



## **Recommended Installation Practice for Harkness Screen Spectral 3D Screen**

These guidelines are principally for large screens (over 6m / 20ft in height). For screens under 6m in height, it is recommended to use a different method – see guidelines "Spectral 3D Screen Installation (rolling)". The method described below can, if preferred, also be used for smaller screens.

These recommendations are intended for installers who have no experience of installing Harkness Spectral 3D (silver) screens. These screens are easily damaged by inadvertently folding or scuffing the surface.

### **Requirements:**

- 1) Installation team. The number of people depends on the size of the screen. Typically 6 people are required for lifting into place a 15m wide (50') screen; and up to 14 people for a 25m (80') screen. One person is the coordinator for the lifting operation. When the screen is lifted in place only 2 people are needed to lace the screen in to the frame.
- 2) Bubble wrap and clean dust sheets to cover the area where the screen is being unpacked.
- 3) 25 mm (1 inch) diameter metal tube (or similar) the width of frame. If the frame is curved then the tube should be to the same curve. This is used to support the screen when lifting in place.
- 4) 10 mm (3/8 inch) diameter rope for lifting the screen in place.
- 5) Sisal cord for lacing the screen to the frame.

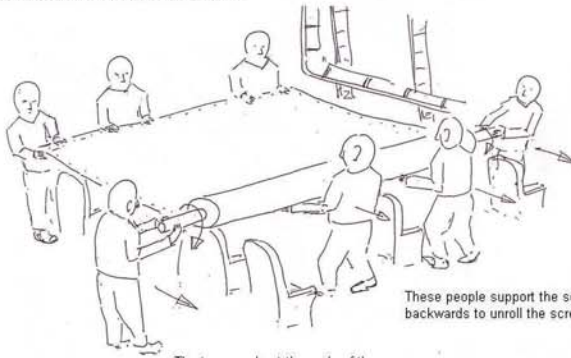
### **Instructions:**

1. Ensure that the auditorium is clean and dry. Adjust the air conditioning so that the ambient temperature is approximately 20-25 °C (65-75°F). Place the screen box or packing tube in the auditorium and allow 2-3 days for the screen to acclimatise to the ambient temperature.
2. If the screen is to be installed in an existing auditorium, remove the old screen and any static or moving masking materials before opening the screen box or tube in the auditorium.
3. Check the screen frame to ensure that it is clean and that there are no sharp edges or points. Remove or cover any sharp points that may damage on the screen.
4. Make sure the area in front of the frame is clean and free from sharp edges or points. An area 2m (6') wider and 2m taller than the screen size is required. Ideally this area is in on the floor in front of the frame, but large screens will have to be unrolled over the seats. Cover any sharp edges, such as steps and seating, with bubble wrap. If possible lay clean dustsheets over the area.
5. If the screen is packed in a wood box, carefully remove all screws or nails and open the box to expose the screen. Smaller screens are packed in cardboard tubes. The screen is rolled on a metal tube and wrapped in brown paper.

6. To remove from the box tip the box on its side and gently roll the screen out of the box in the packaging. If packed in a tube carefully remove the end cap and pull the screen out.
7. Identify the top of the screen (the top of the screen is marked on the brown paper packaging). Place the screen at one side of the auditorium with the top of the screen facing the screen frame, so that it can be unrolled with the silver surface facing upwards.
8. Carefully remove the brown paper. NOTE! The silver surface must not be touched or folded. Handle the screen by the edges only. **If the silver surface is touched or folded the screen may be damaged beyond repair.**
9. Remove the box or tube and brown paper packaging from the auditorium.
10. **Utmost care must be taken when unrolling the screen.** All persons should remove any personal objects that may catch on the screen, such as watches and rings. Hands must be clean. Holding the metal tube at each end, unroll the screen across the auditoria. If the screen is being unrolled on top of the seats a person should be positioned at approximately every 2m (6') to support the weight of the screen. These people must position their arms beneath the screen to support its weight and then move backwards between the seat rows as the screen is unrolled. One or two people must remain at the side of the screen to hold the screen whilst it is being unrolled.
11. If the screen is now resting on top of chair backs, 3-4 people should ensure that the screen does not crease or fall down any gaps. Sisal cord attached to the corners of the screen and at points along the bottom and sides of the screen, is useful to assist in controlling the screen.
12. If the screen top edge has eyelets use sisal cord to lash the metal tube (item 3 in requirements list above) to the top of the screen at every eyelet. Ensure that the screen is lightly stretched along the length of this tube. (If the screen has a pocket in the top edge, the metal tube can be inserted into this pocket).
13. Attach lengths of 10mm diameter rope (item 4) to the metal tube at approximately 1.5m (5') spacing along its length.
14. Pass the free end of the ropes over the top rail of the frame and down to the floor at the rear of the screen frame.
15. Place two people (one to pull and one to secure) on the free end of each rope, at floor level. Two other people climb to the top of the frame and the remaining installation team needs to position themselves around the screen to ensure that the screen does not get snagged during the lift. Designate a person on the ground to coordinate the lifting of the screen.
16. The coordinator is the only person to issue the lifting commands. On the command of the coordinator, slowly and carefully lift the screen up to the top of the screen frame. The best way to lift the screen is short repeated pulls from the people on the ropes with assistance from the two people at the top of the frame. Ensure that the tube attached to the top edge of the screen is kept as level as possible during the lifting.

