

TF Definitive Socket Lamination

(For internal use only)

Technical Information



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1 Introduction

This technical information supports you in the fabrication of a definitive socket for transfemoral fittings. After preparation of the plaster positive, lamination is performed in two layers. Optionally, a third finishing layer can be applied.

This document is directed to trained prosthetists. It is a prerequisite that the qualified personnel are trained in the handling of the various materials, machines and tools. This technical information does not claim to be exhaustive. In addition to the work instructions in this technical information, please read the important information regarding safe processing in the respective instructions for use for the components and materials.

2 Preparation

The required materials and tools are listed in the tables below. The tables contain the materials and tools shown in the photos within this technical information. The prosthetist assumes full responsibility for the use of any other materials.



Materials and Tools	
Designation	Reference Number
PVA Bag	99B81
Dacron Felt	616G6
Perlon Stockinette	623T3=*
Perlon Elastic Stockinette	623T5=*
Carbon Fibre Cloth	616G12
Carbon Fibre Cloth Strap	616B1=50 x 5 cm
Woven Carbon Fibre Stockinette	616G15=80 x 5 cm
C-Orthocryl	617H55
Hardening Powder	617P37=0.150
Pigment paste	617Z6 (red)
Vulkollan cord	617B1
Double-Sided PVC Adhesive Tape	616F10=9
Tube Sock	99B25
Isopropyl alcohol	634A58
Silicone Parting Agent	519L5
Talcum Powder	639A1=1
Lamination Dummy	4X46 (Dummy)
Special Lubricant	453H2=1
Wooden board for heat sealing	–

Measuring Devices and Tools	
Designation	Reference Number
Measuring Cup	642B2=(Volume)

Measuring Devices and Tools	
Designation	Reference Number
Wooden Spatula	699Y3
Hand Sealing Iron	756E1=220V
Sandpaper	–

Prosthetic Components	
Designation	Reference Number
Lamination Anchor	–

3 Procedure

3.1 Preparing the Plaster Positive

INFORMATION

- If the plaster positive is not yet dry, seal the plaster positive with clear lacquer.

Fix the plaster positive with the two-way vacuum pipe in the vice and pull a tube sock over the plaster positive. Bind the tube sock to the valve dummy for a smooth impression of the residual limb end on the socket.

INFORMATION

- If a more flexible inner socket is required, prepare the inner socket before finishing the definitive outer socket. Position the flexible inner socket on the plaster positive before laminating the outer socket. The inner socket remains on the plaster positive during the subsequent lamination phases.

INFORMATION

- If no inner socket is used, do not apply the carbon fibre beyond the trim line. Skin irritations are, thus, prevented.

INFORMATION

The specifications for the reinforcements shown here are examples. The prosthetist is responsible for adjustment according to the patient's weight and functional requirements.

INFORMATION

- Process the carbon fibres without wrinkles and pay attention to the direction of the fibres in order to achieve maximum stability.

3.2 Laminating the First Layer



Heat seal a soaked PVA bag around the small end and pull the PVA bag over the plaster positive.

Tie off the PVA bag between the first and second opening of the vacuum pipe and switch on the vacuum device.

Sew the first two reinforcement layers distally, to precisely shape the residual limb end:

- 1 layer of Dacron felt
- 1 layer of Perlon Stockinette



Slightly offset the next layers and fasten with double-sided adhesive tape so that no seam results:

INFORMATION: Use as little double-sided adhesive tape as possible.

- 3 layers of carbon fibre cloth strap (616B1, unidirectional) from medial to lateral position



The layers end distally approx. **1 cm** from the socket edge.



Slightly offset the next layers and fasten with double-sided adhesive tape so that no seam results:

- 2 circular layers of carbon fibre cloth strap (616B1, unidirectional), approx. **1 cm** distally from socket edge
- Place both ends of the cloth strap in the area of the medial containment wall.





Slightly offset the next layers and fasten with double-sided adhesive tape so that no seam results:

- 3 layers of carbon fibre cloth (bi-directional), on the end of the residual limb



Place the following layers over the tuberosity area in a mosaic fashion:

- 3 layers of carbon fibre cloth

Pull the following layers over and tie off:

- 2 layers of Perlon Elastic Stockinette



Fill a measuring cup with lamination resin.

Optional: Add and mix colour (**3 %** of the overall weight of the laminating resin).

Pull a soaked PVA bag over the laminate and rub with talcum powder. Tie the PVA bag below the second opening of the vacuum pipe.

