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ONLINE ISSN : 1881-1361

PRINT ISSN : 0287-4547

**Dental Materials Journal**

Vol. 29 (2010) , No. 1 p.68-74

[\[PDF \(2383K\)\]](#) [\[References\]](#)**Direct 3-D morphological measurements of silicone rubber impression using micro-focus X-ray CT**[Masayuki KAMEGAWA](#)<sup>1)2)</sup>, [Masayuki NAKAMURA](#)<sup>1)3)4)</sup>, [Yu FUKUI](#)<sup>4)</sup>, [Sadami TSUTSUMI](#)<sup>5)</sup> and [Masaki HOJO](#)<sup>6)</sup>

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(Received April 1, 2009)

(Accepted October 14, 2009)

**Abstract:**

Three-dimensional computer models of dental arches play a significant role in prosthetic dentistry. The microfocus X-ray CT scanner has the advantage of capturing precise 3D shapes of deep fossa, and we propose a new method of measuring the three-dimensional morphology of a dental impression directly, which will eliminate the conversion process to dental casts.

Measurement precision and accuracy were evaluated using a standard gage comprised of steel balls which simulate the dental arch. Measurement accuracy, standard deviation of distance distribution of superimposed models, was determined as  $\pm 0.050$  mm in comparison with a CAD model. Impressions and casts of an actual dental arch were scanned by microfocus X-ray CT and three-dimensional models were compared. The impression model had finer morphology, especially around the cervical margins of teeth. Within the limitations of the current study, direct three-dimensional impression modeling was successfully demonstrated using microfocus X-ray CT.

**Key words:**

[Silicone rubber impression](#), [Micro-focus X-ray CT](#), [3-D morphology](#)

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To cite this article:

Masayuki KAMEGAWA, Masayuki NAKAMURA, Yu FUKUI, Sadami TSUTSUMI and Masaki HOJO. Direct 3-D morphological measurements of silicone rubber impression using micro-focus X-ray CT . Dent. Mater. J. 2010; 29: 68-74 .

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doi:10.4012/dmj.2009-021

JOI JST.JSTAGE/dmj/2009-021

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