17. When the tube is near the top of the screen frame the 10mm ropes are tied off to the frame structure to temporarily hold the screen.
18. If the screen is being fitted to a **lace-in** frame move on to step 26.
19. For **wrap-round** frames, the two people on top of the frame lift the middle of the metal tube and a few centimetres of the screen over the top rail of the frame. Retie the ropes to hold the metal tube and screen in the new position behind the frame. (As the metal tube will bend because of the weight of the screen, only the middle of the tube can first be lifted over the top of the frame.)
20. Lift the remainder of the tube over the frame by working out from the centre. Retie the ropes to secure the tube completely to the top of the frame. (Leave the ropes coiled up at the top of the frame so they are in place for any future screen changes).
21. At the bottom of the frame, in the centre of the frame, pull the screen down and wrap the screen under the frame rail and secure it to the lacing rail. The screen must be stretched sufficiently to pull out any wrinkles in the surface.
22. Repeat step 21, working outwards from the centre, until the surface is smooth and sufficiently tensioned to pull out any wrinkles in the screen surface.
23. On the sides, working down from the top to the bottom, wrap the screen round the sides of the frame and tie it to the frame using every other eyelet. **Do not stretch the screen**, only pull it out so that it is wrapped round the frame.
24. When all 4 sides are tensioned, fold over each corner and secure with sisal to the lacing rail.
25. Check the screen by projecting an image onto it.
26. For **lace-in** frames. The two people on top of the frame, working from the centre outwards, secure the metal tube to the frame top rail. Ensure there is an even gap between the tube and the frame and that the surface is flat.
27. Working out from the centre, secure the top of the screen to the frame. This can be done leaving the lifting tube in place, or the screen can be secured with the eyelets and the tube removed. (If the tube is removed take particular care not to scratch the surface inadvertently.) Ensure that the screen surface is kept flat.
28. At the bottom, work out from the centre of the frame pulling the screen down and lacing the screen to the frame rail. The screen must be stretched sufficiently to pull out any wrinkles in the surface.
29. On the sides, work down from the top to the bottom lacing the screen to the sides of the frame, using every other eyelet. **Do not stretch the screen**, only pull it enough to make it straight.
30. Replace any static or moving masking material.
31. The next day recheck the tension of the screen and if necessary re-tension it. **The screen should only be re-tensioned from the bottom.**

The people on this side restrain the screen and prevent the screen from folding or creasing.



Un-rolling the screen in-front of the frame.

See instruction number 10. Two people on the ends of the screen rotate the screen and move across the auditoria. The people supporting the screen move backwards across the auditoria. DO NOT grab or crush the screen while supporting it. The people on the edge of the screen must hold the screen stationary and not allow it to fold or crease.

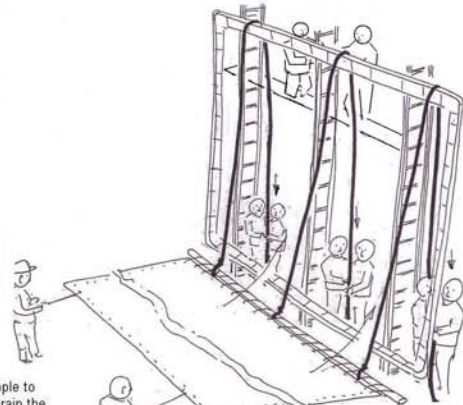
The two people at the ends of the screen rotate the metal tube whilst walking across the auditoria.

These people support the screen walk backwards to unroll the screen

Two people on top of the frame to assist hauling the screen up the frame

**Raising the Screen**

See instruction number 15. The screen is laced to the metal tube and rope attached to the tube. Two people on each rope lift the screen. The two people on top of the frame assist whilst others hold the screen and prevent folding or creasing.

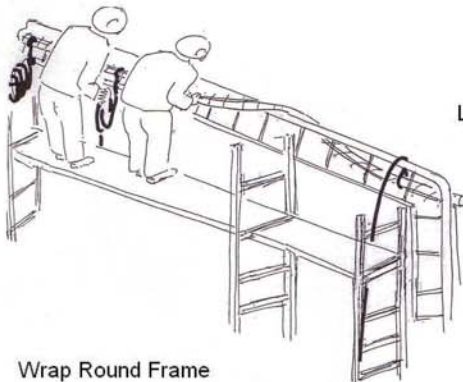


Two people on top of the frame lift the tube and screen over the frame rail and tie the tube to the frame

People to restrain the screen and prevent creases

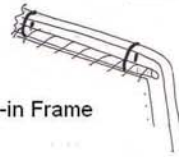
Screen laced to the metal tube

Two people per rope to haul the screen into position



**Wrap Round Frame**

**Lace-in Frame**



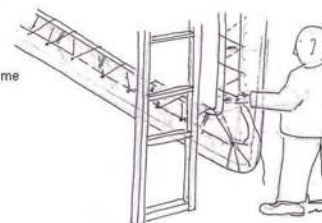
**Fixing the screen into the frame**

See instruction number 19 or 26

Two people on top of the frame attach the metal tube to the frame. If the frame is a wrap frame the tube is lifted over the frame rail and tied to the frame. If the frame is lace-in the tube is tied to the frame rail.

**Fixing the screen at the bottom and sides of the frame**

See instruction number 23 or 29



Screen laced to the frame

The screen is laced at the side using every other eyelet