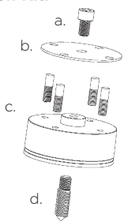
LAMINATION FABRICATION INSTRUCTIONS

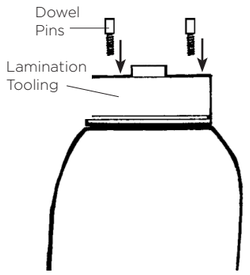
Materials included in the Lamination Fabrication Kit:

a. Lamination Cap Bolt
b. Lamination Cap
c. Lamination Tooling
(includes four Dowel Pins)
d. Tooling Bolt



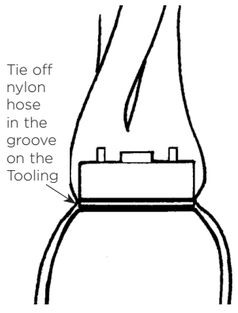
1. Place the modified and smoothed cast with attached Lamination Tooling in a lamination fixture.

2. Apply lubricant to the threads of the four screw-in Dowel Pins, and insert the pins into the Lamination Tooling. Ensure that all four Dowel Pins are securely seated and of the same height when fully inserted.



3. Pull half the length of a nylon hose over the cast and tooling. Tie off the nylon hose in the tie-off groove on the Lamination Tooling. Fold the rest of the hose down onto the model.

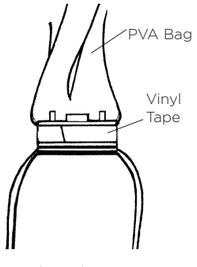
Note: Do not allow the nylon hose to extend above the tie-off groove on the Lamination Tooling. Air leaks may occur in the finished socket if the nylon hose extends past the tie-off groove.



4. Apply a PVA bag over the cast and tooling.

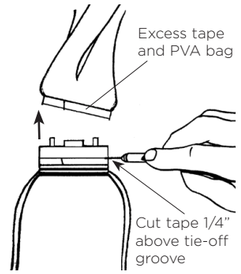
5. Tightly wrap one lap of vinyl tape over the PVA bag and around the circumference of the Lamination Tooling. Do not overlap the starting point of the tape by more than 1" (25 mm).

Note: If the starting point of the tape is overlapped by more than 1" (25 mm), there may be air leaks in the finished socket.



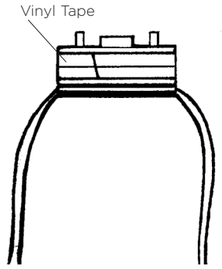
6. Secure the other end of the PVA bag and apply a vacuum.

7. Cut through the tape and the PVA bag along the midline of the tape. Cut approximately 1/4" (5 mm) past the tie-off groove and around the circumference of the tooling. Discard the excess PVA bag and tape.



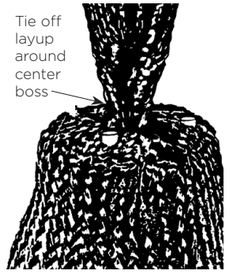
8. Wrap one layer of vinyl tape over the remaining half-width of tape to completely seal the cast from resin leakage. Do not overlap the starting point of the tape by more than 1" (25 mm).

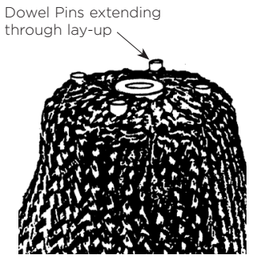
Note: If the starting point of the tape is overlapped by more than 1" (25 mm), there may be air leaks in the finished socket.



9. Apply the desired socket lay-up over the cast and tooling. Tie-off the lay-up around the top threaded center boss.

Note: The Dowel Pins must extend through the layup. Cut small holes in the layup material if necessary to allow the Dowel Pins to pass through the layup.





10. Position the Lamination Cap on the Dowel Pins. Apply lubricant to the Lamination Cap Bolt, insert the Bolt into the Lamination Cap, and hand-tighten the Bolt. Fill the head of the Lamination Cap Bolt with clay to facilitate removal.

11. Apply an outer PVA bag over the layup and fabricate using standard techniques in an appropriately ventilated room. Ensure adequate resin penetration of the layup between the Lamination Tooling and the Lamination Cap. Tie off any excess resin above the Lamination Cap to facilitate removal.

12. After the socket has cured sufficiently, remove the outer PVA bag, the Lamination Cap Bolt, and the Lamination Cap.

13. Remove the socket from the model using standard techniques.

14. Remove the Lamination Tooling from the socket. It may be necessary to rethread the Lamination Cap Bolt into the Lamination Tooling and gently tap with a rubber mallet to completely remove the Tooling from the socket.

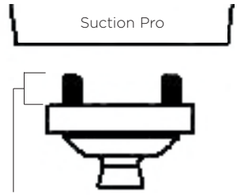
15. Use a deburring tool to deburr the through holes in the distal portion of the socket.

