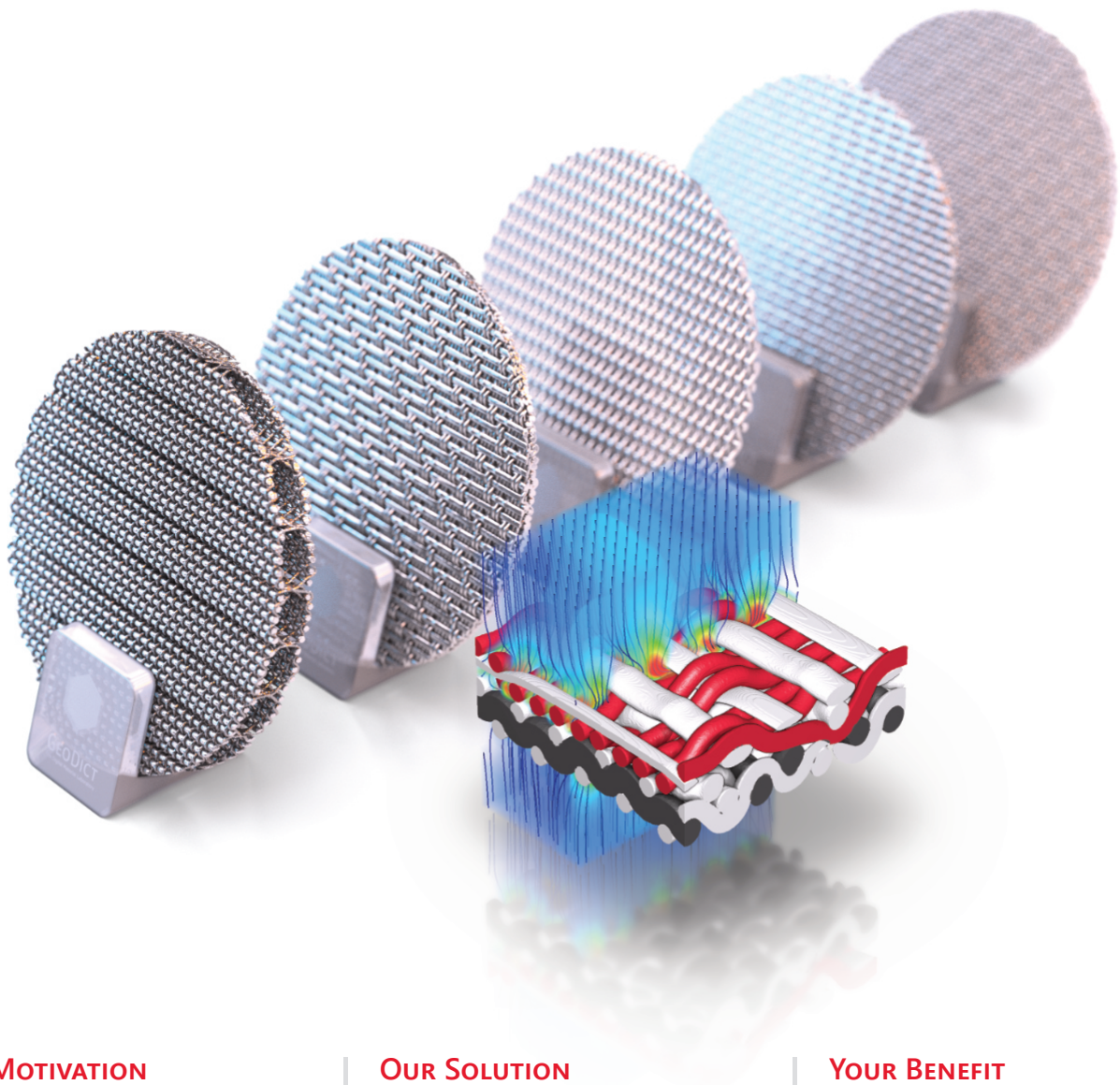


# GEO DICT

The Digital Material Laboratory

DIGITAL DESIGN  
AND DEVELOPMENT  
OF WOVEN MEDIA



## THE MOTIVATION

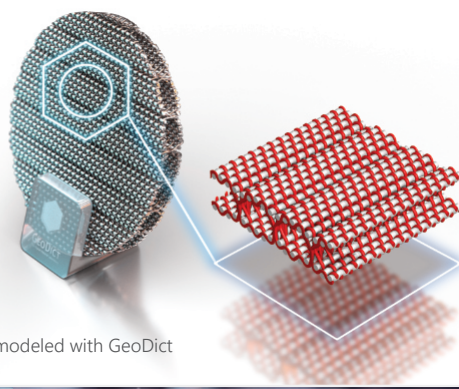
Modeling and simulations of woven media empower users to digitally design, analyze and optimize new products in a time-saving and cost-efficient manner. GeoDict offers the possibility to model and understand novel and complex woven media and to identify and solve problems at an early stage. Various designs and conditions can be tested digitally to find the best solution for an application.

