "The Furniture Industry: Corrugated Board versus Shrink Film" by B. Boberg (FEFCO Bulletin No. 81)

From: European Federation of Corrugated Board Manufacturers (FEFCO); 37, rue D'Amsterdam; F-75008 Paris, France.

13. A collection of 80 slides on packaging is available, upon request, from ITC.