16. Finish the trim lines of the socket according to the directions in the Alpha Liner Instruction Manual.

17. Clean the interior of socket thoroughly, to prevent dirt or debris from allowing air to bypass the Suction Pro.

18. Insert the Suction Pro into the socket and orient it into position.

19. Attach the desired WillowWood 4-hole adapter to the socket. Check to make sure that the length of exposed screw to engage with the Suction Pro is between .4" (10 mm) and .6" (15 mm).



The length of exposed screw to engage with the Suction Pro must be between .4" (10 mm) and .6" (15 mm).

20. For a socket that will be used as definitive prosthesis, apply Loctite 242 Removable Threadlocker (or equivalent) to the screws, and torque the screws to 9 ft-lbs (12 Nm).

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PN-1461-H 24 APR 2014

WillowWood® ALPHA®

Alpha Suction Pro Instructions

WHAT'S IN THE BOX

Alpha Suction Pro (700-SP100 or 700-SP101)
Titanium Pyramid (700-SP101 only)
4 M6 x 16 Flat Head Capscrews
Post Stickers
Instructions

ADDITIONAL MATERIALS REQUIRED

Thermoplastic Tooling Kit (Part No. 700-SP111)
or
Lamination Tooling Kit (Part No. 700-SP110)

WARRANTY

The warranty for the Alpha Suction Pro is one year from the date of invoice. Use of the Alpha Suction Pro for amputees whose modified body weight is more than 250 lbs (115 kg) or who engage in extremely high and abusive activity is against WillowWood's recommendations and will void the one-year warranty. Modified body weight is defined as the weight of the amputee plus any loads carried normally or routinely by the amputee. "Extremely high and abusive activities" are defined as activities such as skydiving, karate, and judo; activities that could result in injury to an individual's natural limb; and activities that expose the prosthesis to corrosives such as salt water.

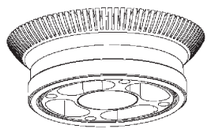
WARRANTY DISCLAIMER

WillowWood warrants that each product manufactured will, at the time of delivery, be of workmanlike quality and substantially free of defects. WILLOWWOOD MAKES NO OTHER WARRANTY, IMPLIED, OR EXPRESSED, AND MAKES NO WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. This warranty shall terminate immediately upon an action to combine our products with other materials or in any manner to change the nature of our products. The sole remedy is replacement of the products or credit for the products. WillowWood's liability shall not exceed the purchase price of the product. WillowWood shall not be liable for any indirect, incidental, or consequential damage.

WILLOWWOOD RETENTION OF RIGHTS

WillowWood retains all intellectual property rights reflected or incorporated in its physical products, regardless of the transfer of the physical products to another party or parties.

INTRODUCTION



In order to fabricate a socket using the Alpha Suction Pro, either a Thermoplastic Tooling Kit (Part No. 700-SP111) or a Lamination Tooling Kit (Part No. 700-SP110) is required.

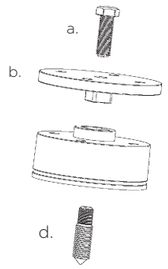
The Alpha Suction Pro is shipped with five Post Stickers, which are used in the fabrication of thermoplastic sockets. The Post Stickers are not required for the fabrication of laminated sockets.

THERMOPLASTIC FABRICATION INSTRUCTIONS

Note: When using the Thermoplastic Tooling Kit to make a definitive socket, use plastic that is at least 1/2" (13 mm) thick.

Items included in Alpha Suction Pro Thermoplastic Tooling Kit:

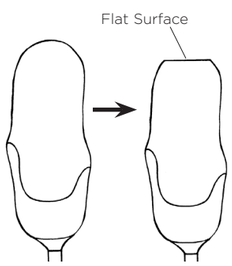
a. Thermoform Cap Bolt
b. Thermoform Cap
c. Thermoform Tooling
d. Tooling Bolt



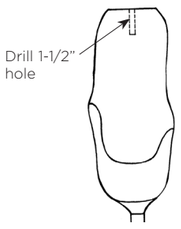
Tools required:

Hand drill
3/16" (or 5 mm) drill bit
1/4" (or 6 mm) drill bit
1/2" (or 13 mm) wrench

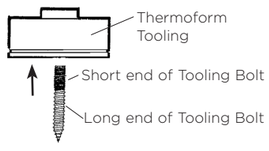
1. Modify the model according to the directions in the Alpha Liner Instructional Booklet.
2. Remove 1/2" (12 mm) of length from the distal end of the model to ensure a flat surface for the fabrication tooling. The flat surface should be perpendicular to the long axis of the cast in both planes.



