

Title: Evaluation of the influence of testing parameters on the melt flow index of thermoplastics

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Abstract: The main goals of the present work are the evaluation of the influence of several variables and test parameters on the melt flow index (MFI) of thermoplastics, and the determination of the uncertainty associated with the measurements. To evaluate the influence of test parameters on the measurement of MFI the design of experiments (DOE) approach has been used. The uncertainty has been calculated using a "bottom-up" approach given in the "Guide to the Expression of the Uncertainty of Measurement" (GUM). Since an analytical expression relating the output response (MFI) with input parameters does not exist, it has been necessary to build mathematical models by adjusting the experimental observations of the response variable in accordance with each input parameter. Subsequently, the determination of the uncertainty associated with the measurement of MFI has been performed by applying the law of propagation of uncertainty to the values of uncertainty of the input parameters. Finally, the activation energy (E_a) of the melt flow at around 200 degrees C and the respective uncertainty have also been determined. (C) 2012 Elsevier Ltd. All rights reserved.

Author Keywords: Melt Flow Index; HDPE; Design of Experiments; Analysis of Variance; Uncertainty

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