

Author:  [ADVANCED](#)

Volume Page

Keyword:    [TOP](#) > [Available Issues](#) > [Table of Contents](#) > [Abstract](#)

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[\[PDF \(432K\)\]](#) [\[References\]](#)**Low-shrinkage Composite for Dental Application**[Nicoleta ILIE](#)<sup>1)</sup>, [Ester JELEN](#)<sup>1)</sup>, [Tatiana CLEMENTINO-LUEDEMANN](#)<sup>1)</sup> and [Reinhard HICKEL](#)<sup>1)</sup>

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**Abstract:**

In modern research, development of monomers that reduce shrinkage of composite materials remains an ongoing quest and perennial challenge. The purpose of this study, therefore, was to analyze the shrinkage behaviour of an innovative composite material for dental restorations based on a monomer with a new chemical formulation, known as silorane. To this end, shrinkage stress development during curing, gel point, and coefficient of near linear fit of contraction stress/time were evaluated after polymerizing the material with 10 different curing regimes.

Shrinkage stress varied between 1.4 MPa after a 10-second curing in a pulsed regime to 4.4 MPa after curing for 40 seconds with a high energy curing unit, Bluephase. Pearson correlation analysis showed that with respect to the tested curing units, shrinkage stress correlated significantly with energy density (0.89), irradiance (0.70), curing time (0.51), coefficient of near linear fit of contraction (0.70), and gel point (-0.60).

Silorane exhibited low shrinkage stress values in comparison to regular methacrylate composites. Nevertheless, stress due to thermal contraction when the light exposure ended was not negligible—but could be reduced by applying the appropriate curing strategy.

**Key words:**[Silorane](#), [Shrinkage](#), [Composite](#)

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