

I. Introduction

1. Outline

This manual outlines the correct handling process for Toray Penfibre's LUMIRROR Polyester (PET) film.

2. Packed for Safety During Transportation

Toray Penfibre has carefully packed LUMIRROR to ensure that it is not damaged under normal transportation conditions. Toray Penfibre provides sufficient shoring for its cargo during loading into container. This is to prevent the cargo from shifting during transit. If any of the following problems arise due to abnormal transportation condition, please refuse delivery and notify Toray Penfibre or its local representatives as soon as possible. (When notifying Toray Penfibre of such problems, please include photos of the damaged products together with the roll numbers written on the boxes.)

Problems due to abnormal transportation conditions

- 1) Cargo has shifted from its correct position.
- 2) Cardboard boxes are broken, crushed, or otherwise damaged.

Claims will be fully investigated and compensation made where appropriate.

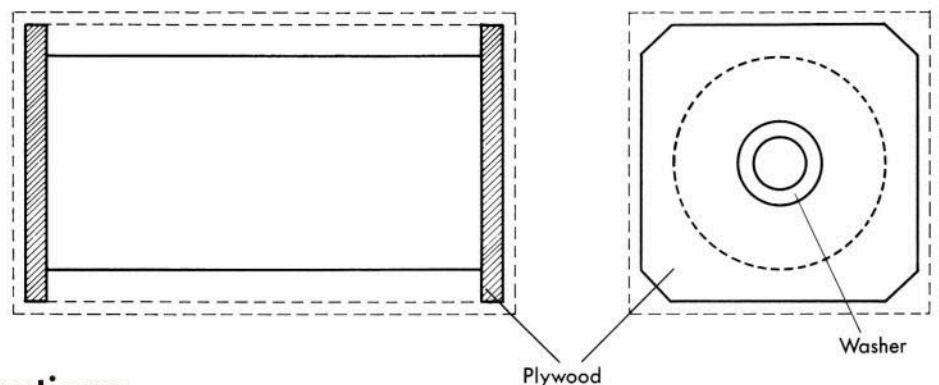
The quality of film made by Penfibre Sdn Bhd is guaranteed for 6 months after delivery, under normal transportation and recommended storage & handling conditions.

II. Delivery of LUMIRROR to Customers' Warehouse

1. Packing of LUMIRROR

LUMIRROR rolls are supported at both ends by plywood, which is bigger than the roll diameter. They are then placed in cartons wrapped with tubular polyethylene film. With this packing system, the rolls are self-suspended. This prevents the surfaces of the rolls from coming in contact with the cartons (Fig. 1). Rolls in the cartons are usually delivered in pallets. Customer may request for wooden crates.

Fig. 1. LUMIRROR Packing



2. Unloading Precautions

When pallets or wooden boxes are unloaded from goods-trains or trucks, it is very important to keep the rolls horizontally and not to drop them or jolt them in any way. If rolls are jolted, it may result in unexpected defects such as wrinkles, marks on the film or paper core damage, which will be observed after unpacking.

III. Storage Condition of LUMIRROR

1. Recommended Storage Conditions

As film is extremely sensitive to temperature and humidity conditions, it is necessary to avoid exposing the film to extremes of temperature and humidity during storage.

Recommended storage conditions are as follows:

Temperature : 15 to 35 °C (59 to 95 °F)

Humidity : 50 to 80% RH

Surface wrinkles and other roll defects can be caused by storage outside of these recommended ranges.

2. Change of Storage Conditions

A sudden change in storage conditions can cause surface wrinkles on the rolls. To protect rolls from these undesirable wrinkles, we recommend the following storage condition prior to processing (Table 1).

Table 1. Recommended Storage Conditions

	Case A	Case B
Original storage conditions	Below 6°C (below 43°F)	7 to 14°C (45 to 55°F)
Recommended procedure before processing	Keep rolls at 7 to 14°C (45 to 55°F) for 24 hours before processing, then proceed as described in Case B.	1. Special procedure are unnecessary provided humidity is less than 80% RH. 2. In case the humidity is more than 81% RH, the rolls are to be kept at 15 to 30°C (59 to 86°F) for 8 hours.

3. Storing Rolls

When rolls of LUMIRROR are to be stored, they should remain as they are received, that is, in the original cartons and on the pallets.

