

Abstract

A cold extrusion process has been developed to tailor a porous structure from polymeric waste. The use of an extruder to manufacture acoustic materials from recycled waste is a novel idea and the author is not aware of any similar attempts. The extruder conveys and mixes the particulates with a reacting binder. The end result is the continuous production of bound particulates through which a controlled amount of carbon dioxide gas that is evolved during the reaction is used to give the desired acoustic properties. The cold extrusion process is a low energy consuming process that reprocesses the post manufacturing waste into new vibro-acoustic products that can be used to meet the growing public expectations for a quieter environment. The acoustical properties of the developed products are modelled using Pade approximation and Johnson-Champoux-Allard models.

Applications for the developed products are widespread and include acoustic underlay, insulation and panels in buildings, noise barriers for motorways and railway tracks, acoustic insulation in commercial appliances and transport vehicles.

Keywords:

Re-cycling polymeric waste, Cold extrusion, Vibro-Acoustic materials, Thermal insulation materials.