



LMS Seminar

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Graded foams by time dependent boundary conditions in blowing agent sorption

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ABSTRACT

Layered and graded foams have proven superior to their uniform counterparts in terms of structural, and functional properties. This is also suggested by nature, which is abundant with porous material structures whose attributes go far beyond any artificial foam. To date, advanced foamed structures have been generated via advanced, though complex/time consuming technologies. We have explored the possibility of generating layered and graded polymeric foams by using simple gas foaming technology, with the sole introduction of time-varying boundary conditions of the gas sorption stage. We show that by ingeniously designing the sorption step it is possible to achieve nontrivial gas concentration profiles and, correspondingly, at pressure release, foams with density and/or morphology profiles.

BIOGRAPHY

Ernesto Di Maio holds a Ph.D. in Technology of Materials and Process from the University of Naples Federico II, Naples, Italy, where he is professor of Materials Science and Technology and director of the foamlab. He was a Visiting Scientist at the Erlangen Graduate School in Advanced Optical Technologies of the Friedrich- Alexander Universität Erlangen-Nürnberg, Germany, a Visiting Research Scholar at the Department of Chemical Engineering of the University of Houston, Texas, USA, and a Visiting Scientist at Tech de Monterrey, Monterrey, Mexico. The research work is focused on polymeric foams, with the study of the physical properties of the polymer/blowing agent system and the processing of the same to produce advanced foams. He is the recipient of the 2021 Morand Lambla award of the Polymer Processing Society. He authored ca. 120 articles in indexed journals, 1 book, and 12 patents on foams and foam-related technologies.