

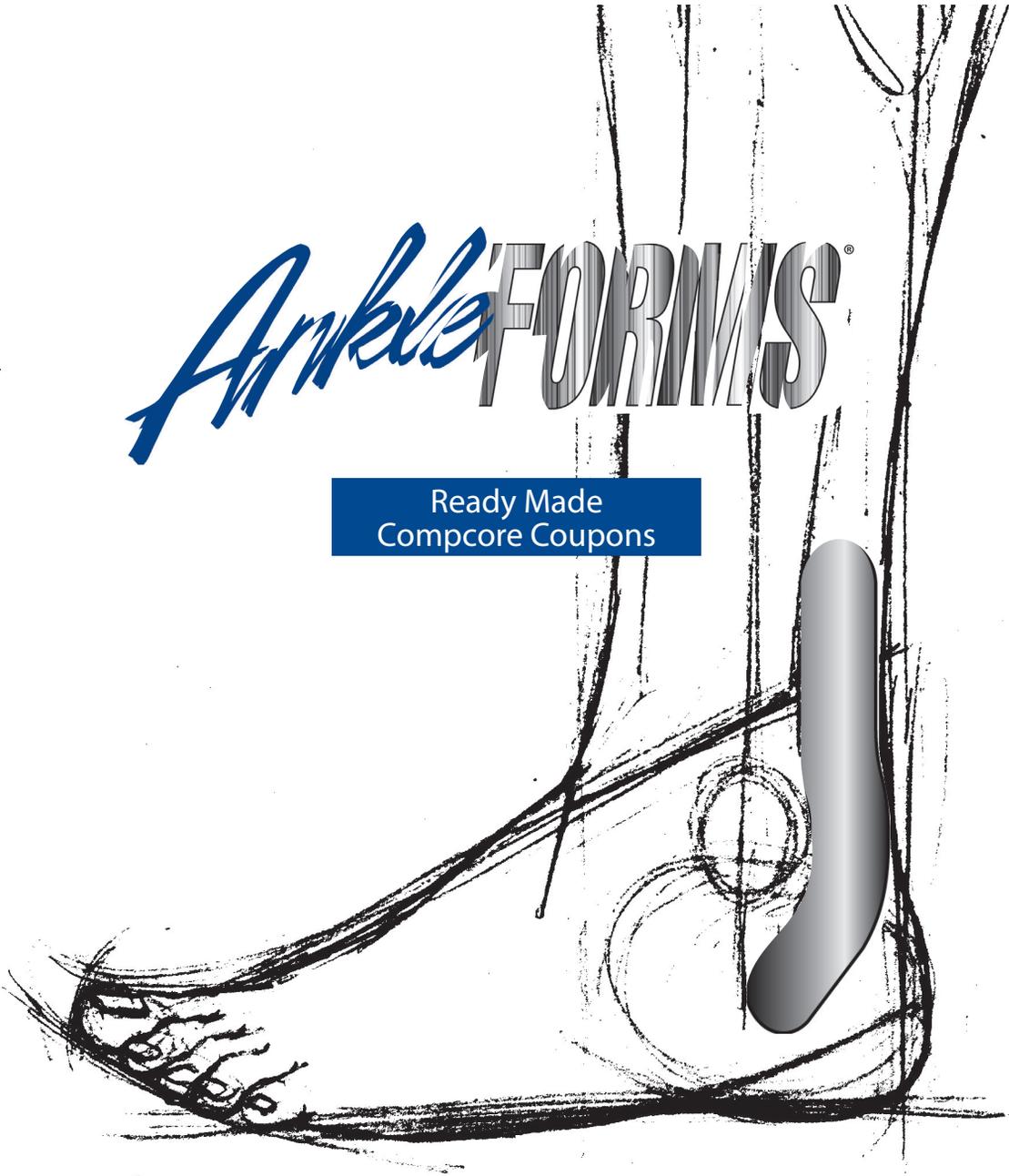


# COMPCORE<sup>®</sup>

Thermo Bonding  
Carbon Reinforcement

# Ankle FORMIS<sup>®</sup>

Ready Made  
Compcore Coupons



US Patent 5,312,669  
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*A Tradition of Excellence A Commitment to Innovation*



635 Executive Dr | Troy, MI 48083  
P: 800-521-2192 | 248-588-7480  
[BeckerOrthopedic.com](http://BeckerOrthopedic.com) | f t in

