

GEO DICT

The Digital Material Laboratory

for Soot Filtration

Vision

Design and improve Diesel Particulate Filter (DPF) and Gasoline Particulate Filter (GPF) through fast simulations.

About

Design the micro-structure of ceramic filter media.
Design honeycomb structures of DPFs and GPFs

Benefits

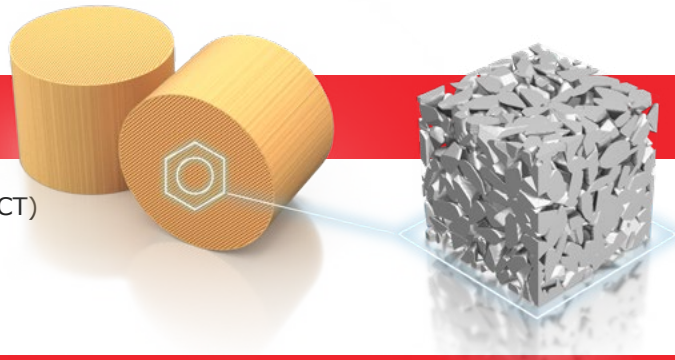
GeoDict reduces the expensive and time-consuming tests of ceramic and honeycomb prototypes.



MATH
2 MARKET

Digitalization

- Import the material as 3D image (e.g. μ CT)
- Design the micro-structure model
- Design the honeycomb model



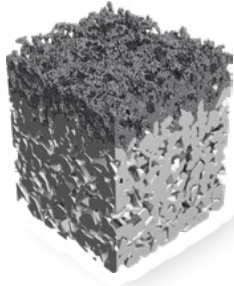
Digitalization of
DPF ceramic

Micro-Structure Design

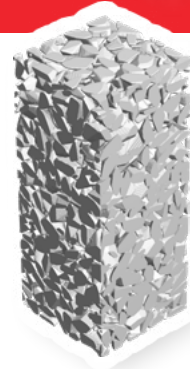
Design your
micro-structure
material with **GrainGeo**
and honeycomb
structures
with **GridGeo**



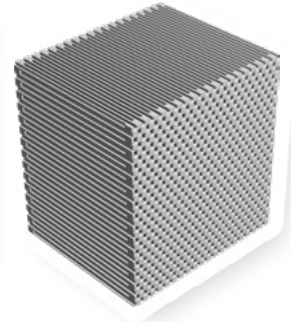
Lead zirconate
titanate ceramic



DPF two-layer ceramic



DPF ceramic

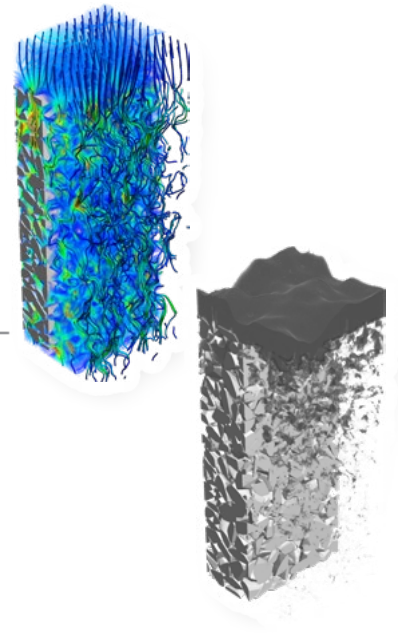


Honeycomb model

Material Analysis

Characterize the
ceramic with
FlowDict and **PoroDict**

- Analyze μ -CT scans and micrographes.
- Determine the clear pressure drop.
- Evaluate pore size distribution and bubble point.
- Determine the permeability of media.



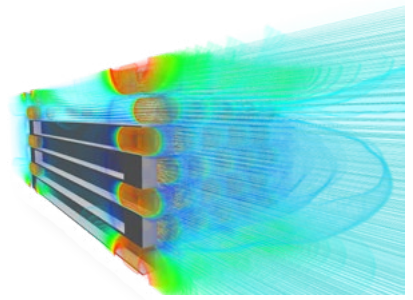
Analyze the filtration
performance
with **FilterDict**

- Simulate soot particle size distribution.
- Evaluate the loading curves.

Design honeycombs
with **GridGeo**

Analyze the filtration
performance
with **FilterDict**

- Square and triangle shaped honeycombs
- Fully customizable geometrical parameters
- Length and lateral dimensions
- Inflow and outflow



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