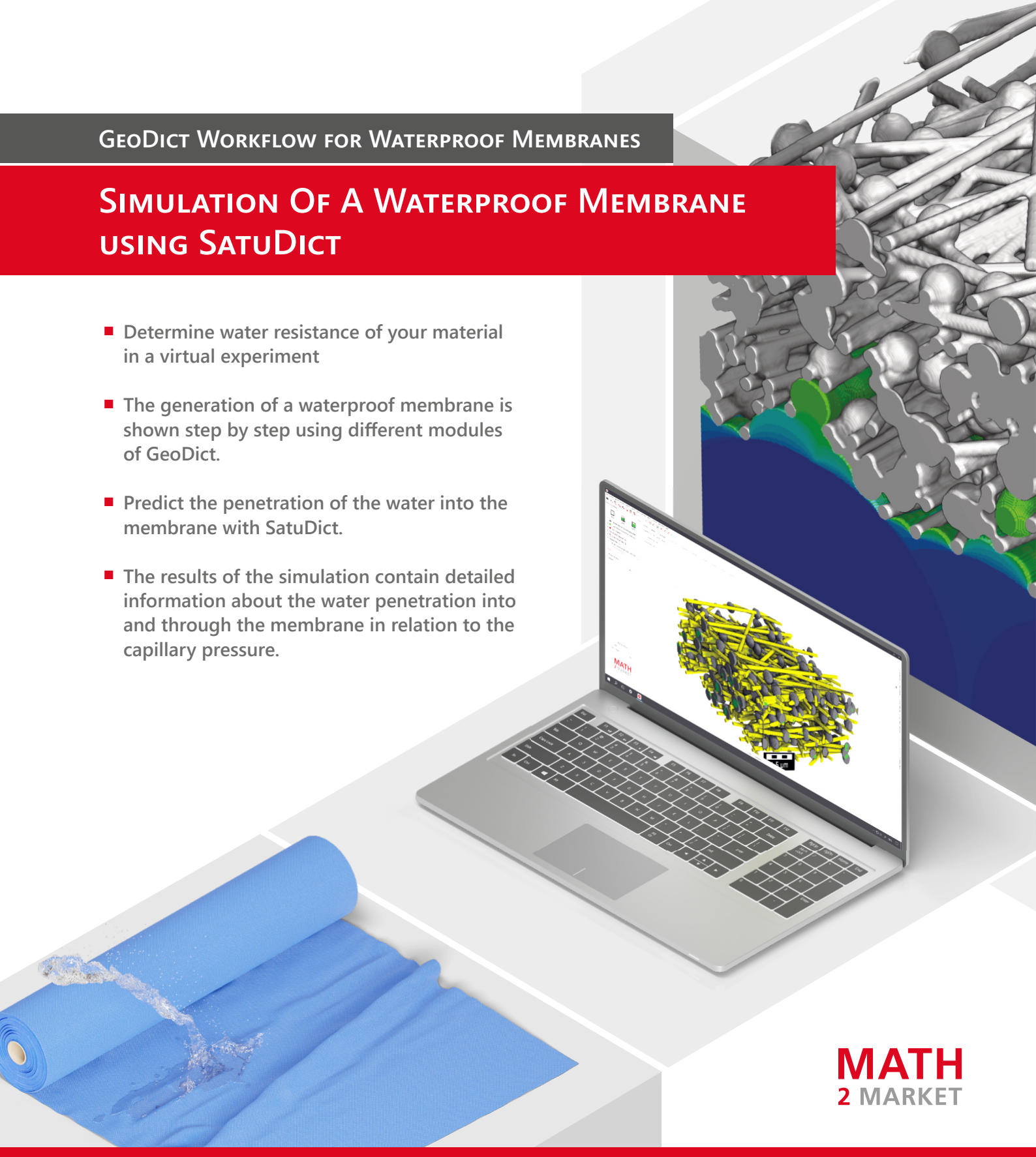
GeoDict

The Digital Material Laboratory

GeoDict Workflow for Waterproof Membranes

Simulation Of A Waterproof Membrane using SatuDict

- Determine water resistance of your material in a virtual experiment
- The generation of a waterproof membrane is shown step by step using different modules of GeoDict.
- Predict the penetration of the water into the membrane with SatuDict.
- The results of the simulation contain detailed information about the water penetration into and through the membrane in relation to the capillary pressure.



