

# Interfacial fracture resistance of ceramic-resin composite bilayer

**Chanavut Asvanund**

Prosthodontics Department,  
Faculty of Dentistry, Mahidol University

**Premwara Triwatana**

Prosthodontics Department,  
Faculty of Dentistry, Mahidol University

**Kallaya Suputtamongkol**

Prosthodontics Department,  
Faculty of Dentistry, Mahidol University

**Jutamast Thepchai**

Prosthodontics Department,  
Faculty of Dentistry, Mahidol University

## Abstract

**Objective:** The purpose of this study was to evaluate the relationship between interfacial crack lengths and Vickers indentation loads on ceramic-resin composite specimens.

**Materials and methods:** Five heat-pressed ceramic specimens, with dimension of 3x4x20mm, were fabricated according to the manufacturer's instructions. For each ceramic bar, the bonding surface was acid-etched, silanized and bonded with hybrid resin composite. The surface of bonded specimen used for indentation was polished through 0.01  $\mu\text{m}$  alumina paste. The diamond pyramidal indenter was used for loading on a ceramic surface closed to the interface. Loads ranging between 0.98 - 9.8 N were used for indentation. The interfacial debonding length of each indentation load was measured. Pearson Correlation analysis was performed for a statistical analysis.

**Results:** From Pearson Correlations, there was a positive relationship between the interfacial crack size and Vickers indentation load ( $R^2 = 0.963$ ). The result from linear regression analysis indicated that the interfacial crack length was directly related to the indenter load.

**Conclusion:** There was a linear relationship between interfacial crack lengths and indentation loads. The further development of a model analysis for bilayered structure should be useful for characterizing the interfacial fracture resistance of dental bilayered specimens.

**Key words:** interfacial crack, ceramic, resin composite, fracture, indentation, bonding

## Correspondence author:

**Kallaya Suputtamongkol**

Prosthodontics Department,  
Faculty of Dentistry, Mahidol University,  
6 Yothi rd. Ratchathawi, Prayathai  
Bangkok 10400

**Tel:** 02-200-7818

**Fax:** 02-200-7816

**Email:** kallaya.sup@mahidol.ac.th

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