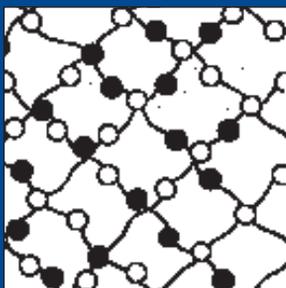
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Acorn Regulatory Consultancy  
Services Limited  
Knockmorris Cahir Co. Tipperary Ireland,  
Postcode: E21 R766  
P 012 4626 8456  
F 012 4626 8648

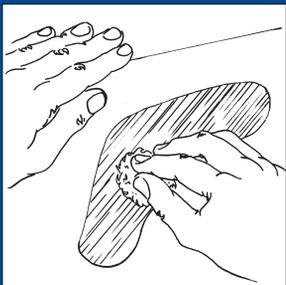




What is Compcore and why does it bond to polypropylene sheet?



Hot polypropylene will form a molecular bond when placed against another piece of hot polypropylene.



Begin by cleaning your AnkleForms and sheet of polypropylene with Isopropyl Alcohol.



A thin layer of 3M 77 adhesive should be sprayed on the positive model where the hot coupon will be placed. This will keep the coupon in place during thermoforming.

\*3m 77 is a registered trademark of 3m Corporation.

The introduction of AnkleForms® not only brings an easier and more cost effective method of reinforcing your solid ankle AFO's, but also serves as the introduction to a new generation of Compcore®.

Compcore was originally designed by Becker Orthopedic for reinforcement of orthotic and prosthetic polypropylene devices. We have improved the technology, addressed polypropylene sheet shrinkage, and revised several manufacturing techniques that will enhance product fabrication in your lab.

Becker has devised a dual coupon non-spread method to use Compcore as a cross band reinforcement in KAFO's. In addition we have made Compcore thinner without sacrificing strength to make your reinforcement co-laminations less bulky. Finally, the surface of Compcore has been improved to increase the bonding potential between the composite and your sheet materials.

Please take the time to review the AnkleForm process guide as we offer some fine points of fabrication with Compcore.

Compcore is a mingling of familiar materials in a new combination. As practitioners and technicians we have all used carbon and fiber glass reinforcements and polypropylene sheet materials. Becker uses a new manufacturing technique to process these fiber materials into a composite sheet impregnated with polypropylene resin.

Coupons or pieces of this prepreg sheet can be bonded into your polypropylene orthosis or prosthesis to provide strategic area reinforcement. The coupons bond to sheet polypropylene due to the fact that polypropylene, when at melt temperature, will bond to itself. Heating your sheet polypropylene in the oven with the polypropylene based composite coupons and immediately co-laminating during thermoforming will bond the coupon to the sheet polypropylene.

In the component kit you will find a thin sheet of Teflon film; this is transfer release film. Place the Compcore coupons on the sheet for heating. The film will allow you to transfer the hot tacky composite coupons from the oven to the model and mold the reinforcement in place on the positive model.

When your sheet materials and coupons are at the correct processing temperature, remove the coupons by holding the Teflon film. The coupon then can be transferred to the positive model and smoothed into position. The film prevents the hot coupons from sticking to your gloves and you are able to easily mold the coupon to the shape of the positive model.

The molding temperature of 331 degrees Fahrenheit is the same for Compcore and sheet polypropylene. The question of when to place the Compcore coupon into the oven is asked and is dependent upon the type of oven that you use in your lab.

A rough measure is to delay placement of the coupon until the perimeter of the sheet has started to turn clear. This is especially true if you are using 3/16" material.

Thin sheet material of less than 3/16" will allow you to place the coupon in the oven at the same time. Sheet material and Compcore can both be overheated. It is best to try a sample co-lamination before making a clinical device for a patient.

The sheet of hot polypropylene must be vacuformed on a hot composite coupon. Heat creates the molecular bond between the two materials. It is important to work as quickly as possible to ensure the best heat bond.

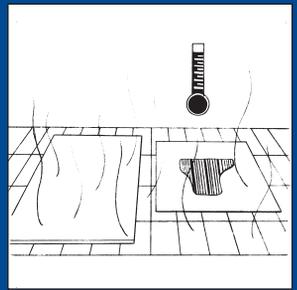
For best results, use string as a wick between the Compcore and the polypropylene. The string should be oriented along the length of the coupon. Use one string per coupon. Lay string on coupon just before pulling and sandwich between coupon and polypropylene.

The original one piece "butterfly" shape suggested in our first generation of Compcore did not allow an area for sheet polypropylene to shrink. Depending on the shrinkage rate of your sheet material the AFO could spread at the ankle.

