QIRT & DIC association to analyse the thermomechanical behavior of a semicristalline polymer

by J.-M. Muracciole*,**, B. Wattrisse*, Y. El Kaïm*, A. Chrysochoos*,**

** Mechanics and Civil Engineering Laboratory, Montpellier II University, France*
*** Polytech'Montpellier , Montpellier II University, France*

Abstract

This paper first presents the characteristics of a new experimental set-up using digital image correlation and infrared thermography. The kinematical data are used to track the temperature variations of material surface elements. They are then combined to construct local energy balance. To illustrate the interest of such an approach, the paper then describes the calorimetric effects accompanying the propagation of necking in a plasticized PolyAmide 11. A thermodynamic analysis of cyclic loading finally aims to show the existence of an entropic elastic effect generally associated with rubber-like materials.

This article was submitted to the QIRT Journal for publication.