Espire™ Elbow

Fabrication Instructions

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CONTENTS

ACCESSORIES

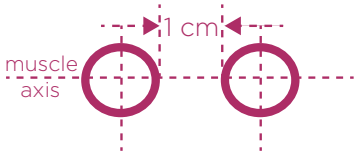
Lamination Collar

Lamination Clamp Assembly (Clamp Ring)

Lamination Dummy

TruSignal A/C Electrodes Kit

ELECTRODE PLACEMENT



Metal Electrode Spacing

Since the electrodes are independent, the clinician can place these where they want in the socket. Each site has 2 active electrodes. In general, each pair of electrodes should lie along the longitudinal axis of the muscle with an edge-to-edge spacing of not more than 1 cm. Any additional reference electrodes (grounds) should be located off-axis, away from the active electrodes where they will not interfere with muscle signals.

1. Transfer electrode placement from the test socket. Mark electrode placement on the plaster cast. This can be achieved by inserting screws or by creating indentations in the actual cast.

Note: If using D/C cased electrodes, attach lamination dummies to cast instead of screws or indentations. For more information, refer to manufacturer's instructions.

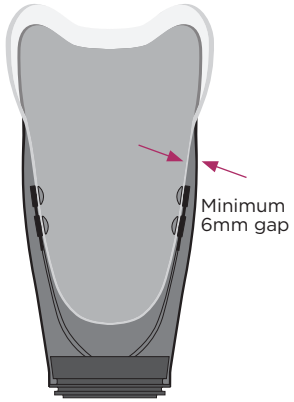
FABRICATING THE INNER SOCKET

2. Select your preferred inner socket material:

Flexible Inner Socket
Blister or drape form over the mould with the screws or indentations in place. This will create a positive or negative space which can simply be drilled through when installing the electrode posts.

Rigid Inner Socket
Laminate over the plaster cast with the electrode locations in place.

CREATING NEGATIVE SPACE WITH FOAM



When creating the final outer socket, a negative space must be created between the distal end of the inner socket and the distal end of the outer socket. This negative space will house excess wires and cables.

Note: Ensure there is a 6mm gap between the walls of the inner and outer sockets, to accommodate the electrode boards.

3. Leaving the flexible inner socket in place over the cast, pull a nylon stretch stockinette over the socket and cast.

4. Apply inner PVA bag and tie off.

5. Using foam insulation tape, wrap the proximal end of the socket and shape as desired.

6. Cover the outside of the foam insulation tape with clear tape.

7. Use a piece of plastic sheeting and cut to the desired size. The plastic sheeting should extend past the distal end of the cast to create a negative space, that will later house excess wires.

8. Cut the plastic to match the contour of the foam insulation tape. The idea is to create a conical shape that will be filled with foam and can be carved down to the desired shape and size.

9. Place the lamination collar on top of the plastic sheeting. It is important to set your alignment at this point and the angle in which the collar will sit.

10. Preserve or transfer alignment from the test fitting, including the position of the anti-rotation stop pin located on the lamination collar.

11. The red line indicates the location of the anti-rotation stop pin on the lamination collar. This sets the rotational position of the Espire Elbow. The Espire will be able to rotate 100° in either direction from this starting point.

12. Once everything is determined, tape the plastic sheeting into place.

13. Lubricate the inside of the lamination collar using petroleum jelly or similar, to ease removal from foam block.

14. Tape the lamination collar to prevent foam from entering the threads.

15. Pour rigid foam and allow to set.

16. Remove plastic sheeting and tape from lamination collar. Carefully remove the lamination collar from the foam.

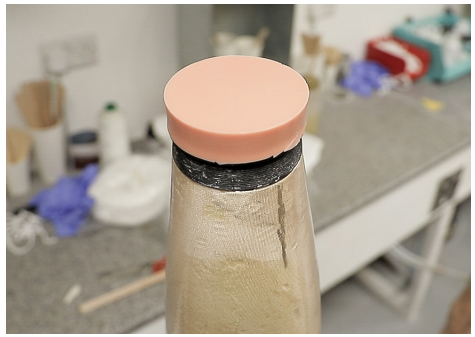
17. Grind foam to desired shape and size.