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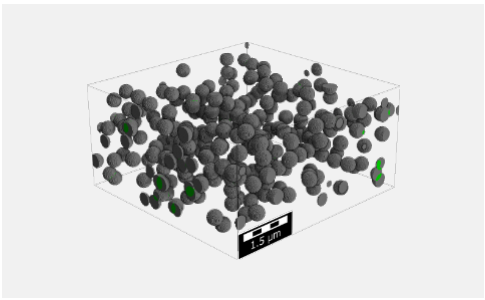
GeoDict Workflow for Digital Material Development

1 Grain Generation

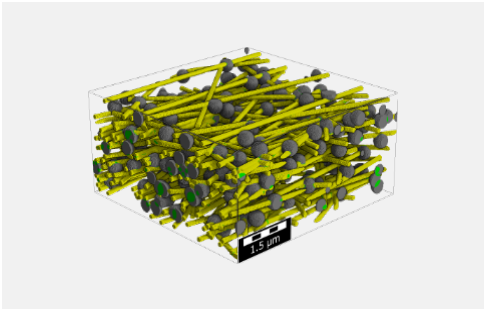


- The generation starts with the creation of grains based on an SEM image.
- The grains serve as crossing points for fibers that will be added in the next step.

Modules: GrainGeo (Create Grains)

Result: Generation of grains

2 Fiber Generation

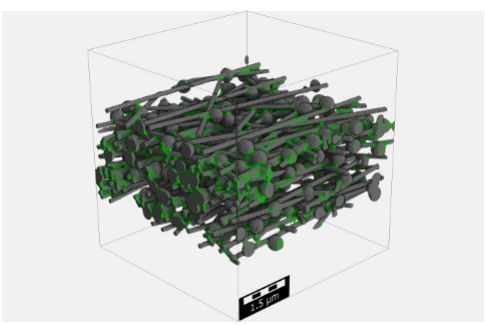


- In the next step, fibers are added that partly go through intersection points defined by grains.
- The type, number, curvature and orientation of the fibers, as well as their shape can be precisely defined and selected in GeoDict.

Modules: FiberGeo (Create Fibers)

Result: Addition of fibers to the structure

3 Addition of Binder

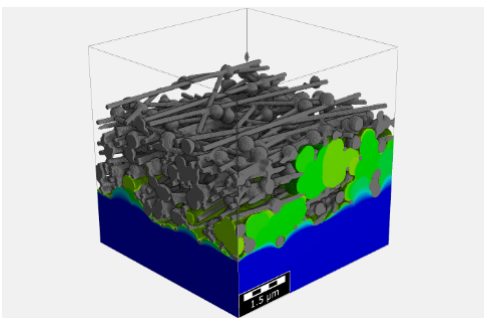


- The structure generation is completed with the help of appropriate binder.
- The added binder links the grains and fibers to fully match the original structure.
- Therefore, the proportion, contact angle and the distribution of the binder can be individually defined.

Modules: FiberGeo (Add Binder)

Result: Completion & enlargement of the structure

4 Simulation SatuDict

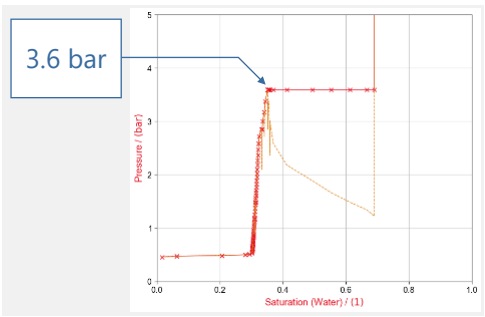


- The results show an accurate prediction of the material's water permeability.
- The exact process from the first contact, over the first penetration into the structure, up to the complete filling of the structure can be visualized.

Modules: SatuDict (Capillary pressure curve)

Result: Visualization of water invading the structure

5 Capillary Pressure Curve



- The results show a two-phase flow simulation as well as a capillary pressure curve.
- The displayed plots can be used to exactly determine at which pressure the water invades the structure and how it proceeds.

Modules: SatuDict (Capillary pressure curve)

Result: Visualization of the capillary pressure curve

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