## OUR SOLUTION

Simulations with GeoDict help manufacturers of woven media to understand existing materials and to improve them in a targeted manner. This understanding not only leads to an efficient improvement of materials, but also to the development of completely new materials. GeoDict covers the entire product design and development.

## YOUR BENEFIT

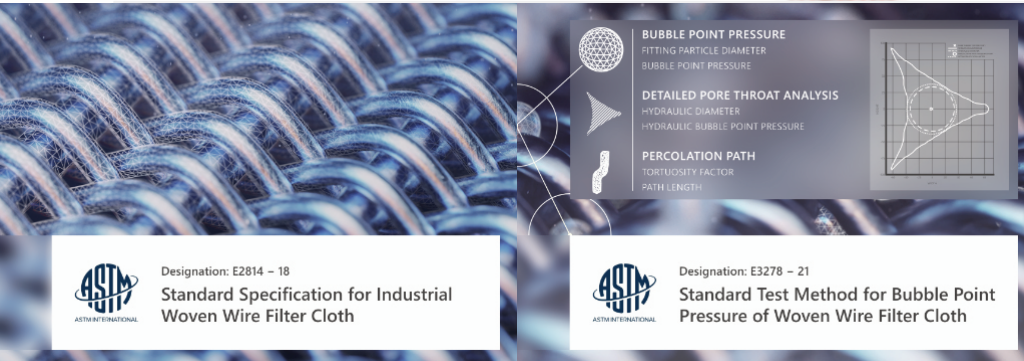
Computer simulations are used to develop new woven media by selecting a few promising designs and reducing costly laboratory testing to these few designs. The development cycle can be significantly accelerated by parallelized parameter studies, resulting in faster and better products, and savings in time and costs.



A distance fabric designed and modeled with GeoDict

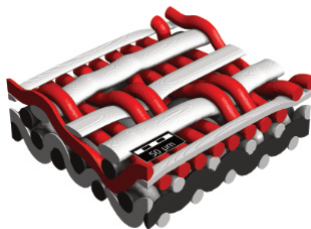
## DIGITALIZATION

Import a  $\mu$ CT scan of the filter material or a CAD model of the filter. Image filters and AI tools help segmenting and identifying useful information.



## MATERIAL ANALYSIS

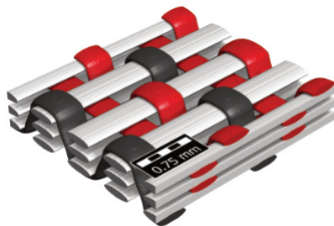
Compute porosity, open & closed pores, pore size distribution, percolation path(s) and bubble point of the woven media using GeoDict software, an internationally recognized standard as per ASTM E2814-18 and ASTM E3278-21 standards.



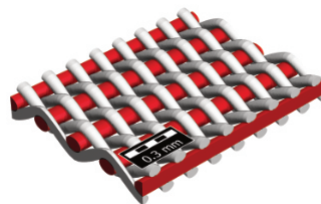
Complex multilayer weave



Multifilament reverse Dutch weave



Multilayer weave orthogonal



Plain reverse Dutch weave

## MICROSTRUCTURE DESIGN

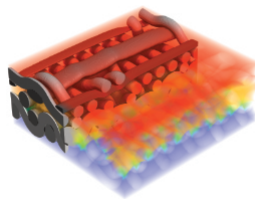
Design and model the microstructure of the woven media with the WeaveGeo module.

Use standard woven media generators (plain weave, twill weave, and satin weave) to model different samples.

Use the FreeWeave option to design and generate any complex and innovative model of woven media.

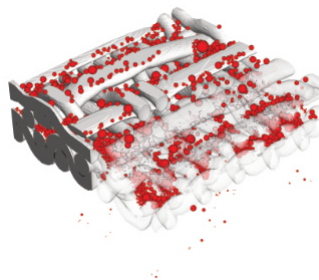
### Flow simulation with FlowDict:

- Simulate the flow through the woven media.
- Determine pressure and velocity distribution, and permeability of the woven media.



### Filtration simulation with FilterDict:

- Simulate single-pass and multi-pass filtration tests
- Simulate particulate flow through the media
- Determine filtration efficiency
- Evaluate pressure drop evolution, (fractional) efficiencies, and filter capacity



## PROPERTY PREDICTION

### Calendering process simulation with the ElastoDict module:

- Simulate the deformation of the woven media under compression.
- Provides the stress-strain curves.
- The user can simulate and check various parameters e.g., the pore size distribution and permeability before and after the calendering process.