

Success through individual solutions.

Our products and solutions in the area of textiles and composite materials meet the highest expectations. With our know-how of composites we are able to find a distinct, specially tailored solution for every customer and field of application. Especially for the VAP technology, SAERTEX offers a range of different products and solutions across the whole value chain.

PRODUCTS

- **VAP membrane**
Only the certified and tested VAP membrane permits the minimisation of trapped gas and air within composites and leads to a steadily high build quality of component parts.
- **NCF stitchbonded materials**
Our stitchbonded constructions made of non-crimp fabrics (NCFs) are mainly based on glass, aramide or carbon fibres; they are available in a wide variety of different types and qualities.



SAERTEX global headquarter in Saerbeck, Germany

SOLUTIONS AND SERVICES

- **Project engineering of VAP manufacturing processes**
We support you in the planning and implementation of a VAP production line.
- **Development support for VAP-compatible parts and assemblies**
We support you in the process-oriented design of component parts in order to maximise their build quality and integrity.
- **VAP technology training**
According to your needs, we can train your employees either in our training facilities or on-site with your own production equipment.

If you are interested in the VAP technology, please contact us under the address given below. Our agents will then discuss the details of a qualified bid with you.

Edition: 06 | 09

SAERTEX worldwide
Germany, France, Portugal, USA, South Africa, India, China



www.saertex.com

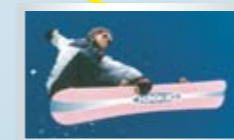
SAERTEX GmbH & Co. KG
Brochterbecker Damm 52
D-48369 Saerbeck

Telefon: +49 • 25 74 • 902 0
Telefax: +49 • 25 74 • 902 209

Email: VAP@saertex.com

VAP TECHNOLOGY

MEMBRANE SUPPORTED LOW-PRESSURE INFILTRATION TECHNOLOGY –
EXCLUSIVELY FROM SAERTEX!



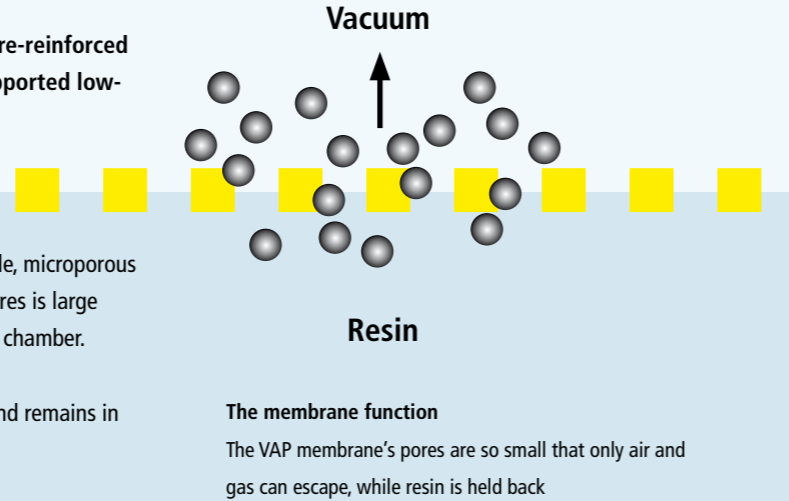
WIND ENERGY | OFFSHORE
BOAT AND SHIPBUILDING
RAILWAY
AUTOMOTIVE
AEROSPACE
PIPE RELINING
CIVIL ENGINEERING
RECREATION

What is VAP technology?

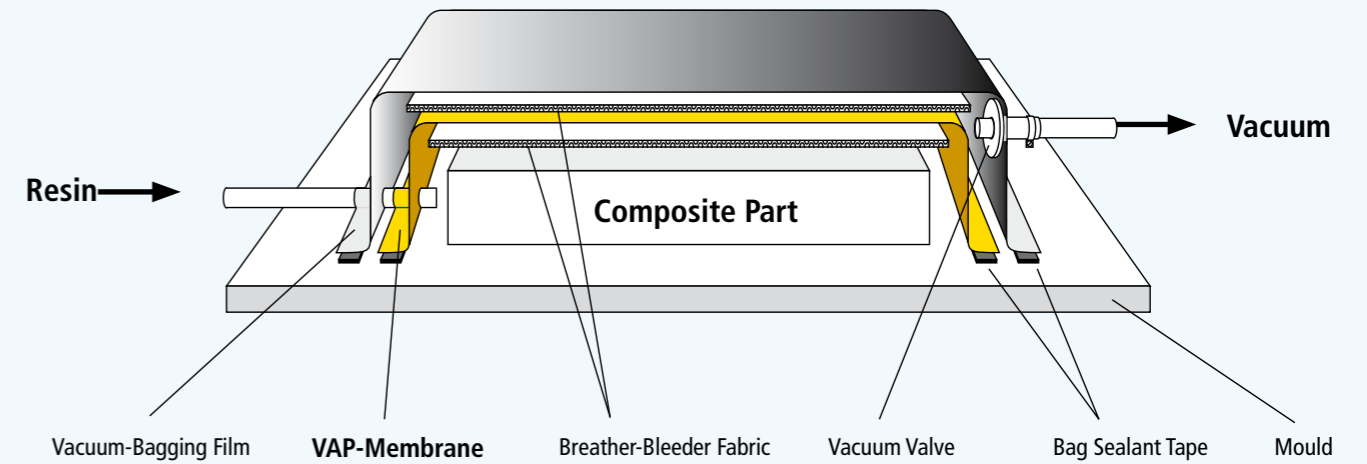
Vacuum Assisted Process (VAP)* is a technique for manufacturing fibre-reinforced parts by means of vacuum technology. VAP employs a membrane-supported low-pressure infiltration process.

