



“Gheorghe Asachi” Technical University of Iasi, Romania



ARTIFICIAL AGING EXAMINATION OF PVC FIBERS AS VIBRATING STRINGS

Dénes Kocsis^{1*}, György Deák², Sándor Kéki², Gergely Dezsó³, Róbert Horváth³

¹Department of Chemical and Environmental Engineering of the University of Debrecen,
2-4 Ótemető Street, Debrecen, HU-4028, Hungary

²Department of Applied Chemistry of the University of Debrecen, 1 Egyetem Square, Debrecen, HU-4032, Hungary

³Department of Production Engineering of the College of Nyíregyháza, 31/b Sóstói Street, Nyíregyháza, HU-4400, Hungary

Abstract

Changes in material properties are examined in this work by vibration diagnostic techniques. In the article examinations of soft poly(vinyl chloride) (PVC) fibers, which were tested as vibrating strings are presented after different UV light induced aging times. The developed experimental system is presented in this manuscript and the main goal is to determine material changes as the results of artificial aging by special vibration diagnostic methods. The damped oscillations, where PVC fibers are stretched and twanged as strings are analyzed in this work. Parameters are also determined and their values are given after different aging time and relevant property changes are identified. The general equation of damped oscillation is written in a modified form, and the change of the traditional damping coefficient proves to be significant and the angular acceleration introduced by us also well characterizes the property changes induced by artificial aging.

Keywords: aging, degradation, material properties, poly(vinyl chloride), vibration

Received: May, 2014; *Revised final:* February, 2015; *Accepted:* February, 2015; *Published in final edited form:* November 2018

* Author to whom all correspondence should be addressed: e-mail: kocsis.denes@eng.unideb.hu; Phone: +36 52 415-155; Fax: +36 (52) 418-643