FABRICATING THE OUTER SOCKET

18. Prepare for lamination by clamping the cast, sliding the foam mould over the cast and adding a stockinette and PVA bag over top.

19. Tape PVA bag at the bottom.

20. Add a second, smaller piece of PVA bag to the top to seal off the bag.



21. Fill the space between the underside of the lamination collar and the cast with putty.

22. Insert the silicone lamination dummy on top of the lamination collar, to protect the threads.

It may be helpful to tape the silicone dummy to the lamination ring to prevent resin leakage.

23. Apply a layer of stockinette and tie off with string in the space below the top lip of the lamination collar.

24. Pull the remaining layer of stockinette down.

25. Perform a layup using your preferred material.

Note: Carbon fibre is electrically conductive and is not recommend for use with myoelectric devices. Instead a Basalt braid is recommended to give a similar finish as shown in the adjacent image.

26. Tie off at the same point as the stockinette underneath the lip of the lamination collar.

27. Complete layup of material, then apply outer PVA bag and draw vacuum pressure to remove air.

28. Perform final lamination.

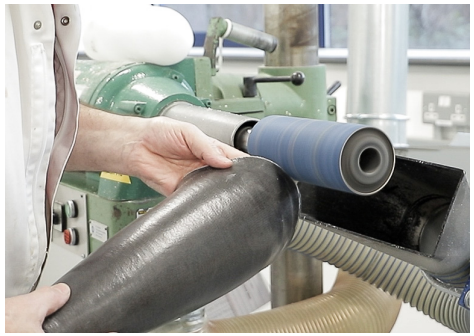
29. After lamination has completely hardened, trim away excess foam or any resin that may have accumulated from threads of the lamination collar, being careful not to damage the interface lip that will be inside of the clamp.

Note: Any damage to the threads can effect the humeral rotation within the lamination collar and clamp assembly.

TESTING THE HUMERAL ROTATION FEATURE

30. Temporarily assemble the Espire Elbow to the lamination collar using the clamp ring.
31. Ensure that humeral rotation moves smoothly and the Espire is attached securely.
32. Remove elbow and clamp before final finishing of the socket.

TRIMMING THE SOCKET



33. Trim outer socket and sand to desired shape and contour. Ideally the edges of the flexible inner socket would protrude out a bit for flexibility.

ELECTRODE INSTALLATION INSTRUCTIONS

Only for TruSignal electrode installation in Espire and Hybrid.

Here you can see the flexible inner socket. The electrode locations are identified by the raised features created when the screws were inserted into the mould.

34. Use an awl or other small tool with a sharp point to puncture the centre of the electrode location.

For test sockets and rigid inner sockets, a power drill with a 3⁄32 drill bit is recommended.

35. Insert the post of the electrode dome through the inside of the socket. The dome should be inside of the socket where it will contact the residual limb.

36. Place the nut snap onto the post of the electrode dome and hand tighten. Use the provided 7⁄16" hex driver (CP HXD), or wrench to tighten snugly.

Note: Do not apply Loctite™ to electrode dome threads. Loctite™ acts as an insulator and would prevent myo signal transmission.

37. Use a pair of wire snips to trim the post. The post should not protrude beyond the snap when secured in place.

38. Snap the electrode boards onto the electrode dome posts and ensure they are attached securely. The location of the electrodes can always be changed later if desired.

39. This is what the inside of the socket will look like once all electrodes are attached and secured.

40. The electrode cables should tuck safely into the space between the distal end of the flexible inner socket and the opening of the hard-outer socket.

FINAL ASSEMBLY

Connect cables to Espire input connector board, install the strain relief disc, and use the clamp ring to attach the Espire Elbow to the socket.

Info: For more information on device assembly, see the Espire Elbow Technical Manuals.

Caution: fabrication should be carried out by individuals appropriately trained in the use of the materials, machinery and tools required; following the correct handling procedures for each as defined by the materials/machinery used.

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