Impregnation of porous glass mat by a non-newtonian fluid with fillers using knife process: study of process parameter impact

Barbara Brudieu*†[1], Jérémie Teisseire[1], Sandrine Clary-Lespinasse[1], Alexandre Prevoteau[1], Franck Pigeonneau[2], Rami Harmand[2], and Romain Castellani[2]

[1]Saint-Gobain Recherche (SGR) – SAINT-GOBAIN – France

[2]Centre de Mise en Forme des Matériaux (CEMEF) – Centre National de la Recherche Scientifique : UMR7635, MINES ParisTech - École nationale supérieure des mines de Paris – France

Résumé

Saint-Gobain gathers several brands that manufacture and sale various product with wet coating made using wet deposition techniques such as mirrors, lacquered glazings for interior decoration, coated porous materials for acoustic wall panels etc.
Manage formulation, rheology and coating process parameters is mandatory to ensure good final properties of a product and high productivity. However, for some systems very complex such as porous materials coated with non-newtonian and highly filled materials, these parameters management is empirical so far at industrial scale which may result in a lack of performance stability. R&D is working for 4 years to better understand the impact of process parameters (rheology, shear rate) on product performances and correlation with its microstructure.
Hence, we will present some results we have obtained by performing industrial trials and by using tools such as capillary rheometer or tomography. We will also present some theoretical and experimental results obtained in the frame of a collaboration with CEMEF that is focused on a better understanding of parameters that drives impregnation in a porous material.

Mots-Clés: capillary rheometer, tomography

*Intervenant

†Auteur correspondant: barbara.brudieu@saint-gobain.com