If it is not possible to store rolls as received, it is necessary to pay special attention to the following (Fig. 2):

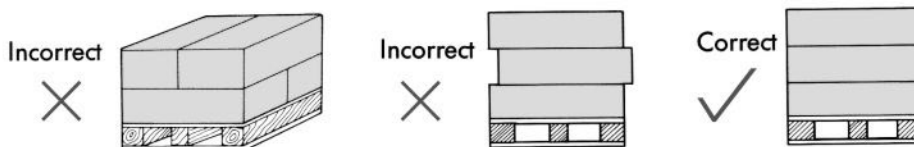
- 1) When de-palletizing, rolls should always be kept horizontal.
- 2) The same applies during transportation of cartons (i.e. they should not be rolled over).

Fig. 2. Not Recommended Rolls Transportation



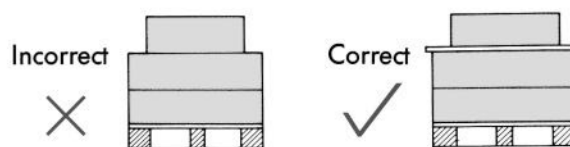
- 3) In order to avoid the above problems, please make sure cartons are not stacked crosswise (Fig. 3).

Fig. 3. Incorrect Stacking



- 4) When stacking cartons of a different size from the ones underneath, flat wooden boards should be placed between the two (Fig. 4).

Fig. 4. Carton Stacking

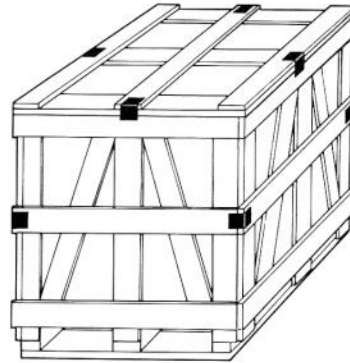


- 5) The height of the stacked cartons should be limited to 170cm for greater safety and working efficiency.

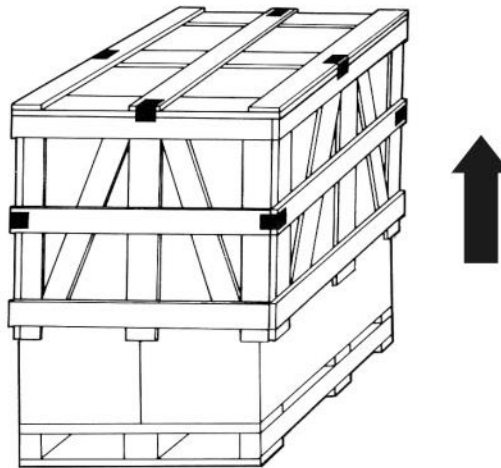
IV. Unpacking of LUMIRROR

1. Unpacking Method for Wooden Crates

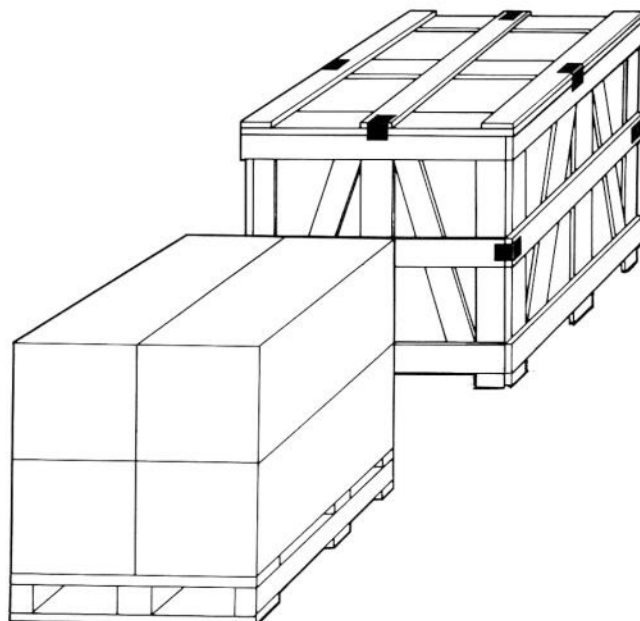
- 1) Remove the nails that hold the wooden crate and the pallet together.



- 2) Lift the wooden crate upwards.



