

Material design for particle reinforced polyamide

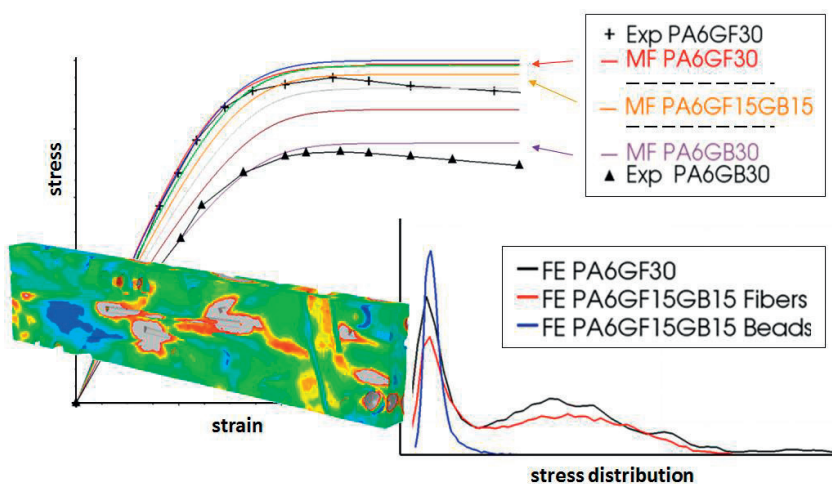
CUSTOMER: SOVITEC

- Leader in the production of glass beads
- Provider of superior polymer solutions based on glass beads fillers
- Driver of innovation on the material market

CHALLENGE

- Replace existing glass fiber reinforcement technology by solutions based on glass beads
- Provide equal or improved material performance with the new solution
- Reduce cost of material production

HOW CAN DIGIMAT TACKLE THESE CHALLENGES?



MATERIALS

Reinforced Plastics

PERFORMANCES

Stiffness, Failure

DIGIMAT

Digmat-MF, Digmat-FE

CAE TECHNOLOGY

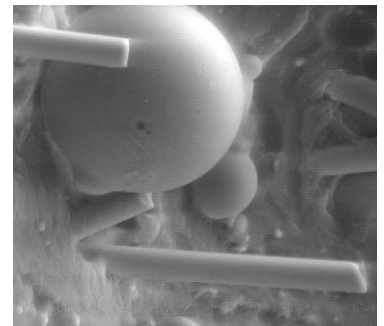
Abaqus Standard

INDUSTRY

Material Supplier

APPLICATION

Material Design



Picture of the PA6/GF30 microstructure

DIGIMAT SOLUTION

- Calibration of micromechanical material models for PA6/GF30 and PA6/GB30 based on experimental results
- Virtual compounding of new material mixture in Digmat-MF
- In-depth micro investigation of promising candidates by Digmat-FE
- PA6/GF15/GB15 provides same composite stiffness in fiber direction and transverse to fiber direction
- 15% of glass beads lead to an isotropisation of thermal properties
- 15% of glass beads lead to an improvement of failure strength

RESULTS

- The introduction of the new material led to:
 - 20% price per produced part
 - 29% cycle time per part
 - 4% part reject rate
 - Machine durability

“This study allowed Sovitec to obtain the arguments necessary in order to be more effective in the prospection of new markets, but also to consolidate its image of serious in the presentation of technical results in the plastic industry. Clearly a Plus.”

Frederic Juprelle, Business Unit Manager, Sovitec

The nonlinear multi-scale material & structure modeling platform

Digimat material modeling platform means developing innovative, optimized and cost-effective products. As a unique nonlinear multi-scale material and structure modeling platform, Digimat offers:

Digimat MF: Mean-Field homogenization software used to predict the nonlinear behavior of multi-phase materials.

Digimat FE: Finite Element based homogenization software used to model the nonlinear behavior of Representative Volume Elements (RVE) of material microstructures.

Digimat MX: Material eXchange platform used to prepare, store, retrieve and securely exchange Digimat material models between material suppliers and end-users.

Digimat CAE: Digimat linear and nonlinear interfaces to major processing and structural FEA software to enable multi-scale analyses of composite structures.

Digimat MAP: Shell & 3D mapping software used to transfer fiber orientation, residual stresses and temperatures between dissimilar processing and structural meshes.

Digimat RP: Easy and efficient solution for the design of fiber reinforced plastic parts.

Digimat HC: Easy and efficient solution for the design of honeycomb sandwich panels.



The material modeling company

MSC Software Company

e-Xstream engineering is a provider of simulation software & engineering services, 100% focused on advanced material modeling. e-Xstream was founded in 2003 in Belgium and Luxembourg. e-Xstream is an MSC Software company since September 2012 with more than 1100 associates working from over 20 offices around the world.

e-Xstream engineering develops and commercializes Digimat – the nonlinear multi-scale material and structure modeling platform that fastens the development of optimal composite materials and parts.

Digimat customers are material experts and structural engineers who accurately predict the behavior of multi-phase composite materials and structures. Digimat is used by all major material suppliers and users across all industries (Automotive, Aerospace, Electric & Electronics, Leisure, Defense ...).

With this important customer base worldwide, e-Xstream combines deep expertise in material modeling and numerical simulations with the business understanding of the large variety of materials used across all industries.

www.e-Xstream.com