3. Using a 3/16" bit, drill a 1-1/2" (40 mm) deep hole in the center of the flat surface prepared in Step 2.

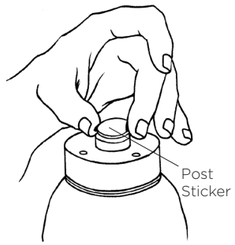


4. Thread the short end of the Tooling Bolt into the Thermoform Tooling as shown in the diagram.

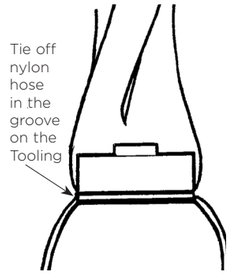


5. Thread the Thermoform Tooling and attached bolt into the hole drilled in Step 3. Position the Tooling so that it is flush with the distal surface of model. Place the Tooling in the desired rotational alignment (with regard to the placement of the 4 holes) before proceeding to Step 6.

6. Blend the Thermoform Tooling with distal surface of model, removing as little material from the model as possible.
7. Apply the Post Sticker (provided with each Suction Pro) to the raised center post on the distal surface of the Thermoform Tooling.

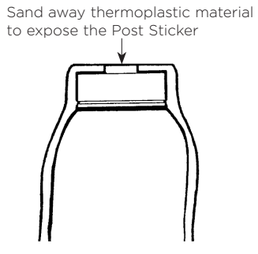


8. Place the Thermoform Cap in an oven for fifteen to twenty minutes at the same temperature that is used to heat the socket material.
9. Make sure that the rotational alignment is still correct with regard to the placement of the 4 holes, then fabricate the thermoplastic socket using standard procedures. If using a nylon hose as a wick, tie off the nylon hose in the tie-off groove on the Thermoform Tooling. Fold the rest of the hose down onto the model.

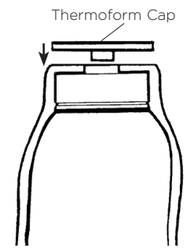


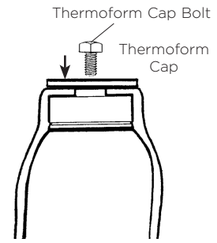
Note: Do not allow the nylon hose to extend above the tie-off groove on the Thermoform Tooling. Air leaks may occur in the finished socket if the nylon hose extends past the tie-off groove.

10. After the socket has cooled sufficiently, sand material away to expose the Post Sticker on the raised center boss on the distal surface of tooling. Remove the Post Sticker.



11. **Wearing heat-protective gloves**, remove the heated Thermoform Cap from the oven. Insert the raised surface into the corresponding void on the raised center boss of the Thermoform Tooling. Thread the Thermoform Cap Bolt through the Thermoform Cap and into the Thermoform Tooling. Tighten the bolt with 1/2" (13 mm) wrench until tight.





12. When the Tooling has cooled sufficiently, drill holes through the distal end of socket with a 1/4" (6 mm) drill bit, using the Thermoform Cap as a drill guide.

13. Remove the Thermoform Cap Bolt from the Thermoform Cap with a 1/2" (13 mm) wrench. Remove the Thermoform Cap.
14. Remove the socket from the model in normal manner.
15. Finish all edges of socket in normal manner to prevent discomfort to wearer.
16. Clean the interior of socket thoroughly, to prevent dirt or debris from allowing air to bypass the Suction Pro.
17. Insert the Suction Pro into the socket, lining up the four holes in the Suction Pro with the four holes in the socket.
18. Attach the desired component(s) to socket. Check to make sure that the length of exposed screw to engage with the Suction Pro is between .4" (10 mm) and .6" (15 mm). Make sure that the screws do not extend into the Suction Pro more than 1/4" (5 mm).
19. If using the socket in a definitive prosthesis, apply Loctite 242 Removable Threadlocker (or equivalent) to the screws, and torque the screws to 9ft-lbs (12 Nm).

TRANSFERRING A SUCTION PRO FROM A THERMOPLASTIC SOCKET INTO A LAMINATED SOCKET

Materials included in the Lamination Tooling Kit:

Lamination Tooling (includes four Dowel Pins)
Tooling Bolt
Lamination Cap
Lamination Cap Bolt

1. Remove the screw-in Dowel Pins from the Lamination Tooling.
2. Thread the short end of the Tooling Bolt into the Lamination Tooling, unless further adjustments will be made to the position of the Lamination Tooling (refer to Step 10 below).

   Note: If you know that you will be making additional test sockets, there is no need to install the Tooling Bolt at this time.
3. Replace the Suction Pro in the dynamically aligned socket with the Lamination Tooling.
4. Reattach all componentry in the original orientation.

   Note: Overtightening of the threads in the nylon Lamination Tooling may result in stripped threads.
5. Secure the socket assembly in the transfer fixture.
6. Pour plaster (or equivalent) into the socket to create a positive model of the socket.
7. After the model has cured, remove the socket assembly from the transfer fixture.
8. Remove the socket from the model in the normal manner.
9. Place the model back into the transfer fixture.
10. Align all components into the most neutral position possible.

    Note: If it is necessary to change the position of the Lamination Tooling when realigning the components, WillowWood recommends fabricating a new test socket. Refer to the Thermoplastic Fabrication Instructions.
11. Reattach the Lamination Tooling to the model if necessary.
12. Proceed to the Lamination Fabrication Instructions.