

June 2007

## Polymerization Shrinkage of Dental Composites

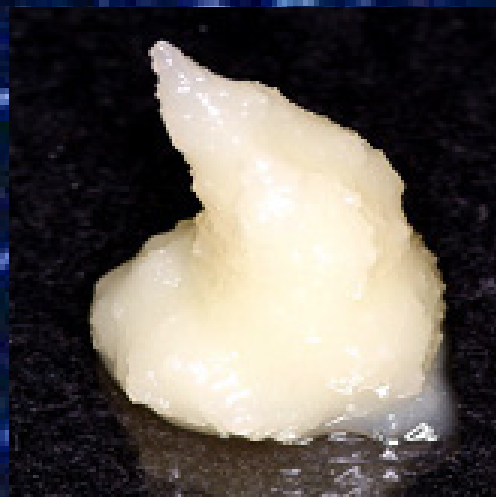
Filled dental composite resins can undergo volumetric shrinkage upon curing. This results in contraction stresses within the material, which can cause mechanical failure at the composite/tooth interface or the formation of marginal gaps permitting the ingress of bacteria into the cavity. Therefore, the dimensional stability of dental composites is essential to the longevity and function of the restoration.

A study was undertaken by the Department of Materials Engineering at Monash University, Melbourne, Victoria, Australia and the results published by W.D. Cook, M. Forrest, and A.A. Goodwin under the title "A simple method for the measurement of polymerization shrinkage in dental composites" in *Dental Materials, Volume 15, Issue 6 (1999)*. In this study a simple non-contact method was developed to measure the polymerization shrinkage of dental composites. A Micromeritics AccuPyc gas pycnometer was used to determine the volumes of specimens prior to and after photopolymerization, from which the total volumetric shrinkage could be determined.

The author states, "The gas pycnometry method described has similar accuracy and is less labor intensive than other liquid-based dilatometric methods of measuring polymerization shrinkage. For convenient and fast analyses where only the total amount of shrinkage is required, the gas pycnometer method is applicable, especially if the resins are photocured."

This method is appropriate for shrinkage measurements where only the total amount of shrinkage is required and in particular for the measurement of shrinkage of photocured materials which are sensitive to water absorption."

A copy of this article can be obtained from Science Direct at [www.sciencedirect.com/science/journal/01095641](http://www.sciencedirect.com/science/journal/01095641).



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