

DIAB Core Infusion™



Allows production of larger components

Ultra low VOC emissions

Faster mold cycle times

High fiber fractions

Additional weight savings

Consistent & repeatable components

Excellent skin/core bonding

The DIAB logo, featuring the word "DIAB" in a bold, blue, sans-serif font. The letter "I" is stylized with a red horizontal bar at the top.

DIAB Core Infusion™

The Tried & Tested Process for the Series Production of Composite Components

DIAB Core Infusion™ brings together all the benefits of sandwich composites with the processing, performance and health and safety advantages of closed molding.

Benefits

The benefits of Core Infusion have been verified in actual production situations and by independent testing. Today core infusion is a standard manufacturing process for major composite component manufacturers operating in the marine, public transportation, wind energy and industrial markets.



Improved Health & Safety

Compared to open molding, DIAB Core Infusion can reduce styrene emissions by up to 90%. The result is a cleaner, safer and healthier working environment that facilitates the recruitment and retention of personnel and enhances quality throughout the production process.



Faster Production

The DIAB process can cut mold cycle times by up to 50% and labor costs by 30%. It can be readily introduced using existing molds and without the need for heavy capital investment or sophisticated and expensive flow modelling software. With the DIAB system the specially grooved core not only enhances the structural performance of the composite component, but also acts as the resin transfer medium. By eliminating the requirement for sacrificial distribution mats or nets the cost of consumables and waste is significantly reduced.

In addition the grooved DIAB infusion core offers significantly higher flow rates than other distribution methods such as nets and flow mats. This not only enables the production of ultra-large components in a single shot but also minimizes the number of resin feeder lines.

Higher Quality & Performance

Repeatable and consistent performance is the hallmark of the DIAB system as it does not rely on the skills of the individual laminator. Laminate quality is much higher than is the case with open molding. Fiber fractions of 65% are readily possible enabling substantial increases in strength and stiffness to be achieved. The combination of high fiber fractions and controlled resin usage enables weight savings of up to 40%. The process also ensures secure bonding between the skins and core.



A Proven & Reliable Process with DIAB Cores

During the development of the infusion process, DIAB produced numerous test panels of different configurations using polyester, vinylester and epoxy resin systems. The programme included shear, out-of plane tensile, climbing drum peel and fatigue. All the results indicated that when compared to plain core material the grooves did not effect the mechanical properties. In addition independent ultra sound testing has been performed on large moldings to confirm the integrity of the skin to core bondline.

Since the introduction of the DIAB system countless composite component producers around the world have adopted DIAB Core Infusion as their process of choice for both large and small moldings destined for service in a very diverse range of 'performance critical' applications.

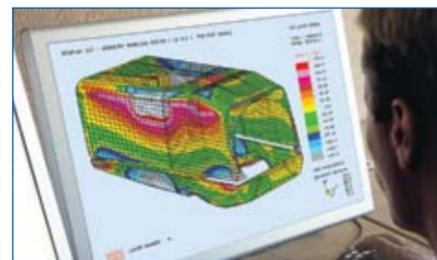
Complete Support

With its extensive and long term experience of infusion molding and sandwich composites, the DIAB Technologies strategically-



located teams are ideally placed to guide a company through every aspect of the process. In this way the changeover can be fast, smooth and cost effective with the absolute minimum interruption to the existing production operation.

If required DIAB Technologies structural engineers can provide a variety of services using a range of engineering tools including finite element modelling. These can include assistance with



the selection of the resins and fiber reinforcements and the re-engineering of an existing component to maximize its strength to weight ratio and/or enhance other performance parameters.

Testing & Training

Once the process methodology has been agreed, DIAB Technologies personnel can work with a company's production team to produce trial components and coupons that can be subjected to a variety of tests in DIAB's own extensive mechanical test laboratories. At the same time on-site training can be provided for personnel to ensure a trouble-free introduction.

The Process in Detail

DIAB Core Infusion is based on using an integral part of the sandwich composite – the core – as the transfer medium.

This is achieved by machining the core surface to produce a series of carefully positioned grooves to facilitate resin distribution. As a result the need for a sacrificial distribution net or mat (as is the case with some other infusion systems) is completely eliminated together with the requirement for peel ply and release film.



A grooved and perforated infusion DIAB core.

The first stage of the process is to apply the gel coat in a conventional way. If desired a skin coat (a relatively thin layer of surface mats) can be applied and then cured in order to enhance the surface finish. Next dry structural reinforcements for the outer skin are positioned in the mold. Then the pre-cut and shaped DIAB Infusion Core is placed into the mold and the inner skin dry reinforcements are laid up.



The core infusion process in progress.

The next stage is to install the resin feeder lines followed by the vacuum line. Finally the vacuum bag is installed and sealed along the edge of the mold flange. The vacuum is then applied and the resin inlet valve is opened to allow the infusion process to begin.



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We are a world leader in the provision of innovative sandwich composite solutions that make our customers products light, strong and competitive.

DIAB's offerings include high performance core materials, cost effective kits and a comprehensive range of engineering and process support services.

We provide composite solutions to a wide range of markets including: wind energy; commercial, military and pleasure marine; transportation; aerospace; industry and construction.

With personnel located throughout the world via 16 sales and technical support operations, we are able to offer worldwide support to our global customer base. We have manufacturing units in Australia, China, Ecuador, India, Italy, Lithuania, Sweden, the USA and Thailand.

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