- 3) Set aside the wooden crate, leaving the cartons on the pallet.

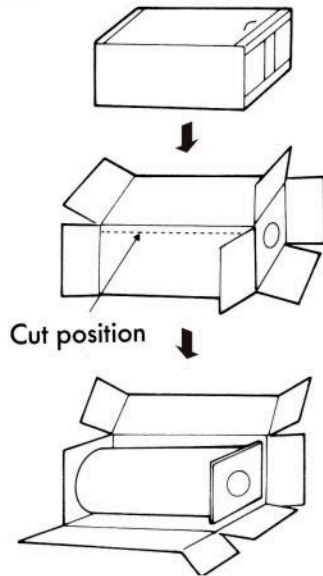


2. Unpacking Method for Cartons

Three types of cartons are used for packing LUMIRROR: side-open style (A), top-open style (A-4), and cover box style (C).

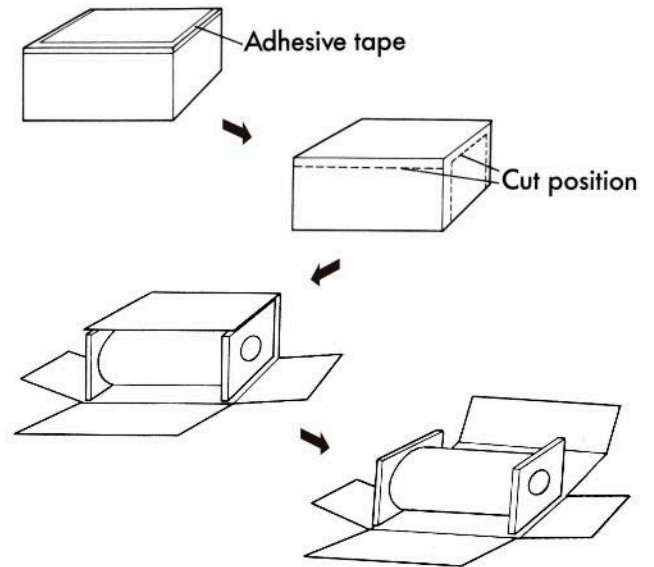
Unpacking of side-open cartons

- 1) Cut the adhesive tape which seals both ends of the carton with a razor or knife.
- 2) Then cut the cartons horizontally to expose the full rolls.



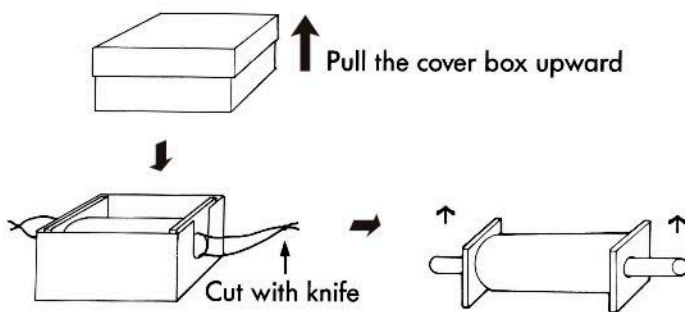
Unpacking of top-open cartons

- 1) Cut the adhesive tape, which seals the top 4 edges of the carton.
- 2) Then cut the cartons horizontally to expose the full rolls.



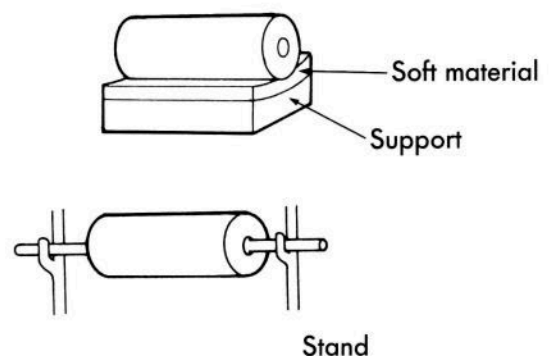
Unpacking of cover box cartons

- 1) Remove the upper cover box.
- 2) Pull out the ends of the Polyethylene tube.
- 3) Insert a rod through the core and lift the roll.



Temporarily laying down the rolls

Lay the roll down on a support covered with soft material or hang the roll on a stand using the supporter inside the core of the roll.



TORAY

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