

SIDE ELEMENT AFO

TRIM LINE OPTIONS

- Anterior ground reaction style (Figure 8)
- Posterior style (Figure 9)



3 1/2" Carbon Graphite Flat Braid

- The 3 1/2 inch braid should cover the plantar surface of the foot from the level of the metatarsals (Figure 7) to below the apex of the heel (Figures 8 & 9).

NOTE: Before cutting to length, stretch the braid to the medial and lateral trim lines. This stretching will shorten the anterior-posterior length of the braid

3/4" Carbon Kevlar Braided Tube

1. Using a layer of nylon hose to hold the braid in place, start the center of the anterior braid at the center of the distal trim line of the foot and work proximal, forming medial and lateral trim lines and smooth radii at the ankle (Figures 8 & 9).
2. Start the center of the posterior braid at the center of heel trim line (distal to the apex of the heel) and form smooth radii at the ankle (Figures 8 & 9).
3. Bring the anterior and posterior braids together at the malleoli. Run the braids up the medial and lateral center lines, with the posterior braid posterior and parallel to the anterior braid.
 - Posterior Trim line - form the distal trim line with the posterior braid and the proximal trim line with the anterior braid. Overlap the braid ends at the posterior midline (Figure 10).
 - Anterior Trim line - form the distal trim line with the anterior braid and the proximal trim line with the posterior braid. Overlap the braid ends at the anterior midline (Figure 11).
4. Trim a length of 3 1/2" braid to fit the calf cuff, taking care that the edges do not extend beyond the edges of the Carbon Kevlar braid (Figures 10 & 11).

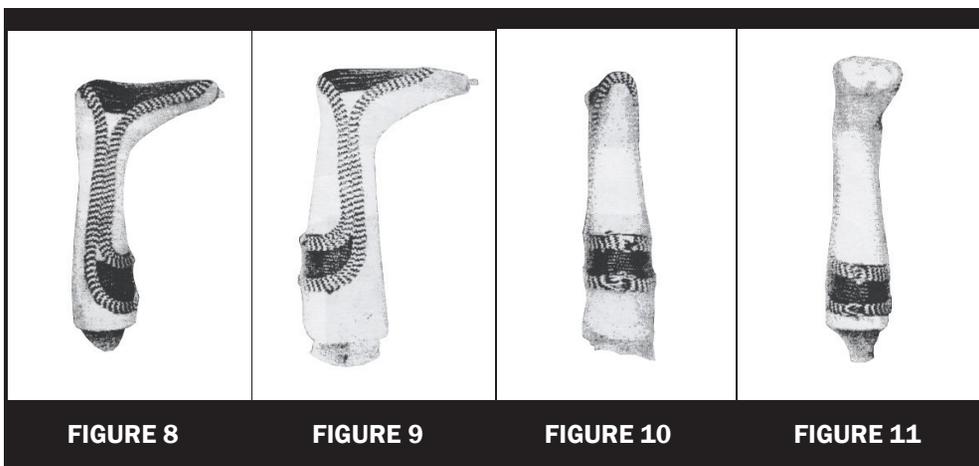


FIGURE 8

FIGURE 9

FIGURE 10

FIGURE 11



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USERS GUIDE

The purpose of the Ultra-G users guide is to provide basic instruction in wet lamination techniques and to give suggestions for possible lay ups. A key feature of the wet lamination method of fabrication is that it allows the practitioner to customize the strength and stiffness of the finished orthosis. The lay ups explained in this guide are typical examples. As the user becomes familiar with the characteristics of the Ultra-G products, lay ups can be varied to match clinical demands.

GENERAL LAY UP GUIDELINES

- The stiffness and strength of the finished lamination will generally increase with the size of the braided tube.
- To increase strength, braided tubes can be layered by pulling one inside another.
- Where different braids come together, such as the intersection of a posterior element and calf band, the braids should overlap so that the forces can be transmitted from one braid to another.
- The amount of nylon hose and other materials e.g. lycra, should be kept to a minimum.
- Lay ups should be designed, whenever possible, so that the woven edges of the braided tubes form the trim lines. This will minimize the amount of cutting and grinding through fibers.