Allow enough of the bag to protrude on the distal end to be able to pour in the lamination resin.

Reversibly tie up the PVA bag on the distal end of the residual limb to test permeability.

Start the vacuum device.

Mix hardener with lamination resin (maximum **3 %** of overall weight of lamination resin).

Pour the lamination resin in the opening of the PVA bag, and then tie off the bag opening airtight.

Tilt the plaster positive downward from its vertical position by approximately **130 °**. This allows air to escape from the lamination resin toward the vacuum channels.

As soon as the lamination resin has soaked the reinforcement to the dorsal socket edge, rotate the plaster positive back to its original position.



Evenly rub the lamination resin into the reinforcement, leaving extra resin at the distal end, and tie off.

INFORMATION: Avoid air inclusions in the material.

Allow lamination resin to cure for **20-25 min.**



Remove the PVA bag and roughen the laminate with sandpaper. In this way, the adhesion for the second lamination phase is ensured.

Smooth rough edges.

Clean the distal end with isopropyl alcohol.

Use the transfer device to position the lamination anchor, and attach with plaster. (see TI Transfer TF Adapter Position OK3107)

INFORMATION: Attach a suitable dummy to the adapter and protect the screws of the adapter with silicone parting agent.

3.3 Laminating the Second Layer



Clean the laminate with isopropyl alcohol.

INFORMATION: When laminating, do not use foil underneath the second layer. The two layers should bind together.

Slightly offset the next layers and fasten with double-sided adhesive tape so that no seam results:

- 2 layers of carbon fibre cloth on the anchor arms.



Apply the following layers:

- 2 layers of woven carbon fibre stockinette.

Pull the first layer of woven carbon fibre stockinette over the laminate to the centre of the socket.

Tie off the woven carbon fibre stockinette below the set screw and fold back.

Apply second layer upwards over the anchor arms.



Pull on 2 layers of Perlon Stockinette.

Fill a measuring cup with lamination resin.

Optional: Add and mix colour (**3 %** of overall lamination resin weight).

Pull a soaked PVA bag over the laminate and rub with talcum powder. Tie the PVA bag below the second opening of the vacuum pipe.

Allow enough of the bag to protrude on the distal end to be able to pour in the lamination resin.

Reversibly tie up the PVA bag on the distal end of the residual limb to test permeability.

Start the vacuum device.

Mix the hardener with the lamination resin (maximum **3 %** of the overall lamination resin weight).

Repeat the casting process like the first layer.

Remove the PVA bag.

If no finishing will be performed:

Mark the trim line.

INFORMATION: Adjust the drill hole diameter of the compressed air gun in order to ensure an airtight connection.

Drill a hole in the prosthetic socket above the set screw of the valve dummy.

Unscrew the set screw.

Inject air into the hole with the compressed air gun, and remove the prosthetic socket from the plaster positive.

If the prosthetic socket will not separate from the plaster positive, remove the plaster from the socket with a chisel.

NOTE: Do not damage the inner wall of the socket.

Remove the dummy and sand the trim line with a socket router. Round off the edge.

NOTE: Do not damage the adapter.

3.4 Optional: Finishing

- 1) Roughen the entire laminate with sandpaper and clean with isopropyl alcohol.
- 2) Pull 1 layer of perlon elastic stockinette over the laminate.
- 3) Pull 1 layer of perlon elastic stockinette or 1 layer of decor fabric over the laminate.
- 4) Fill a measuring cup with lamination resin.
- 5) **Optional:** Add and mix colour (**3 %** of the overall lamination resin weight).
- 6) Pull on a soaked PVA bag over the laminate and tie off proximally. Allow enough of the bag to protrude on the distal end to be able to pour in the lamination resin.
- 7) Reversibly tie up the PVA bag on the distal end of the residual limb to test permeability.
- 8) Start the vacuum device.
- 9) Mix the hardener with the lamination resin (maximum **3 %** of the overall lamination resin weight).
- 10) Repeat the casting process like the first and second layers.
- 11) Allow the lamination resin to cure and pull off the PVA bag.
- 12) Mark the trim line.
- 13) Cut open with an oscillating saw. **NOTE: Do not damage the inner wall of the socket.**
- 14) Remove the prosthetic socket and the rest of the plaster from the plaster positive. **NOTE: Do not damage the adapter.**
- 15) Sand the contour of the socket edge with the socket router.



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