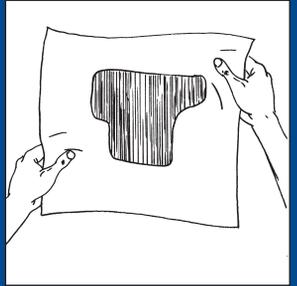
Using two AnkleForm coupons allows an "avenue" of clear polypropylene down the back of the AFO, providing the polypropylene sheet an area to shrink, with little effect on the overall shape of the AFO.

Compcore itself has very little shrinkage due to the heating and cooling cycle. Care must be taken when adding reinforcement coupons to a polypropylene device so that shrinkage of the sheet material can be accommodated.

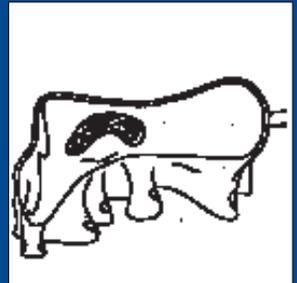
The dual component co-lamination technique was developed



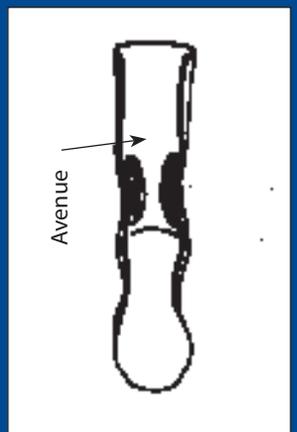
Heat the Compcore coupon and sheet polypropylene to the same oven temperature.



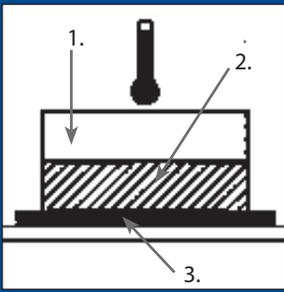
Transfer hot coupon from the oven with the teflon film.



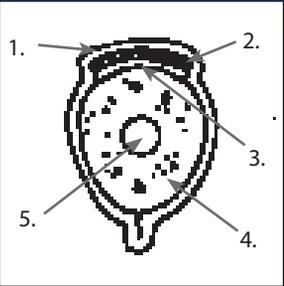
Immediately thermoform the hot polypropylene sheet on top of the Compcore coupons.



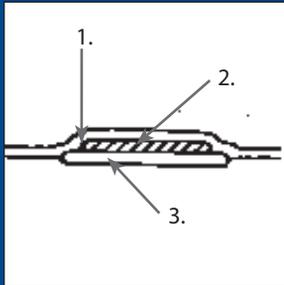
A polypropylene avenue must run between the composite coupons.



1. Poly Coupon
2. Compcore Coupon
3. Transfer Film



1. Polysheet
2. Compcore Coupons
3. Poly Coupon
4. Positive Mold
5. Mandril



1. Polysheet
2. Compcore Coupons
3. Poly Coupon

to provide a method to reinforce the polypropylene shell of a KAFO. Shrinkage of the polypropylene sheet must be balanced in the circumferential reinforcement. The original single reinforcement band did not allow for shrinkage of the polypropylene sheet resulting in some M/L spread.

The circumferential Compcore coupon is prepared in the typical manner along with a mirror coupon of polypropylene. If you are thermoforming your device with 3/16" polypropylene sheet then the polypropylene mirror coupon should be constructed from 1/8" material. Conversely a device in 1/8" material will need a polypropylene coupon of 3/32".

The two coupons should be stacked in the oven on top of Teflon transfer film. Place the Compcore coupon on the bottom of the stack. Heating both together will create a molecular bond between the two coupons.

Place the coupon stack in the oven at the same time as your sheet material. Since two coupons are thicker than the sheet, they will need equal or more heating time than the single layer sheet. Validate the process with your own heating equipment due to the different heating methods of various oven types.

The stack is transferred on the Teflon film with the polypropylene against the positive model. The Compcore face of the dual coupon is then facing the hot sheet of polypropylene. Peel off the Teflon film and immediately vacuform the sheet over the top of the whole positive model.

The inner coupon of polypropylene will balance the overall shrinkage and there should be little or no change in shape to the thermoformed device. Polypropylene sheet shrinkage varies from order to order and at times from sheet to sheet. The dual component cross bank construction technique has worked well in our lab and provides a convenient way to reinforce a KAFO for linear torque.

**BECKER ORTHOPEDIC**  
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635 Executive Drive • Troy, Michigan 48083-4576

248-588-7480 • 800-521-2192

Fax 248-588-2960 • 800-923-2537

BeckerOrthopedic.com