SAFETY NOTES

- Always wear gloves when handling Carbon Graphite and Carbon Kevlar Braids.
- Grinding of braid edges should be kept to a minimum. Be sure to observe Finishing Precautions and Material Safety Data Sheets.

Suggested Braids and Lengths

	Posterior Element AFO			Side Element AFO
	Flexible	Semi-Rigid	Rigid	
3 1/2" Carbon Graphite Flat Braid	2ft (60 cm)	2ft (60 cm)	2ft (60 cm)	2ft (60 cm)
3/4" Carbon Kevlar Braided Tube	4ft (120 cm)	4ft (120 cm)	8ft* (240 cm)*	16ft* (480 cm)*
3/4" Carbon Graphite Braided Tube		1ft (30 cm)		

*Cut into 4 foot lengths (120 cm) and place one tube inside the other to form double thickness braids (see Figure 1)

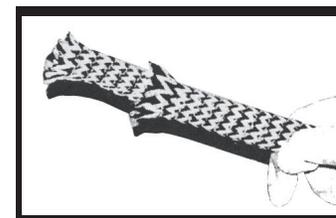


FIGURE 1

LAMINATION INSTRUCTIONS

1. Fill and modify the cast in the usual manner taking care to ensure adequate relief of bony prominences.
2. Seal the mold with lacquer.
3. Wet a PVA bag by rolling it in a towel. Use 4 or 6 inch bags for AFOs.
4. Pull the PVA bag over the mold and secure it to the inner vacuum source. Tie off distal end of bag, apply vacuum and check for leaks.
5. For lay up suggestions, refer to the sections entitled Posterior Element AFO or Side Element AFO.
6. Having completed the lay up, wet a second PVA bag.
7. Pull the second PVA bag over the lay up and secure it to the outer vacuum source. Attach a funnel to the top of the bag. Apply vacuum and check for leaks.
8. Mix resin, hardener and pigment according to the manufacturers instructions. Use 150-250 grams for small casts and 250-350 grams for large casts.
9. Pour the resin into the funnel and use a string to ensure the braids are fully impregnated. Be careful to eliminate air bubbles by stringing out excess resin.

FINISHING

When the resin is cured cut the orthosis from the cast. Using the braids as trim lines, remove excess material. Any material that does not contain braided material should be removed since it is weak and will break.

Strap as you would with any orthosis.

POSTERIOR ELEMENT AFO



POSTERIOR ELEMENT OPTIONS

- *Flexible/Dorsiflexion Assist* - place one layer of 3/4" Carbon Kevlar braid on top of the other (**Figures 2 & 3**).
- *Semi-rigid* - place one layer of 3/4" Carbon Kevlar braid on top of the other. Insert both braids through a length of 3/4" Carbon Graphite braid that extends from the calf cuff to the posterior ankle radius (**Figures 4 & 5**).
- *Rigid* - Double the 3/4" Carbon Kevlar braid through the orthosis by placing one braid inside the other. In the posterior element, place the 3/4" Carbon Kevlar braids next to each other (**Figure 6**).

3 1/2" Carbon Graphite Flat Braid

- The 3 1/2" braid should cover the plantar surface of the foot, typically extending from the metatarsal heads (**Figure 7**) to the posterior aspect of the heel (**Figure 6**).

NOTE: Before cutting to length, stretch the braid to the medial and lateral trim lines. This stretching will shorten the anterior-posterior length of the braid.

3/4" Carbon Kevlar Braided Tube

1. Using a layer of nylon hose to hold the braid in place, start the center of the braid at the center of the distal trim line of the foot and work proximal, forming medial and lateral trim lines (**Figure 2**).
2. Form smooth radii at the ankle and bring the medial and lateral braids together at the posterior of the heel to form the posterior element, taking care to overlap the 3 1/2" braid (**Figure 6**). Form the calf cuff with 3 1/2" braid such that the trim lines will be anterior to the midline of the calf (**Figure 2**). Take care to overlap the ends of the 3/4" Carbon Kevlar braids.



FIGURE 2



FIGURE 3

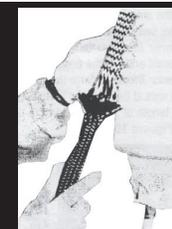


FIGURE 4



FIGURE 5



FIGURE 6



FIGURE 7