The composite part that is to be infiltrated is covered by an air/gas permeable, microporous membrane which creates a resin barrier. The diameter of the membrane's pores is large enough to allow uninhibited removal of gas and air into an exterior vacuum chamber.

The resin that is infiltrated within the membrane is held back by the latter and remains in the so-called construction chamber.



Functional scheme of the VAP process



The functional scheme for the membrane supported low-pressure infiltration technology of VAP is illustrated for a flat composite part. The most important features are:

- Favourable vacuum distribution during infiltration and curing
- Homogeneous fibre volume across the entire component cross-section
- Resin flow channels do not have to be planned in detail
- Gas and air residues from the matrix can be removed across the entire membrane surface
- A resin trap, as required by other known vacuum infiltration processes, is not necessary
- The resin can de-gas freely during infiltration and curing, the forming of pores is suppressed
- The process is in principle self-regulating; the fibre-resin ratio can be set easily by measuring the added amount of resin

Why VAP technology?

The advantages of VAP as compared to other manufacturing processes lie in the minimisation of trapped gas and air within the component part. This results in a high process quality as well as an excellent build quality.

Maximum vacuum can be applied for the whole time during infiltration and curing, this aids a high fibre volume of the component part. Curing works in the same way as with other vacuum infiltration techniques, hence it requires no change in existing equipment.

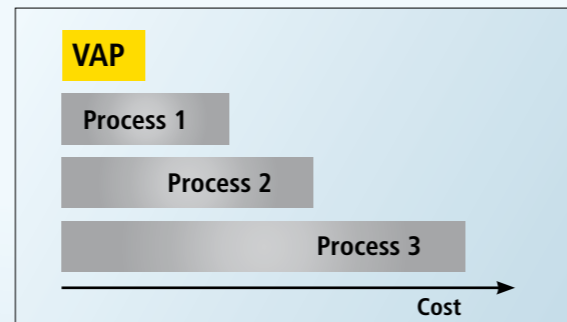
Tests conducted at the University of Delaware, USA have shown that VAP can achieve significant quality improvements in comparison to equally expensive vacuum infiltration processes. Parts treated with VAP, for instance, were virtually free of »dry spots«.

Respective microscope exposures show the high quality of cured parts. Another important advantage of the process is the low up-front investment needed for machines and tools.

- Minimisation of trapped gas and air

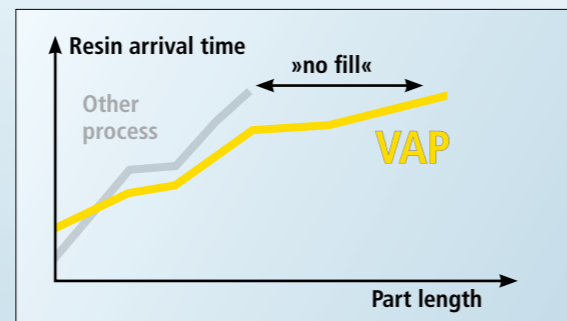
Optical microscope photograph

- Minimum cost for a given process and build quality



Source: In-house research

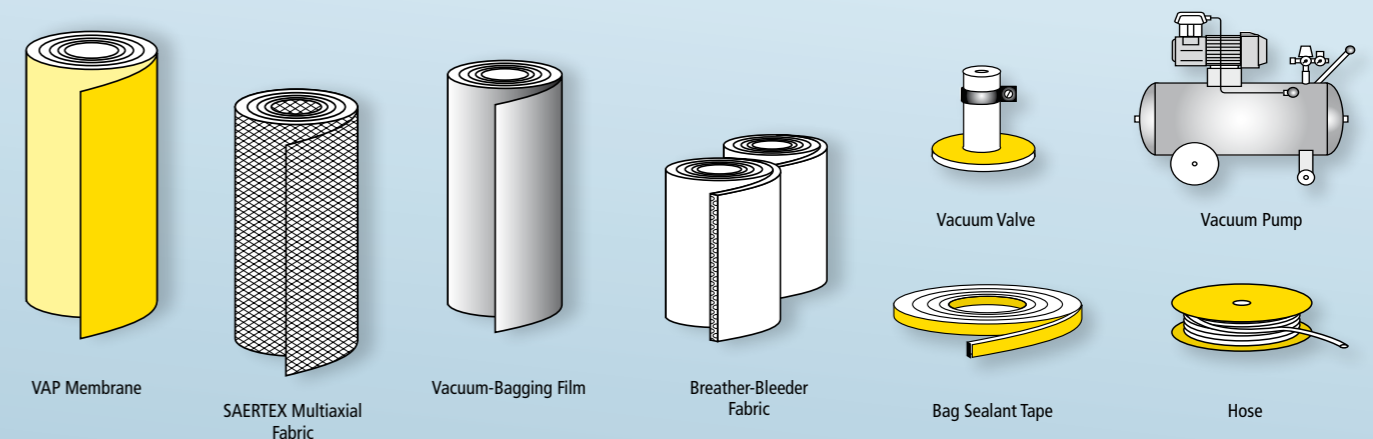
- Minimisation of »dry spots«



Source: University of Delaware, USA

Basic equipment for VAP

The required equipment for getting started with VAP is rather small. Also small businesses can use the technology without having to invest in high-tech machinery, like autoclaves.



*SAERTEX is the sole licensee of patent no. DE 10013409 (held by EADS). The license, however, does not apply to the field of aviation and astronautics.